



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2024-0449; Special Conditions No. 25-860-SC]

Special Conditions: Airbus SAS Model A350 Series Airplanes; Seats with Inertia

Locking Devices

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Airbus SAS (Airbus) Model A350 series airplanes. These airplanes will have a novel or unusual design feature when compared to the state of technology envisioned in the applicable airworthiness standards. This design feature is seats with inertia locking devices (ILD). The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: This action is effective on Airbus on [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Send comments on or before [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: Send comments identified by Docket No. FAA-2024-0449 using any of the following methods:

- *Federal eRegulations Portal:* Go to www.regulations.gov and follow the online instructions for sending your comments electronically.

- *Mail:* Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE, Room W12-140, West Building Ground Floor, Washington, DC, 20590-0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* Fax comments to Docket Operations at 202-493-2251.
- *Docket:* Background documents or comments received may be read at www.regulations.gov at any time. Follow the online instructions for accessing the docket or go to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Dan Jacquet, Cabin Safety Section, AIR-624, Technical Policy Branch, Policy & Standards Division, Federal Aviation Administration, 2200 South 216th Street, Des Moines, WA 98198, telephone 206-231-3208, email Daniel.Jacquet@faa.gov.

SUPPLEMENTARY INFORMATION:

The substance of these special conditions has been published in the Federal Register for public comment in several prior instances with comments received that required no changes to previously issued special conditions. Therefore, the FAA finds, pursuant to 14 CFR 11.38(b), that new comments are unlikely, and notice and comment prior to this publication are unnecessary.

Privacy

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in title 14, Code of Federal Regulations

(14 CFR) 11.35, the FAA will post all comments received without change to www.regulations.gov, including any personal information you provide. The FAA will also post a report summarizing each substantive verbal contact received about these special conditions.

Confidential Business Information

Confidential Business Information (CBI) is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to these special conditions contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to these special conditions, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and the indicated comments will not be placed in the public docket of these special conditions. Send submissions containing CBI to the individual listed in the For Further Information Contact section above. Comments the FAA receives, which are not specifically designated as CBI, will be placed in the public docket for these special conditions.

Comments Invited

The FAA invites interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

The FAA will consider all comments received by the closing date for comments, and will consider comments filed late if it is possible to do so without incurring delay. The FAA may change these special conditions based on the comments received.

Background

On August 16, 2022, Airbus applied for an amendment to Type Certificate No. T000631B for seats with ILD in the Model A350 series airplanes. These airplanes are twin-engine, transport-category airplanes, with a maximum seating for 480 passengers, and a maximum take-off weight of 623,908 pounds.

Type Certification Basis

Under the provisions of title 14, Code of Federal Regulations (14 CFR) 21.101, Airbus must show that the Airbus Model A350 series airplanes, as changed, continue to meet the applicable provisions of the regulations listed in Type Certificate No. T000631B, or the applicable regulations in effect on the date of application for the change, except for earlier amendments as agreed upon by the FAA.

If the Administrator finds that the applicable airworthiness regulations (e.g., 14 CFR part 25) do not contain adequate or appropriate safety standards for the Airbus Model A350 series airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same novel or unusual design feature, or should any other model already included on the same type certificate be modified to incorporate the same novel or unusual design feature, these special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the Airbus Model A350 series airplanes must comply with the exhaust-emission requirements of 14 CFR part 34, and the noise-certification requirements of 14 CFR part 36.

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type certification basis under § 21.101.

Novel or Unusual Design Features

The Airbus Model A350 series airplanes will incorporate the following novel or unusual design features:

Seats with inertia locking devices.

Discussion

Airbus will install, in Model A350 series airplanes, passenger seats that can be translated in the fore and aft direction by an electrically powered motor (actuator) that is attached to the seat primary structure. Under typical service-loading conditions, the motor internal brake is able to translate the seat and hold the seat in the translated position. However, under the inertial loads of emergency-landing and loading conditions, specified in § 25.562, the motor internal brake may not be able to maintain the seat in the required position. The ILD is an “active” device intended to control seat movement (i.e., a system that mechanically deploys during an impact event), by locking the gears of the motor assembly in place. The ILD mechanism is activated by the higher inertial load factors that could occur during an emergency landing event. Each seat place incorporates two ILDs, one on either side of the seat pan. Only one ILD is required to hold an occupied seat in position during worst-case dynamic loading specified in § 25.562.

