

[^{F1}ANNEX I

Definitions, construction and fitting requirements, application for EC type-approval, granting of EC type-approval, modifications of type and amendments to approvals, conformity of production

Textual Amendments

F1 Substituted by [Commission Directive 98/12/EC of 27 January 1998](#) adapting to technical progress [Council Directive 71/320/EEC on the approximation of the laws of the Member States relating to the braking devices of certain categories of motor vehicles and their trailers](#) (Text with EEA relevance).

1. DEFINITIONS

For the purpose of this Directive:

1.1. *'Type of vehicle with respect to the braking equipment'*

means vehicles which do not differ significantly in such essential respects as:

1.1.1. *In the case of motor vehicles*

1.1.1.1. the vehicle category, as defined in Article 1 of this Directive

1.1.1.2. the maximum mass, as defined in point 1.14

1.1.1.3. the distribution of mass among the axles

1.1.1.4. the maximum design speed

1.1.1.5. a different type of braking equipment with particular reference to the presence or otherwise of equipment for braking a trailer

1.1.1.6. the number and arrangement of the axles

1.1.1.7. the engine type

1.1.1.8. the number and ratios of gears

1.1.1.9. ratio(s) of rear drive axle(s)

1.1.1.10. the tyre dimensions

1.1.2. *In the case of trailers*

1.1.2.1. the vehicle category, as defined in Article 1 of this Directive

1.1.2.2. the maximum mass, as defined in point 1.14

1.1.2.3. the distribution of mass among the axles

1.1.2.4. a different type of braking equipment

1.1.2.5. the number and arrangement of the axles

1.1.2.6. the tyre dimensions.

1.2. *'Braking system'*

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means the combination of parts whose function is progressively to reduce the speed of a moving vehicle or to bring it to a halt, or to keep it stationary if it has already halted. These functions are specified in point 2.1.2. The equipment shall consist of the brake control, the transmission and the brake proper.

1.3. *'Graduated braking'*

means braking during which, within the normal range of operation of the equipment, during either the application or the releasing of the brakes,

- the driver can, at any time, increase or reduce the braking force through action of the control,
- the braking force acts in the same direction as the action on the control (monotonic function),
- it shall be easily possible to make a sufficiently fine adjustment to the braking force.

1.4. *'Control'*

means the part actuated directly by the driver (or in the case of some trailers, by an assistant) to supply to the transmission the energy required for braking or controlling it. This energy may be the muscular energy of the driver, or energy from another source controlled by the driver, or in appropriate cases the kinetic energy of a trailer, or a combination of these various kinds of energy.

1.5. *'Transmission'*

means the combination of components situated between the control and the brake and connecting the two operationally. The transmission may be mechanical, hydraulic, pneumatic, electrical, or mixed. Where the braking power is derived from or assisted by a source of energy independent of the driver but controlled by him, the reserve of energy in the device shall likewise be regarded as part of the transmission.

- 1.6. *'Brake'* means the part in which the forces opposing the movement of the vehicle develop. It may be a friction brake (when the forces are generated by the friction between two parts of the vehicle moving relatively to one another); an electrical brake (when the forces are generated by electromagnetic action between two parts of the vehicle moving relatively to but not in contact with one another); a fluid brake (when the forces are generated by the action of a fluid situated between two parts of the vehicle moving relatively to one another); or an engine brake (when the forces are derived from a controlled increase in the braking action of the engine transmitted to the wheels).

1.7. *'Different types of braking equipment'*

means equipment which differs in such essential respects as:

- 1.7.1. components having different characteristics
- 1.7.2. a component made of materials having different characteristics or a component different in shape or size
- 1.7.3. a different assembly of the components.

1.8. *'Braking system component'*

means one of the individual parts which, when assembled, constitute the braking equipment.

1.9. *'Continuous braking'*

means the braking of combinations of vehicles through an installation having the following characteristics:

- 1.9.1. a single control which the driver actuates progressively, by a single movement, from his driving seat
- 1.9.2. the energy used for braking the vehicles constituting the combination of vehicles is supplied from the same source (which may be the muscular energy of the driver)
- 1.9.3. the braking installation ensures simultaneous or suitably phased braking of each of the constituent vehicles of the combination, whatever their relative positions.
- 1.10. *'Semi-continuous braking'*

means the braking of combinations of vehicles through an installation having the following characteristics:

- 1.10.1. a single control which the driver can actuate progressively, by a single movement, from his driving seat
- 1.10.2. the energy used for braking the vehicles constituting the combination of vehicles is supplied from two different sources (one of which may be the muscular energy of the driver)
- 1.10.3. the braking installation ensures simultaneous or suitably phased braking of each of the constituent vehicles of the combination, whatever their relative positions.
- 1.11. *'Automatic braking'*

means braking of the trailer or trailers occurring automatically in the event of separation of components of the combination of coupled vehicles, including such separation through coupling breakage, without the effectiveness of the remainder of the combination being affected.

