

# Symptoms and Causes of Pump Failure

	Bearing run hot and/or fail 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	Pump does not deliver liquid	Pump does not deliver sufficient capacity	Pump does not deliver sufficient pressure	Pump delivers flow intermittently
Pump not primed or prime lost							•	•	•	•
Suction and/or discharge valves closed or clogged				•			•	•	•	
Suction piping incorrect							•	•	•	
Insufficient NPSH available		•		•		•	•	•	•	
Excessive air entrapped in liquid							•	•	•	•
Speed (rpm) too low							•	•	•	
Incorrect rotation					•			•	•	
Broken impeller or bent vanes	•			•				•	•	
Incorrect impeller or impeller diameter								•	•	
System head too high								•	•	
Instruments give erroneous readings								•	•	
Air leak in suction line										•
Excessive shaft misalignment	•	•		•						
Inadequate lubrication	•									
Lubricant contamination	•									
Inadequate lubricant cooling	•									
Axial thrust or radial loads higher than bearing rating	•			•						
Improper coupling lubrication	•									
Suction pressure too high	•	•								
Bearing incorrectly installed	•	•		•						
Impeller out of balance	•	•		•						
Overheating of seal faces		•								
Excessive shaft deflection	•	•		•						
Lack of seal flush at seal faces		•								
Incorrect seal installation		•								
Pump is run dry		•								
Pump run off design point	•	•		•	•					
Shaft/shaft sleeve worn		•		•						
Packing gland not properly adjusted			•		•					
Packing not properly installed			•							
Impeller clogged				•			•			
Coupling out of balance	•	•		•						
Baseplate not installed properly	•	•		•						
Operating speed close to system's natural frequency				•						
Bearing failing	•	•		•						
Piping not properly anchored	•	•		•						
Pump and/or driver not secured to baseplate	•	•		•						
Specific gravity higher than specified	•	•			•					
Viscosity higher than specified	•	•			•					
Internal clearances too tight				•	•					
Chemicals in liquid other than specified						•				
Pump assembled incorrectly	•	•	•	•		•			•	
Higher solids concentration than specified						•				

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Troubleshooting a mechanical or hydraulic problem with a centrifugal pump can be a long and complicated process. Often the root cause is not readily obvious and having more than one symptom present can cloud the picture even further. In truth, the root cause can usually be traced to a relative few sources based on the symptoms present. The ability to

distinguish between a symptom and a cause can speed the process up considerably.

The tabulation above lists a few of the "most likely" symptoms and causes of pump failure or less than expected performance. While not all possible conditions can be listed, the listing is a good starting point from which the investigation can proceed.

We'll be glad to provide you with a laminated copy of this tabulation at no cost. Please send a **Self – Addressed, Stamped Envelope** to the address below for your free copy.

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