



Part 2

Track Spikes

— 1968 —

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SECTION 2.1 SPECIFICATIONS FOR SOFT-STEEL TRACK SPIKES¹ (1968)

2.1.1 SCOPE (1968)

- a. These specifications cover soft-steel track spikes.
- b. A supplementary requirement, Article 2.1.14, of an optional nature is provided. It shall apply only when specified by the purchaser.

2.1.2 PROCESS (1968)

The steel shall be made by one or more of the following processes: open-hearth, electric-furnace, acid-bessemer, basic-oxygen.

2.1.3 CHEMICAL COMPOSITION (1968)

The steel shall conform to the following requirements as to chemical composition:

Carbon, min, percent:	0.06
Acid-bessemer	0.06
Open-hearth, electric-furnace, basic-oxygen	0.12
Copper, when specified under supplementary requirement Article 2.1.14, min, percent	0.20

2.1.4 LADLE ANALYSIS (1968)

- a. A determination for carbon and copper, when copper is specified, shall be made of each heat of steel. This analysis shall be made by the manufacturer from a test ingot taken during the pouring of the heat. The chemical composition thus determined shall be reported to the purchaser or his representative, and shall conform to the requirements specified in Article 2.1.3.

¹ References, Vol. 27, 1926, pp. 636, 1367; Vol. 35, 1934, pp. 925, 1118; Vol. 54, 1953, pp. 972, 1398; Vol. 60, 1959, pp. 786, 1170; Vol. 62, 1961, pp. 644, 946; Vol. 64, 1963, pp. 426, 683; Vol. 69, 1968, p. 357. Reapproved with revisions 1968

- b. When ladle analysis cannot be furnished, the manufacturer shall submit a report of the chemical analysis made on three spikes selected at random from each 10-ton lot.

2.1.5 TENSILE PROPERTIES (1968)

The manufacturer may, at his option, substitute tension tests for the chemical analysis specified in Article 2.1.3, in which case the finished spikes shall conform to the following requirements as to tensile properties:

Tensile strength, min, psi	55,000
Yield point, min, psi	0.5 tensile strength
Elongation in 2 in., min, percent	25

2.1.6 BENDING PROPERTIES (1968)

- a. The body of a full-size finished spike shall stand being bent cold through 180 degrees flat on itself without cracking on the outside of the bent portion.
- b. The head of a full-size finished spike shall stand being bent backward to the line of the face of the spike without showing evidence of forging laps on the surface of the bent portion.

2.1.7 NUMBER OF TESTS (1968)

- a. When the option in Article 2.1.5 is exercised, one tension test shall be made from each 10-ton lot or fraction thereof.
- b. One bend test of each kind specified in Article 2.1.6a and Article 2.1.6b shall be made from each lot of 5 tons or fraction thereof.

2.1.8 RETESTS (1968)

Spikes represented by bend tests failing to meet the requirements prescribed in Article 2.1.6a and Article 2.1.6b may be annealed and resubmitted. If the spikes fail to meet the third test they shall be rejected.

2.1.9 PERMISSIBLE VARIATIONS IN DIMENSIONS (1968)

The finished spikes shall conform to the dimensions specified by the purchaser, subject to the permissible variations specified in Table 2-1.

Table 2-1. Permissible Variations From Specified Dimensions

Type	Inches	
	Over	Under
Cross section	1/32	1/64
Head	3/32	1/32
Length, under head to point	1/8	1/8
Angle, under side of head	1°	1°

5

2.1.10 FINISH (1968)

All finished spikes shall be straight, with well formed heads, sharp points and be free from injurious defects and shall be finished in a workmanlike manner.

2.1.11 MARKING (1968)

A letter or brand indicating the manufacturer shall be pressed on the head of each spike while it is being formed. When copper is specified, the letters "CU" shall be added.

2.1.12 INSPECTION (1968)

The inspector representing the purchaser shall have free entry at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered. The manufacturer shall afford the inspector, without charge, all reasonable facilities to satisfy him that the material is being furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

2.1.13 REJECTION (1968)

- a. Material failing to meet the requirements of these specifications will be rejected.
- b. Material that shows injurious defects subsequent to its acceptance at the manufacturer's works will be rejected and the manufacturer shall be notified.

