ACEUP ENERGY

INVERTER GENERATOR AI2300

PORTABLE GENERATOR
Owner's Manual



SAVE THIS MANUAL FOR FUTURE REFERENCE

Read the en re instruc on manual carefully and make sure that you fully understand it before you use the equipment.

Table of Contents

Section 1 Introduction and Safety 1

Introduction 1
Safety Rules 1
Safety Symbols and Meanings 1
Exhaust and Location Hazards 2
Electrical Hazards 3
Fire Hazards 3
Standards Index 3

Section 2 General Information and Setup 4

Know Your Generator 4
Label Explanation 5
Connection Plugs 6
Off/Run/Choke Switch 6
USB Outlet 6
Economy Switch 6
Generator Status Lights 6
Circuit Protectors 6
Remove Contents from Carton 7
Add Engine Oil 7
Fuel 8

Section 3 Operation 9

Operation and Use Questions 9
Before Starting Engine 9
Prepare Generator for Use 9
Grounding the Generator When In Use 9
Know Generator Limits 9
Transporting/Tipping of the Unit 10
Starting Pull Start Engines 10
Restarting Hot Engines 11
Low Oil Level Shutdown System 11
Charging a 12 VDC Battery 11
Parallel Operation 12

Section 4 Maintenance and Troubleshooting 13

Maintenance 13
Maintenance Schedule 13
Preventive Maintenance 13
Engine Maintenance 13
Storage 16
Troubleshooting 17

Section 1 Introduction and Safety

Introduction

This unit has been designed to provide high-performance, efficient operation, and years of use when maintained properly.

⚠WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury.

The owner is responsible for proper maintenance and safe use of the equipment. Before operating, servicing or storing this generator:

- Study all warnings in this manual and on the product carefully.
- Become familiar with this manual and the unit before use.
- Refer to the Assembly section of the manual for instructions on final assembly procedures. Follow the instructions completely.

Save these instructions for future reference. ALWAYS supply this manual to any individual that will use this machine.

The information in this manual is accurate based on products produced at the time of publication. The manufacturer reserves the right to make technical updates, corrections, and product revisions at any time without notice.

Safety Rules

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The warnings in this manual, and on tags and decals affixed to the unit are, therefore, not all inclusive. If using a procedure, work method or operating technique that the manufacturer does not specifically recommend, verify that it is safe for others. Also make sure the procedure, work method or operating technique utilized does not render the equipment unsafe.

Throughout this publication, and on tags and decals affixed to the generator, DANGER, WARNING, CAUTION and NOTE blocks are used to alert personnel to special instructions about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Their definitions are as follows:

⚠DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING

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

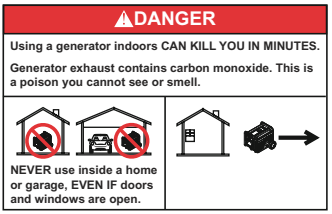
⚠CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTE: Notes contain additional information important to a procedure and will be found within the regular text of this manual.

These safety warnings cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the action or service are essential to preventing accidents.

Safety Symbols and Meanings





⚠DANGER

Asphyxiation. Running engines produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury.

- If you start to feel sick, dizzy, or weak after the generator has been running, move to fresh air IMMEDIATELY. See a doctor, as you could have carbon monoxide poisoning.



⚠DANGER

Asphyxiation. The exhaust system must be properly maintained. Do not alter or modify the exhaust system as to render it unsafe or make it noncompliant with local codes and/or standards. Failure to do so will result in death or serious injury.



⚠DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury.



⚠DANGER

Electrocution. Turn utility and emergency power supplies to OFF before connecting power source and load lines. Failure to do so will result in death or serious injury.

⚠WARNING

Equipment and property damage. Do not alter construction of, installation, or block ventilation for generator. Failure to do so could result in unsafe operation or damage to the generator.



⚠WARNING

Asphyxiation. Always use a battery operated carbon monoxide alarm indoors and installed according to the manufacturer's instructions. Failure to do so could result in death or serious injury.

⚠WARNING

Equipment and property damage. Do not operate unit on uneven surfaces, or areas of excessive moisture, dirt, dust or corrosive vapors. Doing so could result in death, serious injury, property and equipment damage.



⚠WARNING

Moving Parts. Keep clothing, hair, and appendages away from moving parts. Failure to do so could result in death or serious injury.



⚠WARNING

Hot Surfaces. When operting machine, do not touch hot surfaces. Keep machine away from combustables during use. Hot surfaces could result in severe burns or fire.

⚠WARNING

Personal injury. Do not insert any object through the air cooling slots. Generator can start at any time and could result in death, serious injury, and unit damage.

⚠WARNING

Risk of injury. Do not operate or service this machine if not fully alert. Fatigue can impair the ability to service this equipment and could result in death or serious injury.

⚠WARNING

Injury and equipment damage. Do not use generator as a step. Doing so could result in falling, damaged parts, unsafe equipment operation, and could result in death or serious injury.

⚠WARNING

Equipment damage. Do not attempt to start or operate a unit in need of repair or scheduled maintenance. Doing so could result in serious injury, death, or equipment failure or damage.

- For safety reasons, it is recommended that the maintenance of this equipment be performed by an IASD (Independent Authorized Service Dealer). Inspect the generator regularly, and contact the nearest IASD (Independent Authorized Service Dealer) for parts needing repair or replacement.

Exhaust and Location Hazards



⚠DANGER

Asphyxiation. Running engines produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury.