- 1.12. *'Inertia or "overrun" braking'*

means braking by utilising the forces generated by the trailer's moving up on the towing vehicle.

- 1.13. *'Laden vehicle'*

means, except where otherwise stated, a vehicle laden to its 'maximum mass'.

- 1.14. *'Maximum mass'*

means the maximum mass stated by the vehicle manufacturer to be technically permissible (this mass may be higher than the 'permissible maximum mass').

- 1.14.1. *'The distribution of mass among the axles'*

means the distribution of the effect of the gravity on the mass of the vehicle and/or its contents among the axles

- 1.14.2. *'Wheel/axle load'*

means the vertical static reaction (force) of the road surface in the contact area on the wheel/wheels of the axle

- 1.14.3. *'Maximum stationary wheel/axle load'*

means the stationary wheel/axle load achieved under the condition of the laden vehicle.

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1.15. *'Hydraulic braking system with stored energy'*

means a braking system where energy is supplied by a hydraulic fluid under pressure, stored in one or more accumulators fed from one or more pressure pumps each fitted with a means of limiting the pressure to a maximum value. This value shall be specified by the manufacturer.

1.16. *'Category O₃ and O₄ trailer types'*

1.16. *'Semi-trailer'*

means a towed vehicle in which the axle(s) is (are) positioned behind the centre of gravity of the vehicle (when uniformly loaded) and which is equipped with a connecting device permitting horizontal and vertical forces to be transmitted to the towing vehicle.

1.16.2. *'Full trailer'*

means a towed vehicle having at least two axles, and equipped with a towing device which can move vertically (in relation to the trailer) and controls the direction of the front axle(s), but which transmits no significant static load to the towing vehicle.

1.16.3. *'Centre-axle trailer'*

means a towed vehicle equipped with a towing device which cannot move vertically (in relation to the trailer), and in which the axle(s) is (are) positioned close to the centre of gravity of the vehicle (when uniformly loaded) such that only a small static vertical load, not exceeding 10 % of that corresponding to the maximum mass of the trailer or load of 1 000 daN (whichever is the lesser) is transmitted to the towing vehicle.

1.17. *'Retarder'⁽¹⁾*

means an additional braking system having the capability to provide and to maintain a braking effect over a long period of time without a significant reduction in performance. The term 'retarder' covers the complete system including the control device.

1.17.1. *'Independent retarder'*

means a retarder whose control device is separate from that of the service and other braking systems

1.17.2. *'Integrated retarder'⁽²⁾*

means a retarder whose control device is integrated with that of the service braking system in such a way that both retarder and service braking systems are applied simultaneously or suitably phased by operation of the combined control device.

1.17.3. *'Combined retarder'*

means an integrated retarder which in addition has a cut-out device, which allows the combined control to apply the service braking system alone.

1.18. *'Inter-urban motor-coach'*

means a vehicle designed and equipped for inter-urban transport, having no spaces specifically intended for standing passengers, but able to carry for short distances passengers standing in the gangway.

1.19. *'Long-distance touring motor-coach'*

means a vehicle designed and equipped for long-distance journeys, arranged to ensure the comfort of its seated passengers and which does not carry standing passengers.

1.20. *'Anti-lock system'*

See Annex X, point 2.1.

2. CONSTRUCTION AND FITTING REQUIREMENTS

2.1. *General*

2.1.1. *Braking equipment*

2.1.1.1. The braking equipment shall be so designed, constructed and fitted as to enable the vehicle in normal use, despite the vibration to which it may be subjected, to comply with the undermentioned requirements.

2.1.1.2. In particular, the braking equipment shall be so designed, constructed and fitted as to be able to resist the corrosion and ageing phenomena to which it is exposed.

2.1.1.3. Brake linings shall not contain asbestos

2.1.2. *Functions of the braking equipment*

The braking equipment defined in point 1.2 shall fulfil the following functions:

2.1.2.1. Service braking system

The service braking system shall enable the driver to control the movement of the vehicle and to halt it safely, speedily and effectively, whatever its speed and load, on any up or down gradient. It shall be possible to graduate this braking action. The driver shall be able to achieve this braking action from his driving seat without removing his hands from the steering control.

2.1.2.2. Secondary braking system

The secondary braking system shall make it possible to halt the vehicle within a reasonable distance in the event of the failure of the service braking system. It shall be possible to graduate this braking action. The driver shall be able to obtain this braking action from his driving seat while keeping at least one hand on the steering control. For the purpose of these requirements, it is assumed that not more than one failure of the service braking system can occur at one time.

