

## INTRODUCTION

The following pages contain the proposals that were made by the participants of the ECE- R21 ad-hoc working group during:

1. The first meeting which was held in Madrid (03 - 04 February 2000)
2. The second meeting which was held in Cologne (17 - 18 May 2000)
3. The third meeting which was held in Madrid (13 - 14 September 2000)

The group reported to GRSP during the 27<sup>th</sup> session, 8-12 May 2000, about the results of the first meeting of the ad-hoc group with an informal document.

The following draft proposal contains the results after the last meeting in Madrid. The result of this meeting can be described as follows:

1. **Clarification of the scope:** Vehicles of category M1 is introduced instead "passenger cars" / Incorporation of a new item: "Power operated window winders etc."; agreed by the majority of the group
2. **Extension of the definitions:** agreed by the majority of the group.
3. **Incorporation of a dynamic determined head impact zone:** the head impact zone may be determined according to the classic static procedure defined in Annex 1 or according to a new dynamic procedure described in Annex 8. Agreed in principle by the majority of the group.
4. **Power operated window etc.**  
The text of the Directive 74/60/EEC, last amended by Directive 2000/4/EC has been incorporated in the draft proposal. In addition the text has been modified to adapt the requirements to the technical progress.  
The ad- hoc group decided, that OICA should check and if necessary to improve the text of „power operated window, etc.“ because the text of the Directive including the amendments were discussed with the German vehicle manufacturers and some component manufacturers only and should be discussed with all members of OICA.
5. **Leave soft material in place**  
The group agreed to modify the text of the existing requirements and to introduce the head impact test procedure as a tool to find out if a soft material arrangement can protect hard edges or not.

6. **Window winder requirements**

*The ad -hoc group recommend to amend a new explanatory note:*

Explanatory note to paragraph 5.3.2.2.:

With new modern doors designs, window winders handle is sometimes surrounded by the form of the door panel, making it impossible for an occupant to touch it with his knees. It is up to the Technical Services to decide in this cases with the agreement of the manufacturer to carry out the push test as described or not.

7. **Explanatory notes**

*The group recommend GRSP to incorporate the explanatory notes at the end of each paragraph where they belong to.*

*If a explanatory note belongs to more than one paragraph, it should be repeated to each paragraph of the Regulation.*

8. **Establishing of gaps and grilles requirements (OICA)**

*Not discussed in Madrid II; further discussion necessary.*

9. **Head impact test into the deployed airbag (OICA)**

*Agreed by: F, I, E, NL, OICA*

*Disagreed by S, D, UK with serious reservation*

*Further discussion necessary.*

**To-do list:**

- a) Arrangement of the final discussion of paragraphs 5.1.1 and annex 8
- b) Further discussion and decision of gaps and grilles requirements c)  
Further discussion and decision of head impact test into the deployed airbag
- d) Waiting on OICA result of the check of the amended "Directive"- text of " Power operated window etc."

*The chairmans of the ECE-R21 ad- hoc group will work out an improved document on the basis of these Informal Document No. 1, which will be presented to the secretariat of GRSP (Mr. Ramos) in time that he can arrange an official document for the next GRSP- Meeting in May 2001.*

*The members of GRSP should do all further discussions and decisions.*

**Explanation of the used letters:**

The existing text of ECE- R21 is written with Courier New or Courier; all modifications are marked with fat letters.

The text of the Directive 2000/4/EC (power operated window e.t.c.) is written in colour " blue" and the modifications of the text of the Directive in colour "red".

Remarks, made during the Madrid II meeting are written down in " Arial 12" letters.

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GENERAL

TRANS/WP.29/GRSP/2000/..  
XX October 2000

ENGLISH ONLY

**ECONOMIC COMMISSION FOR EUROPE**

**INLAND TRANSPORT COMMITTEE**

Working Party on the Construction of Vehicles

Working Party on Passive Safety (GRSP)  
(Twenty- eight session, 27 - 30 November 2000,  
agenda item 1)

**PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION NO. 21**  
(Interior fittings)

Transmitted by the Experts from Spain and Germany

Note: The text reproduced below has been prepared by the experts from Spain and Germany on the basis of several proposals which has been discussed by members of a special ECE R21 ad hoc working group. These group has been established and agreed by GRSP during the twenty-sixth session, 29 November - 3 December 1999. The members of the ad hoc working group represent experts of E, I, D, F, NL, S, UK, USA, Japan, JASIC, CLEPA and OICA.

The following draft contains the proposals to amend, as a first target and as a short term step, the requirements of the ECE- Regulation No.21, Corrigendum 1 to the 01 series of amendments to Regulation No.21 (TRANS/WP29/713 - 13 April 2000 -).

It is planned by GRSP, to prepare a proposal towards a second target, to create a global harmonised Regulation (which could be ready not before 2003)

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

GE.00-XXXXX

**PROPOSAL**

Paragraph 1. Scope, amend to read:

This Regulation applies to the interior fittings **of vehicles of category M1** with regard to:

1. 1. the interior parts of the passenger compartment other than the rear-view mirror or mirrors;
1. 2. the arrangement of the controls;
1. 3. the roof **or opening roof**, and
1. 4. the seat-back and the rear parts of seats.
1. 5. **Power-operated windows, roof panel and partition systems**

**Justification:**

1. Deletion of the term: "passenger cars" and incorporation of the wording "vehicles of category M1" which is well defined in the R.E.3- document and which corresponds with the definition of the vehicle categories used in the Directives 70/156/EEC, Annex II, section A.
  2. Change of subparagraph 1.3 "the roof or sliding roof", to bring REG 21 in line with the text of the Directive 74/60/EEC, "Interior fittings"
  4. New subparagraph 1.5 incorporating of requirements for power operated windows, roof panel and partition systems
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Paragraph 2 Definitions

Paragraph 2.1, unchanged

Paragraph 2.2. amend to read:

2. 2. "vehicle type"  
with regard to the interior fittings of the passenger compartment (~~other than the rear view mirrors; the arrangement of controls, the roof or sliding roof, the back rest and rear part of the seats~~) means ~~power driven vehicles~~ **vehicles of category M1** which do not differ in such essential respects as:

2. 2. 1. the lines and constituent materials of the bodywork of the passenger compartment;
2. 2. 2. the arrangement of the controls;
2. 2. 3., (added as new paragraph)

the performance of the protective system, if the reference zone according to Annex 8(dynamic evaluation) is chosen by the applicant.

**Remark:** Vehicles that differ only in the performance of the protective system(s) belong to the same vehicle type if they offer an equal or better protection for the occupants compared with the system or vehicle submitted to the technical service responsible for conducting the approval tests.