⚠DANGER

Asphyxiation. The exhaust system must be properly maintained. Do not alter or modify the exhaust system as to render it unsafe or make it noncompliant with local codes and/or standards. Failure to do so will result in death or serious injury.

⚠WARNING

Equipment and property damage. Do not alter construction of, installation, or block ventilation for generator. Failure to do so could result in unsafe operation or damage to the generator.



⚠WARNING

Asphyxiation. Always use a battery operated carbon monoxide alarm indoors and installed according to the manufacturer's instructions. Failure to do so could result in death or serious injury.

- If you start to feel sick, dizzy, or weak after the generator has been running, move to fresh air IMMEDIATELY. See a doctor, as you could have carbon monoxide poisoning.
- NEVER run a generator indoors or in a partly enclosed area such as garages.
- ONLY use outdoors and far away from windows, doors, vents, crawl spaces and in an area where adequate ventilation is available and will not accumulate deadly exhaust gas.
- Using a fan or opening a door will not provide sufficient ventilation.
- Point muffler exhaust away from people and occupied buildings.

Electrical Hazards



⚠DANGER

Electrocution. Contact with bare wires, terminals, and connections while generator is running will result in death or serious injury.



⚠DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury.



⚠DANGER

Electrocution. In the event of electrical accident, immediately shut power OFF. Use non-conductive implements to free victim from live conductor. Apply first aid and get medical help. Failure to do so will result in death or serious injury.

- The frame and external electrically conductive parts of the generator should be properly connected to an approved earth ground.
- Use a ground fault circuit interrupter in any damp or highly conductive area (such as metal decking or steel work).
- Once generator has been started outside, connect electrical loads to extension cord(s) inside.

Fire Hazards



⚠DANGER

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Add fuel in a well ventilated area. Keep fire and spark away. Failure to do so will result in death or serious injury.



⚠DANGER

Explosion and Fire. Do not overfill fuel tank. Fill to 1/2 inch from top of tank to allow for fuel expansion. Overfilling may cause fuel to spill onto engine causing fire or explosion, which will result in death or serious injury.

⚠WARNING

Personal injury. Do not insert any object through the air cooling slots. Generator can start at any time and could result in death, serious injury, and unit damage.



⚠WARNING

Fire risk. Fuel and vapors are extremely flammable. Do not operate indoors. Doing so could result in death, serious injury, or property or equipment damage.



⚠WARNING

Explosion and fire risk. Do not smoke near unit. Keep fire and spark away. Failure to do so could result in death, serious injury, or property or equipment damage.



⚠WARNING

Explosion and Fire. Do not smoke while refueling unit. Failure to do so could result in death, serious injury, or property or equipment damage.

- Allow at least 5 feet of clearance on all sides of the generator when operating to prevent overheating and fire.
- Do not operate the generator if connected electrical devices overheat, if electrical output is lost, if engine or generator sparks, or if flames or smoke are observed while unit is running.
- Keep a fire extinguisher near the generator at all times.

Section 2 General Information and Setup

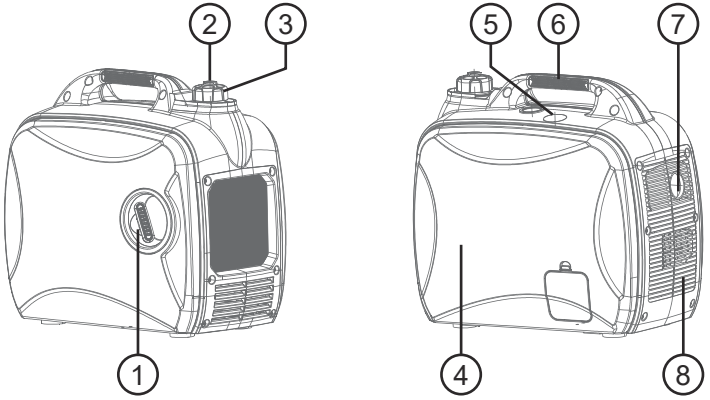


Figure 2-1. Features and Controls

TABLE 1. Generator Components

1	Recoil Starter
2	Fuel Tank Vent
3	Fuel Cap
4	Service Door
5	Spark Plug Cover
6	Carrying Handle
7	Spark Arrestor
8	Muffler Cover

Know Your Generator

⚠WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury.

Label Explanation

	Read the operator's instruction manual before use		Caution
	Carbon monoxide (CO) danger		Electrical hazard
	Risk of being burnt		Fire hazard

TABLE 2. Product Specifications

Generator Specifications	AI2300
Rated Frequency	60 Hz
Starting Power	2300 W
Rated Power	1800 W
Rated AC Voltage	120 V
AC Output Amperage	15 A
Dimensions L x W x H (in/mm)	19.7 x 11.8 x 18.1 (500 x 300 x 460)
Weight (dry)	20 Kg
** Operating Temperature Range: -13 deg. C (8 deg. F) to 40 Deg. C (104 Deg. F). When operated above 25 deg. C (77 deg. F) there may be a decrease in power. ** Maximum wattage and current are subject to, and limited by, such factors as fuel Btu content, ambient temperature, altitude, engine condition, etc.. Maximum power decreases about 3.5% for each 1,000 feet above sea level; and will also decrease about 1% for each 6° C (10° F) above 16° C (60° F) ambient temperature.	
Engine Specifications	**UP148**
Engine Type	Four-stroke, Air-cooled, OHV gasoline engine
Displacement	79.8 cc
Spark Plug Type	E6RTC
Spark Plug Gap (in/mm)	0.024-0.028 (0.6-0.7)
Fuel Capacity / Type	4.2 L / Unleaded
Oil Type	SAE 10W/30
Oil Capacity	0.35 L
Quarter-Load Run Time	10 Hours

