

# TOLCO™ fire protection solutions





We make what matters work.\*



At Eaton, we believe that power is a fundamental part of just about everything people do. That's why we're dedicated to helping our customers find new ways to manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. To improve people's lives, the communities where we live and work, and the planet our future generations depend upon. Because this what really matters. And we're here to make sure it works.



*Powering Business Worldwide*

**To learn more go to: [Eaton.com/whatmatters](https://www.eaton.com/whatmatters)**

**We make what matters work.**

For over 45 years, the TOLCO™ brand has been synonymous with innovative, labor saving pipe hanger and seismic bracing solutions for the fire protection industry.

## Products & Services

- TOLBrace™ Seismic Bracing Calculation Software
- One of the broadest lines of pipe hangers, strut and seismic bracing in the industry

## Fire Protection Team

Our Fire Protection team actively participates in the fire protection industry, including:

- Membership in the NFPA Technical Committee on Hanging and Bracing of Water Based Automatic Fire Sprinkler Systems
- MSS 403 Standards Committee for Pipe Hanging and Seismic Bracing

## Product Certifications

Many of the products shown in this catalog are certified with the following:

- Listed by Underwriters Laboratories (UL) in U.S. and Canada
- Factory Mutual Engineering Approved (FM)
- Pre-approved by the State of California, Office of Statewide Health, Planning and Development (OSHPD) as shown in our OPM-0052-13 Seismic Restraint Systems Guidelines

This catalog is intended to aid design engineers, specifying engineers, Authorities Having Jurisdiction (AHJs) and others seeking solutions to their pipe support and seismic bracing system installations and design challenges.

For more information on B-Line series pipe hangers and supports, and TOLCO seismic bracing solutions utilized in other applications, such as mechanical or plumbing systems, please refer to our Pipe Hangers & Supports and Strut Systems catalogs, and the State of California OSHPD Pre-Approved Seismic Restraint Systems Guidelines OPM-0052-13. These resources and other valuable information can be found online at [www.eaton.com/tolco](http://www.eaton.com/tolco).

For additional support, contact your TOLCO seismic bracing specialist at, [tolcosupport@eaton.com](mailto:tolcosupport@eaton.com)

## ⚠ WARNING

All hanger products in this catalog should be installed and serviced only as illustrated or described. Do not use them for any purpose other than those described in this catalog. Products that are used for unintended purposes could fail, resulting in severe personal injury or death.

Examples of misapplications which could cause severe personal injury or death include, but are not limited to:

- Using a beam clamp on a beam other than those described in the catalog;
- Using concrete inserts as anchors for pulling pipe up to the required elevation;
- Suspending clevis hangers, one under another, which could result in an accumulative load that is greater than that which the pipe hanger will support.

Eaton B-Line series pipe hanger and support products are manufactured in accordance with industry standards. Our customers should exercise care in using these products properly as to avoid potential damage or injury. Contact us if you have any questions about proper installation and use of the products in this catalog.

## NOTICE

*Eaton reserves the right to change the specifications, materials, equipment, prices or the availability of products at any time without prior notice. While every effort has been made to assure the accuracy of information contained in this catalog at the time of publication, Eaton is not responsible for inaccuracies resulting from undetected errors or omissions.*



Manufacturers Standardization  
Society of the Valve and Fitting  
Industry, Inc.



ISO 9001:2008



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[www.eaton.com/pipehangers](http://www.eaton.com/pipehangers)

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† Mark shown in this document is the property of its respective owner.

OSHPD Pre-Approved  
Seismic Restraints  
Systems Guidelines

SEG-17

**B-LINE**  
SERIES

# Seismic engineering guidelines

## OPM-0052-13

For mechanical, electrical, plumbing and  
fire sprinkler systems

Seismic bracing in compliance with  
requirements of

International Building Code (IBC) 2012  
California Building Code (CBC) 2013



Many TOLCO brand products are included in our OSHPD pre-approved seismic guidelines.  
For specific information please visit [www.eaton.com/fireprotection](http://www.eaton.com/fireprotection) to view the OSHPD OPM-0052-13 catalog.

## TOLBrace Fire Protection Software

**Allows you to create a submittal sheet, with all relevant information, at the click of a mouse!**

TOLBrace™ includes a feature that will automatically update your software when new products are added, when there are updates to codes and standards, and/or any necessary software upgrades.

TOLBrace software assists a fire sprinkler system designer with the following:

- Seismic force factor calculations ( $F_p$ )
- Zone of influence calculations
- Sway brace orientation and angle selection
- Structural attachment of sway braces
- Brace material selection
- Appropriate selection of UL Listed and FM Approved sway brace components
- Creating a submittal sheet with all relevant information

TOLBrace follows the requirements of:

- NFPA 13, 2007, 2010, 2013, 2016, & 2019
- Uniform Building Code
- International Building Code
- National Building Code of Canada
- California Office of Statewide Health Planning & Development (OSHPD)



Step 1: Brace Information    Step 2: Load Calculation    Step 3: Bracing Material    Step 4: Choose Seismic    Step 5: Fastener to Structure    Step 6: Conclusions

Cancel    Save    <Previous    Next >

**Step 1: Brace Information**

**Brace Description**  
Brace 1

A 4-way brace typically takes the form of two 2-way braces; one lateral and one longitudinal. These two braces will require separate calculations.

**Brace Type**  
☒ Lateral  
☐ Longitudinal

**Orientation**  
☐ Type A  
☒ Type B  
☐ Type C  
☐ Type D  
☐ Type E  
☐ Type F  
☐ Type G  
☐ Type H  
☐ Type I

**Brace Angle from Vertical: 45 to 59**

For more information, visit [www.eaton.com/tolbrace](http://www.eaton.com/tolbrace).

## Beam Clamps



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Z-Purlin Beam Clamp  
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**B3033**  
Wide Jaw Top  
Flange C-Clamp  
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**B3034**  
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Page 13



**Fig. 65XT- $\frac{3}{8}$**   
Reversible  
Steel C-Clamp  
With Locknut  
 $\frac{3}{4}$ " Throat  
Page 14



**Fig. 65**  
Reversible  
Steel C-Clamp  
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Page 14



**Fig. 66**  
Reversible  
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( $\frac{3}{4}$ " Throat)  
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( $1\frac{1}{4}$ " Throat)  
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## Pipe Hangers



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## Pipe Clamps



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## CPVC Solutions



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**Fig. 3000**  
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**Fig. 76**  
Structural  
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**Fig. 77**  
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**ACPW Series**  
Wood Knocker<sup>TM</sup>†  
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**ACPD Series**  
Bang-It<sup>TM</sup>† Anchors  
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**ATM Series**  
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**B3064**  
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† DDI<sup>TM</sup>, Wood-Knocker<sup>TM</sup> & Bang-IT<sup>TM</sup> are registered trademarks used by DeWalt.

## Threaded Accessories



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**B3210**  
**B3210L**  
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**B3210X**  
**B3210XL**  
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Page 101



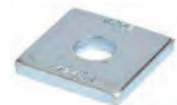
**B3211X**  
**B3211XL**  
Linked Welded  
Eye Rod  
Page 101



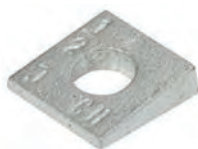
**B3211**  
**B3211L**  
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**FW**  
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**LW**  
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Page 104



**FFW**  
Flat Fender Washer  
Page 104

## Other Products [www.eaton.com/pipehangers](http://www.eaton.com/pipehangers)



**B3040**  
Adjustable  
Beam Clamp



**B3055**  
Steel  
Beam Clamp



**B3045**  
Side  
Beam Clamp



**B3170CT**  
Copper Tubing  
Adjustable  
Swivel Ring



**B3170CTC**  
Copper Tubing  
Plastic Coated  
Adjustable  
Swivel Ring



**B3690**  
Adjustable  
'J' Hanger



**B3198R**  
Extension Split  
Pipe Clamp



**B3198RCT**  
Copper Tubing  
Extension Split  
Pipe Clamp



**B3180FL**  
Flush Mount  
Pipe Strap



**B3180**  
Extended Leg  
Pipe Strap



**B3148**  
Offset  
Pipe Clamp



**B3096**  
Adjustable Pipe  
Saddle Support



**B3089**  
Pipe Support  
Adjuster



**B3090**  
Pipe Saddle  
Support  
With U-Bolt



**B3095**  
Pipe Saddle  
Support



**B3097**  
Pipe Saddle  
With Strap



**B3098**  
Adjustable  
Pipe Support  
w/U-Bolt



**B3082**  
Rod Beam  
Attachment



**ATB**  
(TOLCO 123)  
Toggle Bolt



**B3203**  
Extension Piece



**B3223**  
Offset Eye  
Socket



**B3202**  
Turnbuckle



**B335**  
Three Hole  
Adjustable Hinge



**B650**  
Seismic Retrofit  
Bracket

## Other Products [www.eaton.com/pipehangers](http://www.eaton.com/pipehangers)



**B2500**  
Light Duty  
Spot Insert



**N2500**  
Steel Insert Nut



**B3014**  
Malleable Iron  
Spot Insert



**B3014N**  
Malleable Iron  
Insert Nut



**BPS Series**  
Snap N' Shield  
For Strut Channel



**BPCH Series**  
Snap N' Shield  
For Clevis & Band  
Hangers



**Vibration Pads**



**CHSCS Type**  
Spring Hanger  
w/Seismic  
Cushion Stop  
1" & 2" Deflection



**RH & RHD Type**  
Neoprene Hanger  
1/4" & 1/2" Deflection



**HH30SCS Type**  
Deflection  
Combination Hanger  
15° Tilt Spring &  
Neoprene w/  
Seismic Cushion Stop  
1 1/2" & 2 1/2" Deflection



**Isolator/Restraints**



**Neoprene Mounts  
Seismic Restraints**



**DBP**  
Base



**DB Series**  
Base & Short Channel



**KwikWire Clamp**



**Wire Rope**

# Beam Clamps

## B3037 - Z-Purlin Malleable C-Clamp

**Material:** Malleable Iron

**Function:** Designed for attaching a  $\frac{3}{8}$ "-16 hanger rod to the bottom flange of a Z-purlin.

**Approvals:** Underwriters Laboratories Listed (cULus) for up to 4" (100mm) pipe. Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 23 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 23.

**Finish:** Plain or Electro-Galvanized

**Order By:** Figure number and finish.

**Weight:** Approx. Wt./100 90 Lbs. (40.8kg)

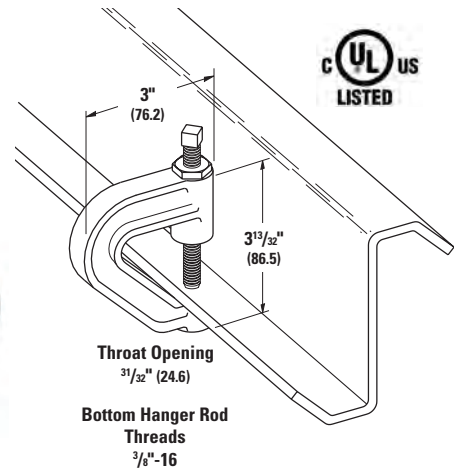
**Design Load:** 400 Lbs. (1.78kN)

**Setscrew Torque:** Per MSS SP-58 14.2.5

$\frac{3}{8}$ " -16 set screws = 5 ft./lbs. (7 Nm)

Caution should be taken not to over-tighten set screws.

Set Screw and  
Locknut Included



## B3033 - Wide Jaw Reversible C-Clamp

**Size Range:**  $\frac{3}{8}$ "-16 thru  $\frac{3}{4}$ "-10 rod

**Material:** Cast Malleable Steel with hardened cup point set screw and jam nut

**Function:** For attachment to structural shapes requiring wider throat especially under roof with bar joist construction. This clamp may be used with the set screw in the up or down position.

**Approvals:** Underwriters Laboratories Listed (cULus) and Factory Mutual Engineering Approved (FM) for  $\frac{3}{8}$ "-16 and  $\frac{1}{2}$ "-13 rod sizes. Conforms to Federal Specification WW-H-171E Type 19 & A-A-1192A, Type 19 & 23 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 19 & 23. Factory Mutual Engineering Approved only with the setscrew in the down position.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, rod size and finish

**Setscrew Torque:** Per MSS SP-58 14.2.5

$\frac{3}{8}$ " -16 set screws = 5 ft./lbs. (7 Nm)

$\frac{1}{2}$ " -13 set screws = 11 ft./lbs. (15 Nm)

$\frac{5}{8}$ " -11 set screws = 21 ft./lbs. (28 Nm)

Caution should be taken not to over-tighten set screws.

