

## COUNCIL DIRECTIVE 96/53/EC

of 25 July 1996

laying down for certain road vehicles circulating within the Community the maximum authorized dimensions in national and international traffic and the maximum authorized weights in international traffic

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 75 thereof,

Having regard to the proposal from the Commission<sup>(1)</sup>,

Having regard to the opinion of the Economic and Social Committee<sup>(2)</sup>,

Acting in accordance with the procedure laid down in Article 189c of the Treaty<sup>(3)</sup>,

- (1) Whereas Council Directive 85/3/EEC of 19 December 1984 on the weights, dimensions and certain other technical characteristics of certain road vehicles<sup>(4)</sup> established, in the framework of the common transport policy, common standards permitting improved use of road vehicles in traffic between Member States;
- (2) Whereas Directive 85/3/EEC has been significantly amended on many occasions; whereas on the occasion of its further amendment it should for reasons of clarity and rationality be recast in a single text together with Council Directive 86/364/EEC of 24 July 1986 relating to proof of compliance of vehicles with Directive 85/3/EEC<sup>(5)</sup>;
- (3) Whereas differences between standards in force in the Member States with regard to the weights and dimensions of commercial road vehicles could have an adverse effect on the conditions of competition and constitute an obstacle to traffic between Member States;

- (4) Whereas, under the principle of subsidiarity, action should be taken at Community level in order to remove this obstacle;
- (5) Whereas the abovementioned standards reflect a balance between the rational and economical use of commercial road vehicles and the requirements of infrastructure maintenance, road safety and the protection of the environment and the fabric of life;
- (6) Whereas common standards on the dimensions of vehicles intended for the carriage of goods should remain stable in the long term;
- (7) Whereas additional technical requirements related to the weights and dimensions of vehicles may apply to commercial vehicles registered or put into circulation in a Member State; whereas these requirements must not constitute an obstacle to the circulation of commercial vehicles between Member States;
- (8) Whereas the definition of 'thick-walled refrigerated vehicle' in Article 2 of Directive 85/3/EEC, as amended by Directive 89/388/EEC<sup>(6)</sup>, should be broadened in order to permit Member States to allow refrigerated vehicles no longer meeting the insulation requirements defined in that Article to circulate in their territory;
- (9) Whereas it is necessary to clarify the concept of 'indivisible load' in order to ensure uniform application of this Directive in respect of permits for vehicles or vehicle combinations carrying such loads;
- (10) Whereas the tonne is universally used and understood as the unit of measurement for vehicle weight and is, therefore, applied in this Directive whilst recognizing that the formal unit of weight is the newton;
- (11) Whereas, in implementation of the internal market, the scope of this Directive should be extended to national transport insofar as it concerns characteristics that significantly affect the conditions of competition in the transport sector and in particular the values relating to the

<sup>(1)</sup> OJ No C 38, 8. 2. 1994, p. 3 and OJ NO C 247, 23. 9. 1995, p. 1.

<sup>(2)</sup> OJ No C 295, 22. 10. 1994, p. 72.

<sup>(3)</sup> Opinion of the European Parliament delivered on 15 November 1994 (OJ No C 341, 5. 12. 1994, p. 39), Council common position of 8 December 1995 (OJ No C 356, 30. 12. 1995, p. 13), and Decision of the European Parliament of 14 March 1996 (OJ No C 96, 4. 4. 1996, p. 233).

<sup>(4)</sup> OJ No L 2, 3. 1. 1985, p. 14. Directive as last amended by Directive 92/7/EEC (OJ No L 57, 2. 3. 1992, p. 29).

<sup>(5)</sup> OJ No L 221, 7. 8. 1986, p. 48).

<sup>(6)</sup> OJ No L 142, 25. 5. 1989, p. 3.

