

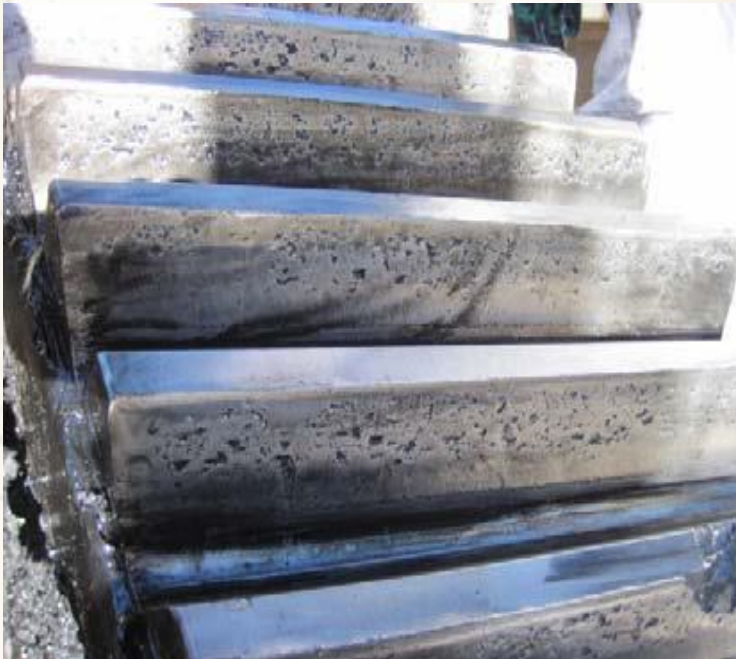


Proof of Performance

PETROTAC EP PREMIUM 20B ON SHOVELS

A mining company in Chile was experiencing significant damage on the Hoist Gears of their shovels. Since commissioning the shovels had been using a low viscosity grease type product that met OEM specifications. This grease based its protection solely on a high 4 ball weld result.

Gearing Damage Present

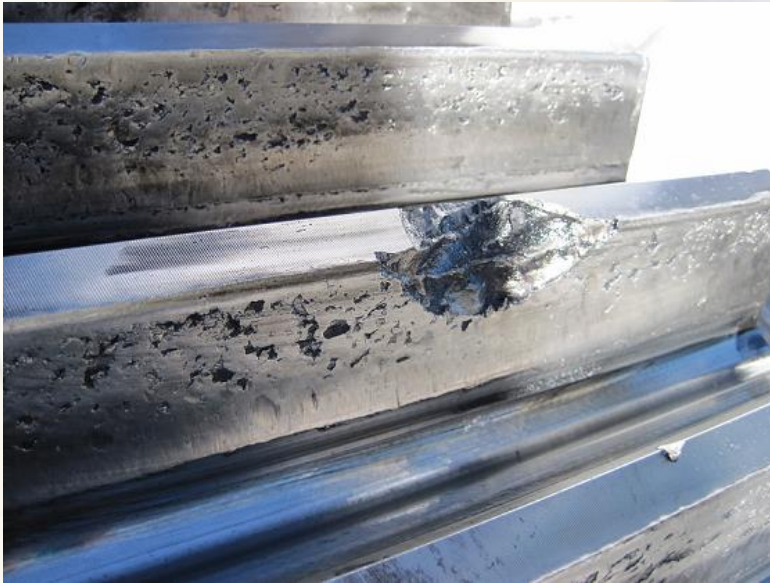


Shovel # 9



Shovel # 10

Shovel # 9



Date: June 2012
Operating hours: 12,100 hours
Status: Pitting over 100% of gear teeth, 32 teeth broken!

Shovel # 10



Date: August 2012
Operating hours: 9,300 hours
Status: Pitting over 100% of gear teeth



Proof of Performance

TEST CONDITION

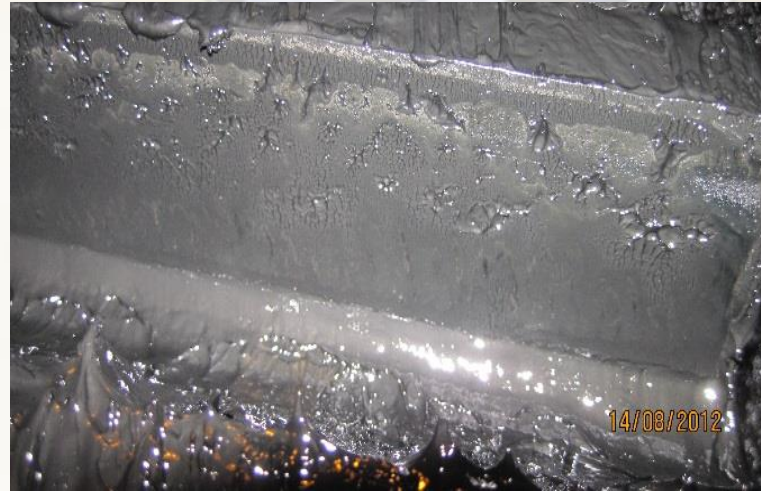
The mine contacted Petron with a request to help them extend the life of their damaged ring gears and pinions until spares gear arrived at the mine.

Petrotac EP Premium 20B which met the requirements of a new Technical Advisory document released by the shovel OEM in 2011 and met the ambient temperature range of the mine. It was Petron's choice for this challenge.

The shovels continued working without further modification to the condition shown above using our Petrotac EP Premium 20B. The condition of the gears was continuously monitored and the gear change was able to be postponed due to the performance of the Petrotac EP Premium 20B.

Both shovels with damaged ring gears surpassed the customers expected life of 13,500 hours and even the OEM time before overhaul (TBO), of 25,000 hours.

FINAL INSPECTION FEBRUARY 2015



Shovel #9



Shovel #10



Proof of Performance

TEST RESULTS

The damage did not progress significantly further after the switch to Petrotac EP Premium 20B. The mine was completely satisfied with the product. The other components, swing gear, stick and saddle block bushing also surpassed OEM time between overhaul.

The below chart shows how the gears with heavy pitting before switching to our Petrotac EP Premium 20B operated without problems for a longer period of time, surpassed the customers expected life and even the OEM time before overhaul which was in serious question with the previous product.

Shovel	Lubricant	Operating Hours	OEM Time	Average	Operating	Hours Over	Hours Over	Increased
	Change Date	at Changeover	Before Overhaul	Actual	Hours	OEM Time	Average	Life Over
			Hours	Hours	Feb-15	Before Overhaul	Actual hours	Average Actual
# 09	6/29/2012	12,934	25,000	13,500	30,401	5,401	16,901	125%
# 10	8/3/2012	9,870	25,000	13,500	26,442	1,442	12,942	96%
NOTES:								
Sh #09 showed critical damage @ 12,000 hours. Users didn't believe the gears would surpass 13,500 hours								

SAVINGS ACHIEVED

In addition to the requirement from the mine to extend the life of the damaged gears, the use of our Petrotac EP Premium 20B also offered cost savings to the mine.

The chart below shows the cost of a set of gears, one ring gear and two pinions for the shovel and the savings to the mine by extending the life of the gears.

Shovel	Ring Gear Cost	Pinion Cost	Savings
			Only Gearing
# 09	\$ 215,000	\$ 135,000	\$ 350,000
# 10	\$ 215,000	\$ 135,000	\$ 350,000
			\$ 700,000