

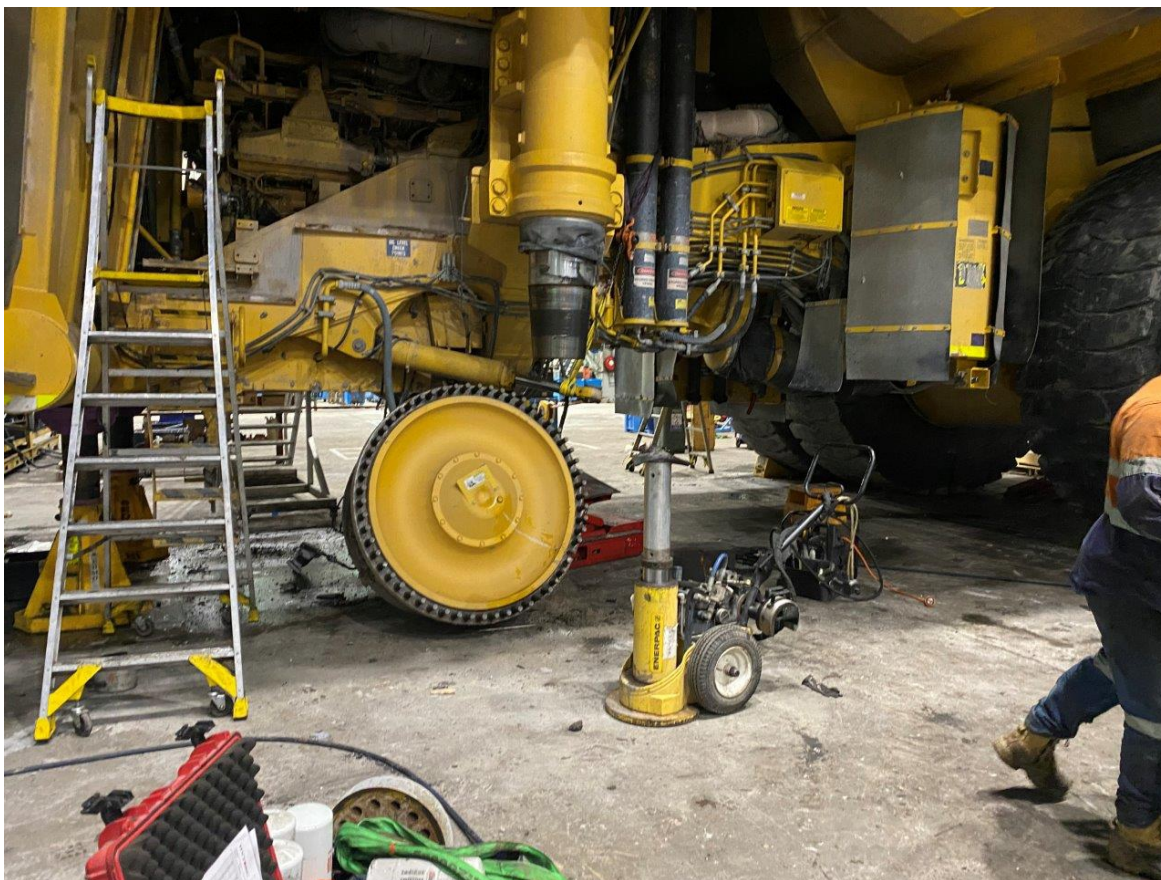
Safety Bulletin

Date: October 2023

Haul truck front strut removal poses risks to workers

This safety bulletin provides safety advice for the NSW mining industry.

Figure 1: The 4.8 tonne front wheel hub of the Komatsu 930E haul truck after falling off a jack stand



Issue

There have been 4 significant incidents with the high potential to cause serious injury or death in relation to removing and/or dismantling in situ haul truck front suspension struts over the past 20 months. Three of these incidents have occurred in the past 6 months.

All of these incidents were captured on workshop video footage. All of the incidents showed workers in close proximity to heavy components, and actual contact with workers during one incident, although none resulted in serious injury.

The most recent incident on 18 September 2023, had the potential for much worse outcomes, and has prompted the Resources Regulator to highlight this known hazard.

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Circumstances

Incident 1 – 21 January 2022

Three workers were removing the front wheel hub from a Komatsu 930E dump truck. The wheel hub fell to the ground after the tapered connection between the wheel hub and spindle was released. The hub, weighing about 4.8 tonnes, fell from the single jack that was set up to support it. The workers narrowly avoided injury from the falling hub.

