



AEROSPACE STANDARD

AS5402™**REV. A**

Issued 2001-08
Revised 2010-04
Reaffirmed 2021-04

Superseding AS5402

(R) Design and Performance Criteria Aircraft Crash Axes

RATIONALE

AS5402A has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE

This SAE Aerospace Standard (AS) provides design criteria and performance tests for crash axes intended for use by aircraft crew members to assist in evacuation, extrication, fire fighting, or other emergency activities.

1.1 Purpose

The purpose of this AS is to assure minimum standards of functionality and performance for crash axes carried aboard aircraft for use by crew members in emergency situations.

1.2 Introduction

In the preparation of this document, consideration has been given to the performance of existing equipment as well as recommendations from flight crew associations, aircraft operators, aircraft manufacturers, and emergency equipment manufacturers. The primary goal of this AS is to ensure that crash axes will perform adequately in emergency situations.

1.3 Alternative Designs

The specifications and test methods provided herein anticipate a traditional "crash ax" configuration with the striking head at one end of a handle and other features including a pike, wedge and pry bar. The striking force is applied perpendicular to the major axis of the handle. These specifications are not intended to limit the design to this traditional configuration. Other alternative designs having a different configuration or other features may be evaluated and determined to meet this Aerospace Standard. In evaluating the alternative designs, it shall be demonstrated that the design offers at least an equivalent level of utility and effectiveness in satisfying the functional performance of ARP5403 on crash axes, as well as the functional tests of Section 5 of this Aerospace Standard. This evaluation shall consider the flight deck and cabin emergencies anticipated by each of the specific design features, and it shall ensure that ease of stowage and emergency use in a confined flight deck space is not compromised.

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Documents

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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 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.

ARP5403 Aircraft Crash Axes

2.1.2 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 E 1842-96 Standard Test Method for Macro-Rockwell Hardness Testing of Metallic Materials

2.1.3 Code of Federal Regulations (CFRs)

Available from the United States Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-0000, www.gpoaccess.gov.

14 CFR Part 25 Airworthiness Standards: Transport Category Airplanes, §25.853

2.1.4 RTCA Publications

Available from Radio Technical Commission for Aeronautics Inc., 1828 L Street, NW, Suite 805, Washington, DC 20036, Tel: 202-833-9339, www.rtca.org.

RTCA DO-160F Environmental Conditions and Test Procedures for Airborne Equipment, December 6, 2007

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this Aerospace Standard.

2.2.1 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.

AIR5401 Aircraft Crash Axes

2.2.2 Code of Federal Regulations (CFRs)

Available from the United States Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-0000, www.gpoaccess.gov.

14 CFR Part 91 General Operating and Flight Rules, §91.513(e)

- 14 CFR Part 121 Operating Requirements: Domestic, Flag, and Supplemental Operations, §121.309(e)
- 14 CFR Part 125 Certification and Operations: Airplanes having a seating capacity of 20 or more passengers or a maximum payload capacity of 6000 pounds or more, §125.207(a)
- 14 CFR Part 135 Operating Requirements: Commuter and On-Demand Operations, §135.177(a)

2.2.3 Other Related Publications

Ergonomics, How to Design for Ease and Efficiency, Kroemer, Karl; Kroemer, Henrike; Kroemer- Elbert, Katrin; Prentice Hall International Series in Industrial & Systems Engineering, 1994

2.3 Definitions

2.3.1 CRASH AX

A hand tool to aid aircraft crew members in emergencies. The hand tool is to assist crew members in penetrating aircraft materials and for prying, twisting and cutting jammed items that are impeding the crew's ability to respond to an emergency

2.3.2 AX BLADE

The ax blade is the part of the crash ax used to cut or chop through materials such as interior paneling, fuselage skin, electrical wires, etc. The blade is part of the ax head.

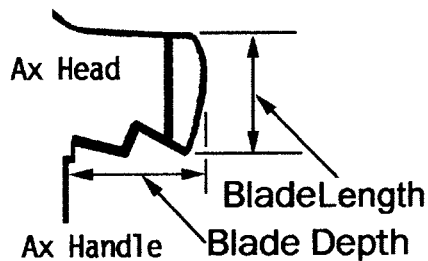


FIGURE 1 – CRASH AX BLADE

2.3.3 PIKE

The pike is the part of the crash ax used to make small openings through materials such as interior paneling, fuselage skin, doors, etc. The pike is typically part of the ax head.

