

Regulation No. 80

Submitted by the expert from Germany

Informal document GRSP-62-36
(62nd GRSP, 12-15 December 2007)
agenda item 26(g))

Comparison of static and
dynamic test procedure

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Gerlach

and traffic accidents

idents with buses

2012 - 03 - 13

Siders – Switzerland

**fatalities: 28
(24 children)**

serious injured: 24

crash into tunnel wall



2003 - 06 - 07

Erzincan – Turkey

fatalities: 27

serious injured: 33

crash into tunnel wall



2017 – 08 – 09

Shanxi – China

fatalities: 36

serious injured: >13

crash into tunnel wall



Regulation No. 80 Rev.02 Amendment 02

ope

THIS REGULATION APPLIES TO:

passenger seats for forward-facing installation in vehicles of categories M2 and M3, of Classes II, III and B¹;
vehicles of categories M2 and M3 of Classes II, III and B¹ in respect of their passenger seat anchorages and seat installation.
does not apply to rearward-facing seats or to any head restraint fitted to these seats.

defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.2, para. 2

TRANS/WP.29/78/REV.2

Classification of power-driven vehicles and trailers

Vehicles of category M2 and M3 belong to:

For vehicles having a capacity exceeding 22 passengers in addition to the driver, there are three classes of vehicles:

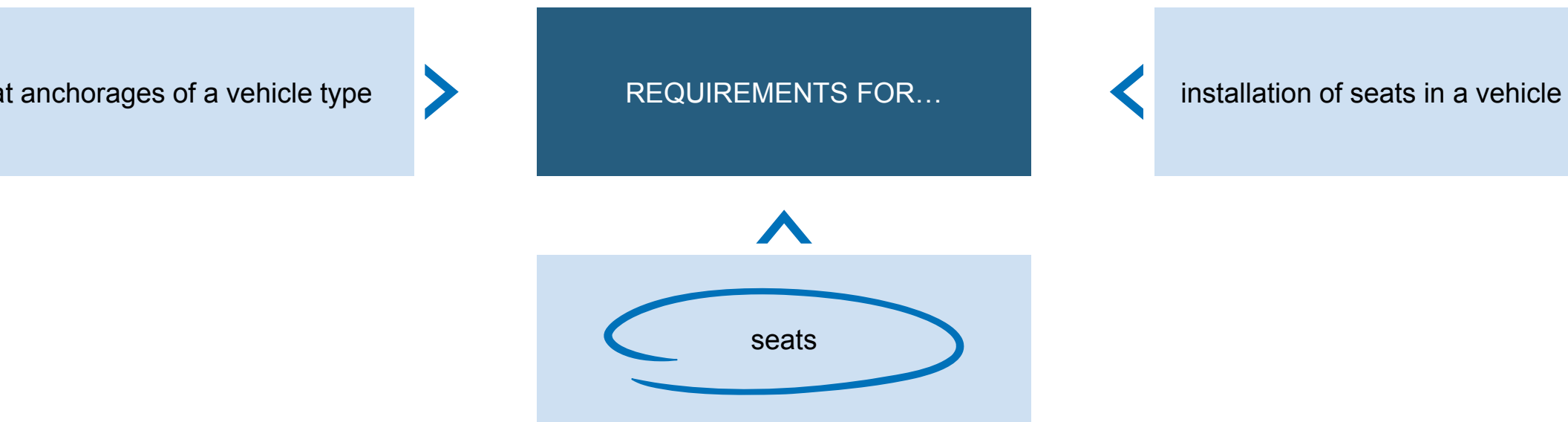
2. "**Class II**": Vehicles constructed principally for the carriage of seated passengers, and designed to allow the carriage of standing passengers in the aisle and/or in an area which does not exceed the space provided for two double seats.
3. "**Class III**": Vehicles constructed exclusively for the carriage of seated passengers.
4. A vehicle may be regarded as belonging in more than one Class. In such a case it may be approved for each Class to which it corresponds.

For vehicles having a capacity not exceeding 22 passengers in addition to the driver, there are two classes of vehicles:

2. "**Class B**": Vehicles not designed to carry standing passengers; a vehicle of this class has no provision for standing passengers.

Regulation No. 80 Rev.02 Amendment 02

Requirements



Regulation No. 80 Rev.02 Amendment 02

Requirements for seats

Each type of forward-facing seat shall be subject to the test requirements of **either Appendix 1 (dynamic test) or Appendices 5 and 6 (static test)** at the request of the manufacturer.

The tests which the seat type has passed shall be recorded in the communication form concerning the approval of a seat type and referring to the model in Annex 1.

Every adjustment and displacement system provided shall incorporate a locking system, which shall operate automatically.

The adjustment and locking systems shall not be required to be in full working order after the test.

A head restraint shall be mounted on every outboard front seat in every vehicle of category M2 with a maximum mass not exceeding 1500 kg. This head restraint shall comply with the requirements of Regulation No. 25, as amended by the 03 series of amendments.

Regulation No. 80 Rev.02 Amendment 02 - Appendix 1

Dynamic test requirements and procedure

REQUIREMENTS

-back effect by seat(s) in front of the occupant and/or by a safety belt

This requirement shall be considered satisfied if the forward movement of any part of the trunk and the head of the manikin does not pass beyond the transversal vertical plane situated at 1.6 m from the R point of the auxiliary seat;

Compliance with biomechanical criteria

forward-facing seat with HYBRID II or III dummy		side-facing seat with dummy according to Regulation No. 95	
Dummy	HYBRID II or III	HIC	< 500
HIC	< 500	Rib Deflection Criterion (RDC)	≤ 42 mm
thorax acceptability criterion (ThAC)	< 30 g (for periods > 3ms)	Soft Tissue Criterion (VC)	1.0 m/sec
femur acceptability criterion (FAC)	< 10 kN and < 8kN (for periods > 20 ms)	Pubic Symphysis Peak Force (PSPF)	≤ 6kN
		Abdominal Peak Force (APF)	≤ 2.5 kN internal (equivalent to external force of 4.5 kN)

Distance of seats and seat anchorages

no complete separation, seat remains firmly held (partial separation ok), locking systems remain locked, no structural part of the seat or accessories has any fracture or sharp or pointed edges or corners

Additional requirements

Regulation No. 80 Rev.02 Amendment 02 - Appendix 1

Dynamic test requirements and procedure

PREPARATION OF THE SEAT TO BE TESTED

Mounting on a testing platform (representative of the body of a vehicle or rigid)

Anchorage on the testing platform provided for the test seat(s) shall be identified to or be the same characteristics as that used in vehicle(s) in which the seat is intended to be used.

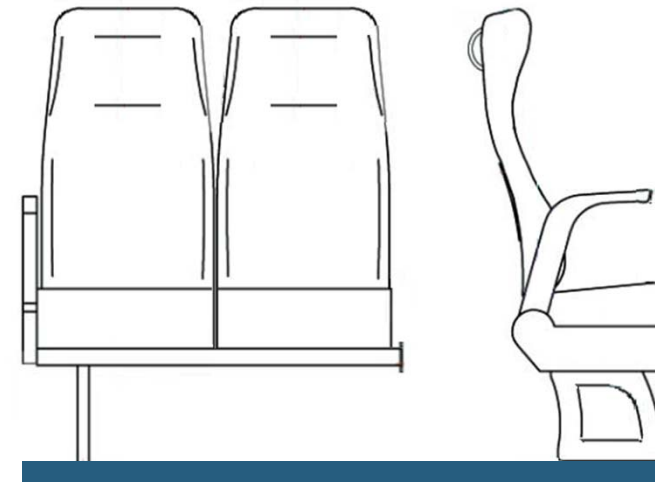
Adjustment shall be complete

If adjustable laterally, the seat shall be positioned for maximum extension.

