

ECE No. 17.08: Seat ECE No. 25.04: Head Restraint Technical requirement

The 61th Asia Expert meeting
5th – 6th Feb. 2020



JAPAN AUTOMOBILE STANDARDS INTERNATIONALIZATION CENTER



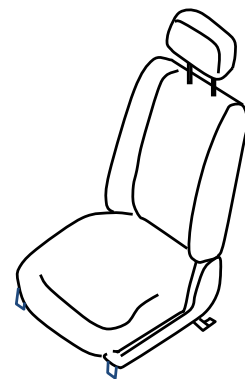
1. Scope

Strength of seats, their anchorages and head restraints

- M1 and N
- M2 and M3

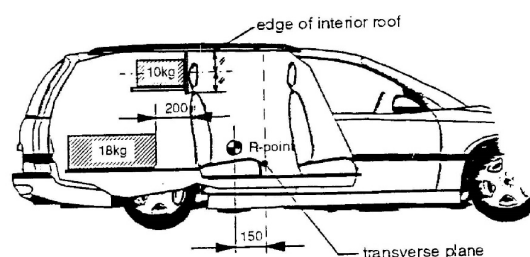
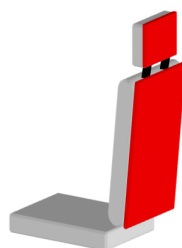
those not covered by Regulation No. 80
(Large passenger Vehicle Seat)
up to 01 series of amendments.

= All seats of Classes I and A vehicles and
driver's seat of other Classes



Design of the rear parts of seat-backs, Partition Systems

- M1

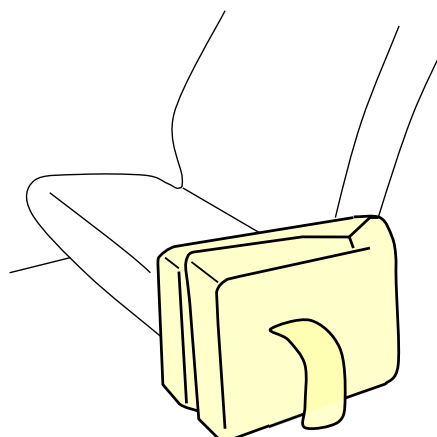


1. Scope

Exemption

- Folding, side-facing or rearward-facing seats, or to any head restraint fitted to these seats

Folding seat: A seat for which original arrangement is a folded position.



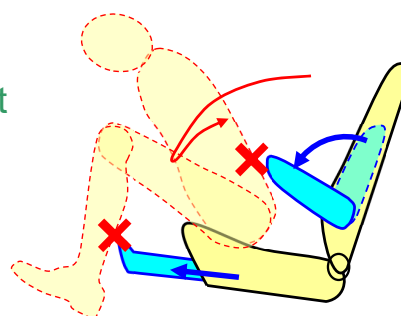
5.2. General Requirements for M1

5.2.1. General Requirements

- Adjustment and displacement system shall have a **locking system**.
- **Not required for comfort devices** such as armrests unless such devices will **cause additional risk of injury**.

Additional risk of injury:

If subject device may move or project and contact the occupant, causing an injury in the event of impact

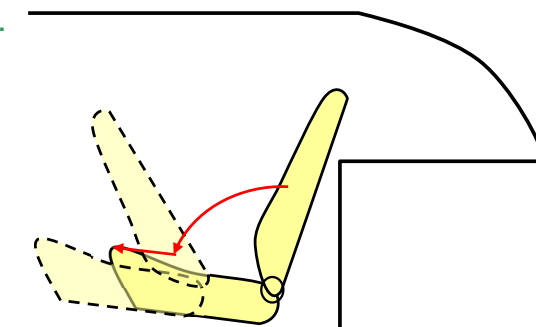


5.2. General Requirements for M1

5.2.2. Displacement system

- Unlocking control for “Displacement system” for easy access of occupants to the space behind the seat concerned (defined in 2.7) shall be placed on the **outside of the seat close to the door**.

* Unlocking control for such device to be used by rear seat passengers may not be placed on the outside of the seat close to the door.



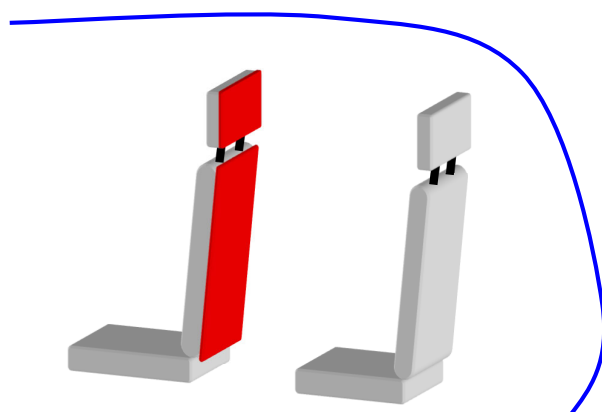
5.2. General Requirements for M1

5.2.3., 5.2.4. Rear Parts of Seats

- The surface up to the curve end shall be considered.
- Apply only to the rigid parts.

The Area **contacted by a 165 mm diameter sphere** when the seat is mounted in the vehicle.

