English Translation Version for Reference Only

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Approved by：Xu Chaoqun

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.

Propeller Feathering Hose Assemblies

1. Purpose.

This China Civil Aviation Technical Standard Order (CTSO) is for manufacturers applying for Propeller Feathering Hose Assemblies CTSO authorization (CTSOA). This CTSO prescribes the minimum performance standards(MPS) that Propeller Feathering Hose Assemblies 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-21R4.

3. Requirements

New models of Propeller Feathering Hose Assemblies identified and

manufactured on or after the effective date of this CTSO must meet the MPS qualification requirements of the following types.

Type 1 (pressure line) hose assemblies which are intended to be used in the line connecting the feathering pump outlet to the propeller governor.

Type 2 (supply line “fire-resistant”) hose assemblies which are intended to be used in the line connecting the oil supply to the feathering pump where this entire line is located aft of the firewall.

Type 3 (supply line “fireproof”) hose assemblies which are intended to be used in the line connecting the oil supply to the feathering pump where this line is located wholly or in part forward of the firewall.

New models of propeller feathering hose assemblies manufactured for use in civil aircraft on or after the effective date of this CTSO, shall meet the “performance” section of Military Specification MIL-H-8795(ASG) dated January 6, 1956, or MIL-H-8790 dated August 22, 1956, with the following exception and shall also meet the appropriate fire test requirements listed below.

a. Exception.

The hydraulic impulse test requirements in MIL-H-8795(ASG) and MIL-H-8790 need not be met for the purposes of this order.

b. Supplementary requirements.

(1) Pressure line (type 1) hose assembly fire test.

1) Test setup and flame requirements.

(a) For the purpose of this test, a length of hose five times the outside diameter or longer shall be subjected to a flame of the size and temperature specified in (d) and (e) of this subdivision while the hose is in a horizontal position. The entire end fitting shall also be subjected to this flame.

(b) The hose assembly shall be installed horizontally in the test setup in such a manner that it includes at least one full 90° bend so that the pressure existing inside the hose will exert an axial force on the end fitting equal to the inside area of the hose multiplied by the internal pressure.

(c) During the test the end fitting which is subjected to flame shall be vibrated at the rate of 2,000 cycles per minute through a total amplitude of not less than 1/8 inch, i.e., a displacement of 1/16 inch on each side of the neutral position.

(d) The flame temperature shall be 2,000°F., plus or minus 50°F. As measured within1/4inch of the surface of the hose and end fitting at the point nearest the flame. Suitable shielded thermocouples or equivalent temperature measuring devices shall be used for measuring the flame temperature. A sufficient number of these shall be used to assure that the specified temperature exists at least along the entire end fitting and along the hose for a distance of not less than three times its outside diameter.

(e) The flame diameter shall not be less than three times the maximum diameter of the hose or three times the maximum diameter of the end fitting (whichever is greater). The length of the flame shall be such that it extends beyond the end fitting and hose when they are in place during the test, for a distance of not less than three times the maximum diameter of the hose or three times the maximum diameter of the end fitting, whichever is greater.

(f) During the test SAE 20 oil or equivalent shall be circulated through the hose assembly, and the oil shall enter the hose assembly at a temperature of not less than 200°F.

(NOTE: Items (d) and (e) above, concerning flame size and distribution, will be revised in accordance with agreements reached with the SAE A-3 Flame Test Subcommittee, when its study of this problem is completed.)

2) Fire test procedure.

(a) Part I.

Pressure: 150 psi (minimum)

Oil flow rate: 1.3 quarts/minute (maximum)

Duration: 4 minutes, 30 seconds

(b) Part II (which shall immediately follow Part I).

Pressure: 1650 psi (minimum)

Oil flow rate: 14 quarts/minute (maximum; any lower flow rate is

acceptable.)

duration: 30 seconds

3) Criteria for acceptability. The hose assembly under test shall be considered acceptable if it complies with these test conditions without evidence of leakage.

(2) Supply line “fire-resistant” (type 2) hose assembly fire test.

1) Test setup and flame requirements. Same as subdivision1) of subparagraph (1) of this paragraph.

2) Fire test procedure.

Pressure: 30 psi (minimum)

Oil flow rate: 1.3 quarts/minute (maximum)

Duration: 5 minutes

3) Criteria for acceptability. Same as subdivision 3) of subparagraph (1) of this paragraph.

(3) Supply line “fireproof” (type 3) hose assembly fire test.

1) Test setup and flame requirements. Same as subdivision 1) of subparagraph (1).

2) Fire test procedure. Test shall be conducted as described in subdivision 2) of subparagraph (2) except that upon completion thereof test shall be extended for an additional 10 minutes, making the total duration 15 minutes.

3) Criteria for acceptability. Same as subdivision 3) of subparagraph

(1) of this paragraph.

c. Deviations. For using alternative or equivalent means of compliance to the criteria in this CTSO, the applicant must show that the equipment maintains an equivalent level of safety. Apply for a deviation under the provision of 21.368(a) in CCAR-21R4.

4. Marking.

Mark at least one major component permanently and legibly with all the information in 21.423(b) of CCAR-21R4. The marking must include the serial number and the following information:

a. Name or trademark of the manufacturer responsible for compliance with this CTSO.

b. Model designation.

c. Date of manufacture.

d. Applicable TSO number, followed immediately by “Type Number” (as “Type 1”, etc.). This identification must be legibly stamped on a steel (or other fireproof material) band securely affixed to the hose assembly.

5. Application Data Requirements.

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-21R4 and one copy each of the following technical data:

a. A Manual(s) containing the following:

(1) Operating instructions and equipment limitations sufficient to describe the equipment's operational capability.

(2) Describe in detail any deviations.

(3) Installation procedures and limitations sufficient to ensure that the Propeller Feathering Hose Assemblies, 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."

(4) Schematic drawings, wiring diagrams, and any other documentation necessary for installation of the Propeller Feathering Hose Assemblies.

(5) List of replaceable components, by part number, that makes up the Propeller Feathering Hose Assemblies. Include vendor part number cross-references, when applicable.

b. Instructions covering periodic maintenance, calibration, and repair,

for the continued airworthiness of the Propeller Feathering Hose Assemblies. Include recommended inspection intervals and service life, as appropriate.

c. A drawing depicting how the article will be marked with the information required by paragraph 4 of this CTSO.

d. The quality system description required by section 21.358 of CCAR-21R4, including functional test specifications. The quality system should ensure that it will detect any change to the approved design that could adversely affect compliance with the CTSO MPS, and reject the article accordingly.

e. Material and process specifications list.

f. List of all drawings and processes (including revision level) that define the article’s design.

g. Manufacturer’s CTSO qualification report showing results of testing accomplished according to paragraph 3 of this CTSO.

6. Manufacturer Data Requirements.

Besides the data given directly to the authorities, have the following technical data available for review by the authorities:

a. Functional qualification specifications for qualifying each production article to ensure compliance with this CTSO.

b. Equipment calibration procedures.

c. Schematic drawings.

d. Wiring diagrams.

e. Material and process specifications.

7. Furnished Data Requirements.

If furnishing one or more articles manufactured under this CTSO to one entity (such as an operator or repair station), provide one copy or technical data and information specified in paragraphs 5.a and 5.b of this CTSO. Add any data needed for the proper installation, certification, use, or for continued compliance with the CTSO, of the Propeller Feathering Hose Assemblies.

8. Availability of Referenced Documents.

Order SAE documents from:

Society of Automotive Engineers, Inc.

400 Commonwealth Drive, WARRENDALE, PA 15096-001, USA

You may also order them online from the SAE Internet website at:

www.sae.org.