# Owner's Manual & Safety Instructions

**Save This Manual** Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's date code in the back of the manual (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

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# PREDATOR

## 14,500 WATT EFI TRI-FUEL GENERATOR

**11,000 GASOLINE RUNNING WATTS**
**14,500 MAX GASOLINE STARTING WATTS**

**10,000 PROPANE RUNNING WATTS**
**13,000 MAX PROPANE STARTING WATTS**

**9,000 NG RUNNING WATTS**
**11,000 MAX NG STARTING WATTS**

**Visit our website at:**
**https://www.harborfreight.com**

**Email our Product Support at:**
**productsupport@harborfreight.com**

**WARNING:** Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified service technician, service agency, manufacturer, or the gas supplier.

**FOR YOUR SAFETY**
**IF YOU SMELL GAS:**

1. Don't touch electrical switches.
2. Extinguish any open flame.
3. Immediately call your gas supplier.

**FOR YOUR SAFETY**

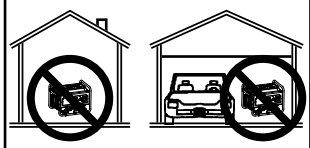
Do not store gasoline or other flammable vapors and liquids in the vicinity of this or any other generator.

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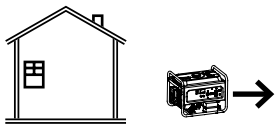
### ⚠ DANGER

**Using a generator indoors CAN KILL YOU IN MINUTES.**

**Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.**



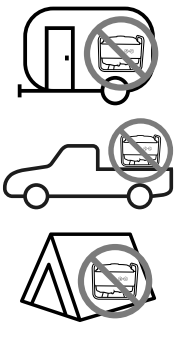
**NEVER use inside a home or garage, EVEN IF doors and windows are open.**



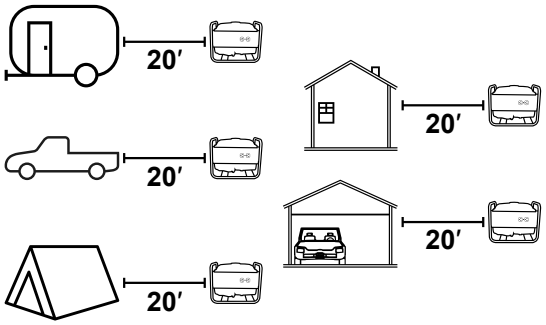
**Only use OUTSIDE and far away from windows, doors, and vents.**

### ⚠ DANGER

**Do not use in trailers, truck beds, or tents.**



**Use at least 20 feet away from people, animals, and structures with exhaust pointed away. Generator will produce carbon monoxide when burning gas, Propane, or Natural Gas.**




When unpacking, make sure that the product is intact and undamaged. If any parts are missing or broken, please visit harborfreight.com/customer-support/contact-us as soon as possible.

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### ⚠ WARNING

**Read this material before using this product. Failure to do so can result in serious injury. SAVE THIS MANUAL.**

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## Specifications

| | | |
|---|---|---|
| Generator | AC Output (Gasoline) | 120/240VAC, 60Hz, 91.67/45.83A, 1 Phase<br>11000 Running Watts<br>14500 Maximum Starting Watts |
| | AC Output Propane) | 120/240VAC, 60Hz, 83.3/41.7A, 1 Phase<br>10000 Running Watts<br>13000 Maximum Starting Watts |
| | AC Output (Natural Gas) | 120/240VAC, 60Hz, 75.0/37.5A, 1 Phase<br>9000 Running Watts<br>11000 Maximum Starting Watts |
| | Receptacles | 4x 120VAC, 20A GFCI<br>1x 120VAC, 30A Twist Lock L5-30R<br>1x 120/240VAC, 30A Twist Lock L14-30R<br>1x 120/240VAC, 50A NEMA 14-50R |
| Displacement | | 500cc |
| Compression Ratio | | 8.5:1 |
| Engine Type | | Horizontal Single Cylinder, 4-stroke, OHV |
| Cooling System | | Forced air cooled |
| Fuel | Type | 87+ octane, stabilizer-treated unleaded Gasoline; Propane or Natural Gas |
| | Gasoline Tank | 9.77 Gallon / 37 Liter |
| | Propane Tank | 40 lb tank minimum |
| | Natural Gas | Fuel Rating: 1000 BTU/cu ft<br>Minimum Fuel Supply Size: 1/2"<br>Supply Pressure: 5~9 WC (1.2-2.24 KPa)<br>Maximum Flow Rate: 125000 BTU/hr |
| Engine Oil | Type SAE | 10W-30 |
| | Capacity | 1.4 Quart / 1.3 Liter |
| Run Time @ 50% Load with full gasoline tank | | 11.5 hours |
| Run Time @ 50% Load with 100 lb Propane tank | | 16.5 hours |
| Sound Level at 23 feet, 50% load | | 78.5 dB(A) |
| Bore x Stroke | | 94mm x 72mm |
| Spark Plug | Type | LG / Torch F7RTJC or equivalent |
| | Gap | 0.031"–0.039" |
| Valve Clearance | Intake | 0.002"–0.004" |
| | Exhaust | 0.002"–0.004" |
| Engine Speed | | 3600 RPM |
| Electric Start Battery | | 12V–14Ah Lead-Acid Non-Spillable |
| Remote Control Battery | | 3V CR2032 |
| Internal Battery | | 3V CR2032<br>Contains non-replaceable batteries |
| Battery Charger | Input: 100–240VAC, 50/60Hz, 0.5A Max • Output: 14VDC, 0.8A<br>Cable Length: 5.9 feet | |

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The emissions control system for this Engine is warranted for standards set by the U.S. Environmental Protection Agency and by the California Air Resources Board (also known as CARB). For warranty information, refer to the last pages of this manual.

In reference to the remote: Changes or modifications not expressly approved by Harbor Freight Tools could void the user's authority to operate the equipment. FCC ID: 2BCTA-SA00004-1

| WARNING SYMBOLS AND DEFINITIONS | |
|---|---|
| ⚠ | 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. |
| ⚠DANGER | Indicates a hazardous situation which, if not avoided, will result in death or serious injury. |
| ⚠WARNING | Indicates a hazardous situation which, if not avoided, could result in death or serious injury. |
| ⚠CAUTION | Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. |
| *NOTICE* CAUTION | Addresses practices not related to personal injury. |

## Symbol Definitions

| Symbol | Property or Statement |
|---|---|
| **EFI** | Electronic Fuel Injection |
| **RPM** | Revolutions Per Minute |
| **HP** | Horsepower |
| **AWG** | American Wire Gauge |
|  | WARNING marking concerning Risk of Eye Injury. Wear ANSI-approved safety goggles with side shields. |
|  | Read the manual before set-up and/or use. |
|  | WARNING marking concerning Risk of Hearing Loss. Wear hearing protection. |

| Symbol | Property or Statement |
|---|---|
|  | WARNING marking concerning Risk of Respiratory Injury. Operate engine OUTSIDE and far away from windows, doors, and vents. |
|  | WARNING marking concerning Risk of Fire while handling fuel. Do not smoke while handling fuel. |
|  | WARNING marking concerning Risk of Fire. Do not refuel while operating. Keep flammable objects away from engine. |
|  | WARNING: Contains coin battery. |

# IMPORTANT SAFETY INSTRUCTIONS

**WARNING! Read all instructions. Failure to follow all instructions listed below may result in fire, serious injury and/or DEATH.**

The warnings and precautions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

This manual contains important instructions that should be followed during installation and maintenance of the generator and any batteries.

**SAVE THESE INSTRUCTIONS**

## IF YOU SMELL GAS

1. **NO FLAMES OR SPARKS!** Immediately put out all smoking materials and other open flames. Do not operate lights, appliances, telephones, or cell phones. Flames or sparks from these sources can trigger an explosion or a fire.
2. **LEAVE THE AREA IMMEDIATELY!** Get everyone out of the area where you suspect gas is leaking.
3. **SHUT OFF THE GAS.** Turn off the main gas supply valve on your propane tank, or the shutoff valve on the natural gas source if it is safe to do so. To close the valve, turn it to the right (clockwise).
4. **REPORT THE LEAK.** From a neighbor's home or other nearby building away from the gas leak, call your propane retailer or local gas company right away. If you can't reach your propane retailer or gas company, call 911 or your local fire department.
5. **DO NOT RETURN TO THE AREA** until your propane retailer, the gas company, emergency responder, or qualified service technician determines that it is safe to do so.
6. **GET YOUR SYSTEM CHECKED.** Before you attempt to use your generator your propane retailer, the gas company, or a qualified service technician must check your entire system to ensure that it is leak-free.

## CAN YOU SMELL IT?

Propane smells like rotten eggs, a skunk's spray, or a dead animal. Some people may have difficulty smelling propane due to their age (older people may have a less sensitive sense of smell); a medical condition; or the effects of medication, alcohol, tobacco, or drugs.

**ODOR LOSS.** On rare occasions, propane can lose its odor. Several things can cause this including:

- The presence of air, water, or rust in a propane tank or cylinder.
- The passage of leaking propane through the soil.

Natural Gas itself is odorless and tasteless, but a chemical is added to give it an odor in order to help detect leaks quickly. Natural Gas is lighter than air and will collect in higher areas.

Since there is a possibility of odor loss or problems with your sense of smell, you should respond immediately to even a faint odor of propane or natural gas.

## GAS DETECTORS

Under some circumstances, you may not smell a propane or natural gas leak. Propane and natural gas detectors (not included) sound an alarm if they sense propane or natural gas in the air. They can provide an additional measure of security. You should consider the purchase of one or more detectors for your home.

**GUIDELINES** regarding propane or natural gas detectors:

- Buy only units that are listed under the latest Underwriters Laboratories (UL) standard.
- Follow the manufacturer's instructions regarding installation and maintenance.
- Never ignore the smell of propane or natural gas, even if no detector is sounding an alarm.

## GENERATOR MAINTENANCE

**LEAVE IT TO THE EXPERTS.** Only a qualified service technician has the training to install, inspect, service, maintain, and repair your generator. Have your generator and propane or natural gas system inspected annually.

**DO NOT TRY TO MODIFY OR REPAIR** valves, regulators, connectors, controls, or other generator and cylinder/tank parts. Doing so creates the risk of a gas leak that can result in property damage, serious injury, or death.

**FOR NATURAL GAS SYSTEMS,** fuel system pipes and hoses must be leak-free and of adequate size to maintain specified supply pressure and volume flow rate under varying generator load conditions.

## CO AND YOUR SAFETY

**WHAT IS CARBON MONOXIDE (CO)?** You can't taste or smell CO, but it is a very dangerous gas. High levels of CO can come from engine exhaust fumes, appliances that are not operating correctly, or from a venting system or chimney that becomes blocked.

**CO CAN BE DEADLY!** High levels of CO can make you dizzy or sick. In extreme cases, CO can cause brain damage or death. Symptoms of CO poisoning include: headache, dizziness, fatigue, shortness of breath, and nausea.

**IF YOU SUSPECT CO IS PRESENT, ACT IMMEDIATELY!**

1. If you or a family member shows physical symptoms of CO poisoning, get everyone out of the area and call 911 or your local fire department.
2. If it is safe to do so, turn off any appliances you suspect may be releasing CO.
3. If no one has symptoms, but you suspect that CO is present, call your propane retailer, the gas company, or a qualified service technician to check CO levels and your propane or natural gas equipment.

**CO DETECTORS CAN IMPROVE SAFETY.** For an extra measure of safety, consider installing a CO detector (not included) listed by UL on each level of your home.

**TO HELP REDUCE THE RISK OF CO POISONING:**

- Have a qualified service technician check your propane appliances and venting systems annually, preferably before the heating season.
- Install UL-listed CO detectors on every level of your home.
- Never use a gas oven or range-top burners to provide space heating.
- **DO NOT USE THE GENERATOR INDOORS OR IN ANY ENCLOSED SPACE OR IN ANY OTHER AREA OR SITUATION THAT WILL ALLOW CARBON MONOXIDE TO ACCUMULATE.**
- Never use a barbecue grill (propane or charcoal) indoors for cooking or heating.
- Regularly check your appliance exhaust vents for blockage.

## RUNNING OUT OF GAS

**DON'T RUN OUT OF GAS. SERIOUS SAFETY HAZARDS, INCLUDING FIRE OR EXPLOSION, CAN RESULT.**

- If an appliance valve or a gas line is left open, a leak could occur when the system is recharged with propane.
- **A LEAK CHECK IS REQUIRED.** In many states, a propane retailer or a qualified service technician must perform a leak check of your propane system before turning on the gas.

# Propane & Natural Gas Precautions

1. Propane and Natural Gas systems must be installed and used in strict conformance with NFPA 58 (Liquefied Petroleum Gas Code), NFPA 54 (National Fuel Gas Code), manufacturer's recommendations, and all relevant local, state, and federal codes and regulations.
2. Propane, Natural Gas, and Gasoline fuel and fumes are flammable, and potentially explosive. Use proper fuel storage and handling procedures. Do not store fuel or other flammable materials nearby.
3. Fire and explosion hazard. Never use a Gas container, Propane connector hose, Propane tank, Natural Gas connector hose, or any other fuel item that appears to be damaged.
4. Fire and explosion hazard. Only use approved propane tanks with an Overfilling Prevention Device (OPD) valve. Keep the tank in a vertical position with the valve on top and placed at ground level on a flat surface. Do not allow tanks to be near any heat source. When transporting and storing, turn the propane tank valve to the fully closed position and disconnect the tank. Make sure to always cover the generator inlet and tank outlet with protective plastic caps.
5. Connect Propane tank using provided attachment kit only. Kit includes 1.5 meter (4.9 ft) hose. Place tank as far away from Generator as hose allows and away from engine exhaust. Do not place tank above Generator.
6. Connect to Natural Gas source using PREDATOR® 1/2″ Natural Gas Quick Connect Hose Kit only, item 70491 (not included). Kit includes 7.6 meter (25 ft) Hose. Do not use Natural Gas Hose with any other appliances.
7. Fire and explosion hazard. If there is a strong smell of Propane or Natural Gas while operating the generator, fully close the Propane tank valve or Natural Gas shutoff valve and shut down the Generator immediately. Once the Propane/Natural Gas is off, use soapy water to check for leaks on the hose and connections on the tank valve and the generator. Do not smoke or light a cigarette or check for leaks using any open flame source such as a match or lighter. If a leak is found, contact a qualified technician to inspect and repair the Propane or Natural Gas system before using the generator.
8. Generator will produce carbon monoxide when burning gasoline, Natural Gas, or Propane.
9. When exchanging Propane tanks, be sure the tank connector is the same size and thread.
10. Propane will freeze skin. Prevent leaking Propane from contacting skin at all times.
11. Propane and Natural Gas are is highly flammable and explosive.
12. Propane is heavier than air and will accumulate in low places. Naural Gas is lighter than air and will accumulate in high places.
13. Propane and Natural Gas has have a distinctive odor added to help detect potential leaks. This odor can diminish over time or due to other factors.
14. Keep Propane tanks in an upright position.
15. In case of a Propane or Natural Gas fire, do not attempt to extinguish unless the fuel supply can be shut off safely. Leave the area immediately and call 911 or your local fire department.
16. Keep the Propane tank, Propane hose, and Natural Gas hose away from engine exhaust.
17. Gas line must have shut-off valve before hose connection.
18. Do not insert any object other than the matching plug into the quick-disconnect coupling. This may cause the coupling to leak, disconnect, or otherwise fail.
19. Do not allow the hose to be kinked, pinched, twisted, or torqued during installation.
20. Protect hose and fittings from dust and dirt while disconnected.

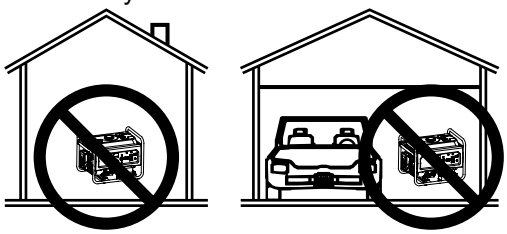
# Set up Precautions

1. Gasoline fuel and fumes are flammable, and potentially explosive. Use proper fuel storage and handling procedures. Do not store fuel or other flammable materials nearby.
2. Have multiple ABC class fire extinguishers nearby.
3. 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.
4. Set up and use only on a flat, level, well-ventilated surface.
5. All connections and conduits from the Generator to the load must only be installed by trained and licensed electricians, and in compliance with all relevant local, state, and federal electrical codes and standards, and other regulations where applicable.
6. Connections for standby power to a building electrical system must be made by a qualified electrician. The connection must isolate the generator power from utility power, and must comply with all applicable laws and electrical codes.
7. A transfer switch should be installed by a licensed electrician in compliance with all applicable laws and electrical codes.
8. Wear ANSI-approved safety goggles, heavy-duty work gloves, and dust mask/respirator during set up.
9. Use only lubricants and fuel recommended in the Specifications chart of this manual.
10. Improper connections to a building electrical system can allow electrical current from the generator to backfeed into the utility lines. Such backfeed may electrocute utility company workers or others who contact the lines during a power outage, and the generator may explode, burn, or cause fires when utility power is restored. Consult the utility company and a qualified electrician if intending to use the generator for back up power.
11. Do not operate the Generator before grounding. The Generator must be earth-grounded in accordance with all relevant electrical codes and standards before operation.
12. Install carbon monoxide alarm(s) with battery backup in nearby buildings according to manufacturer's instructions.

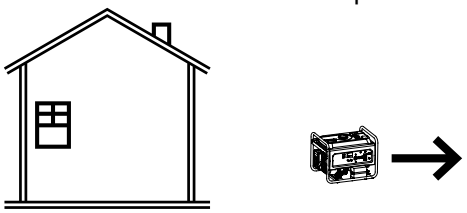
# Operating Precautions

1. 

**CARBON MONOXIDE HAZARD**
**Using a generator indoors CAN KILL YOU IN MINUTES.**
Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.



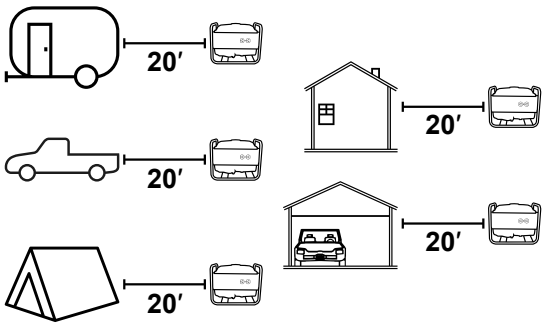
NEVER use inside a home or garage, EVEN IF doors and windows are open.



