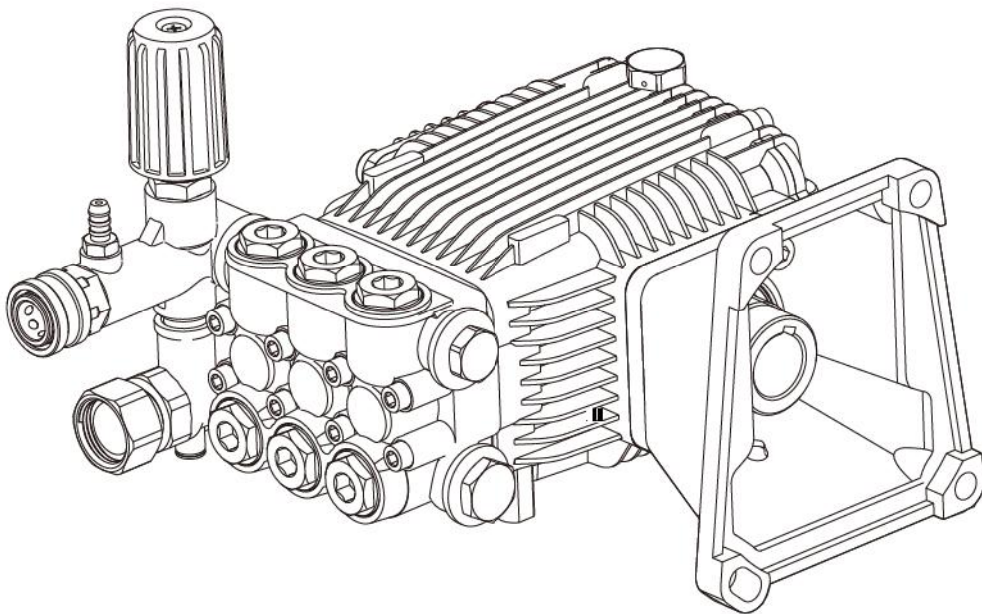


HIGH PRESSURE PUMP TRIPLEX, ENGINE DIRECT DRIVEN

OPERATION AND PARTS LIST MANUAL



This manual contains:

IMPORTANT WARNINGS and **INSTRUCTIONS**. READ AND RETAIN FOR REFERENCE

⚠ WARNING: To reduce the risk of injury, the user must read and understand the operators manual before using this product.

SAVE THIS MANUAL FOR FUTURE REFERENCE

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.

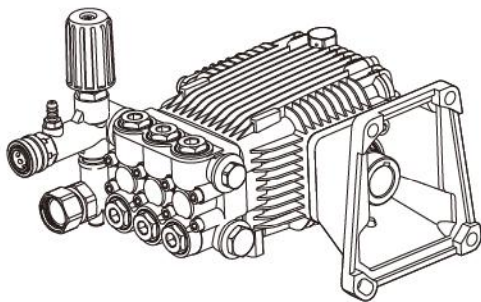
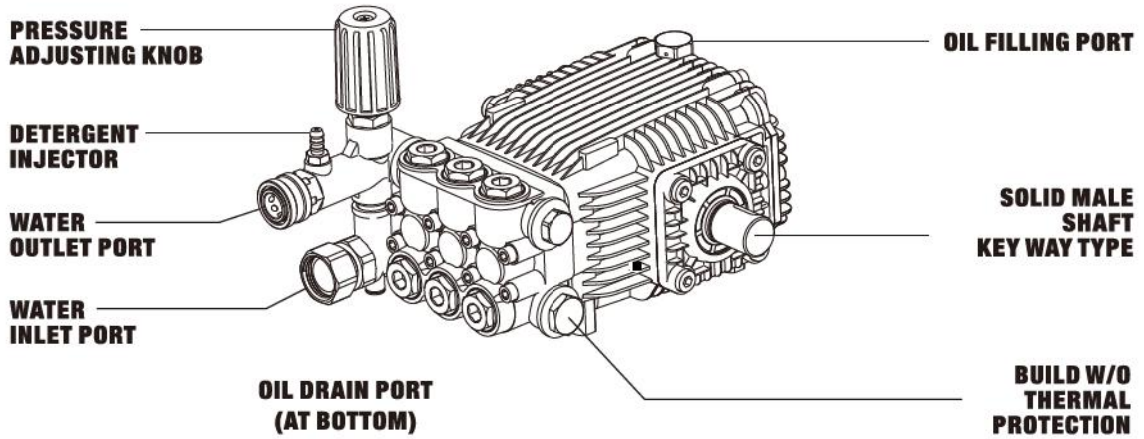


