MET-PRO
Global Pump Solutions

A Met-Pro Fluid Handling Technologies Business
Combining the Resources of **Dean Pump, Fybroc & Sethco**

DEAN PUMP® SERIES RA

Fan Cooled Hot Oil Pumps

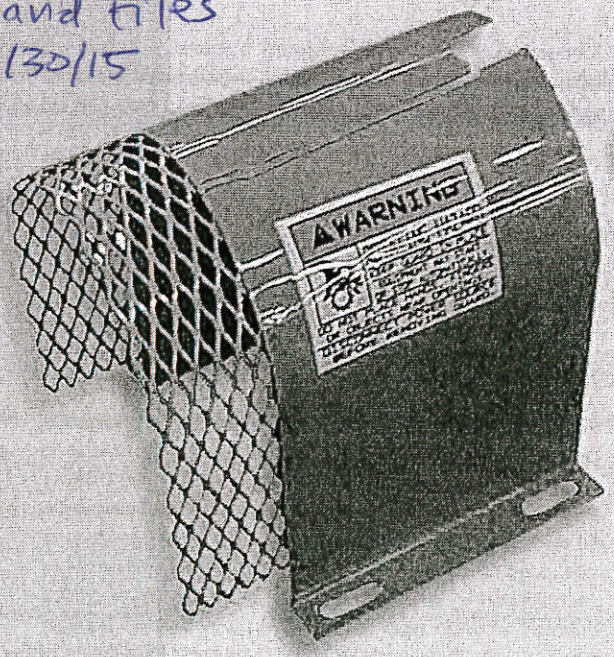
INSTALLATION

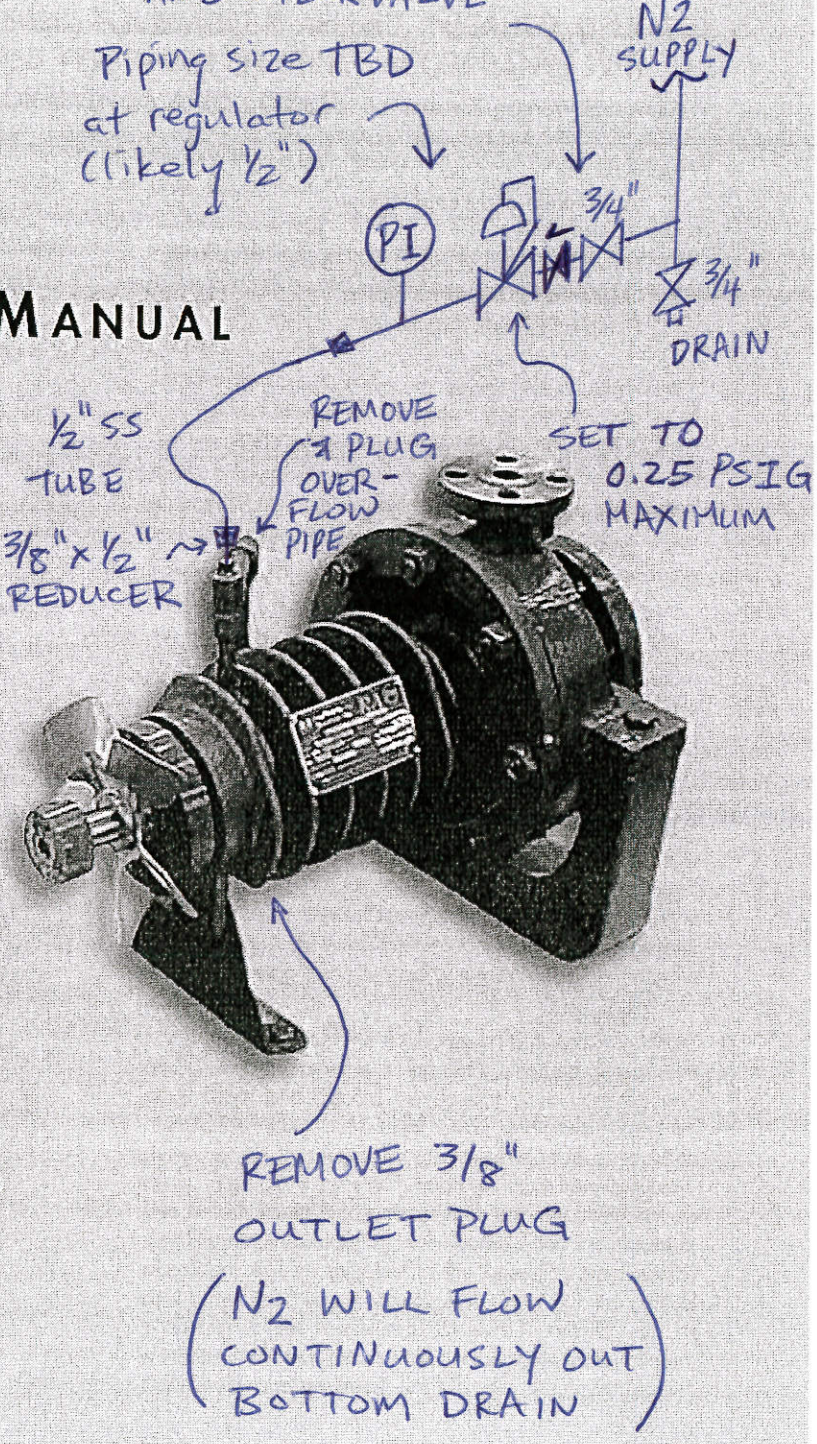
OPERATION

MAINTENANCE MANUAL

P-1003 THF MED TEMP
CIRCULATION PUMP
MECHANICAL SEAL
FLUSHING PLAN

David Files
7/30/15





DO NOT INSTALL, OPERATE, OR SERVICE THIS PUMP
BEFORE READING THE ENTIRE MANUAL

MET PRO CORPORATION

P-1003 THF MED TEMP CIRCULATION PUMP
MECHANICAL SEAL FLUSHING PLAN

PUMP LUBRICATION

BEARINGS

The radial bearing (180) is lubricated by the liquid being pumped and therefore needs no external lubrication.

The thrust bearing(s) (25A) are grease packed "for life" and require no further lubrication until the pump is rebuilt.

The RA2096 uses a "sealed for life" bearing that is packed with grease by the ball bearing manufacturer.

The RA3146 and RA3186 have ball bearings that are hand packed as an assembly procedure when the pump is assembled. The grease is a lithium 12-hydroxysterate soap-thickened grease that has rust inhibitors and extreme pressure additives. This is a NLG1, Grade 2, similar to –

Shell Oil Company's "Alvania" Grease #EP2 or
Union Oil of California's "Unoba EP" Grease Grade 2

Grease is also available from Dean Pump in individual containers. One container is required for a RA3146 pump. Two containers are required for a RA3186 pump. Order "RA3000" Grease #2 for bearing lubrication.

MECHANICAL SEAL

The "RA" pumps are arranged with a mechanical face seal (95A and 95B) that was specifically selected for sealing the more commonly used heat transfer oils. Some of the heat transfer oils "oxidize". The manufacturer of any heat transfer oil that oxidizes will recommend that a nitrogen gas blanket be maintained on the expansion tank of the system to assure that oxygen cannot come in contact with the oil. The "RA" pumps have a cavity provided between the mechanical seal stationary (95A) and the front grease seal (76) to allow the use of a barrier fluid to keep oxygen away from the mechanical seal faces when operating with an oxidizing oil.

All "oils" will oxidize at some point depending upon the amount of air contamination and the temperature. Most "oils" will begin to oxidize at 250°F. Some "oils" will oxidize as low as 150°F. The oxidation rate doubles for every 18 to 20°F increase in temperature, so it is very important to not use a barrier fluid that has a low oxidation temperature. The user should check to see at what temperature his oil will start to oxidize.

