Brake rule reform

The Federal Department of Infrastructure and Transport has recently released draft amendments to the heavy-vehicle brake rules 35 (trucks) and 38 (trailers). The main requirements are that new trucks will need to have anti-lock brakes and that new trailers will need to have either anti-lock brakes or variable proportioning brakes.

These proposals come from stage 1 of the National Heavy Vehicle Braking Strategy that the National Transport Commission developed several years ago. A second stage is foreshadowed that will mandate Electronic Stability Control on new vehicles. The introduction dates for these requirements have not been set and the proposals may yet change.

The proposals are controversial, which is not unusual for brake rule developments. On one side of the argument are operators who have embraced electronic stability controls and on the other side are those who don't want any electronic controls on trucks. Ultimately, design rules reflect the collective wisdom of the transport community intended to improve road safety.

Anti-lock brakes (ABS) have been mandated on new trucks and trailers in Europe and USA/Canada for more than a decade, so mandating ABS in Australia is not a radical proposal. The problem is that ABS is of marginal value on heavy vehicles. Under many common situations ABS might increase stopping distance. There is a compensating stability improvement, which is useful, but the benefits are marginal. The real safety advances will come from stability control, electronic brake balance and roll stability program, but Australia is apparently not ready to do this.

For trailers, it is proposed that Variable Proportioning Brakes (load-sensing valves) be an acceptable alternative to anti-lock brakes. Load-sensing valves alter the brake level on some axle groups in response to a weight signal. Usually the weight signal is an air-suspension bag pressure but it could be the deflection of a spring suspension.

Air-bag controlled load sensing brakes can greatly improve the brake balance on a combination if the setting is correct and they are used on all trailers. Spring-suspension load sensing tends to need regular re-adjustment.

Load-sensing valves (LSVs) can be very successfully used on trailers in a single combination. They are particularly useful on dog trailers behind tip-trucks. As a guide the load sensing valve is set to allow about 60 % brake level when lightly laden. LSVs improve the brake balance when used on a trailer without a valve on the truck. This is true because the ratio of the laden to unladen weight on the trailer is a lot greater than on the truck. The load-sensing valve can bring the brake level of the unladen trailer down to that of the truck. So using a load-sensing valve on the trailer, but not the truck should be beneficial.

On multi-combination vehicles such as B-doubles and B-triples, there is a problem. Mixing trailers with and without load sensing valves creates new brake compatibility problems. If one trailer has a valve set to about 60 per cent then the next trailer (without the valve) will have a higher brake level. Over-braked trailers are more likely to swing sideways during heavy braking. There is no obvious way to prevent mixing of trailers with and without load sensing valves in the general vehicle fleet.

So the difficulty is that anti-lock brakes will provide marginal road-safety benefits and that load- sensing valves on trailers might be a problem on multi-combinations. So why do anything? The answer is that our industry needs to look forward a few years and position itself for improved heavy-vehicle safety. It is now clear that intelligent stability and braking controls give proven road safety benefits. The bulk tanker industry has embraced trailer EBS with Roll Stability Program and proven that safety can be improved. Significant safety benefits have also been seen on B-double timber jinker trailers with electronic stability controls. Lately roll stability programs have been successfully used on concrete agitators, which have a habit of rolling over. Because electronic braking and stability systems can adapt to the conditions, there is a greater safety benefit than would result from using load-sensing valves or ABS.

Mandating anti-lock brakes on new trailers is a first step towards getting to advanced electronic stability control on trailers. The danger is that low-cost, low-performance ABS systems might be used as a competitive alternative to load-sensing valves. Hopefully some trailer manufacturers will opt for EBS rather than ABS, but they are likely to be in the minority. Another important consideration is that a trailer pulled by a truck that has electronic stability control system should have anti-lock brakes as a minimum, to protect it during emergency movements.

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When it comes to trucks, there is no proposal to allow load-sensing valves as an option to brakes.

Variable Proportional Brakes are a bad idea on trucks-only because they promote trailer instability during braking. Australia is not ready to mandate Electronic Stability Control on trucks because US manufacturers are not yet ready to do it. The USA has not mandated ESC on new heavy trucks, although it seems to be close to doing so. In a few years both the European manufacturers and USA manufacturers will have ESC on trucks as standard. Japanese manufacturers will also be able to supply ESC. Some Australian manufacturers can supply ESC now.

In the truck domain the time is not yet right to mandate ESC in Australia. So why not just mandate EBS with Roll Stability Program on trailers now? The main reason seems to be that the Department of Infrastructure and Transport judges that our industry is not ready. However, the technology is ready and the road-safety benefits are clear. A staggering 70 per cent of serious truck crashes are single-vehicle crashes and 32 per cent of all truck crashes had inappropriate truck speed as the principal factor (National Transport Insurers 2009 report). Because advanced electronic braking and stability systems make trucks safer whilst negotiating bends and when avoiding objects, significant safety benefits can be expected.

The time has come to require new trailers to have a Roll Stability Program (RSP), which comes with trailer EBS. This technology is readily available for trailers, there are no technical issues to be solved and no risks to be weighed up. This path will also provide a beneficial match with the growing proportion of trucks that have ESC.

For anyone who reckons that electronic brake control systems will be unreliable, remember when electronic engine controllers could not possibly survive on Australian trucks because of the severe operating conditions? It is now impossible to by a new truck without an engine ECM.

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