

**Causes of Suction Problems**

**Symptoms**

	Pump does not deliver water	Pump has insufficient capacity (gpm)	Pump loses prime after starting	Pump has insufficient pressure	Pump requires excessive power	Packing box leaks water excessively	Packing box has short life	Pump vibrates or is noisy	Bearings have short life	Pump overheats and seizes
Pump not primed	•	•								•
Insufficiently submerged suction pipe inlet	•	•	•							
Pump or suction pipe not completely filled with water	•	•	•					•		
Insufficient Net Positive Suction Head (NPSH – See pg. 20)	•	•						•		•
Suction line, strainer, or centrifugal pump balance line plugged		•					•			
Air leaks into suction line		•	•							
Air leaks into pump through packing box		•	•							
Excessive amount of air or gas in the water		•	•	•						
Foot valve too small, insufficiently submerged, or partially clogged				•				•		

**Causes of System Problems**

**Symptoms**

	Pump does not deliver water	Pump has insufficient capacity (gpm)	Pump loses prime after starting	Pump has insufficient pressure	Pump requires excessive power	Packing box leaks water excessively	Packing box has short life	Pump vibrates or is noisy	Bearings have short life	Pump overheats and seizes
Speed (rpm) too low	•	•		•						
Parallel operation of pumps unsuitable	•	•		•						
Total system head higher than pump design head	•	•		•	•					
Wrong direction of pump rotation	•			•	•					
Speed (rpm) too high					•					
Total system head lower than pump design head					•					

**Causes of Pump Problems**

**Symptoms**

	Pump does not deliver water	Pump has insufficient capacity (gpm)	Pump loses prime after starting	Pump has insufficient pressure	Pump requires excessive power	Packing box leaks water excessively	Packing box has short life	Pump vibrates or is noisy	Bearings have short life	Pump overheats and seizes
Rotary shaft seals (packing) leak air	•									
Foreign matter in impeller	•	•			•			•		
Wear rings worn				•	•					
Impeller damaged				•				•		
Defective pump casing gasket permitting internal leakage				•						
Misalignment of pump and driving unit					•	•	•	•	•	•
Bent shaft between pump and motor or engine					•	•	•	•	•	
Rotating part rubbing on stationary part of motor					•			•	•	•
Packing gland too tight resulting in no water flow to lubricate packing and shaft					•		•			
Packing worn, improperly installed, or incorrect for operating conditions					•	•	•			
Cooling water not getting to water-cooled packing boxes							•			
Packing forced into pump interior						•	•			
Shaft or shaft sleeves worn or scored at the packing						•	•			
Shaft running off center						•	•	•	•	•
Impeller or rotor (electric motors) out of balance						•	•	•	•	•
Bearings worn						•	•	•	•	•
Foundation or platform not rigid or mounting is loose								•		
Pipe not supported								•	•	
Under- or over-greasing of bearings or greasing sealed motor bearings								•	•	
Condensation of atmospheric moisture in the bearing housing								•	•	
Lack of lubrication or improper lubrication								•	•	
Scoring or rusting of bearings in turbine pump								•	•	
Improper installation of bearing, incorrect assembly of stacked bearings, and use of unmatched bearings as a pair (turbine pump)								•	•	
Excessive thrust (seen as shaft movement from mechanical failure or failure of hydraulic balancing device)								•	•	•