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PROPOSAL FOR A REVISION TO REGULATIONS No. 36, 52 and 107  
(M2 and M3 vehicles)

Transmitted by the United Kingdom

Note: The text reproduced below was prepared by the UK in order to specify the requirements for vehicles designed for passengers with reduced mobility. It is based on the technical requirements of European Community Directive 2001/85/EC in the consolidated version as prepared by the OICA for Regulation 107 (alternatively it may be used for inclusion within Regulations 36, 52 and 107). In addition, this document contains proposals to improve and clarify the technical provisions.

## Amendment to Regulation 107 - Requirements

- 5.2 ~~All vehicles of Class I, and those of other Classes which are specially equipped for the carriage of passengers with reduced mobility, shall additionally comply with the provisions set out in Annex 7 to this Regulation.~~ The provisions of Annex 7 shall apply to all vehicles of Class I and to a vehicle of any other Class when so specified by a Contracting Party in order to ensure access to the vehicle and the safety of passengers with reduced mobility.

## Amendment to Annex 7

### 1. General

This Annex contains the provisions which apply to a vehicle designed for easy access for passengers with reduced mobility and wheelchair users.

### 2. Scope

These requirements shall apply to vehicles permitting easier access for persons with reduced mobility.

### 3. Requirements

#### 3.1. Steps

The height of the first step from the ground of at least one service door shall not exceed **250 mm for vehicles of Class I, II and A and 320 mm for vehicles of class III and B.**

~~As an alternative for vehicles of class I and A, the first step from the ground shall not exceed 270 mm in two door openings, one entrance and one exit.~~

A kneeling system and/or retractable step may be engaged.

The height of the steps other than the first step from the ground at the above mentioned door(s), in an access passage and in a gangway, shall be not more than **200 mm for vehicles of Class I, II and A and 225 mm for vehicles of Class III and B.**

The transition from a sunken gangway to a seating area shall not be considered to be a step. **However, the vertical distance between the gangway surface and the floor of the seating area shall not exceed 250 mm.**

**Where any two steps are not separated by a gangway or a floor area the difference in height between them shall not exceed 10mm.**

In vehicles of Class I, II and A, all steps shall have closed vertical risers with all step nosings being designed to minimise the risk of tripping. The width and shape of every step shall be such that a rectangle as indicated in the table below can be placed fully on that step. At a double doorway each half of the doorway shall fulfil this requirement.

Number of passengers		> 22	≤ 22
Area	All steps (cm)	40 x 30	40 x 25

**The leading edge of the surface of every step tread, including the top surface of the tread nosing, shall be marked with a contrasting band of colour 45mm to 50mm in width.**

**Where a vehicle is fitted with a power-operated step, that step shall be fitted with a safety device which stops the motion of the step if the step is subject to a reactive force not exceeding 150N in any direction and if that motion could cause injury to any person.**

- 3.2 Priority seats and space for passengers with reduced mobility
- 3.2.1 A minimum number of forward or rearward facing seats designated as priority seats for disabled passengers shall be situated in a position near to a service door(s) suitable for boarding and alighting. **The minimum number of priority seats shall be four in Class I and II, two in Class III and one in Class A and B.** A seat that folds out of the way when not in use shall not be designated as a priority seat. Paragraph 5.7.8.5.2 of Annex 3 shall not apply to vehicles that comply with this requirement.
- 3.2.2 There shall be adequate space under, or adjacent to, at least one of the priority seats for a guide dog.
- 3.2.3 Armrests, **if fitted, shall be fitted on seats between the seating position and the gangway and** shall be capable of being moved easily out of the way to permit clear access to the seat.
- Handrails or handholds shall be fitted adjacent to priority seats in such a way as to allow the passenger to grasp them easily.
- 3.2.4 The minimum width of a priority seat cushion, measured from a vertical plane passing through the centre of that seating position, shall be 220 mm on each side or, in the case of a continuous seat, 220 mm per seating position on each side.
- 3.2.5 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 400 and 500 mm.
- 3.2.6 The foot space at priority seating positions shall extend forward of the seat from a vertical plane through the forward edge of the seat cushion. The foot space shall not have a slope in any direction of more than 8 %.