Figure 2: Komatsu 930E haul truck front wheel hub falling off jack stand glances worker

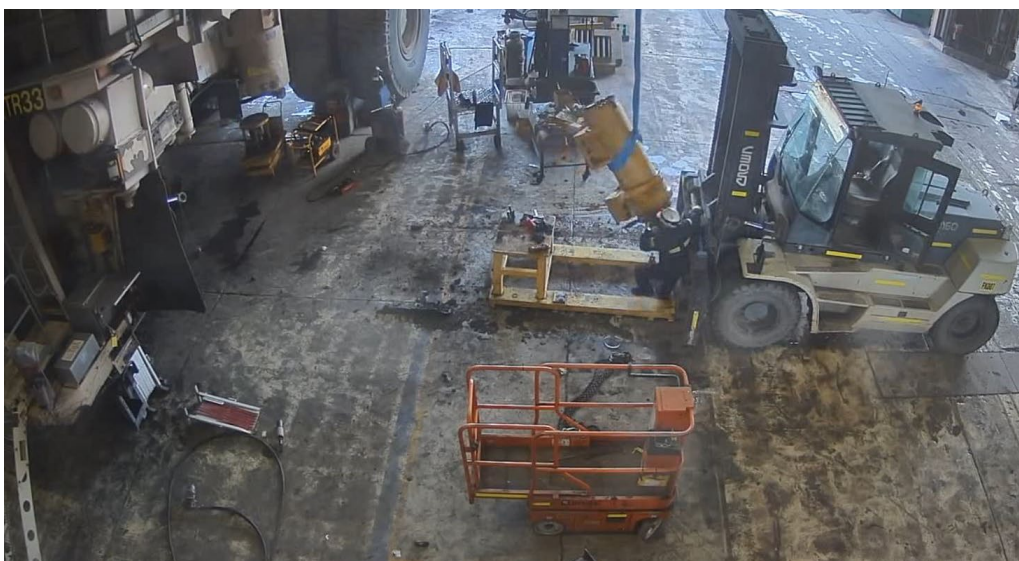


Incident 2 – 26 March 2023

A haul truck was in a workshop for maintenance and the position 1 suspension strut was being replaced. The strut was removed using a custom forklift jig. A worker connected the strut on the jig to the overhead crane with a sling.

The worker began undoing the bolts holding the strut to the jig, however the strut moved, so the worker applied more load with the overhead crane. When the last bolt was undone, the strut started to swing and pushed the worker against the mast of the forklift as he tried to move away from the strut. The worker was not injured.

Figure 3: Front strut suspended from overhead crane hits worker

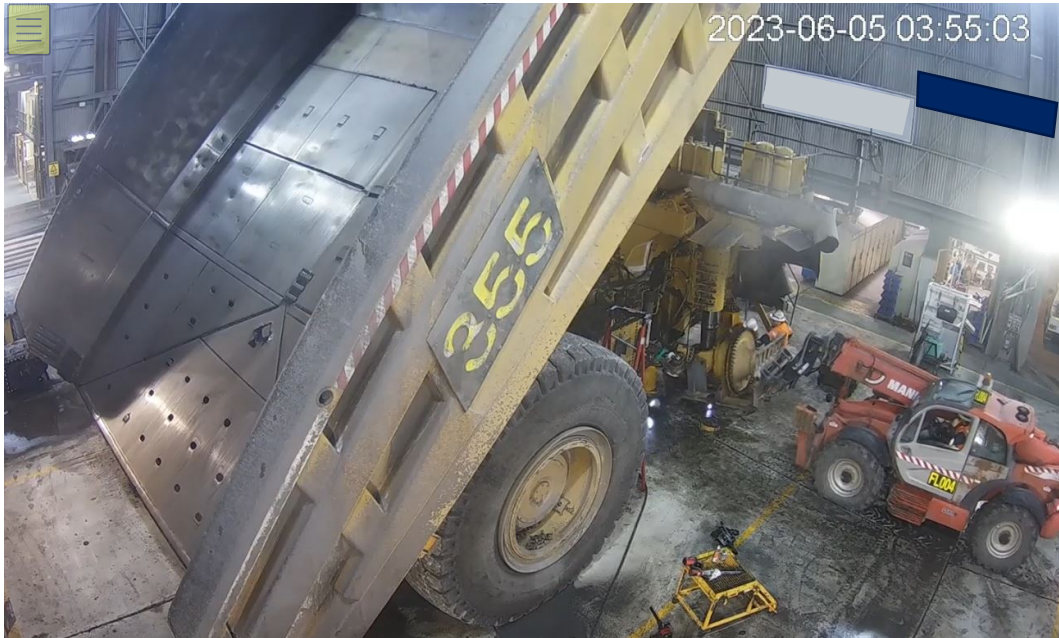


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Incident 3 – 5 June 2023

Workers were changing out a front wheel hub assembly on a Caterpillar 789 haul truck in a workshop. While removing the wheel hub from the taper, the assembly unexpectedly moved. The assembly was fixed to a frame that was sitting on the tynes of a telehandler. The tynes dropped when the load moved. A worker in close proximity was hit in the face. The worker suffered minor grazing.

