



Strapping in for smoother ride

By Nathan Deans*

Have you ever wondered what it might be like to drive a truck through a tunnel in an earthquake?

Well neither have I really, but it was one of the first images I could conjure up in my mind when I was shown some camera footage that was taken by one of my colleagues after a visit to an underground mine in Western Australia.

In an industry that goes to great lengths to sure up internal tunnel and header surfaces (with support structures and spray mix concrete being liberally applied to prevent collapse and rock fall) there is something of a paradoxical lack of energy, effort or expense when it comes to the actual transport or road surface.

With the exceptions of extremely high traffic areas such as entrance tunnels, workshops, crib areas, magazines (explosives storage) and the like, the road surface will most likely remain rough and un-manicured.

On occasion, if appropriate equipment is available, graders will be used to prepare these road surfaces.

Consistently driving down these rough roads is regularly linked to low back injuries from the constant jarring and compression forces experienced by the occupants of a vehicle as they are quite literally thrown around the cabin.

In a passenger or transport vehicle, this type of issue can be addressed in many ways through tinkering with suspension and shock absorbers, tyre compressions and so on.

However, in a specialised service vehicle such as an Agi truck, this is simply not an option.

According to Peter Hallman of Jetcrete Australia, the weight distribution parameters of a typical Agi vehicle are as follows: Unloaded Weight – 14.9 tonnes; loaded weight – 10-12t, rear axle distribution – 19.4t, and; front axle distribution – 6.8t.

So now imagine driving a 25t Agi truck through a tunnel in an earthquake.

Essentially, with this type of vehicle, the only way to properly address the issue of rough riding is to strap the driver firmly into his/her seat and let the seat do the majority of the shock absorption as opposed to the spine.

Specialised mechanical and hydraulic seating systems attempt to do just that. However, the driver needs to be firmly secured in the seat harness for this to work effectively.

An additional complication to this is the often bulky (and always mandatory) personal protective equipment (PPE), which typically includes a cap light battery pack and a self rescuer to be worn on the mining belt at all times.

Case study

At the Cosmos mine site in WA, Body Active Consultancy assisted the Jetcrete workforce in seeking improved cabin seating mechanisms for their Agi trucks as well as trialling a number of different heavy duty mining belts to see if it could find an equipment-based solution to the incidences of lower back injuries being reported by drivers.

In the end, two items were highlighted that could potentially alleviate this issue. The mechanism at the base of the seats was identified as requiring changing from the weight setting type to an air compression type.

It was refitted to all seats with the T back to allow the cap light battery pack and the self rescuer to sit more comfortably on the operator and not push into his/her low back area.

During the trial of these modifications which followed, it was found that the changes allowed for a far more secure fastening of the driver to the seat without the interference



A typical unfinished underground road surface.

associated with the bulky PPE carried on an underground miner's belt.

After extensive consideration of the trial results, Jetcrete Australia decided to implement both of these modifications to the seating in the Agi trucks Australia-wide.

**Deans is in charge of BAC's research and design arm.*

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