Back angle according to manufacturer recommendation or as near as possible to 25°

If available, a head restraint adjustable for height shall be in its lowest position

Installation of safety belts of an approved type



Regulation No. 80 Rev.02 Amendment 02 - Appendix 1

Dynamic test requirements and procedure

DYNAMIC TESTS

Seat spacing 750 mm

Seat height according to vehicle configuration*)

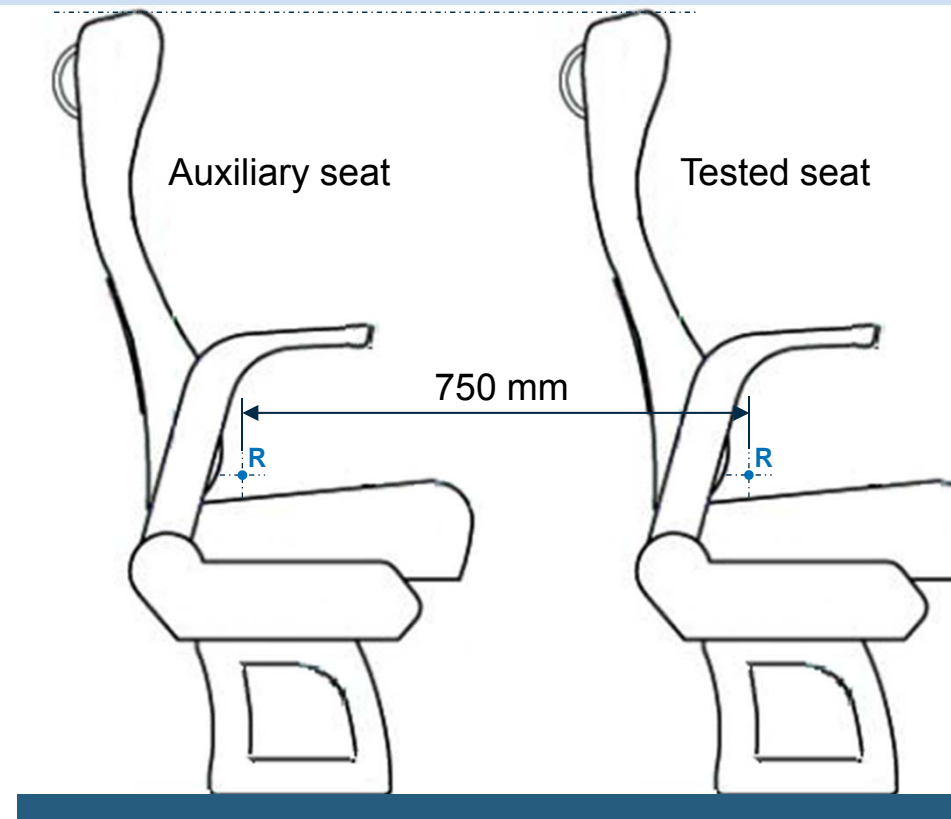
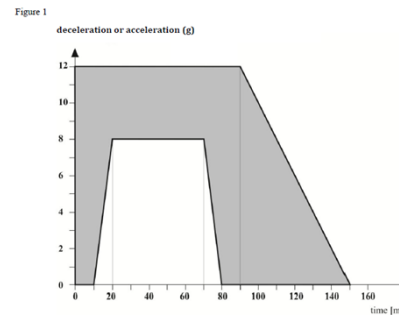
Occupant on auxiliary seat

Initial velocity = 30...32 km/h

Test velocity according to figure 1

Target average deceleration or acceleration between 8 g and 8,5 g

Tested vehicle configurations to be tested



1

Occupant unrestrained

2

Occupant restrained by an safety belt

Safety belt of an approved type

Regulation No. 80 Rev.02 Amendment 02 - Appendix 1

Dynamic test - kinematic of the dummy

DUMMY UNRESTRAINED

t = 0



DUMMY WITH TWO-POINT BELT

t = 0



DUMMY WITH THREE-POINT BELT

t = 0



Regulation No. 80 Rev.02 Amendment 02 - Appendix 1

Dynamic test - kinematic of the dummy

DUMMY UNRESTRAINED
KNEE CONTACT WITH TESTED SEAT



DUMMY WITH TWO-POINT BELT
KNEE CONTACT WITH TESTED SEAT



DUMMY WITH THREE-POINT BELT
KNEE CONTACT WITH TESTED SEAT



Regulation No. 80 Rev.02 Amendment 02 - Appendix 1

Dynamic test - kinematic of the dummy

DUMMY UNRESTRAINED
HEAD CONTACT WITH TESTED SEAT



DUMMY WITH TWO-POINT BELT
HEAD CONTACT WITH TESTED SEAT



DUMMY WITH THREE-POINT BELT
HEAD CONTACT WITH TESTED SEAT



Regulation No. 80 Rev.02 Amendment 02 - Appendix 5

Static test requirements and procedure

REQUIREMENTS

-back effect by seat(s) in front of the occupant

maximum displacement of the central of application of each force does not exceed 400mm

occupant injury risk

minimum displacement of the central of application of each force (upper/lower) 100mm / 50mm

radii-requirement $R > 5\text{mm}$ for Shore 50 A

no radii-requirements (seat and accessories) below a horizontal plane 400mm above the reference plane, even if the occupant may contact them

distance of seats and seat mountings

no complete separation

seat remains firmly held (partial separation ok)

locking systems remain locked

no structural part of the seat or accessories has any fracture or sharp or pointed edges or corners

Regulation No. 80 Rev.02 Amendment 02 - Appendix 5

Static test requirements and procedure

STATIC TEST

Force $1000/H1 \pm 50$ N

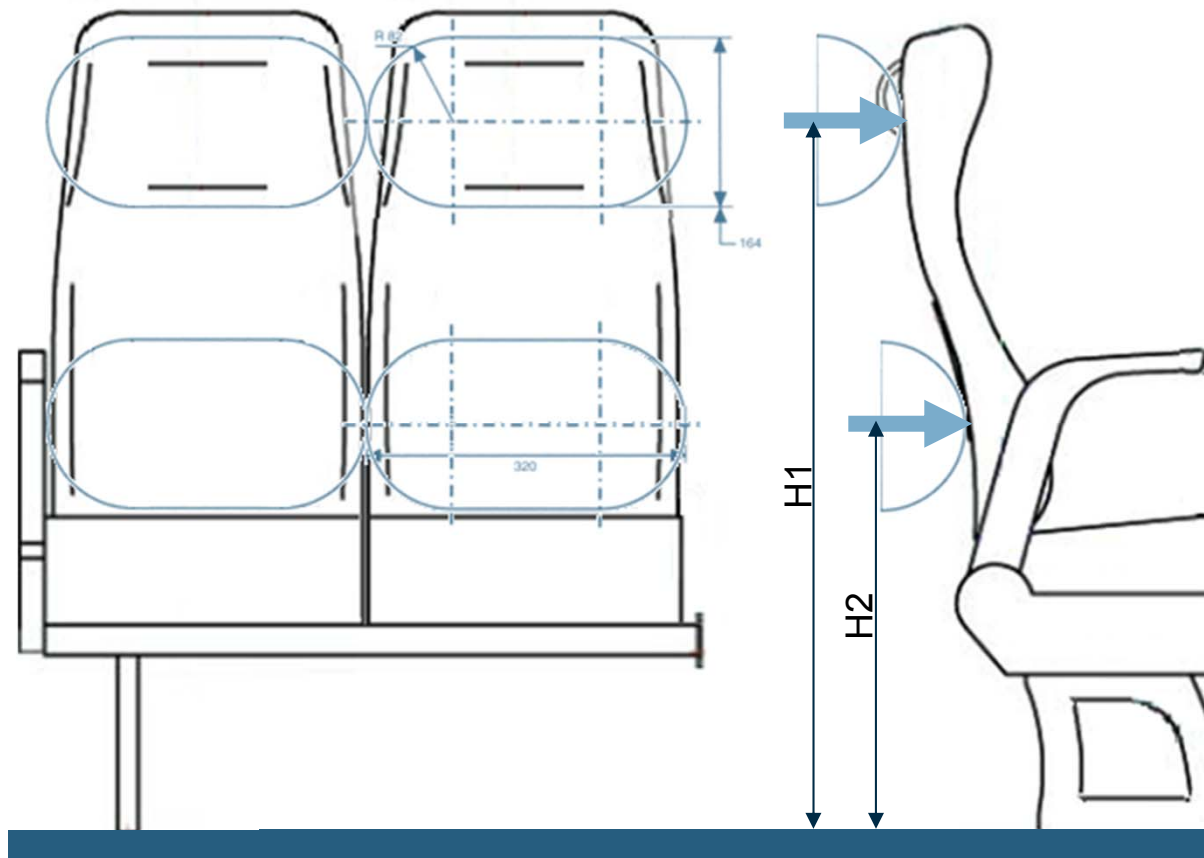
Height $H1$ between 0,70 m and 0,80 m above the reference plane, respectively determination by the manufacturer.

Force $1000/H2 \pm 50$ N

Height $H2$ between 0,45 m and 0,55 m above the reference plane, respectively determination by the manufacturer.

