

**Proposal for draft amendments to Regulation No. 107**

Note: The text reproduced below was prepared by the experts from OICA in order to mark on vehicles reliable information about the number of passengers and the permitted mass of baggage. This is an alternative proposal to that considered at the ninety-first session (ECE/TRANS/WP.29/GRSG/2006/31) and takes into account comments made during that session. The text is based on the text of Regulation No. 107.01 and includes the proposed 02 series of amendments, the proposed Supplement 1 to the 02 series of amendments and the proposed modifications contained in document ECE/TRANS/WP.29/GRSG/2006/7. The modifications to this text are marked in **bold** characters.

A. PROPOSAL

Paragraph 12., amend to read:

"12. **Reserved**":

Annex 3

Paragraph 7.2.3.1., amend to read:

"7.2.3.1. **Space shall be provided in the driver's area, in a position clearly visible to the driver in his seating position, for the markings provided for in paragraph 3.3. of annex 11.** " ~~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:~~

~~7.2.3.1.1. the maximum number of seating places the vehicle is designed to carry;~~

~~7.2.3.1.2. the maximum number of standing places, if any, the vehicle is designed to carry;~~

~~7.2.3.1.3. the maximum number of wheelchairs which the vehicle is designed to carry, if any.~~

Paragraph 7.2.3.2 and 7.2.3.3., amend to read:

"7.2.3.2. **Reserved** " ~~If a vehicle is designed to have a variable number of seating places, area available for standing passengers or number of wheelchairs carried, the requirements of paragraph 7.2.3.1. shall apply to each maximum seating capacity and the corresponding number of wheelchairs and standing passengers as appropriate.~~

"7.2.3.3. **Reserved** " ~~Space shall be provided in the driver's area, in a position clearly visible to the driver, in letters or pictograms not less than 10 mm high and numbers not less than 12 mm high, with:~~

~~7.2.3.3.1. the mass of baggage which may be carried when the vehicle is loaded with the maximum numbers of passengers and crew and the vehicle is not exceeding the~~

~~technically permissible maximum mass, or the permissible mass of any axle. This shall include the mass of baggage:~~

~~7.2.3.3.1.1. in baggage compartments (mass B, paragraph 7.4.3.3.1. of annex 11);~~

~~7.2.3.3.1.2. on the roof if equipped for the carriage of baggage (mass BX, paragraph 7.4.3.3.1. of annex 11)~~

Annex 11, amend to read:

## "Annex 11

### MASSES AND DIMENSIONS

1. This annex applies to the masses and dimensions of vehicles of categories M2 and M3 in so far as they are necessary for the approval of a vehicle in respect of its general construction.

2. DEFINITIONS

For the purposes of this annex:

2.1. "Group of axles" means axles being part of a bogie. A two-axle group is called a tandem and a tri-axle group a tri-axle bogie. By convention, a solo axle is considered as a group of one axle.

2.2. Vehicles dimensions means the dimensions of the vehicle based on its construction, as stated by manufacturer.

2.2.1. "Vehicle length" is a dimension which is measured according to ISO standard 612-1978, term No 6.1.

In addition to the provisions of that standard, when measuring the vehicle length the following devices shall not be taken into account:

- wiper and washer devices,
- front or rear marking-plates,
- customs sealing devices and their protection,
- devices for securing the tarpaulin and their protection,
- lighting equipment,
- mirrors and other devices for indirect vision,
- watching aids,
- air-intake pipes,
- length stops for demountable bodies,
- access steps and hand-holds,
- ram rubbers and similar equipment,
- lifting platforms, access ramps and similar equipment in running order, not exceeding 300 mm, provided that the loading capacity of the vehicle is not increased,
- coupling devices for motor vehicles,
- trolley booms of electrically-propelled vehicles,
- external sun visors.

2.2.2. "Vehicle width" is a dimension which is measured according to ISO standard 612-1978, term No. 6.2.

In addition to the provisions of that standard, when measuring the vehicle width the following devices shall not be taken into account:

- customs sealing devices and their protection,
- devices for securing the tarpaulin and their protection,
- tyre failure tell-tale devices,
- protruding flexible parts of a spray-suppression,
- lighting equipment,
- access ramps in running order, lifting platforms and similar equipment in running order provided that they do not exceed 10 mm from the side of the vehicle and the corners of the ramps facing forwards or rearwards are 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,
- mirrors and other devices for indirect vision,
- tyre-pressure indicators,
- retractable steps,
- the deflected part of the tyre walls immediately above the point of contact with the ground,
- watching aids,
- retractable lateral guidance devices on buses and coaches intended for use on guided bus systems, if not retracted.

