ASME B107.56-2018

(Partitioned From ASME B107.400-2008 and Revised)

Body Repair Tools

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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The American Society of Mechanical Engineers
Two Park Avenue • New York, NY • 10016 USA

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The American Society of Mechanical Engineers
Two Park Avenue, New York, NY 10016-5990

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FOREWORD

The American National Standards Committee B107 on Socket Wrenches and Drives was originally under the sponsorship of The American Society of Mechanical Engineers (ASME). It was subsequently reorganized as an ASME Standards Committee and its title was changed to Hand Tools and Accessories. In 1996, the Committee's scope was expanded to include safety considerations.

In 1999, ASME initiated a project to consolidate hand tool standards by category of tool. The initial implementation included distinct standards within a single publication bearing a three-digit number corresponding to the responsible B107 subcommittee. It was intended that subsequent revisions would integrate the component standards resulting in a more traditional document.

During the consolidation revision of ASME B107.400, Striking Tools, it was determined that since ASME B107.56 included both striking and struck tools with different applications than the other striking tools in ASME B107.400, it should revert to a stand-alone standard under separate cover. This is the first publication of ASME B107.56 since its inclusion in ASME B107.400-2008.

The purpose of ASME B107.56 is to define essential performance and safety requirements specifically applicable to the various tools covered herein. It specifies test methods to evaluate conformance to the defined requirements and indicates limitations of safe use.

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

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

Members of the Hand Tools Institute Striking and Struck Tools Standards Committee, through their knowledge and hard work, have been major contributors to the development of the B107 Standards. Their active efforts in the promotion of these standards are acknowledged and appreciated.

ASME B107.56-2018 was approved by the ASME B107 Standards Committee on February 21, 2018. It was approved as an American National Standard on July 20, 2018. The requirements of this Standard take effect upon its issue date.

ASME B107 COMMITTEE
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 or a case, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B107 Standards Committee
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http://go.asme.org/Inquiry

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.

Proposing a Case. Cases may be issued to provide alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the Standard and the paragraph, figure, or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the Standard to which the proposed Case applies.

Interpretations. Upon request, the B107 Standards 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.

Requests for interpretation should preferably be submitted through the online Interpretation Submittal Form. The form is accessible at http://go.asme.org/InterpretationRequest. Upon submittal of the form, the Inquirer will receive an automatic e-mail confirming receipt.

If the Inquirer is unable to use the online form, he/she may mail the request to the Secretary of the B107 Standards Committee at the above address. The request for an 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 in one or two words.
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. Please provide a condensed and precise question, composed in such a way that a "yes" or "no" reply is acceptable.
Proposed Reply(ies):	Provide a proposed reply(ies) in the form of "Yes" or "No," with explanation as needed. If entering replies to more than one question, please number the questions and replies.
Background Information:	Provide the Committee with any background information that will assist the Committee in understanding the inquiry. The Inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in the format described above may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

Moreover, ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the Inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The B107 Standards Committee regularly holds meetings and/or telephone conferences that are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the B107 Standards Committee. Future Committee meeting dates and locations can be found on the Committee Page at http://go.asme.org/B107committee.

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BODY REPAIR TOOLS

1 SCOPE

This Standard provides performance and safety requirements for body repair hammers, dolly blocks, and spoons that are intended specifically for the reshaping of sheet metal panels normally found on bodies and fenders of motor vehicles. These tools are intended to be used separately or together for repairs.

This Standard is intended to serve as a guide in selecting, testing, and using the hand tools covered herein. It is not the purpose of this Standard to specify the details of manufacturing.

This Standard is also intended to serve as a guide for the development of manuals and posters, and for training personnel to work safely.

2 DEFINITIONS

dinging: the removal of minor imperfections in metal; straightening damaged metal whether spoons, hammers, or dolly blocks are used.

equivalent: interpreted in this Standard to mean alternative designs or features that will provide an equal degree of performance and safety.

hardness: resistance to indentation. Heat treatment will produce changes to hardness of metal.

safety message: the information imprinted on or affixed to the repair hammer, dolly block, or spoon that is intended to promote safety.

shall: indicates mandatory requirements of this Standard.

should: indicates that a provision is of an advisory nature or is stated as a recommendation.

2.1 Type I: Body Repair Hammers

See Figures 2.1-1 and 2.1-2 for illustrations of the body repair hammer features and styles described in this section.

bell: the portion of the hammerhead directly behind the striking face.

bumping, dinging, finishing face: the area of the hammer- head used to restore the damaged sheet metal panel to its original shape by striking.

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

cheeks: the sides of the hammerhead proximate to the eye.

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

handle: the portion that protrudes from the hammerhead and by which the hammer is held.