DANGER-- RISK OF EYE INJURY

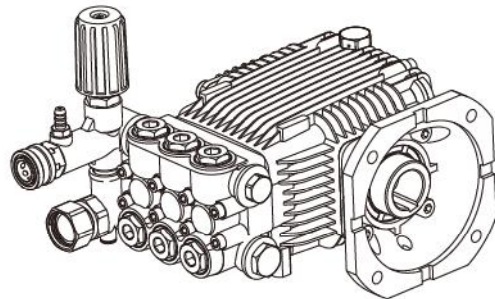
- Spray can splash back or propel objects.

- 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



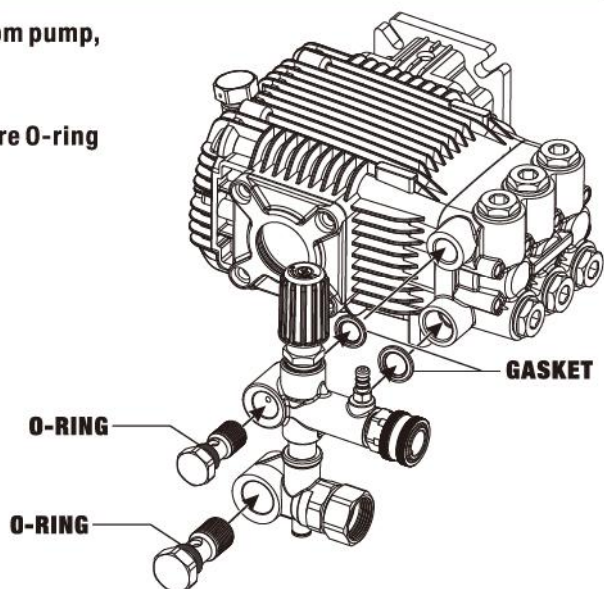
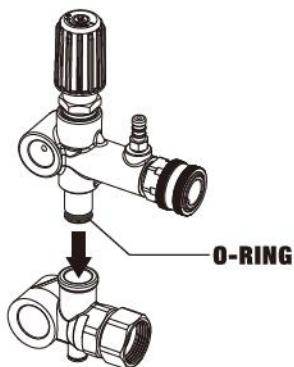
**ENGINE DIRECT DRIVE
HOLLOW SHAFT, KEY WAY TYPE**



**MOTOR DIRECT DRIVE
HOLLOW SHAFT, KEY WAY TYPE**

UNLOADER INSTALLATION

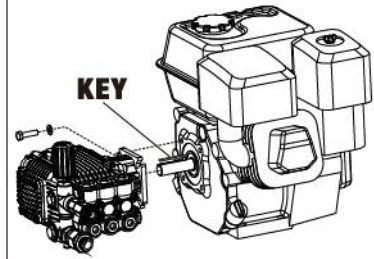
1. The unloader kit was ship separately from pump, check before install to pump.
2. Install the unloader kit to pump, make sure O-ring and gasket is in place.



