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Why do Hydraulic and Lubrication Fluids Need to be Clean?

Influence of Particulate Contamination

Particulate contaminants circulating in fluid power systems cause surface degradation through general mechanical wear (abrasion, erosion, and surface fatigue). This wear causes increasing numbers of particles to be formed, the result being that wear increases if the "chain reaction of wear" is not properly contained (by reducing contamination). Gaps grow larger, leakage oil flows increase in size and operating efficiency (e.g. of pumps, cylinders) decreases.

Hydraulic component clearances are critical and require strategic filtration designs to remove damaging particles. Critical clearances for individual hydraulic components are shown in the table below:

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In hydraulic systems, 70 to 90% of wear and failure is contamination related. Only 10 to 30% can be traced back to misuse, defects or age. Contamination cannot be stopped, only slowed down!

System efficiency can drop by up to 20% before an operator even detects a problem, such as cylinder drift, jerky steering, erratic operation or slower performance. Overall, contamination results in shorter service intervals, higher operating costs and lost productivity.

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Product Application Examples

Mobile Dual Filtration Cart for Roll-Off Cleanliness

Solution: MFD Filter Cart cleans the oil used in the lawn tractors in a roll-off cleanliness program. At the factory, the customer is using the filter cart to clean the fluid prior to shipping the unit. The dual filtration design allows staged filtration and/or water removal if required.

Product Application Examples

Mobile Dual Filtration Cart | MFD with HY-TRAX

Problem: Customer was seeking a solution to quicken the traditional bottle sampling procedures for oil warranty claims. They requested an on-site particle counter to confirm the required ISO code was met before sending the oil for the warranty to be honored.

Solution: Once Schroeder made available the HY-TRAX® retrofit option for existing MFD filtration carts, the customer placed an order for this to record their fluid cleanliness level. As a result, the customer was able to confidently send their oil sample, knowing their corporation would honor the warranty based on the approved bottle sample. Also available with the MFS/MFD and KLS/KLD for oils up to 2500 SUS using the G2185 option.

Mobile Dual Filtration Cart | MFD with HY-TRAX

Problem: Customer was experiencing problems with external ingestion of coal dust getting into the 255 gallon (965 L) lube oil reservoirs on their coal pulverizers causing degradation wear on the bearings and bull gears, which lead to premature aging of the system components.

Solution: Installation of KLD filtration skid cleaned up the system fluid from coal dust particles and other contamination. As a result, the internal wear on system components as well as unscheduled downtime due to contamination was reduced dramatically.

Mobile Dual Filtration Cart | MFD with HY-TRAX

Problem: Customer needed a way to ensure roll-off cleanliness specifications were met after factory assembly and testing of lawn tractors.

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Solution:

Reduce the particle counts down to an ISO 16/14/11 or better, by using 37 gpm (140 L/min) duo pass QF15 housings with an interfaced Allen Bradley 1100, programmable touch pad screens, integrated Testmate® Sensor Unit (TSU) (Testmate® Contamination Monitor or TCM, particle sensor with pump and flow control system) and Testmate® Water Sensor (TWS).

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After the X Skids are turned on, following a new fluid delivery, they can bring the differing fluids into compliance in less than 4 hours. This type of installation is a vital component in fluid conditioning to increase equipment and/or machinery component life and reduce down time and maintenance cost.

Asset Management Filtration Station® | AMFS

Problem: Refuse company faced with short oil life and dirty hydraulic fluid in their trucks.

Solution: Through filter and monitoring 3500 gallons (13,250 L) of hydraulic oil at $6.19 per gallon ($1.64 per Liter), refuse company was able to save $21,665 in 6 months (through extending fluid life). The decision to implement the AMFS filter system company-wide was made.

Telematic Communications Module with Remote Controlled Sampling System

Problem: An Alaskan mining company’s hydraulic shovels were breaking down due to high contamination levels in their hydraulic system. They needed a way to monitor fluid cleanliness levels while the machine was operating.

Solution: Upon installation, the HY-TRAX® Telematic Communications Module provided continuous remote monitoring. Management was able to schedule maintenance intervals without having to leave the office to collect fluid samples. Available as an option on the MFD MFS, X-Skid and KLD. Also available in non-telematics version.

X-Skid Kidney Loop System for In-Plant Fluid Treatment

Problem: High contamination levels in new hydraulic fluids, beyond the standard set for use in construction machinery. Customer uses four different types of fluids, each in 500 gallon (1892 L) tanks, that need to be treated individually.

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