2.1.2.3. Parking braking system

The parking braking system shall enable the vehicle to be held stationary on an up or down gradient even in the absence of the driver, the working parts being then held in the locked position by a purely mechanical device. The driver shall be able to achieve this braking action from his driving seat, subject, in the case of a trailer, to the requirements of point 2.2.2.10.

The trailer compressed air braking system and the parking braking system of the towing vehicle may be operated simultaneously, provided that the driver is able to check, at any time, that the parking brake performance of the vehicle combination, obtained by the purely mechanical action of the parking braking system, is sufficient.

2.1.3. *Pneumatic connections between motor vehicles and trailers*

2.1.3.1. In the case of a braking system operated by compressed air, the pneumatic link with the trailer shall be of the type with two or more lines. However, in all cases, all the requirements of this Directive shall be satisfied by the use of only two lines. shut-off devices which are not automatically actuated shall not be permitted. In the case

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of articulated vehicle combinations, the flexible hoses shall be a part of the towing vehicle. In all other cases, the flexible hoses shall be a part of the trailer.

2.2. Characteristics of braking systems

2.2.1. Vehicles of categories M and N

2.2.1.1. The set of braking systems with which a vehicle is equipped shall satisfy the requirements laid down for the service, secondary and parking braking systems.

2.2.1.2. The equipment providing service, secondary and parking braking may have common components, provided that they fulfil the following conditions:

2.2.1.2.1. There shall be at least two controls, independent of each other and readily accessible to the driver from his normal driving position. For all categories of vehicles, except m_2 and M_3 , every brake control (excluding a retarder control) shall be designed such that it returns to the fully-off position when released. This requirement shall not apply to a parking brake control (or that part of a combined control) when it is mechanically locked in an applied position.

2.2.1.2.2. The control of the service braking system shall be independent of the control of the parking braking system.

2.2.1.2.3. Where the service and secondary braking systems have the same control, the effectiveness of the linkage between that control and the various components of the transmission systems shall not be liable to diminish after a certain period of use.

2.2.1.2.4. Where the service and secondary braking systems have the same control, the parking braking system shall be so designed that it can be actuated when the vehicle is in motion.

This provision shall not apply where an auxiliary control permits at least partial actuation of the service braking system, as provided for in Annex II, point 2.1.3.6.

2.2.1.2.5. In the event of a breakage of any component other than the brakes (as defined in point 1.6) or the components specified in point 2.2.1.2.7, or of any other failure of the service braking system (malfunction, partial or total exhaustion of an energy reserve), the secondary braking system or that part of the service braking system which is not affected by the failure shall be able to bring the vehicle to a halt in the conditions prescribed for secondary braking.

2.2.1.2.6. In particular, where the secondary braking system and the service braking system have a common control and common transmission:

2.2.1.2.6.1. Where the service braking system is actuated by the muscular energy of the driver assisted by one or more energy reserves, the secondary braking performance shall, in the event of failure of that assistance, be capable of being ensured by the muscular energy of the driver assisted by the energy reserves, if any, which are unaffected by the failure, the force applied to the control not exceeding the prescribed maxima.

2.2.1.2.6.2. Where the forces for the service braking system and transmission depend exclusively on the use of an energy reserve controlled by the driver, there shall be at least two completely independent energy reserves, each provided with its own independent transmission; each of them may act on the brakes of only two or more wheels so selected as to be capable of ensuring by themselves the prescribed degree of secondary braking performance without endangering the stability of the vehicle during braking;

in addition, each of these energy reserves shall be fitted with a warning device as defined in point 2.2.1.13.

