



**Models:**  
**CDX2532G**  
**CDX2532G-78**



# **VORTEX**

## **Pump Manual**

## **KEEP THIS BOOKLET**

**Please read and follow carefully before installing, operate, assemble, or maintain this product. Make sure to observe all safety information to avoid injury of yourself and others. Non compliance with recommended information can result in injury or property damage! Keep this booklet for future reference.**



### **Description**

**This plunger pump is capable of pumping 2-2.5 GPM at 2500-3200 PSI. Designed to be coupled with a direct drive gasoline engine with a shaft spinning up to 3400 RPMs. The three legged design provides a convenient connection to most 5hp 7/8" shaft engines. This hollow shaft pump includes a thermal relief valve(for protection from overheating), an adjustable unloader valve (for changing the amount of psi for varying applications), and a soap injection system (for those really dirt jobs).**

# LIMITED WARRANTY

Axial Radial Pumps are warranted for a period of two years to the original purchaser. This is from the date shipped from factory or U.S. Warehouse.

Warranty covers manufacturing defects or workmanship; that may develop under normal use and service in a manner up to the directions and usage recommended by the manufacturer.

Warranty does not apply to misuse or when pump or accessory is altered or used in excess of recommended speeds, pressures, temperatures or handling fluids not suitable for pump or accessory material construction. Warranty does not apply to normal wear (such as but not limited to: seals/packings, valves, plungers and sealing o-rings), freight damage, freezing damage or damage caused by parts or accessories not supplied by Vortex Power Products.

Liability of manufacturer for warranty is limited to repair or replacement of parts only at the option of the manufacturer when such products are found to be of original defect or workmanship at the time it was shipped from factory. This warranty is in lieu of all other warranties, expressed or implied, including any warranty of merchantability and of any and all other obligations or liabilities on the part of the manufacturers or equipment.