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

neck: the reduced cross-section portion of the hammer-head located between the bell and the eye, or the peen and the eye, or both.

peen: the striking surface of the hammerhead located in front of the neck.

pick: the elongated tapered portion of the hammerhead extending from the eye to the point.

point: the striking surface located at the end of the pick.

shrinking: the contracting of stretched sheet metal by heating and upsetting the stretched metal into the heated spot with the body repair hammer.

shrinking face: a striking surface that is normally serrated. It may be flat or crowned.

striking face: the portion of the hammerhead located in front of the bell and chamfer that contacts the sheet metal.

striking-face crown: the convex shape or radius of the striking face.

striking surface: the surface of a hammerhead, peen, chisel, or pick intended to contact the sheet metal.

struck face: the portion of the hammerhead, exclusive of the chamfer, intended to be struck with a striking tool.

Figure 2.1-1 Nomenclature for Body Repair Hammers

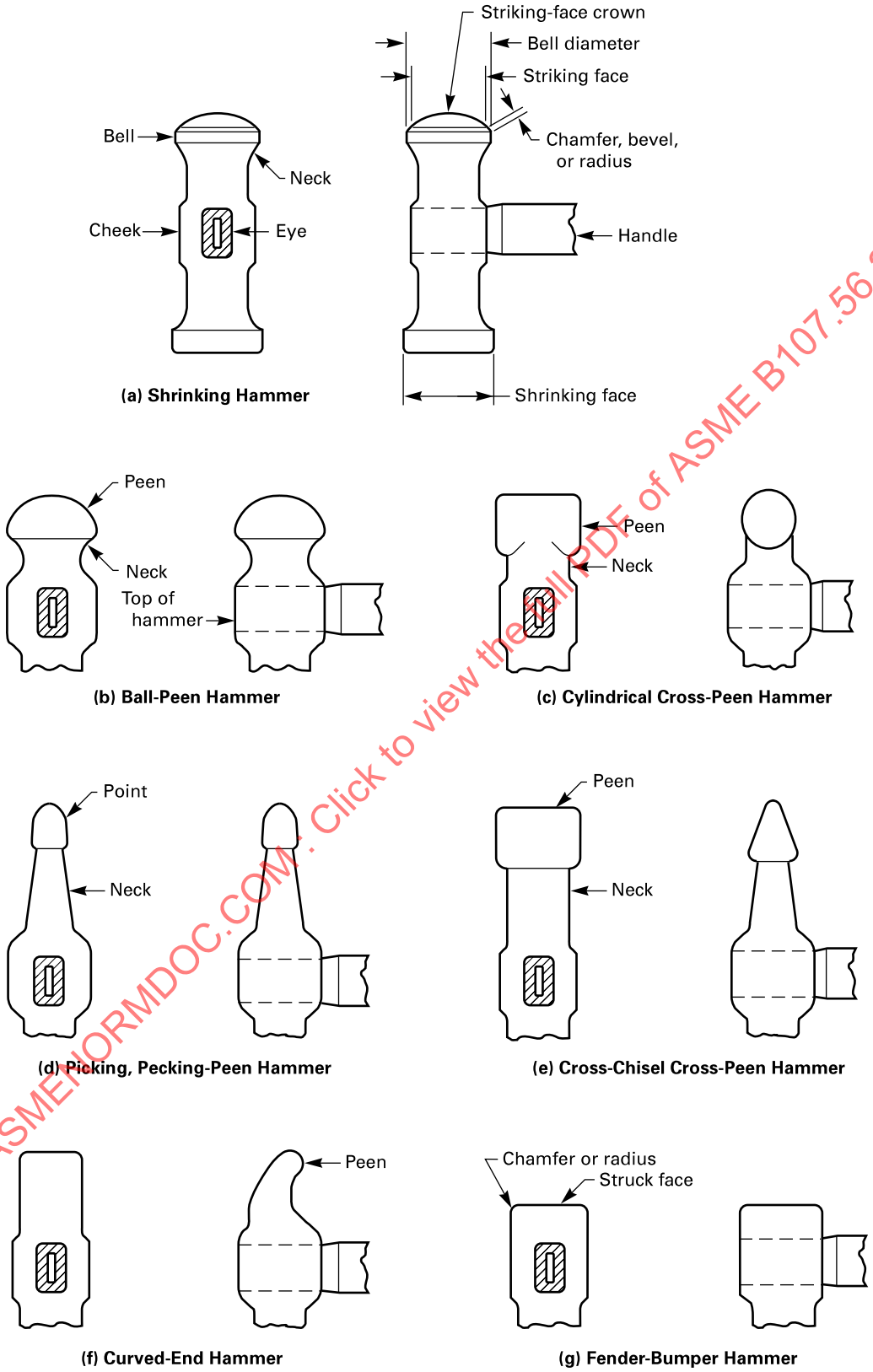
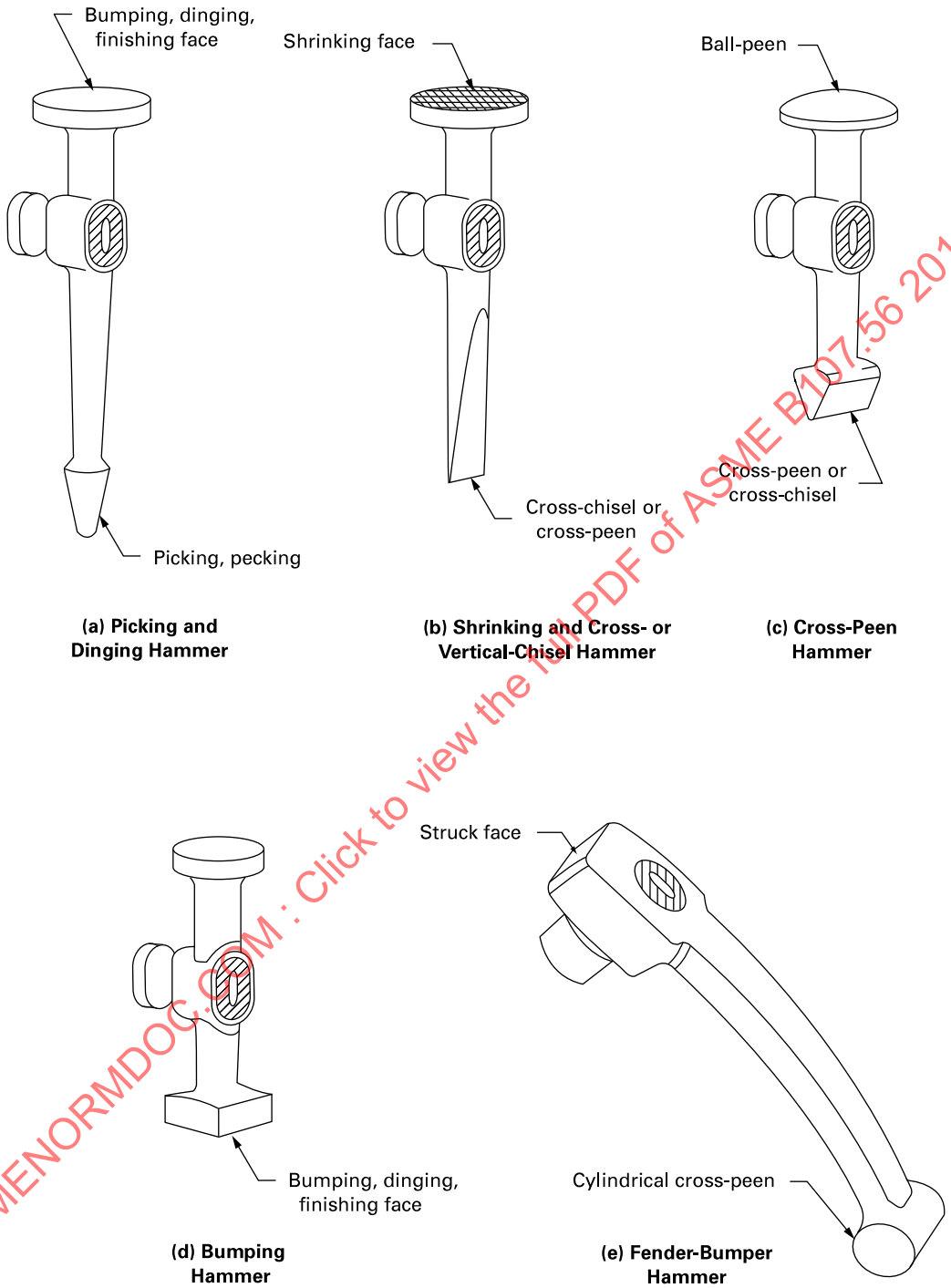