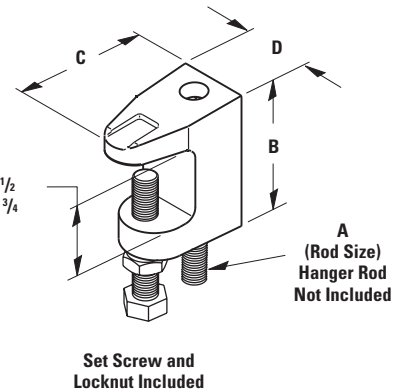
Designed to meet or exceed requirements of FM DS 2-0.

cUL US  
LISTED

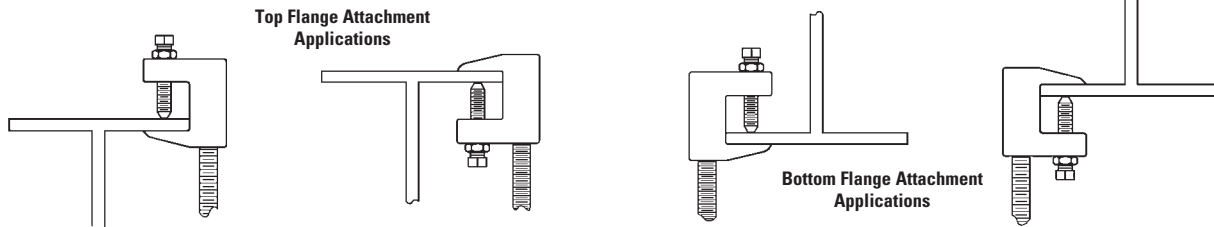
FM  
APPROVED



Throat Opening  
 $1\frac{1}{4}$ " (31.7) for B3033- $\frac{3}{8}$  &  $\frac{1}{2}$ "  
 $1\frac{5}{16}$ " (33.3) for B3033- $\frac{5}{8}$  &  $\frac{3}{4}$ "



Set Screw and  
Locknut Included



| Part No.             | Rod Size A         | Set Screw Size                        | B in. (mm)                | C in. (mm)               | D in. (mm)               | Maximum Iron Pipe Size Per UL in. (mm) | Approx. Wt./100 Lbs. (kg) |
|----------------------|--------------------|---------------------------------------|---------------------------|--------------------------|--------------------------|----------------------------------------|---------------------------|
| B3033- $\frac{3}{8}$ | $\frac{3}{8}$ "-16 | $\frac{3}{8}$ "-16 x 2"               | $2\frac{1}{4}$ " (57.1)   | 2" (50.8)                | $1\frac{1}{8}$ " (28.6)  | 4" (100)                               | 54 (24.5)                 |
| B3033- $\frac{1}{2}$ | $\frac{1}{2}$ "-13 | $\frac{1}{2}$ "-13 x $2\frac{1}{2}$ " | $2\frac{5}{16}$ " (58.7)  | $2\frac{3}{16}$ " (55.6) | $1\frac{1}{4}$ " (31.7)  | 8" (200)                               | 51 (23.1)                 |
| B3033- $\frac{5}{8}$ | $\frac{5}{8}$ "-11 | $\frac{1}{2}$ "-13 x $2\frac{1}{2}$ " | $2\frac{5}{8}$ " (66.7)   | $2\frac{1}{2}$ " (63.5)  | $1\frac{3}{8}$ " (34.9)  | 8" (200)                               | 70 (31.7)                 |
| B3033- $\frac{3}{4}$ | $\frac{3}{4}$ "-10 | $\frac{5}{8}$ "-11 x $2\frac{1}{2}$ " | $2\frac{11}{16}$ " (68.3) | $2\frac{1}{2}$ " (63.5)  | $1\frac{7}{16}$ " (36.5) | 10" (250)                              | 98 (44.4)                 |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## B3034 - C-Clamp

**Size Range:**  $\frac{3}{8}$ "-16 thru  $\frac{3}{4}$ "-10 rod

**Material:** Cast Malleable Steel with hardened cup point set screw and jam nut

**Function:** Recommended for hanging from steel beam where flange thickness does not exceed  $\frac{3}{4}$ " (19.0mm).

**Features:** May be used on top or bottom flange of the beam. Beveled lip allows hanging from top flange where clearance is limited. May be installed with the set screw in the up or down position. Offset design permits unlimited rod adjustment by allowing the rod to be threaded completely through the clamp. The rear window design permits inspection of thread engagement.

**Approvals:** Underwriters Laboratories Listed (cULus) and Factory Mutual Engineering Approved (FM) for  $\frac{3}{8}$ "-16 and  $\frac{1}{2}$ "-13 rod sizes. Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 23 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 19.  $\frac{3}{8}$ "-16 is (cULus) Listed to support up to 4" (100mm) pipe with the set screw in the down position, up to 3" (75mm) pipe with the set screw in the up position.  $\frac{1}{2}$ "-13 is (cULus) Listed to support up to 8" (200mm) pipe with the set screw in the down position, up to 6" (150mm) pipe with the set screw in the up position. Factory Mutual Engineering Approved only with the setscrew in the down position.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

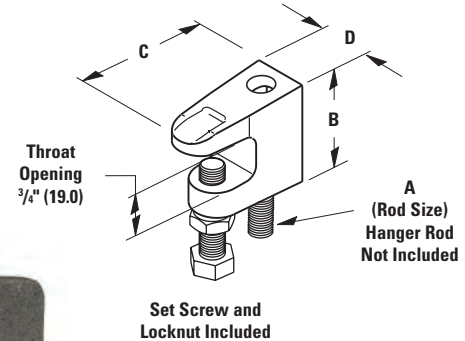
**Order By:** Figure number, rod size and finish

**Setscrew Torque:** Per MSS SP-58 14.2.5

$\frac{3}{8}$ " -16 set screws = 5 ft./lbs. (7 Nm)

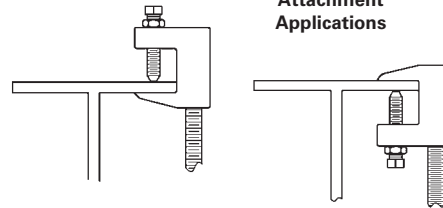
$\frac{1}{2}$ " -13 set screws = 11 ft./lbs. (15 Nm)

Caution should be taken not to over-tighten set screws.

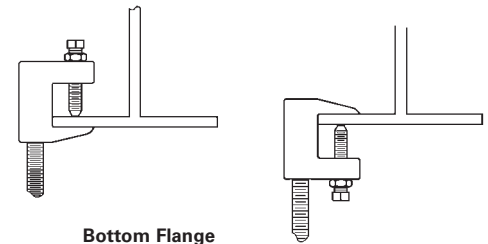


B3034- $\frac{3}{8}$ " shown.

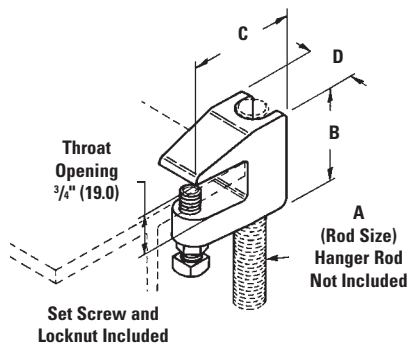
Top Flange Attachment Applications



Bottom Flange Attachment Applications



B3034- $\frac{5}{8}$ " and B3034- $\frac{3}{4}$ " sizes Attach only as shown.



| Part No.             | Rod Size A         | Set Screw Size                        | B                  |        | C                 |        | D                 |        | Maximum Iron Pipe Size Per UL |       | Approx. Wt./100 |        |
|----------------------|--------------------|---------------------------------------|--------------------|--------|-------------------|--------|-------------------|--------|-------------------------------|-------|-----------------|--------|
|                      |                    |                                       | in.                | (mm)   | in.               | (mm)   | in.               | (mm)   | in.                           | (mm)  | Lbs.            | (kg)   |
| B3034- $\frac{3}{8}$ | $\frac{3}{8}$ "-16 | $\frac{3}{8}$ "-16 x $1\frac{1}{2}$ " | $1\frac{5}{8}$ "   | (41.3) | 2"                | (50.8) | $\frac{7}{8}$ "   | (19.0) | 4"                            | (100) | 30              | (13.6) |
| B3034- $\frac{1}{2}$ | $\frac{1}{2}$ "-13 | $\frac{1}{2}$ "-13 x $1\frac{1}{2}$ " | $1\frac{13}{16}$ " | (46.0) | $2\frac{3}{16}$ " | (55.6) | $1\frac{3}{16}$ " | (30.2) | 8"                            | (200) | 47              | (21.3) |
| B3034- $\frac{5}{8}$ | $\frac{5}{8}$ "-11 | $\frac{1}{2}$ "-13 x 2"               | $1\frac{3}{4}$ "   | (44.5) | $2\frac{1}{8}$ "  | (54.0) | $1\frac{1}{4}$ "  | (31.7) | —                             | —     | 58              | (26.3) |
| B3034- $\frac{3}{4}$ | $\frac{3}{4}$ "-10 | $\frac{1}{2}$ "-13 x 2"               | 2"                 | (50.8) | $2\frac{1}{4}$ "  | (57.2) | $1\frac{1}{4}$ "  | (31.7) | —                             | —     | 77              | (35.0) |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 65 - Reversible Steel C-Type Beam Clamp $\frac{3}{4}$ " (19.0mm) Throat Opening

### Size Range:

Fig. 65 -  $\frac{1}{2}$ "-13 rod sizes, and  $\frac{5}{8}$ "-11 rod sizes

Fig. 65XT -  $\frac{3}{8}$ "-16 rod size (see below)

**Material:** Steel with hardened cup point set screw and jam nut

**Function:** Recommended for hanging from steel beam where flange thickness does not exceed  $\frac{3}{4}$ " (19.0mm).

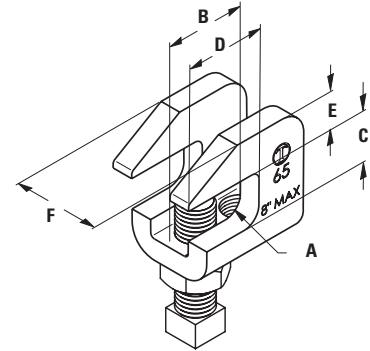
**Features:** All steel construction eliminates structural deficiencies associated with casting type beam clamps. May be used on top or bottom flange of beam. (Beveled lip allows hanging from top flange where clearance is limited.) May be installed with set screw in up or down position. Offset design permits unlimited rod adjustment by allowing the rod to be threaded completely through the clamp. Open design permits inspection of thread engagement.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). Exceeds requirements of the National Fire Protection Association (NFPA), pamphlet 13,  $\frac{3}{8}$ "-16 rod will support  $\frac{1}{2}$ " (15mm) thru 4" (100mm) pipe  
 $\frac{1}{2}$ "-13 rod will support thru 8" (200mm) pipe

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish

Fig. 65 Patent #4,570,885



Set Screw and Locknut Included



| Part No.          | Rod Size A         | B in. (mm)               | C in. (mm)             | D in. (mm) | E in. (mm)              |
|-------------------|--------------------|--------------------------|------------------------|------------|-------------------------|
| 65- $\frac{1}{2}$ | $\frac{1}{2}$ "-13 | 1 $\frac{1}{2}$ " (38.1) | $\frac{3}{4}$ " (19.0) | 1" (25.4)  | $\frac{9}{16}$ " (14.3) |
| 65- $\frac{5}{8}$ | $\frac{5}{8}$ "-11 | 1 $\frac{1}{2}$ " (38.1) | $\frac{3}{4}$ " (19.0) | 1" (25.4)  | $\frac{9}{16}$ " (14.3) |

| Part No.          | F in. (mm)               | Approx. Wt./100 Lbs. (kg) |
|-------------------|--------------------------|---------------------------|
| 65- $\frac{1}{2}$ | 1 $\frac{1}{4}$ " (31.7) | 55 (24.9)                 |
| 65- $\frac{5}{8}$ | 1 $\frac{1}{4}$ " (31.7) | 55 (24.9)                 |

## TOLCO Fig. 65XT - Reversible Steel C-Type Beam Clamp $\frac{3}{4}$ " (19.0mm) Throat Opening

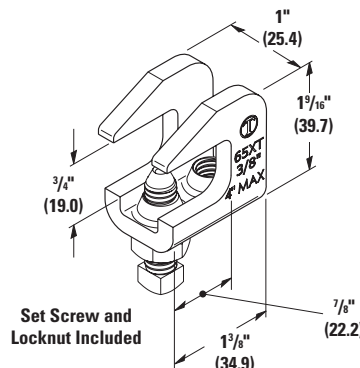
**Feature:** Extruded holes allows for more thread engagement of threaded rod and set screw.

**Finish:** Plain or Electro-Galvanized

**Order By:** Figure number and finish

**Approvals:** Underwriters Laboratories Listed (cULus) and FM Approved (FM) for up to 4" (100mm) pipe.

Designed to meet or exceed requirements of FM DS 2-0 and NFPA 13.



Set Screw and Locknut Included



| Part No. | For Rod Size       | Approx. Wt/100 Lbs. (kg) |
|----------|--------------------|--------------------------|
| 65XT     | $\frac{3}{8}$ "-16 | 28.0 (12.7)              |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 66 - Reversible Steel C-Type Beam Clamp 1 1/4" (31.7mm) Throat Opening

**Size Range:** 3/8"-16, 1/2"-13 rod sizes, and 5/8"-11 rod sizes

**Material:** Steel with hardened cup point set screw and jam nut

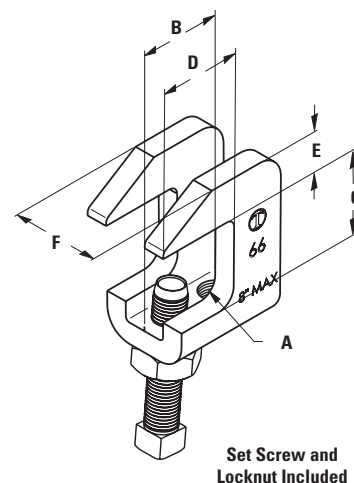
**Function:** Recommended for hanging from steel beam where flange thickness does not exceed 1 1/4" (31.7mm).

**Features:** All steel construction eliminates structural deficiencies associated with casting type beam clamps. May be used on top or bottom flange of beam. (Beveled lip allows hanging from top flange where clearance is limited.) May be installed with set screw in up or down position. Offset design permits unlimited rod adjustment by allowing the rod to be threaded completely through the clamp. Open design permits inspection of thread engagement.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). Exceeds requirements of the National Fire Protection Association (NFPA), pamphlet 13, 3/8"-16 rod will support 1/2" (15mm) thru 4" (100mm) pipe  
1/2"-13 rod will support thru 8" (200mm) pipe

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish



| Part No. | Rod Size A | B<br>in. (mm)  | C<br>in. (mm) | D<br>in. (mm) | E<br>in. (mm) |
|----------|------------|----------------|---------------|---------------|---------------|
| 66-3/8   | 3/8"-16    | 1 3/16" (30.2) | 1 1/4" (31.7) | 1" (25.4)     | 7/16" (11.1)  |
| 66-1/2   | 1/2"-13    | 1 1/2" (38.1)  | 1 1/4" (31.7) | 1" (25.4)     | 9/16" (14.3)  |
| 66-5/8   | 5/8"-11    | 1 1/2" (38.1)  | 1 1/4" (31.7) | 1" (25.4)     | 9/16" (14.3)  |

| Part No. | F<br>in. (mm) | Approx. Wt./100<br>Lbs. (kg) |
|----------|---------------|------------------------------|
| 66-3/8   | 1" (25.4)     | 28 (12.7)                    |
| 66-1/2   | 1 1/4" (31.7) | 55 (24.9)                    |
| 66-5/8   | 1 1/4" (31.7) | 55 (24.9)                    |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Beam Clamps

## TOLCO Fig. 67SS - Stainless Steel Reversible C-Type Beam Clamp $\frac{3}{4}$ " (19.0mm) Throat Opening

## TOLCO Fig. 68SS - Stainless Steel Reversible C-Type Beam Clamp Wide Mouth

**Size Range:**  $\frac{3}{8}$ "-16 and  $\frac{1}{2}$ "-13 rod sizes

**Material:** Stainless Steel (Type 316 or 304)

**Function:** Recommended for hanging from steel beams where flange thickness does not exceed  $\frac{3}{4}$ " (19.0mm) for Fig. 67SS or  $\frac{1}{4}$ " (31.7mm) for Fig. 68SS.