2.2.3. "Vehicle height" is a dimension which is measured according to ISO standards 612-1978, term No. 6.3.

In addition to the provisions of that standard, when measuring the vehicle height the following devices shall not be taken into account:

- aerials,
- pantographs or trolley booms in their elevated position.

For vehicles with an axle-lift device, the effect of this device shall be taken into account."

2.3. "Technically permissible maximum mass on the axle (m)" means the mass corresponding to the maximum permissible static vertical load exerted by the axle on the road surface, based on the construction of the vehicle and of the axle and as stated by the vehicle manufacturer.

2.4. "Technically permissible maximum mass on a group of axles ( $\mu$ )" means the mass corresponding to the maximum permissible static vertical load exerted by the group of axles on the road surface, based on both the construction of the vehicle and of the group of axles and as stated by the vehicle manufacturer.

2.5. "Towable mass" means the total load exerted on the road surface by the axle(s) of the towed vehicle(s).

2.6. "Technically permissible maximum towable mass (TM)" means the maximum towable mass stated by the manufacturer.

2.7. "Technically permissible maximum mass on the coupling point of a vehicle" means the mass corresponding to the maximum permissible static vertical load on the coupling point based on the construction of the vehicle and/or coupling device and as

stated by the manufacturer. By definition, this mass does not include the mass of the coupling device of the vehicle.

2.8. "Technically permissible maximum laden mass of the combination (MC)" means the total mass of a combination of vehicle and trailer(s) as stated by the manufacturer.

2.9. "Axle-lift device" means a device permanently fitted to a vehicle for the purpose of reducing or increasing the load on the axle(s), according to the loading conditions of the vehicle:

- a) either by raising the wheels clear off the ground/lowering them to the ground,
- b) or without raising the wheels off the ground, (e.g. in the case of air suspension systems, or other systems),

in order to reduce the wear on the tyres when the vehicle is not fully laden, and/or make starting (moving off) on slippery ground easier for vehicles or vehicle combinations, by increasing the load on the driving axle.

### 3. REQUIREMENTS

#### 3.1. Measurement of the mass of the vehicle in running order and of its distribution among the axles

The mass of the vehicle in running order and its distribution on the axles are measured on the vehicle(s) submitted in accordance with paragraph 3.4. of this Regulation placed in a stationary position with their wheels set straight ahead. If the measured masses differ by no more than 3 per cent from the masses stated by the manufacturer for the corresponding technical configurations within the type, or by no more than 5 per cent if the vehicle is of category M2 not exceeding 3500 kg, the masses in running order and their distribution among the axles as stated by the manufacturer are used for the purpose of the requirements below. Otherwise the measured masses shall be used and the technical service may then, if necessary, carry out additional measurements on vehicle(s) other than those submitted in accordance with paragraph 3.4. of this Regulation.

#### 3.2. Mass distribution calculations

##### 3.2.1. Calculation procedure

3.2.1.1. For the purpose of the mass distribution calculations hereafter laid down, the manufacturer shall provide the technical service in charge of the tests, with the information (in tabular or any other appropriate form) necessary to identify for each technical configuration within the vehicle type the corresponding technically permissible maximum laden mass of the vehicle, the technically permissible maximum masses on the axles and groups of axles, the technically permissible maximum towable mass, and the technically permissible maximum laden mass of the combination.

3.2.1.2. Suitable calculations shall be carried out in order to make sure that the following requirements are fulfilled for each technical configuration within the type. For this purpose, the calculations may be limited to the worst cases.