Figure 2.1-2 Typical Styles of Body Repair Hammers



(a) Picking and Dinging Hammer

(b) Shrinking and Cross- or Vertical-Chisel Hammer

(c) Cross-Peen Hammer

(d) Bumping Hammer

(e) Fender-Bumper Hammer

2.2 Type II: Dolly Blocks

See Figure 2.2-1 for an illustration of the dolly block features described in this section.

beading edge: an edge of a dolly block with a rounded apex used to raise a bead.

chamfer: the bevel or equivalent radius encircling the perimeter of the working surface.

crown: a broad area of the working surface that is convex in shape.

flanging edge: an edge of a dolly block with an approximately right-angle rounded surface that is used to form a flange.

shrinking surface: a working surface that is normally serrated. It may be flat or crowned.

striking surface: the surface of a dolly block intended to contact the sheet metal.

working face: the convex shape or radius of the striking or struck surface of a dolly block.

working surface: the convex or radiused face of the dolly block intended to contact the sheet metal; the working surface is usually ground, buffed, or otherwise smoothly finished.

2.3 Type III: Body Spoons

See Figure 2.3-1 for an illustration of the parts of body spoons described in this section.

chamfer: the bevel or equivalent radius encircling the perimeter of the working surface.

crown: a broad area of the working surface that is convex in shape.

driving pad: a raised square or rectangular boss on some styles of spoon handles that is designed to be struck with a hammer.

handle: the portion that extends beyond the working area and by which the spoon is held.

slapping surface: the portion of the spoon used to forcefully strike the sheet metal.

struck face: a surface of the light dinging spoon, as shown in Figure 5.1.3-1, illustration (a), generally opposite the working surface, that may be struck by an appropriate striking tool during use; the flat surface of a driving pad on the handle or shank.

Figure 2.2-1 Nomenclature for Dolly Blocks

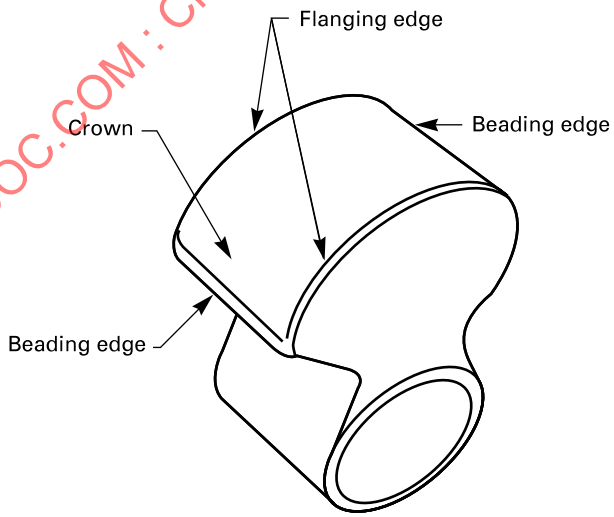
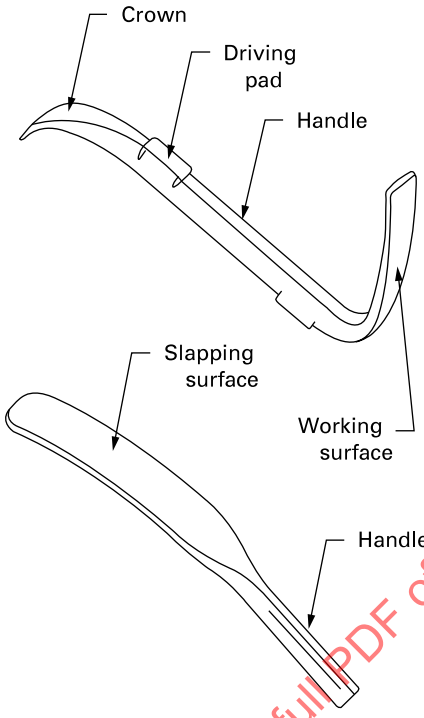


Figure 2.3-1 Nomenclature for Body Spoons



working surface: the portion of the spoon intended to contact the sheet metal; the working surface is usually ground, buffed, or otherwise smoothly finished.

3 REFERENCES

The following is a list of publications referenced in this Standard. Unless otherwise specified, the latest edition shall apply.

ANSI Z87.1, Occupational and Educational Personal Eye and Face Protection Devices
ANSI Z535.4, Product Safety Signs and Labels
Publisher: American National Standards Institute (ANSI), 25 West 43rd Street, New York, NY 10036 (www.ansi.org)

ASTM E18-16, Standard Test Methods for Rockwell Hardness of Metallic Materials
Publisher: American Society for Testing and Materials (ASTM International), 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959 (www.astm.org)

Guide to Hand Tools – Selection, Safety Tips, Proper Use and Care
Publisher: Hand Tools Institute (HTI), 25 North Broadway, Tarrytown, NY 10591 (www.hti.org)

ISO 7010:2011, Graphical symbols — Safety colours and safety signs—Registered safety signs
Publisher: International Organization for Standardization (ISO), Central Secretariat, Chemin de Blandonnet 8, Case Postale 401, 1214 Vernier, Geneva, Switzerland (www.iso.org)

SAE J1703, Motor Vehicle Brake Fuid
Publisher: SAE International, 400 Commonwealth Drive, Warrendale, PA 15096 (www.sae.org)

4 CLASSIFICATION

Type I: Body Repair Hammers
Type II: Body Repair Dolly Blocks
Type III: Body Repair Spoons

5 PERFORMANCE REQUIREMENTS

The illustrations shown herein are descriptive and nonrestrictive, and do not preclude the manufacture of body repair tools that otherwise comply with this Standard. Body repair tools shall withstand the applicable tests in section 6.

5.1 Design

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

No engraving, stamping, or other marks shall be impressed on the working surfaces of body repair tools to prevent transferring to sheet metal surfaces.

5.1.1 Type I: Body Repair Hammers. Body repair hammers are designed for striking against sheet metal panels. They shall consist of a hammerhead with one or more striking surfaces and a handle or, as on a fender bumper [shown in Figure 2.1-2, illustration (e)], one striking surface and one struck face and a handle.