PUMP INSTALLATION

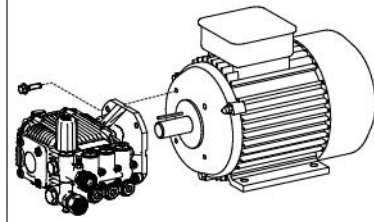
Engine direct drive type

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

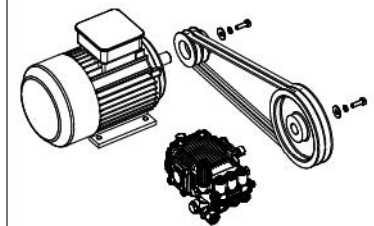
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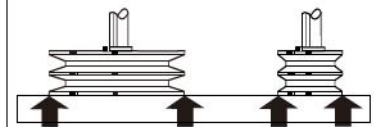
Belt and pulley drive type

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.

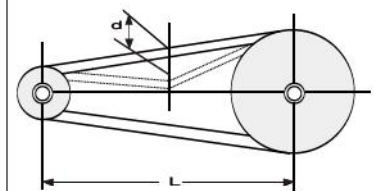


$$\frac{\text{MOTOR RPM}}{\text{PUMP RPM}} = \frac{\text{FLOW(@RATED SPEED)}}{\text{FLOW(DESIRED)}} = \frac{\text{PUMP PULLEY DIA.}}{\text{MOTOR PULLEY DIA.}}$$



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.

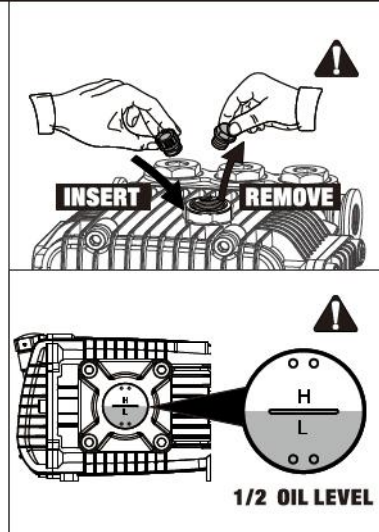


Push the belt midway between the pulleys, check the deflection(D) and adjust: $D=0.016 \times L$

PUMP PREPARING

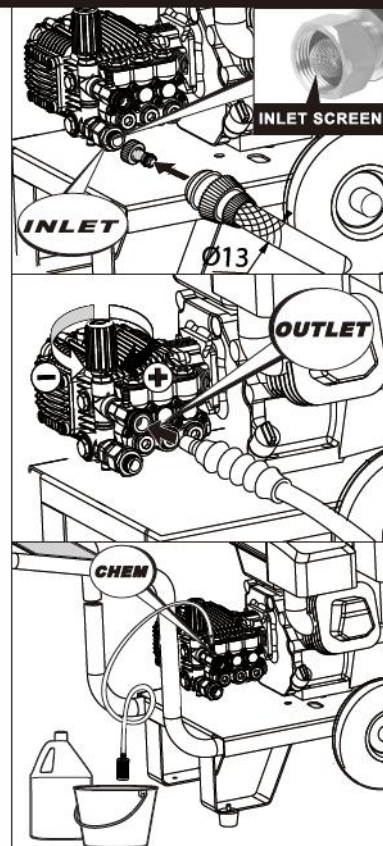
⚠ WARNING Operating pump with low or no oil causes permanent damage, and **VOIDS WARRANTY**, check oil before use.

1. Using an 17mm open-end wrench or socket wrench, remove shipping plug from pressure pump. Discard shipping plug.
2. Remove breather plug from parts bag and insert it into oil filling port.
3. Tighten breather plug securely by hand, make sure o-ring is on it.
4. Check sight glass to ensure pump oil is at 1/2 of the sight glass level
5. Add oil to pump if the level is below indicator on oil gauge.
6. Type of oil SAE 10W/30 or 15W/40, high-quality non-detergent oils, if classified for service SF, SG, SH, SJ or higher.
8. Change after the first 50 hours, then subsequently 200 hours.
9. Outdoor temperatures determine the proper oil viscosity.
Check oil level more frequently.

