



PP0100363 / PP0100365

Water Pumps

Owner's Manual



000789

MODEL: _____

SERIAL: _____

DATE PURCHASED: _____

Register your Powermate® product at:
WWW.POWERMATE.COM
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 equipment 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 Authorized Dealer, 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 water pump:

- Study all warnings in this manual and on the product carefully.
- Become familiar with this manual and the equipment 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 equipment 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 water pump, 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

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

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



⚠ 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)



⚠ WARNING

Risk of Fire. Hot surfaces could ignite combustibles, resulting in fire. Fire could result in death or serious injury. (000110)



⚠ WARNING

Hearing Loss. Hearing protection is recommended when using this machine. Failure to wear hearing protection could result in permanent hearing loss. (000107)



⚠ 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

Risk of Fire. Verify machine has properly cooled before installing cover and storing machine. Hot surfaces could result in fire. (000109)



⚠ 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

Risk of Falling. Use of machine creates wet areas and trip hazards. Be aware of work area conditions. A fall could result in death or serious injury. (000112)



⚠ WARNING

Risk of Falling. Do not use this machine or any components on elevated surfaces. Doing so can result in a fall, serious injury or death. (000114)



⚠ WARNING

Recoil Hazard. Recoil could retract unexpectedly if water pressure is not properly relieved from pump, creating kickback. Kickback could result in death or serious injury. (000113)



⚠ 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)



⚠ WARNING

Moving Parts. Do not wear jewelry when starting or operating this product. Wearing jewelry while starting or operating this product could result in death or serious injury. (000115)



⚠ 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)



⚠ DANGER

Risk of fire. Allow fuel spills to completely dry before starting engine. Failure to do so will result in death or serious injury. (000174)

Exhaust Hazards

- The water pump **MUST** be operated outdoors.
- If you start to feel sick, dizzy, or weak after the water pump has been running, move to fresh air **IMMEDIATELY**. See a doctor, as you could have carbon monoxide poisoning.
- Keep exhaust gas from entering a confined area through windows, doors, ventilation intakes, or other openings. Warn any occupants inside about the symptoms of carbon monoxide so they know to move to fresh air if they begin to feel ill.
- The use of a carbon monoxide detector inside any occupied premises between the water pump and the occupant is recommended.
- If operating the water pump in a trench or pit, do not enter the area while the engine is running. Carbon monoxide will accumulate in enclosed areas.
- Use a respirator or mask whenever there is a chance that harmful gas or vapors might be inhaled.
- Adequate, unobstructed flow of cooling and ventilating air is critical to correct water pump operation. Do not alter the installation or permit even partial blockage of ventilation provisions, as this can seriously affect safe operation of the water pump.

- This exhaust system must be properly maintained. Do nothing that might render the exhaust system unsafe or in noncompliance with any local codes and/or standards.

Fire Hazards



▲ DANGER

Explosion and Fire. Do not overfill fuel tank. Overfilling may cause fuel to leak and ignite or explode, resulting in death or serious injury.

(000204)

- Wipe up any fuel or oil spills immediately. Verify that no combustible materials are left on or near the water pump.
- Reflective exhaust heat may damage the fuel tank, causing fire. Keep at least five (5) feet (152 cm) of clearance on all sides of the pump for adequate cooling, maintenance, and servicing.
- 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 the original equipment manufacturer, retailer, or dealer to obtain a spark arrestor designed for the exhaust system installed on this engine..

Fuel Hazards

- Turn water pump OFF and let it cool at least two (2) minutes before removing fuel cap. Loosen cap slowly to relieve pressure in tank.
- Fill or drain fuel tank outdoors.
- Keep fuel away from sparks, open flames, pilot lights, heat, and other ignition sources.
- DO NOT light a cigarette or smoke.

Before Starting Equipment

- **There is no oil in the engine.** The crankcase must be filled before starting the engine for the first time. See ["Add Engine Oil."](#)
- Verify spark plug, muffler, fuel cap, and air cleaner are in place.
- DO NOT crank engine with spark plug removed.
- Keep your hands and body clear from the discharge of the pump.
- Make sure all connections are tight.
- Secure the pump. Loads from the hoses may cause it to tip over.
- Secure the discharge hose to avoid whipping.