Only use OUTSIDE and far away from windows, doors, and vents.



Do not use in trailers, truck beds, or tents.




Use at least 20 feet away from people, animals, and structures with exhaust pointed away. Engine will still produce carbon monoxide, even when burning other fuels.

**CARBON MONOXIDE SHUTOFF**

**DANGER! TO PREVENT SERIOUS INJURY AND DEATH FROM CARBON MONOXIDE INHALATION:**
**The Carbon Monoxide sensor is <u>an additional layer of protection</u> only. Do not use the Generator in any area or situation that will allow carbon monoxide to accumulate.**

- FLASHING RED LIGHT:
  Dangerous levels of carbon monoxide gas have built up and generator will shutoff. Leave immediately until area has aired out. Move Generator to well-ventilated area before operation.
- FLASHING YELLOW LIGHT:
  Carbon monoxide sensor malfunction. Sensor needs service. Do not use the Generator until the sensor is working properly. For technical questions, please call 1-800-444-3353.

**<u>NOTE:</u>** Yellow light flashes once after starting to indicate passing self-check and is functioning normally.

**Carbon Monoxide sensor must only be serviced by qualified technician to restore it to original settings. Do not modify or tamper with the Carbon Monoxide sensor. Not following these instructions can result in death or serious injury due to Carbon Monoxide sensor malfunction.**

2. Never use a generator indoors, including in garages, basements, crawl spaces and sheds. Opening doors and windows or using fans will NOT prevent carbon monoxide build up in the home.
3. When using generators, keep them outdoors and far away from open doors, windows, and vents to avoid toxic levels of carbon monoxide from building up indoors.
4. If you start to feel sick, dizzy, or weak while using a generator, get to fresh air right away. The carbon monoxide from generators can quickly lead to full incapacitation and death.
5. Keep children away from the equipment, especially while it is operating.
6. Keep all spectators <u>at least six feet</u> from the Engine during operation.
7. Fire Hazard! Do not fill fuel tank while engine is running. Do not operate if gasoline has been spilled. Clean spilled gasoline before starting engine. Do not operate near pilot light or open flame.
8. Do not touch engine during use. Let engine cool down after use.
9. Never store fuel or other flammable materials near the engine.

10. If the plugged in product operates abnormally or unusually slow, immediately stop using the generator as a power source. Read and adhere to the instruction manual of the product to be powered to make sure that it can be safely and efficiently powered by a portable generator.
11. Before connecting an appliance or power cord to the generator: Make sure that it is in good working order. Faulty appliances or power cords can create a potential for electrical shock.
12. Do not exceed the maximum power rating of the generator. Make sure that the total electrical rating of the all of the tools or appliances plugged into the generator at the same time does not exceed that of the generator. Check that the startup surge will not be beyond the limit of the Generator.
13. Avoid substantially overloading which will trip the circuit breaker. Slightly overloading the generator may not trip the circuit breaker, but will lead to premature generator failure.
14. Do not attempt to connect or disconnect load connections while standing in water, or on wet or soggy ground.
15. Do not touch electrically energized parts of the Generator and interconnecting cables or conductors with any part of the body, or with any non-insulated conductive object.
16. Connect the Generator only to a load or electrical system (120 volt or 240 volt) that is compatible with the electrical characteristics and rated capacities of the Generator.
17. GFCI PRECAUTIONS
    Test Ground Fault Circuit Interrupter (GFCI) receptacles (if equipped) before each use as follows:
    a. Disconnect all devices from the Generator.
    b. Start the engine.
    c. Press Test button on receptacle to trip the GFCI device.
    d. The Reset button should extend, cutting off electricity to the receptacle.
    e. If above test fails, do not use receptacle until it is repaired or replaced.
    f. Press Reset button in for use.
18. **The Generator must be grounded before use. An ungrounded Generator has an increased risk of electric shock.** Refer to *Grounding on page 13*.
19. Insulate all connections and disconnected wires.
20. Guard against electric shock. Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerators.

    Only use a suitable means of transport and lifting devices with sufficient weight bearing capacity when transporting the generator.
21. Secure the generator on transport vehicles to prevent it from rolling, slipping, and tilting.
22. Industrial applications must follow OSHA requirements.
23. Do not leave the generator unattended when it is running. Turn off the generator (and remove safety keys, if available) before leaving the work area.
24. The generator can produce high noise levels. Prolonged exposure to noise levels above 85 dBA is hazardous to hearing. Wear ear protection when operating thegenerator or when working nearby while it is operating.
25. Wear ANSI-approved safety glasses, hearing protection, and NIOSH-approved dust mask/respirator during use.
26. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to a heart pacemaker could cause pacemaker interference or pacemaker failure. Caution is necessary when near the engine's magneto or recoil starter.
27. Use only accessories that are recommended by Harbor Freight Tools for your model. Accessories that may be suitable for one piece of equipment may become hazardous when used on another piece of equipment.
28. Do not operate in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Gasoline-powered engines may ignite the dust or fumes.
29. Stay alert, watch what you are doing and use common sense when operating this generator. Do not use while tired or under the influence of drugs, alcohol or medication.
30. Dress properly. Do not wear loose clothing or jewelry. Keep hair, clothing and gloves away from moving parts. Loose clothes, jewelry or long hair can be caught in moving parts.
31. Parts, especially exhaust system components, get very hot during use. Stay clear of hot parts.
32. Do not cover the generator during operation.
33. Keep the stop/start remote control away from children. Do not place in tight spaces with other objects that may actuate the remote buttons and send an undesired start signal to the generator.
34. Keep the engine, generator, and surrounding area clean at all times.
35. Do not smoke, or allow sparks, flames, or other sources of ignition around the equipment, especially when refuelling.
36. Use the generator, accessories, etc., in accordance with these instructions and in the manner intended for the particular type of equipment, taking into account the working conditions and the work to be performed. Use of the equipment for operations different from those intended could result in a hazardous situation.
37. Do not operate the generator with known leaks in the engine's fuel system.

38. When spills of fuel or oil occur, they must be cleaned up immediately. Dispose of fluids and cleaning materials as per any local, state, or federal codes and regulations. Store oil rags in a bottom-ventilated, covered, metal container.
39. Keep hands and feet away from moving parts. Do not reach over or across equipment while operating.
40. Before use, check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the equipment's operation. **If damaged, have the generator serviced before using.** Many accidents are caused by poorly maintained equipment.
41. Use the correct generator for the application. Do not modify the generator or its engine, and do not use the generator for a purpose for which it is not intended.
42. Extension Cord - Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized extension cord will cause a drop in line voltage resulting in loss of power and overheating.

    The table below shows the correct cord size to use depending on cord length and nameplate ampere rating. If in doubt, use the next heavier gauge. The smaller the gauge number, the heavier the cord.

| RECOMMENDED MINIMUM WIRE GAUGE FOR EXTENSION CORDS | | | | | |
|---|---|---|---|---|---|
| **CURRENT (AMPS)** | **Load @ 120V (WATTS)** | **Load @ 240V (WATTS)** | **20 ~ 50 ft** | **50 ~ 75 ft** | **75 ~ 100 ft** |
| 2 | 240 | 480 | 18 AWG | | |
| 4 | 480 | 960 | 18 AWG | | 16 AWG |
| 6 | 720 | 1440 | 18 AWG | 16 AWG | 14 AWG |
| 8 | 960 | 1920 | 16 AWG | | 12 AWG |
| 10 | 1200 | 2400 | 16 AWG | 14 AWG | 12 AWG |
| 15 | 1800 | 3600 | 14 AWG | 12 AWG | 10 AWG |
| 20 | 2400 | 4800 | 12 AWG | 10 AWG | |
| 25 | 3000 | 6000 | 12 AWG | 10 AWG | 8 AWG |
| 30 | 3600 | 7200 | 10 AWG | 8 AWG | |
| 45 | 5400 | 10800 | 6 AWG | 4 AWG | |
| 50 | 6000 | 12000 | 4 AWG | | |

**Note: Do not use extension cords less than 20 feet in length.**

## Battery Charger/Maintainer Precautions

1. Do not expose Battery Charger/Maintainer to rain or snow.
2. Use of an attachment not recommended or sold by the Battery Charger/Maintainer manufacturer may result in a risk of fire, electric shock, or injury to persons.
3. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting Charger/Maintainer.
4. Do not operate Charger/Maintainer with damaged cord or plug – replace the cord or plug immediately.
5. Do not operate Charger/Maintainer if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.
6. Do not disassemble Charger/Maintainer – take it to a qualified technician when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
7. To reduce risk of electric shock, unplug Charger/Maintainer from outlet before attempting any maintenance or cleaning.
8. Locate Charger/Maintainer as far away from Generator as power cord permits.
9. Maintain labels and nameplates on the Charger/Maintainer. These carry important safety information. If unreadable or missing, contact Harbor Freight Tools for a replacement.
10. Unplug the Battery Charger/Maintainer from its electrical outlet before connecting its power cord to the Generator, or performing any inspection, maintenance, or cleaning procedures.
11. Do not use Charger/Maintainer while tired or under the influence of drugs, alcohol or medication.

## Button/Coin Battery Safety

**⚠WARNING**

- **INGESTION HAZARD:** This product contains a button cell or coin battery.
- **DEATH** or serious injury can occur if ingested.
- A swallowed button cell or coin battery can cause **Internal Chemical Burns** in as little as **2 hours**.
- **KEEP** new and used batteries **OUT OF REACH OF CHILDREN**
- **Seek immediate medical attention** if a battery is suspected to be swallowed or inserted inside any part of the body.



This symbol means:
**INGESTION HAZARD:** This product contains a button cell or coin battery.

1. Remove and immediately recycle or dispose of used batteries according to local regulations and keep away from children. Do NOT dispose of batteries in household trash or incinerate.
2. Even used batteries may cause severe injury or death.
3. Call a local poison control center for treatment information.
4. Non-rechargeable batteries are not to be recharged.
5. Do not force discharge, recharge, disassemble, heat above 185° Fahrenheit or incinerate. Doing so may result in injury due to venting, leakage or explosion resulting in chemical burns.
6. Ensure the batteries are installed correctly according to polarity (+ and -).
7. Do not mix old and new batteries, different brands or types of batteries, such as alkaline, carbon-zinc, or rechargeable batteries.
8. Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time according to local regulations.
9. Always completely secure the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children.

## Service Precautions

1. **Before service, maintenance, or cleaning:**
   a. **Unplug all devices from the generator.**
   b. **Push the Engine Switch to the OFF position.**
   c. **Disconnect the battery.**
   d. **Allow the engine to completely cool.**
   e. **Then, remove the spark plug cap from the spark plug.**
   f. **Properly ground Engine/Equipment.** See *Grounding on page 13*.

**WARNING! TO PREVENT SERIOUS INJURY FROM INJECTION, FIRE, AND EXPLOSION:** Depressurize fuel system before servicing it. Remove ignition sources from area. Seek medical attention immediately after injection injury.

2. Depressurize fuel system before servicing it, Refer to *Depressurize Fuel System on page 35.*
3. Keep all safety guards in place and in proper working order. Safety guards include muffler, air cleaner, mechanical guards, and heat shields, among other guards.
4. Make sure the Engine Switch is in the OFF" position before moving the unit and before performing any service, maintenance, or cleaning procedures on the unit.
5. **Keep all electrical equipment clean and dry.** Replace any wiring where the insulation is cracked, cut, abraded, or otherwise degraded. Replace terminals that are worn, discolored, or corroded. Keep terminals clean and tight.
6. **Do not alter or adjust any part of the equipment or its engine that is sealed by the manufacturer or distributor. Only a qualified service technician may adjust parts that may increase or decrease governed engine speed.**
7. Wear ANSI-approved safety goggles, heavy-duty work gloves, and dust mask/respirator during service.
8. Maintain labels and nameplates on the equipment. These carry important information. If unreadable or missing, contact Harbor Freight Tools for a replacement.



**SAVE THESE INSTRUCTIONS.**

9. Have the equipment serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the equipment is maintained. Do not attempt any service or maintenance procedures not explained in this manual or any procedures that you are uncertain about your ability to perform safely or correctly.
10. Store equipment out of the reach of children.
11. Follow scheduled engine and equipment maintenance.

**Refueling:**

1. Turn off the generator before refilling the fuel tank. Do not refill the fuel tank while the engine is running or hot.
2. Do not smoke, or allow sparks, flames, or other sources of ignition around the equipment, especially when refueling.
3. To prevent fuel leakage and fire hazard, Do Not fill fuel tank to the top. Leave a little room for the fuel to expand as needed.
4. Refuel in a well-ventilated area only.
5. Wipe up any spilled fuel and allow excess to evaporate before starting engine. To prevent fire, do not start the engine while the smell of fuel hangs in the air.
6. Do not connect Propane or Natural Gas fuel sources to the Generator while operating with gasoline. Shut down Generator and allow to cool before connecting alternate fuel type.

**Starting Battery Service:**

1. Starting battery service must be performed only by a qualified technician. Keep other people away from battery.
2. When replacing battery, use the following type battery: 12V, 14Ah sealed, lead-acid type.
3. Do not dispose of battery in a fire. The battery can explode.
4. Do not open or mutilate the battery. Battery contains acid which can cause blindness, burns, and is toxic.
5. Battery may explode or cause fire if shorted. When working around batteries:
   a. Remove watches, rings, or other metal objects,
   b. Use tools with insulated handles, and
   c. Do not lay tools or metal parts on top of batteries

**Read the ENTIRE IMPORTANT SAFETY INFORMATION section at the beginning of this manual including all text under subheadings therein before set up or use of this product.**

## ⚠WARNING

**TO PREVENT SERIOUS INJURY AND FIRE: Operate only with proper spark arrestor installed.**

**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.**

**Note:** For additional information regarding the parts listed in the following pages, refer to the Assembly Diagram near the end of this manual.

**NOTICE:** This Generator is not intended to power sensitive electronic equipment without the addition of an appropriate line conditioner and surge protector (both not included). **Sensitive electronic equipment includes, but is not limited to, audio/video equipment, some television sets, computers, and printers.** Sensitive electronic equipment should be operated on approved inverter-type generators or pure sine wave generators.

# Grounding

The Generator must be properly grounded in accordance with all relevant electrical codes and standards before operation. In many locations, local code will not require this generator to be grounded when used with cord and plug equipment plugged directly into the receptacles on the generator. However, your local regulations may require the generator to be grounded. Contact a licensed electrician or consult local authorities regarding local grounding requirements. If grounding is required, have the unit grounded by a qualified electrician if you are not qualified to do so.

General grounding instructions are as follows:

Use one of the following as the grounding electrode:

Pipe or conduit, minimum 3/4 in. diameter, minimum 8 ft. long. If steel, it must have anti-corrosion coating.

Rod, stainless steel or copper- or zinc-coated steel, minimum 5/8 in. diameter, minimum 8 ft. long.

For additional information on grounding methods, please see the National Electrical Code.

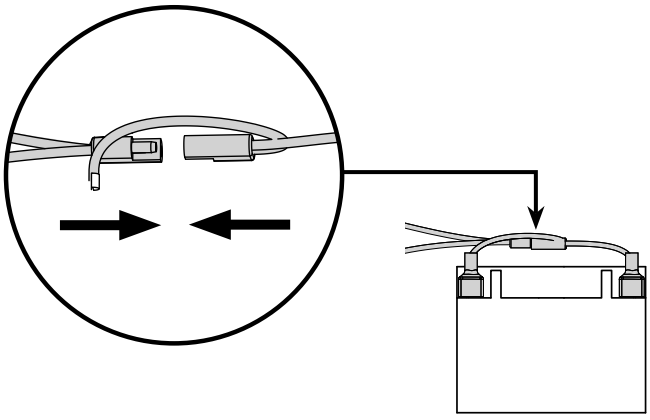
**NOTICE:** There is a permanent conductor between the portable generator stator winding (Neutral Conductor) and the frame.

# 12VDC Battery Connection

**IMPORTANT! For the EFI system and for Manual Start, the included 12VDC Battery must be connected and charged to start with all fuel types.**

For the electric start and auto-choke functions, or to operate on Propane or Natural Gas fuel, the included 12VDC Battery must be connected and charged before first use.

1. Push Engine Switch to OFF position.
2. Connect the two ends of the Battery Quick Connector together.

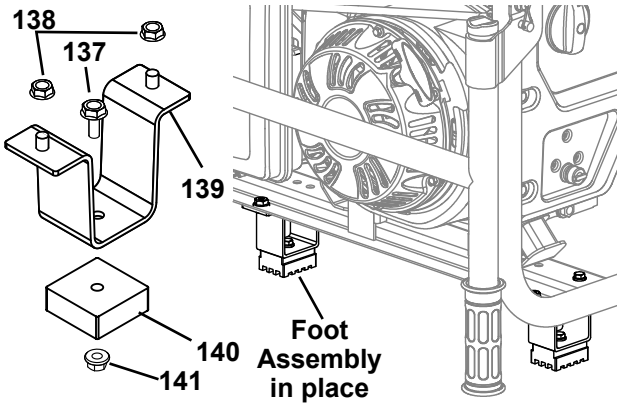


**Note:** The built-in charging circuit charges the Battery while the Engine is running. Turn the Engine Switch off and use the Battery Charger/Maintainer to keep the Battery charged when the Generator is not in use or in storage. Refer to 12VDC Battery: in *Storage* on page 34.

# Foot Assembly

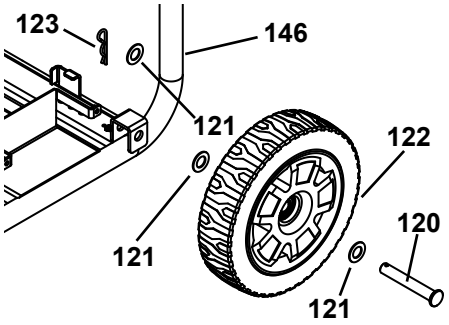
The Feet are installed on the air filter side of the Generator.

1. Prepare a set of 4x4 blocks on level ground. With assistance, place the Generator on the blocks.
2. Secure one Foot (140) onto a Foot Bracket (139) using a Hex Bolt (137) and Hex Flange Nut (138). Repeat for other Foot and Bracket.
3. Align studs on Foot Bracket assembly with holes on bottom of Generator frame and secure in place with two Hex Flange Nuts (138). Repeat for other Foot Bracket assembly.




