



**PressureMower™**  
MOBILE SURFACE CLEANER

[PressureMower.com](http://PressureMower.com)

# **Safety, Operation, Breakdown, and Troubleshooting Manual**

**PressureMower™**

**Do not use or operate machine until this  
manual has been read and fully understood**



|   |            |
|---|------------|
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Model Number \_\_\_\_\_  
Serial Number \_\_\_\_\_  
Date of Purchase \_\_\_\_\_

The model and serial numbers are found on a decal attached to the pressure washer. You should record both the serial number and the date of purchase and keep them in a safe place for future reference.

Thank you for purchasing this machine. We reserve the right to make changes to the pressure washer at any time, without incurring any obligation.

## OWNER/USER RESPONSIBILITY

The owner and/or user must have an understanding of the manufacturer's operating instructions and warnings before using this pressure washer. Warning information should be emphasized and understood. If the operator is not fluent in English, the manufacturer's instructions and warnings shall be read to and discussed with the operator in the operator's native language by the purchaser/owner, making sure that the operator comprehends its contents.

The owner and/or user must study, and maintain for future reference, the manufacturers' instructions.

The operator must know how to stop the pressure washer quickly and understand the operation of all controls. Never permit anyone to operate the pressure washer without proper instructions.

This manual should be considered a permanent part of the pressure washer and should remain with it if the pressure washer is resold.

When ordering parts, specify the model and serial number. Use only identical replacement parts.

This pressure washer is to be used only by trained operators.

## IMPORTANT SAFETY INFORMATION



**WARNING:** To reduce the risk of injury, read the operating instructions carefully before using.

1. Read the owner's manual thoroughly. Failure to follow the instructions could cause a malfunction of the machine and result in death, serious bodily injury, and/or property damage.

2. Know how to stop the pressure washer and bleed the pressure quickly. Be thoroughly familiar with the controls.

3. Stay alert - watch what you are doing.
4. All installations must comply with local codes. Contact your electrician, plumber, utility company, or the selling distributor for specific details.

**DANGER:** Improper connection of the equipment-grounding conductor can result in a risk of electrocution. Check with a qualified electrician or service personnel if you are in doubt as to whether the outlet is properly grounded.



**WARNING:** Keep the wand, hose, and water spray away from electric wiring or fatal electric shock may result.

5. To protect the operator from electrical shock, the machine must be electrically grounded. It is the responsibility of the

owner to connect this machine to a UL grounded receptacle with the proper voltage and amperage ratings. Do not spray water on or near electrical components. Do not touch the pressure washer with wet hands or while standing in water. Always disconnect the power before servicing.

6. Keep the operating area clear of all persons.



**WARNING:** High pressure spray can cause paint chips or other particles to become airborne and fly at high speeds. To avoid personal injury, eye, hand, and foot safety devices must be worn.

8. Eye, hand, and foot protection must be worn when using this pressure washer.



**WARNING:** This pressure washer exceeds 85 db. Appropriate ear protection must be worn.

7. To reduce the risk of injury, close supervision is necessary when this pressure washer is used near children. Do not allow children to operate the pressure washer. This pressure washer must be attended during operation.



**WARNING:** Grip the cleaning wand securely with both hands before starting. Failure to do this could result in injury from a whipping wand.

8. Never make adjustments to the pressure washer while in operation.

9. Be certain all quick coupler fittings are secured before using this pressure washer.



**WARNING:** The high pressure developed by this pressure washer can cause personal injury or equipment damage. Keep clear of the nozzle. Use caution when operating. Do not direct the discharge stream at people, or severe injury or death could result.



**WARNING:** Protect the pressure washer from freezing.

10. To keep the pressure washer in the best operating condition, it is important that you protect the pressure washer from freezing. Failure to do this could cause a malfunction of the pressure washer and result in death, serious bodily injury, and/or property damage. Follow the storage instructions specified in this manual.

11. Inlet water must be clean, fresh water, no hotter than 90°F.



**WARNING:** Risk of asphyxiation. Use this pressure washer only in a well-ventilated area.

12. The manufacturer is not liable for any changes made to our standard pressure washers or any components not purchased from us.

13. The best insurance against an accident is caution and knowledge of the pressure washer.



**WARNING:** Be extremely careful when using a ladder, scaffolding, or any other relatively unstable location. The cleaning area should have adequate slopes and drainage to reduce the possibility of a fall due to slippery surfaces.

