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PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION No. 107

(M2 and M3 category vehicles)

Transmitted by the expert from the United Kingdom

Note: The text reproduced below was prepared by the informal working group on the Safety of Wheelchair Passengers in Vehicles and submitted by the expert from the United Kingdom in order to improve and clarify the technical provisions of Regulation No. 107. It is based on Regulation No. 107 as amended by the 01 series of amendments, and documents TRANS/WP.29/GRSG/2003/21 and TRANS/WP.29/GRSG/2003/22/Rev.2. (The proposed new texts are in **bold** characters, proposed deletions are ~~strikethrough~~).

Note: This document is distributed to the Experts on General Safety Provisions only.

Insert new paragraphs 1.4., 1.4.1., 1.4.2., and 1.5., to read:

- "2 1.4. Pending the addition of provisions within this Regulation for the equipment listed below, nothing in this Regulation shall prevent a Contracting Party—from specifying requirements for vehicles to be registered in its territory for.
- 1.4.1. The fitting and technical requirements for route and destination display equipment;
- 1.4.2. The fitting and technical requirements for audible and visual display equipment.
- 1.5. Changes to the equipment listed in paragraph 1.4. shall not require a new type-approval to this Regulation. "

Paragraph 2.33., amend to read:

- "2.33. "Ramp" means a device to bridge the gap between the floor of a passenger compartment and the ground or kerb. **In its position for use, it includes any surface that may move as part of the ramp deployment or be available for use only when the ramp is in the deployed position and over which a wheelchair is intended to travel.**"

Paragraph 5.2., amend to read:

- "5.2. Vehicles of Class I shall be accessible for people with reduced mobility, including **at least one** wheelchair users, according to the technical provisions laid down in Annex 8."

Paragraph 5.3., amend to read:

- "5.3. Contracting Parties shall be free to choose the most appropriate solution to achieve improved accessibility in vehicles other than those of Class I. However, if vehicles other than those of Class I are equipped with **features or devices** for people with reduced mobility and/or wheelchair users, ~~they those~~ **features or devices** shall comply with the relevant requirements of Annex 8."

Annex 3,

Paragraph 7.7.9.1., amend to read:

- "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 **be capable of operation with the palm of the hand.** ~~have protruding buttons, in vehicles of Class I and A no more than 1500 mm 1500mm from the floor, and shall be a contrasting colour or colours.~~ **There shall be appropriate communication devices distributed**

adequately and evenly throughout the vehicle and no more than 1500 mm from the floor; this does not exclude the possibility of installing higher additional communication devices. Controls 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. The provisions of paragraph 7.6.11.4. apply to any textual markings used."

Paragraph 7.8.1.3., amend to read:

"7.8.1.3. the access to any exits and the area immediately around the service door(s) **including, when in use, any boarding device fitted,**"

Paragraph 7.8.3., amend to read:

"7.8.3. Provisions shall be made to protect the driver from the effects of glare and reflections caused by artificial interior lighting. **Any lighting likely to affect adversely the driver's vision shall operate only while the vehicle is at rest.**"

Annex 8

Paragraph 3.2.4., amend to read:

"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.~~"

Paragraph 3.3.3., amend to read:

"3.3.3. **(Reserved)**"

Paragraph 3.5., replace "non-slip" by "**slip resistant**".

Paragraph 3.6.1., replace "figure 23" by "figure **22**".

Paragraph 3.6.2., amend to read:

"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 bear a boarding ~~aid~~ **device** complying with the provisions of ~~paragraph 3.11.2. (a kneeling system) of this annex; this shall be in combination with the provisions of~~ paragraph 3.11.3. (a lift) or 3.11.4. (a ramp) ~~of this annex.~~"

Paragraph 3.7.3., amend to read:

"3.7.3. **For vehicles of Class I, II and A, W** 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~~ **signs** fixed on or adjacent to them with the following text, **equivalent text or pictogram**:

"Please give up this space for a wheelchair user".