# Wheel Assembly

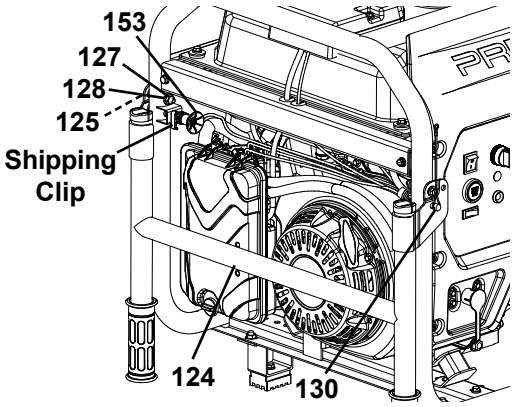
1. Slide one Wheel (122) and two Flat Washers (121) onto a Wheel Axle (120), one Washer on each side of Wheel.
2. Insert the Wheel Axle through the bracket on the bottom of the Generator frame (146). Place a third Flat Washer onto the Axle and secure all in place with an R-Clip (123).
3. Repeat steps 1 and 2 for other Wheel assembly.




# Handle Assembly

The Handle is installed on the air filter side of the Generator.

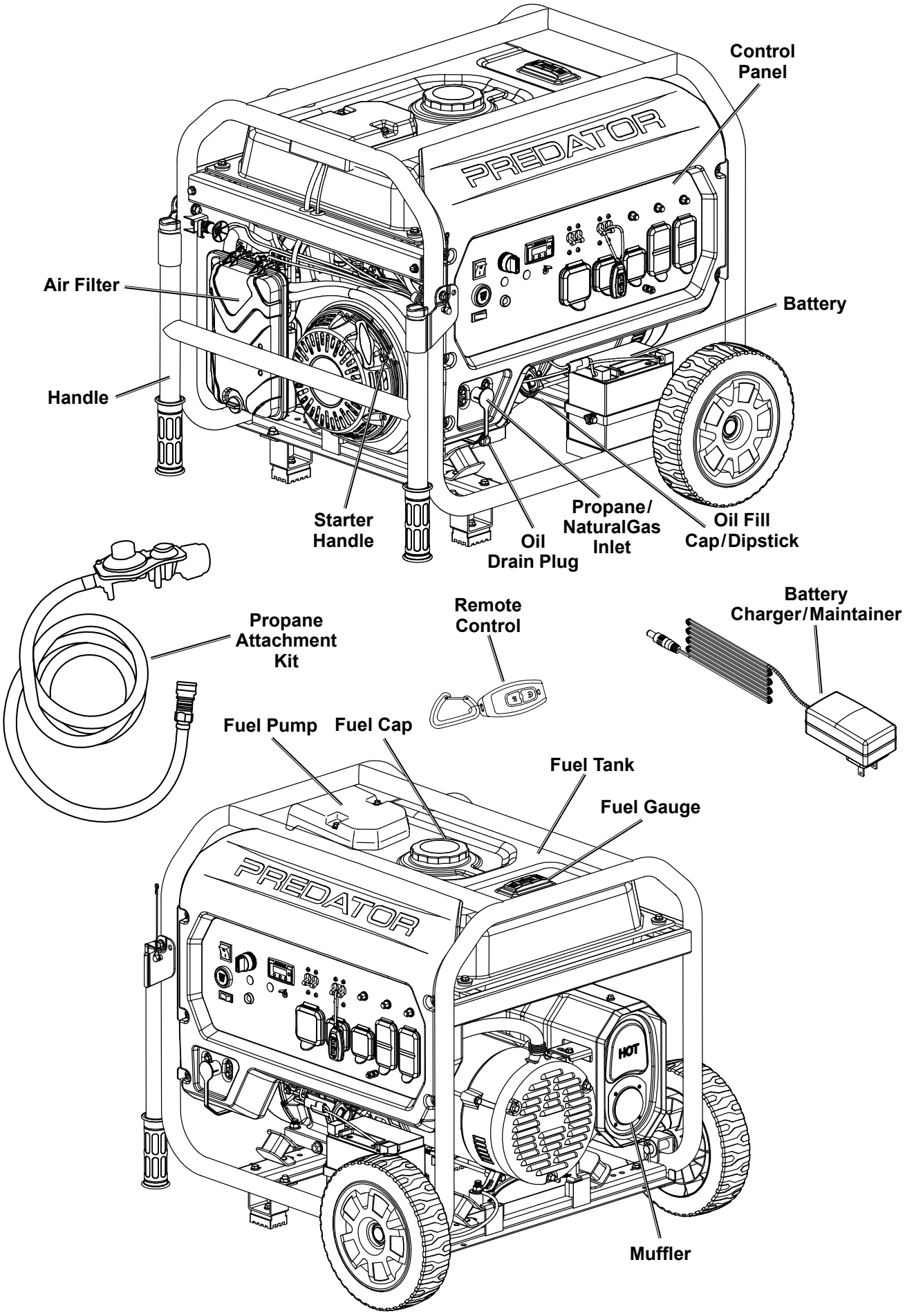
1. Align the holes in the brackets on the Handle (124) with the holes on the Generator frame.
2. Fasten in place using a Step Bolt (125) and Washer (127) Flange Lock Nut (128), one set on each side of Handle.
3. Remove and discard the yellow shipping clip located on the Handle Release Pin (153).
4. Insert the Locking Pin (130) into the hole on the right side of the Generator frame.



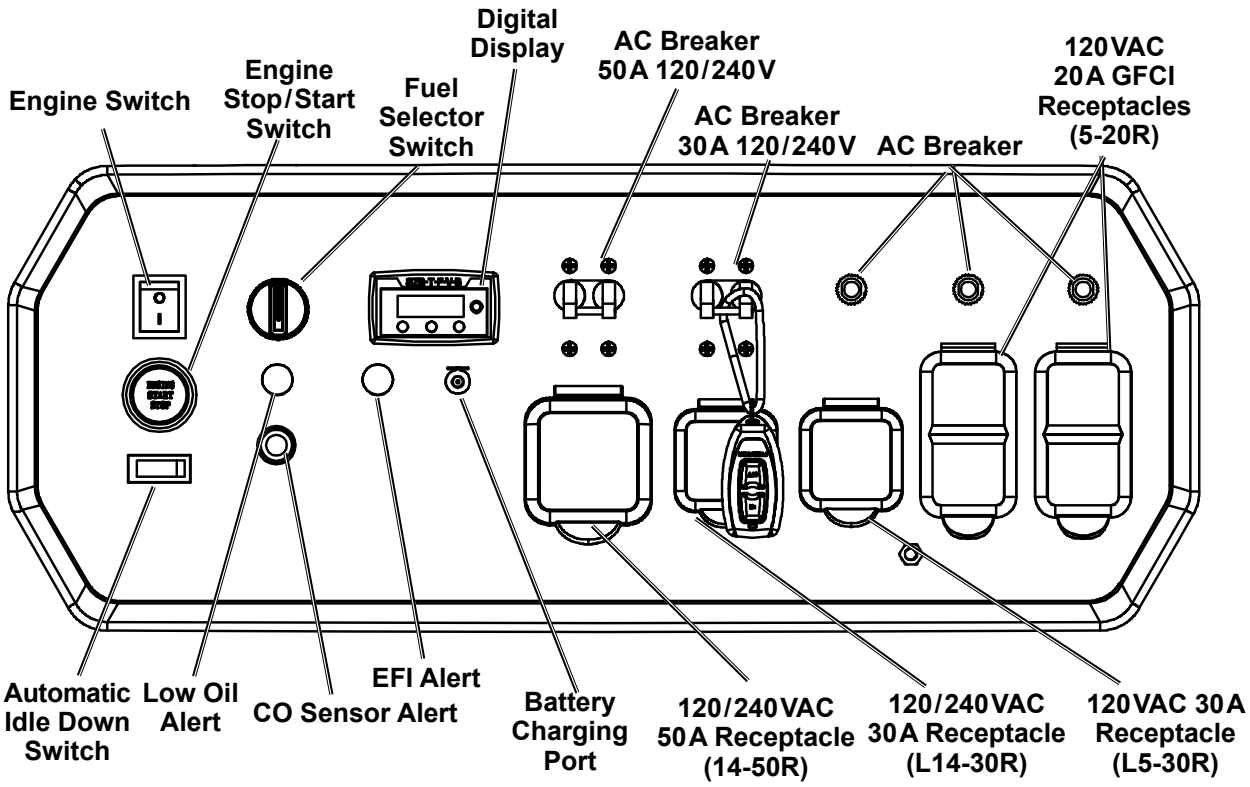

**Handle Operation**

1. To unfold the Handle for use, first remove the Locking Pin, then pull out the Handle Release Pin and lift the Handle up. With the Handle lifted into position, release the Handle Release Pin, then insert the Locking Pin back into place.
2. To fold the Handle down after use, first remove the Locking Pin, then pull out the Handle Release Pin and push the Handle down. With the Handle in position, release the Handle Release Pin, then insert the Locking Pin back into place.

# Components and Controls



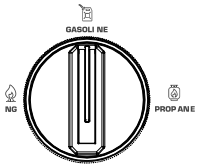
# Components and Controls (continued)



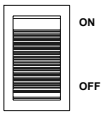

**Control Panel**

The following are descriptions of the controls on the Control Panel. Your Generator has sockets to power your products with circuit breakers to protect the voltage flow.

1. **Fuel Selector Switch:** Used to select from three fuel types - Gasoline, Propane, or Natural Gas.




2. **Engine Switch:** Push to On position to enable starting remotely, electrically, or manually.

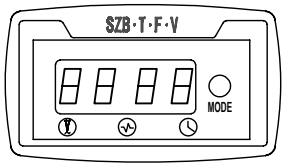



**Note:** The included 12VDC Battery must be connected and charged for system to operate.

3. **Engine Stop/Start Switch:** Used to start and stop the Engine.

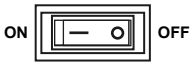



4. **Digital Display:** Press the Mode Button to cycle through the Display's functions:
   - Voltage
     (Displays U + voltage reading. Example: "U240")
   - Frequency
     (Displays F + frequency reading. Ex.: "F60")
   - Current session runtime
   - Total (accumulated) runtime




**Note:** Every 50 hours, a blinking maintenance reminder will appear on the screen (P050, P100, P150, etc.) See Page 30 for maintenance schedule. To clear a maintenance reminder, press and hold the Mode Button for 5 seconds.

5. **Automatic Idle Down Switch:** Used to turn the Engine Idle function ON or OFF. In ON position Engine speed (and frequency) is reduced when no load is detected. Engine runs at full speed (and frequency) when load above 75W is applied.

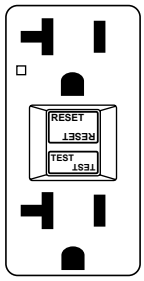



**Notice:** Turn Automatic Idle Switch OFF when connected load is less than 300W.

6. **CO Sensor Alert:** Flashing red light indicates dangerous levels of carbon monoxide gas have built up. Flashing yellow light indicates a carbon monoxide sensor malfunction. Refer to *Carbon Monoxide Shutoff* on page 25 for further information.



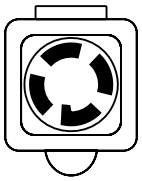
7. **AC Receptacles:** The Generator contains several AC Receptacles to power tools and equipment.



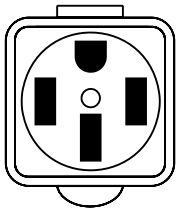

a. 3-Prong, duplex 120 volt GFCI receptacle (NEMA 5-20R)



b. 3-Prong, twistlock, 120 volt 30A receptacle (NEMA L5-30R)



c. 4-Prong, twistlock, 120/240 volt 30A receptacle (NEMA L14-30R)



d. 4-Prong, 120/240 volt, 50A receptacle (NEMA 14-50R)

**⚠WARNING! TO PREVENT SERIOUS INJURY:** Connect tools and equipment only to the Receptacle (120 volt or 240 volt) that is compatible with the electrical characteristics and rated capacities of the tools and equipment being used.

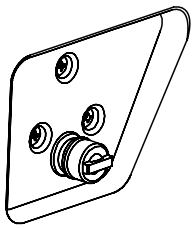
8. **Circuit Breakers:** The circuit breaker protects the Generator from overloading. The rating of the breaker and the load it protects are marked near the breaker. Should any of the Circuit Breakers trip, the Generator will stop the electricity output. If this happens, unplug all loads from the Generator. Then, turn the tripped Circuit Breaker to ON and re-attach loads gradually. **Note:** For push-type Circuit Breakers allow a few minutes for cool-down before resetting.




9. **Low Oil Alert:** If the Engine oil level is too low, the LOW OIL ALERT light turns on and the Engine will automatically shut off.



10. **Propane and Natural Gas Connector:** Used to connect Propane/Natural Gas hose to Generator.



11. **Grounding Terminal:** Prior to each use, set up the ground wire (not included) connection to the Grounding Terminal to properly ground the Generator. Refer to *Grounding* on page 13 for instructions on grounding the Generator.



12. **Battery Charging Port:** Used to charge the 12VDC Generator Battery using the provided Battery Charger/Maintainer.



13. **EFI Alert:** If any fault detected in the EFI system, the EFI Alert will blink in certain pattern to indicate the fault detected, see Troubleshooting on page 35.

**Read the ENTIRE IMPORTANT SAFETY INFORMATION section at the beginning of this manual including all text under subheadings therein before set up or use of this product.**

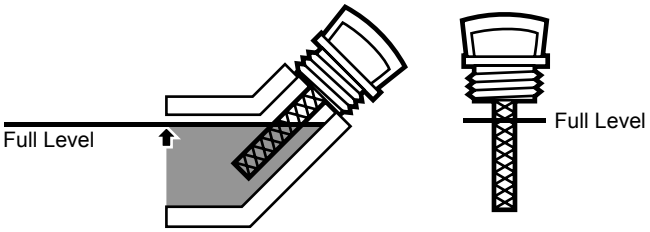
# Pre-Start Checks

Only operate the generator outside and at least 20 feet away from people, animals, and structures, with exhaust pointed away. Inspect Engine and Generator looking for damaged, loose, and missing parts before set up and starting. If any problems are found, do not use equipment until fixed properly.

**Checking and Filling Engine Oil**

**NOTICE: Generator is shipped without engine oil. Engine's crankcase MUST be filled with oil before first use. Your Warranty is VOID if the Engine's crankcase is not properly filled with oil before first use and before each use thereafter. Before each use, check the oil level. Engine will not start with low or no engine oil.**

1. Make sure the Engine is stopped and is level.
2. Clean the top of the Oil Fill Cap/Dipstick and the area around it. Remove the Cap/Dipstick by turning it counterclockwise and wipe it off with a clean, lint free rag.
3. Add the appropriate type of oil until the oil level is at the proper level. SAE 10W-30 oil is recommended for general use. The SAE Viscosity Grade chart on page 32 in the *Maintenance* section shows other viscosities to use in different average temperatures.




4. Reinsert the Dipstick without threading it in and remove it to check the oil level. The oil level should be up to the edge of the hole as shown.
5. Thread the Oil Fill Cap/Dipstick back in clockwise.

**NOTICE: Do not run the engine with too little oil. Engine will shut off if engine oil level is too low.**

**For Gasoline Operation: Checking and Filling Fuel**



**WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:**
Fill the fuel tank in a well-ventilated area away from ignition sources. If the Engine is hot from use, shut the Engine off and wait for it to cool before adding fuel. Do not smoke.

1. Clean the Fuel Cap and the area around it.
2. Unscrew and remove the Fuel Cap.
3. Remove the Strainer and remove any dirt and debris. Then replace the Strainer.

**Note: Do not use gasoline containing more than 10% ethanol (E10). Do not use E85 ethanol. Add fuel stabilizer to the gasoline or the Warranty is VOID.**

**Note: Do not use gasoline that has been stored in a metal fuel container or a dirty fuel container. It can cause particles to enter the carburetor, affecting Engine performance and/or causing damage.**

4. If needed, fill the Fuel Tank to about 1 inch under the fill neck of the Fuel Tank with 87 octane or higher unleaded gasoline that has been treated with a fuel stabilizer additive. Follow fuel stabilizer manufacturer's recommendations for use.
5. Replace the Fuel Cap.
6. Wipe up any spilled fuel and allow excess to evaporate before starting engine. To prevent FIRE, do not start the engine while the smell of fuel hangs in the air.

**For Propane Operation: Connecting Propane Tank**

a. **Propane and Natural Gas systems must be installed and used in strict conformance with NFPA 58 (Liquefied Petroleum Gas Code), NFPA 54 (National Fuel Gas Code), manufacturer's recommendations, and all relevant local, state, and federal codes and regulations.**

b. **The Propane tank capacity must be minimum 40 lb or larger to avoid tank freezing during use. Tank must conform to the standard as listed in Setup Precautions section.**

c. **Propane tanks that use a liquid withdrawal system cannot be used with this Generator.**

d. **Verify the re-qualification date on the tank has not expired.**

e. **Connect Propane tank using provided attachment kit only. Kit includes 1.5 meter (4.9 ft) Hose. Place tank as far away from Generator as Hose allows and away from engine exhaust. Do not place tank above Generator. Do not use included Propane Hose with any other appliances.**

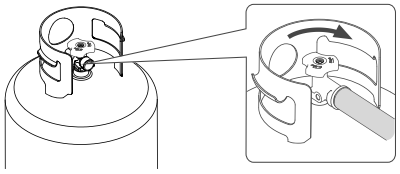
f. **All new tanks or used tanks that have not been plugged or kept closed must be purged of air and moisture by a propane supplier prior to filling.**

g. **Position the tank so the connection between the tank valve and the Propane/Natural Gas Inlet will not cause sharp bends or kinks in the Hose.**

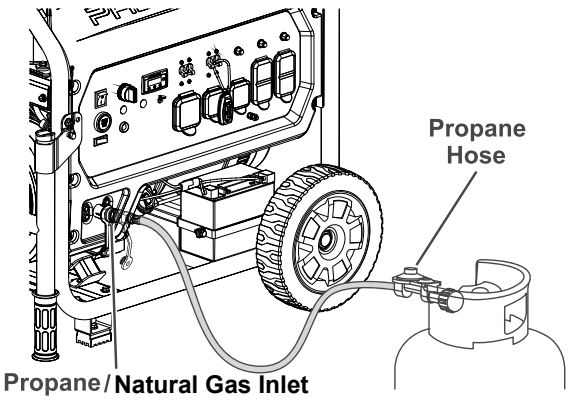
h. **Inspect the Propane Hose before every use. Do not use damaged equipment. If damage is detected, have the problem corrected before further use.**

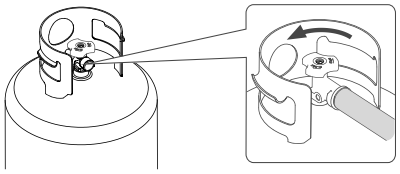
**⚠WARNING! EXPLOSION HAZARD.**
**TO PREVENT SERIOUS INJURY:**
Do not start the engine if the smell of Propane hangs in the air. Close the propane tank valve and disconnect the Propane hose from the Generator when not in use.

