

Accessorizing Gearboxes

Benefits You May Not Have Considered

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At Clopay Plastics in Augusta, Kentucky, my primary job is planning and scheduling along with being the lubrication leader. My job entails the use of a CMMS software product for assigning work orders for PMs and scheduling shutdowns and other maintenance items for technicians. Gearbox checks were one of the tasks on our scheduled downtime PMs to which maintenance techs did not want to be assigned. Today, they request gearbox checks. What changed? We accessorized our gearboxes!

At Clopay we didn't just randomly decide to accessorize our gearboxes. In the process of

planning the construction of our world-class lube room, we wanted to standardize all the gearboxes in the factory to match disconnects used on transfer carts, storage tanks and top-up containers for the prevention of cross-contamination and particle contamination. Gearboxes were also accessorized for easy oil analysis, and were made user-friendly for topping off and filling and draining, safety and environmental reasons, and retrofitted for offline filtration and identification on all gearboxes.

We purchased a cart with five shelves and stocked it with stainless-steel fittings. Labeled trays were used to sort and organize the different fittings. The cart has casters and it is taken to the machines on scheduled shutdowns for accessorizing gearboxes.

Standardization of Gearboxes, Storage Tanks and Transfer Carts

A decision was made to use 3/4-inch hoses, piping and stainless-steel quick-disconnects on all storage tanks, transfer carts and gearboxes. We used Dyna Equip quick-disconnects because they contain Viton seals and self-contained check valves on both the male and female disconnects. We installed quick-disconnects on any gearbox with a two-gallon reservoir or larger so that the transfer carts can be used for oil drains and fills. For smaller gearboxes, we use Oil Safe® containers for topping off and complete fills.



Figure 1. Quick-connect on Gear Box

Continued on Page 24

Continued from Page 22

We fill and drain the oil from the bottom of the gearboxes due to the risk of them becoming pressurized when filling from the top. When filling from the bottom, a gearbox can still



Figure 2. Sight glass added with oil sample port combo, desiccant with stainless piping and top-off plug between gearbox and desiccant.



Figure 3. Waste Oil and Filter Carts

become pressurized, but removing the desiccant breather or the $\frac{1}{4}$ -inch plug that is installed for top-offs will release the entrapped air. The $\frac{1}{4}$ -inch plug can be removed so that a quick-disconnect can be installed in the port. This would allow offline filtration with a filter cart to be used while the equipment is still in production. For cost savings, we carry one $\frac{1}{4}$ -inch quick-disconnect on filtration carts that can be installed and removed when completed. We also use adapters to attach the desiccant breather to the top of $\frac{1}{4}$ -inch piping, which can also be removed for top-off or to install a quick-disconnect for offline filtration.

We also installed $\frac{1}{4}$ -inch stainless-steel pipe fittings for draining oil. If a gearbox is two gallons or larger, a quick-disconnect and a stainless-steel locking ball valve are attached. This adds two levels of protection. With only a ball valve, a person or vibration could open the ball valve causing the oil to drain out, starving the gearbox of oil if no one catches the open valve. The quick-disconnect attached has a built-in check valve that will not allow the oil to drain unless a male disconnect is connected, adding the second level of protection. For smaller gearboxes, a drain pipe is also attached, but without quick-disconnects because these small gearboxes are filled with oil-safe containers. A locking stainless-steel ball valve is installed to reduce the chances of the valve being accidentally opened.

Safety and Environmental

Radiator-style hose clamps will never be observed in our facility. These have been outlawed in all of Clopay factories due to maintenance personnel and operators being cut by the sharp edges on the clamps. We have standardized gearboxes, lube room equipment, storage tanks and hydraulic reservoirs with a $\frac{1}{4}$ -inch push-on multipurpose hose with a push-on stainless-steel barb hose end. When pushed all the way onto the adaptor, the hose seats into the blue finishing cap. One must be careful when selecting hoses and push-on adaptors. Check them for compatibility with the oil, pressure ratings and temperature ratings.

On many gearboxes before the drain pipe extensions were added, the oil was normally

Continued from Page 25

match storage tanks, transfer carts, oil-safe containers and hoses, which takes the guesswork out of what goes where. A storage tank with a certain type of oil will have the same colored tag and written instructions as gearboxes and transfer carts that use the same type of oil.

Every zerk has a colored cap which identifies what type of grease should be used. The grease gun will also be that color and calibrated appropriately, telling the user how much grease is extracted on each pump. Each oil-safe container has the same colored label on it as the lid. We use a label with an adhesive back that withstands cold and hot temperatures.

Filtration and Manual Indicators

Previously, we had minimal filtration on gearboxes, and if we did have a filter, it was the cheapest one on the market. Why? Because we didn't know any better. Today, we install filter assemblies and attach absolute filters with manual indicators. The brackets to

hold the filter assemblies were fabricated and mounted in-house.

Summary

It has been almost four years since Clopay personnel attended our first Noria training course. Before then, none of us had heard of ISO Cleanliness codes. Even if we had, no one would have understood what they meant. Today, we receive new shipments of oil with 18/17/15. The gearboxes discussed in this article have used nontoxic synthetic oil for two years. As of last month's oil analysis, these gearboxes are continually running 14/14/11.

How much has accessorizing gearboxes contributed to achieving good ISO Cleanliness codes? We don't know exactly, but we do know that benefits such as maintenance techs' tasks made easier, faster and safer are enough for us. When lube tasks are simplified, the odds are they will be performed more frequently and with a happier face. The initial cost of accessorizing is expensive, but it has a fast return that will provide benefits for many years. **ML**