



COMMISSION OF THE EUROPEAN COMMUNITIES -

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Proposal for a  
**EUROPEAN PARLIAMENT AND COUNCIL DIRECTIVE**

relating to special provisions for vehicles used for the carriage of passengers  
comprising more than eight seats in addition to the driver's seat  
and amending Council Directive 70/156/EEC

(presented by the Commission)

## EXPLANATORY MEMORANDUM

### A. Objective of the proposal

This proposal for a directive sets out in the context of the European system for type-approval special provisions for vehicles used for the carriage of passengers comprising more than eight seats in addition to the driver's seat (buses and coaches).

1. The framework directive regulating the European type-approval of motor vehicles in the European Union is laid down in Council Directive 70/156/EEC of 6 February 1970<sup>1</sup>, as last amended by Directive 93/81/EEC<sup>2</sup>.

At the current time, whole vehicle type-approval is only possible for cars, since it is only for this product sector that all the 45 separate directives on motor vehicle components and systems have been adopted and implemented. Whole vehicle type-approval for cars has become mandatory for new types of cars from 1 January 1996 in the Union. It will be mandatory for all new vehicles from 1 January 1998.

2. By contrast, for all other vehicle categories, certain separate directives still have to be adopted before a whole vehicle type-approval can be envisaged. In the case of buses and coaches two key directives are missing; the directive on masses and dimensions (COM(91) 239 Final of 8 July 1991), and a directive on the technical construction characteristics of buses and coaches and the fitting out of those vehicles. This Directive, which is based on Article 100a of the Treaty, draws up proposals in this area. Once these two directives have been adopted the technical conditions will exist for whole vehicle type-approval to be introduced for these vehicles; in order to implement this, however, on a mandatory basis throughout Europe, a new Council-Parliament directive will be required setting the starting date.

In the meantime most directives for categories of vehicles other than cars will remain optional (the exception is directives on emissions which are mandatory for all vehicle classes). This means that in cases where Member States have not aligned legislation with European legislation, manufacturers have the option of whether to type-approve their vehicles according to the separate directives making up the EU type-approval system or whether, alternatively, to obtain approvals to national legislation (which may be more or less severe in terms of safety requirements). There are clear advantages, however, to choosing the former approach since only this confers the benefits of free circulation within the internal market.

When in place, the system of whole vehicle type-approval for buses and coaches will offer immense advantages to manufacturers who will then be subject to one set of rules for the construction of vehicles. These vehicles will be accepted throughout the Union. In addition, costs will come down as the internal market for these vehicles is realised. This situation has obvious benefits for manufacturers, operators and users.

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<sup>1</sup> OJ No L 42, 23.2.1970, p. 1.

<sup>2</sup> OJ No L 264, 23.10.1993, p. 49.

## B. Legal basis

1. The measures are proposed on the basis of Article 100a of the Treaty of the Union. The passage of this legislation is also important because it is the last element of the "integrated" approach to improving bus and coach safety announced by Commissioner Bangemann and the then Commissioners for Transport (Matutes) and for the Internal Market (Vanni d'Archirafi) in March 1994. In this document the Commissioners announced that a twin-track approach was required; the introduction of safety belts in minibuses and coaches coupled with improved provisions on vehicle stability and safety enhancements to guard against injuries resulting from "rollover" accidents (the subject of this proposal). Agreement has been reached on the former measure; the Committee for adapting motor vehicle directives to technical progress agreed in April 1996 to introduce 2 and 3 point belts in coaches and minibuses from October 1997 thereby clearing the way for the Commission to adopt the relevant amending directives. The Commission adopted these measures in June 1996.
2. International legislation for the special technical provisions for buses and coaches is stipulated in the regulations of the United Nations Economic Commission for Europe (UN-ECE), to which nearly all Member States are party<sup>3</sup>. They are annexed to the 1958 Agreement *concerning the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts*, which is managed by WP29 of the UN-ECE in Geneva.

Regulation No 36 concerns uniform provisions for large passenger vehicles with regard to their general construction, Regulation No 52 concerns uniform provisions for small capacity public service vehicles and Regulation No 66 concerns the approval of large passenger vehicles with regard to the strength of their structure<sup>4</sup>.

These regulations, although not mandatory for the contracting parties, are used by many Member States in their own legislation either directly or as a basis for their own national law. The UN-ECE regulations are drafted by experts from each European country, whether or not they are members of the European Union. Countries outside Europe have an active participation in the drafting of regulations. These regulations are constantly updated to incorporate revisions in the light of technical progress and improvements to the safety prescriptions. In the case of regulations covering buses and coaches, it is the Group of Experts on General Safety (GRSG) which meets twice per year to examine the proposals to modify such regulations.

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<sup>3</sup> Only Ireland is currently not a member. Procedures are underway to enable the Community to accede to the 1958 Agreement on the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts (COM(95) 723 final).

<sup>4</sup> Member States applying Regulation R36: F, ES, UK, L, FIN.  
Member States applying Regulation R52: F, ES, D, B, L, FIN.  
Member States applying Regulation R66: F, ES, UK, D, B, L, NL, S, FIN.  
These Regulations are also applied "de facto" by some other Member States which have not signed them.

Until now the technical provisions for buses and coaches have been stipulated in national laws. Although a significant number of Member States apply the UN-ECE regulations directly, or use them as a basis of their own national law, actual national laws differ from one Member State to another and constitute a barrier to free circulation of these vehicles within the European Union.

The text is relevant for the EEA Treaty.

### C. Background

In 1993, the Commission requested the Motor Vehicle Working Group (MVWG)<sup>5</sup> to help it draft a proposal for a directive relating to buses and coaches which would improve road and passenger safety and remove existing technical barriers to the free movement of these vehicles. This Working Group has assisted the Commission with the preparation of the Annexes used for the drafting of the present proposal for a directive.

In order to establish the draft directive, the Motor Vehicle Working Group examined a number of possible approaches. One approach it considered was to draft the technical prescriptions without reference to any existing national or international regulation. This was regarded as inappropriate by the experts. Another alternative, consisting of a modular selection of the prescriptions for different types of buses and coaches, was rejected by a large majority of the Group. Another approach was to take as a basis for the draft directive the prescriptions given in UN-ECE regulations R36, R52, R66 and an additional draft Regulation on large double-decker passenger vehicles. By an overwhelming majority, the advice of the MVWG Experts was to use UN-ECE regulations as a basis for the discussions by the Group. In the discussions, the Commission services made it clear, however, that it did not feel totally bound by these technical regulations and that it would propose different prescriptions whenever necessary in order to ensure higher and achievable levels of safety.

#### I. **KEY ISSUES IN THE PROPOSAL**

1. The prescriptions of the draft directive have been thoroughly discussed in the Motor Vehicle Working Group, where the approach was to reach the highest possible degree of harmonization.

Owing to the specific nature of buses and coaches, a range of specific characteristics must be taken into account when establishing the technical criteria to be included in a directive on the special prescriptions for these vehicles.

These prescriptions cover the following:

- the distribution of the combined weight of the passengers, so as to avoid overloading individual axles;
- the number, type and location of the service and emergency exits;

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<sup>5</sup> An advisory Group of Member States and interested Industry Groups, as well as consumers and operators.

- the technical specifications governing service doors, including power-operated doors;
- the approved access steps incorporated in the vehicles;
- the access to service doors, emergency exits, gangways and seats;
- the provision of handrails and handholds for standing passengers;
- the minimum seat size and spacing between seats;
- the stability of the vehicle; and
- the strength of the superstructure.

These elements relate specifically to buses and coaches and therefore must be dealt with in the directive to improve the road and passenger safety of such vehicles.

2. The draft directive includes provisions permitting the approval of bus and coach bodies as separate technical units, as distinct from the integrated vehicle (body + chassis) itself. This extension of the proposal was added following a specially convened meeting of the MVWG in February 1996 to discuss this issue. The Member States and Industry were strongly in favour of the additional technical prescriptions which would reduce administrative type-approval costs for bespoke body builders (of whom there are about 75 in Europe) significantly below what they would have been if full type-approval had been required for each body-chassis combination. Such a system would have been unfavourable to body builders - most of whom are SMEs and whose business is geared to producing customised products to suit operators' needs. By allowing bus and coach bodies to be approved as separate technical units and laying down appropriate installation provisions, the directive contains the flexibility necessary to respond to the different economic needs of the various companies (i.e. the integrated manufacturers as well as the body builders) in this sector.
3. In spite of considerable effort, agreement could not be reached on three significant technical points. In particular the United Kingdom, which operates deregulated bus services, has insisted on certain technical provisions which are not desired by other countries. In addition, allegations have also been made in the public domain that the draft directive, if applied as desired by a number of experts, would result in the removal of the double-decker bus from the roads, because the increased costs of complying with the directive would render these vehicles uneconomic to operate.

Similar arguments were made regarding the effects of the draft directive on "minibuses" and "midibuses", two types of vehicle which have also found a market niche in the UK and Ireland.

The three key controversial technical issues are the following:

(a) *Minimum number of service doors for vehicles designed for buses*

The majority of national experts considered that the number of service doors on buses should increase with the passenger capacity of the vehicle. In addition to facilitating movement into and out of the vehicle, the main reason

for more service doors is that in case of an accident it would be easier to evacuate the vehicle quickly through large service doors rather than through narrow emergency exits.

The minority view expressed was that evacuation could be operated through the emergency exits and that the number of service doors should be left for operators to decide upon, according to their methods of controlling the payment of the fare by the passengers.

(b) *Spacing between seats in different buses and coaches (seat pitch)*

It should be recalled that nearly all Member States, including the United Kingdom and Ireland, have established in their national legislation a minimum seat pitch for these vehicles\*. Furthermore, all national experts considered that the minimum distance between seats should be different in the case of vehicles which include spaces for standing passengers (urban use) than in case of vehicles with no provision for standing passengers (interurban use).

The majority considered that for long distance travel (coaches) the space should be at least 75 cm. This minimum distance encourages long distance passengers to remain seated and belted - and therefore safe - avoiding the situation where those passengers who may be uncomfortably seated choose to stand in the aisle. For urban buses it was argued that the distance between seats should be at least 65 cm - the minimum distance to allow passengers reasonable space and to permit access to seats adjacent to the window. In addition, it was argued, safety would be enhanced by these minimum provisions.

By contrast, a minority considered it is more important to have more passengers seated than to have fewer passengers comfortably seated. To achieve this, the experts proposed therefore a minimum seat pitch of 60 cm for smaller vehicles (i.e. minibuses with up to 16 passengers) and 65 cm for all other vehicles.

(c) *Minimum seat width for vehicles not exceeding an overall width of 2.3 m (mini/midibuses)*

It should be recalled that nearly all Member States, including the United Kingdom and Ireland, have established in their national legislation a minimum seat width for these vehicles.

The United Kingdom and Ireland have a large quantity of different types of buses. Reflecting this diversity, these countries have seen the development of a market for minibuses and midibuses which are often built on commercial truck chassis. Those vehicles, which are narrower than traditional buses, are nonetheless frequently preferred by operators, not least because of the narrow road width in certain regions.

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\* Only Austria does not have such legislation.

The majority of national experts considered that the minimum seat width should be 45 cm for all kinds of buses and coaches, in order to have enough space to ensure passenger safety, to make the seat accessible and to ensure passenger comfort.

The view of the United Kingdom and Ireland is that a minimum seat width of 45 cm is acceptable only for vehicles with an overall width of more than 2.3 m. For vehicles not exceeding an overall width of 2.3 m, they consider that a seat width of 40 cm would be sufficient. For these narrower vehicles, a seat width of 40 cm would permit the installation of four seats in each row, instead of three seats if the minimum required dimension were 45 cm. These experts argued in addition that eliminating a longitudinal row of seats would have a major impact on vehicle operation, economy and safety, since more passengers would be required to stand.

The Commission will come forward with a report that investigates the safety aspects related to the differences in seat width and make any proposals to amend the existing provisions as appropriate.

4. In the light of this situation, the Commission has analysed four possible approaches with a view to finding an acceptable compromise:

- Choose the text supported by the majority of the Member States. This solution has the obvious advantage in that it could probably obtain a qualified majority in the Council. On the other hand, it fails to take account of market requirements of two Member States, arising from a continuation of tradition and the development of new services in these countries due to deregulation, and because of this, it could be expected to be very controversial. Such a decision would also have a negative impact on the manufacturers of these vehicles. Furthermore, considering that this Directive will initially be optional, Member States will have the choice to apply this Directive or to maintain their national legislation. However, as soon as whole EC type-approval for buses and coaches becomes mandatory, this particular Directive will replace national legislation. At the point when it becomes mandatory those two Member States would face the prospect of not being able to type-approve vehicles previously in conformity with their national legislation.
- Exclude from the scope of the draft directive certain specific vehicles. In such a case, the disadvantages mentioned above are avoided. National measures would prevail for the excluded vehicles. On the other hand, those Member States wanting harmonization for these vehicles would be disadvantaged since no European type-approval would exist for them.
- Exclude from the scope of the draft directive the two controversial issues of seat pitch and seat width, which in the opinion of these two Member States are not related to safety. The majority of Member States, however, consider these two issues are related to safety, and all but one have legislation in this area; consequently if this Directive does not include prescriptions on these two elements, then Member states will certainly maintain their national rules and the Internal Market for buses and coaches will not be achieved. Furthermore, there would be a risk of Member States insisting that technical prescriptions additional to those in the directive be met as a condition for European type-approval.

Choose the text supported by the majority of the Member States with a derogation permitting vehicles with certain specific national characteristics to obtain type-approval, but permitting also any other Member State, at their own discretion, to refuse the registration of such vehicles on their territory. This derogation would apply only to vehicles which do not affect competition between Member States.

In weighing these options, the Commission has been motivated above all by the desire to achieve the maximum degree of harmonization consistent with the establishment of the single market, while at the same time acknowledging that in specific circumstances it may not be possible to achieve total harmonization in a single step.

In this context, the Commission also took note of the situation that was reached in the Directive on motorcycle power output Directive 95/1/EC. During the conciliation phase under Article 189(b), the Institutions agreed that there would be no limit in the power output of motorcycles (the Commission had originally proposed a limit of 74 kW), but that Member States would be free to impose a limit of 74 kW and to refuse the sale, registration and entry into service on their territory of such motorcycles. The Commission services will undertake further studies on the issue of the link between power output and accidents and, if necessary, will make further proposals on the matter.

5. In the light of this, the question arises whether a step-by-step approach could be justified in the case of buses and coaches. In this particular case, given the diversity of national regulations and traditions, the Commission believes it would be justified to envisage a derogation from the harmonized rules for certain vehicle types (fourth approach). This derogation should be strictly limited however - to double-deck buses and to buses not exceeding an overall width of 2.3 m (midi and minibuses). The Commission considers that such a derogation should not cover vehicles used in interurban transport, in order to avoid distortions of competition where international transport is concerned. For urban vehicles this potential distortion in competition does not exist.

As regards the scope of the derogation, the Commission considers it should include a provision for Member States to prohibit the sale, the first registration and all successive registrations and also the entry into service of vehicles that are subject to the prescriptions of the derogation. This approach has an additional advantage in that its flexibility in application does not prejudice how the European market for these vehicles might evolve in the future. If, as the UK argues, there will be an increasing market in the EU for midi and minibuses with technical prescriptions analogous to those applied in the UK, as Member States deregulate their bus services, then, logically, there will be a lesser risk that Member States will avail themselves of the option to prohibit the registration of such vehicles.

The derogation should be reviewed no later than 1 January 2005 on the basis of a report to be drawn up by the Commission services.



The above solution will ensure that the degree of harmonization will be as large as possible - in the case of the Member States which will not accept the derogation, harmonization will be total - and it will permit other Member States, at their own discretion, and within clearly defined and circumscribed limits, to maintain their own system of transport and their own specifications for the construction of certain vehicles.

## II. ACCESSIBILITY

Another key element of the Directive concerns the provisions regarding accessibility for people with reduced mobility, including wheelchair users, to buses and coaches. The Commission considers that, in accordance with its Transport and Social Policies, every effort must be made to provide for such accessibility.

Two approaches to this question are possible. One approach would be to establish general provisions applying to all vehicles including the technical requirements for systems to assist the boarding and alighting of wheelchair users, where the vehicle is equipped with these boarding aids. It would then be up to National and Local Authorities to decide, in accordance with the principle of subsidiarity, to choose the kind of solution to the accessibility problem in their own way, by selecting the types of vehicles they want in order to improve accessibility of public transport in each region.

A second approach would be for the Commission to give a clear policy orientation towards the provision of accessible public urban and interurban bus services on grounds both of social policy<sup>6</sup> and on grounds of safety since more accessible transport means also safer transport. In this context it should be noted that most accidents occur when passengers board or alight from a bus.

Both these approaches would require the full technical specifications for different buses and coaches to be established in the Directive.

After reflecting carefully on this matter, the Commission has come to the view that it is essential that the Directive be forward-looking and progressive, the more so because it will not come into force, on an optional basis, before 2000 at the earliest and, in all likelihood, will not become mandatory before 2005. In addition, it seems certain that Member States will progressively establish more technical regulations governing the accessibility of buses and coaches, as the demand for safe and accessible transport develops.

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<sup>6</sup> It is important to recall also that the Commission has submitted to the Council a proposal for a Council directive on minimum requirements to improve the mobility and the safe transport of workers with reduced mobility (COM(91) 539 final - SYN 327, OJ No C 15, 21.1.1992, p. 18). This proposes one of the three possible measures:

- either by built-in technical aids such as lowered floors, lifting platforms, etc.,
- or by technical aids external to the transport vehicle, for example at the stop or platform, such as mobile ramps, low-lift elevating platform trucks, folding platforms, etc.,
- or by personal assistance from specially trained transport company staff.

The Commission does not consider at an initial stage that it would be either feasible or opportune to require that all new types of vehicle complying with the provisions of the Directive should be accessible to persons of reduced mobility from the year 2000. The Commission does consider, however, that it is realistic to require that passenger carrying vehicles designed to provide scheduled urban and interurban services should be accessible. This can be justified on grounds of safety and also because a number of Member States<sup>7</sup> have legislated in this area. In the absence of harmonized rules, therefore, there is a risk of impediments to the furthering of the internal market.

With regard to the definition of accessibility, account has to be taken of the different geographical terrain in different European cities, which would make it impossible for a general requirement for low-floor buses to be used in urban environments. The Commission does consider, however, that where a low-floor bus cannot be employed, a conventional bus with an accessibility aid listed in Annex VII of the Directive should be required.

The Directive establishes, therefore, that the technical prescriptions of new vehicles designed to provide scheduled urban and interurban services approved in accordance with the Directive shall be either low-floor buses (for urban environments) or other accessible vehicles. Reflecting this choice, the Directive has been drafted to require Member States to choose between these options.

Low-floor buses are clearly the most efficient way for Member States to improve accessibility and operational efficiency for faster boarding and alighting for urban environments. The Commission, conscious of the future of low-floor buses to improve public transport, has been working on a program of European Cooperation on Science and Technology (COST). One of these actions is COST 322, the objective of which is to gather information on current European operating experience on low-floor buses, including carefully monitored trials, in order to draw up guidance for best practice.

COST 322 has elaborated a report with a list of main recommendations for low-floor buses. Most of these are contained in the draft Directive and relate to all - not just low-floor - buses. In particular the recommendations of the COST 322 project concerning the height of the initial step and the maximum slope of the gangway forward of the rear axle(s) are contained in the draft.

In the event that low-floor buses cannot be used, the Commission considers that the prescriptions for vehicles other than lower-floor buses (Annex I part C) coupled with a ramp or a lift, should be required so as to ensure access for persons of reduced mobility including wheelchair users.

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<sup>7</sup> For example, in the UK, the Disability Discrimination Act of 1995, gives powers to the government to make regulations for different transport modes, including access for wheelchair users. In Sweden, the Act on Facilities for the Disabled, of 1975, vehicles used for public transport shall be adapted for use by disabled passengers. Ordinances implementing the Act were issued in 1982 and most are compulsory for operators. With respect to public bus services, new vehicles carrying more than 19 passengers with a Gross Vehicle Weight of 800 kg are covered.

The Commission considers that there are strong arguments for extending the requirement to ensure accessibility to vehicles designed to be used to provide scheduled interurban passenger transport services, and in particular Class II vehicles. This will ensure that new vehicles meeting the technical requirements of the proposed optional type-approval directive will progressively be introduced into the bus and coach fleet, thereby ensuring that over time the fleet of vehicles used for scheduled interurban services will become fully accessible. However, the Commission does not at present have the requisite expertise to determine the best technical solution for such vehicles. In this connection, it will shortly submit a proposal laying down the technical requirements for such vehicles on the basis of a full study.

Accordingly, Article 4(1) of the Directive stipulates that such vehicles, if belonging to Class I, shall contain one of the boarding aids laid down in Annex VII of the Directive in order to benefit from free circulation in the Community. However, as regards vehicles of other classes the Commission does currently not have the necessary expertise to determine the most appropriate solutions for ensuring accessibility in relation to scheduled interurban services.

### III. LONGITUDINAL SEATS

The Commission is aware of concerns about longitudinal (side-facing) seating, which many observers consider unsafe, and will undertake research to analyse what specific provisions should apply, including the possibility of eliminating such seating in vehicles not accepting standees. The Commission will also examine in this review the question of whether restraint devices, i.e. seat belts, could make this seating safer.

#### D. Consultation of interested parties

##### 1. Industry position

Industry has been consulted and represented at each meeting of the advisory Motor Vehicle Working Group, which has been consulted by the Commission to assist in drafting this Directive. Chassis and complete vehicle manufacturers, which are exclusively large firms, are in agreement with the proposal. Bus and coach body manufacturers are mostly medium-sized businesses; the possibility of permitting type-approval of separate technical units ensures that their needs have been fully taken into consideration.

In general, therefore, industry is in agreement with the proposal. In the particular case of the British manufacturers and operators, however, there are different views. With the derogation included in the proposal, however, UK manufacturers will be able to continue to build according to actual vehicle configuration.

##### 2. Member States positions

Experts of Member States were represented during the discussions of the Motor Vehicle Working Group. The majority of Member States' experts are in agreement with the technical prescriptions of the proposal. The UK and Ireland have expressed reserves, despite the derogation included in the proposal which will benefit those two countries.

The provisions on accessibility are likely to be controversial in the Council; a number of Member States believing that such matters should, under the principle of subsidiarity, be left to Member States.

### 3. Parliament position

The European Parliament has shown a keen interest in the proposal. Different services of the Commission have been invited to participate at meetings with MEPs in order to explain the background to the draft. The issue that has been of particular interest to the Parliament has been the accessibility for persons of reduced mobility.

### E. Content of the proposal

This Directive shall remain optional until such time as the framework Directive 92/53/EEC becomes mandatory for buses and coaches in all Member States. Whenever a manufacturer chooses to avail himself of the provisions of this Directive, he shall be permitted to do so, and other Member States shall give free circulation to vehicles whose technical requirements meet the conditions of this Directive.

As soon as framework Directive 92/53/EEC becomes mandatory for M<sub>2</sub> & M<sub>3</sub> vehicles<sup>8</sup>, separate directives, including this one, will become mandatory as well.

#### 1. Articles

Generally speaking, the Articles are similar to those of the other separate directives adopted under framework Directive 70/156/EEC, and apply the provisions of the latter. The only exceptions are Articles 3, which establish the derogation, and Article 4, which establishes the provisions on accessibility and Articles 6 and 7 concerning the Committee for Adaptation to Technical Progress the Annexes of the Directive. Considering that adjustments of the directives to technical progress should be implemented swiftly, these Articles allow the Commission to carry out adjustments subject to prior consultation of the Member States through an advisory committee rather than a regulatory committee.

#### 2. Technical Annexes

The technical annexes to the draft Directive cover all the specific aspects of the construction of these vehicles that must be taken into account to improve safety that are not dealt with in the other separate directives. The draft is largely based on the requirements and standards set out in the regulations of the UN Economic Commission for Europe, which are used by most of the Member States either directly or as a basis for national legislation. Although these regulations are updated on a regular basis, the experts meeting within the Working Group have introduced the changes needed to achieve better safety requirements.

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<sup>8</sup> M<sub>2</sub>: Vehicles used for the carriage of passengers, comprising more than eight seats in addition to the driver's seat, and having a maximum mass not exceeding five tonnes.

M<sub>3</sub>: Vehicles used for the carriage of passengers, comprising more than eight seats in addition to the driver's seat, and having a maximum mass exceeding five tonnes.

Although Article 1 of the draft refers to vehicles of categories M<sub>2</sub> and M<sub>3</sub> (see footnote 7), the scope of Annex I does not include prison vehicles, ambulances and off-road vehicles. The requirements apply to vehicles designed for use by police, security and armed forces only to the extent that the provisions are compatible with the intended use and function of these vehicles. The same criterion shall apply to specific vehicles such as mobile libraries, mobile chapels and mobile hospitality units.

This Annex is in three parts.

Part A contains the requirements common to all buses and coaches.

Part B contains the requirements for "low-floor" buses.

Part C contains the requirements for vehicles other than "low-floor" buses.

The draft provides for five classes of vehicle, defined as follows:

(i) For vehicles having a capacity exceeding 22 passengers:

Class I: Vehicles constructed with areas for standing passengers, to allow frequent passenger movement.

Class II: Vehicles constructed principally for the carriage of seated passengers, and designed to allow the carriage of standing passengers in the gangway and in a limited area.

Class III: Vehicles constructed exclusively for the carriage of seated passengers.

(ii) For vehicles having a capacity not exceeding 22 passengers:

Class A: Vehicles designed to carry seated and standing passengers.

Class B: Vehicles without provision for standing passengers.

The rest of Annex I sets out the definitions and the procedures governing applications for type-approval, the granting of approvals, modification of the types and amendments to approvals, and conformity of production, with reference to the procedures established by framework Directive 70/156/EEC. The Annex also contains specific requirements for buses and coaches as a whole. These requirements concern the following: load distribution between axles and loading conditions, area available for passengers, number of passengers accommodated, communication with the driver, interior lighting, and provisions relating to handholds and handrails for standing passengers.

The requirements relating to vehicle stability warrant specific mention. Vehicles must remain fully stable on their wheels on a platform at an angle of 35 degrees (28 degrees for double-decker vehicles) from the horizontal. An alternative calculation method shall be permissible, provided that the validity of the method is established on the basis of a comparative test with a similar vehicle.

Concerning exits, the draft Directive establishes provisions governing their number (which increases with the number of passengers the vehicle can carry), dimensions and accessibility to those exits. These provisions cover service doors, emergency doors, emergency windows and escape hatches. The criterion which the draft has followed with respect to siting is to guarantee that in all circumstances (including overturning of the vehicle or blocking of the service doors in the event of an accident) exits are available in the three directional axes of the space. Technical requirements are set out in the draft for both manually operated and power-operated exits.

With respect to the space for seated passengers, the draft sets the minimum seat width and minimum spacing of seats facing in the same direction or in the opposite direction, and gives the procedure to verify the access to every seat.

Finally, Annex I stipulates requirements for ensuring accessibility for all persons, including those with reduced mobility. The draft Directive establishes that Class I vehicles must have priority seats reserved near the driver for people with reduced mobility, special means of communication with the driver and special handholds and handrails adapted for such people. In the case of Class I vehicles designed to transport one or more passengers in wheelchairs, the draft Directive defines the space provided for the wheelchair, its anchorage, its access to the special platform and where it should be placed. Low-floor buses are considered accessible vehicles if one service door and the platform are large enough to allow the entry and stationing of a wheelchair.

The administrative provisions, including the information document and EEC type-approval certificate, are defined in Annex II, in accordance with framework Directive 70/156/EEC.

Annex III contains all the explanatory diagrams relating to the requirements set out in the other Annexes.

Annex IV defines superstructure requirements in terms of strength. In the event of a roll-over accident, the strength must be sufficient to preserve a survival area and avoid the crushing of the passengers by the superstructure. This Annex applies to single-deck vehicles of Classes II and III, except vehicles used for urban transport where the likelihood of overturning, whilst still possible, is considerably reduced.

Annex V provides guidelines for measuring the closing forces of power-operated doors, to reduce the possibility of injury.

Annex VI sets out special requirements for buses and coaches having a capacity not exceeding 22 passengers. The special requirements are justified in that these vehicles carry fewer passengers than their larger counterparts, and certain provisions can therefore be defined differently.

Annex VII defines technical requirements for vehicles equipped with boarding and alighting aids for wheelchair users. The proposal covers ramps, kneeling systems and lifts, but specifies that other aids may be accepted provided they are safe and effective.

Annex VIII lays down specific requirements for double-deck buses and coaches where the general prescriptions of Annex I cannot apply.

Annex IX sets out requirements relating to wiring used in the construction of these vehicles, which must be of a quality such that it cannot cause fire.

Annex X defines the requirements for the type-approval of the body work as a separate technical unit and the type-approval of a vehicle fitted with a body work already approved as a separate technical unit.

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THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE  
EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular  
Article 100a thereof,

Having regard to the proposal from the Commission<sup>9</sup>,

Having regard to the opinion of the Economic and Social Committee<sup>10</sup>,

Acting in accordance with the procedure laid down in Article 189b of the Treaty<sup>11</sup>,

Whereas the internal market comprises an area without internal frontiers, in which the free  
movement of goods, persons, services and capital is ensured; whereas it is important to  
adopt measures to that end;

Whereas the technical requirements which motor vehicles must satisfy pursuant to national  
laws relate, *inter alia*, to special provisions for vehicles used for the carriage of passengers  
comprising more than eight seats in addition to the driver's seat;

Whereas those requirements differ from one Member State to another;

Whereas owing to differences in technical prescriptions, these vehicles have been  
prevented from circulating freely in the Community; whereas the adoption of harmonized  
requirements by all of the Member States in place of their national regulations will facilitate  
the proper functioning of the internal market for these vehicles;

Whereas it is therefore necessary that all Member States adopt the same requirements  
either in addition to or in place of their existing rules in order, in particular, to allow the  
EC type-approval procedure which is the subject of 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>12</sup>, as last amended by  
European Parliament and Council Directive 97/27/EC<sup>13</sup>, to be applied in respect of each  
type of vehicle;

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<sup>9</sup> OJ No

<sup>10</sup> OJ No

<sup>11</sup> OJ No

<sup>12</sup> OJ No L 42, 23.2.1970, p. 1.

<sup>13</sup> OJ No L 233, 25.8.1997, p. 1.



Whereas this Directive is one of the separate Directives of the EC type-approval procedure, which has been established by Directive 70/156/EEC;

Whereas, in accordance with the principles of subsidiarity and proportionality established by Article 3b of the Treaty, the objective of this Directive, namely the avoidance of barriers to trade within the Community through the application of EC vehicle type-approval for such vehicles, cannot be adequately attained by the Member States on account of the scale and impact of the action proposed in the sector in question, and may therefore be better attained at Community level; whereas this Directive lays down only minimum rules for the attainment of those objectives and does not go beyond what is necessary to that end;

Whereas it is desirable to take account of the existing technical requirements adopted by the UN Economic Commission for Europe (UN-ECE) in its Regulation No 36 ("Uniform Provisions concerning the Approval of Large Passenger Vehicles with regard to their General Construction"), its Regulation No 52 ("Uniform Provisions concerning the Construction of small-capacity Public Service Vehicles") and its Regulation No 66 ("Uniform Provisions Concerning the Approval of Large Passenger Vehicles with regard to the Strength of their Superstructure"), which are annexed to the Agreement of 20 March 1958 concerning the adoption of uniform conditions for approval and reciprocal recognition of approval for motor vehicle equipment and parts;

Whereas, while the principal aim of this Directive is to guarantee the safety of passengers, it is also necessary to provide technical prescriptions to allow accessibility for persons of reduced mobility to the vehicles covered by the Directive, in accordance with the Commission's Transport and Social Policies; whereas every effort must be made to improve access to these vehicles; whereas, therefore, new vehicles, type-approved in accordance with this Directive and designed for the operation of scheduled urban and interurban services, should be accessible to people of reduced mobility in order to facilitate their free movement; whereas it is possible even at this stage to translate this principle into concrete requirements for vehicles of Class I, whilst appropriate technical solutions for the other classes designed to provide for scheduled urban and interurban services have to be evaluated and the relevant provisions of the Directive confirmed or adapted, if necessary, on the basis of a report by the Commission; whereas, pursuant to the principle of subsidiarity, Member States should be encouraged to make vehicles other than such vehicles more accessible to passengers with reduced mobility;

Whereas, to take account of certain specific regulations existing in some Member States, provision should be made for certain limited derogations from the general standards; whereas these derogations concern the number of service doors, the seat width and the spacing between seats for certain vehicles; whereas other Member States should have the right to refuse the registration, sale and entry into service of vehicles whose technical prescriptions derogate in this way from the main provisions of the Directive;

Whereas technical progress requires rapid adaptation of the technical requirements set out in the Annexes to this separate Directive; whereas it is appropriate to assign this task to the Commission in order to simplify and speed up the procedure; whereas in all instances where the European Parliament and the Council confer upon the Commission the power to implement rules drawn up in respect of those vehicles, provision should be made for prior consultation between the Commission and the Member States within an Advisory Committee;

## HAVE ADOPTED THIS DIRECTIVE:

### Article 1

For the purposes of this Directive:

- "Vehicle" means any motor vehicle of category M<sub>2</sub> and M<sub>3</sub>, as defined in Annex II A of Directive 70/156/EEC.
- "Separate technical unit" means a device as defined in Article 2 of Directive 70/156/EEC.

### Article 2

Member States may not refuse EC type-approval or national type-approval for a vehicle, or refuse or prohibit the sale, registration, entry into service or use of a vehicle, on grounds relating to provisions for vehicles used for the carriage of passengers and comprising more than eight seats in addition to the driver's seat, if the requirements of the Annexes are satisfied.

### Article 3

1. Member States may grant EC type-approval to vehicles whose construction characteristics meet the derogations specified in paragraphs 7.6.1.1.bis, 7.6.1.4.bis, 7.7.8.1.bis, 7.7.8.1.1.bis, 7.7.8.4.1.bis of Annex I and 7.6.1.1 bis and 7.6.1.4 bis of Annex VIII for vehicles of Class I, A, and B not exceeding an overall width of 2.3 m and for Class I double-decker vehicles.
2. Member States may prohibit the sale, the first and all successive registrations and the entry into service of vehicles benefiting from the derogations described in paragraph 1.
3. Paragraphs 1 and 2 shall be reviewed, if necessary, by the Commission on the basis of a report to be drawn up by it in 2003.

### Article 4

1. Vehicles of Class I designed to provide scheduled urban and interurban services shall conform either to the technical provisions laid down in Annex I, Part B or to those of Annex I, Part C, and to the requirements for at least one of the boarding aids specified in Annex VII.
2. Where necessary, the Commission shall submit to the European Parliament and the Council, on the basis of a full study, a proposal to amend this Directive in order to lay down the technical requirements for Class II vehicles used for scheduled urban and interurban services.
3. Member States shall have freedom to choose the most appropriate solution to achieve improved accessibility in vehicles other than those referred to in paragraph 1.

### Article 5

Item 52 of Annex IV, Part I, of Directive 70/156/EEC is replaced by the following text:

	Subject	Directive	OJ No	Applicability									
				M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	O <sub>1</sub>	O <sub>2</sub>	O <sub>3</sub>	O <sub>4</sub>
52	Buses and Coaches	97/ /EC	L		x	x							

### Article 6

Any amendment necessary to adapt the requirements of the Annexes to technical progress shall be adopted in accordance with the procedure laid down in Article 7.

### Article 7

The Commission shall be assisted by the committee established under Article 13(1) of Directive 70/156/EEC.

The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft within a time-limit which the Chairman may lay down according to the urgency of the matter, if necessary by taking a vote.

The opinion shall be recorded in the minutes; in addition, each Member State shall have the right to ask to have its position recorded in the minutes.

The Commission shall take the utmost account of the opinion delivered by the committee. It shall inform the committee of the manner in which its opinion has been taken into account.

### Article 8

1. Member States shall adopt and publish the laws, regulations and administrative provisions necessary to comply with this Directive not later than 30 June 1999. They shall forthwith inform the Commission thereof.