1. Turn the Generator OFF and place on a flat surface in a well ventilated area.
2. Verify that the propane tank valve is in the fully closed position.
3. Attach the Quick Connect Adapter on the Propane Hose to the Propane/Natural Gas Inlet on the Generator.
4. Remove the safety plug or cap from the propane tank valve.
5. Attach the other end of the Hose to the Propane connector on the tank. Hand tighten clockwise to a positive stop. To prevent damage, do not use a wrench or tool to tighten the connector.
6. Turn the propane tank valve to the fully open position. Check for leaks by applying soapy water to all connections. Look for bubbles. If bubbles are present at connections, close the propane tank valve and tighten connections. Open the valve and recheck connections. If a leak continues or is not at a connection do not use the Generator. Have the problem corrected before further use.



Close Tank Valve



Open Tank Valve

**For Natural Gas Operation: Connecting to Natural Gas Source**

a. **Propane and Natural Gas systems must be installed and used in strict conformance with NFPA 58 (Liquefied Petroleum Gas Code), NFPA 54 (National Fuel Gas Code), manufacturer's recommendations, and all relevant local, state, and federal codes and regulations.**

b. **Natural Gas source must meet requirements listed in *Specifications* chart on page 3.**

c. **Connect to Natural Gas source using PREDATOR® 1/2" Natural Gas Quick Connect Hose Kit only, item 70491 (not included). Kit includes 7.6 meter (25 ft) Hose. Do not use Natural Gas Hose with any other appliances.**

d. **An Natural Gas shutoff valve (not included) must be installed before connecting the Natural Gas Hose. Do not connect Natural Gas Hose directly to the Natural Gas source.**

e. **Position the Generator so the connection between the Natural Gas shutoff valve and the Propane/Natural Gas Inlet will not cause sharp bends or kinks in the Hose.**

f. **Make sure the Natural Gas source location and the Natural Gas Hose allow the Generator to be located at least 20 feet from any occupied spaces.**

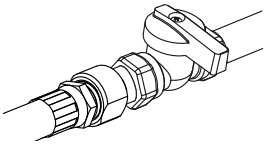
g. **Inspect the Natural Gas Hose before every use. Do not use damaged equipment. If damage is detected, have the problem corrected before further use.**

**⚠WARNING! EXPLOSION HAZARD. TO PREVENT SERIOUS INJURY:**
Do not start the engine if the smell of Natural Gas hangs in the air. Close the NG shutoff valve and disconnect the Natural Gas hose from the Generator when not in use.

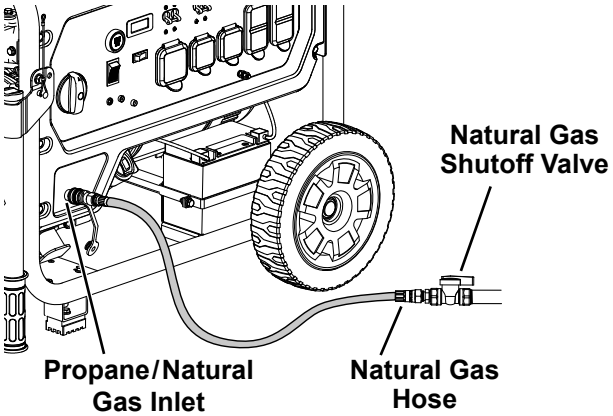
1. Turn the Generator OFF and place on a flat surface in a well ventilated area.
2. Verify that the Natural Gas shutoff valve is in the fully closed position.
3. Attach the Quick Connect Adapter on the Natural Gas Hose to the Propane/Natural Gas Inlet on the Generator.
4. Connect the Coupling from the Natural Gas Hose Kit to the shutoff valve, then connect the Natural Gas Hose assembly to Coupling.

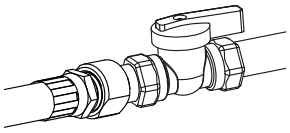
**Note: Natural gas pipe sealant, joint compound, or the proper type of PTFE tape must be used ONLY for the connection from the Coupling to the shutoff valve.**

5. Turn the Natural Gas shutoff valve to the fully open position. Check for leaks by applying soapy water to all connections and joints. Look for bubbles. If bubbles are present at connections, close the shutoff valve and tighten connections. Open the valve and recheck connections. If a leak continues or is not at a connection do not use the Generator. Have the problem corrected before further use.



**Close Natural Gas**



**Open Natural Gas**

**Remote Start**

The Start/Stop Remote Control will operate up to approximately 100 feet in distance from the Generator. The distance at which the Remote will function may be adversely affected by obstructions between the Generator and the Remote Control.

**Note:** The operational range of the Remote Control may decrease as the battery in the Remote become depleted.

Remote replacement battery: CR2032

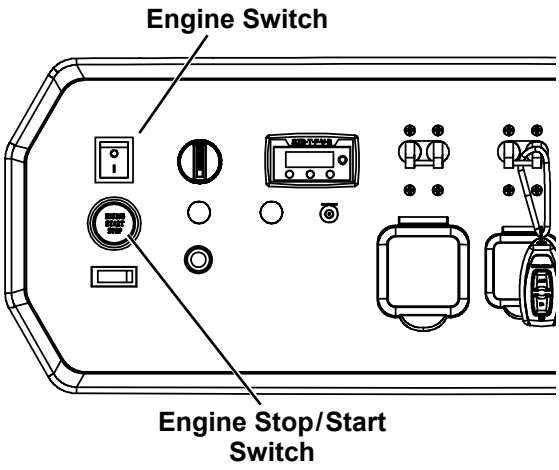
***Reprogramming the Start/Stop Remote Control***

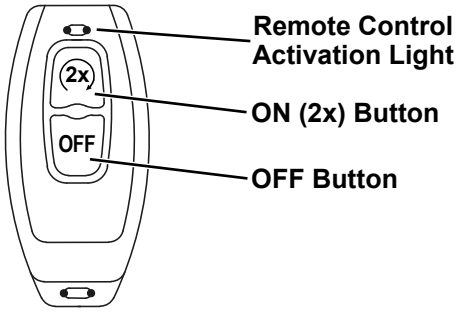
If the Start/Stop Remote Control is replaced or needs to be paired to the generator, follow this procedure:

1. Push the Engine Switch to the ON position.

2. Push and hold the Engine Start/ Stop Switch for 15 seconds until the Switch Indicator Light flashes green and red, then release the Switch.

3. Push the 2x button on the Stop/Start Remote Control. It will pair with Generator and the Switch Indicator Light on the Generator will stop flashing.



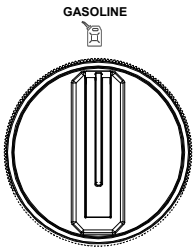




**Fuel Selector Switch**

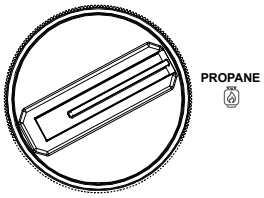
Turn the Fuel Selector Switch on the Control Panel to the desired fuel setting.

**Note:** The included 12VDC Battery must be connected and charged for system to operate.

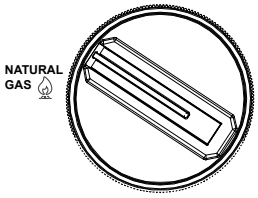
1. To operate the Generator on gasoline turn the Fuel Selector Switch to the GASOLINE setting.




2. To operate the Generator on Propane turn the Fuel Selector Switch to the PROPANE setting.



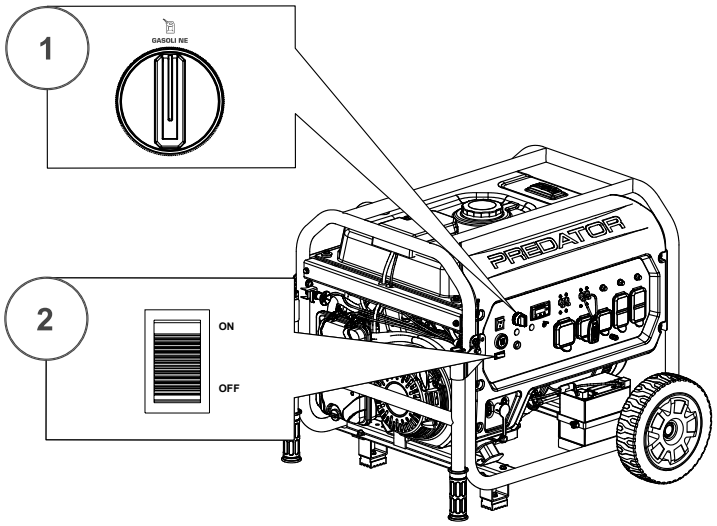

3. To operate the Generator on Natural Gas turn the Fuel Selector Switch to the Natural Gas setting.



# Starting the Engine – Gasoline Operation

**Before Starting the Engine**

a. **Inspect the generator and engine.**
b. **Disconnect all electrical loads from the generator.**
c. **Fill the engine with the proper amount and type of both stabilizer-treated unleaded gasoline and oil.**
d. **Make sure Battery is connected and charged.**

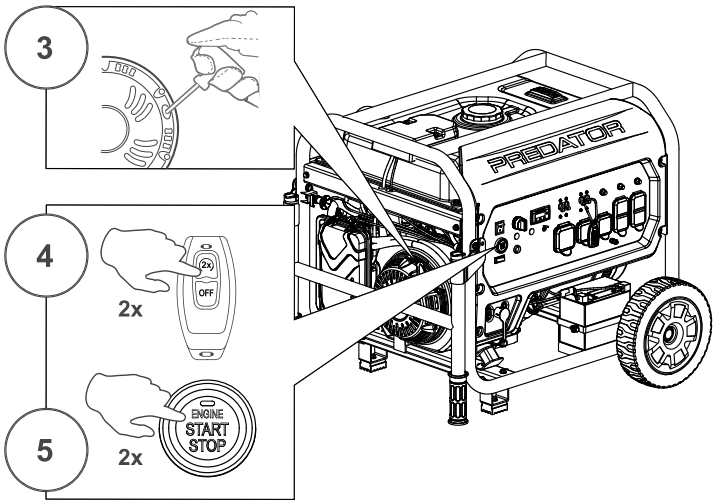



1. Turn the Fuel Selector Switch to the GASOLINE setting.

2. Push the Engine Switch to the ON position.

**Note:** The included 12VDC Battery must be connected and charged for system to operate.

***Select a starting method:***




3. **Manual Start:** Pull the Starter Handle gently until resistance is felt. Allow Cable to retract fully and then pull it quickly. Repeat until the Engine starts. Do not let the Starter Handle snap back against the housing. Hold it as it recoils so it doesn't hit the housing.
4. **Remote Start:** Slowly press and release the 2x Button on the Stop/Start Remote Control twice.
   **Note:** If a CO shutoff event has occurred the remote start capability will be disabled until the Generator Engine has been restarted by another method.
5. **Electric Start:** Slowly press and release the Engine Start/Stop Switch twice.

## If engine does not start:

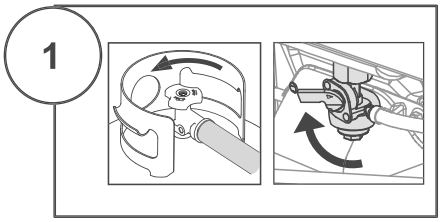
- **Check engine oil level**.
  Engine will not start with low or no engine oil.
- **Check spark arrestor cleanliness**.
  Engine will not start if spark arrestor is clogged.
- **Check 12VDC Battery.**
  Engine will not start if battery is low or is disconnected.

**IMPORTANT:** Allow the Engine to run at no load for five minutes after each start-up so that the Engine can stabilize.

# Starting the Engine – Propane Operation

**Before Starting the Engine**

a. **Inspect the generator and engine.**
b. **Disconnect all electrical loads from the generator.**
c. **Make sure the Propane hose is correctly connected to the generator and propane tank.**
d. **Make sure Battery is connected and charged.**

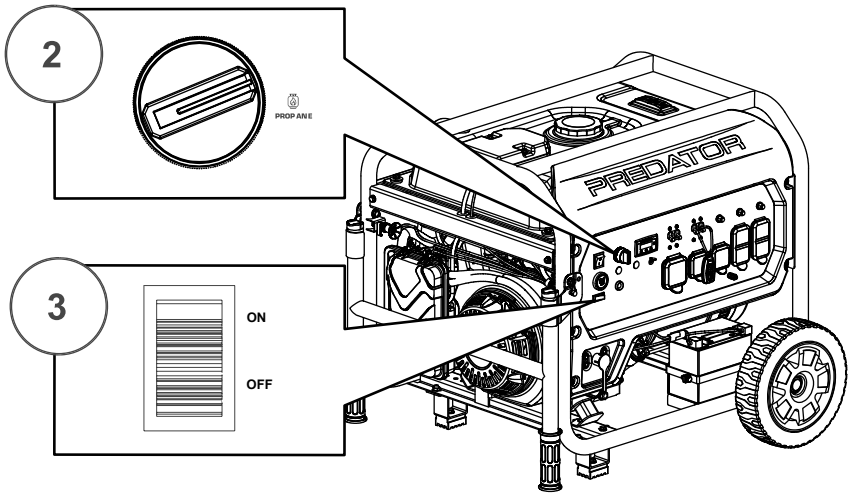



1. Fully open the valve on the Propane tank. Close gasoline Gasoline Valve if open.

2. Turn the Fuel Selector Switch to the PROPANE setting.

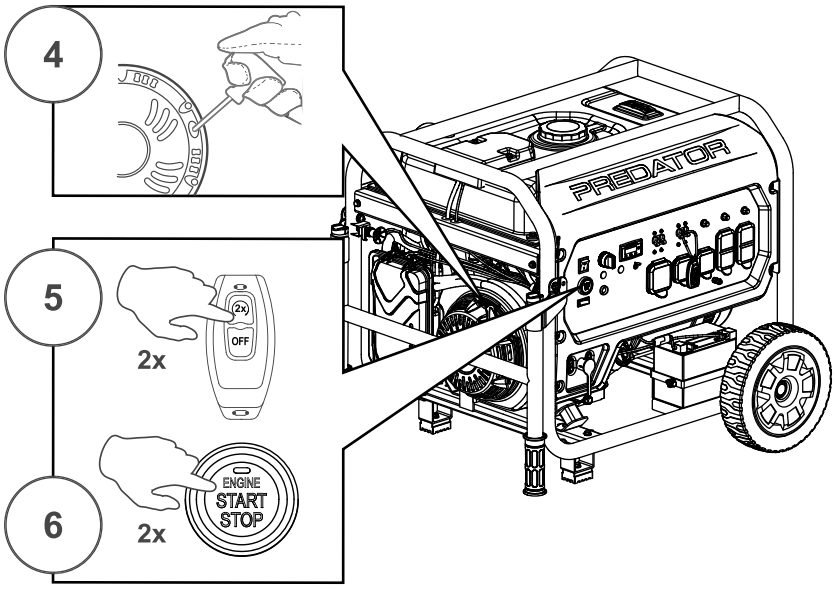
3. Push the Engine Switch to the ON position.

**Note:** For the generator to Start, the included 12VDC Battery must be connected and charged.




***Select a starting method:***

4. **Manual Start:** Pull the Starter Handle gently until resistance is felt. Allow Cable to retract fully and then pull it quickly. Repeat until the Engine starts. Do not let the Starter Handle snap back against the housing. Hold it as it recoils so it doesn't hit the housing.
5. **Remote Start:** Slowly press and release the 2x Button on the Stop/Start Remote Control twice. **Note:** If a CO shutoff event has occurred the remote start capability will be disabled until the Generator Engine has been restarted by another method.
6. **Electric Start:** Slowly press and release the Engine Start/Stop Switch twice.




## If engine does not start:

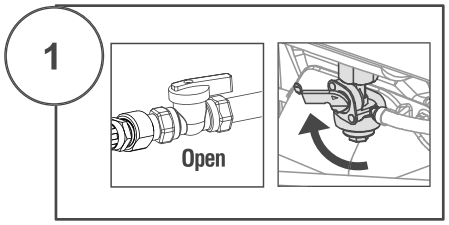
- **Check engine oil level**.
  Engine will not start with low or no engine oil.
- **Check spark arrestor cleanliness**.
  Engine will not start if spark arrestor is clogged.
- **Check 12VDC Battery.**
  Engine will not start if battery is low or is disconnected.

