

Trailer brake interlock safety systems

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Priority: Urgent Necessary For Information

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Circulate: Driver Operator Workshop Parts Fleet Manager

The incident or issue:

ATA Industry Technical Council (ITC) members involved in the transport of dangerous goods, have been advised that some brake interlock systems designed to prevent the vehicle moving during loading/unloading may have the potential to apply the emergency brakes when the vehicle is moving at speed. The emergency brake circuit of a commercial vehicle does not include any ABS or other control system functionality, which could result in wheel locking, creating a dangerous situation. This problem may arise if an element in the interlock system comes loose or fails when the vehicle is in motion.

These systems are mandated in the dangerous goods tanker segment, but are now becoming more common across a range of industries.

Australian Standard 2809.1 *Road tank vehicles for dangerous goods Part 1: General requirements for all road tank vehicles* requires drive away protection ie “the trailer is immobilised whenever it is being loaded and unloaded.” In addition, this standard requires that the system cannot operate whilst the vehicle is being normally driven.

ADR35 truck and ADR38 trailer braking requires auxiliary equipment to have a separate air system to the brake system, with preferential supply to the braking system while the brake system air pressure is below 450 kPa.

As a result, if the trailer air system is fully depleted the interlock system may not prevent a drive-away as the brake system is preferentially charged. The parking brakes will likely fully release before the “protecting circuit” is charged, and the trailer air system cannot be charged unless the towing vehicle park brake is released to “charge” the trailers. If the trailer was voided of air when the “interlock” was engaged – the interlock would be ineffective whilst the trailer system was being charged.

Incident cause:

Wheels can lock up uncontrollably if the vehicle’s interlock system accidentally becomes active when moving at speed and the system’s design allows the application of emergency brakes. This is neither approved nor allowed under *Australian Standard 2809.1 - Road tank vehicles for dangerous goods - General requirements for all road tank vehicles* and is widely accepted not to be best practice.

Potentially and more commonly, a break or interruption to the auxiliary circuit could be caused by road debris and/or animal strike. This may also bring on the uncontrolled emergency brakes, which is unavoidable no matter the system under this situation.

Solution:

The use of a No Air In Motion (NAIM) interlock system will prevent vehicles moving while the interlock is active loading/unloading, but not result in interlock activation when already moving.

Follow-up actions:

- Discuss with your trailer supplier to clarify the style of interlock system fitted or required.
- Check the system does not operate at any speed while in a safe and controlled situation.
- Review interlocked system when based on a TEBS system. This style of system interlock may not operate until the vehicle's speed is above 8 km/h. Therefore, if the system intervention was applied below this speed the system could apply the emergency brakes. It is similar to ABS functionality which do not typically operate or cycle below 15 km/h.

Common interlock system terminology and function

Pneumatic/mechanical systems

Drive away protection

The Dangerous Goods Code and Australian Standard 2809 states that a brake interlock must be applied when transferring product and that just to apply the park brake is not adequate. The system is active and vents the trailer supply line, preventing the releasing of the park/emergency brakes when the interlocks are active.

Roll away protection

In addition to the above, if the drive away protection is active when the driver gets into the cab and releases the park brake, the vehicle cannot drive or roll away because the drive away interlock is still active, providing a signal to prevent the trailer air supply being charged. If the driver then exits the cab without applying the park brake and closes the interlock, the brakes will stay applied as a result of the latching valve in the system. The driver must re-apply the park brake to reset the inter-lock and then release the park/emergency brake to drive away.

Note: Both drive away protection and roll away protection can be activated at any speed and will de-activate when the interlocked item is correctly located again.

No Air In Motion (NAIM)

In addition to both drive away and roll away protection systems above, NAIM typically removes the air off ALL of the interlocks fitted – such as gates, hose reels and hand rails. In the event that a gate opens while the vehicle does not have the park brake applied, there is no air available to pilot the inversion valve and apply the brakes. If the gate did bounce open, a brake interlock system would only activate the next time that the park brake was applied and apply the park/emergency brakes. A prominently positioned label should be include to identify that this system is different to both roll and drive away protection systems.

Note: the ADR does state that the required brake interlock must NOT be able to activate while the vehicle is being normally driven.

Confirming correct system operation of NAIM:

1. Ask the driver to engage the trailer park brake – observe movement in slack adjusters and noise of air venting as the park brake is engaged.
2. Activate an interlock – lift or open an interlock controlled item.
3. Ask the driver to (start truck if stopped) disengage park brakes – you should hear air release from the prime mover but not from the trailer.
4. Try to drive off – trailer brakes should be locked.
5. De-active the interlock. If the vehicle has a NAIM system, it will need to reset by re-activating the park brake before the truck can move off again.

Electrical interlock via Trailer Electronic Brake System (TEBS)

Alternatively, the TEBS system can be configured electronically to control the interlock function. However, a TEBS based interlock only functions when the vehicle's speed is above 8 km/h and power must be supplied. It is easy to circumvent this system and as a result it is not recommended.