

POWERHORSE®

M42411K

Item Number: 42411

Serial Number: _____

Owner's Manual

Instructions for Installation/Set-up, Operation, Servicing, & Storage Portable, Outdoor Use-Only, Gasoline Generator

Can be used to power individual appliances plugged directly into the generator's outlets, or as a back-up connection to a building's power supply (via a professionally installed UL-approved transfer switch).

▲ WARNING

READ and UNDERSTAND this manual completely before using the generator! Failure to properly set up, operate, and maintain this generator could result in *serious injury or death* from *carbon monoxide poisoning, electric shock, fire/explosion, or burns*. Generator has been shipped **WITHOUT** engine oil, Check the oil level using the dipstick and add oil as needed. In particular, be aware of the following hazards:

CO Poisoning

Generators give off carbon monoxide, a poisonous gas that can kill you. You CANNOT smell it, see it, or taste it.

- ONLY run generator OUTDOORS and AWAY from building air intakes. NEVER run generator inside any enclosed or semi-enclosed spaces, including homes, basements, garages, sheds, boxes, RVs, boats or pick-up truck beds. These spaces can trap poisonous gases, EVEN if you run a fan or open windows.
- Install carbon monoxide alarms inside nearby structures/buildings (battery-operated, or plug-in with battery backup).

Electric shock / Electrocution

- High voltage electricity from generator can kill. DO NOT operate in wet locations. Be sure generator is properly grounded. Use only UL-listed, outdoor-rated grounded extension cords of proper size.
- NEVER plug the generator directly into a wall outlet. ANY connection to a building's electrical system MUST ISOLATE THE GENERATOR FROM UTILITY POWER via a UL-approved transfer switch installed by a licensed electrician. Otherwise, back feed from the generator into the power grid could kill utility workers.

Fire / Explosion

- DO NOT overload generator (per rated capacity), and OPERATE ONLY in an area with adequate cooling ventilation so engine does not overheat. Exhaust can be extremely hot. Keep muffler at least 7 feet from all combustible objects.
- All fuels are flammable. Never fuel a running or hot engine. Never pump fuel directly into generator at gas station – use approved container to transfer fuel. Ensure there are no fuel leaks, and keep sources of sparks and flames away.
- ALWAYS keep a fire extinguisher rated “ABC” nearby.

STOP!

CHOOSE THE RIGHT GENERATOR FOR YOUR NEEDS. See the “Power load Planning & Management” section of this manual to determine your power load requirements and then compare to the generator's rated capacity.

INSPECT COMPONENTS: Closely inspect to make sure no components are missing or damaged. See the “Unpacking & Delivery Inspection” section for instructions on whom to contact to report missing or damaged parts.

ARRANGE FOR PROFESSIONAL INSTALLATION of a transfer switch if you will be connecting the generator to your building's electrical system. See the “Installation/Initial Set-Up” section for more information about this requirement.

Any Questions, Comments, Problems, or Parts Orders
Call Powerhorse Product Support 1-866-443-2576

Hazard Signal Word Definitions






	<p>This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.</p>
	<p>DANGER (red) indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.</p>
	<p>WARNING (orange) indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</p>
	<p>CAUTION (yellow) indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.</p>
	<p>CAUTION (yellow) used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.</p>

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Table of Contents

Hazard Signal Word Definitions	2
About Your Generator	4
Specifications	6
Safety Label Locations	7
Machine Component Identification	9
Power Load Planning & Management	11
Installation / Initial Set-Up:	
1. Unpacking & Delivery Inspection.....	14
2. Planning the Power Load.....	14
3. Set-up either as a BUILDING BACK-UP or PORTABLE Power Source	15
4. Selecting a Suitable Site	18
5. Grounding the Generator	20
Operation:	
1. General Safety Rules for Operation	21
2. Preparing for Operation.....	24
3. Starting the Generator.....	29
4. Checking Generator Output.....	31
5. Connecting Loads.....	32
6. Stopping the Engine	32
7. AC Parallel Operation	33
8. Storage & Exercise	35
Maintenance & Repair	37
Troubleshooting	47
Summary of Important Safety Information for Operation	48
Generator Exploded View	52
Generator Kit Exploded View	54
Limited Warranty	63
California Proposition 65 Information	64

About Your Generator

Thank you for purchasing your Powerhorse portable generator!

About Your Generator

This engine-driven, portable generator is designed to provide up to its rated amount of electrical power. (See specifications section of this manual for model specific ratings)

It can supply power:

1. As a portable power source. You can plug appliances directly into the generator's electrical outlets.
2. As a back-up, standby power source for a building. A licensed electrician can connect the generator to your building's electrical system via the installation of an **UL-approved transfer switch**. (See the "Installation & Initial Set-up" section of this manual to learn more about specific requirements and precautions relating to wiring the generator to your building's electrical system.)

You must select a generator adequately sized for your power needs. You need to determine the power needs of all the appliances/tools you wish to power at the same time and choose a generator rated to provide at least that power level. See the "Power Load Planning & Management" section of this manual to determine your specific power load requirements and then compare them to this generator's rated capacity. You must not overload the generator. Overloading will cause damage to the generator and attached electrical devices, and may also result in fire.

Be sure to read about site selection and grounding requirements for running this generator. More detailed information can be found in the "Installation & Initial Set-up, Steps 4 & 5 of this manual.

Contact Powerhorse Product Support at 1-866-443-2576 with questions about optional accessories or to order.

Read this Manual

WARNING

Improper use or maintenance of this generator can result in *serious injury or death* from *carbon monoxide poisoning, electric shock/electrocution, fire/explosion, or burns*.

Read this manual completely before using the generator and follow all instructions and safety rules.

You must follow all instructions and safety precautions presented throughout this manual. A summary of important safety information can be found at the end of the manual. Keep this manual for reference and review.

Proper preparation, operation, and maintenance will result in operator safety, as well as best performance and long life of the generator. For detailed engine operation and maintenance information, always refer to the engine Owner's Manual furnished with the generator.

Powerhorse is constantly improving its products. The specifications outlined herein are subject to change without prior notice or obligation. The purchaser and/or user shall assume liability for any modification and/or alterations of this equipment from original design and manufacture.

About Your Generator

Before using, the user shall determine the suitability of this product for its intended use and assumes liability therein.

Contact Powerhorse Product Support at 1-866-443-2576 for any questions about the appropriate use of this generator.

Warranty Registration

Please fill in the warranty registration information in the back of this manual and have it on hand when you call in on a warranty claim or replacement parts.

ATTENTION:

All Rental Companies and Private Owners who loan this equipment to others!

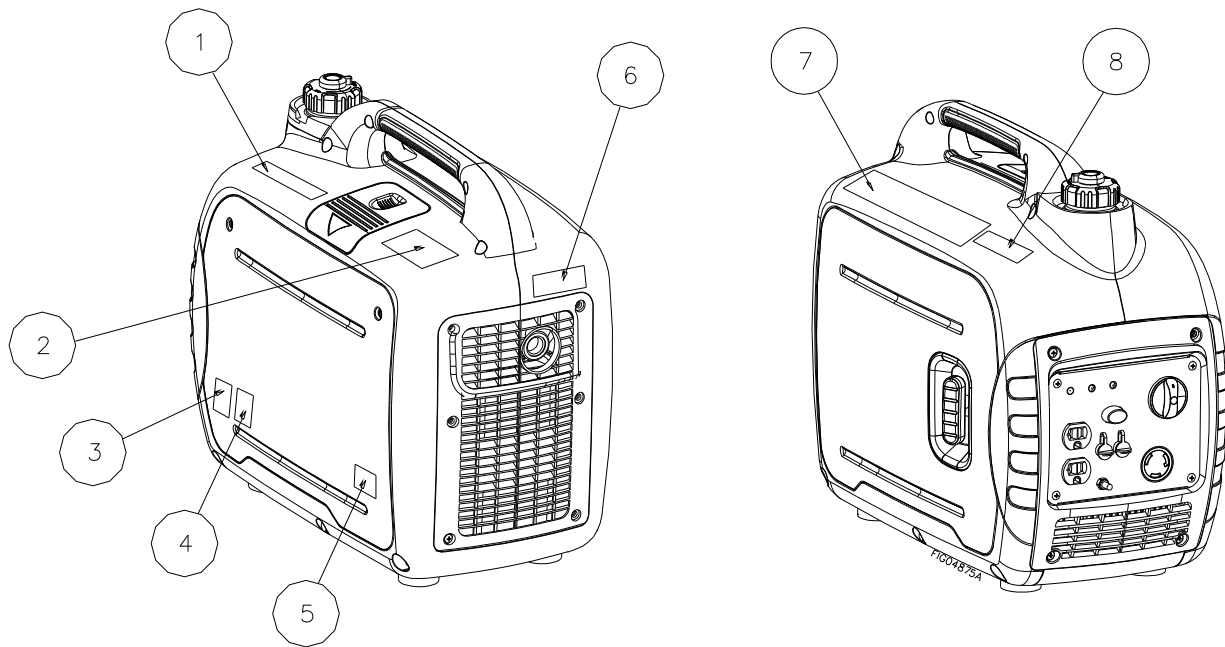
All persons to whom you rent/loan this generator must have access to and read this manual. Keep this owner's manual with the generator at all times and advise all persons who will operate the machine to read it. You must also provide personal instruction on how to safely operate the generator and remain available to answer any questions a renter/borrower might have.

Specifications

Item Number	#42411
Maximum Output	2000 Watts (W)
Continuous Output	1600 Watts (W)
Voltage	120 Volt (V)
Phase	Single phase
Frequency	60 Hertz (Hz)
Power Factor	1.0 p.f.
Engine	Powerhorse 79cc
Engine Speed	3,600 – 5,000 RPM (with ESC button OFF)
Fuel Type	Non-leaded automobile gasoline
Fuel Capacity	1.1 US gallons (4.0L)
Oil Type	10W-30 (API Service SE type or higher)
Oil Capacity	0.42 US quarts (0.35L)
Noise Level	52 dBA ~ 61 dBA @ 7 meters
Starting Method	Recoil
Dimensions	
Length	19.64"
Width	11.22"
Height	17.91"
Dry Weight	46 lbs.

Any Questions, Comments, Problems, or Parts Orders
Call Powerhorse Product Support 1-866-443-2576

Safety Label Locations



Ref. No.	Part #	Description	Qty
1	790858	Overfill & Spark Decal	1
2	790855	Exhaust Decal	1
3	790857	Name Plate	1
4	790854	EPA Decal	1
5	790908	Oil Fill Decal	1
6	790852	Burn Hazard Decal	1
7	790853	CPSC Decal	1
8	790856	Improper Connection Decal	1
N/A	790933	Small Powerhorse Decal (recoil side)	1
N/A	790859	Large Powerhorse Decal	1
N/A	796449	Powerhorse Decal (front)	1

Always make sure safety labels are in place and in good condition. If a safety label is missing or not legible, order new labels or unsafe operation could result.

To order replacement safety labels, call Powerhorse Product Support at 1-866-443-2576.

Safety Label Locations

1

⚠ WARNING	⚠ WARNING
Fire & Overheating Hazard DO NOT overfill fuel tank. Fill fuel only to level mark on fuel strainer. Expansion of fuel from heat of sun or normal operation may cause tank spillage if overfilled. Wipe up fuel spills and allow to dry before starting engine.	Spark Hazard Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrestor may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements. <small>Per California Public Resources Code 4442.6</small>

2

⚠ WARNING
Poisonous Gas This product gives off carbon monoxide, a poisonous gas that can kill you. You CANNOT smell it, see it, or taste it. - ONLY use outside & far away from windows, doors, & vents. - NEVER use inside homes, garages, or sheds, EVEN if you run a fan or open doors or windows. See owner's manual for more details.

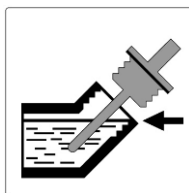
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POWERHORSE®	
ELECTRICAL GENERATOR	
ITEM#	42411 Rev. K
SERIAL#	MMYY XXXX
WATTAGE	2000 SURGE/1600 CONT
AMPS	13.3
VOLTS	120
FREQUENCY	60 HZ
RPM	3,600 - 5,000
INSULATION	CLASS F
PHASE	SINGLE
RATED AMBIENT TEMP	40C
STANDBY POWER ONLY	

4

EMISSION CONTROL INFORMATION													
FAMILY NAME: DCGPS-0805GR EXHAUST EMISSION CONTROL: EM EVAP FAMILY: DCGPS-0805GR EQUIPMENT FAMILY: DCGPHEQPFY ENGINE DISPLACEMENT: 79 cc THIS ENGINE MEETS 2013 MODEL YEAR U.S. EPA & CALIFORNIA EXH / EVP EMISSION REGULATIONS FOR SMALL OFF-ROAD ENGINES. THIS ENGINE IS CERTIFIED TO OPERATE ON UNLEADED GASOLINE.													
The Air Index of this engine is 3													
<table border="1"> <tr> <td>0</td><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td> </tr> <tr> <td colspan="3" style="text-align: center;">Most Clean</td> <td colspan="3" style="text-align: center;">Least Clean</td> </tr> </table>		0	2	4	6	8	10	Most Clean			Least Clean		
0	2	4	6	8	10								
Most Clean			Least Clean										
Note: the lower the Air Index, the less pollution. EMISSIONS COMPLIANCE PERIOD: 125 HOURS Check owners manual for further details. 2013 Model Year J F M A M J J A S O N D													

5



6

⚠ WARNING
Burn Hazard Do not touch hot muffler. Muffler may be hot even if the unit is stopped. Allow unit to cool before servicing.

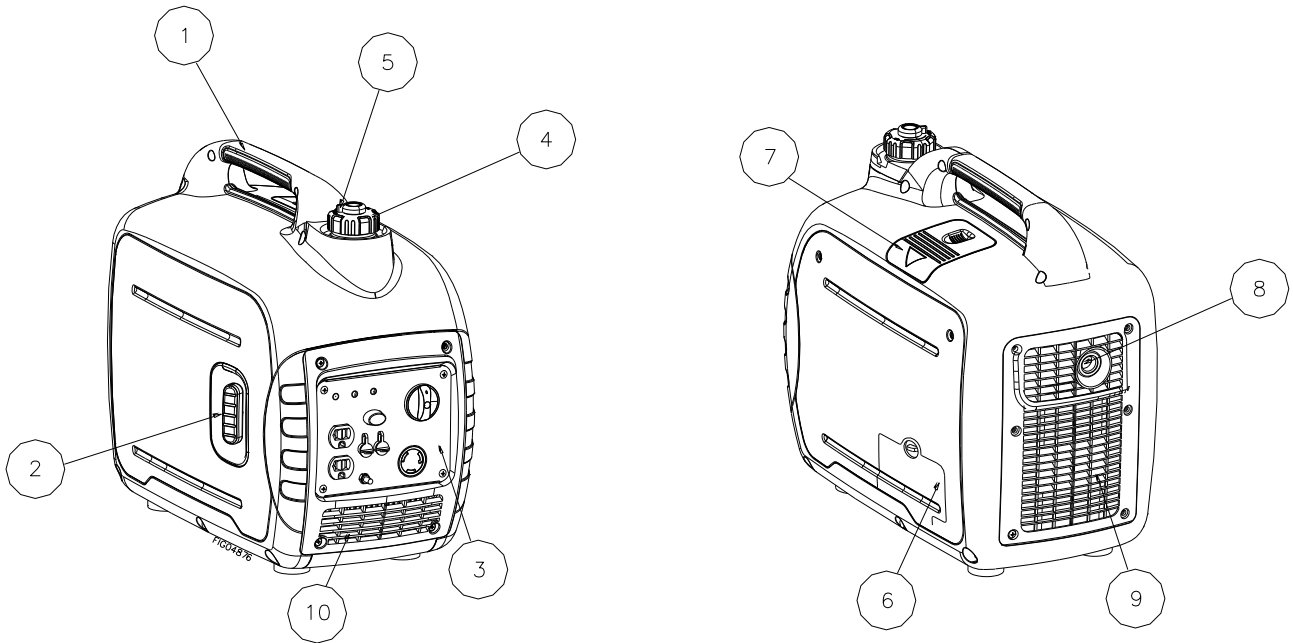
7

⚠ DANGER		
Using a generator indoors CAN KILL YOU IN MINUTES. Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.		
<p>NEVER use inside a home or garage. EVEN IF doors and windows are open.</p>	<p>Only use OUTSIDE and far away from windows, doors, and vents.</p>	<p>Electric Shock/ Electrocutation Hazard High voltage electricity from generator can kill.</p> <p>NEVER plug generator directly into a wall outlet. ANY connection to a building's electrical system MUST ISOLATE GENERATOR FROM UTILITY POWER via a transfer switch. Be sure generator is properly grounded. Use only outdoor-rated, grounded extension cords of proper size. DO NOT operate in wet locations.</p>
		<p>Fire/Explosion Hazard Fuel is flammable and explosive. Exhaust is very hot. Overloading the generator can cause fire.</p> <p>NEVER fuel a running or hot engine. Ensure there are no fuel leaks before starting. Keep sources of sparks and flames away. Clean up fuel spills immediately. Keep muffler at least 7 feet from all combustible objects. DO NOT overload generator. OPERATE ONLY with adequate cooling ventilation so engine does not overheat. ALWAYS keep a fire extinguisher nearby.</p>

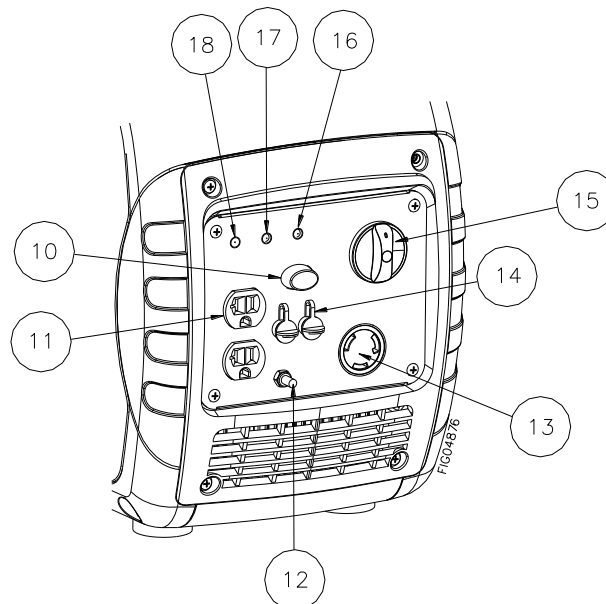
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⚠ WARNING
<p>Improper Connection Improper connections to a building can allow electrical current to backfeed into utility lines, creating an electrocution hazard.</p>

Machine Component Identification



Ref.	Description	Ref.	Description
1	Carrying Handle	6	Oil Fill Cover with Screw
2	Recoil Starter	7	Spark Plug Maintenance Cover
3	Control Panel	8	Muffler
4	Fuel Tank Cap	9	Hot Air Discharge
5	Fuel Tank Cap Air Vent Knob	10	Cool Air Intake



Ref.	Description	Ref.	Description
10	ESC Button (Engine Smart Control)	15	Engine OFF/RUN/CHOKE control
11	120Volt 20 Amp Duplex Receptacles	16	Output Indicator Light (Green)
12	Grounding Post	17	Overload Indicator Light (Red)
13	120Volt 30 Amp Locking Receptacle	18	Low Oil Warning Indicator Light (Red)
14	Parallel Operation Outlets		

REFERENCE GUIDE

Reference 1 – Carrying Handle	Provides a means for moving and lifting the generator. Grasp the handle firmly when pulling the recoil starter grip so the generator does not fall over.
Reference 2 – Recoil Starter Grip	Grasp firmly when starting engine to engage engine cranking.
Reference 3 – Control Panel	An electrical device that contains receptacles, switches and other electrical devices.
Reference 4 – Fuel Tank Cap	The fuel tank cap seals the fuel in the tank.
Reference 5 – Fuel Tank Cap Air Vent Knob	The fuel tank cap air vent knob must be in the ON position for the generator to run. After the generator has cooled, turn the fuel tank cap air vent knob to the OFF position to reduce leakage.
Reference 6 – Oil Fill Cover and Port	Located behind the oil fill cover. Allows for adding the oil and checking the oil level.
Reference 7 – Spark Plug Maintenance Cover	Cover that allows access to spark plug.
Reference 8 – Muffler	An acoustic device installed onto the exhaust system that is designed to reduce noise. The outlet includes a spark arrester.
Reference 9 – Louver	Opening in the casing for ventilation.
Reference 10 – ESC Button	With the Engine Smart Control button ON the generator will automatically reduce the engine speed depending on the size of the load. This will result in better fuel consumption and less noise. With the Engine Smart Control button OFF the engine runs at full RPM regardless if a load is connected or not.
Reference 11 – Duplex Receptacles (NEMA 5-20R)	Electrical device able to accept AC 120V 15A or 20A plugs (NEMA 5-15P or 5-20P)
Reference 12 – Grounding Post	Means to connect the generator to a ground wire.
Reference 13 – Locking Receptacles (NEMA L5-30R)	Electrical device able to accept AC 120V 30A locking plugs (NEMA L5-30P)
Reference 14 – Parallel Operation Outlets	This is the terminal for connecting two Powerhorse Inverter Generators using special cables.
Reference 15 – Engine OFF/RUN/CHOKE control	This switch has the following positions: OFF - Stops the engine and closes the fuel valve. RUN – Running position; opens the fuel valve and allows a warm engine to be started, choke is off. CHOKE – Starting position; opens the fuel valve and turns choke on to start a cold engine.
Reference 16 – Output Light	Illuminates (green) when the generator starts and produces power.
Reference 17 – Overload Light	Illuminates (red) when overload of any connected device is detected, the inverter control unit overheats or AC output voltage rises. The engine also stops and Output Light goes off.
Reference 18 – Low Oil Warning Light	Illuminates (red) when oil falls below the lower level and the engine stops automatically.