TABLE 3. Control Panel Components

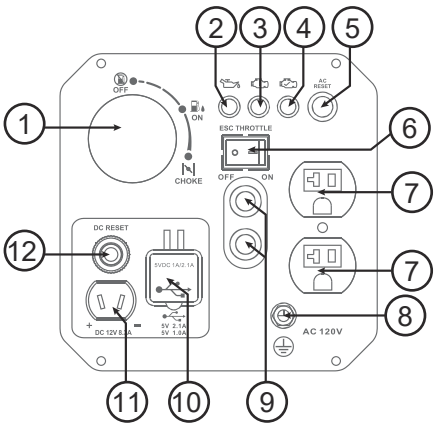


Figure 2-2. Control Panel

1	OFF/ON/CHOKE Switch
2	Low Oil Warning
3	Overload Warning
4	AC Power Light
5	AC Reset
6	Economy Switch
7	AC Socket
8	Grounding Location
9	Parallel Outlets
10	USB Outlets
11	DC Socket (battery charger)
12	DC Reset

Connection Plugs

AC Socket

The AC outlet is overload protected by the invertor. Each socket will power single phase, Volt AC, See ***Figure 2-3***.

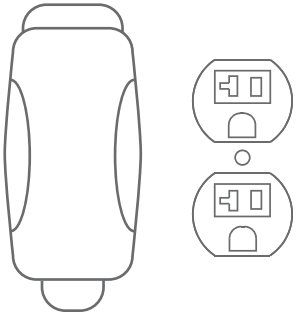


Figure 2-3. AC Socket

OFF / ON / CHOKE Switch

This controls the ON/OFF functions, choke and fuel valve operation. See ***Figure 2-4***.

- The OFF position (1) stops the engine and shuts off fuel flow.
- The ON position (2) is for normal operation and to gradually reduce the use of the choke.
- The CHOKE position (3) switches the fuel valve on to start the engine.

NOTE: The CHOKE is not required to start a warm engine.

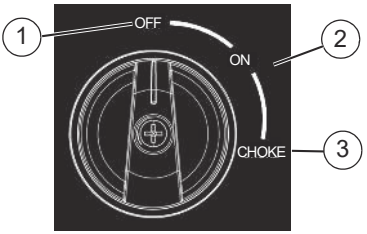


Figure 2-4. Dial (example)

Economy Switch

The economy switch has 2 modes of operation:

- **ON:** The quietest mode and best when running appliances or equipment that are resistive loads (non-motor starting), (example: TV, video game, light, radio).
- **OFF:** Best when running a both inductive (motor-starting loads) and resistive (non-motor starting loads), especially when these loads are turning on and off (example: RV, air conditioner, hairdryer).

Generator Status Lights

See ***Figure 2-5***.

- **Overload LED (orange):** Indicates system overload (2). During motor starting it is normal for the overload LED to illuminate for a few seconds. If LED stays illuminated and the ready LED turns off, the engine will continue to run without output power. Remove all applied loads and determine if attached devices exceed recommended output power. Check for faulty or shorted connections. To restore electrical output, turn dial OFF to reset. Start engine. If condition was corrected, the orange LED will not illuminate and electrical output will be restored. Loads can be applied once the green LED illuminates. If the orange LED returns, contact an IASD (Independent Authorized Service Dealer).
- **Low Oil Level LED (red):** Illuminates when oil level is below safe operating level. Engine shuts down (1).
- **Power LED (green):** Indicates output from generator (3) (unless there is a low oil or overload condition).

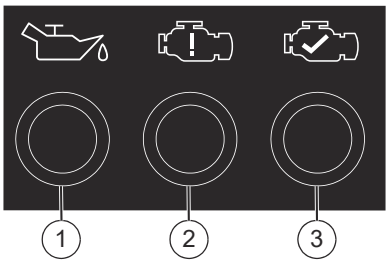


Figure 2-5. Status Indicators

AC Reset

The AC receptacle is protected by inverter module.

If the generator is overloaded or an external short circuit occurs, the inverter module will stop working and there will be no voltage output from the generator.

If this occurs, disconnect all electrical loads to determine the cause of the problem before using the generator again.
Afterwards, press the AC RESET button, the inverter reverts to normal working condition, and the output voltage of the generator returns to normal.

DC Reset

The DC Receptacle is protected by DC reset(circuit protector). If the generator is overloaded or an external short circuit occurs, the circuit protector will trip. If this occurs, disconnect all electrical loads to determine the cause of the problem before using the generator again. Reduce the load if the circuit protector is tripped.

NOTE: Continuous tripping of the circuit protector may cause damage to generator or equipment.
Push DC rest button to reset the circuit protector.

Remove Contents from Carton

1. Open carton completely by cutting each corner from top to bottom.
2. Remove and verify carton contents prior to assembly. Carton contents should contain the following:

TABLE 4. Accessories

Item	Qty.
Main Unit	1
Owner's Manual	1
Oil Funnel	1
DC Charging Cable	1
Tool Kit	1

Add Engine Oil

⚠CAUTION

Engine damage. Verify proper type and quantity of engine oil prior to starting engine. Failure to do so could result in engine damage.

NOTE: The generator is shipped without oil in the engine. Add oil slowly and verify oil level often during filling process to ensure overfilling does not occur.

