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ORDER: 8300.10

APPENDIX: 4

BULLETIN TYPE: Flight Standards Information Bulletin  
(FSIB) for Airworthiness (FSAW)

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BULLETIN TITLE: Modification of Technical Standard  
Order (TSO) Altimeters

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1. SUBJECT. The purpose of this bulletin is to establish Flight Standard's position relating to the approval for return to service of Technical Standard Order (TSO) C10b/C88 encoding altimeters when the encoder fails and must be either repaired or replaced.

2. BACKGROUND. There have been several requests from the field offices for assistance in resolving the issue of approval for return to service of an encoding altimeter when the encoder portion has failed to meet the test and inspection requirements of Title 14 of the Code of Federal Regulations (14 CFR) part 43, Appendix E.

The following lists practices currently being applied by different regions and inspectors concerning this issue.

A. The entire altimeter is replaced by a like kind.

B. The altimeter may continue to be used if the encoder portion is disconnected and replaced with a blind encoder.

C. The encoder is properly repaired so that the altimeter and encoder continue to meet their respective TSO requirements.

D. The encoding altimeter is replaced with a standard altimeter and a separate blind encoder.

14 CFR part 91, section 91.217 requires the data correspondence between the altimeter and the encoder to be TESTED and CALIBRATED to transmit altitude data to within 125 feet of the indicated or calibrated datum of the altimeter used to maintain flight altitude.

Section 91.411 requires each altimeter, each static pressure system, and each automatic pressure altitude reporting system, used under Instrument Flight Rules (IFR), to be tested and inspected and found to comply with part 43, Appendix E.

When an encoding altimeter fails to meet the requirements of section 91.217 or 91.411, the altimeter must be removed and repaired in accordance to the instrument manufacturer's service instructions or to data approved by the

Administrator, as this is considered a major repair.

The data used to repair the altimeter and encoder must ensure these appliances are restored to their original condition for certification pursuant to a type design or design specification as appropriate for approval for return to service.

The minimum standard, for design specifications, has been established as meeting a TSO or a Type Certificate (TC) pursuant to aircraft type certification.

An aircraft altimeter must always meet its type design or certification basis. The test and inspection requirements specified under sections 91.411 and 91.217 impose additional requirements for flights conducted under IFR.

The following is Federal Aviation Administration (FAA) Policy on Solutions A, C, and D mentioned above.

Replacement of the defective altimeter is always an option the owner/operator may choose. This can be accomplished by replacing the defective altimeter with an exact replacement or by replacing the defective altimeter with an altimeter and blind encoder that will meet the certification basis of the aircraft and the operating rule.

A Memorandum has been issued by the Transport Airplane Directorate, Standards Staff, ANM-110, concerning the installation of TCAS II with a blind encoding altimeter as the only source of pressure altitude information to the TCAS II equipment. The Transport Airplane Directorate has determined a blind encoding altimeter will not meet the system safety analysis of improbable as outlined in Advisory Circular (AC) 20-131, Airworthiness and Operational Approval of Traffic Alert and Collision Avoidance Systems. The Memorandum states "TCAS II installations should not be approved with a blind encoding altimeter as the sole source of pressure altitude information."

The replacement of the altitude information source to an Approved TCAS II system must be approved by the Regional Aircraft Certification Office.

The altimeter may always be repaired so as the altimeter and encoder meet their respective TSO requirements.

The following policy addresses Solution B, in part; stating that the encoder portion can be disconnected internally and the altimeter portion be approved for return to service.

Section 21.611(c) allows for a person other than the manufacturer to make a change in the design of a TSO'd article when they obtain approval for the design change under part 43, or under the applicable airworthiness regulations.

FAA Order 8150.1A, paragraph 21, addresses identification of TSO'd articles which are modified by persons other than the TSO holder.

If the design changes are approved under part 43, or under the provisions of the applicable airworthiness regulations, the following identification requirements should be applied to the altered TSO'd products.

E. The modifier's nameplate should be added without removing the TSO identification from the Original Equipment Manufacturer's (OEM) nameplate if:

(1) The OEM has notified the FAA that the modified article continues to meet all requirements of TSO.

or

(2) The modifier certifies to the FAA, based on his tests and investigations, that the article continues to meet all requirements of the TSO.

F. If the modified article does not continue to meet the requirements of the TSO, the TSO identification on the OEM's nameplate should be permanently obliterated in such a manner that it cannot be restored. Such articles would have to be approved as part of an aircraft-type design when installed in the aircraft.

G. If the modified article is produced under the provisions of section 21.303, FAA Parts Manufactured Approval (PMA), the article must be marked in accordance with the requirements of section 45.15.

Part 43, Appendix A (4) states that alterations of the basic design not made in accordance with recommendations of the appliance manufacturer or in accordance with an FAA Airworthiness Directive (AD) are appliance major alteration.

The disabling (alteration) of any encoder portion of an encoding altimeter or substituting the encoder function with a blind encoder is considered a major alteration and cannot be approved for return to service unless the alteration is accomplished with approved data.

3. GUIDANCE. In order to ensure that certification standards are not compromised and to ensure standardization across regions and between district offices, each Principal Avionics Inspectors should inform operators of the procedures that must be followed when they modify an appliance (encoding altimeter) meeting TSO or approved as part of aircraft-type design.

4. ACTION. None

5. INQUIRIES. AFS-350 developed this FSIB. Any questions should be directed to AFS-350, at (202) 267-8177.

6. EXPIRATION. This FSIB will remain in effect until further notice.

/s/  
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