A change of language shall not require a new type-approval to this Regulation."

Paragraphs 3.8., amend to read:

"3.8. Stability of wheelchairs

3.8.1. ~~Wheelchair restraint system~~ In vehicles required to have occupant restraint systems fitted, the wheelchair space shall be designed for the wheelchair user to travel facing forwards and shall be fitted with ~~wheelchair and wheelchair user~~ restraint systems complying **with the requirements specified in paragraphs 3.8.1.2. or 3.8.2. or 3.8.3.**

In vehicles not required to have occupant restraint systems fitted, the wheelchair space shall be fitted with restraint systems complying with **the requirements specified in** paragraph ~~3.8.1.1. or 3.8.3.~~ **3.8.2., 3.8.3. or 3.8.4.**

~~3.8.1.1. In a vehicle where passenger seats are not required to be fitted 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 daN \pm 20 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.~~

~~3.8.1.2.3.8.2.~~ When passenger seats are required **to be fitted** with occupant restraint systems, each wheelchair space shall be provided with a restraint system capable of restraining the wheelchair and ~~its occupant~~ **the wheelchair user**.

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

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

- 3.8.2.1.1.** a) the forces referred hereto shall be applied in forward and rearward directions, separately and on the restraint system itself;
- 3.8.2.1.2.** b) the force shall be maintained for a period of not less than 0.2 seconds;
- 3.8.2.1.3.** 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.

~~3.8.1.2.1.2.~~ In forward direction in the case of a separate wheelchair and wheelchair user restraint system

~~3.8.1.2.1.1.2.1.~~ For category M₂:

- 3.8.2.2.1.1.** 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;
- 3.8.2.2.1.2.** 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;

- 3.8.2.2.1.3.** e) 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;
- 3.8.2.2.1.4.** e) —the forces shall be applied simultaneously.
- 3.8.4.2.4.2.2.** For category M₃:
- 3.8.2.2.2.1.** 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;
- 3.8.2.2.2.2.** 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;
- 3.8.2.2.2.3.** e) 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;
- 3.8.2.2.2.4.** e) the forces shall be applied simultaneously.
- 3.8.4.2.2.3.** In forward direction in the case of a combined wheelchair and wheelchair user restraint system.
- 3.8.2.3.1
- 3.8.4.2.2.3.1.** For category M₂:
- 3.8.2.3.1.1.** 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;
- 3.8.2.3.1.2.** 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;
- 3.8.2.3.1.3.** e) 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;

- 3.8.2.3.1.4.** \Leftrightarrow the forces shall be applied simultaneously.
- ~~3.8.1.2.2.3.2.~~ For category M_3 :
- 3.8.2.3.2.1.** \Leftrightarrow 740 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;
- 3.8.2.3.2.2.** \Leftrightarrow 450 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 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;
- 3.8.2.3.2.3.** \Leftrightarrow 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;
- 3.8.2.3.2.4.** \Leftrightarrow the forces shall be applied simultaneously.
- ~~3.8.1.2.3.4.~~ In rearward direction:
- 3.8.2.4.1.** \Leftrightarrow 810 daN \pm 20 daN in an angle of $45^\circ \pm 10^\circ$ to the horizontal plane of the vehicle and towards the rear of the vehicle on the wheelchair restraint system.
- 3.8.2.5.** **In every case the forces shall be applied to the wheelchair user restraint system by means of a traction device appropriate to the belt type as specified in Regulation No. 14.**
- ~~3.8.2.3.~~ Alternative wheelchair restraint system:
- ~~3.8.2.3.1.~~ 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;
- ~~3.8.2.3.2.~~ 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 Regulation No. 16;
- ~~3.8.2.3.3.~~ Any restraint system fitted to a wheelchair space shall be capable of being easily released in the case of an emergency;
- ~~3.8.2.3.4.~~ Any wheelchair restraint system shall either:

