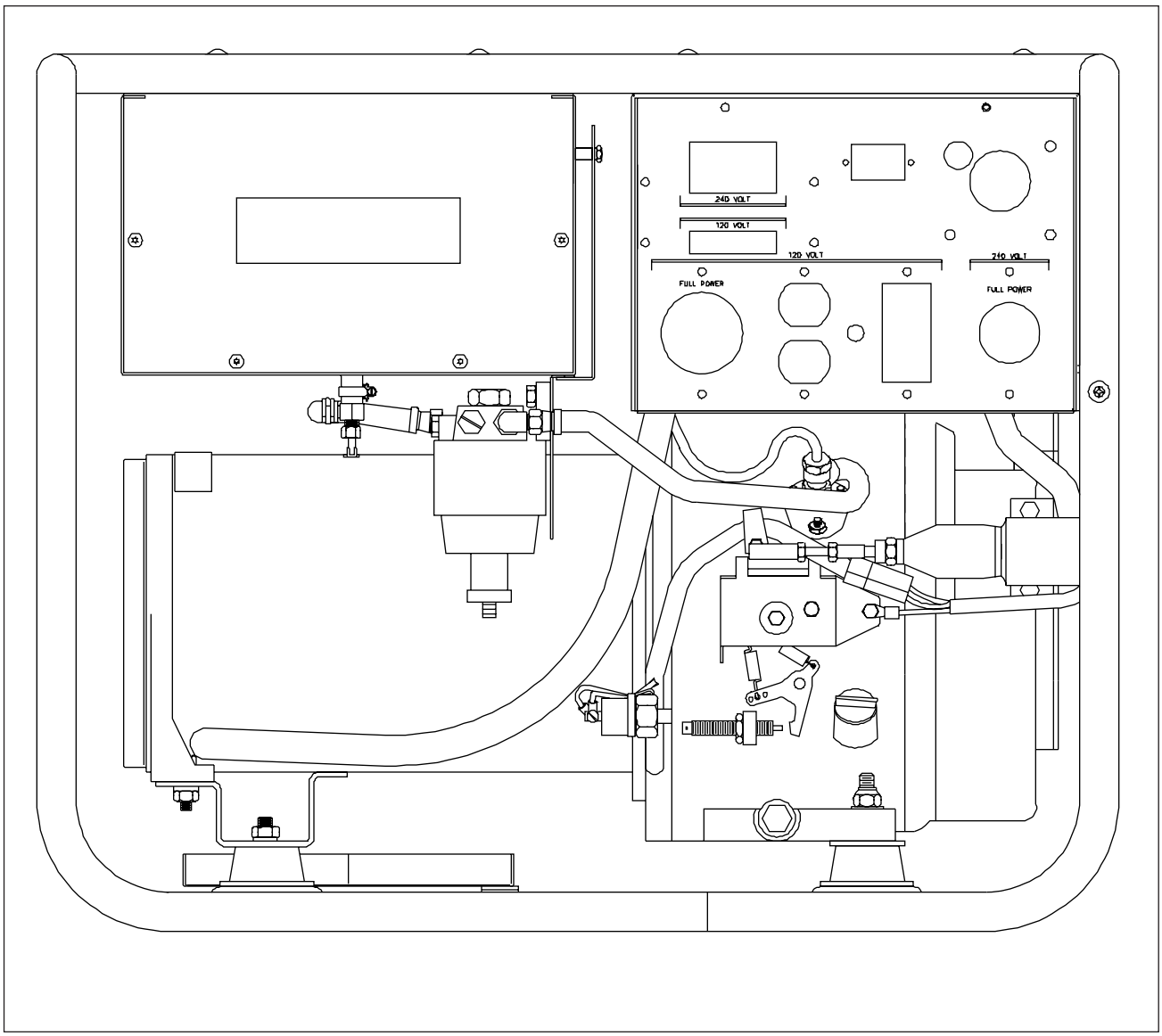
WINCO®

INSTALLATION, OPERATION, and MAINTENANCE INSTRUCTIONS

OWNER'S MANUAL *HD6010DEX/P*



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Read and understand all instructions in the manual before starting and operating the generator set.