**Features:** All steel construction eliminates structural deficiencies associated with casting type beam clamps. May be used on top or bottom flange of beam. May be installed with set screw in up or down position. Offset design permits unlimited rod adjustment by allowing the rod to be threaded completely through the clamp.

**Approvals:** Conforms to Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 19.

$\frac{3}{8}$ "-16 rod will support  $\frac{1}{2}$ " (15mm) thru 4" (100mm) pipe at maximum NFPA 13 spacing

$\frac{1}{2}$ "-13 rod will support thru 8" (200mm) pipe at maximum NFPA 13 spacing

**Order By:** Figure number and stainless steel type.

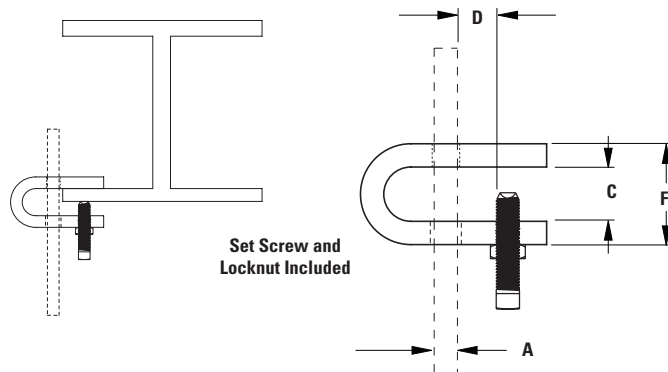
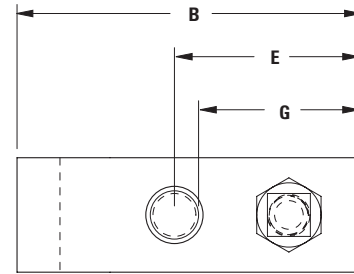


Fig. 67SS

| Part No.            | Rod Size A         | Pipe Size in. (mm)              | B in. (mm) | C in. (mm)             | D in. (mm) | E in. (mm)              |
|---------------------|--------------------|---------------------------------|------------|------------------------|------------|-------------------------|
| 67SS- $\frac{3}{8}$ | $\frac{3}{8}$ "-16 | $\frac{1}{2}$ " - 4" (15 - 100) | 3" (76.2)  | $\frac{7}{8}$ " (22.2) | 1" (25.4)  | $1\frac{5}{8}$ " (41.3) |
| 67SS- $\frac{1}{2}$ | $\frac{1}{2}$ "-13 | 5" - 8" (125 - 200)             | 3" (76.2)  | $\frac{7}{8}$ " (22.2) | 1" (25.4)  | $1\frac{5}{8}$ " (41.3) |

| Part No.            | F in. (mm)              | G in. (mm)              | Approx. Wt./100 Lbs. (kg) |
|---------------------|-------------------------|-------------------------|---------------------------|
| 67SS- $\frac{3}{8}$ | $1\frac{5}{8}$ " (41.3) | $1\frac{1}{8}$ " (28.6) | 84 (38.1)                 |
| 67SS- $\frac{1}{2}$ | $1\frac{5}{8}$ " (41.3) | $1\frac{1}{8}$ " (28.6) | 170 (77.1)                |



Fig. 68SS

| Part No.            | Rod Size A         | Pipe Size in. (mm)              | B in. (mm)               | C in. (mm)              | D in. (mm)               | E in. (mm)              |
|---------------------|--------------------|---------------------------------|--------------------------|-------------------------|--------------------------|-------------------------|
| 68SS- $\frac{3}{8}$ | $\frac{3}{8}$ "-16 | $\frac{1}{2}$ " - 4" (15 - 100) | $2\frac{1}{16}$ " (52.4) | $1\frac{1}{8}$ " (28.6) | $\frac{3}{4}$ " (19.0)   | $1\frac{1}{4}$ " (31.7) |
| 68SS- $\frac{1}{2}$ | $\frac{1}{2}$ "-13 | 5" - 8" (125 - 200)             | $2\frac{1}{4}$ " (57.1)  | $1\frac{1}{4}$ " (31.7) | $\frac{13}{16}$ " (20.6) | $1\frac{1}{4}$ " (31.7) |

| Part No.            | F in. (mm)              | Approx. Wt./100 Lbs. (kg) |
|---------------------|-------------------------|---------------------------|
| 68SS- $\frac{3}{8}$ | 2" (50.8)               | 84 (38.1)                 |
| 68SS- $\frac{1}{2}$ | $2\frac{1}{4}$ " (57.1) | 170 (77.1)                |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 69 - Beam Clamp Retaining Strap

**Size Range:**  $\frac{3}{8}$ "-16 thru  $\frac{3}{4}$ "-10 rod  
 4" (101.6mm) thru 16" (406.4mm) lengths  
 Note: longer lengths are available consult factory

**Material:** Pre-Galvanized Steel

**Function:** To offer more secure fastening of various types of beam clamps to beam where danger of movement might be expected. NFPA 13 requires the use of retaining straps with all beam clamps installed in earthquake areas. Satisfies requirements of NFPA 13.

**Important Note:** Good installation practice of a retaining strap requires that the strap be held tightly and securely to all component parts of the assembly. Therefore a locking mechanism of some kind, such as a hex nut for the Fig. 69 or the beveled locking slot of the Fig. 69R will provide a more secure reliable installation.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). Approved for use with any listed B-Line series or Tolco beam clamp.

**Finish:** Pre-Galvanized

**Order By:** Figure number, length (L), and finish.

**Note:** Minimum return on strap is 1" (25.4mm).  
 Lengths over 16" (406mm) are not UL Listed.

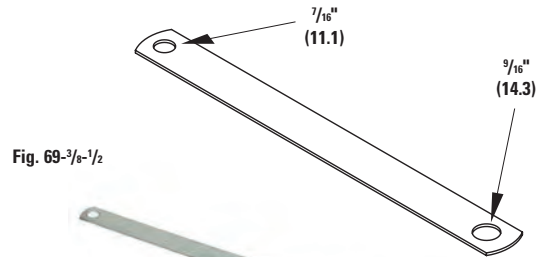


Fig. 69- $\frac{3}{8}$ - $\frac{1}{2}$



Detail A

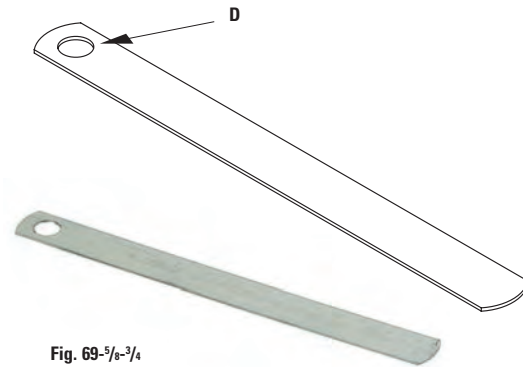
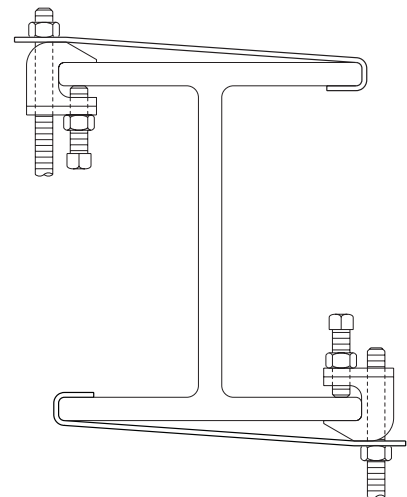


Fig. 69- $\frac{5}{8}$ - $\frac{3}{4}$

| Part No.                             | Hole Dia. D<br>in. (mm)  | For Use With                                                                                                                                                                                                               | Length  |
|--------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 69- $\frac{3}{8}$ - $\frac{1}{2}$ -L | see Detail A             | B3033- $\frac{3}{8}$ , B3034- $\frac{3}{8}$ , B3031- $\frac{3}{8}$ ,<br>65- $\frac{3}{8}$ , 65XT- $\frac{3}{8}$ , 66- $\frac{3}{8}$<br>B3033- $\frac{1}{2}$ , B3034- $\frac{1}{2}$ , 65- $\frac{1}{2}$ , 66- $\frac{1}{2}$ | Specify |
| 69- $\frac{5}{8}$ -L                 | $\frac{11}{16}$ " (17.5) | B3033- $\frac{5}{8}$ , 65- $\frac{5}{8}$ , 66- $\frac{5}{8}$                                                                                                                                                               | Specify |
| 69- $\frac{3}{4}$ -L                 | $\frac{13}{16}$ " (20.6) | B3033- $\frac{3}{4}$                                                                                                                                                                                                       | Specify |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Beam Clamps

## TOLCO Fig. 69R - Retrofit Capable Beam Clamp Retaining Strap

**Size Range:**  $\frac{3}{8}$ "-16 &  $\frac{1}{2}$ "-13 rod  
4" (101.6mm) thru 16" (406.4mm) lengths  
Note: longer lengths are available consult factory



**Material:** Pre-Galvanized Steel

**Function:** To offer more secure fastening of various types of beam clamps to beam where danger of movement might be expected. NFPA 13 requires the use of retaining straps with all beam clamps installed in earthquake areas. Satisfies requirements of NFPA 13.

**Features:** Beveled locking slot\* is precisely formed to align with the threaded section of a hanger rod or set screw and engage the unit securely. May be used as shown in Section "A-A" or inverted. Allows easy installation for new construction or retrofit applications.

**Important Note:** Good installation practice of a retaining strap requires that the strap be held tightly and securely to all component parts of the assembly. Therefore the beveled locking slot of the Fig. 69R will provide a secure reliable installation.

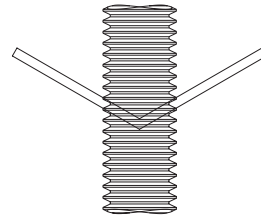
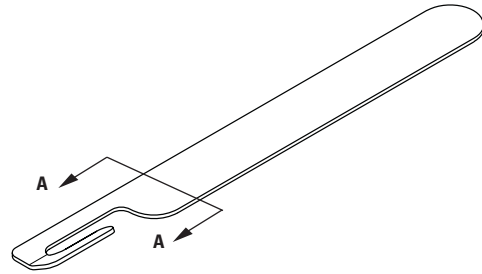
**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). Approved for use with any listed B-Line series or Tolco beam clamp.

**Finish:** Pre-Galvanized

**Order By:** Figure number, length, and finish.

**Note:** Minimum return on strap is 1" (25.4mm)

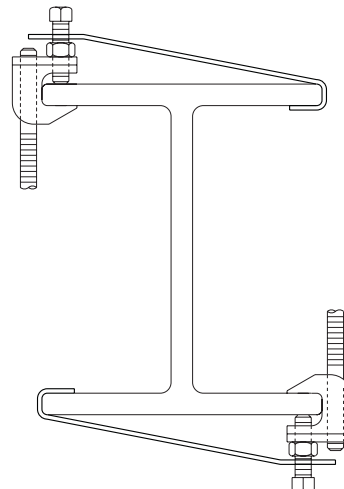
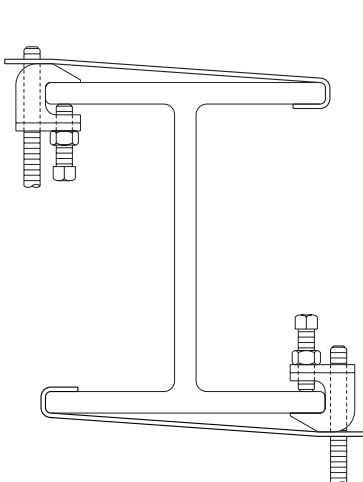
\* Patent #5,947,424



A - A



| Part No.              | Slot Width<br>in. (mm)  | For Use With                                                                                                 | Length  |
|-----------------------|-------------------------|--------------------------------------------------------------------------------------------------------------|---------|
| 69R- $\frac{3}{8}$ -L | $\frac{7}{16}$ " (11.1) | B3033- $\frac{3}{8}$ , B3034- $\frac{3}{8}$ ,<br>65- $\frac{3}{8}$ , 65XT- $\frac{3}{8}$ , 66- $\frac{3}{8}$ | Specify |
| 69R- $\frac{1}{2}$ -L | $\frac{9}{16}$ " (14.3) | B3033- $\frac{1}{2}$ , B3034- $\frac{1}{2}$ , 65- $\frac{1}{2}$ , 66- $\frac{1}{2}$                          | Specify |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

