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(Revision of ASME B107.55M-1998)



The American Society of
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A N A M E R I C A N N A T I O N A L S T A N D A R D

AXES: SAFETY REQUIREMENTS

ASME B107.55-2002
(Revision of ASME B107.55M-1998)

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FOREWORD

The American National Standards Committee B107, Socket Wrenches and Drives, under sponsorship of The American Society of Mechanical Engineers (ASME), was reorganized as an ASME Standards Committee, and its title was changed to Hand Tools and Accessories. In 1996, the B209.7 Committee, which had published an earlier version of this Standard as B209.7, merged with the B107 Committee, and the B107 Committee scope was expanded to include safety considerations. This Standard was previously designated ANSI/HTI B173.4-1991.

The purpose of this Standard is to define essential performance and safety considerations specifically applicable to axes; to specify test methods to evaluate performance relating to the defined considerations; and to indicate limitations of safe use.

Members of the Hand Tools Institute (HTI) Striking and Struck Tools Standards Committee have been major contributors to the development of this Standard through their committee work, their knowledge of the products, and their active efforts in the promotion of the adoption of the Standard.

The format of this Standard is in accordance with *The ASME Codes & Standards Writing*

ASME STANDARDS COMMITTEE B107

Hand Tools and Accessories

(The following is the roster of the Committee at the time of approval of this Standard.)

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General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B107 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Interpretations. Upon request, the B107 Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B107 Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject: _____ Cite the applicable paragraph number(s) and the topic of the inquiry.

AXES: SAFETY REQUIREMENTS

1 GENERAL

1.1 Scope

This Standard provides safety requirements for the design, construction, testing, and use of axes that are intended specifically for use in felling, trimming, and pruning trees; splitting and cutting wood; notching and shaping logs and timbers; driving wooden or plastic stakes; pulling unhardened nails when the tool is provided with a nail slot; or digging when the particular tool is provided with a digging blade.

1.2 Purpose

This Standard is intended to serve as a guide in selecting, testing, and using the hand tools covered. Details of design, testing, and use of the tools covered are specified only as they relate to safety. It is not the purpose of this Standard to specify the details of

1.5 Equivalent

The word *equivalent* in this Standard shall be interpreted to mean alternative designs or features that will provide an equal degree of safety.

2 NORMATIVE REFERENCES

The following documents form a part of this Standard to the extent specified herein. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

- ANSI Z87.1-1989, Practice for Occupational and Educational Eye and Face Protection; Supplement ANSI Z87.1a-1991
- ANSI Z535.4-1991, Product Safety Signs and Labels

