



Maintenance and Servicing of LEWIS® Pumps Equipment



Mining technology for a sustainable future

Maintenance and Servicing of LEWIS® Pumps Equipment

Recommendations

- The location should be clean and well-lighted.
- It is recommended to use one mechanic and a helper to do all the maintenance work.
- Access to a trolley hoist is desirable.
- Review the weights of pump parts.



Main points

- Wash pump thoroughly inside and outside
- Place pump in horizontal position with discharge pipe directly above upper boot
- Support Pump Boot / Boots and discharge pipe are parallel
- Always refer to specific Technical Service Manuals for detailed instructions of disassembly on a purchased pump.
- Contact LEWIS® with any questions or concerns during inspection, disassembly, repair, or rebuild



Keep It Clean!!!

Keeping it clean is important

- LEWIS® maintains very tight tolerances on mating parts.
- Limit the use of hard-faced tools when cleaning machined surfaces.
- Clean up burrs, dings, etc.
- At the minimum, replace all gaskets (64), O-rings (92), ball bearing lock washer (44-2), impeller lock washer (66) and the ball bearing (6).
- Replace other parts as needed or indicated in pump specific manual.
- Don't forget to clean above the cover plate – motor stand, discharge flange, and cover plate top.
- Check the flatness of the cover plate /Note the general condition



Mounting Surfaces

Check

- Check all mounting surfaces for flatness



Lewis Pump Shafts

- Alloy 20 or Equivalent used in all acid pump shafts / Strength and corrosion resistance
- Shrink-fitted Teflon cover maintains barrier between acid and shaft

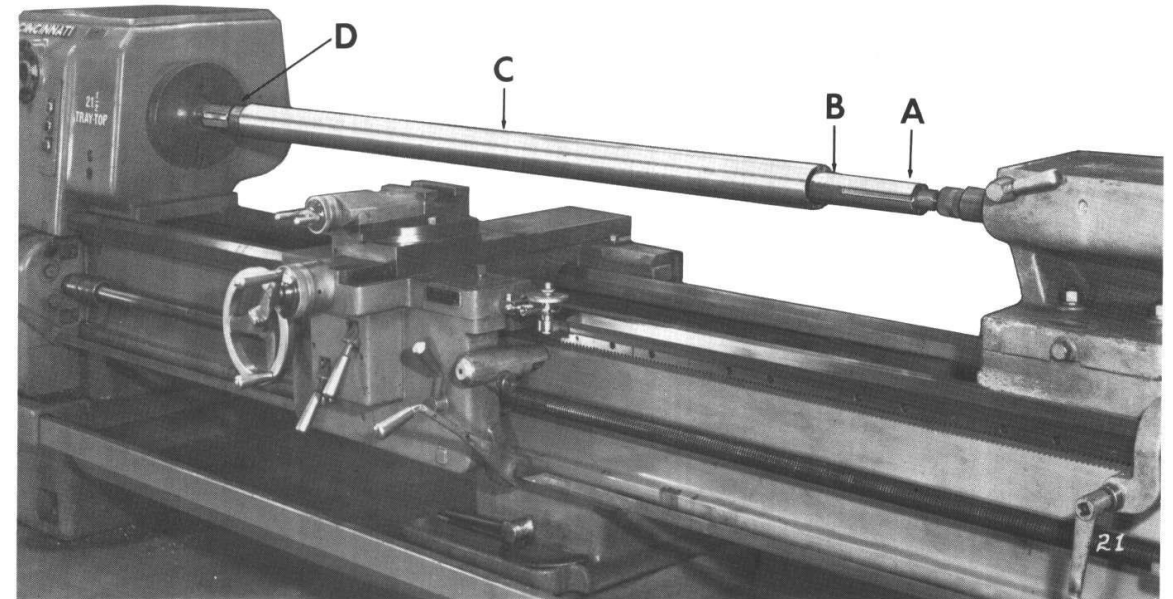


LEWIS® Alloy 20 Pump Shafts with shrink-fitted Teflon covers

Shaft Inspection

Inspection

- Check the shaft diameter at critical locations
- Impeller fit (A)
- Journal fit (B)
- Intermediate journal fit, if applicable (C)
- Ball bearing fit (D)
- Do not weld or apply epoxy putties if undersized
- Place the shaft between lathe center and check concentricity
- Factory specification for T.I.R. is 0.002"