When Member States adopt these provisions, these shall contain a reference to this Directive or shall be accompanied by such reference at the time of their official publication. The procedure for such reference shall be adopted by Member States.

2. Member States shall communicate to the Commission the texts of the main provisions of national law which they adopt in the field covered by this Directive.
3. As from 30 June 1999, Member States may not prohibit the initial entry into service of vehicles which conform to this Directive.

Member States shall apply the provisions referred to in paragraph 1 with effect from 1 October 1999.

Article 9

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

Article 10

This Directive is addressed to the Member States.

Done at Brussels,

For the European Parliament  
The President

For the Council  
The President

## LIST OF ANNEXES

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Part B: Specific requirements for low-floor buses,

Part C: Specific requirements for vehicles other than low-floor buses.

Appendix 1: Verification of static tilting limit by means of calculation.

ANNEX II: Information document and EC Type-Approval Certificate.

Appendix 1: Information document.

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Sub-Appendix 2 Information document for a body type

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ANNEX IV: Strength of Superstructure.

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Sub-appendix 1: Calculation of Total Energy  $E^+$

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ANNEX VI: Special requirements for vehicles having a capacity not exceeding 22 passengers.

ANNEX VII: Requirements for technical devices facilitating the access to buses for people of reduced mobility.

ANNEX VIII: Special requirements for double-decker buses.

ANNEX IX: Electrical conductor test.

ANNEX X: Requirements for the body as a Separate Technical Unit type-approval and type-approval of a vehicle fitted with a body already approved as a Separate Technical Unit.

## ANNEX I

### SCOPE, DEFINITIONS, APPLICATION FOR EC VEHICLE TYPE-APPROVAL OR SEPARATE TECHNICAL UNIT TYPE-APPROVAL OF A BODY, MODIFICATIONS OF VEHICLE OR BODY TYPE , CONFORMITY OF PRODUCTION AND REQUIREMENTS

This Annex, which contains the requirements for buses and coaches, is divided in three parts as follows:

- Part A: Requirements common to all vehicles,
- Part B: Requirements for low-floor buses,
- Part C: Requirements for vehicles other than low-floor buses.

The numbering of paragraphs is common for the three parts.

#### PART A REQUIREMENTS COMMON TO ALL VEHICLES

##### 1. SCOPE

- 1.1 This Directive applies to every single deck, double deck, rigid or articulated vehicle of category M2 or M3 as defined in Annex II A of Council Directive 70/156/EEC.
- 1.2 The requirements of this Directive do not apply to the following vehicles:
  - 1.2.1 prison vehicles;
  - 1.2.2 vehicles specially designed for the carriage of injured or sick persons (ambulances);
  - 1.2.3 off road vehicles.
- 1.3 The requirements of this Directive apply to the following vehicles only to the extent that it is compatible with their intended use and function:
  - 1.3.1 vehicles designed for use by police, security and armed forces;
  - 1.3.2 vehicles which contain seating intended solely for use when the vehicle is stationary, but which are not designed to carry more than 8 persons (excluding the driver) when in motion. Examples of these include mobile libraries, mobile churches and mobile hospitality units. The seats in such vehicles which are designated for use when the vehicle is in motion must be clearly identified to users.

## 2 DEFINITIONS

For the purpose of this Directive:

2.1 "Vehicle" means a vehicle of categories M2 and M3 designed and constructed for the carriage of seated or seated and standing passengers.

2.1.1 For vehicles having a capacity exceeding 22 passengers in addition to the driver, there are three classes of vehicles:

2.1.1.1 "Class I" Vehicles constructed with areas for standing passengers, to allow frequent passenger movement;

2.1.1.2 "Class II" Vehicles constructed principally for the carriage of seated passengers, and designed to allow the carriage of standing passengers in the gangway and/or in an area which does not exceed the space provided for two double seats;

2.1.1.3 "Class III" Vehicles constructed exclusively for the carriage of seated passengers;

A vehicle may be regarded as belonging in more than one Class. In such a case it may be approved for each Class to which it corresponds;

2.1.2 For vehicles having a capacity not exceeding 22 passengers in addition to the driver, there are two classes of vehicles:

2.1.2.1 "Class A": Vehicles designed to carry standing passengers; a vehicle of this Class has seats and shall have provision for standing passengers.

2.1.2.2 "Class B": Vehicles not designed to carry standing passengers; a vehicle of this Class has no provision for standing passengers.

2.1.3 "Articulated vehicle" means a vehicle which consists of two or more rigid sections which articulate relative to one another; the passenger compartments of each section intercommunicate so that passengers can move freely between them; the rigid sections are permanently connected so that they can only be separated by an operation involving facilities which are normally only found in a workshop.

2.1.4 "Low-floor bus" is a vehicle in which at least 35% of the area available for standing passengers (or in its forward section in the case of articulated vehicles, or in its lower deck in the case of double-decker vehicles) forms an area without steps and includes access to at least one service door. Such service door shall be suitable for the admission and discharge of persons of reduced mobility.

2.2 "Definition of type(s)"

2.2.1 "Vehicle type" means a category of vehicles which do not essentially differ in the following aspects:



- body work manufacturer;
- chassis manufacturer;
- vehicle category (M<sub>2</sub>,M<sub>3</sub>);
- vehicle concept (Classes I, II, III, A and B);
- maximum technical mass of the vehicle;
- body work concept (single/double deck, articulated, low-floor);
- capacity limit ( $\leq 12$ ,  $> 12$  and  $\leq 22$ ,  $> 22$  and  $\leq 45$ ,  $> 45$  and  $\leq 50$ ,  $> 50$  and  $\leq 70$ ,  $> 70$  and  $\leq 100$ ,  $> 100$  and  $\leq 140$ ,  $> 140$  passengers);
- body make and body type if the body has been approved as a separate technical unit.

2.2.2 "Body type" for the purposes of type-approval as a separate technical unit means a category of bodies which do not essentially differ in the following aspects:

- body work manufacturer;
- body work make;
- vehicle concept (Classes I, II, III, A and B);
- body work concept (single/double deck, articulated, low-floor);
- capacity limit ( $\leq 12$ ,  $> 12$  and  $\leq 22$ ,  $> 22$  and  $\leq 45$ ,  $> 45$  and  $\leq 50$ ,  $> 50$  and  $\leq 70$ ,  $> 70$  and  $\leq 100$ ,  $> 100$  and  $\leq 140$ ,  $> 140$  passengers);
- mass of the completely equipped vehicle bodywork, differing by 10%;
- specified types of vehicle on which the type of the bodywork can be installed.

2.3 "Approval of a vehicle or a separate technical unit" means the approval of a vehicle type, of a body type, or a superstructure-type as defined in paragraph 2.2 , paragraph 2.2.A of this Annex or paragraph 2.2 of Annex IV, with regard to the constructional features specified in this Directive.

2.4 "Service door" means a door intended for use by passengers in normal circumstances with the driver seated.

2.5 "Double door" means a door affording two, or the equivalent of two, access passages.

2.6 "Sliding door" means a door which can be opened or closed only by sliding it along one or more rectilinear or approximately rectilinear rails.

2.7 "Emergency door" means a door intended for use by passengers as an exit only exceptionally, and in particular in an emergency.

2.8 "Emergency window" means a window, not necessarily glazed, intended for use as an exit by passengers in an emergency only.

2.9 "Double or multiple window" means an emergency window which, when divided into two or more parts by imaginary vertical line(s) (or plane(s)), exhibits two or more parts respectively, each of which complies as to dimensions and access with the requirements applicable to a normal emergency window.

- 2.10 "Escape hatch" means a roof opening intended for use as an exit by passengers in an emergency only.
- 2.11 "Emergency exit" means an emergency door, emergency window or escape hatch.
- 2.12 "Exit" means a service door or emergency exit.
- 2.13 "Floor or deck" means that part of the body work whose upper surface supports standing passengers, the feet of seated passengers and the driver, and may support the seat mountings.
- 2.14 "Gangway" means the space providing access by passengers from any seat or row of seats to any other seat or row of seats or to any access passage; it does not include:
- 2.14.1 the space required to accommodate the feet of seated passengers;
- 2.14.2 the space above the surface of any step or staircase, or
- 2.14.3 any space which affords access solely to one seat or row of seats.
- 2.15 "Access passage" means the passage through a doorway to a gangway.
- 2.16 "Driver's compartment" means the space intended for driver's exclusive use and containing the driver's seat, the steering wheel, controls, instruments and other devices necessary for driving or operating the vehicle.
- 2.17 "Unladen kerb mass (MK)" means the mass of the vehicle with bodywork in running order, unoccupied and unladen but including coolant, oils, fuel, tools, spare wheel and driver. The mass of the driver is assessed at 75 kilograms and the fuel tank(s) is (are) filled to 90% of the capacity specified by the manufacturer.
- 2.18 "Technically permissible maximum mass - (MT)" means the technically permissible maximum mass stated by the manufacturer.
- 2.19 "Passenger" means a person other than the driver or a member of the crew. For the purposes of this Directive, "passengers with reduced mobility" means all passengers who have special difficulty when using public transport, especially elderly people, disabled people and, among these, wheelchair users. Reduced mobility does not necessarily imply any form of medical impairment.
- 2.20 "Member of the crew" means a person assigned to operate as a co-driver or the possible assistant.
- 2.21 "Passenger compartment" means the space intended for passengers' use excluding any space occupied by fixed appliances such as bars, kitchenettes, toilets, or luggage/goods compartments.

- 2.22 "Power-operated service door" means a service door which is operated exclusively by energy other than muscular energy and the opening and closing of which is controlled by the driver.
- 2.23 "Automatically operated service door" means a power-operated service door which can be opened (other than by means of emergency controls) only after a control is operated by a passenger and after activation of the controls by the driver, and which closes again automatically.
- 2.24 "Starting prevention device" means an automatic device which prevents the vehicle being driven away from rest.
- 2.25 "Driver operated service door" means a service door which normally is opened and closed by the driver.

3. APPLICATION FOR EC TYPE-APPROVAL OF A VEHICLE, OF A BODY AS A SEPARATE TECHNICAL UNIT OR A SUPERSTRUCTURE AS A SEPARATE TECHNICAL UNIT

3.1 The application for EC vehicle type-approval or for EC separate technical unit type-approval or for EC type-approval of a vehicle fitted with a body already approved as a separate technical unit pursuant to Article 3(4) of Directive 70/156/EEC of a vehicle type or of a body type or of a vehicle type fitted with a body already approved as a separate technical unit with regard to its special provisions for vehicles used for the carriage of passengers comprising more than eight seats in addition to the driver's seat shall be submitted by the manufacturer.

3.2 A model for the information document is given in:

- Sub-Appendix 1: for a vehicle type,
- Sub-Appendix 2: for a body type, and
- Sub Appendix 3: for a vehicle type fitted with a body already approved as a separate technical unit
- Sub-Appendix 4: for a superstructure

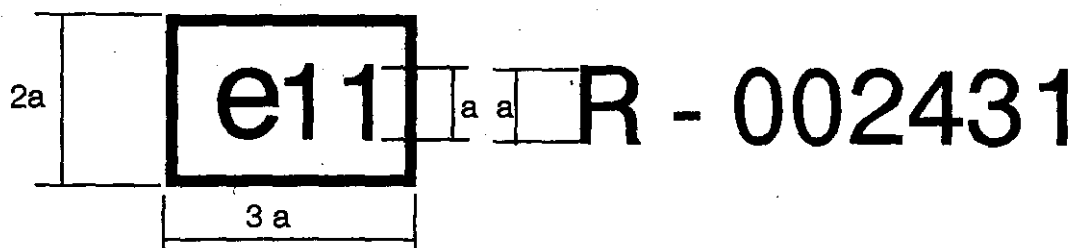
3.3 A vehicle, a body or a superstructure representative of the type to be approved fitted with the special equipment shall be submitted to the Technical Service responsible for the type-approval tests.

4. GRANTING OF EC VEHICLE TYPE-APPROVAL

4.1 If the relevant requirements are satisfied, EC type-approval pursuant to Article 4(3) of Directive 70/156/EEC shall be granted.

- 4.2 A model for the EC type-approval certificate is given in Annex II, Appendix 2:
- Sub-Appendix 1: for a vehicle type,
  - Sub-Appendix 2: for a body type,
  - Sub-Appendix 3: for a vehicle type fitted with a body already approved as a separate technical unit
  - Sub-Appendix 4: for a superstructure.
- 4.3 An approval number in accordance with Annex VII to Directive 70/156/EEC shall be assigned to each type of vehicle , type of body or type of superstructure approved, considering that Section 1 should be modified to read "...5 for Sweden, 12 for Austria, 17 for Finland, 23 for Greece..." and considering that Section 2 shall be completed with the character "B" if the type-approval corresponds to a body or with the character "R" if the type-approval corresponds to a superstructure. The same Member State shall not assign the same number to another type of vehicle, type of body or type of superstructure.
- 4.4 Markings
- 4.4.1 In the case of a body approved as a separate technical unit, the body shall bear:
- 4.4.1.1 the trademark or trade name of the manufacturer of the body,
  - 4.4.1.2 the manufacturer's trade description,
  - 4.4.1.3 the EC type-approval number specified in paragraph 4.3.
- 4.4.2 In the case of a structure approved as a separate technical unit, the structure shall bear:
- 4.4.2.1 a rectangle surrounding the lowercase letter "e" followed by the distinguishing letters or number of the Member State granting the approval:
    - '1' for Germany
    - '2' for France
    - '3' for Italy
    - '4' for Netherlands
    - '5' for Sweden
    - '6' for Belgium
    - '9' for Spain
    - '11' for United Kingdom
    - '12' for Austria
    - '13' for Luxembourg
    - '17' for Finland
    - '18' for Denmark
    - '21' for Portugal
    - '23' for Greece
    - 'IRL' for Ireland

- 4.4.2.2 in the vicinity of rectangle the "base approval number" contained in section 4 of the type-approval number referred to in Annex VII to Directive 70/156/EEC, preceded by the two figures indicating the sequence number assigned to the most recent major technical amendment to Directive 74/61/EEC on the date EEC type-approval was granted. In this Directive, the sequence number is 00;
- 4.4.2.3 the additional symbol "R" indicating that the separate technical unit is approved as a superstructure.
- 4.4.2.4 Example of EC type-approval mark of a superstructure is given below(\*):



- 4.4.3 These marks must be clearly legible and indelible, even when the body and the structure are fitted on a vehicle.
5. MODIFICATION OF THE TYPES AND AMENDMENTS TO APPROVAL
- 5.1 In the case of modifications of the vehicle type, of a type of bodywork or a type of superstructure in particular 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.
7. REQUIREMENTS
- 7.1 Load distribution between axles and loading conditions
- 7.1.1 The load distribution of a stationary vehicle on level ground shall be determined in two conditions:
- 7.1.1.1 unladen, as specified in 7.1.3 and

(\*) The above type-approval mark affixed to a vehicle shows that the vehicle type concerned has, with regard to the strength of the superstructure (R), been type-approved in the United Kingdom (E 11) under type-approval number 002431. The first two digits of the type-approval number indicate that the type-approval was granted in accordance with the requirements of this Directive in its original form.

7.1.1.2 laden, as specified in 7.1.4.

7.1.2 The front axle or axles shall carry not less than the percentage of mass of the vehicle shown in the table below:

Loading conditions	CLASS I & A		CLASS II		CLASS III & B	
	RIGID	ARTIC	RIGID	ARTIC	RIGID	ARTIC
UNLADEN	20	20	25	20	25	20
LADEN	25	20	25	20	25	20

7.1.3 Unladen, for the purpose of this paragraph (7.1), and paragraph 7.3, means the vehicle in the condition described in paragraph 2.17 (unladen kerb mass MK) with the addition of 75 kg for the mass of the crew if there is a crew seat as described in paragraph 7.7.1.8.

7.1.4 Laden, for the purpose of this paragraph (7.1), means the vehicle unladen as described in paragraph 7.1.3 with the addition of a mass Q on each passenger seat, a number, corresponding to the authorised number of standing passengers, of masses Q uniformly distributed over the area S1, a mass equal to B (kg) uniformly distributed in the baggage compartments and, where appropriate, a mass equal to BX uniformly distributed over the surface area of the roof equipped for the carriage of baggage.

7.1.5 The values of Q for the different Classes of vehicle are specified in paragraph 7.3 below.

7.1.6 B(kg) shall have a numerical value not less than  $100 \times V$  (where V is the total volume of baggage compartments, in  $m^3$ ).

7.1.7 BX shall exert specific load of not less than  $75 \text{ kg/m}^2$  over the whole surface area of the roof equipped for the carriage of luggage.

## 7.2 Area available for passengers

7.2.1 The total surface area  $S_0$  available for passengers is calculated by deducting from the total area of the floor of the vehicle:

7.2.1.1 the area of the driver's compartment;

7.2.1.2 the area of steps at doors and the area of any other step with a depth of less than 30 cm, and the area swept by the door and its mechanism when it is operated;

7.2.1.3 the area of any part over which the vertical clearance is less than 135 cm measured from the floor, according to paragraph 7.7.8 and disregarding permitted intrusions. In the case of vehicles to which paragraph 7.7.1.9 applies, this dimension may be reduced to 120 cm;

- 7.2.1.4 the area of any part of the vehicle to which access by passengers is prevented as defined in paragraph 7.9.4;
- 7.2.1.5 the area of any space reserved solely for the carriage of goods or luggage and from which passengers are excluded;
- 7.2.1.6 the area required to provide a clear works area at services;
- 7.2.1.7 the floor area occupied by any staircase in the vehicle.
- 7.2.2 The surface area  $S_1$  available for standing passengers is calculated by deducting from  $S_0$ :
  - 7.2.2.1 the area of all parts of the floor in which the slope exceeds the maximum permissible values as determined in paragraph 7.7.6;
  - 7.2.2.2 the area of all parts which are not accessible to a standing passenger when all the seats are occupied;
  - 7.2.2.3 the area of all parts where the clear height above the floor is less than 190 cm or -in the case of the section of the gangway situated above and behind the rear axle, and the attaching parts thereof - less than 180 cm (handholds shall not be taken into account in this connection);
  - 7.2.2.4 the area forward of a vertical plane passing through the centre of the seating surface of the driver's seat (in its rearmost position) and through the centre of the exterior rear-view mirror mounted on the opposite side of the vehicle;
  - 7.2.2.5 the area 30 cm in front of any seat;
  - 7.2.2.6 any part of the surface of the floor (e.g. a corner or edge) on which it is not possible to place any part of a rectangle of 400 mm x 300 mm;
  - 7.2.2.7 any surface which is not capable of circumscribing a rectangle of 400 mm x 300 mm;
  - 7.2.2.8 in vehicles of Class II, the area in which standing is not allowed.
- 7.3 Number of passengers accommodated
  - 7.3.1 There shall be on the vehicle a number (P) of seating places which conform to the requirements of paragraph 7.7.8. If the vehicle is of Class I or Class II and A, the number P shall be at least equal to the number of square metres of floor available for passengers and crew (if any) ( $S_0$ ) rounded down to the nearest whole number.

7.3.2 The total number N of passenger and crew accommodation for vehicles shall comply with the following inequalities:

$$N \leq P + \frac{S_1}{S_{sp}}, \text{ and } N \leq \frac{MT - MK - 100V - BX}{Q}$$

- P : Number of seating places (paragraph 7.3.1);  
 S<sub>1</sub> : Surface area (m<sup>2</sup>) (paragraph 7.2.2) available for standing passengers;  
 S<sub>sp</sub> : Space provided for one standing passenger (m<sup>2</sup>/passenger) (see below);  
 MT : Technical maximum mass (kg) (paragraph. 2.18);  
 MK : Unladen kerb mass (kg) (paragraph 2.17);  
 V : total volume of luggage compartment (m<sup>3</sup>) (paragraph 7.1.6);  
 BX shall exert specific load of not less than 75 kg/m<sup>2</sup> over the whole roof surface equipped for the carriage of luggage (paragraph 7.1.7.);]  
 Q : Given mass of one passenger (kg) (table in 7.3.2);  
 In the case of vehicles of Class III and B S<sub>1</sub> = 0.  
 The value of Q and S<sub>sp</sub> for each Class of vehicle is as follows:

Class	Q(kg) mass of one place for passenger	S <sub>sp</sub> (m <sup>2</sup> /passenger) space provided for one standing passenger
Class I & A(**)	68	0.125
Class II	71(*)	0.15
Class III & B	71(*)	No standing passenger

(\*) Including 3 kg for hand luggage.

(\*\*) If a vehicle of Class II, Class III or Class B is approved as a Class I or Class A vehicle, the mass of luggage carried in luggage compartments accessible only from outside the vehicle is not taken into account.

7.3.3 When the vehicle is loaded with a number N of passengers and crew and a mass B + BX of baggage the masses on each axle and the mass of the vehicle shall not exceed the value of their respective maximum technical masses.

7.3.4 The vehicle shall be clearly marked in a manner visible on the inside in the vicinity of the front door in letters or pictograms not less than 15 mm high and numbers not less than 25 mm high, with



- 7.3.4.1 the maximum number of seating places the vehicle is designed to carry, -
- 7.3.4.2 the maximum number of standing places, if any, the vehicle is designed to carry and,
- 7.3.4.3 the maximum number of wheelchairs which the vehicle is designed to carry, if any, and
- 7.3.4.4 the mass of luggage which may be carried when the number of passengers and crew in the vehicle are not causing the technical maximum mass of the vehicle, or of any axle, to be exceeded:
  - 7.3.4.4.1 in luggage compartments (see paragraph 7.1.6),
  - 7.3.4.4.2 on the roof if equipped for the carriage of baggage (see paragraph 7.1.7).
- 7.4 Stability test
  - 7.4.1 The stability of a vehicle shall be such that the point at which overturning occurs would not be passed if the surface on which the vehicle stands were tilted to both sides in turn at an angle of 35 degrees from the horizontal.
  - 7.4.2 For the purposes of the above test, the vehicle shall be unladen as described in paragraph 7.1.3, with the addition of:
    - 7.4.2.1 Loads equal to Q (as defined in paragraph 7.3.2) shall be placed on each passenger and crew seat. If the vehicle is intended for standees or with a crew member who is not seated, the centre of gravity of the loads Q or 75 kg representing them, shall be uniformly distributed over the standee or crew area respectively, at a height of 875 mm. Where a vehicle is equipped to carry luggage on the roof, a uniformly distributed mass of not less than that prescribed in paragraph 7.1.7, representing such luggage, shall be secured to the roof. The other luggage compartment shall not contain any luggage.
    - 7.4.3 The height of any step used to prevent a wheel of the vehicle from slipping sideways on a tilt test rig shall not be greater than two-thirds of the distance between the surface upon which the vehicle stands before it is tilted and that part of the rim of that wheel which is nearest to the surface when the vehicle is loaded in accordance with paragraph 7.4.2.
    - 7.4.4 During the test, no parts of vehicle which are not intended to come into contact in normal use shall do so, nor shall any part become damaged or deranged.
    - 7.4.5 Alternatively, a calculation method can be used to show that the vehicle will not overturn under the conditions described in paragraphs 7.4.1 and 7.4.2. Such a calculation shall take into account the following parameters:
      - 7.4.5.1 masses and dimensions;
      - 7.4.5.2 height of centre of gravity;

- 7.4.5.3 spring rates;
- 7.4.5.4 vertical and horizontal tyre rates;
- 7.4.5.5 characteristics of the control of air pressure in the air springs;
- 7.4.5.6 position of the centre of moments,
- 7.4.5.7 torsion resistance of the body.

The method of calculation is described in Appendix 1 to this Annex.

## 7.5 Protection against fire risks

### 7.5.1 Engine compartment

- 7.5.1.1 No flammable sound-proofing material or material liable to become impregnated with fuel, lubricant or other combustible material shall be used in the engine compartment unless the material is covered by an impermeable sheet.
- 7.5.1.2 Precautions shall be taken, either by a suitable layout of the engine compartment or by the provision of drainage orifices, to avoid, so far as possible, the accumulation of fuel, lubricating oil or any other combustible material in any part of the engine compartment.
- 7.5.1.3 A partition of heat resisting material shall be fitted between the engine compartment or any other source of heat (such as a device designed to absorb the energy liberated when a vehicle is descending a long gradient, e.g. a retarder or a device for heating the interior of the body other, however, than a device functioning by warm water circulation) and the rest of the vehicle. All fixings, clips, gaskets etc. used in conjunction with the partition shall be fire resistant.
- 7.5.1.4 A heating device operating other than by hot water may be provided in the passenger compartment if it is encased in material designed to resist the temperatures generated by the device, emits no toxic fumes and is positioned such that no passenger is likely to come into contact with any hot surface.

### 7.5.2 Fuel-feed systems

- 7.5.2.1 No apparatus used for the fuel feed shall be placed in the driver's compartment or the passenger compartment.
- 7.5.2.2 Fuel lines and all other parts of the fuel-feed system shall be accommodated in positions on the vehicle where they have the fullest reasonable protection.
- 7.5.2.3 Twisting or bending movements and vibration of the vehicle structure or the power unit shall not subject the fuel lines to abnormal stress.

7.5.2.4 The unions of pliable or flexible pipes with rigid parts of the fuel-feed system shall be so designed and constructed as to remain leak proof in the various conditions of use of the vehicle, despite ageing, twisting or bending movements, or vibration of the vehicle structure or the power unit.

7.5.2.5 Fuel leaking from any part of the system shall be able to flow away freely to the road surface, but never onto the exhaust system.

### 7.5.3 Electrical equipment and wiring

7.5.3.1 All cables shall be well insulated and all cables and electrical equipment shall be able to withstand the temperature and humidity conditions to which they are exposed. In the engine compartment, particular attention shall be paid to their suitability to withstand the environmental temperature and the effects of all likely contaminants.

7.5.3.2 No cable used in an electrical circuit shall carry a current in excess of that acceptable for such a cable in the light of its mode of installation and the maximum ambient temperature.

7.5.3.3 Every electrical circuit feeding an item of equipment other than the starter, the ignition circuit (positive ignition), the glow-plugs, the engine-stopping device, the charging circuit and the battery earth connection shall include a fuse or a circuit breaker. They may however, be protected by a common fuse or a common circuit-breaker, provided that its rated capacity does not exceed 16 A.

7.5.3.4 All cables shall be well protected and shall be held securely in position in such a way that they cannot be damaged by cutting, abrasion or chafing.

7.5.3.5 Where the voltage exceeds 100 Volts RMS (root mean square) in one or more electrical circuits in a vehicle, a manually-operated isolating switch which is capable of disconnecting all such circuits from the main electrical supply shall be connected in each pole of that supply which is not electrically connected to earth, and shall be located inside the vehicle in a position readily accessible to the driver, provided that no such isolating switch shall be capable of disconnecting any electrical circuit supplying the mandatory external vehicle lights. This paragraph does not apply to high tension ignition circuits or to self-contained circuits within a unit of equipment on the vehicle.

7.5.3.6 All electrical cables shall be so located that no part can make contact with any fuel line or any part of the exhaust system, or be subjected to excessive heat, unless suitable special insulation and protection is provided, as for example to a solenoid operated exhaust valve.

7.5.3.7 All electrical cables shall comply with the prescriptions of Annex IX.

### 7.5.4 Batteries

7.5.4.1 All batteries shall be well secured and easily accessible.

7.5.4.2 The battery compartment shall be separated from the passenger compartment and driver's compartment and ventilated to outside air.

7.5.4.3 The battery terminals shall be protected against the risk of short circuit.

7.5.5 Fire extinguishers and first-aid equipment

7.5.5.1 The vehicle shall be fitted with one or more fire extinguishers, one being near the driver's seat. Vehicles of Classes A & B shall be equipped with at least one extinguisher having a minimum test rating of 8A 34B to CEN Standard EN 3 Part 1 and at least a capacity of 2 kg. Vehicles of Classes I, II & III shall be equipped with at least one extinguisher having a minimum test rating of 21A 113B to CEN Standard EN 3 Part 1 and at least a capacity of 6 kg. The extinguishers shall not contain halogenated hydrocarbons as the extinguishant.

7.5.5.2 Space shall be provided for the fitting of one or more first-aid kits. The space provided shall be not less than 7 dm<sup>3</sup>, the minimum dimension shall not be less than 80 mm.

7.5.5.3 Fire extinguishers and first aid kits may be secured against theft or vandalism (e.g. in an internal locker or behind breakable glass), provided that the locations of these items are clearly marked and means are provided for persons to easily extract them in an emergency.

7.5.6 Materials

No flammable material shall be permitted within 10 cm of the exhaust system or any other significant source of heat unless the material is effectively shielded. Where necessary, shielding shall be provided to prevent grease or other flammable materials coming into contact with exhaust system or other significant heat sources. For the purposes of this paragraph, a flammable material is considered to be one which is not designed to withstand the temperatures likely to be encountered in that location.

7.6. Exits

7.6.1. Number of exits

7.6.1.1. The minimum number of doors in a vehicle shall be two, either two service doors or one service door and one emergency door. The minimum number of service doors required is as follows:

Number of passengers	Number of service doors		
	Class I & A	Class II	Class III & B
9 - 45	1	1	1
46 - 70	2	2	2
71 - 100	3	3	3
101 - 140	4	4	4
> 140	5	5	5

7.6.1.1.bis By derogation to the provisions of 7.6.1.1, Member States may permit the sale or entry into service of new vehicles complying with the following provision:

Every vehicle of Class I and A not exceeding an overall width of 2.3 m. shall have two doors, one service door and one emergency door on the opposite side. The minimum number of doors required is as follows:

Number of passengers	Number of doors
	Class I & A
9 - 45	2
46 - 70	3
71 - 100	4
101 - 140	5
> 140	6

7.6.1.2 The minimum number of service doors in each rigid section of an articulated vehicle shall be one except that this minimum number shall be two in the case of the front section of an articulated vehicle of Class I.

7.6.1.3 For the purpose of this requirement, service doors equipped with a power operated control system shall not be deemed to be emergency doors unless they can be readily opened by hand, once the control prescribed in paragraph 7.6.5.1 has been activated if necessary.

7.6.1.4 The minimum number of emergency exits shall be such that the total number of exits is as follows:

Number of passengers	Minimum total number
9 - 16	3
17 - 30	4
31 - 45	5
46 - 60	6
61 - 75	7
76 - 90	8
91 - 110	9
111 - 130	10
> 130	11

Escape hatches can only count as one of the abovementioned number of emergency exits.

7.6.1.4.bis By derogation to the provisions of 7.6.1.4, Member States may permit the sale or entry into service of new vehicles complying with the following provision:

The minimum number of exits for vehicles of Class I and A not exceeding an overall width of 2.3 m. shall be such that the total number of exits is as follows:

Number of passengers	Minimum total number
9 - 16	3
17 - 30	4
31 - 45	5
46 - 60	6
61 - 75	7
76 - 90	8
91 - 110	9
111 - 130	10
> 130	11

Escape hatches can only count as one of the abovementioned number of exits.

7.6.1.5 Each rigid section of an articulated vehicle shall be treated as a separate vehicle for the purpose of determining the minimum number and the position of exits, except for 7.6.2.4. A number of passengers shall be determined for each rigid section.

7.6.1.6 A double service door shall count as two doors and a double window as two emergency windows.

7.6.1.7 If the driver's compartment does not provide access to the passenger compartment by means of a passageway complying with one of the conditions described in paragraph 7.7.1.1, the following conditions shall be met:

7.6.1.7.1 The driver's compartment shall have two exits, which shall not both be in the same lateral wall; when one of the exits is a window, it shall comply with the requirements set out in paragraphs 7.6.3.1 and 7.6.8 for emergency windows.

7.6.1.7.2 One or two seats are permitted alongside the driver for additional people, in which case both the exits referred to in paragraph 7.6.1.7.1 shall be doors. The driver's door shall be accepted as the emergency door for the occupants of those seats, provided that the driver's seat, the steering wheel, the engine housing, the gear level, the hand brake control etc. do not constitute too great an obstruction. The door provided for those additional people shall be accepted as the emergency door for the driver. Up to five additional seats may be fitted in a compartment incorporating the driver's compartment, provided that the additional seats and the space for these seats comply with all requirements of this Directive and at least one door giving access to the passenger compartment complies with the requirements of paragraph 7.6.3 for emergency doors.

- 7.6.1.7.3 In the circumstances described in paragraphs 7.6.1.7.1 and 7.6.1.7.2, the exits provided for the driver's compartment shall not count as one of the doors required by paragraphs 7.6.1.1 to 7.6.1.2, nor as one of the exits required by paragraph 7.6.1.4, except in the case mentioned in paragraphs 7.6.1.7.1 and 7.6.1.7.2. Paragraphs from 7.6.3 to 7.6.7, 7.7.1, 7.7.2 and 7.7.7 shall not apply to such exits.
- 7.6.1.8 If the driver's compartment and seats adjacent to it are accessible from the main passenger compartment by means of a passageway complying with one of the conditions described in paragraph 7.7.1.1, no external exit is required from the driver's compartment.
- 7.6.1.9 If a driver's door or other exit from the compartment is provided in the circumstances described in paragraph 7.6.1.8, it may only count as an exit for passengers provided:
- 7.6.1.9.1 it is not necessary to squeeze between the steering wheel and the driver's seat, in order to make use of that exit;
- 7.6.1.9.2 it satisfies the requirements relating to the dimensions of emergency doors indicated in paragraph 7.6.3.1.
- 7.6.1.10 Paragraphs 7.6.1.8. and 7.6.1.9 do not preclude there being a door or other barrier between the driver's seat and the passenger compartment, provided that this barrier can be released quickly by the driver in an emergency. A driver's door in a compartment protected by such a barrier shall not be counted as an exit for passengers.
- 7.6.1.11 Escape hatches, additional to the emergency doors and windows, shall be fitted in the roof of the Class II, III and B vehicles. They may also be fitted in the case of Class I and A vehicles. In such cases the minimum number of hatches shall be:

Number of passengers	Number of hatches
not exceeding 50	1
exceeding 50	2

## 7.6.2 Siting of exits

Vehicles having a capacity exceeding 22 passenger seats shall meet the requirements shown below. Vehicles having a capacity not exceeding 22 passengers may meet either the requirements shown below or those contained in Annex VI, paragraph 1.2.

- 7.6.2.1 The service door(s) shall be situated on the side of the vehicle that is nearer to the side of the road corresponding to the direction of traffic in the country in which the vehicle is to be licensed for operation and at least one of them shall be in the forward half of the vehicle. This does not preclude the provision of a door in the rear face of a vehicle for use by wheelchair passengers.

- 7.6.2.2 In case of more than one service door, two of the doors shall be separated such that the distance between transverse vertical planes through their centres of area is not less than 40 per cent of the overall length of the passenger compartment. If one of these two doors forms part of a double door this distance shall be measured between the two doors which are furthest apart.
- 7.6.2.3 The exits shall be placed in such a way that their number on each of the two sides of the vehicle is substantially the same.
- 7.6.2.4 At least one emergency exit shall be situated either in the rear face or in the front face of the vehicle respectively. For Class I vehicles, this provision is fulfilled if the escape hatch is fitted in the roof.
- 7.6.2.5 The exits on the same side of the vehicle shall be suitably spaced out along the length of the vehicle.
- 7.6.2.6 A door shall, provided that it is not a service door, be permitted in the rear face of the vehicle.
- 7.6.2.7 If escape hatches are fitted they shall be positioned as follows: If there is only one hatch, it shall be situated in the middle third of the roof; if there are two hatches, they shall be separated by a distance of at least 2 m. measured between the nearest edges of the apertures in a line parallel to the longitudinal axis of the vehicle.