1. Place generator on a level surface.
2. Remove side cover. See ***Figure 2-6***.

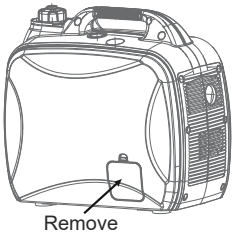


Figure 2-6. Remove Side Cover

3. Clean area around oil fill and oil drain plug.
4. Remove oil fill cap and wipe dipstick clean. See ***Figure 2-7***.

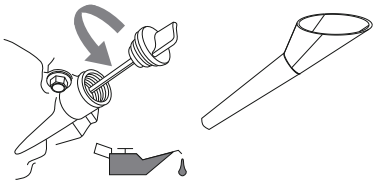
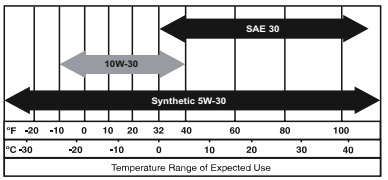


Figure 2-7. Remove Dipstick

5. Insert funnel into oil fill opening. Add recommended engine oil as necessary. Climate determines proper engine oil viscosity. See chart to select correct viscosity.

   NOTE: Use petroleum based oil for engine break-in before using synthetic oil.



6. To check oil level, remove funnel and insert dipstick into oil filler neck. See ***Figure 2-8***.

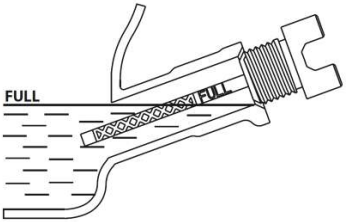


Figure 2-8. Safe Operating Range

7. Remove dipstick and verify oil level is within safe operating range.

NOTE: Verify oil level often during filling process to ensure overfilling does not occur.

8. Install oil fill cap/dipstick and hand-tighten.
9. Replace side cover and screws.

Fuel

⚠DANGER

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Add fuel in a well ventilated area. Keep fire and spark away. Failure to do so will result in death or serious injury.

⚠DANGER

Explosion and Fire. Do not overfill fuel tank. Fill to 1/2 inch from top of tank to allow for fuel expansion. Overfilling may cause fuel to spill onto engine causing fire or explosion, which will result in death or serious injury.

Fuel requirements are as follows:

- Clean, fresh, unleaded gasoline.
- Minimum rating of 87 octane/87 AKI (91 RON).
- Up to 10% ethanol (gasohol) is acceptable.
- DO NOT use E85.
- DO NOT use a gas oil mix.
- DO NOT modify engine to run on alternate fuels. Stabilize fuel prior to storage.

1. Verify unit is OFF and cooled entirely prior to fueling.
2. Place unit on level ground in a well ventilated area.

⚠WARNING

Explosion and Fire. Verify fuel cap vent is set to ON for operation, and OFF for transportation and storage. Failure to do so could result in poor unit performance, death, or serious injury.

3. Clean area around fuel cap and turn vent on fuel cap to ON. See ***Figure 2-9***.

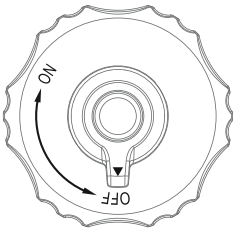


Figure 2-9.Fuel Cap

4. Turn cap slowly to remove.
5. Slowly add recommended fuel. Do not overfill.
6. Install fuel cap.
7. Turn vent on fuel cap to OFF for transportation and storage to avoid fuel spills.

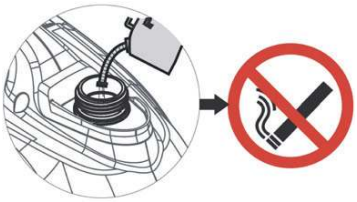


Figure 2-10. Internal Fuel Tank Level

NOTE: Allow spilled fuel to evaporate before starting unit.

IMPORTANT NOTE: It is important to prevent gum deposits from forming in fuel system parts such as the carburetor, fuel hose or tank during storage. Alcohol-blended fuels (called gasohol, ethanol or methanol) can attract moisture, which leads to separation and formation of acids during storage. Acidic gas can damage the fuel system of an engine while in storage. To avoid engine problems, the fuel system should be emptied before storage of 30 days or longer. See the *Storage* section. Never use engine or carburetor cleaner products in the fuel tank as permanent damage may occur.

Section 3 Operation

Before Starting Engine

1. Verify engine oil level is correct.
2. Verify fuel level is correct.
3. Verify unit is secure on level ground, with proper clearance and is in a well ventilated area.

Prepare Generator for Use

⚠DANGER

Asphyxiation. Running engines produce carbon monoxide, a colorless, odorless, poisonous gas. Carbon monoxide, if not avoided, will result in death or serious injury.

⚠DANGER

Asphyxiation. The exhaust system must be properly maintained. Do not alter or modify the exhaust system as to render it unsafe or make it noncompliant with local codes and/or standards. Failure to do so will result in death or serious injury.

⚠WARNING

Risk of fire. Do not use generator without spark arrestor installed. Failure to do so could result in death or serious injury.

⚠WARNING

Asphyxiation. Always use a battery operated carbon monoxide alarm indoors and installed according to the manufacturer's instructions. Failure to do so could result in death or serious injury.

⚠WARNING

Risk of Fire. Hot surfaces could ignite combustibles, resulting in fire. Fire could result in death or serious injury.

⚠WARNING

Hot Surfaces. When operating machine, do not touch hot surfaces. Keep machine away from combustibles during use. Hot surfaces could result in severe burns or fire.