- 3.2.1.3. In the following requirements, the notations  $M$ ,  $m_i$ ,  $\mu_j$ ,  $TM$ , and  $MC$  respectively designate the following parameters, for which the requirements of paragraph 3.2. shall be fulfilled:
- $M$  = the technically permissible maximum laden mass of the vehicle,
- $m_i$  = the technically permissible maximum mass on the axle designated 'i', where 'i' varies from 1 to the total number of axles of the vehicle,
- $\mu_j$  = the technically permissible maximum mass on the solo axle or group of axles designated 'j', where 'j' varies from 1 to the total number of solo axles and groups of axles,
- $TM$  = the technically permissible maximum towable mass, and
- $MC$  = the technically permissible maximum laden mass of the combination.
- 3.2.1.4. In the case of a solo axle, designated 'i' as an axle and 'j' as a group of axles,  $m_i = \mu_j$  by definition.
- 3.2.1.5. In the case of vehicles fitted with loadable axles, the calculations required by paragraph 3.2.1.2. shall be carried out with the suspension of the axles loaded in the normal running configuration. In the case of vehicles fitted with retractable axles, the calculations required by paragraph 3.2.1.2. shall be carried out with the axles lowered.
- 3.2.1.6. For groups of axles, the manufacturer shall indicate the laws of distribution among the axles of the total mass applied on to the group (for instance by stating the distribution formulae or producing distribution graphs).
- 3.2.2. Loading limitations
- 3.2.2.1. The sum of the masses  $m_i$  shall not be less than the mass  $M$ .
- 3.2.2.2. For each group of axles designated 'j', the sum of the masses  $m_i$  on its axles shall not be less than the mass  $\mu_j$ . In addition, each of the masses  $m_i$  shall not be less than the part of  $\mu_j$  applying on the axle 'i' as determined by the mass distribution laws for that group of axles.
- 3.2.2.3. The sum of the masses  $\mu_j$  shall not be less than the mass  $M$ .
- 3.2.2.4.  $MC$  shall not exceed  $M + TM$ .
- 3.2.3. Loading conditions
- 3.2.3.1. The mass of the vehicle in running order, plus the mass  $Q$  multiplied by the number of seated and standing passengers, plus the masses  $WP$ ,  $B$  and  $BX$  as defined in paragraph 3.2.3.2.1., plus the technical permissible maximum mass on the coupling point, if a coupling is fitted by the manufacturer, shall not exceed the mass  $M$ .
- 3.2.3.2. When the vehicle in running order is laden as described in paragraph 3.2.3.2.1., the mass corresponding to the load on each axle shall not exceed the mass  $m_i$  on each axle, and the mass corresponding to the load on each solo axle or group of

axles shall not exceed the mass  $\mu_j$  on that group of axles. Moreover, the mass corresponding to the load on the driving axle or the sum of masses, corresponding to the loads on the driving axles shall be at least 25 per cent of M.

3.2.3.2.1.

The vehicle in running order is loaded with: a mass corresponding to the number P of seated passengers, of mass Q; a mass corresponding to the number SP of standing passengers, of mass Q uniformly distributed over the surface available for standing passengers  $S_1$ ; where appropriate, a mass WP uniformly distributed over each wheelchair space; a mass equal to B (kg) uniformly distributed in the baggage compartments; a mass equal to BX (kg) uniformly distributed over the surface area of the roof equipped for the carriage of baggage, where:

P is the number of seating places.

$S_1$  is the area for standing passengers. In the case of vehicles of classes III or B,  $S_1 = 0$ .

SP, declared by the manufacturer, shall not exceed the value  $S_1/S_{Sp}$ , where  $S_{Sp}$  is the conventional space provided for one standing passenger specified in the table below.

WP (kg), is the number of wheelchair spaces multiplied by 250 kg representing the mass of a wheelchair and user.

B (kg), declared by the manufacturer, shall have a numeric value not less than  $100 \times V$ . This shall include baggage compartments or racks that may be attached to the outside of the vehicle.

V is the total volume of baggage compartments in  $m^3$ . When approving a vehicle of Class I or A, the volume of baggage compartments accessible only from the outside of the vehicle shall be disregarded.

BX, declared by the manufacturer, shall have a numeric value not less than  $75 \text{ kg/m}^2$ .

Double deck vehicles shall not be equipped for the carriage of baggage on the roof and therefore BX for double deck vehicles shall be zero.

Q and  $S_{Sp}$  have values laid down in the following table:

Vehicle class	Q (kg) mass of one passenger	$S_{Sp}$ ( $m^2$ /passenger) conventional space for one standing passenger
Class I and A	68	0.125
Class II	71 (*)	0.15
Class III and B	71 (*)	None

(\*) Including 3 kg for hand baggage.

3.2.3.2.2.