7.6.3 Minimum dimensions of exits

7.6.3.1 The several kinds of exit shall have the following minimum dimensions:

			Class I	Class II and III	Remarks
		Height (cm)	180	165	-
Service door	Door aperture	Width (cm)	single door: see part B & C double door: 120		This dimension may be reduced by 10 cm when the measurement is made at the level of the hand holds
Emergency door		Height (cm)	125		
		Width (cm)	see part B&C		
Emergency window	Area:(cm <sup>2</sup> )		4 000		It shall be possible to inscribe in this area a rectangle of 50 cm x 70 cm
Emergency window situated in the rear face of the vehicle. If the manufacturer does not provide an emergency window of the minimum dimensions prescribed above			It shall be possible to inscribe in the emergency window aperture a rectangle 35 cm high and 155 cm wide. The corners of the rectangle may be rounded to a radius of curvature not exceeding 25 cm.		
Escape hatch	Hatch aperture	Area ( cm <sup>2</sup> )	4 000		It shall be possible to inscribe in this area a rectangle measuring 50 x 70 cm <sup>2</sup>



- 7.6.3.2 Vehicles having a capacity not exceeding 22 passengers may meet either the requirements shown in paragraph 7.6.3.1 or those contained in Annex 6, paragraph 1.1.
- 7.6.4 Technical requirements for all service doors
- 7.6.4.1 Every service door shall be capable of being easily opened from inside and from outside the vehicle when the vehicle is stationary (but not necessarily when the vehicle is moving). However, this requirement shall not be construed as precluding the possibility of locking the door from outside, provided that the door can always be opened from the inside.
- 7.6.4.2 Every control or device for opening a service door from the outside shall not be more than 150 cm from the ground when the vehicle is standing unladen on a level surface.
- 7.6.4.3 Every one-piece manually-operated service door which is hinged or pivoted shall be so hinged or pivoted that if the open door comes into contact with a stationary object while the vehicle is moving forwards it tends to close.
- 7.6.4.4 If a manually-operated service door is fitted with a slam lock it shall be of the two-stage type.
- 7.6.4.5 On the inside of a service door there shall not be any device intended to cover the inside steps when the door is closed. This does not exclude the presence in the step well, when the door is closed, of the door operating mechanism and other equipment attached to the inside of the door which does not form an extension of the floor on which passengers may stand. This mechanism and equipment should not be dangerous for the passengers.
- 7.6.4.6 If the direct view is not adequate, optical or other devices shall be installed to enable the driver to detect from his seat the presence of a passenger in the immediate interior and exterior vicinity of every side service door which is not an automatically-operated service door. In the case of a service door in the rear face of the vehicle not exceeding 22 passengers, this requirement is satisfied if the driver is able to detect the presence of a person 1.3 m. tall standing 1 m behind the vehicle.
- 7.6.4.7 Every door which opens towards the interior of the vehicle and its mechanism shall be so constructed that its movement is not likely to cause injury to passengers in normal conditions of use. Where necessary, appropriate protection devices shall be fitted.
- 7.6.4.8 If a service door is located adjacent to a door to a toilet or other internal compartment the service door shall be proofed against unintentional operation. However, this requirement shall not apply if the door is locked automatically when the vehicle is moving at a speed exceeding 5 km/h.

7.6.4.9 In the case of vehicles having a capacity not exceeding 22 passengers, the service doors which are in the rear face of the vehicle, the leaves shall not be capable of being opened more than 115° nor less than 85° and, when open, shall be capable of being held automatically in that position. This does not preclude the ability to override that stop and open the door beyond that angle when it is safe to do so; for example, to enable reversing against a high platform for loading or to open the doors through 270° to allow a clear loading area behind the vehicle.

7.6.5 Additional technical requirements for power-operated service doors

7.6.5.1 In the event of an emergency every power-operated service door shall be capable, when the vehicle is stationary (but not necessarily when the vehicle is moving), of being opened from inside and, when not locked, from outside by controls which, whether or not the power supply is operating:

7.6.5.1.1 override all other door controls;

7.6.5.1.2 in the case of interior controls, are placed on, or within 300 mm of, the door, at a height of not less 1600 mm above the first step;

7.6.5.1.3 can be easily seen and clearly identified, when approaching the door and when standing in front of the door;

7.6.5.1.4 can be operated by one person when standing immediately in front of the door;

7.6.5.1.5 cause the door to open, or enable the door to be easily opened by hand;

7.6.5.1.6 may be protected by a device which can be easily removed or broken to gain access to the emergency control; the operation of the emergency control, or the removal of a protective cover over the control, shall be indicated to the driver both audibly and visually, and

7.6.5.1.7 in the case of a driver-operated door which does not comply with the requirements of 7.6.5.6.2, it shall be such that after the controls have been operated to open the door and returned to their normal position, the door will not close again until the driver subsequently operates a closing control.

7.6.5.2 A device may be provided which is operated by the driver from this seat to deactivate the outside emergency controls in order to lock the service doors from outside. In this case, the outside emergency controls shall be reactivated automatically either by the starting of the engine or before the vehicle reaches a speed of 20 km/h. Subsequently, deactivation of the outside emergency controls shall not occur automatically, but shall require a further action by the driver.

7.6.5.3 Every driver-operated service door shall be capable of operation by the driver when in the driving seat using controls which, except in the case of a foot control, are clearly and distinctively marked.

- 7.6.5.4 Every power-operated service door shall activate a visual tell-tale, which shall be plainly visible to the driver when seated in the normal driving position in any ambient lighting condition, to warn that a door is not fully closed. This tell-tale shall signal whenever the rigid structure of the door is between the fully open position and a point 30 mm from the fully closed position. One tell-tale may serve for one or more doors. However, no such tell-tale shall be fitted in respect of a front service door which does not comply with the requirements of 7.6.5.6.1.1 and 7.6.5.6.1.2.
- 7.6.5.5 Where controls are provided for the driver to open and close a power operated service door, they shall be such that the driver is able to reverse the movement of the door at any time during the closing or opening process.
- 7.6.5.6 The construction and control system of every power-operated service door shall be such that a passenger is unlikely to be injured by the door or trapped in the door as it closes.
- 7.6.5.6.1 This requirement shall be considered satisfied if the following two requirements are met:
- 7.6.5.6.1.1 the first requirement is that when the closing of the door at any measuring point described in Annex V is resisted by a clamping force not exceeding 150 N, the door shall reopen automatically to its fullest extent and, except in the case of an automatically-operated service door, remain open until a closing control is operated. The clamping force may be measured by any method to the satisfaction of the competent authority. Guidelines are given in Annex V to this Directive. The peak force may be higher than 150 N for a short time provided that it does not exceed 300 N. The reopening system may be checked by means of a test bar having a section of height 60 mm, width 30 mm with corners radiused to 5 mm. As an alternative, this first requirement shall also be considered to be met if, when the door closes, it can be readily reopened by hand, whatever is the level of the energy supply used for the operation of the door. This condition shall be considered to be met if the clamping force measured as in Annex V does not exceed 80 N when the door is between 3 and 12 cm ajar, and 150 N when is between 12 and 40 cm ajar, in all conditions of energy supply;
- 7.6.5.6.1.2 the second requirement is that whenever the doors are closed onto the wrist or fingers of a passenger:
- 7.6.5.6.1.2.1 the door reopens automatically to its fullest extent and, except in the case of an automatically-operated service door, remains open until a closing control is operated, or
- 7.6.5.6.1.2.2 the wrist or fingers can be readily extracted from the doors without risk of injury to the passenger. This requirement may be checked by hand, or by means of the test bar mentioned in paragraph 7.6.5.6.1.1, tapered at one end over a length of 300 mm from a thickness of 30 mm to a thickness of 5 mm. It shall not be treated with polish nor lubricated. If the door traps the bar it shall be capable of being easily removed, or

7.6.5.6.1.2.3 the door is maintained at a position allowing the free passage of a test-bar having a section of height 60 mm, width 20 mm, with corners radiused to 5 mm. This position shall not be more than 30 mm distant from the fully closed position.

7.6.5.6.2 In the case of a front service door the requirement of paragraph 7.6.5.6 shall be considered satisfied if the door:

7.6.5.6.2.1 fulfils the requirements of paragraphs 7.6.5.6.1.1 and 7.6.5.6.1.2, or

7.6.5.6.2.2 is fitted with soft edges; these shall not, however be so soft that if the doors are closed on the test bar mentioned in 7.6.5.6.1.1 the rigid structure of the doors will reach the fully closed position.

7.6.5.7 Where a power-operated service door is held closed only by continued application of the power supply there shall be provided a visual warning device to inform the driver of any failure in the power supply to the doors.

7.6.5.8 A starting prevention device, if fitted, shall be effective only at speeds of less than 5 km/h and shall be incapable of operation above that speed.

7.6.5.9 An audible warning to the driver shall be activated if the vehicle is driven away from rest when any power-operated service door is not fully closed. This audible warning shall be activated at a speed exceeding 5 km/h for doors complying with the requirements of 7.6.5.6.1.2.3.

## 7.6.6 Additional technical requirements for automatically operated service doors

7.6.6.1 Activation of the opening controls.

7.6.6.1.1 Except as provided in paragraph 7.6.5.1, the opening controls of every automatically-operated service door shall be capable of being activated and deactivated only by the driver from his seat.

7.6.6.1.2 Activation and deactivation may be either direct, by means of a switch, or indirect, for example by opening and closing the front service door.

7.6.6.1.3 Activation of the opening controls by the driver shall be indicated inside and, where a door is to be opened from outside, also on the outside of the vehicle; the indicator (e.g. illuminated push button, illuminated sign) shall be on or adjacent to the door to which it relates.

7.6.6.1.4 In the case of direct actuation by means of a switch, the functional state of the system shall be clearly indicated to the driver, by, for example, the position of the switch or an indicator lamp or an illuminated switch. The switch shall be specially marked and arranged in such a way that it cannot be confused with other controls.

7.6.6.2 Opening of automatically-operated service doors.

- 7.6.6.2.1 After activation of the opening controls by the driver, it shall be possible for passengers to open the door as follows:
- 7.6.6.2.1.1 from inside, for example by pressing a push-button or passing a light barrier, and
  - 7.6.6.2.1.2 from outside, except in the case of a door intended only as an exit and marked as such, by, for example, pressing an illuminated push button, a push button beneath an illuminated sign, or a similar device marked with a suitable instruction.
- 7.6.6.2.2 The pressing of the push buttons mentioned in paragraph 7.6.6.2.1.1, and the use of the means of communication with the driver mentioned in paragraph 7.7.9.1, may send a signal which is stored and which, after the activation of the opening controls by the driver, effects the opening of the door.
- 7.6.6.3 Closing of automatically-operated service doors.
- 7.6.6.3.1 When an automatically-operated service door has opened it shall close again automatically after a time interval has elapsed. If a passenger enters or leaves the vehicle during this time interval, a safety device (e.g. a foot board contact, light barrier, one-way gate) shall ensure that the time until the door closes is sufficiently extended.
  - 7.6.6.3.2 If the passenger enters or leaves the vehicle while the door is closing, the closing process shall be interrupted automatically and the door shall return to the open position. The reversal may be actuated by one of the safety devices referred to in paragraph 7.6.6.3.1 or by any other device.
  - 7.6.6.3.3 A door that has closed automatically in accordance with paragraph 7.6.6.3.1 shall be capable of being opened again by a passenger in accordance with paragraph 7.6.6.2; this shall not apply if the driver has deactivated the opening controls.
  - 7.6.6.3.4 After deactivation of the opening controls of the automatically-operated service doors by the driver, open doors shall close in accordance with paragraphs 7.6.6.3.1 to 7.6.6.3.2.
- 7.6.6.4 Inhibition of the automatic closing process on doors marked for special service, e.g. for passengers with prams, disabled persons, etc.
- 7.6.6.4.1 The driver shall be able to inhibit the automatic closing process by actuation of a special control. A passenger shall also be able to inhibit the automatic closing process directly by pressing a special push button.
  - 7.6.6.4.2 The inhibition of the automatic closing process shall be indicated to the driver, e.g. by a visual tell-tale.
  - 7.6.6.4.3 Re-establishment of the automatic closing process shall in any case be capable of being done by the driver.

7.6.6.4.4 Paragraph 7.6.6.3 shall apply to the subsequent closing of the door.

7.6.7 Technical requirements for emergency doors

7.6.7.1 Emergency doors shall be capable of being easily opened from inside and from outside when the vehicle is stationary. However, this requirement shall not be construed as precluding the possibility of locking the door from the outside, provided that the door can always be opened from the inside by the use of the normal opening mechanism.

7.6.7.2 Emergency doors, during the use as such, shall not be of the power-operated type unless, once the control prescribed in paragraph 7.6.5.1 has been actuated and returned to its normal position, the doors do not close again until the driver subsequently operates a closing control. They shall also not be of the sliding type unless that in case of vehicles having a capacity not exceeding 22 passengers, a sliding door, which has been shown to be capable of being opened without the use of tools after a frontal barrier collision test in accordance with Directive 74/297/EEC, can be accepted as an emergency door.

7.6.7.3 The outside handles of emergency doors shall be not more than 150 cm above the ground when the vehicle is standing unladen on level ground.

7.6.7.4 Hinged emergency doors fitted to the side of the vehicle shall be hinged at their forward edge and shall open outwards. Check straps, chains or other restraining devices shall be permitted, provided that they do not prevent the door from opening to, and remaining open at, an angle of at least 100°. If a means is provided sufficient to give free passage to the emergency door access gauge, the 100° minimum angle shall not apply.

7.6.7.5 Emergency doors shall be proofed against unintentional operation. However, this requirement shall not apply if the emergency door is locked automatically when the vehicle is moving at a speed exceeding 5 km/h.

7.6.7.6 All emergency doors shall be provided with an audible device to warn the driver when they are not securely closed. The warning device shall be operated by movement of the door catch and not by movement of the door itself.

7.6.8 Technical requirements for emergency windows

7.6.8.1 Every hinged or ejectable emergency window shall open outwards. Ejectable types shall not become totally detached from the vehicle when operated. The operation of ejectable windows shall be such that inadvertent ejection is effectively prevented.

7.6.8.2 Every emergency window shall:

7.6.8.2.1 either be capable of being easily and instantaneously operated from inside and from outside the vehicle by means of a device recognised as satisfactory,

- 7.6.8.2.2 or be made of readily-breakable safety glass. This latter provision precludes the possibility of using panes of laminated glass or of plastic material. A device shall be provided adjacent to each emergency window, readily available to persons inside the vehicle, to ensure that each window can be broken.
- 7.6.8.3 Every emergency window which can be locked from the outside shall be so constructed as to be capable of being opened at all times from inside the vehicle.
- 7.6.8.4 If the emergency window is of a type horizontally hinged at the top edge, an appropriate device shall be provided to hold it fully open. Every hinged emergency window shall operate so as not to obstruct clear passage from inside or outside the vehicle.
- 7.6.8.5 The height of the lower edge of an emergency window fitted in the side of the vehicle from the general level of the floor immediately below it (excluding any local variations such as the presence of a wheel or transmission housing) shall be not more than 120 cm nor less than 65 cm in the case of a hinged emergency window, or 50 cm in the case of a window made of breakable glass.

However, in the case of a hinged emergency window the height of the lower edge may be reduced to a minimum of 50 cm provided that the window aperture is equipped with a guard up to a height of 65 cm to prevent the possibility of passengers falling out of the vehicle. Where the window aperture is equipped with a guard, the size of the window aperture above the guard shall not be less than the minimum size prescribed for an emergency window.

- 7.6.8.6 Every hinged emergency window which is not clearly visible from the driver's seat shall be fitted with an audible warning device to warn the driver when it is not completely closed. The window lock, and not the movement of the window itself, shall actuate this device.

#### 7.6.9 Technical requirements for escape hatches

- 7.6.9.1 Every escape hatch shall operate so as not to obstruct clear passage from inside or outside the vehicle. Escape hatches shall be either ejectable, hinged or made of readily-breakable safety glass. Ejectable types shall not become totally detached from the vehicle when operated. The operation of ejectable escape hatches shall be such that inadvertent ejection is effectively prevented.

- 7.6.9.2 Escape hatches shall be capable of being easily opened or removed from the inside and from outside. However, this requirement shall not be construed as precluding the possibility of locking the escape hatch for the purpose of securing the vehicle when unattended, provided that the escape hatch can always be opened or removed from the inside by the use of the normal opening or removal mechanism. In the case of a readily-breakable hatch a device shall be provided adjacent to the hatch, readily available to persons inside the vehicle, to ensure that the hatch can be broken.

7.6.10 Technical requirements for retractable steps

see parts B & C.

7.6.11 Markings

7.6.11.1 Each emergency exit shall be marked, inside and outside the vehicle, either by an inscription reading "Emergency exit" or by one of the symbols shown in Annex II, paragraph 3.4 of Council Directive 92/58/EEC.

7.6.11.2 The emergency controls of service doors and of all emergency exits shall be marked as such inside and outside the vehicle either by a representative symbol or by a clearly-worded inscription.

7.6.11.3 Clear instructions concerning the method of operation shall be placed on or close to every emergency control of an exit.

7.6.11.4 The language in which any textual markings intended to comply with paragraphs 7.6.11.1 to 7.6.11.3 above are to be inscribed shall be determined by the approving authority bearing in mind the country/countries in which the applicant intends to market the vehicle in liaison if necessary with the competent authorities of the country/countries concerned. If the authority of the country/countries where the vehicle is to be registered has the language changed, this change shall imply no new type-approval process.

7.7 Interior arrangements

7.7.1 Access to service doors (see Annex III, figure 1)

7.7.1.1 The free space extending inwards into the vehicle from the side wall in which the door is mounted shall permit the free passage of a vertical rectangular panel 2 cm thick, 40 cm wide and 70 cm in height above the floor, having a second panel 55 cm wide superimposed symmetrically above it; the height of the second panel being as prescribed for the relevant class of vehicle.

7.7.1.1.1 Dimension of the upper panel and total height of the dual panel.

The height of the upper panel and the total height of the dual panel shall be:

Number of passengers	≤22*	≤22*	>22		
Classes	A	B	I	II	III
Width of upper panel cm	55	55	55	55	55
Height of upper panel cm	95	70	110	95	85
Total Height of dual panel cm	165	140	180	165	155

The width of the upper panel may be reduced at the top to 40 cm when a chamfer not exceeding 30 degrees from the horizontal is included (Annex III, figure 1).



- (\*) For vehicles having a capacity not exceeding 22 passengers, a relative displacement between the two panels shall be allowed provided that it is in the same direction.

#### 7.7.1.1.2 Alternative panel for access to service doors

As an alternative to the dual panel (paragraph 7.7.1.1 and 7.7.1.1.1), a trapezoidal section, having a height of 50 cm, forming the transition between the width of the upper and the lower panel, may be used. In this case, the total height of the rectangular section and this trapezoidal section of the upper panel shall be 110 cm for all classes of vehicles with a capacity exceeding 22 passengers, and 95 cm for all classes of vehicles with a capacity not exceeding 22 passengers.

The width of the upper panel may be reduced at the top to 40 cm when a chamfer not exceeding 30 degrees from the horizontal is included (Annex III, figure 1).

- 7.7.1.2 The dual panel shall be maintained parallel with the door aperture as it is moved from the starting position, where the plane of the face nearest to the interior of the vehicle is tangential to the outermost edge of the aperture, to the position where it touches the first step, after which it shall be kept at right angles to the probable direction of motion of a person using the entrance.
- 7.7.1.3 When the centre line of this dual panel has traversed a distance of 30 cm from its starting position and the dual panel is touching the step surface it shall be retained in that position.
- 7.7.1.4 The cylindrical figure (see Annex III, figure 6) used for testing the gangway clearance shall then be moved starting from the gangway, in the probable direction of motion of a person leaving the vehicle, until its centre line has reached the vertical plane which contains the top edge of the uppermost step, or until a plane tangential to the upper cylinder touches the dual panel, whichever occurs first, and retained in that position (see Annex III, figure 2).
- 7.7.1.5 Between the cylindrical figure, at the position set out in paragraph 7.7.1.4 and the dual panel, at the position set out in paragraph 7.7.1.3, there shall be a free space whose upper and lower limits are shown in Annex III, figure 2. This free space shall permit the free passage of a vertical panel whose form and dimensions are the same as the cylindrical form (paragraph 7.7.5.1), central section and a thickness of no more than 2 cm. This panel shall be moved, from the cylindrical form tangential position, until its external side is in contact with the dual panel interior side, touching the plane or planes defined by the step upper edges, in the probable direction of motion of a person using the entrance (see Annex III, figure 2).
- 7.7.1.6 The free passage clearance for this figure shall not include any space extending to 30 cm in front of any uncompressed seat cushion and to the height of the top of the seat cushion.

- 7.7.1.7 In the case of a folding seat, this space shall be determined with the seat in the position of use.
- 7.7.1.8 However, a folding seat for use by the crew may obstruct the access passage to a service door when in the position of use provided that:
- 7.7.1.8.1 it is clearly indicated, both in the vehicle itself and on the EC type-approval certificate (see Annex II, Appendix 2), that the seat is for the use of crew only,
- 7.7.1.8.2 when the seat is not in use it folds automatically as necessary to enable the requirements of paragraphs 7.7.1.1 or 7.7.1.2 and 7.7.1.3, 7.7.1.4 and 7.7.1.5 to be met;
- 7.7.1.8.3 the door is not considered to be a mandatory exit for the purpose of paragraph 7.6.1.4, and
- 7.7.1.8.4 when the seat is in the position of use, and when it is in the folded position, no part of it shall be forward of a vertical plane passing through the centre of the seating surface of the driver's seat in its rearmost position and through the centre of the exterior rear-view mirror mounted on the opposite side of the vehicle.
- 7.7.1.9 In the case of vehicles having a capacity not exceeding 22 passengers a doorway and the route by which passengers gain access to it shall be considered unobstructed if they have:
- 7.7.1.9.1 measured parallel with the longitudinal axis of the vehicle, there is a clearance of not less than 22 cm at any point and 55 cm at any point being more than 50 cm above the floor or steps (Annex III, figure 3)
- 7.7.1.9.2 measured perpendicular to the longitudinal axis of the vehicle, there is a clearance of not less than 30 cm at any point and 55 cm at any point being more than 120 cm above the floor or steps or less than 30 cm below the ceiling (Annex III, figure 4).
- 7.7.1.10 The service door and emergency door dimensions in paragraph 7.6.3.1. and the requirements of paragraphs 7.7.1.1. to 7.7.1.7., 7.7.2.1. to 7.7.2.3., 7.7.5.1. and 7.7.8.5. shall not apply to a vehicle of Class B with a maximum mass not exceeding 3,5 tonnes and up to 12 passengers seats in which each seat has unobstructed access to at least two doors.
- 7.7.1.11 The maximum slope of the floor in the access passage shall not exceed 3% when measured with the unladen vehicle standing on a horizontal surface.
- 7.7.2 Access to emergency doors (see Annex III, figure 5)

The following requirements shall not apply to driver's doors used as emergency exits in vehicles having a capacity not exceeding 22 passengers.

7.7.2.1 The free space between the gangway and the emergency door aperture shall permit the free passage of a vertical cylinder 30 cm in diameter and 70 cm high from the floor and supporting a second vertical cylinder 55 cm in diameter, the aggregate height of the assembly being 140 cm.

The width of the upper cylinder may be reduced at the top to 40 cm when a chamfer not exceeding 30° from the horizontal is included .

7.7.2.2 The base of the first cylinder shall be within the projection of the second cylinder.

7.7.2.3 Where folding seats are installed alongside this passage, the free space for the cylinder shall be required to be determined when the seat is in the position for use.

7.7.2.4 As an alternative to the dual cylinder, the gauging device described in paragraph 7.7.5.1 may be used (see Annex III, figure 6).

7.7.3 Access to emergency windows

7.7.3.1 It shall be possible to move a test gauge from the gangway to the exterior of the vehicle through every emergency window.

7.7.3.2 The direction of motion of the test gauge shall be in the direction in which a passenger evacuating the vehicle would be expected to move. The test gauge shall be kept perpendicular to that direction of motion.

7.7.3.3 The test gauge shall be in the form of a thin plate having a size of 60 x 40 cm with corners radiused by 20 cm. However, in the case of an emergency window in the rear face of the vehicle, the test gauge may alternatively have a size of 140 cm x 35 cm with corners radiused by 17.5 cm.

7.7.4 Access to escape hatches

At least one escape hatch shall be situated above at least a part of a seat or some other equivalent support affording access to them.

7.7.5 Gangways (see Annex III, figure 6)

7.7.5.1 The gangway of a vehicle shall be so designed and constructed as to permit the free passage of a gauging device consisting of two co-axial cylinders with an inverted truncated cone interposed between them the gauging device having the following dimensions (in cm):

Classes	A	B	I	II	III
Diameter of lower cylinder	35	30	45	35	30
Height of lower cylinder	90	90	90	90	90
Diameter of upper cylinder	55	45	55	55	45
Height of upper cylinder	50*	30	50*	50*	50*
Overall height	190*	150	190*	190*	190*

The diameter of the upper cylinder may be reduced at the top to 40 cm when a chamfer not exceeding 30 degrees from the horizontal is included (Annex III, figure 1).

The gauging device may come into contact with strap hangers, if fitted, and move them away.

(\*) The height of the upper cylinder and herewith the overall height may be reduced by 10 cm in any part of the gangway to the rear of:

- a transverse vertical plane situated 1.5 m forward of the centre line of the rear axle, and
- a transverse vertical plane situated at the rear edge of the service door or of the rearmost service door if there are more than one service door.

7.7.5.1.1 If there is no exit forward of a seat or row of seats:

7.7.5.1.1.1 In the case of forward-facing seats, the front edge of the cylindrical gauge defined in 7.7.5.1 shall reach at least until the transverse vertical plane tangential to the foremost point of the foremost front row seat back and be retained in that position. From this plane, it must be possible to move the panel shown in Annex III, Figure 7, in such a way that starting from the contact position with the cylindrical gauge, the panel side facing the exterior of the vehicle is displaced forwards a distance of 66 cm.

7.7.5.1.1.2 In the case of sideways facing seats, the forward part of the cylindrical gauge must reach at least the transversal plane which coincides with a vertical plane passing through the centre of the forward seat ( Annex III, figure 7).

7.7.5.1.1.3 In the case of rearward facing seats, the forward part of the cylindrical gauge shall reach at least the transverse vertical plane tangential to the face of the seat cushions of the forward row or seat (Annex III, figure 7).

7.7.5.2 On vehicles of Class I, the diameter of the lower cylinder may be reduced from 45 cm to 40 cm in any part of the gangway to the rear of:

7.7.5.2.1 a transverse vertical plane situated 1.5m forward of the centre line of the rear axle, and

7.7.5.2.2 a transverse vertical plane situated at the rear edge of the rearmost service door.

7.7.5.3 On vehicles of Class III the seats on one side or on both sides of the gangway may be movable laterally, it being then possible to reduce the width of the gangway to a figure corresponding to a lower cylinder diameter of 22 cm, on condition that the operation of a control on each seat, readily accessible to a person standing in the gangway, shall be sufficient to cause the seat to return automatically, even when it is loaded, to the position corresponding to a minimum width of 30 cm.

- 7.7.5.4 On articulated buses the gauging device defined in paragraph 7.7.5.1 shall be able to pass unobstructed through the articulated section. No part of the soft covering of that section, including parts of bellows, shall project into the gangway.
- 7.7.5.5 Steps may be fitted in the gangways. The width of such steps shall not be less than the width of the gangway at the top of the steps.
- 7.7.5.6 Folding seats allowing passengers to sit in the gangway shall not be permitted.
- 7.7.5.7 Laterally-sliding seats which in one position encroach on the gangway shall not be permitted except on vehicles of Class III and subject to the conditions prescribed in paragraph 7.7.5.3.
- 7.7.5.8 In the case of vehicles to which paragraph 7.7.1.9 applies, a gangway shall not be necessary provided the access dimensions specified in that paragraph are respected.
- 7.7.5.9 Gangways and access passages shall be covered with an anti-slip material.

7.7.6 Slope of gangway

The slope of the gangway, measured with the vehicle unladen on a horizontal surface, and with the kneeling system no connected shall not exceed:

- 7.7.6.1 8% in the case of a vehicle of Class I, II and A,
- 7.7.6.2 12.5% in the case of a vehicle of Class III and B, and
- 7.7.6.3 3% in the case of the plane perpendicular to the longitudinal axis of symmetry of vehicle.

7.7.7 Steps (see Annex III, figure 8)

- 7.7.7.1 The maximum and minimum height, and the minimum depth, of steps for passengers at service and emergency doors and within the vehicle shall be as follows:

Classes		I, II & A	III & B
First step from ground	Max. height (cm)	32 <sup>(1)</sup>	36 <sup>(1)(2)</sup>
	Min. depth (cm)	30 <sup>(*)</sup>	
Other steps	Max. height (cm)	25 <sup>(3)</sup>	35 <sup>(4)</sup>
	Min. height (cm)	12	
	Min. depth (cm)	20	

- (\*) 23 cm for vehicles having a capacity not exceeding 22 passengers.
- (1) 150 cm in the case of an emergency door.
- (2) 43 cm in the case of a vehicle with solely mechanical suspension.
- (3) 30 cm in the case of steps at a door behind the rearmost axle.
- (4) 25 cm in gangways for vehicles having a capacity not exceeding 22 passengers.

- 7.7.7.1.1 For the purposes of this Annex, any step from a sunken gangway to a seating area shall not be considered to be a step. The maximum height of such step to a seating area from the gangway shall be 35 cm.
- 7.7.7.2 For the purpose of this paragraph, the height of a step shall be measured at the centre of its width. Furthermore, manufacturers should specifically take account of access by persons with reduced mobility, particularly in relation to a step height to be kept to a minimum.
- 7.7.7.3 The height of the first step in relation to the ground shall be measured with the vehicle on level ground, unladen as defined in paragraph 7.1.3 and the tyre equipment and pressure being as specified by the manufacturer for the maximum technical mass (MT) declared in accordance with paragraph 2.18.
- 7.7.7.4 Where there is more than one step, each step may extend into the area of the vertical projection of the next step by up to 10 cm and the projection over the tread below shall leave a free surface of at least 20 cm (see Annex III, figure 8) with all step nosings being designed such as to minimise the risk of tripping and being in a contrasting colour or colours.
- 7.7.7.5 The width and shape of every step shall be such that a rectangle s indicated in the table below can be placed on that step with not more than 5% of the area of the appropriate rectangle overhanging the step. At a double doorway each half of the doorway shall fulfil this requirement.

Number of passengers		> 22	≤ 22
Area	First step	40 x 30 cm	40 x 20 cm
	Other steps	40 x 20 cm	40 x 20 cm

- 7.7.7.6 All steps shall have an non-slip coating.
- 7.7.8 Passenger seats and space for seated passengers
- 7.7.8.1 Minimum seat width (see Annex III, figure 9).
- 7.7.8.1.bis By derogation to the provisions of paragraph 7.7.8.1, Member States may, for the types of vehicles mentioned in Article 3, permit the sale or entry into service of new vehicles complying with the following provision:
- Minimum seat width (see Annex III, figure 9 bis)
- 7.7.8.1.1 The minimum width of a seat cushion, measured from a vertical plane passing through the centre of that seating position, shall be:

7.7.8.1.1 bis For the types of vehicles mentioned in Article 3 introducing the derogation, the minimum dimensions for each seating place, measured from a vertical plane passing through the centre of that seating place, shall be as follows (see Annex III, figure 9 bis):

Individual seats	Width of the seat cushion, on each side	20
	Width of the available space, measured in a horizontal plane along the seat back at heights between 27 and 65 cm above the uncompressed seat cushion.	20
Continuous seats for two or more passengers	Width of the seat cushion, per passenger on each side.	20
	Width of the available space, measured in a horizontal plane along the seat back at heights between 27 and 65 cm above the uncompressed seat cushion.	20

In case of compliance with paragraph 7.7.8.1.1 bis, paragraphs 7.7.8.1.2.1 and 7.7.8.1.2.2 are not applicable.

7.7.8.1.1.1 20 cm in vehicles of Class I, II, A and B.

7.7.8.1.1.2 22.5 cm in vehicles of Class III.

7.7.8.1.2 The minimum width of the available space for each seating position, measured from a vertical plane passing through the centre of that seating position at heights between 27 and 65 cm above the uncompressed seat cushion, shall be:

7.7.8.1.2.1 25 cm in the case of individual seats, and

7.7.8.1.2.2 22.5 cm in the case of continuous seats for two or more passengers.

7.7.8.1.2.3 For vehicles having a capacity not exceeding 22 passengers, in the case of seats adjacent to the wall of the vehicle, the available space does not include, in its upper part, a triangular area 2 cm wide by 10 cm high (see Annex III, figure 10). In addition, the space needed for safety belts and their anchorages and for the sun visor should be considered as exempted.

7.7.8.2 Minimum depth of seat cushion ( see Annex III, figure 11)

The minimum depth of a seat cushion shall be:

7.7.8.2.1 35 cm in vehicles of Class I, A and B, and

7.7.8.2.2 40 cm in vehicles of Class II and Class III.

7.7.8.3 Height of seat cushion (see Annex III, figure 11)

The height of the uncompressed seat cushion relative to the floor shall be such that the distance from the floor to a horizontal plane tangent to the front upper surface of the seat cushion is between 40 and 50 cm: this height may however be reduced to not less than 35 cm at the wheel arches and at the engine compartment.

7.7.8.4. Seat spacing (see Annex III, figure 12)

7.7.8.4.1 In the case of seats facing in the same direction, the distance between the front of a seat squab and the back of the squab of the seat preceding it, shall, when measured horizontally and at all heights above the floor between the level of the top surface of the seat cushion and a point 62 cm above the floor, not be less than:

Class I, A & B	65 cm
Class II	68 cm
Class III	75 cm

7.7.8.4.1 bis For the types of vehicles mentioned in Article 3 introducing the derogation, Member States may permit the sale or entry into service of new vehicles complying with the following provision:

In the case of seats facing in the same direction, the distance between the front of a seat squab and the back of the squab of the seat preceding it, shall, when measured horizontally and at all heights above the floor between the level of the top surface of the seat cushion and a point 62 cm above the floor, not be less than 65 cm. (see Annex III, fig 12 bis).

For vehicles with up to 16 passengers, the distance between seats may be reduced to 60 cm (see Annex III, figure 12 ter).

7.7.8.4.2 All measurements shall be taken, with the seat cushion and squab uncompressed, in a vertical plane passing through the centreline of the individual seating place.

7.7.8.4.3 Where transverse seats face one another the minimum distance between the front faces of the seat squabs of facing seats, as measured across the highest points of the seat cushions, shall be not less than 130 cm.

7.7.8.4.4 Reclining passenger seats and adjustable driving seats shall be measured with their seat backs and other seat adjustments in the normal position of use specified by the manufacturer.

7.7.8.4.5 Any folding table fitted to a seat back shall be measured in the folded position.

7.7.8.4.6 Seats which are mounted on a track or other system which permits the operator or the user to easily vary the interior configuration of the vehicle shall be measured in the normal position of use specified by the manufacturer in the application for the approval.