14. Do not overreach or stand on an unstable support. Keep good footing and balance at all times.

15. Do not operate this pressure washer when fatigued or under the influence of alcohol, prescription medications, or drugs.

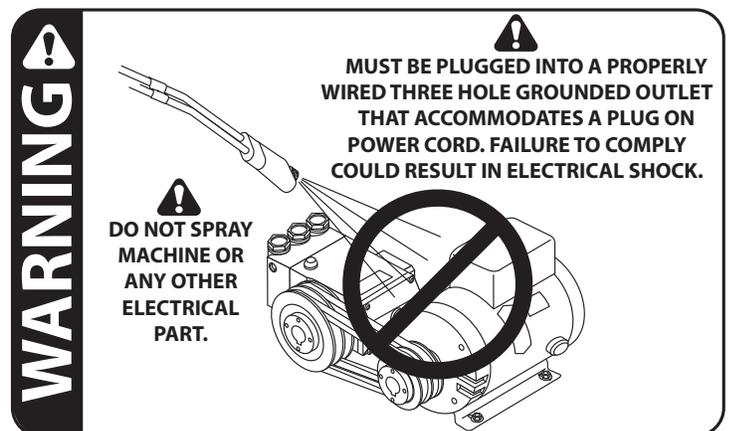
16. Follow the maintenance instructions specified in the manual.

17. Install this pressure washer on non-combustible flooring.

18. Do not allow acids or caustic or abrasive fluids to pass through the pump.

19. Never run the pump dry. Do not leave the spray gun closed longer than three minutes without having the "Clutch" option.

**WARNING:** If a connection is made to a portable water supply, a back-flow device must be used.



We can not anticipate every possible circumstance that might involve potential hazard, The warnings, cautions and safety suggestions in this manual are therefore not all inclusive. If an operating procedure, installation, maintenance or work method not specifically recommended is used. you must satisfy yourself that it is safe for you or other persons. You must also be sure that the product will not be damaged or be made unsafe by the procedure that you choose.

**WARNING:** Fluids under high pressure spray can be nearly invisible and can penetrate the skin and cause extremely serious injury!

If any fluid appears to have penetrated the skin, get emergency medical care at once! Do not treat as a simple cut. Tell the doctor exactly what fluid was injected. For treatment instructions, have your doctor call the:

## **National Poison Control Network (412) 681-6669**

- Never point the spray gun at other persons or any part of the body.
- Never put hands or fingers over the spray tip while in operation.
- Never use your hands to stop or detect leaks.
- Always shut off the unit and trigger the pressure gun to relieve system pressure before removing the spray tip or before performing any machine service.
- Always wear full eye protection (preferably a face shield), protective clothing, gloves and rubber boots when operating the machine to protect yourself from fluid injection or debris dislodged by high pressure spray.
- Always keep guards and shields in place. Replace damaged shields or guards if damaged.
- Never alter or modify this equipment! Your personal safety as well as the safety of other persons is at stake.
- Never exceed the factory pressure or temperature rating of the system. Be sure all accessory equipment and system components used will withstand the pressure developed.
- Never let the pump run without water supply flowing through the unit.
- Never let the unit run for more than five (5) minutes with the gun in the closed position.

- Never allow children or any unauthorized persons to operate the machine. Keep all persons at a safe distance when using the machine.
- Never attempt to clean or wash down the machine using its own spray gun. The machine is water protected, but not water proof. Cleaning the machine in this manner will increase the hazard of electrical shock and/or damage to the machine.
- Never leave an operating machine unattended. Always shut off the machine and relieve pressure before leaving the machine.
- Never spray liquids or toxic chemicals such as insecticides or weed killer.
- Do not use detergents which are not compatible with the discharge hose. Read and follow the instructions given by the detergents manufacturer. Also, follow directions on the container regarding contact with the eyes, nose and skin.
- Always respect and be alert to the potential hazards of electrical equipment, hot burners moving parts, high pressure spray and steam.
- Always be certain that the machine safety decal's are kept clean and legible, replace any decal's that become damaged, lost or painted over.
- Do not attempt repairs or modifications you do not understand. Contact your servicing dealer or contractor.
- Always keep guards or shields in place. Replace any that must be removed for service or that may be damaged.

### **Chemical Warning**

Chemicals used for cleaning are dangerous! Keep all chemicals out of reach of children and untrained adults. Proper safety precautions must be taken before handling any chemicals. Read and follow all directions and instructions on the product label before using chemicals. Wear eye protection and rubber gloves when handling or using chemicals.

