

## **Proposal for Supplement 19 to the 11 series of amendments to UN Regulation No. 13 (Heavy vehicle braking)**

The text reproduced below was prepared by the expert from the European Association of Automotive Suppliers (CLEPA) to resolve problems with installation of stronger spring brake actuators in trailers to realize higher deceleration in the case of emergency braking caused by a cut of the supply line between towing vehicle and trailer. The modifications to the existing text of the Regulation are marked in **bold** for new and ~~strike through~~ for deleted characters.

### **I. Proposal:**

*Annex 8, paragraph 2.5.* amend to read:

“2.5. For power-driven vehicles, the pressure in the spring compression chamber beyond which the springs begin to actuate the brakes, the latter being adjusted as closely as possible, shall not be greater than 80 per cent of the minimum level of the normal available pressure.

In the case of trailers, the pressure in the spring compression chamber beyond which the springs begin to actuate the brakes shall not be greater than that obtained after four full-stroke actuations of the service braking system in accordance with paragraph 1.3 of Part A of Annex 7 to this Regulation **unless a reduction of the pressure within the service braking system energy reservoir does not result in a corresponding reduction of the pressure in the spring compression chamber.** The initial pressure is fixed at 700 kPa.”

### **II. Justification:**

Annex 8, paragraph 2.5. of Regulation No. 13 covers requirements to prevent unintentional braking of the driving vehicle by application of the spring brakes if a significant air consumption is generated as represented in the regulation by four full brake actuations of the service braking system in the case of trailers.

When introducing spring brakes in trailers in the 1990 decade, the spring compression chambers were directly connected to the service brake reservoir.

Paragraph 2.5. of Annex 8 has been introduced to prevent locking of wheels caused by spring brake actuation after application of the service braking system several times and thus dropping the pressure in the energy reservoir.

With introduction of anti-lock braking systems this safety margin was found to be not high enough, because during long ABS braking phases (>15 s) the pressure in the reservoir could fall below the spring brake actuation pressure.

To ensure the ABS function, i.e. prevent wheels from locking also at these low reservoir pressures, an additional check valve between reservoir and spring compression chamber was installed in trailer braking systems. With this check valve the pressure in the spring compression chambers remains at its initial level even when the pressure in the service brake reservoir drops. In case of a cut of the supply line between towing vehicle and trailer the additional check valve will change its operation: it will directly connect the reservoir and the spring compression chamber, bring them on an equal pressure level and so insure the application of the spring braking system.

To ensure a higher margin of safety **both** for the emergency brake (following a cut of the supply line between the towing vehicle and the trailer) and the parking brake, the installation of spring compression chambers with higher brake forces could be done. But these spring compression chambers begin to be actuated at a higher pressure level (e.g. 540 kPa instead of today 490 kPa). In this case the current requirement of Paragraph 2.5. cannot be fulfilled.

Without the described valve solution in the braking system the existing requirement in Paragraph 2.5. is clearly justified and shall be checked accordingly.

The proposed amendment takes this into account, without any loss of safety, but considering the possibility to install stronger spring compression chambers together with the described valve solution.

To be noted that a sufficient capacity of the service brake reservoir is ensured by requirements of Annex 7 paragraph 1.3.1 and Annex 8 paragraph 2.4 copied here below:

*Annex 7*

*1.3.1. The energy storage devices (energy reservoirs) with which trailers are equipped shall be such that, after eight full-stroke actuations of the towing vehicle's service braking system, the energy level supplied to the operating members using the energy, does not fall below a level equivalent to one-half of the figure obtained at the first brake application and without actuating either the automatic or the parking braking system of the trailer.*

*Annex 8*

*2.4. In power-driven vehicles, the system shall be so designed that it is possible to apply and release the brakes at least three times if the initial pressure in the spring compression chamber is equal to the maximum design pressure.*

*In the case of trailers, it shall be possible to release the brakes at least three times after the trailer has been uncoupled, the pressure in the supply line being 750 kPa before the uncoupling. However, prior to the check the emergency brake shall be released. These conditions shall be satisfied when the brakes are adjusted as closely as possible. In addition, it shall be possible to apply and release the parking braking system as specified in paragraph 5.2.2.10. of this Regulation when the trailer is coupled to the towing vehicle.*

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