- 7.7.8.5. Space for seated passengers (see Annex III, figure 13).
- 7.7.8.5.1 A minimum clear space in front of each passenger seat shall be provided as shown in Annex III, figure 13. The seat-back of another preceding seat or a partition whose contour corresponds approximately to that of the inclined seat back may intrude into this space as provided by paragraph 7.7.8.4. The local presence in this space of seat legs shall also be permitted provided that adequate space remains for the passenger's feet. In the case of seats alongside the driver's seat in vehicles with up to 22 passengers, intrusion of the dash board, instrument panel, windscreen, sun visor, seat belts and seat belt anchorages shall be allowed.
- 7.7.8.5.2 However, at least 2 in Class I and 1 in Class A forward or rearward facing seats specifically intended and marked for passengers with reduced mobility other than wheelchair users shall be provided in that part of the bus which is most suitable for boarding. These seats shall be designed for disabled so as to provide enough space, shall have suitably designed and placed handholds to facilitate entry and exit of the seat and provide communication in accordance with paragraph 7.7.9 from the seated position.
- 7.7.8.5.2.1 These seats shall provide at least 110% of the space specified in item 7.7.8.5.1 and at least 110% of the width specified in item 7.7.8.1.1.
- 7.7.8.6 Free space above seating positions
- 7.7.8.6.1 Over each seating position and, except in the case of the front row seats in a vehicle up to 22 passengers, its associated foot space, there shall be measured a free space with a height of not less than 900 mm measured from the highest point of the uncompressed seat cushion and at least 1 350 mm from the mean level of the floor in the foot space. In the case of vehicles to which paragraph 7.7.1.9. applies, this dimension may be reduced to 1 200 mm measured from the floor.
- 7.7.8.6.2 This free space shall extended over the zone defined:
- 7.7.8.6.2.1 by longitudinal vertical planes 200 mm either side of the median vertical plane of the seating position, and;
- 7.7.8.6.2.2 by a transverse vertical plane through the rearmost upper point of the seat back and by a transverse vertical plane 300 mm in front of the foremost point of the uncompressed seat cushion, measured in each case at the median vertical plane of the seating position.
- 7.7.8.6.3 From the edges of the free space defined by paragraphs 7.7.8.6.1 and 7.7.8.6.2, the following zones may be excluded:
- 7.7.8.6.3.1 in the case of the up part of outboard seats, a zone with rectangular cross-section 150 mm in height and 100 mm in width (see Annex III, figure 14);

7.7.8.6.3.2 in the case of the up part of outboard seats, a zone with a triangular-cross-section whose apex is situated 650 mm from the floor and whose base is 100 mm in width (see Annex III, figure 15);

7.7.8.6.3.3 in the case of the footwell of outboard, a zone of a cross-sectional area not exceeding, 200 cm<sup>2</sup> and having a maximum width not exceeding 100 cm (see Annex III, figure 16);

7.7.8.6.3.4 in the case of a vehicle for up to 22 passengers, in the case of the seating places nearest to the rear corners of the body, the outer rear edge of the free space, viewed in plan, may be rounded to a radius not exceeding 150 mm (see Annex III, figure 17).

7.7.8.6.4 In the free space defined by paragraphs 7.7.8.6.1, 7.7.8.6.2 and 7.7.8.6.3, the following additional intrusions shall be permitted:

7.7.8.6.4.1 Intrusion of the back of another seat, its supports and its attachments (e.g. folding table).

7.7.8.6.4.2 In the case of a vehicle for up to 22 passengers, intrusion of a wheel arch provided that one of the following two conditions is fulfilled:

7.7.8.6.4.2.1 the intrusion does not extend beyond the median vertical plane of the seating position (see Annex III, figure 18) or

7.7.8.6.4.2.2 the nearest edge of the area 300 mm in depth available for the feet of the seated passenger is advanced no more than 200 mm from the edge of the uncompressed seat cushion and to not more than 600 mm in front of the squab of the seat, these measurements being made in the median vertical plane of the seating position (see Annex III, figure 19).

7.7.8.6.4.3 In the case of seats alongside the driver's seat in vehicles with up to 22 passengers intrusion of the dashboard/instrument panel, windscreen, sun visors, seat belts, seat belt anchorages and front dome.

7.7.8.7 On Class III & B vehicles, the seats shall be front face or rear face.

#### 7.7.9 Communication with the driver

7.7.9.1 On vehicles of Classes I, II and A, a means shall be provided to enable passengers to signal to the driver that she/he should stop the vehicle. The controls for all such communication devices shall have protruding buttons, no more than 120 cm from the floor, and shall be a contrasting colour or colours. Controls shall be distributed adequately and evenly throughout the vehicle. Activation of the control shall also be indicated to the passengers by means of one or more illuminated signs; The sign shall display the words "bus stopping", or equivalent, and/or a suitable pictogram and shall remain illuminated until the service door(s) open. Articulated vehicles shall have such signs in each rigid section of the vehicle. Double deck vehicles shall have them on each deck.

7.7.9.2 Communication with the crew compartment. If a crew compartment is fitted without access to the driver or passenger compartments, a means of communication between the driver and this crew compartment shall be provided.

7.7.9.3 Vehicles of Classes I, II and A shall have provision for the route number (or letter if applicable) and destination to be displayed. Provisions for a route number at least 20 cm high shall be made on the front of the vehicle and the side in which service doors are fitted. In addition vehicles of Classes I, II and A shall have provisions for a route number at the rear of the vehicle. Provisions for a destination display at least 12 cm high shall be made on the front of vehicles of Classes I, II and A.

7.7.10 Hot drink machines and cooking equipment

Hot drink machines and cooking equipment shall be so installed or guarded that no hot food or drink is likely to be spilled on any passenger due to emergency braking or cornering forces.

7.7.10.1 On vehicles fitted with hot drinks machines or cooking equipment, all passenger seats shall have adequate provision for setting down hot food or drink whilst the vehicle is in motion.

7.7.11 Doors to interior compartments

Every door to a toilet or other interior compartment:

7.7.11.1 shall be self-closing, and shall not be fitted with any device to hold it open if, when open, it could obstruct passengers in an emergency,

7.7.11.2 shall, when open, not conceal any handle, control device for opening or obligatory marking associated with any service door, emergency door, emergency exit fire extinguisher or first kit aid,

7.7.11.3 shall be provided with a means to enable the door to be opened from outside the compartment in an emergency,

7.7.11.4 shall not be capable of being locked from the outside unless it can always be opened from the inside.

7.8 Artificial interior lighting

7.8.1. Internal electrical lighting shall be provided for the illumination of:

7.8.1.1 all passenger compartments, crew compartments, toilet compartments and the articulated section of an articulated vehicle;

7.8.1.2 any step or steps;

7.8.1.3 the access to any exits;

- 7.8.1.4 the internal markings and internal controls of all exits;
- 7.8.1.5 all places where there are obstacles.
- 7.8.2. There shall be at least two internal lighting circuits such that failure of one will not affect the other. A circuit serving only permanent entry and exit lighting can be considered as one of these circuits.
- 7.8.3 Provisions shall be made to protect the driver from the effects of glare and reflections caused by artificial interior lighting.

7.9 Articulated section of articulated vehicles

7.9.1 The articulated section that interconnects rigid portions of the vehicle shall be so designed and constructed as to allow at least one rotary movement about at least one horizontal axis, and at least one vertical axis.

7.9.2 When the articulated vehicle at its unladen kerb mass is stationary on a horizontal level surface there shall not be between the floor of either of the rigid sections and the floor of the rotating base or of the element replacing that base an uncovered gap of a width exceeding:

7.9.2.1 1 cm when all the wheels of the vehicle are on the same plane, or

7.9.2.2 2 cm when the wheels of the axle adjacent to the articulated section are resting on a surface which is 15 cm higher than the surface on which the wheels of the other axles are resting.

7.9.3 The difference in level between the floor of the rigid portions and the floor of the rotating base, measured at the joint, shall not exceed:

7.9.3.1 2 cm in the conditions described in paragraph 7.9.2.1 above, or

7.9.3.2 3 cm in the conditions described in paragraph 7.9.2.2 above.

7.9.4 On articulated vehicles means shall be provided to physically prevent access by passengers to any part of the articulated section where:

7.9.4.1 the floor has an uncovered gap not complying with the requirements of paragraph 7.9.2;

7.9.4.2 the floor cannot carry the mass of the passengers;

7.9.4.3 the movements of the walls constitute a danger to passengers.

7.10 Direction-holding of articulated vehicles

When an articulated vehicle is moving in a straight line the longitudinal median planes of its rigid portion shall coincide and form a continuous plane without any deflection.

7.11 Handrails and handholds

7.11.1 General requirements

7.11.1.1 Handrails and handholds shall be of adequate strength.

7.11.1.2 They shall be so designed and installed as to present no risk of injury to passengers.

7.11.1.3 Handrails and handholds shall be of a section enabling passengers to grasp them easily and firmly. Every handrail shall provide a length of at least 10 cm to accommodate a hand. No dimension of the section shall be smaller than 2 cm or greater than 4.5 cm except in the case of handrails on doors and seats and, in the case of a vehicle of Class II, III and B, in access passages. In these cases hand rails having a minimum dimension of 1.5 cm shall be permitted provided that one other dimension is of at least 2.5 cm. handrails and shall not have sharp bends.

7.11.1.4 The clearance between a handrail or handhold and the adjacent part of the vehicle body or walls shall be of at least 4 cm. However, in the case of a handrail on a door or a seat, or in the access passage of a vehicle of Class II, III and B, a minimum clearance of 3.5 cm shall be permitted.

7.11.1.5 The surface of every handrail, handhold or stanchion shall be colour contrasting and non-slip.

7.11.2 Handrails and handholds for standing passengers.

7.11.2.1 Handrails and/or handholds shall be provided in sufficient number for each point of the floor area intended, in conformity with paragraph 7.2.2 for standing passengers. For this purpose, strap hangers, if fitted, may be counted as handholds, provided that they are held in their position by suitable means. This requirement shall be deemed to be fulfilled if, for all possible sites of the testing device shown in Annex III, figure 20 hereto, at least two handrails or handholds can be reached by the device's movable arm. The testing device may be freely turned about its vertical axis.

7.11.2.2 When applying the procedure described in paragraph 7.11.2.1 above, only such handrails and handholds shall be considered as are not less than 80 cm and not more than 190 cm above the floor.

7.11.2.3 For every position that can be occupied by a standing passenger, at least one of the two required handrails or handholds shall be not more than 150 cm above the level of the floor at that position.

7.11.2.4 Areas which can be occupied by standing passengers and are not separated by seats from the side walls or rear wall of the vehicle shall be provided with horizontal handrails parallel to the walls and installed at a height of between 80 cm and 150 cm above the floor.

7.11.3 Handrails and handholds for service doors

7.11.3.1 Door apertures shall be fitted with handrails and/or handholds on each side.

7.11.3.2 Handrails and/or handholds to be provided for service doors shall be such that they include a grasping point available to a person standing on the ground adjacent to the service door or on any of the successive steps. Such points shall be situated, vertically, between 80 and 110 cm above the ground or above the surface of each step, and horizontally:

7.11.3.2.1 for the position appropriate to a person standing on the ground, not more than 40 cm inwards from the outer edge of the first step; and

7.11.3.2.2 for the position appropriate to a particular step, not outwards from the outer edge of the step considered, and not more than 60 cm inwards from that same edge.

7.11.3.3 In the case of a double door in a vehicle without steps or with only one step, no centre stanchion or handrail shall be fitted.

7.11.4 Handrails to priority seating

7.11.4.1 A horizontal hand-rail at a height of between 80 cm and 90 cm above floor level shall be provided between the service door(s) and the priority seating, described in paragraph 7.7.8.5.2.

7.12 Accessibility for passengers with reduced mobility and provisions for wheelchair users

7.12.1 In order to fix a standard for reduced mobility, one will hereafter consider wheelchair users, who can freely and normally use their arms and hands, as a reference for passengers with reduced mobility.

7.12.2 Vehicles designed to provide scheduled urban and interurban services shall be designed to afford an easy access to passengers with reduced mobility. These vehicles shall comply with the provisions of paragraphs 7.12.3 to 7.12.13 and with the relevant provisions of Annex VII.

The same provisions shall apply to other vehicles designed to afford easy access to passengers with reduced mobility.

7.12.3 Per wheelchair user provided for in the passenger compartment there shall be a special area at least 90 cm wide and 130 cm long.

7.12.4 There shall be at least two doors, among which at least one service door, through which wheelchair users can pass, with a width of at least 90 cm. In the case of vehicles designed for carrying one or two wheelchair users, this number may be reduced to one door, provided that it be a service door and that there be another with a width of at least 60 cm.

7.12.5 Access from the door to the special area:

It shall be possible to move from the doors referred to in paragraph 7.12.4 to the special area referred to in paragraph 7.12.3 with a reference wheelchair of the dimensions shown in Annex III, figure 21.

Besides, the vehicle shall be so designed as to allow an easy evacuation of the wheelchair users from their special area in a case of emergency.

In the case of Class II and Class III vehicles, when the wheelchair users are in their special area, the width of the gangway may be reduced provided that it permits the free passage of a gauging device as defined in paragraph 7.7.5.1, except as for its lower diameter, which shall be 30 cm.

7.12.6 One of the several means of communication shall be provided in Class I and Class II vehicles in accordance with paragraph 7.7.9, except near the parked positions of the wheelchairs.

7.12.7 Stability of the wheelchairs:

7.12.7.1 If the Class I vehicle is designed to carry only one or two wheelchairs, the following provisions are applicable:

- the wheelchair may be unrestrained;
- the longitudinal axis of the space for a wheelchair shall be parallel to the longitudinal axis of the vehicle;
- one of the sides of the space for a wheelchair shall rest against a side of the vehicle;
- the wheelchair shall travel facing backwards;
- a partition perpendicular to the longitudinal axis of the vehicle shall be provided between the space for a wheelchair and the other passenger seats;
- the wheels or the back of the wheelchair shall rest against the partition (or backrest of the seat row in front) in order to avoid the wheelchair tipping over;
- the partition or backrest of the seat row in front shall be able to bear the unrestrained wheelchair totalling a mass of 250 kg, including the user, when the vehicle brakes from a speed of at least 50 km/h to a halt with a deceleration of at least 5 m/sec<sup>2</sup>;
- a handrail or handhold shall be fitted to the side of the vehicle in such a way as to allow the wheelchair user to grasp it easily;

- a retractable handrail (or any equivalent device) shall be fitted on the opposite side of the wheelchair area in order to restrict any lateral shift of the wheelchair and to allow the wheelchair user to grasp it easily;
- a non-skid coat shall cover the floor of the special area;
- a sign shall be fixed adjacent to the special area, with the following text:

"This place is reserved for a wheelchair. The wheelchair must be placed facing backwards resting against the partition brakes on".

#### 7.12.7.2 If the vehicle is designed to carry more than two wheelchair users:

A restraint system shall be provided in order to warrant the stability of the wheelchair(s) totalling a mass of 250 kg each, including the user, when the vehicle brakes from a speed of at least 50 km/h to a halt with a deceleration of at least 5 m/sec<sup>2</sup>.

The restraint system control shall be red and shall be easy to operate for the wheelchair user and anybody else in order to ease evacuation in a case of emergency. Its operating instructions shall be clearly displayed adjacent to it.

The restraint system shall be so designed as to prevent misuse. In particular, it shall not be able to remain half-closed.

#### 7.12.8 Boarding aids/accessibility:

At least one of the doors referred to in paragraph 7.12.4 shall bear a boarding aid complying with the provisions of Annex VII. In addition, any other boarding aid fitted on the vehicle shall comply with the provisions of Annex VII.

#### 7.12.9 Door controls

Any opening control adjacent to a door referred to in paragraph 7.12.4, whether being outside or inside of the vehicle, shall not be higher than 130 cm from the ground or the floor.

Moreover, when a boarding aid is not to be directly operated by a wheelchair user, a means of communication with the driver, shall be fitted outside adjacent to the door, and not higher than 130 cm from the ground.

#### 7.12.10 Lighting

Adequate lighting shall be provided in order to allow wheelchair users to board and unboard conveniently and safely, without disturbing the driver nor other users.



#### 7.12.11 Mass distribution

In the case of Class II vehicles, including those principally designed for wheelchair users, for the purposes of paragraph 7.3, every wheelchair place shall be considered as one seat and therefore be included in "P". Their corresponding area shall be conventionally assumed to be 90 cm x 130 cm and shall be deduced from  $S_0$  in order to determine  $S_1$ . The mass of a wheelchair comprising the mass of the passenger shall be conventionally assumed to be 250 kg. For other vehicles, paragraph 7.3 shall apply, ignoring the presence of wheelchairs. In the case of Class III and Class II primarily intended for the carriage of wheelchair users, the prescriptions of 7.3.1 shall not apply.

#### 7.12.12 Special provisions for vehicles designed for carrying mainly wheelchair users.

If the vehicle is to carry more than eight wheelchair users, at least two exits shall comply with the provisions of Annex VII, unless the vehicle is a low-floor bus with two such exits. Moreover the access to the doors and to the gangways shall permit free passage of crew members.

#### 7.13 Accessibility pictograms

Appropriate pictograms, internal and external, shall indicate the presence of specific seats for passengers with reduced mobility other than wheelchair users and, if necessary, the possible transport of wheelchair users. Such pictograms are represented in Annex III, fig. 22 a and b.

##### 7.13.1 The pictogram of a passenger in wheelchair (Annex III, fig 22 a) and that for impaired capacity passengers other than wheelchair users (Annex III, fig 22 b) shall be applied:

- at the left side end of the relevant service door, below the lower outline of the side windows, if possible on the axis with any coloured bands on the waistline;
- on the vehicle front head, below the lower outline of the windshield, on the vehicle right hand.

The application of the pictogram shall guarantee the clear and easy reading, even when applied on a non plane and vertical surface.

##### 7.13.2 The pictogram for reduced mobility passenger other than wheelchair users shall be applied at each place for passenger with an reduced mobility other than wheelchair users.

The pictogram for a passenger in a wheelchair shall be in the space intended for the passengers in a wheelchair.

7.14 Guarding of stepwells

Where any seated passenger is likely to be thrown forward into a stepwell as a result of heavy braking, a guard shall be fitted. The guard shall have a minimum height from the floor on which the passenger's feet rest of 80 cm and shall extend inwards from the wall of the vehicle at least as far as 10 cm beyond the longitudinal centre line of any seating position where the passenger is at risk or to the riser of the innermost step; whichever is the lesser dimension.

7.14.1 Means shall be provided to prevent objects having a diameter of between 2 and 7 cm rolling into the driver's foot controls zone.

7.15 Luggage racks, driver protection

The occupants of the vehicle shall be protected from objects liable to fall from luggage racks under braking or cornering forces. If luggage compartments are fitted, they must be designed in such a way that luggage is prevented from falling in the event of sudden braking.

7.16 Trap doors, if fitted

Every trap door on the floor of a vehicle shall be so fitted and secured that it cannot be dislodged or opened without the use of tools or keys and no lifting or securing device shall project by more than 8 mm above floor level. Edges of projections shall be rounded.

7.17 Visual entertainment

Forms of visual entertainment for passengers, for example videos, shall be located out of the driver's view when the driver is seated in their normal driving position.

7.18 Driver cab area

7.18.1 The driver seat shall have a minimum width of 50 cm. The minimum distance between the front of the driver seat squab and the part of the steering wheel nearest to the driver shall be 40 cm. This distance shall be measured with the driver seat in its most advanced position.

7.18.2 The instruments panel shall have an ergonomic configuration to allow the driver to reach all the commands without leaving his seat.

ANNEX I

PART B

SPECIFIC REQUIREMENTS FOR LOW-FLOOR BUSES

7.6.3.1 The several kinds of exit shall have the following minimum dimensions:

			Class I	Class II and III	Remarks
		Height (cm)	180	165	-
Service door	Door aperture	Width (cm)	single door: 90 double door: 120		This dimension may be reduced by 10 cm when the measurement is made at the level of the hand holds
Emergency door		Height (cm)	125		
		Width (cm)	60		-
Emergency window	Area:(cm <sup>2</sup> )		4 000		It shall be possible to inscribe in this area a rectangle of 50 cm x 70 cm
Emergency window situated in the rear face of the vehicle. If the manufacturer does not provide an emergency window of the minimum dimensions prescribed above			It shall be possible to inscribe in the emergency window aperture a rectangle 35 cm high and 155 cm wide. The corners of the rectangle may be rounded to a radius of curvature not exceeding 25 cm.		
Escape hatch	Hatch aperture	Area ( cm <sup>2</sup> )	4 000		It shall be possible to inscribe in this area a rectangle measuring 50 x 70 cm <sup>2</sup>

7.6.10 Technical requirements for retractable steps

Low-floor buses cannot have retractable steps.

7.7.6 Slope of gangway

7.7.6.4 12.5% in the case of a low-floor vehicle of Class I or II of the inner part of the gangway, 1m either side of the second axle centre line. This surface shall be particularly slip resistant.

7.7.7.1 Steps

There shall be no steps between at least 35% of the area available for standing passengers and the first step from the ground of at least one service door.

7.11.3.3 Vehicles which do not have steps between the service door and the area available for passengers shall have handrails on each side of the entrance as described in paragraph 7.11.3.2 from a position 10 cm inwards from the first to half the vehicle width.

7.12.2 Low-floor vehicles shall comply with the provisions of paragraphs 7.12.3 to 7.12.7 and 7.12.9 to 7.12.13.

7.12.8 Boarding aids/accessibility:

At least one of the doors referred to in paragraph 7.12.4 shall bear a boarding aid complying with paragraphs 3.3 or 3.4 of Annex VII. In addition, any other boarding aid fitted on the vehicle shall comply with the provisions of Annex VII.

## ANNEX I

### PART C

#### SPECIFICS REQUIREMENTS FOR VEHICLES OTHER THAN LOW-FLOOR BUSES

7.6.3.1 The several kinds of exit shall have the following minimum dimensions:

			Class I	Class II and III	Remarks
		Height (cm)	180	165	-
Service door	Door aperture	Width (cm)	single door: 65 double door: 120		This dimension may be reduced by 10 cm when the measurement is made at the level of the hand holds
Emergency door		Height (cm)	125		
		Width (cm)	55		-
Emergency window	Area:(cm <sup>2</sup> )		4 000		It shall be possible to inscribe in this area a rectangle of 50 cm x 70 cm
Emergency window situated in the rear face of the vehicle. If the manufacturer does not provide an emergency window of the minimum dimensions prescribed above			It shall be possible to inscribe in the emergency window aperture a rectangle 35 cm high and 155 cm wide. The corners of the rectangle may be rounded to a radius of curvature not exceeding 25 cm.		
Escape hatch	Hatch aperture	Area ( cm <sup>2</sup> )	4 000		It shall be possible to inscribe in this area a rectangle measuring 50 x 70 cm <sup>2</sup>

#### 7.6.10 Technical requirements for retractable steps

Retractable steps if fitted shall comply with the following requirements:

- 7.6.10.1 Their operation shall be synchronised with that of the corresponding service or emergency door.
- 7.6.10.2 When the door is closed no part of the retractable step shall project more than 10 mm beyond the adjacent line of the body work.
- 7.6.10.3 When the door is open and the retractable step is in the extended position, the surface area shall conform to the requirements of paragraph 7.7.7 of this Annex.

- 7.6.10.4 It shall not be possible for the vehicle to move from rest, under its own power, when the step is in the extended position. In the case of a manually operated step, an audible or visual indication shall alert the driver when the step is not fully retracted.
- 7.6.10.5 The step shall not be capable of being extended when the vehicle is in motion. If the device to operate the step fails, the step shall retract and remain in the retracted position. However, the operation of the corresponding door shall not be hindered in the event of such a failure, or if the step is damaged.
- 7.6.10.6 When a passenger is standing on the retractable step, corresponding door shall be incapable of being closed. Compliance with this requirement shall be checked by placing a mass of 15 kg representing a small child, at the centre of the step. This requirement shall not apply to any door within the driver's direct field of view.
- 7.6.10.7 The movement of the retractable step shall not be liable to cause any bodily harm either to passengers or to persons waiting at bus stops.
- 7.6.10.8 The corners of retractable steps facing forwards or rear-wards shall be rounded to a radius of not less than 5 mm; the edges shall be rounded to a radius of not less than 2.5 mm.
- 7.6.10.9 When the passenger door is open, the retractable step shall be securely held in the extended position. When a mass of 136 kg is placed in the centre of a single step or a mass of 272 kg is placed in the centre of a double step the deflection at any point on the step shall not exceed 10 mm.
- 7.11.3.1 For double doors, this requirement may be met by the installation of one central stanchion or handrail.

## ANNEX I

### Appendix 1

#### VERIFICATION OF STATIC TILTING LIMIT BY MEANS OF CALCULATION

1. A vehicle may be shown to meet the requirement specified in paragraph 7.4 of Annex I and paragraph 7.4 of Annex VIII of this Directive by a calculation method approved by the technical service for conducting the tests.
2. The technical service responsible for conducting the tests may require tests to be carried out on parts of the vehicle to verify the assumptions made in the calculation.
3. Preparations for calculation.
  - 3.1 The vehicle shall be represented by a spatial system.
  - 3.2 Due to the location of the centre of gravity of the body of the vehicle and the different spring rates of the vehicle suspension and tyres, axles do not generally lift simultaneously on one side of the vehicle as a result of lateral acceleration. Therefore, lateral tilting of the body over each axle has to be ascertained on the supposition that the wheels of the other axle(s) remain on the ground.
  - 3.3 To simplify matters, it shall be assumed that the centre of gravity of the unsprung masses lies in the longitudinal plane of the vehicle on the line passing through the centre of the wheel rotation axle. The small shifting of the roll centre due to deflection of the axle can be neglected. The air suspension control should not be taken into account.
  - 3.4 The following parameters, at least, shall be taken into account:

Vehicle data such as wheel base, tread width and sprung/unsprung masses, location of the centre of gravity of the vehicle, deflection and rebound and the spring rate of the vehicle suspension, considering also non linearity, horizontal and vertical spring rate of the tyres, torsion of the superstructure, location of the roll centre of the axles.
4. Validity of the calculation method.
  - 4.1 The validity of the calculation method shall be established to the satisfaction of the technical service, e.g. on the basis of a comparative test with a similar vehicle.

## ANNEX II

### TYPE-APPROVAL DOCUMENTATION

#### Appendix 1 Sub-Appendix 1

INFORMATION DOCUMENT No .....\*  
pursuant to Annex I of Council Directive 70/156/EEC  
relating to EC Type-approval of a vehicle with respect to the  
special provisions for vehicles used for the carriage of passengers comprising more than  
eight seats in addition to the driver's seat (Directive .../.../...)

The following information, if applicable, must be supplied in triplicate and include a list of contents. Any drawings must be supplied in appropriate scale and in sufficient detail on size A4 or on a folder of A4 format. Photographs, if any, must show sufficient detail.

If the systems, components or separate technical units have electronic controls, information concerning their performance must be supplied.

- 0. GENERAL
  - 0.1 Make (trade name of manufacturer):
  - 0.2 Type and general commercial description(s):
  - 0.3 Means of identification of type, if marked on the vehicle (b):
    - 0.3.0.1 Chassis:
    - 0.3.0.2 Body:
      - 0.3.1 Location of that marking:
  - 0.4 Category of vehicle (c):
  - 0.5 Name and address of manufacturer:
  - 0.8 Address(es) of assembly plant(s):
- 1. GENERAL CONSTRUCTION CHARACTERISTICS OF THE VEHICLE
  - 1.1 Photographs and/or drawings of a representative vehicle:

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\* The item numbers and footnotes used in this Information Document correspond to those set out in Annex I to Directive 70/156/EEC. Items not relevant for the purpose of this Directive are omitted.



- 1.2 Dimensional drawing of the whole vehicle:
- 1.3 Number of axles and wheels:
- 1.4 Chassis (if any) (overall drawing):
- 1.5 Material used for the side -members (d):
- 1.6 Position and arrangement of the engine:
- 1.7 Driving cab (forward, or normal) (z):
- 1.8 Hand of drive:
- 2. **MASSES AND DIMENSIONS (e) (in kg and mm)**  
(Refer to drawing where applicable)
- 2.1 Wheel base(s) (fully loaded) (f):
- 2.4 Range of vehicle dimensions (overall)
  - 2.4.1 For chassis without bodywork
    - 2.4.1.1 Length (j):
    - 2.4.1.2 Width (k):
      - 2.4.1.2.1 Maximum width:
    - 2.4.1.3 Height (unladen) (l) (for suspensions adjustable for height, indicate normal running position):
  - 2.4.2 For chassis with bodywork
    - 2.4.2.1 Length (j):
    - 2.4.2.2 Width (k):
    - 2.4.2.3 Height (unladen) (l) (for suspensions adjustable for height, indicate normal running position):
    - 2.4.2.4 Position of centre of gravity of the laden vehicle in the longitudinal, transverse and vertical directions:
- 2.6 Mass of the vehicle with bodywork in running order, or mass of the chassis with cab if the manufacturer does not fit the bodywork (including coolant, oils, fuel, tools, spare wheel and driver) (o) (max. and min. for each version):
  - 2.6.1 Distribution of this mass among the axles and, in the case of a semi-trailer or centre-axle trailer, load on the coupling point (max. and min. for each version):

- 2.8 Technically permissible maximum laden mass stated by the manufacturer (max. and min. for each version) (y):
- 2.8.1 Distribution of this mass among the axles and, in the case of a semi-trailer or centre-axle trailer, load on the coupling point (max. and min. for each version):
- 2.9 Technically permissible maximum mass on each axle and, in the case of a semi-trailer or centre-axle trailer, load on the coupling point, stated by the manufacturer:
- 9. BODYWORK
- 9.1 Type of bodywork:
- 9.2 Materials used and methods of construction:
- 13. SPECIAL PROVISIONS FOR VEHICLES USED FOR THE CARRIAGE OF PASSENGERS COMPRISING MORE THAN EIGHT SEATS IN ADDITION TO THE DRIVER'S SEAT
- 13.1 Class of vehicle (Class I, Class II, Class III, Class A, Class B):
- 13.2 Area for passengers (m<sup>2</sup>):
- 13.2.1 Total (S<sub>0</sub>):
- 13.2.1.1 Upper deck (S<sub>0a</sub>)<sup>(1)</sup>:
- 13.2.1.2 Lower deck (S<sub>0b</sub>)<sup>(1)</sup>:
- 13.2.2 For standing passengers (S<sub>1</sub>):
- 13.3 Number of passengers (seated and standing):
- 13.3.1 Total (N):
- 13.3.2 Upper deck (N<sub>a</sub>)<sup>(1)</sup>:
- 13.3.3 Lower deck (N<sub>b</sub>)<sup>(1)</sup>:
- 13.4 Number of passengers seated:
- 13.4.1 Total (A):
- 13.4.2 Upper deck (A<sub>a</sub>)<sup>(1)</sup>:
- 13.4.3 Lower deck (A<sub>b</sub>)<sup>(1)</sup>:
- 13.5 Number of service doors:

- 13.6 Number of emergency exits (doors, windows, escape hatches, intercommunication staircase and half staircase):
- 13.6.1 Total:
- 13.6.2 Upper deck<sup>(1)</sup>:
- 13.6.3 Lower deck<sup>(1)</sup>:
- 13.7 Volume of luggage compartments:  $m^3$
- 13.8 Area for luggage transportation on the roof:  $m^2$
- 13.9 Technical devices facilitating the access to vehicles (e.g. ramp, lifting platform, kneeling system), if fitted:
- 13.10 Superstructure strength:
- 13.10.1 Detailed description of the superstructure of the vehicle type including its dimensions, configuration and constituent materials and its attachment to any chassis frame.
- 13.10.2 Drawings of the vehicle and those parts of its interior arrangement which have an influence on the strength of the superstructure or on the residual space.
- 13.10.3 Position of centre of gravity of the unladen vehicle in the longitudinal, transverse and vertical directions:
- 13.10.4 Maximum distance between the centre lines of the outboard passenger seats.

## ANNEX II

### Appendix 1 Sub-Appendix 2

#### INFORMATION DOCUMENT No .....\*

pursuant to Annex I of Council Directive 70/156/EEC

relating to EC Type-approval of a body as a separate technical unit with respect to the special provisions for vehicles used for the carriage of passengers comprising more than eight seats in addition to the driver's seat (Directive .../.../...)

The following information, if applicable, must be supplied in triplicate and include a list of contents. Any drawings must be supplied in appropriate scale and in sufficient detail on size A4 or on a folder of A4 format. Photographs, if any, must show sufficient detail.

If the systems, components or separate technical units have electronic controls, information concerning their performance must be supplied.

- 0. GENERAL
- 0.1 Make (trade name of manufacturer):
- 0.2 Type and general commercial description(s):
- 0.3 Means of identification of type, if marked on the body (b):
  - 0.3.1 Location of that marking:
- 0.7 In the case of components and separate technical units, location and method of affixing of the EC type-approval mark.
- 0.8 Address(es) of assembly plant(s):
- 1. GENERAL CONSTRUCTION CHARACTERISTICS OF THE VEHICLE
  - 1.1 Photographs and/or drawings of a representative vehicle:
  - 1.2 Dimensional drawing of the whole vehicle:
  - 1.3 Number of axles and wheels:
  - 1.4 Chassis (if any) (overall drawing):
  - 1.5 Material used for the side -members (d):

---

\* The item numbers and footnotes used in this Information Document correspond to those set out in Annex I to Directive 70/156/EEC. Items not relevant for the purpose of this Directive are omitted.

- 1.6 Position and arrangement of the engine:
- 1.7 Driving cab (forward, or normal) (z):
- 1.8 Hand of drive:
- 2. **MASSES AND DIMENSIONS (e) (in kg and mm)**  
(Refer to drawing where applicable)
- 2.1 Wheel base(s) (fully loaded) (f):
- 2.4 Range of vehicle dimensions (overall)
- 2.4.3 For bodywork approved without chassis:
- 2.4.3.1 Length (j):
- 2.4.3.2 Width (k):
- 2.4.3.3 Nominal Height (unladen) on intended chassis type(s) (l) (for suspension adjustable for height, indicate normal running position):
- 9. **BODYWORK**
- 9.1 Type of bodywork:
- 9.2 Materials used and methods of construction:
- 13. **SPECIAL PROVISIONS FOR VEHICLES USED FOR THE CARRIAGE OF PASSENGERS COMPRISING MORE THAN EIGHT SEATS IN ADDITION TO THE DRIVER'S SEAT**
- 13.1 Class of vehicle (Class I, Class II, Class III, Class A, Class B):
- 13.1.1 Chassis types where the EC type-approved body can be installed (manufacturer(s) and vehicle(s) types):
- 13.2 Area for passengers (m<sup>2</sup>):
- 13.2.1 Total (S<sub>0</sub>):
- 13.2.1.1 Upper deck (S<sub>0a</sub>):<sup>(1)</sup>
- 13.2.1.2 Lower deck (S<sub>0b</sub>):<sup>(1)</sup>
- 13.2.2 For standing passengers (S<sub>1</sub>):
- 13.3 Number of passengers (seated and standing):
- 13.3.1 Total (N):

- 13.3.2 Upper deck ( $N_a$ ):<sup>(1)</sup>
- 13.3.3 Lower deck ( $N_b$ ):<sup>(1)</sup>
- 13.4 Number of passenger seats:
  - 13.4.1 Total (A):
  - 13.4.2 Upper deck ( $A_a$ ):<sup>(1)</sup>
  - 13.4.3 Lower deck ( $A_b$ ):<sup>(1)</sup>
- 13.5 Number of service doors:
- 13.6 Number of emergency exits (doors, windows, escape hatches, intercommunication staircase and half staircase):
  - 13.6.1 Total:
  - 13.6.2 Upper deck:<sup>(1)</sup>
  - 13.6.3 Lower deck:<sup>(1)</sup>
- 13.7 Volume of luggage compartments: .....m<sup>3</sup>
- 13.8 Area for luggage transportation on the roof: ..... m<sup>2</sup>
- 13.9 Technical devices facilitating the access to vehicles (e.g. ramp, lifting platform, kneeling system), if fitted:
- 13.10 SUPERSTRUCTURE STRENGTH
  - 13.10.1 Detailed description of the superstructure of the vehicle type including its dimensions, configuration and constituent materials and its attachment to any chassis frame.
  - 13.10.2 Drawings of the vehicle and those parts of its interior arrangement which have an influence on the strength of the superstructure or on the residual space.
  - 13.10.3 Position of centre of gravity of the unladen vehicle in the longitudinal, transverse and vertical directions:
  - 13.10.4 Maximum distance between the centre lines of the outboard passenger seats.

## ANNEX II

### Appendix 1 Sub-Appendix 3

INFORMATION DOCUMENT No .....\*  
pursuant to Annex I of Council Directive 70/156/EEC  
relating to EC Type-approval of a vehicle where the body has previously obtained the EC  
type-approval as a separate technical unit, with respect to the special provisions for  
vehicles used for the carriage of passengers comprising more than eight seats in addition to  
the driver's seat (Directive ..../.../....)

The following information, if applicable, must be supplied in triplicate and include a list of contents. Any drawings must be supplied in appropriate scale and in sufficient detail on size A4 or on a folder of A4 format. Photographs, if any, must show sufficient detail.

If the systems, components or separate technical units have electronic controls, information concerning their performance must be supplied.