Ball Bearings

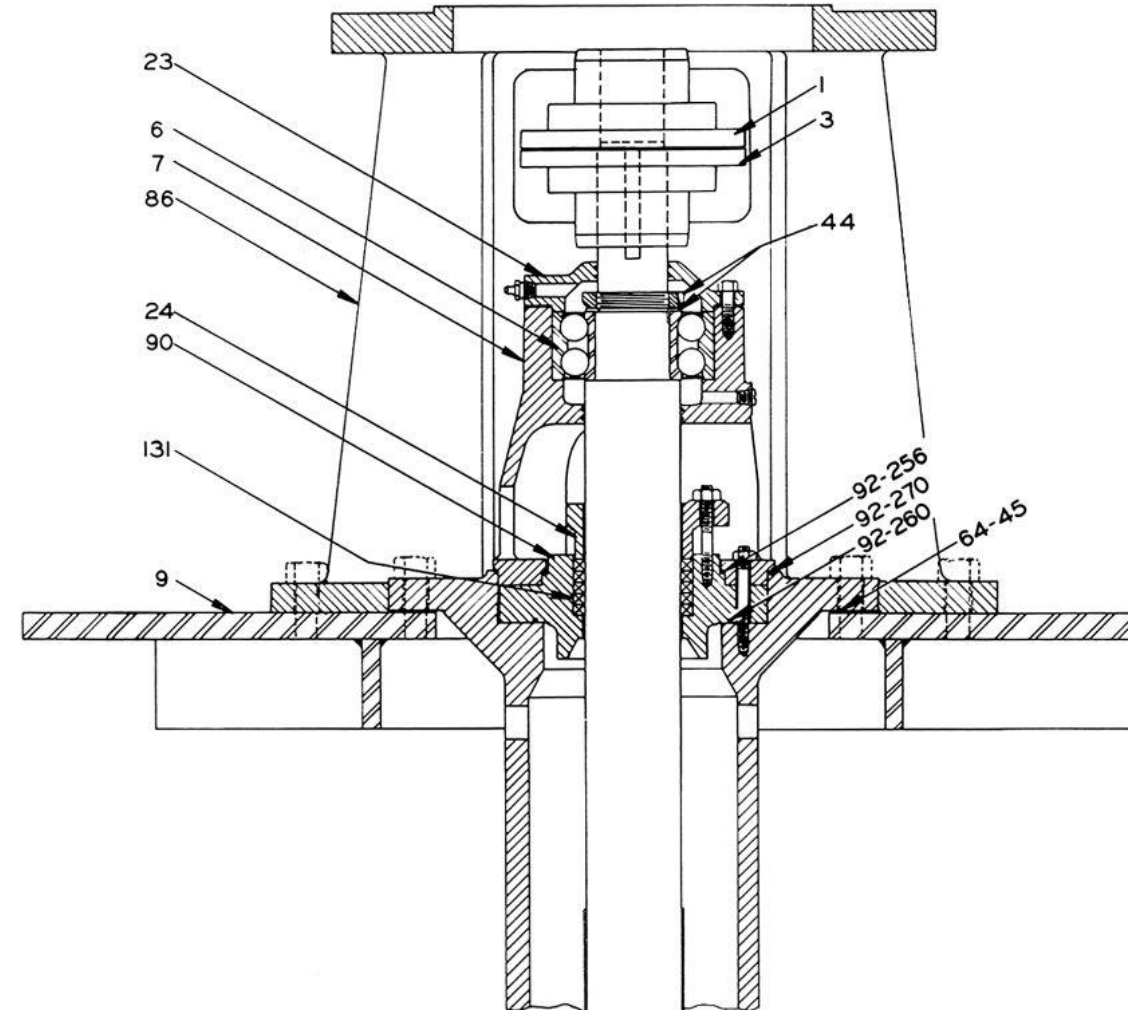
Typical open bearing versus shielded bearing

- Single or double row ball bearings depending on the load/size of the pump
- The tower circulating pumps typically have double row, max capacity shielded ball bearings with C3 internal clearances.
- Shields should not be removed!