USING THIS MANUAL

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

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

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

TABLE OF CONTENTS

PROPER USE AND INSTALLATION

You must be sure your new engine generator set is:

* Properly serviced before starting
* Operated in a well ventilated area
* Exhaust gases are dispersed safely
* Wired by a qualified electrician
* Operated only for its designed purposes
* Used only by operators who understand its operation
* Properly maintained

COPY YOUR MODEL AND SERIAL NUMBER HERE

No other WINCO generator has the same serial number as yours. It is important that you record the number and other vital information here, 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_____

This engine generator set has been designed and manufactured to allow safe, reliable performance. Poor maintenance, improper or careless use can result in potential deadly hazards; from electrical shock, exhaust gas asphyxiation, or fire. Please read all safety instructions carefully before installation or use. Keep these instructions handy for future reference. Take special note and follow all warnings on the unit labels and in the manuals.

ANSI SAFETY DEFINITIONS

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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.

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WARNING:

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

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CAUTION:

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

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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 receptacles and extension cords.
   f. Be sure the unit is properly grounded to an external ground rod driven into the earth.

2. **FIRE HAZARD- Gasoline and other fuels always present a hazard of possible explosion and/or fire.**

   a. Do not refuel when the engine is running or hot. Allow the engine to cool at least two minutes before refueling.
   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 extinguisher rated ABC by NFPA are appropriate.
   e. Store fuel only in an approved container, and only in a well-ventilated area.

3. 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.
   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 or floors).

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

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

5. 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 material that could create potential fire hazards.
   c. Carefully wipe up any gas or oil spills before starting the unit.
   d. Never allow leaves or other flammable material to build up around the engine exhaust area.

6. 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, cover, or receptacle panels while the engine is running.
   d. Use extreme caution when working on electrical components. High output voltages from this equipment can cause serious injury or death.
   e. Always avoid hot mufflers, exhaust manifolds, and engine parts. They all can cause severe burns instantly.
   f. This generator set is not intended for permanent installation. Consult dealer for units intended for stand-by service. Installing a generator set 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.

SPECIFICATIONS

MODEL	HD6010DEX/P
Generator	
Surge Watts	6000
Continuous Watts	5500
Volts	120/240
AMPs @ 240 Volts	22.9
Receptacles	
NEMA 5-15 (120V) GFCI	2 (15A Duplex)
NEMA 15-20 (120V) GFCI	2 (20A Duplex)
NEMA 5-50 (120V)	1 (50A straight blade)
NEMA L6-30 (240V)	1 (30A twist lock)
Engine	
Size	10 HP
Model	L-100-AE 406c.c.
Fuel Capacity	4.5 GAL
Fuel Consumption	0.63g/hr
Starting System	Key-Electric
Muffler	Low Tone
Type	See Engine Shroud Above Recoil For Type
Stop System	Engine Key-Switch
Complete Unit	
Weight (dry)	285 LBS
Dimensions LxWxH	29x21x23.7
Owner Must Provide	
Fuel	#2 Diesel
Oil Type	10W-30 SF, SE, SD, SC See engine manual for additional information.
Oil Capacity	1.75 Quarts
Battery Size (Min - Not Incl)	U1 - 235 CCA

INTENDED USES

1. These engine generator sets have been designed specifically for portable use. Receptacles are provided in the "control box" for you to plug in your loads (portable appliance and tool). These units are dual wound generators, with a full load 120 Volt winding AND a full load 240 Volt winding. 120 and 240 Volt loads do not need to be split and can be operated at the same time. See unit capabilities for further explanation.

2. These units require large quantities of fresh air for cooling of both the engine and the generator. Fresh air is drawn from both the engine end and the generator end and is exhausted at the center of the unit. For safety, long life and adequate performance, these units should never be run in small compartments without positive fresh air flow.

RESTRICTED USES

1. 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.

2. DO NOT operate these portable generators in small compartment., i.e. generator compartment of vehicles, motor homes or travel trailers. Compartments will not allow enough free flow fresh air to reach the engine generator set for cooling. Overheating will cause damage to both the engine and the generator. Small compartments will also develop hot spots where there is very little air flow and may cause a fire.