**IMPORTANT:** Allow the Engine to run at no load for five minutes after each start-up so that the Engine can stabilize.

# Starting the Engine – Natural Gas Operation

**Before Starting the Engine**

a. **Inspect the generator and engine.**
b. **Disconnect all electrical loads from the generator.**
c. **Make sure the Natural Gas hose is correctly connected to the generator and the Natural Gas source.**
d. **Make sure Battery is connected and charged.**

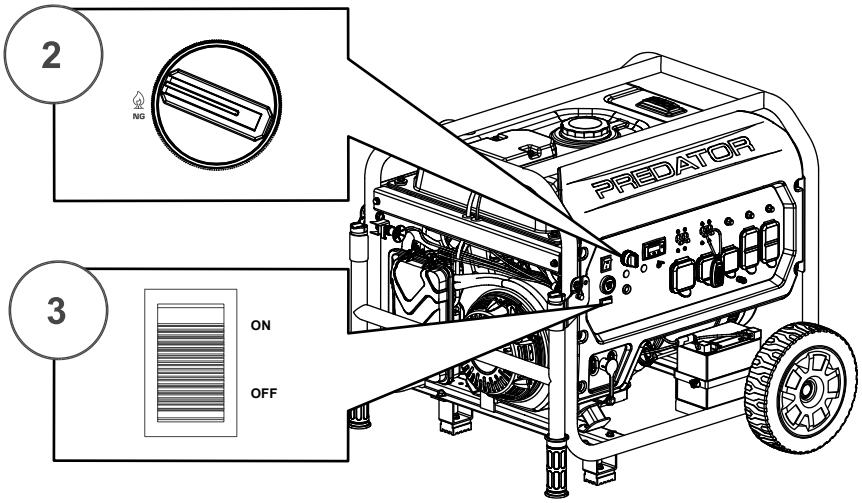



1. Fully open the Natural Gas shutoff valve. Close gasoline Gasoline Valve if open.

2. Turn the Fuel Selector Switch to the Natural Gas setting.

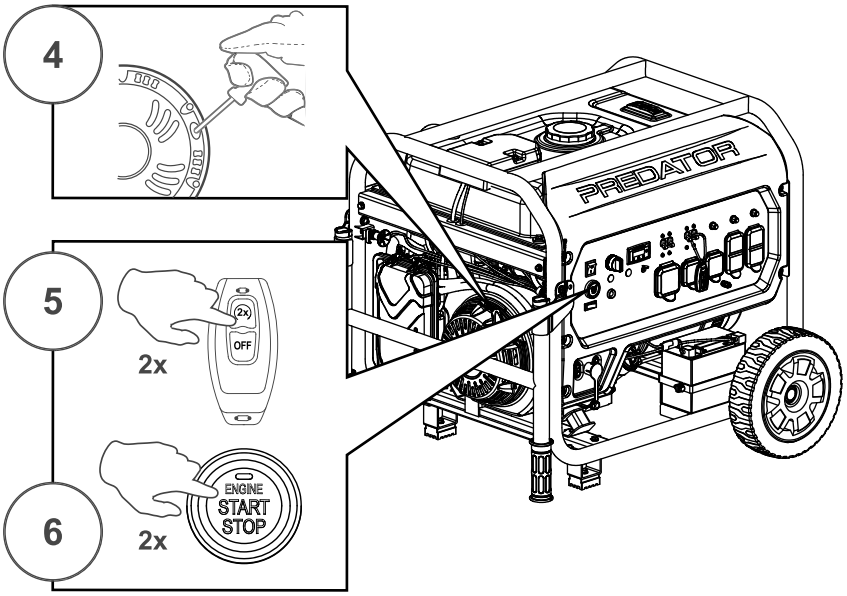
3. Push the Engine Switch to the On position.

**Note:** For the generator to Start, the included 12VDC Battery must be connected and charged.




***Select a starting method:***

4. **Manual Start:** Pull the Starter Handle gently until resistance is felt. Allow Cable to retract fully and then pull it quickly. Repeat until the Engine starts. Do not let the Starter Handle snap back against the housing. Hold it as it recoils so it doesn't hit the housing.
5. **Remote Start:** Slowly press and release the 2x Button on the Stop/Start Remote Control twice. **Note:** If a CO shutoff event has occurred the remote start capability will be disabled until the Generator Engine has been restarted by another method.
6. **Electric Start:** Slowly press and release the Engine Start/Stop Switch twice.




## If engine does not start:

- **Check engine oil level**.
  Engine will not start with low or no engine oil.
- **Check spark arrestor cleanliness**.
  Engine will not start if spark arrestor is clogged.
- **Check 12VDC Battery.**
  Engine will not start if battery is low or is disconnected.

**IMPORTANT:** Allow the Engine to run at no load for five minutes after each start-up so that the Engine can stabilize.

# Switching Fuel Sources

**Fire and explosion hazard. DO NOT add gasoline to the fuel tank or connect a Propane Hose or Natural Gas hose to the generator while the generator is in operation.**

The fuel source can be switched while the Engine is running if a propane tank or natural gas source is connected to the Generator BEFORE operation.

**Switching from Gasoline to Propane or Natural Gas**

1. **IMPORTANT: Disconnect all electrical loads from the Generator before switching from one fuel type to another.**
2. Fully open the valve on the Propane tank or the Natural Gas shutoff valve.
3. Close the gasoline Gasoline Valve on the Engine.
4. Turn the Fuel Selector Switch to the PROPANE or Natural Gas setting.

**Note:** When switching from gasoline to Propane or Natural Gas operation the Engine may run rough for a few seconds. If the Engine stops when switching fuel sources, the unit may be restarted using either fuel source.

**Switching from Propane or Natural Gas to Gasoline**

**IMPORTANT: Disconnect all electrical loads from the Generator before switching from one fuel type to another.**

1. Turn the Fuel Selector Switch to the GASOLINE setting.
2. Turn the Propane tank valve or the Natural Gas shutoff valve to the fully closed position.

# Break-in Period

a. Breaking-in the Engine will help to ensure proper equipment and Engine operation.

b. The break-in period will last about 30 hours of use.
DO NOT exceed 75% of the Generator's running wattage during this period.

- Change the engine oil after this period.

Under normal operating conditions subsequent maintenance follows the schedule explained in the **MAINTENANCE** section.

# CARBON MONOXIDE SHUTOFF

**DANGER! TO PREVENT SERIOUS INJURY AND DEATH FROM CARBON MONOXIDE INHALATION:**
**The Carbon Monoxide sensor is an additional layer of protection only.**
**DO NOT USE THE GENERATOR INDOORS OR IN ANY ENCLOSED SPACE OR IN ANY OTHER AREA OR SITUATION THAT WILL ALLOW CARBON MONOXIDE TO ACCUMULATE.**

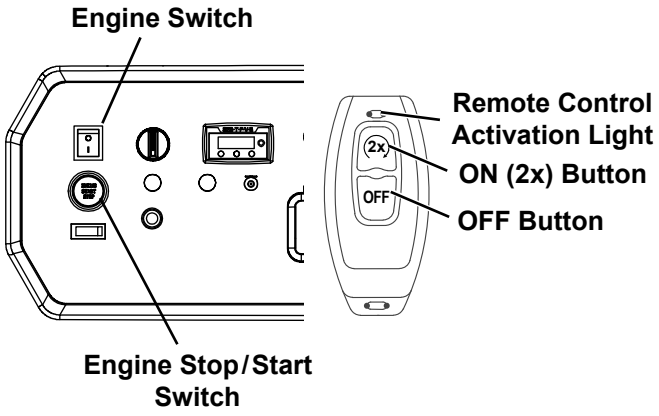
- FLASHING RED LIGHT:
  Dangerous levels of carbon monoxide gas have built up. Leave immediately until area has aired out. Move Generator to well-ventilated area before operation.
- FLASHING YELLOW LIGHT:
  Carbon monoxide sensor malfunction. Sensor needs service. Call 1-800-444-3353 as soon as possible. Do not use the Generator until the sensor is working properly.
  NOTE: Yellow light flashes once after starting to indicate passing self-check and is functioning normally.

**The Carbon Monoxide sensor must only be serviced by a qualified technician to restore it to original settings. Do not modify or tamper with the Carbon Monoxide sensor. Not following these instructions can result in death or serious injury due to Carbon Monoxide sensor malfunction.**

# Reprogramming the Start/Stop Remote Control

If the Start/Stop Remote Control is replaced or needs to be paired to the generator, follow this procedure:

1. Push the Engine Switch to the ON position.
2. Push and hold the Engine Start/Stop Switch for up to 15 seconds until the Switch Indicator Light flashes green and red, then release the Switch.
3. Push the 2x button on the Stop/Start Remote Control. It will pair with Generator and the Switch Indicator Light on the Generator will turn to green.




# Connecting Electrical Loads to the Generator

**Calculate Power Draw**

Power draw can be calculated by multiplying *volts* and *amps*. The resulting number is *wattage*.

- The total combined load through the outlets on the Generator must not exceed the running power of the unit. Never exceed the running wattage for the Generator or any outlet amperage rating.
- Refer to appliance/tool owner's manuals to determine the wattage of electrical load devices.
- Long power cords and extension cords draw additional power. Keep cord length at a minimum.

**WARNING!** Never exceed the rated capacity for this Generator, as serious damage to the Generator and/or appliances, tools, and equipment could result from an overload. Starting and running wattage requirements should always be calculated when matching this Generator's wattage capacity to the appliance, tool, or equipment.

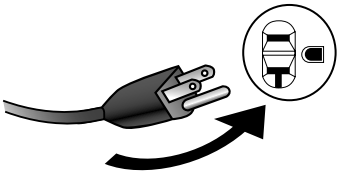
**NOTICE:** Starting and running wattages vary depending on fuel used to operate Generator. Refer to chart:

| Fuel | Starting Watts | Running Watts |
|---|---|---|
| Gasoline | 14,500 Maximum | 11,000 |
| Propane | 13,000 Maximum | 10,000 |
| Natural Gas | 11,000 Maximum | 9,000 |

**Wattage Estimates**

Refer to your device documentation for start-up and running wattage requirements. Check nameplate wattages on all loads before connecting to Generator.

Plug the power cord of the 120/240 volt appliance/tool into the appropriate Outlet on the Generator. Plug in appliances from largest to smallest load.


Plug Load In

a. Connect the items that require the most wattage first.
b. Connect "inductive" load appliances, tools, and equipment next. Inductive loads are small hand tools and some small appliances.
c. Connect any lights next.
d. Voltage sensitive appliances, tools, and equipment should be the last to be connected to the Generator. Plug voltage sensitive items such as TVs, DVD players, microwaves, and cordless telephones into a UL® Listed voltage surge protector (not included). Then, connect the surge protector into the Generator.

**IMPORTANT!** Failure to connect and operate appliances, tools, and equipment in this sequence can cause damage to the Generator, appliances, tools, and equipment and will **void** the Warranty of this Generator.

**Note: Do not allow the Generator to completely run out of fuel with devices attached.**
**A Generator's output may sharply spike as it runs out of fuel, causing damage to attached devices.**

**Low Oil Indicator**

1. If the Engine oil level is too low, the LOW OIL ALERT light turns on and the Engine will automatically shut off.
2. The Engine cannot be restarted until the proper amount of oil has been added. Add the appropriate type of oil until the oil level is at the proper level. SAE 10W-30 oil is recommended for general use.

**NOTICE: Do not run the engine with too little oil. Engine will shut off if engine oil level is too low.**

**Automatic Idle Down Switch**

1. Turn the Automatic Idle Switch ON to limit noise and fuel consumption. Engine speed (and frequency) are reduced when no load is detected. Engine runs at full speed (and frequency) when load above 75W is applied.

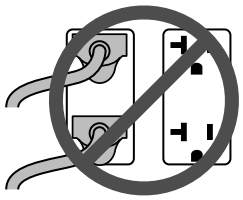
**Note:** Turn Automatic Idle Switch OFF when connected load is less than 300W.

2. Turn the Automatic Idle Switch OFF to operate Engine at full speed:
   a. when starting b. when a heavy load is applied

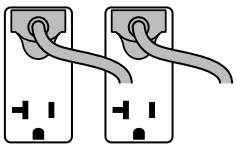
**IF ANY CIRCUIT BREAKERS TRIP CHECK THE FOLLOWING:**

3. Make sure that ***ALL circuit breakers*** are reset before starting the Generator again.
4. Adjust the plugs so the loads are shared across outlet circuits.

**To achieve rated output from the Generator, distribute loads over outlets.**



**Evenly distributed over outlets:**



# Calculating Total Wattage of Devices Used with the Generator

Before using the Generator, check that the products you want to plug into the unit are below the rated and maximum wattage ratings of the Generator. Use the Wattage Calculation Table below, and the watts listed on your products, to help calculate multiple wattage totals.

To use the table:

1. Add up the Running Watts for all items you would like to use at any given time.
2. Make sure that this total is under the 11,000 Gasoline/10,000 Propane/9,000 Natural Gas running wattage of the Generator.
3. Find the single highest starting watts for the selected items and add to the total.
4. Make sure that this total is under the 14,500 Gasoline/13,000 Propane/11,000 Natural Gas max. starting wattage of the Generator.
5. Plug in and turn on products from largest wattage to smallest.

## Wattage Calculation Table

| Equipment | Running Watts |
|---|---|
| | |
| | |
| | |
| | |
| | |
| **Total Running Watts (must be less than 11,000 Gasoline/10,000 Propane/9,000 Natural Gas)** | |
| **Largest Additional Start-up Watts** | |
| **Total Startup Watts needed for all loads (must be less than 14,500 Gasoline/13,000 Propane/11,000 Natural Gas))** | |

Example

| Equipment | Running Watts |
|---|---|
| *Electric Water Heater (2,000 + 0)* | *2,000* |
| *Television (400 + 0)* | *400* |
| *Lawn Mower (1,200 + 1,200)* | *1,200* |
| *Hand Drill (600 + 600)* | *600* |
| | |
| | |
| **Total Running Watts (must be less than 11,000 Gasoline/ 10,000 Propane/9,000 Natural Gas)** | *4,200* |
| **Largest Additional Start-up Watts** | *1,200* |
| **Total Startup Watts needed for all loads (must be less than 14,500 Gasoline/ 13,000 Propane/11,000 Natural Gas)** | *5,400* |

A generator that is rated more than the minimum required max. starting watts will last much longer than a generator that only supplies the exact watts needed.

To Calculate Wattage:
Volts and amps can be multiplied together to get watts (volts x amps = watts).

To Calculate Additional Start-Up Watts (If They Are Not Listed)
For equipment with a motor: Use the rated watts amount as an estimate of additional Start-up Watts.

For most lights or heaters: there are no additional start-up watts.

## Wattage Estimate Charts

Note: Wattages listed below are estimates for that type of equipment only. Check nameplate wattages on all loads before connecting to Generator.

| EMERGENCY | | |
|---|---|---|
| **Device** | **Running Watts** | **Additional Start-up Watts** |
| Refrigerator/Freezer | 700 | 1500 |
| Radio | 100 | 0 |

| JOB SITE | | |
|---|---|---|
| **Device** | **Running Watts** | **Additional Start-up Watts** |
| Air Compressor - 1/2 HP | 1000 | 1000 |
| Table Saw - 10″ | 1700 | 1300 |
| Belt Sander - 3″ | 1200 | 1200 |
| Hand Drill - 1/2″ | 600 | 600 |
| Halogen Work Light | 1000 | 0 |
| Reciprocating Saw | 900 | 900 |

| RECREATION | | |
|---|---|---|
| **Device** | **Running Watts** | **Additional Start-up Watts** |
| AM/FM Radio | 100 | 0 |
| Electric Grill | 1700 | 0 |
| Inflator Pump | 50 | 100 |
| CD/DVD Player | 100 | 0 |
| Box Fan - 20″ | 200 | 200 |
| Coffee Maker | 600 | 0 |

| HOUSEHOLD | | |
|---|---|---|
| **Device** | **Running Watts** | **Additional Start-up Watts** |
| Computer w/ Monitor | 800 | 0 |
| Electric Clothes Dryer | 5500 | 500 |
| Electric Range | 2100 | 0 |
| Electric Water Heater | 2000 | 0 |
| Light Bulb - 100 watts | 100 | 0 |
| Microwave - 1000 watts | 1000 | 200 |
| Sump Pump - 1/2 HP | 1000 | 1100 |
| Television | 400 | 0 |
| Washing Machine | 1100 | 1100 |
| Well Pump - 1/2 HP | 1000 | 1000 |

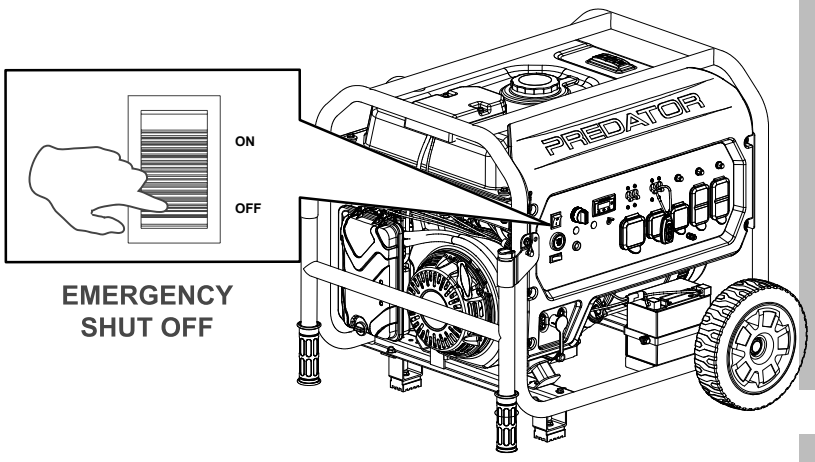
| LAWN & GARDEN | | |
|---|---|---|
| **Device** | **Running Watts** | **Additional Start-up Watts** |
| Hedge Trimmer | 400 | 400 |
| Pressure Washer | 1200 | 1200 |
| Lawn Mower | 1200 | 1200 |
| Edger | 1000 | 1000 |

| HEATING & COOLING | | |
|---|---|---|
| **Device** | **Running Watts** | **Additional Start-up Watts** |
| Central AC - 10,000 BTU | 1500 | 1500 |
| Furnace Fan - 1/2 HP | 900 | 1400 |
| Space Heater | 1800 | 0 |
| Window AC - 10,000 BTU | 1200 | 600 |

# Stopping the Engine

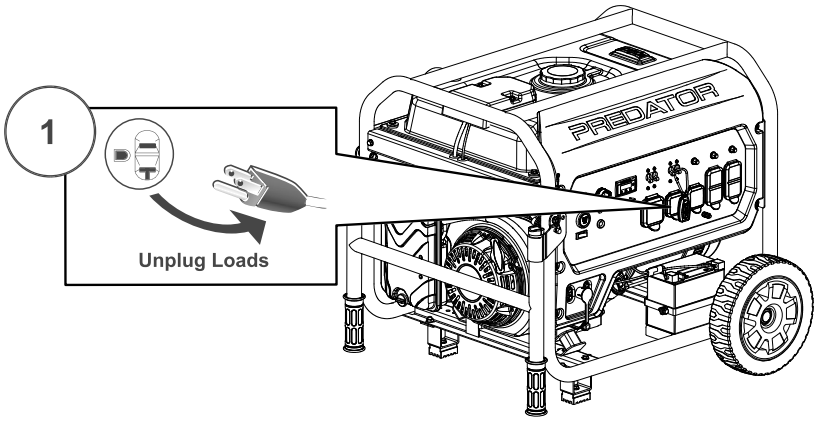
To stop the Engine in an emergency, push the Engine Switch to OFF.