Always have a clean supply of water available to wash off any contact with the skin or eyes. Should any chemical product contact the eyes, immediately flood the eyes with clean water and seek medical attention at once. If skin contact occurs, flood the affected area with plenty of water for 15 minutes. If irritation persists, seek medical attention. If chemicals are swallowed, follow the product label directions and get immediate medical attention.

Read the material safety data sheets on all chemicals before using them.

### Discharge Hose Warning

The discharge hose supplied with the machine is designed for use on steam and high pressure cleaners. Special care, handling and maintenance is required to provide proper and safe operation. The following guidelines must be followed to ensure safe operation and provide the maximum hose service life.

- Never exceed rated machine pressure.
  - Do not route hose in a manner that will cause sharp bending, kinking, cutting, abrasion or either exterior damage.
  - Do not pull on the hose to move the machine, untangle knots or use any other excessive pulling stress.
  - Do not use the hose if cuts, leaks, abrasions, bulges or coupling damage is evident.
  - Do not use the hose if any reinforcement is exposed.
  - Do not attempt field repairs through an unauthorized hydraulic hose repair shop. Special coupling and crimping specifications are required for steam and high pressure washer discharge hose. Contact a qualified pressure washer service representative for repair of damaged hose.
  - Always examine hose coupling and quick disconnect (if provided) before each operation. If leaking is evident do not use. Contact a qualified pressure washer service representative.
  - Never leave the discharge hose lying on the floor or ground to be driven over by vehicles or damaged by falling objects. Always coil and hang the hose immediately after use.
- If there is any doubt about hose condition, replace the hose immediately.

### OSHA Lockout/Tagout Rule

To prevent unexpected energizing, start-UP or release of energy that could cause injury to the employees working on the equipment the following steps must be taken:

1. Turn off equipment.
2. Dissipate or release all residual energy in the machine.
3. Shut off main power by removing cord, or shutting off electrical disconnect switch.
4. Secure the power cord near the machine, or lock and tag the switch.
5. Check all previous steps, and then try to operate the machine to assure that it won't work.

# SETUP

|                                      |            |
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# INSPECTION and IDENTIFICATION

## Machine Delivery Inspection

Examine the shipping crate and machine carefully for any hidden damage during shipping. Claims for damage or shortage should be filed with the contract carrier (trucking company) that delivered the equipment. Remove all loose parts and strapping attached to the machine for shipping purposes.

## Machine Identification

The machine model number, serial number, and specifications are stamped on a plate permanently attached to the right rear side of the machine main frame.

Record the information from this plate for any future reference.

|                              |
|------------------------------|
| Model:                       |
| Output: Gpm:      Psi:       |
| Fuel:                        |
| Elec.: PH:      Volts: Amps: |
| Serial No.:                  |

# LOCATION

The machine is portable and designed to be used at or near the work area under complete control of the operator. Position the machine for easy access to all controls, power, and water supply. Use an additional hose if greater washing distance is needed rather than moving the machine towards the work area.

**IMPORTANT:** In the event that the machine must be located out of sight of the operator, special equipment and/ or controls may be required to provide proper operation and assure operator safety. Contact your dealer or qualified service representative before install-ing or using the machine from a remote location.



**CAUTION:** Even though the machine may be portable, it must always be positioned on a solid level area with drainage to avoid the possibility of the machine tipping over and to avoid falls from slippery surfaces. Avoid areas where water may accumulate.

# MACHINE SETUP

## Connecting the Water Supply

Connect the machine to a cold water supply tap at least 1.5 times the gallons per minute (gpm) output of the machine.

**NOTE:** Use at least a 5/8 inch ID supply hose if operated within 50 feet of water supply. Use 3/4 inch ID hose if over 50 feet.

**IMPORTANT:** If the water supply exceeds eight grains of hardness, install a water softener in the supply line to extend coil life and maintain machine efficiency.



**KNOW THE MACHINE CONTROLS AND INSTRUMENTS BEFORE STARTING OR OPERATING THE MACHINE TO ASSURE SAFE OPERATION.**

## CONTROL OPERATION:

Depending on machine model and optional equipment, the control panel may vary somewhat between models.

## INITIAL MACHINE START-UP

After the machine has been properly set-up and prepared for use, perform the following initial startup procedures before using the machine for cleaning.

1. Turn on the cold water supply valve



**IMPORTANT:** Never let the pump run with out water supply or serious damage will occur.

2. DO NOT attach wash gun. Hold the discharge hose firmly so that the discharge will be directed into a bucket or floor drain.