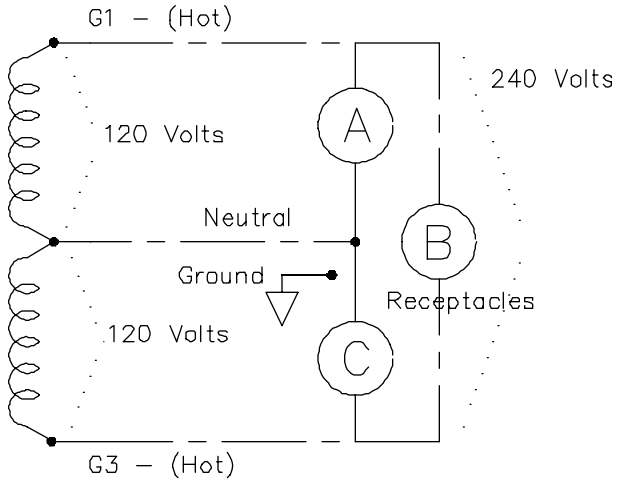
3. DO NOT attempt to operate this unit at 50 cycles. These units are designed and governed to operate at 60 Cycles only.

UNIT CAPABILITIES

1. Generator Connections - The diagram below represents a typical ordinary 4000 watt generator. Only 2000 watts at 120 volts (16.7 Amps) can be taken from the generator at receptacle A and up to 2000 watts at 120 volts from receptacle C. On an ordinary generator, CAUTION MUST BE EXERCISED TO PREVENT OVERLOADING EITHER OF THE 120 VOLT CIRCUITS (A OR C).

   The Winco Heavy Duty series generators have the EXTRA Heavy FULL

CONVENTIONAL DUAL VOLTAGE
120/240 VOLT SCHEMATIC



TYPICAL GENERATOR

D3OUTPUT

   POWER winding to allow the use of all the power available from the engine at either 120 Volts, 240 Volts or any combination of 120 or 240 Volts. You are not restricted to splitting up your large 120 volt loads or choosing to power them OR a 240 Volt load. There are no switches or connectors to change. Simply plug in and use the power without being concerned about overloading the generator.

The following currents (measured in amps) are produced at 120 & 240 volts for typical wattage shown.

AMPS AT -->	120 VOLT	240 VOLT
	RECEPTACLE ID	
MODEL	A	B
HD6010DEX	45.8	22.9

2. 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 current to start them as to run them. Capacitor motors are easier to start and usually require 2 to 4 times as much current to start them as to run them. Repulsion Induction motors are the easiest to start and usually require 1-1/2 to 2-1/2 times as much to start them as to run them.

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

	RUNNING AMPS	STARTING AMPS		
HP		SP	CAP	RI
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	13.0	NOT MADE	26 TO 52	20 TO 33

   The figures given above are for 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.

   For 240 volt motors, the "running" current is half as much as shown for the 120 volt motors of the same size. Some dual voltage 120/240 volt motors are difficult to start on 240 volts when driven by engine/generators and can be started more easily when connected to operate on 120 volts. This is particularly true of "capacitor start-induction run" motors. Sometimes a 240 volt motor which cannot be started on the 240 volt circuit of a 120/240 volt generator can be started on a 120 volt circuit and then quickly switched to the 240 volt circuit after it is started. This can be done in applications where the motor is manually controlled and is started under "no load" conditions.

   Because 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.

3. Motor Starting Capacity - listed below you will find the motor starting capability of your engine generator set.

Generator Model	Motor Size (code "G" capacitor start)
HD6010DEX	3.0 HP

Trying to start a larger motor or higher code (ie. J or K) motor may result in damage to both the generator and the electric motor especially 120 volt motors.

CAUTION: EQUIPMENT DAMAGE

THIS UNIT HAS BEEN SHIPPED WITHOUT OIL. Failure to maintain the engine oil at the proper level will result in serious engine damage.