- 2.2.1.2.7. Certain parts, such as the pedal and its bearing, the master cylinder and its piston(s) (hydraulic systems), the control valve (hydraulic and/or pneumatic systems), the linkage between the pedal and the master cylinder or the control valve, the brake cylinders and their pistons (hydraulic and/or pneumatic systems), and the lever-and-cam assemblies of brakes, shall not be regarded as liable to breakage if they are amply dimensioned, are readily accessible for maintenance, and exhibit safety features at least equal to those prescribed for other essential components (such as the steering linkage) of the vehicle. Where the failure of any such part would make it impossible to brake the vehicle with a performance at least equal to that prescribed for the secondary braking system that part shall be made of metal or of a material with equivalent characteristics and shall not be subject to significant distortion in the normal operation of the braking equipment.
- 2.2.1.3. Where there are separate controls for the service and secondary braking systems, simultaneous actuation of the two controls shall not render both the service and secondary braking systems inoperative, either when both braking systems are in good working order or when one of them is faulty.
- 2.2.1.4. In the event of failure in a part of the transmission of the service braking system, the following conditions shall be met:
- 2.2.1.4.1. A sufficient number of wheels shall still brake by actuation of the service braking system control, whatever the vehicle load.
- 2.2.1.4.2. These wheels shall be so selected that the residual performance of the service braking system satisfies the requirements laid down in point 2.1.4 of Annex II.
- 2.2.1.4.3. However, the above requirements shall not apply to towing vehicles for semi-trailers when the transmission of the service braking system of the semi-trailer is independent of that of the towing vehicle.
- 2.2.1.5. Where use is made of energy other than the muscular energy of the driver, there need not be more than one source of such other energy (hydraulic pump, air compressor, etc.), but the means by which the device constituting that source is driven shall be as safe as practicable.
- 2.2.1.5.1. In the event of failure in any part of the transmission of a vehicle's braking systems, the supply to the part not affected by the failure shall continue to be ensured where this is required for the purpose of halting the vehicle with the degree of effectiveness prescribed for residual and/or for secondary braking. This condition shall be satisfied by means of devices which can be easily actuated when the vehicle is stationary, or by automatic means.
- 2.2.1.5.2. Furthermore, storage devices located down-circuit of this device are such that in the event of a failure in the energy supply, after four full-stroke actuations of the service braking system control under the conditions prescribed in point 1.2 of Annex IV, sections A and B, it is still possible to halt the vehicle at the fifth application with the degree of effectiveness prescribed for secondary braking.
- 2.2.1.5.3. However, for hydraulic braking systems with stored energy, these provisions can be considered to have been satisfied, provided that the requirements of point 1.2.2 of Annex IV, section C, are satisfied.

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- 2.2.1.6. The requirements of points 2.2.1.2, 2.2.1.4 and 2.2.1.5 shall be satisfied without the use of any automatic device of a kind such that its ineffectiveness might pass unnoticed because the parts which are normally in an 'at rest' position are actuated only in the event of failure of the braking system.
- 2.2.1.7. The service braking system shall act on all the wheels on the vehicle.
- 2.2.1.8. The action of the service braking system shall be appropriately distributed among the axles. In the case of vehicles with more than two axles, in order to avoid wheel-locking or glazing of the brake linings, the brake force on certain axles may be reduced to zero automatically when carrying a much reduced load, provided that the vehicle meets all the performance requirements prescribed in Annex II.
- 2.2.1.9. The action of the service braking system shall be distributed between the wheels of the same axle symmetrically in relation to the longitudinal median plane of the vehicle.
- 2.2.1.10. The service braking system and the parking braking system shall act on braking surfaces permanently connected to the wheels through components of adequate strength. It shall not be possible to disconnect a braking surface from the wheels; however, in the case of the service braking system and secondary braking system, such disconnection of the braking surfaces shall be permitted provided that it is only momentary, for instance during a change of gear, and that both the service braking system and the secondary braking system continue to operate with the prescribed degree of effectiveness. In addition, any such disconnection shall be permitted in the case of the parking braking system, provided that it is controlled exclusively by the driver from his driving seat by a system which cannot be actuated by a leak⁽³⁾.
- 2.2.1.11. Wear of the brakes shall be easily compensated by means of a system of manual or automatic adjustment. In addition, the control and the components of the transmission and of the brakes shall possess a reserve of travel and, if necessary, suitable means of compensation such that, when the brakes become heated or when the brake linings have reached a certain degree of wear, effective braking shall be ensured without immediate adjustment being necessary.
- 2.2.1.11.1. Wear adjustment shall be automatic for the service brakes. However, the fitting of automatic adjustment devices shall be optional for off-road vehicles of categories N₂ and N₃, and for rear brakes of vehicles of categories M₁ and N₁. Automatic wear adjustment devices shall be such that after heating followed by cooling of the brakes, effective braking is still ensured. In particular, the vehicle shall remain capable of normal running after the tests conducted in accordance with Annex II, point 1.3 (Type I test) and Annex II, point 1.4 (Type II test), or point 1.6 (Type III test).
- 2.2.11.2. It shall be possible to easily check this wear on service brake linings from the outside or underside of the vehicle, utilising only the tools or equipment normally supplied with the vehicle; for instance, by the provision of appropriate inspection holes or by some other means. Alternatively, acoustical or optical devices warning the driver at his driving position when lining replacement is necessary are acceptable. The removal of front and/or rear wheels shall be permitted for this purpose on category M₁ and N₁ vehicles only.
- 2.2.1.12. In hydraulic braking systems:
- 2.2.1.12.1. The filling ports of the fluid reservoirs shall be readily accessible; in addition, the containers of reserve fluid shall be so made that the level of the reserve fluid can be easily checked without the containers having to be opened. Where this last condition

is not fulfilled, a warning light shall indicate to the driver when the reserve fluid falls to a level liable to cause a failure of the braking system. The driver shall be able to check easily whether the light is functioning properly.