Ball Bearings

- Ball bearing is mounted above the cover plate
- Proper installation is critical
- The bearing is a light push fit on the shaft and into the bearing housing. It has a clearance of 0.01mm on diameter
- The inner race is locked by use of a locknut on the shaft and the outer race is locked using the ball bearing housing cap.



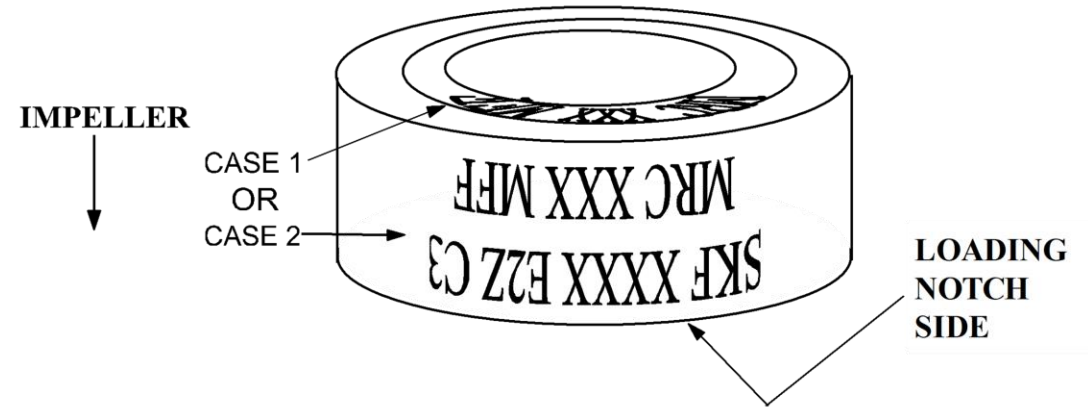
Ball Bearings

Always follow the proper method of applying grease – Install grease to both ball bearing housing and ball bearing housing cap