(without deforming the flexible mesh components)



* Not apply to rearmost seats or back-to-back seats

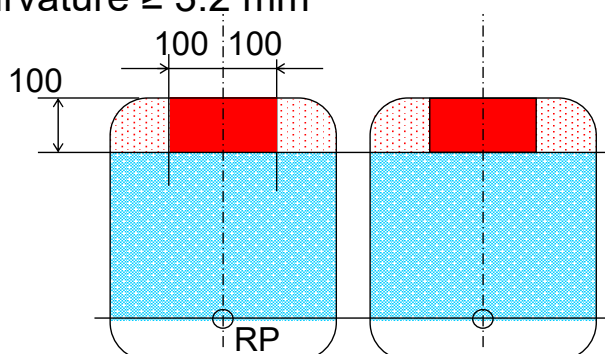
5.2. General Requirements for M1

5.2.3., 5.2.4. Rear Parts of Seats

Requirements

- Area 1: Pass the energy dissipation test and
Radii of Curvature ≥ 2.5 mm
- Area 2: Radii of Curvature ≥ 5.0 mm,
or 2.5 mm if they pass the energy-dissipation
test and the surface is padded.
- Area 3: Radii of Curvature ≥ 3.2 mm

Areas in separate seats
without head restraints
(defined in 6.8.1.)



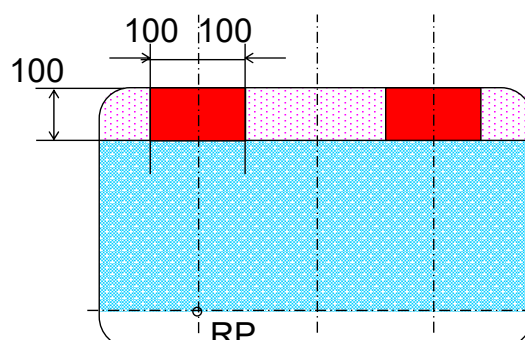
5.2. General Requirements for M1

5.2.3., 5.2.4. Rear Parts of Seats

Requirements

- Area 1: Pass the energy dissipation test and
Radii of Curvature ≥ 2.5 mm
- Area 2: Radii of Curvature ≥ 5.0 mm,
or 2.5 mm if they pass the energy-dissipation
test and the surface is padded.
- Area 3: Radii of Curvature ≥ 3.2 mm




Areas in bench seats
without head restraints
(defined in 6.8.1.)



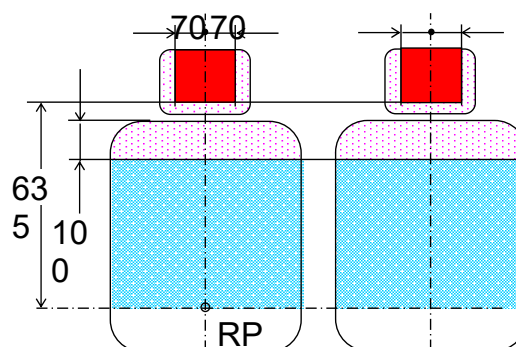
5.2. General Requirements for M1

5.2.3., 5.2.4. Rear Parts of Seats

Requirements

-  Area 1: Pass the energy dissipation test and
Radii of Curvature ≥ 2.5 mm
-  Area 2: Radii of Curvature ≥ 5.0 mm,
or 2.5 mm if they pass the energy-dissipation
test and the surface is padded.
-  Area 3: Radii of Curvature ≥ 3.2 mm

Areas in seats or bench
seats with head restraints
(defined in 6.8.1.)

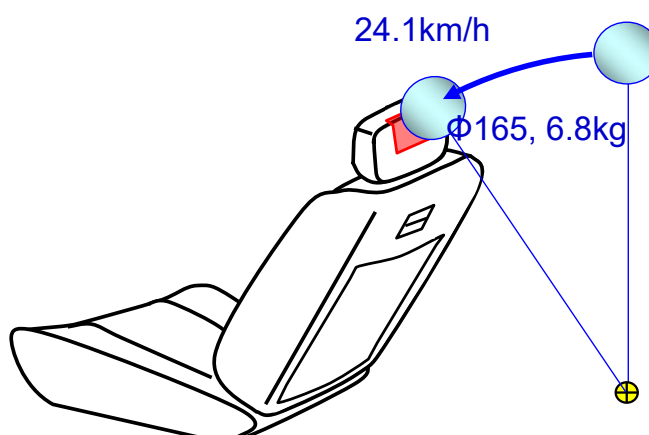


5.2. General Requirements for M1

5.2.3. Rear Parts of Seats

Energy Dissipation Test for Area 1

- Deceleration of the headform does not exceed **80 g** continuously for more than **3 ms**.
- **No dangerous edge** (rigid part) shall occur during or remain after the test



5.2. General Requirements for M1

5.2.4. Rear Parts of Seats --- Radii of Curvature

Exempted Areas

- *Parts covered with material softer than 50 shore A*

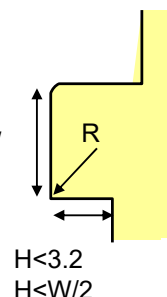


5.2. General Requirements for M1

5.2.4. Rear Parts of Seats --- Radii of Curvature

Exempted Areas

- Areas out of those 3 areas with a projection of less than 3.2 mm.
--- height of the projection is not more than half its width.
- Rear parts of seats situated below a horizontal plane passing through the lowest R point in each row of seats.
- Parts such as "flexible wire mesh*",
* such as springs or harnesses.

