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ASME B107.58M-1998

RIVETING, SCALING, AND TINNER'S SETTING HAMMERS: SAFETY REQUIREMENTS

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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FOREWORD

The American National Standards Committee B107, Socket Wrenches and Drives, under sponsorship of The American Society of Mechanical Engineers, held its organizational meeting on June 28, 1967. Subsequently, the Committee was reorganized as an ASME Standards Committee, and its title was changed to Hand Tools and Accessories.

The scope of this Standard is limited to the essential safety considerations specifically applicable to Riveting, Scaling and Tinners' Setting Hammers.

This Standard was previously designated as ANSI/HTI B173.8-1991.

The development of this Standard was initiated by the Striking and Struck Tools Standards Committee, consisting of technical representatives of Manufacturer members of the Hand Tools Institute (HTI).

Suggestions for improvement of this Standards are welcome. They should be sent to The American Society of Mechanical Engineers, Attn: Secretary, ASME B107 Main Committee, Three Park Avenue, New York, NY 10016-5990.

Following approval by the Standards Committee B107 and the sponsor, the standard was approved as an American National Standard on December 22, 1998.

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Hand Tools and Accessories

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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.

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Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry.
Edition:	Cite the applicable edition of the standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings, which are necessary to explain the question; however, they should not contain proprietary names or information.

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RIVETING, SCALING, AND TINNER'S SETTING HAMMERS: SAFETY REQUIREMENTS

1 GENERAL

1.1 Scope

This Standard provides safety requirements for the design, construction, testing, and use of riveting, scaling and tinner's setting hammers described below. The names given are those generally recognized; styles are not limited to those named or illustrated (see Figs. 1, 2, and 3).

(a) Riveting hammers: Intended specifically for driving, spreading, and setting unhardened rivets in hardened materials (also called tinner's or machinists' riveting hammers).

(b) Scaling hammers: Intended specifically for removing scale, paint, welding flux, rust, or other similar flaking material from the surface of unhardened metal (also called chipping hammers).

(c) Tinner's setting hammers: Intended specifically for closing, forming, and peening of sheet metal (also called peening hammers).

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 manufacturing.

The standard is also meant to serve as a guide in developing manuals and posters and for training personnel to work safely.

1.3 Application

This Standard may be used as a guide by state authorities or other regulatory bodies in the formulation of laws or regulations. It is also intended for voluntary use by establishments that use or manufacture the tools covered.

The methods employed to ensure compliance with this Standard shall be determined by the proper regulatory or administrative authority.

1.4 Shall and Should

Mandatory requirements of this Standard are characterized by the word "shall". If a provision is of an advisory nature, it is indicated by the word "should" or is stated as a recommendation.

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 is a list of publications referenced in this Standard.

ANSI Z87.1-1989, Practice for Occupational and Educational Eye and Face Protection (includes supplement and partial revision of ANSI Z87.1a-1991)

ANSI Z535.4-1991, Product Safety Signs and Labels

Publisher: American National Standards Institute (ANSI), 11 West 42nd Street, New York, NY 10036

ASTM A 322-91, Standard Specification for Steel Bars, Alloy, Standard Grades

ASTM A 576-90b (Reapproved 1995), Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality