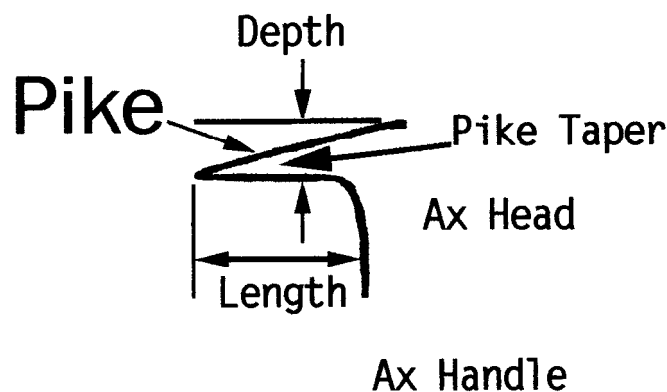


FIGURE 2 – CRASH AX PIKE

2.3.4 WEDGE

The wedge is the part of the crash ax used to widen gaps and/or facilitate a prying action (such as prying a door jammed in its frame). A handle of sufficient length attached to the wedge is necessary in order to use the tool as a lever.

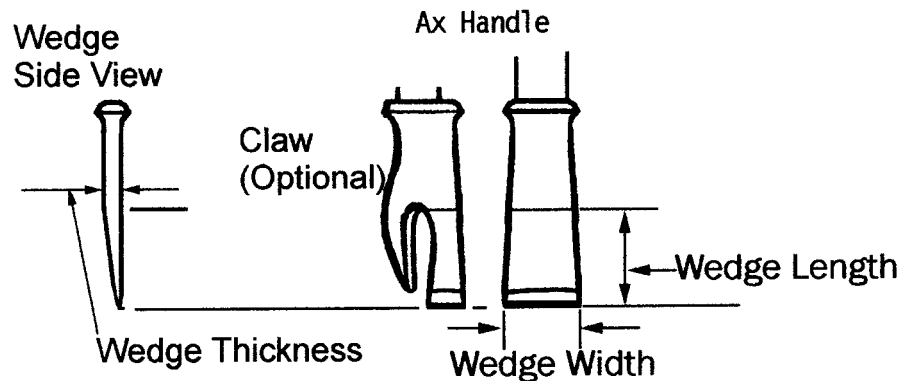


FIGURE 3 – CRASH AX WEDGE

2.3.5 HANDLE

The handle is the part of the crash ax which facilitates the tool's carriage and use as both a striking implement and/or as a pry bar. It shall provide sufficient space for a user's hands, allowing a proper grip in order to use the components of the crash ax.

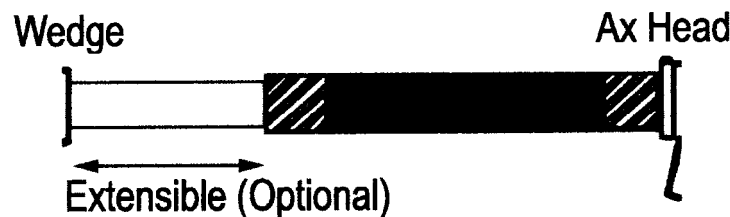


FIGURE 4 – CRASH AX HANDLE

NOTE: The illustrations included in 2.3.2 through 2.3.5 are not intended to be design or configuration limiting.

2.4 Mandating and Recommending Words

2.4.1 SHALL: Indicates a mandatory criterion.

2.4.2 SHOULD: Indicates a criterion for which an alternative, including noncompliance, may be applied if it is documented and justified.

3. FUNCTIONAL REQUIREMENTS

As a minimum, the crash ax design shall facilitate assisting crew members performance of the following emergency functions:

- Prying open jammed flight deck/other emergency exits (e.g., sliding windows, plug hatches, flight deck entry doors, cabin doors, etc.).
- Prying open jammed or locked access panels.
- Penetrating bulkheads or panels to permit application of fire extinguishing agent.