American National Standard

for zinc-coated ferrous cable racks and cable rack hooks for underground line construction

Approved March 2, 1988

Secretariat: National Electrical Manufacturers Association

1 Scope

This standard covers several types and sizes of cable racks and cable rack hooks that are used to support current carrying cables in underground manholes, vaults, and tunnels.

2 Normative references

The following standard contains provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the edition indicated was 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 standard indicated below.

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

3 General

The cable racks and cable rack hooks covered by this standard shall conform in all respects to the requirements hereinafter stated. The text, standards references, and figures supplement each other, and all shall be considered as parts of this standard.

4 Material

4.1 Cable racks and cable rack hooks shall be made from hot-rolled steel which has been produced by the open-hearth, basic-oxygen, or electric-furnace process or from ferrous castings which are of a grade and quality suitable to meet the requirements of this standard.

4.2 Clevis pins and cotter 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

1) This standard has been administratively withdrawn.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

An American National Standard implies a consensus of those substantially concerned with its scope and provisions. An American National Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American National Standard does not in any respect preclude anyone, whether he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. American National Standards are subject to periodic review and users are cautioned to obtain the latest editions.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of approval. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

Copyright © 1992 by ANSI American National Standards Institute, 11 West 42nd Street, New York, N.Y. 10036 ANSI2C992/20

Copyright The Institute of Electrical and Electronics Engineers, Inc.
Provided by IHS under license with IEEE
No reproduction or networking permitted without license from IHS Not for Resale

grade and quality suitable to meet the requirements of this standard.

4.3 Cotters for clevis pins and cotter bolts shall be of the self-locking type and shall be made from corrosion-resistant materials.

5 Types

This standard covers the types of cable racks and cable rack hooks shown in figures 1 through 7. Figure 8 is for information only and illustrates the types of insulators which may be used with the hooks shown in figures 1, 2, 3, 5, 6, and 7. Insulator material is not a part of this standard.

6 Dimensions

Dimensions shall be as shown in figures 1 through 7.

7 Strength

7.1 Cable racks and cable rack hooks shall be of sufficient strength to support the loads specified in figures 1 through 7 and meet the deflection requirements of 7.2 and 7.3.

7.2 Cable rack hooks shall be mounted in the top hole or slot of the proper rack, which, in turn, shall be mounted on a rigid support by bolts at the ends. The load specified in the applicable figure shall be applied 1 inch from the outermost end of the hook. The deflection shall be measured in line with the load and with the load applied and shall not exceed that shown in the applicable figure.

7.3 Cable racks shall resist the loads placed upon the cable rack hooks without undue deflection away from the supporting structure.

7.4 No section of any finished part shall exhibit any brittleness by fracturing or cracking when struck once sharply and vigorously with a 2-pound hammer.

8 Galvanizing

8.1 Cable racks and cable rack hooks shall be hot-dip galvanized after fabrication in accordance with ANSI/ASTM A153-82[1)].

8.2 Clevis pins and cotter bolts shall be galvanized in accordance with the same standard except that the hole for the cotter may be drilled after galvanizing.

9 Other coatings

When an additional coating of rubber or plastic is applied to hooks to protect cable coverings from abrasion, such coatings shall be applied after the hook is galvanized in accordance with 8.1.

