

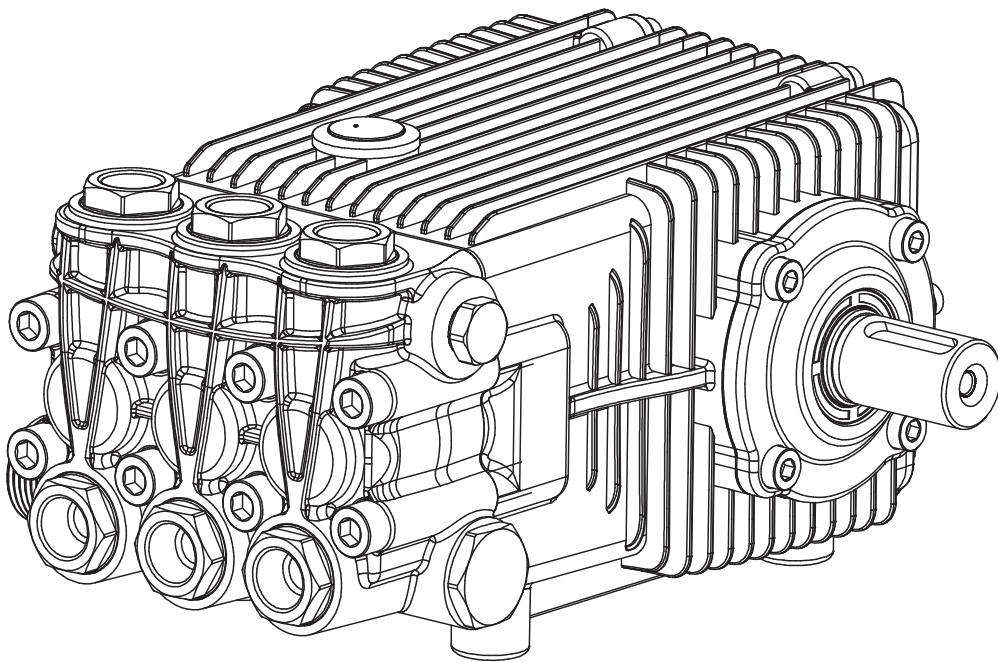


# **HIGH PRESSURE PUMP**

## **COMMERCIAL RECIPROCATING PLUNGER PUMP**

### **PUMP USER MANUAL**

Installation, Use and Maintenance



**Ver: 1.0**



**TO PREVENT SERIOUS INJURY, THE USER MUST READ AND UNDERSTAND  
THE OPERATORS MANUAL BEFORE USING THIS PRODUCT**



## IMPORTANT SAFETY INSTRUCTIONS



### DANGER--RISK OF EXPLOSION OR FIRE

- Fuel and its vapors are extremely flammable and explosive.
- Fire or explosion can cause severe burns or death.

- **ALWAYS** shut off engine and allow it to cool a least 2minutes before adding fuel to the tank.
- **ALWAYS** use care in filling tank to avoid spilling fuel. Move pressure washer away from fueling area before starting engine.
- **ALWAYS** Keep maximum fuel level below top of tank to allow for expansion.
- **ALWAYS** operate and fuel equipment in well ventilated areas free from obstructions. Equip areas with fire extinguishers suitable for gasoline fires.
- **NEVER** operate pressure washer in an area containing dry brush or weeds.
- **ALWAYS** keep pressure washer a minimum of four feet away from surfaces (such as houses, automobiles, or live plants) that could be damaged from muffler exhaust heat.
- **ALWAYS** Store fuel in an OSHA approved container, in a secure location away from work area.
- **NEVER** spray flammable liquids



### DANGER-- RISK TO BREATHING

- Running engine gives off carbon monoxide, an odorless, colorless, poison gas.
- Breathing carbon monoxide can cause nausea, fainting or death.
- Some chemicals or detergents may be harmful if inhaled or ingested, causing severe nausea, fainting or poisoning.

