

## II

(Acts whose publication is not obligatory)

## COMMISSION

## COMMISSION DIRECTIVE

of 11 February 1974

adapting to technical progress the Council Directive of 26 July 1971 on the approximation of the laws of the Member States relating to the braking devices of certain categories of motor vehicles and of their trailers

(74/132/EEC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community;

Having regard to Council Directive No 70/156/EEC<sup>(1)</sup> of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers, as amended by the Act<sup>(2)</sup> annexed to the Treaty concerning the Accession of new Member States to the EEC and EAEC signed in Brussels on 22 January 1972, and in particular to Articles 11, 12 and 13 thereof;

Having regard to the Council Directive of 26 July 1971<sup>(3)</sup> on the approximation of the laws of the Member States relating to the braking devices of certain categories of motor vehicles and of their trailers, as amended by the Act<sup>(4)</sup> annexed to the Treaty concerning the Accession of new Member States to the EEC and EAEC signed in Brussels on 22 January 1972, and in particular to Article 5 thereof;

Whereas many accidents occur due either to the locking of the wheels of the rear axle of an empty truck and of tractive units for articulated vehicles, or equally to the locking of the wheels of a trailer or semitrailer when braked on a road of low adhesion; whereas in these conditions a braking distribution,

excellent when the vehicle is laden, is found to be completely unsuited to operating conditions when the vehicle is empty and may entail locking of the rear axle wheels of motor vehicles or of the wheels of trailer axles, even for relatively low decelerations; whereas the vehicle or the combination of vehicles may skid or jack-knife;

Whereas in the light of technical progress it is now possible to fit vehicles with a device which matches the braking effort to the load;

Whereas the provisions of this Directive are in conformity with the Opinion of the Committee on the adaptation to technical progress of the Directives on the removal of technical barriers to trade in the motor vehicles sector,

HAS ADOPTED THIS DIRECTIVE:

*Article 1*

Annexes II and IX of Council Directive No 71/320/EEC of 26 July 1971 are modified according to the Annex to the present Directive.

*Article 2*

1. With effect from 1 October 1974 no Member State shall on grounds relating to the braking devices:

<sup>(1)</sup> OJ No L 42, 23. 2. 1970, p. 1.

<sup>(2)</sup> OJ No L 73, 27. 3. 1972, pp. 115 and 157.

<sup>(3)</sup> OJ No L 202, 6. 9. 1971, p. 37.

<sup>(4)</sup> OJ No L 73, 27. 3. 1972, pp. 118, 119 and 158.

- refuse EEC type approval, the delivery of the document referred to in Article 10 (1), last subsection, of Council Directive No 70/156/EEC of 6 February 1970, or the national type approval of a type of motor vehicle ;
  - nor prohibit the entry into service of the vehicles ; if the braking devices of this type of vehicle or of these vehicles comply with the provisions of Council Directive No 71/320/EEC of 26 July 1971, as last amended by this Directive.
2. From 1 January 1975 onwards a Member State :
- shall no longer deliver the document envisaged in Article 10 (1), last subsection, of Council Directive No 70/156/EEC of 6 February 1970, for a type of vehicle of which the braking devices do not comply with the provision of Council Directive No 71/320/EEC of 26 July 1971, as last amended by this Directive ;
  - may refuse the national type approval of a type of vehicle of which the braking devices do not comply with the provisions of Council Directive No 71/320/EEC of 26 July 1971, as last amended by this Directive.
3. With effect from 1 October 1975 a Member State may prohibit the entry into service of vehicles of which the braking devices do not comply with the provisions of Council Directive No 71/320/EEC of 26 July 1971, as last amended by this Directive.
4. The Member States shall adopt and publish the provision necessary in order to comply with this Directive before 1 June 1974 and shall forthwith inform the Commission thereof.

*Article 3*

This Directive is addressed to the Member States.

Done at Brussels, 11 February 1974.