# Nozzle Selection Chart

Nozzle Orifice	1000 PSI	1250 PSI	1500 PSI	1750 PSI	2000 PSI	2100 PSI	2200 PSI	2300 PSI	2400 PSI	2500 PSI	2600 PSI	2700 PSI	2800 PSI	2900 PSI	3000 PSI	3250 PSI	3500 PSI	3750 PSI	4000 PSI	4500 PSI	5000 PSI
2.0	1.00	1.12	1.22	1.32	1.41	1.45	1.48	1.52	1.55	1.58	1.61	1.64	1.67	1.70	1.73	1.80	1.87	1.94	2.00	2.12	2.24
2.5	1.25	1.40	1.53	1.65	1.77	1.81	1.85	1.90	1.94	1.98	2.02	2.06	2.09	2.13	2.17	2.25	2.34	2.42	2.50	2.65	2.80
3.0	1.50	1.68	1.84	1.98	2.12	2.17	2.22	2.27	2.32	2.37	2.42	2.47	2.51	2.56	2.60	2.70	2.81	2.90	3.00	3.18	3.35
3.5	1.75	1.96	2.14	2.32	2.47	2.54	2.60	2.66	2.71	2.77	2.82	2.88	2.93	2.98	3.03	3.15	3.27	3.39	3.50	3.71	3.91
4.0	2.00	2.24	2.45	2.65	2.83	2.90	2.97	3.04	3.10	3.16	3.22	3.29	3.35	3.41	3.46	3.61	3.74	3.87	4.00	4.24	4.47
4.5	2.25	2.52	2.76	2.98	3.18	3.26	3.34	3.42	3.49	3.56	3.63	3.70	3.76	3.83	3.90	4.06	4.21	4.36	4.50	4.77	5.03
5.0	2.50	2.80	3.06	3.31	3.54	3.63	3.71	3.79	3.87	3.95	4.03	4.11	4.18	4.24	4.33	4.51	4.68	4.84	5.00	5.30	5.59
5.5	2.75	3.07	3.37	3.64	3.89	3.99	4.08	4.17	4.26	4.35	4.43	4.52	4.60	4.68	4.76	4.96	5.14	5.33	5.50	5.83	6.15
6.0	3.00	3.35	3.67	3.97	4.24	4.35	4.45	4.55	4.65	4.74	4.84	4.93	5.02	5.11	5.20	5.41	5.61	5.81	6.00	6.36	6.71
6.5	3.25	3.63	3.98	4.30	4.60	4.71	4.82	4.93	5.03	5.14	5.24	5.34	5.44	5.54	5.63	5.86	6.08	6.29	6.50	6.89	7.27
7.0	3.50	3.91	4.29	4.63	4.95	5.07	5.19	5.31	5.42	5.53	5.64	5.75	5.86	5.96	6.06	6.31	6.55	6.78	7.00	7.42	7.83
7.5	3.75	4.19	4.59	4.96	5.30	5.43	5.56	5.69	5.81	5.93	6.05	6.16	6.27	6.39	6.50	6.76	7.02	7.26	7.50	7.95	8.39
8.0	4.00	4.47	4.90	5.29	5.66	5.80	5.93	6.07	6.20	6.32	6.45	6.57	6.69	6.81	6.93	7.21	7.48	7.75	8.00	8.49	8.94
8.5	4.25	4.75	5.21	5.62	6.01	6.16	6.30	6.44	6.58	6.72	6.85	6.98	7.11	7.24	7.36	7.66	7.95	8.23	8.50	9.02	9.50
9.0	4.50	5.03	5.51	5.95	6.36	6.52	6.67	6.82	6.97	7.12	7.26	7.40	7.53	7.66	7.79	8.11	8.42	8.71	9.00	9.55	10.06
9.5	4.75	5.31	5.82	6.28	6.72	6.89	7.05	7.22	7.36	7.51	7.66	7.81	7.95	8.09	8.23	8.56	8.89	9.20	9.50	10.08	10.62
10.0	5.00	5.59	6.12	6.61	7.07	7.25	7.42	7.59	7.75	7.91	8.06	8.22	8.37	8.52	8.66	9.01	9.35	9.68	10.00	10.61	11.18
11.0	5.50	6.15	6.74	7.28	7.78	7.97	8.16	8.34	8.52	8.70	8.87	9.04	9.20	9.37	9.53	9.92	10.29	10.65	11.00	11.67	12.30
12.0	6.00	6.71	7.35	7.94	8.49	8.70	8.90	9.10	9.30	9.49	9.67	9.86	10.04	10.22	10.39	10.82	11.22	11.62	12.00	12.73	13.42
12.5	6.25	6.99	7.65	8.27	8.84	9.06	9.27	9.48	9.68	9.88	10.08	10.27	10.46	10.65	10.83	11.27	11.69	12.10	12.50	13.26	13.98
13.0	6.50	7.27	7.96	8.60	9.19	9.42	9.64	9.86	10.07	10.28	10.48	10.68	10.88	11.07	11.26	11.72	12.16	12.59	13.00	13.79	14.53
15.0	7.50	8.39	9.19	9.92	10.61	10.87	11.12	11.37	11.62	11.86	12.09	12.32	12.55	12.77	12.99	13.52	14.03	14.52	15.00	15.91	16.77
20.0	10.00	11.18	12.25	13.23	14.14	14.49	14.83	15.17	15.49	15.81	16.12	16.43	16.73	17.03	17.32	18.03	18.71	19.36	20.00	21.21	22.36



# GENERAL SAFETY INFORMATION

This pump is designed for pumping non-flammable or non-combustible fluids. The pump is intended to pump clean filtered water.



Do not allow children to operate this pump.



Modifications to the manufacturer design is not recommended.



Be careful with where you point the high-pressure discharge. Never point it at a person or animals body or body part.



Do not operate in an enclosed area or around explosive materials. Always make sure you have adequate ventilation in your work environment.



Do not exceed pumps specifications in shaft speed or discharge pressure.



Maximum temperature of pumped water should not exceed 140°F.



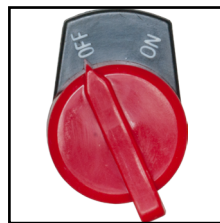
Always wear the proper safety equipment when operating this pump.



## WINTER/LONG TERM STORAGE

1. Drain all of the water from the pump.

2. Screw in bottle of Vortex Pump Saver to the garden hose inlet and open up the valve on the cap of the bottle.



3. Make sure your pressure washer on off switch is in the off position and slowly pull on the pull start rope while squeezing the pump saver bottle to cycle the contents through the pump.