B3042T - Bar Joist Hanger

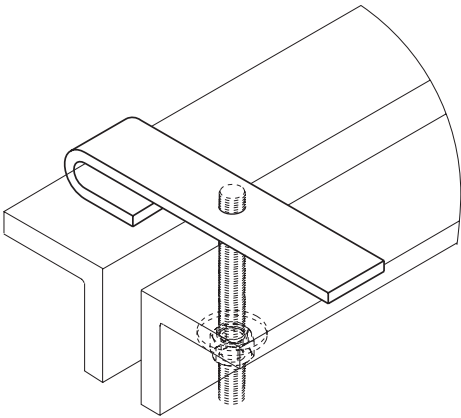
**Size Range:** 3/8"-16 and 1/2"-13 rod

**Material:** Steel

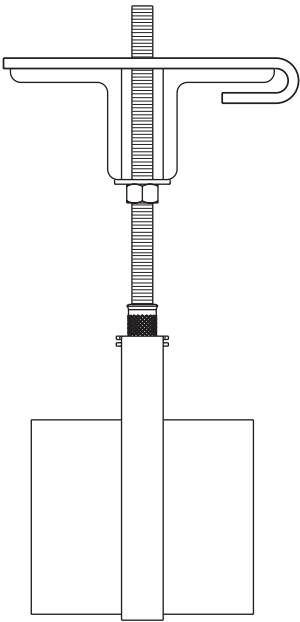
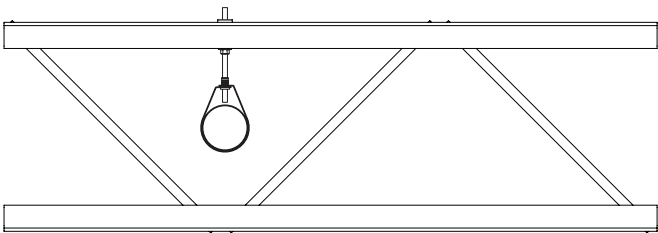
**Function:** Designed to hook on top chord of metal bar joist. Hanger rod is threaded into product and secured with a washer and nut.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, rod size, width and thickness of bar joist, and finish.



| Part No.   | Rod Size<br>Size | For Pipe Size<br>in. | For Pipe Size<br>(mm) | Approx. Wt./100<br>Lbs. (kg) |
|------------|------------------|----------------------|-----------------------|------------------------------|
| B3042T-3/8 | 3/8"-16          | Up to 4"             | (up to 100)           | 50.6 (22.9)                  |
| B3042T-1/2 | 1/2"-13          | 6"                   | (150)                 | 50.0 (22.7)                  |



# Beam Clamps

## TOLCO Fig. 130 - Composite Wood Joist Clamp

**Size Range:** 130-1 = TJI 35 or equivalent  
130-2 = —  
130-3 = TJI 25 or equivalent  
130-4 = TJI 55, TJI 65, & TJI 560D or equivalent  
130-5 = TJI 75 & TJI H90 or equivalent  
130-6 = TJI 96 or equivalent

**Material:** Steel

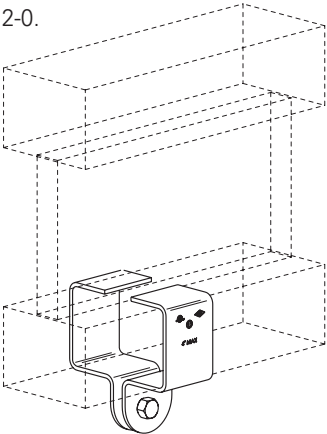
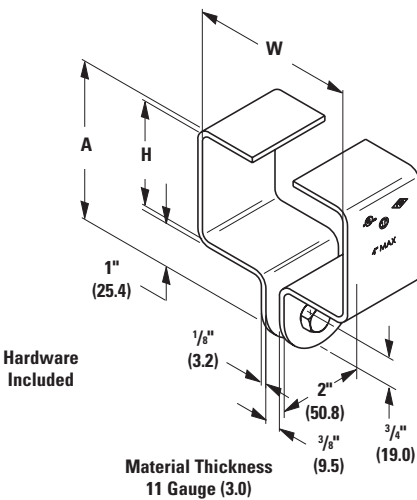
**Function:** Designed for attachment to composite wood joist beams. Use with eye rods, eye sockets, or angle bracket.

**Approvals:** Sizes 1 - 6 are Underwriters Laboratories Listed in the USA (**UL**) and Canada (**cUL**) list through 4" (100mm) pipe. All Fig. 130 Beam Clamps meet requirements of Factory Mutual Engineering (**FM**) and NFPA 13, through 4" (100mm) pipe.

**Finish:** Electro-Galvanized or Hot-Dip Galvanized

**Order By:** Figure number and finish.

Designed to meet or exceed requirements of FM DS 2-0.



| Part No. | Hardware Size | A<br>in. (mm)  | H<br>in. (mm) | W<br>in. (mm)  | Approx. Wt./100<br>Lbs. (kg) |
|----------|---------------|----------------|---------------|----------------|------------------------------|
| 130-1    | 3/8"-16       | 3 1/4" (82.5)  | 1 1/2" (38.1) | 2 5/16" (58.7) | 65 (29.5)                    |
| 130-2    | 3/8"-16       | 3 1/2" (88.9)  | 1 3/4" (44.4) | 2 1/2" (63.5)  | 70 (31.7)                    |
| 130-3    | 3/8"-16       | 3 1/4" (82.5)  | 1 1/2" (38.1) | 1 3/4" (44.4)  | 58 (26.3)                    |
| 130-4    | 3/8"-16       | 3 1/2" (88.9)  | 1 1/2" (38.1) | 3 1/2" (88.9)  | 83 (37.6)                    |
| 130-5†   | 1/2"-13       | 3 5/8" (92.1)  | 1 3/4" (44.4) | 3 1/2" (88.9)  | 86 (39.0)                    |
| 130-6†   | 1/2"-13       | 4 1/2" (114.3) | 2 1/2" (63.5) | 3 7/8" (98.4)  | 101 (45.8)                   |

‘H’ and ‘W’ are beam dimensions.

† Larger bolts and I-rods are required for 5" (125mm) and 6" (150mm) pipe sizes

## B3100 - Clevis Hanger for NFPA Sizes 3/4" (20mm) thru 2" (50mm) TOLCO Fig. 1NFPA - Clevis Hanger for NFPA Sizes 2 1/2" (65mm) thru 12" (300mm)

**Size Range:** 3/4" (20mm) to 12" (300mm)

**Material:** Steel

**Function:** Recommended for the suspension of non-insulated pipe or insulated pipe with a B3151 shield.

**Note:** When an oversized clevis is used, a pipe spacer should be placed over the cross bolt to assure that the lower U-strap will not move in on the bolt. When attaching seismic bracing to the clevis hangers, a 1CBS (clevis bolt spacer) must be installed.

**Order pipe sleeves Fig. 1CBS-(pipe size) separately.**

**Approvals:** Underwriter's Laboratories Listed in the USA (**UL**) and Canada (**cUL**) for sizes 3/4" (20) thru 12" (300). Factory Mutual Engineering Approved (**FM**) for 3/4" (20mm) thru 8" (200mm) pipe. Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 1 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 1. Rod sizes per National Fire Protection Association (**NFPA**) Pamphlet 13.

**Maximum Temperature:** 650°F (343°C).

**Standard Finish:** Plain, Electro-Galvanized, DURA-GREEN™, or Hot-Dip Galvanized also available in Stainless Steel

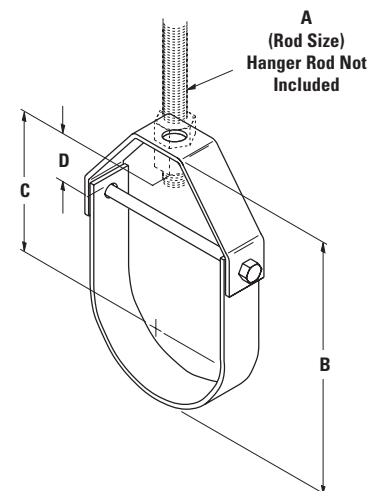
**Order By:** Figure number and finish

For pipe sizes under 2 1/2" (65mm) order B3100 Clevis Hanger, see chart below.

Designed to meet or exceed requirements of FM DS 2-0.



**B**  
Overall Height.  
**C**  
Bottom of hanger rod nut  
to center of pipe.  
**D**  
Bottom of hanger rod nut  
to top clevis bolt.



| Part No.    | Nominal Pipe Size<br>in. (mm) | Rod Size<br>A | B<br>in. (mm)    | C<br>in. (mm)     | D<br>in. (mm)  | Approx. Wt./100<br>Lbs. (kg) |
|-------------|-------------------------------|---------------|------------------|-------------------|----------------|------------------------------|
| B3100-3/4   | 3/4" (20)                     | 3/8"-16       | 2 5/8" (66.7)    | 1 9/16" (39.7)    | 9/16" (14.3)   | 29 (13.1)                    |
| B3100-1     | 1" (25)                       | 3/8"-16       | 2 11/16" (68.3)  | 1 9/16" (39.7)    | 1 1/16" (17.5) | 35 (15.9)                    |
| B3100-1 1/4 | 1 1/4" (32)                   | 3/8"-16       | 3 3/16" (81.0)   | 1 7/8" (47.6)     | 1 5/16" (29.8) | 40 (18.1)                    |
| B3100-1 1/2 | 1 1/2" (40)                   | 3/8"-16       | 3 3/8" (85.7)    | 1 15/16" (49.2)   | 1 1/4" (31.7)  | 42 (19.0)                    |
| B3100-2     | 2" (50)                       | 3/8"-16       | 4 9/16" (115.9)  | 2 7/8" (73.0)     | 1 1/8" (28.6)  | 52 (23.6)                    |
| 1NFPA-2 1/2 | 2 1/2" (65)                   | 3/8"-16       | 5 5/16" (134.9)  | 3 1/4" (82.5)     | 1" (25.4)      | 124 (56.2)                   |
| 1NFPA-3     | 3" (80)                       | 3/8"-16       | 5 15/16" (150.8) | 3 1/2" (88.9)     | 1 1/4" (31.7)  | 140 (63.5)                   |
| 1NFPA-3 1/2 | 3 1/2" (90)                   | 3/8"-16       | 6 7/16" (163.5)  | 3 3/4" (95.2)     | 1 1/4" (31.7)  | 152 (68.9)                   |
| 1NFPA-4     | 4" (100)                      | 3/8"-16       | 7 3/8" (187.3)   | 4 1/4" (107.9)    | 1 1/2" (38.1)  | 190 (86.2)                   |
| 1NFPA-5     | 5" (125)                      | 1/2"-13       | 8 15/16" (226.9) | 5 1/4" (133.3)    | 1 1/2" (38.1)  | 235 (106.6)                  |
| 1NFPA-6     | 6" (150)                      | 1/2"-13       | 9 13/16" (249.2) | 5 1/2" (139.7)    | 1 1/2" (38.1)  | 317 (143.8)                  |
| 1NFPA-8     | 8" (200)                      | 1/2"-13       | 12 9/16" (319.1) | 7 1/8" (181.0)    | 2" (50.8)      | 428 (194.1)                  |
| 1NFPA-10    | 10" (250)                     | 5/8"-11       | 16 1/4" (412.7)  | 9 5/8" (244.5)    | 3 1/4" (82.5)  | 918 (416.4)                  |
| 1NFPA-12    | 12" (300)                     | 5/8"-11       | 18 9/16" (471.5) | 10 13/16" (268.3) | 3 1/8" (79.4)  | 1086 (492.6)                 |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Pipe Hangers

## TOLCO Fig. 1CBS - Clevis Bolt Spacer

**Size Range:** Size 1" (25mm) thru 20" (500mm) clevis hanger

**Material:** Steel

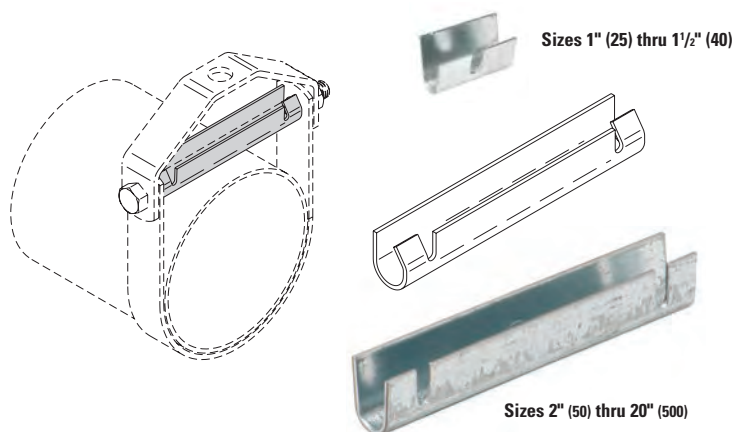
**Function:** Used as a spacer at a seismic brace location to keep clevis hanger from collapsing during seismic event.

**Approvals:** Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines OPM-0052-13, for 2½" - 8" (B3100) only

**Installation Note:** Fig. 1CBS fits easily over the cross bolt and attaches by pinching tabs down.

**Finish:** Pre-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish.



## OPM

| Part No. | Pipe Size<br>in. (mm) | Approx. Wt./100<br>lbs. (kg) |         |
|----------|-----------------------|------------------------------|---------|
| 1CBS-1   | 1" (25)               | 3.2                          | (1.4)   |
| 1CBS-1¼  | 1¼" (32)              | 4.1                          | (1.8)   |
| 1CBS-1½  | 1½" (40)              | 4.8                          | (2.2)   |
| 1CBS-2   | 2" (50)               | 9.4                          | (4.2)   |
| 1CBS-2½  | 2½" (65)              | 11.4                         | (5.2)   |
| 1CBS-3   | 3" (75)               | 13.9                         | (6.8)   |
| 1CBS-3½  | 3½" (90)              | 16.0                         | (7.2)   |
| 1CBS-4   | 4" (100)              | 18.0                         | (8.1)   |
| 1CBS-5   | 5" (125)              | 27.3                         | (12.4)  |
| 1CBS-6   | 6" (150)              | 32.5                         | (14.7)  |
| 1CBS-8   | 8" (200)              | 42.5                         | (19.2)  |
| 1CBS-10  | 10" (250)             | 72.7                         | (32.9)  |
| 1CBS-12  | 12" (300)             | 86.3                         | (39.1)  |
| 1CBS-14  | 14" (350)             | 157.6                        | (71.5)  |
| 1CBS-16  | 16" (400)             | 183.7                        | (83.3)  |
| 1CBS-18  | 18" (450)             | 224.6                        | (101.9) |
| 1CBS-20  | 20" (500)             | 254.0                        | (115.2) |

## TOLCO Fig. 25 - Surge Restrainer

**Size Range:** — One size fits ¾" (20mm) thru 2" (40mm) pipe.

**Material:** — Pre-Galvanized Steel

**Function:** — Designed to be used in conjunction with Fig. 200 band hangers to restrict the upward movement of piping as it occurs during sprinkler head activation or earthquake type activity. The surge restrainer is easily and efficiently installed by snapping into a locking position on the band hanger. This product is intended to satisfy the requirements as indicated in the National Fire Protection Association NFPA 13, 2016 edition, 9.2.3.4.4.1 and 9.2.3.4.4.4 Can be used to restrain either steel pipe or CPVC plastic Pipe.

