

Incident involving the transport of dump trucks 50 tonnes and over

WHAT HAPPENED

An inoperable 100 Tonne Dump Truck (DT) was collected from the quarry, loaded onto a beam trailer by pushing with an excavator, driven by a Fitter. This was chained to the trailer and taken out of the quarry onto a level access road where the height could be accurately measured.

The loaded DT proved too high to be carried on the road. To lower the load the DT suspension needed to be put under load and then chained into the compressed position, which has the effect of lowering the overall height of the DT.

The DT was lowered to the ground and the weight of the machine compressed the rear suspension, which was then held in the compressed state with chains. The process was similar for the front wheels, however because of the clearance these were "blocked" (supported off the ground) using solid forklift tyres. The front wheels were chained with the suspension compressed. However the near side front had not fully compressed, by approximately 3"- 4" (76mm – 100mm) and, once the trailer was raised to travelling height, the load was still over the acceptable travel height by a small margin.

The solution was to allow a little of the gas out of the suspension strut to permit it to fully compress.

Our drivers did not have the tools for this, so asked to borrow a spanner from the IP, who happened to be passing. He preferred to carry out the work himself and the front wheels were again blocked. The IP went out of sight of our drivers, behind the near side front wheel, and was heard releasing gas.

Following the release of gas the IP was heard manipulating the chain. (It is assumed he was increasing the tension now the suspension was fully compressed, but this has not been confirmed, as we have not had sight of the full accident report.)

During this time the wheel, behind which the IP was working, began to turn, slowly at first then more quickly, with the rear of the wheel turning into the space occupied by the IP. Another person in attendance shouted a warning and then grabbed the IP's overall collar using this to pull him from the diminishing space.

This person had the impression that this warning had come in time for the IP to crouch down, avoiding the apex of the tyre. The IP suffered a crush injury and was air lifted to hospital. We were informed he had a broken collar bone, but on the following morning there were reports of other injuries.

Investigation Findings

On assessing the site, it appears that the wheels had turned from parallel to the vehicle sides to their final resting position, by the offside rolling forward off the block on which it was elevated; and the near side rolling backwards.

What is not clear, is what caused this movement, from what had been a stable position for some time; to slow initial movement and then quicker in its final moments. The fact that the nearside tyre was not inflated to the same level as the off side one and the vehicle had not run for some time may have been contributing factors.

The procedure operated is similar to those of other hauliers.

A Method Statement was drafted, detailing how the situation was to be resolved, which included the use of an excavator bucket to return the wheels to parallel to the DT's sides.

This took some considerable force even though the DT had been elevated so the wheels were free of any restriction. Ultimately the bucket would remain in place while the chains were tensioned, to prevent any repetition of the incident, but before that, it was investigated to see if the event could be replicated, by carrying out various tests:

- The circumstances of the original blocking procedure were repeated, using solid forklift tyres. A small amount of movement was observed with the wheels travelling in the same direction as the original event, as the DT was lowered, but this stopped as the DT was lowered further and pressure between the DT and the tyres increased.
- A second test as carried out with the block being a single width of railway sleeper (two sleepers high), which were around 4 foot long, so much longer than the DT's tyres contact point. This time the wheel moved slightly in the opposite direction and again stopped as the DT was lowered to rest.
- A third test was carried out using two sets of railway sleepers side by side (two by two), which covered the full width of the tyre. There was no pivot movement on this occasion, however, as the pressure increased the gap between the parallel sleepers increased as they were squashed outwards and the test was halted as being unsatisfactory.

Although not conclusive, it was felt that the extra length of the railway sleeper would offer some additional protection and this method was used, with the excavator bucket braced against the wheel to prevent any pivot movement, when carrying out the final tightening process to this DT.

Personnel involved in the process had been trained in loading and unloading of machinery and the procedure followed was correct.

- The fact that the wheel moved while on the single sleeper, suggests this is not the ultimate solution as without the excavator bucket in place, the forces involved could move the sleeper
- What was required is something that physically stopped the wheels from pivoting.



LEARNING POINTS / ACTIONS TAKEN

Offered Solutions

This DT was collected on a beam trailer, without the mattress boards on either side being installed, which gave the space for the wheel to pivot.

By installing these mattress boards, the width across the trailer is increased, limiting the space for movement of the wheel if this were to pivot. The use of low loader trailers would have a similar limiting effect, protecting anyone working in the wheel arches from being trapped.

It is recommended that you review your own safe systems of work for the Loading and Unloading of all plant and always ask the question 'what if'

If you require further information we can liaise with the companies concerned directly for further clarification.

Please share this alert with all persons both in house and externally.



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