

AEROSPACE RECOMMENDED PRACTICE

SAE ARP750

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Passenger Seat Design Commercial Transport Aircraft

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PASSENGER SEAT DESIGN
COMMERCIAL TRANSPORT AIRCRAFT

1. PURPOSE:

The purpose of this aerospace recommended practice (ARP) is to provide design criteria that will lead to seat designs which provide maximum safety for air transportation passengers.

NOTE: It is not the purpose of the ARP to specify design methods or specific designs to be followed in the accomplishment of the stated objectives.

2. INTRODUCTION:

2.1 Definitions (as used in this recommended practice):

2.1.1 Seat Assembly: One complete passenger seat unit, whether for single or multiple passenger occupancy normally removable as a unit from the aircraft. The seat assembly includes the seat structure, cushions, trim panels, armrests, dress covers, ashtrays, etc., and may include various options such as footrests, accessory pockets, tray tables (either attached to the passenger seat or plug-in type), flotation seat cushions or life vest provisions, underseat baggage restraint devices, automatic oxygen systems, passenger service and entertainment units (including multiplexing system components attached to seat), and passenger service cart tethering devices, as applicable. It shall not include passenger seat belts, air sickness containers, literature for passenger use, life jackets, headrest covers (antimacassar), or other loose equipment not normally supplied by aircraft seat manufacturers.

2.1.2 Seat Structure: That which provides the primary structural support and restraint link between the passenger and passenger seat belt and the aircraft fuselage structure under the conditions in 2.2.

2.1.3 Seat Secondary Structure: That which provides the requirements for occupant comfort, seat utility and appearance.

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- 2.1.4 Recline Lock Override: That design feature of a reclinable seat back which permits returning the seat back from any angle of recline to the normal upright position by the mere application of force in the direction of travel to the seat back.
- 2.1.5 Seat Back Breakover: The design feature that permits folding the seat back forward from the normal upright position by the mere application of force to the seat back.
- 2.1.6 Seat Design Ultimate Static Load: The highest design static load which the seat is capable of supporting for a minimum of three seconds without a failure which causes loss of restraint function. Design ultimate loads are 1.5 times the design limit loads, and the loading test requirements and test procedures are defined in NAS 809. (NOTE: Gust load conditions for specific aircraft may exceed the upward, downward or side loads specified in NAS 809. These conditions are defined in the specifications of the aircraft manufacturer.)
- 2.1.7 Passenger Weight: Minimum weight criteria as defined by the current FARs shall be used in developing static and dynamic test loads for the seat.
- 2.1.8 Standard Luggage Weight: A weight of 20 lb (9.07 kg) per passenger to be used in developing static and dynamic test loads for the seat.
- 2.1.9 Seat Separation Load: The static or dynamic load required to cause a failure of a nature that will permit detachment of the seat from the aircraft structure.
- 2.2 Scope: In addition to those aspects of a passenger seat as comfort and appearance, the passenger seat, whether aft, forward or side facing, is the basic link that supports and ties the occupant to the aircraft structure. It is essential that the support and tie down functions be accomplished in a manner that will provide maximum safety during all normal conditions of flight, emergency flight maneuvers and crash landings, whether on land or water, and that these functions are not compromised to attain the comfort and appearance features.

3. RECOMMENDATIONS:

3.1 General Provisions:

- 3.1.1 The Federal Aviation Regulations and Technical Standards Orders requirements for air transport passenger seats shall be considered as minimum requirements.
- 3.1.2 The seat structure shall be designed to absorb as much energy as possible after the seat design ultimate load is exceeded and before the seat separation load is reached.
- 3.1.3 Failure of the seat secondary structure under crash landing conditions shall not affect the strength of the seat basic structure, nor on failing shall it leave projections which could cause incapacitating or fatal injuries or trap the occupants.