When Operating Equipment

- NEVER place discharge hose near a power source.
- Do not allow children near the pump while it is operating.
- DO NOT tip engine or equipment at angle which causes fuel to spill.
- DO NOT pump chemicals or flammable liquids, such as fuel, or fuel oils.
- Secure the pump. Loads from the hoses may cause it to tip over.
- Operate water pump only on level surfaces.
- Do not submerge the pump.
- Never use the water pump or any of its parts as a step. Stepping on the equipment can stress and break parts, and may result in dangerous operating conditions from leaking exhaust gases, fuel leakage, oil leakage, etc.
- DO NOT stop the engine by moving the choke lever to the CHOKE position.

When Transporting or Repairing Equipment

- Transport/repair with fuel tank EMPTY.
- Disconnect spark plug wire.
- For safety reasons, it is recommended that the maintenance of this equipment be performed by an Authorized Dealer. Inspect the water pump regularly, and contact the nearest Authorized Dealer for parts needing repair or replacement.
- When working on this equipment, remain alert at all times.
- Never work on the equipment when physically or mentally fatigued.
- Replacement parts must be the same and installed in the same position as the original parts.

When Storing Fuel or Equipment with Fuel In Tank

Store away from furnaces, stoves, water heaters, clothes dryers, or other appliances that have pilot light or other ignition source because they can ignite fuel vapors.

Section 2 General Information and Setup

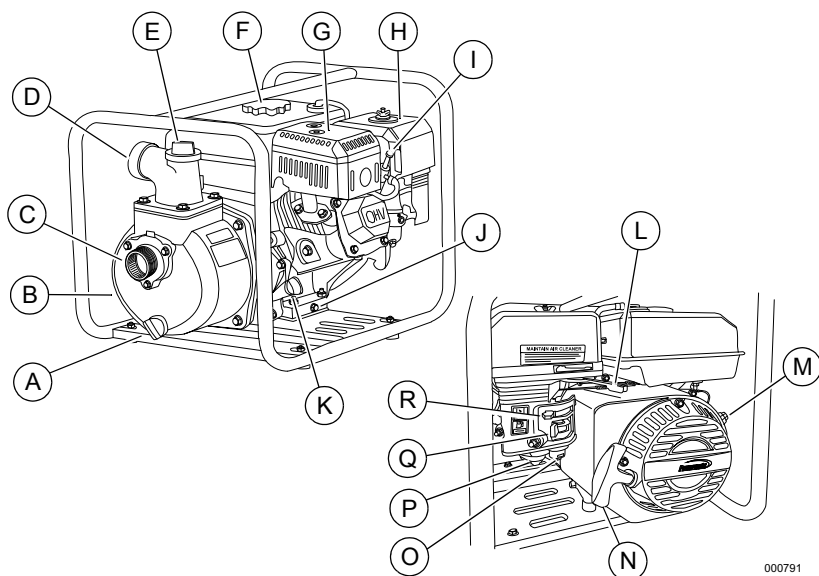


Figure 2-1. Features and Controls

TABLE 1. Water Pump Components

A	Water Drain Plug
B	Pump Housing
C	Suction Port
D	Discharge Port
E	Water Priming Plug
F	Fuel Cap
G	Muffler
H	Air Cleaner (Inside Cover)
I	Spark Plug
J	Oil Drain Plug
K	Oil Fill Cap/Dipstick
L	Throttle
M	Engine Start Switch
N	Recoil Starter Handle
O	Sediment Cup
P	Carburetor Bowl
Q	Fuel Valve
R	Choke Lever

Know Your Water Pump



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)

Read this manual thoroughly before assembling and operating this equipment. Save this manual for future and immediate reference. Replacement owner's manuals are available at www.powermate.com.

This pump is designed to pump clear water only. Do not use for pumping the following:

- Seawater
- Drinking water
- Kerosene
- Fuel, oil, or solvents
- Chemicals

Emissions Information

The U.S. Environmental Protection Agency (and California Air Resource Board for equipment certified to CA standards) requires that this engine comply with exhaust and evaporative emission standards. Locate the emissions compliance decal on the engine to determine what standards the engine meets, and to determine which emissions warranty applies. The engine is certified to meet the applicable emission standards on gasoline. It is important to follow the maintenance specifications in [Maintenance and Troubleshooting](#) to verify that the engine complies with the applicable emission standards for the duration of the product's life. Tampering with or altering the emission control system may increase emissions and may be a violation of Federal or California Law. Acts that constitute tampering include but are not limited to:

- Removal or alteration of any part of the intake, fuel, or exhaust systems.

