



AEROSPACE STANDARD

AS8584**REV. B**

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Superseding AS8584A

Brake Systems, Wheel, Military Aircraft

RATIONALE

Due to current U.S. government rules effecting sharing of information regarding military technology and services (i.e. ITAR, EAR, etc.) further updates to this document will no longer be possible.

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This document has been declared "Stabilized" by the SAE A-5A Wheels, Brakes and Skid Controls Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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Documents

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1. SCOPE

This SAE Aerospace Standard (AS) defines the requirements for brake systems used on military aircraft equipped with wheel-type landing gears.

1.1 Product Classification

Brake systems shall be either mechanical, hydraulic, pneumatic, electric or a combination of each. Braking force control shall be applied to the brake assembly either through a manually operated system or a power operated system (see 2.2). Classifications of brake system types used in previous military specifications no longer apply but are listed in this document for reference purposes (see 5.1).

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

ARP1070	Design of Skid Control and Associated Aircraft Equipment for Total System Compatibility
ARP1493	Wheel and Brake Design and Test Requirements for Military Aircraft

AIR1907	Automatic Braking Systems Requirements
AIR5372	Information on Brake-By-Wire Brake Control Systems
AS5440	Hydraulic Systems, Aircraft, Design and Installation Requirements for
AS8775	Hydraulic System Components, Aircraft and Missiles, General Specification for
AS22759	Wire, Electrical, Fluoropolymer-Insulated, Copper or Copper Alloy
AS50881	Wiring, Aerospace Vehicle

2.1.2 U.S. Government Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, <http://assist.daps.dla.mil/quicksearch/>.

MIL-STD-203	Aircrew Station Controls and Displays: Location, Arrangement and Actuation of, for Fixed Wing Aircraft
MIL-STD-461	Requirements for the Control of Electromagnetic Interface Characteristics of Subsystems and Equipment
MIL-HDBK-470	Designing and Developing Maintainable Products and Systems, Volume I and Volume II
MIL-STD-704	Aircraft Electric, Power Characteristics
MIL-DTL-781	Terminal; Wire Rope Swaging
MIL-STD-790	Established Reliability and High Reliability Qualified Products List Systems for Electrical, Electronic, and Fiber Optic Parts Specifications
MIL-STD-883	Microcircuits
MIL-STD-889	Dissimilar Metals
MIL-HDBK-2084	General Requirements for Maintainability of Avionic and Electronic Systems and Equipment
MIL-W-5013	Wheel and Brake Assemblies, Aircraft General Specification for
MIL-HDBK-5400	Electronic Equipment, Airborne, General Guidelines for
MIL-P-5518	Pneumatic Systems, Aircraft, Design and Installation, General Requirements for (Inactive)
MIL-V-5525	Valves, Aircraft Power Brake
MIL-R-5757	Relays, Electromagnetic, General Specification for
MIL-C-6026	Control Unit, Pressure Generating, Manually Operated, Aircraft Hydraulic Brake System
MIL-PRF-6106	Relays, Electromagnetic, General Specification for
AN6204	Valve, Hydraulic Bleeder
MIL-DTL-7034	Pulleys, Groove, Antifriction Bearing, Grease Lubricated, Aircraft, General Specification for

MIL-S-7742	Screw Threads, Standard, Optimum Selected Series: General Specification for
MIL-C-7979	Cylinder, Hydraulic Brake, Master, Power Assisted
MIL-B-8075	Brake Control Systems, Antiskid, Aircraft Wheels, Instructions for Preparation of Specification for
MIL-D-8708	Demonstration, Aircraft Weapon Systems, General Specification for
MIL-PRF-19500	Semiconductor Devices, General Specification for
MIL-M-38510	Microcircuits, General Specification for
MIL-PRF-38534	Hybrid Microcircuit, General Specifications for
MIL-B-83277	Boots, Flyers FWU-8/P
MIL-DTL-83420	Wire Rope, Flexible, for Aircraft Control
MIL-DTL-83723	Connectors, Electrical, (Circular, Environment Resisting), Receptacles and Plugs, General Specification for

2.1.3 NAS Publications

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, www.aia-aerospace.org.

