

# PUMPTEC, INC MAINTENANCE SHEET

## PREVENTATIVE MAINTENANCE CHECK-LIST

CHECK	DAILY	WEEKLY	50HRS.	500HRS.	1500HRS.	3000HRS.
CLEAN FILTERS	X					
WATER LEAKS	X					
PLUMBING		X				
DESCALE PUMP		X	X			
CAM & BEARING				X	X	
SEAL CHANGE				X	X	
VALVE CHANGE				X		X

*\*\* Each system's maintenance cycle will be exclusive. If system performance decreases, check immediately. If no wear at 600 hours, check again at 1200 hours and each 600 hours until wear is observed. Valves typically require changing every seal change.*

*Duty cycle, temperature, quality of pumped liquid and inlet feed conditions all effect the life of pump wear parts and service cycle.*

*\*\* Remember to service the regulator/unloader at each seal servicing and check all system accessories and connections before resuming operation.*

## DIAGNOSIS AND MAINTENANCE

PROBLEM	PROBABLE CAUSE	SOLUTION
<ul style="list-style-type: none"> <li>▪ Low Pressure</li> </ul>	<ul style="list-style-type: none"> <li>▪ Worn Nozzle</li> <li>▪ Belt slippage</li> <li>▪ Air leak in inlet plumbing</li> <li>▪ Pressure gauge inoperative or not registering accurately</li> <li>▪ Relief valve stuck, partially plugged or improperly adjusted</li> <li>▪ Worn seat or valves</li> <li>▪ Inlet suction strainer clogged or improperly sized</li> <li>▪ Worn V-packing. Abrasives in pumped liquid, severe cavitation inadequate water supply, stressful inlet conditions</li> <li>▪ Fouled or dirty inlet or discharge valved</li> <li>▪ Worn inlet or discharge valved</li> <li>▪ Leaky discharge hose</li> </ul>	<ul style="list-style-type: none"> <li>▪ Replace nozzle of proper size.</li> <li>▪ Tighten or replace; use correct belt</li> <li>▪ Use PTFE liquid or tape.</li> <li>▪ Check pressure with new gauge and replace as needed.</li> <li>▪ Clean and reset relief valve to system pressure and correct by-pass. Check supply tank for contamination.</li> <li>▪ Clean or replace with valve kit.</li> <li>▪ Use adequate size for inlet pump connection and liquid being pumped. Clean frequently.</li> <li>▪ Replace Packing, install and maintain proper filter, check line size and flow available to pump.</li> <li>▪ Clean inlet and discharge valve assemblies.</li> <li>▪ Replace with valve kit.</li> <li>▪ Replace hose. Check connections.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Pulsation, pump runs extremely rough, pressure low.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Faulty Pulsation Dampener</li> <li>▪ Restricted inlet or air entering inlet plumbing.</li> <li>▪ Stuck inlet or discharge valve</li> </ul>	<ul style="list-style-type: none"> <li>▪ Check precharge (should be 30-50%) of system pressure or replace as needed.</li> <li>▪ Check filters and clean as needed. Check fittings and use PTFE liquid or tape for airtight connection.</li> <li>▪ Clean or replace valve. Check supply tank for contamination.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Water leakage from under the manifold * Slight leakage</li> </ul>	<ul style="list-style-type: none"> <li>▪ Worn V-Packing and Lo pressure Seals</li> </ul>	<ul style="list-style-type: none"> <li>▪ Replace with seal kit, check inlet pressure and system temperature, use inlet pressure regulator in inlet line.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Frequent or premature failure of the packing</li> </ul>	<ul style="list-style-type: none"> <li>▪ Scored plungers</li> <li>▪ Over pressure to inlet manifold</li> <li>▪ Abrasive material in the liquid being pumped</li> <li>▪ Excessive temperature of pumped liquid</li> <li>▪ Running pump dry</li> <li>▪ Starving pump of adequate liquid</li> </ul>	<ul style="list-style-type: none"> <li>▪ Replace plungers</li> <li>▪ Reduce inlet pressure per instructions.</li> <li>▪ Install proper filtration on pump inlet plumbing.</li> <li>▪ Reduce liquid inlet temperature to specifications.</li> <li>▪ DO NOT RUN PUMP WITHOUT WATER.</li> <li>▪ Increase supply line to one size large than inlet port size</li> </ul>
<ul style="list-style-type: none"> <li>▪ Strong surging at the inlet and low pressure</li> </ul>	<ul style="list-style-type: none"> <li>▪ Foreign particles in the inlet or discharge valve or worn inlet and/or discharge valves</li> </ul>	<ul style="list-style-type: none"> <li>▪ Check for smooth surfaces on inlet and discharge valve seats. Replace with kit if pitted or worn</li> <li>▪ Check supply tank for contamination. Install and regularly clean filter Do not pump abrasive fluids.</li> </ul>



