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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No. CE225; Special Conditions No. 23-165-SC]

Special Conditions: AMSAFE, Incorporated; Adam Aircraft Industries Model A500; Inflatable Four-Point Restraint Safety Belt With an Integrated Airbag Device

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued to AMSAFE, Inc. for the installation of an AMSAFE, Inc., Inflatable Four-Point Restraint Safety Belt with an Integrated Airbag Device on the Adam Model A500. These airplanes, as modified by the installation of this Inflatable Safety Belt, will have novel and unusual design features associated with the upper-torso restraint portions of the four-point safety belt, which contains an integrated airbag device. 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: The effective date of these special conditions is June 8, 2005. Comments must be received on or before July 21, 2005.

ADDRESSES: Comments on these special conditions may be mailed in duplicate to: Federal Aviation Administration (FAA), Regional Counsel, ACE-7, Attention: Rules Docket, Docket No. CE225, 901 Locust, Room 506, Kansas City, Missouri 64106, or delivered in

duplicate to the Regional Counsel at the above address. Comments must be marked: CE225. Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: Mr. Mark James, Federal Aviation Administration, Aircraft Certification Service, Small Airplane Directorate, ACE-111, 901 Locust, Kansas City, Missouri, 816-329-4137, fax 816-329-4090, e-mail mark.james@faa.gov.

SUPPLEMENTARY INFORMATION: The FAA has determined that notice and opportunity for prior public comment is impractical because these procedures would significantly delay issuance of approval and thus delivery of the affected aircraft. In addition, the substance of these special conditions has been subject to the public comment process in several prior instances with no substantive comments received. The FAA, therefore, finds that good cause exists for making these special conditions effective upon issuance.

Comments Invited

Interested persons are invited to submit such written data, views or arguments, as they may desire. Communications should identify the regulatory docket or special condition number and be submitted in duplicate to the address specified above. All communications received on or before the closing date for comments will be considered by the Administrator. The special conditions may be changed in light of the comments received. All comments received will be available in the Rules Docket for examination by interested persons, both before and after the closing date for comments. A report summarizing each substantive public contact with FAA personnel concerning this rulemaking will be filed in the docket. Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a self-addressed, stamped postcard on which the following statement is made: "Comments to CE225." The postcard will be date stamped and returned to the commenter.

Background

On May 24, 2005, Adam Aircraft Industries applied for a type design change, to include the new Adam

Aircraft Industries Model A500 airplane for the installation of an AMSAFE four-point safety belt restraint system incorporating an inflatable airbag for the pilot and co-pilot seats. The Adam Model A500 is a twin engine, six-place airplane, currently approved under Type Certificate No. A00009DE.

The inflatable restraint system is four-point safety belt restraint system consisting of a lap belt and dual shoulder harnesses. An inflatable airbag is attached to one of the shoulder harnesses, and the other shoulder harness is of conventional construction. The inflatable portion of the restraint system will rely on sensors to electronically activate the inflator for deployment. The inflatable restraint system will be installed on both the pilot and co-pilot seats.

In the event of an emergency landing, the airbag will inflate and provide a protective cushion between the occupant's head and structure within the airplane. This will reduce the potential for head and torso injury. The inflatable restraint behaves in a manner that is similar to an automotive airbag, but, in this case, the airbag is integrated into one of the shoulder harnesses. While airbags and inflatable restraints are standard in the automotive industry, the use of an inflatable four-point restraint system is novel for general aviation operations.

The FAA has determined that this project will be accomplished on the basis of providing the same current level of safety of the Adam Aircraft Industries Model A500 occupant restraint systems. The FAA has two primary safety concerns with the installation of airbags or inflatable restraints:

- That they perform properly under foreseeable operating conditions; and
- That they do not perform in a manner or at such times as to impede the pilot's ability to maintain control of the airplane or constitute a hazard to the airplane or occupants.

The latter point has the potential to be the more rigorous of the requirements. An unexpected deployment while conducting the takeoff or landing phases of flight may result in an unsafe condition. The unexpected deployment may either startle the pilot or generate a force sufficient to cause a sudden movement of the control yoke. Either action could result in a loss of control of the airplane, the consequences of

which are magnified due to the low operating altitudes during these phases of flight. The FAA has considered this when establishing these special conditions.