2.1.14 SUPPLEMENTARY REQUIREMENT (1968)

The following supplementary requirement shall apply only when specified by the purchaser in the inquiry, order and contract:

Copper may be specified as shown in Article 2.1.3 and Article 2.1.4.

SECTION 2.2 SPECIFICATIONS FOR HIGH-CARBON STEEL TRACK SPIKES¹ (1968)

2.2.1 SCOPE (1968)

- a. These specifications cover high-carbon steel track spikes.
- b. A supplementary requirement, Article 2.2.14, of an optional nature is provided. It shall apply only when specified by the purchaser.

¹ References, Vol. 43, 1942, pp. 570, 767; Vol. 53, 1952, pp. 766, 1123; Vol. 54, 1953, pp. 972, 1398; Vol. 62, 1961, pp. 643, 946; Vol. 64, 1963, pp. 428, 683; Vol. 66, 1965, pp. 497, 761; Vol. 69, 1968, p. 358. Reapproved with revisions 1968.

2.2.2 PROCESS (1968)

The steel shall be made by one or more of the following processes: open-hearth, acid-bessemer, electric-furnace, basic-oxygen.

2.2.3 CHEMICAL COMPOSITION (1968)

The steel shall conform to the following requirements as to chemical composition:

Carbon, min, percent:	
Acid-bessemer	0.20
Other processes (Article 2.2.2)	0.30
Copper, when specified under supplementary requirement Article 2.2.14, min, percent	0.20

2.2.4 LADLE ANALYSIS (1968)

- a. A determination for carbon and copper, when copper is specified, shall be made of each heat of steel. This analysis shall be made from a test ingot taken during the pouring of the heat. The chemical composition thus determined shall be reported to the purchaser or his representative, and shall conform to the requirements specified in Article 2.2.3.
- b. When ladle analysis cannot be furnished, the manufacturer shall submit a report of the chemical analysis made on three spikes selected at random from each 10-ton lot.

2.2.5 TENSILE PROPERTIES (1968)

The manufacturer may, at his option, substitute tension tests for the chemical analysis specified in Article 2.2.3, in which case the finished spikes shall conform to the following requirements as to tensile properties:

Tensile strength, min, psi	70,000
Yield point, min, psi	0.5 tensile strength
Elongation in 2 in., min, percent	25

2.2.6 BENDING PROPERTIES (1968)

- a. The body of a full-size finished spike shall stand being bent cold through 120 degrees around a pin, the diameter of which is not greater than the thickness of the spike without cracking on the outside of the bent portion.
- b. The head of a full-size finished spike shall stand being bent backwards to an angle of 55 degrees with the line of the face of the spike, without cracking on the outside of the bent portion.

2.2.7 NUMBER OF TESTS (1968)

- a. When the option in Article 2.2.5 is exercised, one tension test shall be made from each 10-ton lot or fraction thereof.
- b. One bend test of each kind specified in Article 2.2.6a and Article 2.2.6b shall be made from each lot of 5 tons or fraction thereof.

2.2.8 RETESTS (1968)

Spikes represented by bend tests failing to meet the requirements prescribed in Article 2.2.6a and Article 2.2.6b may be annealed and resubmitted. If the spikes fail to meet the third test, they shall be rejected.

2.2.9 PERMISSIBLE VARIATIONS IN DIMENSIONS (1968)

The finished spikes shall conform to the dimensions specified by the purchaser, subject to the permissible variations specified in Table 2-1.

2.2.10 FINISH (1968)

All finished spiked shall be straight, with well formed heads, sharp points and be free from injurious defects and shall be finished in a workmanlike manner.

2.2.11 MARKING (1968)

A letter or brand indicating the manufacturer and also the letters "HC", indicating high carbon, shall be pressed on the head of each spike while it is being formed. When copper is specified, the letters "CU" shall be added.

