



Glacier GFH-157

Centrifuge Solution for Hydraulic Dirt Overload

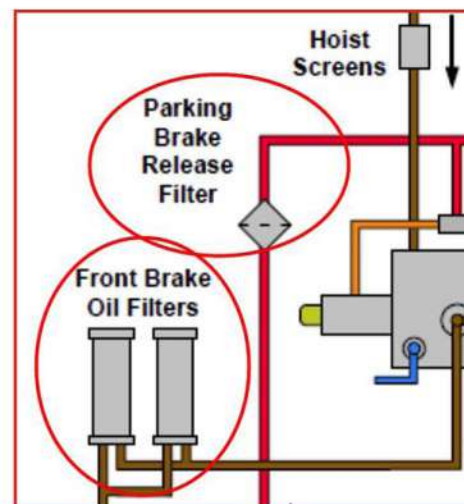


GLACIER
PURIFICATION SYSTEMS

THE PROBLEM

High capacity mine trucks often use a single hydraulic system to operate both dump cylinders and wet disc brakes. Both are critical to efficient and safe operation, although maintenance managers often talk about the consequences of failure in just one of the six pumps in this circuit — contamination spreads rapidly through the entire system, since all the oil is sourced at a common sump.

Two filters in this circuit trap normal wear debris ensuring safe function of the brakes and reliable hoist action. In addition to pump failure debris, these filters collect brake abrasives migrating into hydraulic lube oil as the pads grind discs during braking. At risk are actuators (front & rear brakes), hydraulic coolers, control valves, pumps and cylinder rod seals.



CASE STUDY

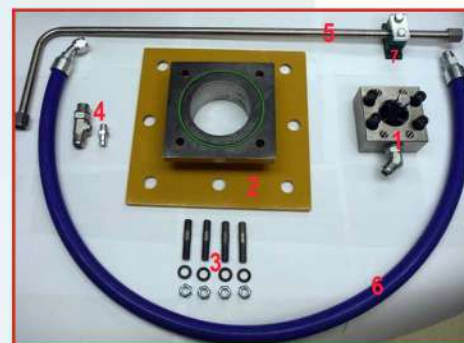
GLACIER FIELD HISTORY

Number : GFH 157
Product : Centrifuge
Experience : Centrifuge Fixes Hydraulic Dirt Overload — Cat 793C Truck
Date : 1 September 15

At one copper mine in Canada, hydraulic system filters were working effectively, trapping abrasives, but required frequent servicing. Given the safety hazards present if these filters collect dirt beyond capacity limits, the Cat 793C truck is equipped with a brake filter differential pressure indicator. This sensor first alarms, then a computer shuts the truck down. At alarm, the operator must act rapidly, moving the vehicle off the haul path. At this mine, a “truck-down” condition creates a potential \$10000/hour profit loss.

Operations needed an answer to this high dirt-load penalty on revenue. The Glacier Advanced Centrifuge System offers mines a reliable way to control lube and hydraulic abrasives using the power of centrifugal separation; centrifuges separate and collect much smaller contaminants than sizes addressed by OEM barrier filters. A centrifuge favors removal of the heaviest most damaging dirt, which are often harmful metallics.

Glacier introduced the Glacier ACS 2000 to his copper mining customer who made the installation and the brake system impact was immediate: unscheduled “truck-down” brake filter service stops went to zero. OEM lube oil results validate what the customer experienced. And, the distributor offered specialized contaminant chemistries which exposed the exact metallic present in the 1.5 pounds collected in the centrifuge.



INSTALLATION

Centrifuge installation was designed for gravity-draining of clean fluid back to the main hydraulic tank. The oil supply was sourced in the rear brake cooling pump supply path and centrifuge pressure maintained by adding a 30 psi check valve at the take-off point.

A reinforced mounting is installed to ensure vibration and cracking resistance.



RESULTS

The first service and sample was achieved after only 549 hours of operation, just one month after first application. These photos show the debris annulus collected on the centrifuge insert. The lab chemistry of this abrasive cake demonstrated its harsh nature, the majority of which was brake lining material.



CONCLUSION

The Glacier ACS 2000 pressure-powered centrifuge is a powerful tool capable of direct and measurable impact on hydraulic system cleanliness resulting in vastly improved vehicle uptime.



SPECIFICATION

Cat 793C Truck with ACS 2000 Centrifuge

Vehicle Application Factors:

Vehicle	: Cat 793 C
Power	: 2415 HP
Hydraulic System Fluid Capacity	: 1500 litres

Mine Operating Details

Vocation	: Copper Mine Open Pit Haul
Work Day	: 20 hours
Truck Capacity	: maximum 214 tons (148 cu. yds).
Haul Grade	: 8%
Environment	: +35°C to -30°C, mountainous
Centrifuge	: 2000cc, 4 gpm nozzles, Gravity Drain
Hydraulic Oil	: Cat Spec 5w30



Pressure-Powered Centrifuge Operation on Cat 793C Hydraulic Circuit

Engine Speed	Centrifuge Pressure	Centrifuge Speed
Low Idle	50 psi	2900 rpm
1400 rpm	75 psi	3900 rpm
High Idle	110 psi	4500 rpm

We thank our distributor for this excellent field report on the superb documentation of his customer's hydraulics and benefits provided by the Glacier ACS pressure-powered centrifuge.