The inflatable restraint system relies on sensors to electronically activate the inflator for deployment. These sensors could be susceptible to inadvertent activation, causing deployment in a potentially unsafe manner. The consequences of an inadvertent deployment must be considered in establishing the reliability of the system. Adam Aircraft Industries must show that the effects of an inadvertent deployment in flight are not a hazard to the airplane or that an inadvertent deployment is extremely improbable. In addition, general aviation aircraft are susceptible to a large amount of cumulative wear and tear on a restraint system. It is likely that the potential for inadvertent deployment increases as a result of this cumulative damage. Therefore, the impact of wear and tear on inadvertent deployment must be considered. Due to the effects of this cumulative damage, a life limit must be established for the appropriate system components in the restraint system design.

There are additional factors to be considered to minimize the chances of inadvertent deployment. General aviation airplanes are exposed to a unique operating environment, since the same airplane may be used by both experienced and student pilots. The effect of this environment on inadvertent deployment must be understood. Therefore, qualification testing of the firing hardware/software must consider the following:

- The airplane vibration levels appropriate for a general aviation airplane; and
- The inertial loads that result from typical flight or ground maneuvers, including gusts and hard landings.

Any tendency for the firing mechanism to activate as a result of these loads or acceleration levels is unacceptable.

Other influences on inadvertent deployment include high intensity electromagnetic fields (HIRF) and lightning. Since the sensors that trigger deployment are electronic, they must be protected from the effects of these threats. To comply with HIRF and lightning requirements, the AMSAFE, Inc., inflatable restraint system is considered a critical system, since its inadvertent deployment could have a hazardous effect on the airplane.

Given the level of safety of the current Adam Aircraft Industries Model A500 occupant restraints, the inflatable

restraint system must show that it will offer an equivalent level of protection in the event of an emergency landing. In the event of an inadvertent deployment, the restraint must still be at least as strong as a Technical Standard Order approved belt and shoulder harnesses. There is no requirement for the inflatable portion of the restraint to offer protection during multiple impacts, where more than one impact would require protection.

The inflatable restraint system must deploy and provide protection for each occupant under a crash condition. The seats of the model A500 are certificated to the structural requirements of § 23.562. Therefore, the test crash pulses identified in § 23.562 must be used to satisfy this requirement.

It is possible a wide range of occupants will use the inflatable restraint. Thus, the protection offered by this restraint should be effective for occupants that range from the fifth percentile female to the ninety-fifth percentile male. Energy absorption must be performed in a consistent manner for this occupant range.

In support of this operational capability, there must be a means to verify the integrity of this system before each flight. As an option, AMSAFE, Inc., can establish inspection intervals where they have demonstrated the system to be reliable between these intervals.

It is possible that an inflatable restraint will be "armed" even though no occupant is using the seat. While there will be means to verify the integrity of the system before flight, it is also prudent to require that unoccupied seats with active restraints not constitute a hazard to any occupant. This will protect any individual performing maintenance inside the cockpit while the aircraft is on the ground. The restraint must also provide suitable visual warnings that would alert rescue personnel to the presence of an inflatable restraint system.

In addition, the design must prevent the inflatable seatbelt from being incorrectly buckled and/or installed such that the airbag would not properly deploy. As an alternative, Adam Aircraft Industries may show that such deployment is not hazardous to the occupant and will still provide the required protection.

The cabins of the Adam Model A500 airplanes identified in these special conditions are confined areas, and the FAA is concerned that noxious gases may accumulate in the event of airbag deployment. When deployment does occur, either by design or inadvertently, there must not be a release of hazardous

quantities of gas or particulate matter into the cockpit.

An inflatable restraint should not increase the risk already associated with fire. Therefore, the inflatable restraint should be protected from the effects of fire, so that an additional hazard is not created by, for example, a rupture of the inflator.

Finally, the airbag is likely to have a large volume displacement, and possibly impede the egress of an occupant. Since the bag deflates to absorb energy, it is likely that the inflatable restraint would be deflated at the time an occupant would attempt egress. However, it is appropriate to specify a time interval after which the inflatable restraint may not impede rapid egress. Ten seconds has been chosen as a reasonable time. This time limit will offer a level of protection throughout the impact event.

Type Certification Basis

Under the provisions of § 21.101, Adam Aircraft Industries, must show that the Adam Aircraft Model A500, as changed, continues to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A00009DE or the applicable regulations in effect on the date of application for the change. The regulations incorporated by reference in the type certificate are commonly referred to as the "original type certification basis." The regulations incorporated by reference in Type Certificate No. A00009DE are as follows:

Adam A500: Title 14, Code of Federal Regulations, Part 23, dated February 1, 1965, as amended by Amendment 23-1 through 23-55.

For the model listed above, the certification basis also includes all exemptions, if any; equivalent level of safety findings, if any; and special conditions not relevant to the special conditions adopted by this rulemaking action.