ASTM A 681-94, Standard Specification for Tool Steels Alloy

ASTM E 18-94, Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

Publisher: American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428

Guide to Hand Tools — Selection, Safety Tips, Proper Use and Care

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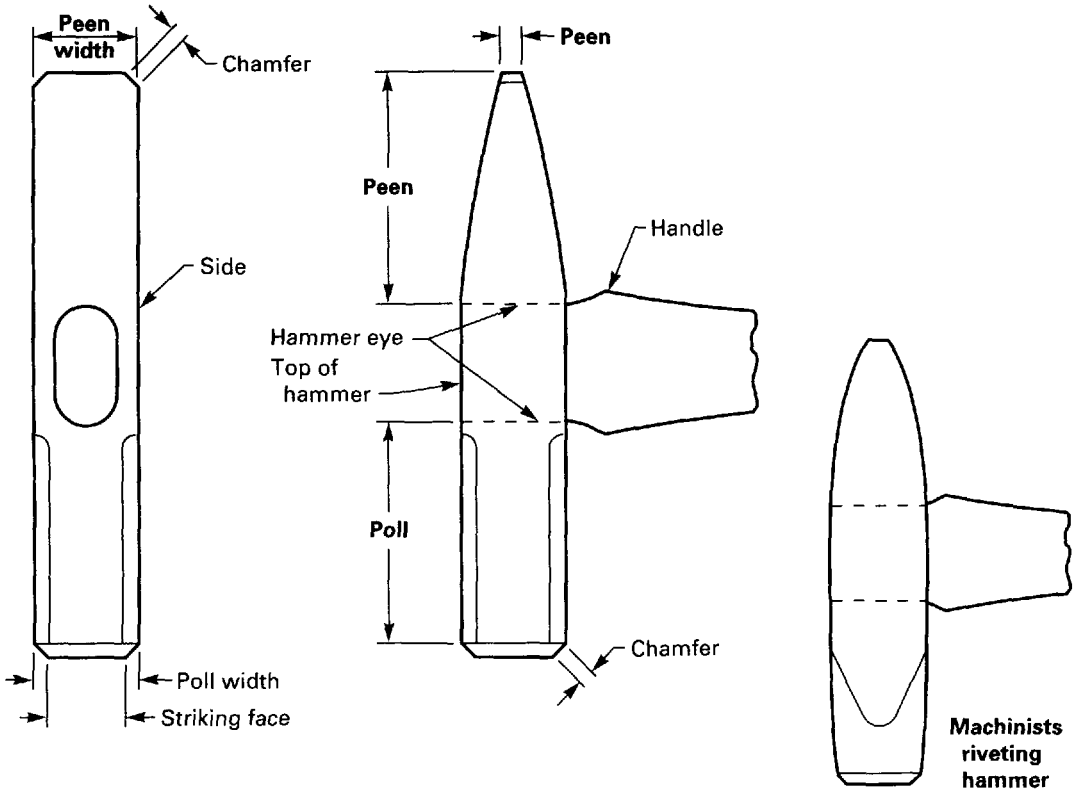

FIG. 1 RIVETING HAMMER NOMENCLATURE

Publisher: Hand Tools Institute (HTI), 25 North Broadway, Tarrytown, NY 10591

3 DEFINITIONS (SEE FIGS. 1, 2, AND 3 AS APPLICABLE)

bevel: the angular portion on scaling and tinner's setting hammers adjacent to the bit or peen edge.

bit: the portion of the scaling hammer at the extreme end of the bevel.

chamfer: the bevel or equivalent radius of riveting and tinner's setting hammers encircling the perimeter of the striking face; also refers to the bevels on the ends of the peen faces, peen edges, or bits of hammers.

eye: an opening or aperture in the head into which the handle is inserted if the handle is separate.

handle: the portion that protrudes from the head and by which the tool is held.

handle grip: material securely attached to the grip end of some styles of hammer handles.

hardness: the condition of the hammerhead resulting from heat treatment.

peen: the portion between the eye and peen face on riveting hammers, between the eye and peen edge on tinner's setting hammers, or between the eye and bevels on scaling hammers.

peen edge: the portion of tinner's setting hammers directly opposite the striking face.

peen face: the portion of rivet hammers directly opposite the striking face.

poll: the portion between the eye and striking face chamfer on riveting hammers and tinner's setting hammers.

safety message: the information intended to promote safety that is imprinted on or affixed to the hammer.

striking face: the portion of the hammerhead, exclusive of the poll and chamfer, directly opposite the peen face or peen edge.

top of hammer: the portion of the hammer directly opposite the handle.

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4 GENERAL REQUIREMENTS

4.1 Design

Riveting, scaling, and tinner's setting hammers shall have a special purpose shape on one end and either a striking face or another special purpose shape on the opposite end. Both ends shall be designed for the specific purposes specified in para. 1.1. Various typical styles are referred to and are shown in Figs. 1, 2, and 3.

4.1.1 The striking face shall have a chamfer of approximately 45 deg. (or equivalent radius) all around the perimeter, with a width equal to approximately one-tenth across the poll width as measured across the chamfer angle. For example, if the width across the poll directly behind the chamfer equals 1.00 in. (25.4 mm), then the chamfer width equals approximately 0.100 in. (2.54 mm).

