



Number: CTSO-C21b

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China Civil Aviation Technical Standard Order

This China Civil Aviation Technical Standard Order (CTSO) is issued according to Part 37 of the China Civil Aviation Regulations (CCAR-37). Each CTSO is a criterion which the concerned aeronautical materials, parts or appliances used on civil aircraft must comply with when it is presented for airworthiness certification.

Aircraft Turnbuckle Assemblies and/or Turnbuckle Safetying Devices

1. Purpose.

This China Civil Aviation Technical Standard Order (CTSO) is for manufacturers applying for aircraft turnbuckle assemblies and/or turnbuckle safetying devices CTSO authorization (CTSOA). This CTSO prescribes the minimum performance standards (MPS) that aircraft turnbuckle assemblies and/or turnbuckle safetying devices must first meet for approval and identification with the applicable CTSO marking.

2. Applicability.

This CTSO affects new application submitted after its effective date. Major design changes to article approved under this CTSO will require a new authorization in accordance with section 21.353 of CCAR-21-R4.

3. Requirements

- a. Minimum Performance Standards. Turnbuckle assemblies and/or

turnbuckle safetying devices that are to be so identified and that are manufactured on or after the date of this CTSO must meet the standards set forth in Sections 3 and 4 of US Military Specification MIL-T-8878C, “Turnbuckles, Positive Safetying”, dated October 8, 1985, with the exceptions/revisions and additions specified in subparagraphs a.(3) and a.(4) respectively of this CTSO. Turnbuckles approved prior to the date of this CTSO may continue to be manufactured under the provisions of their original approval.

b. Test Methods. Federal Test Method Standard 151, Method 211.

c. Exceptions/Revisions.

(1) Disregard the statement in paragraph 3.1 of MIL-T-8878C, “...and which have been listed on or approved for listing on the applicable Qualified Products List.”

(2) Compliance with paragraphs 4.1 and 4.5.2 of MIL-T-8878C are not required.

d. Additions.

(1) In addition to requirements of paragraph 3.3.2 of MIL-T-8878C, include the following:

“Locking clips are for one time use only and shall not be reused. Refer to Military Standard MS-33736.”

(2) In addition to the requirements of paragraph 3.7 of MIL-T-8878C, include the following: “Permanently and legibly mark each article with

“CTSO-C21b.”

(3) In addition to requirements of paragraph 4.6 of MIL-T-8878C, include the following:

Torsion Fatigue. The turnbuckle assembly containing the sample component part shall be subjected to a repetitive torsional load test in which a load equal to 60 percent of the torque load specified in Table I is applied in torsion first in one direction and then reversed for a total of 3,000 complete cycles. There shall be no evidence of failure of any component part.

Vibration. Three representative turnbuckle assemblies, i.e., the smallest, the largest, and an intermediate size, shall be vibrated for 25 hours at a frequency of 3600 cpm at an amplitude of 1/8 inch. The cable tension load for the test shall be 25% of the minimum breaking strength value specified on the applicable MS standard. The locking clip shall not jump out of place or otherwise lose its safetying properties.

(4) In addition to the requirements of paragraph 4.3.1, of MIL-T-8878C, include 4 additional turnbuckle assemblies: one assembly for the torsion fatigue test and three assemblies for the vibration tests.

4. Marking.

Requirements for marking are specified in paragraph 3.7 of MIL-T-8878C, and are in general compliance with section 21.423(b) of

CCAR-21-R4.

5. Application Data Requirements.

a. The applicant must furnish the responsible certification personnel with the related data to support design and production approval. The application data include a statement of conformance as specified in section 21.353(a)(1) in CCAR-21-R4 and one copy each of the following technical data:

(1) A complete description of turnbuckle assembly, including material identification and specification.

(2) Installation instructions for turnbuckle assemblies and limitations.

(3) Report of results of tests conducted in accordance with Paragraph 4.6 of MIL-T-8878C.

(4) Maintenance instructions.

(5) Quality control test specifications to be used to test each production article to ensure compliance with this CTSO.

b. Installation procedures and limitations sufficient to ensure that the aircraft turnbuckle assemblies and/or turnbuckle safetying devices, when installed according to the installation or operational procedures, still meet this CTSO's requirements. Limitations must identify any unique aspects of the installation. The limitations must include a note with the following

statement:

“This article meets the minimum performance and quality control standards required by a CTSO. Installation of this article requires separate approval.”

8. Availability of Referenced Documents.

Copies of military specification MIL-T-8878C and any other specification referred to therein may be obtained from the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120.