5.1.1.1 Striking Surface. The hammerhead striking surfaces include, but are not limited to, any combination of those described here.

(a) Bumping, Dinging, Finishing Face. The striking face may be smooth, flat, or crowned [see Figure 2.1-2, illustrations (a) and (d)]. The cross section of the bell may be round, square, or polygonal.

(b) Picking or *Pecking End*. Has a pointed or rounded tip called a point at the end of a round or polygonal pick [see Figure 2.1-2, illustration (a)]. The axis of the pick may be straight or curved.

(c) Shrinking Face. The serrated striking face may be flat or crowned [see Figure 2.1-2, illustration (b)]. The cross section at the bell may be round or polygonal.

(d) Ball-Peen End. Has a smoothly contoured, approximately hemispherical shape, as shown in Figure 2.1-2, illustration (c).

(e) Cross-Peen or *Cross-Chisel End*. These styles feature a wedge or chisel-shaped peen oriented at a right angle to the axis of the handle, as shown in Figure 2.1-2, illustrations (b) and (c).

(f) Cylindrical Cross-Peen End. Has a generally cylindrical-shaped striking part with its axis oriented approximately at a right angle to the axis of the hammerhead and handle [see Figure 2.1-2, illustration (e)].

(g) Vertical-Peen or *Vertical-Chisel End*. These styles feature a wedge or chisel-shaped peen oriented parallel to the axis of the handle [see Figure 2.1-2, illustration (b)].

5.1.1.2 Chamfer. The chamfer on the bumping, dinging, finishing, and other striking faces shall be a minimum of 0.03 in. at approximately 45-deg or equivalent radius.

5.1.1.3 Peen. The peen may have one of the following shapes:

(a) wedge-shaped (as in a cross-peen or cross- and vertical-chisel)

(b) cylindrical (as in a cylindrical cross-peen)

(c) rounded (as in a ball-peen)

5.1.1.4 Handle. The handle shall be of any design, including ergonomic, that will withstand the appropriate tests specified in paras. 6.2 and 6.3.

5.1.2 Type II: Dolly Blocks. Dolly blocks are designed for straightening, bumping, shrinking, and finishing sheet metal panels during the repair of damaged motor vehicle body and fender sections. They are intended for use with or without body repair hammers, but shall not be struck directly with a hammer.

Dolly blocks may possess a combination of contoured surfaces.

Some styles of dolly blocks and their functions are listed here and shown in Figure 5.1.2-1. The names given are those generally recognized in the body repair industry. The styles covered by the Standard are not limited to those named or illustrated.

(a) General-Purpose Crowned. For use on crowned panels and flat portions of body panels.

(b) General-Purpose Anvil. For various curves and contours of body, door panels, and deep-skirted fenders.

(c) General-Purpose Rail. For bumping, dinging, straightening, and finishing various portions of body door panels and fenders. A general-purpose rail dolly block has two beading and flanging edges.

