

## **COMMENTS AND PROPOSALS TO THE ECE/TRANS/WP.29/GRSG/2007/33 GERMAN DOCUMENT**

“Proposal for a new regulation for vehicle category M3 with regard to the protection of the driver and crew member(s) seated alongside the driver in the case of frontal collision.”

### **GENERAL COMMENTS AS INTRODUCTION**

- Hungary strongly supports the German effort and draft to work out ECE Regulation for the driver's and crew's protection in buses in frontal collision
- First only the M3 vehicles should be considered because the smaller vehicles (M2) are very different in geometry, in construction (front engine, front axle position) and mass range.
- This new regulation is similar to R.66/Rev.1 in the general requirements and test methods: required strength and energy absorption in a dynamic test to ensure a certain residual space.
- R.66/Rew.1 is a good, agreed and accepted regulation, so its terms, definitions, principles and formulas (e.g. worst case) which are relevant to this new regulation, should be used here, too.
- This proposal below is based on the German draft, on the existing version of R.66/Rev.1 and R.107/Rev.1. Practically there is no new paragraph in this proposal, only the adopted versions of those paragraphs from R.66/Rev.1. which are relevant in the new accident situation.

### **1. SCOPE**

Amend to read:

- 1.1. This Regulation applies to single-deck, double-deck, rigid or articulated vehicle of category M3<sup>1</sup>
- 1.2. However the requirements of this Regulation do not apply to off-road vehicles.
- 1.3. This Regulation applies to the following vehicles only the extent that they are compatible with their intended use and function:
  - 1.3.1. M3 vehicles specially designed for the carriage of schoolchildren.
  - 1.3.2. M3 vehicles designed for the secure transport of persons, for example prisoners
  - 1.3.3. M3 vehicles designed for use by police, security and armed forces

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<sup>1</sup> As defined in the Horizontal Regulation

- 1.3.4. 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, mobile hospitality units, etc.

### *Explanation*

This structure of the scope and its content is in line with the scope of R.107/Rev.1 and it could help in the future in its installation into R.107.

## **2. TERMS AND DEFINITIONS**

For the purpose of this Regulation:

- 2.1. as it stands now in the German draft, in para.29
- 2.2. “Vehicle” means a bus or coach designed and equipped for transportation of passengers. The vehicle is an individual representative of a vehicle type.
- 2.3. “Vehicle type” means a category (set?) of vehicles produced with the same design technical specification, main dimensions and constructional arrangement. The vehicle type shall be defined by the vehicle manufacturer.
- 2.4. “Group of vehicle types” means those vehicle types existing now or proposed in the future which are covered by the approval of the worst case in respect of this Regulation.
- 2.5. “Worst case” means the vehicle type among a group of vehicle types least likely to withstand the requirements of this Regulation in respect of the strength of superstructure. The three parameters which define the worst case are: structural strength, position of the residual space, and the surrounding geometry of the driver’s (crew’s) compartment.
- 2.6. “Approval of a vehicle type” means the whole official process in which the vehicle type is checked and tested to prove that it meets all the requirements specified in this Regulation.
- 2.7. “Extension of approval” means the official process in which a modified vehicle type is approved on the basis on earlier approved vehicle type, by comparison of the superstructure, residual space position and the surroundings geometry criteria.
- 2.8. “Front bodywork” means the front part of the complete structure of the vehicle in running order, including all the structural elements which form the driver’s and crew’s compartment.
- 2.9. “Driver’s compartment” means the space intended for the driver’s exclusive use, containing the driver’s seat, the steering wheel, controls, instruments and other devices necessary for driving the vehicle.
- 2.10. “Separate driver’s compartment” means a driver’s cab separated by inner wall from the passenger compartment and the wall is accessible only through a door.
- 2.11. “Crew’s compartment” means the space located alongside the driver intended for the exclusive use of the crew (co-driver, tourist guide) containing the crew seat(s) and the belonging surroundings.

- 2.12. “Superstructure” means the load-bearing components of the front bodywork as defined by the manufacturer, containing those coherent parts and elements which contribute to the strength and energy absorbing capability of the front bodywork and preserve the residual space in the frontal impact test.
- 2.13. “Residual space” means a space to be preserved in the driver’s and crew’s compartment for the driver and crew member(s) to provide better survival possibility in case of frontal collision
- 2.14. “Surroundings of the residual space” means those parts, components of the driver’s and crew’s compartments which may intrude into the residual space due to the impact test.
- 2.15. “Vertical longitudinal central plane” means the vertical plane which passes through the mid-points of the front axle track and rear axle track.
- 2.16. “Body section” means a structural unit produced by the manufacturer for the purpose of approval test. Body section is representative for the front bodywork in respect of the superstructure, the position of the driver’s and crew’s seats; as well as the surrounding of the residual space.