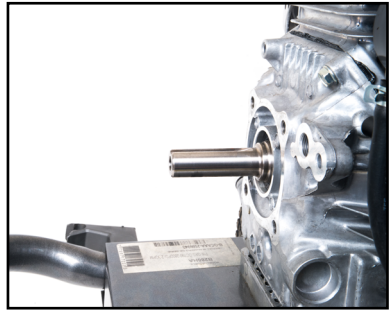
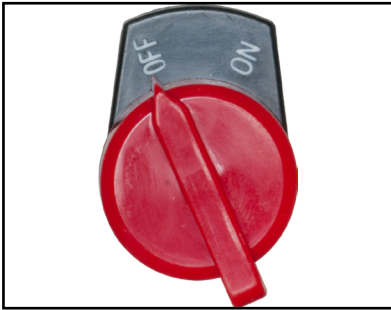
4. When you see pump saver come out of the outlet you can stop cycling the pump. Close the valve on the bottle cap and remove it from your pump.



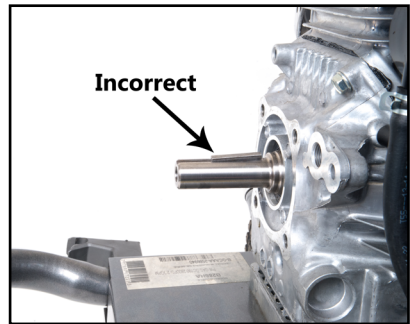
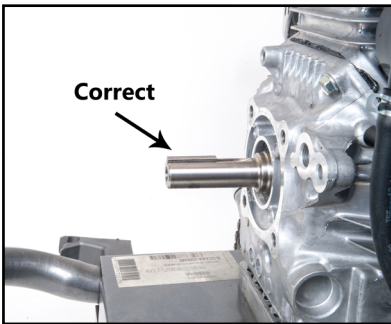
5. Before your next use make sure you flush the pump by running fresh water through it.

# INSTALLATION

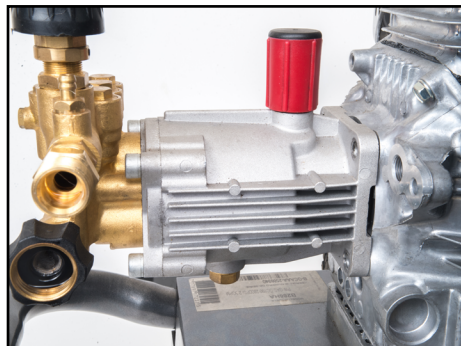
1. Make sure the unit is powered off. Remove the mounting bolts that hold the old pump to the engine, and remove the old pump. Make certain that the engine shaft is clean and free of debris before installation of the new pump.



2. Place the shaft key into the key slot on the engine shaft. Hold it in place with your finger while sliding the pump onto the engine shaft. Make sure that the shaft key does not slide up the shaft and stays firmly in the key slot or you can risk damaging the pump hollow shaft when tightening the mounting bolts.

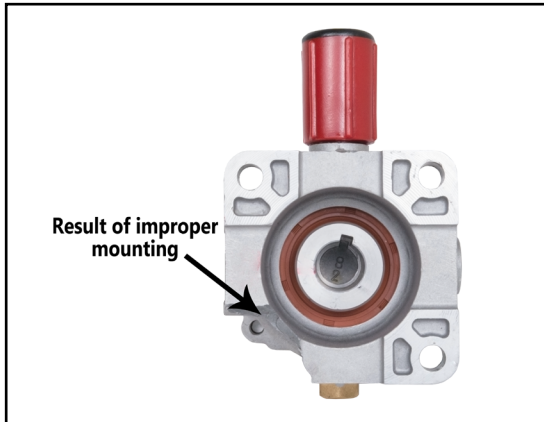


3. After placing the pump onto the shaft with the key in place line up the 4 mounting bolt holes with the 4 engine mount bolt holes. Slide your pump onto the shaft until the mounting tabs are flush with the frame. There should be no gap between the mounting tabs and engine.



# INSTALLATION

4. Once the pump is flush with the frame it's time to bolt it together. Insert the mounting bolt with a washer through the mounting tab bolt hole and tighten down the bolts when you are absolutely positive that the mounting tabs are flush with the engine or you can break a tab or damage the hollow shaft inside the pump.