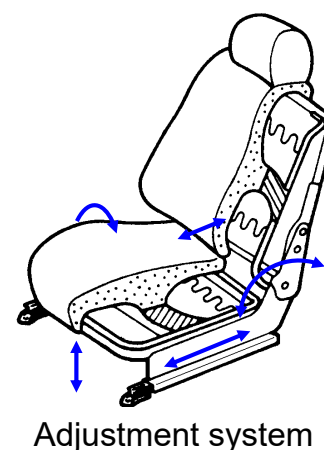
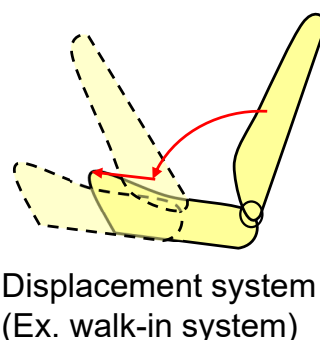
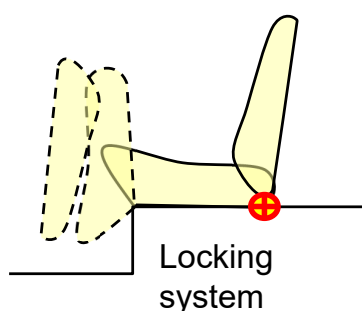


5.2. General Requirements for M1

Seats Performance(5.2.5 to 5.2.7)

Applicable Parts

- Seat frame or the seat anchorage
- Adjustment and displacement systems
- Locking devices of adjustment or displacement systems
- Locking systems



5.2. General Requirements for M1

Seats Performance(5.2.5 to 5.2.7)

Moment Test (6.2)

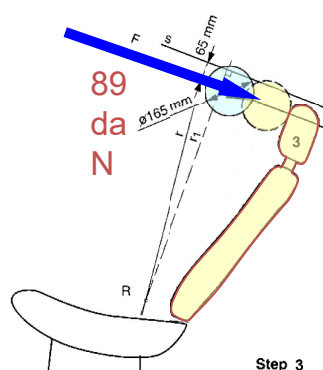
Note: 5.14 Exempted when No breakage
of the seat or seat-back occurred
after head restraint performance
test(6.4)

*In the case of a bench seat, where
part or all of the supporting frame
(including that of the head
restraints) is common* to more than
one seating position, the test shall
be conducted simultaneously for all
those seating positions. (6.4.2.)*



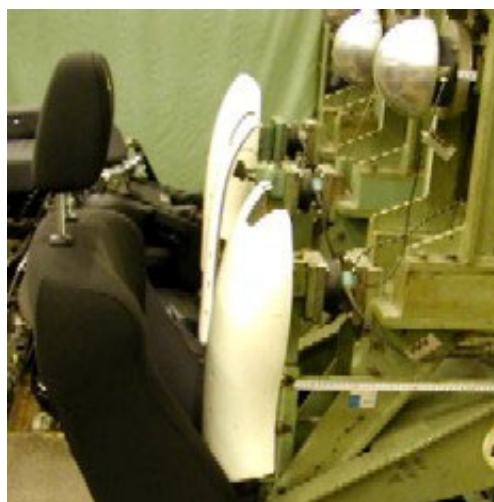
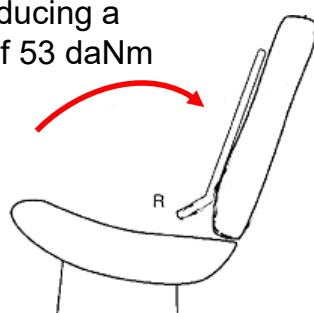
5.2. General Requirements for M1

With Head Restraint



Without Head restraint

Force producing a moment of 53 daNm



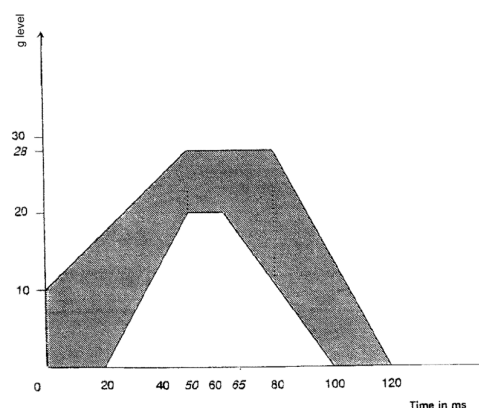
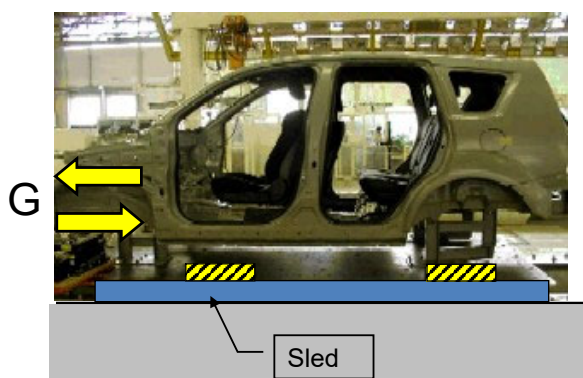
5.2. General Requirements for M1

Seats Performance (5.2.5 to 5.2.6)

Inertia Force Test (6.3)

Apply any of the following deceleration or acceleration

- Not less than 20 g for 30 milliseconds
- Direction imitating a frontal/rear collision
- Test pulse within the corridor below



- *May be replaced by a collision test of the complete vehicle(6.3.5.)*

5.2. General Requirements for M1

Seats Performance(5.2.5 to 5.2.6)