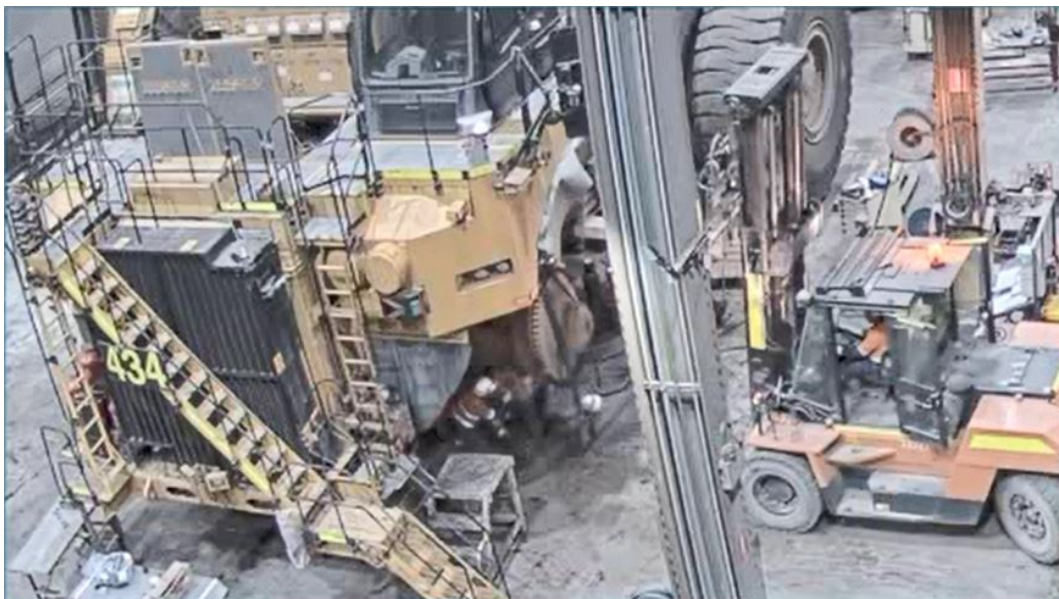
Figure 4: Front strut supported by telehandler hits worker



Incident 4 – 18 September 2023

Workers were disassembling a Caterpillar 795F haul truck front strut in situ using a forklift to support the wheel hub assembly. A worker was below the wheel hub was removing strut bolts with a rattle gun. The wheel hub released from the strut taper, making contact with the worker, knocking them to the ground. The worker was not injured.

Figure 5: Caterpillar 795F front wheel hub assembly supported by forklift during dismantling hits worker



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Investigation

In all of the incidents, workers were in close proximity to the supported load, and contact was made with at least one worker by the moving component.

Contributing factors included:

- the lack of understanding of the mass and balance of the supported component
- the lack of understanding of the magnitude of stored energy in the suspension strut
- the failure to use original equipment manufacturer (OEM)-designed or supplied jigs
- poor suspension or support practices relating to the component's
 - single point of support
 - crane not positioned directly over the load
 - outriggers not used to brace telehandler
 - strut dynamic energy greater than fork / telehandler applied restraining force
- workers placing themselves below supported or suspended loads
- OEM and/or mine maintenance and safe work procedures did not cover the complete scope of work for the job, including the:
 - removal of the hub and suspension strut from the haul truck
 - removal of suspension strut from support jig
 - disassembly and reassembly of the suspension strut
 - reinstallation
- Job hazard analysis for the work lacked detail, and failed to identify high risk steps and/or associated controls.

Recommendations

Maintenance personnel at mines and coal handling facilities should:

- identify the full scope of work for the job
- review the suitability of existing safe work procedures for all, or part, of the job
- assess the risks associated with any portion of the work not covered by safe work procedures, including the work integration with the existing procedures
- identify suitable controls and verifications required to mitigate risks to as low as reasonably practical
- ensure all tools, jigs, lifting equipment, and mobile plant are fit- for-purpose
- ensure all workers are trained and competent in the work to be performed
- assess maintenance work practices, especially in relation to worker positioning around suspended or supported loads, for tasks relating to hubs, spindles, and strut replacement on haul trucks
- ensure adequate supervision of complex tasks and lifts, especially with respect to the position of personnel in proximity to suspended or supported loads.

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