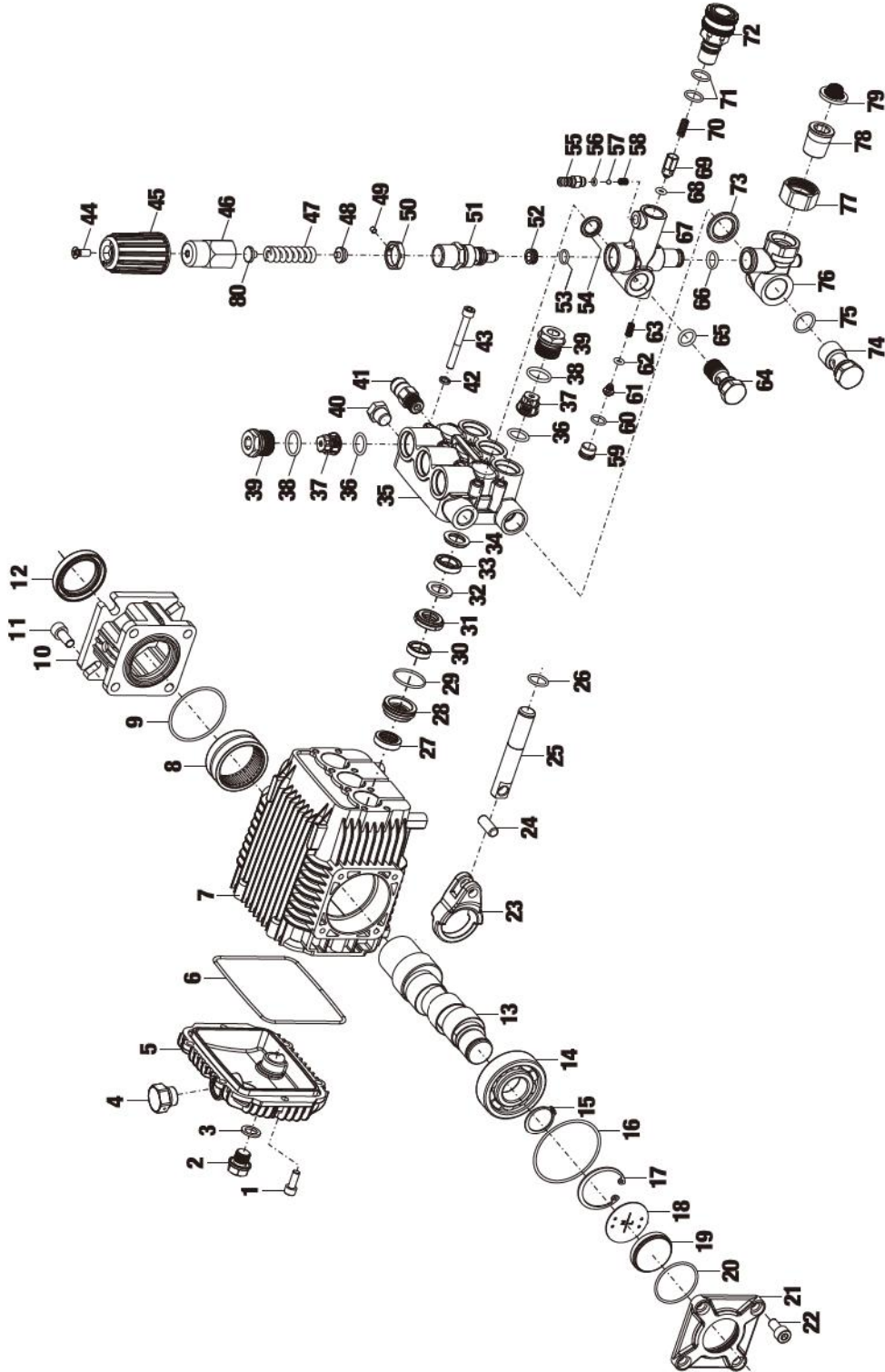


HOSE CONNECTING AND OPERATING

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

REF NO.	DESCRIPTION	QTY	REF NO.	DESCRIPTION	QTY
1	Bolt, crankcase cover	6	41	Thermal relief valve	1
2	Oil drain plug	1	42	Washer	8
3	O-ring, oil drain plug	1	43	Bolt, manifold	8
4	Vented oil cap	1	44	Screw, knob cap	1
5	Crankcase cover	1	45	Plastic knob cap	1
6	Gasket, crankcase cover	1	46	Pressure djusting knob	1
7	Crankcase	1	47	Pressure adjusting spring	1
8	Needle bearing	1	48	Spring seat	1
9	O-ring, flang	1	49	Screw, jam nut	1
10	Flange	1	50	Pressure jam nut	1
11	Bolt, flange	4	51	Unloader vavle assy	1
12	Oil seal, flange	1	52	Valve seat	1
13	Crankshaft	1	53	O-ring, valve seat	1
14	Ball bearing	1	54	Gasket, unloader valve housing	1
15	Scrap ring	1	55	Detergent injector fitting	1
16	O-ring, crankshaft cover	1	56	O-ring, injector fitting	1
17	Retain ring	1	57	Ball, injector fitting	1
18	Oil level plate	1	58	Spring, injector fitting	1
19	Oil sight glass	1	59	Plug, easy start	1
20	O-ring, oil sight glass	1	60	O-ring, plug, easy start	1
21	Crankshaft cover	1	61	Valve core, easy start	1
22	Bolt, crankshaft cover	4	62	O-ring, valve core, easy start	1
