

Why we need a brake code of practice



electronic controls to heavy trucks. Smart trucks can now have stability controls, automatic emergency braking, lane assistant, cruise control management etc. But does smart gear always improve things? Maybe.

Europe has mandated Electronic Stability Control (or Electronic Stability Program) on trucks and trailers starting progressively about now. It seems that North America and Japan will follow this lead. Under current plans, ESC will be mandated on new trucks and trailers in Australia by mid 2015, although this is not confirmed.

So what does ESC do for trucks? It applies brakes on selected wheels to correct the vehicle trajectory. Figure 1 demonstrates how an ESC might respond. The system knows where the driver intended to go because it senses the steering wheel position and the brake and throttle pedals. ESC will also apply the trailer

brakes; and that's where the problems may occur. Of course, ESC always comes with an antilock braking function. On European trucks, ESC is built on top of an Electronic Braking System EBS. On American, Australian and some Japanese trucks, ESC is built onto an ABS system. But it makes no sense to rely on ESC during an emergency manoeuvre if the trailer might lose it due to a missing trailer braking system. Therefore, all of Australia's major truck supply countries mandated ABS on trailers many years ago. In fact, most trailers in Europe also have trailer EBS. The ESC designers assumed that trailers would be reasonably well behaved if the ESC system was to give the trailer a bolt of air pressure. So an ESC truck should pull a trailer that, at least, has ABS and hopefully EBS. Today, very few Australian trailers have antilock brakes, and even fewer have

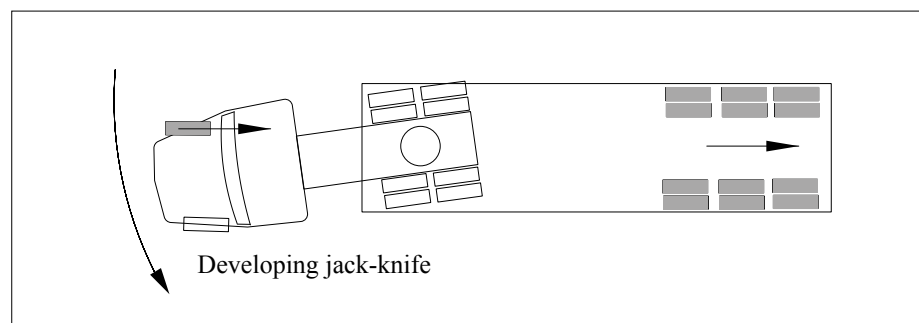
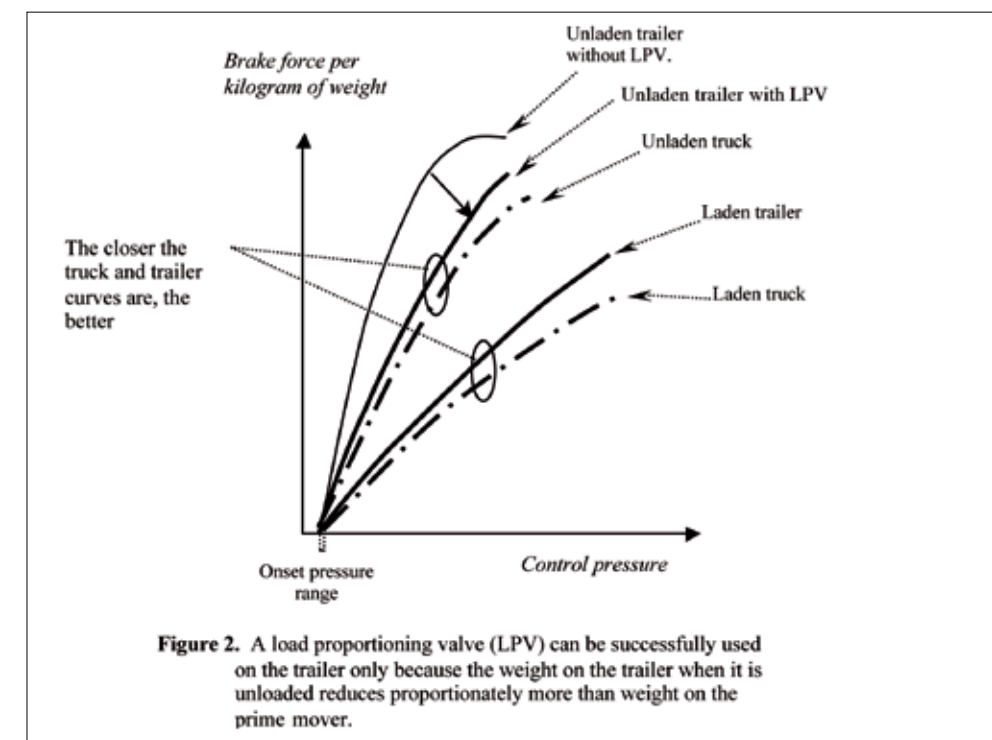


Figure 1

load-sensing brakes or EBS. If the trailer is braked hard by an ESC system, it could lock-up and go sideways. This illustrates why Australia needs a Brake Code of Practice for Combinations and why ARTSA (Australian Road Transport Suppliers Association) has developed one. Truck operators and drivers deserve to be told about good practice when new technologies are introduced.

The mixing of different brake control technologies on trucks and trailers can usually be realised successfully, but some mixtures should be avoided. For example, using a load-proportioning brake valve (LPV) on a truck and not on its trailer is not good practice. The truck LPV reduces the brake power on the truck drive-axle group when it is lightly loaded, but the trailer brake power is unchanged. The brake balance is poorer because it is the trailer that mainly needs to have its brake power reduced. Figure 2 illustrates why. So why can't Australian Design Rules solve this problem? Well, the ADRs (35 for trucks and 38 for trailers) don't impose stringent compatibility requirements on lightly loaded vehicles. The rules were developed when the technology to change the brake level as the load is taken off was not very good. Now it is.

Now the good news: Trailer EBS incorporating roll-stability is readily available and well priced, because there are multiple suppliers. Yet trailer EBS needs to be set-up properly for the actual truck and trailer combination. If it is, the driver will notice a significant improvement in the brake feel and road handling during heavy braking, irrespective of what brake system is on the truck. A shorter stopping distance can be achieved because the driver can more confidently apply the brakes. ARTSA has released Part 1 of its Combination Vehicle Brake Code of



Practice (available at www.artsa.com.au). There are 35 recommendations that ARTSA hopes will help the industry to manage the introduction of new braking and stability technologies. But it's not just about electronic systems; for example, read about how to avoid mismatches between disc and drum brakes on the one combination vehicle. Hopefully Australia can manage the introduction of new truck and trailer technologies well. Remember when electronic fuel injection was first introduced for diesel engines in the late 1980s? The electronic controller was initially in the cabin, then on the firewall, then on a fuel-cooled plate and finally put directly onto the side of the engine. Operators were skeptical. 25 years later, electronics on engines has been a win-win. Better economy, more power, lower emissions.

We have a great challenge to reduce the fatality rate of Australian truck drivers in crashes. It is significantly higher in Australia than in Europe or the USA.

Hopefully new braking and stability technology will help to save truck drivers' lives. ARTSA is developing a proposal for reduced registration charges for new trucks and new trailers that have enhanced safety technologies. We believe there is a good case for the community and truck operators to share the benefits of improved safety performance. Some new thinking is needed because heavy vehicle crash rates seem to be increasing following some improvement over the past decade.

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