UNPACKING

When you unpack your new ENGINE GENERATOR be sure to remove all the information sheets and manuals from the carton.

1. This power plant was in good order when shipped. Inspect the power plant promptly after receiving it. If damage is noted, notify the transportation company immediately; request proper procedures for filing a "concealed damage" claim. Title to the equipment and responsibility for filing claim rests with you when a generator is sent F.O.B. shipping point. Only you can legally file a claim.

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

3. After removing the engine generator from the carton locate and remove the shipping strap attached to the generator shock mount. See attached tag for removal instructions.

UNIT PREPARATION

Before your engine generator was shipped from our factory it was fully checked for performance. The generator was load tested to its full capacity, and the voltage and frequency were carefully checked and adjusted.

1. Lubrication - Before starting the engine, fill the crankcase to the proper level with a good quality oil. The recommended grade of oil and quantity of oil required is listed in both the engine operators manual and in the specifications section (pg 2) of this manual. 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 are not covered by the generator or the engine manufacturers warranty.

2. Diesel Fuel - Always use a good grade of # 2 diesel fuel. For cold weather, blended # 1 fuel may be used - See engine operators manual for recommendations. Never use gasoline or gasohol. Always insure that the fuel is clean and free of all impurities.

WARNING: FIRE

Diesel fuel is flammable and can cause or enlarge fires when proper precautions are not taken.

Never use fuel that has been stored for an extended period of time. Fuel will lose it volatile properties and you will be left with a 'gum' / varnish residue. This varnish like substance will clog the fuel lines and injectors and 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 its best to drain old fuel from the engine and replace with fresh fuel before attempting to start.

3. Battery Installation - All electric start engine generator sets are shipped with a battery kit for customer installation. This kit consists of a battery rack, battery tie down, battery cables, and instruction sheet for installation. After installing the battery rack, file the instruction sheet in the back of this manual for future reference.

   If you intend to use the power plant's electric start system, you will need to purchase and install a battery to operate it. Units equipped with a recoil or rope start will operate satisfactorily without a battery. A twelve volt battery, group U1 rated at 235 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.

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 a 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 eyes, get immediate medical attention.

Optional Dolly Kit - An optional dolly kit is available for this engine generator set. The dolly kit comes with instructions and parts list. After installing the dolly kit, file the instructions and parts list in the back of this manual for future reference.

INITIAL START UP

Use the following checklist to verify the correct preparation of the engine generator before starting.

On All Units Check:
1. Engine oil, fill as required with correct grade and quantity.
2. Fuel level, fill as required with clean fresh fuel.
3. Visually check unit for loose parts.

STARTING and STOPPING

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. See "Operating Speed" section for additional information.

1. Manual starting - Not recommended - This unit has a fuel cut-off solenoid that requires battery power to operate. If the battery is dead or defective, recharge or replace it. Refer to the engine manual for additional starting, operating, and stopping instructions.

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

   a. Turn on the fuel supply.
   b. Move the compression release lever (if equipped) to the full on position. A warm engine usually will require less compression release time than a cold engine.
   c. Operate the start switch briefly. The starter life is improved by using shorter starting cycles with time to cool off between cranking cycles. Do not operate the starter more that 15 seconds during each minute. Repeat if necessary.
   d. When the engine starts, turn the compression release lever off quickly.
   e. The engine should promptly come up to operating speed.

CAUTION: EQUIPMENT DAMAGE

Never permit the compression release to remain on after the engine has run for a short time. It is usually not necessary to release the compression when the engine is warm.

STARTING HINTS

1. Cold weather
   a. Use the proper oil for the temperature expected.
   b. Use fresh winter grade fuel. Winter grade fuel is blended to improve starting. Do not use old or straight summer blend fuel.
   c. Never use ether or any other starting aides without the specific authorization from the engine manufacturer or their instructions. If in doubt - ASK!!! Serious engine damage or personal injury may result from ignoring this simple warning.

2. Hot weather
   a. Be sure to use the proper oil for the temperature expected.
   b. Use only summer blended fuel. Using old fuel left over from winter may cause damage to the engine or clogging of the fuel filters and injection pump. See Engine Manufacturers instructions.

