ASME B107.100-2020
(Revision of ASME B107.100-2010)

Flat Wrenches

AN AMERICAN NATIONAL STANDARD

The American Society of
Mechanical Engineers

ASME B107.100-2020
(Revision of ASME B107.100-2010)

Flat Wrenches

AN AMERICAN NATIONAL STANDARD

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

Date of Issuance: February 18, 2020

This Standard will be revised when the Society approves the issuance of a new edition.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Periodically certain actions of the ASME B107 Committee may be published as Cases. Cases and interpretations are published on the ASME website under the Committee Pages at http://go.asme.org/B107committee as they are issued.

Errata to codes and standards may be posted on the ASME website under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

The Committee Pages can be found at http://go.asme.org/B107committee. There is an option available to automatically receive an e-mail notification when errata are posted to a particular code or standard. This option can be found on the appropriate Committee Page after selecting "Errata" in the "Publication Information" section.

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

CONTENTS

Tables

FOREWORD

The American National Standards Committee B107, Socket Wrenches and Drives, under sponsorship of The American Society of Mechanical Engineers (ASME), was reorganized on June 28, 1967, as an ASME Standards Committee and its title was changed to Hand Tools and Accessories. In 1996 its 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. This revision integrates the component standards, resulting in a more traditional document. To maintain continuity within the user community, the former component standard numbers are renamed as categories in the consolidated standard, and designations are provided in Nonmandatory Appendix A.

The purpose of ASME B107.100 is to define essential performance and safety requirements specifically applicable to various categories of wrenches. It specifies test methods to evaluate performance related to the defined requirements and safety, and indicates limitations of safe use.

This Standard was titled "Wrenches" when it was first issued in 2002. It superseded the following ASME standards: B107.6, Combination Wrenches; B107.9, Box Wrenches, Double Head; B107.39, Open End Wrenches, Double Head; and B107.40, Wrenches, Flare Nut. The 2010 edition was retitled "Flat Wrenches" and incorporated and superseded ASME B107.8, Adjustable Wrenches; ASME B107.21, Wrench, Crowfoot; and ASME B107.60, Ratcheting Box Wrenches.

Principal changes in this edition are to specific proof loads to align the progression of loads, the normalization of the *F* dimension in Category 21 wrenches so that the dimension is the same for a given drive size and wrench opening, the addition of a failure mode test in response to the Additive Manufacturing initiative by ASME, and the reorganization of content into the structure used by previous editions of the component standards, in accordance with the consolidation project objectives. A significant change in this revision is the reduction of lengths, presented in two styles for Category 6 wrenches: Style 1 minimizes overlap and meets the requirements of SAE AS954H; Style 2 meets the requirements of SAE AS954H without reducing overlap from the 2002 version of ASME B107.100. As noted in the Scope, producers may make other lengths that meet the performance and safety requirements of this Standard.

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.

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

ASME B107.100-2020 was approved by the B107 Standards Committee on August 19, 2019, and by the Board on Standards and Testing on January 3, 2020. It was approved by the American National Standards Institute (ANSI) as an American National Standard on January 21, 2020.

ASME B107 COMMITTEE
Hand Tools and Accessories

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

STANDARDS COMMITTEE OFFICERS

J. S. Foote, *Chair*
B. Price, *Vice Chair*
D. Papert, *Secretary*

STANDARDS COMMITTEE PERSONNEL

N. C. Cantlon, Jore Corp.
J. D. Davidson, IDEAL Industries, Inc.
D. M. Eggert, Snap-On, Inc.
J. S. Foote, Trade Association Management, Inc.
D. R. Kritikos, Channellock, Inc.
C. Kuznia, General Services Administration
B. List, Apex Tool Group, LLC
G. E. Olson, Gene Olson Engineering Consultant, Ltd.
W. T. Pagac, Forever Associates
D. Papert, The American Society of Mechanical Engineers
B. Price, Consultant
W. C. Snyder, Wright Tool Co.
H. Yin, Microalloying International, Inc.
B. Solar, *Alternate*, SK Hand Tool, LLC
C. J. Hyatt, *Contributing Member*, Air Force Metrology and Calibration
J. L. Reynertson, Jr., *Contributing Member*, Sturtevant Richmont Division of Snap-On, Inc.
D. D. Schmick, *Contributing Member*, Midwest Tool and Cutlery Co.

CORRESPONDENCE WITH THE B107 COMMITTEE

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

FLAT WRENCHES

1 SCOPE

This Standard provides performance and safety requirements for combination, open end, box, and flare nut wrenches; open end adjustable wrenches, with rack and worm adjustment, generally used on both hexagonal and square fasteners; crowfoot wrenches having a wrench component of the open end type or flare nut type; and ratcheting box wrenches used in hexagonal (6-point), double-hexagonal (12-point), square (4-point), and double-square (8-point) wrenching applications. The tools covered herein are listed by Category number in Table 4-1.

Inclusion of dimensional data in this Standard is not intended to imply that all of the products described herein are stock production sizes. Manufacturers may make sizes not listed in this Standard. Consumers are requested to consult with manufacturers concerning lists of stock production sizes.

2 DEFINITIONS

adjusting worm: portion of the wrench used to adjust the clearance between the fixed and movable jaws.

angle wrench: a wrench with one end having an angle of 55 deg.

box wrench: wrench with an enclosed opening that grips all faces of the fastener.

combination wrench: a wrench that is open on one end and box on the other.

engineer's wrench: in this Standard, a wrench that is open on one end, different size open on the other.

NOTE: Industry may refer to single ended open end wrenches as engineer's wrenches.

fixed jaw: portion of the frame that contacts the fastener.

flare nut wrench: wrench that is used for gripping the nuts on the ends of tubes, with a slotted box end.

frame: portion of the wrench containing the fixed jaw and handle.

handle: portion of the wrench by which the tool is held.

ignition wrench: a thin angle wrench.

movable jaw: movable portion of an adjustable wrench that contacts the fastener.

offset: pitch, or rotation around a transverse horizontal axis.

open end wrench: wrench with a U-shaped opening that grips two opposite faces of a fastener. The other end may be another open end or a nonwrenching end (handle).

proof torque: predetermined test torque to which a sample is subjected.

reversing lever: device to control the reversing mechanism.

reversing torque: force to rotate the wrench in the ratcheting or nonloading direction.

shifter: device to control the reversing mechanism.

slotted box: box wrench end with an opening smaller than the width across flats. See also *flare nut wrench*.

tappet wrench: open end wrench where the head or opening is thinner than standard wrenches to allow clearance to adjust valve trains.

worm retainer: pin used to retain the adjusting worm in the frame.

worm spring: spring used to induce friction between the handle and adjusting worm for holding the adjusting worm in any preset position.

3 REFERENCES

The following is a list of publications referenced in this Standard. The latest available edition shall be used.

ASME B107.4, Driving and Spindle Ends for Portable Hand, Impact, Air, and Electric Tools (Percussion Tools Excluded)
ASME B107.17, Gages and Mandrels for Wrench Openings
Publisher: The American Society of Mechanical Engineers (ASME), Two Park Avenue, New York, NY 10016-5990 (www.asme.org)

ASTM B117, Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM B537, Standard Practice for Rating of Electroplated Panels Subjected to Atmospheric Exposure
ASTM B571, Standard Practice for Qualitative Adhesion Testing of Metallic Coatings
ASTM D968, Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM E18, Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E92, Standard Test Method for Vickers Hardness of Metallic Materials