23	Connecting rod	3	63	Spring, easy start	1
24	Pin	3	64	Water outlet banjo bolt	1
25	Ceramic coating plunger	3	65	O-ring, outlet banjo bolt	1
26	O-ring	3	66	O-ring, unloader valve housing	1
27	Oil seal, plunger	3	67	Unloader valve housing	1
28	Locating ring	3	68	O-ring, outlet checking valve	1
29	O-ring, locating ring	3	69	Outlet checking valve	1
30	Low pressure water seal	3	70	Spring, outlet checking valve	1
31	Compression ring	3	71	O-ring, outlet fitting	2
32	Compression flake	3	72	Quick disconnect outlet fitting	1
33	High pressure water seal	3	73	Gasket, bypass housing	1
34	Supporting ring	3	74	Water Inlet banjo bolt	1
35	Manifold	1	75	O-ring, inlet banjo bolt	1
36	O-ring, checking valve	6	76	Bypass housing	1
37	Checking valve assy	6	77	Swivel nut, inlet connector	1
38	O-ring, valve cap	6	78	Body, inlet connector	1
39	Checking valve cap	6	79	Filter washer, inlet connector	1
40	Outlet plug, manifold	1	80	Upper seat, adjusting spring	1

TROUBLE SHOOTING GUIDE

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

MAINTAIN

OUTLET/INLET CHECKING VALVE MAINTAIN



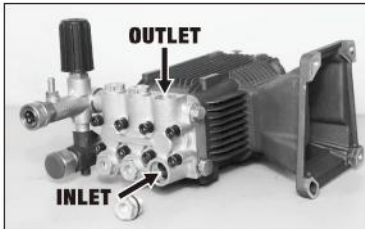
01. Hold the pump firmly, use the open-end wrench or torque wrench size (17mm) to open the valve cap.