**Each priority seating position shall have a free height of not less than 1300 mm for vehicles of Class I, II and A and 900 mm for vehicles of Class III and B, measured from the highest point of the uncompressed seat cushion. This free height shall extend over the vertical projection of the whole of the seat and the associated foot space. Intrusion of a seat back or other object into this space shall be permitted provided that a minimum clear vertical space extending 230 mm in front of the seat cushion is maintained. Where the priority seat is positioned facing a bulkhead more than 1.2 m in height this space shall be 300 mm. From the edges of the free space defined above, intrusions are permitted in accordance with paragraphs 5.7.8.6.3.1 to 5.7.8.6.3.4 of Annex 3 as if reference to the clear space in paragraphs 5.7.8.6.1 and 5.7.8.6.2 of Annex 3 is a reference to the clear space defined above. The provisions of paragraph 5.7.8.1.4 of Annex 3 may apply. A**

**handrail may protrude by a maximum of 90mm into the clear space over the vertical projection of the foot space.**

3.3 Communication devices

3.3.1 Communication devices shall be placed adjacent to any priority seat and within any wheelchair area and shall be at a height between 700 mm and 1200 mm above the floor.

3.3.2 Communication devices ~~situated in the low floor area~~ shall be at a height between 800 mm and 1500 mm where there are no seats **and between 700mm and 1200mm where there are seats.**

3.3.3 The control for all internal communication devices shall be capable of operation with the palm of the hand and shall be in a contrasting colour or colours **and tone.**

3.3.4 If a vehicle is fitted with a ramp or lift, a means of communication with the driver shall be fitted outside, adjacent to the door, **and at a height between 850 mm and 1000 mm from the ground. This requirement may be met with the kneeling system activated.**

**Communication devices fitted in accordance with paragraph 3.3.1 in a wheelchair space and in accordance with paragraph 3.3.4 shall, when activated, provide an audible signal in the driver's cab such that the driver can identify that one of these devices, and not any other communication device, has been activated.**

**A sign displaying words and fitted in accordance with paragraph 5.7.9.1 of Annex 3 shall not display all capital letters.**

3.4 **Signs and Pictograms**

3.4.1 Vehicles fitted with a wheelchair space and/or priority seats shall have pictograms in accordance with Annex 4, figure [24] visible from the outside, both on the front nearside of the vehicle and adjacent to the relevant service door(s). Appropriate pictograms shall also be placed internally adjacent to the wheelchair space(s) ~~and~~ to the priority seat(s). **Pictograms shall be white in colour on a blue background and shall be at least 150mm in height on the outside of the vehicle and at least 60mm in height on the inside of the vehicle.**

**Every wheelchair space shall have a sign or pictogram indicating the direction that the wheelchair must face. Any wheelchair space required to be fitted with a wheelchair restraint system or a wheelchair user restraint system shall have appropriate instructions for the use of the system.**

**Any signs containing text shall be written in the language(s) relevant to the country in which the vehicle is to be registered.**

3.5 ~~Floor slope~~ **Floors and gangways**

The slope of any gangway, access passage or floor area between any priority seat or wheelchair space and at least one entrance and one exit or a combined entrance and exit shall not exceed 8 %. ~~Such sloping areas shall be provided with a non-slip surface.~~

**All floors and gangways shall be slip resistant.**

3.6 Wheelchair accommodation provisions

- 3.6.1 For each wheelchair user provided for in the passenger compartment there shall be a special area at least **750 mm wide, 1300 mm long and 1500mm high**. The longitudinal plane of the special area shall be parallel to the longitudinal plane of the vehicle and the floor surface of the special area shall be slip resistant.

In the case of a wheelchair space designed for a forward facing wheelchair, the top of preceding seatbacks may intrude into the wheelchair space if a clear space is provided as shown in Annex 4, figure 22. **In the case of a wheelchair space designed for a rearward facing wheelchair, the top of the seatbacks of rearward facing seats to the rear of the wheelchair space may intrude into the wheelchair space if a clear space is provided as shown in Annex 4, figure 22.**

**A handrail provided in accordance with paragraph 3.8.3.5. may protrude into the wheelchair space by not more than 90mm.**

- 3.6.2 There shall be at least one doorway through which wheelchair users can pass, In the case of vehicles of Class I, at least one wheelchair access door shall be a service door. **The wheelchair access door shall be fitted with a boarding aid complying with the provisions of paragraph 3.11.3 (a lift) or 3.11.4 (a ramp) and if the vehicle is fitted with a kneeling system with the provisions of paragraph 3.11.2 of this Annex.**

- 3.6.3 A door for wheelchair access, that is not a service door, shall have a minimum height of **1500 mm**. The minimum width of all doors providing wheelchair access to the vehicle shall be 900 mm which may be reduced by 100 mm when the measurement is made at the level of hand holds.

