ETSO-C53a
Date : 24.10.03

European Aviation Safety Agency

European Technical Standard Order

Subject: FUEL AND ENGINE OIL SYSTEM HOSE ASSEMBLIES

1 - Applicability

This ETSO gives the requirements which fuel and engine oil system hose assemblies that are manufactured on or after the date of this ETSO must meet in order to be identified with the applicable ETSO marking.

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

(1) Minimum performance standards are hereby established for the following types of fuel and engine oil system hose assemblies:

(i) Type A. Non-fire-resistant „normal“ temperature hose assemblies which are intended to be used in locations outside fire zones where the fluid and ambient air temperatures do not exceed 12l°C.

(ii) Type B. Non-fire-resistant „high“ temperature hose assemblies which are intended to be used in locations outside fire zones where the fluid and ambient air temperatures do not exceed 232°C.

(iii) Type C. Fire-resistant „normal“ temperature hose assemblies which are intended to be used in locations within fire zones where the fluid and ambient air temperatures do not exceed 12l°C.

(iv) Type D. Fire-resistant „high“ temperature hose assemblies which are intended to be used in locations within fire zones where the fluid and ambient air temperatures do not exceed 232°C.

Each type shall comply with the following requirements. Three samples of each size shall be tested.

(1) Type A hose assemblies shall comply with the „3.3 Performance“ paragraph requirements of Specification MIL-H-8795A, dated July 25, 1958, except as noted in sub-paragraph (2) of this paragraph. The hose incorporated therein shall conform to „3.6 Performance“ paragraph of Specification MIL-H-8794A, dated July 25, 1958, except as noted in sub-paragraph (2) of this paragraph.

(2) Type B hose assemblies shall comply with the „3.6 Performance“ paragraph requirements of Specification MIL-H-25579 (USAF), dated March 19, 1959, except as noted in sub-paragraph (2) of this paragraph.

(3) Type C hose assemblies shall comply with the above requirements for type A hose assemblies and in addition shall pass the fire test described in sub-paragraph (3) of this paragraph.

(4) Type D hose assemblies shall comply with the above requirements for Type B hose assemblies and in addition shall pass the fire test described in sub-paragraph (3) of this paragraph.

(2) Exceptions.

(i) Type A hose assemblies are not required to comply with paragraphs 3.6.1.2 and 3.6.2.7 of Specification MIL-H-8794A. The operating and proof pressures referred to in Table 1 of that specification shall be those values listed in the „Fuel“ column thereof. The burst pressures to be utilized shall be twice the proof pressures listed in the „Fuel“ column in Table 1. The foregoing shall likewise apply in showing compliance with Specification MIL-H-8795A.

(ii) Type B hose assemblies are not required to comply with paragraphs 3.6.5, 3.6.7 and 3.6.10 of Specification MIL-H-25579 (USAF). The burst pressures to be utilized shall be twice the proof pressures listed in Table 1 of that specification.

(3) Fire test procedure and requirements. A description of the standard fire test apparatus and its use is in FAA „Standard Fire Test Apparatus and Procedure“ (Power Plant Engineering Report N°3). The use of a protective sleeve over the hose and/or end fittings is permitted to facilitate compliance with the fire test requirements. Sleeves or covers shall be secured to the hose assembly so fire-resistant properties will be maintained.

(i) Oil pressure during fire test: Type C hose assemblies - the operating pressure specified in the „Fuel“ column of Table 1 in Specification MIL-H-8795A. Type D hose assemblies - the operating pressure specified in Table 1 of Specification MIL-H-25579 (USAF).

(ii) Oil flow rate: $5X(\text{Hose assembly actual ID in inches})^2$. (Example: Flow rate for -16 size $=5X(7/8)^2=3.8$GPM)

(iii) Duration: 5 minutes.

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

3.1.2 - Environmental Standard

As per paragraph 3.1.1 above.

3.1.3 – Computer Software

None

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.