- Altering or defeating the governor linkage or speed-adjusting mechanism to cause the engine to operate outside its design parameters.

Have the engine inspected and repaired by a servicing dealer if these symptoms develop:

- Hard starting or stalling after starting
- Rough idle
- Misfiring or backfiring under load
- Afterburning (backfiring)
- Black exhaust smoke or high fuel consumption

NOTE: Maintenance, replacement, or repair of emissions control devices and systems may be performed by small engine repair establishment or individual. To be covered by warranty, all emissions control service work must be performed by a factory Authorized Dealer. See emissions warranty for further details.

Product Specifications

—	PP0100363	PP0100365
General Specifications		
Net Weight	58 lb (26 kg)	62 lb (28 kg)
Standard Accessories	2 in. Hose Kit (Part #PA0650201)	
Pump Specifications		
Connection Diameter	2 in (50 mm)	3 in (76 mm)
Connection Thread	NPT Thread	
Total Dynamic Head	82 ft (25 m)	85 ft (26 m)
Delivery Volume	158 USG/min (600 L/min)	260 USG/min (984 L/min)
Maximum Suction Head	23 ft (7.01 m) *	
Engine Specifications		
Model	Powermate Air-Cooled 4-Stroke OHV Single Cylinder	
Exhaust Volume	10.9 in ³ (179 cc)	
Output Power	6.0 HP (4.47 kW)	
Fuel	Automotive Unleaded Gasoline	
Fuel Tank Capacity	0.95 USG (3.6 L)	
Starting Method	Recoil Starter	
Spark Plug	BPR6ES (NGK) or W20EPR-U (Denso)	
Continuous Operating Time	Approximately 2 hours (full tank)	
* Maximum suction head is reduced at high elevations. See High Altitude Operation .		

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 one each of the following:
 - Main Equipment
 - Parts Bag (includes):
 - Owner's Manual
 - Engine Owner's Manual

- Owner's Registration Card
- Spark Plug Wrench (1)

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

Add Engine Oil

CAUTION

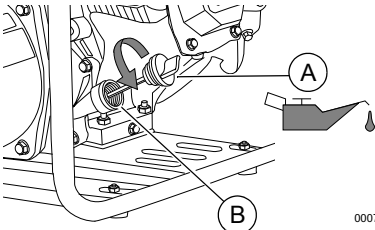
Engine damage. Verify proper type and quantity of engine oil prior to starting engine. Failure to do so could result in engine damage.

(000135)

There is no oil in the engine. The crankcase must be filled before starting the engine for the first time.

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

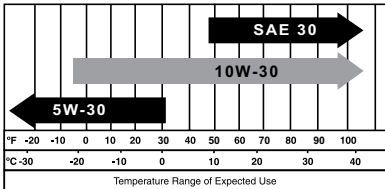
1. Place water pump on a level surface.
2. Verify oil fill area is clean.
3. Remove oil fill cap (A) and wipe dipstick clean. See Figure 2-2.



000794

Figure 2-2. Remove Dipstick

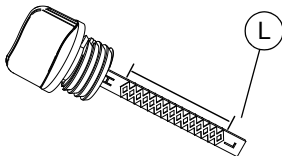
4. Add recommended engine oil to the bottom of the oil fill hole (B). Refer to Figure 2-3 for proper oil viscosity.



000912

Figure 2-3. Recommended Oil

5. Thread dipstick into oil filler neck. Oil level is checked with dipstick fully installed.
6. See Figure 2-4. Remove dipstick and verify oil level is within safe operating range above the lower limit (L).



000116

Figure 2-4. Safe Oil Operating Range

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

Add 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



Explosion and Fire. Do not overfill fuel tank. Overfilling may cause fuel to leak and ignite or explode, resulting in death or serious injury.

