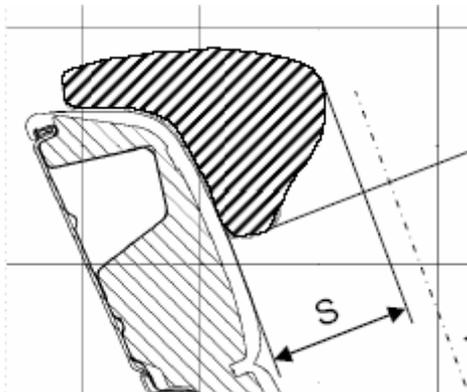


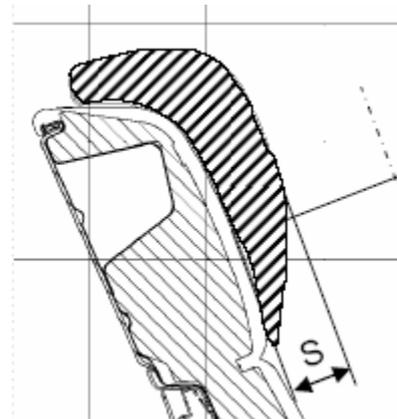
This is a draft proposal for the Global Technical Regulation (GTR) „head restraints“, to specify some more alternatives for non use positions of head restraints in rear seats. The proposal is based and integrated in the current draft text of the GTR head restraints from September 2005.

The text for the alternative “discomfort metric” (5.3.2.2) is based on the method of determine the height of the head restraint as currently given in ECE R17. The description of the 3D manikin in Annex 11 is also taken from ECE R17. The text of the possible “change of torso angle” is taken from the NPRM of FMVSS 202, dated January 2001.

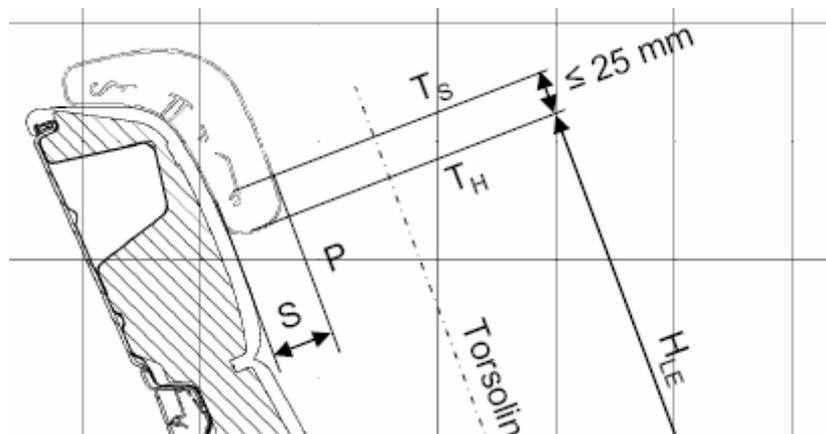
For the alternative “discomfort metric” there was added an additional criteria, where the thickness of the head restraint is measured in detail. The new criteria of measuring the thickness of the head restraint [25 mm] (to be defined) above the lower edge (see below) shall prevent some strange shapes or a very smooth lower edge, which would not be felt as discomfort for the occupant anymore.



“strange” shape, leading to more thickness of head restraint



“smooth” lower edge, may not be recognized as discomfort



new criteria: measuring of thickness S [25 mm] above lower edge



Draft text for GTR:

[...]

### 5.3 Non use position

A rear head restraint may be adjusted to a position at which its height does not comply with the requirements of 5.1.1 (*height of head restraint*) of this section. However, in any such position, the head restraint must meet either 5.3.1 or 5.3.2 of this section.

5.3.1 [... automatic return with 5<sup>th</sup> percentile dummy ...]

5.3.2 The non use position must be clearly recognizable to the occupant as not being included for the use as head restraint, by meeting either 5.3.2.1 or 5.3.2.2 or 5.3.2.3 or 5.3.2.4 of this section.

