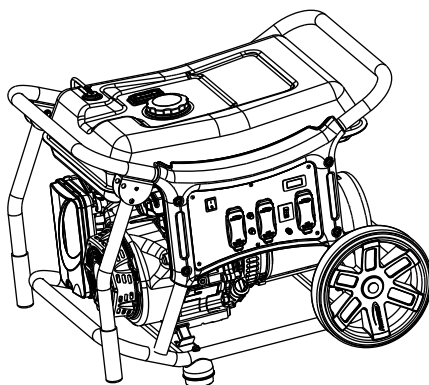




CX1400/3500/5500 Portable Generator Owner's Manual



MODEL: _____

SERIAL: _____

DATE PURCHASED: _____



⚠ WARNING

This product is not intended to be used in a critical life support application. Failure to adhere to this warning could result in death or serious injury.

(000209a)

Register your Powermate product at:
www.powermate.com
1-800-445-1805

SAVE THIS MANUAL FOR FUTURE REFERENCE

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WARNING

California Proposition 65. Engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm.

(000004)

WARNING


California Proposition 65. This product contains or emits chemicals known to the state of California to cause cancer, birth defects, and other reproductive harm.

(000005)

Section 1 Introduction and Safety

Introduction

Thank you for purchasing a Powermate product. This unit has been designed to provide high-performance, efficient operation, and years of use when maintained properly.



WARNING

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

(000100a)

If any section of the manual is not understood, contact your nearest Independent Authorized Service Dealer (IASD), or contact Powermate Customer Service at 1-800-445-1805, or www.powermate.com with any questions or concerns.

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

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

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

THE INFORMATION CONTAINED HEREIN WAS BASED ON MACHINES IN PRODUCTION AT THE TIME OF PUBLICATION. POWERMATE RESERVES THE RIGHT TO MODIFY THIS MANUAL AT ANY TIME.

Safety Rules

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

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

DANGER

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

(000001)

WARNING

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

(000002)

CAUTION

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

(000003)


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

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


Safety Symbols and Meanings

DANGER

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.

000657

DANGER

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

(000103)

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

**⚠ DANGER**

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

(000179a)

**⚠ DANGER**

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

(000104)

**⚠ DANGER**

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

(000116)

⚠ WARNING

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

(000146)

**⚠ WARNING**

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

(000178a)

⚠ WARNING

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

(000250)

**⚠ WARNING**

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

(000111)

**⚠ WARNING**

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

(000108)

⚠ WARNING

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

(000142)

⚠ WARNING

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

(000215)

⚠ WARNING

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

(000216)

⚠ WARNING

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

(000291)



000406

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

Exhaust and Location Hazards

**⚠ DANGER**

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

(000103)

**⚠ DANGER**

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

(000179a)

⚠ WARNING

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

(000146)

**⚠ WARNING**

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

(000178a)

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

Electrical Hazards



⚠ DANGER

Electrocution. Contact with bare wires, terminals, and connections while generator is running will result in death or serious injury. (000144)



⚠ DANGER

Electrocution. Water contact with a power source, if not avoided, will result in death or serious injury. (000104)



⚠ DANGER

Electrocution. In the event of electrical accident, immediately shut power OFF. Use non-conductive implements to free victim from live conductor. Apply first aid and get medical help. Failure to do so will result in death or serious injury. (000145)

⚠ WARNING

Accidental Start-up. Disconnect the negative battery cable, then the positive battery cable when working on unit. Failure to do so could result in death or serious injury. (000130)

- The National Electric Code (NEC) requires the frame and external electrically conductive parts of the generator be properly connected to an approved earth ground. Local electrical codes may also require proper grounding of the generator. Consult with a local electrician for grounding requirements in the area.
- Use a ground fault circuit interrupter in any damp or highly conductive area (such as metal decking or steel work).

Fire Hazards



⚠ DANGER

Explosion and Fire. Fuel and vapors are extremely flammable and explosive. Add fuel in a well ventilated area. Keep fire and spark away. Failure to do so will result in death or serious injury. (000105)



⚠ DANGER

Do not overfill fuel tank. Fill to 1/2 in. of top of tank to allow for fuel expansion. Overfilling may cause fuel to spill onto engine causing fire or explosion, which will result in death or serious injury. (000166)

⚠ WARNING

Do not insert any object through the air cooling slots. Generator can start at any time and could result in death, serious injury, and unit damage. (000142)



⚠ WARNING

Fire risk. Fuel and vapors are extremely flammable. Do not operate indoors. Doing so could result in death, serious injury, or property or equipment damage. (000281)



⚠ WARNING

Explosion and fire risk. Do not smoke near unit. Keep fire and spark away. Failure to do so could result in death, serious injury, or property or equipment damage. (000282)



⚠ WARNING

Explosion and fire risk. Do not smoke while refueling unit. Failure to do so could result in death, serious injury, or property or equipment damage. (000284)

