



Standard Specification for Steel Tie Plates, Low-Carbon and High-Carbon-Hot-Worked¹

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1. Scope

1.1 This specification covers steel tie plates for use in railroad track.

1.2 Two grades of tie plates are described: Grade 1, low-carbon, and Grade 2, high-carbon-hot-worked.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:

A 700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipping²

2.2 American Railway Engineering and Maintenance of Way Association (AREMA):

Specification for Steel Tie Plates³

3. Terminology

3.1 Definitions:

3.1.1 *eccentricity*—the distance from the shoulder to the edge of the tie plate at right angles to the shoulder is larger on the field side than the gage side to compensate for the greater tendency of the field end to cut into the tie; the horizontal distance from middle of the rail seat to middle of the tie plate is the eccentricity.

3.1.2 *field side*—end of tie plate designed to be located on the opposite side of the rail from the centerline of track.

3.1.3 *gage side*—end of tie plate designed to be located closest to the centerline of track.

3.1.4 *hold down holes*—located on the plate away from the rail seat, these holes do not allow spikes to contact the edge of the rail base. Also called *anchor spike holes*.

3.1.5 *length*—overall dimension of the plate at right angles to the rail it supports.

3.1.6 *Discussion*—Tie plates of different length can be used with a given rail section with the length chosen based on the traffic density of the track on which it is to be used.

3.1.7 *line holes*—located at the edge of the rail seat, these holes allow the spikes to contact the edge of the rail base.

3.1.8 *rail seat*—the portion of the tie plate that supports the rail.

3.1.9 *rail seat cant*—tie plates are generally rolled with the rail seat not parallel to the base of the plate so that the rail head is tilted toward the centerline of track to help offset lateral thrust and provide better wheel bearing on the rail head; the AREA recommended cant is a ratio of 1:40.

3.1.10 *rolled width*—the dimension of the finished section as it leaves the rolls and is equal to the length of the tie plate.

3.1.11 *sheared length*—the dimension to which the finished section is cut and is equal to the width of the tie plate.

3.1.12 *shoulder*—a ridge parallel to the rail designed to assist in holding the rail in position.

3.1.13 *Discussion*—The height of the shoulder is about equal to the thickness of the edge of the rail base. If a plate has a *single shoulder*, the shoulder is located on the field side of the rail seat to resist the outward thrust of the rail. A *double shoulder* plate has an additional shoulder on the gage side of the rail seat. Single shoulder plates may accommodate a desired rail section by adjusting the punching of the spike holes on the gage side to match the width of the rail base. Double shoulder plates are limited to a single rail base width.

3.1.14 *tie plate*—a part of the track structure placed under the rail to distribute the wheel load to the tie, cant the rail to the desired angle, assist in maintaining the track to gage and protect the tie.

3.1.15 *Discussion*—The tie plate has a rail seat, either flat or canted, either a single or double shoulder parallel to the rail it supports, and is punched with holes for spikes or other fasteners. The bottom of the tie plate is usually flat, but ribbed or other designs may be used.

3.1.16 *width*—overall dimension of the plate parallel to the rail it supports.

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² *Annual Book of ASTM Standards*, Vol 01.05.

³ *Manual of Railway Engineering*, Chapter 5, Part 1, and is available from American Railway Engineering and Maintenance of Way Assn., 8201 Corporate Drive, Suite 1125, Landover, MD 20785.