**NOTICE:** Generator shutoff under load may damage the Generator and attached equipment.




Under normal conditions, use the following procedure to shut off the Generator:

1. Turn all electrical load devices off and unplug them from the Generator.

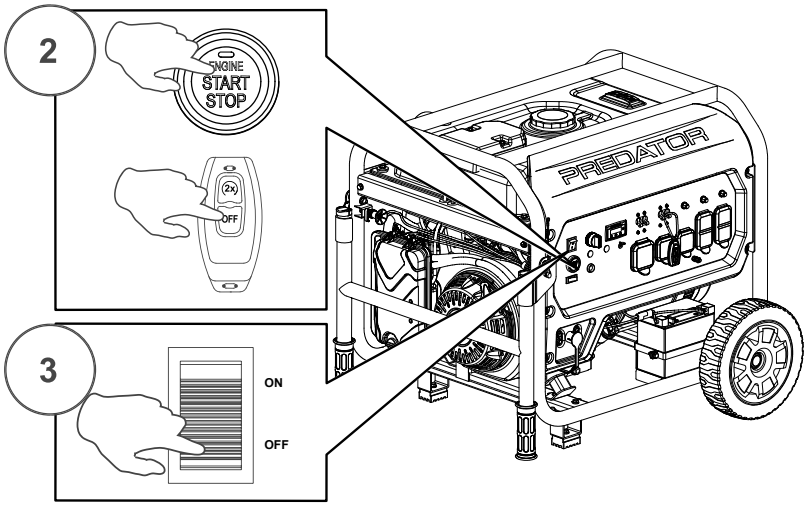



2. Slowly press and release the Engine Start/Stop Switch. Or slowly press and release the OFF button on the Stop/Start Remote Control. Turn the Fuel Selector Switch to the STORAGE position.

**Note:** When the Generator is turned OFF using the Stop/Start Switch or Remote Control, the Generator enters standby mode and can be restarted remotely using procedures indicated in starting section. If Generator is not started within 12 hours the Controller shuts down completely to save the battery. Push the Engine Switch to OFF then ON to reactivate standby mode.

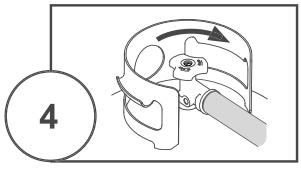
3. Push the Engine Switch to the OFF position.

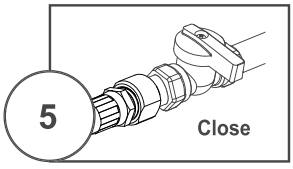
**Note:** Turn the EngineSwitch off when the Generator is not in use to prevent draining the Battery.




4. If operating on Propane, turn the propane tank valve to the fully closed position.

5. If operating on Natural Gas, turn the Natural Gas shutoff valve to the closed position.



## ⚠WARNING

**TO PREVENT SERIOUS INJURY FROM ACCIDENTAL STARTING:**
**Push the Engine Switch of the equipment to the OFF position, wait for the engine to cool, and disconnect the spark plug cap before performing any inspection, maintenance, or cleaning procedures.**

**TO PREVENT SERIOUS INJURY FROM EQUIPMENT FAILURE:**
**Do not use damaged equipment. If abnormal noise, vibration, or excess smoking occurs, have the problem corrected before further use.**

**Follow all service instructions in this manual. The engine may fail critically if not serviced properly.**



**Many maintenance procedures, including any not detailed in this manual, will need to be performed by a qualified technician for safety. If you have any doubts about your ability to safely service the equipment or engine, have a qualified technician service the equipment instead.**

# Cleaning, Maintenance, and Lubrication Schedule

**WARNING! TO PREVENT SERIOUS INJURY FROM INJECTION, FIRE, AND EXPLOSION:** Depressurize fuel system before servicing it. Remove ignition sources from area. Seek medical attention immediately after injection injury.

**Note:** This maintenance schedule is intended solely as a general guide. If performance decreases or if equipment operates unusually, check systems immediately. The maintenance needs of each piece of equipment will differ depending on factors such as duty cycle, temperature, air quality, fuel quality, and other factors.

**Note:** The following procedures are in addition to the regular checks and maintenance explained as part of the regular operation of the engine and equipment.

| Procedure | Before Each Use | Monthly or every 8 hr. of use | Every 3 mo. or 50 hr. of use | Every 6 mo. or 100 hr. of use | Yearly or every 300 hr. of use | Every 2 Years | Page |
|---|---|---|---|---|---|---|---|
| 1. Brush off outside of engine<br>2. Check engine oil level<br>3. Check air filter<br>4. Check Propane/Natural Gas hose assembly | ✓ | | | | | | 18 |
| Change engine oil | | | | ✓ | | | 32 |
| Clean/replace air cleaner | | | ✓* | | | | 32 |
| Check and clean spark arrestor | | | | ✓ | | | 32 |
| Check and clean spark plug | | | | ✓ | | | 33 |
| 1. Check/adjust valve clearance<br>2. Clean fuel tank, strainer and carburetor<br>3. Clean carbon build-up from combustion chamber | | | | | ✓** | | – |
| Replace fuel line if necessary | | | | | | ✓** | – |
| Change Fuel Filter at Fuel Pump. | | | | | | ✓** | |

*Service more frequently when used in dusty areas.

**These items should be serviced by a qualified technician.

# Checking and Filling Fuel

**⚠WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:**
**Fill tank in a well-ventilated area away from ignition sources. If the engine is hot from use, shut the engine off and wait for it to cool before adding fuel. Do not smoke.**

1. Clean the Fuel Cap and the area around it.
2. Unscrew and remove the Fuel Cap.
3. Remove the Strainer and remove any dirt and debris. Then replace the Strainer.

**Note: Do not use gasoline containing more than 10% ethanol (E10). Do not use E85 ethanol. Add fuel stabilizer or the Warranty is VOID.**

**Note: Do not use gasoline that has been stored in a metal fuel container or a dirty fuel container. It can cause particles to enter the fuel injector, affecting engine performance and/or causing damage.**

4. If needed, fill the Fuel Tank to about 1 inch under the fill neck with 87 octane or higher unleaded gasoline that has been treated with a fuel stabilizer additive. Follow fuel stabilizer manufacturer's recommendations for use.
5. Replace the Fuel Cap.
6. Wipe up any spilled fuel and allow excess to evaporate before starting engine. To prevent FIRE, do not start the engine while the smell of fuel hangs in the air.

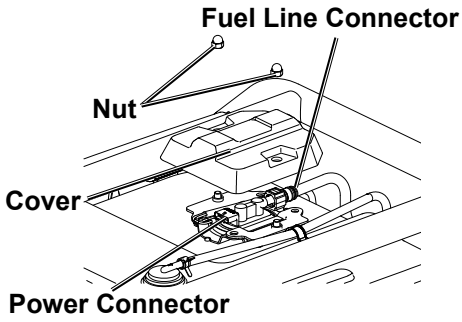
## Depressurize Fuel System

**WARNING! TO PREVENT SERIOUS INJURY FROM INJECTION, FIRE, AND EXPLOSION:**
Depressurize fuel system before servicing it. Remove ignition sources from area. Seek medical attention immediately after injection injury.



**⚠WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:**
Service fuel system in a well-ventilated area away from ignition sources. If the engine is hot from use, shut the engine off and wait for it to cool before servicing. Do not smoke. Have a dry chemical (class B) fire extinguisher nearby.

1. Turn engine off.
2. Unplug all devices from the generator.
3. Turn the Engine Switch to the OFF position.
4. Allow the engine to completely cool.
5. **Properly ground Generator.** *See Grounding on page 13*.
6. Remove two Nuts.
7. Remove Cover.
8. Disconnect fuel pump power connector only. **DO NOT DISCONNECT FUEL LINE YET.**




9. Turn Engine Switch to its "ON" position.
10. Select Gasoline Fuel Selector Switch.
11. Try to start Engine. See Starting the Engine on page 24. Engine may start briefly. Fuel System is now depressurized.

**Note:** Engine will shutdown immediately if started. EFI Alert indicator may indicate an error.

12. Turn Engine Switch to the OFF position.
13. Service fuel system as needed.
14. After service:
    a. Connect Fuel Pump Power Connector.
    b. Replace Nuts, Cover and reassemble Generator.

**WARNING! TO PREVENT SERIOUS INJURY:**
Assemble Generator fully before use.

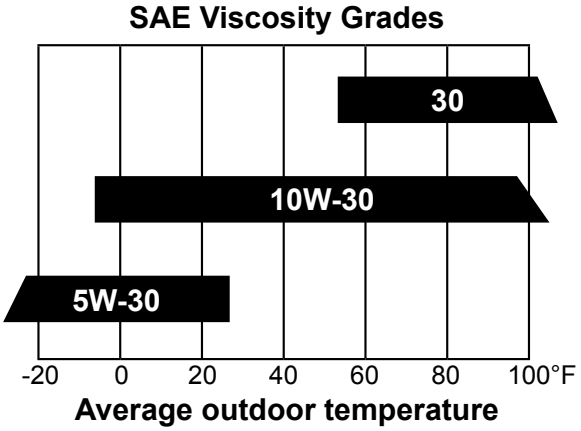
## Engine Oil Change

**CAUTION!** Oil is very hot during operation and can cause burns. Wait for engine to cool before changing oil.

1. Make sure the Engine is stopped and is level.
2. Close the gasoline Gasoline Valve.
3. Place an oil drain pan under the Generator and center under the Oil Drain Plug. Remove the Oil Drain Plug, tilt the Generator slightly to facilitate drainage and wait for oil to drain completely. Recycle used oil.
4. Tilt the Generator and replace the Oil Drain Plug, then set the Generator back down on a level surface.
5. Clean the top of the Oil Fill Cap/Dipstick and the area around it. Remove the Cap/Dipstick, turning it counterclockwise.
6. Add the appropriate type of oil until the oil level is at the proper level. SAE 10W-30 oil is recommended for general use.

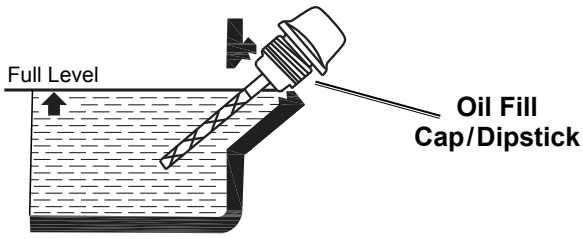
**Note:** Do not thread the dipstick in when checking the oil level.

The SAE Viscosity Grade chart shows other viscosities to use in different average temperatures.




**Note:** Make sure Generator is level when adding oil to prevent overfilling which could cause engine damage.

7. Check the oil level. The oil level should be up to the edge of the hole as shown.

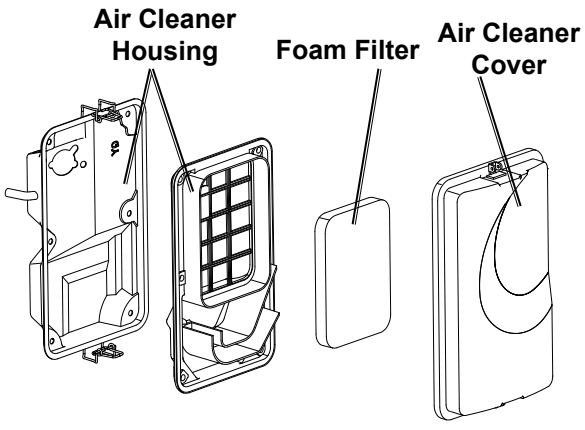



8. Thread the Oil Fill Cap/Dipstick back in clockwise and replace the Access Panel and Oil Drain Door.

**NOTICE: Do not run the engine with too little oil. Engine will not start with low or no engine oil.**

## Air Filter Element Maintenance

1. Remove the Air Filter Cover and the air filter elements and check for dirt. Clean as described below.
2. **Cleaning:**
   - For "paper" filter elements: To prevent injury from dust and debris, wear ANSI-approved safety goggles, NIOSH-approved dust mask/respirator, and heavy-duty work gloves. In a well-ventilated area away from bystanders, use pressurized air to blow dust out of the air filter.
   - For foam filter elements: Wash the element in warm water and mild detergent several times. Rinse. Squeeze out excess water and allow it to dry completely. Soak the filter in lightweight oil briefly, then squeeze out the excess oil.
3. Install the cleaned filter.
4. Secure the Air Filter Cover before use.



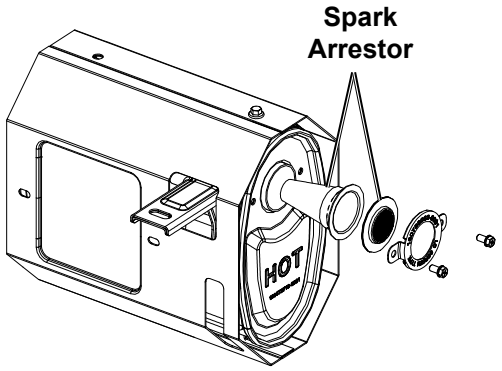
## Spark Arrestor Maintenance

**⚠WARNING**

**TO PREVENT SERIOUS INJURY AND FIRE: Operate only with proper spark arrestor installed.**

**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.**

1. Allow the Generator to cool completely.
2. Remove Spark Arrestor from end of exhaust.
3. Clean the Spark Arrestor using a wire brush (sold separately). Replace Arrestor if damaged.
4. **WARNING! TO PREVENT SERIOUS INJURY FROM ACCIDENTAL BRUSH FIRE, secure Spark Arrestor back in place immediately after cleaning and before further operation.**

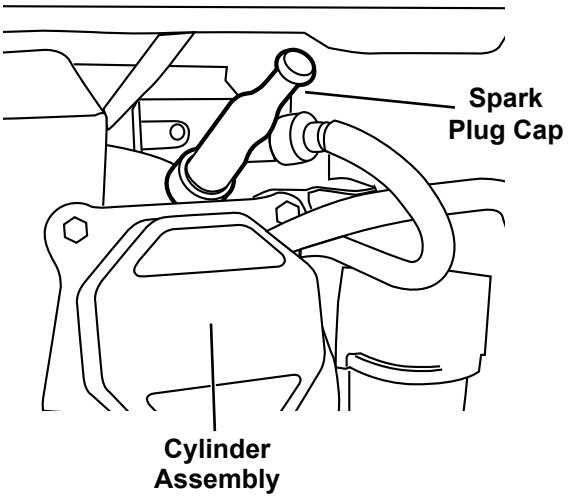



## Remote Control Battery Replacement

1. Loosen screw(s) and open battery compartment.
2. Remove battery and dispose of properly.
3. Insert battery in correct polarity, close compartment and tighten screw(s).

## Spark Plug Maintenance

1. Disconnect Spark Plug Cap from end of plug. Clean out debris from around Spark Plug.
2. Use a spark plug wrench to remove the Spark Plug.




3. Inspect the Spark Plug:
   If the electrode is oily, clean it using a clean, dry rag.
   If the electrode has deposits on it, polish it using emery paper. If the white insulator is cracked or chipped, the Spark Plug needs to be replaced.

**NOTICE:** Use only F7RTJC type spark plug or equivalent. Using an incorrect spark plug may damage the engine.

4. When installing a new spark plug, adjust the plug's gap to the specification on the Specifications chart. Do not pry against the electrode—the spark plug can be damaged.

5. Apply anti-seize material to Spark Plug threads. Install the new spark plug or the cleaned spark plug into the engine.
   - **Gasket-style**: Finger-tighten until the gasket contacts the cylinder head, then tighten about 1/2-2/3 turn more.
   - **Non-gasket-style**: Finger-tighten until the plug contacts the cylinder head, then tighten about 1/16 turn more.

**NOTICE:** Tighten the spark plug properly.
**If loose**, the spark plug will cause the engine to overheat.
**If overtightened**, the threads in the engine block will be damaged.

6. Apply dielectric spark plug boot protector (not included) to the end of the spark plug and reattach the cap securely.

# Storage

When the equipment is to remain idle for longer than 20 days, prepare the engine for storage as follows:

1. **CLEANING**:
   Wait for engine to cool, then clean engine with dry cloth. **NOTICE: Do not clean using water.** The water will gradually enter the engine and cause damage.

**Note:** Keep the Propane/Natural Gas Inlet covered during cleaning and storage.

2. **FUEL:**
   **Gasoline Treatment**
   **To protect the fuel tank during storage, fill the tank with fresh gasoline that has been treated with a fuel stabilizer additive. Follow fuel stabilizer manufacturer's recommendations for use. Refer to Checking and Filling Fuel on page .**

   **Aged gasoline that has not been treated with stabilizer ahead of time must be safely drained away and not run through the engine.**

   **Draining the Fuel Tank**



**⚠WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:**
**Drain tank in a well-ventilated area away from ignition sources. If the engine is hot from use, shut the engine off and wait for it to cool before draining fuel. Do not smoke.**

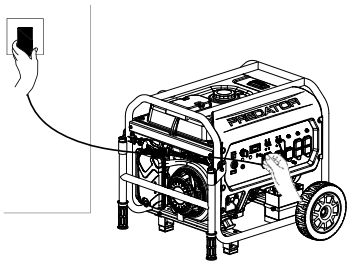
**WARNING! Wear ANSI-approved safety goggles and heavy-duty, chemical resistant work gloves before setting up transfer pump.**

   a. You will need a gasoline-safe transfer pump - sold separately.
   b. Insert the suction tube to the deepest point of the Generator's Fuel Tank.
   c. Place the delivery hose into a gasoline-safe container (not included) in which to pump fuel. Do not place receiving container higher than the pump location. Do not overfill container.

**Note:** Know and obey city and state laws for proper disposal of oil and gasoline. Dispose of properly in accordance with all local laws and regulations.

3. **LUBRICATION:**
   a. Change engine oil.
   b. Clean out area around spark plug. Remove spark plug and pour one tablespoon of engine oil into cylinder through spark plug hole.
   c. Replace spark plug, but leave spark plug cap disconnected.
   d. Pull Starter Handle to distribute oil in cylinder. Stop after one or two revolutions when you feel the piston start the compression stroke (when you start to feel resistance).