STOPPING AND STORAGE

1. Operate the stop switch.
2. Close the fuel shut-off valve. Always shut the fuel off whenever the engine is stopped to prevent fuel leakage from the fuel lines or pump.
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: The use of a fuel additive, such as STA-BIL, or an equivalent, will minimize the formation of gum deposits during storage. Such an additive may be added to fuel in the engine's fuel tank or to fuel in a bulk storage container.

   a. Remove the remaining fuel from the fuel tank.

b. Pour storage additive to fuel tank. Start the engine and allow it to run on the rich additive mixture until the fuel pump loads up and stalls the engine. The fuel lines and injector pump are now filled with a preservative mixture. Always follow the Engine Manufacturer's latest recommendations for additives and procedures for long term storage.
c. While the engine is warm drain oil and refill with fresh oil.
d. Remove the fuel injector(s), pour approximately 1/2 ounce (15 cc) of engine oil into (each) cylinder and crank slowly to distribute oil. Replace fuel injector(s).
e. Clean dirt and chaff from cylinder, cylinder head fins, blower housing, rotating 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 insure 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.

1. 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 may vary slightly, the normal voltage and frequency of the engine-generators described in this book are approximately as follows, under varying loads:

LOAD vs. OUTPUT

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Generator Load Applied*	Frequency Speed (RPM)	(Hz)	Generator voltage 120V Recpt.	240V Recpt.
None	3690	61.5	129V	258V
Half	3600	60.0	120V	240V
Full	3510	58.5	115V	230V

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***Portion of plant's rated output current.**

2. 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. Whenever making any speed adjustments check the unit with a voltmeter or tachometer and be sure the speed is correct.

   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.

2. 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. Frequency can be checked by using an electric clock with a sweep second hand. Timed against a wrist watch or a stop watch the clock should be correct within +/- 2 seconds.

CONNECTING THE LOADS

1. Applying The Load - 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.

   a. Receptacles have been provided on the control panel to connect the loads to. The loads should be applied gradually. 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 the generator and receptacle nameplate rating. Overloading may cause damage to the generator and/or the loads

   b. 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 Specification Section.

   c. 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.

   d. 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 combination of receptacles or a single receptacle as long as the receptacle amperage rating is not exceeded. Both the 120 and 240 volt receptacles can be utilized at the same time. See Specification Section for proper load separation.

2. Grounding - All stationary 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 number 10 Awg wire from clamp to the generator ground lug or the battery negative terminal. 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 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.

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 and 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 appliance 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 2 hot and a ground wire, but **no neutral connection** in the 3 wire 240 volt receptacle. Split 120/240 volt TemPower service requires the installation of a 4 wire receptacle (2 hot, 1 ground, and 1 neutral). 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 select one of the following methods:

a. Wire the distribution panel directly to the generator output using a fine strand (flexible) motor lead wire. DO NOT by-pass the generator control panel mainline circuit breakers.

b. Wire a 120/240 volt, four wire twist-lock receptacle. (NEMA L14-30 {30 Amp} or Hubbell Spec. #CS 6365 {50 Amp}) The use of locking receptacles and locking plugs provides the convenience of quickly disconnecting the wiring for moving the unit and security on the job site. The plug also allows non-electrical workers to safely reconnect the power after moving the unit and prevents the plug from being accidentally removed by bumping or vibration.

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

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. Check the yellow pages of your local telephone directory under "Engines-Diesel" for the closest engine repair center or ask the dealer from whom you purchased the power plant.

1. Change the oil as recommended in the engine operators manual. It is usually required to change oil after the first 25 hours of operation and every 100 hours thereafter under normal operating conditions. Change engine oil more frequently if the engine is operated under heavy load, or in high ambient temperatures. See engine operators manual.

   a. Remove oil drain plug at base of the engine and drain the oil with the engine warm.
   b. Replace oil drain plug.
   c. Remove oil filler plug and refill with new oil. Refer to the table in the engine manual for the proper grade of oil based on your operating temperature.
   d. Replace filler plug.