- 3.6.4 It shall be possible to move from the outside of the vehicle through at least one of the doors for wheelchair access into the special area(s) with a reference wheelchair of the dimensions shown in Annex 4, figure 21. **In the case of Class I or Class II vehicles fitted with more than one wheelchair space it shall be possible meet this requirement for each wheelchair space with every other wheelchair space occupied by a reference wheelchair. It shall be possible to enter and exit the vehicle with the reference wheelchair moving in a forward direction and for the reference wheelchair to enter the wheelchair space in the appropriate direction for travel.**

3.7 Seats in the wheelchair space

- 3.7.1 Folding seats may be fitted in a wheelchair space. However, such seats when folded and out of use shall not intrude into the wheelchair space.
- 3.7.2 A vehicle may be equipped with demountable seats fitted in the wheelchair space provided that such seats may be easily removed by the driver or a crew member.
- 3.7.3 Where the foot space of any seat, or part of a folding seat when in use, intrudes into a wheelchair space, those seats shall have a sign fixed on or adjacent to them with the following text:

*"Please give up this seat to a wheelchair user".*

***The UK has recently concluded research into the safety and security of passengers when travelling in vehicles seated in their wheelchairs. The report will be made available to GRSG and will form the basis for further proposals to amend the following section.***

3.8. Stability of wheelchairs

3.8.1. Wheelchair restraint system. As an alternative to the requirements contained in paragraphs 3.8.1 to 3.8.1.2.3 restraint systems may comply with the requirements contained in paragraphs 3.8.2 to 3.8.2.11.

3.8.1.1. In a vehicle where passenger seats are not required with any kind of occupant restraint system, the wheelchair space shall be fitted with a restraint system in order to warrant the stability of the wheelchair.

A static test shall be carried out in accordance with the following requirements:

- (a) a force of  $250 \text{ daN} \pm 20 \text{ daN}$  per wheelchair shall be applied on the restraint system itself;
- (b) the force shall be applied in the horizontal plane of the vehicle and towards the front of the vehicle if the restraint system is not attached to the floor of the vehicle. If the restraint system is attached to the floor, the force shall be applied in an angle of  $45^\circ \pm 10^\circ$  to the horizontal plane and towards the front of the vehicle;
- (c) the force shall be maintained for a period of not less than 1,5 seconds;
- (d) the restraint system shall be capable of withstanding the test. Permanent deformation, including partial rupture or breakage of the restraint system, shall not constitute failure if the required force is sustained for the specified time. Where applicable, the locking device enabling the wheelchair to leave the vehicle shall be operable by hand after removal of the traction force.

3.8.1.2. When passenger seats are required with occupant restraint systems, each wheelchair space shall be provided with a restraint system capable of restraining the wheelchair and its occupant.

This restraint system and its anchorage's shall be designed to withstand forces equivalent to the ones required for the passenger seats and occupant restraint systems.

A static test shall be carried out in accordance with the following requirements:

- (a) the forces referred hereto shall be applied in forward and rearward direction, separately and on the restraint system itself;
- (b) the force shall be maintained for a period of not less than 0,2 seconds;
- (c) the restraint system shall be capable of withstanding the test. Permanent deformation, including partial rupture or breakage of the restraint system shall not constitute failure if the required force is sustained for the specified time. Where applicable, the locking device enabling the wheelchair to leave the vehicle shall be operable by hand after removal of the traction force.

3.8.1.2.1. *In forward direction in the case of a separate wheelchair and wheelchair user restraint system*

3.8.1.2.1.1. For category M<sub>2</sub>:

- (a) 1110 daN  $\pm$  20 daN in the case of a lap belt. The force shall be applied on the wheelchair user restraint system in the horizontal plane of the vehicle and towards the front of the vehicle if the restraint system is not attached to the floor of the vehicle. If the restraint system is attached to the floor, the force shall be applied in an angle of  $45^\circ \pm 10^\circ$  to the horizontal plane of the vehicle and towards the front of the vehicle;
- (b) 675 daN  $\pm$  20 daN in the horizontal plane of the vehicle and towards the front of the vehicle on the lap portion of the belt and 675 daN  $\pm$  20 daN in the horizontal plane of the vehicle and towards the front of the vehicle on the torso portion of the belt in the case of 3-point belt;
- (c) 1715 daN  $\pm$  20 daN in an angle of  $45^\circ \pm 10^\circ$  to the horizontal plane of the vehicle and towards the front of the vehicle on the wheelchair restraint system;
- (d) the forces shall be applied simultaneously.