- maximum authorized length and width of vehicles and vehicle combinations intended for the carriage of goods;
- (12) Whereas, for the other vehicle characteristics, Member States are authorized to apply in their territory different values from those laid down in this Directive only to vehicles used in national traffic;
- (13) Whereas road trains using extensible coupling systems in practice attain a maximum length of 18,75 m when fully extended; whereas the same maximum length should be authorized for road trains using fixed coupling systems;
- (14) Whereas the maximum authorized width of 2,50 m for vehicles intended for the carriage of goods can leave insufficient internal space for the efficient loading of pallets, which has given rise to the application of different tolerances beyond that level in the legislation of the Member States concerning domestic traffic; whereas a general adaptation to the current situation is therefore necessary in order to provide for clarity in technical requirements, bearing in mind the road safety aspects of these characteristics;
- (15) Whereas if the maximum width of vehicles intended for the carriage of goods is increased to 2,55 m, that standard should also be applied to buses; whereas, in respect of buses, it is however necessary to provide for a transitional period to allow the manufacturers concerned to adapt industrial plant;
- (16) Whereas, to prevent excessive road damage and to ensure manoeuvrability, when authorizing and using vehicles preference should be given to pneumatic or equivalent suspension rather than mechanical suspension; whereas certain maximum axle loads should not be exceeded, and the vehicle must be capable of turning through 360° within certain limit values for the path followed;
- (17) Whereas Member States should be permitted, in national goods transport, to allow vehicles or vehicle combinations with dimensions deviating from those laid down in this Directive to circulate in their territory if the transport operations carried out by such vehicles are defined by this Directive as not significantly affecting international competition in the transport sector, i.e. operations carried out by specialized vehicles and operations carried out according to a modular concept;
- (18) Whereas, in the case of modular concept operations, there should be provision for a transitional period to enable a Member State to adapt its road infrastructure;
- (19) Whereas vehicles or vehicle combinations constructed applying new technologies or new concepts, according to standards which deviate from those laid down by this Directive, should be allowed to carry out local transport operations for a trial period to enable profit to be drawn from technical progress;
- (20) Whereas vehicles which entered into service before the date of implementation of this Directive and which do not comply with the dimension characteristics laid down in this Directive, owing to previously differing national provisions or methods of measurement, should be allowed for a transitional period to continue to provide transport services within the Member State in which the vehicle is registered or put into circulation;
- (21) Whereas progress has been made towards adopting Type-Approval Directives for vehicle combinations with five or six axles; whereas, the requirements regarding conformity with characteristics other than weights and dimensions as laid down in Annex II of Directive 85/3/EEC should therefore be deleted;
- (22) Whereas such a modification is also necessary in order to avoid rules conflicting with international conventions on road traffic and circulation;
- (23) Whereas in order to facilitate the monitoring of compliance with this Directive, it is necessary to ensure that vehicles carry proof of such compliance;
- (24) Whereas this Directive does not affect the obligations of the Member States concerning the deadlines for transposition into national law and for application of the Directives which this Directive replaces,

HAS ADOPTED THIS DIRECTIVE:

#### *Article 1*

1. This Directive applies to:

- (a) the dimensions of motor vehicles in categories M2, M3 and N2 and N3 and their trailers in categories 03 and 04, as defined in Annex II to Council Directive 70/156/EEC 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<sup>(1)</sup>;

<sup>(1)</sup> OJ No L 42, 23. 2. 1970, p. 1. Directive as last amended by the 1994 Act of Accession.

(b) the weights and certain other characteristics of the vehicles defined in (a) and specified in Annex I (2) to this Directive.

2. All the values of weights indicated in Annex I are valid as circulation standards and thus refer to loading conditions, not production standards, which will be defined in a later Directive.

### Article 2

For the purposes of this Directive:

- 'motor vehicle' shall mean any power-driven vehicle which travels on the road by its own means,
- 'trailer' shall mean any vehicle intended to be coupled to a motor vehicle excluding semi-trailers, and constructed and equipped for the carriage of goods,
- 'semi-trailer' shall mean any vehicle intended to be coupled to a motor vehicle in such a way that part of it rests on the motor vehicle with a substantial part of its weight and of the weight of its load being borne by the motor vehicle, and constructed and equipped for the carriage of goods,
- 'vehicle combination' shall mean either:
  - a road train consisting of a motor vehicle coupled to a trailer; or
  - an articulated vehicle consisting of a motor vehicle coupled to a semi-trailer,
- 'conditioned vehicle' shall mean any vehicle whose fixed or movable superstructures are specially equipped for the carriage of goods at controlled temperatures and whose side walls, inclusive of insulation, are each at least 45 mm thick,
- 'bus' shall mean a vehicle with more than nine seats including the driver's seat, constructed and equipped to carry passengers and their luggage. It may have one or two decks and may also draw a luggage trailer,
- 'articulated bus' shall mean a bus consisting of two rigid sections connected to each other by an articulated section. On this type of vehicle the passenger compartments in each of the two rigid sections shall be intercommunicating. The articulated section shall permit the free movement of travellers between the rigid sections. Connection and disconnection of the two sections shall be possible only in a workshop,
- 'maximum authorized dimensions' shall mean the maximum dimensions for use of a vehicle, as laid down in Annex I to this Directive,

— 'maximum authorized weight' shall mean the maximum weight for use of a laden vehicle in international traffic,

— 'maximum authorized axle weight' shall mean the maximum weight for use in international traffic of a laden axle or group of axles,

— 'indivisible load' shall mean a load that cannot, for the purpose of carriage by road, be divided into two or more loads without undue expense or risk of damage and which owing to its dimensions or mass cannot be carried by a motor vehicle, trailer, road train or articulated vehicle complying with this Directive in all respects,

— 'tonne' shall mean the weight executed by the mass of a tonne and shall correspond to 9,8 kilonewtons (kN),

All maximum authorized dimensions specified in Annex I shall be measured in accordance with Annex I to Directive 70/156/EEC, with no positive tolerances.