4.1.2 The striking face of the tinners' setting hammer shall be flat. The striking faces of riveting hammers shall be flat or slightly convex.

4.1.3 The peen face of riveting hammers shall be rounded.

4.1.4 The ends of peen faces, peen edges, or bits shall have a chamfer of approximately 45 deg. or equivalent radius.

4.1.5 Handles shall be of any design, including ergonomic, that can withstand the tests specified in paras. 4.4.3 and 4.4.4.

4.1.6 The tool shall be free of nonfunctional sharp edges, points, and surface roughness that could inflict personal injury on the user when handling the tool.

4.2 Materials

4.2.1 Hammerheads shall be made from special quality, fine grain, hot-rolled carbon steel bars conforming to the chemical requirements specified in Table 1 and to ASTM A 576. Equivalent material, such as alloy steel in conformance with ASTM A 322 or ASTM A 681, may also be used.

TABLE 1 CHEMICAL PROPERTIES OF STEEL HAMMERHEADS

	Required Percentage of Element	
Element	**Minimum**	**Maximum**
Carbon	0.45	0.88
Manganese	0.30	1.20
Phosphorus	. . .	0.04
Sulfur	. . .	0.05
Silicon	. . .	0.30

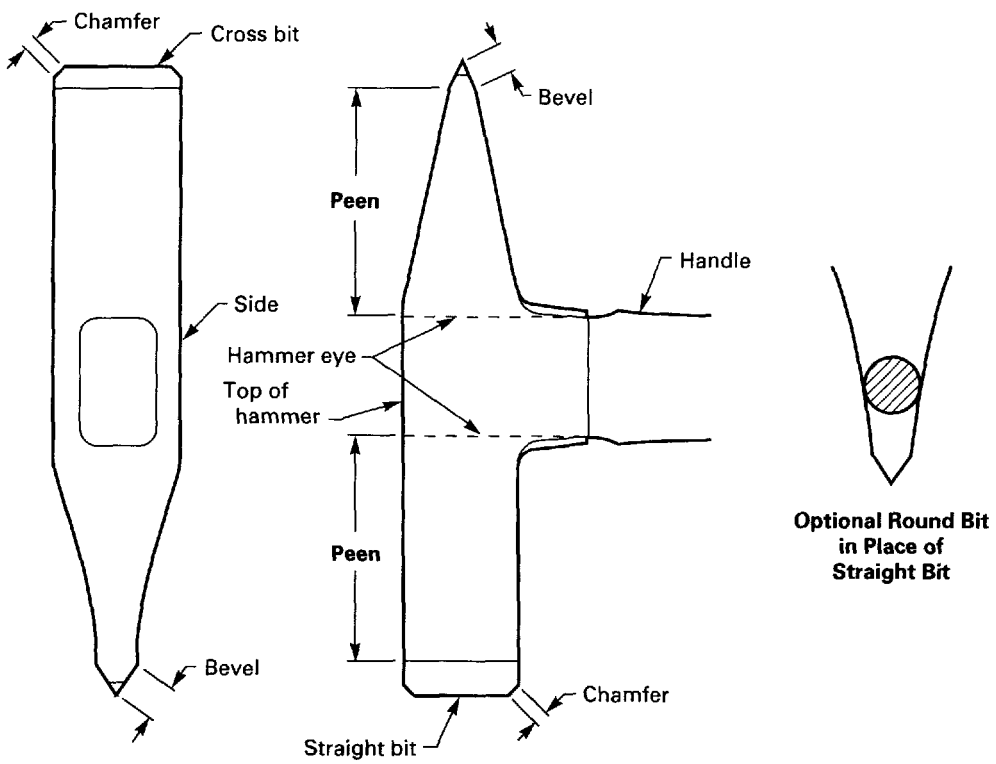

FIG. 2 SCALING HAMMER NOMENCLATURE

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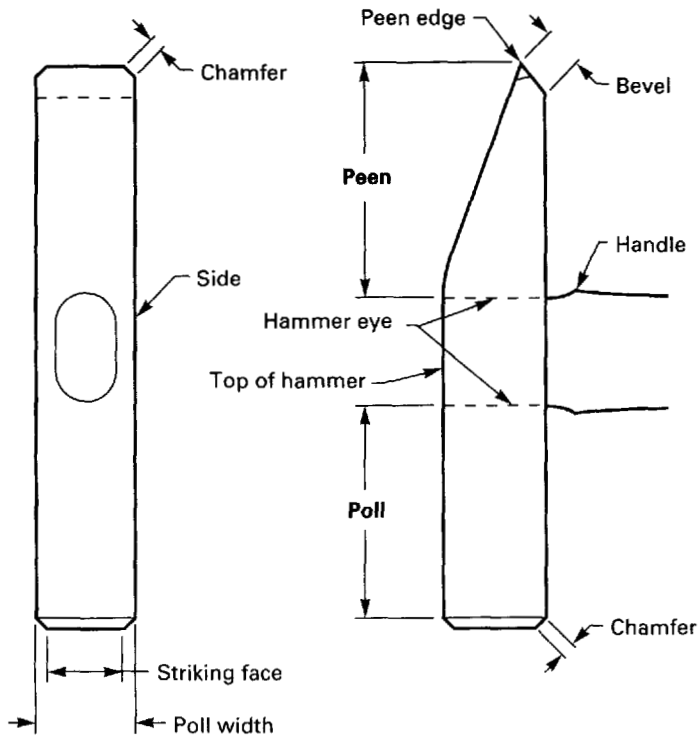

FIG. 3 TINNER'S SETTING HAMMER NOMENCLATURE