**IMPORTANT:** After initial installation, or after a long period of non-use, run the unit with the gun or nozzle removed to flush out any dirt, which could plug the nozzle.

# **OPERATING INSTRUCTIONS**

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## OPERATING INSTRUCTIONS



**WARNING:** Always wear full eye protection (preferably a face shield), protective clothing, rubber gloves, and boots when operating the machine to protect yourself from burns caused by high pressure spray and detergents, fluid injection, or debris dislodged by the high pressure spray.



**WARNING:** Never attempt to clean or wash down the machine using its own spray gun. The machine is water protected, but not water proof. Washing down the machine increases the hazard of electrical shock and/or damage the machine.



**WARNING:** Do not operate the machine outside in the rain or during thunderstorms.



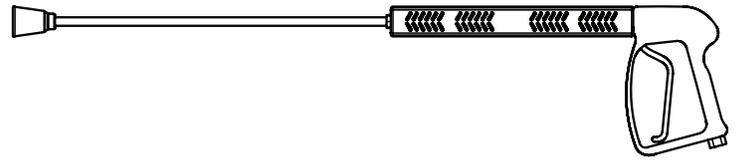
**WARNING:** To minimize the possibility of machine overloading, overheating or relief valve actuation, DO NOT let the unit run more than 5 minutes with the gun in the closed position.

## OPERATING AND USING THE CLEANER

This machine is completely portable and designed to be used at or near the work area under complete control of the operator. Position the machine for easy access to all controls and water supply.

Even though the machine is portable, it must always be positioned on a level surface area with good drainage to avoid falls from slippery surfaces and to assure the machine remains level and stationary when in use. DO NOT attempt to move or “drag” the machine by pulling with the high pressure discharge hose. This practice could damage the hose and increase the risk of personal injury from high pressure fluid injection.

HIGH PRESSURE GUN

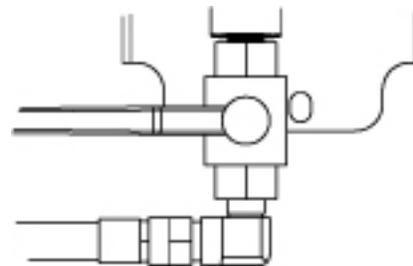


### Starting the Cleaner

**To start your cold water pressure cleaner:**

1. Be sure engine is “off”.
2. Turn on the water and fuel supply.
3. Set valve to operate Surface Cleaner or Pressure Washer. (SEE BELOW)

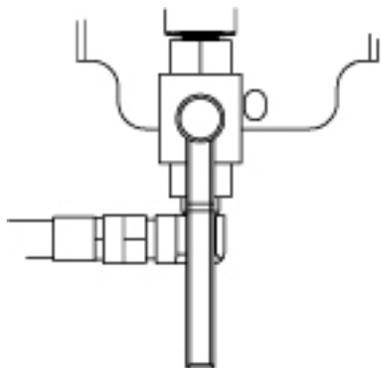
## OPERATING SURFACE CLEANER



VALVE CLOSED:  
NO SUPPLY TO  
HOSE REEL -  
FOR OPERATION  
OF SURFACE  
CLEANER.

1. Pull the recoil to start the engine. Allow the pump to develop constant operating pressure.
2. Engage trigger gun on handle assembly to operate the Surface Cleaner.

## OPERATING PRESSURE WASHER



VALVE OPEN:  
WATER  
SUPPLIED TO  
HOSE REEL FOR  
OPERATION OF  
PRESSURE  
WASHER.

1. When operating Pressure Washer, select and install a high pressure quick-coupled tip on the wand. Turn the nozzle in the quick-coupler for the desired spray pattern (vertical or horizontal).

2. Pull the recoil to start the engine.

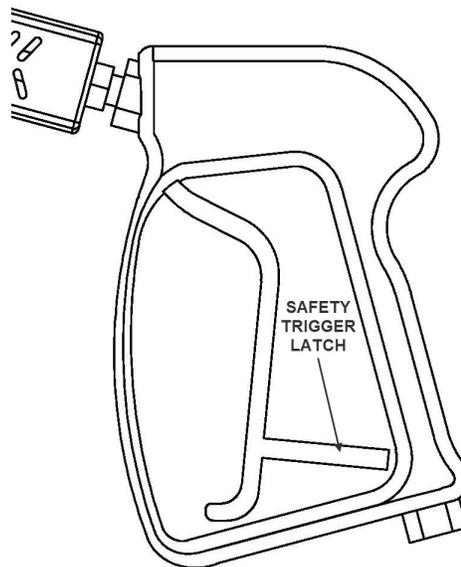
3. Hold the wash gun firmly and squeeze the trigger, to start pump operation. Allow the pump to develop constant pressure.