*For the Commission*

*The President*

François-Xavier ORTOLI

## ANNEX

## Modifications of the annexes of the Council Directive of 26 July 1971 (71/320/EEC)

## ANNEX II: BRAKING TEST AND PERFORMANCE OF BRAKING DEVICES

Item 1.1.3.4 shall read: Without prejudice to the requirements contained in item 1.1.4.2 below, the road shall possess a surface having good adhesion.

After item 1.1.4.1 add item

1.1.4.2. The behaviour of vehicles in categories  $M_1$ ,  $M_2$ ,  $M_3$ ,  $N_1$ ,  $N_2$ ,  $N_3$ ,  $O_3$  and  $O_4$  on a road surface having reduced adhesion shall fulfil the conditions laid down in the Appendix.

## Appendix (See 1.1.4.2): DISTRIBUTION OF BRAKING EFFORT AMONG VEHICLE AXLES

## 1. GENERAL REQUIREMENTS

Vehicles of categories  $M_1$ ,  $M_2$ ,  $M_3$ ,  $N_1$ ,  $N_2$ ,  $N_3$ ,  $O_3$  and  $O_4$  which are not fitted with a wheel anti-locking device shall fulfil the conditions of the present Appendix.

## 2. NOTATION

- $i$  = axle index ( $i=1$ , front axle ;  $i=2$ , rear axle).
- $P_i$  = normal reaction of road surface on axle  $i$  under static conditions.
- $N_i$  = normal reaction of road surface on axle  $i$  under braking.
- $T_i$  = force exerted by the brakes on axle  $i$ .
- $f_i$  =  $T_i/N_i$ , adhesion used by axle  $i$ .
- $J$  = deceleration of vehicle.
- $g$  = acceleration of gravity = 10 m/s<sup>2</sup>.
- $z$  = braking ratio of vehicle =  $J/g$  <sup>(1)</sup>
- $P$  = weight of vehicle.
- $h$  = height of centre of gravity.
- $E$  = wheelbase.
- $k$  = theoretical coefficient of adhesion between tyre and road.

Adhesion curves used by the vehicle means curves showing the adhesion used by the front axle and the rear axle plotted against the vehicle braking ratio on the specified load conditions.

## 3. REQUIREMENTS FOR MOTOR VEHICLES

## 3.1. Two axle vehicles

3.1.1. <sup>(2)</sup> Under all load conditions of the vehicle the adhesion curve for the front wheels shall be above that for the rear wheels:

- for all braking ratios of between 0.15 and 0.8 in the case of vehicles of category  $M_1$ ;
- for braking ratios of between 0.15 and 0.30 in the case of vehicles of other categories, with the exception of urban buses.

In addition, for  $k$  values of between 0.2 and 0.8,

$$z \geq 0.1 + 0.85(k - 0.2)$$

3.1.2. The above conditions shall be fulfilled automatically.

<sup>(1)</sup> For semi-trailers  $z$  is the braking force divided by the static weight on the trailer axle(s).

<sup>(2)</sup> The requirement for Item 3.1.1 shall not be interpreted as requiring a level of efficiency higher than that laid down in Annex II.

- 3.1.3. The pressure at the coupling head of a motor vehicle authorized to draw a trailer fitted with air brakes shall not be affected by the operation of the pressure-regulating devices on the axles of the drawing vehicle.
- 3.1.4. In order to verify the requirement of item 3.1.1., the manufacturer shall provide the adhesion utilization curves for the front and rear axles calculated by the formulas :

$$f_1 = \frac{T_1}{N_1} = \frac{T_1}{P_1 + z \frac{h}{E} P} \quad f_2 = \frac{T_2}{N_2} = \frac{T_2}{P_2 - z \frac{h}{E} P}$$

- 3.1.4.1. Vehicles other than tractive units for semi-trailers.

The graphs shall be plotted for both the following load conditions :

- unladen, in running order with the driver on board,
- laden. Where provision is made for several possibilities of load distribution, the one whereby the front axle is the most heavily laden shall be the one to be taken into consideration.