4.2.2 Hammerheads shall be free of manufacturing and material defects such as seams, laps, pipes, and cold shuts that would jeopardize sound construction. They 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 test requirements in paras. 4.4.3 and 4.4.4.

4.3 Mechanical Properties

4.3.1 The striking face, peen face, peen edge, and bit shall be hardened and tempered to a hardness of 45 HRC to 60 HRC or equivalent. The steel directly behind these areas (poll) shall be a toughened supporting core gradually decreasing in hardness.

4.3.2 The hammer striking face shall not mushroom, chip, crack, or spall when subjected to the test specified in para. 4.4.3 (see para. 4.4.1).

4.3.3 Handles shall not loosen or separate from the hammerhead, crack, or break when subjected to the tests specified in paras. 4.4.3 and 4.4.4 (see para. 4.4.1).

4.4 Tests

Many tests required herein are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

4.4.1 General

Hammers shall be capable of meeting tests specified in para. 4.4.2 through para. 4.4.4. Separate (new) hammers shall be used for each of the tests. Failure to meet the requirements of any one of the tests indicates that the hammers are not in compliance with this Standard.

4.4.2 Hardness Determination Test

Hardness determination with respect to the striking faces, peens, and bits shall be made on a fixtured hammer or on a mounted or unmounted specimen that has been cut from the hammer using the wet abrasive or other equivalent