The Administrator has determined that the applicable airworthiness regulations (*i.e.*, part 23 as amended) do not contain adequate or appropriate safety standards for the AMSAFE, Inc., inflatable restraint, as installed on this Adam Aircraft Industries model because of a novel or unusual design feature. Therefore, special conditions are prescribed under the provisions of § 21.16.

Special conditions, as appropriate, as defined in § 11.19, are issued in accordance with § 11.38, and become part of the type certification basis in accordance with § 21.101.

Special conditions are initially applicable to the model for which they

are issued. Should the applicant apply for a supplemental type certificate to modify any other model included on the same type certificate to incorporate the same novel or unusual design feature, the special conditions would also apply to that model under the provisions of § 21.101.

Novel or Unusual Design Features

The Adam Aircraft Industries Model A500 will incorporate the following novel or unusual design feature:

The AMSAFE, Inc., Four-Point Safety Belt Restraint System incorporating an inflatable airbag for the pilot and copilot seats. The purpose of the airbag is to reduce the potential for injury in the event of an accident. In a severe impact, an airbag will deploy from one shoulder harness, in a manner similar to an automotive airbag. The airbag will deploy between the head of the occupant and airplane interior structure. Therefore, this will provide some protection to the head of the occupant. The restraint will rely on sensors to electronically activate the inflator for deployment.

The Code of Federal Regulations state performance criteria for seats and restraints in an objective manner. However, none of these criteria are adequate to address the specific issues raised concerning inflatable restraints. Therefore, the FAA has determined that, in addition to the requirements of part 21 and part 23, special conditions are needed to address the installation of this inflatable restraint.

Accordingly, these special conditions are adopted for the Adam Aircraft Industries models equipped with the AMSAFE, Inc., four-point inflatable restraint. Other conditions may be developed, as needed, based on further FAA review and discussions with the manufacturer and civil aviation authorities.

Applicability

As discussed above, these special conditions are applicable to the Adam Aircraft Industries Model A500 equipped with the AMSAFE, Inc., four-point inflatable restraint system. Should Adam Aircraft Industries, at a later date, request to modify any other model on the Type Certificate identified in these special conditions to incorporate the same novel or unusual design feature, the special conditions would apply to that model as well under the provisions of § 21.101.

Conclusion

This action affects only certain novel or unusual design features on the previously identified Adam model. It is

not a rule of general applicability, and it affects only the applicant who applied to the FAA for approval of these features on the airplane.

Under standard practice, the effective date of final special conditions would be 30 days after the date of publication in the **Federal Register**; however, the substance of these special conditions has been subjected to the notice and comment period in several prior instances and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. For this reason, and because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon issuance. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

List of Subjects in 14 CFR Part 23

Aircraft, Aviation safety, Signs and symbols.

Citation

■ The authority citation for these special conditions is as follows:

PART 23—[AMENDED]

Authority: 49 U.S.C. 106(g), 40113 and 44701; 14 CFR 21.16 and 21.101; and 14 CFR 11.38 and 11.19.

The Special Conditions

The FAA has determined that this project will be accomplished on the basis of not lowering the current level of safety of the Adam Aircraft Industries Model A500 occupant restraint system. 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 these models, as modified by AMSAFE, Incorporated.

Inflatable Four-Point Restraint Safety Belt with an Integrated Airbag Device on the Pilot and Copilot Seats of the Adam Aircraft Industries Model A500.

1. It must be shown that the inflatable restraint will deploy and will provide protection under crash conditions. Compliance will be demonstrated using the dynamic test condition specified in 14 CFR part 23, § 23.562(b)(2). It is not necessary to account for floor warpage, as required by § 23.562(b)(3). The means

of protection must take into consideration a range of stature from a 5th percentile female to a 95th percentile male. The inflatable restraint must provide a consistent approach to energy absorption throughout that range.

2. The inflatable restraint must provide adequate protection for each occupant. In addition, unoccupied seats that have an active restraint must not constitute a hazard to any occupant.

3. The design must prevent the inflatable restraint from being incorrectly buckled and/or incorrectly installed such that the airbag would not properly deploy. Alternatively, it must be shown that such deployment is not hazardous to the occupant and will provide the required protection.

4. It must be shown that the inflatable restraint system is not susceptible to inadvertent deployment as a result of wear and tear or the inertial loads resulting from in-flight or ground maneuvers (including gusts and hard landings) that are likely to be experienced in service.

5. It must be extremely improbable for an inadvertent deployment of the restraint system to occur, or an inadvertent deployment must not impede the pilot's ability to maintain control of the airplane or cause an unsafe condition (or hazard to the airplane). In addition, a deployed inflatable restraint must be at least as strong as a Technical Standard Order (C114) four-point harness.

