

Protective Brace / Safety Positions for Passengers and Cabin and Cockpit Crew in Emergency Landing Conditions or Aborted Take-Off

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1 Crash-Optimised Brace/Safety Positions

This study is aimed at defining crash-optimised brace/safety positions for passengers and the cabin and cockpit crew in emergency landing conditions.

Presently, there is no clearly defined documentation of findings on brace/safety positions available. From the authorities' point of view, it is therefore not possible to give a uniform recommendation to airlines, which leads to inconsistent requirements of the airlines for their passengers and crew.

This study develops and documents a set of recommendations for the assumption of suitable brace/safety positions.

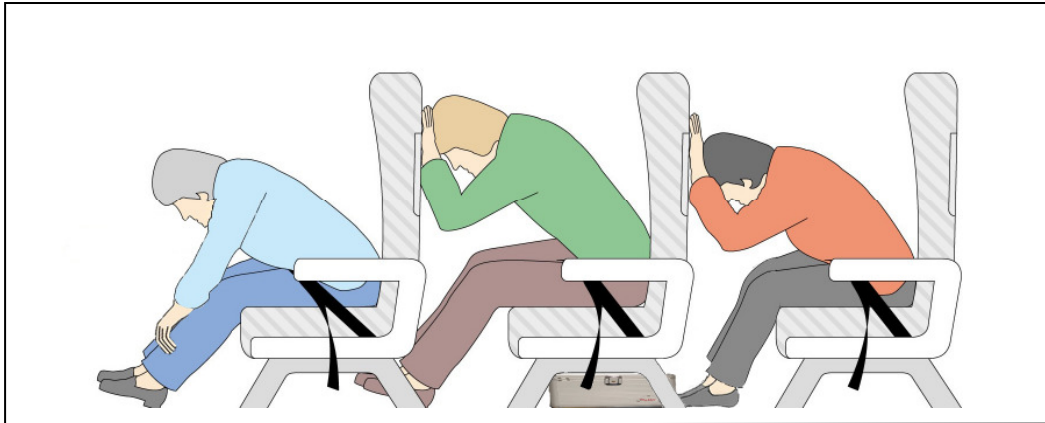
For this purpose, the findings and results achieved in the crash tests and accident analyses carried out as well as the existing studies are used and analysed according to the current standard of knowledge.

The brace/safety position recommended for the respective seat category means the lowest possible load to be expected for the occupants in a crash.

1.1 Passengers

1.1.1 Brace/safety position in forward-facing seats

- Slide well back in the passenger seat as far backward as possible towards the backrest with your buttock.
- The fastened belts must not be twisted.
- Tighten the seat belt across your pelvis firmly.
- Bend the upper torso well forward and place your head, if possible, against the backrest of the seat in front.
- Place hands flat to the left and right beside the head against the seat in front. Stretch out arms in the front row and grasp your lower legs with your hands.
- Stretch out legs and, if possible, place them flat against the rigid structure of the seat in front.
- Put any luggage under the seat in front and push it up to the front. Put your feet against the piece of luggage.
- Keep up this position until the aircraft has come to a complete stop.



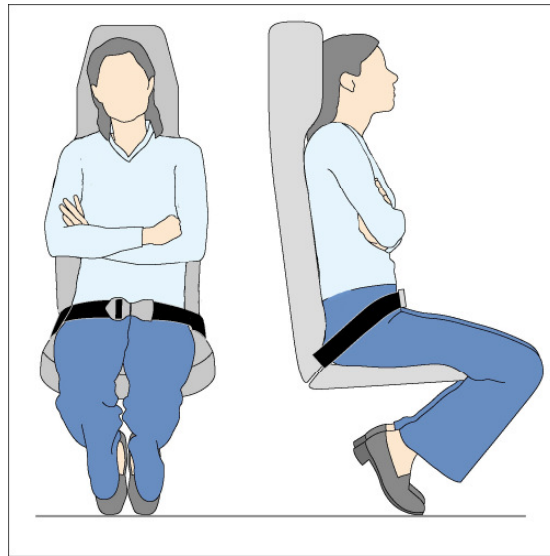
Brace/safety position in forward-facing seats

Important note for the transport of children

The above-outlined brace/safety positions are only applicable for occupants of a height of more than 1.25 m (approx. 6 to 7 years of age). According to the findings of the R&D project "Requirements for Child Restraint Systems in Aircraft" (L-5/95-50140/95) and "Examination for the Enhancement of the Cabin Safety of Infants" (L-2/97-50157/97) small occupants (children and infants) have to be fastened in their own seat in a suitable child restraint system. The correct restraint is defined in the specific aeronautical instruction of installation and use, attached to the respective child restraint system.