(000204)

Fuel requirements are as follows:

- Clean, fresh, unleaded gasoline.
 - Minimum rating of 87 octane/87 AKI (91 RON).
 - Up to 10% ethanol (gasohol) is acceptable.
 - DO NOT use E85.
 - DO NOT use a gas oil mix.
 - DO NOT modify engine to run on alternate fuels. Stabilize fuel prior to storage.
1. Verify equipment is OFF and cooled for a minimum of two minutes prior to fueling.
 2. Place equipment on level ground in a well ventilated area.
 3. Clean area around fuel cap and remove cap slowly.



000117

Figure 2-5. Add Recommended Fuel

4. Slowly add recommended fuel. Do not overfill.
5. Install fuel cap.



DANGER

Risk of fire. Allow fuel spills to completely dry before starting engine. Failure to do so will result in death or serious injury.

(000174)

IMPORTANT: 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 [Storage](#). Never use engine or carburetor cleaner products in the fuel tank as permanent damage may occur.

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.

Installing the Hoses

⚠ CAUTION

Equipment damage. Use only hoses and couplings designed for this pump. Incorrect hoses and couplings can cause performance issues and permanent equipment damage. (000197)

IMPORTANT NOTE: Verify that both hoses are rated for water temperatures of 41° to 113°F (5° to 45° C). Hotter or colder water can rupture the hoses.

1. Place water pump in desired operating location.
2. See Figure 2-6. Connect the suction hose (A) by threading the hose nut (B) onto the pump flange (C).

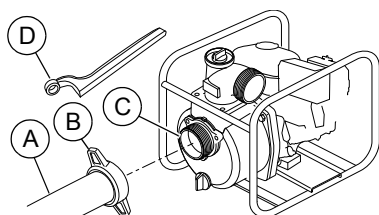


Figure 2-6. Connecting the Hoses

3. Tighten the hose nut with the spanner wrench (D).

NOTE: Do not overtighten the hose nuts. Overtightening the hose nuts will damage or crack the threads.

4. Connect the discharge hose using the same procedure.
5. See Figure 2-7. Attach the strainer (E) to the end of the suction hose.

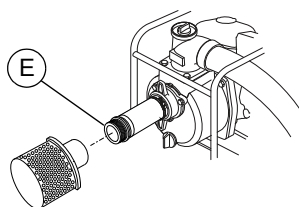


Figure 2-7. Attaching the Strainer

Priming the Pump

IMPORTANT NOTE: Failure to prime the pump will cause pump damage and void the warranty.

See Figure 2-8. Remove water priming plug (A) and fill the pump with water. Replace water priming plug.

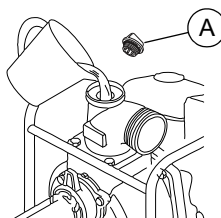


Figure 2-8. Water Priming Plug

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 fresh fuel level is correct.
3. Verify all fittings and couplers are properly secured.
4. Verify hoses are properly connected.
5. Verify equipment is secure on level ground, with proper clearance and is in a well ventilated area.

Placing Water Pump 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)



⚠ 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)

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. Place the pump on a level surface free from any obstructions or potential hazards. The pump should be placed close to the water level to ensure maximum performance.

- Only operate water pump outdoors in a well ventilated area. Never operate water pump indoors, or in a confined space. Be aware of building openings and ventilation systems where exhaust may enter during use.
- Keep at least five (5) ft (152 cm) of clearance on all sides of water pump including overhead. Verify water pump is placed on level ground to avoid tipping during operation.
- Submerge strainer.

NOTE: Suspend the strainer if there is any mud or sand present at the bottom of the water.

- Place discharge hose in appropriate location to drain water. Verify that the hose opening is unobstructed.

⚠ CAUTION

Equipment damage. The hose can be damaged if it comes in contact with the hot engine muffler. Keep hose away from muffler during operation.

(000124)

Pump Output

See Figure 3-1. Pump output will be affected by the type, length, and size of the suction and discharge hoses. Suction head is the distance (A) from the water intake to the suction port. The pumping height, total head, is the distance (B) from the water intake to the point of discharge. As total head increases, the pump output decreases. The discharge capacity is greater than the suction capacity. Therefore, it is important to keep the suction head less than the total head. The time required to draw water from the source to the pump (self-priming time) can be decreased by minimizing the suction head.