2. 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 fill plug before removing. Be sure the oil level is maintained, but DO NOT OVERFILL! Fill level is checked by screwing the dipstick/plug COMPLETELY into the threaded fittting. Oil should register at the the "FULL" mark on the dipstick.

3. Servicing Oil Filter: Consult engine operators manual for recommendations, procedures and intervals. Service more often if necessary if very dirty. Replace the cartridge using only original equipment parts available at any engine service center.
4. Servicing Air Cleaners : Consult engine operators manual for recommendations, procedures and intervals. Service more often if necessary if very dirty. Replace the cartridge using only original equipment parts available at any engine service center.

LOW OIL LEVEL SHUTDOWN SYSTEM

These engine generator sets come equipped standard with a low oil pressure shutdown circuit. The energized to run low oil pressure safety shut-down / warning system is controlled by a normally OPEN pressure switch.

This low oil warning system will automatically stop the engine well before the oil pressure reaches an operational danger point. This feature is designed to prevent costly repairs and downtime.
The lube oil pressure shut-down system uses a special switch mounted in the engine crankcase to sense the oil pressure. If a low oil pressure condition should occur during operation, the switch will open and interrupt the fuel solenoid coil, "killing" the engine.

Use of the oil safety shutdown system on applications that are subject to shock, bumping or severe angles of operation (in excess of 15 degrees) should be avoided. This is especially true if an unexpected shutdown would cause a safety hazard or serious inconvenience for the operator. To disable the low oil pressure safety feature, connect a jumper wire to bridge the contacts on the oil pressure sensor unit mounted on the engine crankcase.

GENERATOR CARE

Proper care and maintenance of the generator is necessary to insure a long trouble

free life.

1. 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 insure that the set is operating properly should it be needed in an emergency.

2. Generator Maintenance - Any major generator service including the installation or replacement of parts should be performed only by a qualified electrical service man. 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 dangerous both to the operator and to the equipment.

CLEANING

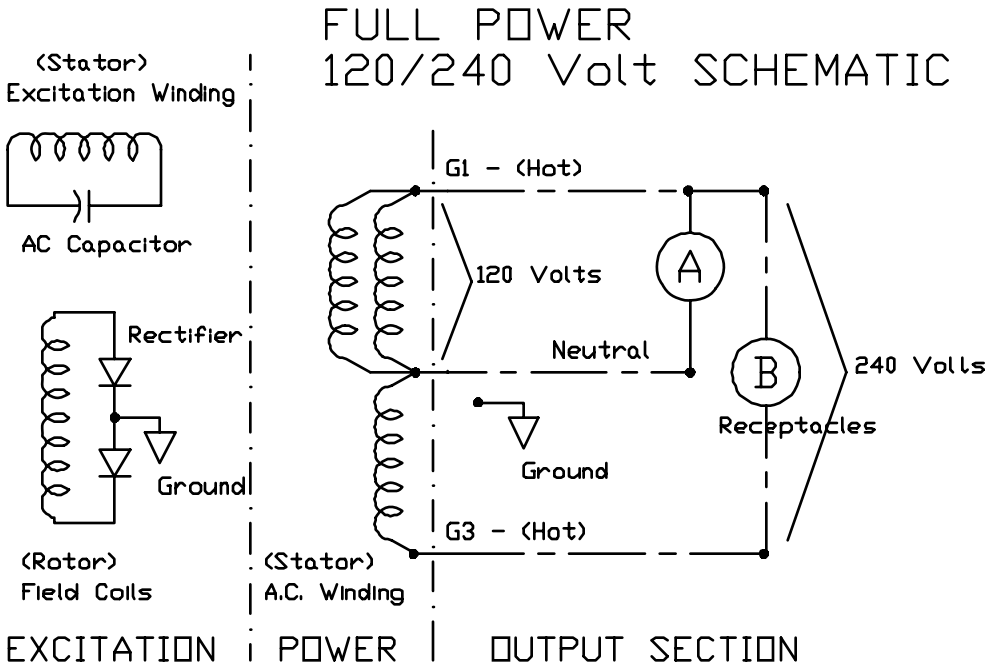
Remove dirt and debris with a cloth or brush. DO NOT use high pressure spray to clean either the engine or the generator. This high pressure spray could contaminate the fuel system and the generator components.

