

Exemption No. 8792

**UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98057**

In the matter of the petition of

Dassault Aviation

for an exemption from § 25.785(b) of
Title 14, Code of Federal Regulations

Regulatory Docket No. FAA-2006-24924

GRANT OF EXEMPTION

By letter dated May 5, 2006, your reference number DGT312857, Sebastien Merat, Dassault Aviation, Airworthiness Office, 54, avenue Marcel DASSAULT AVIATION, BP-24, 33701 Merignac, Cedex, France, petitioned for an exemption. The exemption requests relief from the general occupant protection requirements of Title 14 Code of Federal Regulations (14 CFR) 25.785(b). If granted, this exemption would allow installation of one or more side-facing divans on Dassault Aviation Falcon 7X airplanes.

The petitioner requests relief from the following regulation:

Section 25.785(b) requires general occupant protection for occupants of multiple-place side-facing seats that are occupied during takeoff and landing.

The petitioner's supportive information is as follows:

Background

Dassault Aviation's complete petition for exemption is available on the Department of Transportation's docket management website (DMS). To access the petition, go to <http://dms.dot.gov>. Click on Simple Search and enter the last 5 numbers of the docket number – 24924.

Dassault Aviation petitions for a permanent exemption from § 25.785(b) to install one or more side-facing sofas in the Falcon 7X model aircraft. Dassault Aviation's attached information supports this action and gives reasons why it is in the public interest and will not adversely affect safety.

Statement of Issue

Amendment 25-64 did not adequately consider side-facing sofa installations for transport category airplanes. Amendment 25-64 revises both the emergency landing conditions that must be considered in the design of the airplane and the static load conditions in § 25.561. Also, the amendment adds § 25.562, which requires dynamic testing for all seats approved for occupancy during take-off and landing with a focus on forward-facing seats.

As the existing regulations do not provide adequate safety standards for occupants of side-facing multiple occupant sofas, Dassault Aviation requests an exemption from the general requirements of § 25.785(b).

Petition

The Falcon 7X aircraft model is most often used for executive air transportation under parts 91 and 135 of 14 CFR. Due to the nature of the transportation involved, some customers request at least one side-facing sofa when limited to operation under parts 91 and 135.

Justification and Safety Considerations

Before Amendment 25-64, side-facing seats were not considered a novel design for transport category airplanes. They were routinely approved for installation in compliance with § 25.561 and commonly installed on Fan Jet Falcon Series, Mystere Falcon 50, Mystere Falcon 900 and Falcon 900EX airplanes, and aircraft models produced by other manufacturers.

Section 25.562 of Amendment 25-64 provides a means of enhancing occupant protection under more realistic conditions than had previously existed in terms of both test conditions and pass/fail criteria. The FAA recently published draft guidance (FAA draft issue paper CI-01, reference 2 of this petition) that clarifies FAA Policy Memorandum, "Side-Facing Seats on Transport Category Airplanes," dated November 19, 1997 (available at <http://www2.airweb.faa.gov/RGL>). This guidance concerns occupant protection criteria for multiple occupant side-facing divans. Dassault Aviation recognizes the FAA's primary considerations for multiple occupant side-facing divan installations being:

- "1. No contact between adjacent occupants,
- "2. Retention of occupants in the seat and restraint system.
- "3. Limitation of the load exerted on the torso and pelvis in the lateral direction.

“Consequently, Dassault Aviation desires to use the newly drafted version of the policy [see reference 2 of this petition, available in the Docket] for Falcon 7X divan designs and certification.

“Note: Similar exemptions were granted to Dassault Aviation for Falcon 2000 and 2000EX (exemptions number 7104A and 8007).

“Petitioner’s Proposed Injury Criteria

“In addition to compliance with the structural criteria of § 25.562(c)(7) and (c)(8), the following injury criteria are proposed for occupants of multiple place side-facing divans on the Falcon 7X aircraft:

“a. Existing Criteria: All injury protection criteria of § 25.562(c)(1) through (6) 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, 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 § 25.562(b)(1) and (b)(2). Contact during rebound is allowed.

“c. Body to wall/furnishing contact: If the sofa 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, a conservative representation of the structure and its stiffness must be included in the tests.

“d. Thoracic Trauma: If the torso of an ATD at the forward most seat place impacts the seat and/or adjacent structure during testing, 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. Testing must be conducted with a Side Impact Dummy (SID), as defined by 49 CFR Part 562, Subpart F, or its equivalent.

“e. Pelvis: If the pelvis of an ATD at any seat place impacts the 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 tests(s) of a similar seat installation. Pelvic lateral acceleration must not exceed 130g. Pelvic acceleration data must be processed as defined in FMVSS (Federal Motor Vehicle Safety Standard), Part 571.214, section S6.13.5.

“f. Shoulder Strap Loads: Where upper torso straps (shoulder straps) are used for the divan occupants, the tension loads in individual straps must not exceed 1750 pounds. If dual straps are used for retraining the upper torso, the total strap tension loads must not exceed 2000 pounds.