Power Load Planning & Management

WARNING

NEVER exceed the rated wattage capacity of your generator.

OVERLOADING may cause SERIOUS DAMAGE to the generator and attached electrical devices, and may result in fire.

Your generator **MUST BE SIZED PROPERLY** to provide both the running and starting (surge) wattage of the devices you will be powering. Before using your generator, determine the running and starting wattage requirements of all the electrical devices you will be powering simultaneously. The sum of the running and starting wattages of the devices being powered must not exceed the continuous output rating of your generator. (The continuous output rating of your generator is listed in the “Specifications” section of this manual.) Note that:

- Devices without electric motors such as light bulbs, radios, and televisions have the same running and starting wattage.
- Devices with electric motors such as refrigerators, compressors, and hand tools typically require a starting wattage that is 3 to 5 times greater than the running wattage.

The running and starting wattage requirements are often listed on a device’s nameplate. If wattage is not given on the device’s nameplate, the wattage may be calculated by multiplying the nameplate voltage by nameplate amperage, $\text{Watts} = \text{Volts} \times \text{Amps}$.

Example conversion to watts:

$$120 \text{ Volts} \times 5 \text{ Amps} = 600 \text{ Watts}$$

If only the running voltage is given on the nameplate for a device with an electric motor, the starting wattage can be approximated to be three to five times the running wattage.

Estimates for the running wattage requirements for common devices are listed in **Table 1** below. Guidance for starting wattages is provided in the table’s footnotes.

Table 1

Device	Running Watts (Continuous)	Starting Watts (Surge)
10in. Table Saw	1800	4500
7-1/4in. Circular Saw	1400	2300
8in. Bench Grinder	1400	2500
Air Conditioner - Central (24,000 BTU)	3800	4950
Air Conditioner - RV (13,500 BTU)	1500	3000
Air Conditioner - Window (10,000 BTU)	1200	2200
Battery Charger: 100 Amp with 300 Amp Boost	2400	7800
Battery Charger: 15 Amp	380	-
Battery Charger: 60 Amp with 250 Amp Boost	1500	5750
Belt Sander	1200	2400
Ceiling Fan	800	1200
Clock Radio	100	-
Clothes Dryer (electric)	1800	5750

Power Load Planning & Management (cont'd)

Device	Running Watts (Continuous)	Starting Watts (Surge)
Clothes Dryer (gas)	700	1200
Clothes Washer	1150	2300
Coffee Maker	1750	-
Deep Freezer	700	1000
Desktop Computer w/ 17" monitor	800	-
Dishwasher (Hot Dry)	1500	1500
Drill: 1/2in., 5.4 Amps	600	900
Drill: 3/8in., 4 Amps	440	600
DVD/CD Player	100	-
Electric Fence: 25 Miles	2500	-
Electric Fry Pan	1300	-
Electric Range: 8in. Element	2100	-
Furnace Fan (Gas or fuel oil): 1/2 HP	875	2350
Furnace Fan (Gas or fuel oil): 1/4 HP	600	1000
Furnace Fan (Gas or fuel oil): 1/8 HP	300	500
Garage Door Opener	750	1200
Hair Dryer	1250	-
Hot Plate	2100	-
Inkjet Printer	80	-
Iron	1200	-
Laser Printer	950	-
Lights (Ten 75 Watt light bulbs)	750	-
Microwave Oven 1000W	1000	-
Milk Cooler	1100	1800
Milker (Vacuum Pump): 2 HP	1000	2300
Miter Saw - 10"	1650	2400
Oscillating Fan	200	400
Portable Heater (Kerosene, Diesel: 150,000 BTU)	625	1000
Pressure Washer: 1 HP	1200	3600
Quartz Halogen Work light	1000	-
Reciprocating Saw	1200	2000
Refrigerator Freezer	700	1500
Security System	500	-
Space Heater	1800	-
Stereo Receiver	450	-
Sump Pump: 1/2 HP	1050	2150
Sump Pump: 1/3 HP	800	1300
Television 27"	500	-
VCR	100	-
Water Heater (Electric 40gal)	4000	-
Water Well Pump (1/3hp 220v)	1000	2000

(a) Hard-starting motors require 3-5 times the rated running watts

(b) For extremely hard to start loads such as air conditioners and air compressors, consult the equipment dealer to determine maximum wattage

Power Load Planning & Management (cont'd)

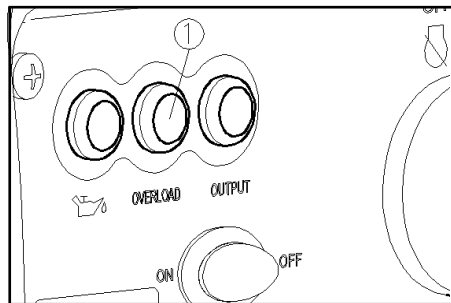
To calculate the running and starting wattage requirements for the devices you will be powering, follow these steps:

1. Make a list of all electrical devices you will be powering at the same time with the generator.
2. List the greater of the running or starting wattage next to each device as obtained from the devices' nameplate or **Table 1**. If only the running wattage for a device with an electric motor is known, the starting wattage can be estimated to be at least 3 times the running wattage.
3. Add the wattages for all devices on your list. This total must be lower than the continuous output rating of your generator.

Example:

Device to be Powered	Greater of Starting/Running Wattage
Light Bulbs (10 – 75 watt)	750 W
Refrigerator Freezer	1500 W
Microwave Oven 1000W	1000 W
Air Conditioner, Window (10,000 BTU)	2200 W
Sump pump (1/3 hp)	1300 W
Total	6750W

In this example, the generator must have a continuous output of at least 6750 watts in order to power all of the devices simultaneously.



The overload indicator light ① comes on when the total wattage exceeds the generators capability. If that happens, proceed as follows:

1. Turn off any connected electric devices and stop the generator.
2. Reduce the total wattage of connected electric devices within the rated output.
3. Check for blockages in the cool air intake (louver) and around the control unit. If any blockages are found remove.
4. After checking, restart the generator.

STAGGERING LOADS

You can increase the number of devices your generator can power by staggering the load on the generator. For example, you could alternately power your refrigerator and air conditioner for limited periods of time -- powering only one of the devices at a time and never powering both at the same time.

Installation / Initial Set-Up

There are a number of important steps required to set up your generator for initial use. These steps are:

Steps for Installation / Initial Set-Up

1. **Unpacking & delivery inspection.**
2. **Planning the power load to stay within the generator's rated capacity.**
3. **Setting up generator for the type of power generation you need:**
 - a. **portable power source, or**
 - b. **connected to a building as a back-up power source.**
4. **Selecting a site for using the generator.**
5. **Grounding.**

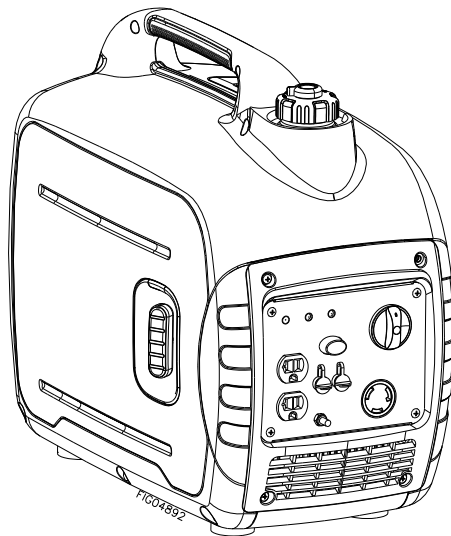
Each of these steps is discussed in detail below:

1. Unpacking & Delivery Inspection

You should inspect the generator immediately after you receive delivery.

See the "Machine Component Identification" section of this manual for a diagram of the generator and its components.

- If you are *missing* or have damaged components, contact Product Support at 1-866-443-2576.



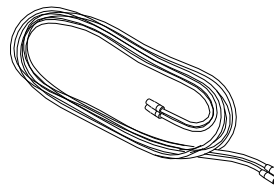
Generator



Funnel
Part # 791453



Spark Plug Wrench
and Handle Bar
Part # 791454



Parallel Cable Kit
Part # 791456



Flat Head
Screw Driver
Part # 791455

2. Planning the Power Load

Plan your power load so that you do not exceed the generator's rated capacity.

See the "Power Load Planning & Management" section of this manual to review how to plan and manage power loads for the generator.

Installation / Initial Set-Up

3. Set-up either as a BUILDING BACK-UP or PORTABLE Power Source

This generator is designed to provide up to its rated amount of electrical power. It can supply electricity in two ways:

1. **As a back-up, standby power source for a building.** For this application, you must arrange for a licensed electrician to connect the generator to your building's electrical system via the installation of an UL-approved transfer switch. The transfer switch must be installed in accordance with building electrical code and guidelines supplied by your power company.
2. **As a portable power source.** You can plug appliances or tools directly into the generator's electrical outlets.

Specific requirements for each are given below.

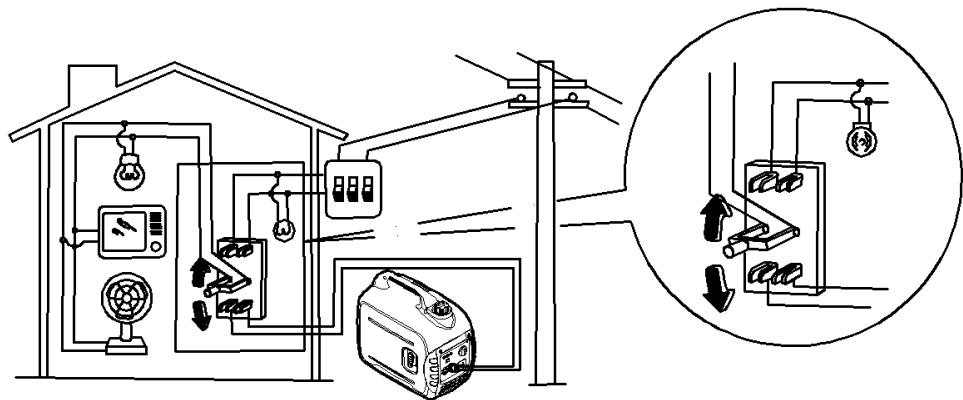
Note: Regardless of whether you use your generator as a back-up power source connected to a building or as a portable power source, you must not overload the generator. Overloading may cause serious damage to the generator and attached electrical devices.

Using as a Back-up Power Source for a Building

Contact a licensed electrician to install an UL-approved transfer switch if you want to use your generator as a back-up power source for a building.

What does a transfer switch do? It:

- a) Safely connects the generator to your building's electrical system by isolating your generator from your utility company's power lines, AND
- b) Connects your generator to a critical subset of your building's circuits that are needed for emergency power needs.



If your generator will be connected to your building's electrical system, it **MUST ALWAYS** be isolated from the utility power grid with a *UL-approved transfer switch installed by a licensed electrician* in compliance with all applicable building and electrical codes, and in accordance with guidelines supplied by your power company.

▲DANGER:

A transfer switch must be installed in order to isolate your generator from the utility power grid. If your generator is **NOT** properly isolated from the utility system, serious hazards will arise:

- ◆ When your generator is running, its output will back feed into the utility power line and transformer that are normally used to provide you with power. The transformer will step up the current to the

Installation / Initial Set-Up

normal line voltage. An unsuspecting utility line worker working on what he thinks is a deactivated line could be electrocuted.

- ◆ If your generator is connected (running or not) when utility power is restored, your generator will be destroyed. It could also explode or cause fire.

In addition to isolating your generator from the utility system, the transfer switch connects your generator to a limited set of circuits in your building that have been chosen as critical to operate during a power outage.

The generator may not power your entire home -- you must work with the installing electrician to determine which devices/appliances you wish to power during an outage. The electrician can help you determine which circuits and devices can be powered simultaneously without overloading the generator.

(See the previous section of this manual entitled “**Power Load Planning & Management**” for more information on load application and selection.)

Using as a Portable Power Source

When using the generator as a portable power source, you can plug electric devices and appliances directly into the generator’s electrical outlets.

There are different kinds of electrical outlets on your generator:

1. 120 Volt, 20 Amp duplex straight-blade receptacles (NEMA 5-20R duplex receptacle compatible with NEMA 5-20P or 5-15P mating plugs).
2. 120 Volt, 30 Amp locking receptacle (NEMA L5-30R receptacle compatible with NEMA L5-30P mating plug).

1. Make sure you plug each electrical device/appliance into the correct generator outlet based on the device’s plug configuration and voltage/amperage rating. Never exceed the amperage rating of an outlet.
2. Extension cords may be used to power devices that are located at a distance from the generator. However, use only UL-listed, outdoor-rated, grounded extension cords of the proper size. Use Table 2 below to choose an adequately sized extension cord according to the amperage of the device being used and the length of the cord.

Table 2

Current/Power	Maximum Extension Cord Length and Size (AWG)			
	0-25 ft.	25-50 ft.	50-100 ft.	100-150 ft.
Current At Full Load (Amps)				
6	18 ga.	16 ga.	14 ga.	12 ga.
8	18 ga.	16 ga.	12 ga.	10 ga.
10	18 ga.	14 ga.	12 ga.	10 ga.
12	16 ga.	14 ga.	10 ga.	8 ga.
14	16 ga.	12 ga.	10 ga.	8 ga.
16	16 ga.	12 ga.	10 ga.	8 ga.
18	14 ga.	12 ga.	8 ga.	8 ga.

Installation / Initial Set-Up

▲WARNING:

Use of under sized extension cords can cause electric shock, fire, or damage to connected devices.

3. All extension and appliance cords must be in good condition and not worn, bare, frayed, or otherwise damaged.

▲WARNING:

Use of damaged electric cords can cause electric shock or fire.

Note: If an extension cord becomes hot to the touch, it is overloaded or damaged and must be replaced.

Northern Tool is NOT responsible for damage or injury resulting from customer use of inadequate extension cords.

Installation / Initial Set-Up

4. Select a Suitable Site

Before using the generator, you must select a suitable **OUTDOOR** location for installation and operation. This location should meet all of the criteria listed below.

▲ WARNING:

You must choose a suitable site for operating your generator to avoid equipment damage and/or injury and possible death from carbon monoxide poisoning, electric shock, or fire. Choose a site that meets all of the criteria specified.

Dry, level surface

The generator should be positioned on a dry, firm, level surface.

Ensure that the generator sits level and will not slide or shift during operation. If applicable, block the generator's wheels to prevent sliding and shifting.

Outdoors only – dangerous carbon monoxide exhaust

▲ WARNING: Carbon monoxide poisoning hazard

The exhaust from your generator contains carbon monoxide (CO), a poisonous gas that can kill. You cannot smell it, see it, or taste it. *Carbon monoxide exhaust is given off whether you are using gasoline, natural gas, or propane as the fuel source to power the generator.* Follow the directions below for choosing a location to operate your generator in order to avoid carbon monoxide poisoning.

The location you choose to operate the generator must be OUTDOORS and away from all air intakes:

- Never run the generator inside any closed or semi-enclosed spaces (even if outdoors), including homes, garages, basements, sheds, or boxes. *These spaces can trap poisonous gases, even if you run a fan or open windows.*
- Never place the generator immediately adjacent to a building or other structure – allow at least 7 feet clearance.
- Place the generator so that the exhaust fumes will not be directed towards people or building air intakes.
- Ensure that working, battery-operated or battery back-up carbon monoxide alarms are used in any dwelling/structure that is in close proximity to the running generator.
- Note that this generator is NOT designed or approved for use in vehicles or marine applications. Never run the generator inside RVs or other vehicles, on boats, or on pick-up truck beds.

▲ WARNING:

Never attempt to attach ductwork to the muffler system to allow for installation inside an enclosure. This could cause hot air deflection, heat build-up, and increased exhaust back-pressure, resulting in possible exhaust leakage or damage to the generator.