NOTE: Some machines are supplied with two or more high pressure spray tips. Tips are generally selected according to pump output and degree of spray pattern (0°, 15°, 25° or 40°) for an intended use. Contact your dealer or service representative if tips are required for special applications.

NOTE: See "Cleaning Tips" section for additional information on tip selection and usage.



**WARNING:** The high pressure gun control gun is equipped with a built-in trigger safety latch. Fold the latch in the fully outward (down) position to guard against accidental trigger release and potential dangerous high pressure spray wand or hose whip when the machine is in operation. The machine should always be shutdown and system pressure relieved before changing tips or performing any other service.



**WARNING:** To prevent bodily injury, Trigger Gun equipped machines are provided with a safety shut off type gun. Always maintain a firm grip on the trigger gun with the wand and nozzle pointed in a safe direction. The trigger gun action of the gun releases system pressure very quickly in a recoil effect. The operator must be familiar with the operation or be trained to anticipate the recoil in order to maintain safe control of the gun and wand.

NOTE: Never leave the discharge hose laying on the floor or ground to be driven over by vehicles or damaged by falling objects. ALWAYS coil and hang the hose for safe storage immediately after use.

## SHUTTING DOWN AFTER USE

### To shut down after use:

1. Turn the engine off by throttling down and cutting fuel supply. Trigger the gun to relieve system pressure.
2. Shutoff and/or disconnect the inlet hose, and wrap up the wand and discharge hose for safe storage.

NOTE: Because the engine is loaded as soon as start-up occurs, if cold starting is difficult, remove the spray tip and release the gun trigger to reduce the engine load. When the engine starts and has warmed somewhat, shut down the engine, reinstall the spray tip and restart the engine in the normal manner.

## GASOLINE ENGINE

1. A separate engine Owners Manual is supplied by the engine manufacturer for each machine model. Read and study this manual carefully for all engine pre-start requirements, starting procedures and all other operating, maintenance and safety related messages regarding the engine before starting or using the machine.

## ENGINE FUEL REQUIREMENTS

2. Fill the gasoline supply tank with, clean, fresh, regular grade unleaded gasoline with a pump sticker octane of 87 or higher. Unleaded is recommended since it leaves less combustion chamber deposits. Regular grade leaded gasoline may be used; however, the combustion chamber and cylinder head may require more frequent service. Do not add oil to the gasoline. Do not overfill the fuel tank. There should be no fuel in the filler neck. Replace the fuel supply tank cap securely.



**WARNING:** Gasoline is extremely flammable, and its vapors can explode under certain conditions. Refuel only in well ventilated areas with the engine stopped and cooled. If any fuel is spilled, clean it up completely and/or move the machine away from the spill area before starting the engine. Store gasoline in approved container away from the machine. DO NOT smoke, or allow flames or sparks where the engine is refueled or where the gasoline is stored. To ignore this warning may result in serious personal injury or death.

3. Check the engine oil level.
4. Check the pump crankcase oil level. Oil level should be at or near the dot in the center of the crankcase oil level sight glass. If a sight glass not available on the pump check the oil dip stick.

## PRESSURE CLEANING TIPS

### High Pressure Cleaning

The wash gun nozzle supplied with the machine provides optimum cold water cleaning for most universal type cleaning requirements if used properly.

**NOTE:** Some machine models are supplied with two or more nozzles. Contact your dealer or service representative if nozzles are required for special applications. Nozzles are generally selected by degree of spray pattern (0°, 15°, 25°, or 40°) for an intended use.

### High Pressure Nozzle Usage

Zero degree (0°) nozzles are generally used for high impact, spot type cleaning of small confined or remote areas on heavier materials that are difficult to reach. These nozzles should not be used on light or thin gauge materials or painted surfaces such as panels or on areas where material warpage could be a problem.

Fifteen degree (15°) nozzles are generally used for severe general purpose type cleaning operations and are most effective when held 6 to 12 inches from the cleaning surface on medium to heavy gauge materials.

Twenty five degree (25°) nozzles are generally used in less severe cleaning operations where a wider spray pattern with less impact is desirable and to speed up the cleaning process.