“Petitioner’s Proposed General Guidelines

“The general guidelines used for testing the sofa are listed below.

“a. All side-facing seats require end closures or other means to prevent the ATD from translating beyond the end of the seat at any time during testing.

“b. All seat positions need to be occupied by ATDs for the longitudinal tests. A minimum of one longitudinal test, conducted in accordance with the conditions specified in § 25.562(b)(2) is required to assess the injury criteria as follows. Note that if the seat is installed aft of a structure (for example, interior wall or furnishing) which does not have a homogeneous surface, an additional test(s) may be required to demonstrate that the injury criteria are met for the area which an occupant could contact. For example, different yaw angles could result in different injury considerations and may require separate tests to evaluate.

- “For configurations without structure (for example, wall or bulkhead) installed directly forward of the forward seat place, Hybrid II ATDs or equivalent must be installed in all seat places.
- “For configurations with structure (for example, wall or bulkhead) installed directly forward of the forward seat place, a SID or equivalent ATD must be in the forward seat place and a Hybrid II ATD or equivalent must be in all other seat places.
- “The test must be conducted with or without floor deformation.
- “The test must be conducted with either no yaw or 10 degrees yaw away from the critical contact angle (provided this 10 degrees yaw is within the yaw range specified in § 25.562(b)(2)) for evaluating occupant injury. Deviating away from the critical contact angle must not result in the critical area of contact not being evaluated.

“c. For the vertical test conducted in accordance with the conditions specified in § 25.562(b)(1), Hybrid II ATDs must be used in all seat positions.

“Public Interest”

The importance of business aviation to the U.S. economy cannot be overstated. Business aviation enables a company to maximize its two most important assets—people and time. The business aircraft office environment allows the travel time of busy executives and their guests to become productive time. Granting this exemption will permit the most efficient use of the aircraft cabin for business meetings and other commercial activities, which will significantly enhance the value of the aircraft to its owner/operator. Further,

granting this exemption will allow better and more comfortable rest area accommodations for busy executives and physically challenged passengers, as well as crewmembers that require rest to perform their flight duties in a safe and alert manner.

The FAA's public comment determination

The FAA has determined that good cause exists for waiving the requirement for Federal Register publication. A summary of this petition was not published in the Federal Register for public comment because the nature of this exemption is similar to those of previous petitions for which no public comments were received.

The FAA's analysis/summary is as follows:

Side-facing seats are considered a novel design for transport category airplanes that include Amendment 25-64 in their certification bases, and were not considered when those airworthiness standards were issued. Therefore, the existing regulations do not provide adequate or appropriate safety standards for occupants of multiple-place side-facing seats. The FAA has been conducting research to develop an acceptable method of compliance with § 25.785(b) for multiple-place side-facing seat installations. Without an acceptable method of compliance available, the FAA finds that it is in the public interest to grant an exemption to the petitioner for Dassault Aviation Falcon 7X airplanes. Note that this public interest argument does not justify granting exemptions once an acceptable method of compliance with § 25.785(b) is developed. As a result, it is the intent of the FAA to not grant similar exemptions once an acceptable method of compliance is developed.

In consideration of the foregoing, I find that a grant of exemption is in the public interest for the reasons specified by the petitioner. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator, Dassault Aviation is granted an exemption from the requirements of 14 CFR 25.785(b) for the general occupant protection requirements for occupants of multiple-place side-facing seats that are occupied during takeoff and landing on Dassault Aviation's Falcon 7X model airplanes. The following limitations apply to this exemption:

1. Existing Criteria: All injury protection criteria of § 25.562(c)(1) through (c)(6) apply to the occupants of side-facing seating. The Head Injury Criterion (HIC) assessments are only required for head contact with the seat and/or adjacent structures.
2. 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 § 25.562(b)(1) and (b)(2). Contact during rebound is allowed.
3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. Test Parameters:

(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 § 25.562(b)(2), is required to assess the injury criteria as follows. Note that if a seat is installed aft of structure (for example, an interior wall or furnishing) that does not have a homogeneous surface, an additional test(s) may be required to demonstrate that the injury criteria are met for the area which an occupant could contact. For example, different yaw angles could result in different injury considerations and may require separate tests to evaluate.

- For configurations without structure (for example, 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 (for example, 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.
- The test may be conducted with or without deformed floor.
- The test must be conducted with either no yaw or 10 degrees yaw for evaluating occupant injury. Deviating away from the no yaw condition must not result in the critical area of contact not being evaluated. Allowing the test to be conducted at 10 degrees yaw will permit many occupant injury tests to be considered the structural test as well and is considered acceptable since an exemption is sought in lieu of compliance with part 25. Note that this condition does not provide relief from the requirement that torso restraint straps, where installed, must remain on the occupant's shoulder during the impact condition of § 25.562(b)(2).

(c) For the vertical test, conducted in accordance with the conditions specified in § 25.562(b)(1), Hybrid II ATDs or equivalent must be used in all seat positions.

Issued in Renton Washington, on October 13, 2006.

/s/

Kalene C. Yanamura
Acting Manager
Transport Airplane Directorate
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