The values specified by the manufacturer shall be taken for h.

- 3.1.4.2. Tractive units for semi-trailers.

- 3.1.4.2.1. Solotractive units. The graphs shall be plotted for an unladen vehicle in running order with the driver on board and h shall be taken as the value specified by the manufacturer.

- 3.1.4.2.2. Laden tractive units. The dynamic load of the semi-trailer on the tractive unit shall be represented by a static weight  $P_s$  applied to the coupling kingpin, equal to :

$$P_s = P_{so} (1 + 0.45 z)$$

where  $P_{so}$  represents the difference between the maximum laden weight of the tractive unit and its unladen weight.

For h the following value shall be taken  $\frac{h_0 P_o + h_s P_s}{P}$

where

- $h_0$  is the value specified in item 3.1.4.2.1,
- $h_s$  is the height of the plane of the coupling on which the semi-trailer rests.
- $P_o$  is the unladen weight of the solotractive unit,
- $P = P_o + P_s$ .

- 3.2. **Vehicles with more than two axles**

The requirements of Item 3.1. shall apply to vehicles with more than two axles. These requirements shall be considered to be met, if, in the case of braking ratios between 0.15 — 0.30, the adhesion used by the front axle is greater than that used by at least one of the rear axles.

#### 4. REQUIREMENTS FOR SEMI-TRAILERS

- 4.1. The following requirements shall only apply to semi-trailers fitted with compressed air brakes.
- 4.2. The braking systems fitted to these semi-trailers shall be such that the curve representing the braking ratio of the semi-trailer's axles plotted against the service line pressure measured at the coupling head within the hatched area of the attached diagram.
- 4.3. This requirement shall be met for all permissible load conditions of the semi-trailer axles.

#### 5. REQUIREMENTS FOR TRAILERS

- 5.1. The following requirements shall only apply to trailers fitted with air brakes. They shall not apply to single-axle trailers nor to twin-axle trailers where the axle spread is less than 2 metres.

- 5.2. The requirements set out in item 3.1 shall apply to twin-axle trailers not excluded by the requirements contained in 5.1.
- 5.3. Trailers with more than two axles shall be subject to the requirements contained in item 3.2.

#### 6. CONDITIONS TO BE FULFILLED IN THE CASE OF FAILURE OF THE BRAKING DISTRIBUTION SYSTEM

When the requirements of this Appendix are met by means of a special device (e.g., controlled mechanically by the suspension of the vehicle), it shall be possible in the case of failure of this device or its control unit to stop the vehicle under the conditions prescribed for emergency braking.

