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DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

Proposed Technical Standard Order (TSO)-C126b, 406 MHz Emergency Locator Transmitters (ELT) and Notice of Intent to Withdraw TSO Authorizations (TSOA) for TSO-C91a, Emergency Locator Transmitter (ELT) Equipment, and TSO-C126 / C126a, 406 MHz Emergency Locator Transmitters (ELT)

AGENCY: Federal Aviation Administration (FAA), DOT

ACTION: Notice of availability and request for public comment.

SUMMARY: This notice announces the availability of proposed TSO-C126b and the FAA's intent to withdraw TSO authorizations (TSOA) issued for the manufacture of automatic fixed (AF) and automatic portable (AP) ELTs under TSO-C91a, TSO-C126, and TSO-C126a which incorporate hook and loop fasteners in their design. This proposed action would affect ELT manufacturers. The FAA is not proposing requiring actions on previously installed ELTs. The FAA is taking this action based on its determination that hook and loop fasteners are not an acceptable means of compliance to meet the mounting and retention requirements of current TSOs for ELTs. The FAA is requesting comment on proposed TSO-C126b and the FAA's proposal to withdraw certain other ELT TSOAs.

DATES: Comments must be received on or before [*insert date that is 60 days after date of publication in the FEDERAL REGISTER*.]

FOR FURTHER INFORMATION CONTACT: Ms. Charisse Green, AIR-130, Federal Aviation Administration, 470 L'Enfant Plaza, Suite 4102, Washington, DC 20024. Telephone (202) 385-5637, fax (202) 385-4651, e-mail to: Charisse.Green@faa.gov.

SUPPLEMENTAL INFORMATION:

COMMENTS INVITED

You are invited to comment on proposed TSO-C126b and the proposed withdrawal of TSOAs for the manufacture of automatic fixed (AF) and automatic portable (AP) ELTs under TSO-C91a, TSO-C126, and TSO-C126a which incorporate hook and loop fasteners in their design by submitting written data, views, or arguments to the address specified in FOR INFORMATION CONTACT. If you propose alternate actions, please provide detailed information on your alternative and indicate whether the information you provide is proprietary. Comments received may be examined, both before and after the closing date at Federal Aviation Administration, 470 L'Enfant Plaza, Suite 4102, Washington, DC 20024., weekdays except Federal holidays, between 8:30 a.m. and 4:30 p.m. The Director, Aircraft Certification Service, will consider all comments received on or before the closing date.

BACKGROUND

In several recent aircraft accidents, ELTs mounted with hook and loop fasteners, commonly referred to as Velcro®, have detached from their aircraft mounting tray. The separation of the ELT from its mounting tray has caused the antenna connection to sever, rendering the ELT ineffective and severely impacting the performance of the TSO'd ELT.

Section 347 of the FAA Modernization and Reform Act of 2012 (Pub. L. 112-95) requires the FAA to determine if the ELT mounting requirements and retention tests specified by TSO-C91a and TSO-C126 are adequate to assess retention capabilities in ELT designs. Based on that determination, the Act requires the Administrator to make any necessary revisions to the requirements and retention tests to ensure that ELTs are properly retained in the event of an aircraft accident.

Evaluation of ELT Mounting Requirements and Retention Tests

The FAA evaluated the mounting requirements and retention tests specified in TSO-C91a, TSO-C126 and TSO-C126a. These TSOs specifically address ELT mounting and require the mounting design to meet certain specifications; however, they do not require or preclude any specific type of retention mechanism. Based upon its evaluation, the FAA has determined that the standards contained in these TSOs do not adequately address the use of hook and loop fasteners. While these types of fasteners can meet the TSO requirements for retention forces in laboratory conditions, accident investigations have found these fasteners are not reliable in service.

Recent accident data reveals hook and loop fasteners have failed to retain the ELT in its mount. The following three documents describe specific accidents in which an ELT failed to remain its mount after an accident:

(1) NTSB Aircraft Accident Report AAR-11-03: The antenna cable was severed from the ELT when the ELT slipped out of the hook and loop fastener which retained the ELT to the installed mount. The ELT functioned properly during post accident testing by the manufacturer and NTSB. As a result of its investigation the NTSB made safety recommendation A-10-170 to the FAA which stated: "Determine if the emergency locator transmitter mounting requirements and retention tests specified by TSO-C91a and TSO-C126a are adequate to assess retention capabilities in ELT designs. Based on the results of this determination, revise, as necessary, TSO requirements to ensure proper retention of ELTs during airplane accidents."

(2) NTSB Factual Report - Aviation NTSB ID WPR10FA273: The antenna cable was severed from the ELT when the ELT slipped out of the hook and loop fastener which retained

the ELT to the installed mount. The ELT functioned but without the antenna the transmissions were not strong enough to be received by the search and rescue satellites.

