DIAGNOSIS AND MAINTENANCE

PROBLEM	PROBABLE CAUSE	SOLUTION
Pulsation	*Faulty Pulsation Dampener	Check pre-charge. If low, recharge or install a new one.
Low Pressure	*Belt slippage	Tighten or replace. Use correct type/length.
	*Air leak in inlet plumbing	Disassemble, reseal and reassemble
	*Pressure gauge inoperative or not registering accurately	Check with new gauge; replace worn or damaged gauge.
	*Relief valve stuck, partially plugged or improperly adjusted; valve seat worn	Clean and adjust relief valve; check for worn or dirty valve seats. Repair with Valve Kit.
	*Inlet suction strainer clogged or improper size	Clean. Use adequate size. Check frequently
	*Worn Piston Assy. Abrasives in pumped fluid or severe cavitation. Inadequate water supply	Install proper filter. Suction at inlet manifold must be limited to lifting less than 20' of water or –8.5 PSI vacuum.
	*Fouled or dirty inlet or discharge valves	Clean inlet and discharge valve assemblies
	*Worn inlet or discharge valves	Replace worn valves, valve seats.
	*Leaky discharge hose	Replace discharge hose and check for air tight connections.
	* Worn nozzle	Replace nozzle to proper size
Pump runs extremely rough, pressure very low	*Restricted inlet or air entering the inlet plumbing	Proper size inlet plumbing; check for air tight seal.
	*Damaged cup or stuck inlet or discharge valve	Replace worn cups or valves; clean out foreign material.
	*Worn inlet seals allowing air into system or leaking fluid	Install new inlet manifold seals and possibly sleeves.
	*Stressful inlet condition	Pressurize inlet
Cylinder o-ring blown next to discharge manifold	*Pressure in excess of rated PSI or distorted manifold from freezing damage	Check for plugged nozzle, closed valves or improperly adjusted by-pass valve and replace defective manifold or o-ring. PROTECT FROM FREEZING.
Leakage at the cylinder o-rings at the discharge manifold and black powdery substance in the area of the o-ring.	*Loose cylinders. Cylinder motion caused by improper shimming of the discharge manifold.	Remove spacer shims on manifold studs. Do not remove too many shims or the ears of the manifold will be bowed when the manifold is retightened, causing looseness in the center of the cylinder.
Water leakage from under the inlet manifold	*Worn inlet manifold seals. Leaking sleeve o-ring.	Install new o-rings as required. Replace scored sleeves.
Oil leak between crankcase and pumping section	*Worn crankcase piston rod seals.	Replace crankcase piston rod seals.
	*Excess oil from wicks	Reduce quantity of oil per oiling.
Oil leaking in the area of crankshaft	*Worn crankshaft seal or improperly installed oil seal retaining package	Remove oil seal retainer and replace damaged gasket and/or seals
	*Bad bearing	Replace bearing
Excessive play in the end of the crankshaft pulley	*Worn main ball bearing from excessive tension on the drive belt	Replace bearing. Properly tension belt. Use correct type and length.
Water in crankcase	*May be caused by humid air condensing into water inside the crankcase	Change oil every 3 months or 500 hour intervals using special CAT PUMP non detergent HYDRAULIC OIL
	*Leakage of manifold inlet seals and/or	Replace seals, sleeves and o-rings

	piston rod sleeve o-ring	
Oil leaking from side of crankcase	*Worn crankshaft seals	Replace seals
Oil leaking at the rear portion of the crankcase	*Damaged or improperly installed oil gauge or worn crankcase rear cover o-ring, or drain plug o-ring	Replace oil gauge, cover o-ring, or drain plug o-ring as needed.
Oil leakage from drain plug	*Loose drain plug or worn drain plug o-ring	Tighten drain plug or replace o-ring
Loud knocking noise in the pump	*Pulley loose on crankshaft *Broken or worn bearing	Check key and tighten set screw Replace bearing Check alignment and belt position
Frequent or premature failure of the inlet manifold seals	*Scored rods or sleeves *Over pressure to inlet manifold *Stressful inlet conditions	Replace rods and sleeves Reduce inlet pressure Pressurize inlet
Short cup life	*Abrasive material in fluid being pumped *Excessive pressure and/or temperature of fluid being pumped *Running pump dry *Front edge of piston sharp. *Chrome plating of cylinders damaged causing excessive wear of cups. May be caused by pumping acid solution *Short life on cups on cylinders	Install proper filtration on pump inlet plumbing Check discharge pressure, fluid temperature, or control valve by-pass. **Do not run pump without water.** Replace with new piston. Install new cups and cylinders Stressful inlet conditions
Strong surging at the inlet and low pressure on the discharge side	*Foreign particles in the inlet or discharge valve or worn inlet and/or discharge valves	Check for smooth mating surfaces or inlet inlet valves and discharge valve sealts. F.V. and inlet valves may be lapped on a very fine oil stone; **Q.V. parts must be replaced.**