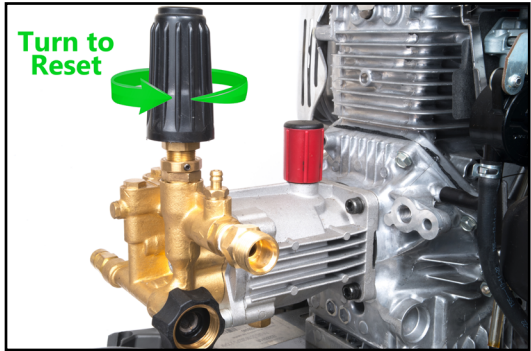


5. Once the pump has been mounted to the engine make sure the on off switch is in the off position and then slowly pull the pull start rope to ensure that the engine shaft spins freely inside the pump. If it does not spin freely then the shaft key either slid up the shaft and is binding or the pump isn't flush to the engine and is binding because it is tilted at an angle. Remove the pump and reinstall ensuring that each step is done correctly.



# UNLOADER ADJUSTMENT

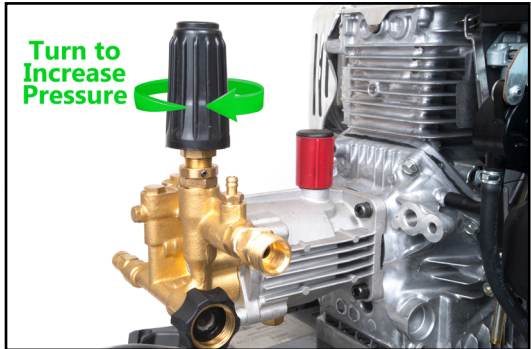
1. The first step is to reset the unloader. Turn the adjustment knob counter clockwise until there is absolutely no pressure against the spring inside the unloader.



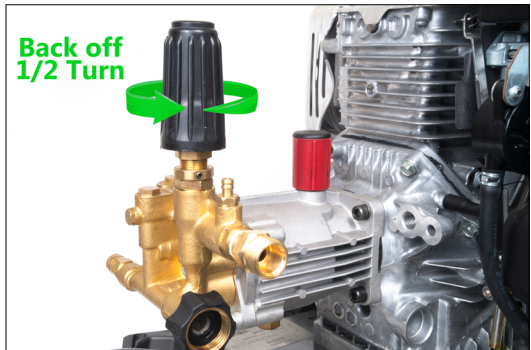
2. Connect hoses to your pump and run water to it. Now you will need to purge the air from your hoses by pulling the trigger until only water comes out.

3. Run your pressure washer

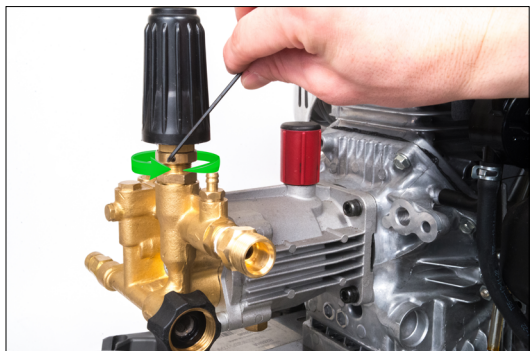
4. With your pressure washer running hold down the trigger and slowly turn the adjustment knob clockwise.



5. When pressure no longer increases turn the knob counter clockwise 1/2 turn and release the trigger. **NOTE:** If the engine stalls or acts as if it is still under-load then you will need to repeat steps 4 and 5 again until your pressure washer goes into by-pass mode and there is no load on the engine.



6. Below the adjustment knob you will find a brass stopper with a set screw. Loosen the set screw and adjust the stopper until it is snug against the adjustment knob. Tighten the set screw to keep it in place