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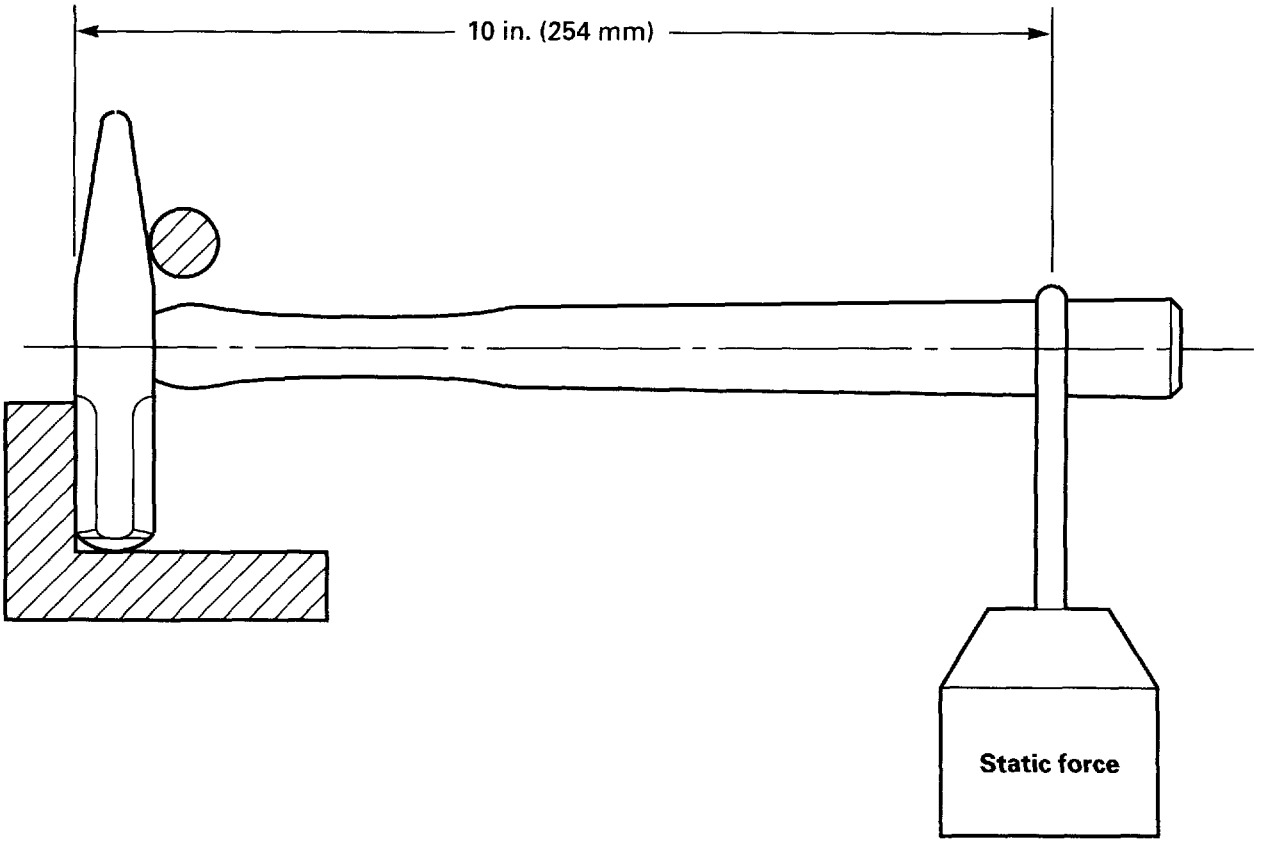

FIG. 4 TYPICAL STATIC FORCE TEST

method. Any hardness test will be acceptable that utilizes equipment and method equivalent to Rockwell hardness determination as specified in ASTM E 18.

4.4.3 Striking and Tensile Force Tests

Prior to tensile force testing, sample hammers shall be subjected to the following striking test:

(a) The tool shall withstand twenty full swinging blows by a person of average build, 160 lb to 180 lb (73 kg to 82 kg), or the mechanical equivalent, commensurate with the end use and weight of the hammer.

(b) The blows shall be struck against the smooth, flat or slightly convex surface of a rigidly supported steel object that has a minimum diameter of 3.0 in. (76 mm), a minimum length of 2.0 in. (51 mm), and a hardness equivalent to a hardness of 92 HRB to 105 HRB.[1]

Following the striking test, assemblies consisting of two or more separate parts (head and handle) shall not loosen or separate (see Fig. 5) under the minimum tensile forces below:

Hammerhead Weight		Static Tensile Force	
(oz)	(g)	(lb)	(N)
Less than 16	(454)	300	(1334)
16 and over	(454)	800	(3558)

4.4.4 Static Force Tests

Samples of the assembled hammer handles shall not break, loosen, or otherwise fail when subjected to the static force test. The minimum testing loads or bending forces are dependent on the nominal head weight and are shown in the following table:

Hammerhead Nominal Weight		Static Test Force	
(oz)	(g)	(lb)	(N)
7	(198)	25	(111)
12	(340)	60	(267)
16	(454)	80	(356)
Over 16	(454)	125	(556)

[1]The severity of the test is such that a degree of permissible deformation such as denting of the bit of scaling hammers is anticipated.