4. **12VDC BATTERY:**
   When Generator is not in use or will be stored for extended periods, use the Battery Charger/Maintainer provided to maintain the Battery:
   a. Plug the Charger/Maintainer power cord into the Battery Charging Port on the Generator.
   b. Plug the Charger/Maintainer into an electrical outlet.
   c. Disconnect the Charger/Maintainer before using the Generator.




5. **STORAGE AREA:**
   Cover and store in a dry, level, well-ventilated area out of reach of children. Storage area should also be away from ignition sources, such as water heaters, clothes dryers, and furnaces.

**NOTICE:** During extended storage periods the Engine must be started every 3 months and allowed to run for 15–20 minutes or the Warranty is VOID.

6. **AFTER STORAGE:**
   Before starting the Engine after storage, keep in mind that untreated gasoline will deteriorate quickly. Drain the Fuel Tank and change to fresh fuel if untreated gasoline has been sitting for a month, if treated gasoline has been sitting beyond the fuel stabilizer's recommended time period, or if the Engine does not start.

# Troubleshooting

| Problem | Possible Causes | Probable Solutions |
|---|---|---|
| Engine will not start | FUEL RELATED: | FUEL RELATED: |
| | 1. No fuel in tank or Fuel Pump failure. | 1. Fill fuel tank with fresh 87+ octane stabilizer-treated unleaded gasoline and Check fuel pump operation. **Do not use Foline with more than 10% ethanol (E15, E20, E85, etc.).** |
| | 2. No fuel flow. | 2. Move Fuel Selector Switch to desired fuel type. For Propane/Natural Gas fuel, make sure Propane tank valve or Natural Gas shutoff valve is fully open. |
| | 3. Battery depleted – must be charged and connected to start. | 3. Battery must be connected and charged for generator operation |
| | 4. Gasoline with more than 10% ethanol used. (E15, E20, E85, etc.) | 4. Clean out ethanol rich gasoline from fuel system. Replace components damaged by ethanol. Use fresh 87+ octane stabilizer-treated unleaded gasoline only. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** |
| | 5. Low quality or deteriorated, old gasoline. | 5. Use fresh 87+ octane stabilizer-treated unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** |
| | 6. Clogged Fuel Filter. | 6. Replace Fuel Filter at Fuel Pump. |
| | 7. Dirty fuel passageways. | 7. Clean out passageways using fuel additive. Heavy deposits may require further cleaning. |
| | 8. Propane tank is too small or empty. | 8. Use 40 lb. tank or larger; make sure tank is full and fully open valve. |
| | 9. Improper Natural Gas rating (pressure and flow). | 9. Make sure the Natural Gas supply system can meet the requirements indicated in the Specification Section . |
| | IGNITION (SPARK) RELATED: | IGNITION (SPARK) RELATED: |
| | 1. Engine Switch at OFF position. | 1. Push Engine Switch to ON position. |
| | 2. Disconnected Battery. | 2. Make sure battery is connected and charged |
| | 3. Low Oil | 3. Make sure the oil level is at proper level. |
| | 4. Spark plug cap not connected securely. | 4. Connect spark plug cap properly. |
| | 5. Spark plug electrode wet or dirty. | 5. Clean spark plug. |
| | 6. Incorrect spark plug gap. | 6. Correct spark plug gap. |
| | 7. Spark plug cap broken. | 7. Replace spark plug cap. |
| | 8. Incorrect spark timing or faulty ignition system. | 8. Have qualified technician diagnose/ repair ignition system. |
| | COMPRESSION RELATED: | COMPRESSION RELATED: |
| | 1. Cylinder not lubricated. Problem after long storage periods. | 1. Pour tablespoon of oil into spark plug hole. Crank engine a few times and try to start again. |
| | 2. Loose or broken spark plug. (Hissing noise will occur when trying to start.) | 2. Tighten spark plug. If that does not work, replace spark plug. If problem persists, may have head gasket problem–see #3. |
| | 3. Loose cylinder head or damaged head gasket. (Hissing noise will occur when trying to start.) | 3. Tighten head. If that does not remedy problem, replace head gasket. |
| | 4. Engine valves or tappets mis-adjusted or stuck. | 4. Have qualified technician adjust/ repair valves and tappets. |
| | ENGINE OIL RELATED: | ENGINE OIL RELATED: |
| | 1. Low engine oil. | 1. Fill engine oil to proper level. Check engine oil before EVERY use. |
| | 2. Engine is over filled with oil. | 2. Remove excess oil. Fill engine oil to proper level. See Checking and Filling Engine Oil on page 18 |
| | 3. Engine mounted on slope, triggering low oil shutdown. | 3. Operate engine on level surface. Check engine oil level. |

| Problem | Possible Causes | Probable Solutions |
|---|---|---|
| Engine will not start (continued) | SPARK ARRESTOR RELATED:<br>Spark Arrestor clogged with soot. | SPARK ARRESTOR RELATED:<br>Clean and replace Spark Arrestor. |
| | ELECTRIC OR REMOTE START RELATED:<br>1. No battery or defective battery installed.<br>2. Engine Start/Stop Switch flashes red – Battery is low.<br>3. Electric start fuse (10A) is blown.<br>4. Stop/Start Remote Control is not paired with Generator.<br>5. Generator not picking up Stop/Start Remote Control signal consistently.<br>6. Engine not restarting remotely after CO shutdown event.<br>7. EFI System Related. | ELECTRIC OR REMOTE START RELATED:<br>1. Install a new battery.<br>2. Charge battery with Battery Charger/Maintainer or start Generator manually and allow to run for 5 hours.<br>3. Replace fuse with similar size fuse.<br>4. Pair Remote Control to Generator. Refer to page 21.<br>5. Replace the Remote Control battery; press on Remote Button longer; stay within operational range of Remote.<br>6. After a CO shutdown event, the remote start capability will be disabled until the Engine has been first restarted non-remotely.<br>7. EFI Alert Indicator Flashes: See EFI Alert Indicator Light pattern table to identify the root cause |
| Engine misfires | 1. Spark plug cap loose.<br>2. Incorrect spark plug gap or damaged spark plug.<br>3. Defective spark plug cap.<br>4. Old or low quality gasoline.<br>5. Incorrect compression. | 1. Check cap and wire connections.<br>2. Re-gap or replace spark plug.<br>3. Replace spark plug cap.<br>4. Use only fresh 87+ octane stabilizer-treated unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).**<br>5. Diagnose and repair compression. Use **Engine will not start: COMPRESSION RELATED** section. |
| Engine stops suddenly | 1. Carbon Monoxide level high. Red light on Carbon Monoxide Sensor illuminates.<br>2. CO Sensor Alert flashes yellow continually shortly after starting.<br>3. CO Sensor Alert flashes yellow continually after longer period of operation.<br>4. Low oil shutdown.<br>5. Fuel tank empty or full of impure or low quality gasoline.<br>6. EFI Alert Indicator flashes.<br>7. Faulty magneto.<br>8. Disconnected or improperly connected spark plug cap.<br>9. Unintentional shutdown signal sent from Stop/Start Remote Control.<br>10. If using Natural Gas: inadequate fuel pressure/flow.<br>11. If using Propane: Propane tank empty or Propane tank too small. | 1. Leave area immediately and allow area to ventilate thoroughly. Only operate generator outside.<br>2. Carbon monoxide sensor malfunction. Sensor needs service. Call 1-800-444-3353 as soon as possible. Do not use the Generator until the sensor is working properly.<br>3. Make sure to operate Generator within rated ambient temperature; maintain minimum 5 ft. clearance from all sides.<br>4. Fill engine oil to proper level. Check engine oil before EVERY use.<br>5. Fill fuel tank with fresh 87+ octane stabilizer treated unleaded gasoline. Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).<br>6. See EFI Alert Indicator Light pattern table to identify the root cause<br>7. Have qualified technician service magneto.<br>8. Secure spark plug cap.<br>9. Store the Remote Control in a safe location and away from children.<br>10. Ensure Natural Gas fuel pressure and flow meet Generator requirements. Refer to *Specifications* on page 3.<br>11. Replace empty Propane tank with full tank. Replace small Propane tank with correct tank size. Refer to *Specifications* on page 3. |
| Engine stops when under heavy load | 1. Dirty air filter<br>2. Engine running cold. | 1. Clean or replace element.<br>2. Allow engine to warm up prior to operating equipment. |

| Problem | Possible Causes | Probable Solutions |
|---|---|---|
| Engine knocks | 1. Old or low quality gasoline. | 1. Fill fuel tank with fresh 87+ octane stabilizer-treated unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** |
| | 2. Engine overloaded. | 2. Do not exceed equipment's load rating. |
| | 3. Incorrect spark timing, deposit buildup, worn engine, or other mechanical problems. | 3. Have qualified technician diagnose and service engine. |
| Engine backfires | 1. Impure or low quality gasoline. | 1. Fill fuel tank with fresh 87+ octane stabilizer-treated unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** |
| | 2. Engine too cold. | 2. Use cold weather fuel and oil additives to prevent backfiring. |
| | 3. Intake valve stuck or overheated engine. | 3. Have qualified technician diagnose and service engine. |
| | 4. Incorrect timing. | 4. Check engine timing. |
| Attached device doesn't have power | 1. Device not plugged in properly. | 1. Turn off and unplug the device, then plug it back in again and turn on. |
| | 2. Circuit Breaker tripped. | 2. Turn off and unplug device, reset Circuit Breaker, plug in device and turn on. |
| | 3. GFCI activated. | 3. Turn off and unplug device. Test GFCI receptacle. If functioning properly reset GFCI, plug in device and turn on. |
| | 4. Product needs service. | 4. Have product repaired. |
| Attached device begins to operate abnormally | 1. Problem with device. | 1. Immediately unplug device. Have device repaired by a qualified technician, or replace device. |
| | 2. Rated load capacity exceeded. | 2. Lower the number of items plugged into the Generator to stay within the rated capacity, or use a more powerful generator. |

**Follow all safety precautions whenever diagnosing or servicing the generator or engine.**

## EFI Fault Indicator Codes

The EFI Alert Light flashes indicating a fault with the engine. The Fault Code can be identified by the flashing frequency of the EFI Alert Light. The following table describes the Blink Pattern of a Fault Code:

**Note:** The EFI Alert Light turns ON 4 seconds and OFF 2 seconds before and after displaying the Fault Code(s) Blink Pattern.

**Note:** "·" indicates short blink (0.25 seconds) and "-" indicates long blink (1.2 seconds).

**Note:** For multiple faults, a 2 second pause occurs between codes.

| Blink Pattern | Fault Code | Fault Description |
|---|---|---|
| · · | 2 | TPS (Throttle Position Sensor) Error. |
| · · · | 3 | Hall (Engine Position and Speed) Sensor Error. |
| · · · · · · | 6 | EFI System voltage is too high. |
| - · | 11 | Fuel Injector Error. |
| - · · · | 13 | Fuel Pump Error. |
| - · · · · · | 15 | Ignition Module Error. |
| - · · · · · · · | 17 | Oxygen Sensor Error. |
| - - · · · · · · · | 27 | Throttle Stepper Motor Error. |

For additional support, please call 1-800-444-3353.

# Component List

| Part | Description | Qty |
|---|---|---|
| 1 | Hex Socket Flange Face Bolt - Small Series | 4 |
| 2 | Cover Subassembly, Cylinder Head | 1 |
| 3 | Stop Engine Piece Subassembly | 1 |
| 4 | Strainer, Breath Groove | 1 |
| 5 | Gasket, Breath Groove | 1 |
| 6 | Cylinder Head Cover Gasket | 1 |
| 7 | Hex Socket Flange Face Bolt - Small Series | 2 |
| 8 | Rocker Subassembly, Valve | 2 |
| 9 | Shaft Subassembly Rocker | 2 |
| 10 | Rotator, Valve | 2 |
| 11 | Clamp, Valve Lock | 4 |
| 12 | Seat, Valve Spring | 2 |
| 13 | Hex Socket Flange Face Bolt - Small Series | 1 |
| 14 | Cylinder Head Cover Pin Limit Plate | 1 |
| 15 | Head Subassembly, Cylinder | 1 |
| 16 | Valves Set | 1 |
| 17 | Gasket, Cylinder Head | 1 |
| 18 | Position Pin - Type A | 2 |
| 19 | Ring Assembly, Piston | 1 |
| 20 | Piston | 1 |
| 21 | Pin, Piston | 1 |
| 22 | Clip, Piston Pin | 2 |
| 23 | Rod, Connecting | 1 |
| 24 | Crankcase Subassembly. | 1 |
| 25 | Stud Bolt (Bm=2D) | 2 |
| 26 | Gasket, Inlet | 1 |
| 27 | Plate, Carburetor Insulator | 1 |
| 28 | Carburetor Seal Gasket | 1 |
| 29 | ECU Assembly | 1 |
| 30 | Air Cleaner Seal Gasket | 1 |
| 31 | High Pressure Fuel Tube Subassembly | 1 |
| 32 | Air Cleaner | 1 |
| 33 | Nut With Flange | 2 |
| 34 | Gasket, Muffler | 1 |
| 35 | Stud Bolt (Bm=2D) | 2 |
| 36 | Type 1 Nut | 2 |
| 37 | Stopper | 1 |
| 38 | Collector, Fuel Steam | 1 |
| 39 | Shroud, Cylinder Body | 1 |
| 40 | Plug, End | 1 |
| 41 | Hex Socket Flange Face Bolt - Small Series | 9 |
| 42 | Seal, Oil | 1 |
| 43 | Cover, Crankcase | 1 |
| 44 | Dipstick Subassembly, Oil | 1 |
| 45 | Seal Strip | 1 |
| 46 | Gasket, Crankcase | 1 |
| 47 | Deep Groove Ball Bearing - P53 | 1 |
| 48 | Position Pin - Type A | 2 |
| 49 | Crankshaft Assembly | 1 |
| 50 | Deep Groove Ball Bearing - P6 | 2 |
| 51 | Balancing Shaft | 1 |

| Part | Description | Qty |
|---|---|---|
| 52 | Wire Clip | 3 |
| 53 | Bolt, Drain Plug | 2 |
| 54 | Seal, Oil | 1 |
| 55 | Flywheel Subassembly | 1 |
| 56 | Impeller | 1 |
| 57 | Pulley, Starter | 1 |
| 58 | Nut, Flywheel | 1 |
| 59 | Stop Detent | 1 |
| 60 | Manual Starting Assembly | 1 |
| 61 | Hex Socket Flange Face Bolt - Small Series | 5 |
| 62 | Pipe Clamp | 2 |
| 63 | Tube, Breather | 1 |
| 64 | Cylinder Head Bolt | 4 |
| 65 | Sensor, Temperature | 1 |
| 66 | Spring, Valve | 2 |
| 67 | Guide, Seal | 1 |
| 68 | Hex Socket Flange Face Bolt - Small Series | 1 |
| 69 | Plug, Rubber | 1 |
| 70 | Starting Motor Assembly | 1 |
| 71 | Hex Socket Flange Face Bolt - Small Series | 2 |
| 72 | Sensor, Engine Oil | 1 |
| 73 | Hex Socket Flange Face Bolt - Small Series | 2 |
| 74 | Nut With Flange | 1 |
| 75 | Coil, Ignition | 1 |
| 76 | Hex Socket Flange Face Bolt - Small Series | 2 |
| 77 | ECU Harness | 1 |
| 78 | Small Spiral Narrow Band Collar - Type A | 2 |
| 79 | Duct, Air | 2 |
| 80 | Sheath | 2 |
| 81 | Plug, Spark | 1 |
| 82 | Camshaft Assembly | 1 |
| 83 | Tappet, Valve | 2 |
| 84 | Lifter Subassembly, Valve | 2 |
| 85 | Seal Strip | 1 |
| 86 | Flat Washer | 2 |
| 87 | Cover, Fuel Tank | 1 |
| 88 | Strainer Fuel | 1 |
| 89 | Fuel Tank Decorated Plate | 1 |
| 90 | Valve, One Way | 1 |
| 91 | Pipe Clamp | 3 |
| 92 | Hose, Fuel Steam Rubber | 1 |
| 93 | Protective Rubber Sleeve | 2 |
| 94 | Hex Socket Flange Face Bolt - Small Series | 2 |
| 95 | Hex Socket Flange Face Bolt - Small Series | 4 |
| 96 | Built-In Electronic Fuel Pump | 1 |
| 97 | Cross Recessed Countersunk Head Screw (Grade 4.8) | 2 |
| 98 | Leveler Assembly, Oil | 1 |
| 99 | Hex Socket Flange Face Bolt - Large Series - Grade B | 4 |
| 100 | Flat Washer - Grade A | 4 |
| 101 | Sleeve, Fuel Tank Rubber | 4 |