1.1.2 Brace/safety position in aft-facing seats

- Slide well back in the passenger seat as far backward as possible towards the backrest with your buttock.
- The fastened belts must not be twisted.
- Fasten lap belt and tighten it firmly.
- Lean back and head against the backrest.
- Cross arms in front of the thorax.
- Place legs together.
- Flex lower legs backward as far as possible.
- Place tips of toes on the floor.
- Keep up this position until the aircraft has come to a complete stop.

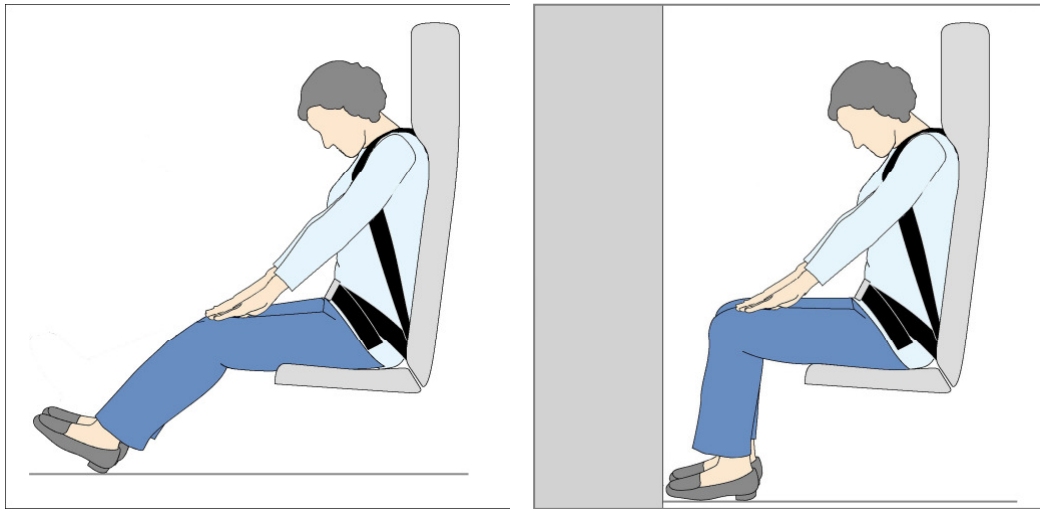


Brace/safety position in aft-facing seats

1.2 Cabin attendants

1.2.1 Brace/safety positions in forward-facing cabin attendant seats

- Slide well back in the seat as far backward as possible towards the backrest with your buttock.
- The fastened belts must not be twisted.
- Fasten lap belt and tighten it firmly.
- Fasten shoulder belt, and, if possible tighten them firmly.
- When tightening shoulder belt, make sure that the lap belt is not lifted towards the abdominal region.
- Lower chin on the chest.
- Stretch arms forward and put hands on the knees.
- Stretch out legs.
- If there is a partition ahead, place feet against it.
- Keep up this position until the aircraft has come to a complete stop.



(without partition)

(with a partition)

Brace/safety position in forward-facing cabin attendant seats

1.2.2 Brace/safety positions in aft-facing cabin attendant seats

- Slide well back in the seat as far backward as possible towards the backrest with your buttock.
- Fastened belts must not be twisted.
- Fasten lap belt and tighten it firmly.
- Fasten shoulder belt.
- Lean back and head against the backrest and, if possible, tighten shoulder belt firmly.
- When tightening the shoulder belt, make sure that the lap belt is not lifted towards the abdominal region.
- If there is no partition in the back, cross your arms in front of the thorax.
- If there is a partition in the back, place arms flat to the left and right beside your body against the partition in the back.
- Place legs together.
- Flex lower legs backwards as far as possible.
- Place tip of toes on the floor.
- Keep up this position until the aircraft has come to a complete stop.



Brace/safety position in aft-facing cabin attendant seats

1.3 Brace/safety positions for the cockpit crew

- Slide well back in the seat as far backward as possible towards the backrest with your lower dorsal region.
- Fastened belts must not be twisted.
- Fasten lap belt and tighten it firmly.
- Fasten shoulder harness, and, if possible, tighten it firmly.
- When tightening the shoulder harness, make sure that the lap belt is not lifted towards the abdominal region.
- Block automatic belts (if possible).
- Place hands and feet at the control elements.



Brace/safety position for the cockpit crew