# TROUBLESHOOTING

Symptom	Possible Cause	Corrective Action
Oil leak between crankcase and pump section	Worn oil seals around plunger	Replace crankcase plunger oil seals
Frequent or premature failure of the packing	1. Cracked, damaged, or worn plunger	1. Replace plunger
	2. Overpressure to inlet manifold	2. Reduce inlet pressure
	3. Material in the fluid being pumped	3. Install filter to pump inlet
	4. Excessive pressure and/or temperature of fluid being pumped	4. Check pressure and water inlet temperature. Be sure they are within specified ranges
	5. Running pump dry	5. Do not run pump without water
Pump runs but produces no flow	Pump is not primed	Flood suction then restart the engine
Pump fails to prime	Air is trapped inside pump	Disconnect discharge hose from pump. Flood suction hose and run the pump until all air has been evacuated
Pump loses prime, chattering noise, and/or pressure fluctuates	1. Air leak in suction hose or inlet	1. Remove suction line and inspect it for a loose liner or debris lodged in the hose. Avoid all unnecessary bends and do not kink
	2. Clogged suction strainer	2. Clean strainer
Low pressure at nozzle	1. Unloader valve is by-passing	1. Make sure unloader is adjusted properly and by-pass seat is not leaking
	2. Incorrect or worn nozzle	2. Make sure nozzle is matched to the flow and pressure of the pump. If the nozzle is worn the replace it with a new one.
	3. Worn packing or valves	3. Replace packing or valves
Pressure gauge fluctuates	1. Valves worn or blocked by debris	1. Clean or replace valves
	2. Packing worn	2. Replace packing
Low pressure	1. Worn nozzle	1. Replace with new nozzle of proper size
	2. Air leak in inlet connection	2. Disassemble, reseal, and reassemble
	3. Relief valve stuck, partially plugged or improperly adjusted valve seat, valve seat worn	3. Clean and adjust relief valve and check for worn or dirty vavle seats
	4. Worn packing. Abrasive in pump cavitation. Inadequate water.	4. Install proper filter at manifold water inlet
	5. Worn inlet, discharge valve blocked or dirty	5. Replace inert and discharge valve
Pump runs extremely rough, pressure very low	1. Inlet restrictions and or air leak	1. Clean out foreign material
	2. Stuck inlet or discharge valve	2. Replace worn valve



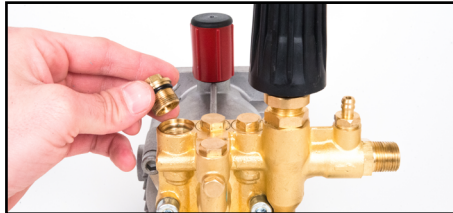
# TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
Water leakage from under manifold	Worn packing or cracked plunger	Install new packing or plunger
Slight leak, oil leaking in the area of the crankshaft	1. Worn crankshaft seal or improperly installed oil seal	1. Remove oil seal retainer and install new oil seal
	2. Bad Bearing	2. Install new bearing
Water in crankcase	1. Humd air condensing into water inside the crankcase	1. Change oil
	2. Worn packing and/or cracked plunger	2. Replace packing and/or plunger
Loud knocking noise in pump	1. Cavitation or sucking air	1. Check that water supply is turned on
	2. Broken or worn bearing	2. Replace bearing

## PUMP SERVICING

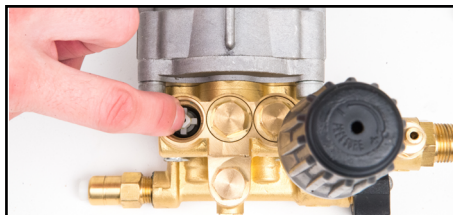
### DISCHARGE VALVE REMOVAL

1. Remove the valve cap and inspect the o-ring for damage and replace if neccessary.
2. Use a pair of needle nose pliers to remove the check valve.
3. Use a small probe to move the poppet up and down inside the valve to insure it is function properly.
4. Remove any debris lodged between the spring and poppet or the poppet and seat.
5. Inspect the seat o-ring for damage and replace if damage is discovered.



### DISCHARGE VALVE INSTALLATION

1. Insert the valve assembly squarely into the valve port and firmly push it in using your finger. Should be quite snug when seated all of the way.
2. Install the valve cap and torque it to down 221 ft. lbs.



# PUMP SERVICING

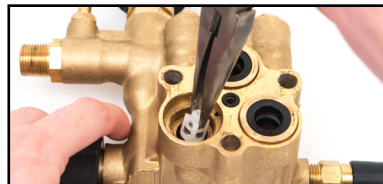
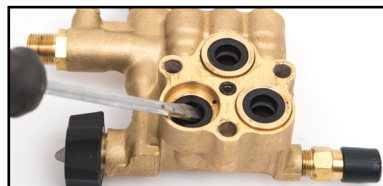
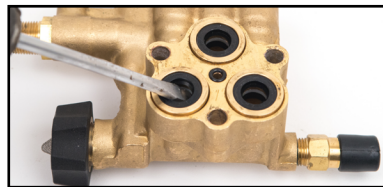
## INLET VALVE REMOVAL

1. Remove the pump head from the body.

### **Note:**

**Be careful not to damage parts below so they can be reused if not worn**

2. Remove the first seal by inserting a screw driver (or other device for levering) under the lip of the seal and lift it up.
3. Using a pair of reversible pliers, carefully remove the seal retainer from the head.
4. Carefully remove the check valve with a pair of needle nose pliers.
5. Use a small probe to move the poppet up and down inside the valve to insure it is function properly.
6. Remove any debris lodged between the spring and poppet or the poppet and seat.
7. Inspect the seat o-ring for damage and replace if damage is discovered.



