



U.S. Department
of Transportation
**Federal Aviation
Administration**

Memorandum

Subject: **ACTION:** Review and Concurrence, Equivalent Level of
Safety ; ACE-02-18

Date:

SEP 13 2009

From: Cessna 525B Project Manager, Wichita ACO

Reply to Mr. Paul Nguyen
Attn. of: ACE-118W

To: Manager, Small Airplane Directorate, ACE-100

Attn:

Background: Cessna Aircraft Company requested a finding of equivalent safety for the Cessna Model 525B, FAA Project Number AT3268WI-A, with respect to minimum dimensions of the passenger entry door as it applies to 14 CFR §23.783 (f)(1). The proposed certification basis for the Model 525B is 14 CFR Part 23, Commuter Category. The emergency exit provisions of 14 CFR §23.783(f)(1), for passenger entry doors, establish a minimum rectangular opening of not less than 24 inches wide by 48 inches high, and corner radii not greater than one-third the width of the opening. Cessna requested an Equivalent Level of Safety on the size of the Model 525B entry door opening. The Model 525B door opening is 20.06 inches wide at the top, 23.80 inches wide at the bottom and 50.83 inches high. The upper corner radii are 5.80 inches and lower corner radii are 5.62 inches.

Applicable regulations: Cessna Model 525B will be certified under commuter category; therefore, the passenger entry doors must meet the requirements of 14 CFR §23.783(f)(1)

Regulation Requiring an ELOS: 14 CFR §23.783(f)(1) specifies the passenger entry doors minimum rectangular opening is not less than 24 inches wide by 48 inches high, and corner radii not greater than one-third the width of the opening.

Compensating features which allow the granting of the ELOS: Cessna proposed that the Model 525B be certificated with a passenger entry door that does not comply with the dimensional requirements established for 14 CFR 23 Commuter Category aircraft.

Paragraph 23.783(f)(1).

(f) In addition, for commuter category airplanes, the following requirements apply:

(1) Each passenger entry door must qualify as a floor level emergency exit. This exit must have a rectangular opening of not less than 24 inches wide by 48 inches high, with corner radii not greater than one-third the width of the exit.

The Model 525B passenger entry door dimensions and design configuration is unchanged from all of Cessna's 500 and 525 series aircraft. The door opening is in the constant section of the cabin and has a circumferential opening of 58.80 inches. The door opening is 20.06

inches wide at the top and 23.80 inches wide at the bottom. The upper corner radii are 5.80 inches and lower corner radii are 5.62 inches. For a projected dimensional comparison between the 500/525 series aircraft and 14 CFR 23 Commuter Category rules, see Figures 1.0, 2.0, and Table 1.0.

