CLEAN OIL
BRIGHT IDEAS

SEA 60 Gear Oil

Caterpillar 797B Haul Truck, Differential / Planetary Gear

CJC™ Application Study

Application Study written by:

Rick Klassen
Klassen Specialty Hydraulics Inc.
Canada

CUSTOMER

Surface extraction mine in the Canadian oil sands.

THE SYSTEM

System: Caterpillar 797B haul truck differential / planetary gear assembly
Oil Type: SAE 60 FDAO (Final Drive & Axle Oil)
Oil Volume: 700 L in differential, 1480 L total combined capacity

THE PROBLEM

The drivetrain of a 380 ton truck is under tremendous stress, and proper lubrication of the gears and bearings is critical. Various factors compromise the cleanliness of the oil, including dirty and wet ambient conditions, wear, contaminated bulk oil, and residual debris from machining and servicing of internal parts. The high viscosity oil and very cold climate (down to -40°C) makes typical fine filtration nearly impossible, so instead the oil is simply dumped and replaced every 2,000 hours or less.

THE SOLUTION

The CJC™ Mobile Flushing Unit, MFU is specially designed for effective and efficient cleaning of differentials and planetaries. This Fine Filter model HDU 27/108 GP-DE2H1MPTY is equipped with integrated tank, heaters, particle monitor, and several other unique features for handling this challenging application. With 4 x CJC™ Filter Inserts B 27/27, the holding capacity is over 25 kg of solids, at 3 micron absolute. The CJC™ MFU automatically adjusts the flow through the filters, based on oil temperature and viscosity, in order to maximize the filtration effect and minimize operator intervention.

THE TEST

A 1-½" suction hose was positioned to draw from the bottom of the differential, and the filter outlet line was split and returned into each planetary. This way the debris is all flushed back to the filter suction point.

OIL SAMPLES

Two samples were taken at the start and every hour there after for the next five hours. One sample from each pair was analyzed with the on-site particle monitor and the duplicate sample was sent to an independent laboratory to verify results.

FINANCIAL BENEFITS

Because of the extreme operating requirements, the oil is very expensive and to replace it can cost upwards of **$15,000 per truck,** and as often as 4 times per year. The customer alone operates over 100x haul trucks.
Caterpillar allows extended oil drains as long as regular oil samples meet minimum cleanliness requirements. If by employing the CJC™ MFU at regular PM intervals, the **oil service life could be extended even by 50%** - that would translate to a savings of **$1.5 M / year** in oil costs alone, not even considering other significant benefits like extending overhaul intervals or reducing failures or parts replacement.

The CJC™ Mobile Flushing Unit, MFU looks small while performing a hot-flush of the 797 differential

The customer operates a large fleet of 797 haul trucks

THE RESULT

	4 µm particles	6 µm particles	14 µm particles
0, at start up	22	20	15
5 hours after of flushing	16	15	12
Reduction	**98,0%**	**96,5%**	**93,0%**

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C.C.JENSEN A/S
Løvholmen 13 • DK-5700 Svendborg • Denmark
Phone: +45 6321 2014 • Fax: +45 6222 4615
sales@cjc.dk • www.cjc.dk