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Trouble Shooting a Pumping System

Once a pump is properly selected and installed in a system, operation should be trouble free. However, in existing systems, or as pump and system conditions change, problems may develop. Following are some troubleshooting hints to help identify and solve problems.

Problem	Possible Cause	Solutions
No flow, pump not turning	Drive motor not running	Check resets, fuses, circuit breakers
	Keys sheared or missing	Replace
	Drive belts, power transmission components slipping or broken	Replace or adjust
	Pump shaft, keys or gears sheared	Inspect; replace parts
No flow, pump turning	Wrong direction of rotation	Reverse
No flow, pump not priming	Valve closed in inlet line	Open valve
	Inlet line clogged or restricted	Clear line, clean filters, etc
	Air leaks due to bad seals or pipe connections	Replace seals; check line for leakage
	Pump speed too slow	Speed up pump. Filling inlet lines with fluid may allow initial start-up.
	Liquid drains or siphons from system during periods	Use check valves
	Air lock – fluids which gas off or vaporize or allow gas to come out of solution during off periods	Manual or automatic air bleed from pump or lines near pump
	Extra clearance rotors, worn pump	Increase pump speed or send pump in for re-conditioning/repair
	Net inlet pressure available too low	Check NIPA, NIPR, recalculate system and change inlet as needed
No flow	Relief valve not properly adjusted or held off seat by foreign material	Adjust or clear valve
Insufficient flow	Speed too low to obtain desired flow	Check flow-speed chart
	Air leak due to bad seals or pipe connections	Replace seals, check inlet fittings
Fluid vaporization (Starved pump inlet)	Strainers, valves, inlet fittings or lines clogged	Clear lines. If problem continues, inlet system may require change.
	NIPA too low	Raise liquid level in source tank
		Increase by raising or pressurizing source tank
	NIPA too low NIPA < NIPR	Select larger pump size with smaller NIPR
	Fluid viscosity higher than expected	Reduce pump speed and accept

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		lower flow or change system to reduce line losses
	Fluid temperature higher than expected	Reduce temperature, reduce speed and accept lower flow or change system to increase NIPA
Insufficient flow, fluid being bypassed somewhere	Relief valve not adjusted or jammed	Adjust or clear
	Flow diverted in branch line, open valve, etc	Check system and controls
Insufficient flow, high slip	Hot (HC) or extra clearance rotors on a cold fluid and/or low viscosity fluid	Replace with standard clearance rotors
	Worn pump	Increase pump speed (within limits); replace rotors and/or recondition pump
	High pressure	Reduce pressure by system changes
Noisy operation	**Cavitation**	
	High fluid viscosity, high vapor pressure fluids, high temperature	Slow down pump, reduce temperature, change system
	NIPA < NIPR	To increase NIPA or reduce NIPR, refer to pump charts or contact supplier
	Air or gas in fluid	
	Leaks in pump or piping	Correct leaks
	Dissolved gas or naturally aerated products	Minimize discharge pressure; also see Cavitation above
	Mechanical noises – Rotor to body contact	
	Improper assembly	Check clearance with shims
	Distortion of pump due to improper piping installation	Reassemble pump or re-install piping to assure free running
	Pressure higher than rated	Reduce pressure if possible
	Worn bearing	Rebuild with new bearings, lubricate regularly
	Worn gears	Rebuild with new gears, lubricate regularly
	Mechanical noises – Rotor to rotor contact	
	Loose or mis-timed gears, twisted shaft, sheared keys, worn splines	Rebuild with new part
	Relief valve chattering	Readjust, repair or replace
	Drive component noise – gear trains, bearings, etc	Repair or replace
Pump requires excessive power (overheats, stalls, high current draw)	Higher viscous losses than expected	If within pump rating, increase drive size
	Higher pressure than expected	Reduce pump speed, increase line size
	Fluid colder than expected, viscosity high	Heat fluid, insulate or heat trace lines. Use pump with more running clearances
	Fluid sets up in line and pump during shut down	Insulate or heat trace line; install soft start; install recirculating bypass system; flush with other fluid

	Fluid builds up on pump surfaces (i.e. chocolate)	Use pump with more running clearance
Short pump service life	High corrosion rate	Upgrade material of pump
	Pumping abrasives	Larger pumps at slower speeds can help
	Speeds and pressures higher than rated	Reduce speeds and pressures by changes in the system
	Worn bearings and gears due to lack of lubrication	Set up and follow regular maintenance and lubrication schedule
	Misalignment of drive and piping. Excessive overhung load or misaligned couplings	Check alignment of piping; check drive alignment and loads