### Article 3

1. A Member State may not reject or prohibit the use in its territory:

- in international traffic, of vehicles registered or put into circulation in any other Member State for reasons relating to their weights and dimensions,
- in national traffic, of goods vehicles registered or put into circulation in any other Member State for reasons relating to their dimensions,

provided that such vehicles comply with the limit values specified in Annex I.

This provision shall apply notwithstanding the fact that:

- (a) the said vehicles are not in conformity with the requirements of that Member State with regard to certain weight and dimension characteristics not covered by Annex I;
- (b) the competent authority of the Member State in which the vehicles are registered or put into circulation has authorized limits not referred to in Article 4 (1) exceeding those laid down in Annex I.

2. However, paragraph 1 (a) shall not affect the right of Member States, with due regard to Community law, to require vehicles registered or put into circulation in their own territory to be in conformity with their national requirements on weight and dimension characteristics not covered by Annex I.

3. Member States may require conditioned vehicles to carry an ATP certificate or ATP certification plate provided for in the Agreement of 1 September 1970 on the international carriage of perishable foodstuffs and on the special equipment to be used for such carriage.

#### Article 4

1. Member States shall not allow the normal circulation of vehicles or vehicle combinations for the national transport of goods in their territory which are not in conformity with the characteristics set out in points 1.1, 1.2, 1.4 to 1.8, 4.2 and 4.4 of Annex I.

2. Member States may nonetheless allow circulation in their territory of vehicles or vehicle combinations for the national transport of goods freight which are not in conformity with the characteristics set out in 1.3, 2, 3, 4.1 and 4.3 of Annex I.

3. Vehicles or vehicle combinations which exceed the maximum dimensions may only be allowed to circulate on the basis of special permits issued without discrimination by the competent authorities, or on the basis of similar non-discriminatory arrangements agreed on a case-by-case basis with those authorities, where these vehicles or vehicle combinations carry or are intended to carry indivisible loads.

4. Member States may allow vehicles or vehicle combinations used for goods transport which carry out certain national transport operations that do not significantly affect international competition in the transport sector to circulate in their territory with dimensions deviating from those laid down in points 1.1, 1.2, 1.4 to 1.8, 4.2 and 4.4 of Annex I.

Transport operations shall be considered not significantly to affect international competition in the transport sector if one of the conditions under (a) and (b) is fulfilled:

- (a) the transport operations are carried out in a Member State's territory by specialized vehicles or specialized vehicle combinations in circumstances in which they are not normally carried out by vehicles from other Member States, e.g. operations linked to logging and the forestry industry;
- (b) the Member State which permits transport operations to be carried out in its territory by vehicles or vehicle combinations with dimensions deviating from those laid down in Annex I also permits motor vehicles, trailers and semi-trailers which comply with the dimensions laid down in Annex I to be used in such combinations as to achieve at least the loading length authorized in that Member State, so that every operator may benefit

from equal conditions of competition (modular concept).

The Member State concerned which has to adapt its road infrastructure in order to be able to fulfil the condition under (b) may nevertheless prohibit, until 31 December 2003 at the latest, the circulation in its territory, in national goods transport operations, of vehicles or vehicle combinations which exceed current national standards on dimensions, provided that national legislation continues to apply to all Community carriers in a non-discriminatory manner.

The Member States shall inform the Commission of the measures taken pursuant to this paragraph.

5. Member States may allow vehicles or vehicle combinations incorporating new technologies or new concepts which cannot comply with one or more requirements of this Directive to carry out certain local transport operations for a trial period. Member States shall inform the Commission thereof.

6. Member States may allow vehicles or vehicle combinations used for goods transport and registered or put into circulation before the implementation of this Directive to circulate in their territory until 31 December 2006 with dimensions exceeding those laid down in points 1.1, 1.2, 1.4 to 1.8, 4.2 and 4.4 of Annex I by virtue of differing national provisions or methods of measurement.