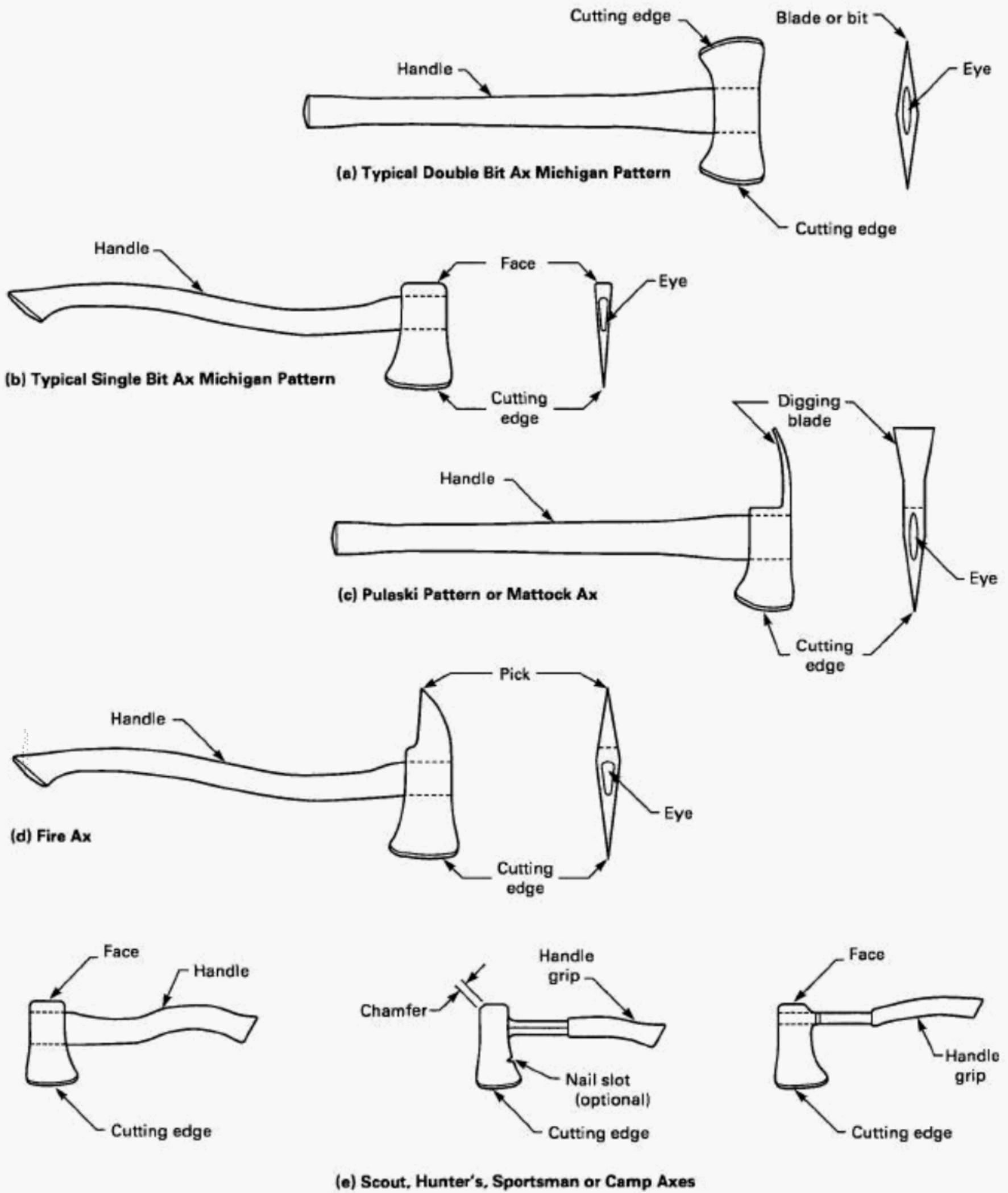


FIG. 1 AX NOMENCLATURE

bit (blade): the broad, tapering portion of the head that terminates in a sharpened cutting edge.

chamfer: the bevel or equivalent radius encircling the perimeter of the striking face.

cutting edge: the sharpened edge of the bit.

digging blade: the portion of the Pulaski Pattern or Mattock ax head directly opposite the bit, positioned at right angles to the handle axis, and terminating in a sharpened edge (when provided).

eye: an opening or aperture located between the bit and the face into which the handle is inserted, if the handle is separate.

face: the flat portion of the head directly opposite the bit (when provided).

handle: the portion that protrudes from the head and

bit shall have a taper from the eye section terminating in a cutting edge sharpened and ready for use in cutting, notching, splitting, shaping, and trimming wood or wood products.

The face may be a flat or slightly convex surface for use in driving wooden or plastic stakes. Chamfering of the face is acceptable but not required.

A nail slot in the bit is acceptable but not required. If provided, it shall be suitable for pulling unhardened nails.

4.1.3 A fire ax shall have a bit on one end of the head with a cutting edge running parallel to the handle length and a pick on the opposite end. The bit shall have a taper from the eye section terminating in a cutting edge sharpened and ready for use in cutting wood or similar materials. The pick shall have a gradually reducing cross section terminating in a sharp

TABLE 1 CHEMICAL PROPERTIES OF STEEL AX HEADS

| Required Percentage of Element | | |
|--------------------------------|---------|---------|
| Element | Minimum | Maximum |
| Carbon | 0.45 | 1.03 |
| Manganese | 0.30 | 1.20 |
| Phosphorus | ... | 0.04 |
| Sulfur | ... | 0.05 |
| Silicon | ... | 0.35 |

shall conform to the requirements for mechanical properties specified in para. 4.3, and shall withstand the striking test specified in para. 4.4.3.

4.2.3 Handles shall be made of any suitable material that will withstand the tests specified in paras. 4.4.3 and 4.4.5.

4.3 Mechanical Properties

4.3.1 All bits, picks, or digging blades shall be

to meet the requirements of any one of the tests indicates that the axes are not in compliance with this Standard.

4.4.2 Hardness Determination Test. Hardness determination with respect to faces, eye sections, bits, picks, and digging blades shall be made on a fixtured ax or suitable mounted or unmounted specimen that has been cut from the tool using the wet abrasive or other equivalent method. Any hardness test that uses equipment and methods equivalent to Rockwell hardness determinations, as specified in ASTM E 18, will be acceptable.

4.4.3 Striking and Tensile Force Test. Prior to tensile force testing, sample axes shall be subjected to the following striking test:

The sample ax shall receive twenty swinging, continuous hard striking blows by a person of average build, 160 to 180 lb (73 to 82 kg), or the mechanical equivalent, commensurate with the end use and weight of the ax, against hard wood material that is rigidly