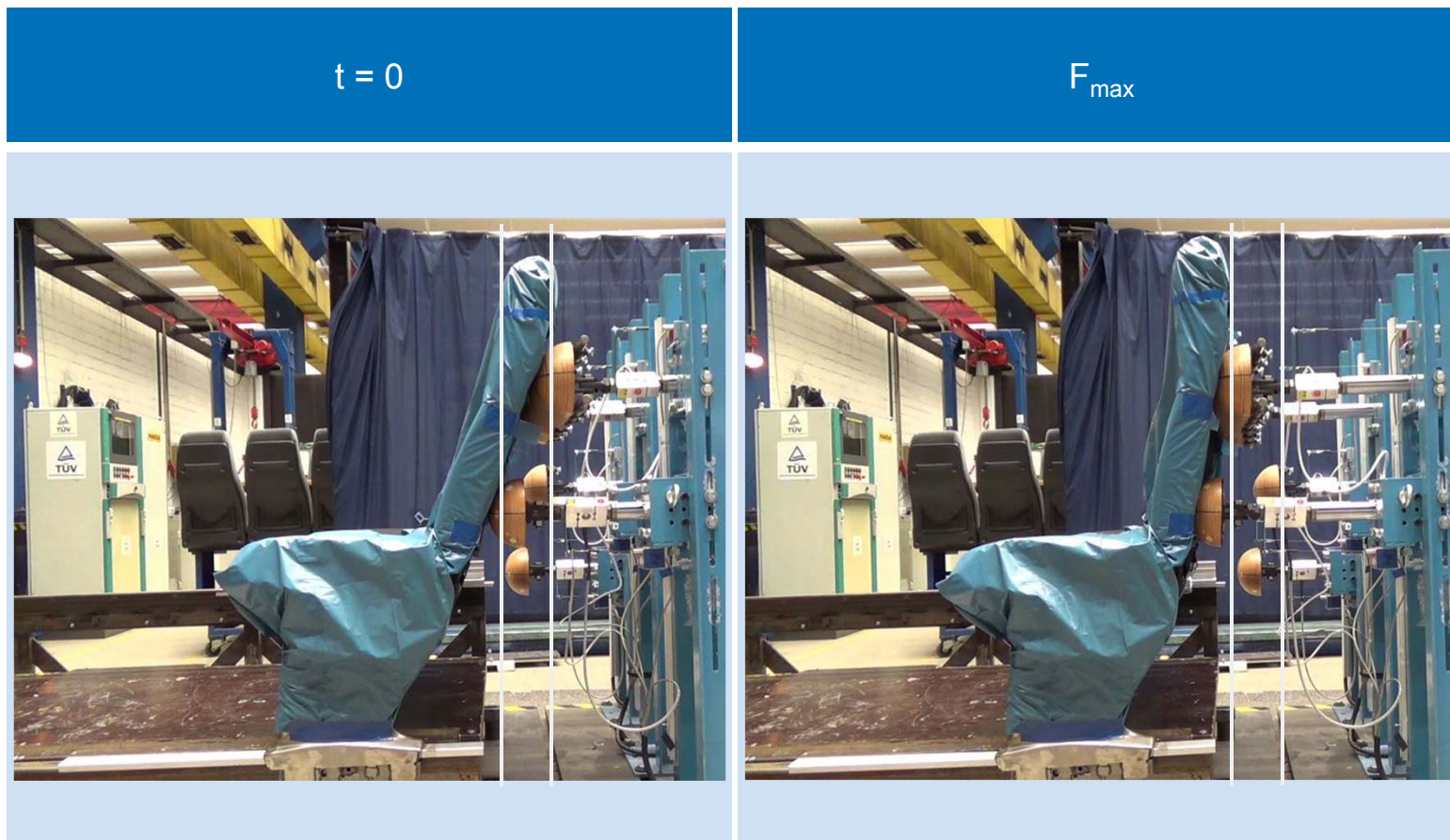
Force of at least 20 N

Forces indicated above shall be applied as rapidly as possible and shall be maintained together at the specified value, whatever the deformation, for at least 30 seconds.





Regulation No. 80 Rev.02 Amendment 02 - Appendix 5

Static test requirements and procedure



Regulation No. 80 Rev.02 Amendment 02

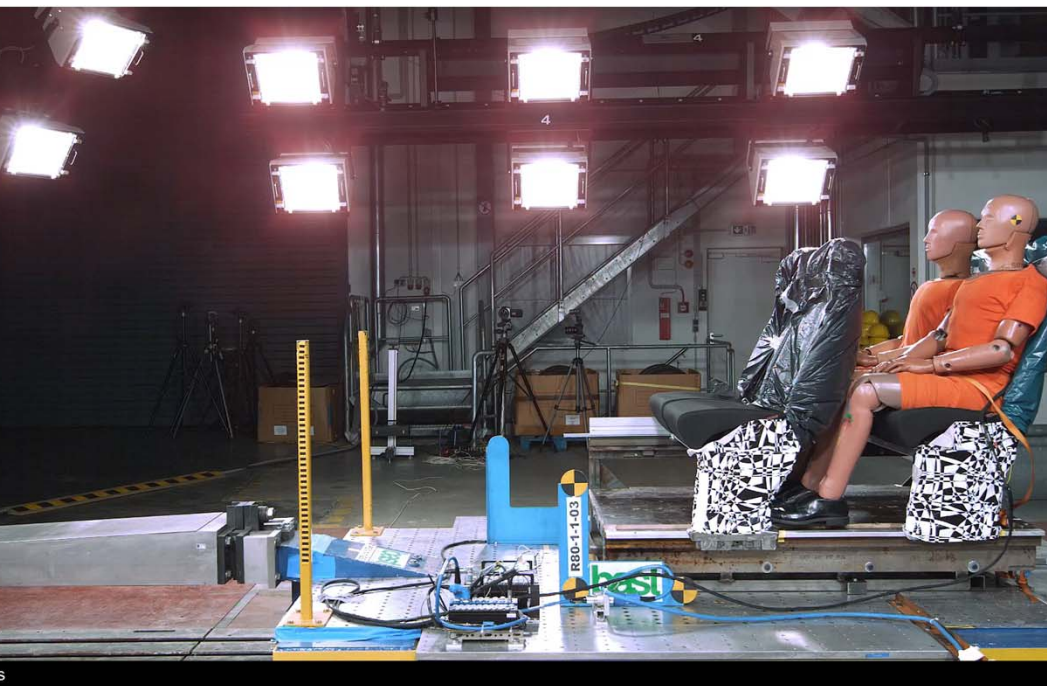
Comparison static/dynamic test

APPENDIX 1 – DYNAMIC TEST		APPENDIX 5 – STATIC TEST	
	hold-back effect by seat(s) in front of the occupant and/or by a safety belt	hold-back effect by seat(s) in front of the occupant	
	compliance with biomechanical criteria	occupant injury risk	
	resistance of seats and seat anchorages	resistance of seats and seat anchorages	
	radii-requirements		

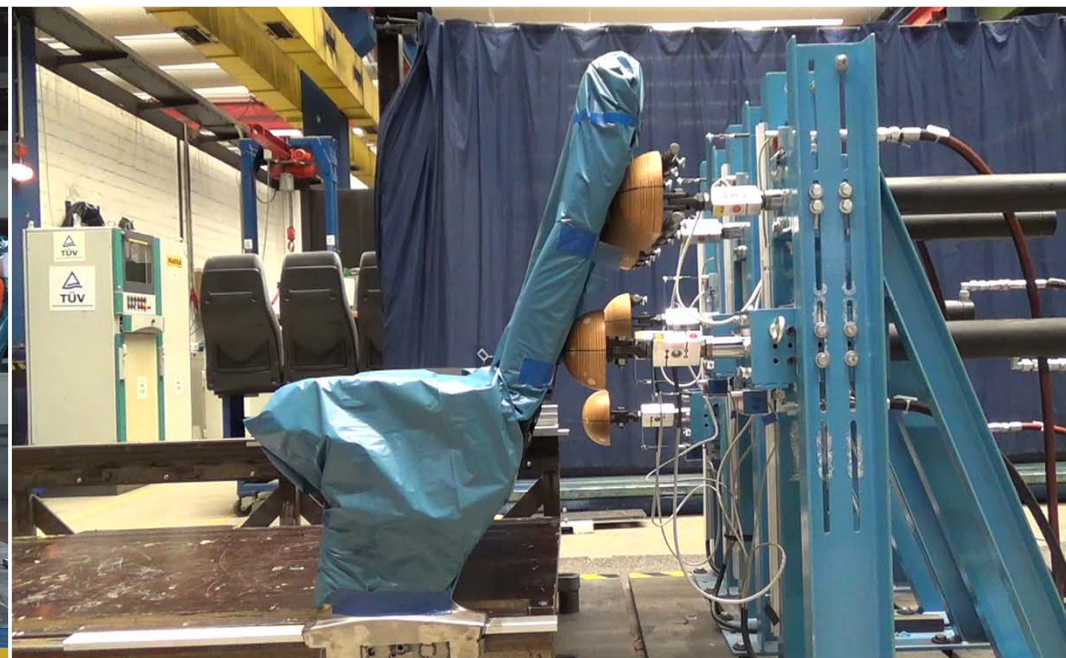
Regulation No. 80 Rev.02 Amendment 02

Comparison static/dynamic test

APPENDIX 1 – DYNAMIC TEST



APPENDIX 5 – STATIC TEST



Regulation No. 80 Rev.02 Amendment 02

Assessment

APPENDIX 1 – DYNAMIC TEST

- testing of belted and unbelted occupants
- analysis of the kinematics (interaction) of dummy and seat
- inertia of dummy and seat
- test of seat anchorages – slide effect
- high relevance to actual accident occurrence due to the use of dummies (see road traffic accidents)

- acceptable forward displacement (1.6m) is too critical
- longitudinal seat displacement is not limited (occupant rescue space)

APPENDIX 5 – STATIC TEST

- testing of seat strength

- force absorption test only
- interaction dummy/seat (belted, unbelted) is not considered
- no dynamic effects (inertia, sliding, kinematics etc.)