The ILD will self-activate only in the event of a predetermined airplane loading condition such as that occurring during crash or emergency landing and will prevent excessive seat forward translation. A minimum level of protection must be provided if the seat-locking device does not deploy.

The normal means of satisfying the structural and occupant protection requirements of § 25.562 result in a non-quantified, but nominally predictable, progressive structural deformation or reduction of injury severity for impact conditions

less than the maximum specified by the rule. A seat using ILD technology, however, may involve a step change in protection for impacts below and above that at which the ILD activates and deploys to retain the seat pan in place. This could result in structural deformation or occupant injury being higher at an intermediate impact condition than that resulting from the maximum impact condition. It is acceptable for such step-change characteristics to exist, provided the resulting output does not exceed the maximum allowable criteria at any condition at which the ILD does or does not deploy, up to the maximum severity pulse specified by the requirements.

The ideal triangular maximum severity pulse is defined in Advisory Circular (AC) 25.561-1B “Dynamic Evaluation of Seat Restraint Systems and Occupant Protection on Transport Airplanes”. For the evaluation and testing of less-severe pulses for purposes of assessing the effectiveness of the ILD deployment setting, a similar triangular pulse should be used with acceleration, rise time, and velocity change scaled accordingly. The magnitude of the required pulse should not deviate below the ideal pulse by more than 0.5g until 1.33 t_1 is reached, where t_1 represents the time interval between 0 and t_1 on the referenced pulse shape as shown in AC 25.561-1B. This is an acceptable method of compliance to the test requirements of the special conditions.

Conditions 1 through 5 ensure that the ILD activates when intended, to provide the necessary protection of occupants. This includes protection of a range of occupants under various accident conditions. Conditions 6 through 10 address maintenance and reliability of the ILD, including any outside influences on the mechanism, to ensure it functions as intended.

These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

Applicability

As discussed above, these special conditions are applicable to the Airbus Model A350 series airplanes. Should Airbus apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, these special conditions would apply to that model as well.

Conclusion

This action affects only a certain novel or unusual design feature on one model series of airplanes. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

Authority Citation

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 44701, 44702, and 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Airbus SAS Model A350 series airplanes.

In addition to the requirements of § 25.562, passenger seats incorporating inertia locking devices (ILD)s must meet the following:

1. Level of Protection Provided by ILD—It must be demonstrated by test that the seats and attachments, when subject to the emergency-landing dynamic conditions specified in § 25.562, and with one ILD not deployed, do not experience structural failure that could result in:
 - a. Separation of the seat from the airplane floor.
 - b. Separation of any part of the seat that could form a hazard to the seat occupant or any other airplane occupant.

- c. Failure of the occupant restraint or any other condition that could result in the occupant separating from the seat.
2. Protection Provided Below and Above the ILD Actuation Condition—If step-change effects on occupant protection exist for impacts below and above that at which the ILD deploys, tests must be performed to demonstrate that the occupant is shown to be protected at any condition at which the ILD does or does not deploy, up to the maximum severity pulse specified by § 25.562. Test conditions must take into account any necessary tolerances for deployment.
3. Protection Over a Range of Crash Pulse Vectors—The ILD must be shown to function as intended for all test vectors specified in § 25.562.
4. Protection During Secondary Impacts—The ILD activation setting must be demonstrated to maximize the probability of the protection being available when needed, considering a secondary impact that is above the severity at which the device is intended to deploy up to the impact loading required by § 25.562.
5. Protection of Occupants other than 50th Percentile—Protection of occupants for a range of stature from a two-year-old child to a ninety-five-percentile male must be shown.
6. Inadvertent Operation—It must be shown that any inadvertent operation of the ILD does not affect the performance of the device during a subsequent emergency landing.
7. Installation Protection—It must be shown that the ILD installation is protected from contamination and interference from foreign objects.
8. Reliability—The performance of the ILD must not be altered by the effects of wear, manufacturing tolerances, aging, or drying of lubricants, and corrosion.
9. Maintenance and Functional Checks—The design, installation, and operation of the ILD must be such that it is possible to functionally check the device in place.

Additionally, a functional-check method and a maintenance-check interval must be included in the seat installer's instructions for continued airworthiness (ICA) document.

10. Release Function—If a means exists to release an inadvertently activated ILD, the release means must not introduce additional hidden failures that would prevent the ILD from functioning properly.

Issued in Kansas City, Missouri, on March 19, 2024.

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