- 3.8.2.3.4.1. meet the dynamic test requirements described in paragraph 3.8.2.3.8. and be securely attached to vehicle anchorages meeting the static test requirements in paragraph 3.8.2.3.6.; or
- 3.8.2.3.4.2. be securely attached to vehicle anchorages such that the combination of restraint and anchorages meets the requirements of paragraph 3.8.2.3.8.
- 3.8.2.3.5. Any wheelchair user restraint shall either:
- 3.8.2.3.5.1. meet the dynamic test requirements described in paragraph 3.8.2.3.9. and be securely attached to vehicle anchorages meeting the static test requirements in paragraph 3.8.2.3.6.; or
- 3.8.2.3.5.2. be securely attached to vehicle anchorages such that the combination of restraint and anchorages meets the dynamic test requirements described in paragraph 3.8.2.3.9. when attached to anchorages set up as described in paragraph 3.8.2.3.6.7.
- 3.8.2.3.6. 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:
- 3.8.2.3.6.1. the forces specified in paragraph 3.8.2.3.7. shall be applied by means of a device reproducing the geometry of the wheelchair restraint system;
- 3.8.2.3.6.2. the forces specified in paragraph 3.8.2.3.7.3. 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 6.3.4. of Regulation No. 14.
- 3.8.2.3.6.3. the forces in paragraph 3.8.2.3.6.1. and paragraph 3.8.2.3.6.2. shall be applied simultaneously in the forward direction and at an angle of $10^{\circ} \pm 5^{\circ}$ above the horizontal plane;
- 3.8.2.3.6.4. the forces in paragraph 3.8.2.3.6.1. shall be applied in the rearward direction and at an angle of $10^{\circ} \pm 5^{\circ}$ above the horizontal plane;
- 3.8.2.3.6.5. the forces shall be applied as rapidly as possible through the central vertical axis of the wheelchair space; and
- 3.8.2.3.6.6. the force shall be maintained for a period of not less than 0.2 seconds.
- 3.8.2.3.6.7. 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.
- 3.8.2.3.7. The forces specified in paragraph 3.8.2.3.6. are:

- 3.8.2.3.7.1. in the case of anchorages provided for a wheelchair restraint system fitted to a category M₂ vehicle:
 - 3.8.2.3.7.1.1. 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
 - 3.8.2.3.7.1.2. 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;
- 3.8.2.3.7.2. in the case of anchorages provided for a wheelchair restraint system fitted to a category M₃ vehicle
 - 3.8.2.3.7.2.1. 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
 - 3.8.2.3.7.2.2. 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;
- 3.8.2.3.7.3. in the case of anchorages provided for a wheelchair user restraint system the forces shall be in accordance with the requirements of ~~paragraph 6.4. of Regulation No. 14.~~ **The forces shall be applied by means of a traction device as appropriate to the belt type as specified in Regulation No. 14.**
- 3.8.2.3.8. A wheelchair restraint system shall be subject to a dynamic test carried out in accordance with the following requirements:
 - 3.8.2.3.8.1. a representative wheelchair test trolley of mass 85 kg shall, from a speed of between 48 km/h to 50 km/h to rest, be subject to a deceleration-time pulse:
 - 3.8.2.3.8.1.1. exceeding 20 g in the forward direction for a cumulative period of at least 0.015 seconds;
 - 3.8.2.3.8.1.2. exceeding 15 g in the forward direction for a cumulative period of at least 0.04 seconds;
 - 3.8.2.3.8.1.3. exceeding a duration of 0.075 seconds;
 - 3.8.2.3.8.1.4. not exceeding 28 g and for not more than 0.08 seconds;
 - 3.8.2.3.8.1.5. not exceeding a duration of more than 0.12 seconds, and
 - 3.8.2.3.8.2. a representative wheelchair test trolley of mass 85 kg shall, from a speed of between 48 km/h to 50 km/h to rest, be subject to a deceleration-time pulse:

