



Why electronic brake control and safety chains should be mandatory on new dog trailers

distribution of the braking effort between axles and avoid wheel lock-up. New dog trailers should have an Electronic Braking System.

For new PBS vehicles, the PBS standard Directional Control Under Braking should be revised by the National Transport Commission to replace the current 'deemed-to-comply technologies', namely ABS or Load-Sensing Valves, with EBS only. There are additional safety and operational benefits with trailer EBS that make the case even stronger. EBS can be programmed to prevent tipping when the dog trailer is not on suitably level ground. EBS can also

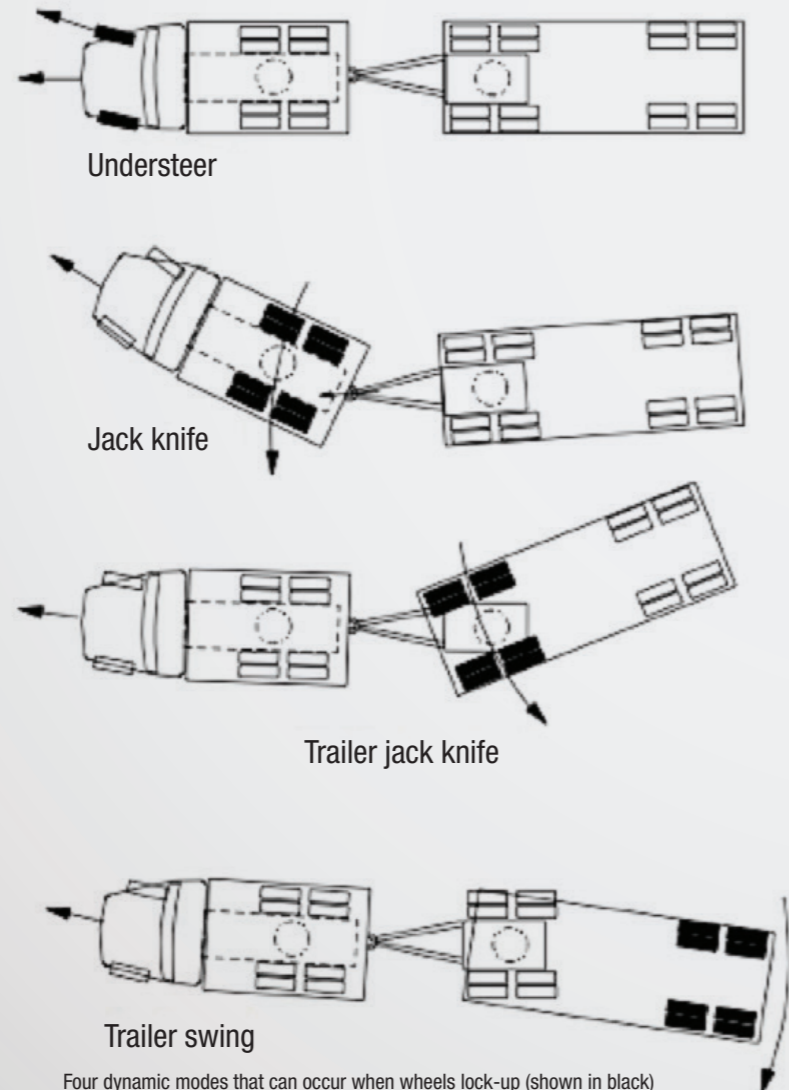
be programmed to 'tune' the low pressure braking levels and improve the wear balance between truck and trailer.

Electronic brake distribution is also desirable on the truck, but less readily available than on trailers. As a minimum, the truck should have an Antilock Brake System (ABS) to protect against drive-group wheel lock-up. Dog trailers typically have either a towing eye or a large ball coupling installed at the front of the A-frame drawbar. The tow coupling is a single point of failure unless an additional safety device is installed. Whilst tow couplings that have been correctly specified and certified are highly reliable devices, there

Dog trailers have always been the trailers of choice for local delivery of dry, bulk materials, such as sand, soil etc. They are also used for bulk liquid delivery. There has been significant growth in longer and heavier dog trailer numbers as a direct result of the Performance Based Standards (PBS) scheme, which has 'unlocked' four, five and six-axle dog trailer designs.