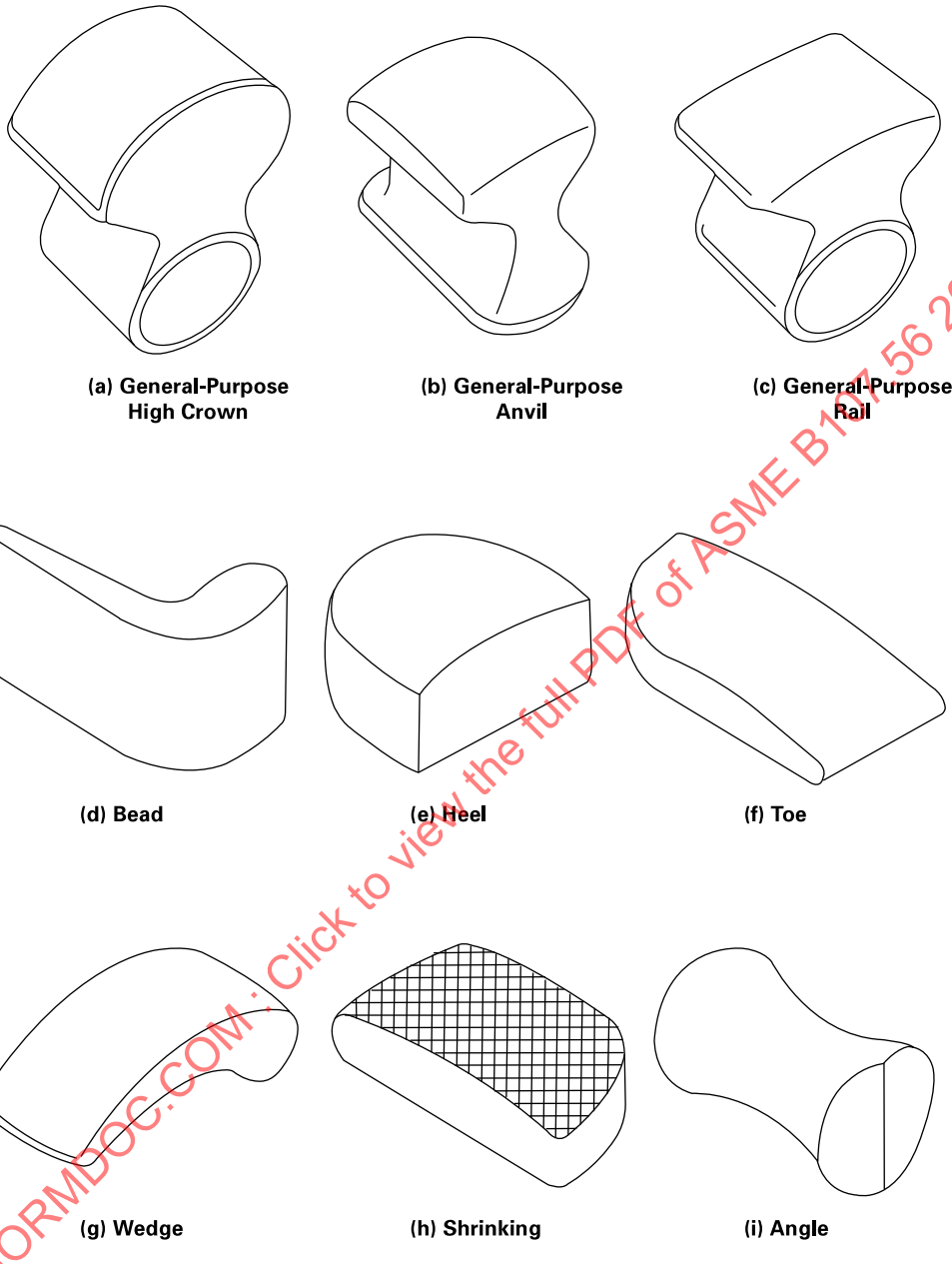
(d) Bead. Suitable for use on long-curved fenders, beads, and flanges.

(e) Heel. Suitable for use on sharp corners and large-radius portions of panels.

(f) Toe. Has a flat face and flat edge suitable for dinging flat surfaces. The crowned and curved contours are suitable for use on odd crowns and contours.

(g) Wedge. Suitable for use behind brackets, braces, and reinforcements.

Figure 5.1.2-1 Typical Styles of Dolly Blocks



(a) General-Purpose High Crown

(b) General-Purpose Anvil

(c) General-Purpose Rail

(d) Bead

(e) Heel

(f) Toe

(g) Wedge

(h) Shrinking

(i) Angle

(h) Shrinking. Has a flat or curved striking surface that is normally serrated.
(i) Angle. For use on various angles, crosses, and curves.

5.1.3 Type III: Spoons. Body spoons are designed variously for dispersing the force of a hammer blow over a wider area, for wedging and prying between panels, for striking against sheet metal panels in con- fined spaces, or for use as a dolly in hard-to-reach areas. They are characterized by an integral handle or shank of a size, shape, and length to provide a comfortable balance and utility to the working end of the spoon.

Spoons may have a combination of contoured surfaces.

Some styles of spoons and their uses are listed here and shown in Figure 5.1.3-1. The names given are those typically used in the body repair industry. The styles covered by this Standard are not limited to those named or illustrated.

(a) Light Dinging Spoon. Light low-crown spoon for distributing the force of a hammer blow over a wider area or greater length of a ridge. Not made for prying.
(b) Surfacing Spoon. Low-crown spoon for spring hammering, slapping, and finishing.
(c) Medium-Crown Spoon. For reducing high ridges or prying. High-crown versions are also available.
(d) Combination Spoon. Heavy-duty, general-purpose, high-crown spoon with an offset handle. Can be used as a dolly.
(e) Spoon Dolly. The long handle permits use in difficult-to-reach areas. Use as a spoon, dolly, or pry, and for caulking.
(f) Double-End Driving Spoon. Can be driven between panels. Use as a pry or spoon. Bevel edge tips.

5.2 Materials

The materials used in the manufacture of these tools shall be such as to produce tools conforming to the requirements specified herein.

5.3 Hardness

5.3.1 Type I: Body Repair Hammers. The striking faces and peen ends of body repair hammerheads shall be hardened and tempered to 48 HRC to 60 HRC or equivalent. The struck face of fender bumper body repair hammerheads shall not exceed 45 HRC or equivalent.

5.3.2 Type II: Dolly Blocks. The hardness of dolly blocks shall be 40 HRC to 52 HRC or equivalent.

5.3.3 Type III: Spoons. The hardness of body repair spoons shall be 38 HRC to 48 HRC or equivalent.

6 TESTS

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

Separate (new) samples shall be used for each of the tests.