**Justification:**

1. Deletion of the phrases of paragraph 2.2 which stand in brackets, see also paragraph 1, Scope.
  2. Consequences after incorporation of the term "vehicles of category M1" and
  3. Introduction of new requirements in the reference zone, keeping in mind, that it is the choice of the vehicle manufacturer as applicant to decide to use the existing requirements (determination of reference zone, determination of the head impact points within the head impact area, carrying out head impact tests to the instrument panel, check of radii requirements etc.)  
or  
on a voluntary base, to use the new requirements according to annex 8. In this case the protection performance of the vehicle equipped with a restraint system shall show, that in case of a frontal impact (details see annex 8) no head impact to the instrument panel occurs or a dynamic determined reference zone can be described.
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Paragraph 2. 3. "reference zone", amended as:

"reference zone" means the head-impact zone as defined in annex 1 to this Regulation. **Alternatively and at the choice of the applicant and based on occupants protected by the restraint systems installed in the vehicle type it is permitted to define a reference zone according to annex 8 of this Regulation. In both cases the following areas are excepted:**

Paragraphs 2.3.1., 2.3.2 and 2.3.3, (unchanged)

**Justification:**

Consequences of the introduction of alternative test requirements according to annex 8.

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Paragraphs 2.4 to 2.9 unchanged

Insert new definitions as paragraphs 2.10 to 2.17

**2.10. "Protective system" means interior fittings and devices intended to restrain the occupants. (see Definition paragraph 2.1. of ECE Regulation 94).**

**2.11. "Type of a protective system", means a category of protective devices which do not differ in such essential respects as:**

- 2.11.1. their technology**
- 2.11.2. their geometry**
- 2.11.3. their constituent materials.**

**Remark: The ad- hoc group decided, that OICA should check and if necessary to improve the text of „power operated window, e.t.c. because the text of the Directive including the red amendments were discussed with the German vehicle manufacturers and some component manufacturers only and should be discussed with all members of OICA.**

2.12. "Power-operated windows" means windows which are closed by power supply of the vehicle.

2.13. "Power-operated roof-panel systems" means movable panels in the vehicle roof which are closed by power supply of the vehicle by either a sliding and / or tilting motion, and which do not include convertible top systems.

2.14. "Power-operated partition systems" means systems which divide a passenger car compartment into at least two sections and which are closed using the power supply of the vehicle.

2.15. "Opening" is the maximum unobstructed aperture between the upper edge or the leading edge, depending on the closing direction, of a power-operated window or partition or roof panel and the vehicle structure which forms the boundary of the window, partition or roof panel, when viewed from the interior of the vehicle or, in the case of partition system, from the rear part of the passenger compartment.

To measure an opening, a cylindrical test rod shall (without exerting force) be placed through it normally perpendicular to the edge (OICA ?????) and perpendicular to the closing direction of the window, roof panel or partition as shown in Annex 9,Figure 1, from the interior of the vehicle or, as applicable, from the rear part of passenger compartment.

2.16. "(Ignition) key" means a specific device that operates the locking system of a vehicle which is built in a way that it can only be operated by this device (key). This definition explicitly includes keyless entry- and/or drive authorisation systems (OICA,?????)

## **2.17. inserted in Madrid II (agreed in the Cologne- meeting):**

2.17. "Airbag" means a device installed to supplement safety belts and restraint systems in power driven vehicles, i. e. systems which in the event of a severe impact effecting the vehicle automatically deploy a flexible structure inteneded to limit, by compression of the gas contained within it, the gravity of the contacts of one or more parts of an occupant of the vehicle with the interior of the passenger compartment.

**Justification:**

New definitions related to the proposed test procedure according to annex 8 and the incorporation of definitions related to power- operated window, roof opening and partition systems ( printed with colour blue) and modification of that text ( printed in colour red) taking into account the adaptation of the requirements to the technical progress.

The draft incorporates tests with airbag systems. The definition explains what an airbag system is. The definition is in line with ECE- Regulation 94.

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**Insertion of the explanatory notes in the text of ECE- Regulation No.21:**

**Justification:**

The below prescribed explanatory notes will be used since more than 20 years and should be well known by all member states. It seems helpful to incorporate these text as state of the interpretations directly in ECE- Regulation No. 21.

**REMARK: The notes should be incorporated at the end of each paragraph where they belong to.**

**If a explanatory note belongs to more than one paragraph, it should be repeated to each paragraph of the Regulation.**

**EXPLANATORY NOTES**

Paragraph 2. 3.

The reference zone is outlined without rear view mirror. The energy-dissipation test is accomplished without the rear view mirror. The pendulum shall not impact the mirror mounting.

Paragraphs 2. 3. and 2. 3. 1.

The exempted area behind the steering wheel as defined by these paragraphs is also valid for the head impact area of the front passengers.

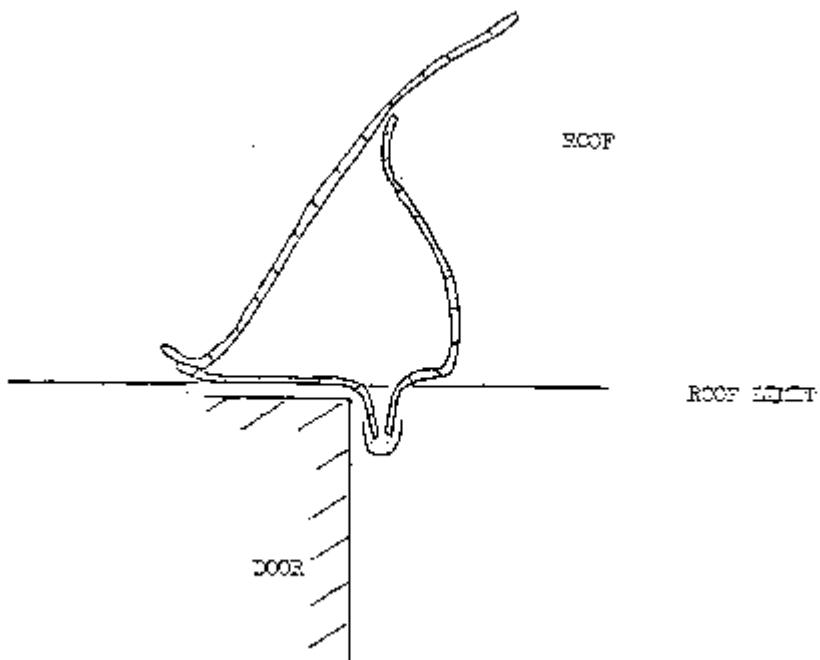
In the case of adjustable steering wheels the zone finally exempted is reduced to the common area of the exempted zones for each of the driving positions which the steering wheel may assume.

In the case where it is possible to choose between various steering wheels the exempted zone is determined by the use of the least favourable steering wheel having the smallest diameter.

Paragraph 2. 4.

The level of the instrument panel extends over the entire width of the passenger compartment and is defined by the rearmost points of contact of a vertical line with the surface of the instrument panel when the line is moved across the width of the vehicle. where two or more points of contact occur simultaneously, the lower point of contact shall be used to establish the level of the instrument panel. In the case of consoles, if it is not possible to determine the level of the instrument panel by reference to the points of contact of a vertical line the level of the instrument panel shall be where a horizontal line 25. 4 mm above the "H" point of the front seats intersects the console.

Paragraph 2. 5. At the vehicle sides the roof shall commence at the upper edge of the door aperture. In the normal case, the lateral roof limits will be represented by the contours formed by the bottom edge (lateral view) of the remaining body when the door has been opened. In the case of windows, the lateral limitation of the roof will be the continuous transparent line (penetration point of the lateral window panes). At the posts, the lateral roof limitation will pass through the connecting line between the transparent lines. The definition of Paragraph 2. 5. is also valid for any opening for the roof, in the closed position, of a vehicle as defined in paragraphs 2. 7. or 2. 8. For measuring purposes, downward facing flanges shall be ignored. These will be considered as forming part of the vehicle sidewall.



