American National Standard

for zinc-coated ferrous single and double upset spool insulator bolts for overhead line construction

Approved March 2, 1988 Secretariat: National Electrical Manufacturers Association

1 Scope

This standard covers both single and double upset spool insulator bolts used in overhead line construction.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ANSI C135.1-1979, *Galvanized steel bolts and nuts for overhead line construction*

ANSI/NEMA PH10-1977, *Galvanized ferrous washers*[1)]

ANSI/ASTM A153-82, *Specifications for zinc coating (hot-dip) on iron and steel hardware*[1)].

3 General

Single and double upset spool insulator bolts covered by this standard shall, in all respects, meet the basic dimensional and performance requirements hereinafter stated. The text, specifications or standard references, and figures supplement each other, and all shall be considered parts of this standard.

4 Material

4.1 Bolts

All single and double upset spool insulator bolts shall be made from hot-rolled steel which has been produced by the open-hearth, basic-oxygen, or electric-furnace process and which is of a grade and quality suitable to meet the requirements of this standard.

[1)] This standard has been administratively withdrawn. Contact the secretariat for more recent information.

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4.2 Nuts

All steel nuts shall be in accordance with ANSI C135.1-1979.

4.3 Locknuts

Locknuts shall be of the double concave type unless another type is specified.

4.4 Washers

Ferrous washers shall be in accordance with ANSI/NEMA PH 10-1977.

4.5 Self-locking cotters

Cotters for spool insulator bolts shall be self-locking type, made from corrosion-resistant material.

5 Dimensions

5.1 Length

That portion of spool insulator bolts used for mounting through a pole shall be considered the "length." This length shall be measured from the threaded end (semicone point not included) to the near face of the closed upset.

5.2 Semicone Points

Single and double upset spool insulator bolts shall have points on each end in accordance with ANSI C135.1-1979.

6 Threads

6.1 Single and double upset spool insulator bolts shall have threads in accordance with ANSI C135.1-1979.

6.2 The external threaded portion of all bolts shall, after galvanizing, be in such condition that nuts tapped in accordance with table 8 of ANSI C135.1-1979 will fit the galvanized bolt so that the nut can be run the entire length of the thread without the use of tools.

7 Galvanizing

After fabrication, single or double upset spool insulator bolts shall be hot-dip galvanized in accordance with ANSI/ASTM A153-82, except the cotter hole may be drilled after galvanizing.

8 Strength

8.1 Single and double upset spool insulator bolts and nuts shall, without deflecting more than 10 degrees under load, develop strengths shown in the table in figure 2 when tested by the method shown thereon.

8.2 The load shall be applied at a rate of approximately 0.4 inch per minute free running crosshead speed of the testing machine.

9 Finish

Single and double upset spool insulator bolts shall be reasonably smooth on all surfaces and shall be free of sharp projections. Cotters shall be cut squarely and shall be free of sharp projections.

10 Marking

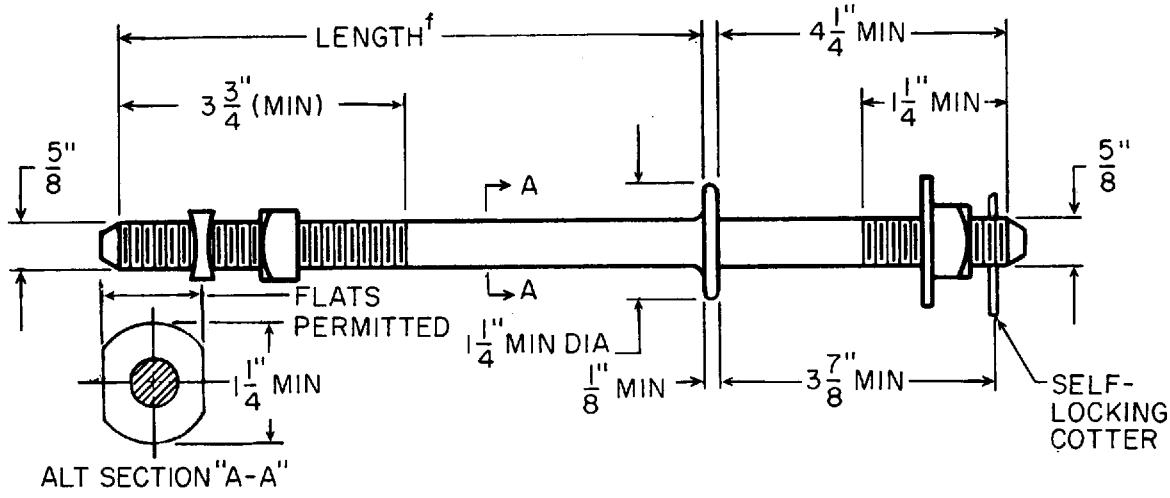
All single and double upset spool insulator bolts shall bear the manufacturer's symbol or identification mark.