- 0. GENERAL
- 0.1 Make (trade name of manufacturer):
- 0.2 Type and general commercial description(s):
  - 0.2.1 Chassis:
  - 0.2.2 Body:
- 0.3 Means of identification of type, if marked on the vehicle (b):
  - 0.3.0.1 Chassis:
  - 0.3.0.2 Body:
  - 0.3.1 Location of marking(s):
- 0.4 Category of vehicle (c):
- 0.5 Name and address of manufacturer:
- 0.8 Address(es) of assembly plant(s):
- 0.9 EC type-approval number of body as separate technical unit:

---

\* The item numbers and footnotes used in this Information Document correspond to those set out in Annex I to Directive 70/156/EEC. Items not relevant for the purpose of this Directive are omitted.

1. GENERAL CONSTRUCTION CHARACTERISTICS OF THE VEHICLE
  - 1.1 Photographs and/or drawings of a representative vehicle:
  - 1.2 Dimensional drawing of the whole vehicle:
  - 1.3 Number of axles and wheels:
    - 1.3.1 Number and position of twin-wheeled axles
  - 1.4 Chassis (if any) (overall drawing):
  - 1.5 Material used for the side-members (d):
  - 1.6 Position and arrangement of the engine:
  - 1.7 Driving cab (forward, or normal) (z):
  - 1.8 Hand of drive:
2. MASSES AND DIMENSIONS (e) (in kg and mm)  
(Refer to drawing where applicable)
  - 2.1 Wheel base(s) (fully loaded) (f):
  - 2.4 Range of vehicle dimensions (overall)
    - 2.4.1 For chassis without bodywork
      - 2.4.1.1 Length (j):
      - 2.4.1.2 Width (k):
        - 2.4.1.2.1 Maximum width:
      - 2.4.1.3 Height (unladen) (l) (for suspensions adjustable for height, indicate normal running position):
    - 2.4.2 For chassis with bodywork
      - 2.4.2.1 Length (j):
      - 2.4.2.2 Width (k):
      - 2.4.2.3 Height (unladen) (l) (for suspension adjustable for height, indicate normal running position):
      - 2.4.2.4 Position of centre of gravity of the laden vehicle in the longitudinal, transverse and vertical directions:



- 2.6 Mass of the vehicle with bodywork in running order, or mass of the chassis with cab if the manufacturer does not fit the bodywork (including coolant, oils, fuel, tools, spare wheel and driver) (o) (maximum and minimum):
- 2.6.1 Distribution of this mass among the axles and, in the case of a semi-trailer or centre axle trailer, load on the coupling point (maximum and minimum):
- 2.8 Technically permissible maximum laden mass stated by the manufacturer (maximum and minimum) (y):
- 2.8.1 Distribution of this mass along the axles and, in the case of a semi-trailer or centre-axle trailer, load on the coupling point (maximum and minimum):
- 2.9 Technically permissible maximum mass on each axle, and in the case of a semi-trailer or centre-axle trailer, load on the coupling point, stated by the manufacturer:
- 9. BODYWORK
- 9.1 Type of bodywork:
- 13. SPECIAL PROVISIONS FOR VEHICLES USED FOR THE CARRIAGE OF PASSENGERS COMPRISING MORE THAN EIGHT SEATS IN ADDITION TO THE DRIVER'S SEAT
- 13.1 Class of vehicle (Class I, Class II, Class III, Class A, Class B):
- 13.2 Area for passengers (m<sup>2</sup>):
- 13.2.1 Total (S<sub>0</sub>):
- 13.2.1.1 Upper deck (S<sub>0a</sub>):<sup>(1)</sup>
- 13.2.1.2 Lower deck (S<sub>0b</sub>):<sup>(1)</sup>
- 13.2.2 For standing passengers (S<sub>1</sub>):
- 13.3 Number of passengers (seated and standing):
- 13.3.1 Total (N):
- 13.3.2 Upper deck (N<sub>a</sub>):<sup>(1)</sup>
- 13.3.3 Lower deck (N<sub>b</sub>):<sup>(1)</sup>
- 13.4 Number of passenger seats:
- 13.4.1 Total (A):
- 13.4.2 Upper deck (A<sub>a</sub>):<sup>(1)</sup>

- 13.4.3 Lower deck (A<sub>b</sub>):<sup>(1)</sup>
- 13.5 Number of service doors:
- 13.6 Number of emergency exits (doors, windows, escape hatches, intercommunication staircase and half staircase):
- 13.6.1 Total:
- 13.6.2 Upper deck:<sup>(1)</sup>
- 13.6.3 Lower deck:<sup>(1)</sup>
- 13.7 Volume of luggage compartments: .....m<sup>3</sup>
- 13.8 Area for luggage transportation on the roof: ..... m<sup>2</sup>
- 13.9 Technical devices facilitating the access to vehicles (e.g. ramp, lifting platform, kneeling system), if fitted:
- 13.10 **SUPERSTRUCTURE STRENGTH**
- 13.10.1 Detailed description of the superstructure of the vehicle type including its dimensions, configuration and constituent materials and its attachment to any chassis frame.
- 13.10.2 Drawings of the vehicle and those parts of its interior arrangement which have an influence on the strength of the superstructure or on the residual space.
- 13.10.3 Position of centre of gravity of the unladen vehicle in the longitudinal, transverse and vertical directions:
- 13.10.4 Maximum distance between the centre lines of the outboard passenger seats.

## ANNEX II

### Appendix 2

#### Sub-Appendix 1

### MODEL

(maximum format: A4 (210 x 297 mm))

### EC TYPE-APPROVAL CERTIFICATE

STAMP OF ADMINISTRATION

Communication concerning the

- type-approval<sup>(1)</sup>
- extension of type-approval<sup>(1)</sup>
- refusal of type-approval<sup>(1)</sup>
- withdrawal of type-approval<sup>(1)</sup>

of a type of a vehicle/component/separate technical unit<sup>(1)</sup> with regard to Directive ..../.../EC, as last amended by Directive ..../.../EC

Type-approval number:

Reason for extension:

#### SECTION I

- 0.1 Make (trade name of manufacturer):
- 0.2 Type and general commercial description(s):
- 0.3 Means of identification of type if marked on the vehicle/component/separate technical unit <sup>(1)</sup> <sup>(2)</sup>:
- 0.3.1 Location of that marking:

---

(1) Delete where not applicable.

(2) If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered by this type-approval certificate such characters shall be represented in the documentation by the symbol:"?" (e.g. ABC??123??).

- 0.4 Category of vehicle<sup>(3)</sup>:
- 0.5 Name and address of manufacturer:
- 0.8 Address(es) of assembly plant(s):

## SECTION II

- 1. Additional information (where applicable): See Addendum
- 2. Technical service responsible for carrying out the tests:
- 3. Date of test report:
- 4. Number of test report:
- 5. Remarks (if any): See Addendum
- 6. Place:
- 7. Date:
- 8. Signature:
- 9. The index to the information package lodged with the approval authority, which may be obtained on request, is attached.

### ADDENDUM

to EC type-approval certificate no. ....

concerning the type-approval of a vehicle with regard to  
Directive .../.../EEC as last amended by Directive .../.../...

- 1. Additional information
  - 1.1. Category of vehicle (M<sub>2</sub>, M<sub>3</sub>)<sup>(1)</sup>:
  - 1.2. Bodywork concept (single/double deck, articulated, low-floor)<sup>(1)</sup>:
  - 1.3. Technically permissible maximum mass (kg):
  - 1.4. Number of passengers (seated and standing):
    - 1.4.1. Total (N):
    - 1.4.2. Upper deck (N<sub>a</sub>)<sup>(1)</sup>:
    - 1.4.3. Lower deck (N<sub>b</sub>)<sup>(1)</sup>:

---

<sup>(3)</sup> As defined in Annex II A to Directive 70/156/EEC.

- 1.4.4 Number of passengers seated:
  - 1.4.4.1 Total (A):
  - 1.4.4.2 Upper deck ( $A_a$ )(1):
  - 1.4.4.3 Lower deck ( $A_b$ )(1):
- 1.5 Mass of luggage (compartment/roof) (kg):
- 1.6 Technical devices facilitating access to buses (ramp, lifting platform, kneeling-system):
- 1.7 Position of centre of gravity of the laden vehicle in the longitudinal, transverse and vertical directions:
- 5. Remarks (including mention if the vehicle benefits of the derogation in Article 3)):

## ANNEX II

### Appendix 2

#### Sub-Appendix 2

### MODEL

(maximum format: A4 (210 x 297 mm))

### EC TYPE-APPROVAL CERTIFICATE

STAMP OF ADMINISTRATION

Communication concerning the

- type-approval (1)
- extension of type-approval (1)
- refusal of type-approval (1)
- withdrawal of type-approval (1)

of a type of a vehicle/component/separate technical unit<sup>(1)</sup> with regard to Directive .../.../EC, as last amended by Directive .../.../EC

Type-approval number:

Reason for extension:

#### SECTION I

- 0.1 Make (trade name of manufacturer):
- 0.2 Type and general commercial description(s):
- 0.3 Means of identification of type if marked on the vehicle/component/separate technical unit <sup>(1)(2)</sup>:
- 0.3.1 Location of that marking:
- 0.4 Category of vehicle <sup>(3)</sup>:

---

<sup>(1)</sup> Delete where not applicable.

<sup>(2)</sup> If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered by this type-approval certificate such characters shall be represented in the documentation by the symbol: "?" (e.g. ABC??123??).

<sup>(3)</sup> As defined in Annex II A to Directive 70/156/EEC.

- 0.5 Name and address of manufacturer:
- 0.7 In the case of components and separate technical units, location and method of affixing of the EC approval mark:
- 0.8 Address(es) of assembly plant(s):

## SECTION II

- 1. Additional information (where applicable): See Addendum
- 2. Technical service responsible for carrying out the tests:
- 3. Date of test report:
- 4. Number of test report:
- 5. Remarks (if any): See Addendum
- 6. Place:
- 7. Date:
- 8. Signature:
- 9. The index to the information package lodged with the approval authority, which may be obtained on request, is attached.

### ADDENDUM

to EC type-approval certificate no. ....

concerning the type-approval of a vehicle with regard to  
Directive .../.../EEC as last amended by Directive .../.../...

- 1. Additional information
  - 1.1. Category of vehicle where the body can be installed (M<sub>2</sub>, M<sub>3</sub>)<sup>(1)</sup>:
  - 1.2. Bodywork concept (single/double deck, articulated, low-floor)<sup>(1)</sup>:
  - 1.3. Chassis type(s) where the body can be installed:
  - 1.4. Number of passengers (seated and standing):
    - 1.4.1. Total (N):
    - 1.4.2. Upper deck (N<sub>a</sub>)<sup>(1)</sup>:
    - 1.4.3. Lower deck (N<sub>b</sub>)<sup>(1)</sup>:

- 1.4.4 Number of passengers seated:
  - 1.4.4.1 Total (A):
  - 1.4.4.2 Upper deck ( $A_a$ )(1):
  - 1.4.4.3 Lower deck ( $A_b$ )(1):
- 1.5 Mass of luggage (compartment/roof) (kg):
- 1.6 Technical devices facilitating access to buses (ramp, lifting platform, kneeling-system):
- 5. Remarks (including mention if the body benefits of the derogation in Article 3)):



## ANNEX II

### Appendix 2

#### Sub-Appendix 3

### MODEL

(maximum format: A4 (210 x 297 mm))

### EC TYPE-APPROVAL CERTIFICATE

**STAMP OF ADMINISTRATION**

Communication concerning the

- type-approval<sup>(1)</sup>
- extension of type-approval<sup>(1)</sup>
- refusal of type-approval<sup>(1)</sup>
- withdrawal of type-approval<sup>(1)</sup>

of a type of a vehicle/component/separate technical unit<sup>(1)</sup> with regard to Directive ...../EC, as last amended by Directive ...../EC

Type-approval number:

Reason for extension:

#### SECTION I

- 0.1 Make (trade name of manufacturer):
- 0.2 Type and general commercial description(s):
- 0.3 Means of identification of type if marked on the vehicle/component/separate technical unit<sup>(1)(2)</sup>:
  - 0.3.1 Location of that marking:
- 0.4 Category of vehicle<sup>(3)</sup>:
- 0.5 Name and address of manufacturer:

<sup>(1)</sup> Delete where not applicable.

<sup>(2)</sup> If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered by this type-approval certificate such characters shall be represented in the documentation by the symbol:"?" (e.g. ABC??123??).

<sup>(3)</sup> As defined in Annex II A to Directive 70/156/EEC.

0.8 Address(es) of assembly plant(s):

**SECTION II**

1. Additional information (where applicable): See Addendum
2. Technical service responsible for carrying out the tests:
3. Date of test report:
4. Number of test report:
5. Remarks (if any): See Addendum
6. Place:
7. Date:
8. Signature:
9. The index to the information package lodged with the approval authority, which may be obtained on request, is attached.

**ADDENDUM**

to EC type-approval certificate no. ....

concerning the type-approval of a vehicle with regard to  
Directive .../.../EEC as last amended by Directive .../.../...

1. Additional information
  - 1.1. Category of vehicle (M<sub>2</sub>, M<sub>3</sub>)<sup>(1)</sup>:
  - 1.2. Bodywork concept (single/double deck, articulated, low-floor)<sup>(1)</sup>:
  - 1.3. Technically permissible maximum mass (kg):
  - 1.4. Number of passengers (seated and standing):
    - 1.4.1. Total (N):
    - 1.4.2. Upper deck (N<sub>a</sub>)<sup>(1)</sup>:
    - 1.4.3. Lower deck (N<sub>b</sub>)<sup>(1)</sup>:
    - 1.4.4. Number of passengers seated:
      - 1.4.4.1. Total (A):
      - 1.4.4.2. Upper deck (A<sub>a</sub>)<sup>(1)</sup>:

- 1.4.4.3 Lower deck ( $A_b$ )(1):
- 1.5 Mass of luggage (compartment/roof) (kg):
- 1.6 Technical devices facilitating access to buses (ramp, lifting platform, kneeling-system):
- 1.7 Position of centre of gravity of the laden vehicle in the longitudinal, transverse and vertical directions:
- 5. Remarks (including mention if the vehicle benefits of the derogation in Article 3)):

ANNEX II

Appendix 2

Sub-Appendix 4

MODEL

(maximum format: A4 (210 x 297 mm))

EC TYPE-APPROVAL CERTIFICATE

STAMP OF ADMINISTRATION

Communication concerning the

- type-approval<sup>(1)</sup>
- extension of type-approval<sup>(1)</sup>
- refusal of type-approval<sup>(1)</sup>
- withdrawal of type-approval<sup>(1)</sup>

of a type of a vehicle/component/separate technical unit<sup>(1)</sup> with regard to Directive ..../.../EC, as last amended by Directive ..../.../EC

Type-approval number:

Reason for extension:

SECTION I

- 0.1 Make (trade name of manufacturer):
- 0.2 Type and general commercial description(s):
- 0.3 Means of identification of type if marked on the vehicle/component/separate technical unit<sup>(1)(2)</sup>:
  - 0.3.1 Location of that marking:
- 0.4 Category of vehicle<sup>(3)</sup>:
- 0.5 Name and address of manufacturer:

---

<sup>(1)</sup> Delete where not applicable.

<sup>(2)</sup> If the means of identification of type contains characters not relevant to describe the vehicle, component or separate technical unit types covered by this type-approval certificate such characters shall be represented in the documentation by the symbol: "?" (e.g. ABC??123??).

<sup>(3)</sup> As defined in Annex II A to Directive 70/156/EEC.

- 0.7 In the case of components and separate technical units, location and method of affixing of the EC approval mark:
- 0.8 Address(es) of assembly plant(s):

**SECTION II**

- 1. Additional information (where applicable): See Addendum
- 2. Technical service responsible for carrying out the tests:
- 3. Date of test report:
- 4. Number of test report:
- 5. Remarks (if any): See Addendum
- 6. Place:
- 7. Date:
- 8. Signature:
- 9. The index to the information package lodged with the approval authority, which may be obtained on request, is attached.

**ADDENDUM**

to EC type-approval certificate no. ....

concerning the type-approval of a superstructure with regard to  
Directive .../.../EEC as last amended by Directive .../.../...

- 1. Additional information
  - 1.1. Category of vehicle where the superstructure can be installed (M<sub>2</sub>, M<sub>3</sub>)<sup>(1)</sup>:
  - 1.2. Bodywork concept (single/double deck, articulated, low-floor)<sup>(1)</sup>:
  - 1.3. Brief description of the superstructure type including dimensions, configuration and constituent materials and its attachment to any chassis frame
  - 1.4. Chassis type(s) where the superstructure can be installed:
  - 1.5. The position of the centre of gravity of the unladen superstructure in the longitudinal, traverse and vertical directions.
  - 1.6. Number of passengers (seated and standing):
    - 1.6.1 Total (N):

1.6.2 Number of passengers seated:

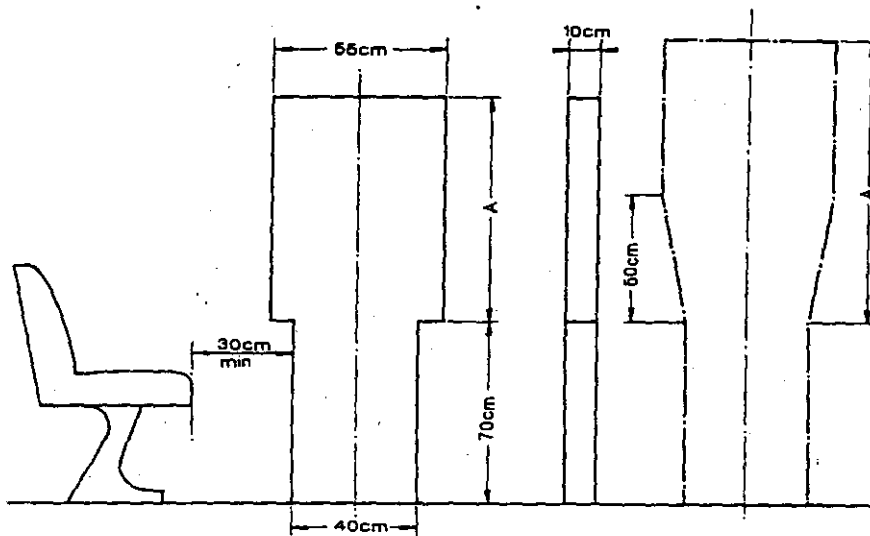
5. Remarks:

**ANNEX III**

**EXPLANATORY DIAGRAMS**

**Figure I**

Access to service doors  
(see paragraph 7.7.1)



alternative

A = 110 cm Classes I, II & III

A = 95 cm Classes A & B

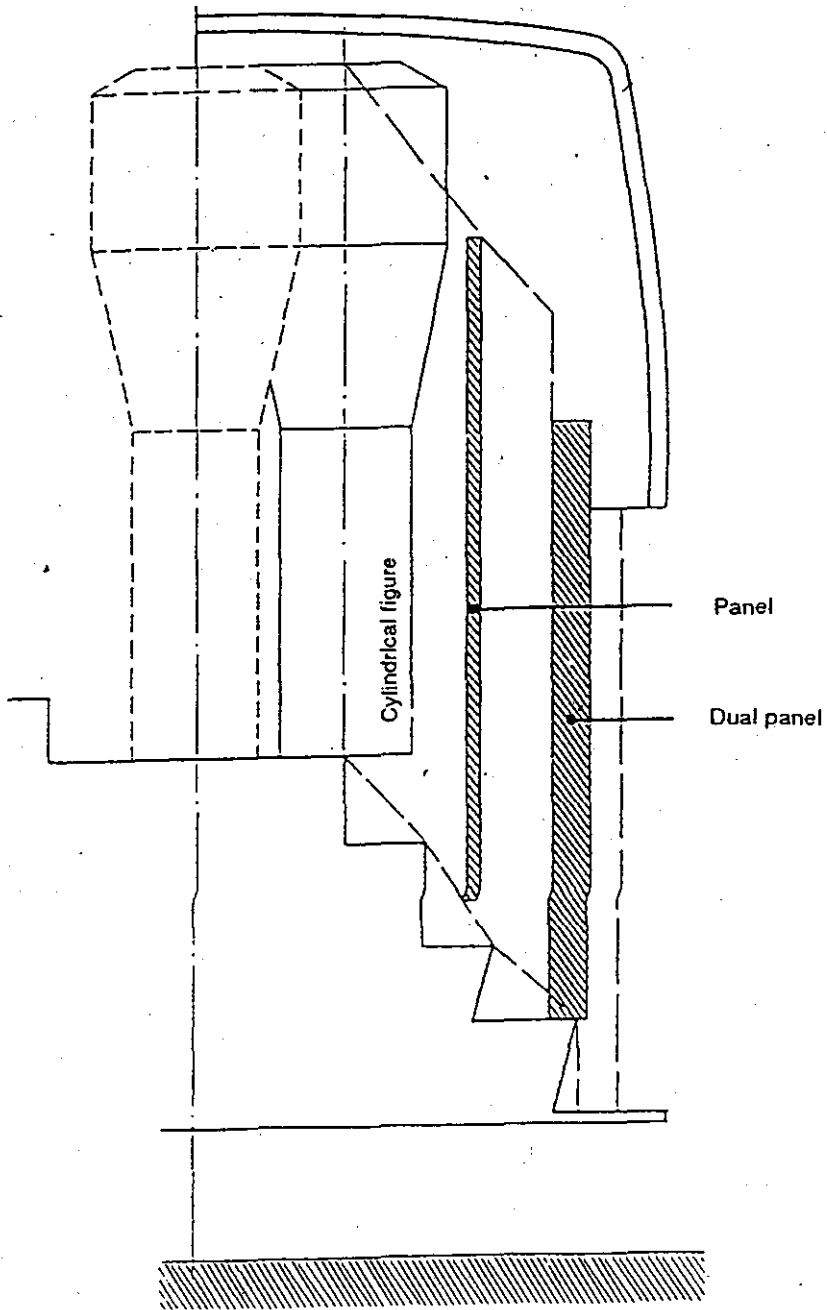
Number of passengers	≤ 22		> 22 *		
Classes	A	B	I	II	III
Dimension A (cm)	95	70	110	95	85
Total height of dual panel	165	140	180	165	155

(\* ) See the respective footnote in paragraph 7.7.1.1.

ANNEX III

Figure 2

Access to service doors  
(see paragraph 7.7.1.4)

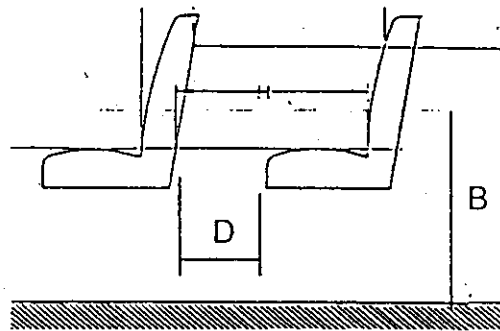




ANNEX III

Figure 3

Determination of unobstructed access to door  
(see paragraph 7.7.1.10.1)

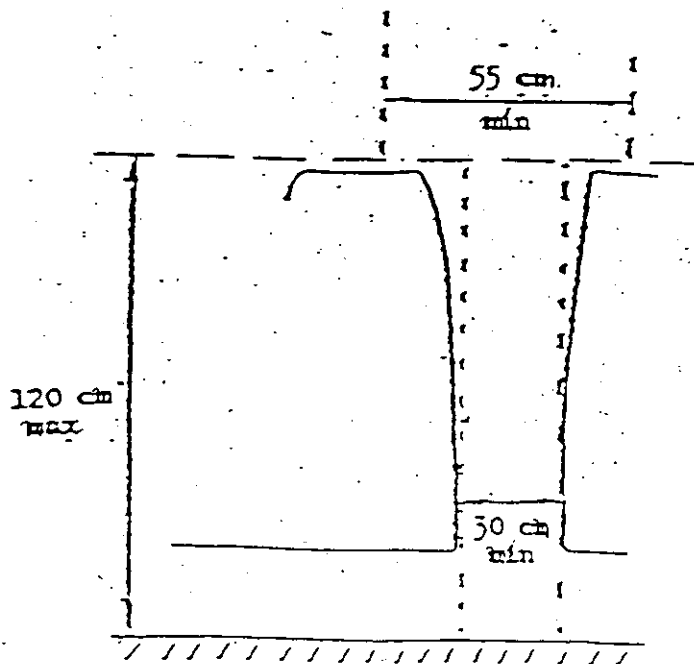


D = 22 cm Min.

B = 50 cm max.

Figure 4

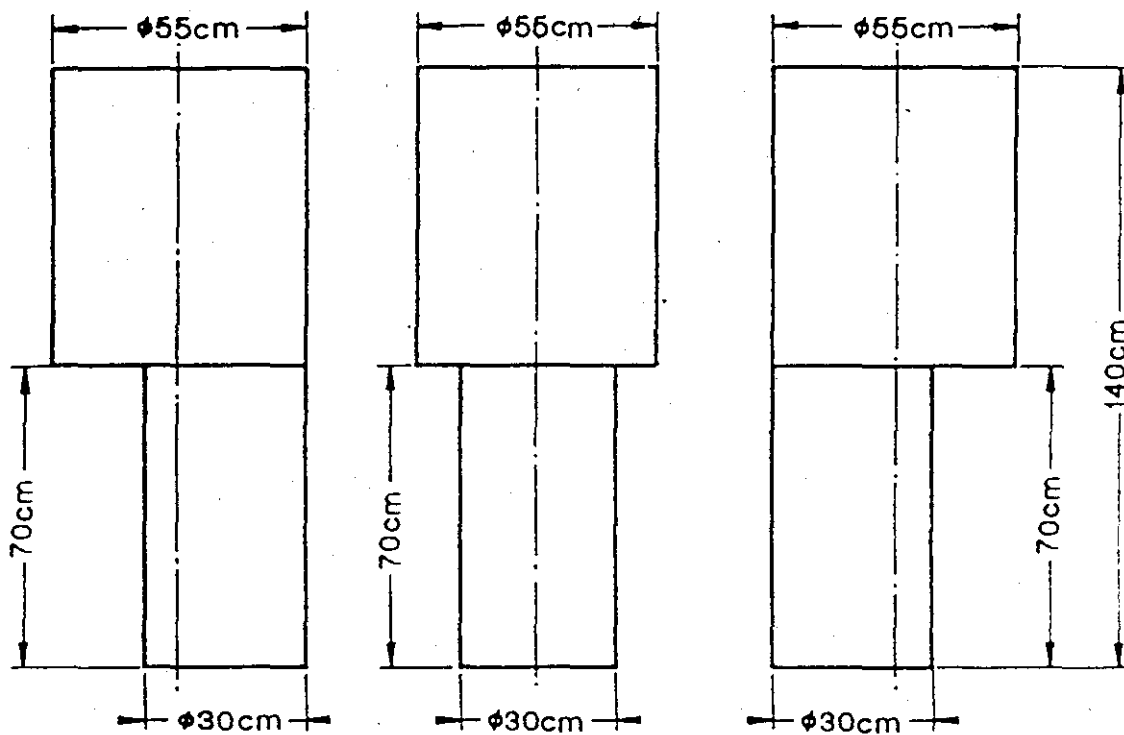
Determination of unobstructed access to door  
(see paragraph 7.7.1.10.2)



ANNEX III

Figure 5

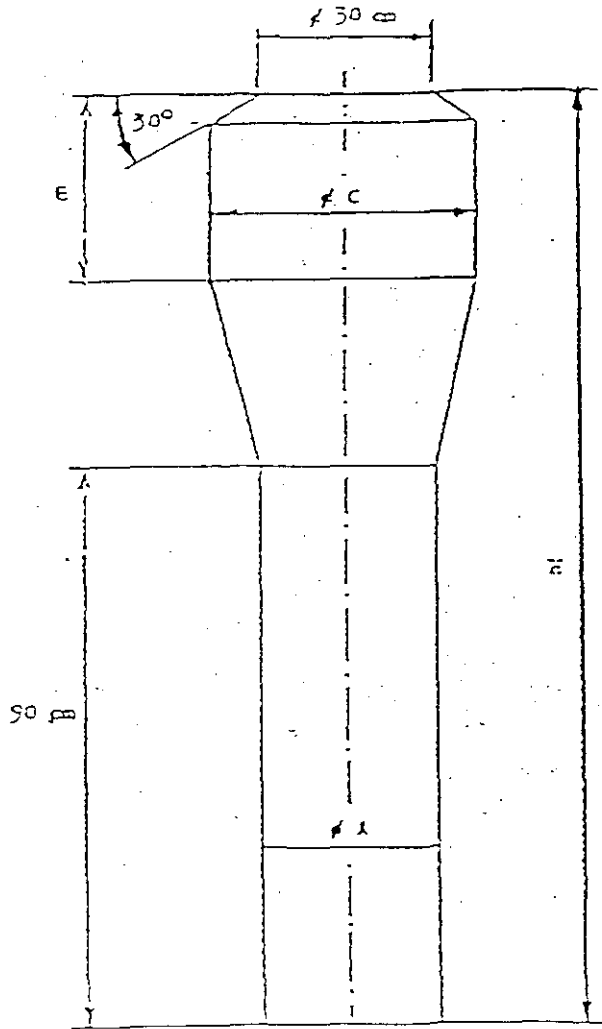
Access to emergency doors  
(see paragraph 7.7.2)



ANNEX III

Figure 6

Gangways  
see paragraph 7.7.5)



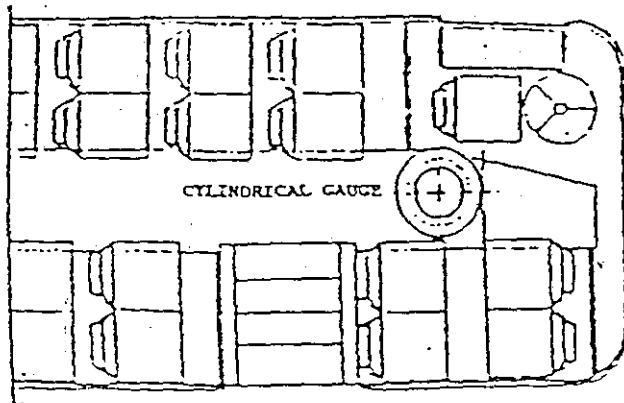
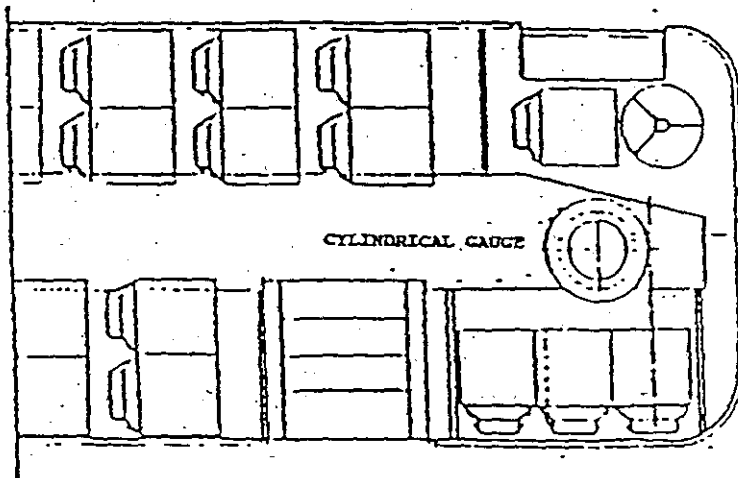
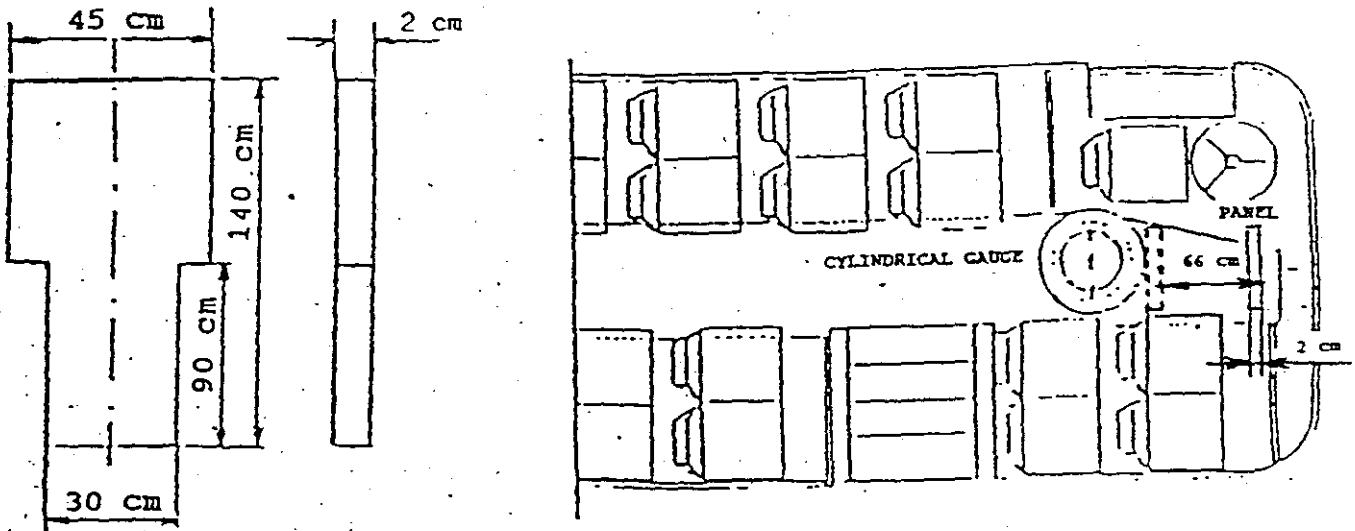
Classes		A	B	I	II	III
Dimensions (cm)	A	35	30	45	35	30
	C	55	45	55	55	45
	B	50*	30	50*	50*	50*
	H	190*	150	190*	190*	190*

\* See the respective footnote ("\*") in paragraph 7.7.5.1.

ANNEX III

Figure 7

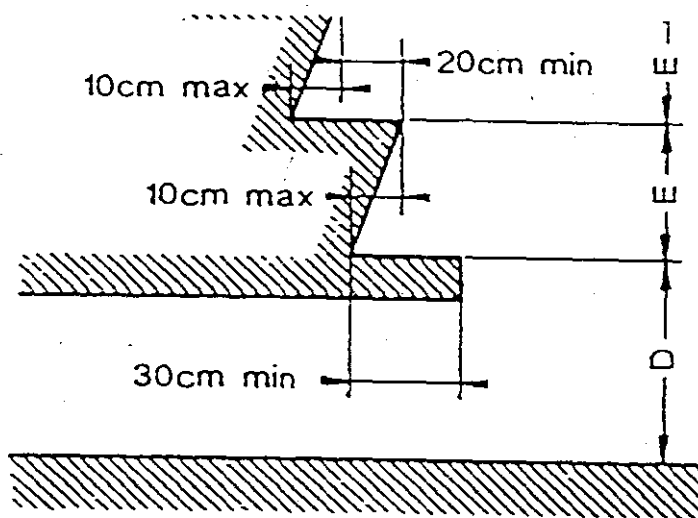
Forward limitation of the gangway  
(see paragraph 7.7.5.1.1.1)



ANNEX III

Figure 8

Steps for passengers  
(see paragraph 7.7.7)



D = Height above the ground, vehicle unladen.

Note:

1. At a double doorway the steps in each half of the access passage shall be treated separately.
2. E need not be the same for each step.