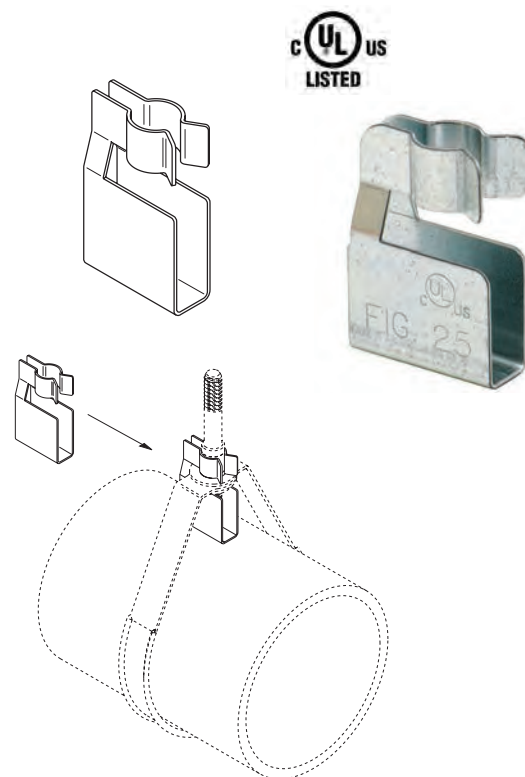
**Approvals:** — Underwriters Laboratories Listed only when used with band hanger Fig. 200, in the USA (UL) and Canada (cUL).

**Finish:** Pre-Galvanized

**Order By:** Figure number and band hanger, size from ¾" (20mm) thru 2" (40mm).

Patent #5,344,108

| Part No. | Approx. Wt./100<br>lbs. (kg) |       |
|----------|------------------------------|-------|
| 25       | 4.8                          | (2.2) |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 200 - "Trimline" Adjustable Band Hanger

## TOLCO Fig. 200F - "Trimline" Adjustable Band Hanger with Felt Lining for Copper Tubing

## TOLCO Fig. 200C - "Trimline" Adjustable Band Hanger with Plastic Coated

## TOLCO Fig. 200S - "Trimline" Adjustable Band Hanger with Removable Nut (For sizes 1" thru 2")

### Size Range:

Fig. 200 - 1/2" (15mm) thru 8" (200mm) pipe

**Material:** Steel, Pre-Galvanized

**Function:** For fire sprinkler and other general piping purposes. Knurled swivel nut design permits hanger adjustment after installation.

### Features:

- 1/2" (15mm) thru 2" (50mm) sizes have flared edges for ease of installation on all pipe types and protects CPVC plastic pipe from abrasion. Captured knurled nut design (flared top) on 1" thru 2" sizes keep nut from separating with hanger. Hanger is easily installed around pipe.
- 1/2" (15mm), 3/4" (20mm), and 2 1/2" (65mm) thru 8" (200mm) Spring tension on nut holds it securely in hanger before installation. Knurled nut is easily removed.
- For 1/2" (15mm) and 3/4" (20mm) sizes with non-captured knurl nuts order Fig. 200S

**Approvals:** Underwriters Laboratories listed (1/2" (15mm) thru 8" (200mm)) in the USA (**UL**) and Canada (**cUL**) for steel and CPVC plastic pipe and Factory Mutual Engineering Approved (**FM**) (3/4" (20mm) thru 8" (200mm)). Conforms to Federal Specifications WW-H-171E & A-A-1192A, Type 10 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 10.

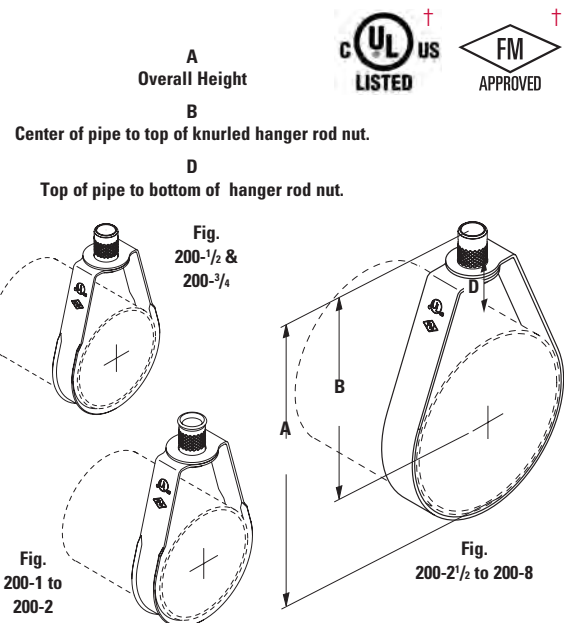
**Maximum Temperature:** 650°F (343°C)

**Finish:** Pre-Galvanized. Stainless Steel materials will be supplied with (2) hex nuts in place of a knurl nut.

**Order By:** Part number and pipe size

**\*\* Note:** For metric hanger rod sizes add the metric rod size to the figure number.  
Example: 200M8-1 1/2 or 200M10-1 1/2

† M8 rod size is not UL Listed or FM Approved



**Fig. 200C**  
200C-1 1/2 shown



**Fig. 200F**  
200F-1 1/2 shown



**Fig. 200**  
shown with captured nut  
1" thru 2" sizes only



**Fig. 200 & Fig. 200S**  
shown with  
non-captured nut

| Part No.** | Pipe Size<br>in. (mm) | Rod Size<br>in. mm** | A<br>in. (mm)   | B<br>in. (mm)  | D<br>in. (mm)   | Max. Rec. Load<br>lbs. (kN) | Approx. Wt./100<br>lbs. (kg) |
|------------|-----------------------|----------------------|-----------------|----------------|-----------------|-----------------------------|------------------------------|
| 200-1/2    | 1/2" (15)             | 3/8"-16 M8† or M10   | 3 1/8" (79.4)   | 2 5/8" (66.7)  | 1 11/32" (34.1) | 400 (1.78)                  | 11 (5.0)                     |
| 200-3/4    | 3/4" (20)             | 3/8"-16 M8† or M10   | 3 1/8" (79.4)   | 2 1/2" (63.5)  | 1 1/16" (27.0)  | 400 (1.78)                  | 11 (5.0)                     |
| 200-1      | 1" (25)               | 3/8"-16 M8† or M10   | 3 3/8" (85.7)   | 2 5/8" (66.7)  | 1 1/8" (28.6)   | 400 (1.78)                  | 12 (5.5)                     |
| 200-1 1/4  | 1 1/4" (32)           | 3/8"-16 M8† or M10   | 3 3/4" (94.0)   | 2 7/8" (73.0)  | 1 5/32" (29.3)  | 400 (1.78)                  | 13 (5.9)                     |
| 200-1 1/2  | 1 1/2" (40)           | 3/8"-16 M†8 or M10   | 3 7/8" (98.4)   | 2 7/8" (73.0)  | 1 3/16" (30.2)  | 400 (1.78)                  | 14 (6.4)                     |
| 200-2      | 2" (50)               | 3/8"-16 M8† or M10   | 4 1/2" (114.3)  | 3 9/16" (80.8) | 1 3/16" (30.2)  | 400 (1.78)                  | 15 (6.9)                     |
| 200-2 1/2  | 2 1/2" (65)           | 3/8"-16 M10          | 5 5/8" (142.9)  | 4 1/8" (104.7) | 1 7/16" (36.5)  | 600 (2.67)                  | 27 (12.3)                    |
| 200-3      | 3" (75)               | 3/8"-16 M10          | 5 7/8" (149.1)  | 4" (101.6)     | 1 1/4" (31.7)   | 600 (2.67)                  | 29 (13.3)                    |
| 200-3 1/2  | 3 1/2" (90)           | 3/8"-16 M10          | 7 3/8" (187.3)  | 5 1/4" (133.3) | 2 3/16" (55.6)  | 600 (2.67)                  | 34 (15.6)                    |
| 200-4      | 4" (100)              | 3/8"-16 M10          | 7 3/8" (187.3)  | 5" (127.0)     | 1 3/8" (34.9)   | 1000 (4.45)                 | 35 (16.0)                    |
| 200-5      | 5" (125)              | 1/2"-13 M12          | 9 1/8" (231.8)  | 6 1/4" (158.7) | 3 11/32" (84.9) | 1250 (5.56)                 | 66 (30.2)                    |
| 200-6      | 6" (150)              | 1/2"-13 M12          | 10 1/8" (257.2) | 6 3/4" (171.4) | 2 7/32" (56.3)  | 1250 (5.56)                 | 73 (33.4)                    |
| 200-8      | 8" (200)              | 1/2"-13 M12          | 13 1/8" (333.4) | 8 3/4" (222.2) | 3 7/32" (81.7)  | 1250 (5.56)                 | 136 (62.3)                   |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Pipe Hangers

## TOLCO Fig. 200H - Heavy Duty Band Hanger (For Trapeze)

**Size Range:** 2" (50mm) thru 4" (100mm) trapeze pipe size.

**Material:** Steel — Pre-Galvanized

**Function:** Designed primarily to support substantially heavier loads than is normally intended for the nominal hanger size. Used extensively to support trapeze installations and the increased loads from both above and below the trapeze assembly.

**Features:** Furnished with  $\frac{3}{8}$ "-16 or  $\frac{1}{2}$ "-13 adjusting threaded ring nut.

**Approvals:** Underwriters Laboratories listed in the USA (UL) and Canada (cUL). Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 10 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 10.

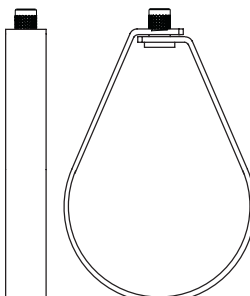
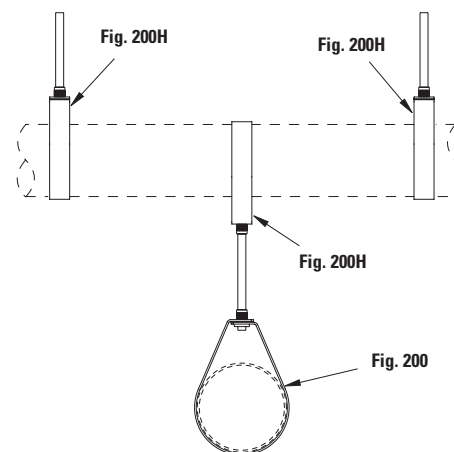
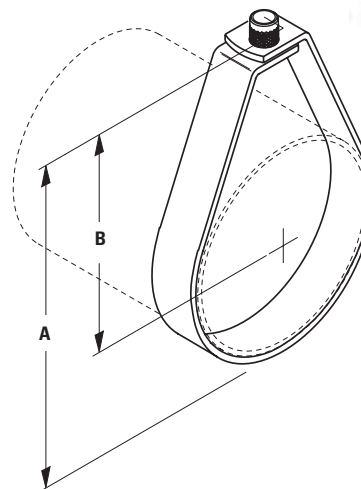
**Maximum Temperature:** 650°F (343°C)

**Finish:** Pre-Galvanized

**Order By:** Figure number, pipe size and rod size.

**Important Design Note.** Because of the increased loads applied to the trapeze assembly, both the upper trapeze supports as well as the lower hanging unit must be able to hold the maximum loads intended.

† If using metric rods the M8 rod size is not UL Listed



| Part No.                             | Pipe Size<br>in. (mm)  | Rod Size            | A<br>in. (mm)              | B<br>in. (mm)              | Approx. Wt./100<br>lbs. (kg) |
|--------------------------------------|------------------------|---------------------|----------------------------|----------------------------|------------------------------|
| 200H-2- $\frac{3}{8}$                | 2" (50)                | $\frac{3}{8}$ "-16† | $4\frac{9}{16}$ " (115.9)  | $3\frac{7}{32}$ " (81.7)   | 48 (21.8)                    |
| 200H-2- $\frac{1}{2}$                | 2" (50)                | $\frac{1}{2}$ "-13  | $4\frac{23}{32}$ " (119.8) | $3\frac{3}{8}$ " (85.7)    | 45 (20.4)                    |
| 200H-2 $\frac{1}{2}$ - $\frac{3}{8}$ | 2 $\frac{1}{2}$ " (65) | $\frac{3}{8}$ "-16† | $5\frac{5}{16}$ " (134.9)  | $3\frac{23}{32}$ " (94.4)  | 59 (26.7)                    |
| 200H-2 $\frac{1}{2}$ - $\frac{1}{2}$ | 2 $\frac{1}{2}$ " (65) | $\frac{1}{2}$ "-13  | $5\frac{15}{32}$ " (138.9) | $3\frac{7}{8}$ " (98.3)    | 56 (25.4)                    |
| 200H-3- $\frac{3}{8}$                | 3" (75)                | $\frac{3}{8}$ "-16† | $5\frac{3}{4}$ " (146.0)   | $3\frac{27}{32}$ " (97.6)  | 63 (28.6)                    |
| 200H-3- $\frac{1}{2}$                | 3" (75)                | $\frac{1}{2}$ "-13  | $5\frac{7}{8}$ " (148.1)   | $3\frac{31}{32}$ " (100.8) | 60 (27.2)                    |
| 200H-4- $\frac{3}{8}$                | 4" (100)               | $\frac{3}{8}$ "-16† | $6\frac{7}{8}$ " (174.6)   | $4\frac{7}{16}$ " (112.7)  | 76 (34.5)                    |
| 200H-4- $\frac{1}{2}$                | 4" (100)               | $\frac{1}{2}$ "-13  | $7\frac{1}{32}$ " (178.6)  | $4\frac{19}{32}$ " (116.7) | 73 (33.1)                    |

Select trapeze pipe size based on section modulus required for span of trapeze per information provided in NFPA 13.