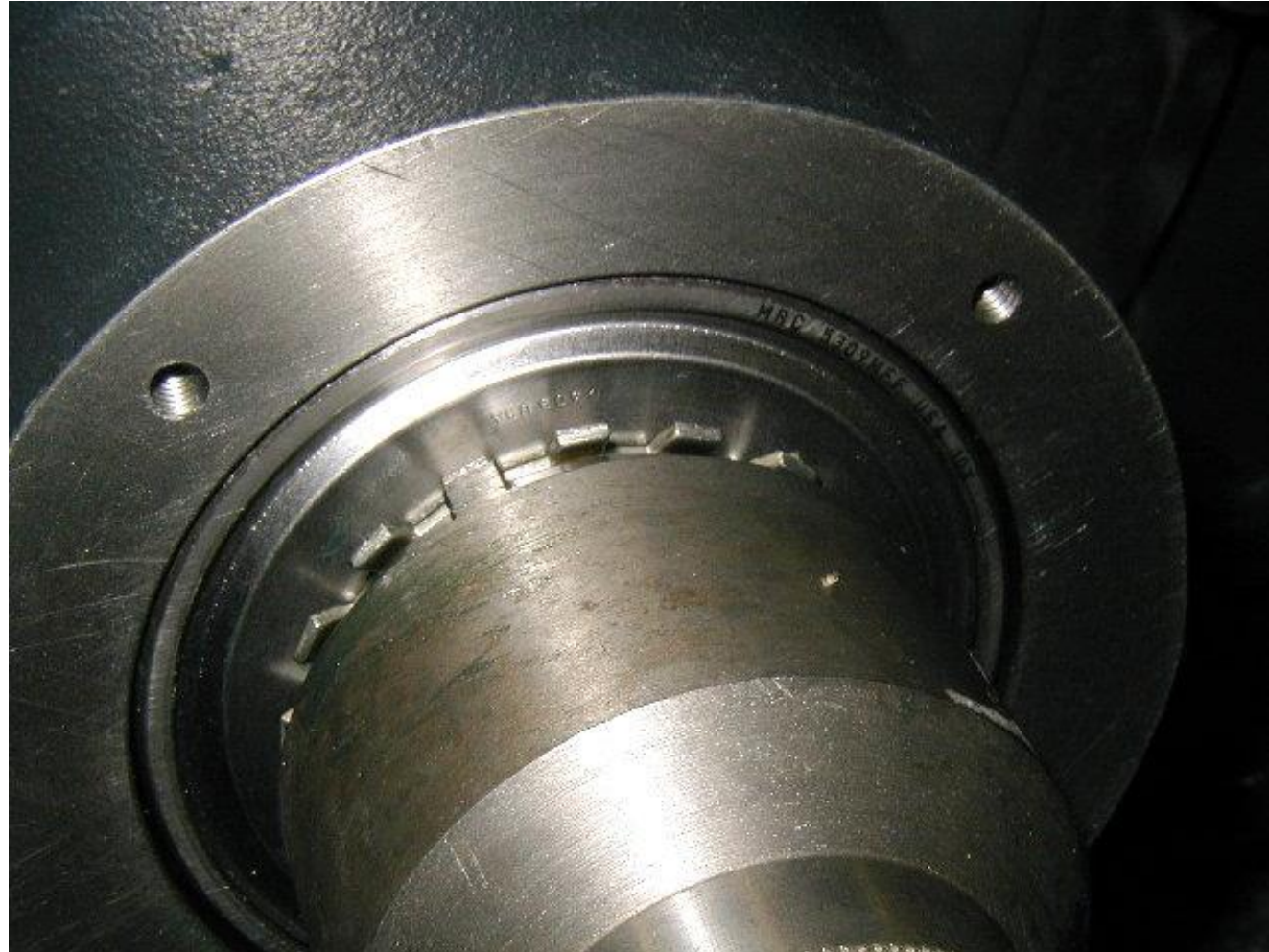
Ball Bearing Orientation

- Loading notch on the impeller
- Under the shield / not visible
- Notch should be installed toward impeller / in order to carry the thrust
- The actual location of the loading notch is determined by the identification markings on bearing from the ball bearing manufacturer as seen in this diagram.