Installation / Initial Set-Up

Adequate cooling ventilation	<p>The generator needs adequate, unobstructed flow of air to allow for proper cooling of engine and generator head.</p> <p>▲ WARNING: Heat build-up from inadequate ventilation can result in fire, posing a serious risk to nearby persons and structures.</p> <ul style="list-style-type: none"> • Situate so there is adequate clearance around generator to allow for cooling airflow so that heat does not build up. • Never place the generator immediately adjacent to a building or other structure – allow at least a 7’ clearance. • Do not run the generator in close proximity to other heat-generating equipment, such as another generator. The combined heat that is generated may raise air temperature in the immediate area and there will not be adequate cooling ventilation. • Do not allow debris to accumulate and block airflow. • Do not operate with a tarp, blanket, or cover surrounding the generator.
No wet conditions	<p>Choose a location where the generator will NOT be exposed to rain, snow, or direct sunlight. Exposure to water can cause electric shock.</p> <p>You <i>may</i> operate the generator under an outdoor, canopy-like structure of heat-resistant material that is open on all sides. Make sure that all parts of canopy are at least 7’ from exhaust, and allow for adequate clearance above generator so that heat does not build up.</p>
Hot exhaust clearance	<p>The exhaust gas from your generator is extremely hot and can cause combustible materials to catch on fire.</p> <ul style="list-style-type: none"> • Make sure your generator’s exhaust system is at least 7 feet from all combustible materials and buildings/structures. • Equip the engine with a spark arrester if the generator will be used near any ignitable forest, brush, or grassy land. (See the “Specifications” section of this manual to determine if your generator is already equipped.) Make sure you comply with applicable local, state, and federal codes. • Keep a fire extinguisher rated “ABC” nearby. Keep it properly charged and be familiar with its use.
Away from dust/dirt	<p>Do not use the generator in extremely dusty or dirty conditions. Excessive dust and dirt can cause premature failure of the machine.</p>
Hearing protection	<p>Generators can produce noise levels of up to 95 dB in close proximity, which can be dangerous to human hearing with prolonged exposure.</p> <p>Hearing protection may be required for persons working within 15-20 feet of the running generator for an extended period of time.</p> <p>▲ WARNING: Never attempt to attach ductwork to the muffler system to lower noise levels. This could cause hot air deflection, heat build-up, and increased exhaust back-pressure, resulting in possible exhaust leakage or damage to the generator.</p>

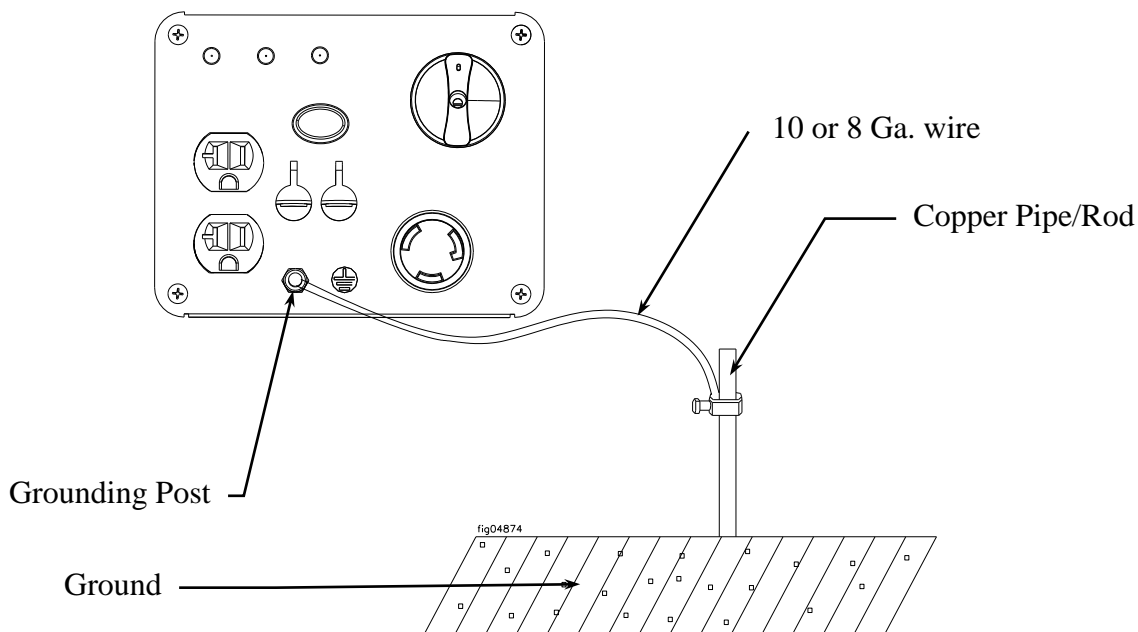
Installation / Initial Set-Up

5. Grounding the Generator

Always ensure the generator is properly grounded to prevent electrical shock.

You must always ground the generator by the following method when using the generator as a portable electrical source:

- 1) Drive a 3/4" or 1" copper pipe or rod into the ground close to the generator. The pipe/rod must penetrate moist earth – the depth required will be dictated by local soil conditions. Consult with an electrician.
- 2) Connect an approved ground clamp to the pipe.
- 3) Run a 10 or 8 gauge wire from the clamp to the generator grounding post located on the electrical panel.
- 4) Do not connect the generator grounding post to a water pipe or a ground used by a radio system.



If a licensed electrician installs the generator with a connection to your building's electrical circuit for use as a back-up power system, grounding may alternatively be completed through the building's grounding system. Ask your electrician. If the generator is not grounded through your building's electrical system, follow the procedure above.

▲ WARNING:

Operating the generator when it is not properly grounded can result in electrical shock.

Operation

Once you have set up your generator for use, it is time to start your generator. The following are the procedures necessary for safe, successful operation of your generator.

Operation Procedures

1. **General Safety Rules for Operation**
2. **Preparing for Operation**
3. **Starting the Engine**
4. **Checking Generator Output**
5. **Connecting Electrical Loads (Portable Power Generation)**
6. **Stopping**
7. **Storage & Exercise of Generator**

Each of these procedures is discussed in detail below:

1. General safety rules for operation

Before starting the generator, review the following general safety rules for operation:

▲ WARNING:

Failure to follow safety rules may result in serious injury or death to the operator or bystanders.

- **Know proper use/how to stop.** Be thoroughly familiar with proper use of the equipment and all generator controls, output receptacles, and connections. Know how to stop the generator quickly if needed (see “Operation, Step 6 - Stopping the Engine”).
- **Instruct operators.** The generator owner must instruct all operators in safe generator set-up and operation. Only trained adults should set up and operate the generator – Do not let children operate.
- **Intended use.** Carefully read about and understand the intended use of this generator. Do not use for other purposes, as unforeseen hazards or equipment damage may result.
- **Under the influence.** Never operate, or let anyone else operate, the generator while under the influence of alcohol, drugs, or medication.
- **Safety equipment / controls.** Do not operate the generator unless all safety covers, guards, and barriers are in place and in good working order, and all controls are properly adjusted for safe operation.
- **Damaged.** Do not operate the generator with damaged, missing, or broken parts.
- **Modifications.** Do not modify the generator in any way. Modifications can create serious safety hazards and will also void the warranty.
- **Engine speed.** Never attempt to modify the engine speed setting. The engine speed is preset for safe and optimal performance of the generator. If speed needs adjusting, it must be done by factory-authorized personnel.
- **External fuel sources.** Never attempt to connect external gasoline/diesel sources in order to increase engine run time. Larger tank at pressure or higher elevation will cause gasoline to leak from carburetor during operation. Fire or explosion could result.

Operation

- **Malfunction during operation.** Immediately turn off the generator if any of the following conditions arise during operation:
 - Excessive change in engine speed, slow or fast
 - Overheating in load connecting devices
 - Sparking or arcs from generator
 - Loss of electrical output
 - Receptacle damage
 - Engine misfire
 - Excessive vibration
 - Flame or smoke
 - Abnormal noise
- **Adjusting / repairing.** Always turn off generator and remove spark plug(s) or spark plug wire(s) before working on the generator to prevent accidental starting. Always discharge the capacitor before working on the generator head to prevent electrical shock. (See Maintenance & Repair section of this manual for instructions on how to do this.)
- **Carbon monoxide poisoning.** The running engine gives off carbon monoxide, a poisonous gas that can kill you. You CANNOT smell it, see it, or taste it. Follow all instructions for site selection and positioning the generator, and avoid inhaling the exhaust. If you start to feel sick, dizzy, or weak while using the generator, shut off the engine and get to fresh air RIGHT AWAY. See a doctor. You may have carbon monoxide poisoning.
- **Other exhaust dangers.** This product contains or emits chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Avoid inhalation of exhaust.
- **Wet conditions.** Do not operate the generator or handle any electrical equipment while standing in water, while barefoot, while hands are wet or while in the rain or snow. Electric shock may result.
- **Ground fault circuit interrupter.** Always use a ground fault circuit interrupter (GFCI) protected extension cord (or outlet, if generator is equipped) in damp or highly electrical conductive areas and on construction jobsites to prevent electrical shock.
- **Avoid contact.** Avoid contact with bare wires, terminals, connections, etc. while the unit is running.
- **Electric shock accident.** If an electric shock accident occurs, immediately shut down the source of electrical power. If this is not possible, attempt to free the victim from the live conductor. Avoid direct contact with victim. Use a nonconducting implement, such as a dry rope or board, to free the victim from the live conductor. Apply first aid and get immediate medical help.
- **Smoking/sparks.** Never smoke near the running generator, and never operate near sources of sparks or flames.
- **Hot muffler.** Never touch hot muffler, hot exhaust manifold, or engine cooling fins. Exhaust and engine parts can be very hot and will burn you.
- **Moving parts.** Keep hands, feet, and apparel away from drive belts, fans, and other moving parts. Never remove any drive belt or fan guard while the unit is operating.

Operation

Static electricity and filling the gasoline tank:

Static electricity can initiate from ungrounded gasoline tanks or containers, from flowing gasoline, and from persons carrying a static electric charge

Static electricity can explosively ignite gasoline vapors that are present during the fueling process, resulting in serious burns to nearby persons. To avoid static electricity while fueling, certain steps must be followed before and during the fueling process in order to minimize and safely dissipate static charge build-up:

- ***Touch a grounded metal object before starting.*** Always dissipate static charge from your body before beginning the fueling process by touching a grounded metal object at a safe distance away from fuel sources.
- ***Use a portable container to fill tank.*** Never fill the generator's gas tank directly from the fuel pump – the generator's tank is not grounded and the high velocity flow of gasoline from a fuel pump can cause static electric build-up. Use an approved portable container to transfer gasoline to the generator's tank.
- ***Fill container on the ground.*** Never fill the portable gas container while it is sitting inside a vehicle, trailer, trunk, or pick-up truck bed. ALWAYS place container on the ground to be filled.
- ***Keep nozzle in contact with container.*** Keep nozzle in contact with the portable container at all times while filling. Manually control the flow of gasoline; do NOT use the nozzle's lock-open device.
- ***Use a portable container made of metal or conductive plastic.*** It will dissipate charge to ground more readily.

About static electricity and fueling

Many common objects can accumulate and retain a static electric charge. Objects made of non-conductive materials (e.g. plastics) easily accumulate and retain static electric charge, as can objects made of conductive material (e.g. metal, water) if they are not electrically grounded. The static electric charge on an object, such as a human body or plastic fuel tank/container, can reach as high as several thousand volts!

A static electric spark can be generated if the static electric charge stored on an object "jumps" to another, less charged object. Such a spark can ignite invisible gasoline vapors that are present during fueling situations.

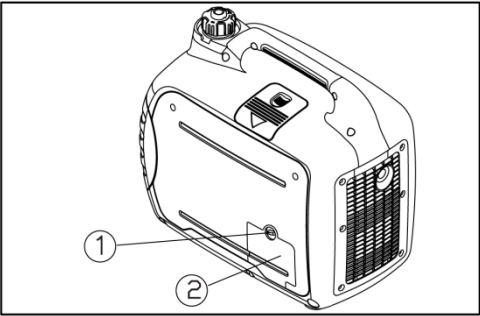
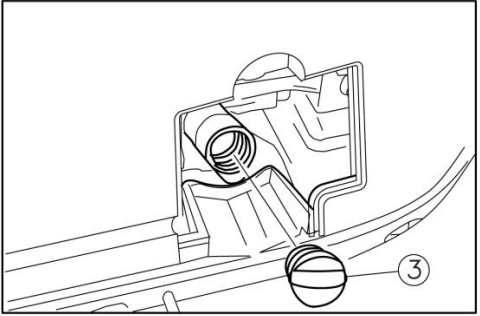
Typical sources of static electric hazards during fueling

The following objects can accumulate a static electric charge and cause an ignition spark in typical fueling situations:

- 1) Ungrounded tanks/containers. Any ungrounded fuel tank or container can accumulate a static electric charge as a result of contact with other objects or friction during transportation. This static electricity can discharge as a spark to the grounded gasoline dispenser nozzle, as the nozzle is first brought close to the tank/container at the beginning of the fueling process.
- 2) Flowing gasoline. Most people are not aware that gasoline accumulates static electric charge while flowing through a hose or pipe. This charge then transfers to and accumulates in the gas tank or container that is being filled. The total amount of charge accumulation depends on the amount of gas pumped into the container, the speed with which it is pumped, and whether or not the tank/container is grounded. If sufficient static electric charge accumulates in the fuel tank or container during the fueling process, the tank/container may discharge a spark to the grounded gasoline dispenser nozzle.
- 3) Persons. A person dispensing the gasoline can carry a static electric charge on their body, typically resulting from contact with their car seat or electronics. The static electricity can discharge as a spark between that person's hand and either the grounded dispenser nozzle or the fuel tank opening.

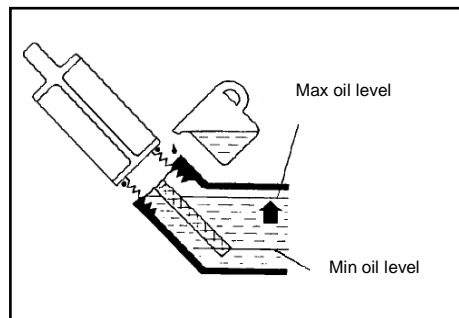
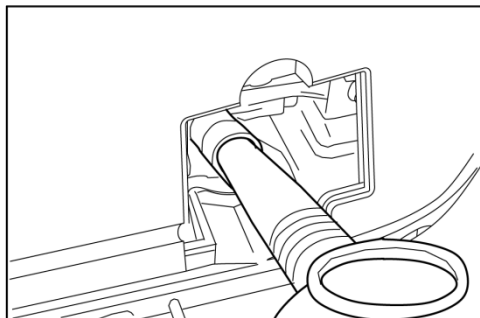
Operation

2. Preparing for Operation

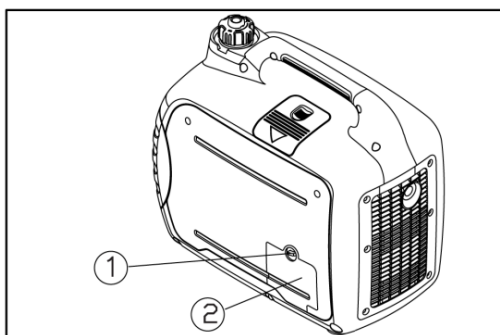
Position generator	<p>Position generator in accordance with the instructions given in “Installation & Initial Set-up, Step 4: Select a Suitable Site” of this manual.</p> <p>Operate outside only, on dry, level ground with adequate clearance and ventilation.</p> <p>⚠ WARNING: Carbon monoxide poisoning hazard Generators give off carbon monoxide exhaust, a poisonous gas that can kill. You CANNOT smell it, see it, or taste it. ONLY run generator OUTDOORS and away from air intakes. NEVER run generator inside any enclosed or semi-enclosed spaces, including homes, garages, basements, sheds, boxes, pick-up truck beds, RVs, or boats. These spaces can trap poisonous gases, EVEN if you run a fan or open windows. <i>Carbon monoxide exhaust is given off whether you are using gasoline, natural gas, or propane to power the generator.</i></p>
Ground generator	<p>Make sure the generator is grounded in accordance with instruction given in “Installation & Initial Set-up, Step 5: Grounding the Generator” of this manual.</p> <p>⚠ WARNING: Electric shock hazard Always ensure generator is properly grounded to prevent electrical shock.</p>
Perform scheduled maintenance as needed	<p>Make sure that any regular maintenance has been performed as prescribed in this manual in the “Maintenance & Repair” section.</p>
Check/add oil	<p>Generator has been shipped WITHOUT engine oil, Check the oil level using the dipstick and add oil as needed.</p> <ol style="list-style-type: none">1) Place the generator on a level surface.2) Remove the screw①, and then remove the oil fill cover②  <ol style="list-style-type: none">3) Remove the oil filler cap③ 

Operation

4) Fill with the recommended amount and type of engine oil, then install and tighten the oil filler cap.



5) Install the oil fill cover ② and tighten the screw ①



(See specification section for oil type and capacity.)

▲WARNING: Burn hazard

Never open oil port while engine is running. Hot oil can spray over face and body.

Notes:

- Low oil shutdown feature prevents the generator from starting without sufficient oil.
- Generator is shipped without oil. You must add oil before first use.

IMPORTANT:

Under long, continuous-run operating conditions, be prepared to:

- Check engine oil level every time you refuel the generator.
- Change oil after the first 20 operating hours, and at least every 100 operating hours thereafter.

Check/fill gasoline tank

Check the gasoline level in the generator. If needed, fill with fresh unleaded gasoline from a portable container, after first reading the warnings and instructions below.

▲WARNING: Gasoline fire/explosion hazard

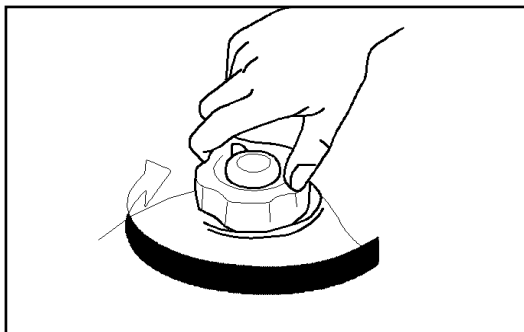
Gasoline is highly flammable and explosive. Heat, sparks, and flames can ignite gasoline vapors, which can become widespread during fueling. A flash fire and/or explosion could result and cause serious injury or death. Use extreme care when handling gasoline. Carefully follow all the instructions in this section to avoid the following conditions which could result in gasoline ignition:

Operation

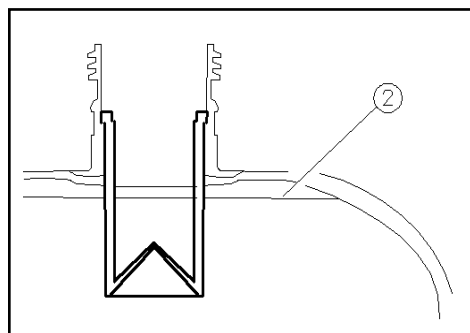
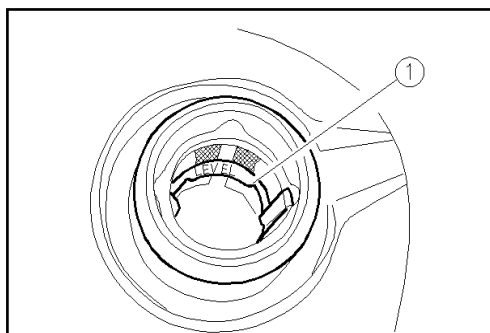
- gas vapor collection inside enclosures
- static electric sparks
- sparks from electric wiring, batteries, or running engines
- sources of heat (such as a hot engine or exhaust)
- open flames, including pilot lights

- 1) Before starting, review the following general safety precautions for fueling:
 - a) Never pump gasoline directly into the generator's gas tank at a gas station – high velocity flow from the pump could result in a static electric build-up in the generator's tank. Always use a portable container to fill the tank. *See warning box about static electric spark hazards below.*
 - b) Fill gasoline tank **OUTDOORS** – never indoors.
 - c) Stay away from all sources of heat, sparks, and flames. Do not smoke.
- 2) Turn generator off and allow unit to cool for at least two minutes before removing gas cap.

Note: A running or still-hot engine is hot enough to ignite fuel.
- 3) Remove generator fuel tank cap.



- 4) Add gasoline through the fill opening up to the red level shown as ① Correct fuel level should provide a small gap for fuel expansion as shown in ②



- Use only an UL-approved portable gasoline container to transfer the gasoline to the generator's tank. Follow the safety warning and instructions below for avoiding static electric sparking.
- Do NOT overfill the gasoline tank.

Operation

⚠️ WARNING: Static electric spark hazard

A static electric spark can explosively ignite gasoline vapor, resulting in a flash fire that could cause serious injury or death.

To avoid static electric sparking while filling the gasoline tank, **the following steps must be followed to minimize and safely dissipate static electric charge build-up before and during the fueling process:**

- Always dissipate static charge from your body before beginning the fueling process by touching a grounded metal object at a safe distance from fuel sources.
- Never fill the generator’s gas tank directly from the fuel pump – the generator’s tank is not grounded and high velocity flow from the pump can cause static electricity build-up. Use an approved portable container to transfer gas to the generator’s tank.
- Never fill the portable gas container while it is sitting inside a vehicle, trailer, trunk, or pick-up truck bed. ALWAYS place container on the ground to be filled.
- Keep nozzle in contact with portable container while filling. Manually control the flow of gasoline; do NOT use the nozzle’s lock-open device.
- A portable container made of metal or conductive plastic is preferred because it dissipates charge to ground more readily.

5) Clean up gasoline spills /splashes immediately.

- If possible, move the generator away from spilled gasoline on the ground.
- Wipe up spilled gasoline, and wait 5 minutes for excess gasoline to evaporate before starting engine.
- Gasoline soaked rags are flammable and should be disposed of properly.
- If gasoline is spilled on your skin or clothes, change clothes and wash skin immediately.

6) Replace gasoline cap securely before starting engine.

7) Store extra gasoline in a cool, dry place in an UL-approved, tightly sealed container.

IMPORTANT:

For continuous operation, be prepared to check and refuel the generator on a regular basis. A tank of gasoline should last about 8.5 hours @ 1/4 load.

