

**ASME B18.2.9-2007**

# **Straightness Gage and Gaging for Bolts and Screws**

**AN AMERICAN NATIONAL STANDARD**



**The American Society of  
Mechanical Engineers**

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**Three Park Avenue • New York, NY 10016**

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# FOREWORD

In May 2001, the B18 Standards Committee authorized B18 Subcommittee 2, Externally Driven Fasteners, to proceed with the development of a Standard covering straightness gage and gaging for bolts and screws. As a result, ASME B18.2.9 was approved by the B18 Standards Committee and B18 Subcommittee 2 in April 2006.

ASME B18.2.9-2007 was approved as an American National Standard on March 7, 2007.

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## Standardization of Bolts, Nuts, Rivets, Screws, Washers, and Similar Fasteners

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Secretary, B18 Standards Committee  
The American Society of Mechanical Engineers  
Three Park Avenue  
New York, NY 10016-5990

**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.

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Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the standard, 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.

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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.
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. The inquirer may also include any plans or drawings, which are necessary to explain the question; however, they should not contain proprietary names or information.

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

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**Attending Committee Meetings.** The B18 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B18 Standards Committee.

# STRAIGHTNESS GAGE AND GAGING FOR BOLTS AND SCREWS

## 1 SCOPE

This Standard describes a gage and procedure for checking bolt or screw straightness at maximum material condition (MMC).

## 2 COMPARISON WITH ISO 4759-1:2000

This Standard uses an adjustable gage, instead of plain sleeve gages like the example shown in ISO 4759-1 Annex C, Figure C.24. The adjustable gage avoids the necessity of a different gage for each diameter-length combination, and for each difference in the specified tolerances on diameter and/or straightness of the fastener.

## 3 REFERENCED STANDARDS

For undated references, the most recent issues of the referenced standards apply.

ASME B18.12, Glossary of Terms for Mechanical Fasteners

ASME Y14.5M, Dimensioning and Tolerancing

Publisher: The American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, P.O. Box 2300, Fairfield, NJ 07007

ISO 4759-1:2000 Tolerances for fasteners — Part 1: Bolts, Screws, Studs and Nuts — Product Grades A, B, and C  
Publisher: International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case Postale 56, CH-1211 Genève 20, Switzerland/Suisse

## 4 TERMINOLOGY

For definitions of terms relating to fasteners or features thereof used in this Standard, refer to ASME B18.12.

## 5 DIMENSIONS

For definitions of terms relating to dimensioning and tolerancing, refer to ASME Y14.5M.

## 6 GAGE

The gage consists of a stationary rail, an adjustable rail, micrometers that indicate the distance between the rails at each end, and a means to secure the adjustable rail in place. A typical gage is illustrated in Fig. 1.

## 7 PROCEDURE

(a) The excluded length, illustrated in Fig. 2, is the length, if any, that is to be excluded from the straightness gage, as specified by the product standard.

(b) The gaged length, illustrated in Fig. 2, is calculated as the bolt or screw length minus the excluded length.