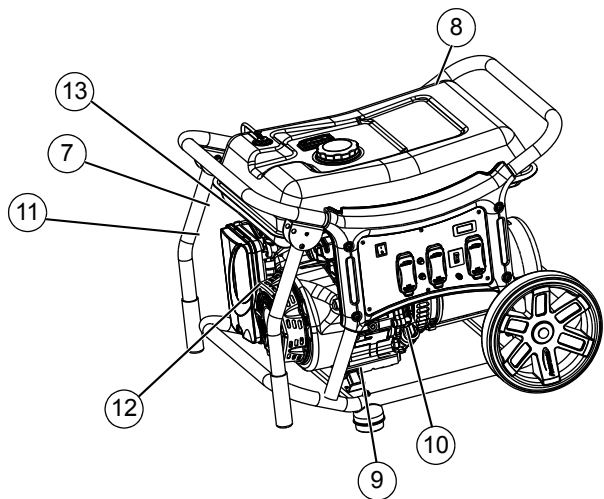
- Wipe up any fuel or oil spills immediately. Verify that no combustible materials are left on or near the generator. Keep the area surrounding the generator clean and free from debris and keep a clearance of five (5) feet on all sides to allow for proper ventilation of the generator.
- Do not operate the generator if connected electrical devices overheat, if electrical output is lost, if engine or generator sparks or if flames or smoke are observed while unit is running.
- Keep a fire extinguisher near the generator at all times.

Standards Index

1. National Fire Protection Association (NFPA) 70: The NATIONAL ELECTRIC CODE (NEC) available from www.nfpa.org
2. National Fire Protection Association (NFPA) 5000: BUILDING CONSTRUCTION AND SAFETY CODE available from www.nfpa.org
3. International Building Code available from www.iccsafe.org
4. Agricultural Wiring Handbook available from www.rerc.org, Rural Electricity Resource Council P.O. Box 309 Wilmington, OH 45177-0309
5. ASAE EP-364.2 Installation and Maintenance of Farm Standby Electric Power available from www.asabe.org, American Society of Agricultural & Biological Engineers 2950 Niles Road, St. Joseph, MI 49085

This list is not all inclusive. Check with the Authority Having Jurisdiction (AHJ) for any local codes or standards which may be applicable to your jurisdiction.

Section 2 General Information and Setup

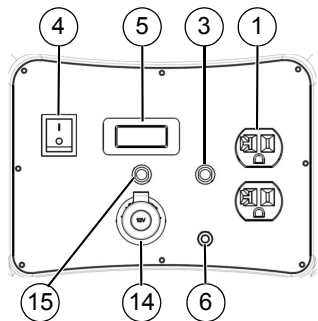


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Figure 2-1. Features and Controls

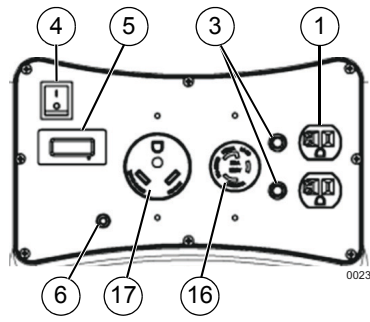
TABLE 1. Generator Components

- | | |
|----|--|
| 1 | 120 Volt AC, 20 Amp Duplex Receptacle |
| 2 | 120/240 Volt AC, 30 Amp Locking Receptacle (NEMA L14-30R) |
| 3 | Circuit Breakers (AC) |
| 4 | On/Off Switch |
| 5 | Hour Meter |
| 6 | Ground Terminal |
| 7 | Choke Lever |
| 8 | Fuel Tank |
| 9 | Oil Drain |
| 10 | Oil Fill |
| 11 | Air Cleaner |
| 12 | Recoil Handle |
| 13 | Fuel Shutoff Valve |
| 14 | Battery Charger |
| 15 | Circuit Breaker (DC) |
| 16 | 120 Volt AC, 30 Amp Locking Receptacle (NEMA L5-30R) |
| 17 | 120 Volt AC, 30 Amp Receptacle (NEMA TT-30R) |
| 18 | 2-pole Circuit Breaker (AC) |
| 19 | 120 Volt AC, 20A GFCI Duplex Receptacle (CX5500 CARB only) |



002339

Figure 2-2. CX1400 Control Panel



002340

Figure 2-3. CX3500 Control Panel (CSA/CARB)

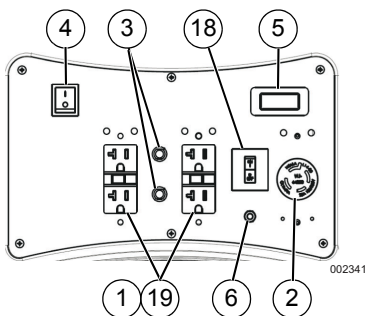


Figure 2-4. CX5500 Control Panel (CSA/CARB)

Replacement owner's manuals are available at www.powermate.com.

Emissions

The United States Environmental Protection Agency (US EPA) (and California Air Resources Board (CARB), for engines/equipment certified to California standards) requires that this engine/equipment complies with exhaust and evaporative emissions standards. Locate the emissions compliance decal on the engine to determine applicable standards. For emissions warranty information, please reference the included emissions warranty. It is important to follow the maintenance specifications in the manual to ensure that the engine complies with the applicable emissions standards for the duration of the product's life.



WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury. (000100a)

Product Specifications

Generator Specifications	1400	3500	5500
Rated Power	1400W	3500W	5500W
Surge Power	1700W	4375W	6875W
Rated AC Voltage	120	120	120/240
Rated AC Load (Amps)	11.7**	29.2**	45.8 / 22.9**
Rated Frequency	60 Hz @ 3600 RPM	60 Hz @ 3600 RPM	60 Hz @ 3600 RPM
Phase	Single Phase	Single Phase	Single Phase
Unit Weight	60 lbs. (27.2 kg)	107 lbs. (48.5 kg)	173 lbs. (78.5 kg)

** Operating Temperature Range: -18 deg. C (0 deg. F) to 40 Deg. C (104 Deg. F). When operated above 25 deg. C (77 deg. F) there may be a decrease in power.

** Maximum wattage and current are subject to, and limited by, such factors as fuel Btu content, ambient temperature, altitude, engine condition, etc. Maximum power decreases about 3.5% for each 1,000 feet above sea level; and will also decrease about 1% for each 6° C (10° F) above 16° C (60° F) ambient temperature.

Engine Specifications	1400	3500	5500
Displacement	98 cc	208 cc	420 cc
Spark Plug Part No.	NGK BPR6HS or equivalent	NGK BPR7ES or equivalent	NGK BPR7ES or equivalent
Spark Plug Gap	0.028-0.031 inch (0.70-0.80 mm)	0.028-0.031 inch (0.70-0.80 mm)	0.028-0.031 inch (0.70-0.80 mm)
Gasoline Capacity	5.7 L (1.5 U.S. gallons)	17 L (4.5 U.S. gallons)	26.5 L (7 U.S. gallons)
Oil Type	See Chart in Add Engine Oil	See Chart in Add Engine Oil	See Chart in Add Engine Oil
Oil Capacity	0.4 L (0.4 qt.)	0.6 L (0.6 qt.)	1.0 L (1.0 qt.)
Run Time at 50% Load	9.5 Hours	12 Hours	12.5 Hours

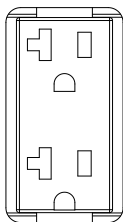
* Go to www.powermate.com or contact an IASD for replacement parts.

Connection Plugs

120 VAC, 20 Amp, Duplex Receptacle

The 120 Volt outlet is overload protected by a 20 Amp push-to-reset circuit breaker. See [Figure 2-5](#). Each receptacle will power 120 Volt AC, single phase, 60 Hz electrical loads requiring up to 2400 watts (2.4 kW) or 20 Amps of current. Use only high quality, well-insulated, 3-wire grounded cord sets rated for 125 Volts at 20 Amps (or greater).

NOTE: Limit length of extension cords to fifteen feet, or less, to prevent voltage drop and overheating of wires.



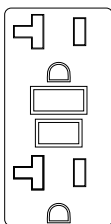
000424

Figure 2-5. 120 VAC, 20 Amp, Duplex Receptacle NEMA 5-20R

120 VAC, 20 Amp, GFCI Duplex Receptacle (if equipped)

The 120 Volt outlet is overload protected by a 20 Amp push-to-reset circuit breaker. See [Figure 2-6](#). Each receptacle will power 120 Volt AC, single phase, 60 Hz electrical loads requiring up to 2400 watts (2.4 kW) or 20 Amps of current. Use only high quality, well-insulated, 3-wire grounded cord sets rated for 125 Volts at 20 Amps (or greater). It also provides protection with a Ground Fault Circuit Interrupter with a press to TEST and RESET button.

NOTE: Limit length of extension cords to fifteen feet, or less, to prevent voltage drop and overheating of wires.



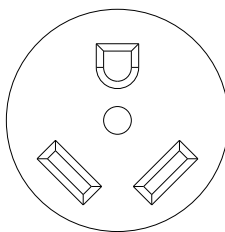
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Figure 2-6. 120 VAC, 20 Amp, GFCI Duplex Receptacle NEMA 5-20R

120 VAC, 30 Amp Receptacle

Use a NEMA TT-30R plug with this receptacle. Connect a suitable 3-wire cord set to the plug and to desired load. The cord set should be rated for 125 Volts AC at 30 Amps (or greater). See [Figure 2-7](#).

Use this receptacle to operate 120 Volt AC, 60Hz, single phase loads requiring up to 3600 watts (3.6kW) of power at 30 Amps. The outlet is protected by a 30 Amp push-to-reset circuit breaker.



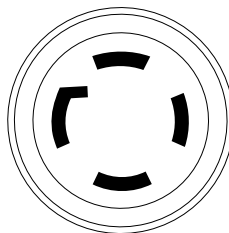
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Figure 2-7. 120 VAC, 30 Amp Receptacle NEMA TT-30R

120/240 VAC, 30 Amp Receptacle

Use a NEMA L14-30 plug with this receptacle (rotate to lock/unlock). Connect a suitable 4-wire grounded cord set to plug and desired load. The cord set should be rated 250 Volts AC at 30 Amps (or greater). See [Figure 2-8](#).

