

European Aviation Safety Agency

European Technical Standard Order

Subject: STALL WARNING INSTRUMENTS

1 - Applicability

This ETSO gives the requirements which stall warning 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 Aeronautical Standard AS 403A issued 15/10/1952. revised 15/7/1958 with exceptions and additions to the standard listed in the following sub-paragraph:

Exceptions and additions

- (i) The following specifically numbered parts in AS 403A do not concern minimum performance and therefore are not essential to compliance with this paragraph: Parts 3.1; 3.1.1.; 3.1.2; 3.2(a), (b), (c) (d), (e), and (f).
- (ii) In lieu of Part 7 of AS 403A, it is a requirement that stall warning instruments covered by this paragraph be capable of successfully passing the tests in Parts 7.1 through 7.7 of AS 403A.
- (iii) Thermal shock: This test shall apply to any hermetically sealed component. The component shall be subjected to four cycles of exposure to water at $85^{\circ}\pm 2^{\circ}\text{C}$ and $5^{\circ}\pm 2^{\circ}\text{C}$ without evidence of moisture penetration or damage to coating or enclosure. Each cycle of the test shall consist of immersing the component in water at $85^{\circ}\pm 2^{\circ}\text{C}$ for a period of 30 minutes and then within 5 seconds of removal from the bath, the component shall be immersed for a period of 30 minutes in the other bath maintained at $5^{\circ}\pm 2^{\circ}\text{C}$. This cycle shall be repeated continuously, one cycle following the other until four cycles have been completed. Following this test, the indicator shall be subjected to the Sealing test specified in (iv). No leakage shall occur as a result of this test.
- (iv) Sealing: This performance test shall apply to each hermetically sealed instrument. The instrument shall be immersed in a suitable liquid such as water. The absolute pressure of the air above the liquid shall then be reduced to approximately 34 hPa (1 inch of mercury (Hg)) and maintained for 1 minute or until air bubbles cease to be given off by the liquid, whichever is longer. The absolute pressure shall then be increased by 85 hPa (2 1/2 inches Hg). Any bubbles coming from within the indicator case shall be considered as a leakage and shall be cause for rejection. Bubbles which are the result of entrapped air in the various exterior parts of the case shall not be considered as a leakage. Other tests methods which provide evidence equal to the immersion test of the integrity of the instrument's

seals may be used. If the instrument incorporates non hermetically sealed appurtenances such as a case extension, these appurtenances may be removed prior to the sealing test.

- (v) Power malfunction indication: Means shall be incorporated in the instrument to indicate when adequate power (voltage and/or current) is not being made available to all phases required for the proper operation of the instrument. The indicating means shall indicate a failure or a malfunction in a positive manner, and be readily discernible under any lighting condition normally encountered in aircraft.

3.1.2 - Environment Standard

As indicated in AS 403A document.

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.