



Rear hub failure and subsequent fire

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Mine type

All surface mines

Incident

The rear hub of a dual set of wheels on a rear dump truck cracked around the circumference and parted. The inner wheel ruptured the oil brake cooling line; the leaking oil pumped onto a hot surface and ignited, the resulting fire spread under the truck. When fire fighters could no longer control the blaze, the truck was isolated and allowed to burn. Explosions were heard as the tyres were destroyed. After 48 hours the vehicle was approached and the smouldering tyres extinguished; the truck was completely gutted.

Equipment

Caterpillar 789 rear dump truck.

Hazard

Metal fatigue causing fire.

Cause

It appears the hubs failed under tensile load, initiated from a fatigue crack.

Comments and recommendations

- Cracked wheel hubs have occurred previously but no adverse consequences have been realised.
- Later, a small fire was noticed on another truck, a rear hub was found cracked and parted.
- All 789's on site were inspected and a significant crack was found on a third rear hub.
- In this instance, the front left hand tyre of the truck exploded; the hub was ejected from the truck and came to rest in the adjacent pit.
- Also in this instance, the front right tyre of the truck exploded, the blast forced the decking, above the tyre up to the headboard of the tray.
- Hubs are usually replaced after 50,000 hours of life, they are then inspected using NDT crack detection and refurbished for a further 50,000 hours life. The user counts the component hours from the last rebuild.
- The failed hubs are the A and B series; the later series to these have not experienced the same failure mode.



Hastings Deering will be issuing an information bulletin for the use and maintenance of the hubs in question; the following may be contained within those published guidelines.

- Replace rear hubs before reaching 60,000 hours.
- Visually inspect hubs each time a wheel is replaced.
- Periodically inspect the early series hubs for signs of cracking, possibly 12 monthly or more frequently if the vehicle is used in arduous conditions.
- Continue with good management practices.
 - Match tyre wear on dual sets
 - Control the haul road, in-pit and dump floor conditions
 - Reduce speed on cornering when loaded
 - Use good loading practices, do not shock load
 - Do not use the dump edge berm as a brake
- Review the mine fire management procedure for rubber tyred vehicles, specifically isolation of burning tyres and removal of all persons from a possible blast zone.

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