3.8.1.2.1.2. For category M<sub>3</sub>:

- (a) 740 daN  $\pm$  20 daN in the case of a lap belt. The force shall be applied on the wheelchair user restraint system in the horizontal plane of the vehicle and towards the front of the vehicle if the restraint system is not attached to the floor of the vehicle. If the restraint system is attached to the floor, the force shall be applied in an angle  $45^\circ \pm 10^\circ$  to the horizontal plane of the vehicle and towards the front of the vehicle;
- (b) 450 daN  $\pm$  20 daN in the horizontal plane of the vehicle and towards the front of the vehicle on the lap portion of the belt and 450 daN  $\pm$  20 daN in the horizontal plane of the vehicle and towards the front of the vehicle on the torso portion of the belt in the case of 3-point belt;
- (c) 1130 daN  $\pm$  20 daN in an angle of  $45^\circ \pm 10^\circ$  to the horizontal plane of the vehicle and towards the front of the vehicle on the wheelchair restraint system,
- (d) the forces shall be applied simultaneously.

3.8.1.2.2. *In forward direction in the case of a combined wheelchair and wheelchair user restraint system*

3.8.1.2.2.1. For category M<sub>2</sub>:

- (a) 1110 daN  $\pm$  20 daN in an angle of  $45^\circ \pm 10^\circ$  to the horizontal plane of the vehicle and towards the front of the vehicle on the wheelchair user restraint system in the case of a lap belt;
- (b) 675 daN  $\pm$  20 daN in an angle of  $45^\circ \pm 10^\circ$  to the horizontal plane of the vehicle and towards the front of the vehicle on the lap portion of the belt and 675 daN  $\pm$  20 daN in the horizontal plane of the vehicle and towards the front of the vehicle on the torso portion of the belt in the case of 3-point belt;
- (c) 1715 daN  $\pm$  20 daN in an angle of  $45^\circ \pm 10^\circ$  to the horizontal plane of the vehicle and towards the front of the vehicle on the wheelchair restraint system;
- (d) the forces shall be applied simultaneously.

3.8.1.2.2.2. For category M<sub>3</sub>:

- (a) 740 daN ± 20 daN in an angle of 45° ± 10° to the horizontal plane of the vehicle and towards the front of the vehicle on the wheelchair user restraint system in the case of a lap belt;
- (b) 450 daN ± 20 daN in an angle of 45° ± 10° to the horizontal plane of the vehicle and towards the front of the vehicle on the lap portion of the belt and 450 daN ± 20 daN in the horizontal plane of the vehicle and towards the front of the vehicle on the torso portion of the belt in the case of 3-point belt;
- (c) 1130 daN ± 20 daN in an angle of 45° ± 10° to the horizontal plane of the vehicle and towards the front of the vehicle on the wheelchair restraint system;
- (d) the forces shall be applied simultaneously.

3.8.1.2.3. *In rearward direction*

- (a) 810 daN ± 20 daN in an angle of 45° ± 10° to the horizontal plane of the vehicle and towards the rear of the vehicle on the wheelchair restraint system.

3.8.2 Alternative wheelchair restraint system:

3.8.2.1 a wheelchair space shall be fitted with a wheelchair restraint system suitable for general wheelchair application and shall allow the carriage of a wheelchair and a wheelchair user facing the front of the vehicle;

3.8.2.2 a wheelchair space shall be fitted with a wheelchair user restraint system which shall comprise of a minimum of two anchorage points and a pelvic restraint (lap belt) designed and constructed of components intended to perform in a similar manner to those of a seat belt conforming to Directive 77/541/EEC as amended;

3.8.2.3 any restraint system fitted to a wheelchair space shall be capable of being easily released in the case of an emergency.

3.8.2.4 any wheelchair restraint system shall either:

3.8.2.4.1 meet the dynamic test requirements described in paragraph 3.8.2.8 and be securely attached to vehicle anchorages meeting the static test requirements in paragraph 3.8.2.6; or

3.8.2.4.2 be securely attached to vehicle anchorages such that the combination of restraint and anchorages meets the requirements of paragraph 3.8.2.8.

