

Issued 1992-03  
Revised 2001-01  
Reaffirmed 2006-11

Superseding ARP4120A

Foldable On-Board Wheelchairs for Passengers With Disabilities

RATIONALE

This document has been reaffirmed to comply with the SAE 5-year Review policy.

1. SCOPE:

This document provides design guidelines for an on-board wheelchair (OBW) used in commercial aircraft operations.

All Federal Regulations must be complied with.

2. REFERENCES:

2.1 Applicable Documents:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

ARP1315 Lavatory Installation  
AIR1815 Safe Carriage of Impaired and Disabled Passengers  
ARP4387 Cabin Accommodations for Passengers with Disabilities - Transport Aircraft  
AS8049 Performance Standard for Seats in Civil Rotorcraft and Transport Planes

2.1.2 U.S. Government Publications: Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

United States Code of Federal Regulations, Title 14  
Parts 25 and 121  
Part 382

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- 2.1.3 Related Publications: The following publications are provided for information purposes only and are not a required part of this SAE Aerospace Technical Report.

Architectural and Transportation Compliance Board - Guidelines for Aircraft Boarding Chairs, 1131 F Street, N.W., Suite 1000, Washington, DC 20004-1111

**3. TECHNICAL REQUIREMENTS:**

**3.1 Stowage/Functional/Operational:**

- 3.1.1 The OBW shall be foldable to minimize space requirements for stowage provisions in the aircraft. As a general guide, under seat stowage may be considered for most aircraft if overall width does not exceed 450 mm (17.7 in). Since under seat stowage height clearance varies, a 280 mm (11 in) maximum height should be used to assure that the OBW will fit under most seats. To assure adequate stowage space, each application requires a configuration study to verify proper fit, location, and security.

NOTE: Should the weight of the OBW exceed the carryon baggage weight of 9.1 kg (20 lb), a structural review will be required for the seat affected by the OBW storage to assure restraint per 14 CFR Part 25.

Stowage of wheelchairs under seat shall not be done in aisles that are used for emergency, overwing exits, or in areas where the wheelchair, upon impact, can impede or hinder evacuation.

- 3.1.2 The OBW should be capable of being moved on its own wheels, even when folded.
- 3.1.3 Operations required to unfold/fold the OBW shall be minimal. The design shall preclude pinching or injury during fold/unfold operations.
- 3.1.4 All locking/unlocking devices shall be designed so that unintended operations will not occur.
- 3.1.5 The method of engaging and disengaging locks shall be visible, identifiable, and readily accomplished by the person or flight attendant using the wheelchair.

**3.2 Design Requirements:**

- 3.2.1 The OBW shall be capable of being pushed from the rear.
- 3.2.2 To allow easy operation in the cabin, it is suggested that wheels shall have a diameter of no less than 90 mm (3.5 in) and a maximum contact area of 296 mm<sup>2</sup> (0.46 in<sup>2</sup>) on a hard surface with a 285 kg (625 lb) load applied at each wheel.
- 3.2.3 At least the front wheels shall be capable of swiveling to provide for ease of handling in the cabin. (All wheel caster swiveling may be desirable for "on spot turning".)

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- 3.2.4 A brake system shall be provided to effectively lock an OBW in a parked position. This feature shall preferably block the wheels. Actuation of the brake shall not degrade or affect the stability of the OBW when occupied. It may be desirable to actuate the brake from both the front and rear end of the OBW.
- 3.2.5 If armrests are provided, they shall be moveable so as to permit a clear transfer of the occupant.
- 3.2.6 A means shall be provided to support the upper torso of the OBW passenger. A means shall also be provided above the knees to keep legs in proper position.
- 3.2.7 Footrest(s) shall be provided. The OBW shall be designed so that it retains its stability, even if the user applies his/her full weight onto the footrest (which is possible during transition from OBW to seat and vice versa). Footrests shall be designed to fold.
- 3.2.8 Foldable assist handles shall be provided at the OBW back to aid the attendant in maneuvering the chair.
- 3.2.9 The OBW shall be designed to comply with the following loads without permanent deformation.
- 3.2.9.1 The overall OBW shall be capable of supporting 250 kg (555 lb) load uniformly distributed over the seat bottom or as a point load on the center of the seat bottom.
- 3.2.9.2 Each wheel shall be capable of carrying 130 kg (290 lb).
- 3.2.9.3 The armrests shall each be capable of carrying 130 kg (290 lb) download or 65 kg (145 lb) lateral. The loads shall be applied independently 50 to 75 mm (2 to 3 in) from the forward end of armrest.
- 3.2.9.4 The footrest(s) shall each be capable of withstanding a download of 130 kg (290 lb).
- 3.2.9.5 The seat back of the OBW shall be capable of withstanding an aft load of 90 kg (200 lb) at the top of the seat back.
- 3.2.9.6 Assist/carrying handles shall withstand a download of 130 kg (290 lb) each.
- 3.2.10 The OBW shall also have a conspicuously located placard that reads, "TO BE STOWED DURING TURBULENCE, TAXI, TAKEOFF (AND) LANDING".
- 3.2.11 The OBW shall have a conspicuously located placard or attached diagram which explains how to fold/unfold the OBW.