

# European Aviation Safety Agency

## European Technical Standard Order (ETSO)

Subject: **PRESSURE INSTRUMENTS – FUEL, OIL AND HYDRAULIC**

### 1 - Applicability

This ETSO gives the requirements which fuel, oil, and hydraulic pressure instruments 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

Standards set forth in the SAE Aerospace Standard (AS) document: SAE AS 408C "*Pressure Instruments - Fuel, Oil and Hydraulic*" from July 1, 2001 unless otherwise specified by **Appendix 1** of this ETSO.

##### 3.1.2 - Environmental Standard

Testing fuel, oil, and hydraulic pressure instruments must be in accordance with SAE AS408C section 7 and EUROCAE ED-14E (RTCA DO-160E) "*Environmental Conditions and Test Procedures for Airborne Equipment*" from March 2005.

##### 3.1.3 - Computer Software

If fuel, oil, and hydraulic pressure instrument includes a digital computer, the software must be developed according to EUROCAE ED-12B (RTCA DO-178B) "*Software Considerations in Airborne Systems and Equipment Certification*" from 1992 .

### **3.1.4 Electronic Hardware Qualification.**

If the fuel, oil, and hydraulic pressure instrument includes a complex custom micro-coded component, this must be developed according to EUROCAE ED-80 (RTCA DO-254), "*Design Assurance Guidance for Airborne Electronic Hardware*" from April 2000.

### **3.2 - Specific**

None

### **4 - Marking**

#### **4.1 - General**

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

#### **4.2 - Specific**

- a) At least one major component of the fuel, oil, and hydraulic pressure instrument shall be marked permanently and legibly with all the information as provided in SAE AS408C, Section 3.2 (except paragraph 3.2.b).
- b) Mark "Fire resistant" or "Fireproof" information legibly and permanently

### **5 - Availability of Referenced Document**

See CS-ETSO Subpart A paragraph 3

**APPENDIX 1.**

**MINIMUM PERFORMANCE STANDARDS (MPS) FOR PRESSURE INSTRUMENTS - FUEL, OIL, AND HYDRAULIC**

1. The MPS applying to this ETSO are provided in SAE AS408C, Pressure Instruments - Fuel, Oil, and Hydraulic, dated July 1, 2001, except for paragraphs 3.1, 3.1.1, 3.1.2, and 3.2.b.

Here are provided the modifications to be applied to the referenced SAE document:

- AS408C**                      **modification:**
- |             |  |
|-------------|--|
| Title       | Replace "Pressure Instruments – Fuel, Oil, and Hydraulic (Reciprocating Engine Powered Aircraft)"<br>Substitute: "Pressure Instruments – Fuel, Oil, and Hydraulic" |
| Section 1.1 | Replace "...primarily for use with reciprocating engine powered transport aircraft, ..."<br>Substitute: "...for use with civil aircraft,..."                       |
- AS408C section 7**      **modification:**
- |           |  |
|-----------|--|
| Para 7.13 | Use test conditions in SAE AS1055 Rev D, "Fire Testing of Flexible Hose, Tube Assemblies, Coils, Fittings, and Similar System Components", dated June 1, 1997, Sections 4 and 5. |
| Para 7.14 | Add test conditions in EUROCAE ED-14E / RTCA DO-160E, Section 16, Power Input.   |
| Para 7.15 | Add test conditions in EUROCAE ED-14E / RTCA DO-160E Section 17, Voltage Spike.  |
| Para 7.16 | Add test conditions in EUROCAE ED-14E / RTCA DO-160E Section 18, Audio Frequency Conducted Susceptibility – Power Inputs.  |
| Para 7.17 | Add test conditions in EUROCAE ED-14E / RTCA DO-160E Section 19, Induced Signal Susceptibility   |
| Para 7.18 | Add test conditions in EUROCAE ED-14E / RTCA DO-160E Section 20, Radio Frequency Susceptibility.   |
2. The performance of fuel, oil and hydraulic pressure instruments can be enhanced or made superior to this specification, depending on intended application and configuration.