- 2.2.1.12.2 The failure of a part of a hydraulic transmission system shall be signalled to the driver by a device comprising a red tell-tale lamp lighting up not later than on actuation of the control and remaining lit as long as the failure persists and the ignition (start) switch is in the 'on' (run) position. However a device comprising a red tell-tale lamp lighting up when the level of the fluid in its reservoirs falls below the value specified by the manufacturer shall be admissible. The tell-tale lamp shall be visible even by daylight; the satisfactory condition of the lamp shall be easily verifiable by the driver from the driver's seat. The failure of a component of the device shall not entail total loss of effectiveness of the braking system in question.
- 2.2.1.12.3 The type of fluid to be used in the hydraulic transmission of braking systems should be identified in accordance with ISO standard 9128-1987. The relevant symbol according to Figure 1 or 2 shall be affixed in a visible position in indelible form within 100 mm of the filling ports of the fluid reservoirs, additional information may be provided by the manufacturers.
- 2.2.1.13. Any vehicle fitted with a service braking system actuated by an energy reservoir shall, where the prescribed secondary braking performance cannot be obtained by means of this braking system without the use of stored energy, be provided with a warning device — in addition to a pressure gauge where fitted — giving an optical or acoustic signal when the stored energy in any part of the system falls to a value at which, without recharging of the reservoir and irrespective of the loading conditions of the vehicle, it shall be possible to apply the service braking system control a fifth time after four full-stroke actuations and obtain the prescribed secondary braking performance (without faults in the service-brake transmission and with the brakes adjusted as closely as possible). The warning device shall be directly and permanently connected to the circuit. When the engine is running under normal operating conditions and there are no faults in the braking system, the warning device shall give no signal except during the time required for charging the energy reservoir(s) after start-up of the engine.
- 2.2.1.13.1 However, in the case of vehicles which are only considered to comply with the requirements of point 2.2.1.5.1 by virtue of meeting the requirements of point 1.2.2 of Annex IV, section C, the alarm device shall consist of an acoustic signal in addition to an optical signal. These devices need not operate simultaneously, provided that each of them meets the above requirements and the acoustic signal is not actuated before the optical signal.
- 2.2.1.13.2 This acoustic device may be rendered inoperative while the parking brake is applied and/or, at the choice of the manufacturer, in the case of automatic transmission the selector in the 'park' position.
- 2.2.1.14. Without prejudice to the requirements of point 2.1.2.3, where the use of an auxiliary energy source is essential for the operation of a braking system, the energy reserve shall be such as to ensure that, should the engine stop, or in the event of a failure of the means by which the energy source is driven, the braking performance remains sufficient to bring the vehicle to a halt in the prescribed conditions. In addition, if the muscular energy applied by the driver to the parking braking system is reinforced by some aid, the actuation of the parking braking system shall be ensured in the event of failure of that aid, if necessary by using a reserve of energy independent of that normally supplying such aid. This reserve of energy may be that intended for the service braking system. The expression 'actuation' also covers the action of releasing.

