



Federal Aviation Administration

Memorandum

Date: March 3, 2015

To: Manager, Wichita ACO, ACE-115W

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: David Fairback, ACE-116W

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for Cabin Entry Door – Independence of Latch Securing Means and Locking System on a Cessna Model 680A airplane, FAA Project # Cessna-072100

ELOS Memo # Cessna-072100-S-5

Regulatory Ref: 14 CFR 25.783(d)(2)

This memorandum informs the certificate management aircraft certification office of an evaluation made by the Transport Airplane Directorate (TAD) on the establishment of an equivalent level of safety (ELOS) finding for the Cessna Model 680A airplane.

Background

Title 14, Code of Federal Regulations (14 CFR) 25.783(d)(2) states:

- (d) Latching and locking. The latching and locking mechanisms must be designed as follows:
 - (2) The latches and their operating mechanism must be designed so that, under all airplane flight and ground loading conditions, with the door latched, there is no force or torque tending to unlatch the latches. In addition, the latching system must include a means to secure the latches in the latched position. This means must be independent of the locking system.

The Model 680A cabin entry door latches are secured by a means that is not completely independent of the locking system.

Applicable regulation(s)

14 CFR 25.783(d)(2)

Regulation(s) requiring an ELOS finding

14 CFR 25.783(d)(2)

Description of compensating design features or alternative Methods of Compliance (MoC) which allow the granting of the ELOS (including design changes, limitations or equipment needed for equivalency)

Section 25.783(d)(2) requires a means to secure door latches in the latched position, in addition to the locks, and requires this securing means to be independent of the locking system. The intent of this requirement is to require robust design features in both the latching and locking systems to prevent doors from opening in flight, if opening could be a hazard. The compensating factors that provide an ELOS for the regulations not complied with are as follows:

- More latches are provided than are necessary to prevent the door from opening.
- A separate latch securing means is provided for each latch.
- Utilizing a common operating system for the six latch securing means and the six locks results in fewer mechanism components and subsequently fewer issues related to wear, backlash, friction, jamming, incorrect assembly, incorrect adjustment, parts becoming loose, disconnected, or unfastened, parts breaking, fracturing, bending, or flexing beyond the extent intended.
- The common operating system is held in the latched and locked position by the rotary actuator pawl which engages a feature on the inner handle.
- Incorrect adjustment of a latch securing means results in detectable system jams.
- Force in the latching direction is provided by an extension spring and, during pressurized flight, the vent panel. The latching direction force acts upon the common operating system.

Explanation of how design features or alternative Methods of Compliance (MoC) provide an ELOS to the level of safety intended by the regulation

The compensating factors raise the level of safety to that required by § 25.783(d)(2) by incorporating redundant, robust and independent design features that prevent the cabin entry door from opening in flight.

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned ELOS finding in project issue paper S-5. This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The TAD has assigned a unique ELOS memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS memorandum number must be listed in the Type Certificate Data Sheet under the Certification Basis section. An example of an appropriate statement is provided below.

Equivalent Level of Safety Findings have been made for the following regulation(s):

14 CFR 25.783(d)(2) Fuselage doors

(documented in TAD ELOS Memorandum Cessna-072100-S-5)



Transport Airplane Directorate,
Aircraft Certification Service



Date

ELOS Originated by Wichita ACO	David Fairback	ACE-116W
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