



SURFACE VEHICLE STANDARD

J10**DEC2013**

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Superseding J10 NOV2007

Automotive and Off-Highway Air Brake Reservoir Performance
and Identification Requirements - Truck and Bus

RATIONALE

Changes are intended to clarify how and when testing is performed: which tests are done on all tanks (sections 4.1.1 and 4.3.1) and which tests are done on a sample (section 3.1) and how leak testing (section 4.1) and integrity testing (section 4.3) are to be performed. The definition of air reservoir is expanded to include air accessory reservoirs as well as air brake reservoirs (section 1.). The allowable leak rate at working pressure is defined (sections 4.1.1 and 4.1.2.2) and references to non-metallic and non-circular reservoirs were removed (section 1.1).

1. SCOPE

This SAE Standard applies to all new production air brake and air accessory reservoirs used in automotive vehicles and off-road machines. This document defines an "air reservoir" as a reservoir having single or multiple compartments that is used for storage of compressed air. This document does not apply to accumulators or reservoirs for storage of gases other than compressed air.

1.1 Purpose

The purpose of this document is to provide MINIMUM performance requirements and a method of identifying new production air brake reservoirs. Additional requirements for corrosion resistance and pressure fatigue tests should be considered by the vehicle manufacturer.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org

ASTM B 117-95 Operating Salt Spray (Fog) Apparatus

ASTM D 1654-92 Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

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3. DESIGN AND PROCESS VALIDATION

3.1 Proof Tests (Done on a sample of tanks)

All air reservoirs shall be capable of withstanding a hydrostatically applied internal pressure of not less than five times the reservoir's rated working pressure.

There shall be no indication of rupture or permanent circumferential deformation exceeding 1% after having been subjected to this test pressure for 5 min.

When testing multiple compartment reservoirs, the pressure shall be applied to and exhausted from all compartments simultaneously. Then pressurize each compartment individually to 1.5 times the indicated rated working pressure to verify the baffle strength in both directions.

3.2 FMVSS Conformance (Off-Highway Applications need not comply)

Initially and at a continuing frequency of not less than once annually, one or more air reservoirs of each size, type (single compartment, multiple compartment, dual compartment with integral check valve) and mounting configuration must be tested for compliance to all requirements of applicable Federal Motor Vehicle Safety Standards.

3.3 The reservoirs tested per these validation requirements shall be selected from production stock and shall be equipped with all permanently attached items such as mounting brackets and fitting bosses.

4. PERFORMANCE REQUIREMENTS

4.1 Leakage Tests (100% Test)

Each air reservoir must be subjected to the following tests as applicable. A sealing compound may be used to seal port threads.

4.1.1 Single Compartment Reservoirs

All air reservoirs shall be subjected to the indicated rated working pressure. Leakage at this pressure shall not exceed 10 std cm³/m.

4.1.2 Multiple Compartment Reservoirs without Check Valves

4.1.2.1 Reservoir Shell

Perform the same test as in 4.1.1 by applying the pressure to and exhausting from all compartments simultaneously.

4.1.2.2 Reservoir Baffle Plate(s)

Check for leakage and weld integrity of the internal baffle plate(s) by applying a pressure equal to the indicated rated working pressure to one side of the baffle plate(s). Leakage shall not exceed 10 std cm³/m.

4.1.3 Multiple Compartment Reservoirs with Integral Check Valves

4.1.3.1 Reservoir Shell

Perform the same test as in 4.1.1 except the pressure must be applied through the supply (inlet) compartment and exhausted through the service (exhaust) compartment.

4.1.3.2 Reservoir Baffle Plates

Perform the same tests as in 4.1.2.2 by plugging the check valve closed when required.

4.1.3.3 Check Valve

With a pressure equal to the indicated rated working pressure in both compartments, exhaust pressure from the supply compartment. The service compartment pressure must remain at the rated working pressure. Leakage past the check valve shall not exceed 100 std cm³/m.

4.2 Corrosion Test (Done on sample of tanks)

All air reservoirs shall be protected internally and externally against detrimental corrosion through the use of either a corrosion-resistant base material or a suitable protective coating or treatment. Any additional tests and requirements deemed important shall be agreed upon by purchaser and seller.

4.2.1 Exterior Surface

The exterior surface shall withstand a minimum of 48 h exposure to salt spray in accordance with ASTM B 117-95. Upon completion of the exposure, evaluate the specimen per ASTM D 1654-92. All maximum creepage points from the scribe are to be measured. A minimum of six measurements are required on each side of the scribe (12 total). No one measurement greater than 3 mm is permissible. No corrosion spots or blisters are permissible in the unscribed area (Rating Number 10). Small openings between mounting brackets and shells shall be disregarded in the corrosion evaluation. Also, edges or areas damaged in specimen preparation or purposely unpainted areas such as threads shall be disregarded.

4.2.2 Interior Surface

The interior surface shall withstand a minimum of 96 h exposure to salt spray in accordance with ASTM B 117-95. Upon completion of the exposure, evaluate the specimen per ASTM D 1654-92. All maximum creepage points from the scribe are to be measured. A minimum of six measurements are required on each side of the scribe (12 total). No one measurement greater than 3 mm is permissible. No corrosion spots or blisters are permissible in the unscribed area (Rating Number 10). Hidden lap areas such as end cap protrusion, internal baffle crevices, and fitting boss clearances shall be disregarded in the corrosion evaluation. Also, edges or areas damaged in specimen preparation or purposely unpainted areas such as threads shall be disregarded.

4.2.3 Specimen Preparation

A production reservoir shall be quartered by cutting it in such a manner that each section includes 50% of the end cap and 25% of the shell. The sectioned test reservoir should have a minimum of 72 h air exposure. Then the specimen shall be scribed in accordance with 5.1 of ASTM D 1654-92. The specimen is then to be placed in the salt spray booth in a manner to provide thorough drainage and in accordance with Section 7 of ASTM B 117-95.

4.3 Integrity Tests (100% Test for Assurance of Structural Soundness)

This test is intended to assure the safety, integrity and structural soundness of each individual air reservoir. When air pressure is used to perform this test, protection against explosive rupture shall be provided. The effectiveness of the protective enclosure shall be verified prior to use.

4.3.1 Single Compartment Reservoirs

All air reservoirs shall be subjected to twice the indicated working pressure. Reservoirs shall be exposed to this pressure for a minimum of 2 seconds without rupture.

4.3.2 Multiple Compartment Reservoirs without Check Valves

Perform the same test as in 4.3.1 by applying pressure to and exhausting pressure from all compartments simultaneously.

4.3.3 Multiple Compartment Reservoirs with Integral Check Valves

Perform the same test as in 4.3.1 except the pressure must be supplied through the supply (inlet) compartment and exhausted through the service (exhaust) compartment.