

TROUBLESHOOTING CENTRIFUGAL PUMPS

Cause	Hydraulic Failure				Mechanical Failure							Remedy
	1	2	3	4	5	6	7	8	9	10	11	
	Pump does not deliver liquid	Pump does not deliver sufficient capacity	Pump does not deliver sufficient pressure	Pump delivers flow intermittently	Bearings run hot and/or fall on a regular basis	High rate of mechanical seal failure	Packing has short life	Pump vibrates at higher- than-normal levels	Pump is drawing too much power	Wear of internal wetted parts is accelerated	Motor requires excessive power	
Pump not primed or prime lost												Reprime pump, check that pump and suction line are full of liquid
Suction and/or discharge valves closed or clogged												Remove obstructions
Suction piping incorrect or not submerged												Shorten suction pipe and submerge line
Insufficient NPSH available, or suction lift too high												Consult factory for proper depth. Use baffle to eliminate vortices
Excessive air entrapped in liquid												Repair leak
Speed (RPM) too low												Change driver speed
Incorrect rotation												Change rotation to concur with direction indicated by arrow on bearing housing or pump casing
Broken impeller or bent vanes												Replace
Incorrect impeller or impeller diameter												Inspect and replace if necessary
System head too high												Change piping, design, rpm, or the impeller diameter
Instruments give erroneous readings												Replace
Air leak in suction line, gaskets or stuffing box												Replace gasket or readjust packing/mechanical seal
Excessive shaft misalignment												Re-align pump and drive
Inadequate lubrication												Check lubricant level
Lubricant contamination												Change lubricant
Inadequate lubricant cooling												Check cooling system
Axial thrust or radial loads higher than bearing rating												System problem
Improper coupling lubrication												Lubricate properly
Suction pressure too high												Reduce suction pressure
Bearing incorrectly installed												Re-install
Impeller out of balance												Balance impeller
Overheating of seal faces												Check lubrication and flush lines
Excessive shaft deflection												Realign the shaft balance rotation, replace bearings
Lack of seal flush at seal faces												Provide seal, flush
Incorrect seal installation												Disassemble and reinstall
Pump is run dry												Install automatic shut-off features
Pump run off design point												Consult factory, install valve, and trim impeller
Shaft/shaft sleeve worn												Re-machine shaft and or replace
Packing gland not properly adjusted												Tighten gland nuts to proper tension
Packing not properly installed												Replace box and packing
Impeller clogged												Back flush pump to clean impeller
Coupling out of balance												Realign shaft and coupling
Baseplate not installed properly												Secure baseplate properly
Pump operating speed too close to system's natural frequency												Consider different speeds of operation
Bearings failing												Replace bearings
Piping not properly anchored												Secure and fasten piping
Pump and/or driver not secured to baseplate												Realign and secure and tighten
Specific gravity higher than specified												Consider new design for application
Viscosity higher than specified												Consider new design for application
Internal clearances too tight												Machine parts to correct tolerances
Chemicals in liquid other than specified												Consider problems associated with corrosion
Pump assembled incorrectly												Disassemble and reassemble properly
Higher solids concentration than specified												Consider solids handling capabilities
Worn suction sideplate or wear rings												Replace defective part as required
Insufficient suctionhead												Ensure that suction line shutoff valve is fully open and line is unobstructed
Worn bearings, mechanical seals, or shaft												Replace
Improper alignment												Align shafts
Pump is cavitating												Examine & re-engineer the system