

European Aviation Safety Agency

European Technical Standard Order

Subject: PROPELLER FEATHERING HOSE ASSEMBLIES

1 - Applicability

This ETSO gives the requirements which propeller feathering hoses assemblies of the following types that are manufactured on or after the date of this ETSO must meet in order to be identified with the applicable ETSO marking:

- (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 „fire proof“) 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 wholly or in part forward of the firewall.

2 - Procedures

2.1 - General

Applicable procedures are detailed in CS-ETSO Subpart A.

2.2 - Specific

None.

3 - Technical Conditions

3.1 - Basic

3.1.1 - Minimum Performance Standard

Standards set forth in Sections 3 and 4 of Military Specifications MIL-H-8795D, dated October 14, 1985, or MIL-H-8790D dated December 30, 1981 with the following exception and shall also meet the appropriate fire test requirements listed below:

Test Methods

- a - *Exception:* the hydraulic impulse test requirements in MIL-H-8795D and MIL-H-8790 need not be met for the purposes of this paragraph.
- b - *Pressure line (type 1) hose assembly fire test*
 - (i) *Test set up 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 33 hertz through a total amplitude of not less than 3.2 mm i.e. a displacement of 1.6 mm on each side of the neutral position.

- (d) The flame temperature shall be 1100°C plus or minus 30°C as measured within 6.35 mm 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 the 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 the 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 93°C.
- (ii) *Fire test procedure*
 - (a) Part I
Pressure: 1034kPa (150 psi) (minimum).
Oil flow rate: 1.23dm³ (1.3 quart)/minute (maximum).
Duration: 4 minutes, 30 seconds.
 - (b) Part II (which shall immediately follow Part I)
Pressure: 11378kPa (1650 psi) (minimum).
Oil flow rate: 13.2dm³ (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 tests conditions without evidence of leakage.
- c - *Supply line „fire-resistant“ (type 2) hose assembly fire test*
 - (i) *Test set up and flame requirements*
Same as paragraph (b)(i) of this paragraph.
 - (ii) *Fire test procedure*
Pressure: 207kPa (30 psi) (minimum).
Oil flow rate: 13.2dm³ (14 quarts)/minute (maximum).
Duration: 5 minutes.
 - (iii) *Criteria for acceptability*
Same as paragraph (b)(iii) of this paragraph.
- d - *Supply line „fire proof“ (type 3) hose assembly fire test*
 - (i) *Test set up and flame requirements*
Same as paragraph (b)(i) of this paragraph.
 - (ii) *Fire test procedure*
Pressure: 207 kPa (30 psi) (minimum).
Oil flow rate: 13.2dm³/minute (14 quarts/minute.) (maximum).
Duration: 15 minutes.
 - (iii) *Criteria for acceptability*
Same as paragraph (b)(iii) of this paragraph.

3.2 - Specific
None

4 - Marking

4.1 - General

Marking is detailed in CS-ETSO Subpart A paragraph 1.2.

4.2 - Specific

None.

5 - Availability of Referenced Document

See CS-ETSO Subpart A paragraph 3.