



# OMEGA UNDERCARRIAGE CASE STUDY



## THE CHALLENGE

Upgrade our current undercarriage technology to continue to perform better and last longer than industry standards

When our customer's came to us asking to design a longer lasting undercarriage, we began working with them to understand where their original machines could be upgraded and why specific areas were experiencing high failure rates and extreme wear. We also researched how often undercarriage components needed to be replaced within the life of the system and how we could extend life to create a more holistic approach, creating less downtime for the customer. Our customers needed a more robust and reliable propel system that would give them the longest life and the least downtime and trusted in L&H to provide them a solution.

## IMPACT TO OPERATIONS

- **Downtime costs** – ranging from \$600/hr - \$60,000/hr depending on a mine's production costs and the mineral being mined
- **Frequent maintenance** – numerous maintenance intervals decrease production and increase maintenance costs
- **Increased safety hazards** – increased downtime means increased safety hazards for employees that are working on machinery.



Advanced materials, forged components, and cutting-edge design innovations extend the Omega undercarriage lifespan by more than 30%, reducing lifetime maintenance, materials waste, and your total cost of ownership.



## THE SOLUTION

### Redesigning key structures and utilizing upgraded materials

We evaluated the most costly and unsafe pitfalls in current industry offerings and redesigned a safer and more robust system. Key structures were upgraded and improved materials were used to create a stronger design. We included innovations that distinctly extend maintenance intervals and simplify repairs.

The L&H Omega Undercarriage leaps ahead of any other undercarriage technology in the world. By understanding the nature of different field conditions and knowing the typical patterns of failure and stress, our engineers have developed an undercarriage that exceeds the performance of every other option on the market.

"L&H works hard to design undercarriages that suit both the environment they will be used in, and the weight of the machine itself. Before deciding upon the materials and geometry that meet these needs, we go through a variety of design tools including analytical calculations, Finite Element Analysis, and casting design. L&H is small enough to be nimble in every circumstance, which means we can make design and manufacturing changes quickly, giving us an edge over our larger competitors."

BILL SCHROYER, ENGINEERING MANAGER

### Innovative shoe design

Deep hardened pins slow wear and an upsized hinge clevis reduces contact loading. Additionally, the impact resistant manganese steel decreases wear rates and have maintained and unprecedented .0001% failure rate, making the Omega shoe the most reliable option on the market.

01

### Deep engagement system

The stable pitch and deep engagement design fits deep into drive tines helping create a larger contact area to reduce wear on the tumblers. The sophisticated design takes the tumbler from under pitched to stable pitch adding additional life to the component. Our engineers built a high-performance, deep engagement track system for both CAT and Joy Global machines that reduces wear.

02

### Straddle mount idler upgrades

Moving the bushing to the outer bearing blocks, the bearing area is doubled and with innovative material of ToughMet bushings, bearing life is tripled.

03

### High hardened rollers

Forged lower rollers and an advanced heat treating process extend life by at least 30%. Additional clearance to our undercarriage was created by an elevated roller path, this provides more maneuverability in poor operating conditions and helps better distribute the weight of the machine.

04

### Increased torque in propel transmission

The L&H Omega propel transmission increases torque by 50-65%, enabling your machine to move through soft ground conditions and withstand the additional weight of larger machine models.

05

### Final drive modification

No need to remove the transmission and motor to replace the final drive shaft, tumbler or bearings. All final drive components can now be removed from the outboard side of the sideframe and the need to realign the motor has been eliminated - a smart modification that saves up to 50% of maintenance downtime.

06

### Improved sideframes

A thicker inboard plate reduces stress and cracking in the original high stress areas, creating easier access to internal components. Additionally, a thicker top deck, full length skirts and outboard gussets protect lower rollers and pin keepers.

07





## THE RESULTS

An assembly that's proven to last more than 30% longer

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## STATISTICS

0.001% failure rate

30% + longer life

100% OEM compatible

PROVEN  
TO LAST  
AT LEAST  
**30%**  
LONGER

When L&H designed, engineered, and manufactured the first L&H Omega undercarriage, our goal was to provide our customers with an assembly that would dramatically decrease downtime and total cost of ownership. Now with undercarriages running across the globe, L&H has proven that the current L&H Omega system lasts at least 30% longer than conventional models.

"L&H's undercarriage system absolutely outperforms all other market offerings and has surpassed industry benchmarks. There is no comparison to the Omega systems reliability and life expectancy."

JEFF SCHILLER, CNRL, TECHNICAL SUPERVISOR SHOVELS

L&H Omega Undercarriage

**36,162 HOURS**

OEM Undercarriage

**23,396 HOURS**

**35% Longer**

In a head-to-head test in a coal mine in Wyoming's Powder River Basin, L&H's 4100A outperformed an OEM undercarriage by 12,766 hours.

That's equal to **1.5 years** or **531 days**