All sizes are UL Listed to support up to 8" pipe at max spacing per NFPA 13.

For 6" (150mm) and 8" (200mm) trapeze pipe, consult factory.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## B3198H - Hinged Extension Split Pipe Clamp

**Size Range:** 3/8" (10mm) to 3" (80mm) pipe

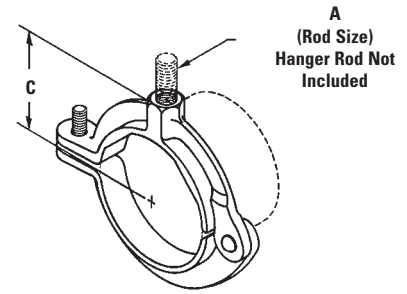
**Material:** Malleable Iron

**Function:** Designed for suspending non-insulated pipe horizontally or vertically.

**Approvals:** Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 25 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 12.

**Standard Finish:** Plain or Electro-Galvanized

**Order By:** Figure number and finish.



| Part No.    | Pipe Size<br>in. (mm) | Rod Size<br>A | C<br>in. (mm)  | Design Load<br>Lbs. kN | Approx. Wt./100<br>Lbs. kg |
|-------------|-----------------------|---------------|----------------|------------------------|----------------------------|
| B3198H-3/8  | 3/8" (10)             | 3/8"-16       | 31/32" (24.6)  | 180 (.80)              | 9 (4.1)                    |
| B3198H-1/2  | 1/2" (15)             | 3/8"-16       | 11/16" (27.0)  | 180 (.80)              | 12 (5.4)                   |
| B3198H-3/4  | 3/4" (20)             | 3/8"-16       | 17/32" (30.9)  | 180 (.80)              | 12 (5.4)                   |
| B3198H-1    | 1" (25)               | 3/8"-16       | 111/32" (34.1) | 180 (.80)              | 13 (5.9)                   |
| B3198H-11/4 | 11/4" (32)            | 3/8"-16       | 119/32" (39.7) | 180 (.80)              | 18 (8.1)                   |
| B3198H-11/2 | 11/2" (40)            | 3/8"-16       | 123/32" (43.6) | 180 (.80)              | 21 (9.5)                   |
| B3198H-2    | 2" (50)               | 3/8"-16       | 2" (50.8)      | 180 (.80)              | 44 (19.9)                  |
| B3198H-21/2 | 21/2" (65)            | 1/2"-13       | 211/32" (59.5) | 300 (1.33)             | 73 (33.1)                  |
| B3198H-3    | 3" (80)               | 1/2"-13       | 223/32" (69.0) | 300 (1.33)             | 95 (43.1)                  |



## B3198HCT - Hinged Extension Split Pipe Clamp

**Size Range:** 1/2" (15mm) to 2" (50mm) copper tubing

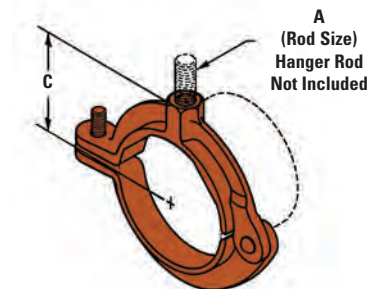
**Material:** Malleable Iron

**Function:** A rigid support to suspend tubing horizontally or vertically.

**Approvals:** Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 25 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 12.

**Standard Finish:** DURA-COPPER™

**Order By:** Figure number and finish.



| Part No.      | Tubing Size<br>in. (mm) | Rod Size<br>A | C<br>in. (mm) | Design Load<br>Lbs. (kN) | Approx. Wt./100<br>Lbs. (kg) |
|---------------|-------------------------|---------------|---------------|--------------------------|------------------------------|
| B3198HCT-1/2  | 1/2" (15)               | 3/8"-16       | 5/8" (15.9)   | 180 (.80)                | 8 (3.6)                      |
| B3198HCT-3/4  | 3/4" (20)               | 3/8"-16       | 13/16" (20.6) | 180 (.80)                | 10 (4.5)                     |
| B3198HCT-1    | 1" (25)                 | 3/8"-16       | 15/16" (23.8) | 180 (.80)                | 10 (4.5)                     |
| B3198HCT-11/4 | 11/4" (32)              | 3/8"-16       | 11/8" (28.6)  | 180 (.80)                | 14 (6.3)                     |
| B3198HCT-11/2 | 11/2" (40)              | 3/8"-16       | 19/16" (39.7) | 180 (.80)                | 18 (8.1)                     |
| B3198HCT-2    | 2" (50)                 | 3/8"-16       | 17/8" (47.6)  | 180 (.80)                | 23 (10.4)                    |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Pipe Hangers

## TOLCO Fig. 120 - "U" Hanger

**Size Range:** Size 3/4" (20mm) thru 8" (200mm) pipe

**Material:** Steel

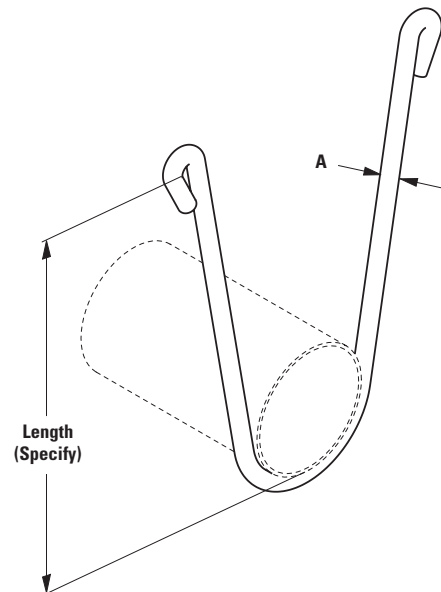
**Function:** Used to support piping from wood beams where no contraction is expected. Used extensively in automatic fire sprinkler systems.

**Approvals:** Complies with requirements of National Fire Protection Association (NFPA), Pamphlet 13.

**Maximum Temperature:** 750°F (399°C)

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, pipe size, length and finish



| Part No.  | Pipe Size<br>in. (mm) | A<br>in. (mm) | Fastener Size |
|-----------|-----------------------|---------------|---------------|
| 120-3/4   | 3/4" (20)             | 5/16" (7.9)   | 16 x 2*       |
| 120-1     | 1" (25)               | 5/16" (7.9)   | 16 x 2*       |
| 120-1 1/4 | 1 1/4" (32)           | 5/16" (7.9)   | 16 x 2*       |
| 120-1 1/2 | 1 1/2" (40)           | 5/16" (7.9)   | 16 x 2*       |
| 120-2     | 2" (50)               | 5/16" (7.9)   | 16 x 2*       |
| 120-2 1/2 | 2 1/2" (65)           | 3/8" (9.5)    | 3/8 x 2 1/2** |
| 120-3     | 3" (80)               | 3/8" (9.5)    | 3/8 x 2 1/2** |
| 120-3 1/2 | 3 1/2" (90)           | 3/8" (9.5)    | 3/8 x 2 1/2** |
| 120-4     | 4" (100)              | 3/8" (9.5)    | 1/2 x 3**     |
| 120-5     | 5" (125)              | 1/2" (12.7)   | 1/2 x 3**     |
| 120-6     | 6" (150)              | 1/2" (12.7)   | 1/2 x 3**     |
| 120-8     | 8" (200)              | 1/2" (12.7)   | 5/8 x 3**     |

\* Drive Screw

\*\* Lag Bolt

Note: 30° leg style for some sizes. Consult factory for availability.

## TOLCO Fig. 120MJ - Mutt & Jeff "U" Hanger

**Size Range:** Size  $\frac{3}{4}$ " (20mm) thru 8" (200mm) pipe

**Material:** Steel

**Function:** Used to support piping from wood beams where no contraction is expected. Used extensively in automatic fire sprinkler systems. Fig. 120MJ is used when the wood beam is on a diagonal.

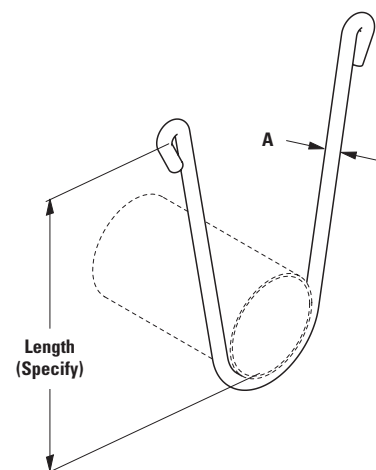
**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, side length and finish

| Part No.              | Pipe Size         |       | A                |        | Fastener Size                      |
|-----------------------|-------------------|-------|------------------|--------|------------------------------------|
|                       | in.               | (mm)  | in.              | (mm)   |                                    |
| 120MJ- $\frac{3}{4}$  | $\frac{3}{4}$ "   | (20)  | $\frac{5}{16}$ " | (7.9)  | 16 x 2*                            |
| 120MJ-1               | 1"                | (25)  | $\frac{5}{16}$ " | (7.9)  | 16 x 2*                            |
| 120MJ-1 $\frac{1}{4}$ | 1 $\frac{1}{4}$ " | (32)  | $\frac{5}{16}$ " | (7.9)  | 16 x 2*                            |
| 120MJ-1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ " | (40)  | $\frac{5}{16}$ " | (7.9)  | 16 x 2*                            |
| 120MJ-2               | 2"                | (50)  | $\frac{5}{16}$ " | (7.9)  | 16 x 2*                            |
| 120MJ-2 $\frac{1}{2}$ | 2 $\frac{1}{2}$ " | (65)  | $\frac{3}{8}$ "  | (9.5)  | $\frac{3}{8}$ x 2 $\frac{1}{2}$ ** |
| 120MJ-3               | 3"                | (80)  | $\frac{3}{8}$ "  | (9.5)  | $\frac{3}{8}$ x 2 $\frac{1}{2}$ ** |
| 120MJ-3 $\frac{1}{2}$ | 3 $\frac{1}{2}$ " | (90)  | $\frac{3}{8}$ "  | (9.5)  | $\frac{3}{8}$ x 2 $\frac{1}{2}$ ** |
| 120MJ-4               | 4"                | (100) | $\frac{3}{8}$ "  | (9.5)  | $\frac{1}{2}$ x 3**                |
| 120MJ-5               | 5"                | (125) | $\frac{1}{2}$ "  | (12.7) | $\frac{1}{2}$ x 3**                |
| 120MJ-6               | 6"                | (150) | $\frac{1}{2}$ "  | (12.7) | $\frac{1}{2}$ x 3**                |
| 120MJ-8               | 8"                | (200) | $\frac{1}{2}$ "  | (12.7) | $\frac{5}{8}$ x 3**                |

\* Drive Screw

\*\* Lag Bolt



## TOLCO Fig. 120W - Wrap Around "U" Hanger

**Size Range:** Size  $\frac{3}{4}$ " (20mm) thru 2" (50mm) pipe

**Material:** Steel

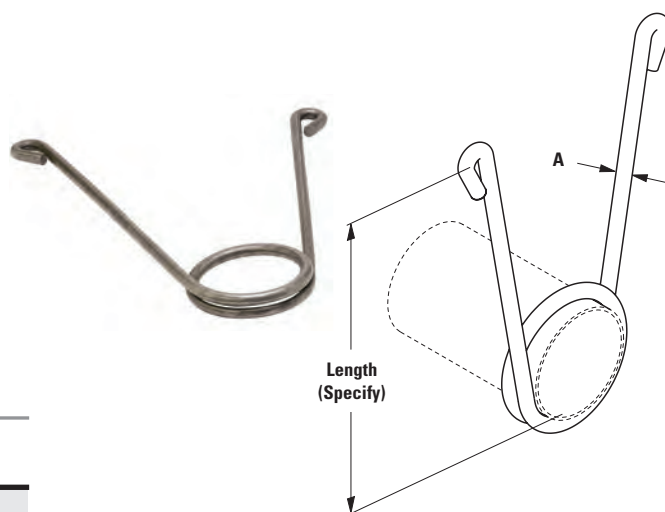
**Function:** Required for automatic fire protection agencies to be used on the end of branch lines to prevent pipe from whipping vertical and striking ceiling or beam.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, side length and finish

| Part No.             | Pipe Size         |      | A                |       | Fastener Size |
|----------------------|-------------------|------|------------------|-------|---------------|
|                      | in.               | (mm) | in.              | (mm)  |               |
| 120W- $\frac{3}{4}$  | $\frac{3}{4}$ "   | (20) | $\frac{5}{16}$ " | (7.9) | 16 x 2*       |
| 120W-1               | 1"                | (25) | $\frac{5}{16}$ " | (7.9) | 16 x 2*       |
| 120W-1 $\frac{1}{4}$ | 1 $\frac{1}{4}$ " | (32) | $\frac{5}{16}$ " | (7.9) | 16 x 2*       |
| 120W-1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ " | (40) | $\frac{5}{16}$ " | (7.9) | 16 x 2*       |
| 120W-2               | 2"                | (50) | $\frac{5}{16}$ " | (7.9) | 16 x 2*       |

\* Drive Screw



Note: 30° leg style for some sizes. Consult factory for availability.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Pipe Hangers

## TOLCO Fig. 120RWA - (Model B) Retrofit Wrap Around "U" Hanger Clamp

**Size Range:** 1" (25mm) thru 6" (150mm) pipe

**Material:** Steel

**Function:** Designed to restrain movement of the pipe within standard U-hangers as required by NFPA 13. Where retrofit capability is crucial, the Fig. 120RWA is a labor efficient alternative to the standard B-Line series Fig. 120W wrap around U-hanger.

Fig. 120RWA can also be used in new installations.

**Features** Installs easily by tightening two hex nuts. Features a unique bracing slot that locks onto a standard U-hanger to become a solid unit that will stabilize the pipe during seismic activity or sprinkler head activation. Designed to be used in retrofit or new construction applications. Will clamp to existing U-Hangers without restriction to leg angle.