5.3.2.1 [... rotation of at least 60° ...]

5.3.2.2 Discomfort metric: When measured in accordance with Annex 10 §1, the lower edge of the head restraint ( $H_{LE}$ ) must be not more than [460 mm], but not less than [250 mm] from the R-Point and the thickness S shall not be less than [25 mm].

5.3.2.3 Marking: The head restraint must be marked with a label in accordance with Annex 10 §2.

5.3.2.4 Change of torso angle: The head restraint must, when tested in accordance with Annex 10 §3, cause the torso reference line angle to be at least 5 degrees closer to vertical than when the head restraint is in any position of adjustment in which its height is not less than that specified in 5.1.1 of this section and its backset is not more than that specified in 5.1.3 of this section.



## Annex 10

### Non use position test procedures

- 1 Discomfort metric

Demonstrate compliance with 5.3.2.2 in accordance with 1.1 through 1.4 of this section.
- 1.1 All lines, including the projection of the reference line, shall be drawn in the vertical median plane of the seat or seating position concerned, the intersection of such plane with the seat determining the contour of the head restraint and of the seat-back (see figure 4 of annex 10 to this Regulation).
- 1.2 Adjust the head restraint to its non use position.
- 1.3 Determine the height  $H_{LE}$  of the lower edge of the head restraint as shown in Figure 4:
  - 1.3.1 The manikin described in Annex 11 shall be placed in a normal position on the seat.
  - 1.3.2 The projection of the reference line of the manikin is then, in the seat concerned, drawn in the plane specified in paragraph 1.1 above. The tangent  $T_H$  to the bottom of the head restraint is drawn perpendicular to the reference line.
  - 1.3.3 The distance " $H_{LE}$ " from the R-point to the tangent  $T_H$  is the height to be taken into consideration in implementing the requirements of paragraph 5.3.2.2 of this regulation.
- 1.4 Determine the thickness  $S$  of the lower edge of the head restraint as shown in Figure 4:
  - 1.4.1 The projection of the reference line of the manikin is, in the seat concerned, drawn in the plane specified in paragraph 1.1 above. A tangent  $T_S$  is drawn above and parallel to the tangent  $T_H$ , as specified in 1.3.2, with a distance of not more than  $[25\text{ mm}]$  above. A parallel  $P$  to the torso reference line passing through the intersection of tangent  $T_S$  with the surface of the head restraint is drawn in the same plane. The distance " $S$ ", measured perpendicular to the torso reference line, from parallel  $P$  to the surface of the seat back at this position is the thickness to be taken into consideration in implementing the requirements of paragraph 5.3.2.2 of this regulation.