Forty degree (40°) nozzles are generally used when minimum impact is desired for light materials, painted surfaces, and large surface areas where warpage may be a problem due to the higher impact of smaller nozzle sizes. This nozzle is also ideal for applying hot wax.

For the best results, the gun should always be used with long slow deliberate strokes, 6-12 inches away from the surface, in much the same manner as using a paint sprayer. This provides the most effective cleaning impact and avoids streaks or skips in the cleaning process. "Waving" the gun aimlessly across the surface wastes expensive detergent and prolongs the cleaning process.

If the machine is used to apply wax after the cleaning and rinsing process, the gun should be held farther from the surface to get a "misting" effect when applying the wax. For best results, follow the directions supplied by the manufacturer for applying wax.

Most cleaning agents are more effective if the surface is rinsed first to loosen the dirt.

Detergents should be applied from the bottom to the top to avoid streaks, allowed to set for a moment or two to react with the dirt, then rinsed from the top down to avoid streaks or skips. Never use more detergent than is necessary to clean the surface. Always follow the directions supplied by the manufacturer on the container regarding detergent use, particularly regarding painted and/or aluminum surfaces.

# **SPECIFICATIONS**

| Model            | GPM | PSI  | HP | Drive  | Pump            | Nozzles        | Hose       |
|------------------|-----|------|----|--------|-----------------|----------------|------------|
| <b>PM24-10HR</b> | 3.5 | 3000 | 10 | Direct | Triplex Plunger | 0°/15°/25°/40° | 3/8" x 25' |
| <b>PM30-14HR</b> | 4   | 3500 | 14 | Direct | Triplex Plunger | 0°/15°/25°/40° | 3/8" x 25' |
| <b>PM24-10</b>   | 3.5 | 3000 | 10 | Direct | Triplex Plunger | 0°/15°/25°/40° | 3/8" x 4'  |
| <b>PM30-14</b>   | 4   | 3500 | 14 | Direct | Triplex Plunger | 0°/15°/25°/40° | 3/8" x 4'  |

# **MAINTENANCE**

**ROUTINE MAINTENANCE**

**4-2**



## A Properly Maintained Machine is a Safe Machine

It is the operator's responsibility to make daily inspections of the machine for anything that could cause a potential service, fire, or safety problem.

### ROUTINE MAINTENANCE

#### Service & Maintenance Schedule

Preventative maintenance is the easiest and least expensive type of maintenance. The life of any machine depends on the care that it is given. Regular inspections of the machine's systems and critical components are the key to preventative maintenance. To prevent machine down time and prolong the life of your unit, follow these simple routines.

#### Daily

- Perform all required engine daily service (See Engine Manual).
- Check pump oil level.
- Check wash nozzle for clogging or damage.
- Check cold water supply before starting.
- Check cold water supply before starting.
- Check fuel supply.
- Check for fluid leaks or machine damage.
- Check for leaks

#### Weekly

- Check pressure hose for wear or damage.
- Check and/or clean fuel filter as required.  
(This will depend on the quality of fuel used)
- Perform required engine weekly service. (See Engine Manual)
- Check engine muffler condition.

#### Monthly

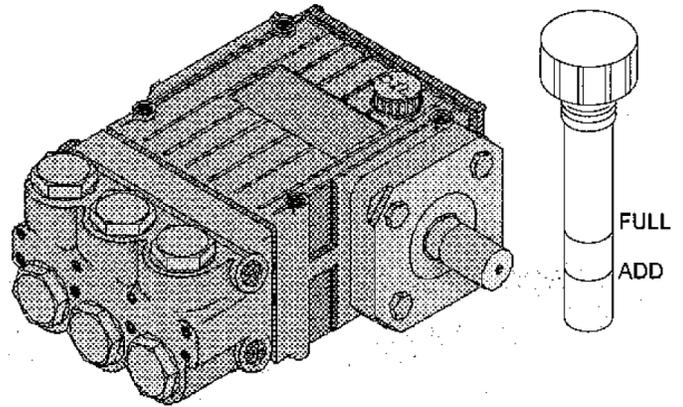
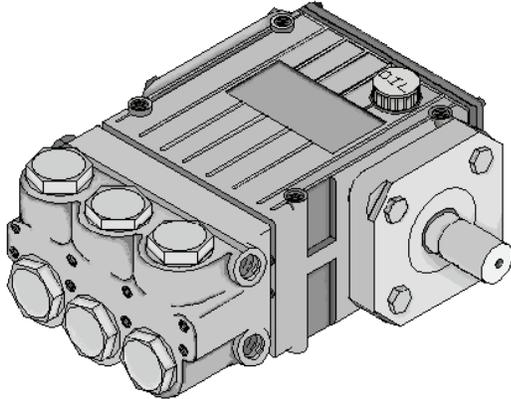
- Check discharge hose quick-couplers.
- Perform required engine monthly service.  
(see Engine Manual).
- Check quick coupler for leakage.