Use this receptacle to operate 120 Volt AC, 60 Hz, single phase loads requiring up to 2760 Watts (2.7 kW) of power at 23 Amps or 240 Volt AC, 60 Hz, single phase loads requiring up to 5520 watts (5.5 kW) of power at 23 Amps. The outlet is protected by a 2-pole 23 Amp toggle switch circuit breaker.



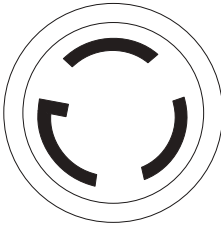
000204

Figure 2-8. 120/240 VAC, 30 Amp Receptacle NEMA L14-30R

110/120 VAC, 30 Amp Receptacle

Use a NEMA L5-30 plug with this receptacle (rotate to lock/unlock). Connect a suitable 3-wire cord set to the plug and to desired load. The cord set should be rated for 125 Volts AC at 30 Amps (or greater). See [Figure 2-9](#).

Use this receptacle to operate 120 Volt AC, 60Hz, single phase loads requiring up to 3600 watts (3.6kW) of power at 30 Amps. The outlet is protected by a 30 Amp push-to-reset circuit breaker.



000844

**Figure 2-9. 120 VAC, 30 Amp Receptacle
NEMA L5-30**

Remove Contents from Carton

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

TABLE 2. Accessories

Item - All Models	Qty.
Main Unit	1
Owner's Manual	1
Liter SAE Oil	1
Oil Funnel	1
Hardware Bag - CX1400	Qty.
Spark Plug Wrench with Rod	1
Battery Cable Set	1
Hardware Bag - CX3500	Qty.
Wheel (1)	2
Axle Pin (2)	2
Cotter Pin (3)	2
Foot Spacer (4)	2
Rubber Feet (5)	2
M10 x 4mm Flat Washer (6)	2
M6 x 25 Bolt (7)	2

M8 x 65 Bolt (8)	2
M6 Nyloc Nut (9)	2
Hardware Bag - CX5500	Qty.
Wheel (1)	2
Handle and Handle Bracket (2)	2
Axle Pin (3)	2
Cotter Pin (4)	2
Foot Spacer (5)	2
Rubber Feet (6)	2
M12 x 4mm Flat Washer (7)	2
M12 x 1.5mm Flat Washer (8)	2
M8 Flat Washer (9)	2
M8 x 50 Bolt (10)	2
M8 x 80 Bolt (11)	2
M8 Nyloc Nut (12)	4
Handle Grip (13)	2
Tool Kit	Qty.
5mm Hex Key	1
10 x 13mm Wrench	1
Spark Plug Wrench with Rod	1

3. Call Powermate Customer Service 1-800-445-1805 with the unit model and serial number for any missing carton contents.
4. Record model, serial number, and date of purchase on front cover of this manual.

Assembly



WARNING

Consult Manual. Read and understand manual completely before using product. Failure to completely understand manual and product could result in death or serious injury. (000100a)

Call Powermate Customer Service at 1-800-445-1805 for any assembly issues or concerns. Please have model and serial number available.

The following tools are required to install the accessory kit.

- See [Table 2: Accessories](#) (Tool Kit)

NOTE: The wheels are not intended for over-the-road use.

CX3500

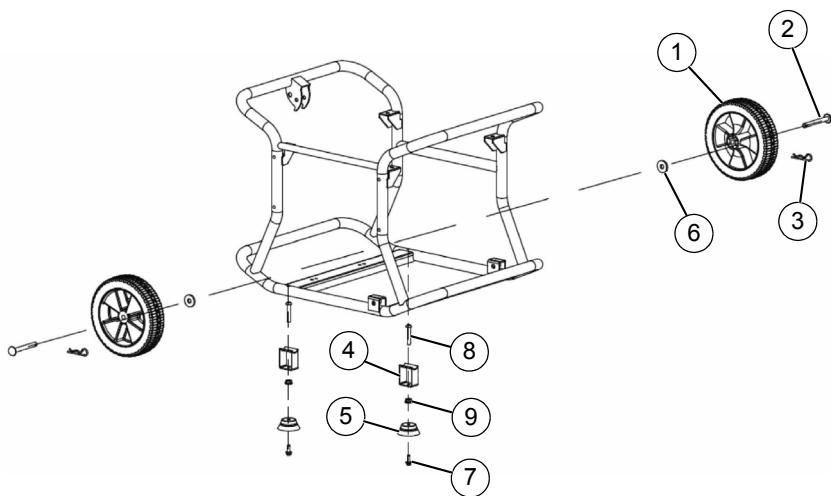
See [Figure 2-11](#).

Install wheels as follows:

1. Slide axle pin (2) through wheel (1), M10 x 4mm flat washer (6), and frame.
2. Insert cotter pin (3) through axle (2). Bend tabs (of cotter pins) outward to lock into place.

Install frame foot assembly as follows:

1. Slide rubber foot (5), M6 nyloc nut (9), and foot spacer (4) onto M6 x 25 bolt (7).
2. Align through holes in frame rail and secure with M8 x 65 bolt (8).



002346

Figure 2-10. Wheel and Foot Assembly (CX3500)

CX5500

See [Figure 2-11](#).

