



Technical Standard Order

Subject: TSO-C42, PROPELLER FEATHERING HOSE ASSEMBLIES

Part 514 - Technical Standard Orders for Aircraft Materials, Parts, Processes, and Appliances

Under section 601 of the Civil Aeronautics Act of 1938 and the delegation of authority from the Civil Aeronautics Board in § § 3.18, 4a.31, 4b.18, 6.18 and 7.18 of the Civil Air Regulations, the Administrator of civil Aeronautics is authorized to adopt performance standards and specifications of materials, parts, processes, and appliances used in aircraft as he may find necessary to implement provisions of the Civil Air Regulations. The Administrator adopted the Technical Standard Order system as a means to carry out this delegated authority. This system, in brief, provides for CAA - industry cooperation in the development of these performance standards, and a form of self-regulation by industry in demonstrating compliance with these standards. Since the original adoptions of this part, which contains the C series TSO's, it has been found desirable to make clarifying editorial and format changes. Hence, Part 514 of the Regulations of the Administrator is being amended to provide two subparts. Subpart A contains the general requirements applicable to all Technical Standard Orders, such as "Method of Conformance," "Marking," and "Deviations." Subpart B contains the technical specifications to which a specific product must conform.

SUBPART A--GENERAL

§ 514.1 *Basis and purpose* --(a)
Basis. Section 601 of the Civil Aeronautics Act of 1938, as amended, and § § 3.18, 4a.31, 4b.18, 6.18 and 7.18 of the Civil Air Regulations.

(b) *Purpose.* The purpose of this part is to establish minimum performance standards for aircraft materials, parts, processed, and appliances which are to be used on civil aircraft of the United States, and to prescribe the manner by which the manufacturer must

show compliance with such performance standards.

§ 514.2 *Method of conformance.* A manufacturer of an aircraft material, part, process, or appliance for which standards are established in Subpart B of this part, prior to distribution for use on a civil aircraft of the United States, shall furnish a written statement of conformance certifying that the material, part, process, or appliance meets the applicable performance standards

established in this part. The statement of conformance shall be signed by a person duly authorized by the manufacturer, and shall be furnished to the Chief, Aircraft Engineering Division, Office of Aviation Safety, Civil Aeronautics Administration, Washington 25, D.C.

If complaints of nonconformance with the requirements of this Order are brought to the attention of the CAA and investigation indicates that such complaints are justified, the Administrator will take appropriate action to restrict the use of the product in civil aircraft.

§ 514.3 *Marking*. Materials, parts, processes, and appliances for which a statement of conformance has been submitted, shall be legibly and permanently marked with the following information:

(a) Name and address of the manufacturer responsible for compliance,

(b) Equipment name, or type or model designation,

(c) Weight to the nearest pound and fraction thereof,

(d) Serial number and/or date of manufacturer, and

(e) Applicable Technical Standard Order (TSO) number.

§ 514.4 *Deviations*. No deviation will be granted from the performance standards established in Subpart B. Requests for deviation from other requirements of this part should be addressed to the Aircraft Engineering Division, Office of Aviation Safety, Civil Aeronautics Administration, Washington 25, D.C.

TECHNICAL STANDARD ORDERS ARE OBTAINABLE WITHOUT CHARGE FROM THE CAA, DISTRIBUTION SECTION, WASHINGTON 25, D.C.

SUBPART B

§ 514.40 Propeller feathering hose assemblies (rubber and wire braid construction) -- TSO-C42 --(a) Applicability -- (1) Minimum performance standards. Minimum performance standards are hereby established for propeller feathering hose assemblies of the following types which are to be used in civil aircraft of the United States:

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

(ii) 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.

(iii) 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 March 1, 1957, shall meet the “performance” section of Military Specification MIL-H-8795(ASG) dated January 6, 1956,^{1/} or MIL-H-8790 dated August 22, 1956,^{1/} with the following exception and shall also meet the appropriate fire test requirements listed below.

(2) 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.

(3) Pressure line (type 1) hose assembly fire test -- (i) 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 within ¼ inch 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.)

1/ Copies of these specifications may be obtained by addressing a request to the Commanding General, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio

(ii) 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

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

(4) Supply line “fire-resistant” (type 2) hose assembly fire test--(i) Test setup and flame requirements. Same as subdivision (i) of subparagraph (3) of this paragraph.

(ii) Fire test procedure.

Pressure: 30 psi (minimum)
Oil flow rate: 1.3 quarts/minute (maximum)
Duration: 5 minutes

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

(5) Supply line “fireproof” (type 3) hose assembly fire test -- (i) Test setup and flame requirements. Same as subdivision (i) of subparagraph (3).

(ii) Fire test procedure. Test shall be conducted as described in subdivision (ii) of subparagraph (4) except that upon completion thereof test shall be extended for an additional 10 minutes, making the total duration 15 minutes.

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

(b) Marking. The following marking is required in lieu of that specified in § 514.3:

- (1) Name or trademark of the manufacturer responsible for compliance with this TSO.
- (2) Model designation.
- (3) Date of manufacture.

(4) 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.

(c) Effective date. March 1, 1957.