- 3.8.2.3.8.2.1. exceeding 5 g in the rearward direction for a cumulative period of at least 0.015 seconds;
- 3.8.2.3.8.2.2. not exceeding 8 g in the rearward direction and for not more than 0.02 seconds;
- 3.8.2.3.8.3. the test in paragraph 3.8.2.3.8.2. shall not apply if the same restraints are used for the forward and rearward direction or if an equivalent test has been conducted;
- 3.8.2.3.8.4. for the above test, the wheelchair restraint system shall be attached to either:
 - 3.8.2.3.8.4.1. anchorages fixed to the test rig which represents the geometry of the anchorages in a vehicle for which the restraint system is intended, or
 - 3.8.2.3.8.4.2. anchorages forming part of a representative section of the vehicle for which the restraint system is intended, set up as described in paragraph 3.8.2.3.6.7.
- 3.8.2.3.9. A wheelchair **user** restraint shall comply with the test requirements specified in ~~paragraph 7.7.4. of Regulation No. 16~~ or an equivalent test to the deceleration-time pulse in paragraph 3.8.2.3.8.1. A seat belt approved to Regulation No. 16 and so marked shall be deemed to comply.
- 3.8.2.3.10. A test in paragraph 3.8.2.3.6., 3.8.2.3.8. or 3.8.2.3.9. shall be deemed to have failed unless the following requirements are met:
 - 3.8.2.3.10.1. no part of the system shall have failed, or shall have become detached from its anchorage or from the vehicle during the test;
 - 3.8.2.3.10.2. mechanisms to release the wheelchair and user shall be capable of release after completion of the test;
 - 3.8.2.3.10.3. in the test in paragraph 3.8.2.3.8. the wheelchair shall not move more than 200 mm in the longitudinal plane of the vehicle during the test;
 - 3.8.2.3.10.4. 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.
- 3.8.2.3.11. Its operating instructions shall be clearly displayed adjacent to it.
- 3.8.3.4. ~~In alternative to the provisions of paragraph 3.8.1.1., the wheelchair space shall be~~ **Vehicles not required to have occupant restraint systems fitted may, as an alternative to the provisions of paragraph 3.8.2. or 3.8.3., be provided with a wheelchair space** designed for the wheelchair user to travel unrestrained with the wheelchair facing rearwards against a support or backrest, in accordance with the following provisions:

- 3.8.4.1. a) one of the longitudinal sides of the space for a wheelchair shall rest against a side or wall of the vehicle **or a partition**;
- 3.8.4.2. b) a support or backrest perpendicular to the longitudinal axis of the vehicle shall be provided in the forward end of the wheelchair space;
- 3.8.4.3. c) the support or 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;
- 3.8.4.4. d) 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;
- 3.8.4.5. e) 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. **This handrail may, if fitted at a height not less than 850 mm above the floor of the wheelchair space, extend over the vertical projection of the wheelchair space by not more than 90 mm;**
- 3.8.4.6. f) a retractable handrail or any equivalent **rigid** 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;
- ~~g) the floor surface of the special area shall be slip resistant;~~
- 3.8.4.7. h) 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"

Paragraph 3.10 .. amend to read:

"3.10. (Reserved)."

Paragraph 3.11.. amend to read:

"3.11 Provisions for boarding aids devices"

Paragraph 3.11.1.1., amend to read:

"**3.11.1.1.** The controls actuating the boarding ~~aids~~ **devices** shall be clearly marked as such. The extended or lowered position of the boarding ~~aid~~ **device** shall be indicated by a tell-tale to the driver."

Paragraph 3.11.1.3., amend to read:

" 3.11.1.3. Access to one of the service or emergency doors on the vehicle may be obstructed by a boarding ~~aid~~ **device** providing the following two conditions are satisfied from both inside and outside the vehicle."