#### Annually

- Change pump oil. (See Pump Lubrication)
- Perform required engine yearly service (See engine manual).
- Replace worn wash gun nozzle and quick couplers.
- Replace worn gun nozzle(s) and quick-couplers.

**Pump Lubrication Requirements**

The pump is pre-lubed from the factory. After the first 50 hours of operation, change the crankcase oil. Change oil every three months or 500 hours (whichever occurs first) thereafter. Use SAE 30W non-detergent motor oil.

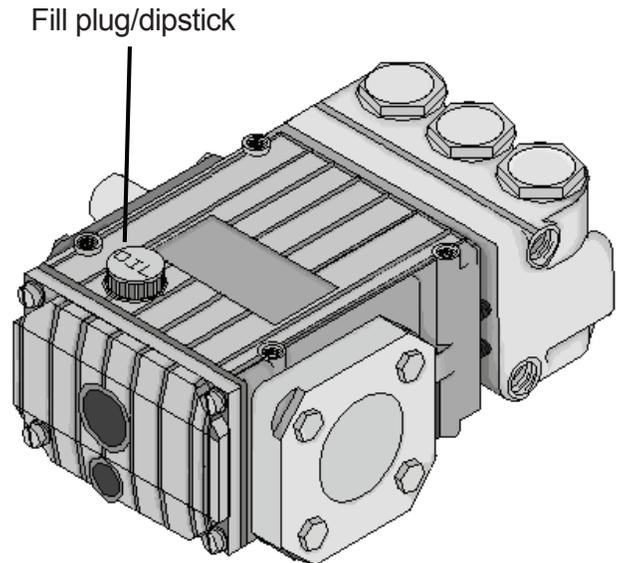


**Changing Pump Oil**

The oil may be drained by removing the plug located at the rear of the pump crankcase. The crankcase may also be drained by removing the fill plug and using a suction gun with a flexible tube to suction the oil out. After draining, fill the crankcase with the specified oil to the full level. Do not overfill.

**Checking Pump Oil Level**

Loosen and remove the check/fill plug to check the oil level. The dipstick is notched on the stem. The top of the notch is the “full” mark and the bottom is the “add” mark. Replace the dipstick securely after checking the oil level.

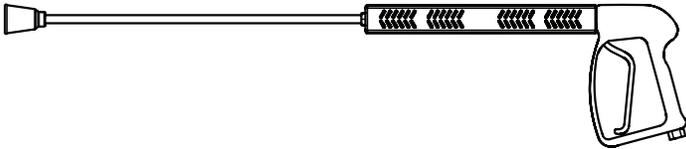


## Pressure Hose

Inspect the hose for damage and/or wear. Replace the hose if it is damaged in any way.

- Avoid extending the hose across high traffic areas and never leave the hose where it can be run over by vehicles of any type.
- Never pull on the hose to move the machine or place undue stress on the hose.
- Never pull the hose around a sharp corner or force it into a small loop. The wire braid has a minimum bend radius of five inches.
- Wrap up the hose as soon as you finish and store it in a safe location.

## Trigger Gun and Wand Assembly



- Inspect the trigger gun for damage or wear and check for complete trigger shut off daily. The gun must be able to completely shut off flow in the event of accidental or operational trigger release. Repair or replace if defective.
- Inspect the wand and couplings for wear, damage, or leaks daily. Replace a damaged wand, DO NOT attempt repairs!!

## Winterizing and Storage

To protect the machine from severe damage resulting from water freezing inside the pump or other components, or from corrosion resulting from long periods of inactivity or storage, use the following procedure:

### To winterize and store your machine:

1. Disconnect the water supply line
2. Pre-mix a 50-50 solution of permanent anti-freeze and water in a five gallon container.

**IMPORTANT:** Do not use anti-leak type anti-freeze.

3. Feed anti-freeze pre-mixture into the garden hose adapter on the inlet of the pump.
4. Hold the wash gun trigger open. Turn on the machine, wait a few seconds, then release the trigger. Open the trigger again after a few seconds and release. Cycle the wash gun trigger on and off four times, then hold the gun open until the anti-freeze appears at the nozzle tip. Turn off the machine. The machine is now winterized and prepared for storage.