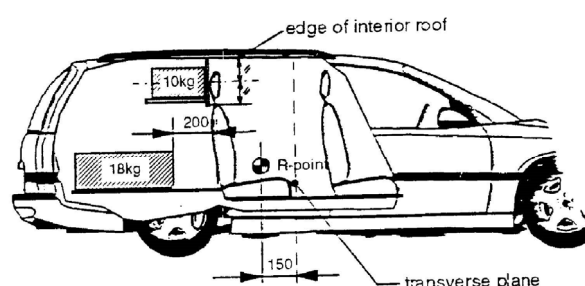
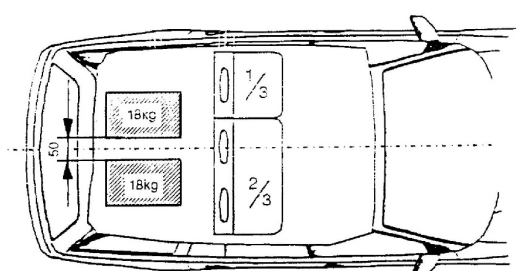
Requirements

- **No failure** during and after the test(5.2.5.)
 - Permanent deformations, including ruptures, may be accepted, provided that these do **not increase the risk of injury** in the event of a collision and the prescribed loads were sustained.
- Displacement system capable of being **unlocked** (5.2.7.)
- Permit the **displacement of the seat or the part of the seat** (5.2.7.)

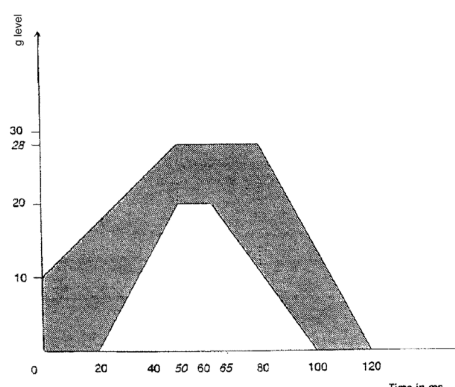
5.2. General Requirements for M1

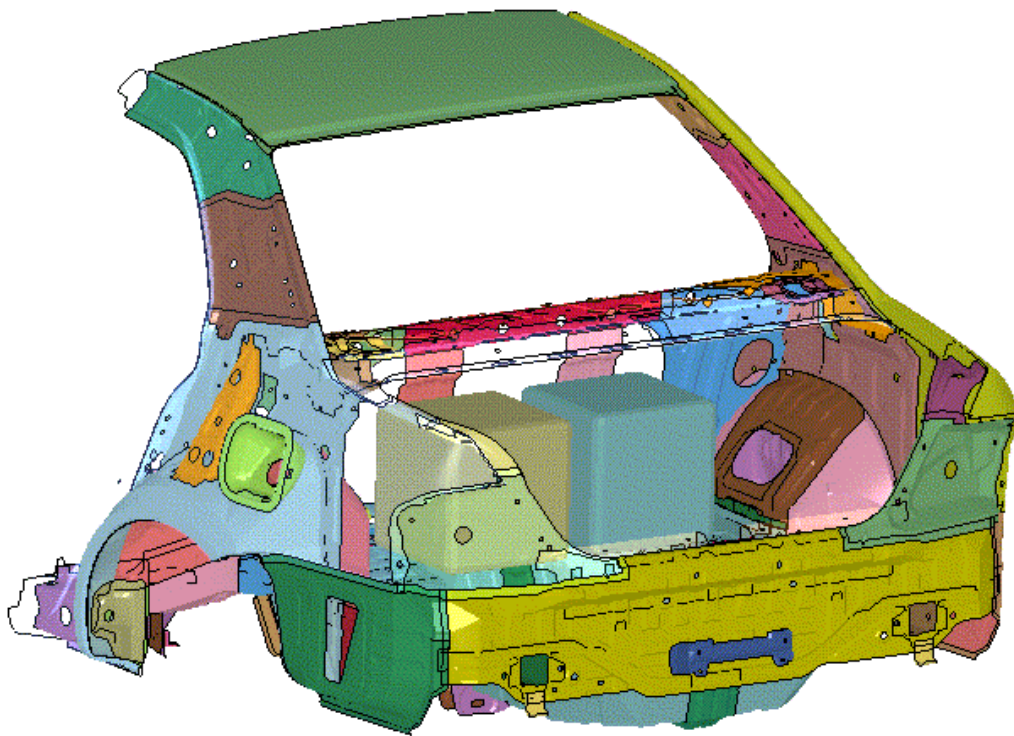
Seats Performance(5.2.5 to 5.2.7)

Displacement of Luggage Test (5.15, Annex 9)



- Body anchored securely to a test sled
- **Decelerated or** accelerated such that the curve remains within the area of the graph and the **total velocity change ΔV** is $50 \pm 0/-2$ km/h.





5.2. General Requirements for M1

Seats Performance(5.2.5 to 5.2.7)

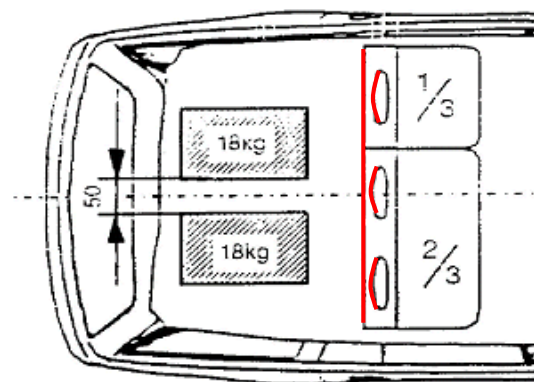
Requirements

- **No release** of the locking systems (5.2.6.)
- Displacement system capable of being **unlocked**(5.2.7.)
- Permit the **displacement of the seat or the part of the seat** (5.2.7.)