#### Article 5

Without prejudice to Article 4 (6):

- (a) articulated vehicles put into circulation before 1 January 1991 which do not comply with the specifications contained in points 1.6 and 4.4 of Annex I shall be deemed to comply with such specifications for the purposes of Article 3 if they do not exceed a total length of 15,50 m;
- (b) road trains, the motor vehicle of which was put into circulation before 31 December 1991 and which do not comply with the specifications contained in points 1.7 and 1.8 of Annex I, shall until 31 December 1998 be deemed to comply with such specifications for the purposes of Article 3 if they do not exceed a total length of 18,00 m.

#### Article 6

1. Member States shall take the necessary measures to ensure that Article 1 vehicles referred to in Article 1 and

complying with this Directive carry one of the proofs referred to in (a), (b) and (c):

- (a) a combination of the following two plates:
- the 'manufacturer's plate' established and attached in accordance with Directive 76/114/EEC<sup>(1)</sup>,
  - the plate relating to dimensions, in accordance with Annex III, established and attached in accordance with Directive 76/114/EEC;

(b) a single plate established and attached in accordance with Directive 76/114/EEC and containing the information on the two plates referred to in (a);

(c) a single document issued by the competent authorities of the Member State in which the vehicle is registered or put into circulation. Such document shall bear the same headings and information as the plates referred to in (a). It shall be kept in a place easily accessible to inspection and shall be adequately protected.

2. If the characteristics of the vehicle no longer correspond to those indicated on the proof of compliance, the Member State in which the vehicle is registered shall take the necessary steps to ensure that the proof of compliance is altered.

3. The plates and documents referred to in paragraph 1 shall be recognized by the Member States as the proof of vehicle compliance provided for in this Directive.

4. Vehicles carrying proof of compliance may be subject:

- as regards common standards on weights, to random checks,
- as regards common standards on dimensions, only to checks where there is a suspicion of non-compliance with this Directive.

5. The middle column of the proof of compliance relating to weights shall contain, where appropriate, the Community weight standards applicable to the vehicle in question. As regards vehicles referred to in point 2.2.2 (c) of Annex I, the entry '44 tonnes' shall be included in brackets under the maximum authorized weight of the vehicle combination.

6. Each Member State may decide, in respect of any vehicle registered or put into circulation in its territory, that the maximum weights authorized by its national

legislation shall be indicated in the proof of compliance in the left-hand column and the technically permissible weights in the right-hand column.

#### Article 7

This Directive shall not preclude the application of road traffic provisions in force in each Member State which permit the weight and/or dimensions of vehicles on certain roads or civil engineering structures to be limited, irrespective of the State of registration of such vehicles.

#### Article 8

Article 3 shall not apply in Ireland and the United Kingdom until 31 December 1998:

(a) as regards the standards referred to in points 2.2, 2.3.1, 2.3.3, 2.4 and 3.3.2 of Annex I:

- with the exception of the articulated vehicles referred to in point 2.2.2 where:

- (i) the total laden weight does not exceed 38 tonnes;
- (ii) the weight on any tri-axle at the spacing specified in point 3.3.2 does not exceed 22,5 tonnes,

- with the exception of the vehicles referred to in points 2.2.3, 2.2.4, 2.3 and 2.4, where the total laden weight does not exceed:

- (i) 35 tonnes for the vehicles referred to in points 2.2.3 and 2.2.4;
- (ii) 17 tonnes for the vehicles referred to in point 2.3.1;
- (iii) 30 tonnes for the vehicles referred to in point 2.3.3, subject to compliance with the conditions specified in that point and in point 4.3;
- (iv) 27 tonnes for the vehicles referred to in point 2.4,

(b) as regards the standard referred to in point 3.4 of Annex I, with the exception of the vehicles referred to in points 2.2, 2.3 and 2.4, where the weight per driving axle does not exceed 10,5 tonnes.

#### Article 9

As regards the standard referred to in point 1.2 (a) of Annex I, a Member State may reject or prohibit the use in its territory, until 31 December 1999, of buses with a width exceeding 2,5 m.

Member States shall inform the Commission of the measures taken pursuant to this Article. The Commission shall inform the other Member States thereof.

<sup>(1)</sup> OJ No L 24, 30. 1. 1976, p. 1. Directive as amended by Commission Directive 78/507/EEC (OJ No L 155, 13. 6. 1978, p. 31).

*Article 10*

The Directive listed in Annex IV, Part A, shall be repealed with effect from the date in Article 11, without prejudice to the obligations of the Member States concerning the deadlines for transposition set out in Annex IV, Part B.

References to the repealed Directives shall be construed as references to this Directive and shall be read in accordance with the correlation table set out in Annex V.

*Article 11*

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 17 September 1997. They shall forthwith inform the Commission thereof.

When Member States adopt these measures, they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their

official publication. The methods of making such reference shall be laid down by Member States.