- **ALWAYS** Operate pressure washer in a well ventilated area. Avoid enclosed areas such as garages, basements ,etc.
- **ALWAYS** Keep exhaust gas from entering a confined area through windows, doors, ventilation intakes, or other openings.
- **NEVER** operate unit in a location occupied by humans or animals.
- **ALWAYS** use the only fluids specifically recommended for high pressure washers.
- **ALWAYS** follow manufacturers recommendations, use a respirator or mask whenever there is a chance that vapors may be inhaled.
- **NEVER** use chlorine bleach or any other corrosive compound.



### WARNING--RISK OF FALL HAZARD

- Use of pressure washer can create puddles and slippery surfaces.
- Kickback from spray gun can cause you to fall.

- Keep operating area clear of all persons, pets, and obstacles.
- Do not operate the product when fatigued or under the influence of alcohol or drugs. Stay alert at all times.
- Never defeat the safety features of this product.
- Do not operate machine with missing, broken, or unauthorized parts.
- Never leave wand unattended while unit is running.
- If engine does not start after two pulls, squeeze trigger of gun to relieve pump pressure. Pull starter cord slowly until resistance is felt. Then pull cord rapidly to avoid kickback and prevent hand or arm injury.
- Keep children away from the pressure washer at all times.
- Do not overreach or stand on an unstable support.
- The cleaning area should have adequate slopes and drainage to reduce the possibility of a fall due to slippery surfaces.
- Be extremely careful if you must use the pressure washer from a ladder, scaffolding, or any other similar location.
- Firmly grasp spray gun with both hands when using high pressure spray to avoid injury when spray gun kicks back.



### DANGER-- RISK OF HOT SURFACES

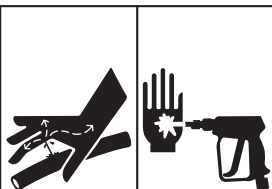
- Contact with hot surfaces, such as engines exhaust components, could result in serious burn.

- During operation, touch only the control surfaces of the pressure washer. Keep children away from the pressure washer at all times. They may not be able to recognize the hazards of this product.

**WARNING--RISK OF ELECTRICAL SHOCK**

- Risk of electrocution.
- Contact with power source can cause electric shock or burn.

- Unplug any electrically operated product before attempting to clean it. Direct spray away from electric outlets and switches.
- NEVER spray near power source.

**WARNING--RISK TO FLUID INJECTION**

- The high pressure stream of water that this equipment produces can cut through skin and its underlying tissues, leading to serious injury and possible amputation. Spray gun traps high water pressure, even when engine is stopped and water is disconnected, which can cause injury.

- ALWAYS point spray gun in safe direction and squeeze trigger, to release high pressure, every time you stop engine.
- NEVER aim spray gun at people, animals, or plants.
- NEVER place hands in front of nozzle.
- Make sure hose and fittings are tightened and in good condition. Never hold onto the hose or fittings during operation.
- Do not allow hose to contact muffler.
- Never attach or remove wand or hose fittings while system is pressurized.
- Use only hose and high pressure accessories rated for pressure higher than your pressure washer's p.s.i.
- To relieve system pressure, shut off engine, turn off water supply, and pull gun trigger until water stops flowing.
- DO NOT allow CHILDREN to operate pressure washer.
- NEVER repair leaking connections with sealant of any kind. Replace o-ring or seal.
- NEVER connect high pressure hose to nozzle extension.
- Keep high pressure hose connected to pump and spray gun while system is pressurized.
- DO NOT secure spray gun in open position.
- DO NOT leave spray gun unattended while machine is running.
- NEVER use a spray gun which does not have a trigger lock or trigger guard in place and in working order.
- ALWAYS be certain spray gun, nozzles and accessories are correctly attached.

**DANGER-- RISK OF CHEMICAL BURN**

- Use of acids, toxic or corrosive chemicals, poisons, insecticides, or any kind of flammable solvent with this product could result in serious injury or death.

- Do not use acids, gasoline, kerosene, or any other flammable materials in this product. Use only household detergents, cleaners and degreasers recommended for use in pressure washers.
- Wear protective clothing to protect eyes and skin from contact with sprayed materials.
- Do not use chlorine bleach or any other corrosive compound

**DANGER-- RISK OF MOVING PARTS**

- Starter and other rotating parts can entangle hands, hair, clothing, or accessories.