6.1 Hardness Test

Hardness determination shall be made per ASTM E18.

6.2 Striking and Tensile Force Test—Type I

Prior to tensile force testing, sample body repair hammers shall be subjected to a preconditioning striking test as specified in para. 6.2.1, 6.2.2, or 6.2.3 as applicable, using the following test setup:

A rigidly supported steel bar, with a minimum diameter of 6 in., a minimum height of 3 in., and a hardness of 92 HRB to 105 HRB or equivalent, shall be used to support a 26-gage (0.0179 in.) steel metal panel that fully covers the steel bar (see Figure 6.2-1).

The hammer handle shall not splinter, break, loosen, or separate. The striking faces, points, peens, or chisel ends of body repair hammerheads shall not sink, mushroom, chip, crack, or spall.[1]

Swinging blows shall be struck by a person of average build, 160 lb to 180 lb, commensurate with the end use and weight of the tool. The blows shall be struck with the hammer held or fixtured at the normal gripping area. The test shall be conducted at room temperature.

6.2.1 Dinging, finishing, bumping, and ball-peen hammer ends shall withstand 20 full swinging blows through a 90-deg arc.

[1] The striking test is so severe that a degree of permissible deformation of serrations on the striking face of hammers can be anticipated.

Figure 5.1.3-1 Typical Styles of Body Spoons

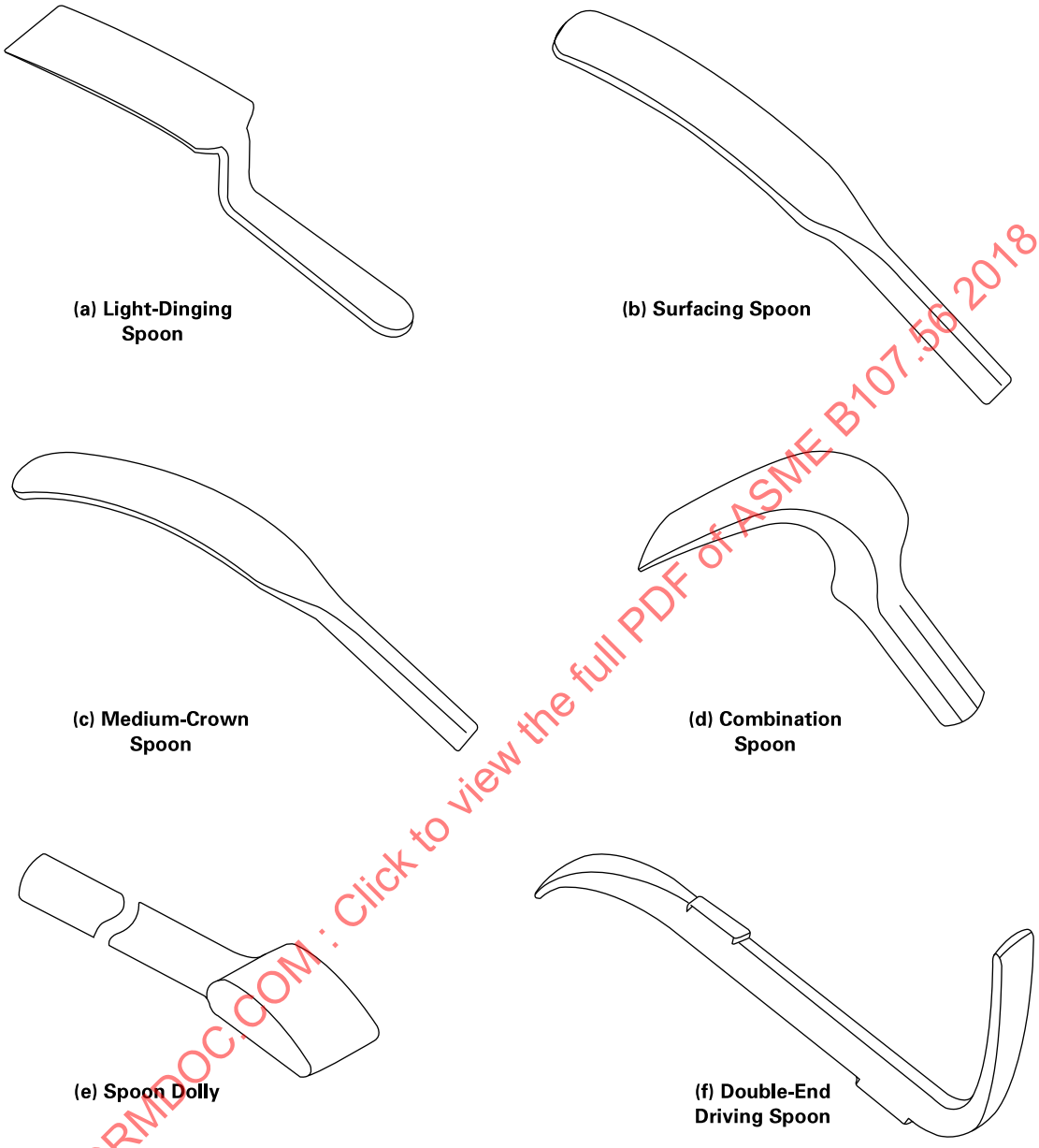
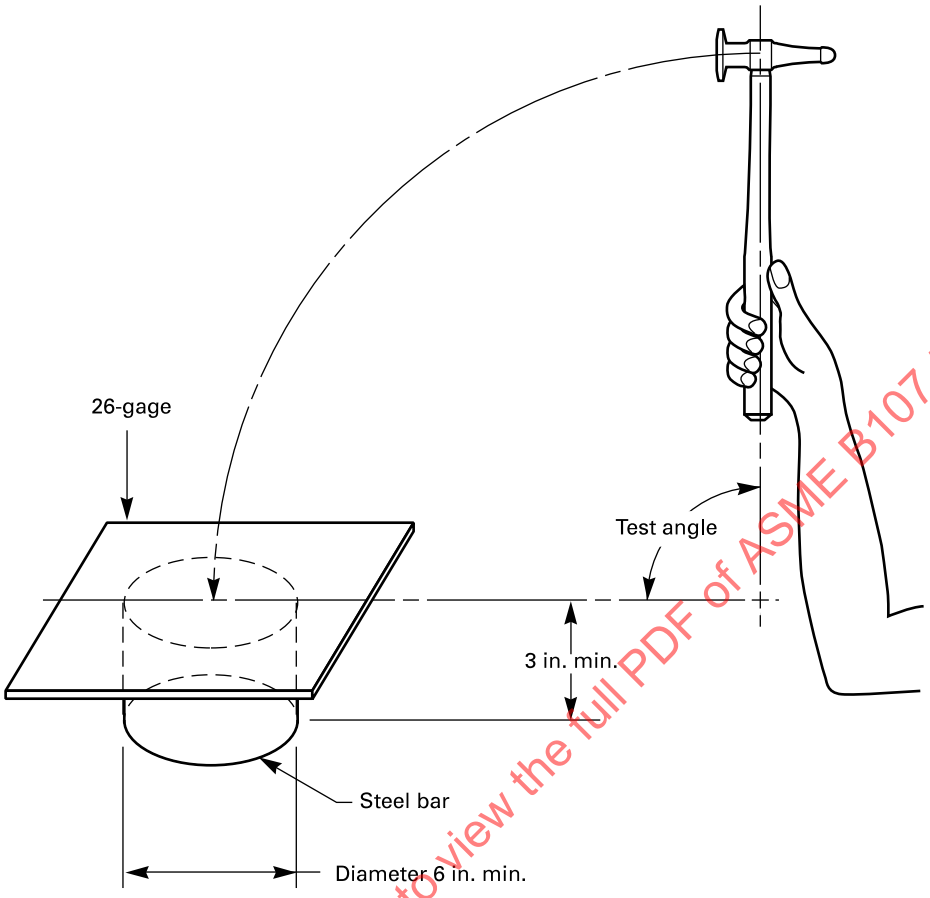


