

Exemption No. 9593

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC 20591

In the matter of the petition of

**CESSNA AIRCRAFT
COMPANY**

for an exemption from Title 14 CFR
part 23, § 23.562(a)
of Title 14, Code of
Federal Regulations

Regulatory Docket No. FAA-2007-0107

GRANT OF EXEMPTION

By letter dated August 14, 2007, Mr. Kim Hackett, DOA Administrator, Cessna Aircraft Company, One Cessna Boulevard, Wichita, KS 67277-7704 petitioned the Federal Aviation Administration (FAA) on behalf of Cessna, for an exemption from §§ 23.562(a) of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would allow the Cessna Model 525C to install a multiple-place, side-facing divan into the aircraft using alternative testing criteria included herein.

The petitioner requests relief from the following regulations:

Sections 23.562(a): This section pertains to dynamic seat testing for forward and aft-facing aircraft seats. This petition, if granted, permits these airplanes to be certificated by using similar criteria that pertains to side facing seats.

The petitioner supports its request with the following information:

The petitioner states:

Rationale: "The multiple-place side facing couch is required to comply with the requirements of 14 CFR 23.562, however, the pass/fail injury criteria of these requirements were primarily developed for forward and aft facing seats and the FAA has

determined that the existing regulations do not provide adequate safety standards for occupants of side facing couches. For this reason the FAA has indicated that the only certification method available for side facing couches is through an exemption from 14 CFR 23.562(a).

“The following proposed injury criteria and testing will show that the multiple-place side facing couch will meet the existing injury criteria requirements of 14 CFR 23.562(c) and in addition will meet the requirements for TTI, lateral pelvic acceleration, and will show that body-to-body contact between the two occupants will not cause serious injury.”

Equivalent Level of Safety:

Proposed Injury Criteria:

“(a) Existing Criteria: All injury protection criteria of 14 CFR 23.562(c)(1) through (c)(7) apply to the occupants of the side facing couch. HIC assessments are only required for head contact with the seat and/or adjacent structures.

“(b) Body-to-body contact: Contact between the head, pelvis, torso or shoulder area of one ATD with another ATD’s head, pelvis, torso, or shoulder area during the tests conducted in accordance with 14 CFR 23.562(b) is allowed if the contact is minor and would not cause serious injury to either occupant. Contact of the legs, feet, arms and hands of the occupants is acceptable. Contact during rebound is allowed.

“(c) Thoracic Trauma: If the torso of an ATD at the forward most seat place impacts seat and/or adjacent structure during testing, compliance with Thoracic Trauma Index (TTI) injury criterion must be substantiated by dynamic test or by rational analysis based on previous test(s) of a similar seat installation. TTI data must be acquired with a Side Impact Dummy (SID), as defined by 49 CFR Part 572, Subpart F, or an equivalent ATD or a more appropriate ATD and must be processed as defined in Federal Motor Vehicle Safety Standard (FMVSS) Part 571.214, section S6.13.5. TTI must be less than 85, as defined in 49 CFR Part 572, Subpart F. Torso contact during rebound is acceptable and need not be measured.

“(d) Pelvis: If the pelvis of an ATD at any seat place impacts seat and/or adjacent structure during testing, pelvic lateral acceleration injury criteria must be substantiated by dynamic test or by rational analysis base on previous test(s) of a similar seat installation. Pelvic lateral acceleration must not exceed 130g. Pelvic acceleration data must be processed as defined in FMVSS Part 571.214, section S6.13.5.

“(e) Body-to-wall/furnishing contact: If the seat is installed aft of a structure such as an interior wall or furnishing that may contact the pelvis, upper arm, chest, or head of an

occupant seated next to the structure, the structure or a conservative representation of the structure and its stiffness must be included in the tests.

“(f) Occupant Retention: The forward side of the side facing couch requires a statically tested end closure or a means to prevent the occupant from sliding off the seat.”

Proposed Testing:

“(a) A minimum of one longitudinal test, conducted in accordance with the conditions specified in 14 CFR 23.562(b)(2)(3), is required to assess the injury criteria. Use a Side Impact Dummy (SID) or equivalent ATD or more appropriate ATD in the forward seat placed aft of the structural barrier. Use Hybrid II ATD or equivalent in all other seat places. The test will be conducted with 10 degrees yaw and with deformed floor. This test will show compliance to 14 CFR 23.562(c)(1)(2)(3)(4)(5)(6).

“(b) A minimum of one vertical test, conducted in accordance with the conditions specified in 14 CFR 23.562(b)(1), is required to assess the injury criteria. Use Hybrid II ATD or equivalent for the 60 degree pitch test. This test will show compliance to 14 CFR 23.562(c)(1)(2)(3)(4)(5)(7).”

Public Interest:

“Cessna Aircraft Company is a major U.S. corporation, which manufactures, sells, and services business aircraft to the domestic and international markets. Its manufacturing facilities are mainly located in the United States and its sales and service facilities are located in the United States and other locations throughout the world. The company employs thousands of employees in the United States providing strong support to the local economies where these employees and facilities are located. The owners and operators of Cessna business aircraft demand comfort from their executive passenger seating. The owners and operators very often prefer to configure their aircraft interiors to facilitate use of the interior space for in-flight conferences and other work not normally accomplished aboard airline aircraft. These interior configurations include side facing seating installations (couches). In order to satisfy the customer demands and maintain its marketing competitiveness, Cessna is seeking to accommodate side facing seating installations in its business aircraft. Doing this without compromising safety, can only increase the sales volume of these aircraft, benefiting Cessna, its employees and the local and national economies they support. Due to the high demand for these business aircraft, it is important that Cessna be granted the regulatory relief requested. The stabilizing effect that Cessna has on the job market is significant and is in the best interest of the public. Failure to achieve this goal will result in a significant loss of income for the national economy and will have a negative effect on both domestic and foreign trade for the United States.