**NOTE:** If kept relatively undiluted, anti-freeze may be reused again and again.

# **TROUBLESHOOTING**



**WARNING:** Before attempting any repairs or maintenance, be sure the machine is shut off and disconnected

Troubleshooting is an organized study of the problem and a planned method or procedure for investigation and correction of the difficulty. The following troubleshooting guide includes some of the problems that you may encounter during the service life of the machine.

The troubleshooting guide does not give all the answers for correction of problems listed, but is meant to stimulate a train of thought and indicate a work procedure directed toward the source of the trouble.

### **THINK BEFORE ACTING**

Study the problem thoroughly and ask yourself these questions:

1. What are the warning signs preceding the trouble?
2. What previous repair and maintenance work has been done?
3. Has a similar problem occurred before?
4. If the machine still runs, is it safe to continue operation to make further checks?

### **DO THE EASIEST THINGS FIRST**

Most problems are simple and easily corrected. For example, a “Engine will not start” complaint may be caused by no fuel supply or dirty filter. Always check the easiest and obvious things first. Following this simple rule saves time and trouble.

### **FIND AND CORRECT THE BASIC CAUSE OF THE TROUBLE**

After a mechanical failure has been corrected, be sure to locate and correct the cause of the problem so that the same failure will not be repeated. A complaint of “failed fuel pump” may be corrected by replacing the faulty pump, but something caused the pump to fail. The cause may be debris or more often water in the fuel.

The following pages list some of the problems, causes and probable fixes the operator can study to become aware of what might cause the problem should it arise. If the hints in this manual do not correct a problem, contact a dealer or authorized service representative.

**DO NOT** attempt repairs you do not understand.

# TROUBLESHOOTING

| PROBLEM   | POSSIBLE CAUSE  | SOLUTION  |
|---|---|---|
| <b>Low Pressure</b>                                 | <ol style="list-style-type: none"> <li>1. Worn or oversized spray nozzle.</li> <li>2. Clogged water and/or detergent inlet strainer.</li> <li>3. Air leak in inlet plumbing.</li> <li>4. Dirt or foreign particle in the valve assembly.</li> <li>5. Worn or damaged inlet or discharge valve.</li> </ol> | <ol style="list-style-type: none"> <li>1. Replace the worn nozzle.</li> <li>2. Clean or replace the fouled strainers.</li> <li>3. Locate the air leak. Reseal the connection or replace the damaged part.</li> <li>4. Remove any dirt or particles.</li> <li>5. Replace the worn valves.</li> </ol> |
| <b>Rough operation with loss of pressure</b>        | <ol style="list-style-type: none"> <li>1. Restricted inlet plumbing or air leak in inlet plumbing.</li> <li>2. Damaged pump parts.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Ensure an adequate water supply and supply hose. Repair the inlet fittings.</li> <li>2. Replace any damaged pump parts. Clean out any foreign particles.</li> </ol>   |
| <b>Water leakage - intake manifold or crankcase</b> | <ol style="list-style-type: none"> <li>1. Worn manifold seals or condensation inside the crankcase.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Replace the seals. Change the oil at regular intervals.</li> </ol>  |
| <b>Loud knocking, noisy operation</b>               | <ol style="list-style-type: none"> <li>1. Inadequate water supply to pump creating a "vacuum knock".</li> <li>2. Worn or broken bearing(s).</li> </ol>  | <ol style="list-style-type: none"> <li>1. Check for a restricted inlet and an adequate tap water supply.</li> <li>2. Replace the bearing(s) as needed.</li> </ol>   |
| <b>Oil Leaks</b>                                    | <ol style="list-style-type: none"> <li>1. Worn crankcase seals, crankcase cover seal, or drain plug seal.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Replace the seals.</li> </ol>   |
| <b>Excessive pump shaft play</b>                    | <ol style="list-style-type: none"> <li>1. Worn and loose bearings.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Replace the bearings. Check the bearing seals, spacers, and retainers. Replace any worn parts.</li> </ol>   |
| <b>Irregular spray pattern</b>                      | <ol style="list-style-type: none"> <li>1. Worn or partially clogged spray nozzle.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Clean or replace the nozzle.</li> </ol>   |

# **LEGAL NOTICES**



### **California Proposition 65**

**WARNING:** This product contains chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm.  
For more information: [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)