⚠CAUTION

Equipment and property damage. Disconnect electrical loads prior to starting or stopping unit. Failure to do so could result in equipment and property damage.

Grounding the Generator When In Use

The generator is equipped with an equipment ground connecting the generator frame and the ground terminals on the AC output receptacles. This allows the generator to be used as a portable without grounding the frame of the generator. See ***Figure 3-1***.

- Neutral Floating

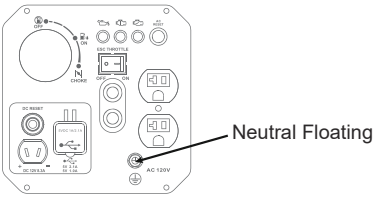


Figure 3-1.Grounding the Generator

The generator (stator winding) is isolated from the frame and from the AC receptacle ground pin. Electrical devices that require a grounded receptacle pin connection will not function if the receptacle ground pin is not functional.

Know Generator Limits

Overloading a generator can result in damage to the generator and connected electrical devices. Observe the following to prevent overload:

- Add up the total wattage of all electrical devices to be connected at one time. This total should NOT be greater than the generator's wattage capacity.
- The rated wattage of lights can be taken from light bulbs. The rated wattage of tools, appliances, and motors can be found on a data label or decal affixed to the device.
- If the appliance, tool, or motor does not give wattage, multiply volts times ampere rating to determine watts (volts x amps = watts).
- Some electric motors, such as induction types, require about three times more watts of power for starting than for running. This surge of power lasts only a few seconds when starting such motors. Make sure to allow for high starting wattage when selecting electrical devices to connect to the generator:

1. Figure the watts needed to start the largest motor.
2. Add to that figure the running watts of all other connected loads.

Wattage Reference Guide is provided to assist in determining how many items the generator can operate at one time.

NOTE: All figures are approximate. See data label on appliance for wattage requirements.

Wattage Reference Guide

Device	Running Watts
*Air Conditioner (12,000 Btu)	1700
*Air Conditioner (24,000 Btu)	3800
*Air Conditioner (40,000 Btu)	6000
Battery Charger (20 Amp)	500
Belt Sander (3")	1000
Chain Saw	1200
Circular Saw (6-1/2")	800 to 1000
*Clothes Dryer (Electric)	5750
*Clothes Dryer (Gas)	700
*Clothes Washer	1150
Coffee Maker	1750
*Compressor (1 HP)	2000
*Compressor (3/4 HP)	1800
*Compressor (1/2 HP)	1400
Curling Iron	700
*Dehumidifier	650
Disc Sander (9")	1200
Edge Trimmer	500
Electric Blanket	400
Electric Nail Gun	1200
Electric Range (per element)	1500
Electric Skillet	1250
*Freezer	700
*Furnace Fan (3/5 HP)	875
*Garage Door Opener	500 to 750
Hair Dryer	1200
Hand Drill	250 to 1100
Hedge Trimmer	450
Impact Wrench	500
Iron	1200
*Jet Pump	800
Lawn Mower	1200
Light Bulb	100
Microwave Oven	700 to 1000
*Milk Cooler	1100
Oil Burner on Furnace	300
Oil Fired Space Heater (140,000 Btu)	400
Oil Fired Space Heater (85,000 Btu)	225
Oil Fired Space Heater (30,000 Btu)	150
*Paint Sprayer, Airless (1/3 HP)	600
Paint Sprayer, Airless (hand-held)	150
Radio	50 to 200
*Refrigerator	700
Slow Cooker	200
*Submersible Pump (1-1/2 HP)	2800
*Submersible Pump (1 HP)	2000
*Submersible Pump (1/2 HP)	1500
*Sump Pump	800 to 1050
*Table Saw (10")	1750 to 2000
Television	200 to 500
Toaster	1000 to 1650
Weed Trimmer	500
* Allow 3 times the listed watts for starting these devices.	

Transporting/Tipping of the Unit

Do not store or transport the unit at an angle greater than 15 degrees.

Starting Pull Start Engines

⚠WARNING

Recoil Hazard. Recoil could retract unexpectedly. Kickback could result in death or serious injury.

⚠CAUTION

Equipment and property damage. Disconnect electrical loads prior to starting or stopping unit. Failure to do so could result in equipment and property damage.

1. Turn fuel cap vent ON. See ***Figure 2-9***.
2. See ***Figure 3-2***. Rotate the OFF/ON/-CHOKE dial to CHOKE (1).
3. Switch Economy switch to OFF.
4. Firmly grasp recoil handle and pull slowly until increased resistance is felt. Pull rapidly up and away.

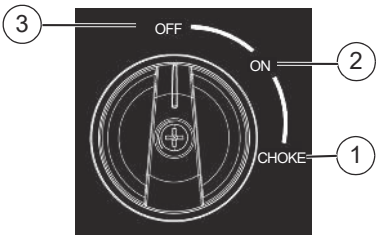


Figure 3-2.OFF/ON/CHOKE Positions

5. See *Figure 3-2*. When engine starts, rotate OFF/ON/CHOKE dial to ON (2).CHOKE operation is reduced as OFF/ON/-CHOKE dial is rotated towards ON.

NOTE: If engine fires, but does not continue to run, rotate the OFF/ON/CHOKE dial to OFF and repeat starting instructions.

IMPORTANT NOTE: Do not overload generator or individual panel receptacles. See *Figure 3-3*. If an overload occurs, the overload LED (A) will illuminate and AC output ceases. To correct, see *Generator Status Lights*. Read *Know Generator Limits* carefully.