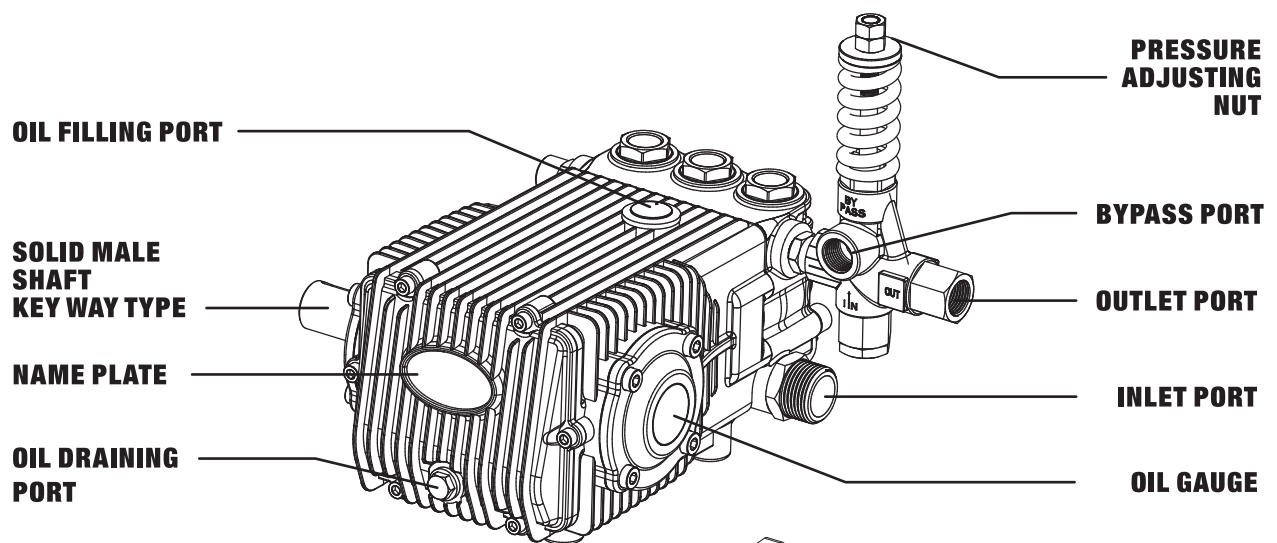
- NEVER operate pressure washer without protective housing or covers.
- DO NOT wear loose clothing, jewelry or anything that may be caught in the starter or other rotating parts.
- Tie up long hair and remove jewelry.

**DANGER-- RISK OF EYE INJURY**

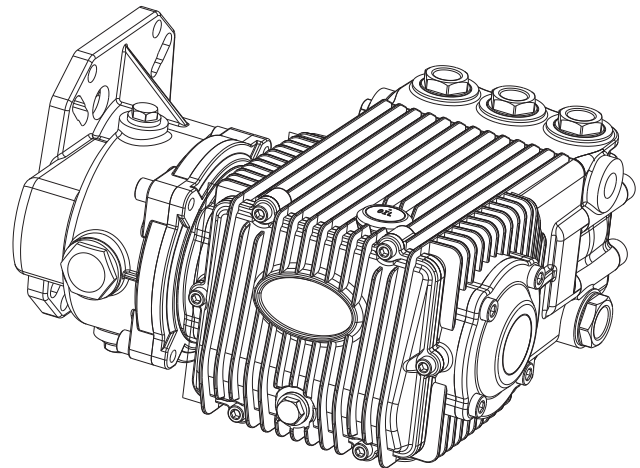
- Spray can splash back or propel objects.

- Always wear safety goggles when using this equipment or in vicinity of where equipment is in use.
- Before starting the pressure washer, be sure you are wearing adequate safety goggles.
- NEVER substitute safety glasses for safety goggles.