Install wheels as follows:

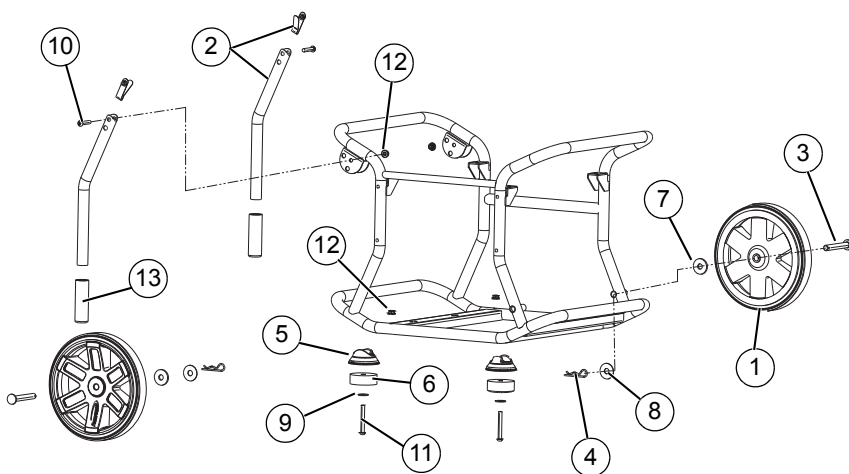
1. Slide axle pin (3) through wheel (1), M12 x 4mm flat washer (7), and frame.
2. Install M12 x 4mm flat washer (7) and insert cotter pin (4) through axle (3). Bend tabs (of cotter pins) outward to lock into place.

Install frame foot assembly as follows:

1. Slide M8 flat washer (9), rubber foot (6), foot spacer (5) onto M8 x 80 bolt (10).
2. Align through holes in frame rail and secure with M8 nyloc nut (12).

Install handle as follows:

1. Slide M8 x 50 bolt (10) through handle bracket and handle (2). Secure with M8 nyloc nut (12).



001592

Figure 2-11. Wheel, Handle and Foot Assembly (CX5500)

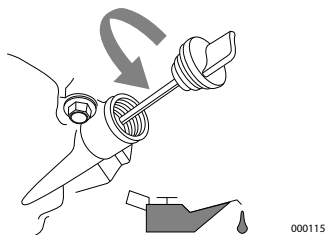
Add Engine Oil

CAUTION

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

(000135)

1. Place generator on a level surface.
2. Verify oil fill area is clean.
3. Remove oil fill cap and wipe dipstick clean. See [Figure 2-12](#).

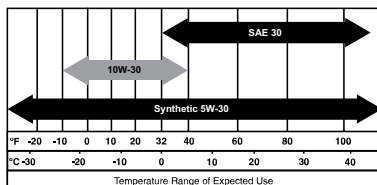


000115

Figure 2-12. Remove Dipstick

4. Add recommended engine oil. Climate determines proper engine oil viscosity. See chart to select correct viscosity.

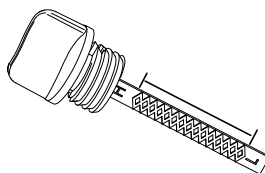
NOTE: Use petroleum based oil (supplied) for engine break-in before using synthetic oil.



000399

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

5. Thread dipstick into oil filler neck. Oil level is checked with dipstick fully installed.
6. See [Figure 2-13](#). Remove dipstick and verify oil level is within safe operating range.



000116

Figure 2-13. Safe Operating Range

7. Install oil fill cap/dipstick and hand-tighten.

Fuel



▲ DANGER

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

(000105)



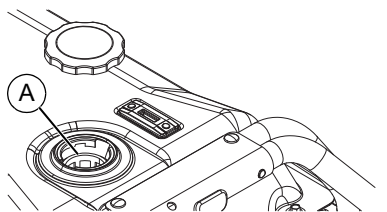
▲ DANGER

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

(000166)

Fuel requirements are as follows:

- Clean, fresh, unleaded gasoline.
 - Minimum rating of 87 octane/87 AKI (91 RON).
 - Up to 10% ethanol (gasohol) is acceptable (where available; non-ethanol-premium fuel is recommended).
 - DO NOT use E85.
 - DO NOT use a gas oil mix.
 - DO NOT modify engine to run on alternate fuels. Stabilize fuel prior to storage.
1. Verify unit is OFF and cooled for a minimum of two minutes prior to fueling.
 2. Place unit on level ground in a well ventilated area.
 3. Clean area around fuel cap and remove cap slowly.
 4. Slowly add recommended fuel. Do not fill above red fuel indicator (A). See [Figure 2-14](#).
 5. Install fuel cap.



000206

Figure 2-14. Add Recommended Fuel

NOTE: Allow spilled fuel to evaporate before starting unit.

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

Section 3 Operation

Operation and Use Questions

Call Powermate customer service at 1-800-445-1805 with questions or concerns about equipment operation and maintenance.