HEIGHT ABOVE GROUND LEVEL, VEHICLE UNLADEN

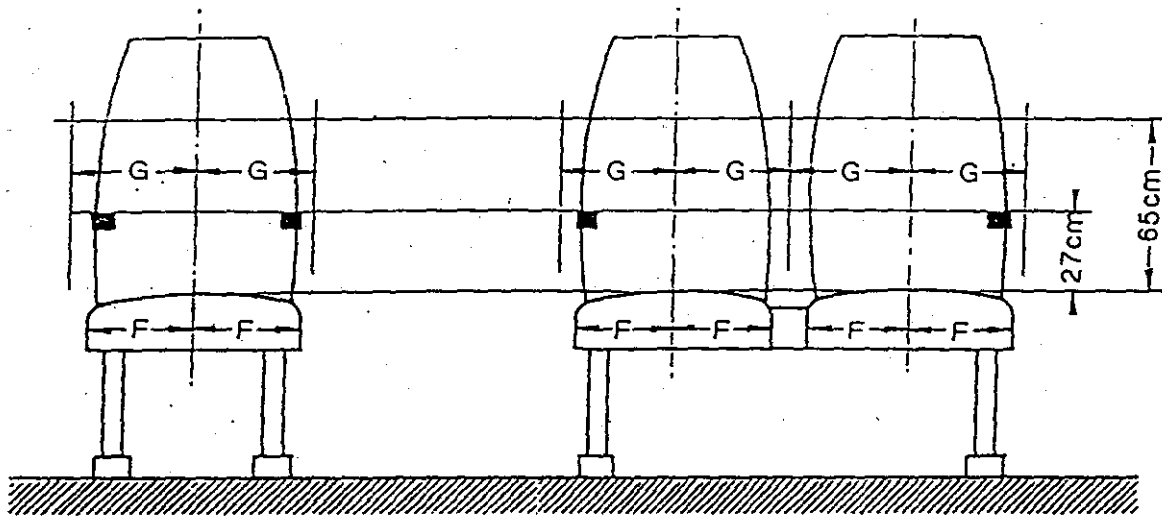
	Classes	I, II & A	III & B
First step from ground	Max. height D	32 (*)	36 (*)
	Min. depth F	30 (*)	30 (*)
Other steps	Max. height E	25 (*)	35 (*)
	Min. height E	12	12
	Min. depth	20	20

\* See the respective footnotes ("\*") in paragraph 7.7.7.1.

ANNEX III

Figure 9

Dimensions of passenger seats  
(see paragraph 7.7.8.1)



Individual seat

Continuous seat

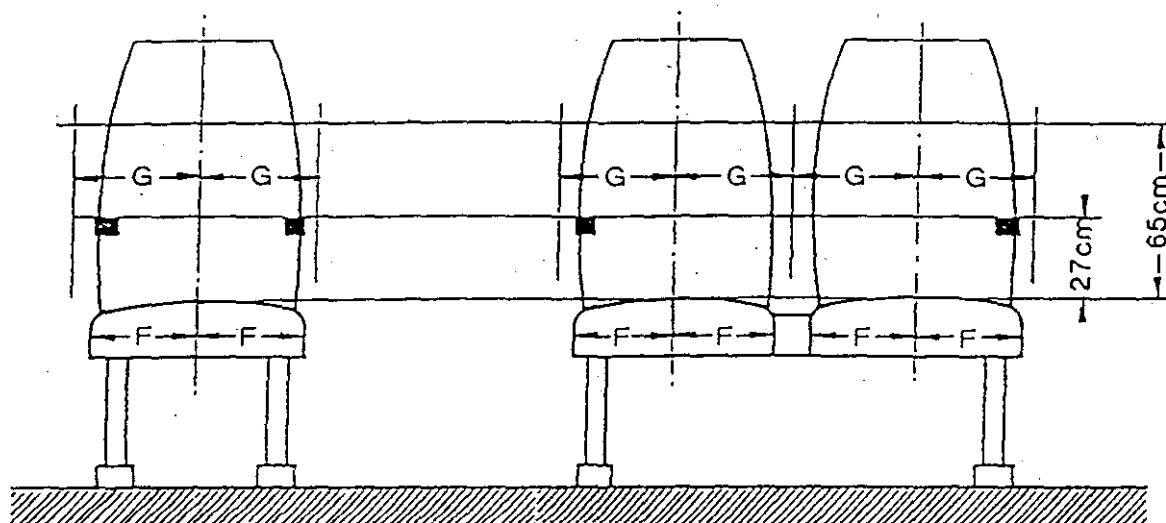
	G (cm) min	
F (cm) min	continuous seats	Individual seats
20*	22.5	25

\* 22.5 for Class III

ANNEX III

Figure 9 bis

Dimensions of passenger seats for vehicles referred to in article 4  
(see paragraph 7.7.8.1 bis)



Individual seat

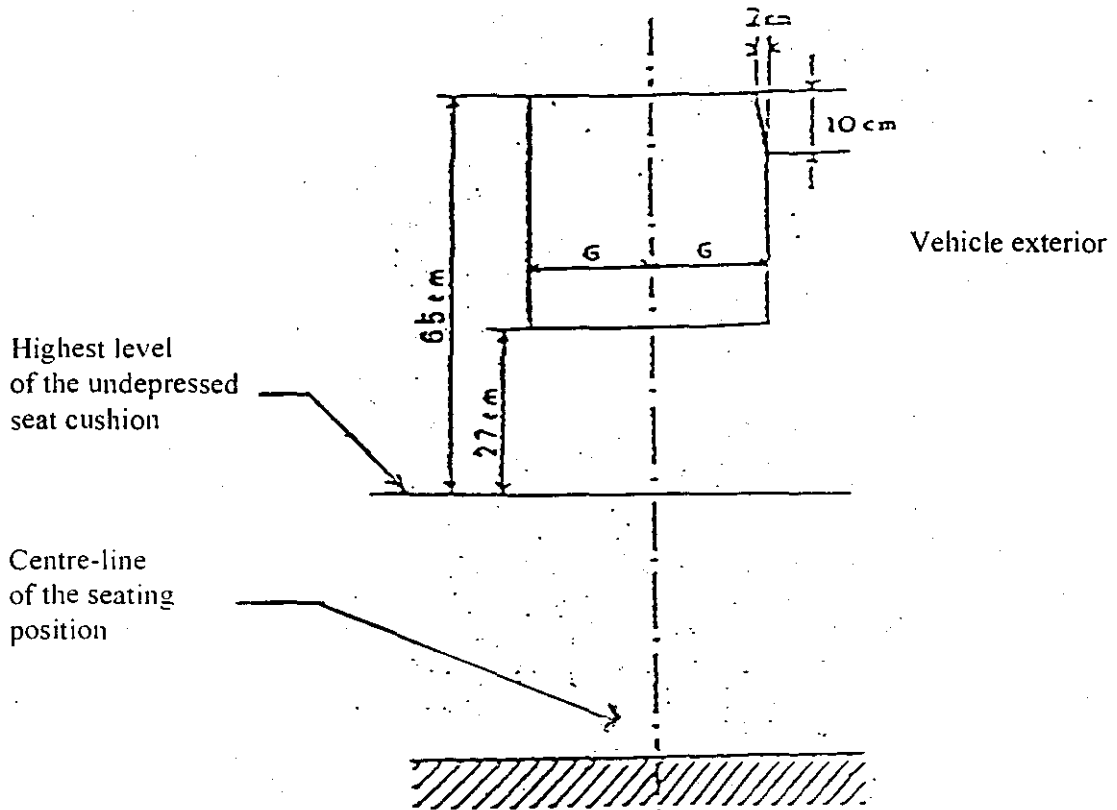
Continuous seat

F (cm) min	G (cm) min	
	continuous seats	Individual seats
20	20	20

ANNEX III

Figure 10

Permitted intrusion at shoulder height  
Transversal section of the minimum available space at shoulder height  
for a seat adjacent to the wall of the vehicle  
(see paragraph 7.7.8.1.2.3)



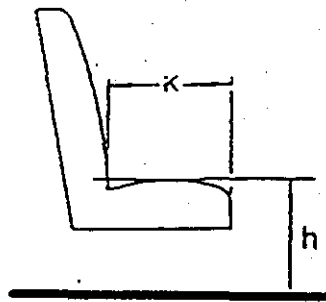
- G = 22.5 if continuous seat
- G = 25 cm if individual seat
- G = 20 cm in vehicles with less than 22 passengers or less than 2.3 m wide



ANNEX III

**Figure 11**

**Seat-cushion depth**  
(see paragraph 7.7.8.2 & 7.7.8.3)



$h = 40-50 \text{ cm (*)}$   
 $k = 35 \text{ cm min. (**)}$

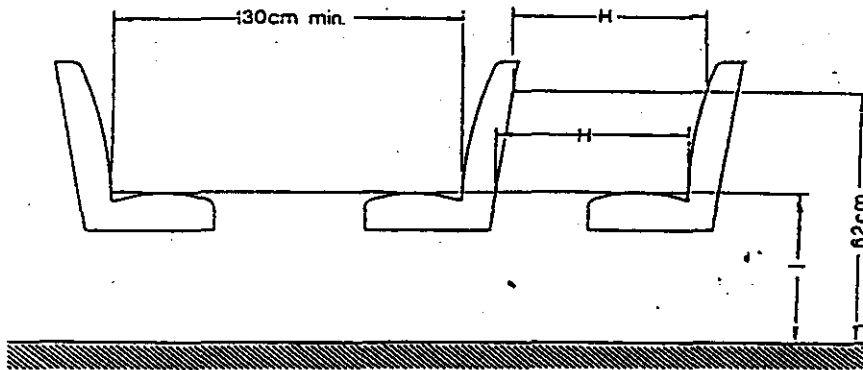
\*/ 35 cm at wheel arches and engine compartment

\*\*/ 40 cm in vehicles of Classes II & III

ANNEX III

Figure 12

Seat spacing  
(see paragraph 7.7.8.4)



	H
Classes I, A & B	65 cm
Class II	68 cm
Class III	75 cm

ANNEX III

Figure 12 bis

Seat spacing  
(see paragraph 7.7.8.4.1 bis)

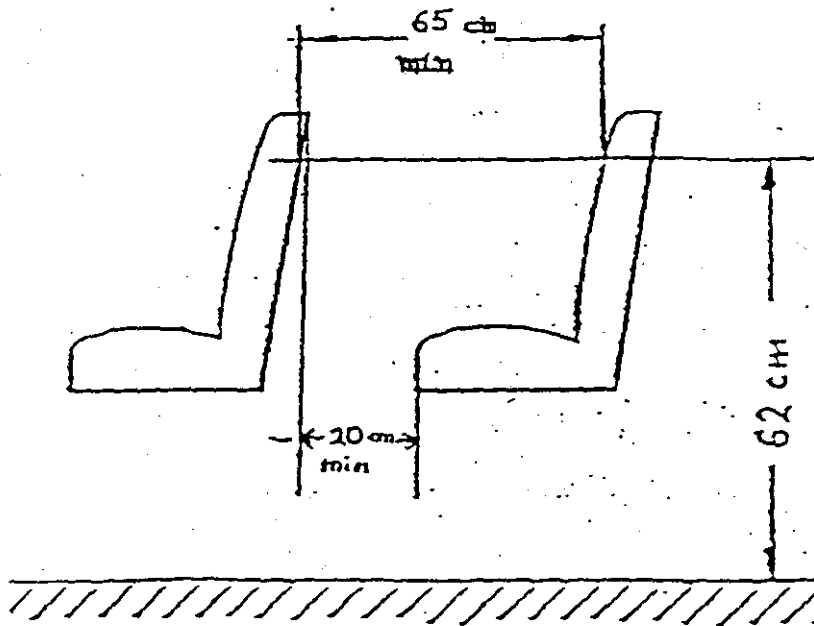
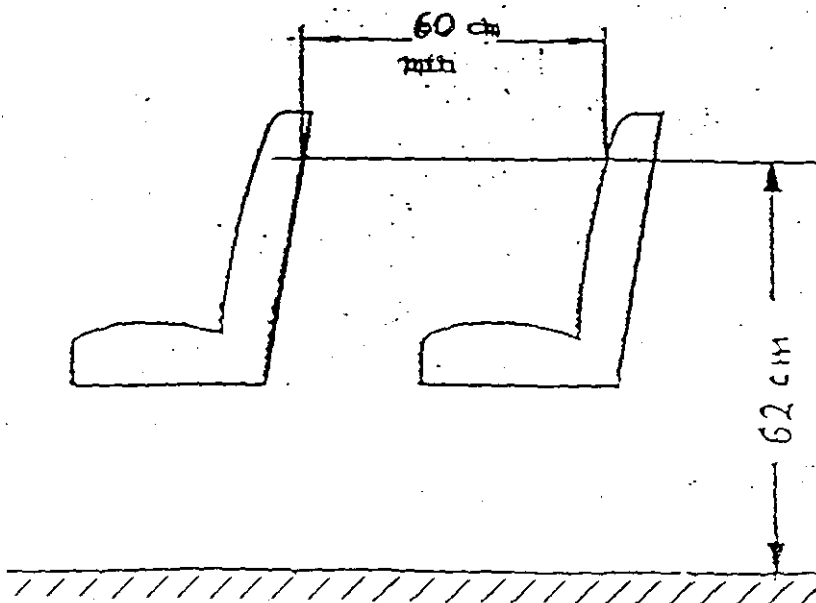


Figure 12 ter

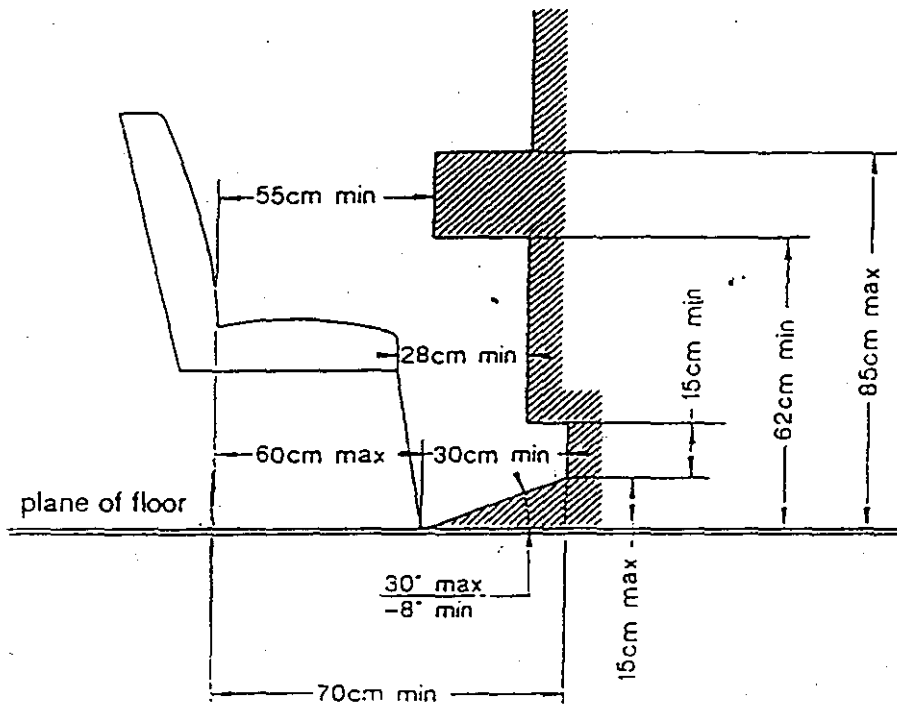
Seat spacing  
(see paragraph 7.7.8.4.1 bis)



ANNEX III

Figure 13

Space for seated passengers  
(See paragraph 7.7.8.5)

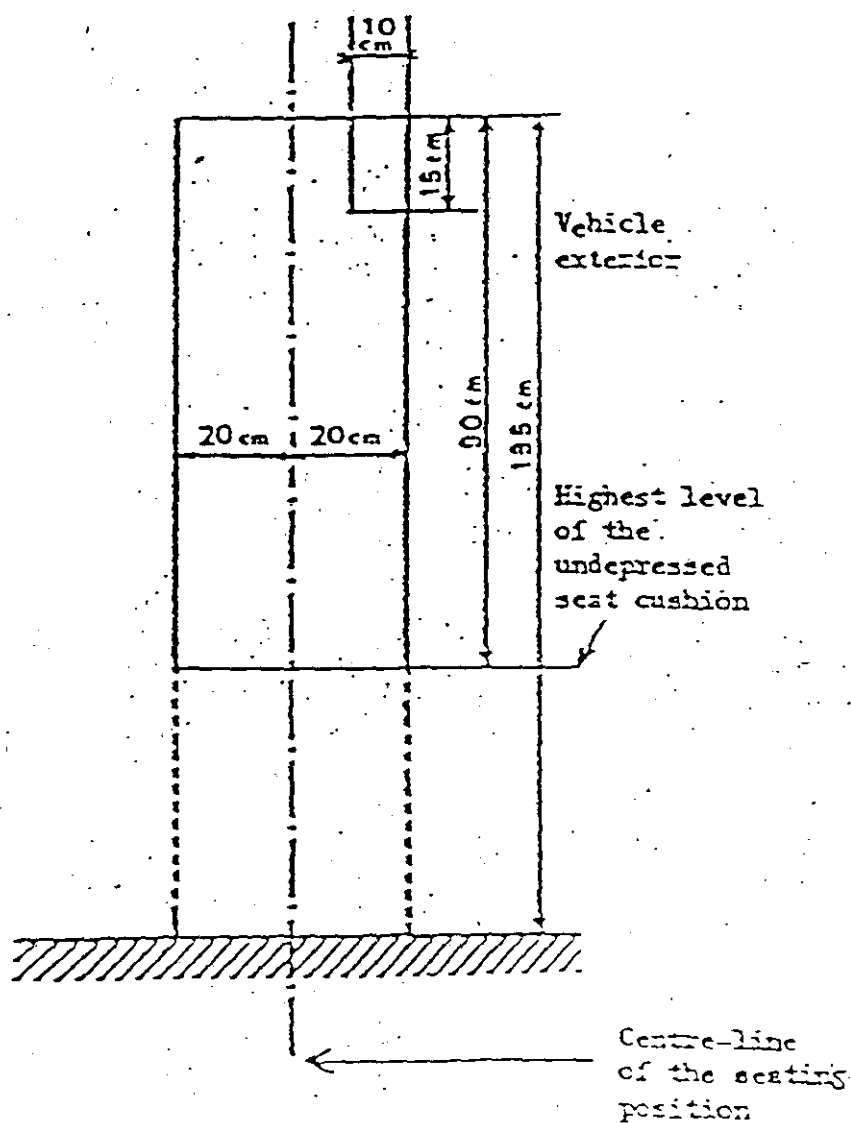


ANNEX III

Figure 14

Permitted intrusion into space above seat

Transversal section of the minimum free space above a seating  
place adjacent to the wall of the vehicle  
(see paragraph 7.7.8.6.3.1)



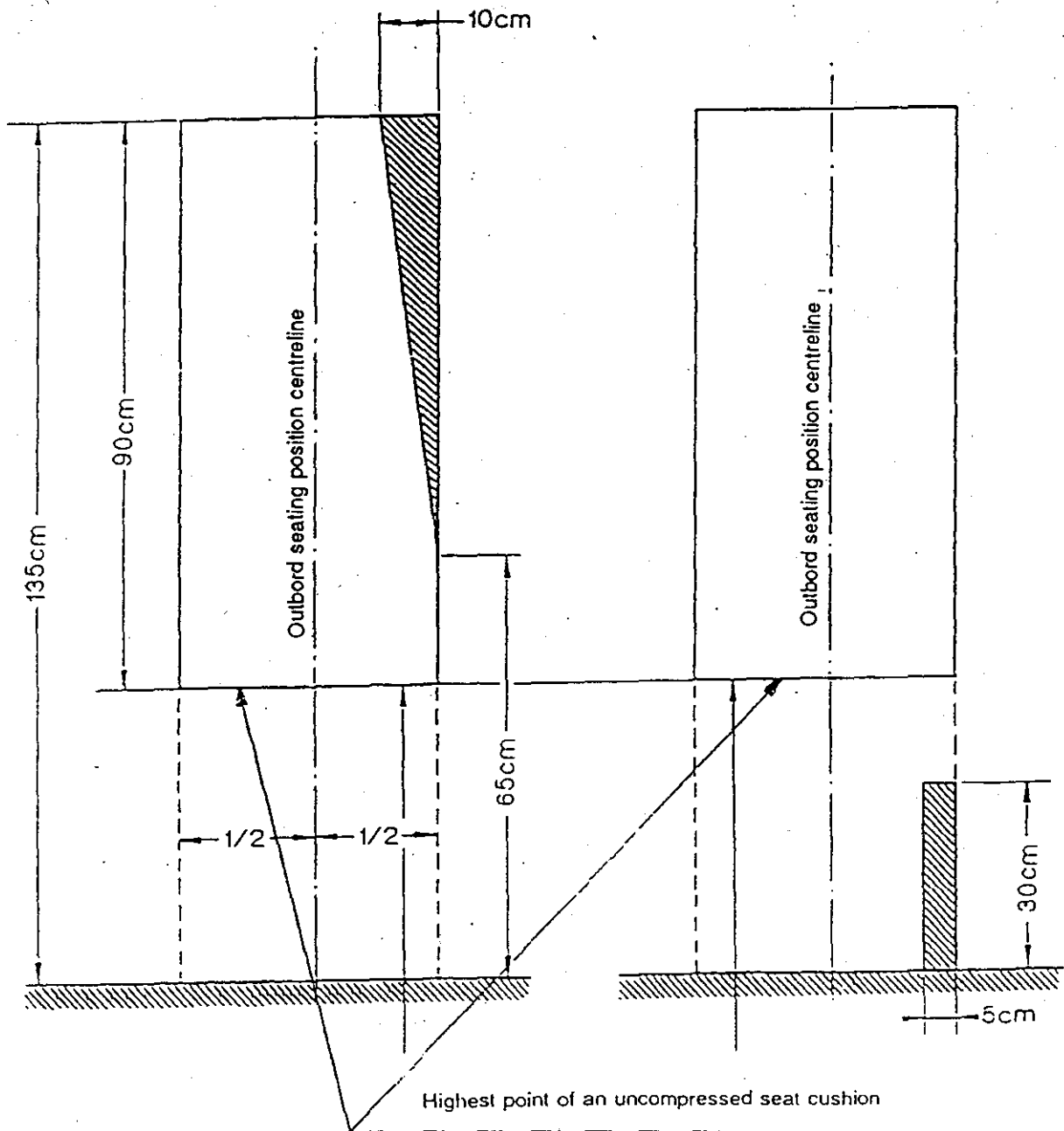
ANNEX III

Figure 15

PERMITTED INTRUSION OF  
A STRUCTURAL MEMBER  
(see paragraph 7.7.8.6.3.2)

Figure 16

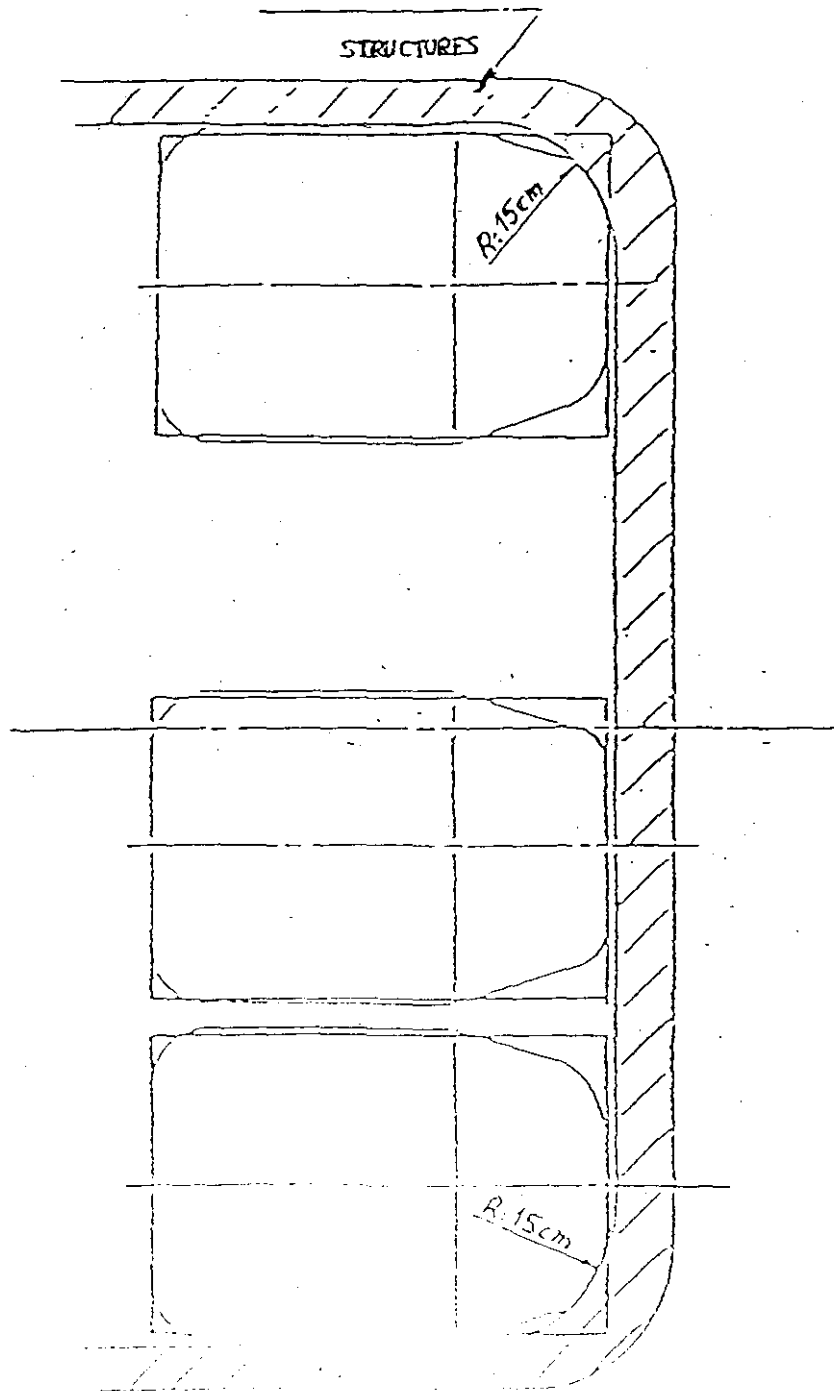
PERMITTED INTRUSION OF A CONDUCT  
(see paragraph 7.7.8.6.3.3)



ANNEX III

Figure 17

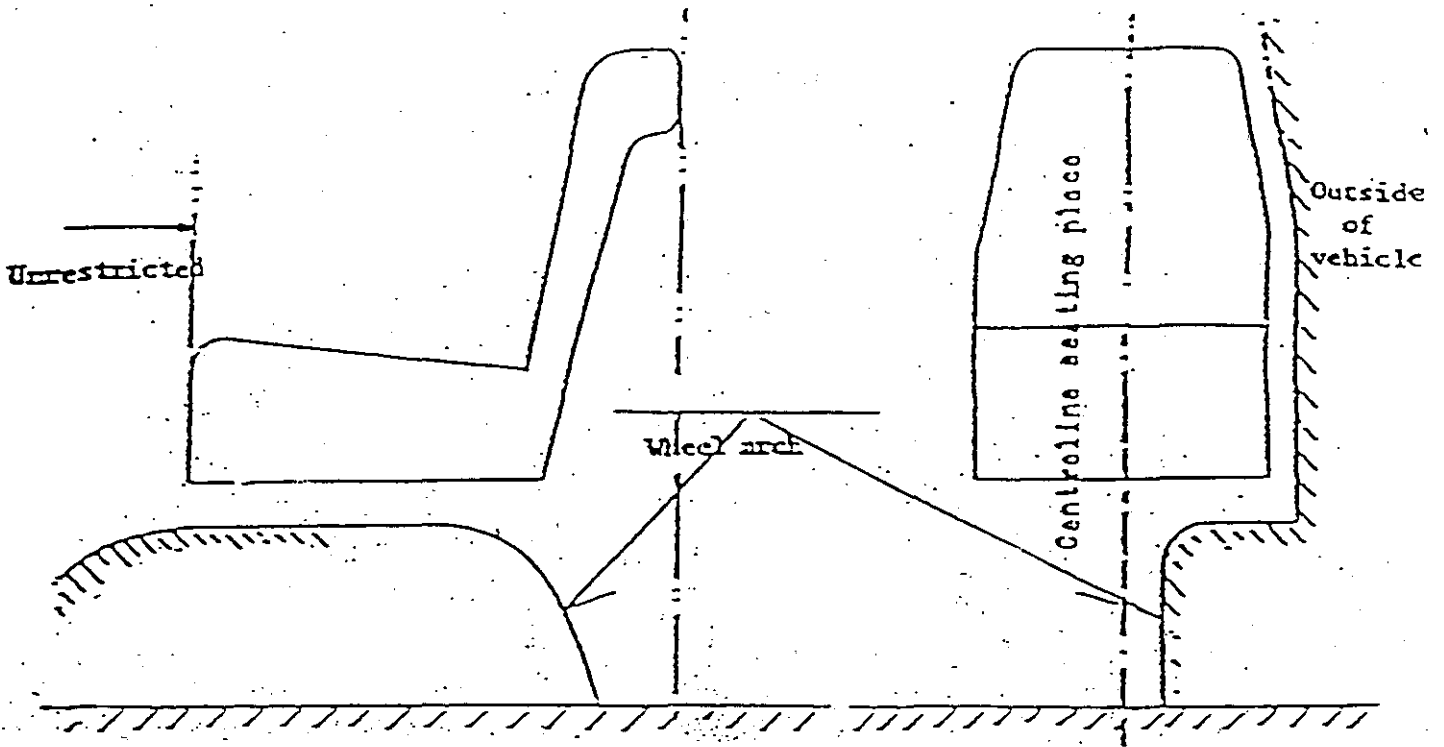
Permitted intrusion at rear corner seats  
View of the prescribed area of the seat (two side seats at the rear)  
(see paragraph 7.7.8.6.3.4)



ANNEX III

Figure 18

Permitted intrusion of a wheel arch not extending beyond the vertical centre line of the side seat  
(see paragraph 7.7.8.6.4.2.1)

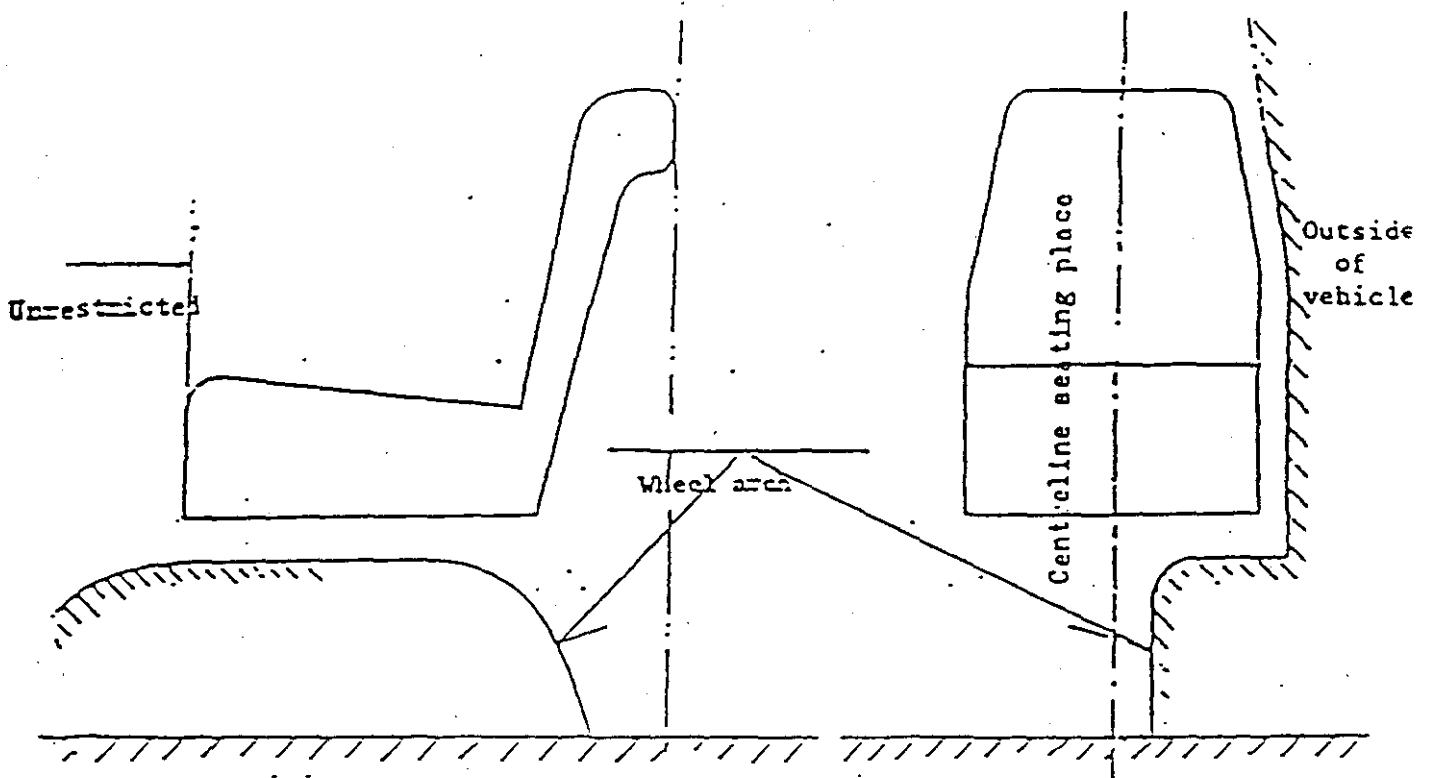




ANNEX III

Figure 19

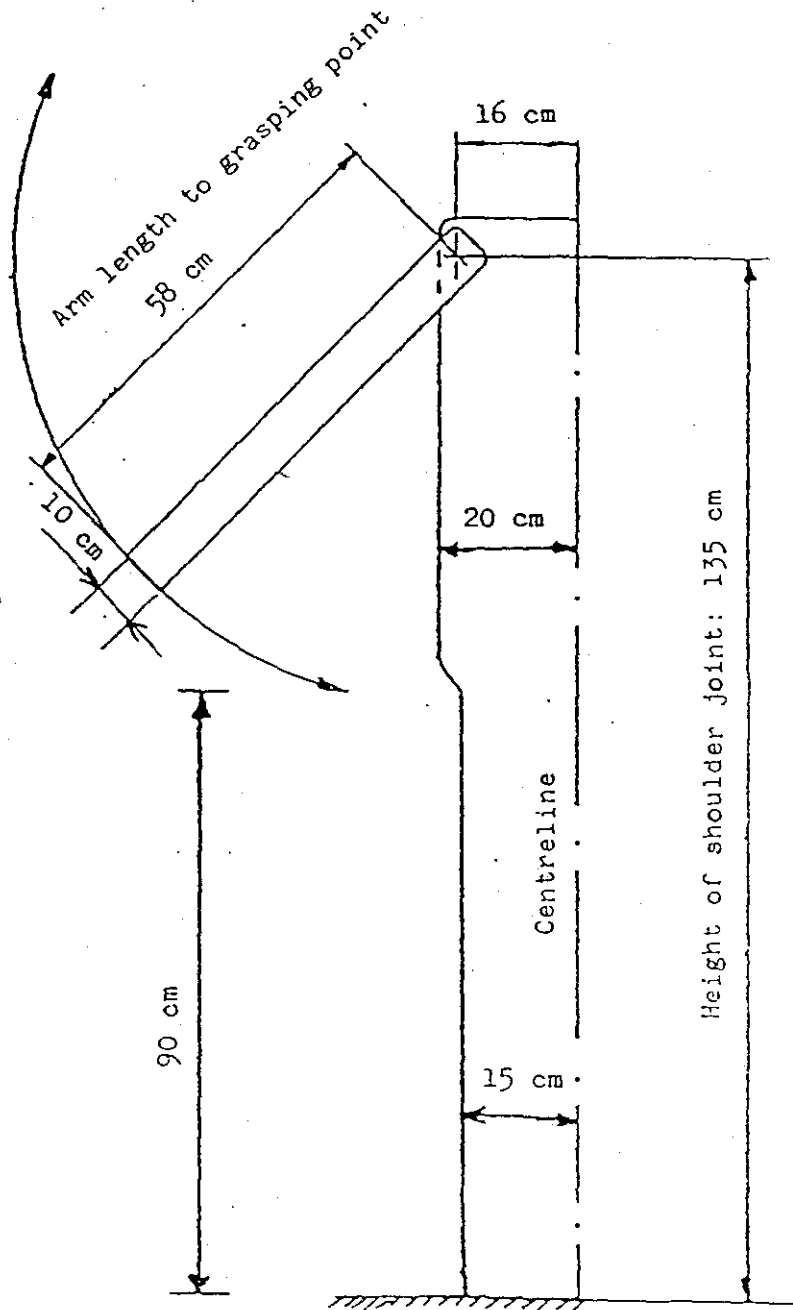
Permitted intrusion of a wheel arch extending beyond  
the vertical centre line of the side seat  
(see paragraph 7.7.8.6.4.2.2)



ANNEX III

Figure 20

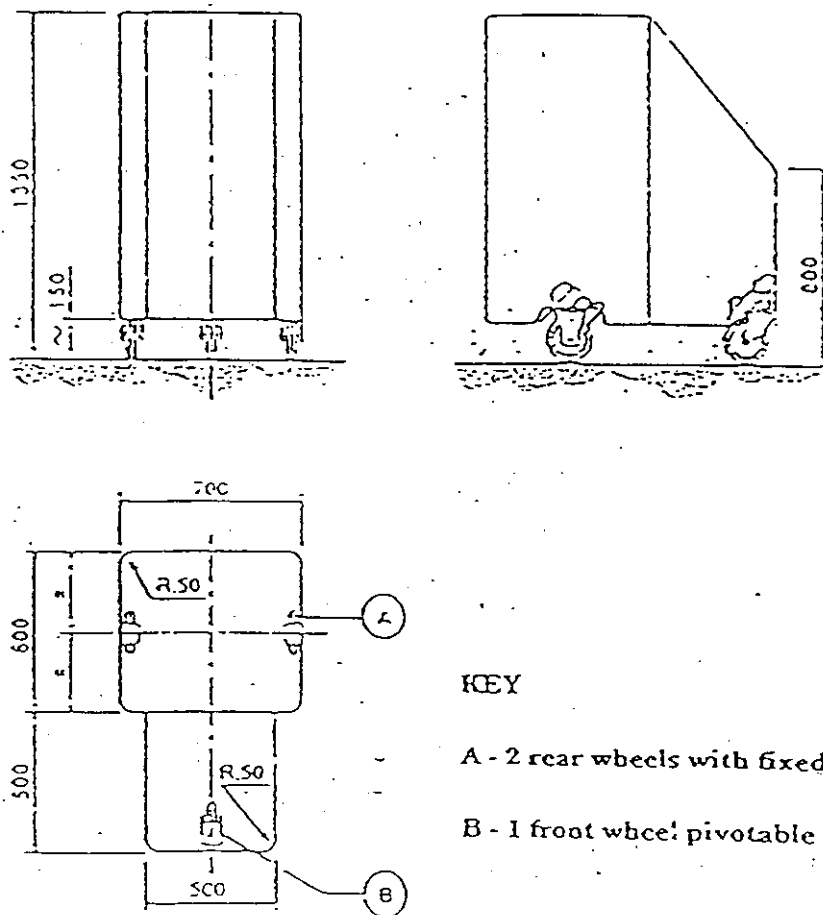
Testing device for siting of handholds  
(see paragraph 7.11.2.1)



ANNEX III.

