

J.S. Redpath – LC brake field test Updated 24.01.2014

J.S. Redpath is a mining construction and engineering mine contractor. They currently have a project at the Hudbay Minerals Lalor mine located near Snow Lake Manitoba. The Lalor mine is an underground ramp/shaft access mine with operations at a 950 meter or 3000 foot depth, with an 8km drive one way to get to the work headings. The ramp slope varies between 12% and 18%. The mine has very wet and corrosive conditions. Product materials being mined are Zinc and Gold

The J. S. Redpath vehicle is being used to carry 10-14 personnel from ground level to the mine construction underground. This drive normally takes 15-20 minutes. The vehicle was commissioned into service at Lalor on October, 14, 2013. As of January 22, 2014, the vehicle has 839 hours logged.

After 754 hours, J.S Redpath serviced the brake by draining and replacing the cooling oil. The mechanic reported the oil was “a little black, but not bad. No smell or filings in the oil”. Based on this reported information about the oil change on the LC brakes after 750 hours, the oil was still in good condition (no smell and no filings), and could have continued to be used. The oil change interval for the Ausco LC brakes has yet to be determined, but it is safe to say that under normal usage, the oil change could make it at least 1,000 hours. There has been no other service of the brakes.

J.S. Redpath also operates vehicles on this site using the OEM front caliper and rear drum brake system. They provided detailed maintenance records on three of these vehicles from January 2013 thru September 2013. Total number of brake repair reported on these three vehicles was 54 and the total repair hours was 273. Using standard OEM parts mine prices provided by ENS Toyota and €45 per hour labor used at Redpath, the average parts and labor cost for a Landcruiser using OEM brakes is €20,356.00 annually. Payback for the Gold Solution, using a €17, 692.00 install price, is 10 months.

Note that Redpath uses €45 per hour for their labor. Most mines labor cost is reported to be more near €100, which would yield the annual parts and labor cost at €27,041.00 with a payback in less than 8 months.

J.S. Redpath also operates vehicles equipped with the rear only SIBS brakes from Advanced Braking Technology of Perth Australia. Redpath reports that the SIBS brakes require cooling fluid change every 250 hours. At the typical operating rate at Lalor, this is about once a month.

Redpath reports the SIBS cooling fluid costs €175 for 5 liter. Each brake requires 1 liter. At €45/hour labor, 2 hours to service the brakes, and €35/liter for the fluid, Redpath pays at least €2000 per year per vehicle changing cooling fluid. Again, using the €100/hour labor reported by most mines, the annual cost for the ABT recommended cooling fluid change would be near €3500 per vehicle. The Gold LC brake is estimated to be €250 per year, using 1.7 liter of Cat TO4 per brake and twice a year.

Redpath also reports that the SIBS rear brakes glaze due to the driver attempting to drive off in first gear with the SIBS park brake still applied. Redpath has also experienced the fracture or failure of the rear SIBS brake mounting bolts which attaches the brake to the OEM axle which damages the rear axle

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mounting flange. The Ausco Gold LC brake provides four wheel parking brake and cannot be “driven thru” in first gear according to the mechanic at Redpath.

These Redpath vehicles equipped with the rear only SIBS brakes use the OEM front caliper brakes. Using the repair history for the first nine months of 2013 provided by Redpath on three vehicles running the OEM front calipers, it was noted they had done three front brake repairs on average equating to four front brake repairs a year on average.

Using parts costs provided by ENS Toyota and estimating the labor times to replace front pads, calipers, and rotors and €100/hour labor cost, it is estimated that Redpath pays nearly €6000 annually repairing front calipers.

Adding the SIBS cooling oil change cost and the front caliper repair cost, Redpath’s repair costs for a rear SIBS only vehicle is €9500. This excludes any other SIBS repairs such as hub seals or the deglazing process. Including the installation cost of the rear only SIBS system of on average €12,000, the total cost would be €21,500. The payback then using the Ausco Gold LC brake system would be just under 10 months.

On January 22, 2014, Ausco visited the Lalor mine to complete the first physical inspection and interview the drivers and site personnel on their experience uses the Ausco wet brake system. We noted the extreme conditions at this mine site. Redpath vehicles are kept outside and exposed to the cold for between one to three hours between shifts with temperatures ranging from -29 C (-20F) in the mornings to afternoon near -26 C (-14F).

The head mechanic explained that the vehicle is used to take personnel into the mine, with up to 13 people in the back and 2 in the cab. This mechanic drives them down into the mine. He reported the stopping power was the same loaded or unloaded. When asked about the LC brake performance, the mechanic reported he likes it.

The Ausco representative was allowed to ride along and took the truck back to the ramp entrance to the portal. The distance from Redpath buildings to the portal was about 3 km. This was the only place that wasn’t snow covered. They performed a 2nd gear full speed service and emergency stops. The brakes worked great. The mechanic stated he liked the stopping power and distance. Both times the wheels locked up. The surface had large chunks of loose gravel.

The four Ausco brakes were inspected for wear by checking the internal ball ramp actuator travel. The total travel increase since the test began was just at 0.007 inch which is considered very slight wear and typical during the break-in period of the brake. The brake cooling oil was drained one brake at a time. No smell or dirt was found nor the presence of water.

When asked what he thought of the Ausco brake system thus far, the Redpath Mobile Fleet Maintenance Superintendent stated, “had the opportunity to install the Ausco 4 wheel set up, on one of our units a few months ago, and has been working in a pretty tough environment ever since. Ramp access travel time to the workplace is 1.5 hours one way, so the brakes are seeing some pretty good

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extremes. We have currently logged near 1000hrs, and have not had one problem to date, very impressive as opposed to conventional brakes which we are/were doing service at least every 40 hours. Anyway just wanted to let you know, so far I see the cost savings adding up quickly!"

In summary, the Gold LC brake field test at Redpath's Lalor mine is proceeding extremely well. Compared to the operating costs of either the OEM brake system or the rear only SIBS system, the Ausco Gold LC brake system offers more than reasonable payback and superior performance. When asked about the overall vehicle braking experience on all vehicles used at this site, the Redpath truck mechanic replied everyone likes the Ausco brake the most and that we are viewed as "the best on the market".