1. Keep the air inlet screen on both the engine and generator free of any dirt or debris to insure 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 flywheel. Clean more often if necessary. Failure to keep these areas clean may cause overheating and permanent damage to the unit.

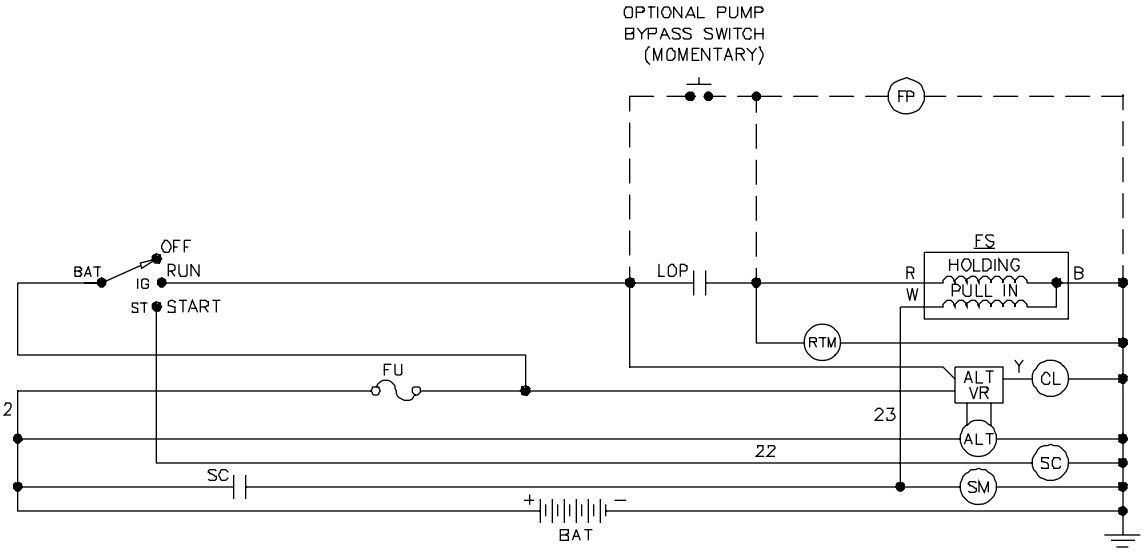
2. Periodically clean muffler area to remove all grass, dirt and combustible debris to prevent a fire.

3. On engine mufflers equipped with spark arresters, the spark arrester must be removed every 50 hours for cleaning and inspection. Replace if damaged.

Won't Start (general)	***Fouled fuel injector.** ***Out of fuel.**
Won't Start (electric)	***Dead battery.** ***Defective start switch.** ***Defective start solenoid.**
Battery not re-charging	***Broken or loose charging wire.** ***Defective charging circuit (engine).** ***Defective battery.**
Voltage too low	***Engine speed is too low.** ***Generator overloaded.** ***Defective rectifier.** ***Defective stator.** ***Defective rotor (field).**
Circuit Breaker Trips	***Defective load.** ***Defective receptacle.**
Voltage too high	***Engine speed is too high.**
Generator overheating	***Overloaded.** ***Insufficient ventilation.**
No output voltage	***Short in load (disconnect).** ***Broken or loose wire.** ***Defective receptacle.** ***No residual magnetism in generator.** ***Defective stator.** ***Defective rotor (field).** ***Shorted capacitor.** ***Defective rectifier.**