Inspect Fuel System / Check for Leaks

Inspect fuel system & check for leaks BEFORE starting generator.

Do not start generator until all needed repairs have been completed.

⚠️ WARNING: Fuel leak hazard

Gasoline is highly explosive and fuel leaks can result in fire or explosions. You can be burned and seriously injured if the fuel system is not properly hooked up or there is a fuel leak when you start the engine.

Inspect the entire fuel system.

Look for:

- signs of leaks or deterioration,
- chafed or spongy fuel hose,

Operation

	<ul style="list-style-type: none">• loose connections,• loose or missing fuel hose clamps,• a damaged gasoline tank, or• a defective gasoline shut-off valve.
Personal Protection	<ol style="list-style-type: none">1) Hearing can be damaged from prolonged, close-range exposure to the type of noise produced by this generator. The use of ear plugs or other hearing protection device is recommended for persons working within 15-20 feet of the running generator for an extended period of time.2) Loose or dangling apparel can become entangled in moving parts. Metal jewelry can conduct electricity. Never wear jewelry or loose-fitting clothing when starting or operating the generator.

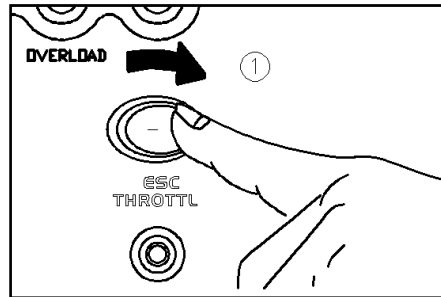
Operation

3. Starting the Generator

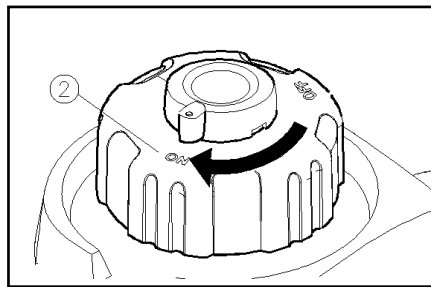
After you have completed the pre-start checklist procedures, you are ready to start the generator.

To start the engine:

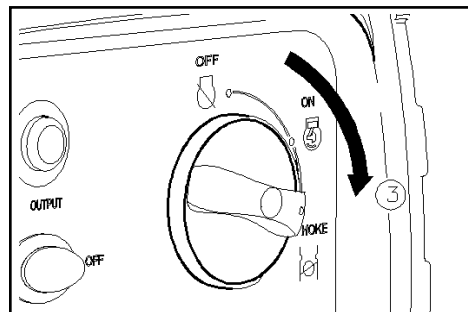
- 1) Turn the ESC throttle switch ① to “OFF”.



- 2) Turn the fuel cap air vent knob to “ON” ②.



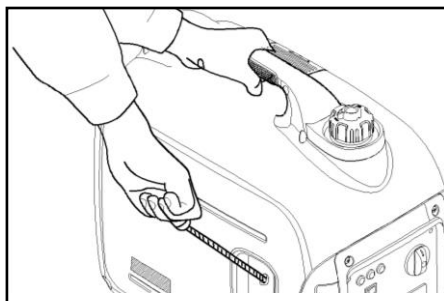
- 3) Turn the Engine OFF/RUN/CHOKE control to one of the following:
 - A. CHOKE ③ position for starting a cold engine
 - B. RUN position for starting a warm engine



NOTE: The choke is not required to start a warm engine. The choke is switched off when in the CHOKE position. The fuel and ignition circuit are switched off when in the OFF position.

Operation

- 4) Pull slowly on the recoil starter until it is engaged, then pull it briskly.



NOTE: Grasp the carrying handle firmly to prevent the generator from falling over when pulling the recoil starter.

- 5) After a cold engine is started, allow time to warm up so when the knob is turned to the RUN position the generator will stay running.

- 6) Under long, continuous-run operating conditions, be prepared to:

- a. Check and refuel the engine on a regular basis. A tank of gas should last about 8.5 hours @ 1/4 load.

▲ WARNING:

A running engine is hot enough to ignite fuel. Never add fuel or remove gas cap if engine is running or still hot. Let cool at least 2 minutes.

- b. Check engine oil level each time you refuel.
c. Change oil after the first 20 operating hours, and at least every 100 operating hours thereafter.

▲ WARNING:

Never open oil port while engine is running. Hot oil can spray over face and body.

Operation

4. Checking Generator Output

Although the speed of the engine was carefully adjusted at the factory so that the generator produces the proper voltage and frequency, **output voltage should be checked periodically to ensure the generator is working properly before connecting loads to the generator.**

Output voltage should be checked with a portable voltage meter:

1. Start engine and allow to warm up for five minutes. Do not connect any loads.
2. Use voltage meter to check output voltage at the generator's outlets/receptacles.
3. Measured voltage should be within the following ranges:
 - a. 120V +/- 10% at 120V receptacles.
4. If measured voltage is not within the specified range, have generator adjusted by factory authorized personnel. Do not attempt to adjust the engine speed yourself.

NOTE:
Slight variation in voltage/speed with changing electrical loads

All engines have a tendency to slow down when a load is applied. When electrical loads are 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 it is running with no load. Additionally, there may be small brief surges and drops in voltage as motors connected to the generator cycle on or off.

The slight variation has no appreciable effect in the operation of motors, lights, and most appliances.

Operation

5. Connecting Loads

You will want to be careful when connecting loads so as not to overload the generator, especially if you are powering devices with motors that require a higher starting power load.

Instructions are provided below for connecting loads when you are using the generator:

- As a portable power source
- Connected to a building as a back-up power source

⚠WARNING:

Do not overload generator. Make sure that combined starting and running loads do not exceed rated capacity of generator. Overloading the generator can cause damage to the generator and attached electrical devices, and may result in fire.

Using as a Portable Power Source

Connect electrical loads one at a time according to the following instructions:

1. Allow engine to reach operating speed by allowing it to warm up for approximately 5 minutes before connecting electrical devices.
2. After engine is warmed up, begin by connecting the items that require the highest wattage first. The recommended sequence is as follows:
 - a. Connect items with motors such as refrigerators, freezers, air conditioners, or small hand tools, one at a time. Let each motor stabilize before connecting the next device.
 - b. Connect any lights you are planning on powering.
 - c. Connect voltage sensitive equipment such as electronics via surge protectors. Plug devices such as TV's, computers, and microwaves into a UL listed voltage surge protector, then plug the surge protector into the generator.

Using as a Back-up Power Source for a Building

Each transfer switch installation will be unique.

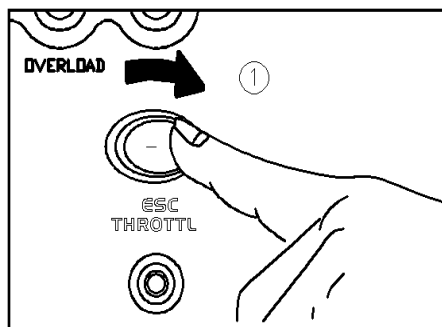
Proper instructions for how to safely bring the generator online with the building's electrical system should be provided by the installing electrician, who should also provide personal instruction to the owner/operator.

Failure to follow the proper procedure as provided by the electrician could expose persons to the hazards noted above.

6. Stopping the Engine

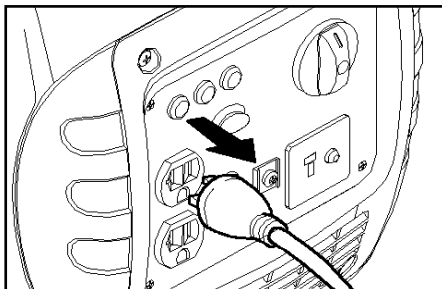
Stop the engine using the following steps:

1. Turn the ESC switch ① to "OFF", if applicable.

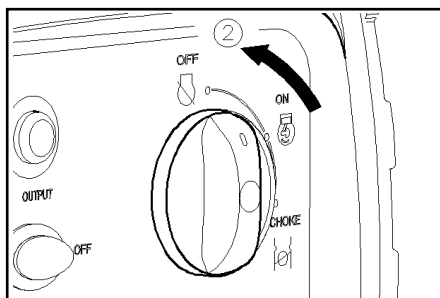


Operation

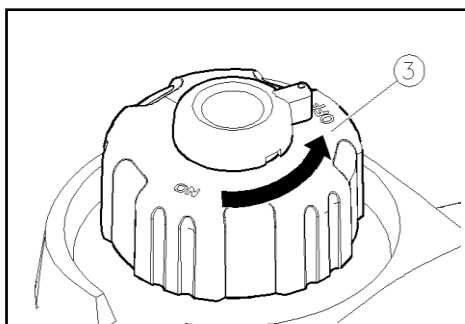
2. Disconnect any loads.



3. Turn the Engine OFF/RUN/CHOKE control ② to “OFF”.
 - a) Ignition circuit is switched off.
 - b) Fuel is switch off.



4. After the engine has completely cooled down, turn the fuel cap air vent knob to “OFF” ③



7. AC Parallel Operation

AC parallel operation allows the connection between two generators to increase available power. **Before connecting an appliance to either generator during parallel operation, you must:**

- Make sure that the appliance is in good working order.
- Verify the appliance electrical rating does not exceed that of the receptacle.
- Ensure that each generator is individually grounded. See Installation/Initial Set-up section.
- Ensure that the ESC switch is in the same position on both generators.
- Make sure all devices that were connected to the generator's outlets have been disconnected.

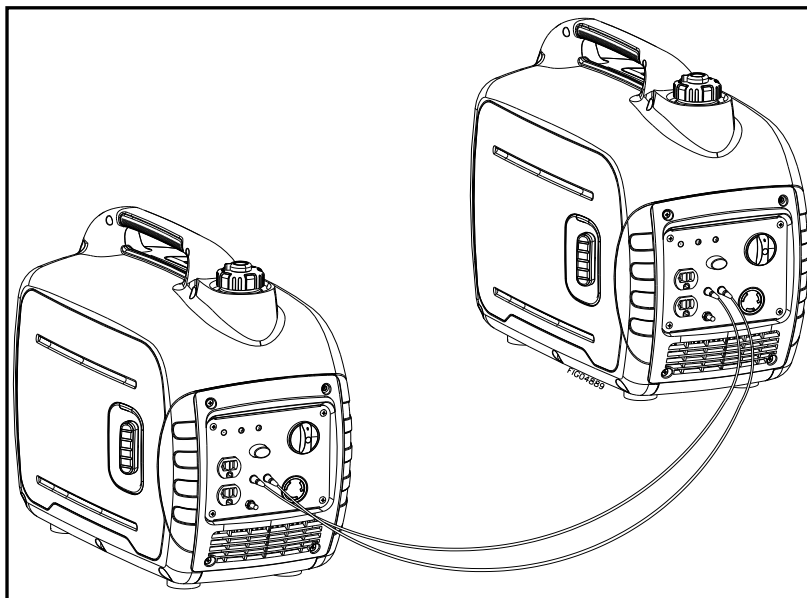
Note: Most motorized appliances require more than their electrical rating for startup. When an electrical motor is started, the overload indicator (red) may come on. This is normal if the overload indicator (red) goes off within 4 seconds. If the overload indicator (red) stays on, contact Powerhorse Product Support @ 1-866-443-2576.

Operation

Follow the steps provided below for parallel operation.

Connect Parallel Cables

1. Connect the red parallel operation cable to the parallel operation outlets designated with the red o-ring on each of the generators.
2. Connect the black parallel operation cable to the remaining parallel operation outlets on each of the generators.



Starting the Generators

1. Start both generators and make sure that the output indicator (green) on each generator comes ON.

Connecting Appliances

1. Plug an appliance into any of the AC receptacles.
2. Turn on the appliance.

Note: If either generator is overloaded, or if there is a short circuit in a connected appliance, the overload indicator (red) will go ON. The overload indicator (red) will stay ON, and after about 4 seconds, current to the connected appliance(s) will shut off, and the output indicator (green) will go OFF. Stop both generators and investigate the problem. Determine if the cause is a short circuit in a connected appliance or an overload. Correct problem and restart the generator. Substantial overloading may damage or shorten the service life of the generator.

Note: For single generator operation, the parallel operation cable must be removed.

⚠ WARNING:

Never connect or remove the parallel operation cables when the generator is running.

Operation

8. Storage & Exercise

When you are finished using the generator, you must:

- Disconnect all loads
- Allow generator to completely cool down
- Store the generator properly
- Plan on exercising the engine regularly unless the generator is prepared for long-term storage.

Detailed instructions are provided below.

Disconnect loads

When you are finished using the generator:

- Make sure all devices that were connected to the generator's outlets have been disconnected.

Cool engine before storing

Let engine cool for at least five minutes before storing. A hot engine can be a fire hazard.

Choose a storage location

Store the generator in a location that is:

- Clean and dry
- Away from sources of heat, open flames, sparks, or pilot lights, even if the generator's fuel tank is empty. Residual fuel in the tank could ignite.
- Away from extreme high or low temperatures.

Prevent accidental starting

Remove spark plug(s) in order to ensure the generator cannot be started accidentally in a storage location or by untrained persons.

Exercise generator every 4 weeks

The generator should be exercised regularly.

At least every four weeks, start the engine and let it run for 10 to 15 minutes with a small load plugged in, such as a lamp or fan.

Monthly exercising of the generator will:

- Dry out any moisture that has accumulated in the windings. If left, this moisture can cause corrosion in the winding.
- Ensure that the unit is operating properly should it be needed in an emergency.

Perform regular maintenance

Perform periodic maintenance as directed in this manual to keep the generator in safe working condition.

Storage Chart

You must prepare the engine for long term storage to prevent gum deposits from forming and causing malfunction of the engine.

STORAGE TIME	RECOMMENDED SERVICE PROCEDURE TO PREVENT HARD STARTING
Less than 1 month	No preparation required.
1 to 2 months	Fill with fresh gasoline and add gasoline stabilizer*.
2 months to 1 year	Fill with fresh gasoline and add gasoline stabilizer*. Drain the carburetor.
1 year or more	Drain the fuel tank and carburetor. Change the engine oil and lubricate the cylinder.

* Use gasoline stabilizers that are formulated to extend storage life.

Operation

Prepare engine for 1 to 2 month storage	<p><u>Add fuel stabilizer:</u></p> <ol style="list-style-type: none"> 1. Ensure gasoline tank is full. 2. Add fuel stabilizer to fuel tank. 3. Run engine at least 10 minutes after adding stabilizer to allow it to enter the fuel system. 4. Shut off engine. 5. Disconnect spark plug wire and remove spark plug. 6. Add one teaspoon oil through spark plug hole. 7. Place rag over spark plug hole and turn starter (or pull the recoil) a few times to lubricate the combustion chamber. 8. Replace spark plug, but do not reconnect the spark plug wire.
Prepare engine for 2 months to 1 year storage	<p><u>Add fuel stabilizer and drain carburetor:</u></p> <ol style="list-style-type: none"> 1. Ensure gasoline tank is full. 2. Add fuel stabilizer to fuel tank. 3. Run engine at least 10 minutes after adding stabilizer to allow it to enter the fuel system. 4. Shut off engine. 5. Remove the side cover and screws. 6. Loosen the carburetor drain screw (See Maintenance & Repair section). 7. Drain the gasoline from the carburetor into a suitable container. 8. Tighten the carburetor drain screw. 9. Remove spark plug access cover. 10. Disconnect spark plug wire and remove spark plug. 11. Add one teaspoon oil through spark plug hole. 12. Place rag over spark plug hole and turn starter (or pull the recoil) a few times to lubricate the combustion chamber. 13. Replace spark plug, but do not reconnect the spark plug wire.
Prepare engine for 1 year or more storage	<p><u>Drain fuel tank and drain carburetor:</u></p> <ol style="list-style-type: none"> 1. Remove the fuel tank cap, remove the filter. 2. Remove the fuel in the fuel tank using one of these methods: 3. Extract the fuel from the fuel tank into an approved gasoline container using a commercially available hand siphon. (NTE sells Item # 206500). Install the fuel filter and fuel tank cap. 4. Drain the fuel from tank into a suitable container using the barb on the bottom of the fuel tank. 5. Start the generator and allow to run until it stops (approx. 20 minutes) 6. Remove the side cover and screws. 7. Drain the fuel from the carburetor by loosening the drain screw on the carburetor. 8. Tighten the drain screw. 9. Install the side cover and tighten the screws. Remove spark plug access cover. 10. Disconnect spark plug wire and remove spark plug. 11. Add one teaspoon oil through spark plug hole. 12. Place rag over spark plug hole and turn starter (or pull the recoil) a few times to lubricate the combustion chamber. 13. Replace spark plug, but do not reconnect the spark plug wire.

Maintenance & Repair

Inspect and maintain your generator as specified below in order to keep it in safe and optimal working order. Follow all safety rules and recommended maintenance steps.

⚠ WARNING

ALWAYS shut off the engine, disconnect the spark plug(s) and discharge the capacitor before cleaning, adjusting, or servicing the generator. Make sure all guards and shields are replaced before using.

Note: The generator head is brushless and maintenance free. The bearing is a heavy-duty sealed ball bearing, which requires no maintenance or lubrication.

Maintenance & Repair

Follow safety rules

Read and follow these safety rules whenever you will be servicing the generator:

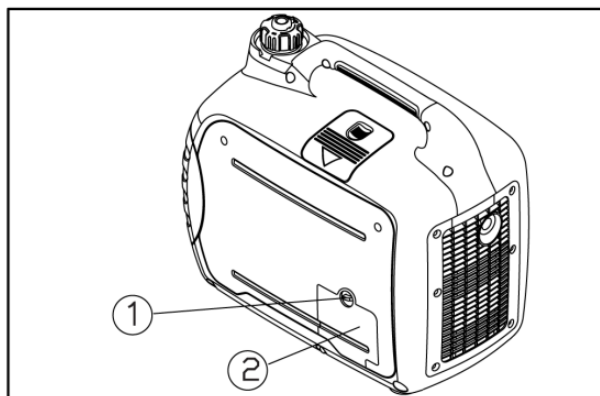
- **Turn off generator.** Always turn off generator and remove spark plug(s) or spark plug wire(s) before working on the engine or generator to prevent accidental starting.
- **Discharge capacitor.** When the generator is shut down, the capacitor may maintain a charge. Always discharge the capacitor before working on the generator head to prevent electrical shock. Discharge using a screwdriver with an insulated handle. While wearing safety glasses, touch opposite terminals of the capacitor together with the tip of the screwdriver. If there is stored charge in the capacitor, a spark will be generated thereby discharging the capacitor.
- **Replace guards.** Make sure all guards and shields are replaced after servicing the generator.
- **Repair.** Major service, including the installation or replacement of parts, should be performed only by a qualified electrical service technician. Obtain factory approved parts from Powerhorse Product Support at 1-866-443-2576.
- **Replacement parts.** If a part needs replacement, only use factory approved repair parts. Replacement parts that do not meet specifications may result in a safety hazard or poor operation of the generator and will void the warranty.