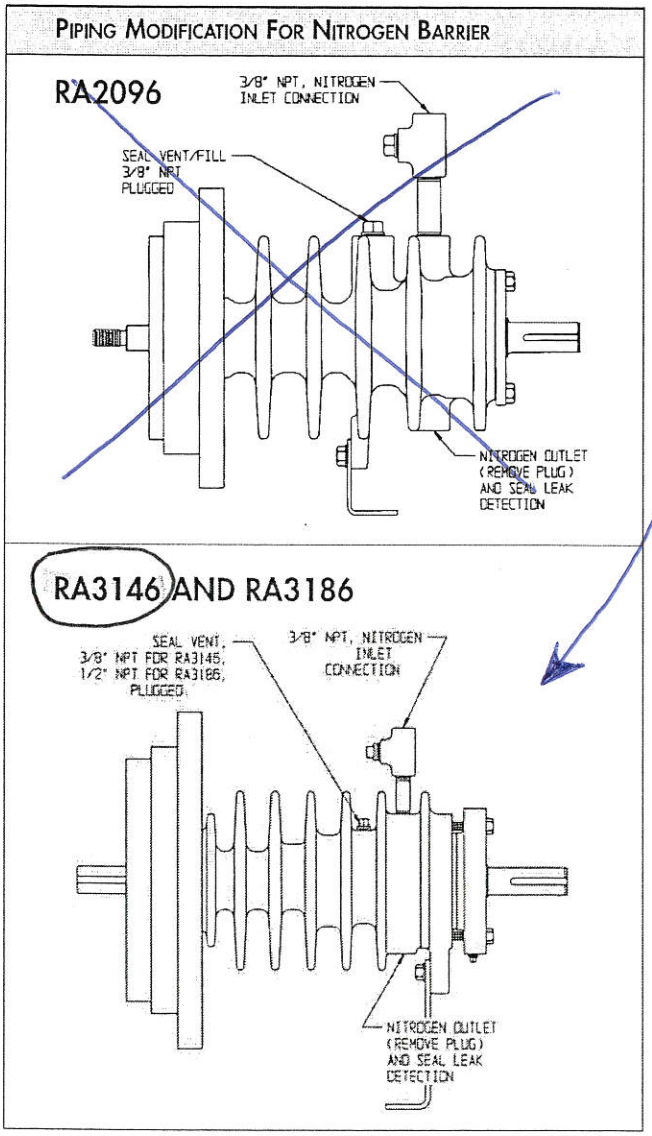
When the oil being pumped is one that oxidizes, a barrier fluid should be used. Select a fluid to be used as the barrier fluid that is compatible with the pumpage and not detrimental to the lip seal, bearings, mechanical seal, or the bearing housing. The best fluid to use is nitrogen, but many customers prefer to use a liquid instead of a gas. Many oil companies produce a (barrier) oil that would be compatible with the oil being pumped, mechanical seal elastomers, lip seal, bearings, bearing grease, and the bearing housing. Two examples of this type of oil are Calflo AF (Petro-Canada) and Dowtherm RP (Dow Chemical). The user should check with his oil supplier for his recommendation for a non-oxidizing or low oxidizing oil to use as a barrier. Sometimes the oil being pumped can be used as the barrier fluid.

Since most of our customers are using a liquid as a barrier fluid, the pump is supplied with the barrier oil piping shown at the bottom of page 6.

When using a liquid barrier fluid, the barrier cavity is filled through the pipe tee located directly above the cavity. Remove the 3/8" pipe plug (84) from the top of the tee (see the drawing at the bottom of page 6) and pour the barrier liquid into the tee until the liquid level is flush with the bottom of the pipe nipple that extends horizontally out of the side of the tee. Any excess above this level will run out on to the baseplate. Rotate the shaft by hand (wear gloves for this operation) to help remove any trapped air pockets. Refill to previous level and replace the pipe plug (84).

If nitrogen is to be used as the barrier fluid, the barrier piping must be modified, from that shown on page 6, to that shown below. Remove the vertical overflow pipe nipple, the 3/8" pipe elbow, and the horizontal pipe nipple connecting the pipe elbow to the pipe tee. Discard these parts. Move the pipe plug in the top of the pipe tee to the side connection of the pipe tee. Remove the 3/8" barrier oil drain plug from the bottom of the bearing housing, and discard it. Connect the nitrogen supply line to the top of the pipe tee and regulate the pressure to 1/4 P.S.I.G. maximum. The 3/8" connection at the bottom of the bearing housing will be left un-plugged to become an outlet for the nitrogen and serve as a leak detection in the event of mechanical seal failure.

PIPING MODIFICATION FOR NITROGEN BARRIER



When pumping a heat transfer oil that does not oxidize, a barrier fluid is not needed. Modify the barrier piping as described above for the use of nitrogen except plug both of the connections in the pipe tee. A collection pan could be placed on the baseplate under this drain opening to collect any condensed vapors or leakage from the mechanical seal when the faces wear.