3.8.2.5 any wheelchair user restraint shall either:

3.8.2.5.1 meet the dynamic test requirements described in paragraph 3.8.2.9 and be securely attached to vehicle anchorages meeting the static test requirements in paragraph 3.8.2.6; or

3.8.2.5.2 be securely attached to vehicle anchorages such that the combination of restraint and anchorages meets the dynamic test requirements described in paragraph 3.8.2.9 when attached to anchorages set up as described in paragraph 3.8.2.6.7.



- 3.8.2.6 A static test shall be carried out on the anchorage points for both the wheelchair restraint system and the wheelchair user restraint in accordance with the following requirements:
- 3.8.2.6.1 the forces specified in paragraph 3.8.2.7 shall be applied by means of a device reproducing the geometry the wheelchair restraint system;
  - 3.8.2.6.2 the forces specified in paragraph 3.8.2.7.3 shall be applied by means of a device reproducing the geometry of the wheelchair user restraint and by means of a traction device specified in paragraph 5.3.4 of Annex I to Directive 76/115/EEC;
  - 3.8.2.6.3 the forces in paragraph 3.8.2.6.1 and paragraph 3.8.2.6.2 shall be applied simultaneously in the forward direction and at an angle of  $10^\circ \pm 5^\circ$  above the horizontal plane;
  - 3.8.2.6.4 the forces in paragraph 3.8.2.6.1 shall be applied in the rearward direction and at an angle of  $10^\circ \pm 5^\circ$  above the horizontal plane;
  - 3.8.2.6.5 the forces shall be applied as rapidly as possible through the central vertical axis of the wheelchair space; and
  - 3.8.2.6.6 the force shall be maintained for a period of not less than 0.2 seconds.
  - 3.8.2.6.7 the test shall be carried out on a representative section of the vehicle structure together with any fitting provided in the vehicle which is likely to contribute to the strength or rigidity of the structure.
- 3.8.2.7 The forces specified in paragraph 3.8.2.6 are:
- 3.8.2.7.1 in the case of anchorages provided for a wheelchair restraint system fitted to a category M<sub>2</sub> vehicle:
    - 3.8.2.7.1.1 1110 daN applied in the longitudinal plane of the vehicle and towards the front of the vehicle at a height of not less than 200 mm and not more than 300 mm measured vertically from the floor of the wheelchair space, and
    - 3.8.2.7.1.2 550 daN applied in the longitudinal plane of the vehicle and towards the rear of the vehicle at a height of not less than 200 mm and not more than 300 mm measured vertically from the floor of the wheelchair space;
  - 3.8.2.7.2 in the case of anchorages provided for a wheelchair restraint system fitted to a category M<sub>3</sub> vehicle:
    - 3.8.2.7.2.1 740 daN applied in the longitudinal plane of the vehicle and towards the front of the vehicle at a height of not less than 200 mm and not more than 300 mm measured vertically from the floor of the wheelchair space, and
    - 3.8.2.7.2.2 370 daN applied in the longitudinal plane of the vehicle and towards the rear of the vehicle at a height of not less than 200 mm and not more than 300 mm measured vertically from the floor of the wheelchair space;
  - 3.8.2.7.3 in the case of anchorages provided for a wheelchair user restraint system the forces shall be in accordance with the requirements of paragraph 5.4 of Annex I to Directive 76/115/EEC.