Paragraph 2. 7.

A non-removable rear window is understood to be a rigid structural element. Cars with non-removable rear windows of rigid material are considered to be cars with opening roofs as defined under paragraph 2. 8.

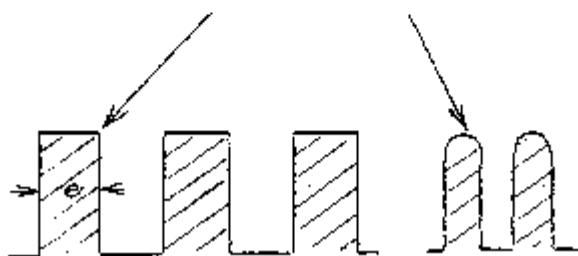
Paragraph 5. 1. 1.

A sharp edge is an edge of a rigid material having a radius of curvature of less than 2. 5 mm except in the case of projections of less than 3. 2 mm, measured from the panel. In this case, the minimum radius of curvature shall not apply provided the height of the projection is not more than half its width and its edges are blunted.

Grills are considered to comply with the regulations if they meet the minimum requirements of the following table:

gap between elements	flat elements		rounded elements min. radius
	e/min.	min. radius	
	0 - 10	1.5	0.5
10 - 15	2.0	0.33	0.75
15 - 20	3.0	0.50	1.25

MIN. RADIUS



Paragraph 5. 1. 2.

During the test, it is determined whether parts within the impact zone used for reinforcement may be displaced or protrude so as to increase the hazards to passengers or the severity of injuries.

Paragraph 5. 1. 3.

These two concepts (level and lower edge of the instrument panel) may be distinct. However, this point is included in paragraph 5. 1. (... above the level of the instrument panel ...) and, therefore is applicable only where these two concepts are combined. In the case where the two concepts are not combined, i. e. where the bottom edge of the instrument panel is located below the level of the instrument panel, it will be considered under paragraph 5. 3. 2. 1. by reference to paragraph 5. 8.

Paragraph 5. 1. 4.

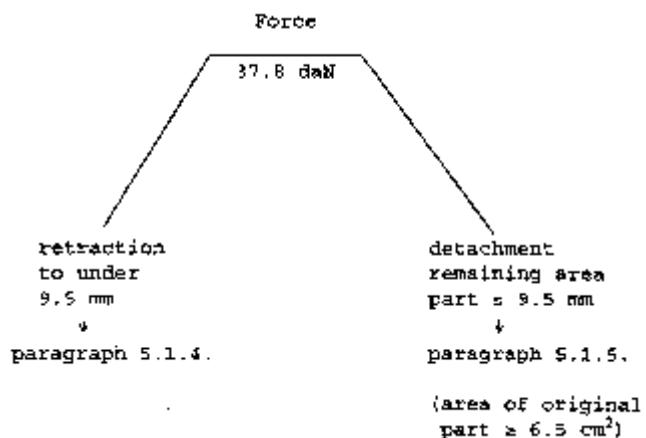
If a pull handle or knob has a width dimension equal to or more than 50 mm and is located in a zone such that if it were less than 50 mm in width the maximum projection would be determined using the headform measuring apparatus with annex 6, paragraph 2. , the maximum projection shall be determined in accordance with annex 6, paragraph 1. , i. e. by using a 165 mm diameter sphere and determining the maximum variation in height of the "y" axis.

The cross-sectional area shall be measured in a plane parallel to the surface on which the component is mounted.

Paragraph 5. 1. 5.

Paragraphs 5. 1. 4. and 5. 1. 5. complement each other; the first sentence of paragraph 5. 1. 5. (i. e. a force of 37. 8 daN for retraction or detachment) is applied and then paragraph 5. 1. 4. in case of retraction up to a protrusion between 3. 2 and 9. 5 mm or, in the case of detachment, the two last sentences of paragraph 5. 1. 5. (the cross-section area is measured before the force is applied). However, if, under practical circumstances paragraph

5. 1. 4. must be applied (retraction to under 9. 5 mm and over 3. 2 mm) it could be more convenient, at the manufacturer's discretion, to verify the specifications of paragraph 5. 1. 4. before applying the force of 37. 8 daN specified in paragraph 5. 1. 5.



Paragraph 5. 1. 6.

Since, in the presence of soft materials, the requirements apply only to the rigid support, the projection is measured for the rigid support only. The shore hardness measurement is made on samples of the test subject itself. where, due to the condition of the material, it is impossible to carry out a hardness measurement by the shore A procedure, comparable measurements shall be used for evaluation.

Paragraph 5. 2. 1.

Foot pedals, their arms and immediate pivotal mechanism, but not the surrounding support metal, shall be excluded from consideration.

The ignition key is deemed to satisfy the requirements of this paragraph if the protruding part of its shank consists of a material of between 60 and 80 shore A hardness and a thickness of at least 5 mm, or is covered with such a material of 2 mm minimum thickness on all surfaces.

Paragraph 5. 2. 2.

The criterion to determine whether the parking brake control can be contacted is the use of:

the simulated head specified in annex 1, if the control is located above or on the level of the instrument panel (to be tested in accordance with paragraph 5. 1. and within the impact zone);

the knee specified in annex 7 if the control element is located below the level of the instrument panel (in this case the control lever is tested in accordance with paragraph 5. 3. 2. 3. ).

Paragraph 5. 2. 3.

The technical specifications listed in paragraph 5. 2. 3. apply also to shelves and those parts of consoles below the level of the instrument panel located between the front seats, provided that these are located in front of the "H" point. If a cavity is closed it will be treated as a glove compartment and not be subject to these specifications.

Paragraph 5. 2. 3. 1.

The dimensions specified refer to the surface before the addition of material of less than 50 shore A hardness (see paragraph 5. 2. 4. ).

Energy-dissipating tests shall be conducted in the spirit of annex 4 .

Paragraph 5. 2. 3. 2.

If a shelf becomes detached or breaks up, no dangerous features must result; this applies not only to the rim but also to other edges facing into the passenger compartment as a result of the applied force.

The strongest part of the shelf shall be considered to be adjacent to a fixture. Also, "substantially distorted" shall mean that, under the effect of the applied force, the deflection of the shelf, measured from the initial point of contact with the test cylinder, must be a fold or a deformation visible to the naked eye. Elastic deformation shall be admissible.

The length of the test cylinder shall be at least 50 mm.

Paragraph 5. 3.

"Other parts" shall include such parts as window catches, seat belt upper anchorages and other parts located in the foot space and at the door side, unless these parts have been treated previously or are exempted in the text.

Paragraph 5. 3. 2.

The space between the forward bulkhead and the instrument panel which is located higher than the bottom edge of the instrument panel is not subject to the specifications of paragraph 5. 3.

Paragraph 5. 3. 2. 1.

The 3. 2 mm radius applies to all contactable components covered by paragraph 5. 3. when considered in all positions of use.