Figure 21

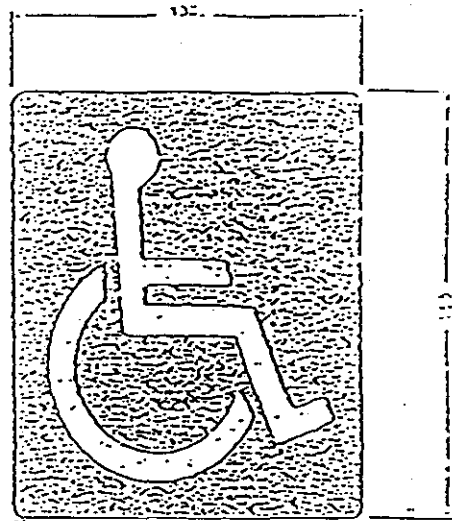
Reference wheelchair  
(see paragraph 7.12.5)



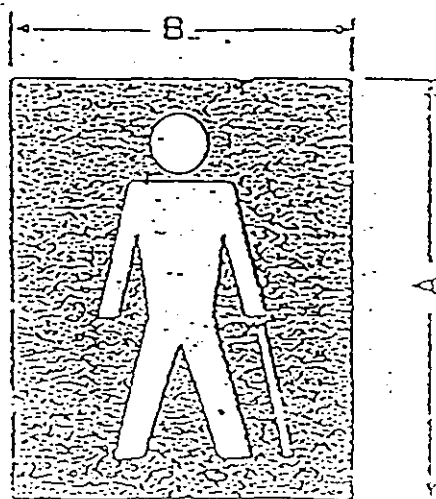
ANNEX III

**Figure 22**  
(see paragraphs 7.13 & 7.13.1)

° Pictograms for wheelchair users (22 a)



Pictogram for passengers with reduced mobility others than wheelchair users (22b)



## ANNEX IV

### STRENGTH OF SUPERSTRUCTURE

#### 1. Scope

This Annex applies to all single deck Class II and III vehicles.

#### 2. Definitions

For the purposes of this Annex:

- 2.1 "Residual space" means the space to be preserved in the passenger compartment during and after the structure has been subjected to one of the test prescribed in this Annex.
- 2.2 "Superstructure" means the part of a vehicle structure which contribute to the strength of the vehicle in the event of a roll-over accident.
- 2.3 "Body section" means a section containing at least two identical vertical pillars on each side representative of a part or parts of the structure of the vehicle.
- 2.4 "Total energy" means the energy assumed to be absorbed by the complete structure of the vehicle. This may be determined as shown in this Annex.

#### 3. General specifications and requirements

If the superstructure has obtained the approval conform to the Regulation UN-ECE N°66 of the Economic Commission for Europe, it is considered that it complies with these general specifications and requirements.

- 3.1 The superstructure of the vehicle shall be of sufficient strength to ensure that during and after it has been subjected to one of the methods of test or calculation prescribed in paragraph 4:
  - 3.1.1 no displaced part of the vehicle intrudes into the residual space, as specified in paragraph 5, and
  - 3.1.2 no part of the residual space projects outside the deformed structure.
- 3.2 The requirements of paragraph 3.1 above shall apply to the vehicle including all its structural parts, members and panels and all projecting rigid parts such as luggage racks, ventilation equipment, etc. However, bulkheads, partitions, rings or other members reinforcing the superstructure of the vehicle and fixed appliances, such as bars, kitchenettes or toilets, shall be ignored for the purposes of paragraph 3.1.
- 3.3 In the case of an articulated vehicle each part of the vehicle shall comply with the requirements specified in paragraph 3.1 above.

#### 4. Test methods

- 4.1 Each type of vehicle shall be verified according to one of the following methods at the discretion of the manufacturer or according to an alternative method approved by the competent authority:
- 4.1.1 a roll-over test on a complete vehicle in accordance with the procedure set out in Appendix 1;
  - 4.1.2 a roll-over test on a body section or sections representative of a complete vehicle in accordance with Appendix 2;
  - 4.1.3 a pendulum test on a body section or sections in accordance with Appendix 3; or
  - 4.1.4 a verification of strength of superstructure by calculation in accordance with Appendix 4.
- 4.2 If the methods prescribed in paragraphs 4.1.2, 4.1.3 or 4.1.4 cannot take account of a significant variation between one section of the vehicle and another, for example an air-conditioning installation on the roof, additional test methods or calculations shall be submitted to the technical service. In the absence of such additional information the vehicle may be required to undergo the method of test prescribed in paragraph 4.1.1.

#### 5. Residual space

- 5.1 For the purpose of paragraph 2.1, the residual space means the volume within the passenger compartment which is swept when the transverse vertical plane defined in figure 1 (a) is moved in a straight line or lines so that the point "R" in figure 1 (a) passes from the "R" point of the rearmost outer seat, through the "R" point of every intermediate outer seat to the "R" point of the foremost outer passenger seats.
- 5.2 The position of the "R" point shown in figure 1 (b) shall be assumed to be 500 mm above the floor under the passengers' feet, 300 mm from the inside surface of the side of the vehicle and 100 mm in front of the seat back in the centre line of the outboard seats.

#### 6. Interpretation of test results

- 6.1 If body sections are tested, the technical service responsible for conducting the test shall ensure that the vehicle complies with the conditions specified in Sub-Appendix 2 of Appendix 3, which contains requirements for the distribution of the main energy absorbing parts of the superstructure of a vehicle.

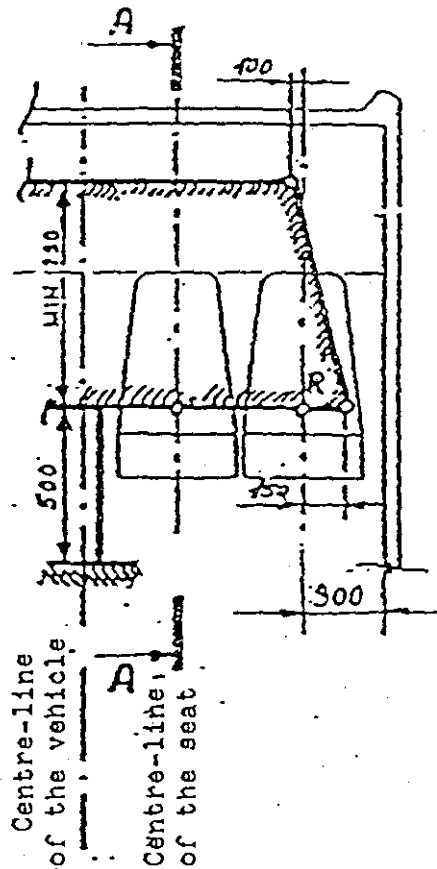
Figure 1

Residual space

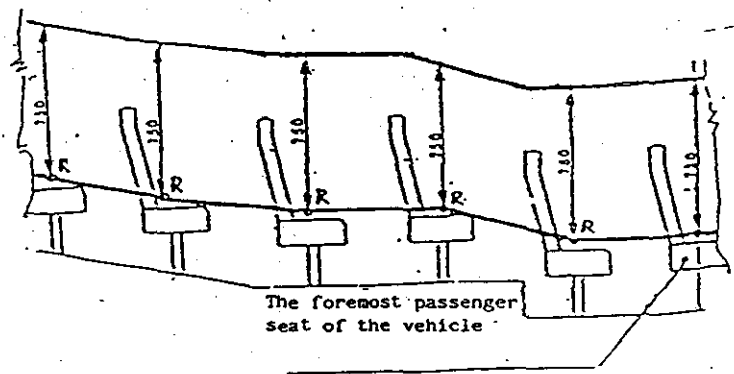
(All dimensions in millimetres)

1 (a) LATERALLY

Templates to be fixed on the floor of the vehicle



1 (b) LONGITUDINALLY - Section A-A of the vehicle in the vertical plane of the centre-line of the inboard seats.



-----  
Note : See requirement of paragraph 5.2



## Appendix 1

### Roll-over test on a complete vehicle

#### 1. Test condition

- 1.1 While the vehicle need not be in a fully finished condition, it shall be representative of production vehicles in respect of unladen kerb mass, centre of gravity and distribution of mass as declared by the manufacturer.
- 1.2 Driver and passenger seats shall be placed with their backs, if adjustable, in their most upright position. The height of the seats, if adjustable, shall be in the highest position.
- 1.3 Every door and opening window of the vehicle shall be closed and latched but not locked. Windows and glazed bulkheads or screens may be glazed or unglazed at the applicant's discretion. If they are unglazed, an equivalent weight shall be imposed on the vehicle at the appropriate positions.
- 1.4 Tyres shall be inflated to the pressure prescribed by the vehicle manufacturer and, if the vehicle has an air-spring suspension system, the air supply to the air spring shall be ensured. Any automatic levelling system shall be adjusted with the vehicle on a flat, horizontal surface to the level specified by the manufacturer. Shock absorbers shall operate normally.
- 1.5 Fuel, battery acid and other combustible, explosive or corrosive materials may be substituted by other materials, provided that the conditions prescribed in paragraph 1.1 above are met.
- 1.6 The impact area shall consist of concrete or other rigid material.

#### 2. Test procedure (See figure 1)

- 2.1 The vehicle shall be placed on a platform in order to be rolled over on one side. This side shall be specified by the manufacturer.
- 2.2 The position of the vehicle on the platform shall be such that when the platform is horizontal:
  - 2.2.1 the axis of rotation is parallel to the longitudinal axis of the vehicle,
  - 2.2.2 the axis of rotation is 0 - 200 mm from the vertical step between the two levels,
  - 2.2.3 the axis of rotation is 0 - 100 mm from the side of the tyre at the widest axle,
  - 2.2.4 the axis of rotation is 0 - 100 mm below the horizontal starting plane on which the tyres stand, and
  - 2.2.5 the difference between the height of the horizontal starting plane and the horizontal lower plane on which impact takes place shall be not less than 800 mm.

- 2.3 Means shall be provided to prevent the vehicle moving along its longitudinal axis.
- 2.4 The test apparatus shall prevent the tyres from sliding sideways in the direction of roll-over by means of side walls.
- 2.5 The test apparatus shall ensure the simultaneous lifting of the axles of the vehicle.
- 2.6 The vehicle shall be tilted without rocking and without dynamic effects until it rolls over. The angular velocity shall not exceed 5 degrees per second (0.087 rad/sec).
- 2.7 High-speed photography, deformable templates or other suitable means shall be used to determine that the requirement of paragraph 3.1 of this Annex has been met. This shall be verified at not less than two positions, nominally at the front and rear of the passenger compartment, the exact positions being at the discretion of the technical service. Templates shall be fixed to substantially non-deformable parts of the structure.



## Appendix 2

### Roll-over test on a body section

#### 1. Test conditions

- 1.1 The body section shall represent a section of the unladen vehicle.
- 1.2 The geometry of the body section, the axis of rotation and the position of the centre of gravity in the vertical and lateral directions shall be representative of the complete vehicle.
- 1.3 The mass of the body section, expressed as a percentage of the unladen kerb mass of the vehicle, shall be specified by the manufacturer.
- 1.4 The energy to be absorbed by the body section, expressed as a percentage of the total energy which would be absorbed by a complete vehicle, shall be specified by the manufacturer.
- 1.5 The percentage of total energy described in paragraph 1.4 shall not be less than the percentage of total kerb mass described in paragraph 1.3.
- 1.6 The test conditions specified in paragraph 1.6 of Appendix 1 and in paragraphs 2.1 to 2.6 of Appendix 3 shall apply.

#### 2. Test procedure

- 2.1 The test procedure shall be the same as the procedure described in Appendix 1, except that the body section described above shall be used instead of a complete vehicle.

## Appendix 3

### Pendulum test on a body section

1. Energy level and direction of impact
  - 1.1 The energy to be transmitted to a particular body section shall be the sum of the energies declared by the manufacturer to be allocated to each of the cross-sectional rings included in that particular body section.
  - 1.2 The appropriate proportion of the energy prescribed in Sub-Appendix 1 to this Appendix shall be applied to the body section by the pendulum such that at the moment of impact the direction of motion of the pendulum makes an angle of 25 degrees (+ 0°; - 5°) to the central longitudinal vertical plane of the body section. The precise angle within this range shall be specified by the vehicle manufacturer.
2. Test conditions
  - 2.1 A sufficient number of tests shall be carried out for the technical service conducting the test to be satisfied that the requirement specified in paragraph 3.1 of this Annex has been met.
  - 2.2 For the purposes of the test, body sections shall have sections of the normal structure fitted between the pillars in relation to the floor, underframe, sides and roof. Sections of such paragraphs as luggage racks, ventilation ducting etc., where fitted, shall also be included.
  - 2.3 Every door and opening window of the body section shall be closed and latched but not locked. Windows and glazed bulkheads or screens may be glazed or unglazed at the applicant's discretion.
  - 2.4 Where appropriate, seats may also be included, at the option of the manufacturer, in their normal positions in relation to the structure of the body section. The normal fixings and joints between all members and attachments shall be incorporated. The backrests if adjustable shall be in their most upright position and the height of the seats, if adjustable, shall be in the highest position.
  - 2.5 The side of the body section to be impacted shall be at the discretion of the manufacturer. Where more than one body section is required to be tested, both shall be impacted on the same side.
  - 2.6 High speed photography, deformable templates or other suitable means shall be used to determine that the requirement specified in paragraph 3.1 of this Annex has been met. Templates shall be fixed to a substantially non-deformable part of the structure.
  - 2.7 The body section to be tested shall be firmly and securely attached to the mounting frame through the cross-bearers or parts which replace these in such a way that no significant energy is absorbed in the support frame and its attachments during the impact.

2.8 The pendulum shall be released from such a height that it strikes the body section at a speed of between 3 and 8 m/s.

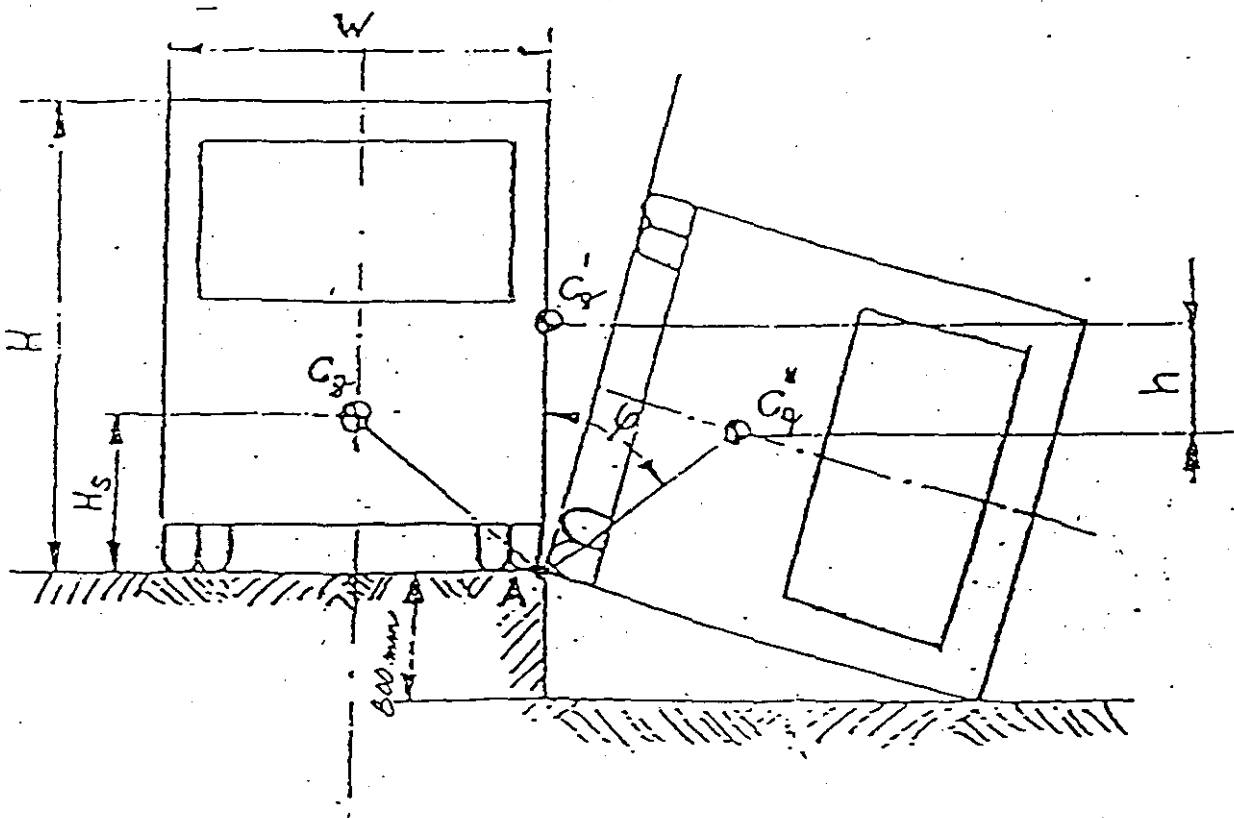
3. Description of the pendulum

3.1 The striking face of the pendulum shall be made of steel, or plywood 20 mm  $\pm$  5 mm thick, and the mass of the pendulum shall be evenly distributed. Its striking face shall be rectangular and flat, having a width of not less than the width of the body section being tested and a height of not less than 800 mm. Its edges shall be rounded to a radius of curvature of not less than 15 mm.

3.2 The body of the pendulum shall be rigidly attached to two rigid bars. The axis of the bars shall be not less than 3,500 mm from the geometric centre of the body of the pendulum.

Appendix 3 - Sub-appendix 1

Calculation of total energy ( $E^*$ )



Assumptions :

1. The shape of the cross-section of the body is assumed to be rectangular.
2. The suspension system is assumed to be rigidly fixed.
3. The movement of the body section is assumed to be pure rotation about point "A".

### Calculation of total energy (E\*)

If the fall of the centre of gravity (h) is determined by graphical methods,

E\* may be taken to be given by the formula :

$$E^* = 0.75 M.g.h. \text{ (Nm)}$$

Alternatively, E\* may be calculated by the formula :

$$E^* = 0.75 M . g . \left[ \sqrt{\left(\frac{W}{2}\right)^2 + H_s^2} - \frac{W}{2H} \sqrt{H^2 - 0.8^2} + 0.8 \frac{H_s}{H} \right] \text{ (Nm)}$$

where :

M = the unladen kerb mass of the vehicle (kg)

g = 9.8 m/s<sup>2</sup>

W = the overall width of the vehicle (m)

H<sub>s</sub> = the height of the centre of gravity of the unladen vehicle (m)

H = the height of the vehicle (m)



### Appendix 3 - Sub-appendix 2

#### Requirements for the distribution of the main energy absorbing parts of the superstructure

1. A sufficient number of tests shall be carried out for the technical service to be satisfied that the complete vehicle meets the requirements of paragraph 3.1 of this Annex. This shall not necessarily require more than one test.
2. Calculations based on data obtained from a test on a body section may be used to demonstrate the acceptability of another body section which is not identical with the body section already tested if it has many structural features in common with it.
3. The manufacturer shall declare which pillars of the superstructure are considered as contributing to its strength and shall also declare the amount of energy ( $E_i$ ) that each pillar is intended to absorb. These declarations shall meet the following criteria :

- (1)  $\sum_{i=1}^{i=m} E_i > E^*$  Where m is the total number of declared pillars
- (2) (a)  $\sum_{i=1}^{i=n} E_{iF} \geq 0.4 E^*$  Where n is the number of declared pillars forward of the centre of gravity of the vehicle
- (b)  $\sum_{i=1}^{i=p} E_{iR} \geq 0.4 E^*$  Where p is the number of declared pillars to the rear of the centre of gravity of the vehicle
- (3)  $L_F \geq 0.4 l_f$
- (4)  $L_R \geq 0.4 l_r$
- (5)  $\frac{d_{\max}}{d_{\min}} \leq 2.5$  This shall apply only where  $d_{\max}$  is greater than 0.8 x maximum deflection permitted without intrusion of the residual space.

- where
- $E_i$  is the declared amount of energy that can be absorbed by  $i^{\text{th}}$  pillar of the superstructure.
  - $E_{iF}$  is the declared amount of energy that can be absorbed by the  $i^{\text{th}}$  pillar forward of the centre of gravity of the vehicle.
  - $E_{iR}$  is the declared amount of energy that can be absorbed by the  $i^{\text{th}}$  pillar to the rear of the centre of gravity of the vehicle.
  - $E^*$  is the total energy to be absorbed by the complete structure of the vehicle.

$d_{\max}$  is the greatest amount of deflection measured in the direction of impact of any section of the body structure after it has absorbed its own declared impact energy.

$d_{\min}$  is the least amount of deflection, measured in the direction of impact and at the same point on the bay as  $d_{\max}$ , of any section of the body structure after it has absorbed its own declared impact energy.

$$L_F = \frac{\sum_{i=1}^{i_f} (E_{if} l_{if})}{\sum_{i=1}^{i_f} E_{if}} =$$
 Weighted mean distance of the declared pillars in front of the centre of gravity of the vehicle.

$$L_R = \frac{\sum_{i=1}^{i_r} (E_{ir} l_{ir})}{\sum_{i=1}^{i_r} E_{ir}} =$$
 Weighted mean distance of the declared pillars to the rear of the centre of gravity of the vehicle

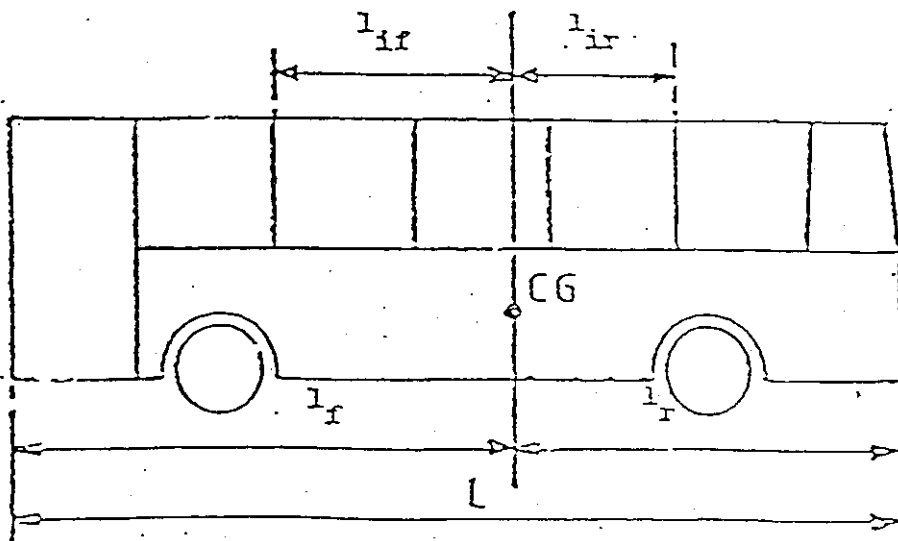
where  $l_{if}$  is the distance from the centre of gravity of the vehicle of the  $i^{\text{th}}$  pillar forward of the centre of gravity.

$l_{ir}$  is the distance from the centre of gravity of the vehicle of the  $i^{\text{th}}$  pillar rearward of the centre of gravity.

$l_f$  is the distance of the front of the vehicle from the centre of gravity of the vehicle.

$l_r$  is the distance of the rear of the vehicle from the centre of gravity of the vehicle.

(Bus picture)



## Appendix 4

### Verification of strength of superstructure by calculation

1. A superstructure or sections of a superstructure may be shown to meet the requirement specified in paragraph 3.1 of this Annex by a calculation method approved by the technical service responsible for conducting the tests.
2. If the structure is likely to be subject to deformations beyond the elastic limit of the materials used, then the calculations shall simulate the behaviour of the structure when undergoing large plastic deformations.
3. The technical service responsible for conducting the tests may require tests to be carried out on joints or parts of the structure to verify the assumptions made in the calculation.
4. Preparations for calculation
  - 4.1 Calculations cannot be started until the structure has been analysed and a mathematical model of it produced. This will define the separate members to be considered and identify the points at which plastic hinges may develop. The dimensions of the members and the properties of material used must be stated. Physical tests must be made on the hinge points to determine the force (moment of rotation)-deformation characteristics in the plastic mode as this is essential data for the calculations. The strain rate and the dynamic yield stress appropriate for this strain rate must be determined. If the calculation method will not indicate when a significant fracture will occur, it will be essential to determine, by experiment, separate analyses or appropriate dynamic distribution. Distribution of loading along the length of a vehicle shall be stated.
  - 4.2 The calculation method shall include the deformations up to the elastic limits of the materials followed by the identification of where plastic hinges will form and the subsequent formation of other plastic hinges unless the position and sequences of formation of plastic hinges is known from previous experience. The method shall accommodate the changes of geometry of the structure that take place, at least up to the stage where the deformations have passed the acceptable limits. The calculations shall simulate the energy and the direction of impact which would occur if that particular superstructure were to be submitted to the roll-over tests prescribed in Appendix 1. The validity of the calculation method shall have been established by comparison with the results of physical tests, which need not necessarily have been made in connection with the vehicle now being approved.
5. Tests of section of superstructure

When a calculation method is used for a section of the complete superstructure, the same conditions shall apply as stated above for the complete vehicle.

## ANNEX V

(see paragraph 7.6.5.6.1.1)

### GUIDELINES FOR MEASURING THE CLOSING FORCES OF POWER-OPERATED DOORS

#### 1. General

The closing of a power-operated door is a dynamic process. When a moving door hits an obstacle, the result is a dynamic reaction force, the history of which (in time) depends on several factors (e.g. mass of the door, acceleration, dimensions).

#### 2. Definitions

2.1 Closing force  $F(t)$  is a time function, measured at the closing edges of the door (see paragraph 3.2).

2.2 Peak force  $F_S$  is the maximum value of the closing force.

2.3 Effective force  $F_E$  is the average value of the closing force related to the pulse duration:

$$F_E = \frac{1}{T} \int_{t_1}^{t_2} F(t) dt$$

2.4 Pulse duration  $T$  is the time between the  $t_1$  and  $t_2$

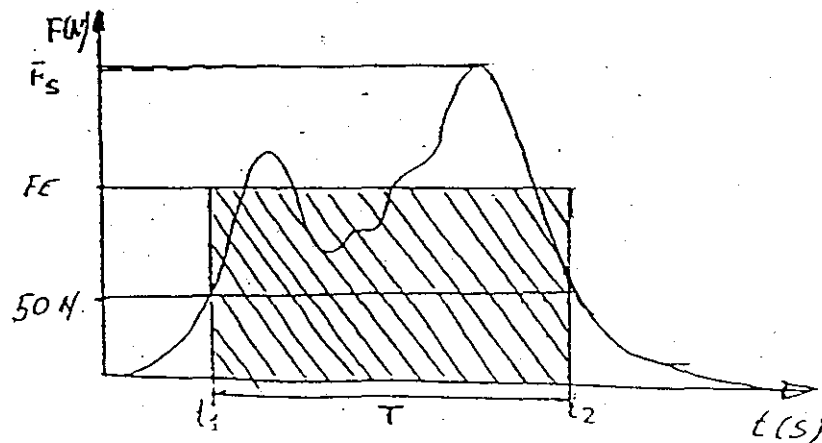
$$T = t_2 - t_1$$

where  $t_1$  = threshold of sensitivity, where the closing force exceeds 50N.

$t_2$  = fade-away threshold, where the closing force becomes less than 50N.

2.5 The relation between the above parameters is shown in figure 1 below (as an example):

Figure 1



- 2.6 Clamping force  $F_C$  is the arithmetical mean value of the effective forces, measured at the same measuring point subsequently more times:

$$F = \frac{\sum_{i=1}^{i=n} (F_E)_i}{n}$$

### 3. Measurements

#### 3.1 Conditions of measurement:

3.1.1 Temperature range: 10° - 30 °C

3.1.2 The vehicle shall stay on a horizontal surface.

#### 3.2 Measurements points shall be:

3.2.1 At the main closing edges of the door:

- one in the middle of the door;
- one 150 mm above the lower edge of the door.

3.2.2 In the case of doors equipped with clamping prevention devices for the opening process:

At the secondary closing edges of the door at that point which is considered to be the most dangerous place of clamping.

3.3 At least three measurements shall be taken at each of the measuring points to determine the clamping force according to paragraph 2.6.

3.3 The signal of the closing force shall be recorded by means of a low-pass filter with a limiting frequency of 100 Hz. Both the threshold of sensitivity and the fade-away threshold to limit the pulse duration shall be set at 50 N.

3.5 The deviation of the reading from the rated value shall not be more than  $\pm 3 \%$ .

### 4. Measuring device

4.1 The measuring device shall consist of two parts: one handle and one measuring part which is a load cell (see figure 2).

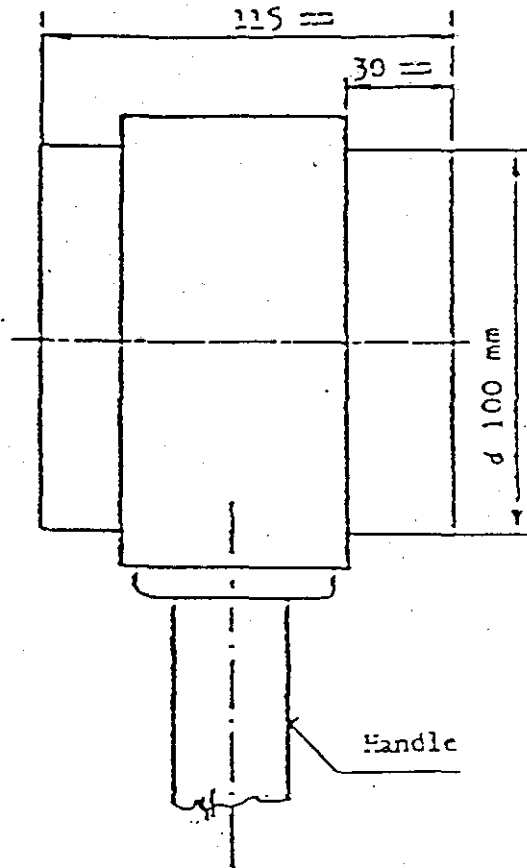
4.2 The load cell shall have the following characteristics:

4.2.1 It shall consist of two sliding housings with the outer dimension of 100 mm in diameter and 115 mm in width. Inside the load cell a compression spring shall be fitted between the two housings such that the load cell can be pressed together if an appropriate force is applied.

4.2.2 The stiffness of the load cell shall be  $10 \pm 0.2$  N/mm. The maximum spring deflection shall be limited to 30 mm so that a maximum peak force of 300N is achieved.

ANNEX V

Figure 2



## ANNEX VI

### SPECIAL REQUIREMENTS FOR VEHICLES HAVING A CAPACITY NOT EXCEEDING 22 PASSENGERS

#### 1.1 Minimum dimensions for exits

The several kinds of exits shall have the following dimensions:

Aperture	Dimensions	Remarks
Service door	<u>Entry height</u> Class A 165 cm B 150 cm	The service door entry height shall be measured as the vertical distance measured on a vertical plane of the horizontal projections of the mid-point of the door aperture and the top surface of the lowest step
	Aperture height	The vertical height of the service door aperture shall be such as to permit the free passage of the dual panel referred to in paragraph 7.7.1.1. of Annex 1. The height at the upper corners may be reduced with round-offs, with a radius of not more than 15 cm.
	<u>Width</u> Single door: 65 cm  Double door: 120 cm	For Class B vehicles where the service door aperture height lies between 140 and 150 a minimum single door aperture width of 75 cm shall apply. For all the vehicles the width of any service door may be reduced by 10 cm when the measurement is made at the level of the hand holds and by 25 cm in cases where intruding wheel arches or the actuating mechanism for automatic or remote-control doors or the rake of the windscreen so require.
Emergency door	Height: 125 cm  Width: 55 cm	The width may be reduced to 30 cm in cases where intruding wheel arches so require, providing that the width of 55 cm is respected at the minimum height of 40 cm above the lowest part of the door aperture. The height at the upper corners may be reduced with round-offs, with a radius of not more than 15 cm.
Emergency window	Aperture area: 4 000 cm <sup>2</sup>	A 5% tolerance shall, however, be permitted in respect of this area for type-approvals issued for one year following the entry into force of this Directive. It shall be possible to inscribe this area in a rectangle of 50 cm x 70 cm.

1.1.1

A vehicle to which paragraph 7.7.1.9. of Annex I applies shall meet the requirements of paragraph 7.6.3.1 in respect with emergency windows and escape hatches, and the following requirements in respect with service doors and emergency doors:

Aperture	Dimensions	Remarks
Service door	Aperture height: 110 cm	This dimension may be reduced by a radius at the corners of the aperture not exceeding 15 cm radius.
	<u>Width</u> Single door: 65 cm Double door: 120 cm	This dimension may be reduced by a radius at the corners of the aperture not exceeding 15 cm radius The width may be reduced by 10 cm when the measurement is made at the level of the handholds and by 25 cm in cases where intruding wheel arches or the actuating mechanism for automatic or remote-control doors or the rake of the windscreen so require.
Emergency door	Height: 110 cm Width: 55 cm	The width may be reduced to 30 cm in cases where intruding wheel arches so require, providing that the width of 55 cm is respected at the minimum height of 40 cm above the lowest part of the door aperture. The height and width at the upper corners may be reduced with round-offs, with a radius of not more than 15 cm.