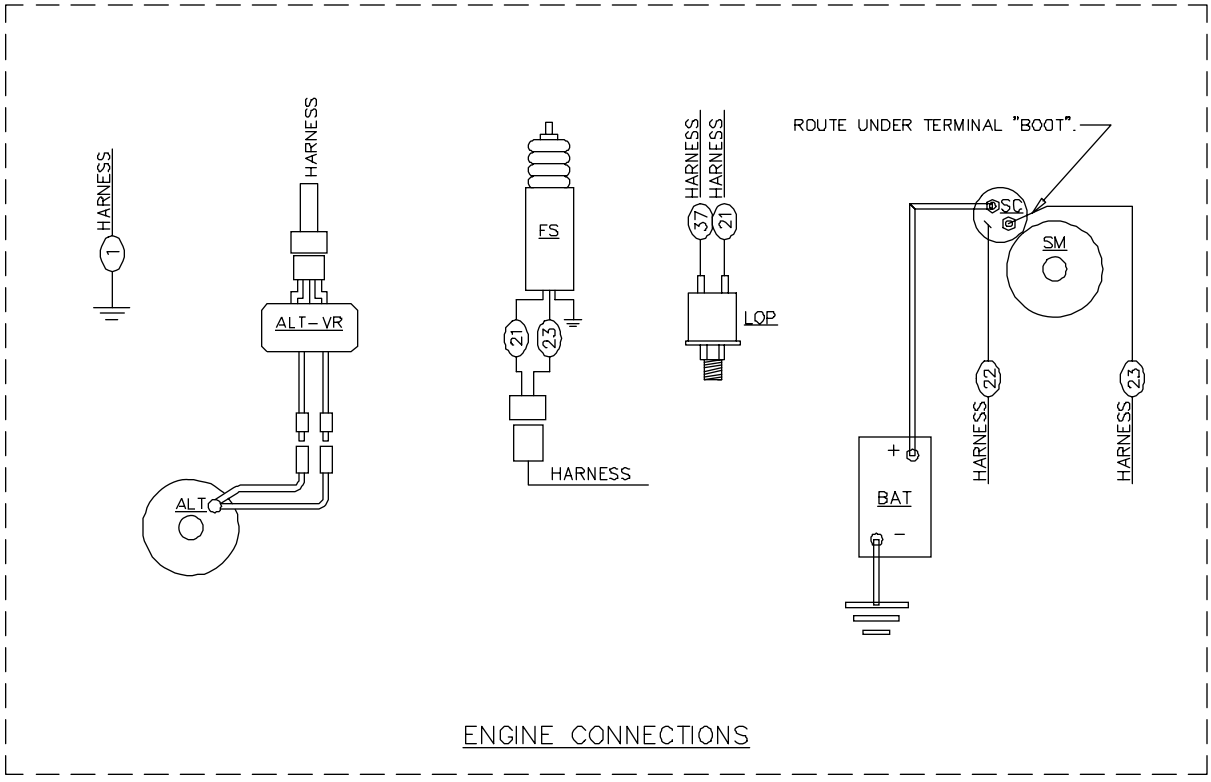

FULL POWER
120/240 Volt SCHEMATIC
(Stator)
Excitation Winding
AC Capacitor
Rectifier
Ground
(Rotor)
Field Coils
G1 - (Hot)
120 Volts
A
Neutral
B
240 Volts
Receptacles
Ground
G3 - (Hot)
(Stator)
A.C. Winding
EXCITATION
POWER
OUTPUT SECTION

HD6010DE SCHEMATIC/WIRING – 15836–400



LEGEND

ALT	ALTERNATOR	FU	FUSE
ALT–VR	ALTERNATOR VOLTAGE REGULATOR	GND	GROUND
BAT	BATTERY	LOP	LOW OIL PRESSURE SWITCH
CL	CHARGE LAMP	RTM	RUNNING TIME METER
FP	FUEL PUMP	SC	START CONTACTOR
FS	FUEL SOLENOID	SM	STARTING MOTOR



ENGINE CONNECTIONS

WINCO, Inc.
24 Month Limited Warranty

WINCO, Incorporated warrants to the original purchaser for 24 months 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, return the product within 24 months from the date of purchase, transportation charges prepaid, to your nearest WINCO Authorized Service Center or to WINCO, Inc. at Le Center Minnesota.

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 24 months 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 reserves the right to change or improve its products without incurring any obligations to make such changes or improvement on products purchased previously.

EXCLUSIONS:

WINCO does not warrant engines, 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.

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Le Center, Minnesota 56057