As exceptions, glove compartments shall be considered only in the closed position; seat belts will normally be considered only in the fastened position, but any part which has a fixed stowage position shall also comply with the 3. 2 mm radius requirement in that stowed position.

Paragraph 5. 3. 2. 2.

The reference surface is found by application of the device described in annex 6, paragraph 2., with a force of 2 daN. Where this is not possible, the method described in annex 6, paragraph 1., shall be used with a force of 2 daN. The evaluation of dangerous projections is subject to the discretion of the authority responsible for the tests.

The force of 37. 8 daN is applied even if the original projection is less than 35 or 25 mm, as applicable. The projection is measured under the applied load. The horizontal, longitudinal force of 37. 8 daN is normally applied by means of a flat-ended ram of not more than 50 mm diameter but, where this is not possible, an equivalent method may be used; for instance, by removing obstacles.

**(Insertion of a new explanatory note to paragraph 5.3.2.2.):**

With new modern doors designs, window winders handle is sometimes surrounded by the form of the door panel, making it impossible for an occupant to touch it with his knees. It is up to the Technical Services to decide in this cases with the agreement of the manufacturer to carry out the push test as described or not.

Paragraph 5. 3. 2. 3.

The furthest projecting part, in the case of a gear lever, is that part of the grip or knob first contacted by a vertical transverse plane moved in a longitudinal, horizontal direction. If any part of a gear lever or handbrake lies above the "H" point level, that lever will have to be considered as if the whole of it were above the "H" point level.

Paragraph 5. 3. 4.

Where the horizontal plane( s) passing through the "H" point of the lowest front and rear seats do not coincide, then a vertical plane perpendicular to the vehicle' s longitudinal axis shall be determined, passing through the front seat "H" point. The exempted zone will then be considered separately for both the front and rear passenger compartments, relative to their respective "H" point and up to the vertical plane defined above.

Paragraph 5. 3. 4. 1.

Movable sun visors shall be considered in all positions of use. The frames of sun visors shall not be regarded as rigid supports (see para. 5. 3. 5. ).

Paragraph 5. 4.

When the roof is tested to measure those protrusions and parts which can be contacted by a ball having a diameter of 165 mm, the roof lining must be removed. When evaluating the specified radii the proportions and properties attributable to the materials of the roof lining shall be taken into

consideration. The roof testing area shall extend in front of and above the transverse plane limited by the torso reference line of the manikin placed on the rearmost seat.

Paragraph 5. 4. 2. 1.

(See para. 5. 1. 1. for definition of "sharp edges").

The downward projection shall be measured normal to the roof in accordance with annex 6, paragraph 1.

The width of the projecting part shall be measured at right angles to the line of the projection. In particular the rigid roof sticks or ribs shall not project away from the inner surface of the roof more than 19 mm.

Paragraph 5. 5.

Any roof ribs on opening roofs must meet paragraph 5. 4. if they are contactable by a 165 mm diameter sphere;

Paragraphs 5. 5. 1. 2. , 5. 5. 1. 2. 1. , 5. 5. 1. 2. 2.

The opening and operating devices when in a position of rest and with the roof closed must meet all of the specified conditions.

Paragraph 5. 5. 1. 2. 3.

The force of 37. 8 daN is applied even if the original projection is 25 mm or less. The projection is measured under the applied load.

The force of 37. 8 daN applied in the direction of impact defined in annex 4 as the tangent to the trajectory of the headform is normally applied by means of a flat-ended ram of not more than 50 mm diameter, but where this is not possible an equivalent method may be used; for instance, by removing obstacles. The "position of rest" means the position of the operating device when it is in the locked position.

Paragraph 5. 6.

The rod system of convertible tops does not represent a roll-over bar.

Paragraph 5. 6. 1.

The top part of the windscreen frame starts above the transparent contour of the windscreen.

Paragraph 5. 7. 1. 1.

See paragraph 5. 1. 1. for definition of "sharp edge".

Paragraph 5. 7. 1. 2.

In defining the head impact zone of the back of the front seats any structure necessary to support the seat back shall be considered as a component of this seat back.

Paragraph 5. 7. 1. 2. 3.

The padding of the seat frame structure shall also avoid dangerous roughness and sharp edges likely to increase the risk of serious injuries to the occupants.

#### ANNEX 1

##### DETERMINATION OF THE HEAD-IMPACT ZONE

Paragraph 2. 1. 1. 2.

The choice between the two procedures for determining height is to be left to the manufacturer.

Paragraph 2. 2.

When determining points of contact, the length of the arm of the measuring apparatus is not changed during a particular operation. Each operation starts from the vertical position.

Paragraph 3.

The 25.4 mm dimension means the measurement from a horizontal plane passing through the "H" point to the horizontal tangent to the lower profile of the headform.

#### ANNEX 4

##### PROCEDURE FOR TESTING ENERGY-DISSIPATING MATERIALS

Paragraph 1. 4.

The breakage of any component during the energy-dissipation test, see Note on paragraph 5. 1. 2.

#### ANNEX 5

##### PROCEDURE FOR DETERMINING THE "H" POINT AND THE ACTUAL TORSO ANGLE FOR SEATING POSITIONS IN MOTOR VEHICLES

Paragraph 4.

For determining the "H" point of any seat, other seats may be removed if necessary.

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Paragraph 3 ,APPLICATION FOR APPROVAL, unchanged

Paragraph 4 , APPROVAL, unchanged

Paragraph 5 .REQUIREMENTS, amend to read:

Paragraph 5.1 amend to read:

5. 1. Forward interior parts of the passenger compartment above the level of the instrument panel in front of the front seat "H" Points, excluding the side doors.

5.1.1 amend to read:

**New text arrangements according to the discussion in Madrid II, see 5.1.1. and 5.1.7., 5.1.7.1 and 5.1.7.2.:**

5. 1. 1. The reference zone defined in paragraph 2. 3. above shall not contain any dangerous roughness or sharp edges likely to increase the risk of serious injury to the occupants.

**If the head impact area is determined according to annex 1, the parts referred to in paragraphs 5. 1. 2. to 5. 1. 6. below shall be deemed satisfactory if they comply with the requirements of those paragraphs.**

**If the head impact area is determined according to annex 8 the requirements of paragraph 5.1.7 apply.**

**Justification:**

The alternative test according to annex 8 is consequently added as second possibility and will be explained at the beginning of 5.1 in paragraph 5.1.1.

Paragraphs 5.1.2.to 5.1.5., unchanged

Paragraph 5. 1. 6., amend to read:

**In the case of a projection comprising a component made of non-rigid material of less than 50 shore A hardness mounted on a rigid support, the requirements of paragraphs 5. 1. 4. and 5. 1. 5. shall apply only to the rigid support or it can be demonstrated by sufficient tests according to the procedure described in annex 4 that the soft material of less than 50 shore A hardness will not be cut during head impact tests.**

**Justification:**

In case of knobs the upper surface is often covered by a material softer than 50 shore A to provide a better grip or haptic feeling to the occupants who use the knob. Most of the designs are not dangerous even if the original radii requirements apply not to the hard surface, but to the soft material. The test according to annex 4 allows to determine if the arrangement is dangerous in the sense of the Regulation.

