

Dozer Blade Lift Cylinder Light Bracket Modification

BMA – Goonyella Riverside Mine

The Problem

The problem was a high risk task within the mobile maintenance area, repairing dozer lights, which is undertaken on a regular basis. Repairing lights on dozers has historically been the most frequent breakdown downtime event in the mobile equipment area. The breakdown generally occurs in the field and in this environment there is no safe method for accessing the lights. Goonyella Riverside has more than 30 machines with these lights in the fleet of D11, D10 and D9 dozers.

This task requires a person to work at heights. Previous attempts have been made to eliminate or reduce the associated risk by mounting handrails in the area and adding anchor points however these introduced other risks.

Prior to the implementation of this innovation there were two options for repairing the dozer lights:

1. Using the float to transport the dozer to the workshop so that the repair could be undertaken in a controlled environment with access to equipment such as a snorkel lift. This method took a significant amount of time due to the availability of the float and in this waiting period the dozer is stood down as the lights are critical for safe operation;
2. The quickest but unsafe method of climbing on to the bonnet of the dozer in the field to repair the lights with no protection from falling. The repair is usually a short duration job and completing this task allows the machine to go back to work.

In the past, undertaking this task unsafely has had serious consequences. In 2004 there was an incident at Goonyella Riverside where a fitter fell off the bonnet of a rubber tyre dozer and resulted in both of his ankles being broken. There was also a fatality in Queensland in December 1992 when a fitter fell from the front of a D11N dozer.

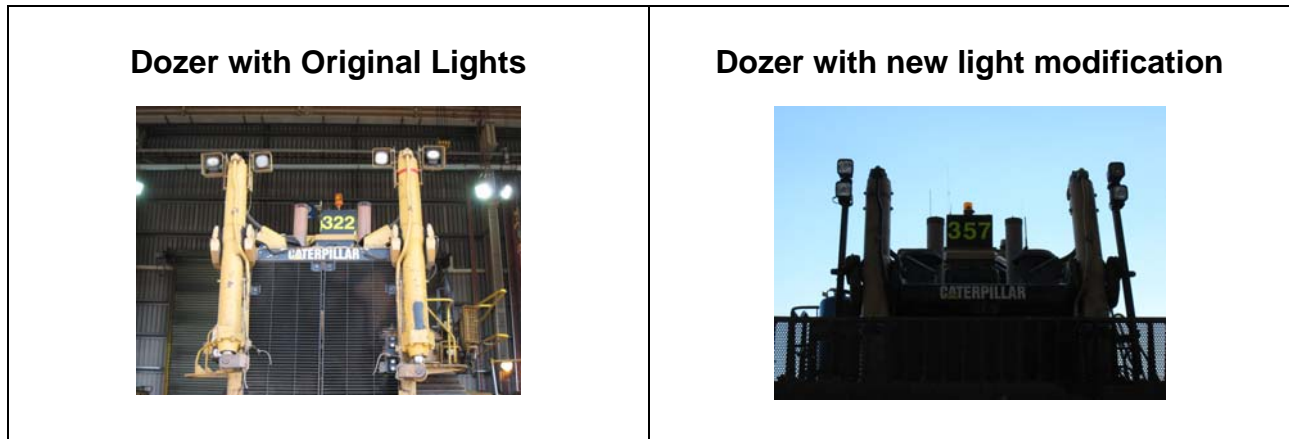
The Solution

The solution to reducing the high risk level for the above task to a low risk task was the development of a new innovation – the Dozer Blade Lift Cylinder Light Bracket Modification.

Fold down light brackets were designed which can be accessed from the dozer track. This eliminates the need to work at heights and brings the repair work down to a safe work environment. A handrail system has also been fabricated to be placed on the

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tracks to eliminate falling from this lower height and reduce the risk even further. The frame is made of aluminium so is light and easy to lift into place when required.



Once the machine is isolated, the retainer bolt located on the bottom of the saddle clamp is removed and the lowering rope is released from its locator.



The light bracket is then lowered using the rope until it comes to rest on the step handrail allowing for maintenance work to be undertaken.



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Once the lights are repaired, the light bracket is raised by the rope, the retainer bolt refitted and the lowering rope placed back in the locator.



A seven month trial was held onsite to ensure that the new light bracket construction can withstand operating conditions prior to full site release. The trial has now been completed and the new lights are in the process of being fitted to the entire tracked dozer fleet.

Benefits/Effects

The Dozer Blade Lift Cylinder Light Bracket Modification innovation has met and exceeded our initial expectations. This innovation has reduced the previously high risk task of repairing dozer lights in the field to a low risk task.

By re-designing the light bracket and allowing easier access, maintenance can now be performed under the 1.8 meter working at heights threshold imposed at Goonyella Riverside mine thus greatly reducing the risk associated with falls from height. On average, there will be 2-3 repairs required to dozer lights each night shift so the realisation of this benefit is huge.

Dozer operators also experience a benefit from the repositioned bracket, enabling better vision through the front windscreen which was previously hindered by the lights mounted on the inside of the lift cylinder. The innovation has also resulted in less equipment downtime due to faster repairs.

As part of this project different types of bulbs were trialed to extend bulb life and reduce the number of repairs required. This trial has resulted in a higher quality of bulb being specified for the dozers and has reduced the number of repairs required.

Transferability Across Industry

Due to the diverse use of dozers across varying heavy machinery industries, the potential to implement this innovation across different disciplines is limitless.

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The lighting design has been documented with engineering drawings which can be supplied to any fabrication shop to be replicated. These drawings are currently being made available within the BMA network of mines.

Investigation is currently underway to modify the light bracket design to suit the wheeled dozers onsite and in the wider mining community.

Innovation

The Dozer Blade Lift Cylinder Light Bracket Modification was designed and constructed by site employees and is an original.

Goonyella Riverside Maintenance employees, Kevin Dalton (Preventative Maintenance Co-ordinator) and Dennis O'Flanagan (Senior Planner), were involved in identifying the original hazard and are responsible for the modification design. Brendan Buckton (Boilermaker) and Kevin Dalton manufactured and fitted the light bracket prototype. The reason for undertaking the project was to reduce an identified high risk task which has previously resulted in serious incidents. The solution would also have the added benefits of reducing equipment downtime and maintenance resource needs for this task.

The innovation was developed through brainstorming and trial and error. A fold down light used on conveyors in the processing plant sparked the initial idea for this innovation.