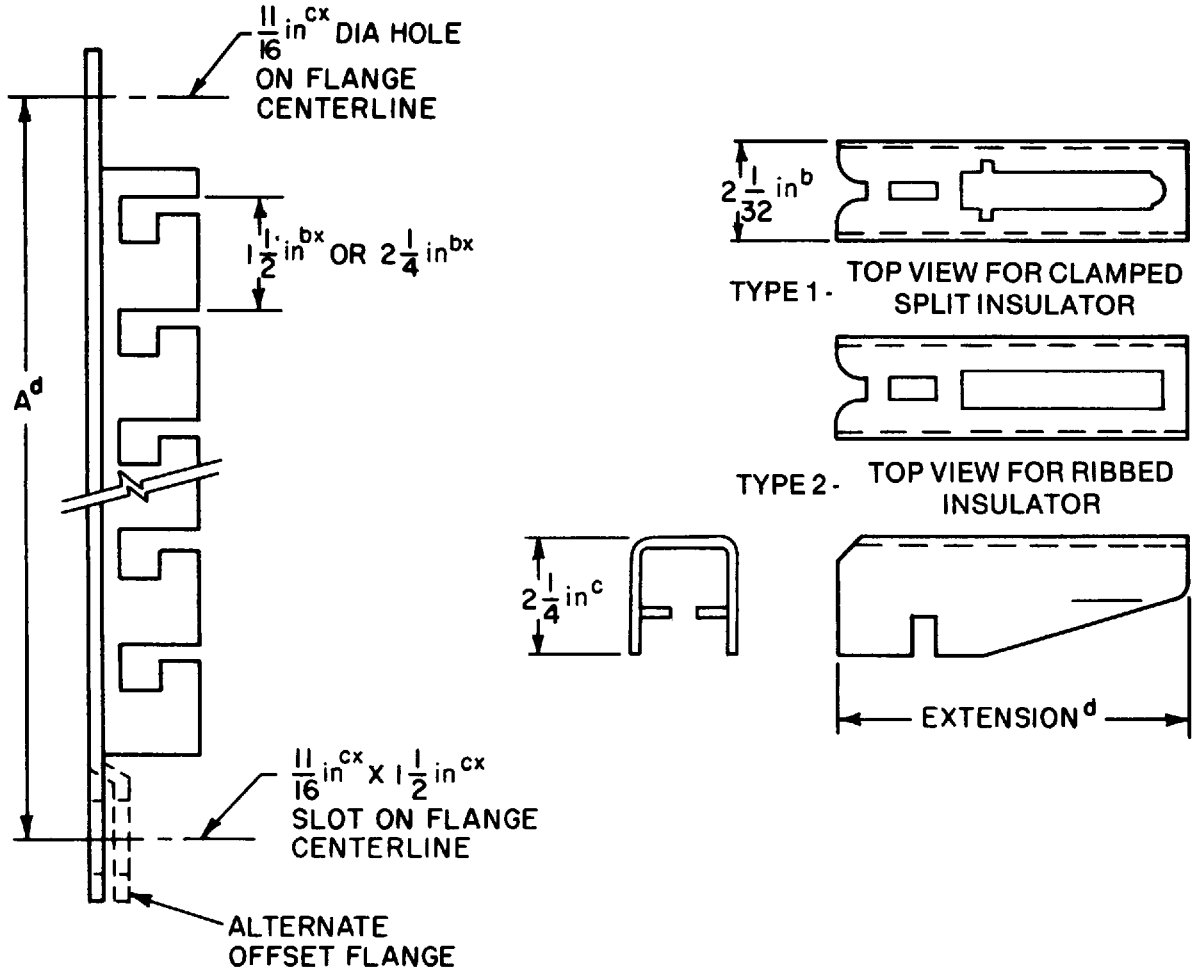
10 Finish

Cable racks, cable rack hooks, clevis pins, and cotter bolts shall be free of sharp edges and projections. Cotters shall be cut square and shall be free of sharp projections.

11 Marking

Each bundle or shipping container shall be marked with the manufacturer's name and catalog number.

Copyright The Institute of Electrical and Electronics Engineers, Inc.
Provided by IHS under license with IEEE
No reproduction or networking permitted without license from IHS
Not for Resale



Number of slots	Dimension A[d] in	
	1-1/2-inch slots	2-1/4-inch slots
10	19-1/2	26-1/4
11	21	28-1/2
14	25-1/2	35-1/4
18	31-1/2	44-1/4
24	40-1/2	57-3/4

Rack
2-1/4" × 2-1/4" × 1/4" Tee
(a)

Type	Slot number	Extension[d] in	Load lb	Maximum deflection in
1	1	7-3/4	400	3/16
1	2	13	400	3/8
1	3	18-3/8	200	3/8
2	1	7	400	3/16
2	2	11-3/4	400	5/16
2	3	16-1/2	200	3/8

Formed Strip Steel Hook
(b)

ALLOWABLE VARIATIONS:

a = 1/64 inch	c = 1/16 inch	f = 1/4 inch
b = 1/32 inch	d = 1/8 inch	x = 0 inch

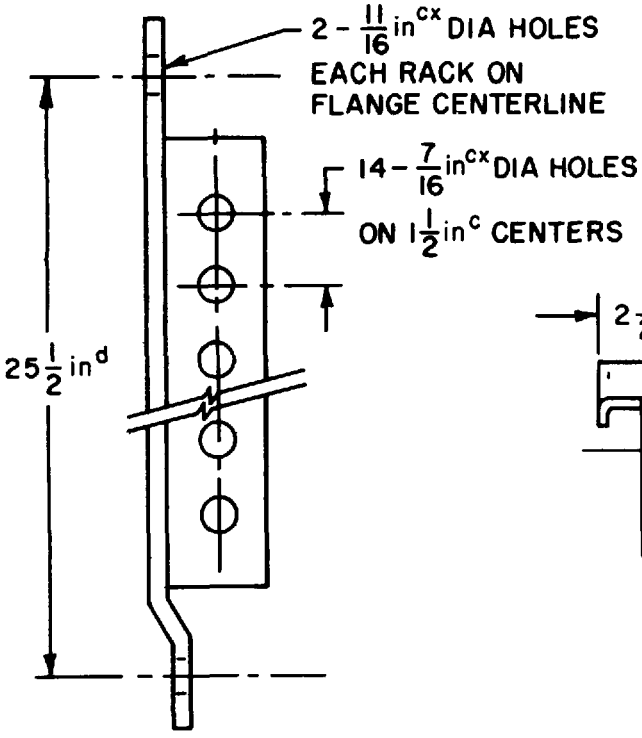
A single-letter superscript indicates that the plus and minus values are the same: for example, a = ±1/64 inch.