In the case of a vehicle equipped with a variable seating capacity, area available for standing passengers ( $S_1$ ) and/or equipped for the carriage of wheelchairs, the requirements of paragraphs 3.2.3.1. and 3.2.3.2. shall be determined for each of the following conditions as applicable:

- 3.2.3.2.2.1. with all possible seats occupied followed by the remaining area for standing passengers (up to the standing capacity limit declared by the manufacturer, if reached, excluding areas designated for use exclusively by wheelchair users) and, if space remains, any wheelchair spaces occupied;
- 3.2.3.2.2.2. with all possible standing areas occupied (up to the standing capacity limit declared by the manufacturer excluding areas designated for use exclusively by wheelchair users), followed by the remaining seats available for seated passengers and, if space remains, any wheelchair spaces occupied;
- 3.2.3.2.2.3. with all possible wheelchair spaces occupied followed by the remaining area for standing passengers (up to the standing capacity limit declared by the manufacturer, if reached) and then the remaining seats available for use occupied.
- 3.2.3.3. When the vehicle is in running order or laden as specified in paragraph 3.2.3.2.1., the mass corresponding to the load on the front axle or group of axles shall not be less than the percentage of the mass of the vehicle in running order or of the technically permissible maximum laden mass 'M' laid down in the following table:

Classes I and A		Class II		Classes III and B	
Rigid	Articulated	Rigid	Articulated	Rigid	Articulated
20	20	25 (1)	20	25 (1)	20

(1) This figure is reduced to 20% for 3 axle vehicles of classes II and III having two steered axles.

- 3.2.3.4. Where a vehicle is to be approved to more than one Class, paragraphs 3.2.3.1. and 3.2.3.2. shall apply to each Class.
- 3.3. Marking of vehicles.
- 3.3.1. The vehicle shall be clearly marked on the inside in a position visible to the driver in his seating position:
  - 3.3.1.1. in letters or pictograms not less than 15 mm high and numbers not less than 25 mm high, with:
    - 3.3.1.1.1. the maximum number of seating places the vehicle is designed to carry;
    - 3.3.1.1.2. the maximum number of standing places, if any, the vehicle is designed to carry;
    - 3.3.1.1.3. the maximum number of wheelchairs which the vehicle is designed to carry, if any.
  - 3.3.1.2. in letters or pictograms not less than 10 mm high and numbers not less than 12 mm high, with:
    - 3.3.1.2.1. the mass of baggage which may be carried when the vehicle is fully loaded according to paragraph 3.2.3.
    - 3.3.1.2.2. as appropriate this shall include the mass of baggage:

- 3.3.1.2.2.1. in baggage compartments (mass B, paragraph 3.2.3.2.1.);
- 3.3.1.2.2.2. on the roof if equipped for the carriage of baggage (mass BX, paragraph 3.2.3.2.1.).
- 3.3.2. Space shall be provided adjacent to the above markings allowing the vehicle to be marked, in letters or pictograms not less than 10 mm high and numbers not less than 12 mm high, with the mass of baggage B and BX which may be carried when the vehicle is loaded with the maximum number of passengers and crew and the vehicle is not exceeding the maximum laden mass, or the maximum mass of any axle or group of axles at which the vehicle can be put into service in the Contracting Party where it is to be registered. Contracting Parties that require the marking of this mass shall, in agreement with the manufacturer, determine the mass of baggage to be marked and take the necessary measures to ensure that vehicles are so marked prior to their registration.

3.4. Manoeuvrability

- 3.4.1. Any vehicle must be able to manoeuvre on either side for a complete circular trajectory of 360° inside an area defined by two concentric circles, the outer circle having a radius of 12.50 m and the inner circle having a radius of 5.30 m, without any of the vehicle's outermost points (with the exception of the protruding parts excluded from the measurement of the vehicle width) projecting outside the circumferences of the circles. For vehicles with axle-lift devices, this requirement also applies with the retractable axle(s) in the lifted position or loadable axle(s) in the unladen condition.
- 3.4.1.1. The requirements of paragraph 3.4.1. shall be verified with the outermost front point of the vehicle guided along the contour of the outer circle (see figure A).
- 3.4.2. With the vehicle stationary, a vertical plane tangential to the side of the vehicle and facing outwards from the circle shall be established by marking a line on the ground. In the case of an articulated vehicle, the two rigid portions shall be aligned with the plane. When the vehicle moves from a straight line approach into the circular area described in paragraph 3.4.1., no part of it shall move outside of that vertical plane by more than 0,60 m (see figures B and C).

