CASE STUDY

APPLIED Industrial Technologies®

CUSTOMER
WEST FRASER

LOCATION
SMITHERS, BRITISH COLUMBIA, CANADA

EQUIPMENT
TAYLOR TXB 360L FORKLIFT

APPLICATION
WET BRAKE (HYDRAULIC)

ROI:
PAYBACK IN 5 MONTHS

COST OF OPERATIONS:
BEFORE: $2.71
AFTER: $1.71

> "I could not believe how quickly OEI's magnetic filter technology cleaned the hydraulic fluid. In 300 hours, it brought the ISO cleanliness value below industry standard."
>
> — Glen Cullen
> Shop Manager, West Fraser

CHALLENGE

Inadequate filtration in Taylor forklift's hydraulic system is incurring high repair and maintenance costs due to rapid oil oxidation and component breakdown. The culprit behind particle contamination ingression is the unfiltered cooling wet brake circuit, which introduces wear particles into the hydraulic fluid system.

Given that wear contamination ranging from 1µm-4 µm is the most damaging to close tolerance hydraulic components, addressing this issue is crucial to improving the system's overall performance and reducing unplanned maintenance costs. With OEI filtration technology implemented it will effectively eliminate wear particles, reducing oil oxidation, thereby mineral oil can be cost effectively replaced with superior synthetic oil.

SOLUTION

The implementation of OEI's magnetic filter technology offered a comprehensive solution to the issue. Firstly, installing an OEI Mag-Y-Strainer on the unfiltered wet brake cooling circuit to reduce the new wear contaminants into the hydraulic system. Additionally, a custom hydraulic tank filter cap was designed and installed in the OEM filter. Once OEI Components have cleaned the system, TO-4+ Syn all season hydraulic oil can be used. OEI magnetic filters operate with minimal flow restriction avoiding damage to seals and stress to pumps.

RESULTS

Figure 2 shows contamination captured shortly after installation.
Non-ferrous material is also captured due to cross contamination and static charge.

Figure 1: OEI's Magnetic Y Strainer attached to wet brake circuit.

Figure 2: OEM hydraulic filter housing with the OEI Filter cap installed.

Figure 3: OEI Magnetic drain plug installed within the machine

ISO particle tests were conducted before and after implementation of OEI magnetic filtration.

In just 300 hours of operation ISO counts for particles 4 microns and greater went from 23/20/15 down to 18/16/14. In 500 hours, ISO count was 17/15/13.

Figure 5: OEI custom fabricated Magnetic filter cap, with wear particles

Figure 4: Contamination from the wet brake circuit captured by OEI Magnetic Y-Strainer

CONCLUSION

The incorporation of magnetic filtration technology with a 22+ year operational life has proven to be a game-changer. It has significantly reduced maintenance costs by extending hydraulic oil change service intervals from 2,000hrs to 6,000, minimizing labor and oil expenses, while simultaneously maximizing the benefits and lifespan of synthetic oil. According to West Fraser's maintenance records, the technology implementation can lead to a remarkable reduction of up to 309 liters of hydraulic oil usage per unit annually. When considering the fleet of 300 forklifts in operation across the US and Canada, this equates to a collective saving of 92,700 liters.

Moreover, the positive impact extends to environmental sustainability, as extended service intervals contribute to a substantial reduction in GHG emissions. Additionally, West Fraser reported an astounding 58% reduction in hydraulic system routine maintenance and labor costs, demonstrating a significant improvement in the operation cost of the Taylor forklift, which dropped from $2.71 per hour to $1.71 per hour. The integration of OEI magnetic filtration has undoubtedly brought about considerable benefits, with OEI Upgrades for the Hydraulic circuit costing roughly 900$. It has proven to be a highly valuable investment for improving reliability and operating costs.