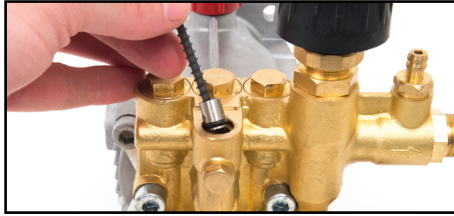
## INLET VALVE INSTALLATION

1. Insert the valve assembly squarely into the valve port and firmly push it in using your finger. Should be quite snug when seated all of the way.
2. Insert the first water seal (it will be the thicker one) and with your finger press it into the valve port with the flat side facing up. Should be a tight fit.
3. Assemble the retainer with the remaining water seal in place (flat side facing up). Lubricate the retainer o-ring then insert the assembled retainer all of the way into the valve port. The retainer should stick out past the head surface.
4. Reinstall head and torque bolts to 221 ft. lbs.

# PUMP SERVICING

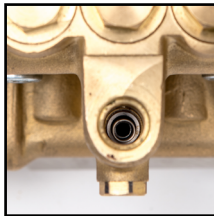
## EASY START REMOVAL

1. Remove the easy start plug and inspect the o-ring for damage or wear and replace if necessary.
2. Remove the ball and spring then clean them and the barb of calcium build-up.
3. Using a coarse wood screw, insert it into the seat and twist it until the threads catch in the small hole at the bottom of the seat. When the threads catch you will be able to pull the seat out. Inspect the o-ring for damage or wear and replace if necessary.



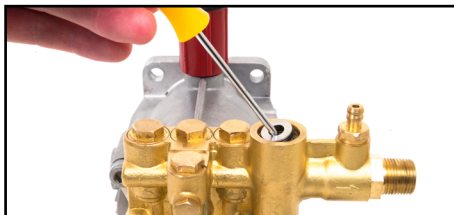
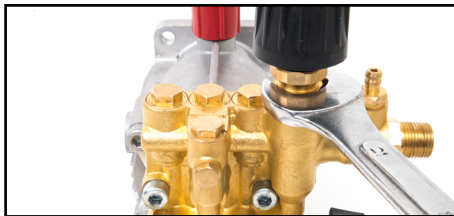
## EASY START INSTALLATION

1. Insert the seat then use something long and skinny to push it fully into position inside the pump head.
2. Place the spring in next making sure that it is inserted inside the seat.
3. Insert the ball on top of the spring.
4. Install the easy start plug and torque it down to 221 ft. lbs.



## UNLOADER VALVE REMOVAL

1. Remove unloader from the head.
2. Using a hooked pick pull pull out the seat. It may be stuck tight so you may need to pull from multiple angles to work it out. Inspect seat o-ring for damage or wear and replace if necessary.

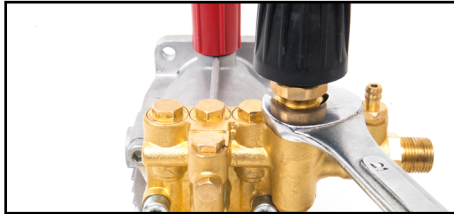
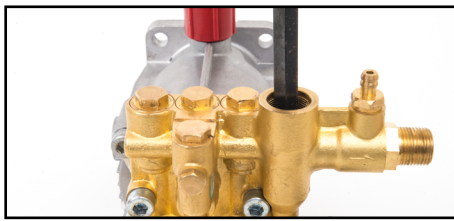




# PUMP SERVICING

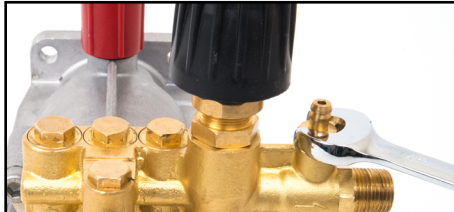
## UNLOADER VALVE INSTALLATION

1. Insert the seat squarely in the port with the flat side facing up and the concave side facing down.
2. Press the seat into place with a wide blunt tool that will allow you to distribute pressure equally across the seat while pressing it in place.
3. Reinstall the unloader valve and tighten.