Ball Bearing Orientation

Proper installation can be aided with the use of Assembly Assist Tools



GENERAL - Access limited to Weir Personnel or by NDA

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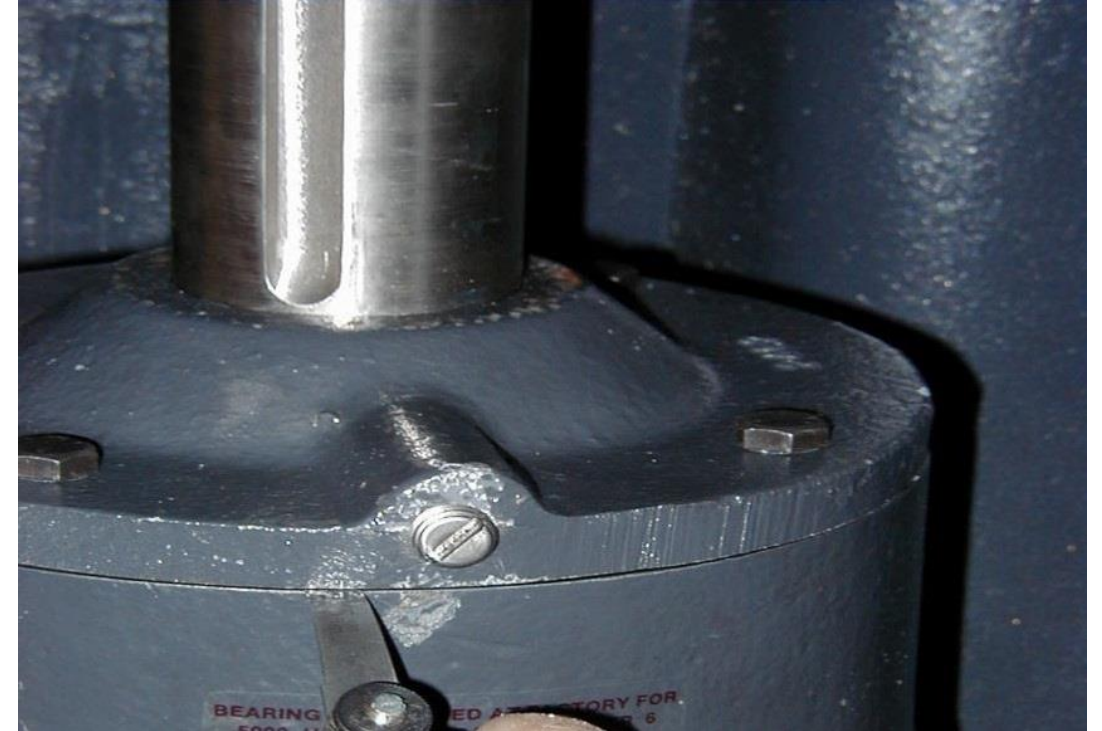
Proper Torque Tightening of Ball Bearing Locknut

- Locknut should be tightened to proper torque – see manual
- Too tight – overheating
- Too loose - Vibration

Bearing Bore (mm)	Pump Size	Locknut Torque (lb-ft)	Locknut Torque (kg-m)
40	1-1/4VS, 1-1/4GVS	50 - 80	7 - 11.06
45	2-1/2H, 4H, 5H	64 - 90	8.84 - 12.44
50	2VSHR, 3VSH, 5VSH, 1-1/4VSH, 2-1/2MTV	67 - 100	9.26 - 13.82
60	2VS, VSE, VSH, 6H, 7H, 4VOP, 5VOP	99 - 150	13.68 - 20.73
65	7MT, 8MTR, 8MSR, 8H, 10MTR, 10MSR, 10H	131 - 175	18.11 - 24.19
75	12H, 14MT	173 - 250	24 - 34.56
85	4CLS, 2CLS, 20LH	222 - 325	30.69 - 45
95	18H	277 - 425	38.29 - 58.76
100	24LH	345 - 475	47.69 - 65.67
110 - 120	30LH, 36LH	380 - 550	52.53 - 76.04