Perform engine maintenance

Engine maintenance items include:

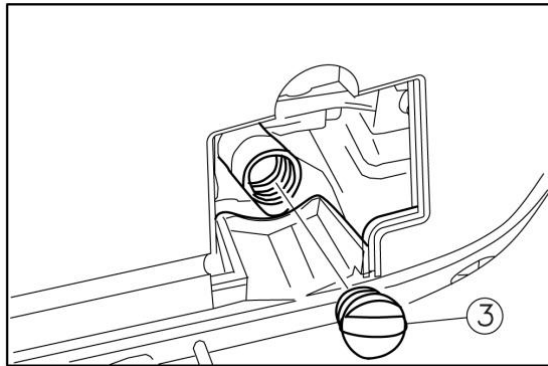
Changing Oil

- a) Place the generator on a level surface and warm up for several minutes.
- b) Remove the screw ① and then remove the oil fill cover ②



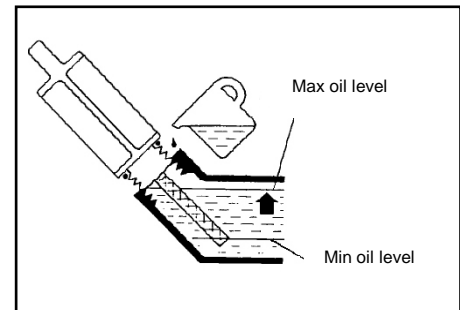
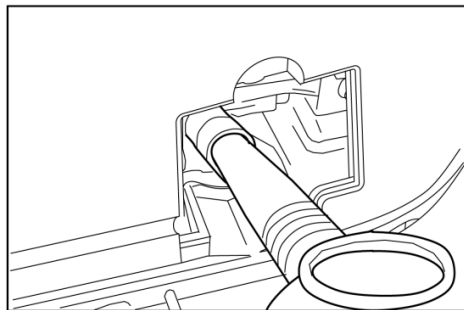
Maintenance & Repair (cont'd)

- c) Remove the oil filler cap③

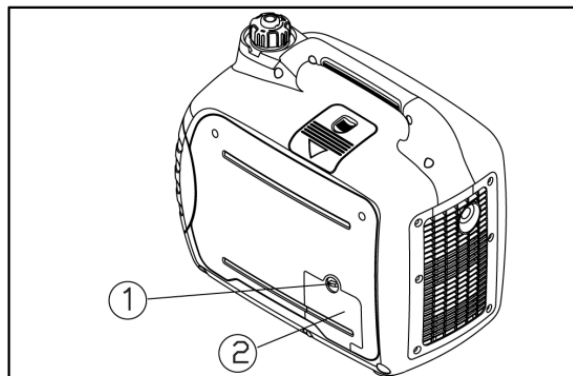


- d) Place an oil pan under the engine. Tilt the generator to drain the oil completely.
- e) Place generator on a level surface.
- f) Fill with the recommend amount and type of engine oil, then install and tighten the oil filler cap (See Specification section for oil type and capacity).

NOTE: DO NOT tilt generator when adding engine oil, this could result in overfilling and cause damage to the engine.



- g) Install the oil fill cover②and tighten the screw①

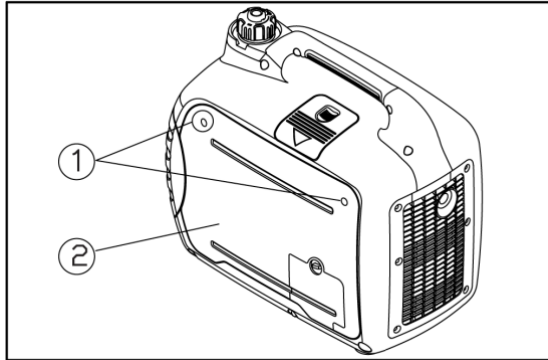


Using a funnel, add oil up to the max oil level with the recommended oil type for your engine and expected ambient conditions.
(See specification section for oil type and capacity.)

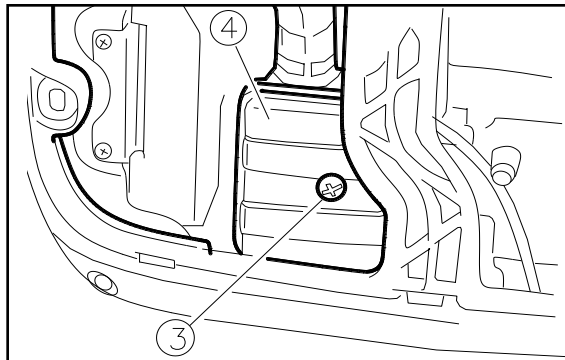
Maintenance & Repair (cont'd)

Air filter check/replacement

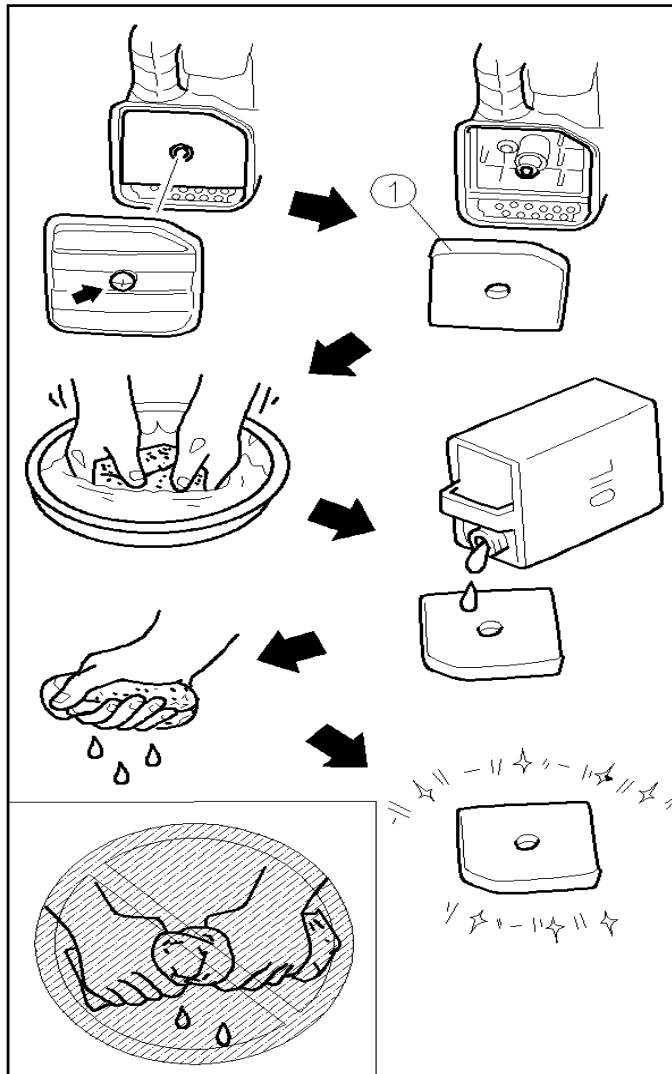
- a) Place the generator on a level surface and warm up for several minutes.
- b) Remove the screws ① and then remove the side cover ②.



- c) Remove the air filter screw ③ and then pull off air filter case cover ④.

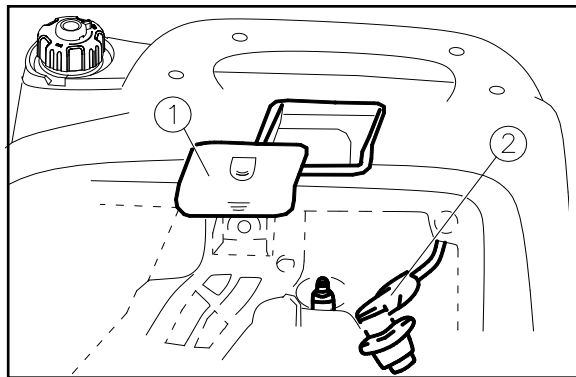


- d) Remove the foam element ① (see image on next page).
- e) Wash the foam element in a solution of household detergent and warm water, rinse thoroughly and let air dry.
- f) Soak the foam element in oil and squeeze out excess oil. The foam element should be wet but not dripping.
Note: DO NOT twist or wring out the foam element when squeezing, this could cause it to tear.
- g) Install the foam element.
- h) Install the air filter case cover in its original position and tighten the screw.
- i) Install the side over and tighten the screws.



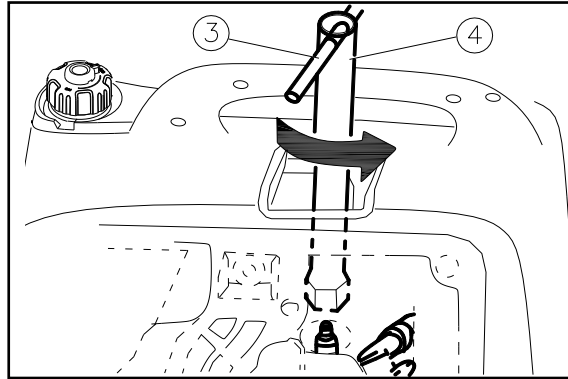
Spark plug cleaning and replacement

- a) Remove the access cover ① and spark plug cap ② Insert the spark plug wrench through the access cover opening.

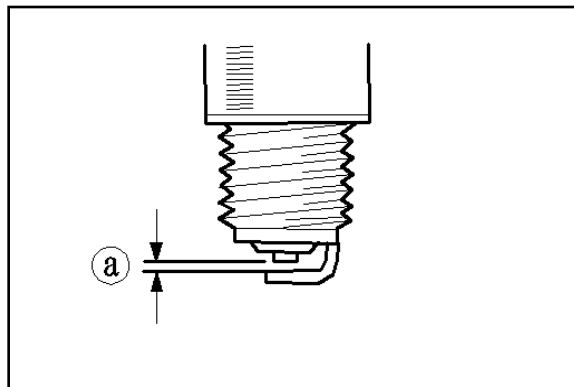


Maintenance & Repair (cont'd)

- b) Slide the handlebar ③ through the hole in the spark plug wrench ④ and turn it counter clockwise to remove the spark plug.
- c) Check for discoloration and remove any carbon build up. The porcelain insulator around the center electrode of the spark plug should be a medium-to-light tan color.



- d) Check the spark plug type and gap ①. The gap should be measured with a wire thickness gauge.



Standard Spark Plug:
E6TC/E6RTC (BOSCH)
BP7HS / BPR7HS (NGK)
L87YC / R L87YC (CHAMPION)
W16FP / W16FPR (DENSO)

If need EMC Certification, engine must use E6RTC or BPR7HS spark plug

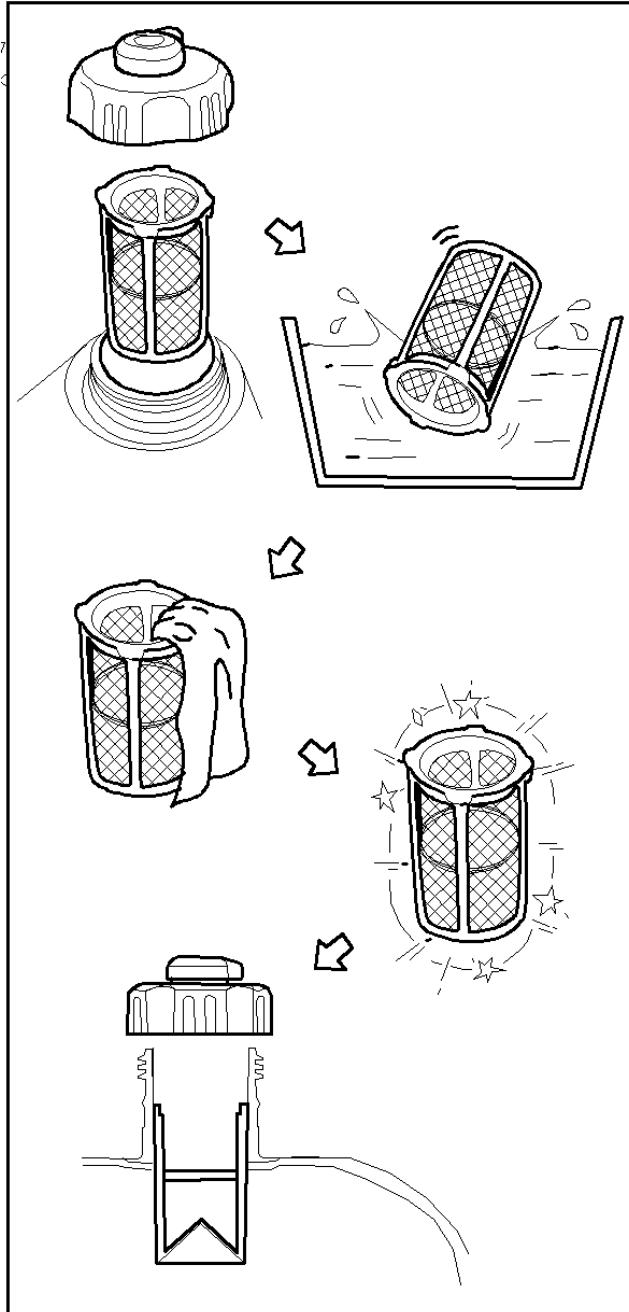
Spark Plug Gap:
0.6-0.7mm (0.024-0.028in)

- e) Install the spark plug. Torque specification is 14.8 ft. lbs. If a torque wrench is not available, a good estimate of the correct torque is 1/4-1/2 turn past finger tight.
- f) Install the spark plug cap and access cover.

Maintenance & Repair (cont'd)

Fuel tank filter check/replacement

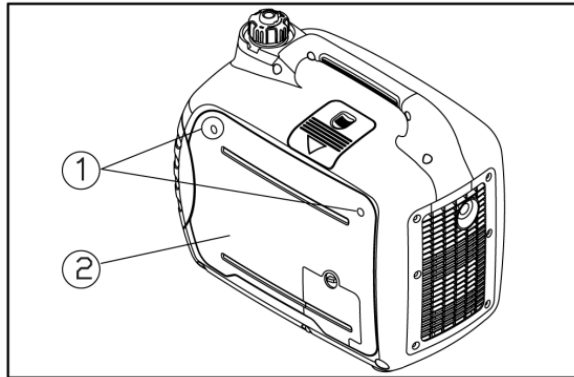
- Remove the fuel tank cap and filter.
- Clean the filter with gasoline.
- Wipe the filter and install it.
- Install the fuel tank cap.



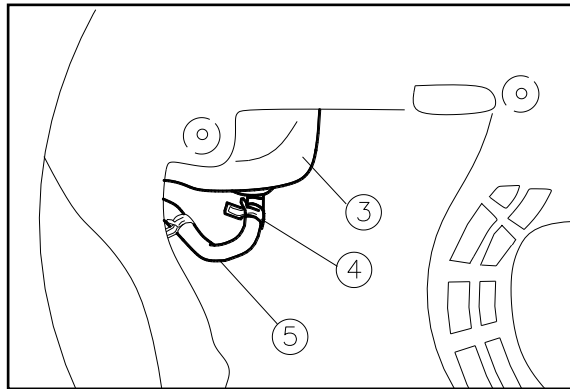
Maintenance & Repair (cont'd)

Fuel filter check/replacement

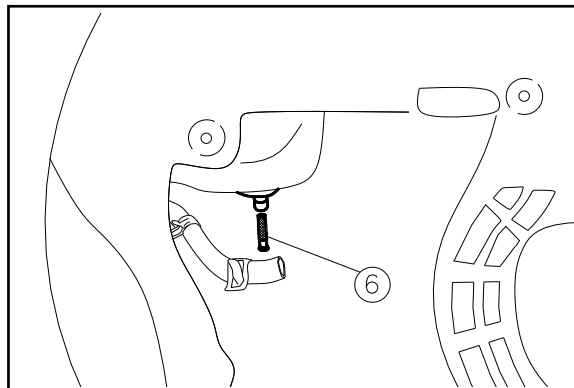
- a) Remove the screws ① and the side cover ②



- b) Hold and move up the clamp ④ then take off the hose ⑤ from the bottom of the tank ③



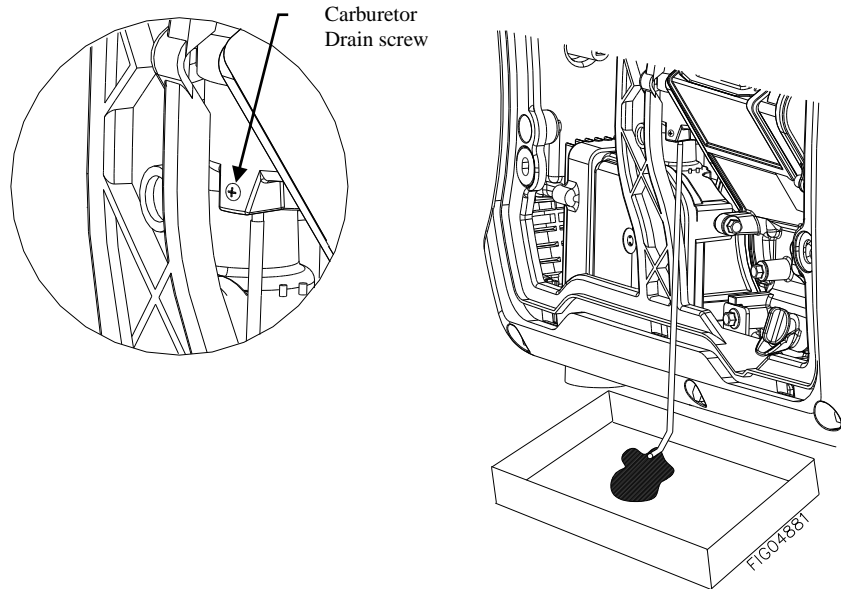
- c) Remove the fuel filter ⑥
d) Clean the filter with gasoline.
e) Dry the filter and put it back into the bottom of the tank.
f) Install the hose and clamp.
g) Install the side cover and tighten the screws.



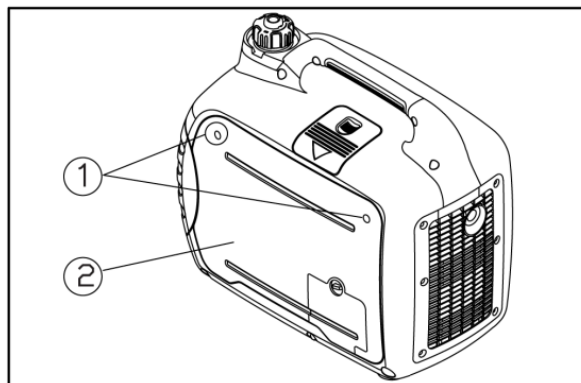
Maintenance & Repair (cont'd)

Draining the Carburetor

- a) Remove the side cover and screws.
- b) Loosen the carburetor drain screw.
- c) Drain fuel into suitable container.
- d) Tighten the carburetor drain screw.



- e) Install side cover ② and tighten the screws ①



Check receptacles

Check receptacles before each use to make sure they are not cracked or broken.

If a receptacle is cracked or otherwise damaged, do not use until replaced with an authorized factory part. Using cracked or damaged receptacles can be both dangerous to the operator and destructive to the equipment.

Maintenance & Repair (cont'd)

Inspect fuel system / check for leaks

Inspect the fuel system and check for leaks on a regular basis.

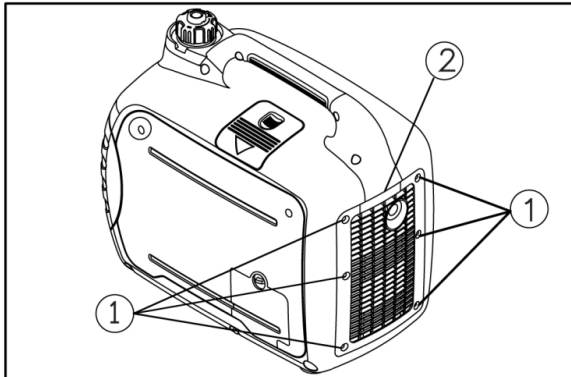
- 1) Inspect the entire fuel system. Look for: signs of leaks or deterioration, chafed or spongy fuel hose, loose connections, loose or missing fuel hose clamps, damaged gasoline tank, or defective gasoline shut-off valve.

Clean & inspect spark arrester

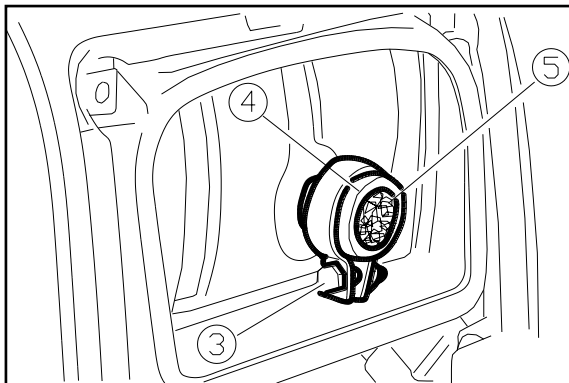
Clean and inspect the spark arrester muffler

If the engine is equipped with a spark arrester muffler, clean and inspect it regularly. Replace if damaged.

