

# VIKING PUMP

## Symptoms Of Internal Gear Pump Failure And Items To Check

### SYMPTOM

### Hydraulic:

### Mechanical:

### CAUSE

		Hydraulic:					Mechanical:				
		Pump turns, but no flow	Low capacity	Pump will not develop sufficient pressure	Pump develops too much pressure	Pump no longer self-priming	Pump won't turn / motor stalls	Pump runs noisy / excessive vibration	Pump runs hot	Frequent seal failures	Packing has short life
<b>System:</b>	NPSHa not sufficient	•	•				•		•		•
	Air leaks into pump	•	•	•		•	•		•		•
	Pump has run dry	•	•	•		•	•		•	•	•
	Liquid temperature higher than expected		•	•			•		•	•	
	Viscosity higher than expected				•	•	•	•	•	•	
	Pump running too fast for application		•		•		•	•	•	•	•
	Abrasives present / parts not hardened		•			•			•	•	•
	Suction or differential pressure too high								•		•
	Suction valve not open	•						•			
	Suction valve partially open		•	•				•			
	Discharge valve not open	•			•		•				
	Clogged strainer	•	•	•				•			
	Supply tank empty	•								•	•
<b>Pump:</b>	Incorrect rotation	•									
	Incorrect head placement	•	•	•							
	Wrong clearance setting for application	•	•	•		•	•		•		•
	Worn pump internals	•	•	•		•	•			•	
	Packing gland too tight / skewed						•		•		•
	Improper seal installation								•		
	Inadequate lubrication								•	•	•
	Relief valve improperly set		•	•	•				•		
	Relief reversed				•						
	Material compatibility problems									•	•
	Incorrect speed (lower speed)	•	•								
<b>Drive:</b>	Drive misalignment						•	•	•	•	•
	Base or equipment not secured							•			
	Drive incorrectly sized for horsepower requirement			•			•				

**NPSHa Not Sufficient** - Pump cavitating due to inadequate suction side pressure. Buildup in suction lines, partially closed inlet valves, dirty strainers, or an increase in liquid viscosity are all potential causes.

**Air Leaks Into Pump** - Pump pulling in air through a loose fitting or in a vortexing tank. Causes a cavitation-like noise.

**Pump Has Run Dry** - Gear pumps that are frequently run dry will exhibit increased wear and seal problems.

**Liquid Temperature Higher Than Expected** - Increases in temperature much beyond what the pump was specified to handle can fail seal elastomers, cause pins and bushings to lose their interference fits, or seize the pump.

**Viscosity Higher Than Expected** - Rotor and shaft materials, seals, and clearances are viscosity limited and may cause failures if not checked and adjusted. Viscosity increases may stall or damage the drive if not properly sized. Viscosity increases can also cause NPSH problems (watch for cold startups).

**Pump Running Too Fast** - Increases in speed increase the pump's NPSH requirement and line losses on both sides of the pump. This will also increase the HP requirement.

**Abrasives** - Abrasive applications need to be run with slow pumps with hardened parts.

**Incorrect Rotation** - Usually causes no damage, but can blow out lipseals in the 75 series models.

**Incorrect Head Place** - In relation to the crescent, can cause no flow or only partial flow. Easy to check, but often overlooked.

**Wrong Clearance** - Tight clearances raise the HP requirement, but boost the pump's capacity. Make sure that they are set properly for the viscosity and the temperature. High temperatures can seize incorrectly set pumps.

**Worn Internals** - Worn parts cause the pump to lose capacity. Wear in one area can cause wear in others.

**Tight Packing Gland** - Overtightened packing can wear the shaft causing increased weeping. This in turn can cause a customer to further tighten the gland perpetuating this problem. Packing requires some weeping for lubrication. Without this lubrication the pump will run hot and the HP requirement will increase.

**Improper Seal Installation** - Often seal failures can be linked to improper installation. The stationary face should be checked for eccentric or uneven wear patterns.

**Inadequate Lubrication** - Causes increased wear and frictional heat.

**Relief Valve Setting** - Valve needs to be set to full-bypass pressure. A valve that is consistently bypassing will cause lower than expected capacity and a heat rise over time.

**Relief Valve Reversed** - Needs to be checked twice. A reversed RV seems to work fine until overpressure occurs. The valve cap should face toward the suction port.

**Material Corrosion** - Causes pitting type wear or seal leaking due to incompatible elastomers.

**Drive Problems** - Just as critical as pump and system problems and easy to check. Make sure that V-belt driven units are not too tight and have adequate shaft support.

**Vacuum and Pressure Gauges** - Installing a vacuum gauge in the suction port and a pressure gauge in the discharge port can be the fastest way to diagnose system problems. The readings will give a clue where to start looking for the trouble. Refer to TSM000 for additional information.