Before Starting Engine

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

Prepare Generator for Use



⚠ DANGER

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

(000103)



⚠ DANGER

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

(000179a)



⚠ WARNING

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

(000118a)



⚠ WARNING

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

(000178a)



⚠ WARNING

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

(000110)



⚠ WARNING

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

(000108)

⚠ CAUTION

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

(000136)

Grounding the Generator When In Use

The generator is equipped with a terminal for the connection of a grounding electrode system. Article 250.34 (A) does not require the frame of the generator to be connected to a grounding electrode system when the generator only supplies power to cord and plug connected equipment through the receptacles on the generator.

When the generator supplies power to a 3 pole manual transfer switch or distribution panel boards for temporary power, a grounding electrode system shall be installed and connected to the grounding electrode terminal on the generator. See NEC 250.30, 250.34 and 250.52 for clarification. See [Figure 3-1](#).

- Neutral Bonded to Frame

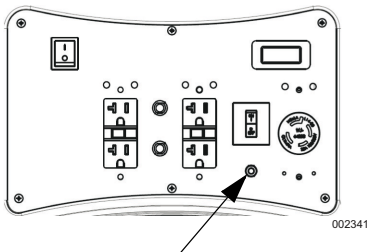


Figure 3-1. Grounding the Generator

Special Requirements

Review all Federal or State Occupational Safety and Health Administration (OSHA) regulations, local codes, or ordinances that apply to the intended use of the generator.

Consult a qualified electrician, electrical inspector, or the local agency having jurisdiction:

- In some areas, generators are required to be registered with local utility companies.
- If the generator is used at a construction site, there may be additional regulations which must be observed.

Connecting the Generator to a Building Electrical System

When connecting directly to a building electrical system, it is recommended that a manual transfer switch be used. Connections for a portable generator to a building electrical system must be made by a qualified electrician and in strict compliance with all national and local electrical codes and laws.

Know Generator Limits

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

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

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

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

Table 3. Wattage Reference Guide

Device	Running Watts
*Air Conditioner (12,000 Btu)	1700
*Air Conditioner (24,000 Btu)	3800
*Air Conditioner (40,000 Btu)	6000
Battery Charger (20 Amp)	500
Belt Sander (3")	1000
Chain Saw	1200
Circular Saw (6-1/2")	800 to 1000
*Clothes Dryer (Electric)	5750
*Clothes Dryer (Gas)	700
*Clothes Washer	1150
Coffee Maker	1750
*Compressor (1 HP)	2000
*Compressor (3/4 HP)	1800
*Compressor (1/2 HP)	1400
Curling Iron	700
*Dehumidifier	650
Disc Sander (9")	1200

Edge Trimmer	500
Electric Blanket	400
Electric Nail Gun	1200
Electric Range (per element)	1500
Electric Skillet	1250
*Freezer	700
*Furnace Fan (3/5 HP)	875
*Garage Door Opener	500 to 750
Hair Dryer	1200
Hand Drill	250 to 1100
Hedge Trimmer	450
Impact Wrench	500
Iron	1200
*Jet Pump	800
Lawn Mower	1200
Light Bulb	100
Microwave Oven	700 to 1000
*Milk Cooler	1100
Oil Burner on Furnace	300
Oil Fired Space Heater (140,000 Btu)	400
Oil Fired Space Heater (85,000 Btu)	225
Oil Fired Space Heater (30,000 Btu)	150
*Paint Sprayer, Airless (1/3 HP)	600
Paint Sprayer, Airless (hand-held)	150
Radio	50 to 200
*Refrigerator	700
Slow Cooker	200
*Submersible Pump (1-1/2 HP)	2800
*Submersible Pump (1 HP)	2000
*Submersible Pump (1/2 HP)	1500
*Sump Pump	800 to 1050
*Table Saw (10")	1750 to 2000
Television	200 to 500
Toaster	1000 to 1650
Weed Trimmer	500
* Allow 3 times the listed watts for starting these devices.	

Transporting/Tipping of the Unit

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

Starting Pull Start Engines



⚠ WARNING

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

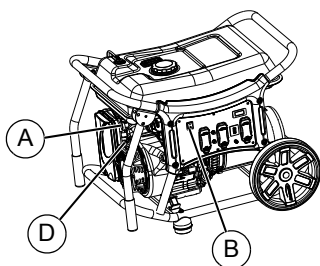
(000183)

⚠ CAUTION

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

(000136)

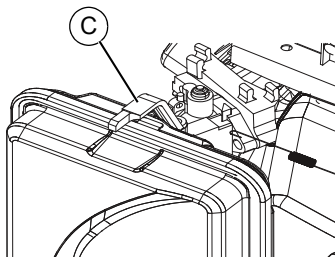
1. Unplug all electrical loads from the unit's receptacles before starting engine.
2. Place generator on a level surface.
3. See [Figure 3-2](#). Open the fuel shut-off valve (A).
4. Turn engine ON/OFF switch (B) to ON. See [Figure 3-2](#).



001593

Figure 3-2. Engine Controls

5. Slide engine choke (C) to Full CHOKE position (left). See [Figure 3-3](#).



000209

Figure 3-3. Choke Position

6. See [Figure 3-2](#). Firmly grasp recoil handle (D) and pull slowly until increased resistance is felt. Pull rapidly up and away.
7. When engine starts, move choke lever to 1/2 CHOKE position until engine runs smoothly, then fully into ON position. If engine falters, move choke back to 1/2-CHOKE position until engine runs smoothly, then to ON position.