5.15. Protection from Displaced Luggage (M1)

Applicable parts

- **Seat-backs** and/or **head restraints** located such that they constitute the forward boundary of the luggage compartment (5.15.1)
- The **partitioning systems** may be positioned in place, if these systems are fitted as standard equipment (5.15.2)



Exemption (5.15.3)

- Luggage retention systems which are activated automatically in case of an impact

5.15. Protection from Displaced Luggage (M1)

Requirements (5.15.1, 5.15.2)

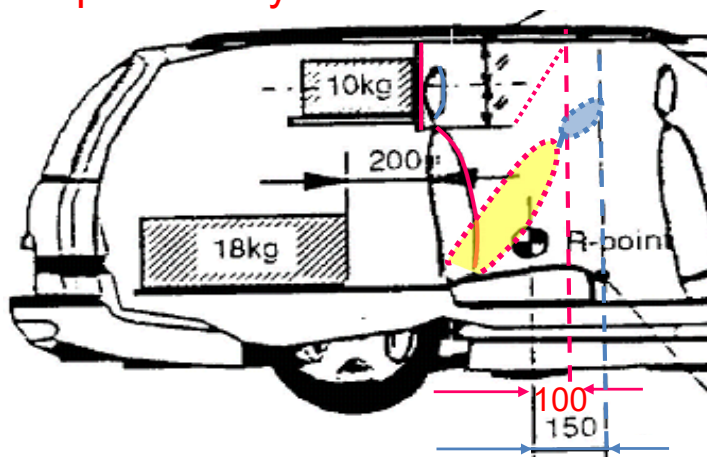
- Seat-back and its locking mechanism, and partition system shall remain in place.
- During the test, the test blocks shall remain **behind the seat-back(s)** in question.
- No sharp or rough edges shall be present in the partition system after the test.

5.15. Protection from Displaced Luggage(M1)

Requirements (5.15.1, 5.15.2)

Forward contour of the parts, that are harder than 50 Shore A, does not move forward of a transverse vertical plane which passes through the following point

- (a) **Head restraint** : 150 mm forward of the R point
- (b) **Seat-back/partition system**: 100 mm forward of the R point



5.3. Requirements for Other Categories

Categories

- N1, N2, N3
- M2 and M3

those not covered by Regulation No. 80
(Large passenger Vehicle Seat)
up to 01 series of amendments.

= All seats of Classes I and A vehicles and
driver's seat of other Classes

5.3. Requirements for Other Categories

Requirements

- Seats and bench seats must be **firmly attached** to the vehicle. (5.3.1)
- Sliding seats and bench seats must be **automatically lockable** in all the positions provided. (5.3.2)
- Adjustable seat-backs must be **lockable** in all the positions provided. (5.3.3)
- All seats which can be tipped forward or have fold-on backs must **lock automatically** in the normal position. (5.3.4)

5.4. Mounting of Head Restraints

Categories and Requirements

M1

- Mounting --- Every outboard **front** seat
- Specifications --- ECE R17(this regulation)

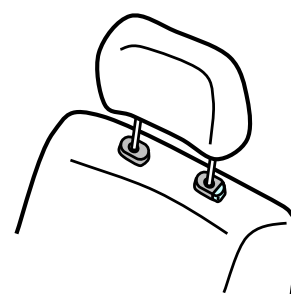
M2 ≤ 3,500kg and N1

- Mounting --- Every outboard **front** seat
- Specifications --- ECE R25

The requirements are almost equal to those of ECE R17.

Head Restraint not required by this regulation

- May be approved to ECE R17(Optional)



Mounting of Head Restraints

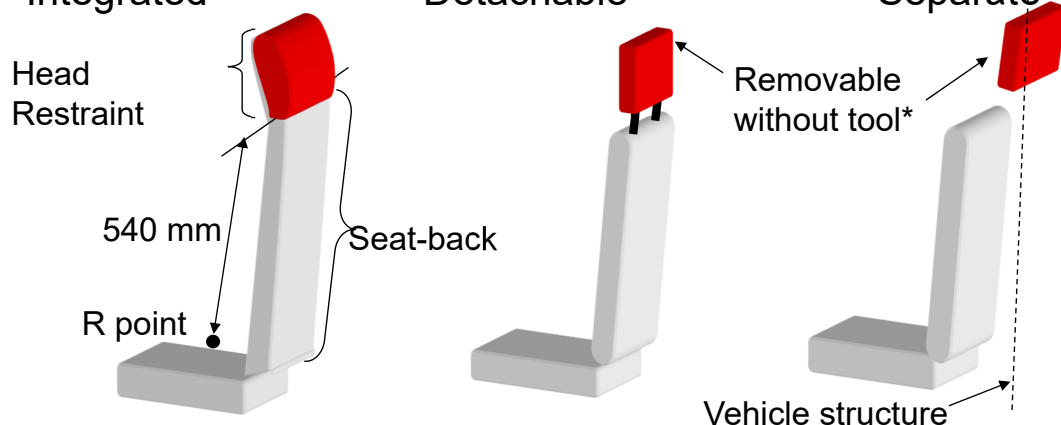
Applicable Components

Head restraint (3 types)

Integrated

Detachable

Separate



* If the use of tools or partial or complete removal of the seat covering is required for detachment of the head restraint, it is considered as an integrated head restraint.