#### 7. MARKINGS

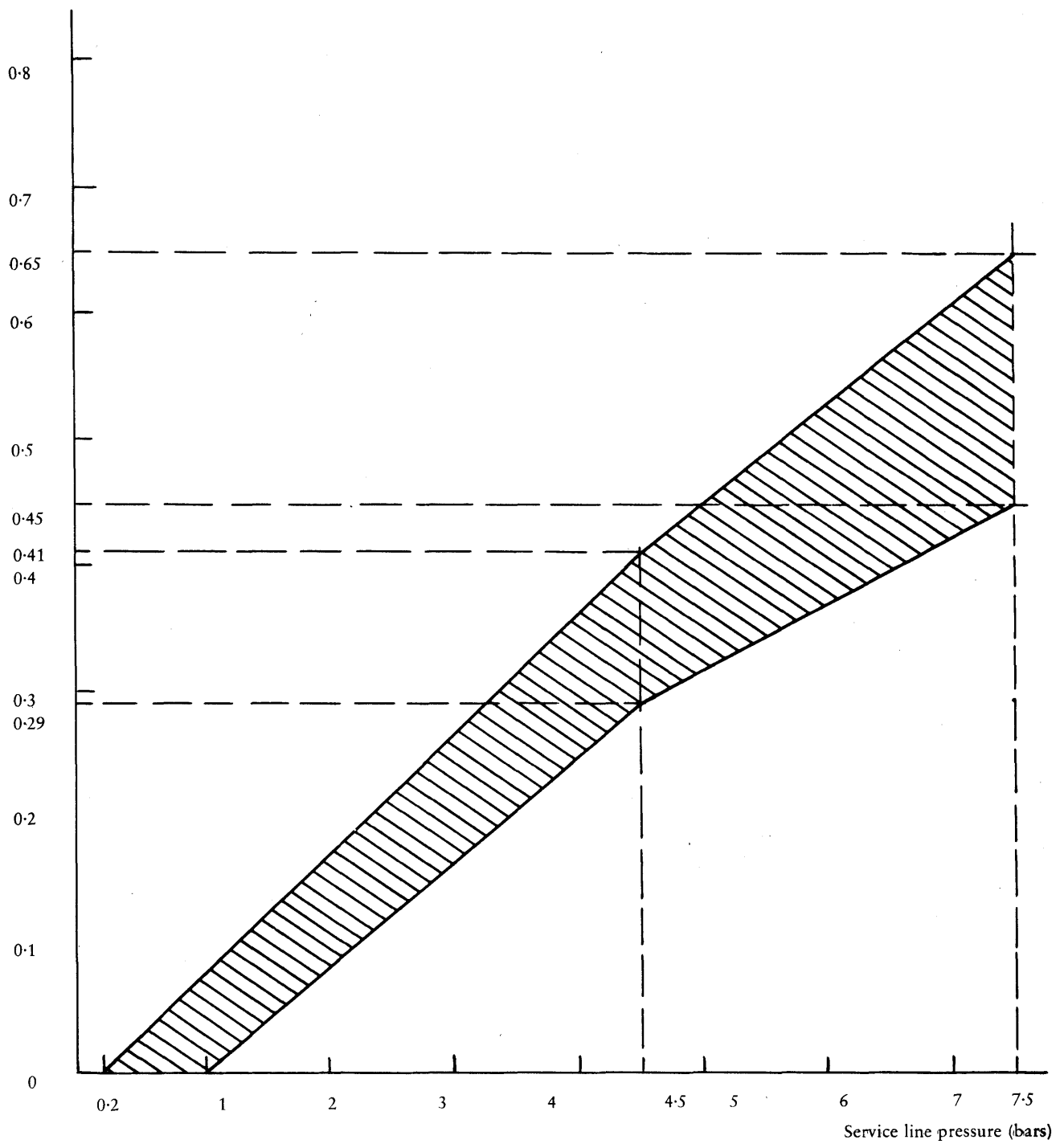
- 7.1. Vehicles, other than those of category M<sub>1</sub>, which meet the requirements of this Appendix by means of a device mechanically controlled by the suspension of the vehicle, shall be marked to show the useful travel of the device between the positions corresponding to vehicle unladen and laden states respectively.
- 7.2. When the requirements of this Appendix are met by means of a device actuated by compressed air, the vehicle shall be marked to show the pressure values at the outlet side of the device during full braking of the vehicle under both unladen and laden conditions.
- 7.3. The markings referred to under items 7.1 and 7.2 above shall be affixed in a visible position in indelible form.

#### 8. VEHICLE INSPECTION

During the EEC type-approval testing of a vehicle the technical inspection authority shall verify conformity with the requirements contained in the present Appendix and carry out any further tests considered necessary to this end. The report on the additional tests shall be appended to the EEC type-approval certificate.

Diagram (See item 4.2 of the Appendix)

$z$  = Braking ratio



**ANNEX IX: MODEL COMMUNICATION CONCERNING THE EEC TYPE-APPROVAL OF A VEHICLE WITH REGARD TO BRAKING**

After item 17, the following *new items 17 (a) and 17 (a) 1* shall be added:

- 17 (a) Distribution of braking among the axles of a vehicle.
  - 17 (a) 1. Does the vehicle fulfil the requirements contained in the Appendix (see item 1.1.4.2.)..... yes/no (\*).
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