Automatic adjustors on wheel-brakes for class O1 and O2 trailers

GRRF
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• Motivation
• Legislation
• Functioning of an autoreverse-mechanism
• Benefits
• State of the art
• Target / Justification
• No changes in the braking-systems of O1/O2 trailers in the last 30 years
• Most times a mechanical transmission of the actuation forces to the wheel-brakes is used with no automatic adjustment of the wheel-brakes
• Without regular manual adjustment, the brakes work less effective
Directive 71/320/EEC incl. all amendments, annex I, paragraph 2.2.2.8.1

and ECE R13 - Rev.7 - Amend.2 - paragraph 5.2.2.8.1 say:

„Wear adjustment shall be automatic for the service brakes. However, the fitting of automatic adjustment devices is optional for vehicles of categories O1 and O2. …“

**Reason:**

Up till now it was not possible to join an automatic adjustment device with the mandatory automatic reverse mechanism in the brakes without getting incorrect adjustment while reversing the trailer.
Extra travel on the spread-lever while reversing caused miss-adjustment. Brakes will not run free!!!
• Shortening of the stopping distance due to the use of an automatic adjustment device in the wheel-brakes => Safety increase

All the time, when the vehicle trailer combination with automatic adjusted brakes in the trailer already stands still, the combination with poor adjusted brakes in the trailer still does have a velocity of appr. 17 km/h.

Benefits

Stopping distance 36,7m
Activation time: \[ t_B = t_a + t_s + t_f \]
3.55s = 0.15s + 0.35s + 3.05s

Stopping distance 39,4m
Activation time: \[ t_B = t_a + t_s + t_f \]
4.28s = 1.04s + 0.89s + 2.35s

Test masses:
Mk=2400kg
ma=1400kg
S=80kg
C=1320kg
Testing speed:
V1=60 km/h
Benefits

- Avoidance of force peaks on coupling device and in the braking system
• **Benefit on electronic stabilization systems for trailers and caravans**

Nowadays there are different electronic stabilization systems for overrun-braked trailers and caravans on the market, which apply the wheel-brakes when an instability has been detected. In combination with poor adjusted brakes they need more valuable time to generate the stabilizing effect and so loose some of their power.
Manufacturers of brakes for O1 and O2 trailers should be able to have brakes with an integrated automatic adjustment device and an autoreverse mechanism in their product range very soon or they already have such products on the market.

e.g. Brake with automatic adjustment and automatic reverse (already available on the market)
Amendment of ECE R13 - Paragraph 5.2.2.8.1

Deletion of sentence: "However, the fitting of automatic adjustment devices is optional for vehicles of categories O1 and O2."

Justification:

The shown results of the tests clearly proved, that with automatic adjusted wheel-brakes the slack in the braking system can be removed permanently and therefore:

- stopping distances can be shortened significantly
- exaggerated peaks of the force on the drawbar can be avoided
- electronic stabilization systems react quicker and have their maximum power
For trailers of class O3 and O4, automatic adjustment is mandatory for many years now.

In the meantime, the technical problems when joining an autoreverse-system with automatic adjustment device in wheel-brakes for O1 and O2 trailers have been solved at all major brake manufacturers.

With permanently well adjusted brakes, the stopping distances can be significantly shortened and accidents can be avoided or mitigated.

- When taking all these facts into account, an exemption for brakes for O1 and O2 trailers seems no longer to be appropriate.

- Proposal of Germany:
  Amendment of R-13; automatic adjustment of the service brakes should be mandatory also for trailers of class O1 and O2 till 01.01.2018.
Thank you for your attention!

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