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- 2.2.1.15. In the case of a motor vehicle to which the coupling of a trailer equipped with a brake controlled by the driver of the towing vehicle is authorised, the service braking system of the towing vehicle shall be fitted with a device so designed that if the trailer braking system should fail, or the air supply line (or such other type of connection as may be adopted) between the towing vehicle and trailer should break, it will still be possible to brake the towing vehicle with the effectiveness prescribed for the secondary braking system; it is accordingly prescribed, in particular, that this device be fitted to the towing vehicle⁽⁴⁾.
- 2.2.1.16. The auxiliary equipment shall be supplied with energy in such a way that during its operation the prescribed performance values can be reached and that even in the event of damage to the source of energy, the operation of the auxiliary equipment cannot cause the reserves of energy feeding the braking systems to fall below the level indicated in point 2.2.1.13.
- 2.2.1.17. Where a trailer belongs to category O₃ or O₄, the service braking system must be of a continuous or semi-continuous type.
- 2.2.1.18. In the case of a vehicle authorised to tow a category O₃ or O₄ trailer, the braking system shall satisfy the following conditions:
- 2.2.1.18.1. When the secondary braking system of the towing vehicle is actuated, there shall also be a graduated braking action on the trailer.
- 2.2.1.18.2. Should the service braking system of the towing vehicle fail, and if this system is made up of at least two independent sections, the section or sections not affected by this failure must be able partially or fully to actuate the trailer brakes. It shall be possible to graduate this braking action; if this operation is achieved by a valve which is normally at rest, then such a valve may only be incorporated if its correct functioning can easily be checked by the driver, either from within the cab or from outside the vehicle, without the use of tools.
- 2.2.1.18.3. In the case of a fracture or leak in one of the air supply lines (or in such other type of connection as may be adopted), it shall nevertheless be possible for the driver to fully or partially actuate the trailer brakes, by means either of the service braking system control or of the secondary braking system control or of the parking braking system control, unless the fracture or leak automatically causes the trailer to be braked with the performance prescribed in point 2.2.3 of Annex II.
- 2.2.1.18.4. In the case of a two-line air supply system, the requirement in point 2.2.1.18.3 shall be considered to be met if the following conditions are fulfilled:
- 2.2.1.18.4.1. When the designated brake control of the controls mentioned in point 2.2.1.18.3 is fully actuated, the pressure in the supply line shall fall to 1,5 bar within the following two seconds.
- 2.2.1.18.4.2. When the supply line is evacuated at the rate of at least 1 bar/s, the automatic braking of the trailer shall start to operate before the pressure in the supply line falls to 2 bar.
- 2.2.1.19. The following vehicle types shall satisfy the Type IIA test described in point 1.5 of Annex II and not the Type II test described in point 1.4 of that Annex:
- inter-urban motor-coaches and long-distance touring motor-coaches of category M₃
 - and motor vehicles of category N₃ authorised to tow trailers of category O₄.

Where the maximum mass of this vehicle exceeds 26 000 kilograms, the test mass shall be limited to 26 000 kilograms, or in the case where the unladen vehicle mass exceeds the mass of 26 000 kilograms, this mass is to be taken into account by calculation.

- 2.2.1.20. In the case of a motor vehicle equipped to tow a trailer with electric braking systems, the following requirements shall be met:
- 2.2.1.20.1 The power supply (generator and battery) of the motor vehicle shall have a sufficient capacity to provide the current for an electrical braking system. With the engine running at the idling speed recommended by the manufacturer and all electrical devices supplied by the manufacturer as standard equipment of the vehicle switched on, the voltage in the electrical lines, at maximum current consumption of the electrical braking system (15 A), shall not fall below the value of 9,6 V measured at the connection. The electrical lines must not be capable of short-circuiting even when overloaded.
- 2.2.1.20.2 In the event of a failure in the towing vehicle's service braking system, where that system consists of at least two independent units, the unit or units not affected by the failure shall be capable of partially or fully actuating the brakes of the trailer.
- 2.2.1.20.3 The use of the stop-light switch and circuit for actuating the electrical braking system is permissible only if the actuating line is connected in parallel with the stop-light and the existing stop-light switch and circuit are capable of taking the extra load.
- 2.2.1.21. In the case of a pneumatic service braking system comprising two or more independent sections, any leakage between those sections at or downstream of the control shall be continuously vented to atmosphere.
- 2.2.1.22. Motor vehicles of categories M₂, M₃, N₂ and N₃ with not more than four axles shall be equipped with anti-lock systems of category 1 in accordance with the requirements of Annex X.
- 2.2.1.23. If motor vehicles not mentioned in point 2.2.1.22 are fitted with anti-lock systems, they shall comply with the requirements of Annex X.
- 2.2.1.24. In the case of a motor vehicle authorised to tow a trailer of category O₃ or O₄ the service braking system of the trailer may only be operated in conjunction with the service, secondary or parking braking system of the towing vehicle.
- 2.2.1.25. Motor vehicles authorised to tow a trailer equipped with an anti-lock system, with the exception of vehicles of categories M₁ and N₁, shall be fitted with a separate optical warning signal for the anti-lock system of the trailer, meeting the requirements of points 4.1, 4.2 and 4.3 of Annex X. They shall also be equipped with a special electric connector for the anti-lock systems of trailers, in accordance with Annex X, point 4.4 of this Directive.
- 2.2.1.26. Motor vehicles of category M₁ may be equipped with temporary-use spare wheels/tyres, provided they meet the requirements of Annex XIII.
- 2.2.2. *Vehicles of category O*
- 2.2.2.1. Trailers of category O₁ need not be fitted with a service braking system; however, if trailers of this category are equipped with a service braking system, this shall comply with the same requirements as those of category O₂.
- 2.2.2.2. Every trailer of category O₂ shall be fitted with a service braking system either of the continuous or semi-continuous type or of the inertia (overrun) type. The latter

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type shall be authorised only for trailers other than semi-trailers. However, electrical braking systems conforming to the requirements of Annex XI shall be permitted.

