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 BULLETIN TITLE: Maintenance of Pressure Cylinders in Use as  
 Aircraft Equipment  
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1. PURPOSE. This bulletin provides guidance to Airworthiness Aviation Safety Inspectors (ASI) regarding the maintenance and inspection of pressure cylinders that serve as aircraft equipment in operations under Title 14 of the Code of Federal Regulations (14 CFR) parts 91, 121, 125, 129, 135, and § 129.14. The guidance presented is in accordance with established standards of the United States Department of Transportation (DOT), DOT Research and Special Programs Administration (RSPA), United States Coast Guard (USCG), Underwriters Laboratories (UL), Military Specifications (MIL SPEC), and applicable pressure cylinder manufacturer's methods. This bulletin provides additional guidance to FAA Order 8300.10, Airworthiness Inspector's Handbook, and cancels FAA Order 8000.40D, Maintenance of Pressure Cylinders in Use as Aircraft Equipment.

2. BACKGROUND.

A. The development of DOT regulations (Title 49 of the Code of Federal Regulations (49 CFR) parts 100-185) regarding the transportation of hazardous material and magnetized materials by aircraft was based on the applicable regulations of the Interstate Commerce Commission. Initially, the transportation of hazardous material was prohibited in scheduled air transportation. However, regulatory efforts that were directed toward the transportation of dangerous articles, gave little attention to similar, hazardous material used aboard aircraft as part of the aircraft systems as required equipment.

B. Examples of hazardous materials are the pressure cylinders used for a variety of aircraft applications, including supplemental oxygen for passengers and flightcrew, onboard fire extinguishers, and emergency escape door slide air cylinders and other life support systems.

C. Title 49 CFR parts 171 through 180, Hazardous Materials Regulations (HMR), pertains to the retest and inspection of cylinders in transportation in commerce. However, cylinders used as components in aircraft are not considered to be in transportation in commerce when installed in an aircraft. As a result, the retest period for cylinders used as a component of and installed in an aircraft is not subject to the HMR. However, 49 CFR part 180, § 180.205, formerly part 173, § 173.34(e), would apply to a cylinder that is removed from the aircraft and offered for transportation as an article of commerce. In this case, the cylinder must include the appropriate exterior packaging and hazard communication requirements (i.e., shipping papers, marking, and labeling).

D. Presently, there are no specific 14 CFR regulations for certification, manufacture, and maintenance of pressure cylinders used aboard aircraft. However, 14 CFR § 21.305 has a general provision that allows approval of material, parts, processes, or appliances in any manner approved by the Administrator. Therefore, pressure cylinders may be approved in conjunction with aircraft type certification procedures. Under this regulatory provision, the standards for pressure cylinders are approved for use aboard aircraft by using the requirements of DOT, RSPA, USCG, UL, domestic and foreign manufacturers of pressure cylinders, and MIL SPEC.

E. Rules on inspecting and testing pressure cylinders used aboard aircraft are not specified in 14 CFR parts 91, 121, 125, 129, § 129.14, and part 135. The FAA recognizes the lack of specific guidance on cylinder aging, internal corrosion, external pressure changes, cycles, and extreme temperature changes. Therefore, the FAA Flight Standards Service has also accepted standards developed by DOT, RSPA, and other experts for maintaining the integrity of pressure cylinders. These standards are addressed in 49 CFR § 180.205.

### 3. GUIDANCE.

A. The Administrator grants approval to owners/operators to conduct operations under the provisions of 14 CFR § 119.5(g) and the inspection program listed in § 91.409. These regulations establish the linkage of authority for the Administrator to adopt the rules and regulations of DOT, RSPA, USCG, UL, MIL SPEC, and applicable manufacturers as acceptable methods for controlling the retesting (e.g., hydrostatic) and life limits of pressure cylinders.

B. Title 14 CFR Part 91 Operators. Pressure cylinders that are installed as aircraft equipment will be maintained and inspected in accordance with manufacturer's requirements.

C. Title 14 CFR Part 135 Aircraft Type-Certificated for Passenger Seating Configuration of Nine Seats or Less. Pressure cylinders that are installed as aircraft equipment will be listed in the approved, automated operations specifications (OpSpecs) D104. These cylinders will be maintained as follows:

(1) DOT specification cylinders, including DOT 3HT cylinders, will be inspected and tested as required by 49 CFR § 180.205.

(2) Cylinders manufactured under an exemption issued by RSPA must be inspected and tested as required by the terms of the exemption.

(3) All other cylinders must be inspected and tested as required by subparagraph 3C(1) above as it applies to DOT 3HT cylinders unless alternative testing and inspection procedures are specified by the manufacturer or referenced authority.

D. Title 14 CFR parts 121/135 aircraft type-certificated for passenger seating configuration of ten or more seats (including cargo configuration) with scheduled heavy maintenance checks will accomplish maintenance and inspection of pressure cylinders through the operator's Continuous Airworthiness Maintenance Program (CAMP). The FAA recommends performing maintenance and inspection on pressure cylinders during scheduled heavy maintenance to reduce the risk of injury to personnel and/or damage to equipment. For the purposes of this bulletin, heavy maintenance checks may be accomplished in phases or in "C" or "D" checks or operator's equivalent designation. The following maintenance and inspection requirements will be incorporated into the operator's manual:

(1) The operator will establish a written maintenance/inspection program specifically for the cylinders covered in 49 CFR § 175.10. The operator will comply with the airframe or cylinder manufacturer's life-limit recommendations.

(2) Each cylinder must be inspected at regular intervals to ensure that the required internal pressure or weight of contents is maintained. Each cylinder must also be inspected to ensure that the valving, safety relief devices, mounting brackets, and associated instrumentation are secure and acceptable for continued safe flight.

(3) Any cylinder removed from an aircraft for any reason must be inspected to determine that the required internal pressure or weight of contents is within acceptable limits. There can be no visible evidence of degradation of the cylinder or attached accessories. Cylinders showing degradation or loss of contents must be retested and requalified (or rejected and condemned) as prescribed in 49 CFR § 180.205.

(4) Any cylinder that is part of a supplementary oxygen system, that in the course of its normal operation is gradually depleted, may remain in service if it meets the operational requirements in 14 CFR § 91.211, Supplemental oxygen.

(5) Any cylinder (except supplemental oxygen) that is part of an aircraft system, which has been discharged for any reason, must be requalified and visually inspected in accordance with 49 CFR § 180.205.

(6) Cylinders may remain in service without the required periodic retesting, reinspection, and marking as prescribed in 49 CFR § 180.205 if they meet the criteria in paragraphs 3D(1), (2), (3), and (4) and have not been discharged.

4. ACTION. ASIs should verify that the owner/operator has established maintenance procedures for the inspection, retest, and life limit requirements for pressure cylinders. These requirements must be included in the inspection programs as required by 14 CFR §§ 91.409, 121.367, 125.247, 129.14, 135.419 and 135.425.

5. INQUIRIES. This bulletin was developed by the Flight Standards Air Carrier Maintenance Branch, AFS-330. Any questions about the guidance in this bulletin should be directed to Stephen Gibbs, AFS-330, at (202) 267-3440.

6. LOCATION. This bulletin will be incorporated into FAA Order 8300.10, volume 2, chapter 35, section 1; chapter 64, section 1, paragraph 9, and section 2, paragraph 3; chapter 91; and chapter 105. Until this bulletin is incorporated into the handbook, inspectors should make reference to this bulletin in the appropriate margins of their handbook.

/s/  
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