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Insert the following new paragraphs:

5.1.7. The following paragraphs shall apply:

5.1.7.1 If the protective system of the vehicle type cannot avoid head contacts of the occupants defined in paragraph 2.1. of Annex 8 with the instrument panel and a dynamic reference zone according to Annex 8 is determined the requirements of paragraphs 5.1.2. to 5.1.6. are applicable only to the parts located in that zone.

Other areas of the dashboard above the level of the instrument panel shall contain no dangerous parts likely to increase the risk of serious injuries to the occupants. If these parts can be contacted by a 165mm diameter sphere, they shall be at least blunted.

5.1.7.2. If the protective system of the vehicle type is able to avoid head contacts of the occupants defined in paragraph 2.1. of Annex 8 with the instrument panel and therefore no reference zone can be determined, the requirements of paragraphs 5.1.2. to 5.1.6. are not applicable to this vehicle type.

The dashboard above the level of instrument panel shall contain no dangerous parts likely to increase the risk of serious injuries to the occupants. Parts of the vehicle in that area which can be contacted by a 165mm diameter sphere, shall be at least blunted.

**Justification:**

Consequences of the introduction of the requirements according to Annex 8. It is the choice of the applicant to use the well known requirements for the knobs and levers, surfaces and parts above the level of the instrument panel ( see 5.1 to 5.1.6 above

or

to demonstrate the behaviour and the benefits of the restraint system. In this case, if no head impact occur, the requirements for knobs and levers and parts can be deleted except the general requirement of a minimum radius, that means blunted edges in every case.

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Paragraphs 5.2 to 5.2.3.2 unchanged

Paragraph 5.2.4 modified as:

5. 2. 4. If the items in question contain a part made of material less than 50 shore A hardness when fitted to a rigid support, the above requirements, except for the requirements covered by annex 4 relating to energy-absorption, shall apply only to the rigid support or it can be demonstrated by sufficient tests according to the procedure described in annex 4 that the soft material of less than 50 shore A hardness will not be cut during the head impact test. In that case the required radius shall apply to the soft surface only.

**Justification:**

In case of knobs the upper surface is often covered by a material softer than 50 shore A to provide a better grip or haptic feeling to the occupants who use the knob. Most of the designs are not dangerous even if the original radii requirements apply not to the hard surface, but to the soft material. The test according to annex 4 allows to determine if the arrangement is dangerous in the sense of the Regulation.

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**Further requirements to “window-winder” has been deleted from the agenda of the ad-hoc group and shall be revised as “long term item” in the near future.**

**The ad –hoc group recommend to amend the Explanatory Notes as follows:**

**Insert a new explanatory note to paragraph 5.3.2.2.:**

**With new modern door designs, window winders handle is sometimes surrounded by the form of the door panel. It is often impossible for an occupant to touch the handle with his knees. It is up to the Technical Services to decide in this cases with the agreement of the manufacturer to carry out the push test as described or not.**

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Paragraphs 5.3.2.3 to 5.3.4.1. unchanged

Paragraph 5.3.5 amended as:

5. 3. 5. If the parts considered above comprise a component made of material of less than 50 shore A hardness, mounted on a rigid support, the above requirements shall apply only to the rigid support. **or it can be demonstrated by sufficient tests according to the procedure described in annex 4 that the soft material of less than 50 shore A hardness will not be cut during the head impact test. In that case the required radius shall apply to the soft surface only.**

**Justification:**

In case of knobs the upper surface is often covered by a material softer than 50 shore A to provide a better grip or haptic feeling to the occupants who use the knob. Most of the designs are not dangerous even if the origin radii requirements apply not to the hard surface, but to the soft material. The test according to annex 4 allows to determine if the arrangement is dangerous in sense of the Regulation.

-----

Paragraph 5.4 and subparagraphs unchanged

5.5. Vehicles with an opening roof

Paragraphs 5.5.1 to 5.5.1.2.3. unchanged

(The following new item is inserted)as:

**Paragraph 5.5.2.**

In addition, power-operated roof-panel systems and their controls shall meet the requirements of item 5.8 below.

**Justification:**

Consequences of the introduction of requirements for power-operated window/roof opening/partition systems. It is proposed to lay down these requirements in paragraph 5.8. of the Regulation No. 21.

---

Paragraphs 5.6 to 5.7.2 unchanged

**No final discussion during the Madrid II meeting !**

**OICA will present the correct versions of ECE- Regulation 17 ( ??series of amendments) and 25 ( ??series of amendments)**

**D propose to add: In case of use of an approval according to REG 17 and/ or REG 25 it is permitted to test the seat/head restraint system again, if further requirements exist in ECE- Regulation 21 for such parts.**

Paragraph 5.7.3 amend to read:

5. 7. 3. The requirements of paragraph 5. 7. shall be considered to be satisfied in the case of ~~head restraints~~ **rear parts of seats** that ~~either~~ are part of a vehicle type approved under Regulation No. 17 (03 ?? series of amendments) **and in addition** ~~or~~ are approved under Regulation No. 25 (02 ?? series of amendments).

**(D):In case of use of an approval according to REG 17 it shall be stated in this approval, that all aspects of the requirements of ECE- Regulation No.21 related to the rear parts of seats are fulfilled.**

**Justifications:**

1. made in OICA report of the meeting in Cologne: Current text only mentions about head restraints while the R17 provides similar requirements for rear part of seats. The proposed amendment avoids redundancy between REG 21 and REG 17.  
2. made by D: The REG 21 requirements for the rear parts of the seat describe the determination of head impact points in relation to all seating positions which are provided by the manufacturer behind that seat. (For example, determination of head impact points from the seat behind, from the centre seating position and from the other outboard seating position). ECE- Regulation 17 should be brought fully in line with REG 21; then the above mentioned last sentence of the proposal can be deleted.

The ad hoc group will be highly requested to keep the existing text of REG 21 !!

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Paragraphs 5.8. and 5.8.1., Other not mentioned fittings, are renumbered as item 5.9 and 5.9.1

**Justification:**

See paragraph 5.5.2.1. above, incorporation of requirements for power-operated window etc.

---

New text of paragraph 5.8

**5.8 Power-operated windows, roof panel systems and partition systems**

5.8.1. The requirements below apply to power-operated windows/roof-panel systems/partition systems to minimise the possibility of injuries caused by accidental or improper operation.

**5.8.2. Normal operating requirements**

Except as provided in Item 5.8.3, power-operated windows/roof-panel systems/partition systems may be closed under one or more of the following conditions:

5.8.2.1. when the ignition key is inserted in the ignition control in any position of use or, in an equivalent condition, in case of a keyless entry- and/or drive authorization system

5.8.2.2. by muscular force unassisted by power supply of the vehicle;

5.8.2.3. on continuous activation by a locking system on the outside of the vehicle;

5.8.2.4. during the interval of time between the moment the ignition has been switched from "on" to "off" and/or the key has been removed or, in case of a keyless entry and/or drive authorisation system in an equivalent condition and the moment that neither of the two front doors has been opened sufficiently to permit egress of occupants;

5.8.2.5. when the closing movement of a power-operated window, roof panel or partition starts at an opening not exceeding 4 mm;

5.8.2.6. when the power-operated window of a vehicle's door without an upper door frame closes automatically whenever the pertinent door is closed. In this case the maximum opening, as defined in Item 2.16, prior to window closing, shall not exceed 12 mm.

