



## **OIL FILTRATION SYSTEMS, INC.**

111 Parkway Drive, Boerne, Texas 78006

Phone: 830-816-3332

Fax: 830-816-3331

**Web: [oilfiltrationsystems.com](http://oilfiltrationsystems.com)**

### **CASE STUDY**

#### **FILTRATION OF REAR DIFFERENTIAL & HYDRAULIC OIL HAUL TRUCKS – MINING INDUSTRY**

**LOCATION: LARGE COPPER MINE - MORENCI, ARIZONA**

The mining industry around the world utilizes large haul trucks to move ore from the pit to the primary crushers. These haul trucks are expensive pieces of equipment with a critical hydraulic system, as well as large rear differentials lubricated by an ISO 680 gear oil.



Due to very harsh operating conditions in the mining industry (high heat and high ingestion of particulate contamination), the world's leading manufacturer of haul trucks recommends that the hydraulic oil be changed out every 2000 hours and the rear differential oil be changed out every 3000 hours. The haul trucks come equipped with OEM hydraulic filter elements which are changed out at regular intervals, but oil analysis showed unusually high and unacceptable levels of particulate contamination in the oil after only 500-hours of operation. A high incidence of premature cylinder wear and the failure of several rear wheel bearings was attributed in large part to abrasion caused by clearance-sized particles (10-Micron and smaller) between metal faces.

**GOAL:** To extend the life of hydraulic cylinders and rear wheel bearings, reducing all maintenance costs associated with repair and replacement of component parts.

**SOLUTION:** Utilize high-efficiency kidney-loop filtration to reclaim both the hydraulic and rear differential oils during routine maintenance (PMs) performed on the haul trucks every 500 hours.



Custom designed Portable Filtration Systems provided by Oil Filtration Systems, Inc. are equipped with high-efficiency 7-Micron filter elements rated Beta<sup>©</sup>>1000 per ISO 16889, meaning that 99.9% of all particles 7-Micron and larger are removed in a single pass. Since both oils must be reclaimed to meet or exceed OEM recommended cleanliness levels during a normal 4-hour maintenance interval, a relatively high flow rate on the Portable Filtration Systems is required.

Hydraulic Oil – **20 GPM Portable Filtration System** equipped with a single 840X filter housing.

Rear Differential Oil – **40 GPM Portable Filtration System** equipped with a multi-element housing which holds (4) 840X filter elements.



## **RESULTS:**

Before utilizing the high-efficiency kidney-loop filtration systems, oil analysis routinely showed very high levels of particulate contamination (**ISO 23/21 or higher**).

By reclaiming the oil every 500-hours with Oil Filtration Systems, oil analysis revealed the following average results:

<b><u>Beginning</u></b>	<b><u>Ending</u></b>	
<b>ISO 19/17</b>	<b>ISO 15/13</b>	<b>Hydraulic Oil</b>
<b>ISO 20/17</b>	<b>ISO 16/14</b>	<b>Rear Differential Oil</b>



Because the end-user can now successfully reclaim both oils to cleanliness levels that meet or exceed OEM recommended specifications, and maintain much lower particle counts between recommended change-out intervals, expected long-term benefits include:

- Extended Bearing Life
- Fewer Cylinder Repairs/Replacements
- Reduced Down Time

Actual long-term monetary benefits of utilizing the Oil Filtration Systems have yet to be determined, since this program has only been in place for approximately 18 months.