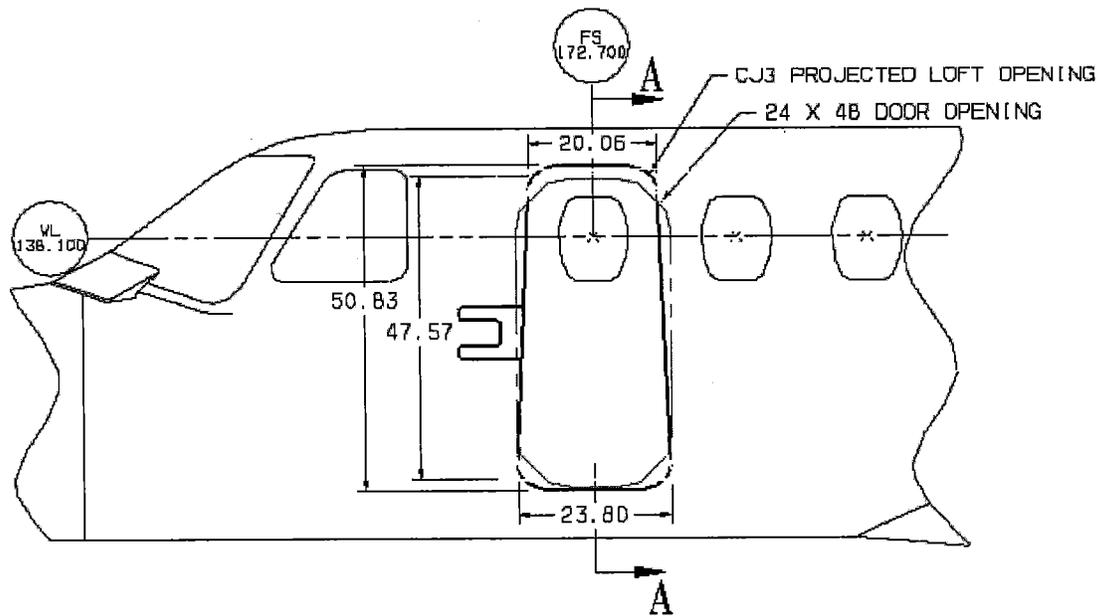


Figure 1.0

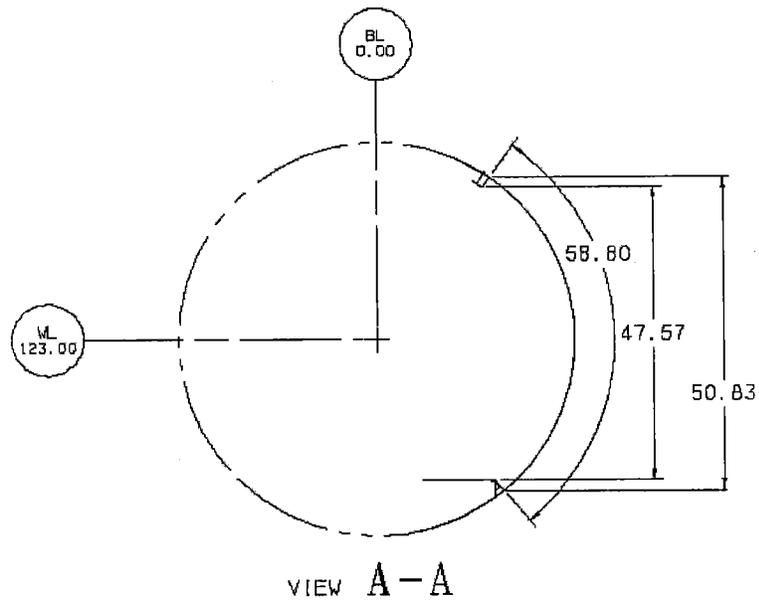


Figure 2.0

**Table 1.0
Door Opening Dimensions**

	§23.783(f)(1)	Model 525B CJ3
Width - Upper (inch)	24 minimum	20.06
Width - Lower (inch)	24 minimum	23.82
Height (inch)	48 minimum	50.83
Corner Radii - Upper (inch)	8 maximum	5.80
Corner Radii - Lower (inch)	8 maximum	5.62
Total Projected Egress Area (inch²)	1,097.1	1,031.0

The passenger entry door serves as one of the means for emergency egress. This door is certified under 14 CFR Part 25 rules on Cessna Models 550, 551, S550, 550 Bravo, 560, and 560 Encore. Each of these aircraft has a maximum capacity of eleven (11) passengers plus two (2) crewmembers. In addition, Models 525 and 525A are certified under 14 CFR Part 23 rules, with a maximum passenger capacity of six (6) passenger plus two (2) crewmembers and eight (8) passengers plus two (2) crewmembers respectively. These combined models represent a total fleet of 2,915 aircraft and have accumulated over 12,062,300 hours of flight time. The Model 525B will be designed with a standard interior configuration of six (6) passengers plus two (2) crewmembers and a maximum capacity of nine (9) passengers plus two (2) crewmembers in an optional configuration. Emergency egress testing of the passenger entry door was demonstrated on a Cessna Model 500 in September of 1976. This test was conducted with nine (9) passengers plus two (2) crewmembers. The results of this test are documented in report 500-7047-162. Based on this evacuation test, it can be concluded that passenger evacuation time and safety is not jeopardized by the 500/525 series passenger entry door size.

Explanation of how these features provide an ELOS: The passenger entry door opening size requirements of 14 CFR §23.783 were written to ensure passenger egress is not obstructed. The background information above demonstrates the ability of rapid and safe egress from all of Cessna's 500/525 series Citations and the FAA has concurred.

ACO Recommendation: The Wichita ACO recommends that an ELOS be granted for § 23.783(f)(1). The FAA notes that Cessna's request for equivalent level of safety is based

on data and rationale developed from a Cessna Model 500 emergency egress test in September 1976. These data have demonstrated that the differences in egress time and safety between this arrangement and arrangements that directly comply with 14 CFR § 23.783(f)(1) are very minimal. In this case, the data indicate that, in the dimensional variance door opening size used on the Cessna 525B, the overall effect on egress and safety is negligible.

Ronald K Rathgeber
Ronald K. Rathgeber, ACE-115W
Manager, Wichita Aircraft Certification Office

7/7/03

Concurrence:

For [Signature]
Manager, Standards Office, ACE-110

9-2-03

Date

Frank P. Posturing Jr
Manager, Small Airplane Directorate, ACE-100

9-3-03

Date