(3) Transportation Safety Board of Canada Aviation Safety Advisory A11W0151-D1-A2, *Loose Attachment of Kannad 406 AF-Compact (ER) ELT.* This advisory highlights an October 2011 Cessna 208B accident where inadequate installation of the hook and loop fastener resulted in the ELT sliding out of its mount, disconnecting from the antenna cable, and failing to perform its intended function.

Both government and industry guidance material discourages the use of hook and loop fasteners and notes potential difficulties with their use in ELT mounting. Advisory material discouraging the use of hook and loop fasteners includes the following:

(1) Advisory Circular AC 91-44A, *Operational and Maintenance Practices for Emergency Locator Transmitters and Receivers,* paragraph 6.a., states that attachment of ELTs solely by means of Velcro® strips and other flexible materials is not considered satisfactory since the "g" switches may fail to operate or the equipment may come out of its mounting resulting in damage to the ELT and possible damage to the antenna or antenna coaxial cable.

(2) RTCA DO-DO-182, *Emergency Locator Transmitter (ELT) Equipment Installation and Performance*, section 1.2 a., states that ELTs secured with Velcro® strips are an improper installation.

(3) NASA Technical Memorandum-81960, *Evaluation of Emergency- Locator-Transmitter Performance in Real and Simulated Crash Tests*, states: “Typical mounts can vary from sturdy mounts, to mounts using Velcro®, plastic ties, and mounts on non-airframe structure in the airplanes. This diversity in mounting techniques include improper and/or inadequate

mounting of many ELT's and is likely to be one source of problems of nonfunctioning and/or false activations of some units."

FAA Concerns

After completing its evaluation of the use of hook and loop fasteners for ELT retention the agency identified the following concerns:

(1) Hook and loop fasteners fail to retain the ELT when insufficient tension is applied when closing the fastener. There is no repeatable method for installation and no method to evaluate the tension of the hook and loop fastener. The allowance for pilots to secure ELTs to the aircraft when changing ELT batteries further increases the potential for inconsistent and unsatisfactory installations.

(2) Hook and loop fasteners closed with proper tension may stretch or loosen over time due to wear, fluids, vibration, and use leading to insufficient tension to retain the ELT.

(3) Hook and loop fasteners closed with proper tension do not provide stated retention capability due to debris which can contaminate the hooks and loops of the fastener.

(4) Hook and loop fasteners closed with proper tension degrade due to environmental factors such as repeated heating and cooling cycles, temperature extremes, and contamination resulting from location in equipment areas.

Safety Awareness Information Bulletin (SAIB) HQ-12-32, Hook and Loop Style Fasteners as a Mounting Mechanism for Emergency Locator Transmitters, was issued May 23, 2012 to bring immediate attention to this issue. It outlines actions ELT manufacturers can take to improve their installation and maintenance instructions to mitigate the concerns with hook and loop ELT retention.

Determination

The FAA has determined that hook and loop fasteners are not an acceptable means of compliance to meet the mounting and retention requirements of the current ELT TSOs.

Proposed Actions

Based on its evaluation, the FAA proposes to:

(1) Issue TSO-C126b which would preclude the use of hook and loop fasteners as a means of securing an ELT in its mounting tray.

(2) Withdraw TSO authorizations issued for the manufacture of ELTs under TSO-C91a, TSO-C126 and TSO-C126a, which incorporate hook and loop fasteners into their design unless the design is revised to replace the hook and loop fastener with an alternative acceptable to the FAA before June 30, 2014.

(3) Withdraw TSO authorizations issued for the manufacture of ELTs under TSO-C91a, TSO-C126, and TSO-C126a, which incorporate hook and loop fasteners into their design unless the installation and maintenance instructions for the article are revised to include the following information by June 30, 2013:

a. Detailed instructions for properly securing the ELT during installation and reinstallation, as well as a method to determine the appropriate tension of the hook and loop style fasteners. Revised instructions will provide improved guidance on the proper installation of ELTs for owners and operators in the interim period before an enhanced mounting design is available, and for owners and operators who choose not to install the enhanced mounting design when it is available.

b. Detailed instructions for inspecting the hook and loop style fasteners for wear, contamination, environmental degradation, and other effects to ensure they meet the standards of the applicable TSO.

c. A replacement interval for the hook and loop style fasteners.

(4) Encourage owners and operators to install the manufacturer's proposed updated mounting designs in accordance with the revised maintenance and installation instructions.

HOW TO OBTAIN COPIES

You can view or download TSOs C91a, C126, C126a by logging onto http://rgl.faa.gov and select Technical Standard Order, and the proposed TSO-C126b may be found at http://www.faa.gov/aircraft/draft_docs/tso/ . For a paper copy of the documents, contact the person listed in "**For further Information Contact**."

Issued in Washington, DC, on July 10, 2012.

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