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Filtration pump and hydraulic reservoir modifications can reduce maintenance effort and increase reliability.

Preventive maintenance of a hydraulic system is basic and simple and if followed properly can eliminate most hydraulic component failure.* However, many hydraulic systems are not designed to facilitate maintenance work. A properly designed hydraulic reservoir and the use of a filtration pump can increase maintenance efficiency and increase equipment reliability.

Modifications to an existing hydraulic system need to be accomplished professionally. Here are some recommendations on what should be included.

Filtration pump with accessories
The use of a properly designed filtration pump will reduce contamination introduced into the hydraulic system when fluid level is topped off or when new fluid is added.

Hydraulic fluid from the distributor is usually not filtered to the requirements of an operating hydraulic system. This oil is typically strained to a mesh rating but not filtered to a micron rating. However, hydraulic fluid must be filtered to 10 microns absolute or less for most hydraulic system (25 microns is the size of a white blood cell, and 40 microns is the lower limit of visibility with the unaided eye).

Many maintenance organizations add hydraulic fluid to a system through a contaminated funnel and may even use a bucket that has had other types of fluids and lubricants in it previously, without cleaning them.

Recommended equipment and parts:

- Portable filter pump with a filter rating of 3 microns absolute.
- Quick disconnects that meet or exceed the flow rating of the portable filter pump.
- A ¾-in. pipe long enough to reach the bottom of the type of container the distributor uses to deliver fluids.
- A 2-in. reducer bushing to ¾-in. npt to fit into the 55 gal drum, if you receive your fluid by the drum. If you receive fluid in larger quantities, mount the filter pump assembly to the supports of the double wall tote tank.

- Reservoir vent screens should be replaced with 3/10-micron filters and the openings around piping entering the reservoir should be sealed.

Designing a frame that will allow the filter pump and fluid drum to be transported by fork truck could further enhance the fluid handling operation. Regulations require that secondary containment be addressed. The assembly should include a catch pan so that any fluid any spilled fluid would "leak" into the pan.

Hydraulic reservoir features

A well-designed hydraulic reservoir will minimize the risk of introducing contamination when oil added to the system or contaminates being allowed to enter through the air intake of the reservoir. A valve should also be installed for oil sampling.

The air breather strainer should be replaced with a 10-micron filter if the hydraulic reservoir cycles. (The breather should be sized to the output of the reservoir.) A quick disconnect should be installed on the bottom of the hydraulic unit and at the ¾ level point on the reservoir with valves to isolate the quick disconnects in case of failure. This allows the oil to be added from a filter pump as previously discussed and would allow for external filtering of the hydraulic reservoir oil if needed. Install a petcock valve on the front of the reservoir that will be used for consistent oil sampling.

Recommended equipment and parts:

- Quick disconnects that meet or exceeds the flow rating of the portable filter pump.
- Two gate valves with pipe nipples.
- One 10-micron filter breather.

Do not weld on a hydraulic reservoir to install the quick disconnects or air filter.

Maintenance of a hydraulic system is the first line of defense to prevent component failure and thus improves equipment reliability. These equipment modifications can enhance that effort. **MT**

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*Preventive maintenance issues were discussed by the author in a previous article "Developing PMs for Hydraulic Systems".