6. It must be shown that deployment of the inflatable restraint system is not hazardous to the occupant and will not result in injuries that could impede rapid egress. This assessment should include occupants whose restraint is loosely fastened.

7. It must be shown that an inadvertent deployment that could cause injury to a standing or sitting person is improbable. In addition, the restraint must also provide suitable visual warnings that would alert rescue personnel to the presence of an inflatable restraint system.

8. It must be shown that the inflatable restraint will not impede rapid egress of the occupants 10 seconds after its deployment.

9. For the purposes of complying with HIRF and lightning requirements, the inflatable restraint system is considered a critical system since its deployment could have a hazardous effect on the airplane.

10. It must be shown that the inflatable restraints will not release hazardous quantities of gas or particulate matter into the cabin.

11. The inflatable restraint system installation must be protected from the effects of fire such that no hazard to occupants will result.

12. There must be a means to verify the integrity of the inflatable restraint activation system before each flight or it must be demonstrated to reliably operate between inspection intervals.

13. A life limit must be established for appropriate system components.

14. Qualification testing of the internal firing mechanism must be performed at vibration levels appropriate for a general aviation airplane.

Issued in Kansas City, Missouri on June 8, 2005.

John Colomy,

Acting Manager, Small Airplane Directorate, Aircraft Certification Service.

[FR Doc. 05-12148 Filed 6-20-05; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2005-20869; Directorate Identifier 2004-NM-09-AD; Amendment 39-14139; AD 2005-13-03]

RIN 2120-AA64

Airworthiness Directives; AvCraft Dornier Model 328-100 and -300 Airplanes

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain

AvCraft Dornier Model 328-100 and -300 airplanes. This AD requires operators to install colored identification strips on the pulley brackets, fairlead bracket assemblies, operational assemblies, and flight control cables. This AD is prompted by a report that the flight control systems do not have elements that are distinctively identified. We are issuing this AD to prevent the incorrect re-assembly of the flight control system during maintenance, which could result in reduced controllability of the airplane.

DATES: This AD becomes effective July 26, 2005.

The incorporation by reference of certain publications listed in the AD is approved by the Director of the Federal Register as of July 26, 2005.

ADDRESSES: For service information identified in this AD, contact AvCraft Aerospace GmbH, P.O. Box 1103, D-82230 Wessling, Germany.

Docket: The AD docket contains the proposed AD, comments, and any final disposition. You can examine the AD docket on the Internet at <http://dms.dot.gov>, or in person at the Docket Management Facility office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The Docket Management Facility office (telephone (800) 647-5227) is located on the plaza level of the Nassif Building at the U.S. Department of Transportation, 400 Seventh Street SW., room PL-401, Washington, DC. This docket number is FAA-2005-20869; the directorate identifier for this docket is 2004-NM-09-AD.

FOR FURTHER INFORMATION CONTACT: Dan Rodina, Aerospace Engineer, International Branch, ANM-116, FAA,

Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 227-2125; fax (425) 227-1149.

SUPPLEMENTARY INFORMATION: The FAA proposed to amend 14 CFR part 39 with an AD for certain AvCraft Dornier Model 328-100 and -300 airplanes. That action, published in the **Federal Register** on April 6, 2005 (70 FR 17370), proposed to require operators to install colored identification strips on the pulley brackets, fairlead bracket assemblies, operational assemblies, and flight control cables.

Comments

We provided the public the opportunity to participate in the development of this AD. No comments have been submitted on the proposed AD or on the determination of the cost to the public.

Explanation of Change to Applicability

We have revised the applicability of the proposed AD to identify model designations as published in the most recent type certificate data sheet for the affected models.

Conclusion

We have carefully reviewed the available data and determined that air safety and the public interest require adopting the AD with the change described previously. We have determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Costs of Compliance

The following table provides the estimated costs for U.S. operators to comply with this AD.

ESTIMATED COSTS

Action	Work hours	Average labor rate per hour	Parts	Cost per airplane	Number of U.S.-registered airplanes	Fleet cost
Installation	16	\$65	\$291	\$1,331	112	\$149,072

The following table provides the estimated costs for operators to comply with this AD if they have airplanes that

are subject to the concurrent requirements.

ESTIMATED COSTS—CONCURRENT REQUIREMENTS

Concurrent Dornier Service Bulletin	Work hours	Average labor rate per hour	Parts	Cost per airplane
SB-328-27-290	5	\$65	Operator Supplied	\$325
SB-328-27-291	5	65	Operator Supplied	325
SB-328-27-292	5	65	Operator Supplied	325