5.8.2.7. Remote closing shall be allowed by continuous activation of a remote actuation device, provided ~~one of~~ the following conditions ~~is~~ are fulfilled:

5.8.2.7.1. the remote actuation device shall be incapable of closing the power-operated window/roof panel/partition from a distance of more than 11 metres from the vehicle;

5.8.2.7.2. the remote actuation device shall be incapable of closing the power-operated window/roof panel/partition:

- if the actuation device and the vehicle are separated by an opaque surface and
- if the distance between the remote actuation device and the vehicle is more than 6 metres.

**Proposal OICA (Barry Cooke) :**

5.8.2.7. Remote closing shall be allowed by continuous activation of a remote actuation device, provided one of the following conditions is fulfilled:

5.8.2.7.1 the remote actuation device shall be incapable of closing the power-operated window/roof panel/partition from a distance of more than 6 metres from the vehicle;

5.8.2.7.2 the remote actuation device shall be incapable of closing the power-operated window/roof panel/partition, in each of the following two circumstances:

- when the actuation device and the vehicle are separated by an opaque surface;
- and
- when the distance between the remote actuation device and the vehicle is more than 11 metres.

5.8.2.8. One-touch closing shall be permitted only for the power-operated window of the driver's door and the roof panel, and only during the time when the ignition key is in the engine running position or after the engine was switched off, as long as none of the front doors was opened wide enough to enable the occupants to leave the vehicle.

**5.8.3. Auto-reversing requirements**

5.8.3.1. None of the requirements in Item 5.8.2 shall apply if a power-operated window/roof panel system/partition is fitted with an auto-reversing device.

5.8.3.1.1. This device shall reverse the window/roof panel/partition before it exerts a pinch force of more than 100 N within the opening of 200 mm to 4 mm above the top edge of a power-operated window/partition or in front of the leading edge of a sliding roof panel and at the trailing edge of a tilting roof panel.

5.8.3.1.2. After such an auto-reversal, the window or roof panel or partition shall open to one of the following positions:

5.8.3.1.2.1. a position that permits a semi-rigid cylindrical rod of a diameter of 200 mm to be placed through the opening at the same contact point(s) used to determine the reversing behaviour in Item 5.8.3.1.1;

5.8.3.1.2.2. a position that represents at least the initial position before closing was initiated;

5.8.3.1.2.3. a position at least 50 mm more open than the position at the time when reversing was initiated;

5.8.3.1.2.4. in the case of tilting motion of a roof panel, the maximum angular opening.

5.8.3.1.3. To check power-operated windows/roof-panel systems/partition systems with reversing devices, a measuring instrument/test rod shall be placed through the opening from the inside of the vehicle or, in the case of a partition system, from the rear part of the passenger compartment in such a way that the cylindrical surface of the rod contacts any part of the vehicle structure which forms the boundary of the window/roof-panel aperture/partition. The force deflection ratio of the measuring instrument shall be 10 N/mm with a tolerance of max. 1 N/mm. The position of the test rods (normally located perpendicular to the window/roof panel /-partition and perpendicular to the closing-direction) are illustrated in **Annex 9**, Figure 1. The relative position of the test rod shall be kept during the test.

#### 5.8.4. Switch location and operation

5.8.4.1. Switches of power-operated windows/roof panels/partitions shall be located or operated in such a way to minimise the risk of accidental closing. The switches shall require continuous actuation for closing except in the case of Items 5.8.2.6, 5.8.2.8 or 5.8.3.

5.8.4.2. All rear-window, roof-panel and partition switches intended for use by occupants in the rear of the vehicle shall be capable of being switched off by a driver-controlled switch which is located forward of a vertical transverse plane passing through the R points of the front seats. The driver controlled switch is not required if a rear window, roof panel or partition is equipped with an auto-reversing device. If, however, the driver-controlled switch is present, it shall not be able to override the auto-reversing device.

The driver-controlled switch shall be located so as to minimise any accidental manipulating. It shall be identified by the symbol shown in **Annex 9, Figure 2-Appendix 4** or an equivalent labelling, for example, according to ISO 2575: 1998.

#### **5.8.5. Protection devices to the power source**

All protection devices which are used to prevent damage to the power source in the case of an overload or stalling shall reset themselves after an overload or an automatic switch off. It is not permissible to resume the motion in the closing direction automatically.

**Madrid II OICA- Proposal: (insert after closing direction) .....automatically during a one-touch closing operation.**

#### **5.8.6. Handbook instructions**

5.8.6.1. The owner's manual of the vehicle shall contain clear instructions relating to the power-operated window/roof panel/partition, including:

5.8.6.1.1. explanation of possible consequences (entrapment),

5.8.6.1.2. use of the driver-controlled switch,

5.8.6.1.3. a „WARNING“ message indicating the dangers, particularly to children in the case of improper use/activation of the power-operated windows/roof-panel systems/partition systems. This information should indicate the responsibilities of the driver, including instructions for other occupants and the recommendation to leave the vehicle only if the key is removed from the ignition lock, or if, in case of a keyless entry-and/or drive authorization system, an equivalent condition is ensured.

5.8.6.1.4. a „WARNING“ message indicating that special care should be taken when using remote closing systems (see Item 5.8.2.7), for example to actuate it only when the operator has a clear view of the vehicle to be sure that nobody can be trapped by power-operated windows/roof-panel/partition equipment’.

5.8.7. If a power-operated window, roof-opening and/ or partition system is installed in a vehicle that can not be tested according to the test procedures mentioned above the approval may be granted if the manufacturer can demonstrate an equal or improved protection- effect for the occupants.

#### **Justification:**

The Directive 74/60/EEC, last amended by Directive 2000/4/EC (based on a document which has been distributed in Brussels in 1997), incorporates requirements for power-operated window, roof-opening and partition systems. It is helpful to bring the ECE- Regulation 21 in line with the text of the Directive. The existing text of the Directive 2000/4/EC is printed in colour blue. In the meantime it seems necessary to modify the existing text of the Directive 2000/4/EC and to adapt these text to the technical progress. All draft modifications are printed in colour red.

---

Insert and renumber the former paragraph 5.8. as:

5.9. Other non-specified fittings.

5.9.1. The requirements of paragraph 5 shall apply to such fittings not mentioned in previous paragraphs which, within the meaning of the various requirements in points 5.1 to 5.8 and according to their location in the vehicle, are capable of being contacted by the occupants. If such parts are made of a material softer than 50 shore A hardness and mounted on (a) rigid support(s), the requirements in question shall apply only to the rigid support(s). (see 5.1.6. e.t.c. before)

5.9.2. For parts like a center console, for example, or other components of the vehicle which belong to 5.9.1., it is not necessary to perform a energy dissipation test according to Annex 4 to any component contactable by the device and procedure specified in Annex 1 if

- in the opinion of the Technical Service the occupants head is unlikely to contact the component, because of the restraint system(s) installed in the vehicle

or

- because the manufacturer can proof the lack of such contact using, for example, the method described in Annex 8, or any equivalent method.

**Justification:**

Clarification of the assessment procedure in special cases where "Other not mentioned fittings" has to be tested. Use of the testing philosophy according to Annex 8 and keeping in mind the safety belt installation requirements which allows the occupants to use a restraint system.