2. Member States shall communicate to the Commission the text of the main provisions of domestic law which they adopt in the field covered by this Directive.

*Article 12*

This Directive shall enter into force on the day of its publication in the *Official Journal of the European Communities*.

*Article 13*

This Directive is addressed to the Member States.

Done at Brussels, 25 July 1996.

*For the Council*  
*The President*  
H. COVENEY

## ANNEX I

## MAXIMUM WEIGHTS AND DIMENSIONS AND RELATED CHARACTERISTICS OF VEHICLES

1. **Maximum authorized dimensions for the vehicles referred to in Article 1 (1) (a)**
  - 1.1 *Maximum length:*

— motor vehicle	12,00 m
— trailer	12,00 m
— articulated vehicle	16,50 m
— road train	18,75 m
— articulated bus	18,00 m
  - 1.2 *Maximum width:*

(a) all vehicles	2,55 m
(b) superstructures of conditioned vehicles	2,60 m
  - 1.3 *Maximum height (any vehicle)* 4,00 m
  - 1.4 Removable superstructures and standardized freight items such as containers are included in the dimensions specified in points 1.1, 1.2, 1.3, 1.6, 1.7, 1.8 and 4.4
  - 1.5 Any motor vehicle or vehicle combination which is in motion must be able to turn within a swept circle having an outer radius of 12,50 m and an inner radius of 5,30 m
  - 1.6 Maximum distance between the axis of the fifth-wheel king pin and the rear of a semi-trailer 12,00 m
  - 1.7 Maximum distance measured parallel to the longitudinal axis of the road train from the foremost external point of the loading area behind the cabin to the rearmost external point of the trailer of the combination, minus the distance between the rear of the drawing vehicle and the front of the trailer 15,65 m
  - 1.8 Maximum distance measured parallel to the longitudinal axis of the road train from the foremost external point of the loading area behind the cabin to the rearmost external point of the trailer of the combination 16,40 m
2. **Maximum authorized vehicle weight (in tonnes)**
  - 2.1 *Vehicles forming part of a vehicle combination*
    - 2.1.1 Two-axle trailer 18 tonnes

2.1.2	Three-axle trailer	24 tonnes
2.2	<i>Vehicle combinations</i>	
2.2.1	Road trains with five or six axles	
	(a) two-axle motor vehicle with three-axle trailer	40 tonnes
	(b) three-axle motor vehicle with two or three-axle trailer	40 tonnes
2.2.2	Articulated vehicles with five or six axles	
	(a) two-axle motor vehicle with three-axle semi-trailer	40 tonnes
	(b) three-axle motor vehicle with two or three-axle semi-trailer	40 tonnes
	(c) three-axle motor vehicle with two or three-axle semi-trailer carrying a 40-foot ISO container as a combined transport operation	44 tonnes
2.2.3	Road trains with four axles consisting of a two-axle motor vehicle and a two-axle trailer	36 tonnes
2.2.4	Articulated vehicles with four axles consisting of a two-axle motor vehicle and a two-axle semi-trailer, if the distance between the axles of the semi-trailer:	
2.2.4.1	is 1,3 m or greater but not more than 1,8 m	36 tonnes
2.2.4.2	is greater than 1,8 m	36 tonnes + 2 tonnes margin when the maximum authorized weight (MAW) of the motor vehicle (18 tonnes) and the MAW of the tandem axle of the semi-trailer (20 tonnes) are respected and the driving axle is fitted with twin tyres and air suspension or suspension recognized as being equivalent within the Community as defined in Annex II
2.3	<i>Motor vehicles</i>	
2.3.1	Two-axle motor vehicles	18 tonnes
2.3.2	Three-axle motor vehicles	— 25 tonnes — 26 tonnes where the driving axle is fitted with twin tyres and air suspension or suspension recognized as being equivalent within the Community as defined in Annex II, or where each driving axle is fitted with twin tyres and the maximum weight of each axle does not exceed 9,5 tonnes
2.3.3	Four-axle motor vehicles with two steering axles	— 32 tonnes where the driving axle is fitted with twin tyres and air suspension or suspension recognized as being equivalent within the Community as defined in Annex II, or where each driving axle is fitted with twin tyres and the maximum weight of each axle does not exceed 9,5 tonnes
2.4	<i>Three-axle articulated buses</i>	28 tonnes