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Summary

The performance of the seat in a real crash depends on chosen test procedure (static or dynamic)
Dynamic test has a higher relevance to actual accident occurrence because of the
assessment of the kinematics of dummy and seat
evaluation of biomechanical criteria
analysis of the crash performance of unbelted and belted occupants
Static test analyzes the force absorption of the seat only
Knowledge on both procedures from over 500 type approval tests

Proposal

In order to increase the safety of occupants in buses in case of a collision, it is recommended to

- delete the static test and thereby the choice between two different test procedures of UN Regulation No.80
- modify UN Regulation No.80 in certain paragraphs

Regulation No. 80 Rev.02

Proposal for the 04 series of amendments to UN Regulation No.80

E/CE/324/Rev.1/Add.79/Rev.2 E/CE/TRANS/S05/Rev.1/Add.79/Rev.2	
Regulation No. 80	
Uniform provisions concerning the approval of seats of large passenger vehicles and of these vehicles with regard to the strength of the seats and their anchorages	
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Appendices

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Proposal for the 04 series of amendments to UN Regulation No.80

E/CE/324/Rev.1/Add.79/Rev.2
E/CE/TRANS/S05/Rev.1/Add.79/Rev.2

1. Scope

- 1.1. This Regulation applies to:
- (a) Passenger seats for forward-facing installation in vehicles of categories M₂ and M₃ of Classes II, III and B¹;
 - (b) Vehicles of categories M₂ and M₃ of Classes II, III and B¹ in respect of their passenger seat anchorages and seat installation.
 - (c) It does not apply to rearward-facing seats or to any head restraint fitted to these seats.
- 1.2. At the request of the manufacturer, vehicles of category M₂¹ approved to Regulation No.17 shall be deemed to meet the requirements of this Regulation.
- 1.3. Vehicles where some seats benefit from the derogation provided in paragraph 7.4. to Regulation No. 14 shall be approved to this Regulation.
- 1.4. The installation of side-facing seats shall be prohibited in vehicles of categories M₂ (of class II, III and B) and M₃ (of class II, III and B).
- 1.5. At the request of the manufacturer and in agreement with the Technical Service, as well as the Type Approval Authority of the Contracting Party, an approval may be granted for vehicles of category M₃ (of Class III or B) of a technically permissible maximum laden mass exceeding 10 tonnes with side-facing seats on condition that these side-facing seats are grouped together at the rear of the vehicle to form an integrated saloon of up to 10 seats. Such side-facing seats shall be fitted with, at least, a head restraint and a two-point belt with retractor type-approved in accordance with Regulation No. 16. Further, the anchorages for their safety belts shall comply with dimensional and strength requirements based on those as laid down in Regulation No. 14. However it shall be taken into account that the seat is side-facing instead of forward-facing, and test and inspections shall not be waived on that basis. The communication document (Annex 2) shall bear the remark stating that side-facing seats have been permitted according to this paragraph. Such approvals shall not be granted anymore as from 1 November 2014 or as from the date of adoption of uniform test provisions for side-facing seats (i.e. this Regulation) as well as provisions for such seats regarding safety-belt anchorages (i.e. Regulation No. 14) and vehicles equipped with safety-belts (i.e. Regulation No. 16), whichever date is earlier.
- 1.6. Paragraph 1.4. shall not apply to ambulances or to vehicles intended for use by the armed services, civil defence, fire services and forces responsible for maintaining public order.
- 1.7. Paragraph 1.4. shall not apply to vehicles of category M₃ (of class II, III and B) of a technically permissible maximum laden mass exceeding 10 tonnes with side-facing seats provided the requirements of paragraph 7.4. are met.

1. Scope

1.1. This Regulation applies to:

- (a) Passenger seats for forward-facing installation in vehicles of categories M2 and M3, of Classes II, III and B 1);
- (b) Vehicles of categories M2 and M3 of Classes II, III and B 1) in respect of their passenger seat anchorages and seat installation.
- (c) It does not apply to rearward-facing seats or to any head restraint fitted to these seats.

1.2. At the request of the manufacturer, vehicles of category M2 1) approved to Regulation No. 17 shall be deemed to meet the requirements of this Regulation.

1.3. Vehicles where some seats benefit from the derogation provided in paragraph 7.4. to Regulation No. 14 shall be approved to this Regulation.

1.4. The installation of side-facing seats shall be prohibited in vehicles of categories M2 (of class II, III and B) and M3 (of class II, III and B) with the exception of vehicles of category M3 (of class II, III and B) of a technically permissible maximum laden mass exceeding 10 tonnes provided the requirements of paragraph 7.4. are met

1.5. Paragraph 1.4. shall not apply to ambulances or to vehicles intended for use by the armed services, civil defense, fire services and forces responsible for maintaining public order.

¹ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.2, para. 2

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Proposal for the 04 series of amendments to UN Regulation No.80

Rev.1/Add.79/Rev.2
UNR508/Rev.1/Add.79/Rev.2

2.23. "Seat spacing" means, in the case of seats facing in the same direction, the distance between the front of a seat squab and the back of the seat squab of the seat preceding it, measured horizontally at the height of 620 mm above the floor.

3. Application for approval

3.1. The application for approval of a seat shall be submitted by the seat manufacturer or by his duly accredited representative.

3.2. The application for approval of the vehicle shall be submitted by the vehicle manufacturer or by his duly accredited representative.

3.3. The application for approval of a seat or a vehicle shall be accompanied by the following documents in triplicate and the following particulars:

3.3.1. For approval of a seat:

3.3.1.1. A detailed description of the seat, its attachment fittings and its adjustment, displacement and locking systems;

3.3.1.2. Drawings, on an appropriate scale and in sufficient detail, of the seat, its attachment fittings and adjustment, displacement and locking systems;

3.3.2. For approval of a vehicle:

3.3.2.1. A detailed description of the parts of the structure of the vehicle used as anchorages;

3.3.2.2. Drawings, on an appropriate scale and in sufficient detail, of the parts of the vehicle used as anchorages.

3.4. The following shall be submitted to the technical service responsible for the approval tests:

3.4.1. Two seats representative of the type to be approved, in the case of approval of a seat;

3.4.2. A part of the vehicle structure, in the case of approval of a vehicle.

4. Approval

4.1. If the seat submitted for approval under this Regulation meets the relevant requirements of paragraph 5. below, approval of that seat type shall be granted.

4.2. If the vehicle submitted for approval under this Regulation meets the relevant requirements of paragraphs 6. and 7. below, approval of that vehicle type shall be granted.

4.3. An approval number shall be assigned to each type approved. Its first two digits (at present 03, corresponding to the 03 series of amendments) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to any other seat type or any other vehicle type.

4.4. Notice of approval or of extension or refusal of approval of a seat type and/or a vehicle type pursuant to this Regulation shall be communicated to the

4. Approval

4.1. If the seat submitted for approval under this Regulation meets the relevant requirements of paragraph 5. below, approval of that seat type shall be granted.

4.2. If the vehicle submitted for approval under this Regulation meets the relevant requirements of paragraphs 6. and 7. below, approval of that vehicle type shall be granted.

4.3. An approval number shall be assigned to each type approved. Its first two digits (at present ~~03~~ 04, corresponding to the 04 series of amendments) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to any other seat type or any other vehicle type.

4.4. Notice of approval or of extension or refusal of approval of a seat type and/or a vehicle type pursuant to this Regulation shall be communicated to the Parties to the 1958 Agreement applying this Regulation, by means of a form conforming to the model in Annex 1 and/or Annex 2 to this Regulation.