11 Marking of shipping packages

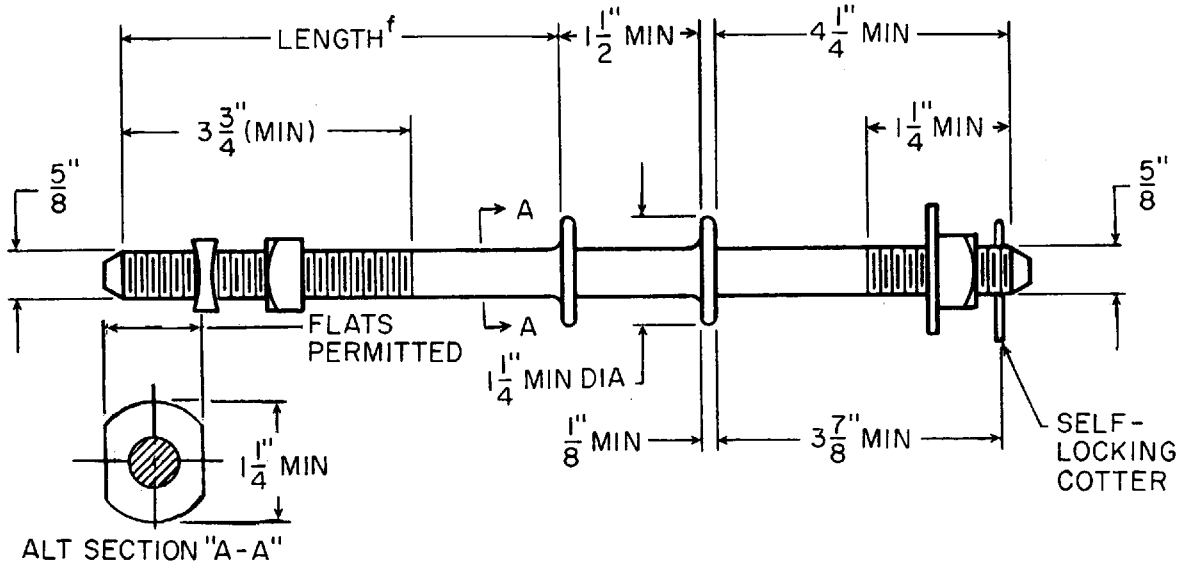
Each package of single or double upset spool insulator bolts shall be marked with the manufacturer's name and catalog number.

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Single upset spool insulator bolt



Double upset spool insulator bolt



Lengths

8"
9"
10"
12"

a = 1/64"	d = 1/8"	g = 3/8"	k = 1"
b = 1/32"	e = 3/16"	h = 1/2"	x = 0"
c = 1/16"	f = 1/4"	j = 3/4"	

NOTE – A wrenching surface may be provided on spool insulator bolts. The wrenching surface must not interfere with or damage insulator.\

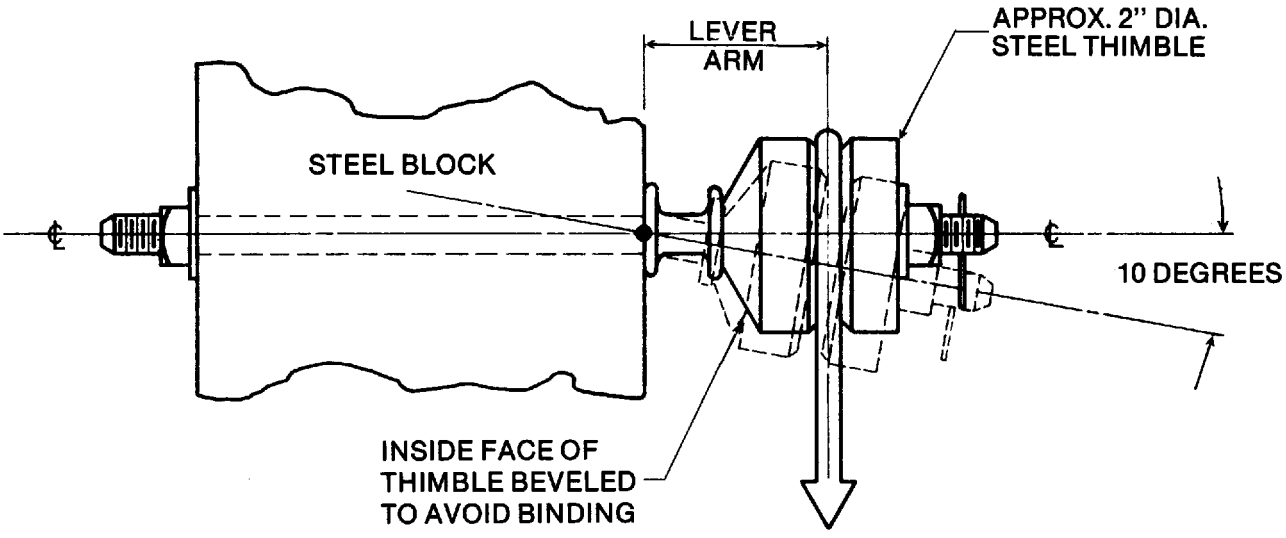
Allowable variations

A single-letter superscript indicates that the plus and minus values are the same; for example, a = ±1/64".

A double-letter superscript indicates that the plus value is that of the first letter and the minus value is that of the second letter; for example, ax = +1/64", –0.

Figure 1 – Single and double upset spool insulator bolts

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NOTES

1 Application of load must coincide with center line of testing machine.

2 Angle of deflection shall be determined by the intersection of the center line axis of the bolt in its initial position, with a line drawn through the center points of the bolt at the deflected position and the upset shoulder nearest mounting support.

Type of insulator bolt	Lever arm	Min. load at ten degrees deflection
Single upset bolt	1 5/8"	1900 lbs.
Double upset bolt	3"	800 lbs.

Figure 2 – Single and double upset spools insulator bolts

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