



Autoloader // Haultec

Rebecca Daum November 2014 - December 2014



Design 1.365 meter below ground

LKAB invited us to visit their mine in Kiruna - the world's largest underground iron ore mine. For more information about our research trip check out the video on vimeo.



https://vimeo.com/112481735





a Kiruna

Umeå









Analyzing and structuring material from field trip

_Knowledge about _LKAB strategy _Atlas Copco strategy



of all material

How could we eliminate the haul and return time?



The shorter that cycle is, the lower the cost per ton gets. There is a lot of potential in reducing the haul and return times to increase the efficency.

Load-Haul-Dumping



Separating the loading from hauling and dumping

Autoloader_Haultec | Concept



loading:

i **32 t** (4 m³) **♦** 4 min 00 sec cycle time: 0 min 15 sec hauling, dumping, returning: 3 min 45 sec

8 t / min



21,3 t / min

Increasing efficiency and flexibility by dividing the workload

Friday Barrow Str

S. S. M. S. M. S. S. S.

調査主

89



Collective Cognitive Haul-Dump Wagons







Concept Technical Package



LEGO[®] Mock-Ups



Sketching + Photoshop rendering



CAD modelling







Image: Section Section

Image: Section

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Autoloader // Haultec

A flexible, efficient and economic system for underground mining.





Autoloader_Haultec | Components



Sandvik LH 621 Atlas Copco Scooptram ST-2G Autoloader Haultec

> Compare the size of the Autoloader and the Haultec wagon to regular LDHs.,

the drift and unwinds the cable, the rail will keep the cable in a certain distance to the loader. The cable will be placed on the tunnels edges and is protected.





To shrink the vehicle, the boom arm slides on the rail to the back of the loader, and the front conveyor belt slides on top of the second one. The loader is decreasing to a minimum length to have a low turning radius. For the narrow tunnels that is a crucial factor.







filler and sanding $_$ Filler and sanding

defining form by hand Manual production of all foam parts (lathing, cutting, sanding)

laser cutting_ Producing all laser cut parts from either MDF boards or plexiglass



assembling Putting the parts together,

adding logos and graphics

finalizing parts_

Preparations for painting⁺ After the painting with the paint spray gun⁺ some parts needet manual correction

paint preparations

(mounting parts on sticks, mixing paing)