Figure A

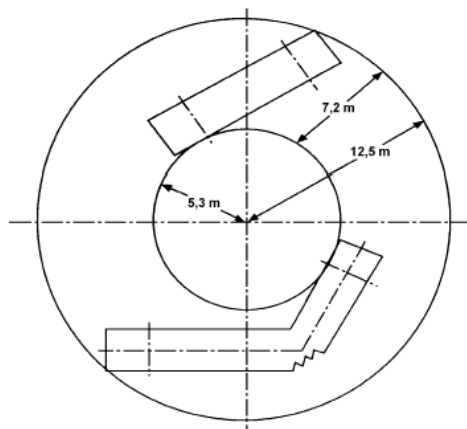
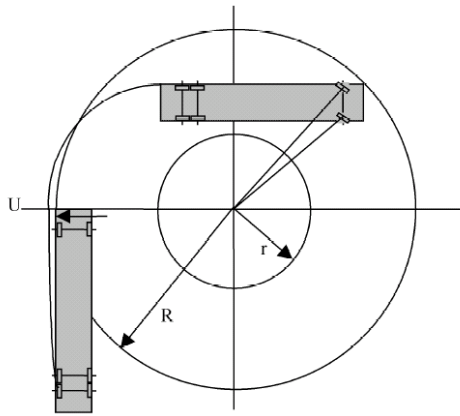


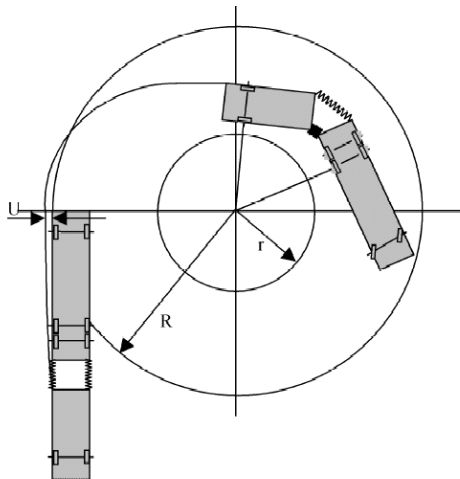


Figure B



$R = 12.5 \text{ m}$   
 $r = 5.3 \text{ m}$   
 $U = \text{maximum } 0.6 \text{ m}$

Figure C



$R = 12.5 \text{ m}$   
 $r = 5.3 \text{ m}$   
 $U = \text{maximum } 0.6 \text{ m}$

- 3.4.3. The requirements of paragraphs 3.4.1. and 3.4.2. may also be verified, at the request of the manufacturer, with an appropriate equivalent calculation or geometric demonstration.
- 3.4.4. In the case of incomplete vehicles, the manufacturer shall declare the maximum permissible dimensions for which the vehicle is to be checked against the requirements of paragraphs 3.4.1. and 3.4.2."

**B. JUSTIFICATION**

As there is no harmonized Regulation concerning the permissible axle loads and gross vehicle masses, different limits are established by national legislations of Contracting Parties. Such variations create major problems for vehicle operators and vehicles exceeding nationally permissible limits may be found on roads.

In order to reduce the risk of inadvertent overloading, OICA proposes to establish requirements that would assist the driver to estimate the amount of baggage that can be legally carried on a vehicle when it is loaded with the maximum number of passengers and is circulating in the territory of a particular country. Therefore, it is proposed that the number of passengers and the baggage mass relevant to the maximum technical masses of the vehicle and of its axle(s) should be clearly marked in the driver's compartment and that space is provided allowing the marking of the baggage mass that is relevant to masses in the country where the vehicle is registered. Contracting Parties requiring this baggage mass to be marked should, in agreement with the vehicle manufacturer, determine the actual mass to be marked.

Marking the vehicle with the number of passengers and the mass of baggage that can be carried is directly linked to Annex 11 "Masses and Dimensions", which requires calculations to be carried out for the different technical configurations. OICA proposes to transfer the marking requirements from Annex 3 and to introduce them into Annex 11. Annex 3 will only contain a requirement of the space necessary for the marking and not for the marking itself.

Annex 11 is a copy of the requirements of the European Directive 97/27/EC and when introducing it into Regulation No. 107, incorrectly included prescriptions that are not relevant to vehicles of categories M2 and M3. OICA proposes to reedit Annex 11 in a manner which only contains prescription relevant to vehicles of categories M2 and M3, which is more easily understandable and which introduces the marking requirements mentioned above.

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