## PUMP DESCRIPTION

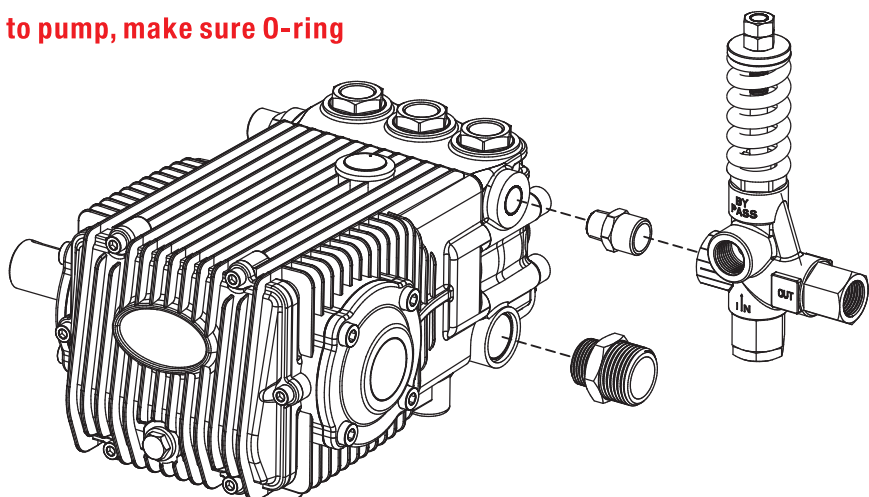


**GEARBOX ENGINE DIRECT DRIVE  
HOLLOW SHAFT, KEY WAY TYPE**



## UNLOADER INSTALLATION

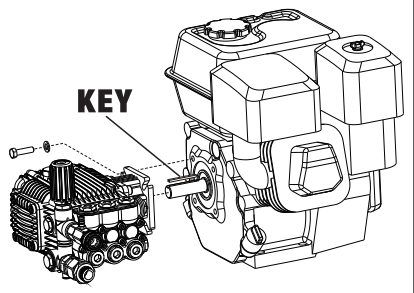
1. The unloader kit was ship separately from pump, check before install to pump.
2. Install the unloader kit to pump, make sure O-ring and gasket is in place.



# PUMP INSTALLATION

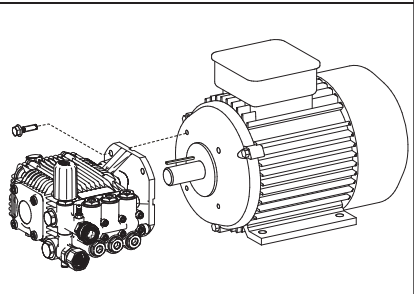
**Engine direct drive type**

1. Install the shaft key into the keyway.
2. Align the two key ways and push the pump completely onto engine.
3. Install all four bolts through the pump flange and tighten on to engine evenly.



**Motor direct drive type**

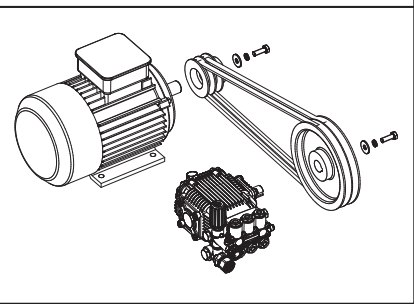
1. Install the shaft key into the keyway.
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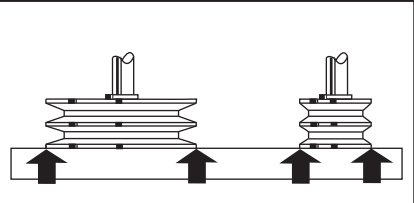
**Belt and pulley drive type**

Belt and pulley drive systems are typically use to reduce the pump speed. Pump may be rotated in either direction allowing either clockwise or counter clockwise operation of the motor.

For determining proper pulley sizes, use the blow formula.