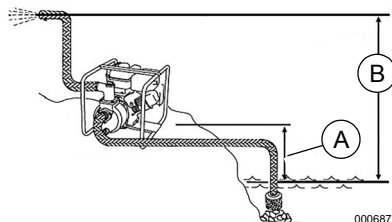


Figure 3-9. Pump Output

High Altitude Operation

This equipment produces maximum suction lift at elevations below 1000 ft (305 m). For every increase of 1000 ft (305 m) above sea level:

- the engine will lose about 3% of its power
- total head will be reduced by about 10 in (25 cm).

Lower atmospheric pressure results in slower engine speeds and reduced water flow through the pump.

Transporting / Tipping

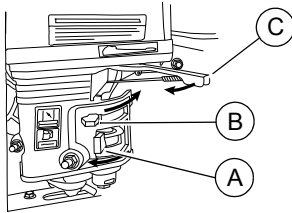
Do not operate, store or transport the equipment at an angle greater than 15 degrees.

Starting the Engine

⚠ CAUTION

Equipment damage. Before starting engine, verify pump is primed with water and suction strainer is submerged. Failure to do so will cause pump damage and void the warranty. (000203)

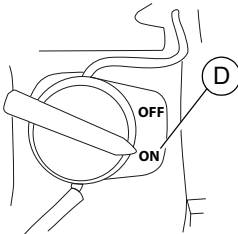
1. Remove water priming plug and fill the pump with water. Replace water priming plug.
2. See Figure 3-2. Move fuel valve lever (A) to ON position.



000841

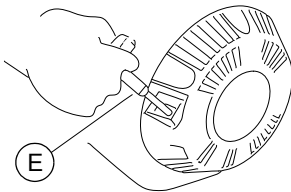
Figure 3-10. Starting the Engine

3. Move choke lever (B) to CLOSED position.
- NOTE:** For warm engine, leave choke lever in OPEN position.
4. Move throttle lever (C) about 1/3 away from the MIN position.
5. See Figure 3-3. Turn engine switch (D) ON.



000128

Figure 3-11. Engine Switch



000823

Figure 3-12. Engine Recoil

⚠ WARNING



Recoil Hazard. Recoil could retract unexpectedly if water pressure is not properly relieved from pump, creating kickback. Kickback could result in death or serious injury. (000113)

6. Grasp recoil handle (E) and pull slowly until you feel some resistance. Then pull rapidly to start engine. Return recoil handle slowly. DO NOT let recoil snap back against recoil housing.
7. When engine starts, slowly move choke lever to OPEN position as engine warms. If engine falters, move choke lever to CLOSE position, then to OPEN position.
- If engine fails to start after six pulls, move choke lever to "OPEN" position, and repeat step 6.
8. When the engine is running smoothly, adjust the throttle lever to set the desired engine speed.



⚠ 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)

Preventing Water Hammer

Water hammer occurs when the discharge flow is suddenly blocked or stopped. Pressurized water trapped inside the pump can crack the pump housing. To prevent water hammer:

- Do not close the discharge valve while the pump is operating.
- Do not allow vehicles to drive over the discharge hose.
- Do not abruptly compress the discharge hose.

Water Pump Shut Down

1. Move throttle lever from fast to slow.
2. Turn engine switch OFF.
3. Move fuel valve lever to OFF position.
4. Allow the engine to cool thoroughly.

After Each Use

After cooling, remove the priming plug (A) and drain plug (B) from the pump housing and allow it to drain thoroughly.

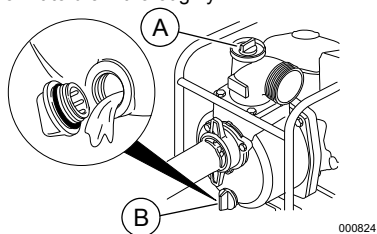


Figure 3-13. Draining Pump Housing

NOTE: DO NOT allow water to remain in pump after use. Trapped water can freeze and crack the pump housing.

Follow these procedures after every use:

1. Drain pump housing.
2. Disconnect hoses.
3. Wipe pump with a clean, dry cloth to remove excess water and dirt.
4. Store equipment in a clean, dry area.

NOTE: If storing for more than 30 days, see [Storage](#).

Section 4 Maintenance and Troubleshooting

Maintenance Recommendations

Regular maintenance will improve performance and extend water pump life. See an Authorized Dealer for service.

Water pump warranty does not cover items subjected to operator abuse or negligence. To receive full warranty value, operator must maintain water pump as instructed in this manual, including proper storage as detailed in [Storage](#).