**Approvals:** Underwriters Laboratories listed in the USA (UL) and Canada (cUL) as a restrainer. NFPA 13 (2016) 9.3.6.3.

**Finish:** Plain and Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, type numbers and pipe size

**Ordering Note:** Order by the following type and pipe size:

Type 1 — (1" (25mm) and 1 1/4" (32mm) pipe size)

Type 2 — (1 1/2" (40mm) and 2" (50mm) pipe size)

Type 3 — (2 1/2" (65mm) and 3" (80mm) pipe size)

Type 4 — (4" (100mm) pipe size)

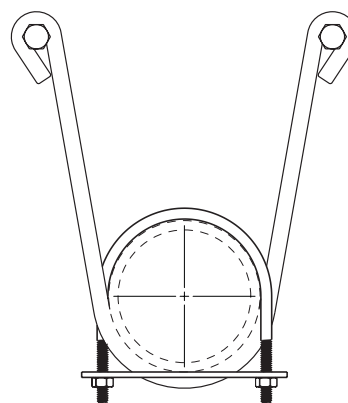
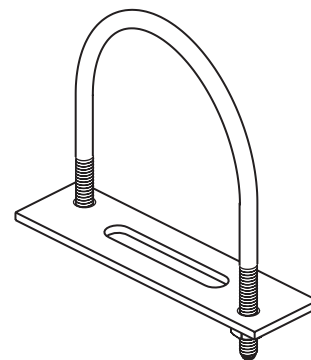
Type 6 — (5" (125mm) and 6" (150mm) pipe size)

**Important Note:** The bracing slot feature is sized to fit the U-Hanger rod schedule as required by NFPA 13 as follows:

5/16" (7.9mm) rod for up to 2" (50mm) pipe

3/8" (9.5mm) rod for 2 1/2" (65mm) - 6" (160mm) pipe

For other rod size requirements consult factory.



| Part No.           | Type | Pipe Size<br>in. (mm) |
|--------------------|------|-----------------------|
| 120RWA-TYPE1-1     | 1    | 1" (20)               |
| 120RWA-TYPE1-1 1/4 | 1    | 1 1/4" (25)           |
| 120RWA-TYPE2-1 1/2 | 2    | 1 1/2" (40)           |
| 120RWA-TYPE2-2     | 2    | 2" (50)               |
| 120RWA-TYPE3-2 1/2 | 3    | 2 1/2" (65)           |
| 120RWA-TYPE3-3     | 3    | 3" (80)               |
| 120RWA-TYPE4-3 1/2 | 4    | 3 1/2" (90)           |
| 120RWA-TYPE4-4     | 4    | 4" (100)              |
| 120RWA-TYPE6-5     | 6    | 5" (125)              |
| 120RWA-TYPE6-6     | 6    | 6" (150)              |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## B3373 - Standard Riser Clamp B3373C - PVC Coated Standard Riser Clamp

**Size Range:** (B3373) 1/2" (15mm) thru 30" (760mm) pipe  
(B3373C) 1/2" (15mm) thru 6" (150mm) pipe

**Material:** Steel

**Function:** Used for supporting vertical piping.

**Approvals:** Underwriters Laboratories Listed in the USA (UL), Canada (cUL) 3/4" (20mm) - 8" (200mm). Factory Mutual Engineering Approved (FM), 3/4" (20mm) thru 8" (200mm). Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 8, and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 8.

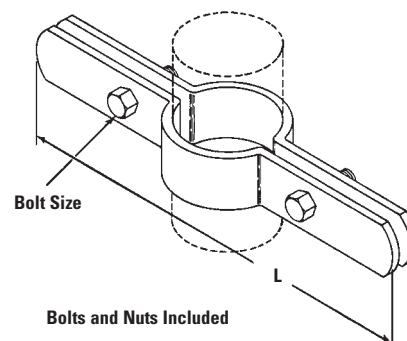
**Maximum Temperature:** 650°F (343°C)

**Finish:** Plain. Contact customer service for alternative finishes and materials.

### Order By:

Figure number, pipe size and finish.

Designed to meet or exceed requirements of FM DS 2-0.



B3373C



| Part No.    | Pipe Size<br>in. (mm) | L<br>in. (mm)     | Bolt Size        | Approx. Wt./100<br>Lbs. (kg) |
|-------------|-----------------------|-------------------|------------------|------------------------------|
| B3373-1/2   | 1/2" (15)             | 9" (228.6)        | 3/8"-16 x 1 1/4" | 101 (45.9)                   |
| B3373-3/4   | 3/4" (20)             | 9 1/4" (234.9)    | 3/8"-16 x 1 1/4" | 105 (47.7)                   |
| B3373-1     | 1" (25)               | 9 9/16" (242.9)   | 3/8"-16 x 1 1/4" | 109 (49.4)                   |
| B3373-1 1/4 | 1 1/4" (32)           | 10" (254.0)       | 3/8"-16 x 1 1/4" | 112 (50.9)                   |
| B3373-1 1/2 | 1 1/2" (40)           | 10 1/4" (260.3)   | 3/8"-16 x 1 1/2" | 113 (51.1)                   |
| B3373-2     | 2" (50)               | 10 3/4" (273.0)   | 3/8"-16 x 1 1/2" | 165 (75.0)                   |
| B3373-2 1/2 | 2 1/2" (65)           | 11 1/4" (285.7)   | 3/8"-16 x 1 1/2" | 180 (81.6)                   |
| B3373-3     | 3" (80)               | 11 15/16" (303.2) | 3/8"-16 x 1 1/2" | 195 (88.4)                   |
| B3373-3 1/2 | 3 1/2" (90)           | 12 3/8" (314.3)   | 1/2"-13 x 1 3/4" | 217 (98.5)                   |
| B3373-4     | 4" (100)              | 12 7/8" (327.0)   | 1/2"-13 x 1 3/4" | 228 (103.5)                  |
| B3373-5     | 5" (125)              | 14" (355.6)       | 1/2"-13 x 1 3/4" | 480 (217.7)                  |
| B3373-6     | 6" (150)              | 15 3/16" (385.8)  | 1/2"-13 x 2"     | 526 (238.6)                  |
| B3373-8     | 8" (200)              | 17 3/4" (450.8)   | 5/8"-11 x 2 1/2" | 957 (434.1)                  |
| B3373-10    | 10" (250)             | 19 7/16" (493.7)  | 5/8"-11 x 2 1/2" | 1101 (499.4)                 |
| B3373-12    | 12" (300)             | 21 11/16" (550.9) | 5/8"-11 x 3"     | 1622 (735.7)                 |
| B3373-14    | 14" (350)             | 23 9/16" (598.5)  | 5/8"-11 x 3"     | 1732 (785.6)                 |

**Notes:** For ductile iron (D.I.) pipe use part number B3373DI-pipe size. Contact B-Line Engineering for more information.

For larger sizes, consult the full line pipe hanger catalog.

# Pipe Clamps

## B3140 - Standard Pipe Clamp

## B3140C - Standard Pipe Clamp PVC Coated

## B3140F - Standard Pipe Clamp Felt Lined



**Size Range:** B3140/B3140C Size 1/2" (15mm) thru 12" (300mm) pipe.

**Material:** Steel

**Function:** Recommended for the suspension of non-insulated pipe or insulated pipe with B3151 shields. (Use B3200 weldless eye nut, B3210 eye rod or B3211 welded eye rod.) B3140F and B3140C are designed to help reduce noise and vibration and/or prevent electrolysis.

**Approvals:** Underwriters Laboratories Listed in the USA (UL), Canada (cUL) 3/4" (20mm) - 12" (300mm), and approved by Factory Mutual Engineering (FM), 3/4" (20mm) - 8" (200mm). Federal Specification WW-H-171E & A-A-1192A, Type 4, and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 4.

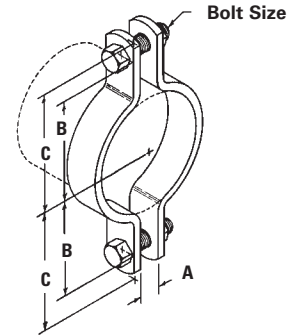
**Note:** For piping that requires sway bracing refer to Fig. 4A.

**Maximum Temperature:** — 750°F (399°C)

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, pipe size and finish.

**Order Note:** When ordering B3140F allow for 3/16" (4.8mm) felt on each half of clamp.



Designed to meet or exceed requirements of FM DS 2-0.



B3140



B3140C



B3140F

| Part No.    | Pipe Size<br>in. (mm) | A<br>in. (mm)  | B<br>in. (mm)    | C<br>in. (mm)    | Bolt Size | Approx. Wt./100<br>lbs. (kg) |
|-------------|-----------------------|----------------|------------------|------------------|-----------|------------------------------|
| B3140-1/2   | 1/2" (15)             | 3/8" (9.5)     | 3 1/32" (24.6)   | 1 17/32" (38.9)  | 5/16"-18  | 30 (13.6)                    |
| B3140-3/4   | 3/4" (20)             | 9/16" (14.3)   | 1 3/32" (27.8)   | 1 21/32" (42.0)  | 5/16"-18  | 31 (14.0)                    |
| B3140-1     | 1" (25)               | 9/16" (14.3)   | 1 5/16" (33.3)   | 1 7/8" (47.6)    | 5/16"-18  | 33 (14.5)                    |
| B3140-1 1/4 | 1 1/4" (32)           | 1 7/32" (13.5) | 1 7/16" (36.5)   | 2" (50.8)        | 5/16"-18  | 39 (17.7)                    |
| B3140-1 1/2 | 1 1/2" (40)           | 1 9/32" (15.1) | 1 21/32" (42.0)  | 2 1/32" (56.4)   | 5/16"-18  | 41 (18.6)                    |
| B3140-2     | 2" (50)               | 9/16" (14.3)   | 2 1/8" (54.0)    | 2 3/4" (69.8)    | 1/2"-13   | 118 (53.5)                   |
| B3140-2 1/2 | 2 1/2" (65)           | 5/8" (15.9)    | 2 21/32" (67.5)  | 3 9/32" (83.3)   | 1/2"-13   | 130 (58.9)                   |
| B3140-3     | 3" (75)               | 5/8" (15.9)    | 2 15/16" (74.6)  | 3 9/16" (90.5)   | 1/2"-13   | 150 (68.0)                   |
| B3140-3 1/2 | 3 1/2" (90)           | 5/8" (15.9)    | 3 5/32" (80.1)   | 3 25/32" (96.0)  | 1/2"-13   | 158 (71.6)                   |
| B3140-4     | 4" (100)              | 3/4" (19.0)    | 3 9/16" (90.5)   | 4 5/16" (109.5)  | 5/8"-11   | 239 (108.4)                  |
| B3140-5     | 5" (125)              | 3/4" (19.0)    | 4 1/8" (104.8)   | 4 7/8" (123.8)   | 5/8"-11   | 272 (123.4)                  |
| B3140-6     | 6" (150)              | 7/8" (22.2)    | 4 15/16" (125.4) | 5 13/16" (147.6) | 3/4"-10   | 541 (245.4)                  |
| B3140-8     | 8" (200)              | 1" (25.4)      | 6 1/16" (154.0)  | 6 15/16" (176.2) | 3/4"-10   | 642 (291.2)                  |
| B3140-10    | 10" (250)             | 1" (25.4)      | 7 3/8" (187.3)   | 8 11/16" (220.7) | 7/8"-9    | 1366 (619.6)                 |
| B3140-12    | 12" (300)             | 1" (25.4)      | 8 7/16" (214.3)  | 9 3/4" (247.6)   | 7/8"-9    | 1543 (699.9)                 |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## B2400 - Standard Pipe Strap

**Size Range:** 1/2" (15mm) thru 24" (600mm) pipe

**Material:** Steel

**Function:** Designed for supporting pipe runs from strut supports.

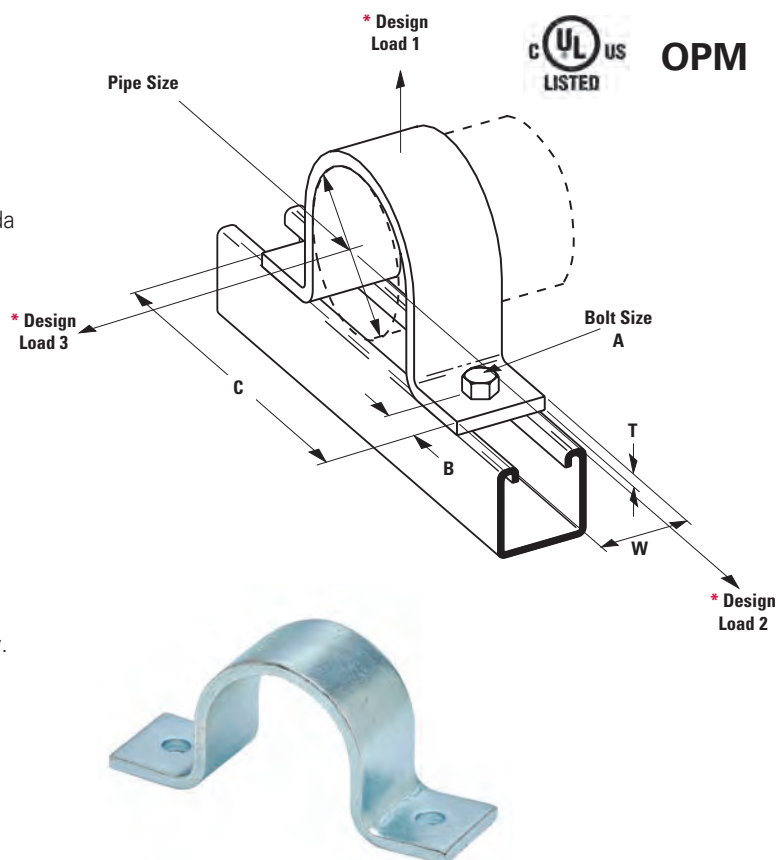
**Approvals:** Underwriters Laboratories Listed (UL), Canada (cUL) for B2400-3/4" thru B2400-8". Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 26 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 26. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines OPM-0052-13

