Transmitted by the expert from CLEPA

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Proposal for amendments to ECE/TRANS/WP.29/GRRF/2008/2 (Brake Assist Systems)

This document is a proposal for amendment to the Brake Assist proposal of document ECE/TRANS/WP.29/GRRF/2008/2 and concerns Brake Assist Systems of Category A with the evaluation of performance being made on the measurement of brake line pressure as an alternative to vehicle deceleration.

Regulation No. 13-H, Annex 10

A. Proposal

Add an additional paragraph 3.2.5. and amend the title of Figure 1 to read Figure 1a and add an additional Figure 1b.

"3.2.5. As an alternative, which can be selected by the manufacturer, the pedal force figures for F_T, $F_{ABS,min}$, $F_{ABS,max}$ and $F_{AB,extrapolated}$ may be derived from the brake line pressure response characteristic instead of the vehicle deceleration characteristic. This shall be measured as the brake pedal force is increasing.

3.2.5.1. The pressure, at which ABS cycling commences, shall be determined by making five tests from 80 km/h in which the brake pedal is applied up to the level which produces ABS operation and the five pressures at which this occurs as determined from front wheel pressure records, shall be recorded and the mean value obtained as P_{ABS}.

3.2.5.2. The threshold pressure P_T shall be stated by the manufacturer.

3.2.5.3. Figure 1b shall be constructed in the manner set out in paragraph 3.2.4. but using line pressure measurements to define the parameters set out in paragraph 3.2.5. above where:

$$F_{ABS,extrapolated} = \frac{F_T \times P_{ABS}}{P_T}$$

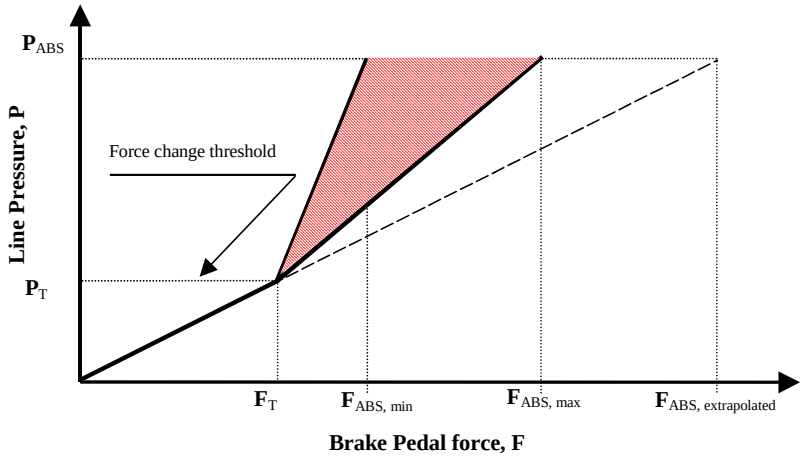

Figure 1b

B. **Justification**.

Problems experienced, particularly with heavier vehicles such as large vans, result from vehicles without brake assist, not following the dotted linear projection of braking performance with increasing pedal forces, that is suggested in Figure 1(a).

This is because the practical deceleration characteristic tends to be curved downwards rather than being linear as shown in Figure 1(a) which increases the task faced by a BAS booster.

The use of brake assist, formed from an Optimised Dual-rate Brake Booster, achieves a counteraction to this curving performance. Whilst the driver does not perceive a sudden jump in deceleration above F_T, increasing pedal effort does show a significant increase in the ratio of brake line pressure increase against pedal force increase. This allows the driver to achieve maximum (ABS limited) braking performance on the dry surface, with a pedal effort which is significantly less than would be the case with a standard brake booster.

With heavier vehicles, the reduction of some 60% in pedal force, should qualify an Optimised Dual-rate Brake Booster as an acceptable BAS since the main requirement is fulfilled.

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