



Start-up of New or Rebuilt Hydraulic Pumps (A practical guide)

Over the years, Fluidyne has helped many machine builders or users re-start hydraulic systems after new or rebuilt pumps have been installed. We have provided this assistance both before and after re-start is initiated. Often, when there has already been a failed attempt, companies wished they had taken the opportunity to go over the basics, before the re-start was tried.

While the start-up procedure is known, sometimes the pump has run so long without trouble, the maintenance department is not well practiced in the re-start of a system with a new pump. This process is different than a daily re-start, when everything is the same as when the system was last shut down.

This practical check list was prepared to review the basics and remind us of the importance of this new pump start-up procedure. Underlying this process is the understanding that, when the previous pumps failed, the extensive debris from that failure went somewhere, and that somewhere is often the lines, components and reservoir of the existing system. This makes the following steps critical to ensure a successful re-start and a healthy hydraulic system.

- 1) Remove hydraulic oil from reservoir using a filter cart.
- 2) Clean reservoir and flush hydraulic lines and hoses. If a hose appears physically worn, this is often a good time to take the opportunity to replace the hose, as the system is already drained.
- 3) Return used or new oil to reservoir with a 5 micron filter cart. If re-using existing fluid it should be re-circulated in reservoir with the filter cart for at least 2 hours. New mineral based hydraulic oil should have anti-wear, anti-foam, and anti-rust additives—AW-68 or AW-32. New fluids should also be re-circulated using the filter cart to clean any debris which may still be in the reservoir or that may have come from the storage container.
- 4) Change all system filters to new elements. Use "beta rated" elements. For systems operating under 1,000 psi, 10 micron is acceptable, for higher pressure systems, 5 micron is preferred. Hydraulic systems with servo or proportional valves should use finer filtration, typically 3 micron filters are recommended.
- 5) If present, check the main system relief, to be sure the main spool and control piston are free of debris which would prevent their proper operation. Manufacturers' have technical data sheets to assist in this check.
- 6) Prior to starting the pump - fill the hydraulic pump housing with filtered clean oil – pumps with a case drain, use the "top" case drain port to fill. While filling, allow air to escape from the housing, to be sure the pump housing is really full of oil.
- 7) Check pump for correct rotation (view pump from the shaft end). Typically, right hand rotation is clockwise and left hand rotation is counter clockwise when viewed from shaft end.
- 8) Set the compensator and/or relief valve to a low pressure setting for initial start. The compensator or relief valve can be adjusted up to the desired system pressure after pump is running.
- 9) If you have both a relief valve and a compensator, the relief valve should be set at least 15% higher than the compensator setting. Note: Fix volume pumps have no compensator, only a system relief valve.
- 10) After start-up, do not set any pressure settings higher than needed for proper machine operation. This will avoid the generation of excess heat and helps extend the life of all system components.
- 11) Re-fill (top off) reservoir to "full" level after the pump is running and all lines and hoses are full of oil.
- 12) When first started, a pump will tend to be "noisy" until the air trapped in lines and components clears the system. If the noise persists, shut down the system and check the suction side plumbing for fittings which might be allowing air to enter the system.

All pump companies have help desks or sales people who can assist in start-up and trouble shooting. When in doubt, take advantage of these resources to get the assistance you need to get your hydraulic system up and running.

With proper maintenance and procedures, hydraulic systems and components are cost effective, reliable, flexible, forgiving, and a long serving technology. These practices allow hydraulics to meet the needs of many diverse industries throughout the world.

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