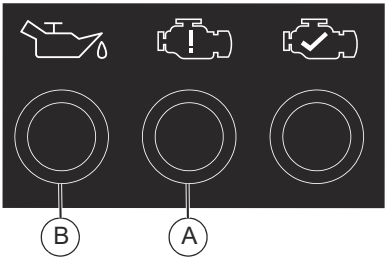


Figure 3-3.Shutdown Fault

Generator Shut Down

⚠CAUTION

Equipment and property damage. Disconnect electrical loads prior to starting or stopping unit. Failure to do so could result in equipment and property damage.

1. Shut off all loads and unplug electrical loads from generator panel receptacles.
2. Let engine run at no-load for several minutes to stabilize internal temperatures of engine and generator.
3. See *Figure 3-2* Rotate OFF/ON/CHOKE dial to OFF (3).
4. Turn fuel cap OFF.

Restarting Hot Engines

⚠CAUTION

Equipment and property damage. Disconnect electrical loads prior to starting or stopping unit. Failure to do so could result in equipment and property damage.

1. See *Figure 3-2*. Turn OFF/ON/CHOKE dial from STOP to ON. This will open the fuel valve and permit starting.
2. Firmly grasp recoil handle and pull slowly until increased resistance is felt. Pull rapidly up and away.

Low Oil Level Shutdown System

The engine is equipped with a low oil level sensor that shuts down the engine automatically when the oil level drops below a specified level to prevent engine damage. See *Figure 3-3* (B). The engine will not run until the oil has been filled to the proper level.

If the engine shuts down and there is sufficient fuel, check engine oil level.

Parallel Operation

For output power up to 3420W, two inverters can operate in parallel using Parallel Kit (optional). See the Parallel Kit Operator's Manual.

NOTE: All connections to the parallel kit should be made while both inverters are turned off and all loads disconnected.

1. Make sure the Engine Economy Switch is in the same position on both generators.
2. Make appropriate parallel connections to the outlets on each inverter as outlined in the owner's manual supplied with the kit.

NOTE: Do not disconnect any parallel kit connections once the units are running.

3. Start both units per starting instructions. Once the green output indicator illuminates, devices can be connected and turned on using the parallel kit outlet.
4. Follow ***Generator Shut Down*** instructions.

NOTE: For inverters, load applied to the parallel kit is not to exceed 3420 watts due to a 5% power loss when paralleling. See manual.

NOTE: Only use our approved parallel kit.

Section 4 Maintenance and Troubleshooting

Maintenance

Regular maintenance will improve performance and extend engine/equipment life. We recommends that all maintenance work be performed by an Independent Authorized Service Dealer (IASD). Regular maintenance, replacement, or repair of the emissions control devices and systems may be performed by any repair shop or person of the owner's choosing. To obtain emissions control warranty service free of charge, the work must be performed by an IASD (Independent Authorized Service Dealer). See the emissions warranty.

Maintenance Schedule

Follow maintenance schedule intervals, whichever occurs first according to use.

NOTE: Adverse conditions will require more frequent service.

NOTE: All required service and adjustments should be each season as detailed in the following chart.

At Each Use
Check engine oil level
Every 50 Hours
Clean/Replace Air Filter**
Change oil ‡
Every 100 Hours or Every Season*
Replace Spark Plug
Clean Spark Arrestor
Valve Clearance Adjustment
Every 200 Hours or Every Season
Inspect/clean air cleaner filter**
Replace Fuel Filter +

‡ Change oil after first 30 hours of operation, then every 50 hours.
+ To be performed by IASD (Independent Authorized Service Dealer).
* Change oil every month when operating under heavy load or in high temperatures.
** Clean more often under dirty or dusty operating conditions. Replace air filter parts if they cannot be adequately cleaned.
*** Check valve clearance and adjust if necessary after first 50 hours of operation and every 100 hours thereafter.

Preventive Maintenance

Dirt or debris can cause improper operation and equipment damage. Clean generator daily or before each use. Keep area around and behind muffler free from combustible debris. Inspect all cooling air openings on generator.

⚠WARNING

Personal injury. Do not insert any object through the air cooling slots. Generator can start at any time and could result in death, serious injury, and unit damage.

- Use a damp cloth to wipe exterior surfaces clean.
- Use a soft bristle brush to loosen caked on dirt, oil, etc.
- Use a vacuum to pick up loose dirt and debris.
- Low pressure air (not to exceed 25 psi) may be used to blow away dirt. Inspect cooling air slots and openings on generator. These openings must be kept clean and unobstructed.

NOTE: DO NOT use a garden hose to clean generator. Water can enter engine fuel system and cause problems. If water enters generator through cooling air slots, some water will be retained in voids and crevices of rotor and stator winding insulation. Water and dirt buildup on generator internal windings will decrease insulation resistance of windings.

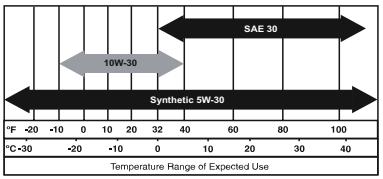
Engine Maintenance

⚠WARNING

Accidental start-up. Disconnect spark plug wires when working on unit. Failure to do so could result in death or serious injury.

Engine Oil Recommendations

To maintain the product warranty, the engine oil should be serviced in accordance with the recommendations of this manual. For your convenience, maintenance kits designed and intended for use on this product are available from the manufacturer that include engine oil, oil filter, air filter, spark plug(s), a shop towel and funnel. These kits can be obtained from an Independent Authorized Service Dealer (IASD).