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 inch, -0 inch.

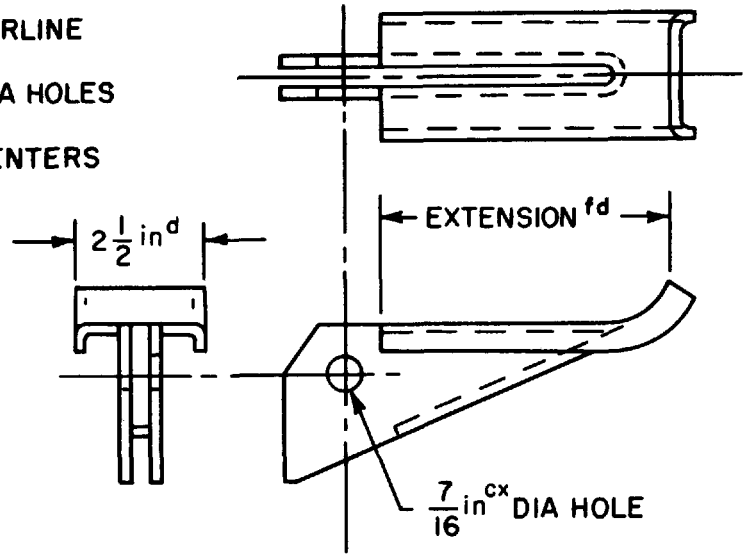
NOTE – See figure 8 for applicable insulators.

Figure 1 – Zinc-coated ferrous cable racks and cable rack hooks

Copyright The Institute of Electrical and Electronics Engineers, Inc.
Provided by IHS under license with IEEE
No reproduction or networking permitted without license from IHS
Not for Resale

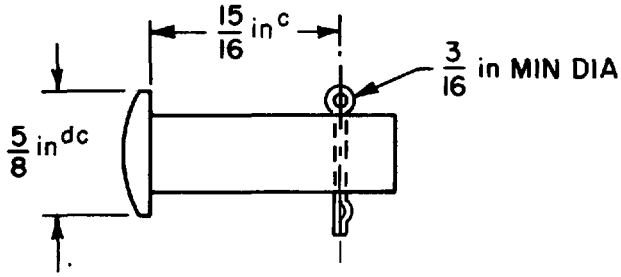


Rack
2-1/4" × 2-1/4" × 1/4" Tee
(a)



Extension[fd] in	Load lb	Maximum deflection in
6	400	5/8
10-1/2	400	3/4
15	200	1/2

Formed strip steel hook
(b)



3/8"[a]Dia × 1-1/4"[c] cotter bolt
with self-locking cotter 1/8" × 1"
(c)

ALLOWABLE VARIATIONS:

a = 1/64 inch	c = 1/16 inch	f = 1/4 inch
b = 1/32 inch	d = 1/8 inch	x = 0 inch

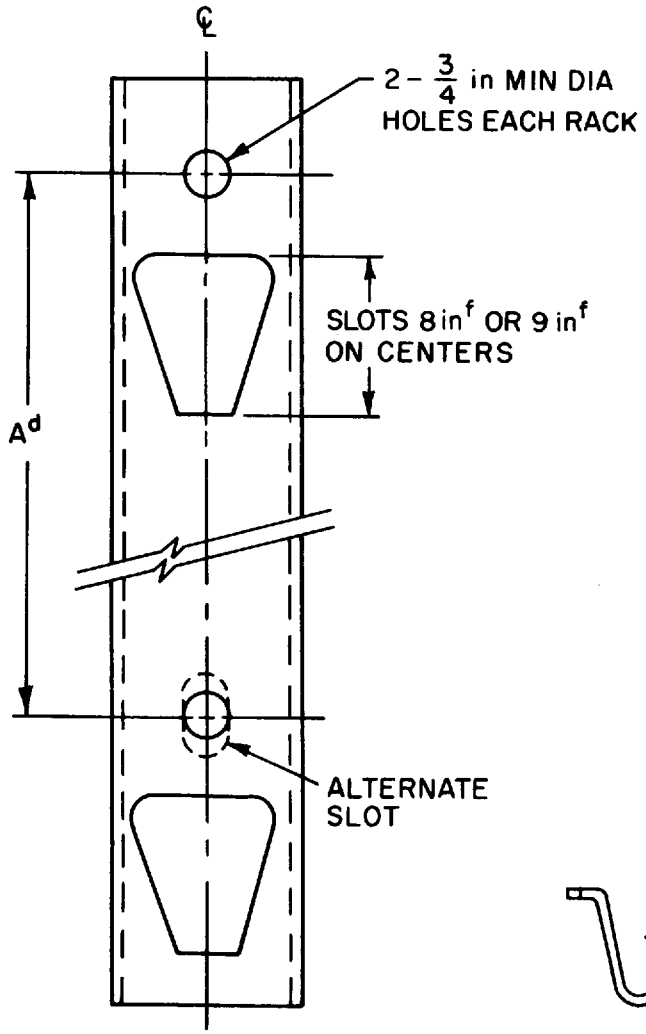
A single-letter superscript indicates that the plus and minus values are the same: for example, a = ±1/64 inch.