3.	<b>Maximum authorized axle weight of the vehicles referred to in Article 1 (1) (b) (in tonnes)</b>	
3.1	<i>Single axles</i> Single non-driving axle	10 tonnes
3.2	<i>Tandem axles of trailers and semi-trailers</i> The sum of the axle weights per tandem axle must not exceed, if the distance (d) between the axles is:	
3.2.1	less than 1 m ( $d < 1,0$ )	11 tonnes
3.2.2	between 1,0 m and less than 1,3 m ( $1,0 \leq d < 1,3$ )	16 tonnes
3.2.3	between 1,3 m and less than 1,8 m ( $1,3 \leq d < 1,8$ )	18 tonnes
3.2.4	1,8 m or more ( $1,8 \leq d$ )	20 tonnes
3.3	<i>Tri-axles of trailers and semi-trailers</i> The sum of the axle weights per tri-axle must not exceed, if the distance (d) between the axles is:	
3.3.1	1,3 m or less ( $d \leq 1,3$ )	21 tonnes
3.3.2	over 1,3 m and up to 1,4 m ( $1,3 < d \leq 1,4$ )	24 tonnes
3.4	<i>Driving axle</i>	
3.4.1	Driving axle of the vehicles referred to in 2.2.1 and 2.2.2	11,5 tonnes
3.4.2	Driving axle of the vehicles referred to in points 2.2.3, 2.2.4, 2.3 and 2.4	11,5 tonnes
3.5	<i>Tandem axles of motor vehicles</i> The sum of the axle weights per tandem axle must not exceed, if the distance (d) between the axles is:	
3.5.1	less than 1 m ( $d < 1,0$ )	11,5 tonnes
3.5.2	1,0 m or greater but less than 1,3 m ( $1,0 \leq d < 1,3$ )	16 tonnes
3.5.3	1,3 m or greater but less than 1,8 m ( $1,3 \leq d < 1,8$ )	— 18 tonnes — 19 tonnes
	where the driving axle is fitted with twin tyres and air suspension or suspension recognized as being equivalent within the Community as defined in Annex II, or where each driving axle is fitted with twin tyres and where the maximum weight for each axle does not exceed 9,5 tonnes	

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4. **Related characteristics of the vehicles referred to in Article 1 (1) (b)**
- 4.1 *All vehicles*  
The weight borne by the driving axle or driving axles of a vehicle or vehicle combination must not be less than 25% of the total laden weight of the vehicle or vehicle combination, when used in international traffic
- 4.2 *Road trains*  
The distance between the rear axle of a motor vehicle and the front axle of a trailer must not be less than 3,00 m.
- 4.3 *Maximum authorized weight depending on the wheelbase*  
The maximum authorized weight in tonnes of a four-axle motor vehicle may not exceed five times the distance in metres between the axes of the foremost and rearmost axles of the vehicle
- 4.4 *Semi-trailers*  
The distance measured horizontally between the axis of the fifth-wheel king pin and any point at the front of the semi-trailer must not exceed 2,04 m
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## ANNEX II

**CONDITIONS RELATING TO EQUIVALENCE BETWEEN CERTAIN NON-AIR SUSPENSION SYSTEMS AND AIR SUSPENSION FOR VEHICLE DRIVING AXLE(S)**

## 1. DEFINITION OF AIR SUSPENSION

A suspension system is considered to be air suspended if at least 75 % of the spring effect is caused by the air spring.

## 2. EQUIVALENCE TO AIR SUSPENSION

A suspension recognized as being equivalent to air suspension must conform to the following:

- 2.1. during free transient low frequency vertical oscillation of the sprung mass above a driving axle or bogie, the measured frequency and damping with the suspension carrying its maximum load must fall within the limits defined in points 2.2 to 2.5;
- 2.2. each axle must be fitted with hydraulic dampers. On tandem axle bogies, the dampers must be positioned to minimize the oscillation of the bogies;
- 2.3. the mean damping ratio D must be more than 20 % of critical damping for the suspension in its normal conditions with hydraulic dampers in place and operating;
- 2.4. the damping ratio D of the suspension with all hydraulic dampers removed or incapacitated must be not more than 50 % of D;
- 2.5. the frequency of the sprung mass above the driving axle or bogie in a free transient vertical oscillation must not be higher than 2,0 Hz;
- 2.6. the frequency and damping of the suspension are given in paragraph 3. The test procedures for measuring the frequency and damping are laid down in paragraph 4.

## 3. DEFINITION OF FREQUENCY AND DAMPING

In this definition a sprung mass M (kg) above a driving axle or bogie is considered. The axle or bogie has a total vertical stiffness between the road surface and the sprung mass of K Newtons/metre (N/m) and a total damping coefficient of C Newtons per metre per second (N.s/m). The vertical displacement of the sprung mass is Z. The equation of motion for free oscillation of the sprung mass is:

$$M \frac{d^2 Z}{dt^2} + C \frac{dZ}{dt} + kZ = 0$$

The frequency of oscillation of the sprung mass F (rad/sec) is:

$$F = \sqrt{\frac{K}{M} - \frac{C^2}{4M^2}}$$

The damping is critical when  $C = C_0$ ,

where

$$C_0 = 2\sqrt{KM}$$

The damping ratio as a fraction of critical damping is  $C/C_0$ .

