



## Designation: ~~A183 – 03 (Reapproved 2009)~~ A183 – 14

# Standard Specification for Carbon Steel Track Bolts and Nuts<sup>1</sup>

This standard is issued under the fixed designation A183; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

## 1. Scope

1.1 This specification covers carbon steel track bolts and carbon steel nuts for use in conjunction with joint bars to connect rails in railroad track.

~~1.2 Two grades of track bolts are defined: Heat-treated bolts for general track use.~~

~~1.2.1 Grade 1, Low-Carbon, Untreated, primarily for industrial and mine track use.~~

~~1.2.2 Grade 2, Heat-Treated, for general track use.~~

~~1.3 Two grades of nuts are defined: Medium carbon nuts for general application on track bolts.~~

~~1.3.1 Grade 1, Low-Carbon or Soft Steel, primarily for application on Grade 1 track bolts.~~

~~1.3.2 Grade 2, Medium-Carbon, for general application on track bolts.~~

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

## 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

[A700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Shipment](#) (Withdrawn 2014)<sup>3</sup>

[F606 Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators, and Rivets](#)

2.2 *ANSI/ASME Standards*:<sup>4</sup>

[B1.1 Unified Inch Screw Threads](#)

[B18.10 Track Bolts and Nuts](#)

iTeh Standards

(www.itesh.com)

Document Preview

[ASTM A183-14](#)

<https://standards.itesh.ai/catalog/standards/sist/217f0e42-71d8-43cc-96c4-9e9dc41854ff/astm-a183-14>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.01 on Steel Rails and Accessories.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

<sup>4</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10036, <http://www.ansi.org>, 10016-5990, <http://www.asme.org>.

2.3 AREMA Standard:<sup>5</sup>

American Railway Engineering and Maintenance-of-Way Association Manual, Design of Track Bolts and Nuts, Chapter 4, Part 1

### 3. Ordering Information

3.1 Orders for track bolts and nuts under this specification shall include the following information:

- 3.1.1 Quantity of bolts and nuts (weights),
- 3.1.2 ASTM designation and date of issue,
- ~~3.1.3 Grade of bolt: 1, low-carbon untreated, or 2, heat-treated (see 1.2 and Table 1),~~
- 3.1.3 Design of bolt: oval or elliptical neck (see 2.3),
- 3.1.4 Dimensions of bolt: nominal diameter and length under head,
- ~~3.1.6 Grade of nut: 1, low-carbon, or 2, medium-carbon (see 1.3 and Table 1 and Table 2),~~
- 3.1.5 Nominal size of nut, thickness, and chamfer angle (see 2.3),
- 3.1.6 Thread fit of nuts on bolts: free or wrench-turn fit (see 2.2), and
- 3.1.7 Certification or test reports, if required (see Section 12).

### 4. Manufacture

4.1 The steel shall be made by the open-hearth, basic-oxygen, or electric-furnace process, and may be either continuous strand or ingot cast.

4.2 Bolts, including the head and oval or elliptical neck, may be produced by hot or cold forging at the option of the manufacturer.

4.3 Bolt threads may be machine cut or hot- or cold-rolled at the option of the manufacturer.

4.4 ~~Grade 2 bolts~~ Bolts shall be heat-treated by quenching in a liquid medium from above the austenitizing temperature, and tempering at a temperature not less than 750°F (399°C). ~~Grade 1 bolts need not be heat-treated.~~

### 5. Chemical Requirements

5.1 The steel shall conform to the requirements for chemical composition specified in Table 1.

5.2 *Heat or Cast Analysis*—An analysis of each heat or cast shall be made by the manufacturer to determine the percentages of the elements specified in Table 1. The analysis shall be made from a test sample taken preferably during the pouring of the heat. The chemical composition thus determined shall conform to the heat-cast requirements of Table 1.

5.3 *Product Analysis*—An analysis may be made by the purchaser from a finished bolt or nut. The chemical composition thus determined shall conform to the product requirements of Table 1. The phosphorous content thus determined shall not exceed that specified in Table 1 by more than 25 %. Note that rephosphorized or resulfurized material is not subject to rejection based on product analysis for these elements.

### 6. Tensile Requirements

6.1 *Tension Tests:*

<sup>5</sup> Available from the American Railway Engineering and Maintenance-of-Way Association (AREMA), 10003 Derekwood Lane, Suite 210 Lanham, MD 20706, <http://www.arena.org>.

**TABLE 1 Chemical Requirements**

Element, %	Bolts				Nuts			
	Grade 1		Grade 2		Grade 1		Grade 2	
	Heat-Cast	Product	Heat-Cast	Product	Heat-Cast	Product	Heat-Cast	Product
Carbon, min or range	0.15	0.13	0.30	0.27	0.15	0.13	0.40–0.55	0.37–0.58
Phosphorus, max	0.04	0.050	0.04	0.050	0.12	<sup>Δ</sup>	0.04	0.050
Sulfur, max	0.33	<sup>Δ</sup>	0.06	0.070	0.33	<sup>Δ</sup>	0.06	0.070

**TABLE 1 Chemical Requirements**

Element, %	Bolts	Nuts
	Heat-Cast	Heat-Cast
Carbon, min or range	0.28–0.55	0.30–0.55
Phosphorus, max	0.030	0.04
Sulfur, max	0.050	0.06

<sup>Δ</sup> Where rephosphorized or resulfurized material is applied, due to the degree to which phosphorus and sulfur segregate, check analyses for these elements are not technologically appropriate.