

**Exemption No. 5983**

**UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
RENTON, WASHINGTON 98055-4056**

In the matter of the petition of

**Saab Aircraft AB**

for an exemption from §§ 25.562(b)(2)  
and 25.562(c)(5) of the Federal  
Aviation Regulations

**Regulatory Docket No. 27155**

**DENIAL OF EXEMPTION**

By letter RN 150037 dated June 21, 1994, Mr. Bengt Hasselberg, Director of Airworthiness, Saab Aircraft AB, S-581 88 Linköping, Sweden, petitioned for an extension to Exemption 5623B regarding Head Injury Criterion (HIC) of § 25.562(c)(5) and the floor distortion requirement of § 25.562(b)(2) of the Federal Aviation Regulations (FAR). The existing exemption expires on December 31, 1994, or upon delivery of a US certificate of airworthiness, whichever comes first.

**Sections of the FAR affected:**

Section 25.562(c)(5), as amended by Amendment 25-64, requires that each occupant must be protected from serious head injury under the conditions prescribed in paragraph (b) of this section. Where head contact with seats or other structure can occur, protection must be provided so that the head impact does not exceed a HIC of 1,000 units. The level of HIC is defined by the equation:

$$\text{HIC} = \left[ (t_2 - t_1) \left[ \frac{1}{(t_2 - t_1)} \int_{t_1}^{t_2} a(t) dt \right]^{2.5} \right]_{\max}$$

**Related Section of the FAR:**

Section 25.785(a), as amended by Amendment 25-64, requires that each seat, berth, safety belt, harness, and adjacent part of the airplane at each station designated as occupiable during takeoff and landing must be designed so that a person making proper use of those facilities will not suffer serious injury in an emergency landing as a result of inertia forces specified in §§ 25.561 and 25.562. (Due to a non-substantive editorial change, these requirements are contained in § 25.785(a) and (b) of current Part 25.)

**The petitioner's supportive information is as follows:**

Since the issuance of Exemption No. 5623B, Saab has continued to conduct tests to qualify padding to the surface of the wardrobe. This testing has been done with a pad on a rigid panel in order to avoid requalification of every mounting surface used by every customer. (In a progress report submitted separately as required by Exemption No. 5623, Saab has requested an FAA position on the need for using a rigid wall surface.) Test results have continued to yield unacceptably high HIC values. While work on pads is continuing, Saab is no longer confident that this is a practical solution. Materials which have yielded marginal HIC values are not practical for installation. Therefore, Saab is still not confident that a production solution will be available by December 31, 1994, and therefore requests an extension until July 1, 1995. Saab is also pursuing alternate means of providing head injury protection, that may provide more predictable performance. In addition, deliveries to US customers will not occur until approximately fall of 1995.

A summary of the June 21, 1994, Saab Aircraft AB petition for extension was published in the Federal Register on August 5, 1994 (59 FR 40079). There were no comments.

**The FAA's analysis/summary is as follows:**

The FAA originally issued Exemption 5623 based on the lack of commercial availability of design solutions for compliance with the HIC requirement, for occupants seated behind bulkheads. In issuing the exemption, the FAA established a date that would have allowed type certification of the airplane, but would have expired before the first such airplane was delivered to a US operator. Since deliveries to US customers will not occur until late 1995, there is no need for an extension of the exemption. That is, there will be no US configurations that do not comply with the rule, and therefore a further grant of exemption would not be in the public interest.

The FAA notes that Saab has been making a good faith effort to comply with the regulation, as noted in their progress reports submitted in accordance with Exemption No. 5623. Saab has, however, concentrated on a particular design solution even though the results of development testing have not been promising. While this solution may yet prove viable for the Saab 2000,

the FAA cannot accept the failure of a single design approach as a basis for exemption from the regulation. Other design approaches have been further developed in the meantime and do appear to have practical application. The FAA is not inclined therefore, to continue to grant relief from the HIC requirement..

With respect to the need for testing with a rigid panel, this is entirely up to the applicant. The need to substantiate each subsequent installation separately, if the actual panel is used, will be dependent on the differences between the qualified surface and the new surface. A successful test using a rigid panel would probably obviate the need for subsequent testing. However, if it is an unrealistic simulation and prevents a demonstration of compliance, it may actually be counterproductive.

In consideration of the foregoing, I find that a grant of exemption is not in the public interest. Therefore, pursuant to the authority contained in §§ 313(a) and 601(c) of the Federal Aviation Act of 1958, delegated to me by the Administrator (14 CFR 11.53), the petition of Saab Aircraft AB for exemption from the HIC requirements of § 25.562(c)(5) of the FAR, for front row seats on SAAB 2000 airplanes is hereby denied. Other provisions of Exemption 5623, together with its conditions and limitations, remain the same and are applicable until December 31, 1994.

Issued in Renton, Washington, on

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Transport Airplane Directorate  
Aircraft Certification Service