Figure 6.2-1 Striking Test Setup for Body Repair Hammers



6.2.2 Pecking, cylindrical cross-peen, cross-peen, cross-chisel, and shrinking hammer ends shall withstand 20 full swinging blows through a 45-deg arc.

6.2.3 Fender-bumper body repair hammers shall be subject to the preconditioning striking test that uses the same test setup as shown in Figure 6.2-1. The cylindrical cross-peen shall be held against the sheet metal with the handle extending horizontally. The striking face of a 16-oz ball-peen hammer shall be used to subject the struck face of the fender-bumper hammer to 20 full swinging blows through a 90-deg arc. The fender-bumper hammerhead shall not chip, crack, spall, or mushroom.

Following the preconditioning striking test, the hammerhead shall not loosen or separate from the handle when subjected to a static tensile force of 400 lbf.

6.3 Static Force Test — Type I

Samples of the assembled body repair handles shall not break, loosen, or otherwise fail when subjected to a static force (see Figure 6.3-1) of 25 lbf while

(a) the hammerhead is locked securely in the test fixture with the striking face down and the handle extended in a horizontal plane

(b) a static force of 25 lbf is applied vertically at a point on the handle measuring 10 in. from the top of the hammer

6.4 Grip Tests

6.4.1 Solvent Resistance Test. Grips shall be fully immersed in the test fluids specified for 15 min to 20 min at room temperature, removed, and let stand for 24 hr to 28 hr. Test fluids are SAE J1703 brake fluid, gasoline, ethylene glycol, and ethyl alcohol. There shall be no significant swelling nor surface attack of the material being tested. Grips shall be tested while attached to the sample tool handle.