1.2

Siting of exits

1.2.1

The service door(s) shall be situated on the side of the vehicle that is nearer to the side of the road corresponding to the direction of the traffic in the country in which the vehicle is to be registered, or in the rear face of the vehicle.

1.2.2

The exits shall be placed in such a way that there is at least one exit on each side of the vehicle.

1.2.3

The forward half and the rearward half of the passenger space shall each contain at least one exit.

1.2.4

At least one exit shall be situated either in the rear face or in the front face of the vehicle unless an escape hatch is fitted on the roof.



## ANNEX VII

### REQUIREMENTS FOR BOARDING AIDS FACILITATING ACCESS TO VEHICLES

#### Requirements

This Annex contains the requirements which the boarding aids referred to in paragraph 7.12 must comply with. Boarding aids not described in this Annex may be accepted by the technical service in charge of the test provided that they are recognised to be as safe as those described in this Annex.

#### 1. Scope

These requirements shall apply to vehicles equipped with technical boarding aids, thereby permitting easier access for persons with reduced mobility.

#### 2. Definitions

2.1 Boarding aids means devices or systems facilitating access to buses, such as kneeling systems, lifts, ramps, etc.

2.2 Kneeling system means a boarding aid which lowers and lifts totally or partially the superstructures of vehicles.

2.3 Lift means a boarding aid in the door area with a lifting platform to overcome the difference between the height of the vehicle floor and the ground.

2.4 Ramp means a boarding aid to bridge the gap between the floor of the vehicle and the ground.

2.5 Safety device means a device which when activated, reduces the risk of injury.

#### 3. Requirements

##### 3.1 General provisions

##### 3.1.1 Accessibility test

The vehicle and the boarding aids shall be such that a wheelchair user being able to use normally his arms and hands and sitting on a platform 15 cm above the ground (representing a pavement) is able to board easily in the vehicle through the service doors designed for this purpose, when the relevant access controls are operated.

The requirement shall also be assumed to be met if the vehicle passes the test without any boarding aid in the case for certain low-floor buses.

### 3.1.2 Markings

The controls actuating the boarding aids shall be clearly marked as such. The extended or lowered position of the boarding aid shall be indicated by tell-tale to the driver.

### 3.1.3 Emergency operation

In the event of the failure of a safety device, lifts, ramps and kneeling systems shall be incapable of operation, unless they can be safely operated by manual effort. The type and location of the emergency operating mechanism shall be clearly marked. In the event of power failure, lifts must be capable of manual operation.

### 3.1.4 Access to doors

Access to one of the doors on the vehicle may be obstructed by a boarding aid providing the following two conditions are satisfied from both inside and outside the vehicle.

3.1.4.1 The boarding device does not obstruct the handle or other device for opening the door.

3.1.4.2 The boarding device can be readily moved to leave the doorway clear for use in an emergency.

### 3.2 Kneeling system

#### 3.2.1 Special provisions

##### 3.2.1.1 Operating mechanism

An operating control shall be required to activate a kneeling system. If the kneeling system is interlocked with any other system, e.g. the parking brake, failure of the kneeling system must not adversely affect that other system. Furthermore, operation of the interlocked system shall not cause kneeling to take place.

##### 3.2.1.2 Modes of operation

The raising and lowering of the vehicle body may be controlled either manually or automatically. A vehicle may be equipped with both systems, driver selectable.

#### 3.2.1.2.1 Manual operating mechanism

The manual operating mechanism shall be controlled from the driver's seat. The mechanism for lowering the body shall be designed in such a way that if released during lowering it automatically returns to the off position within at least 80% of the total lowering distance. In so doing the lowering process shall be stopped and reversed immediately. It shall be only possible to initiate the lowering process again when the vehicle body is in its normal position (position during travel).

#### 3.2.1.2.2 Automatic control

When there is an automatic control mechanism which is simultaneously activated by the control of another device, e.g. of a service door, it shall be possible for the lowering process to be stopped and reversed by the driver of the vehicle by means of an emergency switch located within reach of the driver. It shall only be possible to initiate the lowering process again when the vehicle body is in its normal position (position during travel). The lowering process shall be initiated only when the doors are closed. It shall be at least 80% complete before the service doors are fully open. The raising process shall not be initiated if a service door is still open.

#### 3.2.1.3 Lowering the body of the vehicle

The lowering process shall take place at speeds no faster than 5 km/h. It shall be ensured that the bus cannot drive off when the body is lowered.

#### 3.2.1.4 Raising the body of the vehicle

It shall not be possible to initiate the raising process if a service door is still completely open. The raising process shall be interrupted when the reversing mechanism of a door is operated.

#### 3.2.1.5 Special mode of operation

It may be possible by an additional manual control located separately on the dashboard to stop the raising process at any time provided the vehicle is at standstill and the starting prevention device is activated.

### 3.3 Lift

#### 3.3.1 General provisions

Lifts shall only be capable of operation when the vehicle is at a standstill. Raising and lowering of the lift shall be indicated by three flashing yellow lights and an audible signal. These lifts shall be positioned as follows: two lights on the outside of the vehicle on either side of the door in the lower area; one lighting the interior above that door. The lights shall comply with Directive 76/756 EEC.

When raising of the platform and before lowering is initiated a device preventing the wheelchair from rolling off shall automatically come into operation.

### 3.3.2 Additional technical requirements for power operated lifts

3.3.2.1 The operating mechanism shall be designed in such a way that, if released, it automatically returns to the off position. As it does so the movement of the lift shall immediately be stopped and it shall be possible to initiate a movement in either direction without delay.

3.3.2.2 Areas not visible to the operator where the movement of the lift might trap or crush objects shall be protected by a safety device (e.g. reversing mechanism).

3.3.2.3 In the event of one of these safety devices coming onto operation, the movement of the lift shall immediately be stopped and movement in the opposite direction initiated.

### 3.3.3 Operation of power operated lifts

3.3.3.1 Where the lift is at a service door situated within the direct field of vision of the driver of the vehicle, the lift may be operated by the driver when the driving seat.

3.3.3.2 In all others cases, the control shall be adjacent to the lift. They shall be capable of being activate and deactivated only by the driver from his seat.

3.3.3.3 After activation of the operational controls by the driver of the vehicle from his seat it shall be possible to operate the lift by the user or by an attendant. It must be possible for the driver and user or attendant to communicate with each other.

3.3.3.4 The actuating mechanism shall be operated against unauthorised use (e.g. key-operated switch).

### 3.3.4 Manually operated lift

The lift shall be designed for operation by controls adjacent to the lift.

### 3.3.5 Operation of manually operated lifts

The lift shall be so designed that excessive forces are not required to operate it.

### 3.3.6 Dimensions and load capacity

The lift platform shall be not less than 80 cm wide, and not less than 125 cm long, and shall be capable of operating when carrying a mass of at least 300 kg.

## 3.4 Ramp

### 3.4.1 General provisions

3.4.1.1 The ramp shall only be capable of operation when the vehicle is at a standstill.

3.4.1.2 Edges on the outside shall be rounded to a radius of no less than 2.5 mm  
Corners on the outside shall be rounded to a radius of not less than 5 mm.

3.4.1.3 Extension and retraction of the ramp shall be indicated by three flashing yellow lights and an audible signal; the ramps shall be identifiable by clearly visible red and white retro-reflecting hazard markings on the outer edges.

### 3.4.2 Modes of operation

Extension and retraction of the ramp may be carried out either manually or power operated.

### 3.4.3 Additional technical requirements for power operated ramps.

3.4.3.1 Extension of the ramp in the horizontal direction shall be protected by a safety device.

3.4.3.2 In the event of one of these safety devices coming into operation, the movement of the ramp shall immediately be stopped.

3.4.3.3 The horizontal moment of a ramp shall be interrupted when it is loaded with a mass of 15 kg.

### 3.4.4 Operation of power operated ramps.

Ramps may be operated by the driver of the vehicle from the driver's seat, or by the passenger at the door by means of a switch which has been rendered operable by the driver, or by a special operating mechanism at the door in question (e.g. key-operated switch).

### 3.4.5 Operation of manually operated ramp.

The ramp shall be so designed that excessive forces are not required to operate the ramp.

### 3.4.6 Dimensions of the ramp

The ramp shall provide a space at least 80 cm wide. The slope of the ramp, when extended or folded manually to the outside of the bus, should not exceed 12 % to facilitate access to the bus for wheelchair users in particular.

## ANNEX VIII

### SPECIAL REQUIREMENTS FOR DOUBLE-DECKER VEHICLES

This Annex contains the requirements for double-decker vehicles, where these differ from the basic requirements of Annex I. Unless otherwise stated below, all the requirements of Annex I shall apply to double-decker vehicles. The numbering of paragraphs below follows that of Annex I.

#### 2 DEFINITIONS

For the purpose of this Directive:

- 2.1 "Double-decker vehicle" means a vehicle where the provided spaces for passengers are arranged, at least in one part, in two superimposed levels and spaces for standing passengers are not provided in the upper deck.
- 2.1.4 "Double-decker articulated bus or coach" means a vehicle which consists of two or more rigid sections which articulate relative to one another; the passenger compartments of each section intercommunicate on at least one deck so that passengers can move freely between them; the rigid sections are permanently connected so that they can only be separated by an operation involving facilities which are normally only found in a workshop.
- 2.12 "Exit" means a service door, intercommunication staircase or emergency exit.
- 2.14 "Gangway" means the space providing access by passengers from any seat or row of seats to any other seat or row of seats or to any access passage from or to any service door or intercommunication staircase. It does not include:
- 2.14.1 the space extending 30 cm in front of any seat, except where a sideways-facing seat is situated above wheel arch, in which case this dimension may be reduced to 22.5 cm.
- 2.15 "Access passage" means the passage between a doorway or intercommunication staircase and a gangway.
- 2.25 "Intercommunication staircase" means a staircase which allows communication between the upper and lower decks.
- 2.26 "Separate compartment" means a space in the vehicle which may be occupied when the vehicle is in use and which does not communicate by means of a suitable passageway with the driver's compartment other than by more than one change of deck.
- 2.27 "Half staircase" is a staircase from the upper deck which terminates in a emergency door.

#### 7. REQUIREMENTS

##### 7.1 Load distribution between axles and loading conditions

- 7.1.8 Double-decker vehicles shall not be equipped to carry luggage on the roof.

## 7.2 Area available for passengers

7.2.1 The surface area on each deck ( $S_{Oa}$  upper deck, and  $S_{Ob}$  lower deck) available for passengers is calculated by deducting from the total area of each deck, as appropriate:

7.2.1.2 the area of steps at doors and the area of any step in the intercommunication staircase and the area of any step with a depth of less than 30 cm, and the area swept by the door when it is operated;

7.2.1.3 the area of any part over which the vertical clearance is less than 135 cm measured from the floor (disregarding intrusions permitted according to paragraph 7.7.8.6.2. of Annex I); and

7.2.2 The surface area  $S_1$  available for standing passengers is calculated by deducting from  $S_{Ob}$ :

7.2.2.3 the area of all parts where the clear height above the floor is less than 180 cm (handholds shall not be taken into account in this connection);

7.2.2.5 The space extending 30 cm in front of any seat, except where a sideways-facing seat is situated above wheel arch, in which case this dimension may be reduced to 22.5 cm.

## 7.3 Number of passengers accommodated

7.3.1 There shall be on each deck of the vehicle a number ( $A_a$ ,  $A_b$ ) of seating places which conform to the requirements of paragraph 7.7.8. of Annex 1. If the vehicle is of Class I or Class II, the numbers  $A_a$  and  $A_b$  shall be at least equal to the number of square metres of floor on that deck available for passengers and crew (if any) ( $S_{Oa}$ ,  $S_{Ob}$ ) rounded down to the nearest whole number.

## 7.4 Stability test

7.4.1 The stability of a vehicle shall be such that the point at which overturning occurs would not be passed if the surface on which the vehicle stands was tilted to both sides in turn to an angle of 28 degrees from the horizontal.

7.4.2 For the purposes of the above test, the vehicle shall be unladen as described in paragraph 7.1.3. of Annex I, with the addition of loads equal to  $Q$  as defined in paragraph 7.3.2. of Annex I placed on each upper deck passenger seat. If the vehicle is intended to be used with a crew member who is not seated, the centre of gravity of the mass of 75 kg representing the crew member shall be placed in the upper deck gangway at a height of 875 mm. The baggage compartments shall not contain any baggage.

7.4.5 Alternatively, a calculation method can be used to show that the vehicle will not overturn under the conditions described in paragraphs 7.4.1 and 7.4.2. Such a calculation shall take into account the following parameters:

7.4.5.1 masses and dimensions;

7.4.5.2 height of centre of gravity;

- 7.4.5.3 spring rates;
- 7.4.5.4 vertical and horizontal tyre rates;
- 7.4.5.5 characteristics of the control of air pressure in the air springs;
- 7.4.5.6 position of the momentary centre;
- 7.4.6.7 torsion resistance of the body.

The method of calculation is described in Appendix 1 of Annex I.

7.5.5 Fire extinguishers and first-aid equipment

7.5.5.1 Double-decker vehicles shall be fitted with two or more fire extinguishers, one being near the driver's seat and one on the upper deck. Vehicles of Classes A & B shall be equipped with at least one extinguisher on each deck, having a minimum test rating of 8A 34B to CEN Standard EN 3 Part 1 and at least a capacity of 2 kg. Vehicles of Classes I, II & III shall be equipped on the lower deck with at least one extinguisher having a minimum test rating of 21A 113B to CEN Standard EN 3 Part 1 and at least a capacity of 6 kg, and shall be equipped on the upper deck with at least one extinguisher having a minimum test rating of 8A 34B to CEN Standard EN 3 Part 1 and at least a capacity of 2 kg. The extinguishers shall not contain halogenated hydrocarbons as the extinguishant.

7.6 Exits

7.6.1 Number of exits

7.6.1.1.bis By derogation to the provisions of 7.6.1.1, Member States may permit the sale or entry into service of new vehicles complying with the following provision:

Every double-decker vehicle of Class I shall have two doors, one service door and one emergency door on the opposite side. The minimum number of doors required is as follows:

Number of passengers	Number of doors
	Class I
9 - 45	2
46 - 70	3
71 - 100	4
101 - 140	5
> 140	6

7.6.1.4 The minimum number of emergency exits shall be such that the total number of exits is as follows, the number of exits for each separate deck and each separate compartment being determined separately. Toilet compartments or galleys are not considered to be separate compartments for the purposes of defining the number of emergency exits. Escape hatches can only count as one of the abovementioned number of emergency exits:



Number of passengers and crew per compartment to be accommodated in each compartment or deck	Minimum total number of emergency exits
1 - 8	2
9 - 16	3
17 - 30	4
31 - 45	5
46 - 60	6
61 - 75	7
76 - 90	8
91 - 110	9
111 - 130	10
> 130	11

7.6.1.4.bis By derogation to the provisions of 7.6.1.4, Member States may permit the sale or entry into service of new vehicles complying with the following provision:

The minimum number of exits for Class I double decker vehicles shall be such that the total number of exits is as follows:

Number of passengers	Minimum total number
9 - 16	3
17 - 30	4
31 - 45	5
46 - 60	6
61 - 75	7
76 - 90	8
91 - 110	9
111 - 130	10
> 130	11

Escape hatches can only count as one of the abovementioned number of exits.

7.6.1.11 Escape hatches, additional to the emergency doors and windows, shall be fitted in the roof of the upper deck of Class II and Class III vehicles. They may also be fitted in the case of Class I vehicles. In such case the minimum number of hatches shall be:

Total number of passengers in the upper deck (Aa)	Number of hatches
not exceeding 50	1
exceeding 50	2

7.6.1.12 Each intercommunication staircase shall be considered to be an exit from the upper deck.

7.6.1.13 All persons accommodated in the lower deck must in an emergency situation have access to the exterior of the vehicle without having to enter the upper deck.

7.6.1.14 The upper deck gangway shall be connected by one or more intercommunication staircases to the access passageway of a service door or to the lower deck gangway within 3 m of a service door.

(a) Two, or at least one-and-one-half staircases, shall be provided in Class I and Class II vehicles if more than 50 passengers are carried on the upper deck;

(b) Two, or at least one-and-one-half staircases, are to be provided in Class III vehicles if more than 30 passengers are carried on the upper deck.

7.6.2 Siting of exits

7.6.2.2 Two of the doors shall be separated such that the distance between transverse vertical planes through their centres of area is not less than either 25 per cent of the overall length of the vehicle or 40 per cent of the overall length of the passenger compartment on the lower deck; this shall not apply if the two doors are on different sides of the vehicle. If one of these two doors forms part of a double door, this distance shall be measured between the two doors which are farthest apart.

7.6.2.3 The exits on every deck shall be placed in such a way that their number on each of the two sides of the vehicle is substantially the same.

7.6.2.4 In each deck, at least one emergency exit shall be situated either in the rear face or in the front face of the vehicle respectively.

7.6.2.8 If the space reserved for the driver's seat and the passengers' or crew seats beside the driver's seat does not communicate with the main passengers' compartment by means of a suitable passageway;

7.6.2.8.1 the main compartment reserved for passengers shall contain exits satisfying the requirement of paragraph 7.6.1 with respect to number and those of paragraph 7.6.2 with respect to siting;

7.6.2.8.2 the driver's door shall be accepted as the emergency door for the occupants of the seats situated beside the driver's seat provided that the driver's seat, the steering wheel, the engine housing, the gear lever and hand brake control, etc., do not constitute too great an obstruction. The service door provided for the passengers shall be in the side of the vehicle opposite to that containing the driver's door and shall be accepted as the emergency door for the driver;

7.6.4 Technical requirements for all service doors

7.6.4.6 If the direct view is not adequate, optical or other devices shall be installed to enable the driver to detect from his seat the presence of a passenger in the immediate exterior vicinity of every service door which is not an automatically-operated service door. In the case of vehicles of Class I, this requirement also applies to the interior of all service doors and to the immediate vicinity of each intercommunication staircase on the upper deck.

7.6.7 Technical requirements for emergency doors

7.6.7.3 The outside handles of lower deck emergency doors shall be not more than 150 cm above the ground when the vehicle is standing unladen on level ground.

7.6.7.6 If the driver's service door is not readily accessible, in particular if it is necessary to squeeze between the steering wheel and the driver's seat in order to reach the service door, that service door shall not be deemed to be an emergency door, except in the case described in paragraph 7.6.2.8.

7.7.5 Gangways (see Annex VIII, figure 1)

7.7.5.1 The gangways of a vehicle shall be so designed and constructed as to permit the free passage of a gauging device consisting of two co-axial cylinders with an inverted truncated cone interposed between them, the gauging device having the following dimensions (in cm):

	Class I		Class II		Class III	
	UD	LD	UD	LD	UD	LD
Diameter of lower cylinder	45	45	35	35	30	30
Height of lower cylinder	90	102	90	102	90	102
Diameter of upper cylinder	55	55	55	55	45	45
Height of upper cylinder	50	50	50	50	50	50
Overall height	168	180	168	180	168	180

The gauging device may come into contact with strap hangers for standing passengers, if fitted, and move them away. The width of the upper panel may be reduced at the top when a chamfer not exceeding 30 degrees from the horizontal is included (figure 1)

7.7.5.3 On articulated buses or coaches, the gauging device defined in paragraph 7.7.5.1. shall be able to pass unobstructed through the articulated section on any deck where the two sections permit through passage by passengers. No part of the soft covering of that section, including parts of bellows, shall project into the gangway.

7.7.7 Steps

7.7.7.1 85 cm maximum in the case of an emergency door in the lower deck and 150 cm maximum in the case of the emergency door in the upper deck.

7.7.8.6 Free height over seating positions

7.7.8.6.1 Each seating position shall have a free height of not less than 90 cm measured from the highest point of the uncompressed seat cushion. This free height shall extend over the vertical projection of the whole area of the seat and the associated foot space. In the case of the upper deck, this free height may be reduced to 85 cm.

7.7.12 Intercommunication staircase (see Annex III, figure 1)

7.7.12.1 The minimum width of any intercommunication staircase shall be so designed as to permit the free passage of the single door access template as defined in figure 1 of Annex III. The panel shall be moved starting from the gangway of the lower deck up to the last step, in the probable direction of motion of a person using the staircase.

7.7.12.2 Intercommunication staircases shall be so designed, that during heavy braking of the vehicle moving in the forward direction there is no danger of a passenger being projected downwards.

This requirement is considered to be fulfilled if at least one of the following conditions is met:

7.7.12.2.1 no part of the staircase is forward descending;

7.7.12.2.2 the staircase is equipped with guards or a similar provision;

7.7.12.2.3 there is an automatic device in the upper part of the staircase which prevents the use of the staircase when the vehicle is in motion; this device shall be easily operable in an emergency.

7.7.12.3 It shall be verified, by use of the cylinder of paragraph 7.7.5.1., that access conditions from the gangways (upper and lower) to the staircase are adequate.

7.11 Handrails and handholds

7.11.5 Handrails and handholds for intercommunication staircases

7.11.5.1 Suitable handrails or handholds shall be provided at each side of all intercommunication staircases. These shall be positioned between 80 cm and 110 cm above the tread edge of each step.

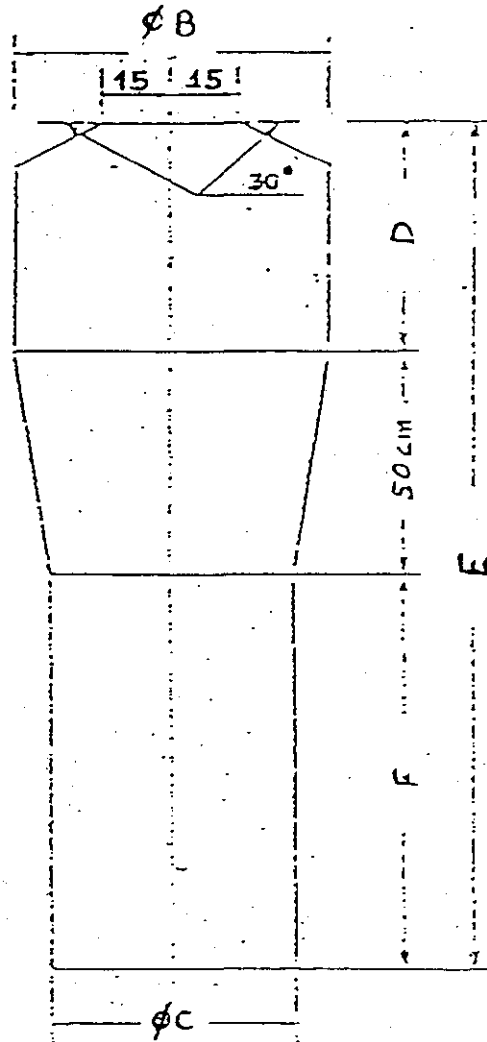
- 7.11.5.2 The handrails and/or handholds to be provided shall be such that they include a grasping point available to a person standing on the lower or upper deck adjacent to the intercommunication staircase, and at any of the successive steps. Such points shall be situated vertically between 80 and 110 cm above the lower deck or each above the surface of each step, and, horizontally:
- 7.11.5.2.1 for the position appropriate to a person standing on the lower deck, not more than 40 cm inwards from the outer edge of the first step, and
- 7.11.5.2.2 for the position appropriate to a particular step, not outwards from the outer edge of the step considered, and not more than 60 cm inwards from the same edge.
- 7.14 Guarding of stepwells and exposed seats
- 7.14.2 On the upper deck of a double-decker vehicle, the intercommunication staircase well shall be protected by an enclosed guard having a minimum height of 80 cm measured from the floor. The lower edge of the guard shall not be more than 10 cm from the floor.
- 7.14.3 The front windscreen ahead of passengers occupying upper-deck front seats must be provided with a padded guard. The higher edge of that protection shall be situated vertically between 80 cm and 90 cm above the floor where the passenger's feet rest.
- 7.14.4 The riser of each step in a staircase shall be closed.

## ANNEX VIII

Figure 1

### Gangways

(see paragraph 7.7.5. of Annex VIII)



	B(cm)	C(cm)	D(cm)	E(cm) */	F(cm) */
Class I	55	45	50	180(168)	102(90)
Class II	55	35	50	180(168)	102(90)
Class III	45	30 (22 in the case of laterally movable seats)	50	180(168)	102(90)

\*/ Dimensions in brackets apply for upper deck only.

## ANNEX IX

### ELECTRICAL CONDUCTOR TEST

#### 1. Principle:

This test consists of submitting specified test pieces of the electrical conductors as installed in the vehicle, to a flame in order to evaluate their resistance to fire.

#### 2. Equipment

The test equipment consists in:

##### 2.1 Test enclosure.

The test enclosure consists of a metallic screen with 3 faces:

- 1200 ± 25 mm in height
- 300 ± 25 mm in width
- 450 ± 25 mm in depth.

The front face is open and the top and bottom is closed. The base need not be metallic.

##### 2.2 A heat source.

The heat source consists of a gas burner (Bunsen burner) of internal diameter between 9.5 mm and 10 mm. Its control is such that the length of the outer flame is approximately 125 mm and that of the inner flame approximately 40 mm.

The functioning of the burner is tested in the following manner: The base of the burner being horizontal, a naked copper wire of  $0.71 \pm 0.025$  mm in diameter and having a free length of at least 100 mm is introduced horizontally into the flame, at 50 mm above the top edge of the burner, such that the free end of the wire is situated above the far vertical edge of the burner (see figure 1). The time necessary to melt the wire shall not exceed 6 seconds, nor be less than 4 seconds.

#### 3. Test pieces:

The test piece is formed by a piece of conductor 600 mm ± 25 mm long.

#### 4. Test method:

The test piece is held vertical and placed in the middle of the test enclosure such that its lower end is approximately 50 mm from the base of the enclosure. For the test, the base of the burner forms an angle of 45° with the axis of the test piece. The distance between the burner and the test piece must be such that the inner

flame just touches the centre line of the sample (see figure 2): The flame must be applied about 100 mm above the lower end of the test piece for a continuous period T (seconds) given by the formula:

$$T = 60 + M/25$$

where M is the mass in grams of the test piece of conductor per length of 600 mm.

5. Results:

The observed phenomena are recorded in the test report, notably:

- the duration of combustion,
- the length of the charred section.

6. Classification:

Based on the results obtained, the material will be classified as follows:

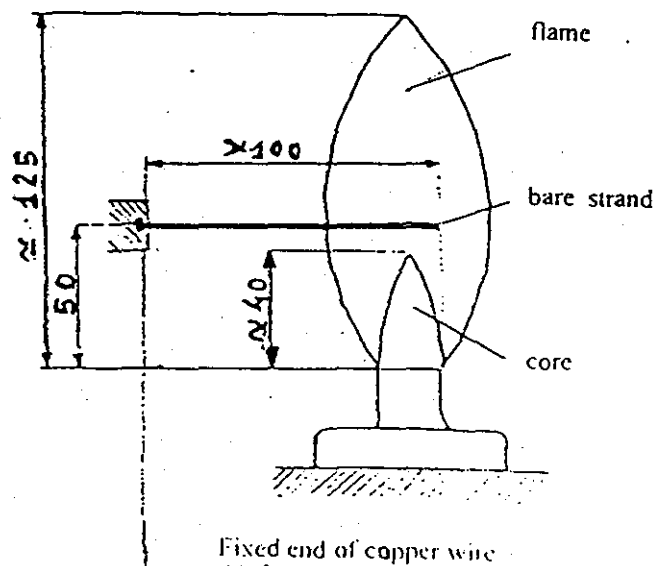
Category 1: Combustion is self-extinguished.  
The upper end of the test piece is intact.

Category 2: Combustion is self-extinguished.  
The upper end of the test piece is charred or affected.

Category 3: Combustion is not self-extinguished.

7. Requirements: Only category 1 conductors are permitted.

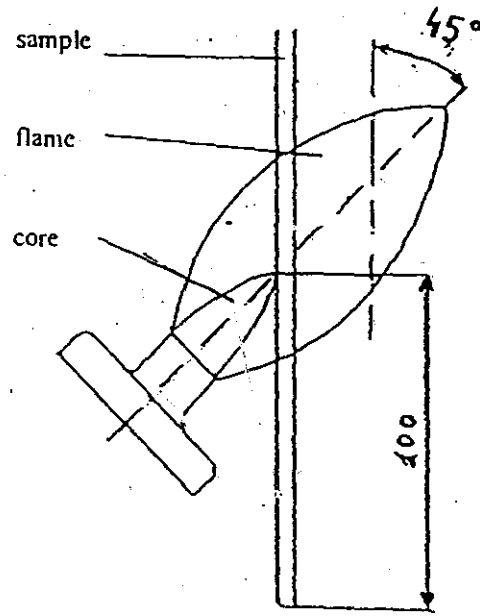
Figure 1





ANNEX IX

Figure 2



## ANNEX X

### SEPARATE TECHNICAL UNIT TYPE-APPROVAL AND TYPE-APPROVAL OF A VEHICLE FITTED WITH A BODY ALREADY APPROVED AS A SEPARATE TECHNICAL UNIT

1. SEPARATE TECHNICAL UNIT TYPE-APPROVAL.
  - 1.1 In order to be granted separate technical unit type-approval to this Directive for a vehicle body, the manufacturer must demonstrate to the satisfaction of the approval authority compliance with the following requirements:
    - 1.1.1 Annex I, paragraphs 1 to 6, 7.2, 7.3.1, 7.3.2 (first inequality), 7.5.3 (as it applies to wiring in the body), 7.5.4 (if batteries are installed in the body), 7.5.5, 7.5.6, 7.6 to 7.8 (except for items covered in paragraph 2.1.1 below); 7.11 to 7.12 (except 7.12.11), 7.13 to 7.18.
    - 1.1.2 Annexes II to III.
    - 1.1.3 Annex IV (if applicable).
    - 1.1.4 Annex V (if applicable).
    - 1.1.5 Annex VI (if applicable).
    - 1.1.6 Annex VII (if applicable), except paragraph 3.2 and in respect of heights from ground.
    - 1.1.7 Annex VIII (if applicable), except paragraphs 7.4, 7.6.7.3 and 7.7.7.1.
    - 1.1.8 Annex IX (as regards wiring fitted to body).
  - 1.2 Approval may be granted subject to conditions to be met by the completed vehicle (such as, for example, characteristics of suitable chassis, restriction on use or installation ...), these conditions being recorded on the approval certificate.
  - 1.3 Any such conditions must be communicated to the purchaser of the vehicle body or the next stage builder of the vehicle in an appropriate form.
2. TYPE-APPROVAL OF A VEHICLE FITTED WITH A BODY ALREADY APPROVED AS A SEPARATE TECHNICAL UNIT.
  - 2.1 In order to be granted type-approval to this Directive for a vehicle fitted with a body which has already been granted approval as a separate technical unit, the manufacturer must demonstrate to the satisfaction of the approval authority compliance with the following requirements, any preceding approval as an incomplete vehicle being taken into account:

- 2.1.1 Annex 1, paragraph 1 to 6, 7.1, 7.2 7.3.2, 7.3.3, 7.3.4, 7.4, 7.5.1, 7.5.2, 7.5.3 (as it applies to wiring in the chassis and body installation), 7.5.4 (where not already approved), 7.5.6, 7.6.1, 7.6.4, (7.6.4.6 in respect of rear service doors and 7.6.4.8 in respect of speed interlock if fitted), 7.6.5, (7.6.5.2 in respect of speed interlock if fitted, 7.6.5.8 in respect of speed interlock if fitted, and 7.6.5.9 in respect of speed interlock if fitted), 7.6.6, 7.6.7, 7.6.11, 7.7.1, 7.7.6, 7.7.7 (as it applies to first step height), 7.9, 7.10, 7.11.3, 7.12.8, 7.12.9, 7.12.11, 7.12.12, 7.13.
- Annex 1, Appendix 1, if applicable.
- 2.1.2 Annexes II to III.
- 2.1.3 Annex VII (if applicable).
- 2.1.4 Annex VIII (if applicable), except paragraphs 7.4, 7.6.7.3 (in respect of height from ground), and 7.7.7.1 (in respect of first step height from ground).
- 2.1.5 Annex IX (as it applies to wiring in the chassis and body installation).
- 2.1.6 Any conditions laid down in accordance with paragraph 1.2 above."

## **IMPACT ASSESSMENT FORM**

Proposal for a Parliament and Council Directive relating to special provisions for vehicles used for the carriage of passengers comprising more than eight seats in addition to the driver's seat - document III/4076/90-Revision 7.

*1. Taking account of the principle of subsidiarity, why is Community legislation necessary in this area and what are its main aims?*

This directive is one of the separate directives of the framework directive 70/156/EEC and the last piece of legislation needed to obtain EEC type-approval for buses and coaches and thus achieve the Internal Market for those vehicles. A directive on the special provisions on buses and coaches is envisaged in Council directive 92/53/EEC (Annex IV, Part I, Point 52).

*2. Who will be affected by the proposal?*

All small, medium and large bus and coach manufacturers will be affected in a positive way, since they will be subject to one set of rules and to one single type-approval for the whole Union - instead of one per Member State now. This should bring the type-approval cost down considerably for these vehicles, hence the cost of transport services, both local and long distance. Consumers will therefore also benefit.

Industry are in general in favour of single EEC type-approval for all kinds of vehicles including buses and coaches. From their point of view administrative and financial burdens will be greatly reduced since the same procedure will not have to be repeated in every different Member State for a vehicle to be admitted.

Even though there is a limited number of chassis manufacturers, body manufacturers - half of whom are small and medium size businesses - are scattered all around the countries of the Union.

*3. What will business have to do to comply with the proposal?*

No special changes, given that the directive, which is based on safety standards, harmonises national rules already applied by the manufacturers.

Moreover, given that one EEC type-approval will be enough for a vehicle to be admitted to all fifteen Member States, businesses will have to pay fifteen times less to national technical services conducting the tests (which at over one thousand Ecus per type-approval is a considerable amount), notwithstanding related expenses such as wasted executive time, the preparation of voluminous files, engineers' trips to each country etc.

*4. What Economic effect is the proposal likely to have?*

For the reasons given under item 3, there is likely to be no negative economic effect with the exception of scheduled urban buses, where an increase in cost can be foreseen as a result of ensuring accessibility for people with reduced mobility. This cost (initially estimated up to 10% per vehicle) can be expected to be reduced as volumes increase and scale economies

ensue. Competition, however, will increase in the market for bus and coach manufacturers, because obtaining EEC type-approval will automatically open up the markets of all Member States.

Open competition for these kinds of vehicles can be expected over time to engender a restructuring in the industry, which will have to adapt quickly and efficiently to technical progress. Companies will have to increase also their productivity, which can be expected to have employment effects. On the other hand the industry should become internationally more competitive on third country markets.

5. *Does the proposal contain measures to take account of the specific situation of small and medium size firms?*

Chassis manufacturers are exclusively large firms, but the needs of body manufacturers, who are by almost half medium size businesses, have been taken into consideration (i.e. the possibility to obtain the type-approval of the body work as a separate technical unit). Indeed, representatives of small and medium size enterprise (SME) associations were invited to and present at all the experts consultation meetings which took place over the last three years for the drafting of this directive, and their advice proved most helpful to the Commission.

In the particular case of UK-built special series of buses, known as midi- or minibuses, which are often built by SMEs, a derogation has been introduced to allow them to go on producing for a long time. Other countries may also choose to register these vehicles if they wish.

It is by no means the intention of the Commission to damage any part of a market within the Community.

6. *Consultation*

All organisations concerned were represented at the successive meetings of the advisory Motor Vehicle Working Group, which has been consulted by the Commission in view of drafting this directive.

Generally, all the organisations consulted are in agreement with the proposal. In the particular case of the British manufacturers and operators there are different views. With the derogation included in the proposal the UK can continue to use its actual vehicle configuration.

7. *Specificity for tourism*

The directive has taken account of all those accidents which have occurred in the recent years involving coaches. Among other measures, a stability test has been introduced for single and double-decker vehicles, as well as a test concerning the strength of the superstructure of single deck coaches, allowing a residual space for the passengers in case of turn-over.

Coaches have become a very important means of tourism, therefore the directive has given the highest safety level for interurban and international travelling. The measures figuring in the directive will improve both passive and active safety in case of accident, so as to reduce considerably human injuries.

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