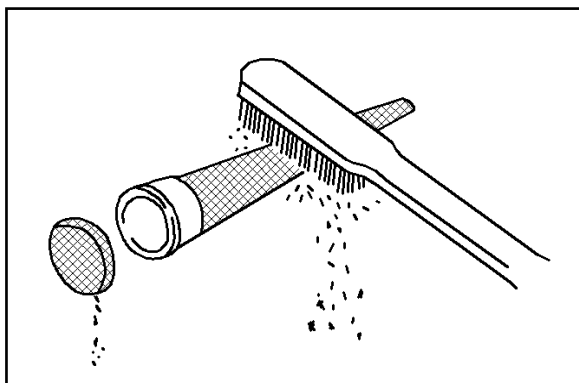
1. Remove the screws ① and pull outward on the end cover ②



2. Loosen the securing bolt ③ to remove the muffler cap ④, the muffler screen, and the spark arrester ⑤



3. Clean the muffler screen and spark arrester. Replace if damaged.



NOTE: When cleaning, use a wire brush lightly to avoid damaging or scratching muffler screen and spark arrester.

Maintenance & Repair (cont'd)

	<p>4. Install spark arrester.</p> <p>5. Install the muffler screen and muffler cap.</p> <p>6. Install the end cover and tighten the screws.</p>
Keep generator clean	<p>Keep generator clean.</p> <p>If dust or debris accumulates on the generator, clean the generator with a damp cloth or soft bristle brush. Do not allow air intakes to become blocked.</p> <p><u>Note:</u> Do not spray generator with a garden hose or pressure washer. Water may enter the generator and cause damage to the rotor, stator, or internal windings.</p>
High Altitude Operation	<p>CAUTION: Operating at an altitude of greater than 5000 feet (1500 meters) may affect your engines performance, fuel consumption, and emissions. To remain emissions compliant and improve engine performance at higher altitudes, a high-altitude kit is required. A high altitude kit includes a carburetor jet resized to help correct air / fuel mixture at altitude. To order a high altitude kit or if you have additional questions, go to www.northerntool.com or contact us at 1-866-443-2576 – Powerhorse. Please note, engines with the high-altitude kit installed operated at lower altitudes could cause severe engine damage and affect emissions compliance. When modified, a tag or decal should be added to the product stating that a high-altitude kit was installed and to remind you to re-service the carburetor (re-jet) when operating in lower altitude environments.</p>

IMPORTANT:

If a part needs replacement, only use parts that meet the manufacturer’s specifications. Replacement parts that do not meet specifications may result in a safety hazard or poor operation of the generator.

**Contact Powerhorse Product Support at 1-866-443-2576
for any questions, problems, or parts orders.**

Troubleshooting

<u>Problem</u>	<u>Possible Causes</u>	<u>Possible Remedies</u>
Engine will not start.	<ul style="list-style-type: none"> a) Low oil level. b) Fouled spark plug. c) Out of fuel. d) Switch in OFF position. e) Fuel tank cap air vent knob OFF. f) Bad fuel. 	<ul style="list-style-type: none"> a) Fill crankcase to proper oil level. b) Clean or replace spark plug. c) Fill fuel tank. d) Place switch in Run or Choke position. e) Turn ON. f) Drain tank and carburetor. Refuel.
Voltage too low.	<ul style="list-style-type: none"> a) Defective inverter board. b) Generator is overloaded. 	<ul style="list-style-type: none"> a) Bring generator to a qualified technician for inspection. b) Reduce the load. (See Power Load Planning & Mgt. section of this manual.)
Voltage too high.	<ul style="list-style-type: none"> a) Engine speed too high. 	<ul style="list-style-type: none"> a) Bring generator to a qualified technician for adjustment.
Generator overheating.	<ul style="list-style-type: none"> a) Generator is overloaded. b) Insufficient ventilation. 	<ul style="list-style-type: none"> a) Reduce the load. (See Power Load Planning & Mgt. section of this manual.) b) Make sure there is at least 7 feet of clearance on all sides of generator.
No output voltage.	<ul style="list-style-type: none"> a) Defective load connected to generator. b) Broken or loose wire. c) Defective receptacle. d) Defective stator. e) Defective rotor. 	<ul style="list-style-type: none"> a) Disconnect load. b) Bring generator to a qualified technician for repair. c) Replace receptacle. d) Bring generator to a qualified technician for repair. e) Bring generator to a qualified technician for repair.
Engine lacks power.	<ul style="list-style-type: none"> a) Generator is overloaded. b) Dirty air filter. c) Bad fuel 	<ul style="list-style-type: none"> a) Reduce the load. (See Power Load Planning & Mgt. section of this manual.) b) Clean or replace air filter. c) Drain tank and carburetor. Refuel.
Engine shuts down during operation.	<ul style="list-style-type: none"> a) Out of fuel. b) Low oil level. 	<ul style="list-style-type: none"> a) Fill fuel tank. b) Fill crankcase to proper oil level.

Summary of Important Safety Information for Operation

This section provides a summary of the various safety procedures and measures that have been presented throughout the manual. Keep this summary handy and refer to it to refresh your memory about how to safely use your generator.

WARNING

Carefully read and make sure you understand the following safety information before using the generator. Improper use or maintenance of the generator can result in *serious injury or death* from *carbon monoxide poisoning, electric shock, fire/explosion, or burns*.

General

- **Read manual.** Read this Owner's Manual and the engine Owner's Manual completely before attempting to set-up and use the generator. Serious injury or death can result if safety instructions are not followed.
- **Instruct operators.** The generator owner must instruct all operators in safe generator set-up and operation. Do not allow anyone to operate the generator who has not read the Owner's Manual and been instructed on its safe use.
- **Adults only.** Only trained adults should set up and operate the generator. Do not let children operate.
- **Under the influence.** Never operate, or let anyone else operate, the generator while under the influence of alcohol, drugs, or medication.
- **Intended use.** Carefully read about and understand the intended use of this generator. Do not use for other purposes, as unforeseen hazards or equipment damage may result.

Prohibition Against Modifications

Never modify or alter the generator in any way. Modifications can create serious safety hazards and will also void the warranty.

- **Engine speed.** Never attempt to modify the engine speed setting. The engine speed is preset for safe and optimal performance of the generator. If speed needs adjusting, it must be done by factory-authorized personnel.
- **Fuel/exhaust system.** Never modify the exhaust system, fuel tanks, or fuel lines. Carbon monoxide poisoning, fire, or explosion could result.
- **Guards.** Do not operate generator unless all guards and cover shields, which prevent access to moving parts and pinch points, are in place. Failure to guard the power transmission mechanisms *may result in serious injury or death*.

Safety – Installation & Set-up

Battery Safety

Batteries are hazardous because they contain caustic acid, can emit explosive gases, and can cause electric shock. *Caution must be exercised when making connections to a battery to avoid shock and contact with the acid, and to prevent any sparking that could lead to an explosion.* Follow safety rules carefully when connecting battery to generator:

- **Eye/skin protection.** Always wear eye protection and protective clothing when connecting or disconnecting battery.
- **Sparks/Smoking.** Never smoke or work near sparks or other sources of ignition.
- **Electric shock.** Never touch both battery terminals at the same time with your hand or any non-insulated tools.
- **Connection/disconnection sequence.** ALWAYS connect and disconnect cables to the correct battery terminals in the proper sequence:
 - When CONNECTING the battery, connect the RED cable to the POSITIVE terminal FIRST.
 - When DISCONNECTING the battery, disconnect the BLACK cable from the NEGATIVE terminal FIRST
- **Acid/skin contact.** If battery acid contacts skin or clothing, flush immediately with water and neutralize with baking soda.

Summary of Important Safety Information for Operation (cont'd)

Installation / Initial Set-up Safety

- **Dry, level surface.** Situate generator on a dry, firm, level surface. Ensure generator sits level and will not slide or shift during operation. Block wheels if applicable.
- **Operate OUTSIDE only – dangerous carbon monoxide exhaust!** Generators give off carbon monoxide exhaust, a poisonous gas that can kill. You CANNOT smell it, see it, or taste it. ONLY run generator OUTDOORS and away from building air intakes. NEVER run generator inside homes, garages, sheds, or other semi-enclosed spaces. These spaces can trap poisonous gases, EVEN if you run a fan or open windows. Carbon monoxide is given off whether you are using gasoline, natural gas, or propane to power the generator.
- **No vehicle/marine use.** This generator is NOT designed or approved for use in vehicles or marine applications. Never run the generator inside RVs or other vehicles, on boats, or on pick-up truck beds.
- **Cooling ventilation.** The generator needs adequate, unobstructed flow of air to allow for proper cooling of engine and generator head. Situate so there is adequate clearance around generator to allow for cooling airflow. Do not allow debris to accumulate and block airflow.
- **Grounding.** Always ensure generator is properly grounded to prevent electrical shock. This generator is equipped with a grounding post. Always complete the grounding path from the generator to a copper pipe/rod driven into moist earth to a sufficient depth. Check with an electrician for local grounding requirements. If a licensed electrician installs the generator with a connection to your building's electrical circuit for use as a standby power system, grounding will be complete through the building's grounding system.
- **Isolate connection to building's electrical circuit.** Never plug the generator directly into a wall outlet. ANY connection to a building's electrical system MUST ISOLATE THE GENERATOR FROM UTILITY POWER via an UL-approved transfer switch installed by a licensed electrician in compliance with all applicable local building and electrical codes. If the generator is not isolated from the utility power system by such means, generator output will back feed into the utility power grid. This may result in injury or death to utility power workers or others who contact the lines during a power outage. It may also cause the generator to explode or cause fires when utility power is restored.
- **Wet conditions.** Water conducts electricity. Do not operate generator where it is wet. Operate on a dry surface under an open, canopy-like structure.
- **CO alarms.** Ensure that working, battery-operated or battery back-up carbon monoxide alarms are used in any dwelling/structure that is in close proximity to the running generator.
- **Hot exhaust - fires.** Exhaust from engine can be extremely hot and cause fire. Position muffler at least 7' from combustible objects during operation.
- **Spark arrester.** Equip engine with a spark arrester if generator will be used near any ignitable forest, brush, or grassy land. See the "Specifications" section of this manual to determine if your generator is already equipped. Make sure you comply with applicable local, state and federal codes.
- **Fire extinguisher.** Keep a fire extinguisher rated "ABC" by the National Fire Protection Association nearby. Keep it properly charged and be familiar with its use.

Safety – Before Use

Know how to operate

- **Review safety rules.** Before each use of this generator, review the "Rules for Safe Operation." Failure to follow these rules may result in serious injury or death.
- **Know how to operate.** Be thoroughly familiar with all controls and with the proper use of the equipment. Know how to stop the generator quickly if needed.

Personal protective equipment

- **Hearing protection.** The use of ear plugs or other hearing protection device is recommended for those in close proximity to the generator while it is operating.
- **Loose / dangling.** Loose or dangling apparel can become entangled in moving parts. Metal jewelry can conduct electricity. Never wear jewelry or loose-fitting clothing when operating the generator.

Gasoline Safety

Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel. Use extreme care when handling:

- **Fuel outdoors.** Fill fuel tank outdoors – never indoors. Gasoline vapors can ignite if they collect inside an enclosure. Explosion can result.

Summary of Important Safety Information for Operation (cont'd)

- **Use approved container.** Never pump fuel directly into engine at gas station. Static charge can build and ignite fuel. Use an UL approved fuel container to transfer gas to the engine.
- **Running / hot engine.** A running engine is hot enough to ignite fuel. Never add fuel or remove gas cap if engine is running or still hot. Stop the engine and allow to cool at least two minutes before adding fuel.
- **Heat / flames / sparks.** Stay away from sources of heat, flame, or sparks while adding fuel.
- **Don't overfill.** DO NOT overfill the gas tank. Fill to bottom of fill neck to allow for fuel expansion.
- **Replace cap.** Replace gas cap securely before starting engine.
- **Spills.** Clean up fuel spills immediately. Move generator away from spilled fuel on the ground. Wipe fuel off engine and wait 5 minutes for excess fuel to evaporate before starting engine. Gas soaked rags should be disposed of properly.
- **On skin / clothes.** If gasoline is spilled on your skin or clothes, change clothes and wash skin immediately.
- **Inspect fuel system.** Check fuel system on a regular basis. Look for signs of leaks, deterioration, chafed or spongy fuel hose, loose or missing fuel hose clamps, damaged fuel tank, or a defective fuel shut-off valve. Do not start generator until needed repairs have been completed.
- **Gasoline storage.** Store gasoline in a cool, dry place in an UL-approved, tightly sealed container.

Safety – During Use

- **Safety equipment / controls.** Always operate the generator with all safety covers, guards, and barriers in place and in good working order, and all controls properly adjusted for safe operation.
- **Know how to stop.** Be thoroughly familiar with proper use of the equipment and all generator controls, output receptacles, and connections. Know how to stop the generator quickly if needed.
- **Damaged.** Do not operate the generator with damaged, missing, or broken parts.
- **Carbon monoxide exhaust.** The running engine gives off carbon monoxide, a poisonous gas that can kill you. You CANNOT smell it, see it, or taste it. If you start to feel sick, dizzy, or weak while using the generator, shut off the engine and get to fresh air RIGHT AWAY. See a doctor. You may have carbon monoxide poisoning.
- **Other exhaust dangers.** This product contains or emits chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Avoid inhalation of exhaust.
- **Smoking/sparks.** Never smoke near the running generator, and never operate near sources of sparks or flames.
- **Check output voltage.** Check output voltage to ensure the generator is working properly before connecting loads to the generator. Failure to do so could result in damage to equipment powered by the generator and possible injury to the individual. Do not adjust output speed of engine to change voltage. If voltage is not within specified range, have generator repaired by factory authorized personnel.
- **Stabilize before connecting loads.** Start generator and let engine stabilize before connecting electrical loads.
- **Do not overload.** Do not overload the generator. Make sure that combined starting and running loads do not exceed rated capacity of generator or damage will result.
- **Protect sensitive electronics.** Some electronic equipment, such as computers and audio/video equipment, can be damaged by small fluctuations in the flow of power. Use a surge suppressor for any voltage-sensitive electronic equipment you will be powering with the generator.
- **Wet conditions.** Do not operate the generator or handle any electrical equipment while standing in water, while barefoot, while hands are wet or while in the rain or snow. Electric shock may result.
- **Ground fault circuit interrupter.** Always use a ground fault circuit interrupter (GFCI) protected extension cord (or outlet, if generator is equipped) in damp or highly electrical conductive areas and on construction jobsites to prevent electrical shock.
- **Electrical cords.** Use only UL-listed, outdoor-rated, three prong extension cords of the proper size. All extension and appliance cords must be in good condition and not worn, bare, frayed, or otherwise damaged. Use of inadequate or damaged electric cords can cause electric shock or fire.
- **Avoid contact.** Avoid contact with bare wires, terminals, connections, etc. while the unit is running.
- **Electric shock accident.** If an electric shock accident occurs, immediately shut down the source of electrical power. If this is not possible, attempt to free the victim from the live conductor. Avoid direct contact with victim. Use a nonconducting implement, such as a dry rope or board, to free the victim from the live conductor. Apply first aid and get immediate medical help.
- **Hot muffler.** Never touch hot muffler, hot exhaust manifold, or engine cooling fins. Exhaust and engine parts can be very hot and will burn you.
- **Moving parts.** Keep hands, feet, and apparel away from drive belts, fans, and other moving parts. Never remove any drive belt or fan guard while the unit is operating.

Summary of Important Safety Information for Operation (cont'd)

- **Refueling.** DO NOT refuel the engine until it has cooled at least two minutes.
- **Malfunction during operation.** Immediately turn off the generator if any of the following conditions arise during operation:
 - Excessive change in engine speed, slow or fast
 - Overheating in load connecting devices
 - Sparking or arcs from generator
 - Loss of electrical output
 - Receptacle damage
 - Engine misfire
 - Excessive vibration
 - Flame or smoke
 - Abnormal noise
- **Adjusting / repairing.** Always turn off generator and remove spark plug(s) or spark plug wire(s) before working on the generator to prevent accidental starting.

Safety – After use

- **Cool engine before storing.** Let engine cool for at least five minutes before storing. A hot engine can be a fire hazard.
- **Shut off fuel supply.** Make sure gasoline shut-off valve is in the OFF position.
- **Prevent accidental starting.** When generator is not in use, remove key from starter (key start engines) and secure in a safe location, or remove spark plug(s) in order to ensure that generator cannot be started in a storage location or by untrained persons.
- **Storage location.** Store the generator in a dry location away from sources of heat, open flames, sparks or pilot lights – such as water heaters, space heaters, furnaces, clothes dryers, or other gas appliances – EVEN IF the generator's gas tank is empty. Residual gasoline could ignite.
- **Exercise regularly.** Exercise generator every four weeks to dry out moisture that accumulates in the windings. If generator cannot be exercised on a regular basis, prepare generator for long term storage.
- **Periodic maintenance.** Perform periodic maintenance as directed in this manual to keep the generator in safe working condition.

Safety - Inspection/Maintenance

Inspect and maintain your generator on a regular basis and repair as needed to keep it in safe working condition:

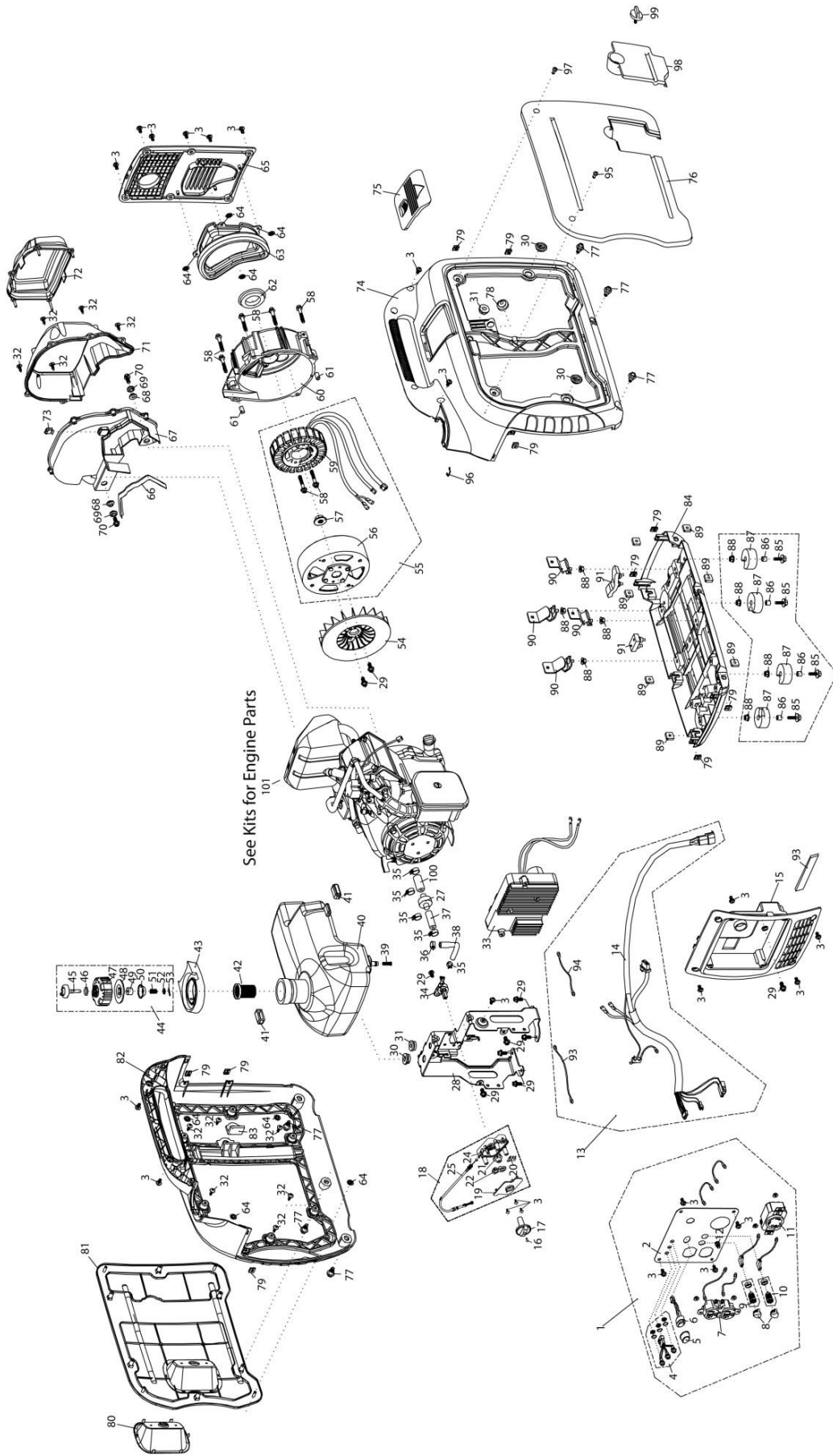
- **Turn off generator.** Always turn off generator and remove spark plug(s) or spark plug wire(s) before working on the engine or generator to prevent accidental starting.
- **Discharge capacitor.** When the generator is shut down, the capacitor may maintain a charge. Always discharge the capacitor before working on the generator head to prevent electrical shock.
- **Replace guards / shields.** Make sure all guards and shields are replaced after servicing the generator.
- **Replacement parts.** If a part needs replacement, only use parts that meet the manufacturer's specifications. Replacement parts that do not meet specifications may result in a safety hazard or poor operation of the generator and will void the warranty.