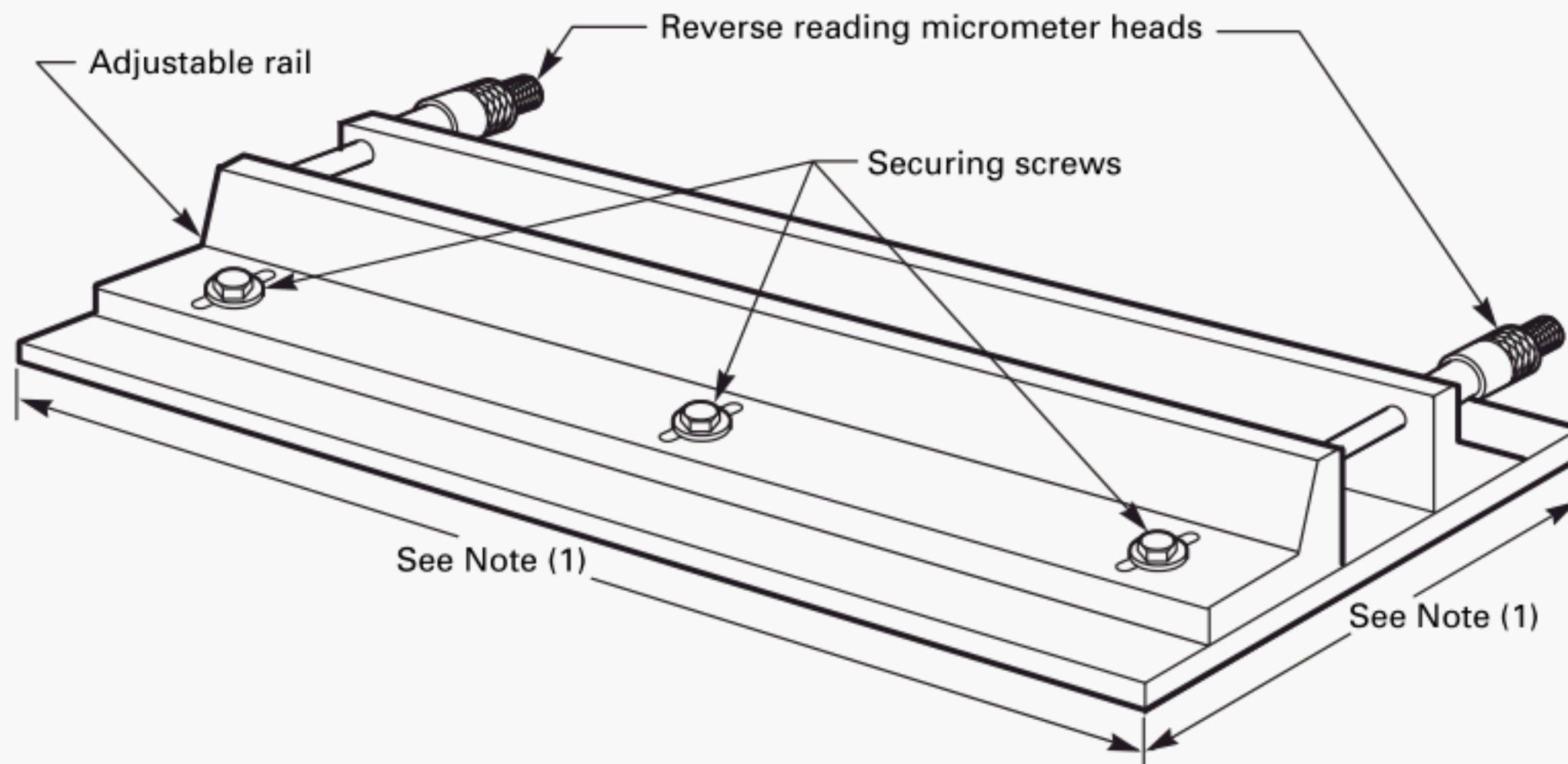
(c) The straightness tolerance at MMC for the product to be inspected is calculated for the gaged length by the formula specified in the product standard.

(d) The resultant condition is calculated as the larger of the maximum major diameter of the thread or the maximum body diameter of the bolt or screw, plus the straightness tolerance at MMC.

(e) The adjustable rail of the gage is adjusted to provide a parallel space between the rails equal to the resultant condition by obtaining common readings on both micrometer heads, and is secured in place.

(f) The gaged length of the product to be inspected is inserted between the rails, then rotated by hand through a full 360 deg. Any interference occurring between the product and the gage sufficient to prevent rotation indicates that the specified straightness is not met.

