



Technical Standard Order

Subject: Aircraft Wheels, Brakes and Wheel/Brake Assemblies for Parts 23, 27 and 29 Aircraft

1. **PURPOSE.** This Technical Standard Order (TSO) prescribes the minimum performance standards (MPS) that Parts 23, 27 and 29 aircraft wheels, brakes and wheel/brake assemblies must meet to be identified with the applicable TSO marking.

2. **APPLICABILITY.**

a. This TSO is effective for new applications submitted after the effective date of this TSO. However, applications submitted against TSO-C26c, Aircraft Wheels and Wheel-Brake Assemblies, with Addendum I, dated May 18, 1984, may be accepted up to six months after the effective date of this TSO, in cases where we know that the applicant was working against the earlier MPS before the new change became effective.

b. Aircraft wheels, brakes and wheel/brake assemblies approved under a previous TSO authorization may continue to be manufactured under the provisions of their original approval, as specified in Title 14 of the Code of Federal Regulations (14 CFR) § 21. 603(b).

c. However, major design changes to aircraft wheels, brakes and wheel/brake assemblies approved under TSO-C26c require a new authorization under this TSO for 14 CFR parts 23, 27, and 29 applications and TSO-C135, Transport Airplane Wheels and Brake Assemblies, dated May 2, 2002, for 14 CFR part 25 applications, per 14 CFR § 21.611(b).

NOTE: This TSO **does not** provide MPS for 14 CFR part 25, Transport Category Airplanes. For transport category airplanes, see TSO-C135, Transport Airplane Wheels and Brake Assemblies, dated May 2, 2002.

3. **REQUIREMENTS.** New models of aircraft wheels, brakes and wheel/brake assemblies that are to be so identified and that are manufactured on or after the effective date of this TSO must meet the MPS in this TSO, APPENDIX 1, Minimum Performance Standard (MPS) for aircraft wheels, brakes and wheel/brake assemblies for small airplanes and rotorcraft. The MPS is based, in part, on the Society of Automotive Engineers (SAE), Aerospace Recommended Practice (ARP) 5381, Minimum Performance Recommendations for Part 23, 27, and 29 Aircraft Wheels, Brakes, and Wheel-Brake Assemblies, dated October 2000.

a. **Functional Qualification.** The required performance shall be demonstrated under the test conditions specified in APPENDIX 1 of this TSO.

b. Deviations. The FAA has provisions for using alternative or equivalent means of compliance to the criteria set forth in the MPS of this TSO. Applicants invoking these provisions shall demonstrate that an equivalent level of safety is maintained and shall apply for a deviation per 14 CFR § 21.609.

4. MARKING.

a. In lieu of the marking specified in 14 CFR 21.607(d), the following information shall be legibly and permanently marked on the major equipment components:

- (1) Name of the manufacturer responsible for compliance.
- (2) Serial number.
- (3) Part number.
- (4) Applicable technical standard order (TSO) number.
- (5) Rim size (this marking applies to wheels only).
- (6) Hydraulic fluid specification (this marking applies to brakes only).

b. All stamped, etched, or embossed markings must be located in non-critical areas.

5. DATA REQUIREMENTS.

a. Application Data. In addition to the data specified in 14 CFR, § 21.605, the manufacturer must furnish one copy each of the following to the Manager of the FAA Aircraft Certification Office (ACO) having geographical purview of the manufacturer's facilities:

(1) The applicable limitations pertaining to installation of wheels, or wheel and brake assemblies on airplane(s), including the data requirements of paragraph 6.1 of appendix 1 of this TSO.

(2) The manufacturer's TSO qualification test report.

b. Data to be Furnished with Manufactured Articles. As specified in 14 CFR, § 23/27/29.1529, the continued airworthiness of the aircraft on which the equipment is to be installed must be considered.

(1) Prior to entry into service use, the manufacturer must make available the applicable maintenance instructions and data necessary for continued airworthiness. The manufacturer must send this information, upon request, to the ACO specified in paragraph 5(a) above (14 CFR, § 21.50(b)).

(2) The manufacturer must provide the applicable maintenance instructions and data necessary for continued airworthiness to each organization or person receiving one or more articles manufactured under this TSO. In addition, a note with the following statement must be included:

The existence of TSO approval of the article, displaying the required marking, does not automatically constitute the authority to install and use the article on an airplane. The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those desiring to install this article either on or within a specific type or class of airplane to determine that the airplane operating conditions are within the capacity of the article demonstrated in accordance with the TSO standards. The article may be installed only if further evaluation by the user/installer documents an acceptable installation, and the installation is approved by the Administrator.

Additional requirements may be imposed based on airplane specifications, wheel and brake design, and quality control specifications. In-service maintenance, modifications, and use of replacement components must be in compliance with the performance standards of this TSO, as well as any additional specific airplane requirements.

6. AVAILABILITY OF REFERENCED DOCUMENTS.

a. Copies of SAE ARP5381 may be purchased from the Society of Automotive Engineers Inc., Department 331, 400 Commonwealth Drive, Warrendale, PA 15096-0001. Copies also can be obtained through the SAE Internet website at: www.sae.org.

b. You may buy copies of Federal Aviation Regulations 14 CFR part 21, Subpart O, from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402-9325. Copies also can be obtained from the Government Printing Office (GPO), electronic CFR Internet website at: www.access.gpo.gov/ecfr/.

c. Advisory Circular (AC) 20-110, Index of Aviation Technical Standard Orders, AC 20-36, Index of Articles Certified under the Technical Standard Order System, and TSO-C26d may be obtained from the U.S. Department of Transportation, Subsequent Distribution Office, M-30 Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785, Telephone (301) 322-4477 or FAX (301) 386-5394. Copies also may be obtained from the FAA Internet website at: www.faa.gov/avr/air/airhome.htm and select from the "Available Information" drop down list.

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APPENDIX 1. MINIMUM PERFORMANCE STANDARD for aircraft wheels, brakes and wheel/brake assemblies for small airplanes and rotorcraft.

This appendix prescribes the Minimum Performance Standard (MPS) of SAE ARP5381, “Minimum Performance Recommendations for Part 23, 27, and 29 Aircraft Wheels, Brakes, and Wheel-Brake Assemblies”, dated October 2000, as modified by the FAA in this TSO. Additions to and one deletion from the standard, are shown in italics as follows:

Additions:

1. *Page 3, a new paragraph was added after 3.6 to reflect public comments:*

Suitable Tire for Brake Tests, TT_{BT}

TT_{BT} is the rated tire type and size.

TT_{BT} is the tire type and size that has been determined as being the most critical for brake performance and/or energy absorption tests. The TT_{BT} must be a tire type and size approved for installation on the wheel (TS_{WR}). The suitable tire may be different for different tests.

2. *Page 7, a new paragraph was added after 4.3 to reflect public comments:*

Fire Protection: Except for small parts (such as fasteners, seals, grommets, and small electrical parts) that would not contribute significantly to the propagation of a fire, all solid materials used must meet the applicable flammability rules for the part and category of aircraft.

Deletion:

1. *Page 13, paragraph 5.3.3.2 was disregarded. Worn brake testing is not a requirement of Parts 23, 27 or 29, so it cannot be included in this TSO.*