02. Use the circlip pliers to take out the checking valve carefully.



03. Check and clean the valve, change if there is any damage.



01. Maintain the outlet and inlet checking valve same way.

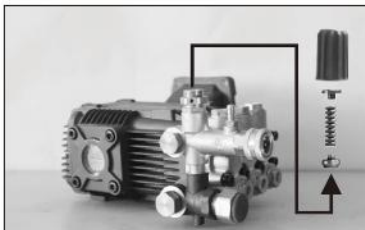


02. Use the circlip plier to put back the checking valve, and make sure the valve is in place.

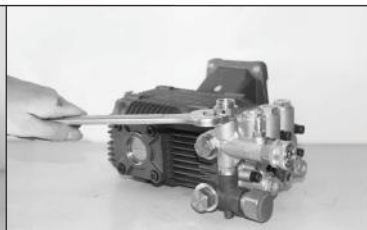


03. Hold the pump firmly, use the torque wrench size (17mm) to tighten the valve cap with the torque 70N\m.

UNLOADER VALVE MAINTAIN



01. Take out the knob, spring upper seat, spring, and spring seat sequentially



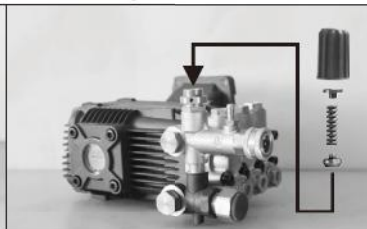
02. Hold the pump firmly, use the open-end wrench size (17mm) to loose the unloader valve assy from valve housing



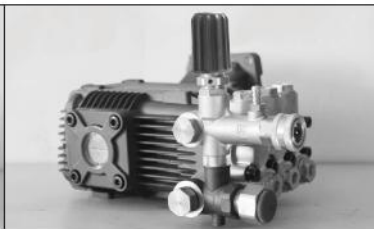
03. Check the unloader valve assy, change if there is any damage.



01. Put back unloader valve assy into the housing and tighten.



02. Put back spring set, spring, and knob sequentially.



03. Adjusting the pressure by turn the knob clockwise and counterclockwise.

MAINTAIN

WATER SEAL MAINTAIN



01. Hold the pump firmly, use the hexagon head torque wrench size (17mm) to loose the bolts..



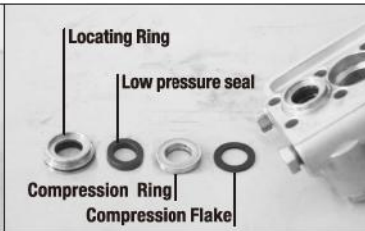
02. Take out all the bolts, dismantle the manifold from the crankcase.



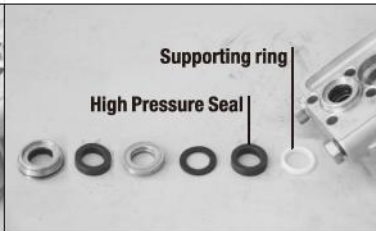
03. Put the manifold assy on a flat surface with the seal cavity face up.



01. Use the pliers to take out the locating ring.



02. Take out the locating ring, compression ring, compression flake by hand. Take out the low pressure seal from inside of locating ring.



03. Use small tool bar to take out the high pressure seal and supporting ring. Check all seals, change if there is any damage.



01. To install the high pressure seal it better to use the special tooling, it contains the guiding tube and plug.



02. Put the guiding tube in to the cavity, and put the supporting ring at bottom.



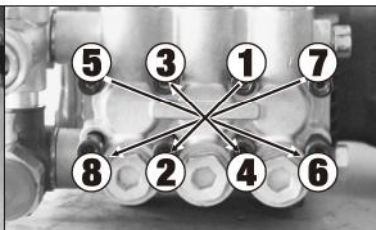
03. Put the compression flake on the guiding tube and then high pressure seal.



01. Plug in to the guiding tube, and push the plug completely down.



02. Put back the low pressure seal in to the locating ring, and put the locating ring into the cavity, push in place.



03. Hold the pump firmly, use the hexagon head torque wrench size (17mm) to tighten the bolts diagonally, show as above.

SAVE THIS MANUAL FOR FUTURE REFERENCE