- 2.2.2.3. Every trailer of category O₃ or O₄ shall be fitted with a service braking system of the continuous or semi-continuous type.
- 2.2.2.4. The service braking system shall act on all the wheels of the trailer.
- 2.2.2.5. The action of the service braking system shall be suitably distributed among the axles.
- 2.2.2.6. The action of every braking system shall be distributed between the wheels of each axle symmetrically in relation to the longitudinal median plane of the vehicle.
- 2.2.2.7. The braking surfaces required to attain the prescribed degree of effectiveness shall be in constant contact with the wheels, either rigidly or through components not liable to failure.
- 2.2.2.8. Wear of the brakes shall be easily compensated by a system of manual or automatic adjustment. In addition, the control and the components of the transmission and of the brakes shall possess a reserve of travel and if necessary, suitable means of compensation such that, when the brakes become heated or when the brake linings have reached a certain degree of wear, effective braking shall be ensured without immediate adjustment being necessary.
 - 2.2.2.8.1. 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. Automatic wear adjustment devices shall be such that after heating followed by cooling of the brakes, effective braking is still ensured.

In particular, the vehicle shall remain capable of normal running after the tests conducted in accordance with Annex II, point 1.3 (Type I test) and Annex II, point 1.6 (Type III test).
 - 2.2.2.8.2. It shall be possible to easily check the wear on service brake linings from the outside or underside of the vehicle, utilising only the tools or equipment normally supplied with the vehicle; for instance, by the provision of appropriate inspection holes or by some other means.
- 2.2.2.9. The braking systems shall be such that the trailer is stopped automatically if the coupling separates while the trailer is in motion. However, this requirement does not apply to trailers with a maximum mass not exceeding 1,5 metric tons provided that the trailers are fitted, in addition to the main coupling, with a secondary coupling (chain, cable, etc.), which, in the event of separation of the main coupling, can stop the drawbar from touching the ground and provide some residual steering action on the trailer.
- 2.2.2.10. On every trailer which is required to be fitted with a service braking system, parking braking shall be ensured even when the trailer is separated from the towing vehicle. It shall be possible for a person standing on the ground to actuate the parking braking system; however, in the case of a trailer used for the carriage of passengers, it shall be possible to actuate this braking system from inside the trailer. The expression 'actuate' also covers the action of releasing.
- 2.2.2.11. If the trailer is fitted with a device enabling compressed-air actuation of the braking system, other than the parking braking system, to be cut out, the device shall be so designed and constructed that is positively restored to the 'at rest' position not later than on the resumption of the supply of compressed air to the trailer.

- 2.2.2.12. Trailers of categories O₃ and O₄ fitted with a two-line air supply system shall satisfy the conditions specified in point 2.2.1.18.3.
- 2.2.2.13. Trailers of categories O₃ and O₄ shall be equipped with anti-lock systems in accordance with the requirements of Annex X.
- 2.2.2.14. If trailers not mentioned in point 2.2.2.13 are fitted with anti-lock systems, they shall comply with the requirements of Annex X.
- 2.2.2.15. The auxiliary equipment shall be supplied with energy in such a way that during its operation, the service braking energy storage device(s) shall be maintained at a pressure of at least 80 % of the minimum towing vehicle supply pressure as prescribed in point 3.1.2.2 of the Appendix to Annex II.
- 2.2.2.15. In the event of a break or leak from the auxiliary equipment or any associated pipes, the sum of the forces exerted at the periphery of the braked wheels shall be at least 80 % of the value prescribed for the trailer concerned in 2.2.1.2.1 of Annex II. However, where such breakage or leakage affects the control signal to a special device as referred to in point 6 of the Appendix to Annex II, the performance requirements of that point shall apply.

[F²2.3. Brake linings and brake lining assemblies

- 2.3.1. Brake lining assemblies used to replace components at the end of their working life shall comply with the requirements in Annex XV for those categories of vehicles specified in point 1.1 of Annex XV.
- 2.3.2. However, where the brake lining assemblies are of a type covered by point 1.2 of the Addendum to Annex IX and are intended for fitment to a vehicle/axle/brake to which the relevant type approval document refers, they do not need to comply with Annex XV provided they fulfil the requirements in points 2.3.2.1 to 2.3.2.2.

2.3.2.1. Marking

The brake lining assemblies shall bear at least the following identifications:

- 2.3.2.1.1. Vehicle and/or component manufacturer's name or trade mark;
- 2.3.2.1.2. Make and identifying part number of the brake lining assembly as recorded in the information mentioned in point 2.3.4.