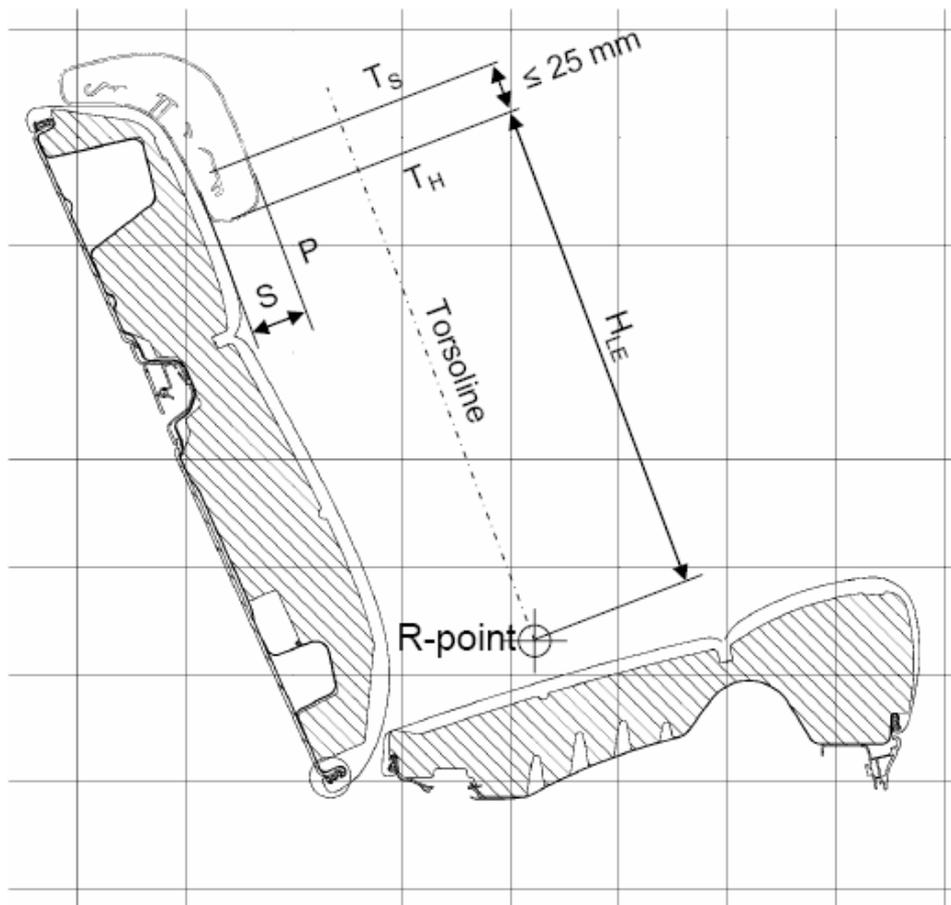


Figure 4

- 2 Marking: Demonstrate compliance with 5.3.2.3 in accordance with 2.1 of this section.
  - 2.1 The warning label, in the form of a pictogram which may include explanatory text, shall be durably affixed and located such that it is clearly recognisable by the occupant when entering the vehicle to the designated seating position. Examples of possible designs of pictograms are shown in figures [Y] to [Z] below.
- 3 Change of torso angle: Demonstrate compliance with 5.3.2.4 in accordance with 3.1 through 3.4 of this section.
  - 3.1 Place the head restraint into any position meeting the requirements of 5.1.1 of this section;
  - 3.2 Measure the torso reference line angle with the manikin described in Annex 11;
  - 3.3 Fold or retract the head restraint to any position in which its minimum height is less than that specified in 5.1.1 of this section or in which its backset is more than that specified in 5.1.3 of this section; and
  - 3.4 Again measure the torso reference line angle.

## Annex 11

### DESCRIPTION OF THE THREE DIMENSIONAL "H" POINT MACHINE <sup>1)</sup> (3 DH machine)

#### 1 BACK AND SEAT PANS

The back and seat pans are constructed of reinforced plastic and metal; they stimulate the human torso and thigh and are mechanically hinged at the "H" point. A quadrant is fastened to the probe hinged at the "H" point to measure the actual torso angle. An adjustable thigh bar, attached to the seat pan, establishes the thigh centreline and serves as a baseline for the hip angle quadrant.

#### 2 BODY AND LEG ELEMENTS

Lower leg segments are connected to the seat pan assembly at the T-bar joining the knees, which is a lateral extension of the adjustable thigh bar. Quadrants are incorporated in the lower leg segments to measure knee angles. Shoe and foot assemblies are calibrated to measure the foot angle. Two spirit levels orient the device in space. Body element weights are placed at the corresponding centres of gravity to provide seat penetration equivalent to a 76 kg male. All joints of the 3 DH machine should be checked for free movement without encountering noticeable friction.

