



AEROSPACE INFORMATION REPORT

AIR6417™

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Aircraft Brake Quality Assurance Rejected Takeoff Test History and Considerations

RATIONALE

The practice of conducting recurring dynamometer Rejected Takeoff (RTO) tests to measure carbon brake performance is a result of issues with inconsistent stopping performance data between manufacturing lots of carbon heat sinks.

Given the importance of achieving target stopping performance during an aircraft RTO event, as well as the high cost of each Quality Assurance (QA) RTO test, information related to QA RTO tests is useful in determining the most appropriate testing regimen to assure carbon brake RTO performance consistency.

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Documents

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1. SCOPE

This SAE Aerospace Information Report (AIR) provides information related to experience with carbon brake quality-assurance rejected takeoff tests, and considerations regarding test setup, test conditions, test frequency and cost considerations.

1.1 Purpose

Given the importance of achieving target stopping performance during an aircraft RTO event, as well as the high cost of each Quality Assurance (QA) RTO test, the purpose of this document is to provide information related to QA RTO tests that is useful in determining the most appropriate testing regimen to assure carbon brake RTO performance consistency.

2. REFERENCES

2.1 Applicable documents

The following publications form a part of this document to the extent specified 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 Federal Aviation Authority Publications

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov.

FAA Advisory Circular 25.735-1 "BRAKES AND BRAKING SYSTEMS CERTIFICATION TESTS AND ANALYSIS,"
Section 4.a.(3)(c)

FAA Regulation 14 CFR 25.109 "Accelerate-Stop Distance"

TSO-C135a Transport Airplane Wheels and Wheel Brake Assemblies

TSO-C26c Aircraft Wheels, Brakes and Wheel/Brake Assemblies for Parts 23, 27 and 29 Aircraft

2.1.2 European Union Aviation Safety Agency Documents

Available from European Aviation Safety Agency, Postfach 10 12 53, D-50452 Cologne, Germany, Tel: +49-221-8999-000, www.easa.eu.int.

EASA AMC SUBPART D, 25.735 "Brakes and Braking Systems Certification Tests and Analysis," Section 4.a.(4) (c)

2.2 DEFINITIONS

CARBON BRAKE: A brake using alternating rotors and stators made of carbon-carbon composite where the carbon serves as both the disc structure and friction material.

HEAT SINK: The heat sink is the total of rotors, stators, and stationary end plates that hold the friction materials and absorb brake heat.

STEEL BRAKE: A brake using rotors and stators that have alternating steel and other friction material (i.e., ceramic/metallic) friction surfaces.

TOW: Untwisted bundle of continuous carbon filament.