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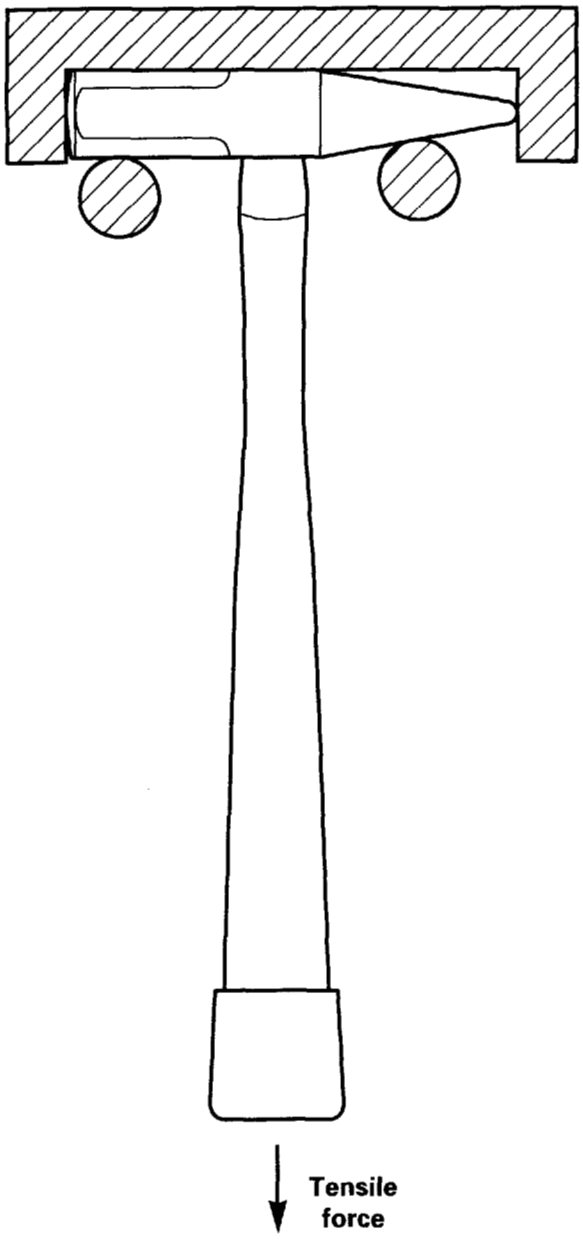

FIG. 5 TYPICAL TENSILE FORCE TEST

The following test procedure shall be used:

(a) While the hammerhead is locked securely in the test fixture with the striking face down and the handle extended in the horizontal plane, a static force shall be applied vertically at a point on the handle measuring 10.0 in. (254 mm) from the top of the hammer. (See Fig. 4.)

5 SAFETY REQUIREMENTS AND LIMITATIONS OF USE

(a) To avoid possible eye or other bodily injury, the hammers covered herein shall be used only for the purposes specified in para. 1.1.

(b) The sides of the polls or peens (see Fig. 1) shall not be used for striking or pounding.

(c) Safety goggles or equivalent eye protection conforming to ANSI Z87.1 shall be worn by the user and by all persons in the immediate area in which any hammer or other striking tool is being used to avoid injury from possible flying objects.

(d) Hammerheads shall be inspected prior to each use and their use discontinued at the first sign of chipping, mushrooming, or cracking of any portion.

(e) No area, section, or portion of a hammer shall be ground, welded, treated by reheating, or otherwise altered from the original condition as furnished by the manufacturer, except that a dull peen edge or bit may be redressed to its original contour using a hand file or a whetstone.

(f) Handles shall be inspected prior to each use and those damaged shall be replaced. Replacements shall be capable of withstanding the test requirements in paras. 4.4.3 and 4.4.4 and shall be equivalent to the original handle. Handles of tools shall be free of splinters or cracks and shall be kept tight in the head of the tool.

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

(h) Instructors, employers, or both, shall stress proper use and safety in the use of striking tools and shall emphasize the necessity to wear, and ensure the use of, safety goggles or equivalent eye protection. The publication *Guide to Hand Tools — Selection, Safety Tips, Proper Use and Care* provides guidelines for the safe use of these tools.

(i) Each hammer assembly shall be stamped, labeled, or otherwise marked by the manufacturer with the following safety message or equivalent:



WARNING
WEAR SAFETY GOGGLES
USER AND BYSTANDER

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 appear on replacement handles.

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