2.3.2.2. Packaging

The brake lining assemblies shall be packaged in axle sets in accordance with the following requirements:

- 2.3.2.2.1. Each package shall be sealed and constructed to show previous opening;

- 2.3.2.2.2. Each package shall display at least:

2.3.2.2.2.1. The quantity of brake lining assemblies contained;

2.3.2.2.2.2. Vehicle and/or component manufacturer's name or trade mark;

2.3.2.2.2.3. Make and identifying part number(s) of the brake lining assembly (assemblies), as recorded in the information mentioned in point 2.3.4.

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- 2.3.2.2.2. Part number(s) of the axle set, as recorded in the information mentioned in point 2.3.4.
- 2.3.2.2.2. Sufficient information for the customer to identify the vehicles/axles/brakes for which the contents are approved.
- 2.3.2.2.3. Each package shall contain fitting instructions with particular reference to ancillary parts and stating that the brake lining assemblies must be replaced in axle sets.
- 2.3.2.2.3. The fitting instructions may alternatively be supplied in a separate transparent container together with the brake lining assembly package.
- 2.3.3. Brake lining assemblies supplied to vehicle manufacturers exclusively for use during the assembly of vehicles do not need to comply with the requirements in points 2.3.2.1 and 2.3.2.2 above.
- 2.3.4. The vehicle manufacturer shall provide to the technical service and/or approval authority the necessary information in electronic format which makes the link between the relevant part numbers and the type approval documentation.

This information shall contain:

- make(s) and type(s) of vehicle
- make(s) and type(s) of brake lining
- part number(s) and quantity of the brake lining assemblies
- part number(s) of the axle set
- type approval number of the braking system of the relevant vehicle type(s).]

Textual Amendments

- F2** Inserted by [Commission Directive 2002/78/EC of 1 October 2002 adapting to technical progress Council Directive 71/320/EEC on the approximation of the laws of the Member States relating to the braking devices of certain categories of motor vehicles and their trailers.](#)

3. APPLICATION FOR EC TYPE-APPROVAL
- 3.1. The application for EC type-approval, pursuant to Article 3(4) of Directive 70/156/EEC, of a vehicle-type with regard to the braking equipment shall be submitted by the vehicle manufacturer.
- 3.2. A model for the information document is given in Annex XVIII in the case of motor vehicles or in Annex XIX in the case of trailers with other than inertia (overrun) braking systems.
- 3.3. A vehicle representative of the vehicle-type to be approved shall be submitted to the technical service responsible for conducting the approval tests.
4. GRANTING OF EC TYPE-APPROVAL
- 4.1. If the relevant documents are complied with, EC type-approval pursuant to Article 3(4) of Directive 70/156/EEC shall be granted.
- 4.2. A model for the type-approval certificate is given in Annex IX, Appendix 1.

- 4.3. An approval number in accordance with Annex VII to Directive 70/156/EEC shall be assigned to each type of vehicle approved. The same Member State must not assign the same number to another type of vehicle.
5. MODIFICATIONS OF THE TYPE-AND AMENDMENTS TO APPROVALS
 - 5.1. In the case of modifications of the type approved pursuant to this Directive, the provisions of Article 5 of Directive 70/156/EEC shall apply.
6. CONFORMITY OF PRODUCTION
 - 6.1. Measures to ensure the conformity of production shall be taken in accordance with the provisions laid down in Article 10 of Directive 70/156/EEC.]

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- (1) ^{F1}Until uniform procedures have been agreed to calculate the effects of retarders on the provisions in the Appendix to point 1.1.4.2 of Annex II, this definition does not cover vehicles fitted with regenerative braking systems.
- (2) Until uniform procedures have been agreed to calculate the effects of retarders on the provisions in the Appendix to point 1.1.4.2 of Annex II, vehicles equipped with an integrated retarder must also be equipped with an anti-lock system, acting on at least the service brakes of the axle controlled by the retarder, and on the retarder, and complying with the requirements specified in Annex X.
- (3) This point must be interpreted in the following way: the performance of the service and secondary braking systems must remain within the limits prescribed in the Directive, even during momentary disconnection.
- (4) This point is to be interpreted in the following way: it is essential, in all cases, that the service braking system should be fitted with a device (for instance a limiting valve) ensuring that the vehicle can still be braked by the service braking system, but with a performance prescribed for the secondary braking system.]

Textual Amendments

- F1** Substituted by [Commission Directive 98/12/EC of 27 January 1998 adapting to technical progress Council Directive 71/320/EEC on the approximation of the laws of the Member States relating to the braking devices of certain categories of motor vehicles and their trailers \(Text with EEA relevance\).](#)