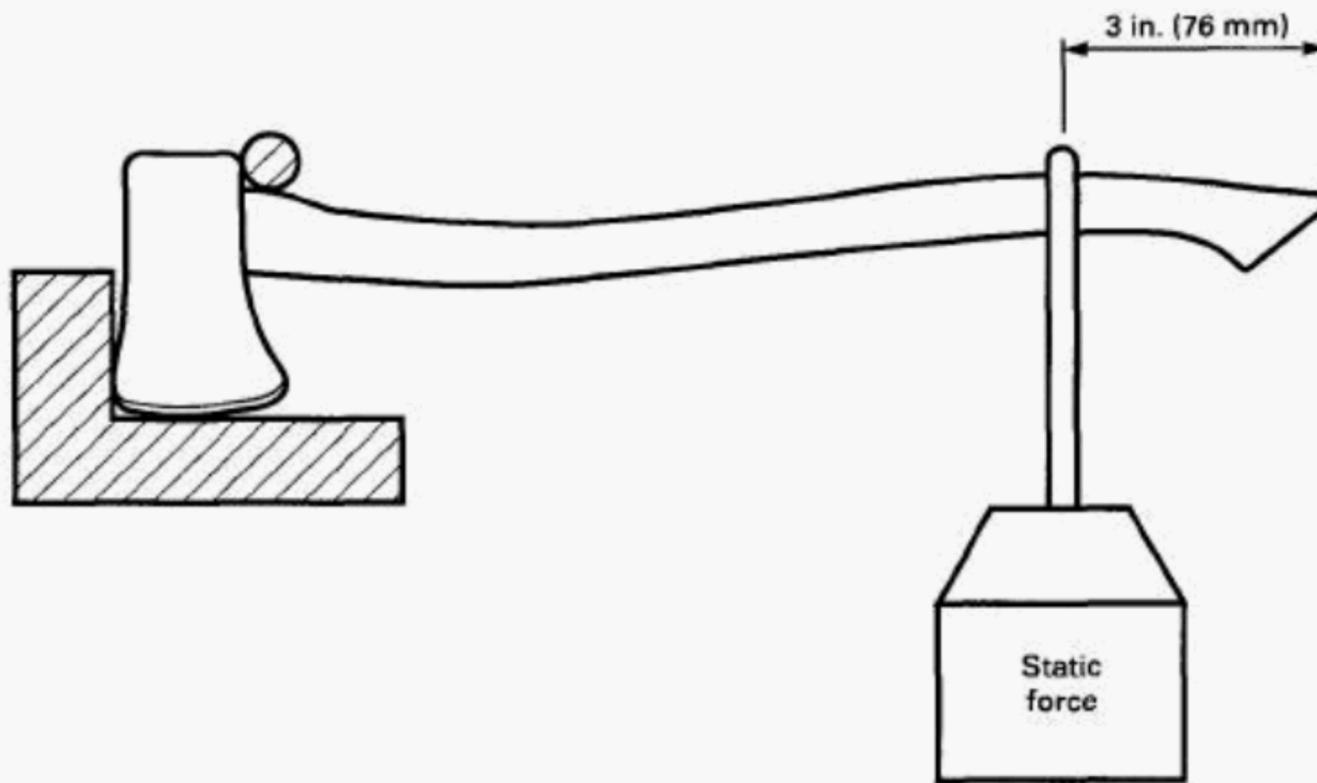


FIG. 2 TYPICAL STATIC FORCE TEST

5 SAFETY REQUIREMENTS AND LIMITATIONS OF USE

5.1

Axes are special-purpose tools designed and intended only for the specific purpose of cutting wood and other equally soft materials. When a face is provided, it is intended only for striking wood or other equally soft materials, such as plastic.¹

5.2

To avoid possible eye or other bodily injury, axes shall be used only for the purposes specified in para. 1.1.

5.3

To avoid injury from possible flying objects, safety goggles or equivalent eye protection conforming to ANSI Z87.1 shall be worn by the user and by all

5.5

When nail slots are provided, they should be used only for pulling unhardened nails.

5.6

An ax shall not be used as a maul or splitting wedge. It shall not be struck by another striking tool.

5.7

The ax heads shall be inspected prior to each use and their use discontinued at the first sign of chipping, mushrooming, or cracking of any portion.

5.8

No part of the ax head shall be ground, welded, treated by reheating, or otherwise altered from the original condition as furnished by the manufacturer, except that the ax may be properly resharpened (see

be refined or removed by honing. (See redressing instructions as outlined in the publication *Guide to Hand Tools — Selection, Safety Tips, Proper Use and Care.*)

5.10

Handles shall be inspected prior to each use and those that are damaged shall be replaced. Replacements shall withstand the test requirements in paras. 4.4.3 and 4.4.5 and shall be equivalent to the original handle in size and quality. Handles of tools shall be free of splinters or cracks and shall be kept tight in the head of the tool.

5.11

When provided, handle grips that have loosened from the handle shall be tightened or replaced.

5.12

Instructors, employers, or both shall stress safety and the proper use of axes. They shall emphasize the necessity for and ensure the wearing of safety goggles or equivalent eye protection. The publication *Guide to*

Hand Tools — Selection, Safety Tips, Proper Use and Care provides guidelines for safe use of these tools.

5.13

Each ax shall be stamped, labeled, or otherwise marked by the manufacturer with the following safety message or equivalent safety message:



**WARNING
WEAR SAFETY GOGGLES
USER AND BYSTANDER**

This tool can be made to chip if struck against a hardened nail or other hard object. Use this hammer to drive and pull common nails only. Flying chips can result in eye or other bodily injury.

This safety message shall be located in a position that will not interfere with the quality or performance of the tool.

The above safety message shall also appear on replacement handles.

The principles set forth in ANSI Z535.4 shall be used as the guide for alternate, equivalent methods of labeling.