Paragraph 6., MODIFICATION AND EXTENSION OF APPROVAL OF THE VEHICLE TYPE, unchanged

Paragrahh 7., CONFORMITY OF PRODUCTION, unchanged

Paragraph 8., PENALTIES FOR NON-CONFORMITY OF PRODUCTION, unchanged

Paragraph 9., PRODUCTION DEFINITELY DISCONTINUED, unchanged

Paragraph 10., NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS, AND OF ADMINISTRATIVE DEPARTMENTS, unchanged

Annex 1, DETERMINATION OF HEAD- IMPACT ZONE, unchanged

Annex 2, COMMUNICATION , unchanged

Annex 3, ARRANGEMENT OF THE APPROVAL MARKS, unchanged

Annex 4, PROCEDURE FOR TESTING ENERGX-DISSIPATING MATERIALS, unchanged

Annex 5, PROCEDURE FOR DETERMINING THE „H“ POINT AND THE ACTUAL TORSO ANGLE FOR SEATING POSITIONS IN MOTOR VEHICLES, unchanged

Annex 5 - Appendix 1, DESCRIPTION OF THE THREE-DIMENSIONAL „H“ POINT MACHINE, unchanged

Annex 5.- Appendix 2, THREE-DIMENSIONAL REFERENCE SYSTEM, unchanged

ANNEX 5 - Appendix 3, REFERENCE DATA CONCERNING SEATING POSITIONS, unchanged

Annex 6, METHOD OF MEASURING PROJECTIONS, unchanged

Annex 6, Appendix Figure: Apparatus for measuring projections, unchanged

Annex 7, APPARATUS AND PROCEDURE FOR APPLICATION OF PARAGRAPH 5.2.1. OF THIS REGULATION, unchanged

The text of annex 8 has been modified by G. Felten, following the discussion, which took place during the meeting in Madrid II. The group does not agree the proposal made by the representative of Italy, to use the pendulum with a length of 736 mm to 840 mm to evaluate a dynamic determined head impact zone, because this instrument is unrealistic to check the performance of a restraint system which consists of a belt. The following text should be discussed by the members of the ad-hoc group and finally in GRSP.

**(New) Annex 8, DETERMINATION OF A DYNAMIC DETERMINED HEAD IMPACT ZONE**

1. Determination of the dynamic determined head impact zone with regard to the protective system
  - 1.1. Differing from the procedure described in Annex 1 the applicant may prove, by a procedure accepted by the technical service responsible for conducting the tests, that a dynamic determined head impact zone is relevant for this vehicle type.
  - 1.2. A suitable method to prove a dynamic determined head impact zone may be either:
    - 1.2.1. Vehicle impact tests  
to determine the sequence of movement of the occupants with regard to the protective system installed in the vehicle type, using the frontal impact conditions in the range of +/- 30 degrees (for example frontal impact tests according to FMVSS 208) with an impact speed of at least 48,3 km/h.  
The dynamic determined head impact zone has to be evaluated for the occupants represented by dummies of the types 5<sup>th</sup> percentile female, 50<sup>th</sup> percentile male and 95<sup>th</sup> percentile male, each placed in its recommended design seating position before the test as defined by the manufacturer.  
or
    - 1.2.2. Sled tests  
The sequence of movement shall be investigated under the effect of the deceleration-time diagram as shown in Annex 8 of Regulation No.16 (reference speed 50 km/h) respecting the above prescribed dummy family and producing a direction of a forward displacement of the respective dummies corresponding to the movement of the dummies during real frontal impact tests according to paragraph 1.2.1.  
The direction of the forward displacement of the dummies seems sufficient, if the centre line of the test object, normally a body shell, deviates +/- 18 degree from the longitudinal centerline of the sled  
or

### 1.2.3. Simulated impact testing

The sequence of movements of the occupants, represented by the above described dummy family according to 1.2.1 shall be investigated under the configurations of 1.2.1 or 1.2.2.

It is sufficient to validate the simulation method on at least one of the impact conditions as prescribed in paragraphs 1.2.1 or 1.2.2 above.

2. The **dynamic determined** head impact zone includes all areas of the instrument panel that may be contacted by the head of restraint occupants using the protective system installed in the vehicle type.
3. If the vehicle type can be fitted with different protection systems it is sufficient to investigate the protection system with the minimum performance. Protection systems that can be deactivated by the driver or the occupant have to be used as designed by the manufacturer.
4. The manufacturer or his representative is entitled to present calculations, simulations, test data or test results which sufficiently prove the dynamic determined head impact zone.

### **Justification:**

The proposal to incorporate annex 8 as a voluntary requirement considers:

Introduction of new requirements in the reference zone, keeping in mind, that it is the choice of the vehicle manufacturer to decide to use the existing requirements (determination of the head impact area, head impact tests to the instrument panel, radii requirements)