Inspect Engine Oil Level

⚠WARNING

Risk of burns. Allow engine to cool before draining oil or coolant. Failure to do so could result in death or serious injury.

Inspect engine oil level prior to each use, or every 8 hours of operation.

1. Place generator on a level surface.
2. Clean area around oil fill, and oil drain plug.
3. Remove oil fill cap and wipe dipstick clean. See ***Figure 4-1***.

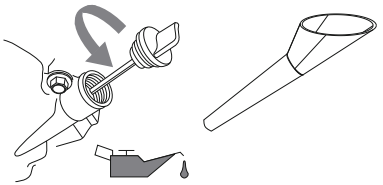


Figure 4-1. Engine Oil Fill

4. To check oil level, insert dipstick into oil filler neck without screwing it in. See ***Figure 4-2***.

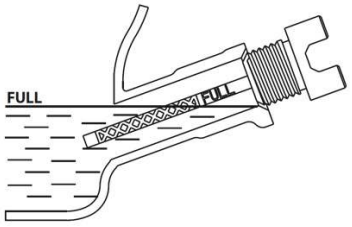


Figure 4-2. Safe Operating Range

5. Remove dipstick and verify oil level is within safe operating range.
6. Add recommended engine oil as necessary.

NOTE: Verify oil level often during filling process to ensure overfilling does not occur.

7. Replace oil fill cap and hand-tighten.

NOTE: Some units have more than one oil fill location. It is only necessary to use one oil fill point.

Change Engine Oil

⚠WARNING

Accidental start-up. Disconnect spark plug wires when working on unit. Failure to do so could result in death or serious injury.

When using generator under extreme, dirty, dusty conditions, or in extremely hot weather, change oil more frequently.

NOTE: Don't pollute. Conserve resources. Return used oil to collection centers.

Change oil while engine is still warm from running, as follows:

1. Place generator on a level surface.
2. Remove screws and side cover. See ***Figure 4-3***.



Figure 4-3. Remove Side Cover

3. Disconnect the spark plug wire from the spark plug and place the wire where it cannot contact spark plug.
4. Clean area around oil fill and oil drain plug.
5. Remove oil fill cap and wipe dipstick clean.
6. Tip unit and drain oil completely into a suitable container.
7. Once oil is sufficiently drained from unit, tip unit back to a level position.
8. Insert funnel into oil fill opening. See ***Figure 4-4***. Add recommended engine oil as necessary.

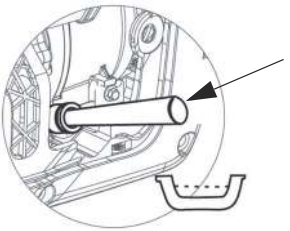


Figure 4-4. Oil Fill Opening With Funnel

9. To check oil level, remove funnel and insert dipstick into oil filler neck without screwing it in. See ***Figure 4-2***.
10. Remove dipstick and verify oil level is within safe operating range.

NOTE: Verify oil level often during filling process to ensure overfilling does not occur.

11. Replace oil fill cap and hand-tighten.
12. Wipe up any spilled oil.
13. Replace side cover and screws.
14. Properly dispose of oil in accordance with all applicable regulations.

Air Filter

Engine will not run properly and may be damaged if run with a dirty air filter. Service air filter more frequently in dirty or dusty conditions.

To service air filter:

1. Remove screws and side cover. See ***Figure 4-3***.
2. Unscrew bolt (A) and remove air filter cover. See ***Figure 4-5***.
3. Wash filter (B) in soapy water. Squeeze dry in clean cloth (DO NOT TWIST).
4. Clean air filter cover before installation.
5. Replace side cover and screws.

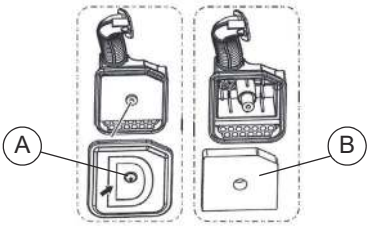


Figure 4-5. Air Filter Assembly

Service Spark Plug

To service spark plug:

1. Remove spark plug cover. See ***Figure 2-1***.
2. Clean area around spark plug.
3. Remove and inspect spark plug.
4. Inspect electrode gap with wire feeler gauge and reset spark plug gap to 0.6 - 0.7mm (0.024 - 0.028 in). See ***Figure 4-6***.

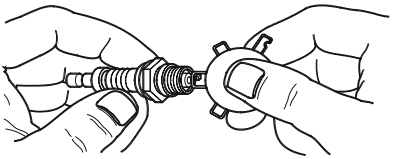


Figure 4-6. Spark Plug

NOTE: Replace spark plug if electrodes are pitted, burned or porcelain is cracked. Use ONLY recommended replacement plug. See ***Product Specifications***.

5. Install spark plug finger tight, and tighten an additional 3/8 to 1/2 turn using spark plug wrench.

Inspect Muffler and Spark Arrester

Contact original equipment manufacturer, retailer, or dealer to obtain a spark arrester designed for exhaust system installed on this engine.

NOTE: Use ONLY original equipment replacement parts.

Inspect muffler for cracks, corrosion, or other damage. Remove spark arrester, if equipped, inspect for damage or carbon blockage. Replace parts as required.

Inspect Spark Arrester Screen

⚠WARNING

Hot Surfaces. When operating machine, do not touch hot surfaces. Keep machine away from combustibles during use. Hot surfaces could result in severe burns or fire.

