



# AEROSPACE STANDARD

**AS1188****REV. A**

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Superseding AS1188

## Aircraft Tire Inflation-Deflation Equipment

### RATIONALE

By Committee vote, this document was deemed mature and unlikely to have additional relevant information to become available and, hence, no further updates are planned.

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## 1. PURPOSE

To specify minimum requirements for on-board inflation-deflation equipment for aircraft tires.

## 2. SCOPE

This specification covers minimum design and test requirements for aircraft tire inflation-deflation equipment for use on all types of aircraft. It shall be the responsibility of the airframe manufacturer to determine the compatibility of the requirement with the applicable aircraft and to specify requirements in excess of these minimums as necessary.

## 3. APPLICABLE DOCUMENTS

The following documents shall form a part of this standard to the extent specified herein. The applicable issue of each shall be that in effect on the date of this Aerospace Standard unless otherwise specified in the manufacturer's Model (Detail) Specifications. Supplementary specifications, standards, or the like, which by reference in any of the following publications are indicated to be part thereof, shall not be considered effective except as specifically stated in the manufacturer's model (Detail) Specification or as may be otherwise mutually agreed upon between the vendor and the purchaser.

|             |                                                              |
|-------------|--------------------------------------------------------------|
| MIL-STD-130 | Identification Marking of U. S. Military Property            |
| MIL-STD-210 | Climatic Extremes for Military Equipment                     |
| MIL-STD-704 | Electric Power, Aircraft, Characteristics and Utilization of |
| MIL-STD-810 | Environmental Test Methods                                   |
| MIL-STD-838 | Lubrication of Military Equipment                            |
| MIL-STD-889 | Dissimilar Metals                                            |
| MIL-T-5041  | Tires, Pneumatic, Aircraft                                   |

## 4. GENERAL REQUIREMENTS

- 4.1 **Materials:** Materials shall be suitable for the purpose intended. All metals used in the construction of inflation-deflation equipment shall be corrosion resistant or suitably plated or treated to resist corrosion during stocking and normal service life.

Use of component materials which will not require replacement due to exceeding age limitations shall be a design objective. Where component materials have an age limitation, it shall be identified with the replacement date.

- 4.1.1 **Insulation of Dissimilar Metals:** Components of dissimilar metals in contact shall be insulated by the application of at least one zinc-chromate primer coat to one of the components prior to assembly. Zinc-chromate paste of suitable consistency may be substituted for the zinc-chromate primer. Dissimilar metals are as defined by MIL-STD-889.

- 4.2 **Special Tools:** The design shall be such that special or unusual tools shall not be required for installation or removal, or for normal maintenance and inspection of the inflation-deflation equipment. The design will provide to the greatest possible extent for the disassembly, reassembly, and service maintenance by means of those tools and items of maintenance equipment which are normally available as commercial standard. Designs requiring special maintenance tools and equipment shall be kept to a minimum.
- 4.3 **Workmanship:** Workmanship and finish shall be of the quality necessary to produce inflation-deflation assemblies that are free from defects which affect proper functioning in service.
- 4.4 **Identification:** The inflation-deflation equipment shall be plainly marked as follows per MIL-STD-130:
- (a) SAE AS 1188
  - (b) Name of unit
  - (c) Assembly number
  - (d) Serial number and date of manufacture
  - (e) Manufacturer's name
  - (f) Pressure Rating