It is time to consider the basic safety features of dog trailers because of the significant increase in ratings that have occurred and because of the particular road-safety challenges that they present.

The ratio of legal-laden to unladen weight of a four-axle dog trailer is more than 3:1. Five and six-axle dog trailers have a higher ratio than this. The truck that pulls it will typically have this ratio as 2:1. The brake systems on both vehicles are sized for the maximum load. When vehicles are lightly laden, the dog trailer is over-braked compared to the truck because the brake force per tonne is much greater for the dog trailer than the truck. The risk is that the wheels on the dog trailer will lock-up easily and the trailer may swing sideways during heavy braking. There is also the problem that the front axle of the dolly tends to dip during heavy braking and the rear axle of the dolly lifts and its wheels lock up. The solution to the brake-balance challenge is to install an Electronic Brake System (EBS) on the dog trailer, which reduces the brake level in proportion to load (as indicated by the air bag pressure). It also manages the braking event to achieve acceptable



Four dynamic modes that can occur when wheels lock-up (shown in black)

remains a risk of failure, whether due to mechanical defect or human error. There are five evident failure modes:

1. The demountable towing eye loosens and pulls out.
2. The weld-in towing eye is poorly welded and comes off.
3. The drawbar breaks. Mechanical damage due to articulation clashes or tipping gate clashes can be a factor in damaging the drawbar.
4. The coupling on the towing vehicle breaks.
5. The towbar on the towing vehicle breaks.

Safety chains could be effective for modes 1, 2, 4 and may be effective in some cases for modes 3 and 5. It is safer for all road users – and particularly for the heavy-vehicle driver – if vehicles in combination stay together. Compliant safety chains are designed to provide a strong secondary connection during emergencies. In 2001, I was present at a presentation where an expert made the case to an industry and government reference group for mandating safety chains on all drawbar trailers, not just pig trailers as is required by ADR 62, but the advocacy was unsuccessful. There was a prior investigation (1995) commissioned by government into the case for mandating safety chains on new dog trailers that identified many drawbar separation incidents. The recommendation

was that mandated safety chains on new dog trailers could not be justified on a cost-benefit basis. It is time to revisit this issue, taking account of better crash statistics, modern vehicle weights and modern thinking about road-safety risks. Australian Design Rule 62 requires that safety chains be installed on new rigid drawbar trailers (such as centre-axle or pig trailers) but not on hinged-drawbar trailers (including dog trailers). The reason for the difference is that should a pig trailer separate from the truck, safety brakes may not reliably operate because the pig trailer tips forward, whereas a hinged-drawbar trailer would remain level. Incidentally, ADR 62 requires that trucks that have a towbar (necessary for a drawbar trailer) must have safety-chain attachments irrespective of application. This requirement has been generally ignored, so that retrofitting safety chains onto most dog trailers would be ineffective because the truck does not have the attachment points. The decision to not mandate safety chains on new hinged-drawbar trailers in the design rule ADR 62 was wrong. The level of road trauma due to trailer separations is not accurately known and so an informed Regulation Impact Statement cannot be written. The policy of harmonising the Australian rules with the international rules (UN ECE) is another major consideration because UN ECE Regulation 55 does not

require safety chains on hinged drawbar trailers. However, basic risk mitigation considerations would lead us to safety chains.

The National Heavy Vehicle Regulator is about to establish a government-industry working group to review coupling safety and maintenance requirements. ARTSA welcomes this and will contribute to it. We hope that recommendations to Ministers might eventually come from this process.

Our industry needs to provide guidance to Ministers so that they can provide the leadership that the community expects. We made a mistake long ago by not mandating safety chains on dog trailers. We should now correct that mistake for hinged-drawbar dog trailers.

In the short-term, vehicle operators with drawbar trailers should scrutinise:

- tightness of nuts (looking for movements) on detachable towing eyes and couplings;
- quality of welds (looking for cracks) on weld-in towing eyes;
- check the condition of drawbars (looking for cracks, breaks and dents in structural members).
- Look for signs of wear on couplings, including checking manufacturer's wear specifications.

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An ADR-compliant 19mm safety chain attachment system fitted to towbar and trailer. Compliant safety chain attachments are currently required on all towbars, but chains and attachments are not mandatory for hinged drawbar dog trailers.