Regulation No. 80 Rev.02

Proposal for the 04 series of amendments to UN Regulation No.80

E/CE/324/Rev.1/Add.79/Rev.2 E/CE/TRANS/585/Rev.1/Add.79/Rev.2	
4.5.	Parties to the 1958 Agreement applying this Regulation, by means of a form conforming to the model in Annex 1 and/or Annex 2 to this Regulation. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every seat conforming to a seat type approved under this Regulation and to every vehicle conforming to a vehicle type approved under this Regulation an international approval mark consisting of: 4.5.1. A circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval ³ ; 4.5.2. The number of this Regulation, followed by the letter R, a dash and the approval number, placed to the right of the circle prescribed in paragraph 4.5.1. 4.6. The approval mark shall be clearly legible and shall be indelible. 4.7. As the case may be, the approval mark shall be placed on the seat or seats or on, or close to, the data plate affixed to the vehicle by the manufacturer. 4.8. Examples of arrangements of approval marks are given in Annex 3.
5.	Requirements for seats
5.1.	Each type of forward-facing seat shall be subject to the test requirements of either Appendix 1 (dynamic test) or Appendices 5 and 6 (static test) at the request of the manufacturer.
5.2.	The tests which the seat type has passed shall be recorded in the communication form concerning the approval of a seat type and conforming to the model in Annex 1.
5.3.	Every adjustment and displacement system provided shall incorporate a locking system, which shall operate automatically.
5.4.	The adjustment and locking systems shall not be required to be in full working order after the test.
5.5.	A head restraint shall be mounted on every outboard front seat in every vehicle of category M ₂ with a maximum mass not exceeding 3,500 kg. This head restraint shall comply with the requirements of Regulation No. 25, as amended by the 03 series of amendments.
6.	Requirements for seat anchorages of a vehicle type
6.1.	The anchorages for the seats of the vehicle shall be capable of withstanding: 6.1.1. Either the test described in Appendix 2; 6.1.2. Or, if a seat is mounted on the part of the vehicle structure being tested, the tests prescribed in Appendix 1. The seat need not to be an approved seat
³ The distinguish numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to Consolidated Resolution on the Construction of Vehicles (R.E.3), document TRANS/WP.29/78/Rev.2/Amend.1.	
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5. Requirements for seats

- 5.1. Each type of forward-facing seat shall be subject to the test requirements of either Appendix 1 (dynamic test) or **Appendix 1 if applicable Appendix 1 in combination with Appendix 6** (static test) at the request of the manufacturer.
- 5.2. The tests which the seat type has passed shall be recorded in the communication form concerning the approval of a seat conforming to the model in Annex 1.
- 5.3. Every adjustment and displacement system provided shall incorporate a locking system, which shall operate automatically.
- 5.4. The adjustment and locking systems shall not be required to be in full working order after the test.
- 5.5. A head restraint shall be mounted on every outboard front seat in every vehicle of category M₂ with a maximum mass not exceeding 3,500 kg. This head restraint shall comply with the requirements of Regulation No. 25, as amended by the 03 series of amendments.

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Proposal for the 04 series of amendments to UN Regulation No.80

Rev.1/Add.79/Rev.2
ANS/505/Rev.1/Add.79/Rev.2

provided that it satisfies the requirements of paragraph 3.2.1. of the above mentioned appendix.

6.2. Permanent deformation, including breakage, of an anchorage or of the surrounding area shall be permissible provided that the prescribed force has been sustained throughout the prescribed period.

6.3. When there is more than one type of anchorage on a vehicle, each variant shall be tested in order to obtain an approval for the vehicle.

6.4. One test may be used to approve simultaneously a seat and a vehicle.

6.5. In the case of vehicles of category M₂, seat anchorages shall be deemed to comply with the requirements of paragraphs 6.1. and 6.2. if the safety-belt anchorages of the corresponding seating positions are fitted directly to the seats to be installed and these belt anchorages comply with the requirements of Regulation No. 14, if necessary with the derogation provided in paragraph 7.4.

7. Requirements for installation of seats in a vehicle type

7.1. All forward-facing seats installed shall be approved to the requirements of paragraph 5. of this Regulation and subject to the following conditions:

7.1.1. The seat shall have a reference height of at least 1 m; and

7.1.2. The H-point of the seat immediately behind shall be less than 72 mm higher than the H-point of the seat in question or, if the seat behind has the H-point more than 72 mm higher, the seat in question shall be tested and approved for installation in such a position.

7.2. When approved to Appendices 1, Test 1 and 2 shall apply, except as follows:

7.2.1. Test 1 shall not apply where the rear of the seat cannot be struck by an unrestrained passenger (i.e. there is no forward or side-facing seat directly behind the seat to be tested).

7.2.2. Test 2 shall not apply:

7.2.2.1. If the rear of the seat cannot be struck by a restrained passenger; or

7.2.2.2. If the seat behind is a forward-facing seat fitted with a 3-point belt with anchorages that comply fully with Regulation No. 14 (without derogation); or

7.2.2.3. If the seat fulfils the requirements of Appendix 6 to this Regulation.

7.3. When approved to Appendices 5 and 6, all tests shall apply, except as follows:

7.3.1. The test of Appendix 5 shall not apply if the rear of the seat cannot be struck by an unrestrained passenger (i.e. there is no forward or side-facing seat directly behind the seat to be tested).

7.3.2. The test of Appendix 6 shall not apply:

7.3.2.1. If the rear of the seat cannot be struck by a restrained passenger; or

7.3.2.2. If the seat behind is a forward-facing seat fitted with a 3-point belt with anchorages that comply fully with Regulation No. 14 (without derogation).

7.1.3. The torque to attach the seat anchorages in order to meet the requirements of Appendix 1 shall be specified by the vehicle manufacturer. This requirement does not apply to interlocking seat fixations and seat fixations with a force application.

7.1.3.1. If applicable the torque to attach the seat anchorages specified by the vehicle manufacturer shall be shown by a pictogram fixed to the seat.

7.1.3.2. The procedure to attach the seat and if applicable the torque to attach the seat shall be contained in the owner's manual of the vehicle.

~~7.3. When approved to Appendices 5 and 6, all tests shall apply, except as follows:~~

~~7.3.1. The test of Appendix 5 shall not apply if the rear of the seat cannot be struck by an unrestrained passenger (i.e. there is no forward or side-facing seat directly behind the seat to be tested).~~

~~7.3.2. The test of Appendix 6 shall not apply:~~

~~7.3.2.1. If the rear of the seat cannot be struck by a restrained passenger; or~~

~~7.3.2.2. If the seat behind is a forward-facing seat fitted with a 3-point belt with anchorages that comply fully with Regulation No. 14 (without derogation).~~

~~7.4.~~

7.4.4. Renumbering to 7.3., 7.3.1., 7.3.2., 7.3.3. and 7.3.4.

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Proposal for the 04 series of amendments to UN Regulation No.80

Rev.1/Add.79/Rev.2 ANS/505/Rev.1/Add.79/Rev.2	
10.1.1.	Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the seat and/or the vehicle still complies with the requirements, or
10.1.2.	Require a further test report from the Technical Service responsible for conducting the tests.
10.2.	Confirmation or refusal of approval, specifying the alterations shall be communicated by the procedure specified in paragraph 4.4. above to the Parties to the Agreement applying this Regulation.
10.3.	The Type Approval Authority issuing the extension of approval shall assign a series number for such an extension and inform thereof of the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 and/or Annex 2 to this Regulation.
11.	Production definitively discontinued If the holder of the approval completely ceases to manufacture a vehicle type approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication that authority shall inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 and/or Annex 2 to this Regulation.
12.	Transitional provisions
12.1.	As from the official date of entry into force of the 02 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 02 series of amendments.
12.2.	As from 1 November 2012 Contracting Parties applying this Regulation shall grant approvals only if the requirements of this Regulation, as amended by the 02 series of amendments, are satisfied.
12.3.	As from 1 November 2014, approvals granted in conformity with this Regulation shall cease to be valid, except those granted in conformity with the requirements of this Regulation as amended by the 02 series of amendments.
12.4.	As from 1 November 2014, Contracting Parties applying this Regulation may refuse first national or regional registration (first entry into service) of a vehicle which has not been type approved in conformity with the requirements of the 02 series of amendments to this Regulation.
12.5.	As from 1 November 2014 or as from the date of adoption of uniform test provisions for side-facing seats (i.e. this Regulation) as well as provisions for such seats regarding safety-belt anchorages (i.e. Regulation No. 14) and vehicles equipped with safety-belts (i.e. Regulation No. 16), whichever date is earlier, approvals granted under paragraph 1.5. of this Regulation shall cease to be valid.
12.6.	Even after the date of entry into force of the 02 series of amendments, approvals of the components to the 01 series of amendments to this Regulation shall remain valid and Contracting Parties applying this

- 12.5.** Even after the date of entry into force of the 02 series of amendments, approvals of the components to the 01 series of amendments to this Regulation shall remain valid and Contracting Parties applying this Regulation shall continue to accept them and shall not refuse to grant extensions of approval to the 01 series of amendments to this Regulation.
- 12.6.** As from the official date of entry into force of the 03 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 03 series of amendments.
- 12.7.** As from 24 months after the date of entry into force of the 03 series of amendments Contracting Parties applying this Regulation shall grant approvals for new vehicle types only if the requirements of this Regulation, as amended by the 03 series of amendments, are satisfied.
- 12.8.** Starting 60 months after the entry into force of the 03 series of amendments to this Regulation, Contracting Parties applying this Regulation may refuse national or regional type approval and may refuse first national or regional registration (first entry into service) of a vehicle which does not meet the requirements of the 03 series of amendments to this Regulation.
- 12.9.** Even after the date of entry into force of the 03 series of amendments, approvals of components to the 01 or 02 series of amendments to this Regulation shall remain valid and Contracting Parties applying this Regulation shall continue to accept them and shall not refuse to grant extensions of approval to the 01 or 02 series of amendments to this Regulation.