NOTE: If engine fires, but does not continue to run, move choke lever to Full CHOKE and repeat starting instructions.

IMPORTANT NOTE: Do not overload generator or individual panel receptacles. These outlets are overload protected with push-to-reset circuit breakers. If amperage rating of any circuit breaker is exceeded, that breaker opens and electrical output to that receptacle is lost. Read [Know Generator Limits](#) carefully.

Generator Shut Down

⚠ CAUTION

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

(000136)

1. Shut off all loads and unplug electrical loads from generator panel receptacles.
2. Let engine run at no-load for several minutes to stabilize internal temperatures of engine and generator.
3. Move ON/OFF switch to OFF.
4. Close fuel valve.

NOTE: Under normal conditions, close fuel valve and allow generator to run carburetor bowl out of fuel. For emergencies, switch to OFF.

Low Oil Level Shutdown System

The engine is equipped with a low oil level sensor that shuts down the engine automatically when the oil level drops below a specified level. The engine will not run until the oil has been filled to the proper level.

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

Section 4 Maintenance and Troubleshooting

Maintenance

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

NOTE: Call Powermate customer service at 1-800-445-1805 with questions about component replacement.

Maintenance Schedule

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

NOTE: Adverse conditions will require more frequent service.

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

At Each Use
Check engine oil level
Every 100 Hours or Every Season*
Change oil ‡
Change fuel filter
Every Season
Replace spark plug
Check valve clearance***
Every 200 Hours or Every Season
Inspect/clean air filter**
‡ Change oil after first 30 hours of operation, then every season. * Change oil and oil filter every month when operating under heavy load or in high temperatures. ** Clean more often under dirty or dusty operating conditions. Replace air filter parts if they cannot be adequately cleaned. *** Check valve clearance and adjust if necessary after first 50 hours of operation and every 100 hours thereafter.

Preventive Maintenance

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

WARNING

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

(000142)

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

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

Engine Maintenance

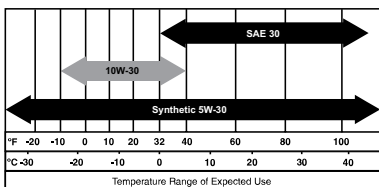
WARNING

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

(000141)

Engine Oil Recommendations

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



000399

Inspect Engine Oil Level



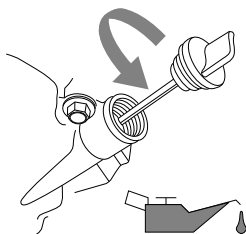
⚠ WARNING

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

(000139)

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

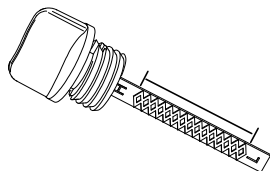
1. Place generator on a level surface.
2. Clean area around oil fill.
3. See Figure 4-1. Remove oil fill cap and wipe dipstick clean.



000115

Figure 4-1. Engine Oil Fill

4. Screw dipstick into filler neck. Remove dipstick and verify oil level is within safe operating range. See [Figure 4-2](#).



000116

Figure 4-2. Safe Operating Range

5. Add recommended engine oil as necessary.
6. Install oil fill cap and hand-tighten.

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

Change Engine Oil

⚠ WARNING

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

(000141)

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

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

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

1. Place generator on a level surface.
2. Disconnect the spark plug wire from the spark plug and place the wire where it cannot contact spark plug.
3. Clean area around oil fill, and oil drain plug.
4. Remove oil fill cap.
5. Remove oil drain plug and drain oil completely into a suitable container.
6. Install oil drain plug and tighten securely.
7. Slowly pour oil into oil fill opening until oil level is within safe operating range. DO NOT overfill.
8. Install oil fill cap, and hand-tighten.
9. Wipe up any spilled oil.
10. Properly dispose of oil in accordance with all applicable regulations.

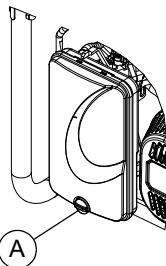
Air Filter

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

To service air filter:

1. See [Figure 4-3](#). Turn knob (A) and remove air filter cover.
2. Wash in soapy water. Squeeze filter dry in clean cloth (DO NOT TWIST).
3. Clean air filter cover before re-installing it.

NOTE: To order a new air filter, contact the nearest authorized service center at 1-888-436-3722.



000379

Figure 4-3. Air Filter Assembly

Service Spark Plug

To service spark plug:

1. Clean area around spark plug.
2. Remove and inspect spark plug.
3. Inspect electrode gap with wire feeler gauge and reset spark plug gap to 0.028-0.031 in (0.7-0.8 mm). See [Figure 4-4](#).

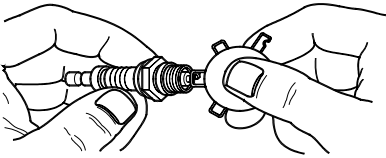


Figure 4-4. Spark Plug

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

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

Inspect Muffler and Spark Arrestor

NOTE: It is a violation of California Public Resource Code, Section 4442, to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrestor, as defined in Section 4442, maintained in effective working order. Other states or federal jurisdictions may have similar laws.

