



# ROPER PUMP CO. TECHNICAL MANUAL

**TM:002**

Revised  
12/31/03

**Subject: Maintenance and Performance Questions** By: Laney Seabolt

## TROUBLESHOOTING PUMP PROBLEMS

A summary of the causes of common malfunctions.

PROBLEM	POSSIBLE CAUSES
<b>NO LIQUID DELIVERED</b>	Pump rotating in wrong direction.
	Pump not primed.
	Inlet lift too high. Check this with gauge at pump inlet.
	Clogged inlet line.
	Inlet pipe not submerged.
	Air leaks in inlet line.
	Faulty pressure relief device in system.
	Pump Worn.
<b>RAPID WEAR</b>	Excessive pressure.
	Nonlubricating liquid.
	Pump runs dry.
	Incompatibility of liquid and pump materials.
	Pipe strain on pump. See TM:001, Mounting Pumps; Installation of Pipes.
	Excessive abrasives in liquid.
<b>EXCESSIVE NOISE</b>	Starved Pump.
	Air leaks in inlet line.
	Air or gases in liquid.
	Pump speed too high.
	Relief valve chatter. Check pressure setting.
	Improper mounting. Check alignment thoroughly. See TM:001 Mounting Pumps
<b>PUMP TAKES TOO MUCH POWER</b>	Speed too high.
	Liquid more viscous than previously anticipated.
	Operating pressure higher than specified. Check this with gauge at pump discharge.
	Discharge line obstructed.
	Mechanical defect, such as bent shaft.
	Pipe strain on pump. See TM:001, Mounting Pumps; Installation of Pipes.
	Pressure relief device not operating properly.
Air leaks in inlet line.	
<b>INSUFFICIENT LIQUID DELIVERED</b>	Air leaks through mechanical seal.
	Speed too slow.
	Excessive lift at inlet. Check this with gauge at pump inlet.
	Viscosity of liquid too high for size and length of inlet pipe.
	Foot valve, if used, too small, stuck, or not working properly.
	Foot valve or end of inlet pipe not immersed deeply enough in liquid.
	Excessive clearance in pump caused by wear or corrosion.
	Faulty pressure relief device.



## **COMMON MAINTENANCE QUESTIONS**

### ***Question:***

At what point do I need to overhaul my pump?

### ***Answer:***

As with all rotating equipment, your pump will eventually wear to a point where the pump's performance is diminished. The pump's performance is dependent upon the application. For instance, a very worn pump may work at an acceptable level in an application involving a high viscosity (thick) liquid when combined with low discharge pressure. This same pump would most likely be unsatisfactory in a low viscosity, high-pressure application. The best answer to the above question is the following: You need to overhaul your pump when you feel that the performance has dropped to an unacceptable level for your application.

If you have set up your own test procedure to check your used pumps, it will be helpful to test at least one new pump of each size to use as a benchmark for setting your own acceptance levels.

### ***Question:***

What parts will I need to replace to get my pump back to "like-new" condition?

### ***Answer:***

As a general rule, replace all gaskets, o-rings, packing, lip seals, and mechanical seals at each servicing regardless of their apparent condition. These parts are usually less expensive than the labor costs and downtime incurred if the pump has to be serviced a second time to stop a leak.

The parts subject to wear should be examined for obvious wear and corrosion. This includes bearings, shafts, gears, cases, and endplates. Measurements should be made and compared to the dimensions shown in your IOM that came with your pump. Replace any parts that are worn beyond the limit shown.

If the pump is used exclusively in an abrasive application or high viscosity application, you may be able to extend the life of the gears or case. If the gears show heavy wear on only one side of the tooth, very little wear on the ends and O.D., the gears can be turned over, end-for-end, in the pump. This will put the previously unworn sides of the gear teeth in contact. Similarly, if your pump has a case that is machined the same on both ends and has straight through ports and it is worn on the inlet side only, the case may be turned around and used again.



***Question:***

What do I look for to determine excessive wear?

***Answer:***

- **Bearings**

If bearing measurements differ from the dimensions shown in the IOM that came with your pump, the bearings should be replaced. See the section in your IOM for proper bearing removal and installation.

- **Cases**

Excessive case wear is usually the result of worn bearings or shafts allowing gears to contact the case bores. Minor rubbing of the case bore is normal.

- **Gears**

The gears are serviceable if there is no degradation of the teeth or end faces. Check for uniform wear. There should be no burrs or gouges on any of the gear's surfaces.

- **Endplates**

Excessive wear is usually the result of pumping products containing abrasives. If the endplates are damaged in the area that the ends of gears rub, they should be replaced. If a bearing has turned or spun in the bore, the endplate must be replaced.

- **Shafts**

Replace the shaft if it is scored in the packing, seal, or bearing area. Even shafts that appear smooth must be measured and compared to the dimensions shown in the IOM that came with your pump.

- **Packing**

Replace packing if it cannot be properly adjusted to control leakage as described in the section on **Shaft Sealing** in the IOM that came with your pump. It is normal and necessary for packing to drip slightly. Never rebuild a pump with used packing.

- **Mechanical Seals**

Scratches on seal faces and deterioration of the elastomer will result in seal leakage. Mechanical seal failures can result in large amounts of liquid leaking from the pump.



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***Question:***

Do I need special tools to disassemble and reassemble my pump?

***Answer:***

A list of tools required can be found in the **Tool List** in the IOM that came with your pump.

***Question:***

Is it okay to reface worn endplates?

***Answer:***

No. Roper does not recommend this procedure. Refacing reduces the face flange thickness and increases the possibility of interference between the internal parts.

***Question:***

How long can my pump run dry?

***Answer:***

One minute is a practical maximum for running a pump dry. Anything longer could cause the pump to overheat resulting in possible pump damage or failure.

***Question:***

At what point should I buy a new pump?

***Answer:***

A new pump should be purchased when the old pump cannot be economically repaired.

***Question:***

Are there service centers where I can get my pump repaired?

***Answer:***

Most Roper distributors are able to repair pumps. Consult the factory to find your nearest distributor. Also, Roper Pump Company has a repair department. Any pump repaired at the factory is rebuilt to like-new condition and carries a new pump warranty. Pumps may be returned to the factory by an authorized Roper pump distributor.

***Question:***

Are repair kits available? What do they contain?

***Answer:***

Overhaul kits are available and stocked by many Roper distributors. In some cases, installing some new parts with existing worn parts can actually decrease your pump's performance. Therefore, Roper recommends purchasing a complete overhaul kit whenever servicing is required.



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## REPLACEMENT PARTS

Repair parts can be ordered from your nearest Roper distributor. For the location of a distributor near you, contact Roper Pump Company. **DO NOT** order repair parts by their key number shown in the IOM that came with your pump. Order by Roper part number only and include the nameplate data for aid in identification. Repair parts lists depicting Roper part numbers are available for most pumps.

- *Roper Pump Company assumes no responsibility for parts other than those supplied by Roper.* The use of substitutes may result in poor performance or in an accident causing physical damage or injury to personnel.
- **WARNING!** Only use genuine Roper gaskets. Gasket thickness determines proper clearances. Always check quantity of gaskets removed and replace with exact quantity. Proper material must be used based on application.