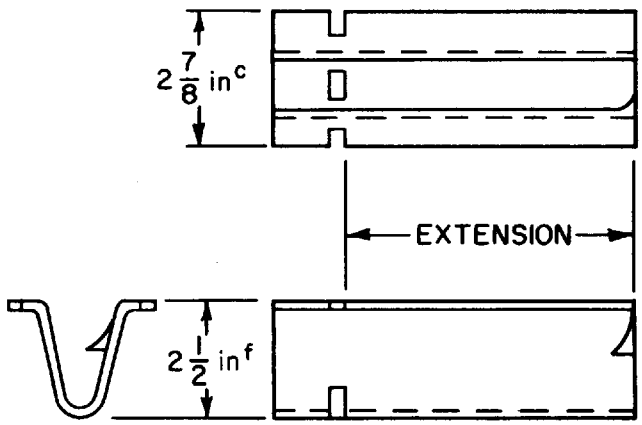
A double-letter superscript indicates that the plus value is that of the first letter and the minus value is that of the second letter: for example, ax = + 1/64 inch, –0 inch.

NOTE – See figure 8 for applicable insulators.

Figure 2 – Zinc-coated ferrous cable racks and cable rack hooks

Copyright The Institute of Electrical and Electronics Engineers, Inc.
Provided by IHS under license with IEEE
No reproduction or networking permitted without license from IHS
Not for Resale





Number of slots	Dimension A[d] in	
	8-inch slots	9-inch slots
2	8	9
4	24	27
6	40	45

Rack
4" × 1-9/16" × 3/16" Channel
(a)

Minimum extension in	Load lb	Maximum deflection in
5-1/4	400	3/8
10-1/4	400	1/2
16	200	5/8
22	100	5/8

Formed strip steel hook
(b)

ALLOWABLE VARIATIONS:

a = 1/64 inch	c = 1/16 inch	f = 1/4 inch
b = 1/32 inch	d = 1/8 inch	x = 0 inch

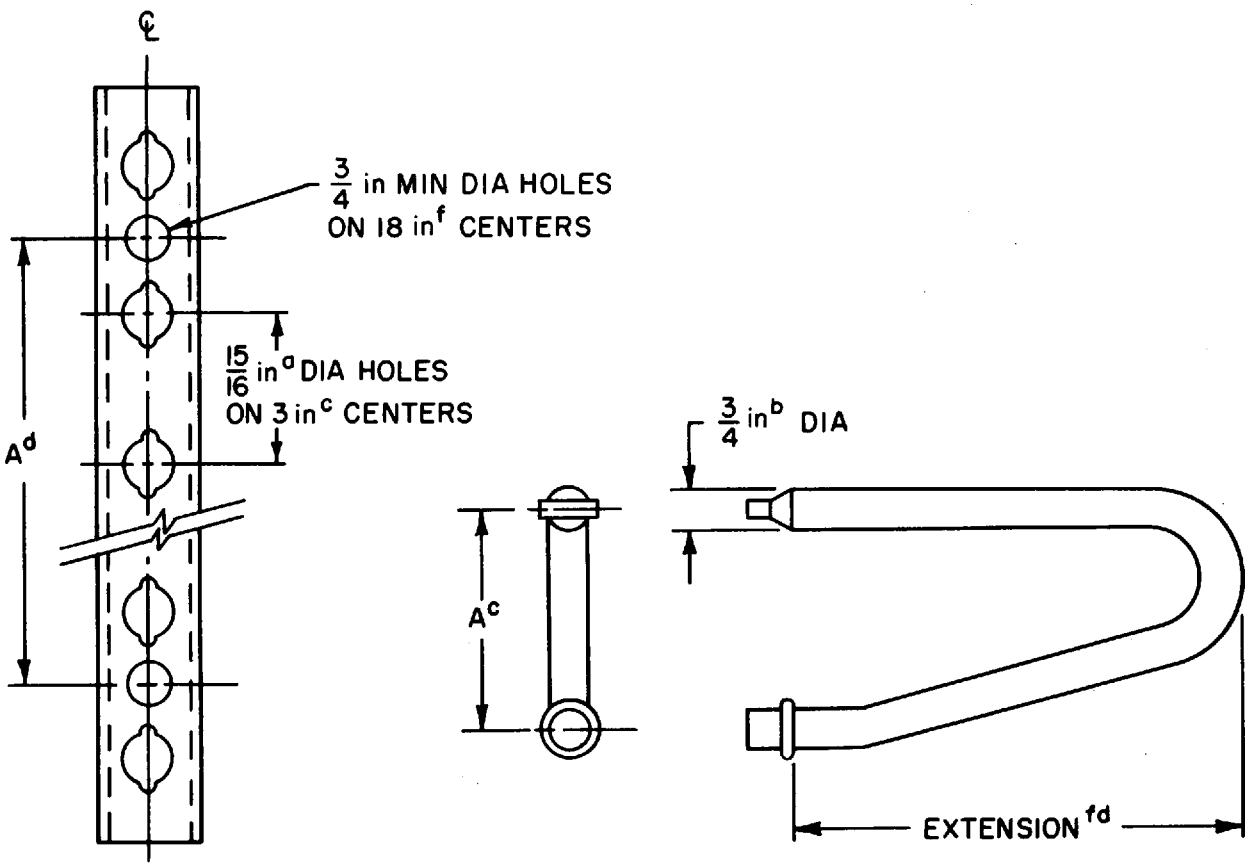
A single-letter superscript indicates that the plus and minus values are the same: for example, a =-± 1/64 inch.