Gap Between Ball Bearing Housing and Cap

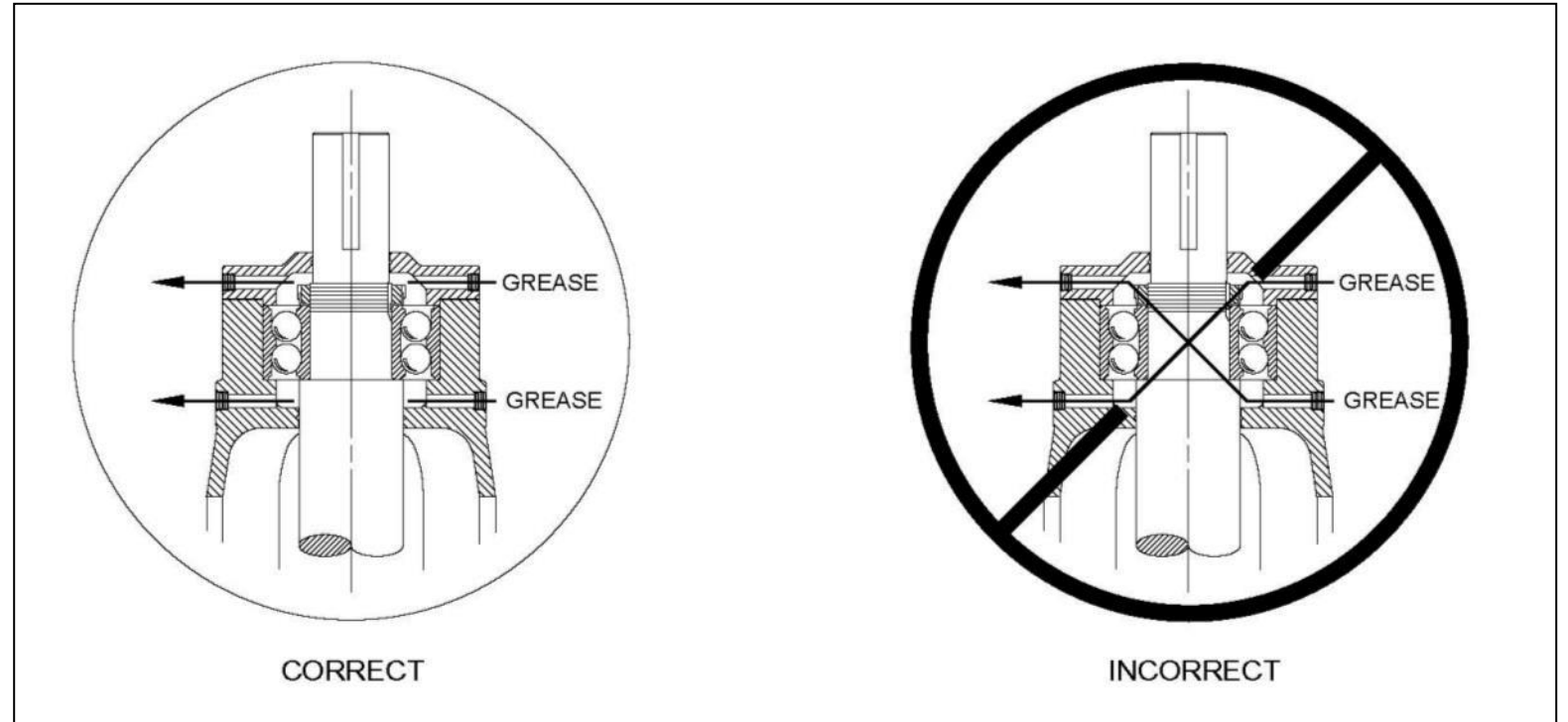
- LEWIS® design uses the ball bearing housing cap to lock the outer race of the bearing.
- There should be a gap between the 2 parts.
- Often we see maintenance personnel installing a gasket here which eliminates the cap therefore keeps the cap from locking the bearing in place



Maintenance

Bearing Lubrication

- Always follow the proper method of applying grease.
- Remove two diametrically opposite plugs, filling the housing with grease from one side until grease appears.
- Flushing the old grease is important
- Do not try to force grease through the bearing; squirt from top port to bottom port
- at the opposite port
- *Only* grease every 3 – 6 months with
- Exxon-Mobil Polyrex EM (Polyurea) or equivalent



Final Adjustment

- Check for freedom of rotation
- Place in vertical position
- Slowly rotate by hand
- Check for binding or rubbing
- Make sure it rotates freely without any difficulty
- Seal off all the openings
- Rotate the pump occasionally



Dangers of Using Non-OEM Parts



Dangers of Using Non-OEM Parts



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Non-OEM Solutions



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Keep in Mind

- Serial number usage allows for a detailed tracking of parts used for each pump purchased.
- LEWIS® PN are the same for all pump, the correct SN gets the right parts (PN 16 is always an Impeller)
- Consult with LEWIS® pumps before making changes. (Flow, head, piping, etc)
- Notify LEWIS® Pumps of any changes made to any pump so the BOM can be updated.



Questions?