5.5. Seats to be Fitted with Head Restraints

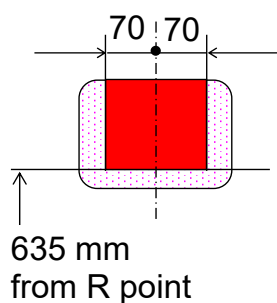
General Requirements

- No dangerous roughness or sharp edge in any position of use (5.5.1)
- Secured to the seat or to the vehicle (5.5.4)
 - No rigid and dangerous parts project from the padding* or attachment after the test

* *including padding of the head restraint, the anchorage, and the seat back*

5.5. Seats to be Fitted with Head Restraints

Requirements for **Front and rear faces** of the head restraints



Area 1: Meet energy dissipation test
(5.4.2, 5.6)
(See also 5.1.3 and Annex 6)

Area 2: Radii of Curvature ≥ 5.0 mm,
or 2.5 mm if they pass the
energy-dissipation test(5.4.3)

Exemption

- Rear faces of head restraints if no seat is provided behind the intended seat.(5.4.4)

5.5. Seats to be Fitted with Head Restraints



5.6. Height of Head Restraints

Height Requirements in use position* (mm)
(5.6.2 to 5.6.3, 5.6.5)

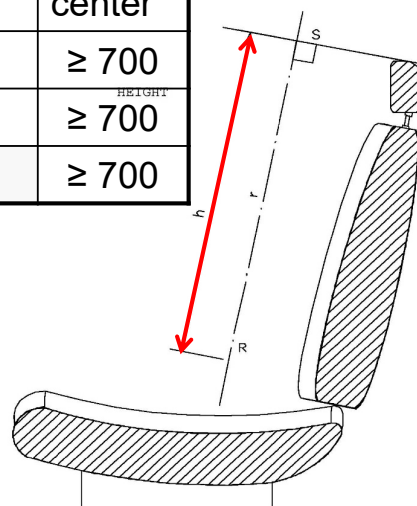
The head restraint must not be adjustable to the height less than the following, except for the non-use position.

		Front	Rear outboard	Rear center
Fixed		$\geq 800^*$	$\geq 750^*$	≥ 700
Adjustable	Highest	$\geq 800^*$	$\geq 750^*$	≥ 700
	Lowest	≥ 750	≥ 750	≥ 700

* Exempted in order to obtain clearance up to 25 mm between the head restraint and the interior surface of the vehicle**
In such cases, the lowest position shall not be less than 700 mm(5.6.4)

** *minimum clearance in all directions*

Measuring Procedure (5.6.1)



5.6. Height of Head Restraints

Retraction to Non-use Position

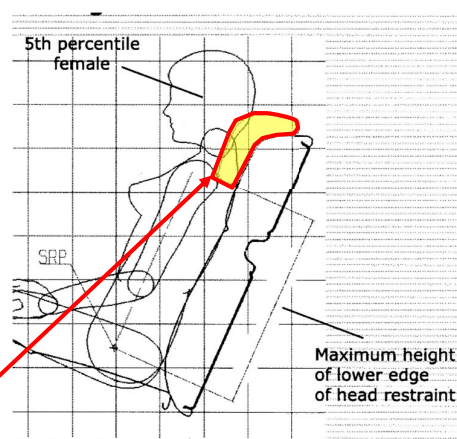
Front Seat (5.6.3.4)

- may be **automatically retracted** to the height **less than 750 mm** when the seat is not occupied, provided that it **automatically return** to the position of use when the seat is occupied.

Rear Seat (5.6.3.3)

- may be **retracted** to the height **less than 700 mm**, provided that it is **clearly recognizable** to the occupant as a “non-use” position.

ex. - not being able to be seated with comfort (see figure)
- providing a warning label



Interfering with shoulder

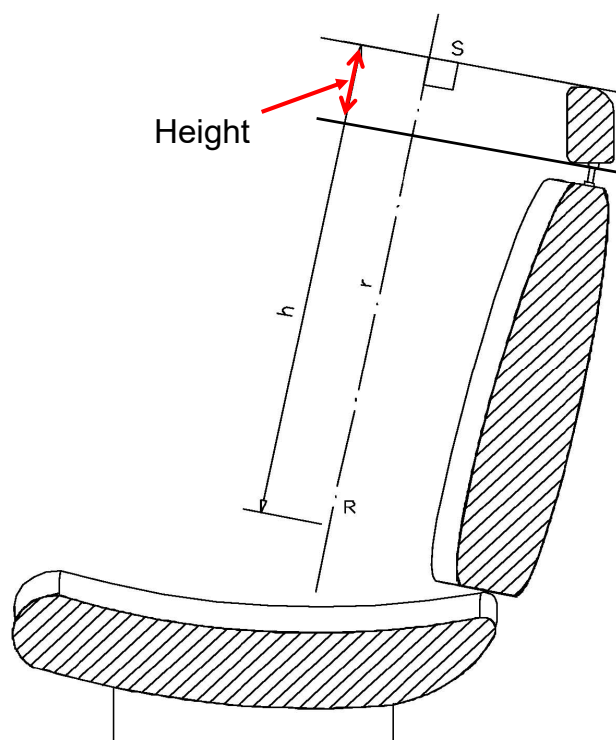
5.7.1. Part of Device on which Head Rests

Application

Head restraints adjustable for height:

Requirement

$\geq 100 \text{ mm}$



5.8. Gap between Seat-back and Head Restraint

If non-adjustable for height:

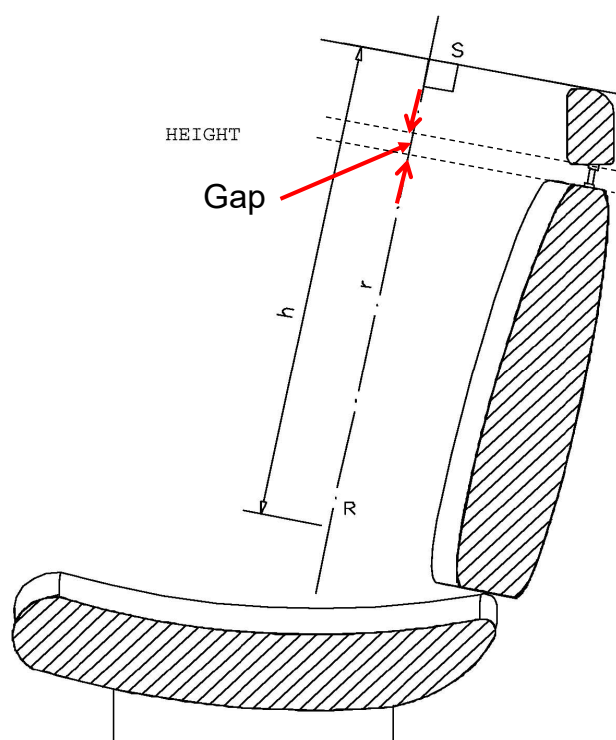
$\leq 60 \text{ mm}$

If adjustable for height:

$\leq 25 \text{ mm}$

in the lowest position

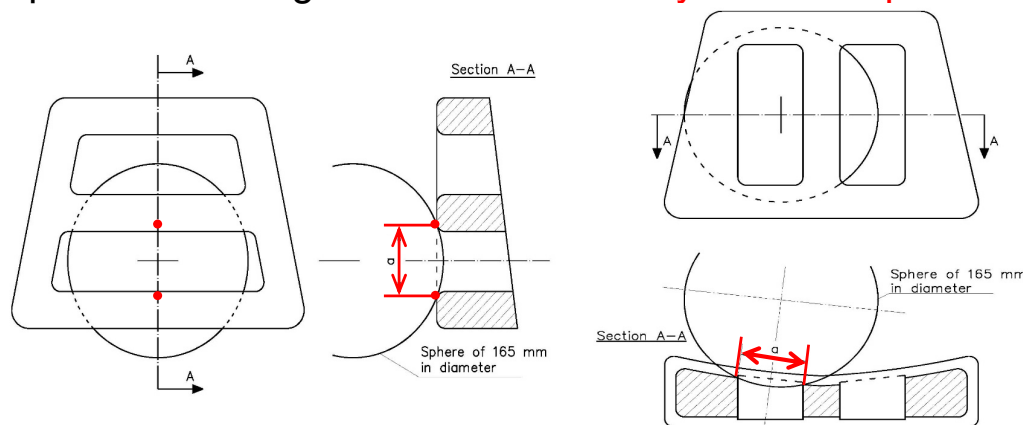
in all position for seats
with separate head restrair



5.9., 5.10. Gap within Head Restraint

Requirements

- Gap not exceeding 60 mm measured by 165 mm sphere.



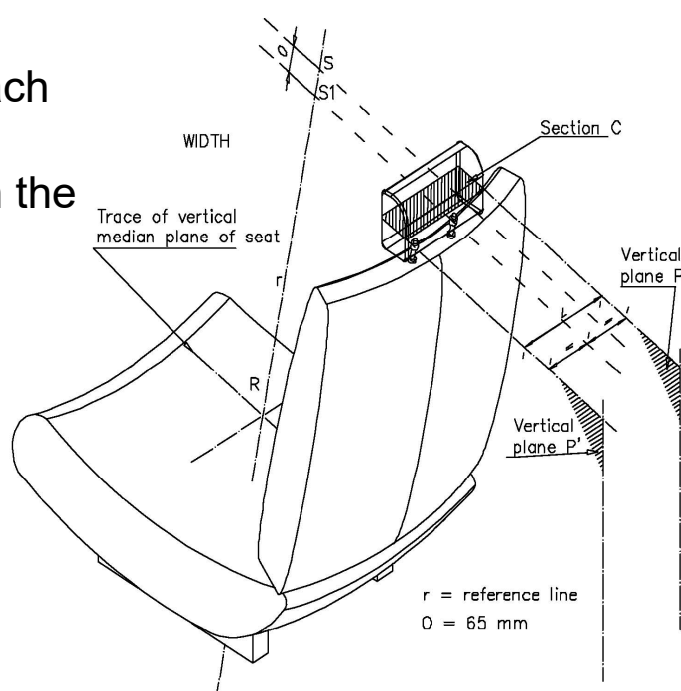
or

- Backward displacement less than 102 mm after applying a force producing a moment of 37.3 daNm (5.12.)

5.11. Head Restraint Width

Requirement

Not less than 85 mm to each side of the vertical median plane of the seat for which the head restraint is intended.