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 inch, -0 inch.

NOTE – See figure 8 for applicable insulators.

Figure 3 – Zinc-coated ferrous cable racks and cable rack hooks

Copyright The Institute of Electrical and Electronics Engineers, Inc.
Provided by IHS under license with IEEE
No reproduction or networking permitted without license from IHS
Not for Resale



Number of slots	A^d in
8	18
14	36
20	54

Rack
2" × 1" × 3/16" Channel
(a)

A^c in	Extension[fd] in	Load lb	Maximum deflection in
3	22-13/16	500	1/2
3	15-13/16	300	1/2
6	22-13/16	300	1/2

Formed round steel hook
(b)

ALLOWABLE VARIATIONS:

a = 1/64 inch	c = 1/16 inch	f = 1/4 inch
b = 1/32 inch	d = 1/8 inch	x = 0 inch

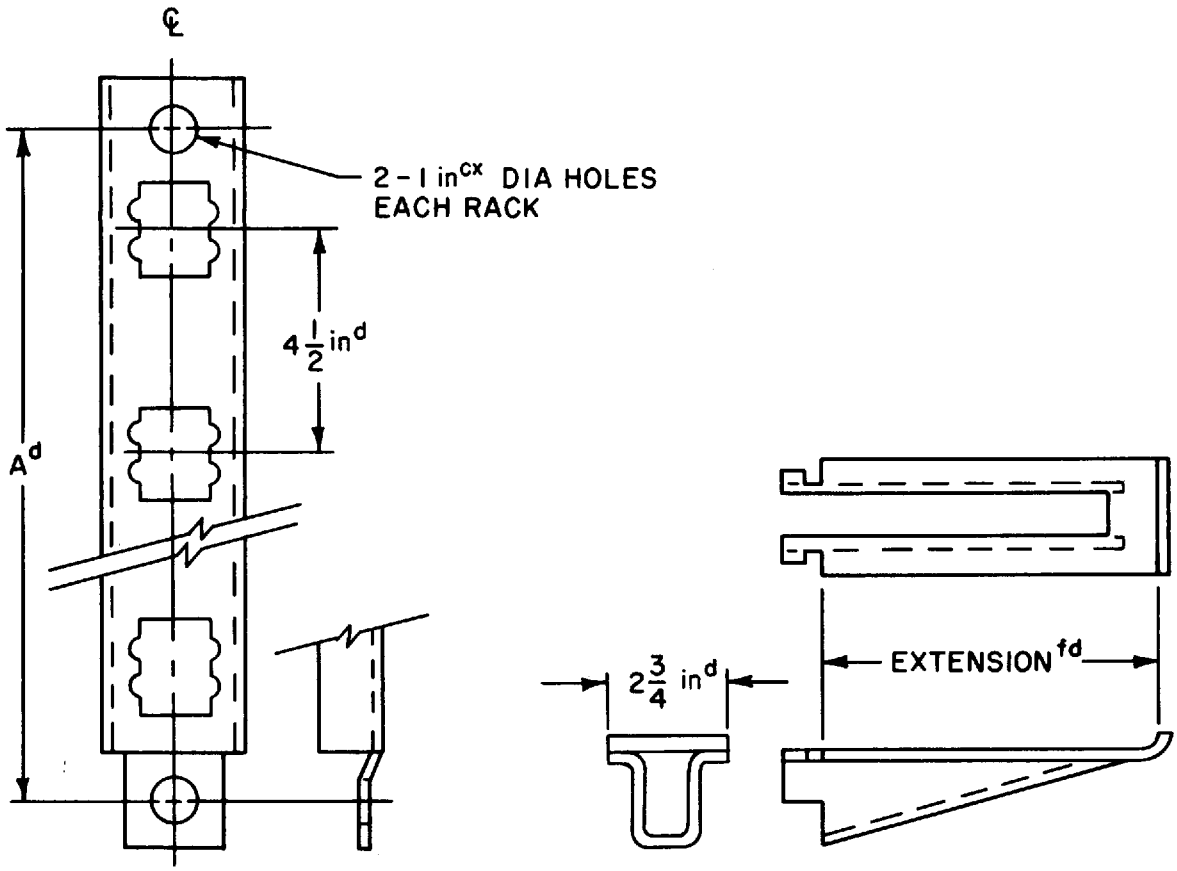
A single-letter superscript indicates that the plus and minus values are the same: for example, a = ±1/64 inch.

