



Industry advisory: fitting of roll stability function on dangerous goods trailers

Common questions and answers

Q1: What does the EPA NSW determination mean for dangerous goods operators?

A1: It means that dangerous goods tank trailers¹ carrying bulk loads will need to be fitted with a roll stability function within the next 5 years. The EPA NSW advice relates only to tank trailers and not prime movers or rigid vehicles, or to bulk dangerous goods load carried in ISO tanks or flexitainers (ie. a bladder within a shipping container).

Q2: What is a roll stability function and how does it differ from EBS, ABS and other advanced braking systems

A2: Anti lock braking systems (ABS) originated over 20 years ago and were designed to prevent wheel lock up in braking. In the last 5 to 10 years the ABS systems have been considerably enhanced with the development of Electronic Braking Systems (EBS) that integrates anti-lock braking system (ABS) technology, automatic traction control (ATC), and other key vehicle control system features to deliver the next generation of braking control.

A further development has been the inclusion of Roll Stability Function, often referred to as RSS, RSC or other similar acronyms.

A Roll Stability Function is an active vehicle safety system that automatically intervenes if a high rollover risk is detected while driving. If a rollover threat is occurring, the system intervenes and assists the driver in minimizing the rollover risk by automatically reducing vehicle speed. A Roll Stability Function is designed specifically for your prime mover or trailer

¹ A Tank Trailer as defined by AS2809 is a vehicle that is designed and constructed specifically as a road tank vehicle. It is applicable also to conventional vehicles that are to carry portable or demountable tanks or tank containers which are filled or emptied whilst on the vehicle and as a consequence are deemed to be a road tank vehicle.

to help maintain vehicle stability and aid in reducing vehicle rollovers. Roll Stability Functions continuously check and update the lateral acceleration of the vehicle and compare it to a critical threshold where rollover may occur. When the critical threshold is exceeded, the Roll Stability Function intervenes to slow down the vehicle. (Depending on the system this could use a combination of reducing engine torque, and engaging the engine retarder (for the prime mover), and automatically apply braking systems (for either the prime mover and or the trailer)). Frequently, activation takes place before the driver is aware of the need. When fitted to a vehicle (and it can be fitted to a prime mover or a trailer or both) the Roll Stability Function is integrated into an anti-lock braking system (ABS) or Electronic Braking System (EBS).²

Most ABS units will not have a roll stability control capability. Most EBS units will have a roll stability function capability, although this module may not have been enabled when first installed.

Q3: Will a trailer fitted with roll stability function work if I don't have an EBS or ABS equipped prime mover?

A3: Yes, provided the control unit on the trailer has a constant power supply, the trailer EBS or ABS will work. This means that trailers should only be towed by prime movers capable of providing a constant power supply to the trailer roll stability function system.

Q4: What power supply is needed from the prime mover to activate the trailer roll stability function?

A4: The roll stability function can be activated by either 12 or 24 volt power. The towing vehicle (Prime Mover or forward trailer) needs to be fitted with the appropriate ISO 7638 compliant connector. The electrical connection between the truck and trailer/s must be made for the system to be active.

Q5: Will the roll stability function work on multi trailer combinations?

A5: Yes it will. Most multi combination units (B Triples, and combinations with more than two trailers) generally have a 24v power supply from the prime mover.

² For further information on electronic braking, refer to the ATA's Technical Advisory note at <http://atatruck.net.au/industry-resources/electronic-braking-systems-ebs-advisory-procedure>

Q6: Do I have to have disc-brakes to specify a roll stability function?

A6: No, the system is independent of brake type. However, automatic slack adjusters are recommended with drum brakes and the use of auto slack adjusters with ABS/EBS forms part of the new ADR38/04 requirement.

