ASME B107.100-2023
(Revision of ASME B107.100-2020)

Flat Wrenches

AN AMERICAN NATIONAL STANDARD

The American Society of
Mechanical Engineers

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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 (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 It superseded the following ASME standards: B107.6, Combination Wrenches; B107.9, Box Wrenches, Double Head; B107.39, Open End Wrenches, Double Head; and B107.40, Wrenches,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 The 2010 edition was retitled "Flat Wrenches" and incorporated and superseded ASME B107.8, Adjustable Wrenches; ASME B107.21, Wrench, Crowfoot; and ASME B107.60, Ratcheting Box Wrenches.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 the 2020 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. The 2023 edition corrects numerous table values.

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 9, 2020. It was approved by the American National Standards Institute (ANSI) as an American National Standard on January 21, 2020.

ASME B107.100-2023 was approved by the B107 Standards Committee on March 8, 2023, and by the Board on Standards and Testing on May 9, 2023. It was approved by the American National Standards Institute (ANSI) as an American National Standard on June 30, 2023.

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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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Revisions and Errata. The committee processes revisions to this Standard periodic basis 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 in the next edition of the Standard.

In addition, the committee may post errata on the committee web page. Errata become effective on the date posted. Users can register on the committee web page to receive e-mail notifications of posted errata.

This Standard is always open for comment, and the committee welcomes proposals for revisions. 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 background information and supporting documentation.

Cases

(a) The most common applications for cases are

(1) to permit early implementation of a revision based on an urgent need

(2) to provide alternative requirements

(3) to allow users to gain experience with alternative or potential additional requirements prior to incorporation directly into the Standard

(4) to permit the use of a new material or process

(b) Users are cautioned that not all jurisdictions or owners automatically accept cases. Cases are not to be considered as approving, recommending, certifying, or endorsing any proprietary or specific design, or as limiting in any way the freedom of manufacturers, constructors, or owners to choose any method of design or any form of construction that conforms to the Standard.

(c) A proposed case shall be written as a question and reply in the same format as existing cases. The proposal shall also include the following information:

(1) a statement of need and background information

(2) the urgency of the case (e.g., the case concerns a project that is underway or imminent)

(3) the Standard and the paragraph, figure, or table number(s)

(4) the edition(s) of the Standard to which the proposed case applies

(d) A case is effective for use when the public review process has been completed and it is approved by the cognizant supervisory board. Approved cases are posted on the committee web page.

Interpretations. Upon request, the committee will issue an interpretation of any requirement of this Standard. An interpretation can be issued only in response to a request submitted through the online Interpretation Submittal Form at https://go.asme.org/InterpretationRequest. Upon submitting the form, the inquirer will receive an automatic e-mail confirming receipt.

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Committee Meetings. The B107 Standards Committee regularly holds meetings that are open to the public. Persons wishing to attend any meeting should contact the secretary of the committee. Information on future committee meetings can be found on the committee web page at https://go.asme.org/B107committee.

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ASME B107.100-2023
SUMMARY OF CHANGES

Following approval by the ASME B107 Committee and ASME, and after public review, ASME B107.100-2023 was approved by the American National Standards Institute on June 30, 2023.

ASME B107.100-2023 includes the following changes identified by a margin note, **(23)**.

Page	*Location*	*Change*
2	3	References updated
4	Table 5.1.1-1	For $\frac{1}{2}$-in. nominal wrench opening, maximum width of open head revised
5	Table 5.1.1-1M	For 17-mm nominal wrench opening, maximum width of open head revised
6	Table 5.1.1-2	Under "Style 1," "Long, Max." revised to "Long, Min."
7	Table 5.1.1-2M	(1) Under "Style 1," "Long, Max." revised to "Long, Min."
		(2) For 4-mm to 12-mm nominal wrench openings, entries under "Style 1, Long, Max." and "Style 2" revised
10	Table 5.1.2-1	For $\frac{1}{4}$-in. nominal wrench opening, maximum outside diameter of box head revised
11	Table 5.1.2-1M	For 11-mm to 20-mm nominal wrench openings, maximum outside diameter of box head revised
17	Table 5.1.3-1	(1) For $\frac{1}{2}$-in. nominal wrench opening, maximum width of open head under "Types I and II, Classes 1 and 2" revised
		(2) For $\frac{11}{16}$-nominal wrench opening, maximum width of open head under "Type III" revised
18	Table 5.1.3-1M	For 6-mm nominal wrench opening, maximum width of open head under "Type III" revised
40	Table 5.3.2-3	Title revised
47	Table 6.2.3-1M	For 24-mm nominal wrench hex opening, proof torque under "Type II" revised

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

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