5.12. Backward Displacement

Test Condition

Force producing a moment of 37.3 daNm by 165 mm sphere

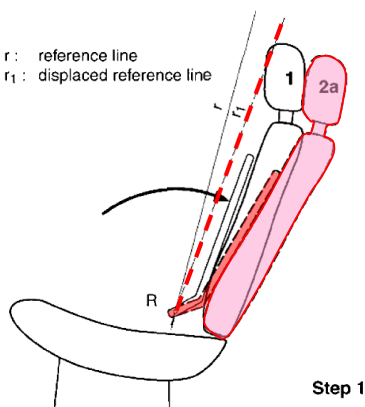
Requirement

Backward displacement(x) shall be less than 102 mm

1. and r:

Original unloaded position.

r : reference line
r₁ : displaced reference line

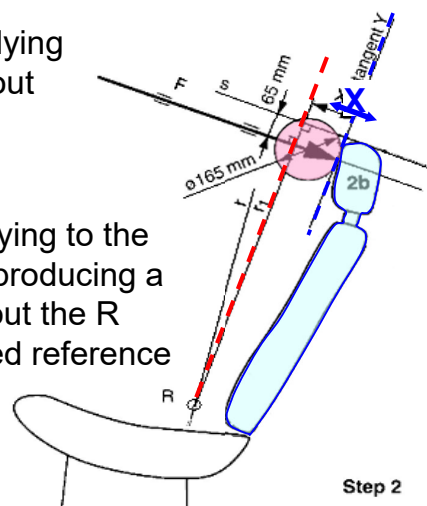


2a. and r1:

Displaced position after applying a moment of 37.3 daNm about the R point.

2b.:

Displaced position by applying to the 165 mm sphere a force F producing a moment of 37.3 daNm about the R point, keeping the displaced reference line r1 in place.



5.13. Head Restraint Strength

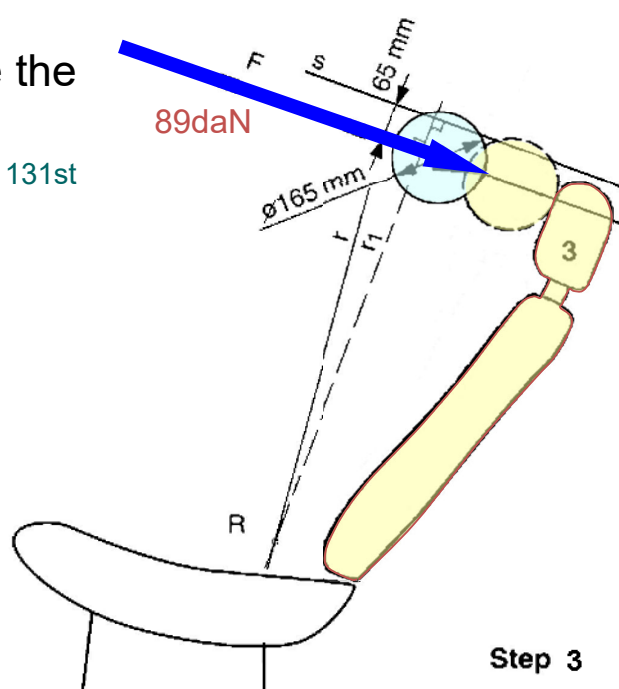
Test conditions

After the backward displacement test, increase the load to 89daN*.

* Amended as ECE R17-Rev.4-C1 at the 131st WP29(Nov., 2003).

Requirement

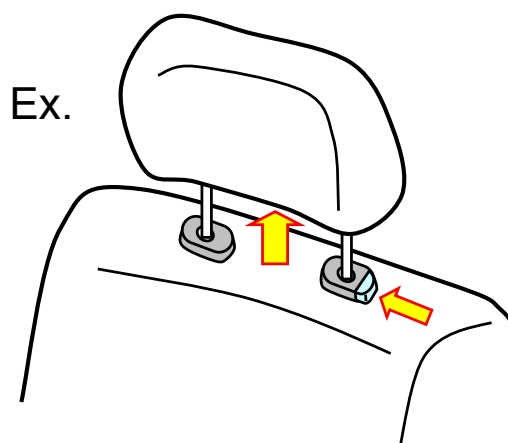
Bear without breakage



5.14. Prevention of Unintended Position

For adjustable head restraints

- Deliberate action by the user is required to raise the restraint beyond the maximum operational height (including removal by pulling upward)



ECE No.25 Head Restraint

**This can be covered and exempted
by ECE No.17 or No.80.**

1/	The head restraints which conform to the provisions of Regulation No. 17 are not required to conform to the provisions of this Regulation.
1/	Seats of category M2 vehicles with a maximum mass exceeding 3,500 kg and of category M3 vehicles type approved according to Regulation No. 80 are not required to conform to the provisions of this Regulation

1. Scope of R25 Head Restraint

Following components for vehicles of

ALL categories

- Head-restraints
- Seat backs which involve a part used as a head-restraint (integrated head-restraints).

Exemption

- **Category M1** vehicles if they conform to ECE Regulation No. 17.
- Folding, side-facing or rearward-facing seats.

Mounting of Head Restraints

Categories and Requirements

M1

- Mounting --- Every outboard seat
- Specifications --- ECE R17(this regulation)

M2 ≤ 3,500kg and N1

- Mounting --- Every outboard front seat
- Specifications --- **ECE R25**
The requirements are equivalent to those of ECE R17.

Head Restraint not required by this regulation

- May be approved to ECE R17(Optional)

6. General Specifications

Corresponding
clause of R17

6.1.	No dangerous roughness	5.5.1.
	Energy absorption	5.5.2.
	Exemption of rearmost head restraint	5.5.4.
6.2.	Provision of padding	5.5.3.
6.3.	Retention of head restraint	5.5.5.
6.4.	Height of head restraints	5.6.
6.5.	Height of head supporting area	5.7.
6.6.	Gap within head restraint	5.9., 5.10.
	Gap between seatback and head restraint	5.8.
6.7.	Width	5.11.
6.8.	Backward displacement	5.12.
6.9.	Strength	5.13.
6.10.	Prevention of Unintended Position	5.14.

Thank you!