- 3.8.2.8 A wheelchair restraint system shall be subject a dynamic test carried out in accordance with the following requirements:
  - 3.8.2.8.1 a representative wheelchair test trolley of mass 85 kg shall, from a speed of between 48km/h to 50km/h to rest, be subject to a deceleration-time pulse:
    - 3.8.2.8.1.1 exceeding 20 g in the forward direction for a cumulative period of at least 0.15 seconds;
    - 3.8.2.8.1.2 exceeding 15 g in the forward direction for a cumulative period of at least 0.4 seconds;
    - 3.8.2.8.1.3 exceeding a duration of 0.075 seconds;
    - 3.8.2.8.1.4 not exceeding 28 g and for not more than 0.08 seconds;
    - 3.8.2.8.1.5 not exceeding a duration of more than 0.12 seconds and
  - 3.8.2.8.2 a representative wheelchair test trolley of mass 85 kg shall, from a speed of between 48km/h to 50km/h to rest, be subject to a deceleration-time pulse:
    - 3.8.2.8.2.1 exceeding 5 g in the rearward direction for a cumulative period of at least 0,015 seconds;
    - 3.8.2.8.2.2 not exceeding 8 g in the rearward direction and for not more than 0,02 seconds;
  - 3.8.2.8.3 the test in paragraph 3.8.2.8.2 shall not apply if the same restraints are used for the forward and rearward direction or if an equivalent test has been conducted;
  - 3.8.2.8.4 for the above test, the wheelchair restraint system shall be attached to either:
    - 3.8.2.8.4.1 anchorages fixed to the test rig which represents the geometry of the anchorages in a vehicle for which the restraint system is intended, or
    - 3.8.2.8.4.2 anchorages forming part of a representative section of the vehicle for which the restraint system is intended, set up as described in paragraph 3.8.2.6.7.
- 3.8.2.9 A wheelchair occupant restraint shall comply with the test requirements specified in paragraph 2.7.8.4 of Annex I to Directive 77/541/EEC or an equivalent test to the deceleration-time pulse in paragraph 3.8.2.8.1. A seat belt approved to Directive 77/541/EEC and so marked shall be deemed to comply.
- 3.8.2.10 A test in paragraph 3.8.2.6, 3.8.2.8 or 3.8.2.9 shall be deemed to have failed unless the following requirements are met:
  - 3.8.2.10.1 no part of the system shall have failed, or shall have become detached from its anchorage or from the vehicle during the test;
  - 3.8.2.10.2 mechanisms to release the wheelchair and user shall be capable of release after completion of the test;
  - 3.8.2.10.3 in the test in paragraph 3.8.2.8 the wheelchair shall not move more than 200 mm in the longitudinal plane of the vehicle during the test;

- 3.8.2.10.4 no part of the system shall be deformed to such an extent after completion of the test that, because of sharp edges or other protrusions, the part is capable of causing injury.
- 3.8.2.11 Its operating instructions shall be clearly displayed adjacent to it.
- 3.8.3. In alternative to the provisions of paragraph 3.8.1.1, the wheelchair space shall be designed for the wheelchair user to travel unrestrained with the wheelchair facing rearwards against a support or backrest, in accordance with the following provisions:
- 3.8.3.1 one of the longitudinal sides of the space for a wheelchair shall rest against a side or wall of the vehicle;
- 3.8.3.2 a support or backrest perpendicular to the longitudinal axis of the vehicle shall be provided in the forward end of the wheelchair space;
- 3.8.3.3 the support of backrest shall be designed for the wheels or the back of the wheelchair to rest against the support or backrest in order to avoid the wheelchair from tipping over;
- 3.8.3.4 the support or backrest of the seat row in front shall be able to withstand a force of  $250 \text{ daN} \pm 20 \text{ daN}$  per wheelchair. The force shall be applied in the horizontal plane of the vehicle and towards the front of the vehicle in the middle of the support or backrest. The force shall be maintained for a period of not less than 1,5 seconds;
- 3.8.3.5 a handrail or handhold shall be fitted to the side or wall of the vehicle in such a way to allow the wheelchair user to grasp it easily;
- 3.8.3.6 a retractable handrail or any equivalent device shall be fitted on the opposite side of the wheelchair space in order to restrict any lateral shift of the wheelchair and to allow the wheelchair user to grasp it easily;
- 3.8.3.7 the floor surface of the special area shall be slip resistant;
- 3.8.3.8 a sign shall be fixed adjacent to the wheelchair area with the following text :  
*'This space is reserved for a wheelchair. The wheelchair must be placed facing rearwards resting against the support or backrest with the brakes on.'*
- 3.9 Door controls
- 3.9.1 Any opening control adjacent to a door referred to in paragraph 3.6, whether being outside or inside of the vehicle, ~~shall not be higher than 1300 mm from the ground or the floor.~~ **shall be at a height between 850mm and 1000mm from the ground or the floor. Any other opening control shall be at a height between 800mm and 1500mm from the ground or the floor. These requirements may be met with the kneeling system activated.**
- 3.10 Lighting
- 3.10.1 Adequate lighting shall be provided to illuminate the area inside and immediately outside the vehicle to allow people with reduced mobility to board

and alight in safety. Any lighting likely to affect the driver's vision shall operate only while the vehicle is at rest.

3.11 Provisions for boarding aids

3.11.1 *General requirements*

3.11.1.1 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 a tell-tale to the driver.