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

NOTE: Use ONLY original equipment replacement parts.

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

Inspect Spark Arrestor Screen (CARB models)



⚠ WARNING

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

(000108)

1. See [Figure 4-5](#). Loosen screw and remove retainer clamp (A) and retainer (B).
2. Remove retainer screw (C) from muffler outlet tube.

3. Remove screen (D) and replace if torn, perforated or otherwise damaged. If screen is not damaged, clean with commercial solvent.
4. Replace screen and retainer, secure with screw.
5. Install clamp.

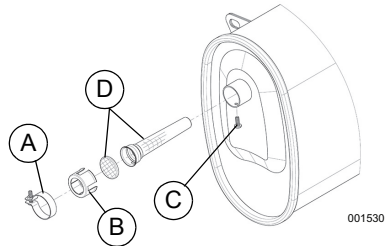


Figure 4-5. Spark Arrestor Screen

Valve Clearance

IMPORTANT NOTE: If uncomfortable about doing this procedure, or the proper tools are not available, take generator to the nearest service center to have valve clearance adjusted.

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

- Intake – 0.1mm ± 0.02mm (cold), (0.004" ± 0.001" inches)
- Exhaust – 0.15mm ± 0.02mm (cold), (0.006" ± 0.001" inches)

Storage

General



⚠ DANGER

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

(000143)



⚠ WARNING

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

(000109)

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

- DO NOT place a storage cover on a hot generator. Allow unit to cool to room temperature before storage.
- DO NOT store fuel from one season to another unless properly treated.
- Replace fuel container if rust is present. Rust in fuel will cause fuel system problems.

-
- Cover unit with a suitable protective, moisture resistant cover.
 - Store unit in a clean and dry area.
 - Always store generator and fuel away from heat and ignition sources.

Prepare Fuel System for Storage

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

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

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

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



WARNING

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

(000181)

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

Change Oil

Change engine oil before storage. See [Change Engine Oil](#).

Troubleshooting

PROBLEM	CAUSE	CORRECTION
Engine is running, but AC output is not available.	<ol style="list-style-type: none"> 1. Circuit breaker OPEN. 2. Poor connection or defective cord set. 3. Connected device is bad. 4. Fault in generator. 5. GFCI receptacle is OPEN (if equipped). 	<ol style="list-style-type: none"> 1. Reset circuit breaker. 2. Check and repair. 3. Connect another device that is in good condition. 4. Contact IASD. 5. Correct ground fault and press reset button on GFCI receptacle (if equipped).
Engine runs well at no-load, but bogs when load is applied.	<ol style="list-style-type: none"> 1. Short circuit in a connected load. 2. Generator is overloaded. 3. Engine speed is too slow. 4. Shorted generator circuit. 5. Dirty fuel filter. 	<ol style="list-style-type: none"> 1. Disconnect shorted electrical load. 2. See Know Generator Limits. 3. Contact IASD. 4. Contact IASD. 5. Replace fuel filter.
Engine will not start; or starts and runs rough.	<ol style="list-style-type: none"> 1. ON/OFF switch is OFF. 2. Fuel shut-off is OFF. 3. Dirty air filter. 4. Out of fuel. 5. Stale fuel. 6. Spark plug wire not connected to spark plug. 7. Bad spark plug. 8. Water in fuel. 9. Overchoking. 10. Low oil level. 11. Excessive rich fuel mixture. 12. Intake valve stuck open or closed. 13. Engine lost compression. 14. Dirty fuel filter. 	<ol style="list-style-type: none"> 1. Turn ON/OFF switch ON. 2. Turn fuel shut-off ON. 3. Clean or replace air filter. 4. Fill fuel tank. 5. Drain fuel tank and fill with fresh fuel. 6. Connect wire to spark plug. 7. Replace spark plug. 8. Drain fuel tank; fill with fresh fuel. 9. Set choke to no choke position. 10. Fill crankcase to correct level. 11. Contact IASD. 12. Contact IASD. 13. Contact IASD. 14. Replace fuel filter.
Engine shuts down during operation.	<ol style="list-style-type: none"> 1. Out of fuel. 2. Low oil level. 3. Fault in engine. 	<ol style="list-style-type: none"> 1. Fill fuel tank. 2. Fill crankcase to correct level. 3. Contact IASD.
Engine lacks power.	<ol style="list-style-type: none"> 1. Load is too high. 2. Dirty air filter. 3. Engine needs to be serviced. 4. Dirty fuel filter. 	<ol style="list-style-type: none"> 1. Reduce load (see Know Generator Limits). 2. Clean or replace air filter. 3. Contact IASD. 4. Replace fuel filter.
Engine surges or stumbles.	<ol style="list-style-type: none"> 1. Choke is opened too soon. 2. Carburetor is running too rich or too lean. 	<ol style="list-style-type: none"> 1. Set choke to halfway position until engine runs smoothly. 2. Contact IASD.

Notes



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Powermate, LLC
S45 W29290 Hwy. 59
Waukesha, WI 53189
1-800-445-1805
www.powermate.com