

# Troubleshooting for:



## 8.2 Troubleshooting guide

A properly sized and installed pump should provide trouble-free operation; however, problems in pumping systems may occur over time. The following information may help in identifying and resolving such problems:

Problem	Possible cause(s)	Solution(s)
Pump not turning	Drive motor not running	Check circuit breakers, fuses
	Keys sheared or missing	Replace keys
	Drive belts, etc. slipping or broken	Adjust or replace
	Shaft or gears sheared	Replace
No flow, pump turning	Rotation in wrong direction	Reverse rotation
No flow, pump not priming	Inlet valve closed	Open valve
	Inlet line clogged	Clean line and filters
	Air leaks because of bad seals and/or pipe connections	Replace seals, pressurize lines to check for leakage
	Speed of pump too slow	Increase speed, fill inlet lines, install foot valve
	Liquid drains or siphons	Install foot or check valves
	Air lock due to fluids that may vaporize or allow gas to come out of solution	Install air bleed in lines near pump
	Excess clearance between rotors, body and cover	Increase pump speed, install foot valve, have pump rebuilt
	Net inlet pressure too low	Check Net Inlet Pressure Available at Pump and Net Inlet Pressure Required by Pump. Calculate system and modify inlet system as needed.
No flow	With vacuum inlet system, atmospheric "blow back" prevents pump from starting flow	Install check valve in discharge line
	Relief valve not properly adjusted or held open by foreign material	Adjust or clear valve
Fluid vaporization (starved Pump inlet)	Filters, valves, inlet filters or lines clogged	Clean
	Inlet line too small or too long, too many valves or fittings, filter too small	Make necessary changes
	Net Inlet Pressure Available at Pump too low	Increase level in source tank or pressurize tank Select larger pump with less inlet pressure required
	Viscosity of pump fluid higher than anticipated	Reduce pump speed (lower flow will result) or modify system
	Temperature of fluid higher than anticipated	Provide cooling, reduce speed, modify system to increase available inlet pressure
Insufficient flow	Speed too low	Increase speed
	Air leaks because of bad seals and/or pipe connections	Replace seals, pressurize lines to check for leakage
Relief valve not adjusted or held	Adjust/clean	Open
	Flow diverted in system	Check system valves and controls
	Hot clearance rotors used with "cold" or low viscosity fluid	Replace with standard rotors
	Worn pump	Increase speed, recondition pump
	Pressure too high	Modify system
Noisy operation	Cavitation due to high fluid Viscosity, high vapor pressure or high temperature	Reduce speed and/or temperature, modify system
	Inlet Pressure Available less than Inlet Press Required	Modify System
	Air or gas in system due to system leaks	Fix leaks
	Dissolved gas or naturally aerated products	Reduce discharge pressure, reduce speed and/or temperature, modify system
	Rotor to body contact	Check back face and rotor to cover clearances and reshim as necessary Check for distortion of pump due to Installation of piping. Reassemble pump and/or re-install piping
	Pressure higher than pump is Rated	Reduce pressure
	Worn bearings or gears	Replace as needed, ensure regular lubrication
	Rotor to rotor contact noise due to twisted shaft, sheared keys, loose or mistimed gears, worn splines	Rebuild with new parts as needed
	Relief valve chattering	Readjust, repair or replace valve
	Drain train components	Lubricate, repair or replace as needed
Pump overheats, stalls, draws excessive current (trips breaker, blows fuses)	Higher viscous losses than anticipated	If pump is within rating, increase drive size
	Pressure higher than anticipated	Reduce speed, increase line size
	Fluid colder than anticipated, high viscosity	Heat fluid/insulate and heat lines, increase running clearances
	Fluid sets up during shutdown	Insulate or heat lines, install recirculating or "soft start" drive, flush with different fluid
	Fluids such as chocolate, latex build up on internal pump surfaces	Increase running clearances
Pump service life not as long as expected	Misalignment of drive and piping, excessive pump overhang	Align piping and drive
	Abrasive fluid	Use larger pump at slower speed
	Bearings and gears lack lubrication	Establish and follow lubrication schedule
	Speeds and pressures higher than pump is rated	Reduce speed and pressures by system modification
	Pump corrodes	Upgrade material used in pump

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## Troubleshooting

### 1. Problem: No fluid is delivered.

- a. Power is not on.
- b. Net positive suction head available (NPSHa) is lower than required for the vapor pressure of the liquid pumped. You should calculate NPSHa and redesign piping, if necessary.
- c. There are leaks in suction line.
- d. Direction of shaft rotation is incorrect.
- e. Relief valve setting is too low (if the pump is equipped with a relief valve). Liquid is discharging through the by-pass port.