Generator Exploded View Rev – K

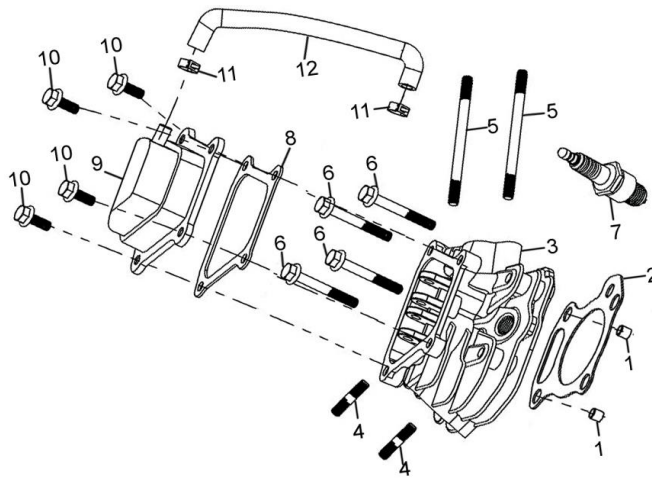
Ref #	Part #	Description	Qty	
1	Kit # 17	Control Panel assembly	1	
2		Control Panel w/decal	1	
3	Kit # 15, 16 & 18	Screw M5x12	22	
4	Kit # 17	LED indicator light (2 red & 1 green)	1	
5		ESC throttle switch cover	1	
6		ESC throttle switch	1	
7		L5-20R Duplex Receptacle	1	
8		Grid socket waterproof glue sets	2	
9		Grid socket (red)	1	
10		Grid socket (black)	1	
11		L5-30R Locking receptacle	1	
12		Ground bolt	1	
13		Wire harness assembly	1	
14		Wire harness	1	
15		Panel seat	1	
16		Kit # 16	Screw M4X10	1
17			Engine OFF/RUN/CHOKE Control Knob	1
18			Combination switch	2
19	Assembled Switch Seat		2	
20	Switch		1	
21	Control Knob Collar		1	
22	Assembled Switch Slip Block		1	
24	Assembled Switch Slip Seat		1	
25	Resistance air inlet and cable		1	
27	Kit # 14	Fuel Filter	1	
28	Kit # 16	Inverter mounting bracket	1	
29	Kit # 12 & 16	Bolt, flange M6 x 12	10	
30	Kit # 14 & 18	Rubber, fuel cushion	3	
31		Rubber, fuel cushion	2	
32	Kit 12 & 18	Tapping screw	11	
33	Kit # 16	Inverter Assy.	1	
34		Fuel Switch	1	
35	Kit # 14	Clamp	5	
36		Clamp	1	
37		Tube, fuel	1	
38		Tube, fuel	1	
39		Fuel filter	1	
40		Tank, Fuel	1	
41		Rubber, fuel cushion	2	
42		Fuel Filter	1	
43		Fuel retainer	1	
44		Cap/Gasket Assy, Tank	1	
45	N/A	Fuel tank knob	1	
46	N/A	Sealing ring	1	
47	N/A	Fuel tank shell	1	
48	N/A	Fuel tank gasket	1	
49	N/A	Filter sponge	1	
50	N/A	Gasket gland	1	
51	N/A	Compression spring	1	
52	N/A	Washer	1	

Ref #	Part #	Description	Qty
53	N/A	Pin clip	1
54	Kit # 12	Fan, Generator cooling	1
55	Kit # 13	(120V) Alternator Assy	1
56		Rotor	1
57		Nut	1
58		M6X30 bolt M6X30	1
59		Stator	7
60		Housing	1
61		Pin, Dowel	2
62		End cap	1
63		Inlet cover	1
64	Kit # 12	Lock washer	9
65	Kit # 18	Exhaust Cover	1
66	Kit # 12	Muffler shield strip	1
67		Muffler inner cover	1
68		Bushing	2
69		Shaped Bushing	2
70		M6X14	6
71		Muffler outer cover	1
72		Muffler exhaust cover	1
73		Diversion cover card clip	1
74	Kit # 18	Right case column	1
75		Spark plug maintenance cover	1
76		Right side cover plate	1
77	Kit # 15 & 18	Bolt	6
78	Kit # 18	Buffer rubber	1
79	Kit # 15 & 18	Clip next nut	10
80	Kit # 18	Handle cover	1
81		Left side cover plate	1
82		Left case column	1
83		Buffer rubber	1
84	Kit # 15	Frame floor combination	1
85		Bolt	4
86		Bushing	4
87		Frame, rubber feet	4
88		Nut M6	8
89		Square nut	6
90		Frame shock absorption seat	4
91		Buffer rubber	1
92		Buffer rubber	1
93		N/A	Ground lead
94	N/A	Ground lead	1
95	Kit # 18	Slotted head screws	2
96		Clip	1
97		Bolt	2
98	Kit # 18	Oil Fill Cover	1
99	Kit # 18	Screw, Oil Fill Cover	1
100	Kit # 14	Tube, fuel	1
101	Kits #1-#11	Engine w/Air Filter and Muffler	1
N/A	794940	Spark Arrester (not shown)	1

Generator Exploded View Rev – K

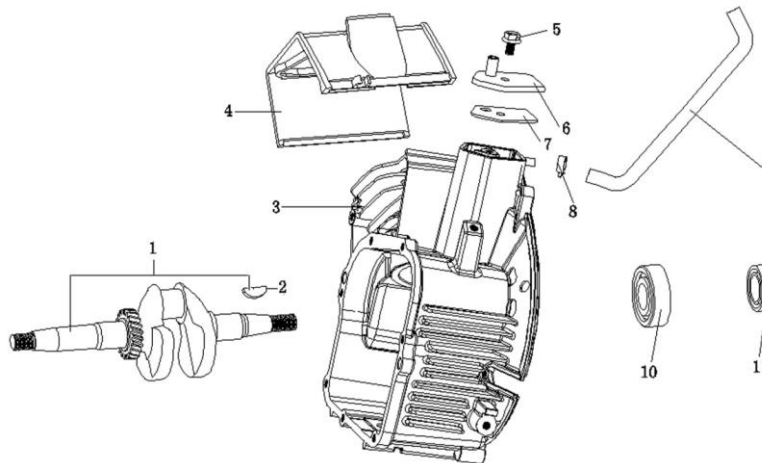


Generator Exploded View Rev – K



Kit # 1 - Part # 798003 Cylinder Head Kit

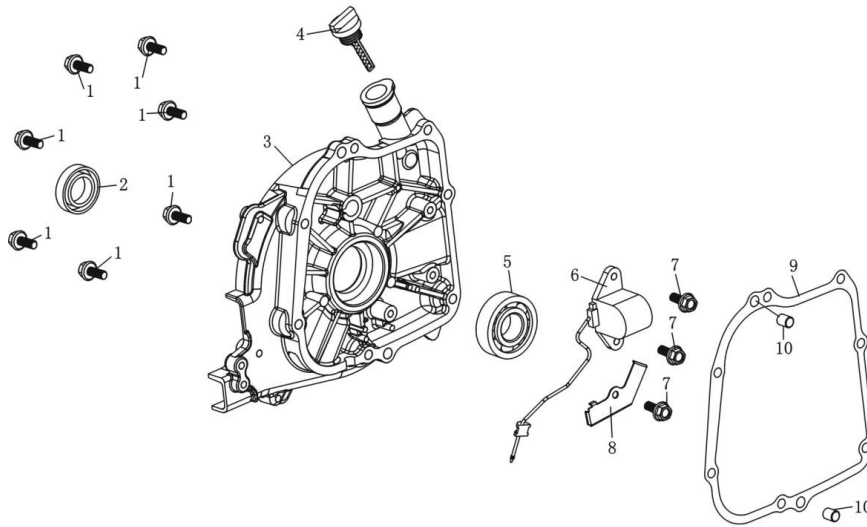
Ref #	Part #	Description	Qty
1	N/A	PIN,DOWEL Ø8X10	2
2	N/A	GASKET, CYLINDER	1
3	N/A	CYLINDER HEAD ASSY	1
4	N/A	BOLT ,STUD ,EXHAUST	2
5	N/A	BOLT ,STUD ,INLET	2
6	N/A	BOLT, FLANGE M6X50	4
7	794946	SPARK PLUG BPR7HS	1
8	N/A	PACKING , HEAD COVER	1
9	N/A	COVER COMP., HEAD	1
10	790978	BOLT, FLANGE, M6X14	4
11	790969	CLAMP	2
12	798000	TUBE,BREATHER	1



Kit # 2 - Part # 798002 Crank Case Kit

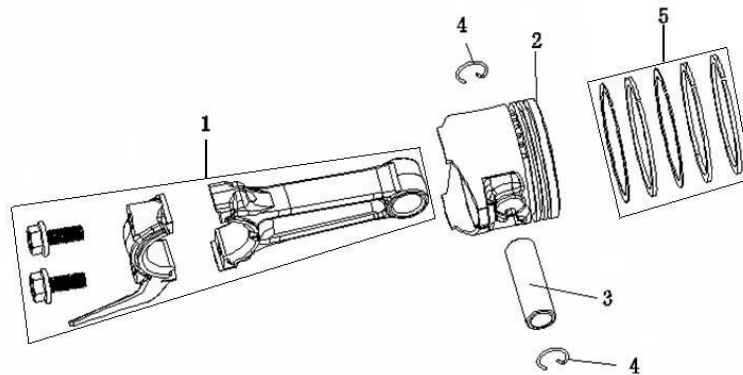
Ref #	Part #	Description	Qty
1	N/A	CRANKSHAFT COMP	1
2	N/A	WOODRUFF KEY	1
3	N/A	CRANK CASE	1
4	N/A	SHROUD COMP	1
5	N/A	BOLT, FLANGE M6X20	1
6	N/A	CAP,BREATHER CHAMBER	1
7	N/A	PACKING,BREATHER CHAMBER	1
8	790969	LOOP,TUBE	2
9	798001	TUBE,BREATHER	1
10	N/A	BALL BEARING 6204	1
11	N/A	OIL SEAL	1

Generator Exploded View Rev – K



Kit # 3 – Part # 790952 Crank Case Cover Kit

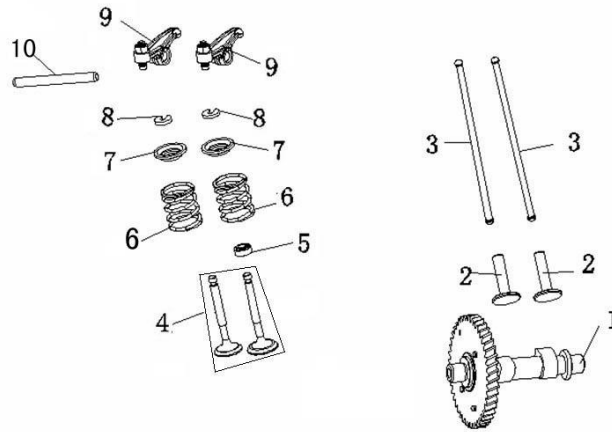
Ref #	Part #	Description	Qty
1	790974	BOLT, FLANGE M6X20	7
2	N/A	OIL SEAL	1
3	N/A	COVER , CRANKCASE	1
4	790975	CAP/DIPSTICK ASSY	1
5	N/A	BALL BEARING 6204	1
6	790976	OIL LEVEL SWITCH	1
7	790977	BOLT, FLANGE M6X12	3
8	N/A	PLATE	1
9	N/A	PACKING , CASE COVER	1
10	N/A	PIN , DOWEL	2



Kit # 4 – Part # 790953 Piston/Connecting Rod Assembly

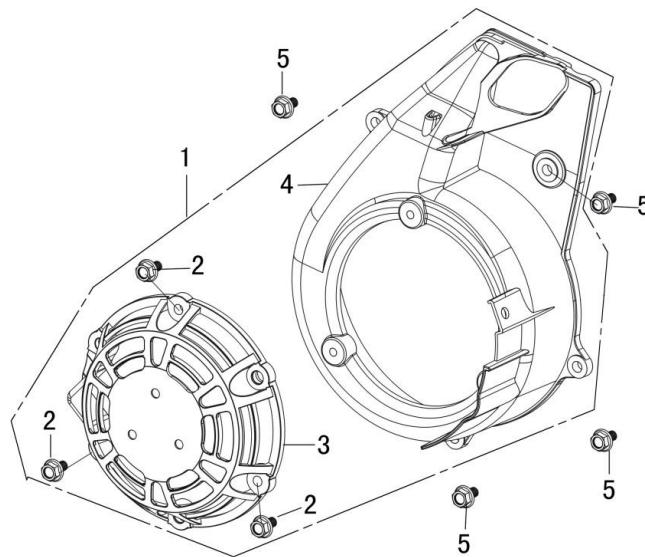
Ref #	Part #	Description	Qty
1	N/A	CONN ROD ASSY	1
2	N/A	PISTON	1
3	N/A	PISTON PIN	1
4	N/A	CLIP,PISTON PIN	2
5	N/A	RING SET,PISTON	1

Generator Exploded View Rev – K



Kit # 5 – Part # 790954 Camshaft Kit

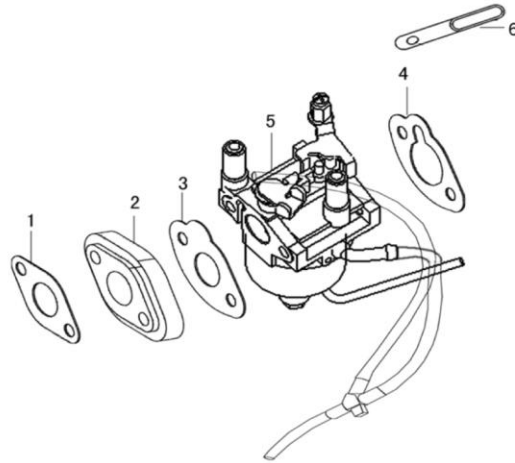
Ref #	Part #	Description	Qty
1	N/A	CAMSHAFT ASSY.	1
2	N/A	LIFTER, VALVE	2
3	N/A	PUSH ROD	2
4	N/A	VALVE KIT	1
5	N/A	SEAL, GUIDE	1
6	N/A	SPRING, VALVE	2
7	N/A	RETAINER, VALVE SPRING	2
8	N/A	VALVE LOCKER	2
9	N/A	ROCKER ARM ,ASSY	2
10	N/A	SHAFT, ROCKER	1



Kit # 6 – Part # 790955 Starter Subassembly Kit

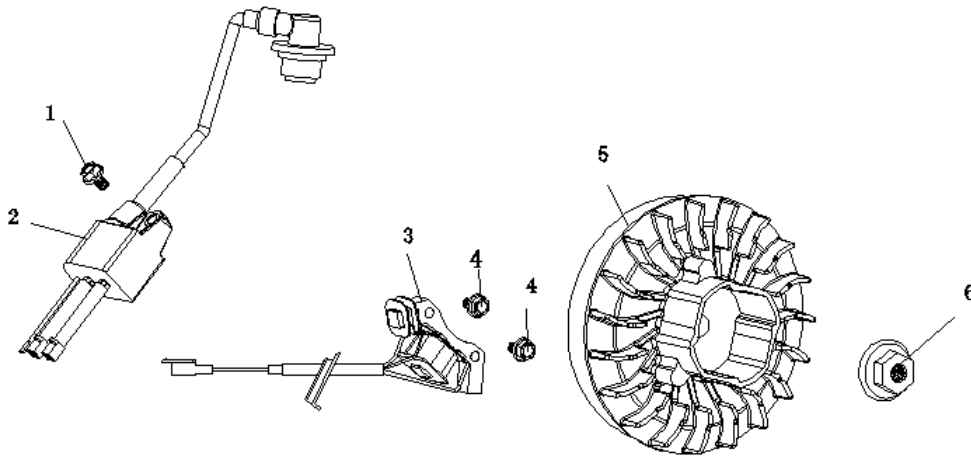
Ref #	Part #	Description	Qty
1	N/A	RECOIL STARTER COMP.	1
2	790978	BOLT, FLANGE, M6X14	3
3	790979	STARTER ASSY.	1
4	N/A	COVER COMP., FAN	1
5	790980	BOLT, FLANGE, M6X16	4

Generator Exploded View Rev – K



Kit # 7 – Part # 796479 Carburetor Assembly Kit

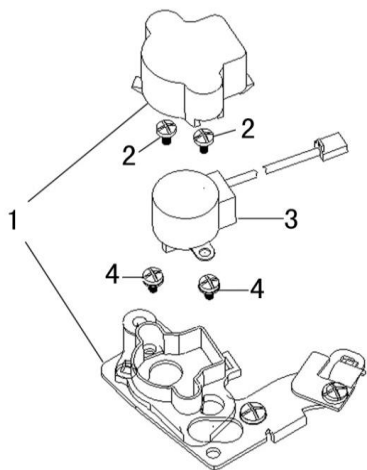
Ref #	Part #	Description	Qty
1	N/A	GASKET, INSULATOR	1
2	N/A	INSULATOR , CARBURETOR	1
3	N/A	PACKING, CARBURETOR	1
4	N/A	PACKING, CARBURETOR	1
5	N/A	CARBURETOR W/DRAIN HOSE	1
6	N/A	CLIP	1



Kit # 8 – Part # 790957 Flywheel/Ignition Coil Assembly Kit

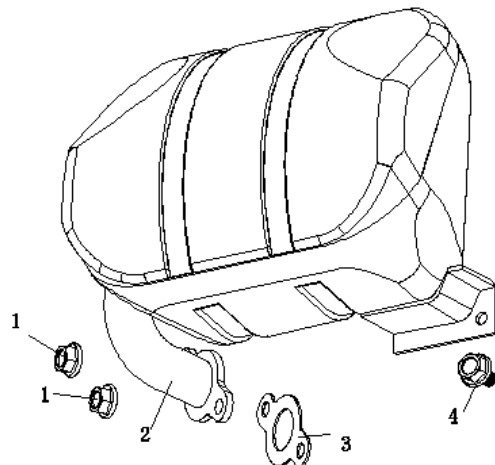
Ref #	Part #	Description	Qty
1	790980	BOLT, FLANGE, M6X16	1
2	790981	COIL ASSY., IGNITION	1
3	790982	COIL ASSY., CHARGE	1
4	N/A	BOLT, FLANGE, M6X20	2
5	N/A	FLYWHEEL COMP.	1
6	N/A	NUT FLANGE M12	1