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 inch, –0 inch.

NOTE – See figure 8 for applicable insulators.

Figure 4 – Zinc-coated ferrous cable racks and cable rack hooks

Copyright The Institute of Electrical and Electronics Engineers, Inc.
Provided by IHS under license with IEEE
No reproduction or networking permitted without license from IHS
Not for Resale



Number of slots	A^d in
1	6-1/2
3	15-1/2
5	24-1/2
7	33-1/2

Rack
3" × 1-3/8" × 3/16" Channel
(a)

Extension^{fd} in	Load lb	Maximum deflection in
6	400	1/4
11-1/2	400	1/2
17	200	1/2

Formed strip steel hook
(b)

ALLOWABLE VARIATIONS:

a = 1/64 inch	c = 1/16 inch	f = 1/4 inch
b = 1/32 inch	d = 1/8 inch	x = 0 inch

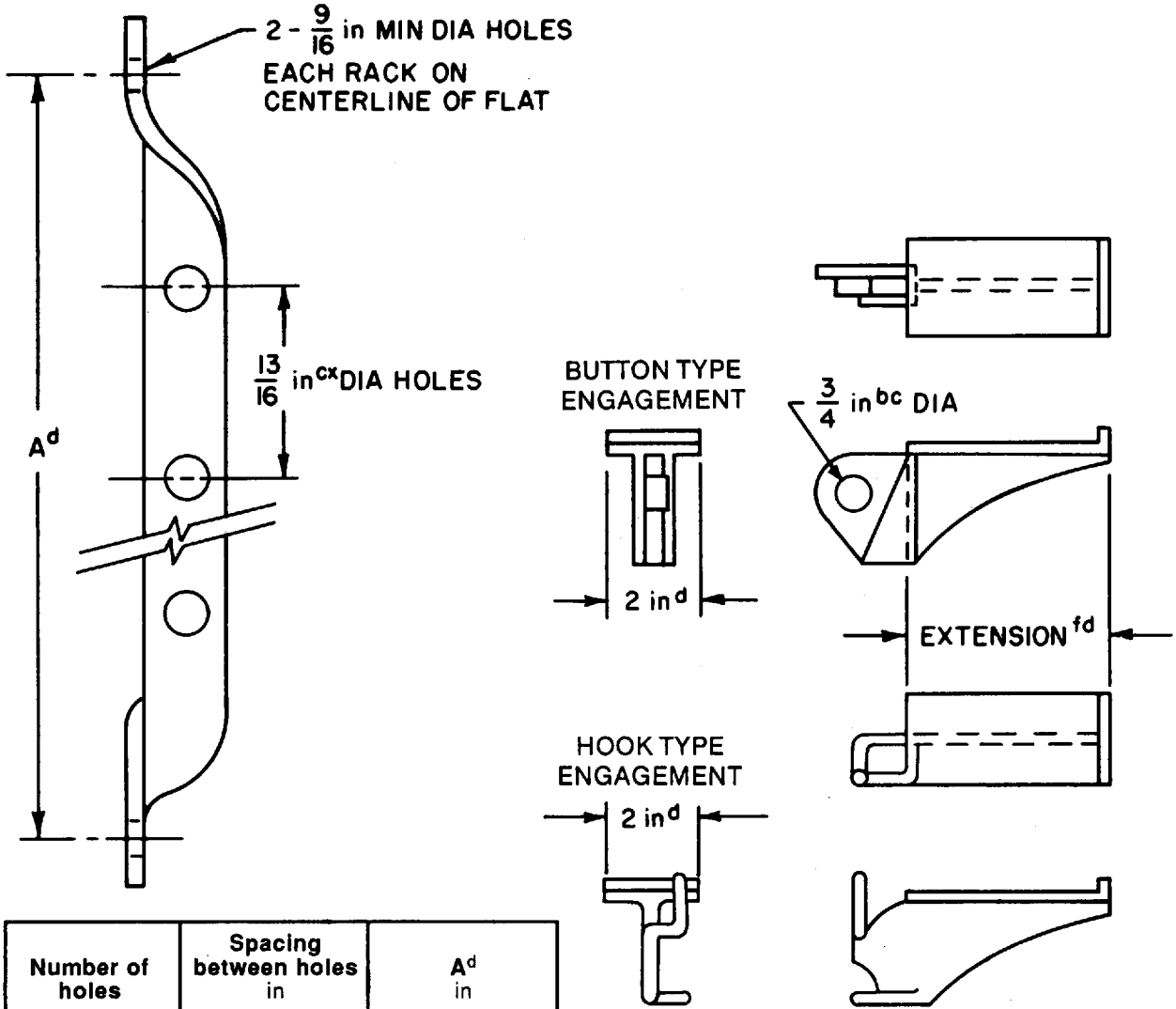
A single-letter superscript indicates that the plus and minus values are the same: for example, a = ±1/64 inch.

