



AEROSPACE INFORMATION REPORT

AIR805™

REV. D

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Superseding AIR805C

Jet Blast Windshield Rain Removal Systems for Commercial Transport Aircraft

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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1. SCOPE

Information in this report is applicable to design and development of aircraft jet blast windshield rain removal systems.

1.1 Purpose

The purpose of this information report is to present the factors that affect the design and development of aircraft jet blast windshield rain removal systems. Rain removal system design will generally be unique to specific aircraft. Design of these systems typically requires a preliminary design for the system based on available empirical data to be followed with a laboratory development program and a flight test validation program. Published windshield rain removal performance test data is available only for limited windshield configurations.

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 the 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.

AIR1168/4 Ice, Rain, Fog and Frost Protection; SAE Aerospace Applied Thermodynamics Manual

ARP780 Environmental Systems Schematic Symbols

ARP4101/2 Pilot Visibility From The Flight Deck

2.1.2 EASA Publications

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

CS 25.773 Pilot Compartment View

2.1.3 US Government Publications

2.1.3.1 U. S. Department of Defense Publications

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

JSSG-2009 Department of Defense Joint Services Specification Guide, Air Vehicle Subsystems

MIL-R-81367 Rain Removal Systems, Aircraft Windshield, Jet Air Blast

2.1.4 FAA Publications

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

14 CFR §25.773 Pilot Compartment View

AC 25.773-1 Pilot Compartment View Design Considerations, FAA Advisory Circular, Initiated by ANM-110, 1/8/1993

2.1.5 Other Applicable References

AFWAL-TR-80-3003, "Guidelines for the Design of Aircraft Windshield/Canopy Systems" by James H. Lawrence, Jr., Air Force Wright Aeronautical Laboratories, Wright Patterson Air Force Base, Oh, Feb 1980

"Handbook of Geophysics" Revised Edition, U.S. Air Force, 1960 - The Macmillan Company.

Humphreys, W. J., Physics of the Air, p. 280 (Table of Rain Drop Size and Fall for Moderate Rain, 1 mm Diameter and ...)

NA 58H-348, "Evaluation of Windshield Forward Visibility with an Air Blast Rain Removal Nozzle for the A3J-1 Airplane", North American Aviation, Columbus, Oh, 4/25/60

NAVEDTRA 14019, "Aviation Structural Mechanic E 1 & C", Published by Naval Education and Training Professional Development and Technology Center, March 1991

NAVEDTRA 14020, "Aviation Structural Mechanic E2", Published by Naval Education and Training Professional Development and Technology Center, August 1989

WADC TR 58-444, "Design Manual for Windshield Jet Blast Rain and Ice Removal" by Harry R. Meline and Ivan D. Smith; Research, Inc., Wright Air Defense Command, Wright Patterson Air Force Base, Oh, November 1958.

2.2 Related Publications

WADC TN 55-117, "Evaluation of a Jet Bleed Windshield Rain Removal System and Rain Repellent" by Frederick R. Burke, Wright Air Defense Command, Wright Patterson Air Force Base, Oh, July 1955

WL-TR-94-3129, "An Analysis of B-1B Exterior Jet Blast Windshield Anti-Ice Performance Using Pre-Cooled Compressor Bleed Air", D. S. Emmer & M. P. Bouchard, Flight Dynamics Directorate, Wright Laboratory, Air Force Material Command, Wright Patterson Air Force Base, Oh., July 1994

2.3 Definitions

1.5V_{SR1} 1.5 Times the Reference Stall Speed at Maximum Landing Weight with Flaps at Approach Position and Landing Gear Retracted. Refer to 14 CFR/CS 25.103.

2.4 Terminology

AC Advisory Circular

APU Auxiliary Power Unit

CFR Code of Federal Regulations

cm Centimeter

CS Certification Specification

EASA European Aviation Safety Agency