Regulation No. 80 Rev.02

Proposal for the 04 series of amendments to UN Regulation No.80

E/CE/324/Rev.1/Add.79/Rev.2 E/CE/TRANS/S05/Rev.1/Add.79/Rev.2	
	Regulation shall continue to accept them and shall not refuse to grant extensions of approval to the 01 series of amendments to this Regulation.
12.7.	As from the official date of entry into force of the 03 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 03 series of amendments.
12.8.	As from 24 months after the date of entry into force of the 03 series of amendments Contracting Parties applying this Regulation shall grant approvals only if the requirements of this Regulation, as amended by the 03 series of amendments, are satisfied.
12.9.	Starting 60 months after the entry into force of the 03 series of amendments to this Regulation, Contracting Parties applying this Regulation may refuse national or regional type approval and may refuse first national or regional registration (first entry into service) of a vehicle which does not meet the requirements of the 03 series of amendments to this Regulation.
12.10.	Even after the date of entry into force of the 03 series of amendments, approvals of components to the 01 or 02 series of amendments to this Regulation shall remain valid and Contracting Parties applying this Regulation shall continue to accept them and shall not refuse to grant extensions of approval to the 01 or 02 series of amendments to this Regulation.
13.	Names and addresses of Technical Services responsible for conducting approval tests and of Type Approval Authorities The Parties to the 1958 Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, issued in other countries, are to be sent.

- 12.9.** Even after the date of entry into force of the 03 series of amendments, approvals of components to the 01 or 02 series of amendments to this Regulation shall remain valid and Contracting Parties applying this Regulation shall continue to accept them and shall not refuse to grant extensions of approval to the 01 or 02 series of amendments to this Regulation.
- 12.10.** As from the official date of entry into force of the 04 series of amendments, no Contracting Party applying this Regulation shall refuse to grant or refuse to accept UN type-approvals under this UN Regulation as amended by the 04 series of amendments.
- 12.11.** As from 1 September [2019], Contracting Parties applying this UN Regulation shall not be obliged to accept UN type-approvals to the preceding series of amendments, first issued after 1 September 20[19].
- 12.12.** Until 1 September [2020], Contracting Parties applying this UN Regulation shall accept UN type-approvals to the preceding series of amendments, first issued before 1 September 20[19].
- 12.13.** As from 1 September [2020], Contracting Parties applying this UN Regulation shall not be obliged to accept UN type-approvals issued to the preceding series of amendments to this Regulation.
- 12.14.** Contracting Parties applying this UN Regulation shall not refuse to grant UN type-approvals according to any previous series of amendments to this UN Regulation or extensions thereof.

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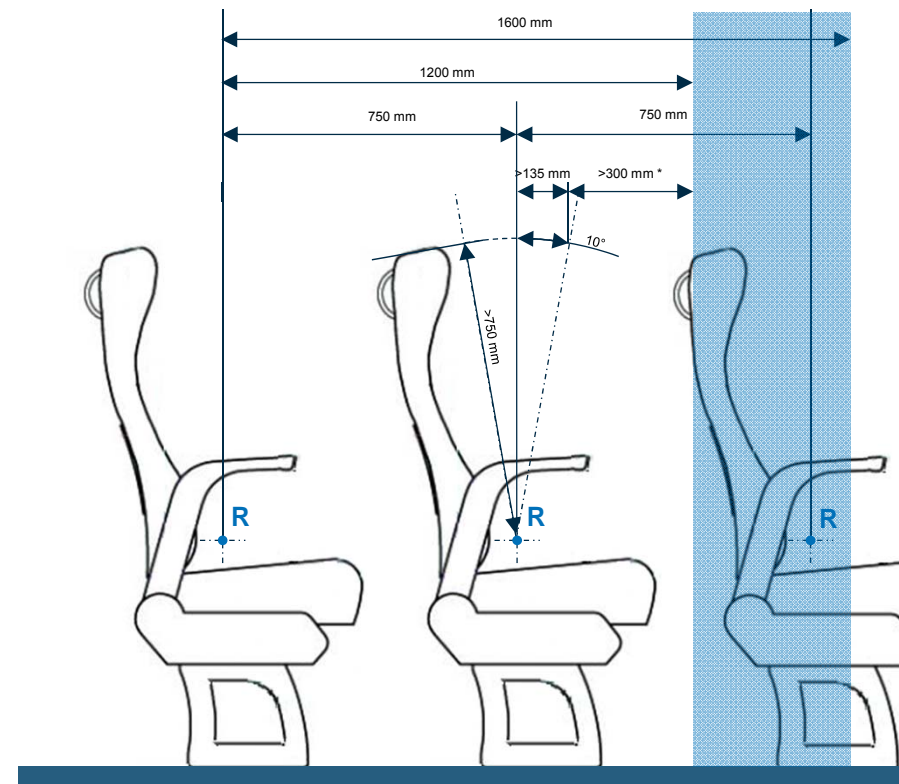
Proposal for the 04 series of amendments to UN Regulation No.80

Annex 1	
Test procedures for seats according to paragraph 5. and/or anchorages according to paragraph 6.1.2. and/or the installation of side-facing seats according to paragraph 3. of Appendix 7	
1.	Requirements
1.1.	The tests are to determine:
1.1.1.	If the seat occupant(s) is (are) correctly retained by the seat(s) in front of him (them) and/or by the use of a safety belt.
1.1.1.1.	This requirement shall be considered satisfied if the forward movement of any part of the trunk and the head of the manikin does not pass beyond the transversal vertical plane situated at 1.6 m from the R point of the auxiliary seat;
1.1.2.	If the seat occupant(s) is (are) not seriously injured.
1.1.2.1.	This requirement shall be considered satisfied if the following biomechanical acceptability criteria for the instrumented manikin, determined in accordance with Appendix 4, are met, that is:
1.1.2.2.	For a manikin in an auxiliary forward-facing seat the following biomechanical acceptability criteria have to be met:
1.1.2.2.1.	The head acceptability criterion HIC is less than 500;
1.1.2.2.2.	The thorax acceptability criterion (ThAC) is less than 30 g except for periods totalling less than 3 ms ($g = 9.81 \text{ m/s}^2$);
1.1.2.2.3.	The femur acceptability criterion (FAC) is less than 10 kN and the value of 8 kN is not exceeded for periods totalling more than 20 ms;
1.1.2.3.	For a manikin in an auxiliary side-facing seat the following biomechanical acceptability criteria have to be met:
1.1.2.3.1.	The head acceptability criterion HIC is less than 500;
1.1.2.3.2.	The thorax acceptability criteria:
	(a) Rib Deflection Criterion (RDC) less than or equal to 42 mm;
	(b) Soft Tissue Criterion (VC) less than or equal to 1.0 m/sec;
1.1.2.3.3.	The pelvis acceptability criterion:
	Pubic Symphysis Peak Force (PSPF) less than or equal to 6 kN;
1.1.2.3.4.	The abdomen acceptability criterion:
	Abdominal Peak Force (APF) less than or equal to 2.5 kN internal force (equivalent to external force of 4.5 kN).
1.1.3.	If the seat and the seat mountings are strong enough.
1.1.3.1.	This requirement shall be considered satisfied if:

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1. Requirements

- 1.1. The tests are to determine:
 - 1.1.1. If the seat occupant(s) is (are) correctly retained by the seat(s) in front of him (them) and/or by the use of a safety belt.
 - 1.1.1.1. This requirement shall be considered satisfied if the forward movement of any part of the trunk and the head of the manikin does not pass beyond the transversal vertical plane situated at ~~1.6 m~~ **1.2 m** from the R point of the auxiliary seat;
 - 1.1.2. If the seat occupant(s) is (are) not seriously injured.