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 inch, –0 inch.

NOTE – See figure 8 for applicable insulators.

Figure 5 – Zinc-coated ferrous cable racks and cable rack hooks

Copyright The Institute of Electrical and Electronics Engineers, Inc.
Provided by IHS under license with IEEE
No reproduction or networking permitted without license from IHS
Not for Resale



Number of holes	Spacing between holes in	A^d in
1	–	13
5	3-1/2	27
5	7	41
5	8	45
5	9	48
6	5	38
6	8	53
9	3-1/2	41
9	7	69
11	2	33-1/8
13	3-1/2	55

Rack
1-3/4" × 3/8" Flat
(a)

Extension^{fd} in	Load lb	Maximum deflection in
4	400	1/8
8	400	1/4
12	300	3/8
15	200	3/8

Malleable iron hook
(b)

ALLOWABLE VARIATIONS:

a = 1/64 inch	c = 1/16 inch	f = 1/4 inch
b = 1/32 inch	d = 1/8 inch	x = 0 inch

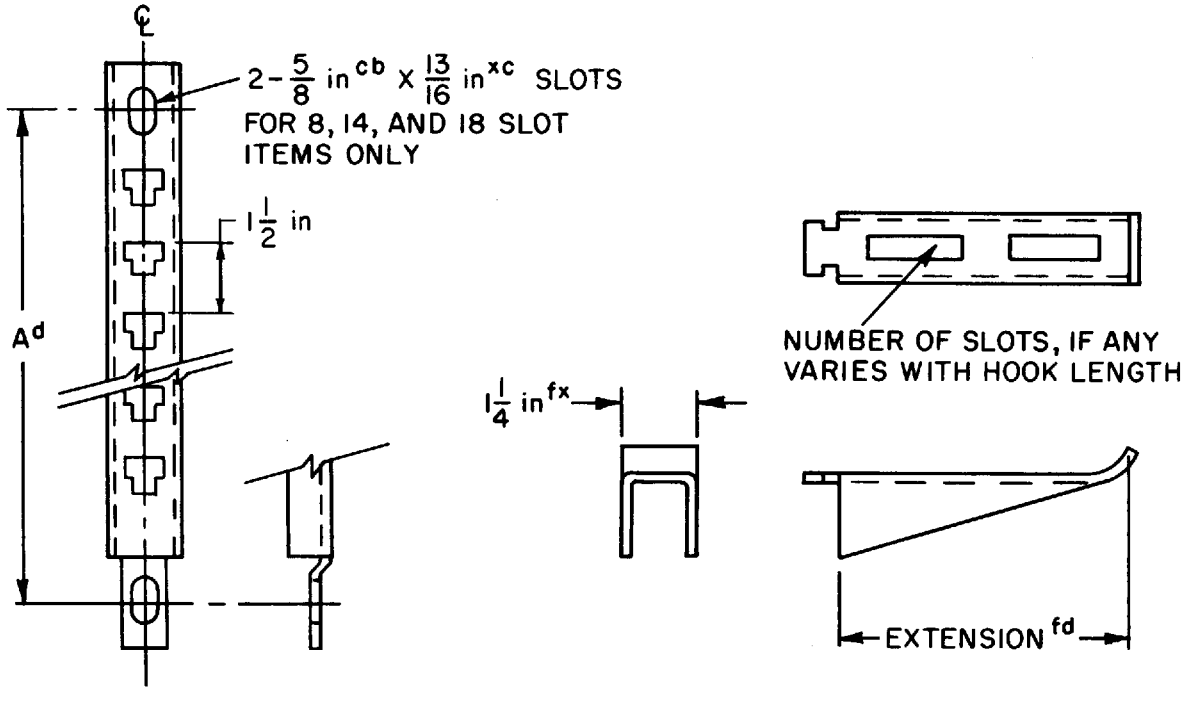
A single-letter superscript indicates that the plus and minus values are the same: for example, a = ±1/64 inch.