Q7: Do I require a “blue plate” sign off for retro fitting roll stability function to the trailer

A7: Yes, an authorised engineering signatory needs to inspect the installation and approve as per NHVR requirements in your State. This is because the brake system is being altered from original compliance. Ask your engineer to include a clause regarding roll stability function on the sign-off form. The signatory will need to assess the installation taking account of VSB6 codes G1 & G4; and Appendix 1 in ADR 38.

Q8: Will trailers fitted and plated interstate be accepted by NSW?

A8: Plating of trailers now falls under the National Heavy Vehicle Law. This means that plating should have national recognition.

Q9: How long does each trailer installation take?

A9: This depends on each trailer type. If axles already have pole rings fitted then an installation should take between 2-3 days. If axles require pole rings it will take between 3-4 days to complete. Retrofitting should only be carried out once the tanker trailer is gas free. Each company that engages personnel to retrofit a roll stability function on dangerous goods trailers would need to inform/ advise of a suitable gas free and or hot work procedure.

Q10: Does the Roll Stability Function need commissioning?

A10: Yes, this has to be done by an Authorised Installer or the supplier of the system. This is called an end of line test (EOLT) and can only be done using special equipment and by a person nominated by the brake system supplier. On completion of the EOLT, the supplier should be able to issue the customer with a completion report specific to that trailer.

Q11: Should Automatic Slack Adjusters be fitted?

A11: Yes, it is highly recommended that for drum brake axles, that auto-slack adjusters meeting the OE's specification are fitted. Auto slack adjusters help with braking performance, and are required when using ABS or EBS under the amended ADR 38/04.

Q12: Do I need to fit a warning light in the cabin of the prime mover?

A12: Yes. A warning lamp complying with ADR35/04 appendix 1 clause 1.3.3 should be fitted in the truck cab.

Q13: For B Doubles, does the A trailer need to be equipped with power and an ISO7638 plug/socket to power the B Trailer?

A13: Yes. Each trailer that has provision to tow another trailer must be equipped with a rear ISO 7638 plug/socket in accordance with clause 6.7.2 of ADR38/04, to enable following trailer/s to have their roll stability function powered up. Most manufacturers provide a "Must Connect" sticker to reminder operators that the plug needs to be connected for the system to work.

Q14: What on-going maintenance of the new roll stability function unit is required?

A14: If a fault arises, the Roll Stability Function is required to activate a warning lamp in the cab of the truck. If this warning light is activated then the system needs to be checked to verify that it is working.

Recommend checks for the roll stability function should include:

- Check the system is powering up - audible clicks should be heard adjacent to the main module/ valve upon power up when vehicle is stationary
- Check the warning light in the cab illuminates on initial power up and then goes out

More detailed fault finding and system verification can be performed but this would require the use of specialist readers.

Q15: Are there specific items that need to be attended to when maintaining the braking system fitted with roll stability function?

A15: Roll Stability Functions calculate the amount of brake torque required to slow the vehicle down based on the components fitted in the braking system, and that it is correctly adjusted. When incorrect components are fitted (such as brake boosters, slack adjusters, brake pads etc) this will change the required braking torque output and either produce not enough braking torque, or too much, both being an undesirable situation. It is therefore vital that correct braking components be used during the maintenance process.

Q16: Is it possible to get a Prime-Mover with a roll-stability function?

A16: Yes. Prime-movers that have an EBS will probably also have roll-stability as a feature. This function is now mandated on new prime-movers in Europe.

Prime-movers that are manufactured in the USA or Australia do not have EBS but may have an Electronic Stability Control (ESC) function that includes roll-stability control. The USA has not yet mandated ESC but has foreshadowed doing so on new prime-movers. The EPA requirement relates only to tank trailers and not prime movers or rigid trucks that have a tank installed.

Q17: Does a Prime-Mover with a roll-stability function enhance the operation of a trailer roll-stability control system?

A17: Yes. The prime-mover roll-stability function has a steering wheel position sensor that indicates the driver's intended path. It can transmit early information about the severity of a bend to the trailer system(s) that allows an early intervention to occur.