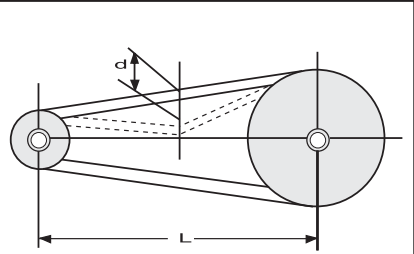


$$\frac{\text{MOTOR RPM}}{\text{PUMP RPM}} = \frac{\text{FLOW(@RATED SPEED)}}{\text{FLOW(DESIRED)}} = \frac{\text{PUMP PULLEY DIA.}}{\text{MOTOR PULLEY DIA}}$$



Straightedge touching sheaves at four points indicates alignment.

1. Install the pulley onto the pump and motor shaft. Mount the pump next to the motor, and make sure the pulley are lined up properly. Use a straightedge as shown. Rotate to check for run-out and bent shafts.
2. Install belt and use slots in the pump mounting rails to tighten the belts. Make sure the belts have proper tension. Belts that are too tight will cause bearing wear, and belts that are too loose will cause slipping.



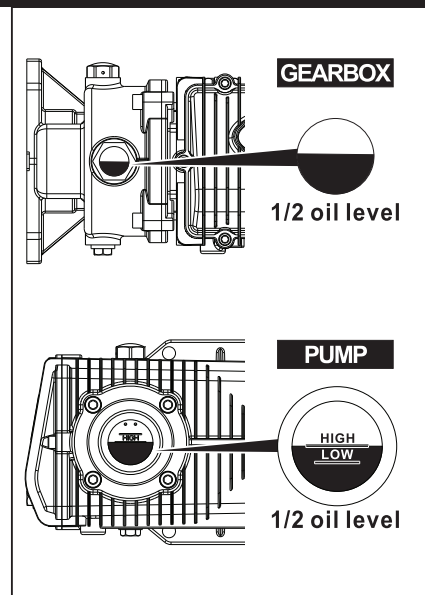
Push the belt midway between the pulleys, check the deflection(D) and adjust:  $D=0.016 \times L$

## PUMP PREPARING

### 1. Preparing Pressure Pump and Gearbox

**⚠ WARNING** Operating the pump with no or low oil will causes permanent damage, check oil level before first start, and every time before use.

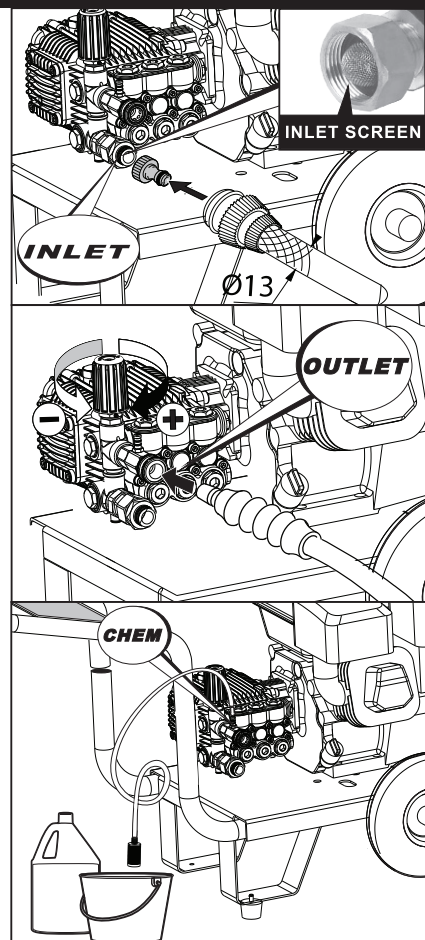
- 1.1 Check the oil glass on the end of pressure pump and gearbox to ensure oil is at 1/2 of the sight glass level
- 1.2 Add oil if level is below indicator on oil gauge. Use 30-weight non-detergent oi both for the pump and gearbox.
- 1.3 Outdoor temperatures determine the proper oil viscosity.
  - \*\*Below 40 F (4 C) the use of SAE 30 will result in hard starting.
  - \*\*Above 80 F (27 C) the use of 10W30 may cause increased oil consumption. Check oil level more frequently.