Clean Spark Arrestor Screen

The engine exhaust muffler has a spark arrestor screen. Inspect and clean the screen every 100 hours of operation or every season, whichever comes first.

To service spark arrestor:

1. See ***Figure 4-7***. Remove the clamp to remove retainer.
2. Slide spark arrestor screens out from the muffler outlet tube.
3. Inspect screens and replace if torn, perforated or otherwise damaged. Do NOT use a defective screen. If screen is not damaged, clean with a commercial solvent.

4. Replace the screens, and retainer, and secure with clamp.



Figure 4-7. Spark Arrestor Screen

Valve Clearance

Important: Please contact an Independent Authorized Service Dealer for service assistance. Proper valve clearance is essential for prolonging the life of the engine.

Check valve clearance after the first fifty-hours of operation. Adjust as necessary.

- Intake — 0.10 ± 0.02mm (cold), (0.004" ± 0.001" inches)
- Exhaust — 0.10 ± 0.02mm (cold) (0.004" ± 0.001" inches)

Storage

General

⚠DANGER

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Store fuel in a well ventilated area. Keep fire and spark away. Failure to do so will result in death or serious injury.

⚠WARNING

Risk of Fire. Verify machine has properly cooled before installing cover and storing machine. Hot surfaces could result in fire.

It is recommended to start and run the generator for 30 minutes, every 30 days. If this is not possible, refer to the following list to prepare unit for storage.

- DO NOT place a storage cover on a hot generator. Allow unit to cool to room temperature before storage.
- DO NOT store fuel from one season to another unless properly treated.
- Replace fuel container if rust is present. Rust in fuel will cause fuel system problems.
- Cover unit with a suitable protective, moisture resistant cover.
- Store unit in a clean, dry area.
- Always store generator and fuel away from heat and ignition sources.

Prepare Fuel System/Engine for Storage

Fuel stored over 30 days can go bad and damage fuel system components. Keep fuel fresh, use fuel stabilizer.

If fuel stabilizer is added to fuel system, prepare and run engine for long term storage. Run engine for 10-15 minutes to circulate stabilizer throughout fuel system. Adequately prepared fuel can be stored up to 24 months.

NOTE: If fuel has not been treated with fuel stabilizer, it must be drained into an approved container. Run engine until it stops from lack of fuel. Use of fuel stabilizer in fuel storage container is recommended to keep fuel fresh.

1. Change engine oil.
2. Remove spark plug.
3. Pour tablespoon (5-10cc) of clean engine oil or spray a suitable fogging agent into cylinder.

⚠WARNING

Vision Loss. Eye protection is required to avoid spray from spark plug hole when cranking engine. Failure to do so could result in vision loss.

4. Pull starter recoil several times to distribute oil in cylinder.
5. Install spark plug.
6. Pull recoil slowly until resistance is felt. This will close valves so moisture cannot enter engine cylinder. Gently release recoil.

Change Oil

Change engine oil before storage. See, ***Change Engine Oil***.

Troubleshooting

PROBLEM	CAUSE	CORRECTION
Engine won't start.	1. Dial turned off. 2. Out of fuel. 3. Defective spark plug. 4. Plugged fuel filter. 5. Defective or stuck Dial assembly. 6. Incorrect engine oil level. 7. Defective ignition coil. 8. Fuel cap vent OFF. 9. Carb is flooded. 10. Throttle plate closed.	1. Turn on Dial. 2. Fill fuel tank. 3. Replace spark plug. 4. Replace fuel and fuel filter. 5. Contact IASD (Independent Authorized Service Dealer). 6. Check/fill engine oil. 7. Contact IASD (Independent Authorized Service Dealer). 8. Turn fuel cap vent ON. 9. Drain carb. 10. Open throttle plate (push toward back of unit).
Engine starts, then shuts down.	1. Out of fuel. 2. Incorrect engine oil level. 3. Contaminated fuel. 4. Defective low oil level switch. 5. Fuel cap vent OFF.	1. Fill fuel tank. 2. Check engine oil level. 3. Contact IASD (Independent Authorized Service Dealer). 4. Contact IASD (Independent Authorized Service Dealer). 5. Turn fuel cap vent ON.
Engine will not start; or starts and runs rough.*	1. Choke is stuck or left on. 2. Dirty or clogged air filter. 3. Defective or dirty spark plug. 4. Dirty fuel filter. 5. Dirty or gummed up carburetor. 6. Unit not warmed up. 7. Fuel cap vent OFF. 8. Spark arrestor clogged.	1. Turn choke off. 2. Clean or replace air filter. 3. Replace spark plug. 4. Replace fuel and fuel filter. 5. Clean carburetor. 6. Gradually adjust Dial and reduce choke until engine runs smoothly in RUN position. 7. Turn fuel cap vent ON. 8. Clean spark arrestor.
No AC output.	1. Generator is overloaded. 2. Inverter module is overheated. 3. Short circuit in electrical device. 4. Defective inverter assembly.	1. Disconnect all loads. Shut down generator to reset module. Reduce loads, restart generator. 2. Verify service door is ON. Let cool 15 minutes by running engine without AC output. Press and hold Reset button on control panel, restart generator. 3. Verify condition of extension cords and items being powered. Press and hold Reset button on control panel. 4. Contact IASD (Independent Authorized Service Dealer).
Fuel leaks from drain hoses.	1. Carburetor drain in bowl is not closed.	1. Turn valve clockwise to close.
* Engine speed increases and decreases — This is normal as generator starts up and loads vary.		


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