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(Revision of ASME B107.17-2015)

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# Gages and Mandrels for Wrench Openings

AN AMERICAN NATIONAL STANDARD



The American Society of
Mechanical Engineers

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# Gages and Mandrels for Wrench Openings

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

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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.

The purpose of ASME B107.17 is to establish final inspection gage sizes and test mandrel sizes for wrench openings and spark plug wrench openings for inch and metric sizes. This Standard covers commonly manufactured sizes.

This Standard may also 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.

Changes in the 2019 edition include alignment/correction of significant digits in tolerances with data columns and the conversion of mandrel dimensions from tolerances to minimum/maximum values.

Members of the Hand Tools Institute Wrenches 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.

This revision was approved as an American National Standard on February 24, 2020.

# 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
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.

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# GAGES AND MANDRELS FOR WRENCH OPENINGS

## 1 SCOPE

This Standard establishes final inspection gage sizes and test mandrel sizes for wrench openings and spark plug wrench openings for inch and metric sizes. This Standard does not cover every available size, only those most commonly manufactured.

## 2 APPLICATION

The gages covered by this Standard shall be used to ensure the manufacture of conforming products in inch and metric sizes.

## 3 REFERENCES

The following document is referenced in this Standard. The latest edition shall be used.

ASTM E18, 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)

## 4 REQUIREMENTS

The gages shall be similar to those shown in Figure 4-1 for hex gages and Figure 4-2 for square gages. Dimensions in inch series tables are in inches, and dimensions in metric series tables are in millimeters, except as specified.

### 4.1 Material

**4.1.1 Gages.** The gages shall be made of steel, suitable for the purpose intended, and hardened to 60 HRC minimum. The hardness shall be tested using procedures outlined in ASTM E18.

**4.1.2 Mandrels.** The mandrels shall be made of steel, suitable for the purpose intended, and hardened to 56 HRC minimum. The hardness shall be tested using procedures outlined in ASTM E18.

### 4.2 Gage Use and Design

The gages shall be of the sizes and tolerances given in Tables 4.2-1, 4.2-1M, 4.2-2, 4.2-2M, 4.2-3, and 4.2-3M. Formulas are provided for sizes not listed.

The gages shall be used in accordance with accepted practices. Manufacturers may use gages with tighter dimensions than those shown herein.

The size for all limits (GO and NO GO) gages shall not exceed the extreme limits specified herein. All variations (manufacturing tolerance, calibration error, wear allowance, etc.) in the gages, whatever their cause or purpose, shall bring these gages within the extreme limits of the gage size specified within this Standard. Thus a gage that represents a minimum limit may be larger, but never smaller, than the minimum size specified; likewise, the gage that represents a maximum limit may be smaller, but never larger, than the maximum size specified.

**4.2.1 Rounding Method.** A rounding method shall be used for determining dimensions for gages. When the next digit beyond the last digit to be retained is

*(a)* less than 5, the last digit to be retained is not changed

*(b)* 5 or more, the last digit to be retained is increased by one

### 4.3 Mandrels Use and Design

**4.3.1 Mandrels for Nut End Socket Openings.** The hexagon mandrels shall be of the size and tolerances given in Tables 4.3.1-1 and 4.3.1-1M. The square mandrels shall be of the size and tolerance given in Table 4.3.1-2. The mandrel shall be inserted into the nut end socket opening to the depth indicated in the applicable table.

**4.3.2 Mandrels for Wrench Openings.** The hexagon mandrels shall be of the size and tolerances given in Tables 4.3.1-1, 4.3.1-1M, and 4.3.1-2. The mandrel shall be fully engaged to the thickness of the wrench head.