NOTE: Call 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.

Before Each Use
Check engine oil level
Check air cleaner
Check and retighten fasteners
After Each Use
Drain water from pump
Every 3 Months or 50 Hours
Service air cleaner*
Change oil ‡
Every 6 Months or 100 Hours
Service air cleaner*
Clean sediment cup
Check and adjust spark plug
Clean spark arrestor (if equipped)
Every Year or 300 Hours
Replace air filter elements*
Check and adjust valve clearance
Replace spark plug
Clean fuel tank
‡ Change oil every 8 hours during first 20 hours of operation, and every 50 hours thereafter.
* Service more often in dusty or dirty conditions.

Preventive Maintenance

Dirt or debris can cause improper operation and equipment damage. Clean water pump daily or before each use. Keep area around and behind muffler free from combustible debris.

- 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 [172 kPa]) may be used to blow away dirt.

Engine Maintenance

⚠ WARNING

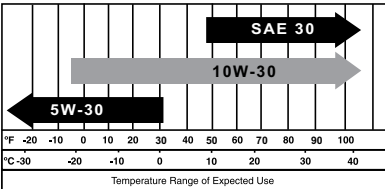
Accidental start-up. Disconnect spark plug wires when working on unit. Failure to do so could result in death or serious injury.

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Engine Oil Recommendations

Only high-quality detergent oils classified for service SJ or higher are recommended. DO NOT use special additives.

5. Climate determines proper engine oil viscosity. Refer to Figure 4-1.



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Figure 4-1. Recommended Oil

Inspect Engine Oil Level

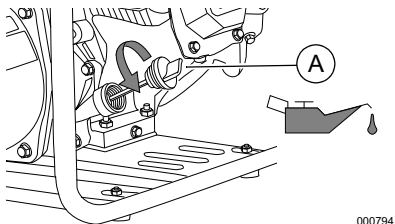
⚠ WARNING

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

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

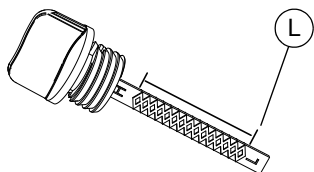
1. Place water pump on a level surface.
2. Clean area around oil fill.
3. See Figure 4-2. Remove oil fill cap (A) and wipe dipstick clean.



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Figure 4-2. Engine Oil Fill

4. Screw dipstick into filler neck. Verify oil level is within safe operating range above the lower limit (L) on dipstick. See Figure 4-3.



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Figure 4-3. Safe Oil Operating Range

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

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.

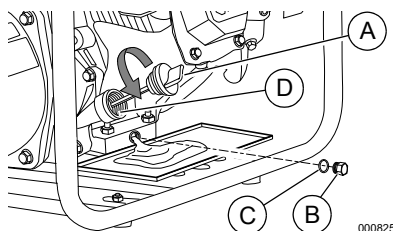
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When using water pump under extreme, dirty, dusty conditions, or in extremely hot weather, change oil more frequently.

NOTE: Properly dispose of used oil in accordance with all local laws and regulations.

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

1. Disconnect the spark plug wire from the spark plug and place the wire where it cannot contact spark plug.
2. Place a suitable collection container beneath the engine.
3. See Figure 4-4. Remove oil fill cap (A).



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Figure 4-4. Changing Engine Oil

4. Remove the oil drain plug (B) and discard the washer (C). Drain oil completely.
5. Place a new washer on the oil drain plug. Install oil drain plug and tighten securely.
6. Slowly add recommended engine oil to the bottom of the oil fill hole (D). DO NOT overfill.
7. Install oil fill cap, and finger tighten.
8. Wipe up any spilled oil.
9. Properly dispose of oil in accordance with all applicable regulations.