* forward-displacement of loaded seat + movement

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Proposal for the 04 series of amendments to UN Regulation No.80

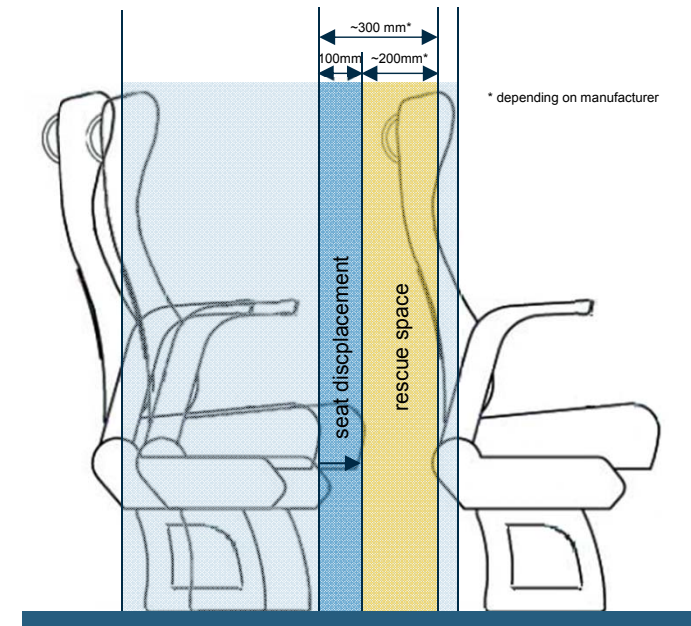
E/CE/TRANS/585/Rev.1/Amend.79/Rev.2 Appendix 1	
1.1.3.1.1.	No part of the seat, the seat mountings or the accessories becomes completely detached during the test.
1.1.3.1.2.	The seat remains firmly held, even if one or more anchorages are partly detached, and all the locking systems remain locked during the whole duration of the test.
1.1.3.1.3.	After the test no structural part of the seat or accessories has any fracture or sharp or pointed edges or corners likely to cause any bodily injury.
1.2.	All fittings forming part of the back of the seat or accessories thereto shall be such as to be unlikely to cause any bodily injury to a passenger during impact. This requirement shall be considered satisfied if any part contactable by a sphere 165 mm in diameter presents a radius of curvature of at least 5 mm.
1.2.1.	If any part of the fittings and accessories referred to above is made of a material of hardness less than 50 Shore A on a rigid backing, the requirements set out in paragraph 1.2. above shall apply only to the rigid backing.
1.2.2.	The parts of the back of the seat such as adjustment devices for the seat and accessories shall not be subject to any requirements of paragraph 1.2. if in the position of rest they are situated below a horizontal plane 400 mm above the reference plane, even if the occupant might enter into contact with them.
2.	Preparation of the seat to be tested
2.1.	The seat to be tested shall be mounted:
2.1.1.	Either on a testing platform representative of the body of a vehicle,
2.1.2.	Or on a rigid testing platform.
2.2.	The anchorage on the testing platform provided for the test seat(s) shall be identified to or have the same characteristics as that used in vehicle(s) in which the seat is intended to be used.
2.3.	The seat to be tested shall be complete with all upholstery and accessories. If the seat is fitted with a table, it shall be in the stowed position.
2.4.	If adjustable laterally, the seat shall be positioned for maximum extension.
2.5.	If adjustable, the seat back shall be adjusted so that the resulting inclination of the torso of the manikin used for determining the H-point and the actual torso angle for seating positions in motor vehicles is as close as possible to that recommended by the manufacturer for normal use or, in the absence of any particular recommendation by the manufacturer, as near as possible to 25° towards the rear in relation to the vertical.
2.6.	If the seat back is equipped with a head restraint adjustable for height, it shall be in its lowest position.
2.7.	Safety-belts of an approved type, conforming to Regulation No. 16 and mounted on anchorages installed according to Regulation No. 14 (including, if appropriate, the derogation provided in paragraph 7.4. to that Regulation) shall be fitted to both the auxiliary seat and the seat to be tested.

1.1.3.1.1.No part of the seat, the seat mountings or the accessories becomes completely detached during the test;

1.1.3.1.2.The seat remains firmly held, even if one or more anchorages are partly detached, and all the locking systems remain locked during the whole duration of the test;

This requirement shall be considered satisfied if no part of the anchorage of the seat has moved more than 100 mm in the direction of the test;

1.1.3.1.3.After the test no structural part of the seat or accessories has any fracture or sharp or pointed edges or corners likely to cause any bodily injury.



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Proposal for the 04 series of amendments to UN Regulation No.80

E/CE/324/Rev.1/Am.79/Rev.2 E/CE/TRANS/585/Rev.1/Am.79/Rev.2 Appendix 1	
1.1.3.1.1.	No part of the seat, the seat mountings or the accessories becomes completely detached during the test.
1.1.3.1.2.	The seat remains firmly held, even if one or more anchorages are partly detached, and all the locking systems remain locked during the whole duration of the test.
1.1.3.1.3.	After the test no structural part of the seat or accessories has any fracture or sharp or pointed edges or corners likely to cause any bodily injury.
1.2.	All fittings forming part of the back of the seat or accessories thereto shall be such as to be unlikely to cause any bodily injury to a passenger during impact. This requirement shall be considered satisfied if any part contactable by a sphere 165 mm in diameter presents a radius of curvature of at least 5 mm.
1.2.1.	If any part of the fittings and accessories referred to above is made of a material of hardness less than 50 Shore A on a rigid backing, the requirements set out in paragraph 1.2. above shall apply only to the rigid backing.
1.2.2.	The parts of the back of the seat such as adjustment devices for the seat and accessories shall not be subject to any requirements of paragraph 1.2. if in the position of rest they are situated below a horizontal plane 400 mm above the reference plane, even if the occupant might enter into contact with them.
2.	Preparation of the seat to be tested
2.1.	The seat to be tested shall be mounted:
2.1.1.	Either on a testing platform representative of the body of a vehicle,
2.1.2.	Or on a rigid testing platform.
2.2.	The anchorage on the testing platform provided for the test seat(s) shall be identified to or have the same characteristics as that used in vehicle(s) in which the seat is intended to be used.
2.3.	The seat to be tested shall be complete with all upholstery and accessories. If the seat is fitted with a table, it shall be in the stowed position.
2.4.	If adjustable laterally, the seat shall be positioned for maximum extension.
2.5.	If adjustable, the seat back shall be adjusted so that the resulting inclination of the torso of the manikin used for determining the H-point and the actual torso angle for seating positions in motor vehicles is as close as possible to that recommended by the manufacturer for normal use or, in the absence of any particular recommendation by the manufacturer, as near as possible to 25° towards the rear in relation to the vertical.
2.6.	If the seat back is equipped with a head restraint adjustable for height, it shall be in its lowest position.
2.7.	Safety-belts of an approved type, conforming to Regulation No. 16 and mounted on anchorages installed according to Regulation No. 14 (including, if appropriate, the derogation provided in paragraph 7.4. to that Regulation) shall be fitted to both the auxiliary seat and the seat to be tested.

2. Preparation of the seat to be tested

2.1. The seat to be tested shall be mounted:

~~2.1.1. — Either~~ on a testing platform representative of the body of a vehicle

~~2.1.2. — Or on a rigid testing platform.~~

~~2.2. — The anchorage on the testing platform provided for the test seat(s) shall be identified to or have the same characteristics as that used in vehicle(s) in which the seat is intended to be used.~~

~~2.3.~~

~~...~~

~~2.7.~~ Renumbering as 2.2., 2.3., 2.4., 2.5., and 2.6.