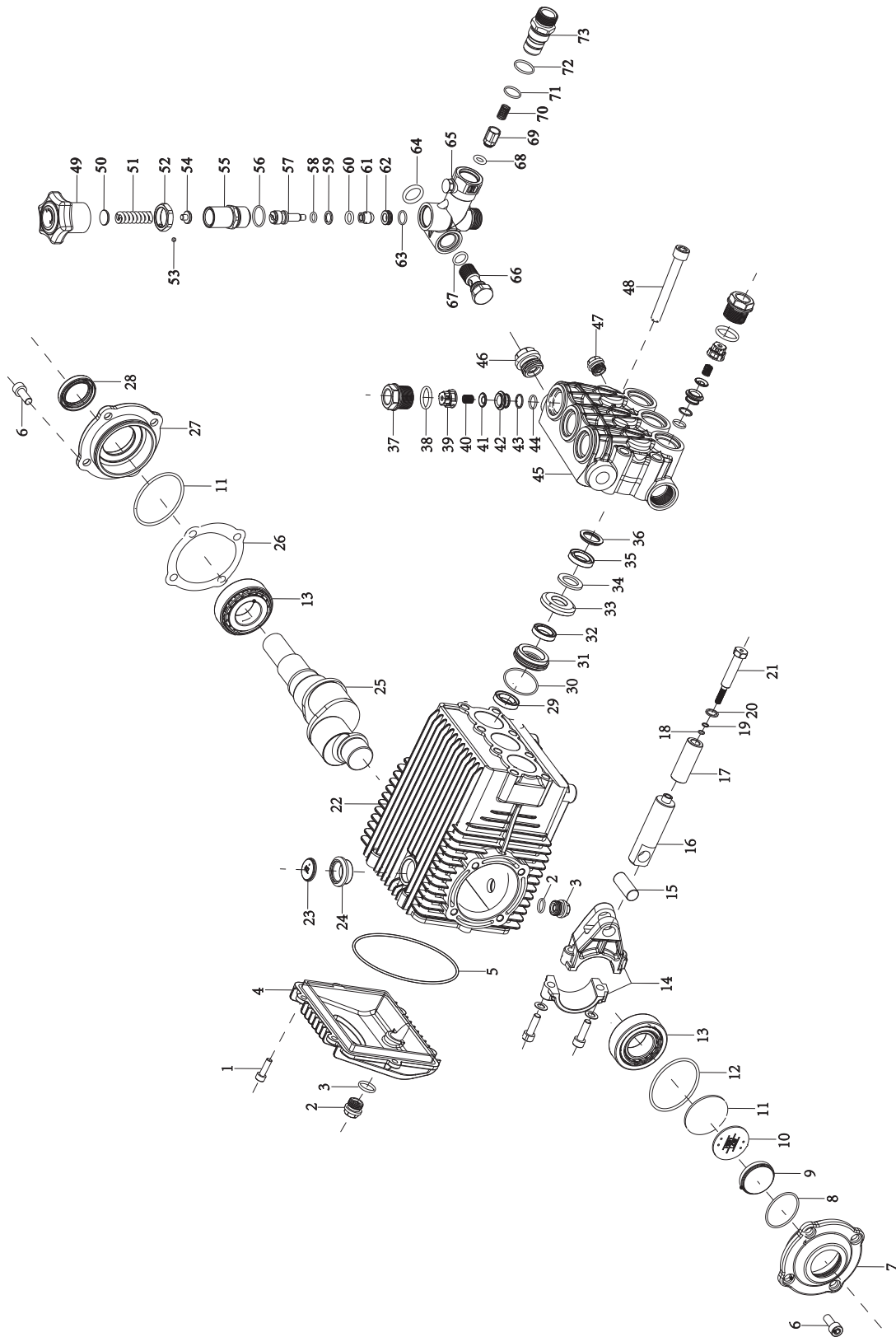
## HOSE CONNECTING AND OPERATING

1. Before connecting garden hose to water inlet, inspect inlet screen . Clean screen if it contains debris or have it replaced if damaged.
 