NASM33540

2.2 Definitions

ANTISKID CONTROL SYSTEM: A group of interconnected components that interact to control excessive brake pressure and thus prevent inadvertent tire skidding and contribute to shorter aircraft stopping distances.

AUTOBRAKING CONTROL SYSTEM: Control of braking with an automatic system and the pilot out of the control loop. An input of the desired level of deceleration is made prior to takeoff or landing.

BACKUP BRAKE CONTROL SYSTEM: Control of braking used when normal braking is not available. Backup braking may be activated automatically or may require pilot action. This system is sometimes referred to as an emergency brake system.

BRAKE-BY-WIRE CONTROL SYSTEM: A system where pilots' brake pedal commands are measured using electrical transducers and the corresponding signals are used to provide proportional control of airplane deceleration. This system is described in further detail in AIR5372.

BRAKE DESPIN CONTROL SYSTEM: Deceleration of braked wheels upon landing gear retraction prior to the wheels entering the wheel well.

MANUALLY OPERATED (NON POWERED) BRAKING SYSTEM: A system that provides braking force directly through manual actuation.

NORMAL BRAKE CONTROL SYSTEM: Interconnected components used during routine operations that provide stopping forces proportional to an applied operator input.

PARKING BRAKE SYSTEM: Components that allow the pilot to apply and set sufficient pressure to lock the wheels and which maintain that pressure without aircraft power or further operator action.

POWER OPERATED BRAKING SYSTEM: A system which meters fluid from a pressure generating source proportional to an operator applied input.

WHEEL and BRAKE ASSEMBLIES: Components which convert the braking pressure or signal into torque to slow tire rotation and bring the aircraft to a stop.

3. REQUIREMENTS

3.1 General Requirements

The brake systems covered by this specification shall be operable under all weather conditions and be compatible with the type (temperature range) and class (pressure limits) of hydraulic or pneumatic systems as specified in either AS5440 or MIL-P-5518, whichever is applicable.

3.2 Selection of Specifications and Standards

Specifications and standards for all materials, parts, and Government certification and approval of processes and equipment which are not specifically designated herein and which are necessary for the execution of this specification shall be selected in accordance with procedures established by the procuring activity, except as provided in 3.2.1.

3.2.1 Standard Parts

Standard parts (MS, AN, NAS, AS, etc.) shall be used wherever they are suitable for the purpose and shall be identified on the drawings by their part numbers. Commercial utility parts, such as screws, bolts, nuts, cotter pins, etc., may be used provided they possess suitable properties and are replaceable by the standard parts without alteration, and provided the corresponding standard part numbers are referenced in the parts list, and if practicable, on the supplier's drawings. In the event there is no suitable corresponding standard part in effect on date of invitation for bids, commercial parts may be used provided they conform to all requirements of this specification.

3.3 Materials

Materials used in the brake system components shall be of high quality, suitable for the purpose intended, and shall conform to applicable Government specifications as specified herein.

3.3.1 Dissimilar Metals

The use of dissimilar metals in contact, as defined in MIL-STD-889, shall be avoided. Where complete compliance proves impractical, electrolytic action shall be minimized by plating or some other suitable method of dissimilar surface isolation.

3.3.2 Corrosion Resistance

Corrosion prevention is of prime importance and material selection shall be made accordingly.

3.4 Design and Construction

Detail design and construction of the components and brake system shall conform to the contractor-prepared detail specification and the requirements specified herein. The components shall be suitably sealed against dust, dirt, and moisture to insure satisfactory operation in the aircraft environment. The useful life shall be specified in the detail specification and shall be compatible with the aircraft design useful life.

3.5 System Design Requirements

The following are features that may be required for brake systems depending upon the aircraft configuration and braking requirements. The design and installation of aircraft braking systems shall be in accordance with the applicable requirements of AS5440, MIL-P-5518, and AS8775 and shall employ to the fullest possible extent the standard components listed therein. All detachable components and parts shall be safetied in accordance with NASM33540 or secured by an approved method that will prevent loosening.