During free transient oscillation of the sprung mass the vertical motion of the mass will follow a damped sinusoidal path (Figure 2). The frequency can be estimated by measuring the time for as many cycles of oscillation as can be observed. The damping can be estimated by measuring the

heights of successive peaks of the oscillation in the same direction. If the peak amplitudes of the first and second cycles of the oscillation are  $A_1$  and  $A_2$ , then the damping ratio  $D$  is;

$$D = \frac{C}{C_0} = \frac{1}{2\pi} \ln \frac{A_1}{A_2}$$

'ln' being the natural logarithm of the amplitude ratio.

#### 4. TEST PROCEDURE

To establish by test the damping ratio  $D$ , the damping ratio with hydraulic dampers removed, and the frequency  $F$  of the suspension, the loaded vehicle should either:

- (a) be driven at low speed ( $5 \text{ km/hr} \pm 1 \text{ km/hr}$ ) over an 80 mm step with the profile shown in Figure 1. The transient oscillation to be analyzed for frequency and damping occurs after the wheels on the driving axle have left the step;
- or
- (b) be pulled down by its chassis so that the driving axle load is 1,5 times its maximum static value. The vehicle held down is suddenly released and the subsequent oscillation analyzed;
- or
- (c) be pulled up by its chassis so that the sprung mass is lifted by 80 mm above the driving axle. The vehicle held up is suddenly dropped and the subsequent oscillation analyzed;
- or
- (d) be subjected to other procedures insofar as it has been proved by the manufacturer, to the satisfaction of the technical department, that they are equivalent.

The vehicle should be instrumented with a vertical displacement transducer between driving axle and chassis, directly above the driving axle. From the trace, the time interval between the first and second compression peaks can be measured to obtain the frequency  $F$  and the amplitude ratio to obtain the damping. For twin-drive bogies, vertical displacement transducers should be fitted between each driving axle and the chassis directly above it.

Figure 1

#### Step for suspension tests

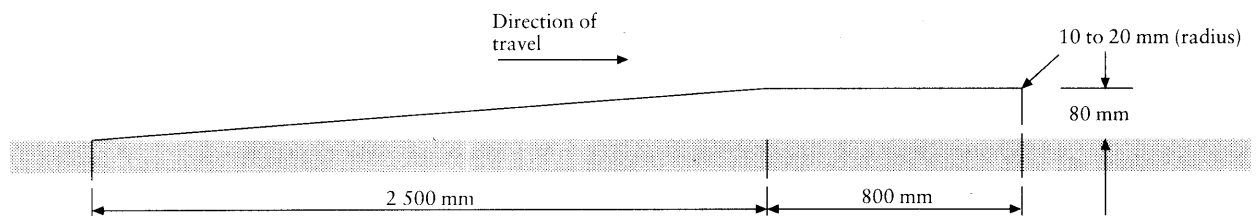
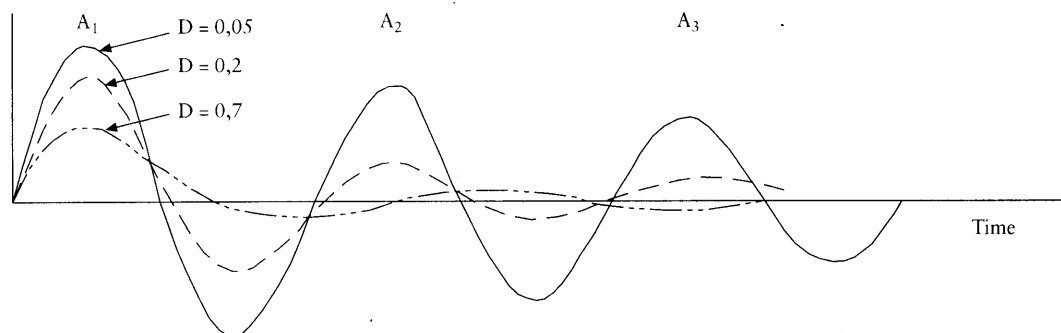