# INLET CONDITION CHECK-LIST

## REVIEW BEFORE START-UP

Inadequate inlet conditions can cause serious malfunctions in the best designed pump. Surprisingly, the simplest of things can cause the most severe problems or go unnoticed to the unfamiliar or untrained eye. *REVIEW THIS CHECK-LIST BEFORE OPERATION OF ANT SYSTEM.* Remember, no two systems are alike so there can be no **ONE** best way to set-up a system. All factors must be carefully considered.

**INLET SUPPLY** should exceed the maximum flow being delivered by the pump to assure proper performance.

- Open inlet shut-off valve and turn on water supply to avoid starving the pump. **DO NOT RUN PUMP DRY.**
- Avoid closed loop systems especially with high temperature, ultra-high pressure or large flows. Conditions vary with regulating/unloader valve.
- When using an inlet supply reservoir, size it to provide adequate liquid to accommodate the maximum output of the pump, generally a minimum of 6-10 times the GPM (however, a combination of system factors can change this requirement)

**INLET LINE SIZE** should be adequate to avoid starving the pump.

- Line size must be a minimum of one size larger than the pump inlet fitting. Avoid tees, 90 degree elbows or valves in the inlet line of the pump to reduce the risk of flow restriction and cavitation.
- The line **MUST** be a FLEXIBLE hose, NOT a rigid pipe, and reinforced on SUCTION systems to avoid collapsing.
- The simpler the inlet plumbing the less the potential for problems. keep the length to a minimum, the number of elbows and joints to a minimum (ideally no elbows) and the inlet accessories to a minimum.
- Use pipe sealant to assure air-tight, positive sealing pipe joints.

**INLET PRESSURE** should fall within the specifications of the pump.

- Acceleration loss of liquids may be increased by high RPM, high temperatures, low vapor pressures or high viscosity.
- Optimum pump performance is obtained with +20 PSI (1.4 BAR) inlet pressure. With adequate inlet plumbing, most pumps will perform with flooded suction. Maximum inlet pressure is 50 PSI (3.5 BAR)
- After prolonged storage, pump should be purged of air to facilitate priming. Disconnect the discharge port allow liquid to pass through pump and measure flow.

**BY-PASS TO INLET** Care should be exercised when deciding the method of by-pass from control valves.

- It is recommended the by-pass be directed to a baffled reservoir tank, with at least one baffle between the by-pass line and the inlet line to the pump.
- Although not recommended, by-pass liquid may be returned to the inlet line of the pump if the system is properly designed to protect your pump.
- A low-pressure, flexible hose should be used from the by-pass connection to the inlet of the pump.
- Caution should be exercised not to undersize the by-pass hose diameter and length.
- Check the pressure in the by-pass line to avoid overpressurizing the inlet.

## Avoid Cavitation Damage

CONDITION	SOLUTION
Inadequate inlet line size	<ul style="list-style-type: none"> <li>▪ Increase line size to the inlet port or one size larger</li> </ul>
Rigid Inlet Plumbing	<ul style="list-style-type: none"> <li>▪ Use flexible wire reinforced hose to absorb pulsation and pressure spikes</li> </ul>
Excessive Elbows in Temperature	<ul style="list-style-type: none"> <li>▪ Keep elbows to a minimum and less than 90°</li> </ul>
Excessive Liquid Temperature	<ul style="list-style-type: none"> <li>▪ Do not exceed pump temperature specifications</li> <li>▪ Adequately size tank for frequent or high volume bypass properly ventilate cabinets</li> </ul>
Air Leaks in Plumbing	<ul style="list-style-type: none"> <li>▪ Check all connections</li> <li>▪ Use teflon tape</li> </ul>
High Viscosity Liquids	<ul style="list-style-type: none"> <li>▪ Verify viscosity against pump specifications before operation</li> <li>▪ Elevate liquid temperature enough to reduce viscosity</li> <li>▪ Lower RPM of pump</li> <li>▪ Pressure feed pump</li> <li>▪ Increase inlet line size</li> </ul>
Clogged Filters	<ul style="list-style-type: none"> <li>▪ Perform regular maintenance or use clean filters to monitor build up</li> <li>▪ Use adequate mesh size for liquid and pump specifications.</li> </ul>