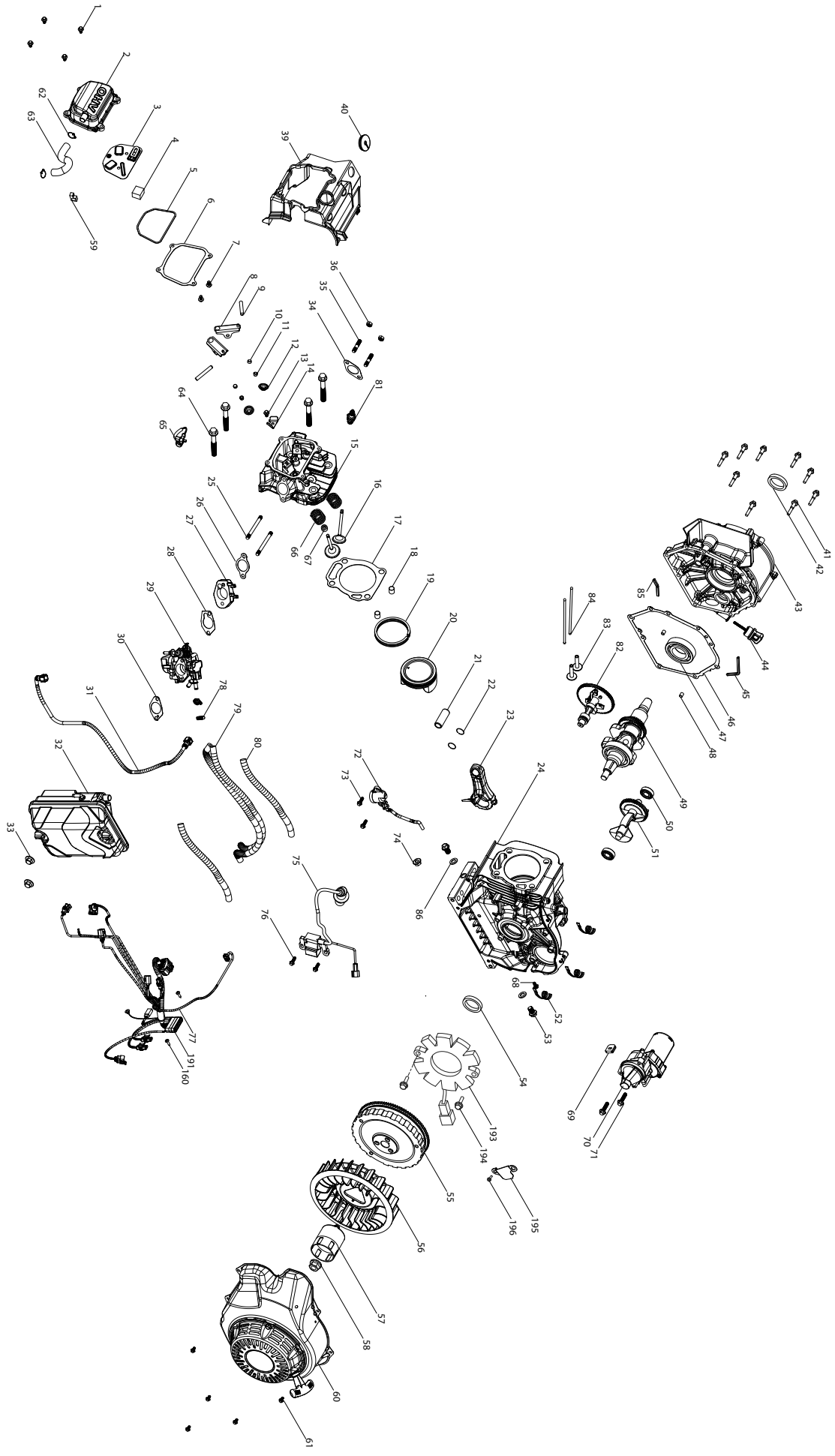
# Component List (continued)

| Part | Description | Qty |
|---|---|---|
| 102 | Bush | 4 |
| 103 | Fuel Tank | 1 |
| 104 | Pipe Clamp | 3 |
| 105 | Hose, Air Cleaner Rubber | 1 |
| 106 | Hex Socket Flange Face Bolt - Small Series | 3 |
| 107 | Guide Cover | 1 |
| 108 | Valve, One Way | 1 |
| 109 | Muffler Assembly | 1 |
| 110 | Hose, Air Cleaner Rubber | 1 |
| 111 | Nut With Flange | 2 |
| 112 | Hex Socket Flange Face Bolt - Small Series | 2 |
| 113 | Wire, Anode | 1 |
| 114 | Wire, Cathode | 1 |
| 115 | Battery | 1 |
| 116 | Thermal Baffle | 1 |
| 117 | Clamp, Battery | 1 |
| 118 | Hex Socket Flange Face Bolt - Large Series - Grade B | 2 |
| 119 | Thermal Baffle | 1 |
| 120 | Shaft, Front Wheel | 2 |
| 121 | Flat Washer - Grade A | 6 |
| 122 | Wheel, Front | 2 |
| 123 | Cotter Pin | 2 |
| 124 | Handle Tube Assembly | 1 |
| 125 | Hex Step Bolt | 2 |
| 126 | Plug, End | 2 |
| 127 | Wave Elastic Washer | 2 |
| 128 | Type 2 All Metal Hex Lock Nut With Flange | 2 |
| 129 | Strap | 1 |
| 130 | Pin Shaft | 1 |
| 131 | Sleeve, Handle Rubber | 2 |
| 132 | Hex Socket Flange Face Bolt - Small Series | 1 |
| 133 | Support Air Cleaner | 1 |
| 134 | Hex Socket Flange Face Bolt - Large Series - Grade B | 2 |
| 135 | Crosspiece Subassembly | 1 |
| 136 | Protective Rubber Sleeve | 2 |
| 137 | Hex Socket Flange Face Bolt - Small Series | 2 |
| 138 | Type 2 All Metal Hex Lock Nut With Flange | 4 |
| 139 | Support Engine Frame Shock Absorption | 2 |
| 140 | Seat, Engine Frame Shock Absorption | 2 |
| 141 | Nut With Flange | 2 |
| 142 | Nut With Flange - Fine Thread | 4 |
| 143 | Cushion, Engine Frame | 4 |
| 144 | Nut With Flange | 4 |
| 145 | Hex Socket Flange Face Bolt - Large Series - Grade B | 4 |
| 146 | Frame Assembly, Engine | 1 |
| 147 | Seat, Engine Frame Shock Absorption | 4 |

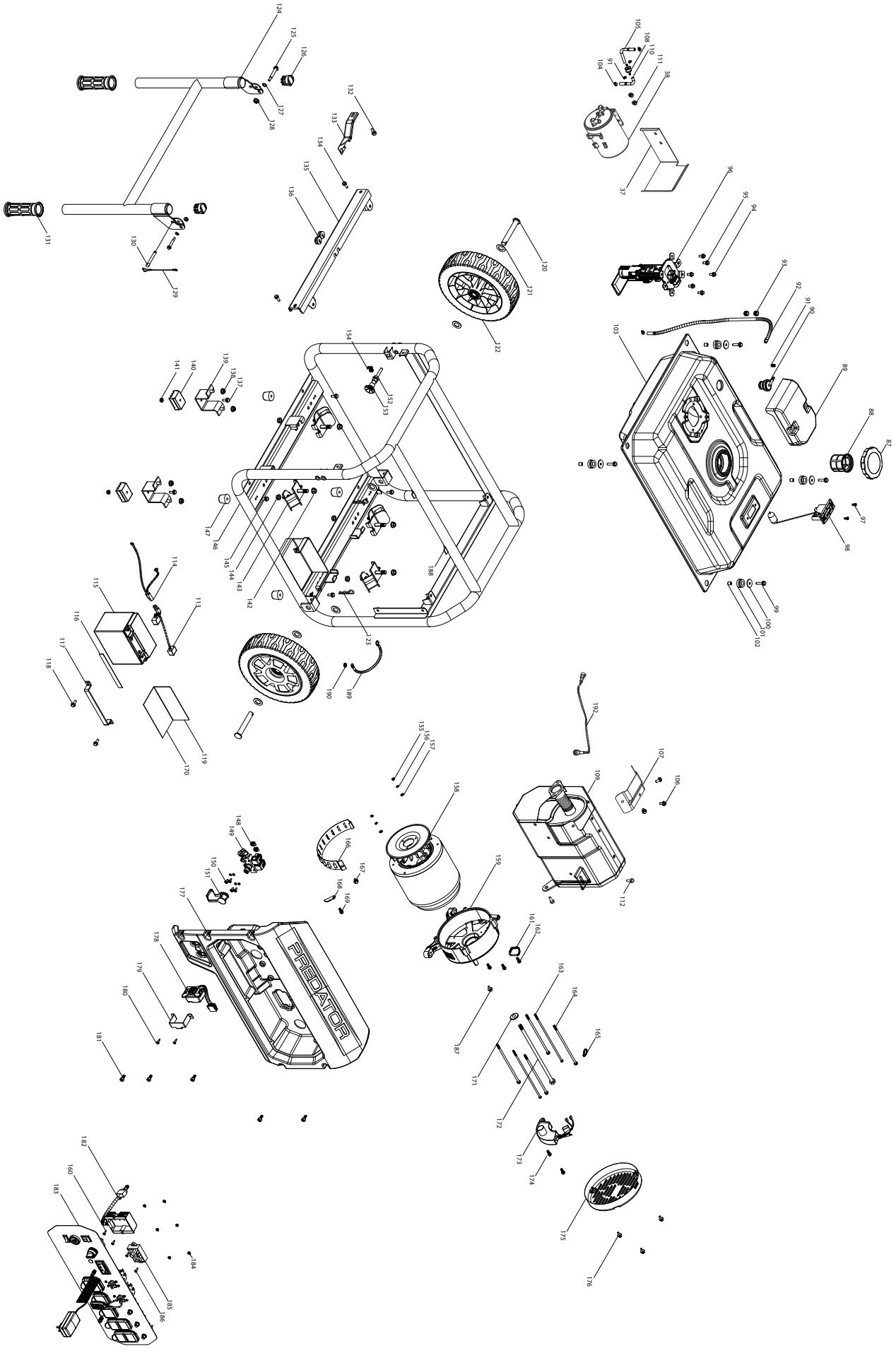
| Part | Description | Qty |
|---|---|---|
| 148 | Small Spiral Narrow Band Collar - Type A | 2 |
| 149 | Fuel Rail Assembly | 1 |
| 150 | Cross-Recessed Pan Head Screw | 4 |
| 151 | Dust-Proof Cap | 1 |
| 152 | Nut | 1 |
| 153 | Pin Shaft | 1 |
| 154 | Pipe Clamp | 1 |
| 155 | Nut Stator | 2 |
| 156 | Standard Spring Washer | 2 |
| 157 | Flat Washer - Grade A | 2 |
| 158 | Motor Assembly | 1 |
| 159 | Motor Support | 1 |
| 160 | Cross-Recessed Pan Head Screw | 4 |
| 161 | Grounding | 1 |
| 162 | Hex Socket Flange Face Bolt - Small Series | 1 |
| 163 | Stator Bolt | 2 |
| 164 | Stator Bolt | 4 |
| 165 | Band | 1 |
| 166 | Shroud, Motor | 1 |
| 167 | Hex Socket Flange Face Bolt - Small Series | 1 |
| 168 | Stopper, Motor Right Cover | 1 |
| 169 | Hex Socket Flange Face Bolt - Small Series | 1 |
| 170 | Thermal Baffle | 1 |
| 171 | Flat Washer - Grade A | 1 |
| 172 | Bolt Rotor | 1 |
| 173 | Regulator, Voltage | 1 |
| 174 | Hex Socket Flange Face Bolt - Small Series | 2 |
| 175 | Motor Tail Cover | 1 |
| 176 | Hex Socket Flange Face Bolt - Small Series | 3 |
| 177 | Seat, Panel | 1 |
| 178 | Carbon Monoxide Alarm | 1 |
| 179 | Pressure Plate | 1 |
| 180 | Self-Tapping Screw | 2 |
| 181 | Hex Socket Central Stud Pan Head Screw | 5 |
| 182 | Charger Module | 1 |
| 183 | Panel Subassembly, Control | 1 |
| 184 | Nut With Flange | 6 |
| 185 | Control Module | 1 |
| 186 | Cross-Recessed Pan Head Self-Tapping Screw | 2 |
| 187 | Hex Socket Flange Face Bolt - Small Series | 3 |
| 188 | Buffering Pad Support | 2 |
| 189 | Grounding | 1 |
| 190 | External Teeth Serrated Lock Washer | 1 |
| 191 | Controller, Electronic | 1 |
| 192 | Oxygen Sensor | 1 |
| 193 | Coil Subassembly, Charge | 1 |
| 194 | Hex Socket Flange Face Bolt - Small Series | 2 |
| 195 | Clamp, Charge Coil | 1 |
| 196 | Hex Socket Flange Face Bolt - Small Series | 1 |

The component list and assembly diagram are shown for reference only.
To view all currently available replacement parts, please visit harborfreight.com/parts

# Assembly Diagram



# Assembly Diagram (continued)



# PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE COMPONENT LISTS AND ASSEMBLY DIAGRAMS IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

R**ecord Product's Date Code Here:**_____

**Note:** If product has no date code, record month and year of purchase instead.

**Note:** Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts. Specify UPC 193175566867 when ordering parts.

# FCC STATEMENT FOR THE REMOTE

**NOTICE:** The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

# Limited 90 Day Warranty (Retail)

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS, EXCEPT FOR THE EMISSIONS CONTROL SYSTEM WARRANTY BELOW.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state. HFT also warrants that the emissions control system on your engine is designed, built, and equipped so that it conforms to the United States Environmental Protection Agency's (EPA) emissions requirements in effect at the time of manufacture.

# Emissions Control System Warranty



The California Air Resources Board and Harbor Freight Tools (HFT) are pleased to explain the emissions control system warranty on your [Model Year] and engine powered equipment. In California, new equipment that uses Small Off-Road Engine must be designed, built, and equipped to meet the State's stringent anti-smog standards. HFT must warrant that the emissions control system on your Small Off-Road Engine and engine powered equipment will be free from defects in material and workmanship for two (2) years, provided there has been no abuse, neglect, or improper maintenance of your Small Off-Road Engine or engine powered equipment. HFT also warrants that the emissions control system on your engine is designed, built, and equipped so that it conforms to the United States Environmental Protection Agency's (EPA) emissions requirements in effect at the time of manufacture.

Your emissions control system may include parts such as: carburetor or fuel-injection system, the ignition system, catalytic converter, fuel lines, fuel tanks, fuel caps, valves, canisters, filters, hoses, belts, clamps, connectors, and other emission-related assemblies or components.

Where a warrantable condition exists, HFT will repair or replace, at our option, your engine at no cost to you, including diagnosis, parts and labor.

## MANUFACTURER'S WARRANTY COVERAGE

This emissions control system is warranted for two years. If any emission-related part on your engine is defective, the part will be repaired or replaced by HFT.

## OWNER'S WARRANTY RESPONSIBILITIES

As the Small Off-Road Engine and engine powered equipment owner, you are responsible for the performance of the required maintenance listed in your Owner's Manual. HFT recommends that you retain all receipts covering maintenance on your Small Off-Road Engine/equipment, but HFT cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the Small Off-Road Engine and engine powered equipment owner, you should however be aware that HFT may deny you warranty coverage if your Small Off-Road Engine or engine powered equipment or a part has failed due to abuse (including failure to follow the fuel use instructions contained in this manual), neglect, improper maintenance, or unapproved modifications.

You are responsible for presenting your Small Off-Road Engine or engine powered equipment to HFT as soon as the problem exists. To obtain warranty repair or replacement, either: (a) contact HFT Product Support at 1-800-444-3353 or productsupport@harborfreight.com or (b) bring the Small Off-Road Engine or engine powered equipment to your nearest Harbor Freight Tools retail store. The nearest Harbor Freight Tools retail store can be found on the internet at https://www.harborfreight.com. The warranty repairs or replacement should be completed in a reasonable amount of time, not to exceed 30 days.

If you have a question regarding your warranty coverage, you should contact HFT Product Support at 1-800-444-3353 or productsupport@harborfreight.com.

## GENERAL EMISSIONS WARRANTY COVERAGE

a) The warranty period begins on the date the engine or equipment is delivered to an ultimate purchaser. The warranty period is two years.

b) HFT warrants to the ultimate purchaser and each subsequent owner that the engine is:
   1. Designed, built, and equipped so as to conform with the applicable United States Environmental Protection Agency's (EPA) emissions requirements in effect at the time of manufacture and all applicable regulations adopted by the California Air Resources Board; and
   2. Free from defects in materials and workmanship that cause the failure of a warranted part to be identical in all material respects to the part as described in the engine manufacturer's application for certification for a period of two years.

c) The warranty on emissions-related parts is as follows:
   1. Any warranted part that is not scheduled for replacement as required maintenance in the written instructions provided is warranted for the warranty period stated above. If any such part fails during the period of warranty coverage, it will be repaired or replaced by HFT. Any such part repaired or replaced under the warranty will be warranted for the remaining warranty period.
   2. Any warranted part that is scheduled only for regular inspection in the written instructions is warranted for the warranty period stated above. A statement in the written instructions to the effect of "repair or replace

as necessary" does not reduce the period of warranty coverage. Any such part repaired or replaced under warranty will be warranted for the remaining warranty period.

3. Any warranted part that is scheduled for replacement as required maintenance in the written instructions will be warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part will be repaired or replaced by HFT. Any such part repaired or replaced under warranty will be warranted for the remainder of the period prior to the first scheduled replacement point for the part.
4. At no charge to the owner, repair or replacement of any warranted part under the warranty will be performed at a retail store or by HFT shipping the product for repair.
5. Notwithstanding the provisions herein, warranty services or repairs will be provided at all retail stores or by contacting HFT Product Support at 1-800-444-3353 or productsupport@harborfreight.com.
6. The owner will not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at a retail store.
7. HFT is liable for damages to other engine components proximately caused by a failure under warranty of any warranted part.
8. Throughout the engine's and emission control system's warranty period stated above, HFT will maintain a supply of warranted parts sufficient to meet the expected demand for such parts and will obtain additional parts if that supply is exhausted.
9. Any replacement part may be used in the performance of any warranty maintenance or repairs and will be provided without charge to the owner. Manufacturer-approved replacement parts that do not increase emissions will be used in the performance of any warranty maintenance or repairs and will be provided without charge to the owner. Such use will not reduce the warranty obligations of HFT.
10. Add-on or modified parts that are not exempted by the California Air Resources Board may not be used. The use of any non-exempted add-on or modified parts will be grounds for disallowing a warranty claim. HFT is not liable to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.
11. HFT will provide any documents that describe its warranty procedures or policies upon request of the Executive Officer.

d) Emission Warranty Component List.

1. Fuel Metering System
   a. Carburetor and its internal parts (and/or pressure regulator or fuel injection system).
   b. Fuel tank.
   c. Cold start enrichment system.
   d. Air/fuel ratio feedback and control system.
2. Air Induction System
   a. Controlled hot air intake system.
   b. Intake manifold.
   c. Air filter.
3. Ignition System
   a. Spark plugs.
   b. Magneto ignition system.
   c. Spark advance/retard system.
4. Catalyst System (if so equipped)
   a. Exhaust pipe stud/exhaust manifold.
   b. Thermal reactor.
   c. Catalytic converter (if so equipped).
5. Particulate Controls
   a. Traps, filters, precipitators, and any other device used to capture particulate emissions.
6. Miscellaneous Items Used in Above Systems
   a. Vacuum, temperature and time sensitive valves and switches.
   b. Hoses, belts, connectors, and assemblies.
7. Evaporative Emission Control System
   a. Fuel tank.
   b. Fuel caps, valves, canisters, filters, vapor hoses, clamps, connectors, belts, and assemblies.
8. Air Injection System (if so equipped)
   a. Air pump or pulse valve.
   b. Valves affecting distribution of flow.
   c. Distribution manifold.

HFT provides with each product written instructions for the maintenance and use of the product by the owner.

PREDATOR®

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