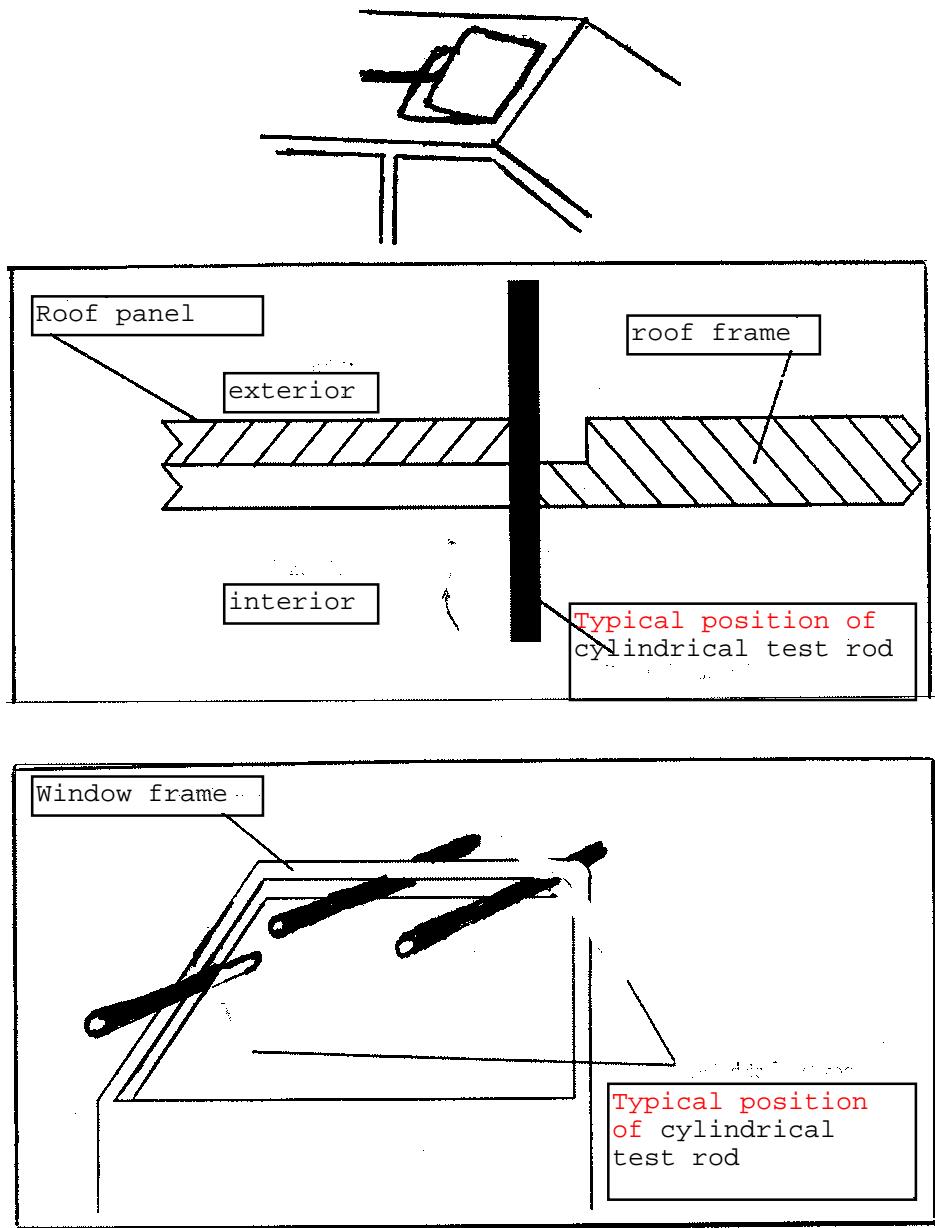
or

on a voluntary base, to use the new requirements according to annex 8. In this case the protection performance of the vehicle equipped with a restraint system (safety belts, airbag system(s), load limiter etc. )shall be in a condition, that in case of frontal impact within the range of +/- 30 degrees no head impact to the reference zone occurs.

**ANNEX 9**

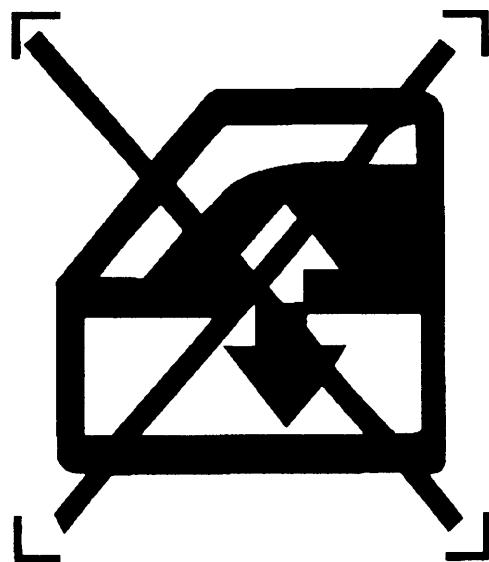
**POSITION OF CYLINDRICAL TEST ROD IN THE OPENING ROOF AND WINDOW OPENINGS**

**TYPICAL POSITIONS OF TEST RODS**



**FIGURE 1**

**SYMBOL FOR DRIVER CONTROLLED SWITCH**



**FIGURE 2**

**Justification:**

Consequences following the above mentioned requirements, .i.e. the amended version of Directive 2000/4/EC

**Because of lack of time the following gap / grilles- proposal could not discussed during the meeting of Madrid II. The chairman of the ad-hoc group recommend to discuss the proposal during the next GRSP- meeting**

**Additional documents provided for the discussion in Madrid:**

**An:** "G. FELTEN Felten" <felten@de.tuv.com>, "R. CHICHARRO Chicharro" <chicharro@inta.es>  
**Kopie:** Paul serre <pserre@ccfa.fr>, oica Yves Van Der Straaten <oicatech@club-internet.fr>, Castaing <cespa@utac.com>, Yannick Souchet <yannick.souchet@equipement.gouv.fr>, "oica@oica.net" <coica@oica.net>  
**Thema:** Proposal of amendments to regulation 21 Viren-geprueft/Virus-checked

As agreed in Cologne on 18 May please find attached 3 documents about 2 proposals regarding window winders and gaps/grilles requirements (points 4 and 5 of the Cologne agenda). These proposals correspond to the agreements we got in Cologne, at least between a majority of attendees.

About window winder test exemption I have some doubt on the need to have the alternative between the 2 conditions of the proposal. Are these 2 conditions fully consistent ? Maybe we had better to keep the "kneeform" condition only ? This could be discussed next meeting in Madrid.

About gaps and grilles proposal, I think that nothing has to be changed but perhaps some of the wording, which could be improved .

See you soon,

Daniel Pouget



- Ad hoc GRSP on ECE 21, sharp edges, gaps and grilles.doc
- ECE 21 GAP.bmp
- Ad hoc GRSP on ECE 21, window winder.doc  
(Remark Felten: Incorporated in the above described document)

## **ECE 21, PROPOSAL OF AMENDMENT TO GAPS AND GRILLES REQUIREMENTS**

**(prepared by OICA, according to ad hoc GRSP meeting in Cologne, May 2000)**

### **PROPOSAL**

1°) Delete, within the explanatory notes, the whole § 5.1.1 on sharp edges and grilles (pages 18)

2°) Add a new § 2.10 (page 5)

2.10 A sharp edge is an edge of a rigid material having a radius of curvature of less than 2,5 mm, except in the case of projections of less than 3,2 mm, measured from the panel.

3°) Insert a new § 5.8 (page 13)

#### **5.8 Common specifications**

The following specifications apply to all interior parts of the passenger compartment which are defined from paragraph 5.1 to paragraph 5.7 :

5.8.1 If the edge of a rigid material projects by less than 3,2 mm, this edge has not to be rounded to the minimum radius of curvature, provided the height of the projection is not more than half its width and this edge is blunted.

5.8.2 Grilles are considered to comply with the regulation if they meet the minimum requirements of the following table :

(insert the existing table, page 18, of the current explanatory notes)

4°) Renumber existing § 5.8 and 5.8.1 as § 5.9 and 5.9.1

5°) Insert, within the explanatory notes, a new paragraph 2.10, after paragraph 2.7 (page 17)

#### **Paragraph 2.10**

In case of a gap between the edge of a rigid material and the panel, this edge shall be rounded to a minimum radius of curvature depending on the height of the projection, according to paragraphs 2.10 and 5.8.1. This projection height has to be determined according to the procedure described in paragraph 1 of annex 6 (See figure below).

(Insert new figure)

### **JUSTIFICATION**

The requirements on sharp edges and grilles are indicated within the explanatory notes about § 5.1.1, concerning components located within the reference zone. It is obvious that these requirements are as much worthwhile for other zones, whatever the location of edges and grilles within the interior parts of the passenger compartment, which are defined from § 5.1 to § 5.7.

**Proposal made by OICA:**

**Insert a new paragraph 1.4.4 in annex 4 , PROCEDURE FOR TESTING ENERGY-DISSIPATING MATERIALS:**

**1.4.4.**

If an airbag is installed and covers at least part of the reference zone, the test may be carried out with the airbag inflated at the request of the applicant

**Justification:**

Alternative agreed in Cologne by a majority, but absent from the compilation by G. Felten

The above mentioned text has been discussed in Madrid II again with the following result:

**Agreed by:** F, I, E, NL, OICA

**Disagreed by:** S, D, UK serious reservation