## CHEMICAL INJECTOR REMOVAL

1. Remove the hose barb and inspect the o-ring for damage or wear and replace if necessary.
2. Remove the ball and spring. Then clean them and the barb of calcium build-up.



## CHEMICAL INJECTOR INSTALLATION

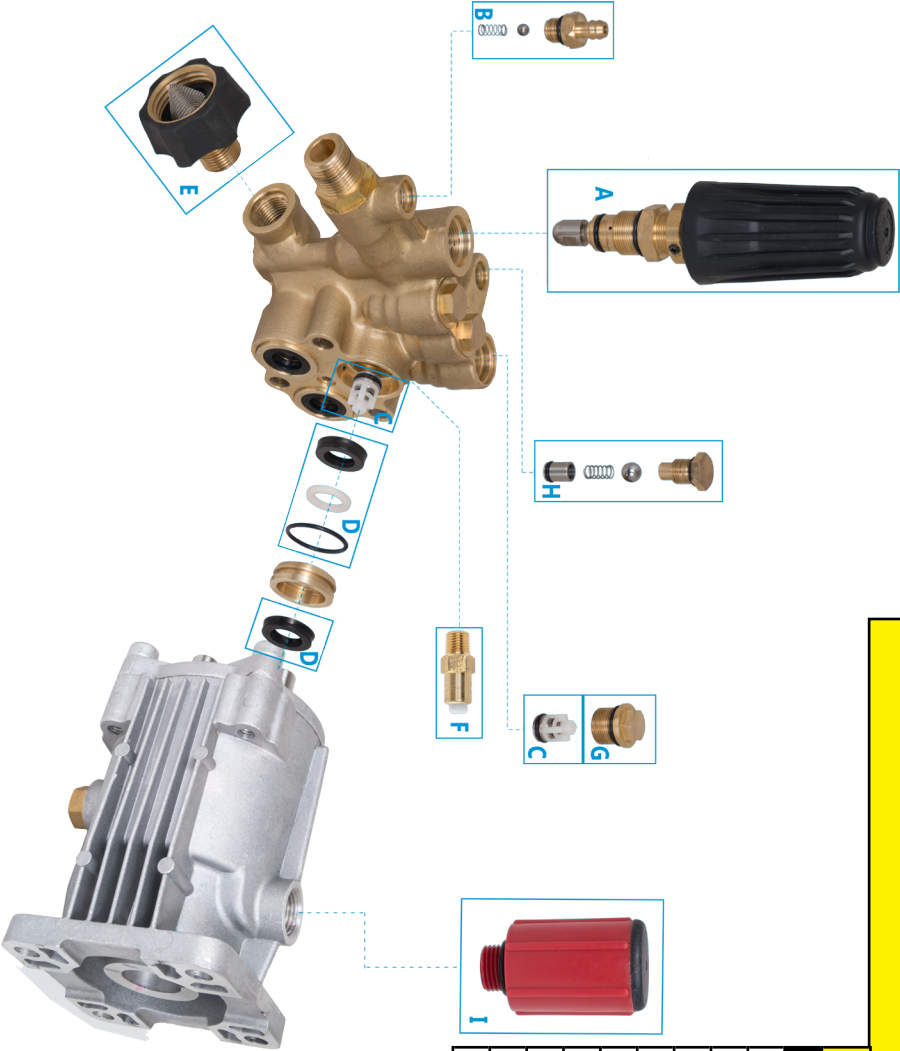
1. Insert ball into the injector barb followed by the spring
2. Place the pump so that you can place the assembled hose barb into the injector port without the components falling out.
3. Tighten down the injector barb until snug. Do not overtighten because the barb can easily break or strip out the threads.



# PUMP BREAKDOWN

## REPLACEMENT PART KITS

PART NO			Description	Price
A	1002.0405	Unloader Valve		
B	1001.3301	Injector Kit		
C	1001.3300	Check Valve Kit		
D	1001.3298	Water Seal Kit		
E	1000.6353	Garden Hose Fitting		
F	1001.2150	Thermal Valve		
G	1002.0458	Single Valve Cap		
H	1002.0409	Easy Start Kit		
I	1001.3302	Vent Tube		



## Notes

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