Service Air Cleaner

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

To service air cleaner:

1. Unscrew wing nut from air cleaner cover (A), and remove cover.

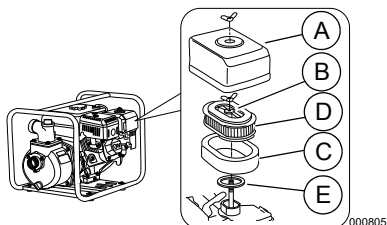


Figure 4-5. Servicing Air Cleaner

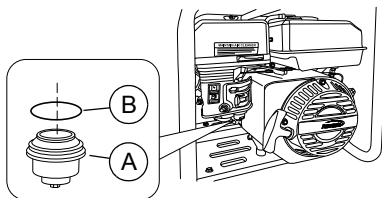
2. Unscrew lower wing nut from air filter assembly (B). Pull air filter assembly off the post.
3. Remove foam filter element (C) from paper filter element (D).
4. Inspect both filter elements and replace if damaged. To order replacements, contact Powermate® Customer Service at 1-800-445-1805 for the name of your nearest Authorized Service Center.
5. Clean foam filter element in warm soapy water. Rinse, and allow to dry thoroughly. Dip in clean engine oil and squeeze out excess oil.
6. Tap paper filter element several times on hard surface to remove dirt. Compressed air (not exceeding 30 psi (207 kPa)) can be also used to blow through filter element from the inside.
7. Use a clean, damp cloth to wipe dirt from inside air cleaner cover.
8. Place foam filter element over paper filter element. Verify gasket (E) is in place, and install air filter assembly on post.
9. Install air cleaner cover. Tighten wing nut securely.

Clean Sediment Cup

Over time, the fuel tank may become fouled with dirt and water. The sediment cup collects these materials and prevents them from entering the carburetor.

To clean sediment cup:

1. Turn fuel valve OFF.
2. See Figure 4-6. Unscrew sediment cup (A) and remove it.



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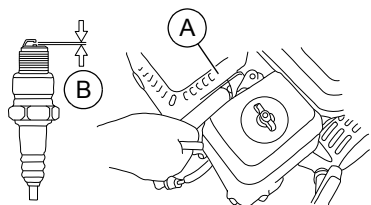
Figure 4-6. Clean Sediment Cup

3. Remove O-ring (B).
4. Wash sediment cup in non-flammable solvent and dry it thoroughly.
5. Install new O-ring and sediment cup.
6. Turn fuel valve ON and check for leaks.

Service Spark Plug

To service spark plug:

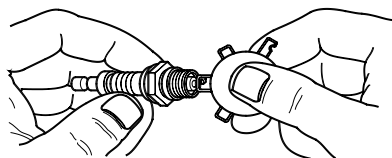
1. Clean area (A) around spark plug.



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Figure 4-7. Servicing Spark Plug

2. Remove and inspect spark plug.
3. Inspect electrode gap (B) with wire feeler gauge and reset spark plug gap to 0.028 - 0.031 in (0.70 - 0.80 mm). See Figure 4-8.



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Figure 4-8. Spark Plug Gap

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. DO NOT OVERTIGHTEN.

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.

Check/Adjust Valve Clearance

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

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

- Intake (cold): 0.0039 in.–0.0059 in. (0.10mm–0.15mm)
- Exhaust (cold): 0.0059 in.– 0.0079 in. (0.15mm–0.20mm)

Storage



⚠ 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.

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Refer to the following list to prepare equipment for storage.

- DO NOT place a storage cover on a hot water pump. Allow equipment 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 equipment with a suitable protective, moisture resistant cover.
- Store equipment in a clean and dry area.
- Always store water pump 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 a 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](#).

Prepare Water Pump for Storage

Protect equipment from freezing temperatures. Failure to do so will permanently damage pump and render equipment inoperable. Freeze damage is not covered under warranty.

Protect equipment from freezing temperatures as follows:

1. Shut engine off by turning engine start switch to OFF.
2. Disconnect hoses.
3. Let engine cool.
4. Remove water drain plug and drain trapped water.
5. Turn fuel valve to OFF.
6. Pull recoil handle approximately six times to remove remaining liquid from pump.
7. Winterize engine per manufacturer specifications.

Store equipment in a clean and dry area.