**DO NOT run pressure washer if inlet screen is damaged.**
2. Run water through your garden hose for 30 seconds to clean out any debris.
3. Connect the garden hose (not to exceed 50 feet in length and with the ID no less than 13mm) to the water inlet. Tighten by hand.
4. Turn ON the water, squeeze the trigger to purge the pump system of air and impurities.
5. Attach the high pressure hose to pump outlet and tighten.
6. Keep spray gun a safe distance from area you plan to spray.
7. Increase (decrease) spray pressure by turning pressure control knob clockwise (counterclockwise).
8. Press chemical hose onto barbed fitting located near back of high pressure hose connection.
9. Press other end of chemical hose with filter, into container holding chemicals or cleaning solutions. Install chemical (black) nozzle.



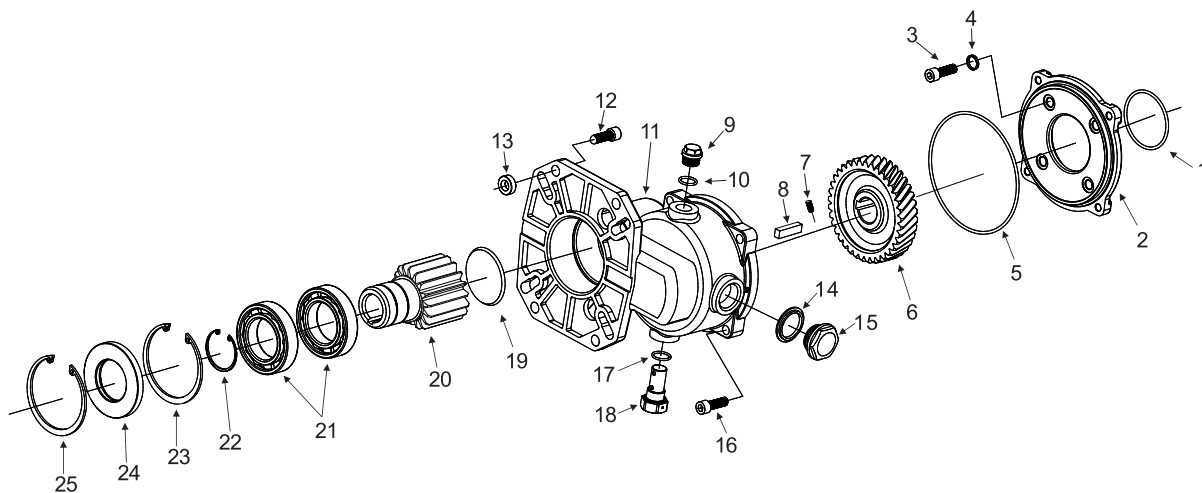
# EXPLODED VIEW



## PARTS LIST

<b>REF NO.</b>	<b>DESCRIPTION</b>	<b>REF NO.</b>	<b>DESCRIPTION</b>
1	Bolt	37	Valve Plug
2	Drain Plug	38	O-Ring
3	O-ring	39	Valve Cage
4	Crankcase Cover	40	Spring
5	O-ring	41	Valve Disc
6	Bolt	42	Valve Seat
7	Bearing Cover	43	Backup Ring
8	O-ring	44	O-ring
9	Oil Gauge	45	Manifold
10	Oil Level Indicate Plate	46	Manifold Upper Plug
11	Clamp Ring	47	Manifold Lower Plug
12	O-ring	48	Manifold Fixing Bolt
13	Bearing	49	Adjusting Knob
14	Connecting Rod	50	Upper Seat
15	Pin	51	Spring
16	Plunger Guide	52	Jam Nut
17	Ceramic Tube	53	Set Screw
18	Backup Ring	54	Spring Seat
19	O-ring	55	Spring Housing
20	Washer	56	O-ring
21	Fixing Bolt	57	Spindle
22	Crankcase	58	O-ring
23	Oil Cap Cover	59	Backup Ring
24	Oil Cap	60	O-ring
25	Crankshaft	61	Valve Bullet
26	Washer	62	Valve Seat
27	Bearing Cover	63	O-ring
28	Oil Seal	64	Oring
29	Plunger Oil Seal	65	Valve Housing
30	O-ring	66	O-ring
31	Seal Retainer	67	Banjo Bolt
32	Low Pressure Seal	68	O-ring
33	Compaction Ring	69	Outlet Checking Valve
34	Compaction Flake	70	Spring
35	High Pressure Seal	71	O-ring
36	Supporting Seat	72	O-ring
		73	Outlet Fitting