Figure 2

#### A damped transient response



## ANNEX III

## PLATE RELATING TO DIMENSIONS REFERRED TO IN ARTICLE 6 (1) (a)

- I. The plate relating to dimensions, as far as possible affixed next to the plate referred to in Directive 76/114/EEC, must contain the following data:
1. name of the manufacturer<sup>(1)</sup>;
  2. vehicle identification number<sup>(1)</sup>;
  3. length of the motor vehicle, trailer or semi-trailer (L);
  4. width of the motor vehicle, trailer or semi-trailer (W);
  5. data for the measurement of the length of vehicle combinations:
    - the distance (a) between the front of the motor vehicle and the centre of the coupling device (coupling hook or fifth wheel); in the case of a fifth wheel with several coupling points, the minimum and maximum values must be given ( $a_{\min}$  and  $a_{\max}$ );
    - the distance (b) between the centre of the coupling device of the trailer (fifth wheel ring) or of the semi-trailer (kingpin) and the rear of the trailer or of the semi-trailer; in the case of a device with several coupling points, the minimum and maximum values must be given ( $b_{\min}$  and  $b_{\max}$ ).
- The length of vehicle combinations is the length of the motor vehicle and trailer or semi-trailer placed in a straight line behind each other.
- II. The values given on the proof of compliance shall reproduce exactly the measurements carried out directly on the vehicle.

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<sup>(1)</sup> This information need not be repeated where the vehicle carries a single plate containing data on both weights and dimensions.

## ANNEX IV

## PART A

## REPEALED DIRECTIVES

(referred to in Article 10)

- Directive 83/3/EEC on the weights, dimensions and certain other technical characteristics of certain road vehicles and its successive amendments:
  - Directive 86/360/EEC
  - Directive 88/218/EEC
  - Directive 89/338/EEC
  - Directive 89/460/EEC
  - Directive 89/461/EEC
  - Directive 91/60/EEC
  - Directive 92/7/EEC
- Directive 86/364/EEC relating to proof of compliance of vehicles with Directive 85/3/EEC on the weights, dimensions and certain other technical characteristics of certain road vehicles.

## PART B

<i>Directive</i>	<i>Deadline for transposition</i>
85/3/EEC (OJ No L 2, 3. 1. 1985, p. 14)	1 July 1986 1 January 1990
86/360/EEC (OJ No L 217, 5. 8. 1986, p. 19)	1 January 1992
86/364/EEC (OJ No L 221, 7. 8. 1986, p. 48)	29 July 1987
88/218/EEC (OJ No L 98, 15. 4. 1988, p. 48)	1 January 1989
89/338/EEC (OJ No L 142, 25. 5. 1989, p. 3)	1 July 1991
89/460/EEC (OJ No L 226, 3. 8. 1989, p. 5)	1 January 1993
89/461/EEC (OJ No L 226, 3. 8. 1989, p. 7)	1 January 1991
91/60/EEC (OJ No L 37, 9. 2. 1991, p. 37)	30 September 1991
92/7/EEC (OJ No L 57, 2. 3. 1992, p. 29)	31 December 1992

ANNEX V  
CORRELATION TABLE

This Directive	85/3/EEC	86/360/EEC	86/364/EEC	88/218/EEC	89/338/EEC	89/460/EEC	89/461/EEC	91/60/EEC	92/7/EEC
Article 1 (1)	Article 1 (1)								
Article 1 (1) (a)	—								
Article 1 (1) (b)	Article 1 (1) (b)								
Article 1 (2)	Article 1 (2)								
Article 2 1st to 4th and 6th to 10th indents					Article 1 (2)				
Article 2 5th, 11th and 12th indents	—								
Article 2 last paragraph	—								
Article 3 (1)	—								
Article 3 (1) (a) (b)	Article 3 (1) (a) (b)								
Article 3 (2)	Article 3 (2)								
Article 3 (3)	—								
Article 4	—								
Article 5 (a)							Article 1 (1)		
Article 5 (b)								Article 1 (1)	
Article 6 (1 to 4)			Article 1 (1 to 4)						





This Directive	85/3/EEC	86/360/EEC	86/364/EEC	88/218/EEC	89/338/EEC	89/460/EEC	89/461/EEC	91/60/EEC	92/7/EEC
Point 2.3 to 2.3.1					Article 1 (5) (c)				
Point 2.3.2 to 2.3.3									Article 1 (1) (b to c)
Point 2.4					Article 1 (5) (c)				
Point 3 to 3.3.2	Point 3 to 3.3.2								
Point 3.4 to 3.4.1		Article 1 (3)							
Point 3.4.2 to 3.5.2					Article 1 (5) (d)				
Point 3.5.3									Article 1 (1) (d)
Point 4 to 4.2	Point 4 to 4.2								
Point 4.3					Article 1 (5) (e)				
Point 4.4							Article 1 (4)		
Annex II									Annex III
Annex III			Annex						