ASME B107.300-2021
[Revision of ASME B107.300-2010 (R2016)]

Hand Torque Tools and Torque Testers

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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Two Park Avenue • New York, NY • 10016 USA

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

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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, 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. To maintain continuity within the user community, the former component standard numbers are renamed as categories in the consolidated standard.

This edition completes the integration of the component standards into a single document. Prior editions of B107.14, Hand Torque Tools (Mechanical); B107.28, Electronic Torque Instruments; and B107.29, Electronic Tester, Hand Torque Tools, are obsolete.

The purpose of B107.300 is to define essential performance and safety requirements for the following three types of torque instruments:

(a) manually operated torque instruments, commonly used for mechanical measurement of torque for control of the tightness of threaded fasteners

(b) electronic torque testers used for checking manually operated, hand-held torque wrenches and screwdrivers

(c) manually operated electronic torque instruments with integral or interchangeable heads

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.

This edition includes requirements for endurance, torque value ranges, and accuracy for these torque instruments; specifies test methods to evaluate performance related to the defined requirements; and indicates limitations of safe use. Calculation examples and a cross-reference to tools described in ISO 6789 are provided in the appendices.

This Foreword is not a part of ASME B107.300 and is included for information purposes only.

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

ASME B107.300-2021 was approved by the B107 Standards Committee on March 12, 2021, and by the Board on Standards and Testing on March 12, 2021. It was approved as an American National Standard on June 10, 2021, and takes effect when issued.

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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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.

HAND TORQUE TOOLS AND TORQUE TESTERS

1 SCOPE

This Standard provides performance and safety requirements for manually operated torque instruments, commonly used for measurement of torque to control the tightness of threaded fasteners. It also provides performance and safety requirements for manually operated electronic torque instruments with integral or interchangeable heads. It includes requirements for endurance, torque value ranges, angle measurements, and accuracy for these torque instruments. It further provides performance and safety requirements for electronic torque testers used for checking manually operated, hand-held torque wrenches and torque screwdrivers. It is not intended to describe products infrequently utilized or those designed for special purposes.

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 instruments covered.

2 DEFINITIONS

accuracy: the permissible deviation, tolerance, or error band. A higher value means a lower certainty of correctness.

angle: the amount of axial rotational displacement from a start point to an end point.

break-over: a temporary reduction in torque indicating a target value has been achieved, indicated by a displacement of the handle of at least 10 deg.

click: a temporary reduction in torque indicating a target value has been achieved, indicated by a displacement of the handle of less than 5 deg.

first peak: the maximum torque value just prior to the torque drop-off, which on Category 14, Types II and IV torque wrenches occurs as the wrench begins its momentary reduction in torque.

flex-head: see *flexible ratchet head*.

flexible ratchet head: a handle with the capability of operating at an angle other than perpendicular to the axis of rotation.

full scale: see *rated capacity*.

graduation: a mark on the instrument indicating a torque value.

hand torque instrument: a tool combining hand wrenching and torque measurement functions, formerly referred to as *hand torque wrench*.

increment: the value of the difference between adjacent graduations.

indicated value: for Category 14, Type I, the value the instrument displays when torque is applied; for Types II, III, and IV, the value to which the instrument is set or preset.

measured value: the actual torque determined by a torque tester.

operating load: the operating load shall be calculated by dividing the rated capacity by the distance between the axis of the torque moment and the center of the grip or designated load point.

peak: the maximum torque value reached during the process of applying the load to the wrench.

pivot: a short rod or shaft on which a related part rotates or swings.

rated capacity: the maximum intended torque the user shall measure or apply.

resolution: the smallest distinguishable change in displayed value.

scale: the representation of the range of the instrument, divided into increments marked by numbered and unnumbered graduations.

setting: the amount of torque the instrument is expected to apply.

torque-to-angle: a method of assembly where a threshold torque is applied and then more torque is applied to produce a specific angle.

track: continuous readout of torque applied at any moment.

usable range of the transducer: the range to which the accuracy requirements of para. 5.9 are applied.

3 REFERENCES

The following documents form a part of this Standard to the extent specified herein. The latest edition shall be used.

ASME B107.4, Driving and Spindle Ends for Portable Hand, Impact, Air, and Electric Tools (Percussion Tools Excluded)