2.2.12 INSPECTION (1968)

The inspector representing the purchaser shall have free entry at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered. The manufacturer shall afford the inspector, without charge, all reasonable facilities to satisfy himself that the material is being furnished in accordance with these specifications. All tests and inspections shall be made at the place of manufacture, prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

2.2.13 REJECTION (1968)

- a. Material failing to meet the requirements of their specifications will be rejected
- b. Material that shows injurious defects subsequent to its acceptance at the manufacturer's works will be rejected and the manufacturer shall be notified.

2.2.14 SUPPLEMENTARY REQUIREMENT (1968)

The following supplementary requirement shall apply only when specified by the purchaser in the inquiry order and contract

- Copper may be specified as shown in Article 2.2.3 and Article 2.2.4.

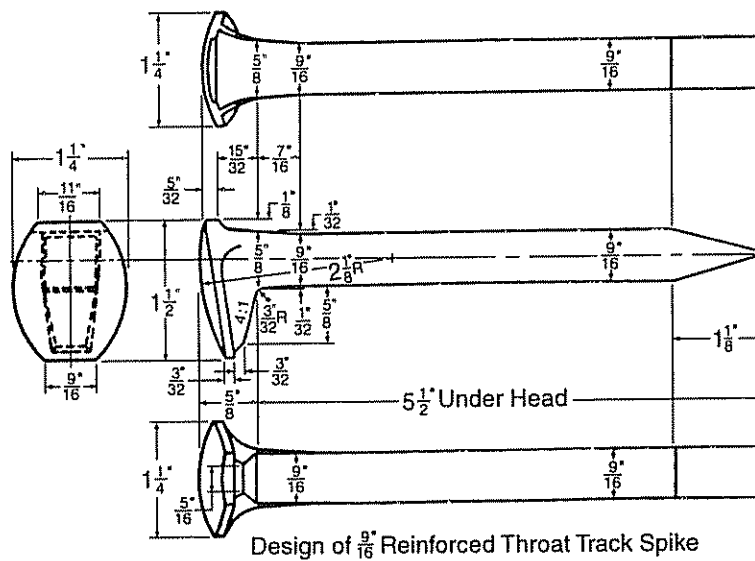
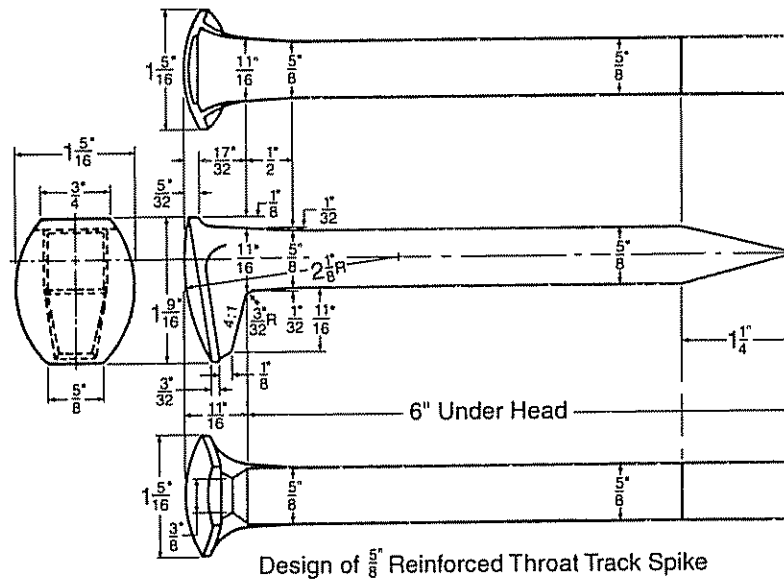
SECTION 2.3 DESIGN OF CUT TRACK SPIKE¹ (1963)

Figure 2-1. Cut Track Spike Design

¹ References, Vol. 22, 1921, pp. 653, 972; Vol. 35, 1934, pp. 925, 1118; Vol. 38, 1937, pp. 511, 713; Vol. 49, 1948, pp. 325, 639; Vol. 54, 1953, pp. 972, 1398; Vol. 63, 1962, pp. 487, 753 Reapproved without change 1962.