## 5. PERFORMANCE REQUIREMENTS

- 5.1 **General:** The inflation-deflation devices shall be operated at the prescribed tire pressure ranges with provision to manually preset or automatically control the tire pressure at all ranges of the supply pressure.
- 5.2 **Valves:** The valve or valves shall be able to control the tire pressure to the preset level within +5/-0 percent.
- 5.2.1 Deflation shall be accomplished with no malfunction from the formation of ice crystals during pressure reduction.
- 5.2.2 Leakage or bleeding shall not occur due to pressure build-up when tire is bottomed or heated to maximum operating temperature.
- 5.3 **Pressure Control Indicator:** The pressure control indicator shall show the maximum and minimum preset levels with detents every 5 PSIG between maximum and minimum range. Detents shall be suitably identified for their corresponding pressure level.
- 5.4 **Pressure Cut-Off Device:** A positive automatic cut-off device for both inflation and deflation systems shall be provided to obtain the desired tire pressure.
- 5.5 **Pressure Relief Device:** A pressure relief device shall be provided to prevent exceeding one and one-half times over-inflation in the event of an inflation valve malfunction.
- 5.6 **Inflation-Deflation Time and Cut-Off:** The inflation-deflation system shall be designed to meet the inflation-deflation times specified. The inflation-deflation cut-offs shall be automatically activated when the tire pressure reaches the preset point.
- 5.7 **Inflation-Deflation System Operating Environment:** The inflation-deflation equipment shall meet the specified inflation-deflation time during and after the environment tests specified in this standard.
- 5.8 **Tire Air Condition:** The inflation-deflation system shall operate with initial air inside the tire at 110 F with saturated moisture content.

## 6. DESIGN AND CONSTRUCTION

- 6.1 **Mounting:** The wheel shall be removable without tire or system bleed.

- 6.2 **Electrical Requirements:** Electrically operated components of the inflation-deflation equipment shall operate in accordance with MIL-STD-704.
- 6.3 **Lubrication:** The inflation-deflation equipment shall conform to MIL-STD-838 for any lubrication necessary.
- 6.4 **Sealing:** All components of the inflation-deflation equipment shall be sealed against dust, dirt, moisture, and water insofar as is practical. The system shall be suitable for the climatic extremes defined by MIL-STD-210. There shall be no external moisture traps in the unit.

## 7. QUALIFICATION TESTS

- 7.1 **Test Samples:** A test sample shall consist of all the components of the inflation-deflation system exclusive of air supply required for the control of one wheel. In the case where common controls or valves are used for the control of more than one wheel, the entire control or valve shall be submitted for testing, but only one wheel inflation-deflation unit need be tested. The qualification samples shall be representative of the production assembly. Samples shall be tested in the manner described in this document, or as authorized by the procuring activity.
- 7.2 **Test Sequence:** The test schedule and sequence should be as follows or as authorized by the procuring activity.

| Test                    | Sample 1 | Sample 2 |
|-------------------------|----------|----------|
| 1. Proof Pressure       | X        | X        |
| 2. Functional Test      | X        | X        |
| 3. High Temperature     |          | X        |
| 4. Altitude Test        |          | X        |
| 5. Low Temperature      |          | X        |
| 6. Temperature-Altitude |          | X        |
| 7. Dust                 |          | X        |
| 8. Humidity             |          | X        |
| 9. Fungus Test          |          | X        |
| 10. Salt and Fog        |          | X        |
| 11. Acceleration        | X        |          |
| 12. Shock               | X        |          |
| 13. Vibration           | X        |          |
| 14. Endurance           | X        |          |
| 15. Burst Pressure Test |          | X        |

(Table I in MIL-STD-810 provides advisory information on recommended test sequence.)

### 7.3 Functional Tests:

- 7.3.1 The inflation-deflation system only shall demonstrate that its leakage rate does not exceed 1% of the specified operating pressure in a 24 hour period. It is permissible to check the leakage rate while the inflation-deflation system is assembled to the wheel/tire assembly; however, the inflation-deflation system must be isolated from the wheel/tire assembly by means of a plug or other positive sealing device during the 24 hour check.

A six hour temperature stabilization period is permitted, and a pressure adjustment due to temperature change between beginning and end of test is permitted.

- 7.3.2 **Pressure Cut-Off:** The inflation-deflation system shall demonstrate positive pressure cut-off within the specified operating pressure range.