“Other petitioners have been granted an exemption for the installation of multiple-place side facing couches for Part 25 aircraft, this includes, but is not necessarily limited to Dassault Aviation (Regulatory Docket No. 29583, January 2000), Bombardier Completion Centre (Regulatory Docket No. 29820, February 2000), Galaxy Aerospace Company and NORDAM Group (Regulatory Docket No. 30056, August 2000), and many more. These types of exemptions create unfair competition for Cessna, should Cessna be denied this petition.

“Granting this request for an exemption to Cessna is in the public interest as it allows the efficient transport of employees, corporate executives and important clientele in an environment that would otherwise be impossible without this relief.”

A summary of the petition was published in the Federal Register on January 3, 2008 (73 FR 535). No comments were received.

The FAA's analysis is as follows:

To obtain this exemption, the petitioner must show, as required by §§ 11.81(d) and (e) respectively, that granting the request is in the public interest and will not adversely affect safety.

While similar requests have been granted in the past, this exemption will be applied to the current associated rules and policy which have since changed as a result of ongoing testing. The FAA has carefully reviewed the information contained in the petitioner's request for exemption. The FAA agrees that the requirements proposed by Cessna, are similar to transport category requirements. Cessna will test the divans to the criteria included below. It should be noted that the proposed requirements have been revised to reflect 14 CFR part 23 rules.

The FAA's Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest and will not adversely affect safety when tested to the defined criteria. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator, Cessna is granted an exemption from 14 CFR § §§ 23.562(a) of Title 14, Code of Federal Regulations (14 CFR) to the extent necessary to allow type certification of the Cessna 525C airplane without an exact showing for compliance with these 14 CFR part 23 requirements. For the 525C, this exemption is subject to the following conditions and limitations listed below:

Conditions and Limitations

The following injury criteria and installation/testing guidelines represent the minimum acceptable standard for incorporation in an exemption from the general occupant injury criteria of § 23.562(a). Note that this addresses an exemption from the general occupant injury criteria of § 23.562(a) only for multiple-place, side-facing seats. Compliance with the structural requirements must be demonstrated for side-facing seats using the same conditions for the test and pass/fail criteria as for fore- and aft-facing seats.

1. Injury Criteria

(a) Existing Criteria: All injury protection criteria of § 23.562(c)(3) through (c)(7) apply to the occupants of side facing seating. Head Injury Criterion (HIC) assessments are only required for head contact with the seat and/or adjacent structures.

(b) Body-to-Body Contact: Contact between the head, pelvis, torso or shoulder area of one Anthropomorphic Test Dummy (ATD) with the adjacent seated ATD's head, pelvis, torso or shoulder area is not allowed during the tests conducted in accordance with § 23.562(b)(1) and (b)(2). Contact during rebound is allowed.

(c) Thoracic Trauma: If the torso of an ATD at the forward most seat place impacts seat and/or adjacent structure during testing, compliance with Thoracic Trauma Index (TTI) injury criterion must be substantiated by dynamic test or by rational analysis based on previous test(s) of a similar seat installation. TTI data must be acquired with a Side Impact Dummy (SID), as defined by 49 CFR Part 572, Subpart F, or an equivalent ATD or a more appropriate ATD and must be processed as defined in Federal Motor Vehicle Safety Standard (FMVSS) Part 571.214, section S6.13.5. TTI must be less than 85, as defined in 49 CFR Part 572, Subpart F. Torso contact during rebound is acceptable and need not be measured.

(d) Pelvis: If the pelvis of an ATD at any seat place impacts seat and/or adjacent structure during testing, pelvic lateral acceleration injury criteria must be substantiated by dynamic test or by rational analysis based on previous test(s) of a similar seat installation. Pelvic lateral acceleration must not exceed 130g. Pelvic acceleration data must be processed as defined in FMVSS Part 571.214, section S6.13.5.

(e) Body-to-Wall/Furnishing Contact: If the seat is installed aft of a structure such as an interior wall or furnishing that may contact the pelvis, upper arm, chest, or head of an occupant seated next to the structure, the structure or a conservative representation of the structure and its stiffness must be included in the tests. It is recommended, but not required, that the contact surface of the actual structure be covered with at least two inches of energy absorbing protective padding (foam or equivalent) such as Ensolite.

(f) Shoulder Strap Loads: Where upper torso straps (shoulder straps) are used for sofa occupants, the tension loads in individual straps must not exceed 1,750 pounds. If dual straps are used for restraining the upper torso, the total strap tension loads must not exceed 2,000 pounds.

(g) Occupant Retention: All side-facing seats require end closures or other means to prevent the ATD's pelvis from translating beyond the end of the seat at any time during testing.

2. General Guidelines

(a) All seat positions need to be occupied by ATDs for the longitudinal tests.

(b) A minimum of one longitudinal test, conducted in accordance with the conditions specified in § 23.562(b)(2), is required to assess the injury criteria as follows:

- For configurations without structure (e.g., wall, bulkhead) installed directly forward of the forward seat place, Hybrid II ATDs or equivalent must be in all seat places.
- For configurations with structure (e.g., wall, bulkhead) installed directly forward of the forward seat place, an SID or equivalent ATD or more appropriate ATD must be in the forward seat place and a Hybrid II ATD or equivalent must be in all other seat places.

(c) For the vertical test, conducted in accordance with the conditions specified in § 23.562(b)(1), Hybrid II ATDs or equivalent must be used in all seat positions.

Issued in Kansas City, MO, on February 1, 2008.



Kim Smith
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