

CHAPTER 4 TROUBLE SHOOTING AND REMEDIES

Pumps can perform satisfactory function if properly handled and maintained. Should trouble occur speedy remedies must be found for it. Table 4.1 shows commonest causes of trouble and suggested remedies.

Table 4.1

Troubles	Causes	Remedies
Pump cannot discharge	<ol style="list-style-type: none"> 1. Pump not completely or insufficiently filled with liquid. 2. Much air leakage in suction line. 3. Air pocket in suction line. 4. Suction lift too high. 5. Wrong direction of rotation. 6. Suction strainer and suction line clogged. 7. Speed too low. 8. Impeller clogged. 	<ol style="list-style-type: none"> 1. Prime once more. 2. Check suction line. 3. Check suction line. 4. Check vacuum gauge on suction side. 5. Check rotation. 6. Check interior of suction line. 7. Check by tachometer. 8. Check pump interior.
Insufficient discharge	<ol style="list-style-type: none"> 1. Air leakage. 2. Speed too low. 3. Discharge head too high. 4. Suction lift too high. 5. Suction pipe end not sufficiently submerged. 6. Suction strainer and suction line clogged. 7. Impeller clogged. 8. Wrong direction of rotation. 9. Clearance between impeller and mouth ring due to latter's wear down. 10. Cavitation due to high liquid temperature. 	<ol style="list-style-type: none"> 1. Check suction line and stuffing box. 2. Check by tachometer. 3. Check by discharge pressure gauge. 4. Check by suction vacuum gauge. 5. Extend suction pipe. 6. Check interior of suction line. 7. Check pump interior. 8. Check rotation. 9. Replace mouth ring by new one. 10. Recheck design.
Pump discharges liquid after starting, but soon fails to discharge	<ol style="list-style-type: none"> 1. Pump not sufficiently filled with liquid. 2. Air pocket in suction line. 3. Much air leaks into suction line. 4. Air leaks through stuffing box. 	<ol style="list-style-type: none"> 1. Prime sufficiently. 2. Check piping and if wrong correct it. 3. Check suction side. 4. Check if mechanical seal is incorrectly fitted or carbon is broken.
Primemover overloaded	<ol style="list-style-type: none"> 1. Speed too high (power frequency too high.) 2. Impeller touches mouth ring. 3. Rotating elements touch due to bent shaft. 4. Casing deformed. 5. Liquid specific gravity is greater than designed one. 6. Voltage too low (constant input, but increase in current) 	<ol style="list-style-type: none"> 1. Lower frequency. 2. Check state of installation and alignment. 3. Replace shaft by new one. 4. Check if undue force is given by piping. 5. Recheck design. 6. Check power source.

Overheating of bearing	<ol style="list-style-type: none"> 1. Grease is too little. 2. Grease is too much. 3. Grease or oil has improper consistency or it is deteriorated. 4. Misalignment is great. 5. Shaft is bent. 6. Injury or too much wear in ball bearing. 7. Too much thrust force. 	<ol style="list-style-type: none"> 1. Supply grease through grease nipple. 2. Remove relief nipple and operate for several hours to expel surplus grease. 3. Replace old grease or oil with specified new grease or oil. 4. Correct alignment of pump and driver. 5. Replace with new shaft. 6. Replace with new ball bearing. 7. Check if balance holes on impeller is clogged and if clearance between mouth ring and impeller becomes too much, and correct them if any.
Abnormal noise in ball bearing	<ol style="list-style-type: none"> 1. Injury in balls or rolling face. 2. Too much clearance due to abnormal wear. 3. Abnormal wear in retainer. 	Replace with new ball bearing.
Vibration in pump	<ol style="list-style-type: none"> 1. Misalignment. 2. Shaft bent. 3. Impeller partially clogged with foreign matter. 4. Incorrect installation. 5. Weak foundation. 6. Suction and discharge pipings not sufficiently secured. 7. Rotating elements touch stationary elements. 	<ol style="list-style-type: none"> 1. Check alignment of pump and driver. 2. Renew shaft. 3. Check pump interior. 4. Check state of installation. 5. Measure vibration up and down, right and left around pump's mounting on foundation, if vibration is too great reinforce foundation. 6. Refer to Chapter 1, Part 3, and give necessary support. 7. Check pump alignment and bending of shaft.
Leakage in mechanical seal	<ol style="list-style-type: none"> 1. Injury or excessive wear down in rubbing faces. 2. Foreign matter in rubbing faces. 3. Insufficient tightening of mechanical seal cover. 4. Break down of "O" ring. 5. Insufficient tightening of setscrews for stopper ring (54-7). 6. Injury or wear down of part of shaft or sleeve where rotary ring's "O" ring (54-5) contacts. 7. Scale sticks in groove for "O" ring (54-5), causing rotary ring to stick and rubbing faces to open. 	<ol style="list-style-type: none"> 1. Remove mechanical seal cover and check rubbing faces. 2. Ditto. 3. Check if 2 cover bolts are evenly tightened. 4. Check "O" rings for stationary and rotary rings. 5. Tighten sufficiently setscrew. 6. Renew shaft or sleeve. 7. Disassemble and remove scale completely.
Heating of mechanical seal (sometimes accompanied by abnormal noise)	<ol style="list-style-type: none"> 1. Rubbing face pressure too great due to pressure increase in stuffing box. 2. Flushing is insufficient. 3. Pump operated dry. 	<ol style="list-style-type: none"> 1. Check if flusing pipe is clogged. 2. Ditto. 3. Stop pump immediately.