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Proposal for the 04 series of amendments to UN Regulation No.80

Rev.1/Add.79/Rev.2
UNR50/Rev.1/Add.79/Rev.2

3.	Dynamic tests
3.1.	Test 1 The testing platform shall be mounted on a trolley.
3.2.	Auxiliary seat The auxiliary seat may be of the same type as the seat being tested and shall be located parallel to and directly behind the seat being tested. The two seats shall be at the same height, adjusted identically and on a seat spacing of 750 mm.
3.2.1.	If an auxiliary seat of a different type is used this shall be mentioned in the communication form concerning the approval of a seat type and in conformity to the model in Annex 1 to this Regulation.
3.3.	Manikin
3.3.1.	The manikin shall be placed unrestrained on the auxiliary seat so that its plane of symmetry corresponds to the plane of symmetry of the seating position in question.
3.3.2.	Irrespective of the seating position of the dummy, the angle between the upper arm and the torso arm reference line on each side shall be $40^\circ \pm 5^\circ$. The torso arm reference line is defined as the intersection of the plane tangential to the front surface of the ribs and the longitudinal vertical plane of the dummy containing the arm. The legs shall be extended to the maximum and shall, if possible, be parallel; the heels shall touch the floor.
3.3.3.	Each manikin required shall be installed on a seat in accordance with the following procedure:
3.3.3.1.	The manikin shall be placed on the seat as close as possible to the desired position,
3.3.3.2.	A flat rigid surface 76 mm x 76 mm in area shall be placed as low as possible against the front of the manikin's torso,
3.3.3.3.	The flat surface shall be pressed horizontally against the manikin's torso at a load of between 25 and 35 daN;
3.3.3.3.1.	The torso shall be drawn forward by the shoulders to the vertical position, then laid back against the seat back. This operation shall be performed twice;
3.3.3.3.2.	Without the torso moving, the head shall be placed in a position such that the platform supporting the measuring instruments contained in the head is horizontal and that the median sagittal plane of the head is parallel to that of the vehicle (for side-facing seats, the median sagittal plane of the head shall be parallel to the vertical median plane of the seat).
3.3.3.4.	The flat surface be carefully removed,
3.3.3.5.	The manikin shall be moved forward on the seat and the installation procedure described above repeated,
3.3.3.6.	If necessary, the position of the lower members shall be corrected,
3.3.3.7.	The measuring instruments installed shall not in any way affect the movement of the manikin during impact,

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3. Dynamic test

3.1. Test 1

The testing platform shall be mounted on a trolley. **If applicable, the seats shall be attached to the testing platform with torque specified by the manufacturer.**

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Proposal for the 04 series of amendments to UN Regulation No.80

E/CE/TRANS/505/Rev.1/Add.79/Rev.2
Appendix 5

Appendix 5

Static test requirements and procedure

1. Requirements
 - 1.1. The requirements for seats tested according to this appendix are to determine:
 - 1.1.1. If the seat occupants are correctly retained by the seats in front of them;
 - 1.1.2. If the seat occupants are not seriously injured; and
 - 1.1.3. If the seat and the seat mountings are strong enough.
 - 1.2. The requirements of paragraph 1.1.1. above shall be considered satisfied if the maximum displacement of the central of application of each force prescribed in paragraph 2.2.1. measured in the horizontal plane and in the longitudinal median plane of the relevant seating position does not exceed 400 mm.
 - 1.3. The requirements of paragraph 1.1.2. above shall be considered satisfied if the following characteristics are met:
 - 1.3.1. The maximum displacement of the central point of application of each of the forces prescribed in paragraph 2.2.1., measured as described in paragraph 1.2., is not less than 100 mm.
 - 1.3.2. The maximum displacement of the central point of application of each of the forces prescribed in paragraph 2.2.2., measured as described in paragraph 1.2., is not less than 50 mm.
 - 1.3.3. All fittings forming part of the back of the seat or accessories thereto shall be such as to be unlikely to cause any bodily injury to a passenger during impact. This requirement shall be considered satisfied if any part contactable by a sphere 165 mm in diameter presents a radius of curvature of at least 5 mm.
 - 1.3.4. If any part of the fittings and accessories referred to above is made of a material of hardness less than 50 shore A on a rigid backing, the requirements set out in paragraph 1.3.3. above shall apply only to the rigid backing.
 - 1.3.5. The parts of the back of the seat such as adjustment devices for the seat and accessories shall not be subject to any requirements of paragraph 1.3.3. if in the position of rest they are situated below a horizontal plane 400 mm above the reference plane, even if the occupant might enter into contact with them.
 - 1.4. The requirements of paragraph 1.1.3. shall be considered satisfied if:
 - 1.4.1. No part of the seat, the seat mountings or the accessories becomes completely detached during the test;
 - 1.4.2. The seat remains firmly held, even if one or more anchorages is (are) partly detached, and all the locking systems remain locked during the whole duration of the test;
 - 1.4.3. After the test no structural part of the seat or accessories has any fracture or sharp or pointed edges or corners likely to cause any bodily injury.

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Appendix 5

Static test requirements and procedure


reserved

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E/CE/024/Rev.1/Add.79/Rev.2
E/CE/TRANS/05/Rev.1/Add.79/Rev.2
Annex 1

Communication
(Maximum format: A4 (210 x 297 mm))

 issued by: Name of administration:

Concerning: Approval granted
Approval extended
Approval refused
Approval withdrawn
Production definitively discontinued

of a seat type or types with regard to its (their) strength pursuant to Regulation No. 80

Approval No. Extension No.

1. Trade name or mark of the seat:
2. Seat type:
3. Manufacturer's name and address:
4. If applicable, name and address of the manufacturer's representative:
5. Additional information:
 - 5.1. Brief description of the seat type, its attachment fittings and its adjustment, displacement and locking systems including the minimum distance between fitting points:
 - 5.2. Position and arrangement of seats:
 - 5.3. Seats, if any, which incorporate a safety belt anchorage:
 - 5.4. Energy absorption test of the rear part of the seat-back: yes/no²⁾
 - 5.5. Drawings showing the area of the rear part of the seat-back verified for energy dissipation:

¹ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).
² Strike out what does not apply.

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Annex 1

5.1. Brief description of the seat type, its attachment fittings and its adjustment, displacement and locking systems including the minimum distance between fitting points **and if applicable, the torque for the seat fixation:**

~~5.7. Seat approved in accordance with paragraph 5.1. of this Regulation (static test): yes/no²⁾~~

~~5.8. Test according to Appendix 5: yes/no²⁾~~

5.9-7. Test according to Appendix 6: yes/no²⁾


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Proposal for the 04 series of amendments to UN Regulation No.80

E/ECE/024/Rev.1/Add.79/Rev.2
E/ECE/TRANS/505/Rev.1/Add.79/Rev.2
Annex 2

2

Communication
(Maximum format: A4 (210 x 297 mm))

 issued by: Name of administration:

Concerning: Approval granted
Approval extended
Approval refused
Approval withdrawn
Production definitively discontinued

of a type of a vehicle with regard to the strength of the seat anchorages pursuant to Regulation No. 80

Approval No. Extension No.

1. Trade name or mark of the vehicle:

2. Vehicle type:

3. Manufacturer's name and address:

~~4. Supplier's name and address of the seat anchorages:~~

5. Additional information:

5.1. Brief description of the vehicle type according to its anchorages and minimum value of the distance between the anchorages:

5.2. Make and type of type approved seats (if any):

5.3. For each row of seats: individual/bench, fixed/adjustable, fixed back/adjustable back, tipping back/inclining back:¹

5.4. Position and arrangement of seats (type approved seats and other seats):

~~5.5. Seats, if any, which incorporate a safety belt anchorage:~~

¹ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).
² Strike out what does not apply.

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- 5.1. Brief description of the vehicle type according to its anchorages and minimum value of the distance between the anchorages **applicable, the torque for the seat fixation.**

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Proposal for the 04 series of amendments to UN Regulation No.80

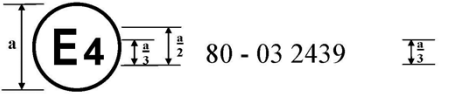
E/CE/TRANS/585/Rev.1/Add.79/Rev.2
E/CE/TRANS/585/Rev.1/Add.79/Rev.2
Annex 3

3

Arrangements of approval marks

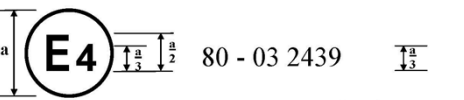
1. Arrangement in the approval mark for a seat

a = 8 mm min



The above approval mark affixed to a seat shows that the seat type concerned has, with regard to the strength of the seats, the test being carried out in accordance with paragraph 2 of Annex 4, been approved in the Netherlands (E4) under number 032439. The approval number indicates that the approval was granted in accordance with the requirements of Regulation No. 80 as amended by the 03 series of amendments.

2. Arrangement in the approval mark for a vehicle type



a = 8 mm min

The above approval mark, affixed to a vehicle, shows that this type of vehicle has been approved in the Netherlands (E4) under number 032439 with regard to the strength of the anchorages on the vehicle. The approval number indicates that the approval was granted in accordance with the requirements of Regulation No. 80 as amended by the 03 series of amendments.

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80 - ~~03~~ 04 2439

The above approval mark affixed to a seat shows that the seat type concerned has, with regard to the strength of the seats, the test being carried out in accordance with paragraph 2 of Annex 4, been approved in the Netherlands (E4) under number 032439. The approval number indicates that the approval was granted in accordance with the requirements of Regulation No. 80 as amended by the ~~03~~ 04 series of amendments.

80 - ~~03~~ 04 2439

The above approval mark, affixed to a vehicle, shows that this type of vehicle has been approved in the Netherlands (E4) under number 032439 with regard to the strength of the anchorages on the vehicle. The approval number indicates that the approval was granted in accordance with the requirements of Regulation No. 80 as amended by the ~~03~~ 04 series of amendments.

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