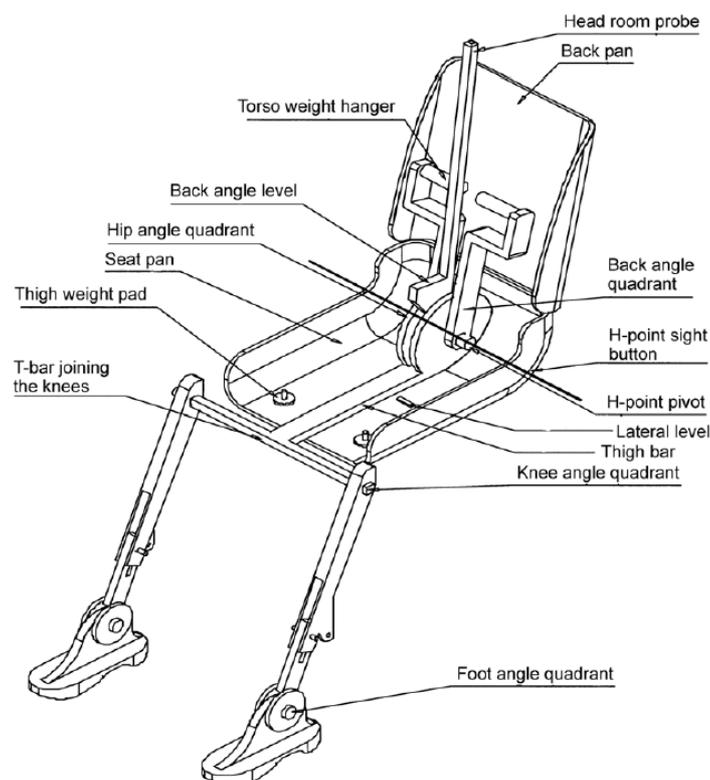


Figure 1 - 3 DH machine elements designation

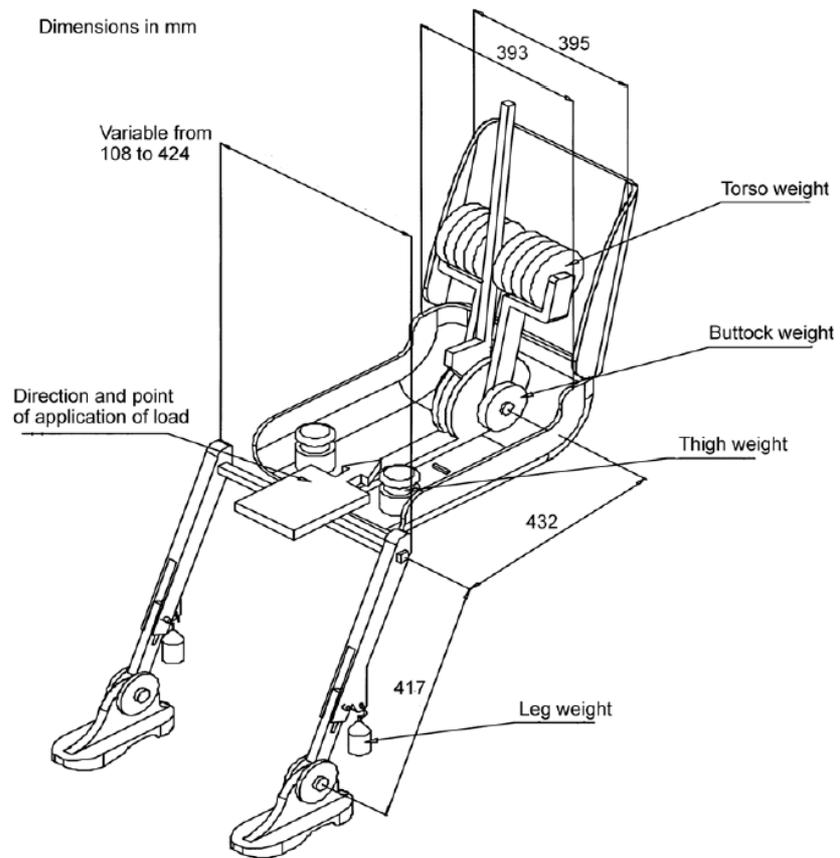


Figure 2 - Dimensions of the 3 DH machine elements and load distribution

<sup>1)</sup> For details of the construction of the 3 DH machine refer to Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale, Pennsylvania 15096, United States of America. The machine corresponds to that described in ISO Standard 6549-1980.