### 2. Problem: Capacity is too low.

- a. There are air leaks in suction line.
- b. Suction losses are too high. The suction lift is too great or the suction line is too small or too long. This can be detected by installing a vacuum gauge directly at the pump suction. The maximum vacuum at the pump suction should never exceed 15" of mercury. Vaporization caused by higher vacuums will generally result in capacity drop-off. Redesign suction conditions.
- c. Pump speed is too slow.
- d. Strainer is too small or obstructed.
- e. Suction pipe or port is not immersed in liquid deep enough.
- f. Piping is improperly installed permitting an air pocket to form in the pump.
- g. Increased clearances or wear in the pump will sometimes cause the pump to deliver an insufficient supply of liquid.

### 3. Problem: Pump works spasmodically.

- a. Leaky suction lines.
- b. Suction conditions vary.
- c. Air or vapor is in the liquid.

### 4. Problem: Excessive power draw.

- a. Pressure is too high.
- b. Liquid is more viscous than originally expected.
- c. Suction or discharge line is obstructed.
- d. There is insufficient horsepower.
- e. There are mechanical defects:
  - i. Drive shaft and pump are misaligned.
  - ii. Pump is binding due to incorrect clearance setting.
  - iii. Pump shaft is bent.
  - iv. There is misalignment within pump due to bad piping or poor installation, causing strain or distortion.

### 5. Problem: Pump is noisy.

- a. Pump is cavitating due to inadequate suction conditions.
- b. There is misalignment of coupling.
- c. Coupling is set too close to pump.
- d. There is vibration of the pump due to a worn or bent shaft.
- e. There are air leaks on suction side of pump or air entrainment in the fluid.

### 6. Problem: Pump leaks.

- a. Bolts need tightening, allowing gaskets or O-rings to leak.
- b. Gaskets or O-rings are damaged.

Note: Packings are designed to leak. Leakage should be at a rate that will prevent excessive heating on the bracket at the packing area.

# Troubleshooting for:



# 6 Operating Problems

The table given below provides solutions to problems that might arise during pump operation. With respect to the same, it is assumed that the pump has been properly installed and has been correctly selected for the application in question. Should there be a need for technical service please contact MOVEX.

Operating problems	Probable causes
Motor overload.	8, 9, 12, 16, 20, 21, 22, 23, 24, 26.
Insufficient discharge flow rate.	2, 4, 5, 7, 8, 9, 10, 11, 13, 14.
No pressure on the discharge side.	1, 2, 3, 6, 7.
Irregular discharge flow rate/pressure.	2, 4, 5, 6, 9, 12.
Noise and vibrations.	2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 16, 19, 20, 21, 22, 23, 24, 25, 26.
The pump gets clogged.	8, 9, 11, 16, 19, 20, 21, 22, 24, 25, 26.
Overheating of pump.	7, 8, 9, 11, 12, 16, 20, 21, 22, 23, 24, 26.
Abnormal wear.	4, 5, 11, 15, 16, 19, 24, 25.
Leak.	17, 18, 27.

Probable causes	Solutions
1 Wrong rotation direction.	Invert the rotation direction.
2 Insufficient NPSH.	Increase available NPSH : - Rise the suction tank - Lower the pump - Reduce the speed - Increase the diameter of the suction pipe - Shorten and simplify the suction piping.
3 Pump not purged.	Purge or fill.
4 Cavitation.	Increase suction pressure (see 2).
5 The pump sucks in air.	Check suction pipe and all its connections.
6 Suction pipe clogged.	Check the suction pipe and filter(s), if any.
7 Wrong setting of relief valve.	Check the relief valve's setting.
8 Discharge pressure too high.	If necessary, reduce the loss of head by increasing the diameter of the discharge pipe.
9 Viscosity of the liquid is too high.	- Reduce the pump speed. - Reduce the viscosity, for example, by heating the liquid.
10 Viscosity of liquid too low.	- Increase the pump speed. - Increase the viscosity, for example, by cooling the liquid.
11 Temperature of liquid too high.	Reduce the temperature by cooling the liquid.
12 Pump speed too high.	Reduce the pump speed.
13 The lobes are worn.	Replace the lobes.
14 Pump speed too low.	Increase the pump speed.
15 Product very abrasive.	Fit hardened lobe hubs.
16 Worn bearings.	Replace the bearings, check the pump.
17 Worn or damaged shaft sealing.	Replace the lip seal or/and the sleeve.
18 O-rings not the right ones for the liquid.	Fit the proper O-rings; check with the supplier.
19 Worn gears.	Replace and readjust the gears.
20 Insufficient lubricating oil level.	Fill up with oil.
21 Unsuitable lubricating oil.	Use an appropriate oil.
22 The lobes rub.	- Reduce the temperature. - Reduce the discharge pressure. - Adjust the clearance.
23 Coupling misalignment.	Align the coupling.
24 Tension on the pipelines.	Connect the pipelines to the pump free of tensions.
25 Foreign bodies in the liquid.	Insert a filter in the suction pipe.
26 Pump and / or electric motor not fixed on foundation.	Tighten, check that the piping has been connected stress-free and align the coupling.



**If the problem persists, use of the pump must cease immediately. Contact the pump's manufacturer or its representative.**