### **3. APPLICATION FOR APPROVAL**

- 3.1. As it stands in the German draft
- 3.2. It shall be accompanied by three copies of the undermentioned documents:
  - 3.2.1. the main identifying data and parameters of the vehicle type, or group of vehicle types,
  - 3.2.2. general layout drawings of the vehicle type or group of vehicle types; drawings of the front bodywork with the interior arrangement, exact position of the driver’s and crew’s seats,
  - 3.2.3. all the data and information which are needed to evaluate the worst case criteria in a group of vehicles:
    - 3.2.3.1. drawings and detailed description of the superstructure of the vehicle type or group of vehicle types according to Annex 3.
    - 3.2.3.2. detailed description (drawing) of the residual space(s) for every vehicle type to be approved,
    - 3.2.3.3. detailed drawings about the surroundings, structural parts, fittings which may intrude into the residual space in the approval test.
- 3.3. On request of the technical service a complete vehicle (or one vehicle from each vehicle type, if approval is requested for a group of vehicle types) shall be presented to check all the data and information which are relevant to the approval.
- 3.4. According to the approval (test) method chosen by the manufacturer, appropriate test piece(s) shall be submitted to the technical service upon its request. The arrangement of test piece(s) shall be agreed with the technical service. In case of test piece(s) which has been tested earlier, the test reports shall be submitted.

#### ***Explanation***

This text is in line with R.66/Rev.1 with the necessary modifications.

#### **4. APPROVAL**

- 4.1. As it stands in the German draft, adding to that in the first line "... or group of vehicle types ..."
- 4.2. As it stands in the German draft.
- 4.3. As it stands in the German draft
- 4.4. As it stands in the German draft

#### ***Remark***

Footnote "1" should be replaced by a reference to the Horizontal Regulation.

#### **5. REQUIREMENTS AND GENERAL SPECIFICATIONS**

- 5.1. The superstructure shall have the sufficient strength to ensure that the residual space during and after the frontal impact test is unharmed. That means: no part of the surroundings which is outside the residual space at the start of the test (e.g. instrument panel, steering wheel, parts of the inner front wall, etc.) shall intrude into the residual space.
- 5.2. The residual space shall be related to the driver's and crew's seats as it is described in Annex 4. The manufacturer may define a bigger residual space than is required for a given seat arrangement to simulate a worst case in a group of vehicle types to allow future design development.
- 5.3. The basic approval method is a frontal impact test on a complete vehicle. The front bodywork shall be impacted with an appropriate impact device as it is specified in Annex 5.
- 5.4. At the discussion of the manufacturer one of the following equivalent approval methods can be also chosen:
  - 5.4.1. frontal impact test on body section in accordance with Annex 6.
  - 5.4.2. computer simulation – via dynamic calculation – of the basic approval method in a accordance with Annex 7.
  - 5.4.3. The basic principle is that the equivalent approval methods must be carried out in such a way that it represents the basic approval test method specified in paragraph 5.3. If this requirement is not met, the technical service may refuse the approval.
- 5.5. In case of separated driver's compartment the driver shall have the possibility to leave easily the compartment after the impact test. This requirement is met if one door of the compartment (either inside or outside door) is easily openable.

#### ***Explanation***

This section is an adapted version of paragraph 5 in R.66/Rev.1. with the possible and necessary simplification due to the simpler problem.

## **6. MODIFICATION AND EXTENSION OF APPROVAL OF A VEHICLE TYPE**

### 6.1. As it stands in the German draft

#### 6.1.1. as it stands in the German draft

6.1.2. After the German text add the following: "... to prove that the new vehicle type complies with the requirement of this Regulation and constitutes part of a group of vehicle types together with the approved vehicle; or"

6.1.3. refuse the extension of approval and require a new approval procedure to be carried out.

### 6.2. The decision of the administrative department and the technical service shall be based on the threefold criteria of the worst case:

6.2.1. the structural criterion means whether the superstructure is changed or not (see Annex 4) If no change or the new superstructure is stronger, this is favourable.

6.2.2. the residual space criterion is based on the position of the residual space related to the driver's and crew's compartment (Position of the driver's and crew's seats) If there is no change in the position, or they have better position (farther from the impact zone) this is favourable.

6.2.3. the criterion of the surroundings means all the distances of the surroundings from the residual space. Those parts, elements of the surroundings shall be considered which may intrude into the residual space in the test (e.g. instrument panel, steering wheel, parts of the inner front wall, etc.) If these are not smaller than those in the approved vehicle type, this is favourable.

6.3. If all three criteria described in paragraph 6.2. are changed favourably, the extension of the approval shall be granted without further investigation. If all three answers are unfavourable, a new approval procedure is required.

If the answers are mixed, further investigations (e.g. tests, calculation, structural analysis) will be required. These investigations shall be determined by the technical service cooperating with the manufacturer,

6.4. Confirmation or refusal of approval, specifying the alterations, shall be notified by the procedure specified in paragraph 4.3. to the Contracting Parties which apply this Regulation.

6.5. The administrative department issuing the extension of approval shall assign a series number to each communication from drawn up for such an extension.

### ***Explanation***

These paragraph are taken from R.66/Rev.1, only with the necessary modifications

## **7. CONFORMITY OF PRODUCTION**

## **8. PENALTIES FOR NON-COMFORMITY OF PRODUCTION**

## **9. PRODUCTION DEFINITELY DISCONTINUED**

## **10. TRANSITIONAL PROVISIONS**

## **11. NAMES AND ADDRESSES OF TECHNICAL SERVICES**

### *Explanation*

These administrative paragraphs may be taken e.g. from R.66/Rev.1.

## **ANNEXES**

- Annex 1 Communication from
- Annex 2 Approval mark
- Annex 3 Viewpoints on the structural description of the superstructure
- Annex 4 Specification of the residual space
- Annex 5 Basic approval test on complete vehicle
- Annex 6 Impact test on body section
- Annex 7 Computer simulation of the basic approval test

### *Notice*

If GRSG agree, the Annexes will be prepared for the next meeting, based on the original German document and also on R.66/Rev.1.