Generator Exploded View Rev – K



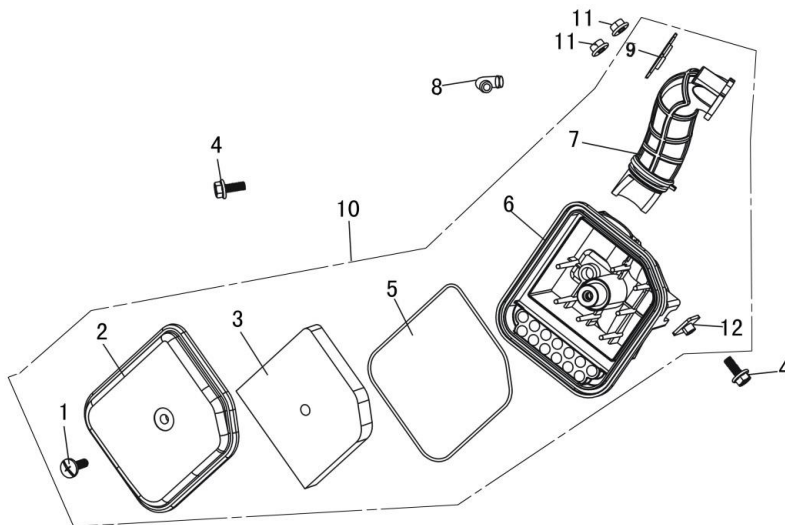
Kit # 9 – Part # 790958 Control System Kit

Ref #	Part #	Description	Qty
1	N/A	BRACKET, ELETROMOTO	1
2	N/A	SCREW M3	2
3	N/A	RECOIL START ASSY	1
4	N/A	SCREW M5	2



Kit # 10 – Part # 790959 Muffler Assembly Kit

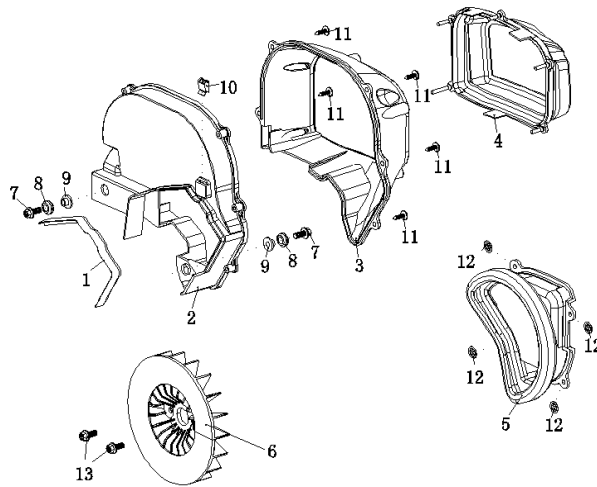
Ref #	Part #	Description	Qty
1	N/A	NUT M6	2
2	N/A	MUFFLER ASSY	1
3	790983	EXHAUST PIPE GASKET	1
4	790977	BOLT, FLANGE, M6X12	1



Kit # 11 – Part # 790960 Air Cleaner Assembly Kit

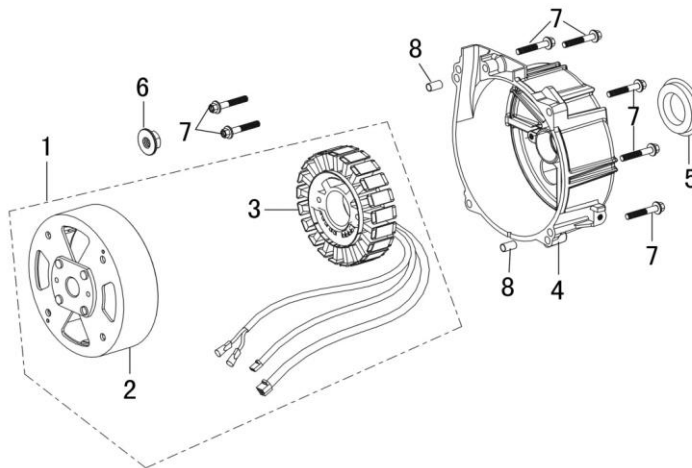
Ref #	Part #	Description	Qty
1	N/A	SCREW	1
2	N/A	COVER, AIR CLEANER	1
3	790985	FOAM ELEMENT	1
4	N/A	BOLT,FLANGE M6×20	2
5	N/A	SEAL, AIR CLEANER	1
6	N/A	BASE, AIR CLEANER	1
7	N/A	INLET PIPE	1
8	N/A	TIE-IN TUBE, BREATHER	1
9	N/A	FLANGE,MUFFLER	1
10	N/A	AIR CLEANER ASSY	1
11	N/A	NUT,FLANGE M6	2
12	N/A	IMPLANT NUT	1

Generator Exploded View Rev – K



Kit # 12 – Part # 790964 Air Cooling Components Kit

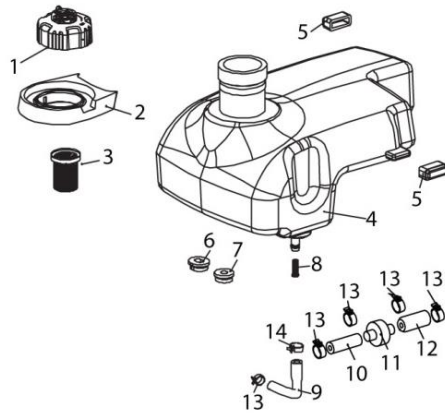
Ref #	Part #	Description	Qty
1	N/A	MUFFLER SHIELD STRIP	1
2	N/A	MUFFLER INNER COVER	1
3	N/A	MUFFLER OUTER COVER	1
4	791002	MUFFLER EXHAUST COVER	1
5	791003	INLET COVER	1
6	N/A	FAN, GENERATOR COOLING	1
7	N/A	BOLT, FLANGE M6X14	2
8	N/A	SHAPED BUSHING	2
9	N/A	BUSHING	2
10	791004	CLIP	1
11	N/A	SCREW, PAN, M4X15	5
12	N/A	LOCK WASHER	4
13	N/A	BOLT, FLANGE M6X12	2



Kit # 13 – Part # 792197 Rotor and Stator Assembly Kit

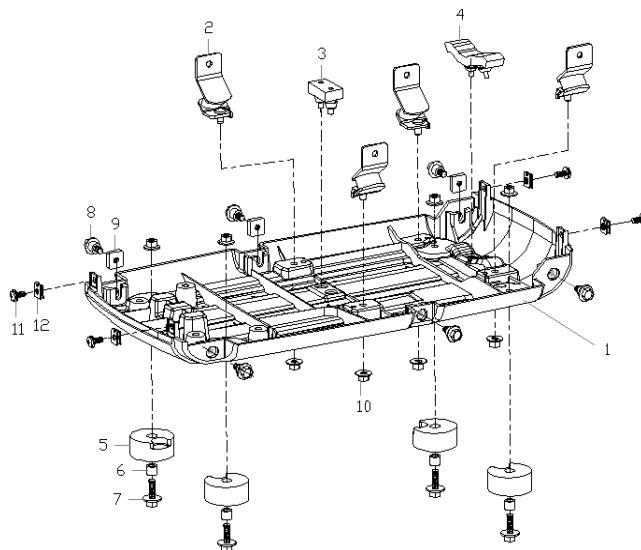
Ref #	Part #	Description	Qty
1	790998	ALTERNATOR ASSY.	1
2	N/A	ROTOR	1
3	N/A	STATOR	1
4	N/A	HOUSING	1
5	N/A	END CAP	1
6	N/A	NUT	1
7	N/A	BOLT, FLANGE M6X30	7
8	N/A	PIN, DOWEL	2

Generator Exploded View Rev – K



Kit # 14 – Part # 795866 Fuel Tank Kit

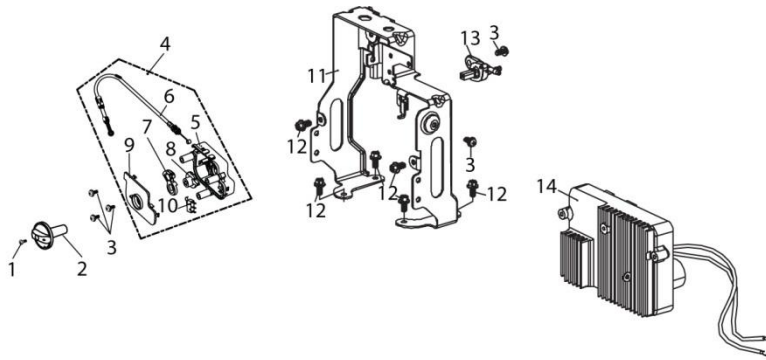
Ref #	Part #	Description	Qty
1	790986	CAP COMP., FUEL FILLER	1
2	795873	FUEL RETAINER	1
3	790988	FILTER, FUEL TANK	1
4	N/A	TANK COMP., FUEL	1
5	N/A	RUBBER, FUEL CUSHION	2
6	N/A	RUBBER, FUEL CUSHION	1
7	N/A	RUBBER, FUEL CUSHION	1
8	790989	FUEL FILTER	1
9	790994	TUBE, FUEL	1
10	795870	TUBE, FUEL	1
11	796281	FUEL FILTER	1
12	795871	TUBE, FUEL	1
13	790997	CLAMPS	5
14	790996	CLAMPS	1



Kit # 15 – Part # 797180 Frame Kit

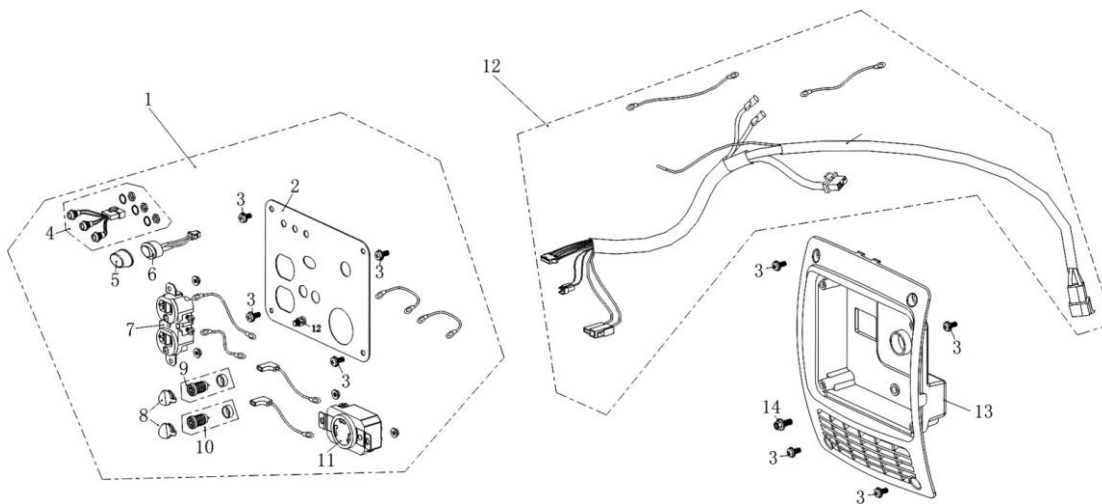
Ref #	Part #	Description	Qty
1	N/A	FRAME BOTTOM	1
2	797179	FRAME ISOLATION MOUNTS	4
3	791006	RUBBER MOUNT	1
4	791007	RUBBER MOUNT	1
5	791008	FRAME RUBBER FEET	4
6	791009	BUSHING	4
7	791010	BOLT	4
8	N/A	BOLT	6
9	N/A	SQUARE NUT	6
10	N/A	NUT M6	8
11	790993	SCREW FLAT M5X12	4
12	N/A	CLIP NUT	4

Generator Exploded View Rev – K



Kit # 16 – Part # 795861 Inverter Assembly Kit

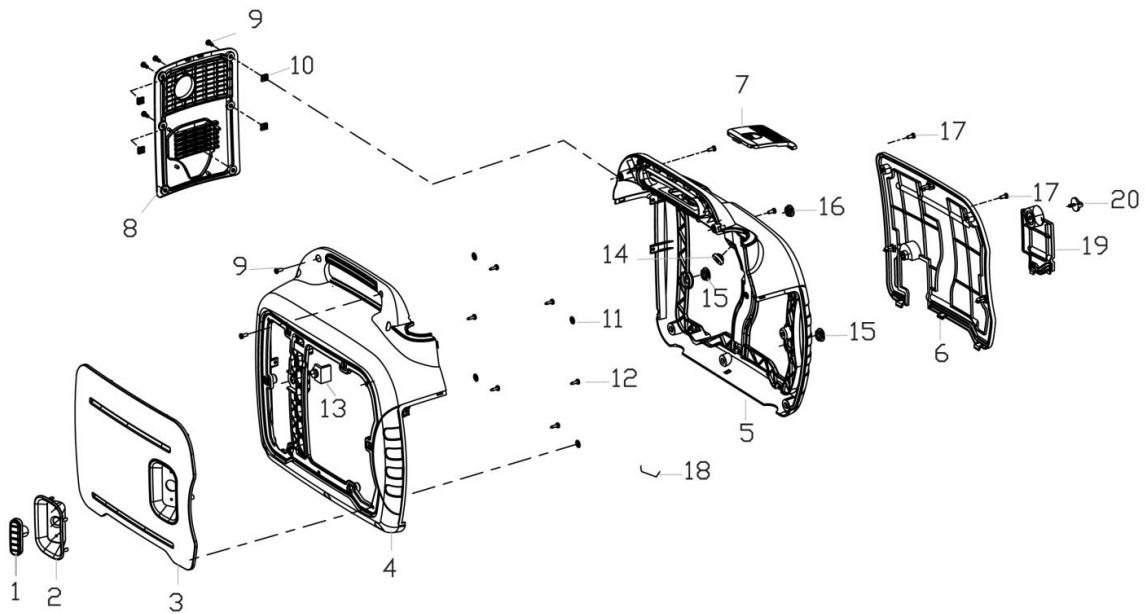
Ref #	Part #	Description	Qty
1	795869	SCREW M4×18	1
2	795867	OFF/RUN/CHOKE CONTROL KNOB	1
3	790993	SCREW FLAT M5X12	5
4	795862	COMBINATION SWITCH	1
5	N/A	ASSEMBLED SWITCH SLIP SEAT	1
6	N/A	CHOKE CABLE	1
7	N/A	ASSEMBLED SWITCH SLIP BLOCK	1
8	N/A	CONTROL KNOB COLLAR	1
9	N/A	ASSEMBLED SWITCH SLIP BLOCK	1
10	N/A	SWITCH	1
11	N/A	INVERTER MOUNTING BRACKET	1
12	N/A	BOLT, FLANGE M6X12	6
13	795868	FUEL SWITCH	1
14	N/A	INVERTER ASSY	1



Kit # 17 – Part # 795863 Control Panel Assembly Kit

Ref #	Part #	Description	Qty
1	791019	CONTROL PANEL ASSY	1
2	N/A	CONTROL PANEL W/DECAL	1
3	790993	SCREW FLAT M5X12	8
4	N/A	LED INDICATOR LIGHTS	1
5	N/A	ESC THROTTLE SWITCH COVER	1
6	N/A	ESC THROTTLE SWITCH	1
7	N/A	L5-20R DUPLEX RECEPTACLE	1
8	N/A	GRID SOCKET WATERPROOF SETS	2
9	N/A	GRID SOCKET (RED)	1
10	N/A	GRID SOCKET (BLACK)	1
11	N/A	L5-30R LOCKING RECEPTACLE	1
12	795865	WIRE HARNESS	1
13	795864	PANEL SEAT	1
14	N/A	BOLT,FLANGE M6X12	1

Generator Exploded View Rev – K



Kit # 18 – Part # 799760 Case and Cover Kit

Ref #	Part #	Description	Qty
1	791011	PULL CORD HANDLE	1
2	791012	HANDLE COVER	1
3	791013	LEFT SIDE COVER PLATE	1
4	N/A	LEFT CASE ASSEMBLY	1
5	N/A	RIGHT CASE ASSEMBLY	1
6	792105	RIGHT SIDE COVER PLATE	1
7	791015	SPARK PLUG MAINTENANCE COVER	1
8	791016	EXHAUST COVER	1
9	790993	SCREW FLAT MAT	8
10	791018	CLIP NEXT NUT	6
11	N/A	LOCK WASHER	5
12	N/A	SCREW, PAN, M4X15	6
13	N/A	BUFFER RUBBER	1
14	N/A	BUFFER RUBBER	1
15	N/A	RUBBER TANK CUSHION	2
16	N/A	RUBBER TANK CUSHION	1
17	N/A	BOLT	2
18	N/A	CLIP	1
19	792106	OIL FILL COVER	1
20	792107	SCREW, OIL FILL COVER	1

Limited Warranty

Dear Valued Customer:

The Powerhorse Product you just purchased is built with the finest material and craftsmanship. Use this product properly and enjoy the benefits from its high performance. By purchasing a Powerhorse product, you show a desire for quality and durability. Like all mechanical equipment this unit requires a due amount of care. Treat this unit like the high quality piece of machinery it is. Neglect and improper handling may impair its performance. Please thoroughly read the instructions and understand the operation before using your product. Always contact Powerhorse Product Support at 1-866-443-2576 prior to having any service or warranty work performed, as some services performed by parties other than Powerhorse approved service centers may void this warranty. This warranty is in lieu of any other warranty expressed or implied and Powerhorse assumes no other responsibility or liability outside that expressed within this warranty.

Limited Warranty

Powerhorse shall warranty any piece of equipment manufactured, or parts of equipment manufactured, to be free from defects in material or workmanship for a period of:

Powerhorse Warranty		
Item #	Consumer Warranty Period	Commercial Warranty Period
42411	2 years from date of purchase by user	90 days from date of purchase by user

“Consumer use” means personal residential household use by a consumer. “Commercial use” means all other uses, including use for commercial, income producing or rental purposes or when purchased by a business.

This warranty applies to the original purchaser of the equipment (verification of purchase, in the form of a receipt, is the responsibility of the buyer), is non-transferable, and covers parts and labor. Parts will be replaced or repaired at no charge, except when the equipment has failed due to lack of proper maintenance. If a part is no longer available, the part may be replaced with a similar part of equal function. Any misuse, abuse, alteration or improper installation or operations will void warranty. Determining whether a part is to be replaced or repaired is the sole decision of Powerhorse. Powerhorse will not provide for replacement of complete products due to defective parts. Any costs incurred due to replacement or repair of items outside of a Powerhorse approved facility is the responsibility of the buyer and not covered under warranty. Transportation costs to and from service center is the responsibility of the customer.

In addition to the normal warranty, Powerhorse shall warrant any normal wear item from defects in material or workmanship for a period of 90 days from the date of purchase by user. Normal wear items include, but are not limited to, filter elements.

This warranty specifically excludes the following; failure of parts due to damage caused by accident, fire, flood, windstorm, acts of God, applications not approved by Powerhorse in writing, corrosion caused by chemicals, use of replacement parts which do not conform to manufacturer’s specifications, damage to accessory parts such as starting batteries, damage related to rodent and/or insect infestation and damage caused by vandalism. Additional exclusions: loss of running time, inconvenience, loss of income, or loss of use, including any implied warranty of merchantability of fitness for a specific use. Also, Outdoor Power Equipment needs periodic parts and service to perform well, and this warranty does not cover instances when normal use has exhausted the life of a component or the engine.

This warranty does not cover any personal injury or damage to surrounding property caused by failure of any part. Repair or replacement of parts does not extend the warranty period.

The engine warranty is covered under the same terms and conditions as outlined above. Normal engine maintenance such as spark plugs, air filters, adjustments, fuel system cleaning and obstruction due to build up is not covered by this Powerhorse warranty.

Please fill in the following information and have it on hand when you call in on a warranty claim.

Customer Number: _____

Date of Purchase: _____

Powerhorse Serial Number: _____

Item Number: _____

▲ WARNING: This product can expose you to chemicals including gasoline engine exhaust, which is known to the State of California to cause cancer, and carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm.

For more information go to www.P65Warnings.ca.gov.



POWERHORSE®

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