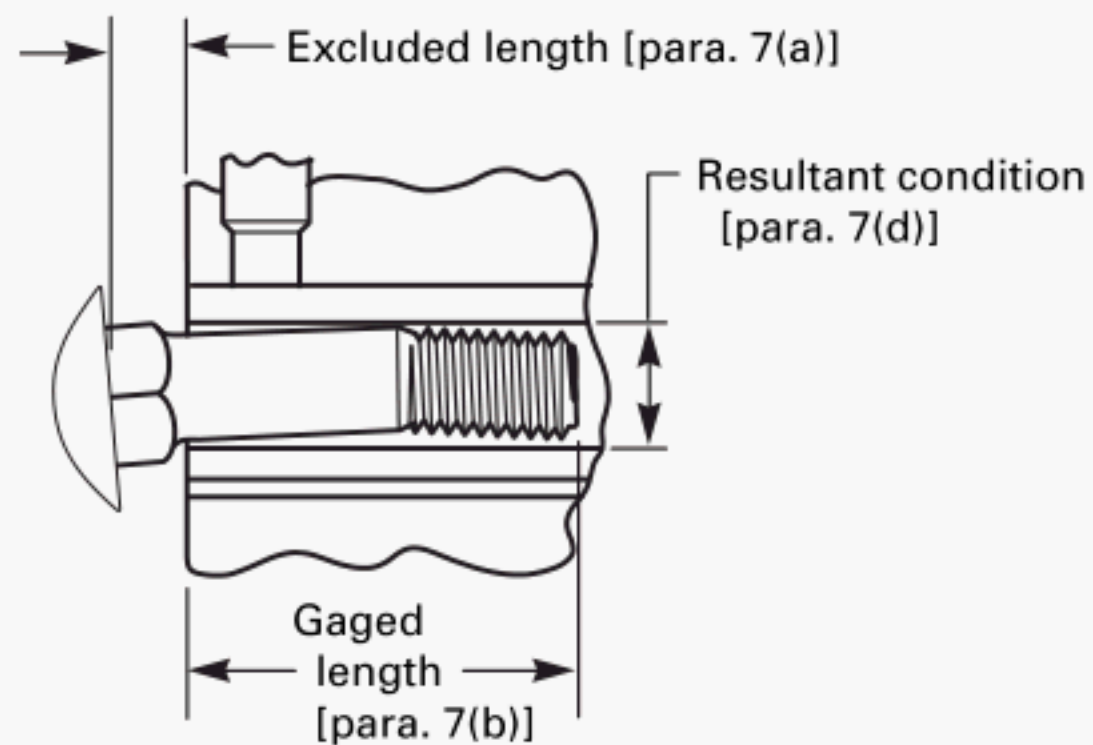
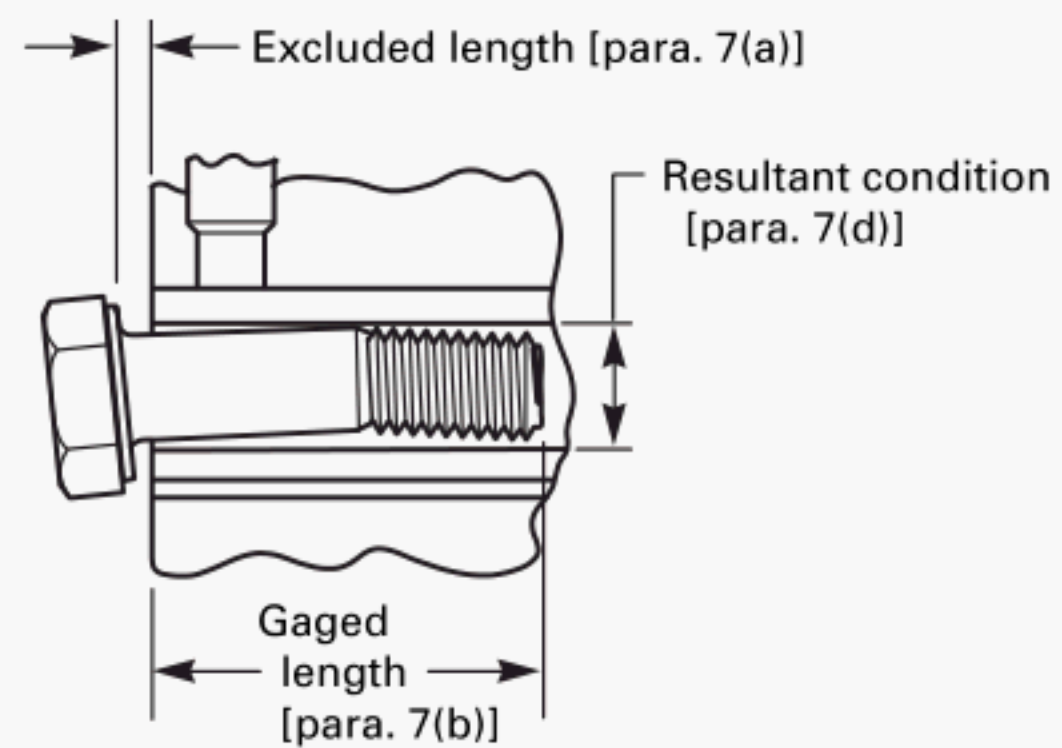
**Fig. 1 Typical Straightness Gage**



**NOTE:**

(1) The gage must be of sufficient width and length to accommodate the diameter and length of the fastener being gaged.

**Fig. 2 Gaging**



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