## GEARBOX EXPLODED VIEW AND PARTS LIST



**PARTS LIST**

REF NO.	DESCRIPTION	REF NO.	DESCRIPTION	REF NO.	DESCRIPTION
1	O-Ring	9	Oil drain plug	17	O-Ring
2	Mounting cover	10	O-Ring	18	Venting plug
3	Blot	11	Case	19	Blocking flake
4	Washer	12	Blot	20	Engine gear
5	O-Ring	13	Washer	21	Bearing
6	Pump gear	14	Gasket	22	Snap ring
7	Set screw	15	Sight gauge	23	Snap ring
8	Key	16	Blot	24	Oil seal
				25	Snap ring

## TROUBLE SHOOTING GUIDE

Problem	Probable Cause	Solution
<b>Pump will not draw Chemicals</b>	<ol style="list-style-type: none"> <li>1.Spray wand not set to low pressure..</li> <li>2.Chemical filter clogged.</li> <li>3.Chemical screen not in chemical.</li> <li>4.Chemical solution too thick.</li> <li>5.Pressure hose too long</li> <li>6.Chemical build-up in chemical injector.</li> </ol>	<ol style="list-style-type: none"> <li>1.See "Using Spray Wand" section.</li> <li>2.Clean Filter.</li> <li>3.Ensure end of chemical hose is fully submerged into chemicals.</li> <li>4.Dilute chemical. Chemical solutions should have same consistency as water.</li> <li>5.Lengthen water supply hose instead of pressure hose.</li> <li>6.Have parts cleaned or replaced by authorized dealer.</li> </ol>
<b>No or low pressure (after period of normal use).</b>	<ol style="list-style-type: none"> <li>1.Worn seal or packing.</li> <li>2.Worn or obstructed valves.</li> <li>3.Worn unloader piston.</li> <li>4.Worn E-Z start valve.</li> </ol>	<p>Have parts cleaned or replaced by authorized dealer.</p>
<b>Water leaking at spray gun/spray wand connection.</b>	<ol style="list-style-type: none"> <li>1.Worn or broken O-ring.</li> <li>2.Loose hose connection.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and replace O-ring.</li> <li>2. Tighten hose connection.</li> </ol>
<b>Water leaking at pump.</b>	<ol style="list-style-type: none"> <li>1.Loose connections.</li> <li>2.Piston packings worn.</li> <li>3.Worn or broken O-rings.</li> <li>4.Pump head or tubes damaged from freezing.</li> </ol>	<ol style="list-style-type: none"> <li>1.Check and replace O-ring</li> <li>2.Tighten hose connection.</li> <li>1.Tighten connections.</li> <li>2.Have parts cleaned or replaced by authorized dealer.</li> <li>3.Have parts cleaned or replaced by authorized dealer.</li> <li>4.Have parts cleaned or replaced by authorized dealer.</li> </ol>
<b>Oil leaking at pump</b>	<ol style="list-style-type: none"> <li>1.Oil seals worn.</li> <li>2.Loose drain plug.</li> <li>3.Worn drain plug O-ring.</li> <li>4.Worn fill plug O-ring.</li> <li>5.Pump overfilled.</li> <li>6.Incorrect oil used.</li> <li>7.Vent plug clogged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Have parts cleaned or replaced by authorized dealer.</li> <li>2.Tighten drain plug.</li> <li>3.Inspect and replace O-ring.</li> <li>4.Inspect and replace O-ring.</li> <li>5.Check for correct amount.</li> <li>6.Drain and refill with correct type and amount of oil.</li> <li>7.Clean vent plug. Use air hose to free it of blockage. If problem persists, replace vent plug.</li> </ol>
<b>Pump pulsates</b>	Nozzle obstructed.	Clean up the nozzle

**SAVE THIS MANUAL FOR FUTURE REFERENCE**