3.11.1.2 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 and ramps must be capable of manual operation. **Where there is more than one lift or ramp available to wheelchair users only one such lift or ramp must be capable of manual operation.**

**The safe working load shall be marked in a position clearly visible to the operator of a lift ramp.**

3.11.1.3 Access to one of the service or emergency 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:

- the boarding device does not obstruct the handle or other device for opening the door,

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

3.11.2 *Kneeling system*

3.11.2.1 A switch shall be required to enable operation of the kneeling system.

3.11.2.2 Any control which initiates the lowering or raising of any part or the whole of the body relative to the road surface must be clearly identified and be under the direct control of the driver.

3.11.2.3 The lowering or raising process shall be capable of being stopped and immediately reversed by a control both within the reach of the driver, whilst seated in the cab, and also adjacent to any other operating controls provided for the operation of the kneeling system.

3.11.2.4 Any kneeling system which is fitted to a vehicle shall not:

allow the vehicle to be driven at a speed of more than 5 km/h when the vehicle is lower than the normal height of travel, or

allow the vehicle to be ~~raised or~~ lowered when the operation of the service door is prevented for any reason.

- 3.11.3 *Lift*
- 3.11.3.1 General provisions
- 3.11.3.1.1 Lifts shall only be capable of operation when the vehicle is at standstill. **All sides of the lift platform shall have a means of preventing a wheelchair from rolling off. This shall be by means of one or more devices which, when raising of the platform and before lowering is initiated, automatically come into operation and may be combined with fixed devices. Such devices shall be not less than 100mm in height along both sides transverse to the longitudinal axis of the lift platform and not less than 25mm in height along both sides parallel to the longitudinal axis of the lift platform and measured vertically above the surface of the platform. One or more of these requirements may be met by parts of the vehicle offering an equivalent level of protection. Any such means of protection shall minimise the risk of entrapment or injury to any person on the lift platform.**
- 3.11.3.1.2 The lift platform shall not be less than 800 mm wide, and not less than 1200 mm long and shall be capable of operating when carrying a mass of at least 300 kg.
- If the surface of the lift platform when in use is designed to rise more than 500mm above the ground a horizontal handrail or handhold shall be provided on at least one side of the lift platform positioned not less than 650mm and not more than 1100mm measured vertically above the surface of the lift platform.**
- 3.11.3.2 Additional technical requirements for power operated lifts
- 3.11.3.2.1 The operating control 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.
- 3.11.3.2.2 A safety device (e.g. reversing mechanism) shall protect areas not visible to the operator, where the movement of the lift might trap or crush objects.
- 3.11.3.2.3 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.
- The vertical operating speed of the lift platform shall not exceed 0,15m/s.**
- 3.11.3.3. Operation of power operated lifts
- 3.11.3.3.1 ~~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 in the driver's seat.~~ **Where the driver has adequate view of the lift sufficient to monitor the full range of its operation and use, to ensure the safety of passengers, the lift may be operated by the driver when in the driver's seat. This requirement may be met by suitable optical devices.**
- 3.11.3.3.2 In all others cases, the controls shall be adjacent to the lift. They shall be capable of being activated and deactivated only by the driver from his seat.

- 3.11.3.4 Manually operated lift
  - 3.11.3.4.1 The lift shall be designed for operation by controls adjacent to the lift.
  - 3.11.3.4.2 The lift shall be so designed that excessive forces are not required to operate it.
- 3.11.4 *Ramp*
  - 3.11.4.1 General provisions
    - 3.11.4.1.1 The ramp shall only be capable of operation when the vehicle is at standstill.
    - 3.11.4.1.2 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.
    - 3.11.4.1.3 The ramp shall be at least 800 mm wide. **The principle surface of the ramp, when extended or folded out on to a kerb of 150 mm in height above the ground, shall not exceed a slope of 12 %.** A kneeling system may be used to achieve this test.
 