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 inch, -0 inch.

NOTE – See figure 8 for applicable insulators.

Figure 6 – Zinc-coated ferrous cable racks and cable rack hooks

Copyright The Institute of Electrical and Electronics Engineers, Inc.
Provided by IHS under license with IEEE
No reproduction or networking permitted without license from IHS
Not for Resale



Number of slots	A^d in
8	13-1/2
14	22-1/2
18	28-1/2
37	Hook Slots
43	Used as
47	Mounting
54	Holes

Rack
1 1/2" × 9/16" × 3/16" Channel
(a)

Extension^{fd} in	Load lb	Maximum deflection in
4	600	3/8
7-1/2	400	3/8
10	300	3/8
14	300	1
18	200	1

Formed strip steel hooks
(b)

ALLOWABLE VARIATIONS:

a = 1/64 inch	c = 1/16 inch	f = 1/4 inch
b = 1/32 inch	d = 1/8 inch	x = 0 inch

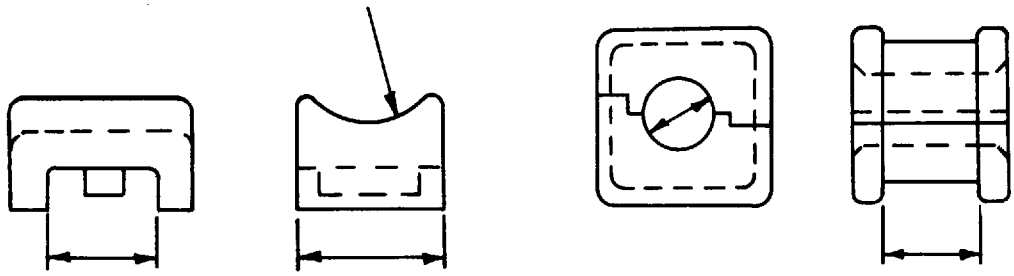
A single-letter superscript indicates that the plus and minus values are the same: for example, a = ±1/64 inch.

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 inch, -0 inch.

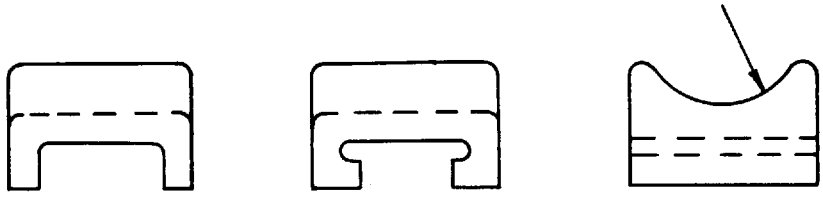
NOTE – See figure 8 for applicable insulators.

Figure 7 – Zinc-coated ferrous cable racks and cable rack hooks

Copyright The Institute of Electrical and Electronics Engineers, Inc.
Provided by IHS under license with IEEE
No reproduction or networking permitted without license from IHS
Not for Resale



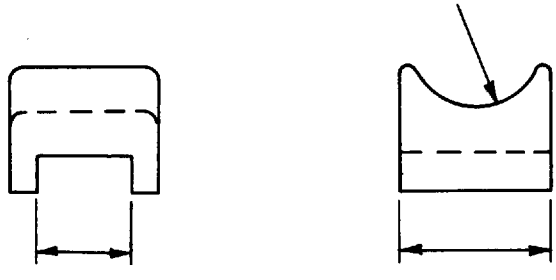
Insulators for figure 1
(a)



Insulators for figures 2, 5 and 6
(b)



Insulators for figures 3 and 5
(c)



Insulators for figure 7
(d)

NOTE – Definite dimensions for insulators should be requested from the supplier because of the many variations in cable diameters, hook widths, and lengths of the insulator along the hook.

Figure 8 – Insulators for zinc-coated ferrous cable racks and cable rack hooks

Copyright The Institute of Electrical and Electronics Engineers, Inc.
Provided by IHS under license with IEEE
No reproduction or networking permitted without license from IHS
Not for Resale