Transporting / Tipping

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

Troubleshooting

PROBLEM	CAUSE	CORRECTION
Engine will not start, or starts and runs rough.	<ol style="list-style-type: none"> 1. Dirty air filter 2. Out of fuel. 3. Stale fuel. 4. Spark plug wire not connected to plug. 5. Bad spark plug. 6. Water in fuel. 7. Excessively rich fuel mixture. 8. Impeller obstructed. 	<ol style="list-style-type: none"> 1. Clean or replace air filter. 2. Fill fuel tank. 3. Replace with fresh fuel. 4. Connect wire to spark plug. 5. Replace spark plug. 6. Drain fuel tank; replace with fresh fuel. 7. Contact authorized servicing dealer. 8. Clean impeller.
Pump not operating.	<ol style="list-style-type: none"> 1. Air leak in suction hose. 2. Suction and/or discharge hoses blocked. 3. End of suction hose not submerged. 4. Total head exceeds pump capacity. 	<ol style="list-style-type: none"> 1. Check suction hose and connections for leaks. Tighten or repair. 2. Check hoses and strainer. Clear obstructions. 3. Increase suction hose length or move pump closer to water. 4. Reduce total head or choose a different pump for the task.
Weak discharge flow.	<ol style="list-style-type: none"> 1. Air leakage (intake) at suction side 2. Reduced engine power output. 3. Damaged mechanical seal. 4. Suction lift too high. 5. Suction hose too long, or hose diameter too small. 6. Leaking discharge hose or connection. 7. Damaged mechanical seal.* 8. Impeller obstructed. 9. Worn impeller.** 	<ol style="list-style-type: none"> 1. Check suction hose and connections for leaks. Tighten or repair. 2. Contact authorized servicing dealer. 3. Replace mechanical seal. 4. Lower suction lift. 5. Shorten suction hose, or increase hose diameter. 6. Check discharge hose and connection for leaks. Tighten or repair. 7. Replace mechanical seal. 8. Clean impeller. 9. Replace impeller.
Pump does not prime water, or priming takes a long time.	<ol style="list-style-type: none"> 1. Air leakage (intake) at suction side. 2. Insufficient priming water inside pump casing. 3. Water drain plug is loose. 4. Engine malfunction. 5. Damaged mechanical seal. 6. Incorrectly sized suction hose. 7. Suction hose is too long. 8. Excessive suction lift. *** 	<ol style="list-style-type: none"> 1. Check suction hose and connections for leaks. Tighten or repair. 2. Add priming water. 3. Tighten water drain plug. 4. Contact authorized servicing dealer. 5. Replace mechanical seal. 6. Use correct suction hose. 7. Move pump closer to water.
Oil leakage at muffler or air cleaner.	Engine failure.	Repair or replace.
Water leakage between engine and pump.	Damaged mechanical seal.	Replace mechanical seal.

* Mechanical seal damage may be caused by normal wear, overheating, or pumping incompatible fluids.

** Excessive impeller wear is primarily due to cavitation. Causes include restricted suction and excessive suction lift.

*** Total suction head should not exceed 23 ft (7.01 m).

Troubleshooting Procedures

Cleaning The Impeller

See Figure 4-9. The impeller (A) is located inside the volute casing (B). If the impeller is blocked with debris, remove the four mounting screws (C) to detach the pump from the engine. Remove debris from the impeller.

NOTE: It is not necessary to remove the impeller for cleaning.

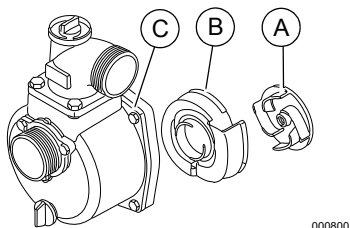


Figure 4-9. Cleaning the Impeller

Correcting Suction Problems

NOTE: Leaking air at the suction side of the pump may cause weak or non-existent discharge flow.

To check for air leaks

1. Disconnect the suction hose.
2. Prime the pump with water and start the engine.
3. See Figure 4-10. Hold a sheet of cardboard against the suction port and wait 30 seconds.

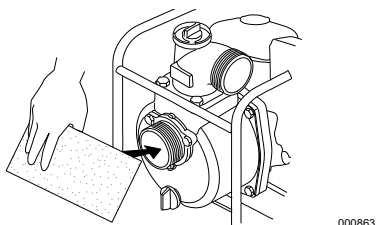


Figure 4-10. Testing for Suction

NOTE: If you feel suction against the cardboard, the pump is operating correctly, but there is a problem with the suction hose or the suction hose connection.

See Figure 4-11. Verify suction hose is not flat anywhere along its length (A). Holes or cracks (B) will also affect suction. Finally, confirm that the suction hose is connected correctly.



Figure 4-11. Common Suction Hose Faults

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