**The ramp shall be capable of extending or folding out on to the ground and in that position the principle surface of the ramp shall not exceed a slope of 36%. A kneeling system may be used to achieve this test.**
    - 3.11.4.1.4 Any ramp which when ready for use exceeds 1200 mm in length shall be fitted with a device to prevent the wheelchair rolling off the sides.
    - 3.11.4.1.5 Any ramp shall be capable of operating safely with a load of 300 kg
  - 3.11.4.2 Modes of operation
    - 3.11.4.2.1 Extension and retraction of the ramp may be carried out either manually or power-operated. **As an alternative a ramp may be portable such that it may be detached from the vehicle if it can be safely and securely stowed on the vehicle in a position where it is readily available for use. A portable ramp must be secure when in its position for use.**
  - 3.11.4.3 Additional technical requirements for power-operated ramps.
    - 3.11.4.3.1 Extension and retraction of the ramp shall be indicated by ~~flashing yellow lights and~~ an audible signal; the ramps shall be identifiable **by a clearly visible band of colour 45mm to 50mm in width around the edges of the ramp surface and contrasting with the surface of the ramp.** ~~red and white retro-reflecting hazard markings on the outer edges.~~
    - 3.11.4.3.2 **Extension of the ramp in the horizontal any direction of motion likely to cause injury shall be protected by one or more safety devices.**
    - 3.11.4.3.3 ~~In the event of one of these safety devices coming into operation, the movement of the ramp shall immediately be stopped.~~ These safety devices shall immediately stop the movement of the ramp when the ramp is subject to a reactive force not exceeding 150N.
    - 3.11.4.3.4 The horizontal movement of a ramp shall be interrupted when it is loaded with a mass of 15 kg.

- 3.11.4.4 Operation of power-operated ramps.
  - 3.11.4.4.1 ~~Where the ramp is at a service door situated within the direct field of vision of the driver of the vehicle, the ramp may be operated by the driver when in the driver's seat.~~ Where the driver has adequate view of the ramp sufficient to monitor its deployment and use, to ensure the safety of passengers, the ramp may be operated by the driver when in the driver's seat. This requirement may be met by suitable optical devices.
  - 3.11.4.4.2 In all others cases, the controls shall be adjacent to the ramp. They shall be capable of being activated and deactivated only by the driver from his seat.
- 3.11.4.5 Operation of manually operated ramp.
  - 3.11.4.5.1 The ramp shall be so designed that excessive forces are not required to operate the ramp.

#### **Additional provisions to be included in Annex 7**

##### **Vehicles**

**In vehicles of Class I or II, at least 35 per cent of the area available for passengers (of the forward section in the case of articulated vehicles, or the lower deck in the case of double-decker vehicles) shall form a single area without steps, reached through at least one service door and contain the priority seats.**

##### **Gangway**

**Laterally-sliding seats which in one position encroach on the gangway shall not be permitted except on vehicles of Class III. In the condition where all such seats are extended fully towards the gangway the width of the gangway shall be sufficient to allow the passage of a gangway lower cylinder not less than 300mm in diameter.**

##### **Handrails and handholds passengers**

**In Class I, II and A vehicles handrails and/or handholds shall be provided in sufficient number for each point of the floor area intended, in conformity with paragraph 5.2.2 of Annex 3 for standing passengers and in all gangways between every seating position and every entrance and exit. 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 4, figure 20 hereto but with the length of the movable arm set at 410mm, 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.**

**Only such handrails and handholds shall be considered as are not less than 800 mm and not more than 1900 mm above the floor.**

**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 1500 mm above the level of the floor at that position. This does not apply to an area adjacent to a door where the door or its mechanism is in the open position would prevent the use of this handhold.**

**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 1200 mm and 1500 mm above the floor.**

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

**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 800 and 1100 mm above the ground with any kneeling system activated and above the surface of each step, and horizontally:**

**for the position appropriate to a person standing on the ground, not more than 400 mm inwards from the outer edge of the first step or where the first step is not a fixed step, not more than 100mm inwards from the outer edge of the first fixed step; and**

**for the position appropriate to any other step, not outwards from the outer edge of the step considered, and not more than 600 mm inwards from that same edge or of the floor of the vehicle.**

**Class III and B vehicles may, as an alternative to one of these handrails, be fitted with a handrail not more than 100mm horizontally inwards from the outer edge of the first fixed step and extending vertically between 800 and 2000mm above the ground with any kneeling system activated or to the highest point practicable having regard to the structure of the vehicle. A break in this handrail is permitted sufficient to allow space for door gear operation.**

**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 100 mm to accommodate a hand. No dimension of the section shall be smaller than 30 mm or greater than 35 mm except in the case of handrails on either side of an entrance or exit where an oval handrail of maximum section between 30 and 35mm and the minimum section not less than 20mm. Handrails shall not have sharp bends.**

**The clearance between a handrail or handhold and the adjacent part of the vehicle body or walls shall be of at least 45 mm.**