**Finish:** Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, pipe size and finish

**Note:** Ductile iron sizes available.

Special "B" dimensions available on request, consult factory.



| Part No.    | Pipe Size<br>in. (mm) | A<br>in. (mm) | B<br>in. (mm)  | C<br>in. (mm)     | T<br>in. (mm) | W<br>in. (mm) |
|-------------|-----------------------|---------------|----------------|-------------------|---------------|---------------|
| B2400-1/2   | 1/2" (15)             | 5/16" (7.9)   | 7/16" (11.1)   | 2 13/16" (71.4)   | 10 Ga. (3.4)  | 1 5/8" (41.3) |
| B2400-3/4   | 3/4" (20)             | 5/16" (7.9)   | 7/16" (11.1)   | 3" (76.2)         | 10 Ga. (3.4)  | 1 5/8" (41.3) |
| B2400-1     | 1" (25)               | 5/16" (7.9)   | 7/16" (11.1)   | 3 17/32" (89.7)   | 10 Ga. (3.4)  | 1 5/8" (41.3) |
| B2400-1 1/4 | 1 1/4" (32)           | 5/16" (7.9)   | 7/16" (11.1)   | 3 3/4" (95.2)     | 10 Ga. (3.4)  | 1 5/8" (41.3) |
| B2400-1 1/2 | 1 1/2" (40)           | 5/16" (7.9)   | 7/16" (11.1)   | 4 1/16" (103.2)   | 10 Ga. (3.4)  | 1 5/8" (41.3) |
| B2400-2     | 2" (50)               | 7/16" (11.1)  | 1 1/16" (17.4) | 5 21/32" (143.6)  | 1/4" (6.3)    | 1 5/8" (41.3) |
| B2400-2 1/2 | 2 1/2" (65)           | 7/16" (11.1)  | 1 1/16" (17.4) | 6 5/32" (156.3)   | 1/4" (6.3)    | 1 5/8" (41.3) |
| B2400-3     | 3" (80)               | 7/16" (11.1)  | 1 1/16" (17.4) | 6 25/32" (172.2)  | 1/4" (6.3)    | 1 5/8" (41.3) |
| B2400-3 1/2 | 3 1/2" (90)           | 7/16" (11.1)  | 1 1/16" (17.4) | 7 3/32" (184.9)   | 1/4" (6.3)    | 1 5/8" (41.3) |
| B2400-4     | 4" (100)              | 9/16" (14.3)  | 1 1/16" (17.4) | 7 25/32" (197.6)  | 1/4" (6.3)    | 1 5/8" (41.3) |
| B2400-5     | 5" (125)              | 9/16" (14.3)  | 1 1/16" (17.4) | 8 7/8" (225.4)    | 1/4" (6.3)    | 1 5/8" (41.3) |
| B2400-6     | 6" (150)              | 9/16" (14.3)  | 1 1/16" (17.4) | 9 15/16" (252.4)  | 1/4" (6.3)    | 1 5/8" (41.3) |
| B2400-8     | 8" (200)              | 9/16" (14.3)  | 1 1/16" (17.4) | 11 31/32" (304.0) | 1/4" (6.3)    | 1 5/8" (41.3) |

For larger sizes, consult the full line pipe hanger catalog.

\* See OPM-0052-13 for design loads.

## TOLCO Fig. 22 - Hanger for CPVC Plastic Pipe & IPS Steel Pipe Single Fastener Strap



**Size Range:** 3/4" (20mm) thru 2" (50mm) CPVC pipe

**Material:** Pre-Galvanized Steel

**Function:** Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. The product acts as a hanger when tab is upward and the fastener screw is in the horizontal position. Fig. 22 can be installed on the top of a beam, but in this situation acts as a guide to the piping which is supported by the beam itself. It is not intended to support CPVC pipe from under a flat horizontal surface, such as a ceiling.

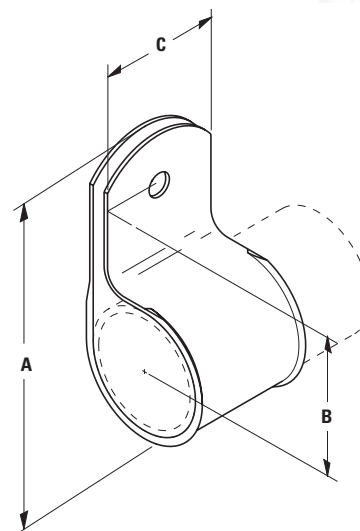
**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (1) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Features:** Fig. 22 incorporates features which protect the pipe and ease installation. The flared edge design protects CPVC pipe from any rough surface. It is easily attached to the building structure using the special UL Listed hex head self threading screw\* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment to be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

**Finish:** Pre-Galvanized

**Order By:** Figure number and pipe size.

\* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.



| Part No. | CPVC<br>Pipe Size<br>in. (mm) | A<br>in. (mm)  | B<br>in. (mm) | C<br>in. (mm) | Max. Hanger<br>Spacing<br>Ft. (m) | Fastener Hex<br>Head Size<br>in. (mm) | Approx.<br>Wt./100<br>Lbs. (kg) |
|----------|-------------------------------|----------------|---------------|---------------|-----------------------------------|---------------------------------------|---------------------------------|
| 22-3/4   | 3/4" (20)                     | 27/16" (61.9)  | 15/16" (33.3) | 13/16" (30.2) | 5'-6" (1.67)                      | 5/16" (7.9)                           | 9 (4.1)                         |
| 22-1     | 1" (25)                       | 211/16" (68.3) | 17/16" (36.5) | 13/16" (30.2) | 6'-0" (1.83)                      | 5/16" (7.9)                           | 9 (4.1)                         |
| 22-1 1/4 | 1 1/4" (32)                   | 31/16" (77.8)  | 15/8" (42.3)  | 13/16" (30.2) | 6'-6" (1.98)                      | 5/16" (7.9)                           | 11 (5.0)                        |
| 22-1 1/2 | 1 1/2" (40)                   | 35/16" (84.1)  | 13/4" (44.4)  | 13/16" (30.2) | 7'-0" (2.13)                      | 5/16" (7.9)                           | 12 (5.4)                        |
| 22-2     | 2" (50)                       | 33/4" (95.2)   | 21/8" (54.6)  | 13/16" (30.2) | 8'-0" (2.44)                      | 5/16" (7.9)                           | 15 (6.8)                        |

### Reduced Spacing For IPS Pipe

| Part No. | IPS<br>Pipe Size<br>in. (mm) | Max. Hanger<br>Spacing<br>Ft. (m) |
|----------|------------------------------|-----------------------------------|
| 22-3/4   | 3/4" (20)                    | 1'-9" (1.67)                      |
| 22-1     | 1" (25)                      | 1'-10" (1.83)                     |
| 22-1 1/4 | 1 1/4" (32)                  | 2'-4" (1.98)                      |
| 22-1 1/2 | 1 1/2" (40)                  | 2'-9" (2.13)                      |
| 22-2     | 2" (50)                      | 3'-6" (2.44)                      |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# TOLCO Fig. 22L2 - One Hole Hanger/Restrainer for CPVC & Steel Pipe

**Size Range:** 3/4" (20mm) thru 2" (50mm) CPVC & steel pipe

**Material:** Pre-Galvanized Steel

**Function:** cULus Listed to perform as a hanger and restrainer for CPVC or IPS piping systems. The innovative design also allows for a preferred installation location close to a CPVC fitting without applying damaging compression forces on the pipe which could result in serious Mechanical ESC (Environmental Stress Cracking).

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) to support fire sprinkler piping. Can be installed in wood or into minimum 20 gauge (0.9mm) steel using (1) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Installation Note:** Comes in open position for easier installation. Because of multi – structural installation possibilities, specific fastener not included; see notes below for various applications.

**For Concrete Installation** — UL requires a minimum test load of 340 lbs for CPVC hangers and 750 lbs for steel pipe hangers; verify anchors meet or exceed these requirements.

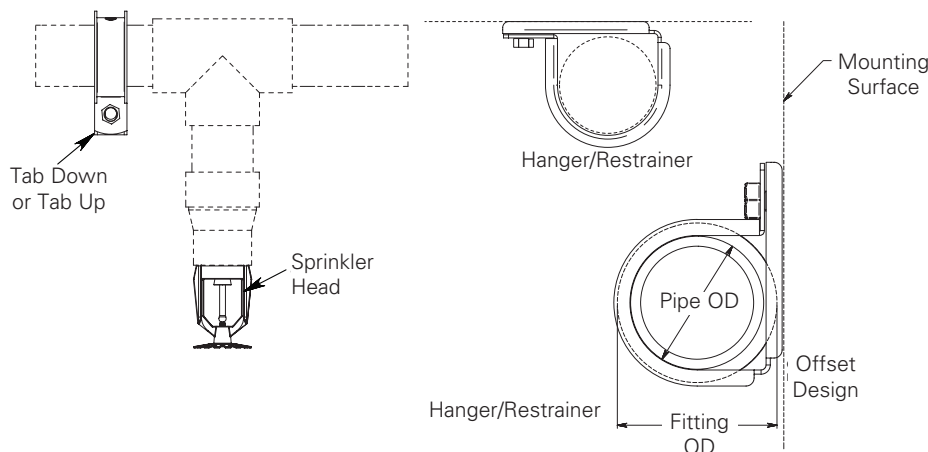
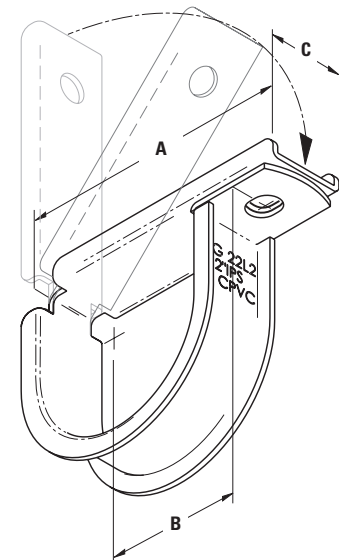
**For Wood Installation** — #14 x 1 1/2" wood screws will support the required load for cULus.

**For Steel Installation** — 1/4" x 1" (min. 20ga steel) Tek type screw will support required UL load.

**Finish:** Pre-Galvanized

**Order By:** Part number

*Patent Pending*



| Part No.   | CPVC or Steel<br>Pipe Size<br>in. (mm) | A<br>in. (mm)   | B<br>in. (mm)  | C<br>in. (mm) | Max. Hanger<br>Spacing - CPVC<br>Ft. (m) | Max. Hanger<br>Spacing - Steel<br>Ft. (m) | Approx.<br>Wt./100<br>Lbs. (kg) |
|------------|----------------------------------------|-----------------|----------------|---------------|------------------------------------------|-------------------------------------------|---------------------------------|
| 22L2-3/4   | 3/4" (20)                              | 2 3/16" (55.6)  | 1 5/16" (23.8) | 3/4" (19.0)   | 5 1/2 (1.67)                             | NA (NA)                                   | 9 (4.1)                         |
| 22L2-1     | 1" (25)                                | 2 1/2" (63.5)   | 1 1/8" (28.6)  | 3/4" (19.0)   | 6 (1.83)                                 | 12 (3.66)                                 | 9 (4.1)                         |
| 22L2-1 1/4 | 1 1/4" (32)                            | 2 13/16" (71.4) | 1 1/4" (31.7)  | 3/4" (19.0)   | 6 1/2 (1.98)                             | 12 (3.66)                                 | 11 (5.0)                        |
| 22L2-1 1/2 | 1 1/2" (40)                            | 3 1/8" (79.4)   | 1 7/16" (36.5) | 3/4" (19.0)   | 7 (2.13)                                 | 15 (4.57)                                 | 12 (5.4)                        |
| 22L2-2     | 2" (50)                                | 3 9/16" (90.5)  | 1 5/8" (41.3)  | 3/4" (19.0)   | 8 (2.44)                                 | 15 (4.57)                                 | 15 (6.8)                        |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 23 - Hanger for CPVC Plastic Pipe & IPS Steel Pipe Double Fastener Strap (B-Line B3182)



**Size Range:** 3/4" (20mm) thru 3" (80mm) CPVC pipe

**Material:** Pre-Galvanized Steel

**Function:** Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. Fig. 23 can be installed on the top, bottom or side of a beam.

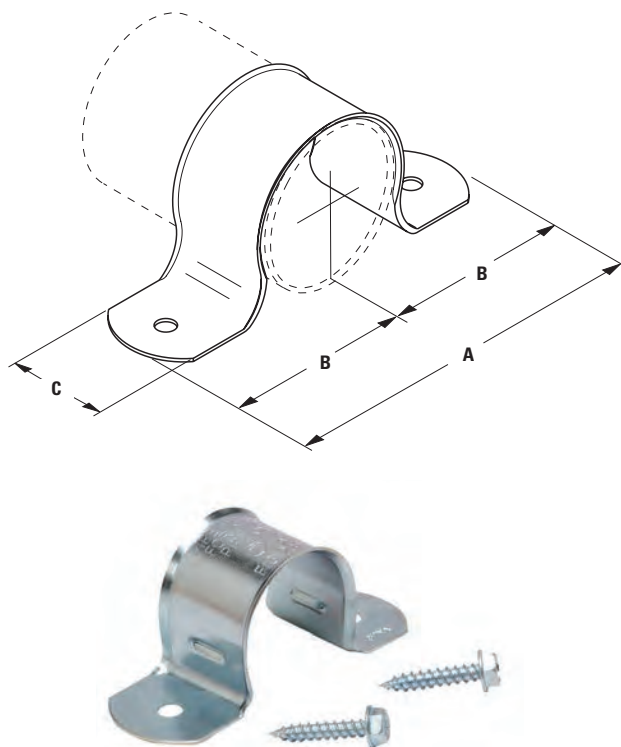
**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) sizes 3/4" (20mm) thru 2" (50mm) to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (2) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Features:** Fig. 23 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. It also incorporates snap restrainers allowing easier and faster installation. Easily attaches to the building structure using the two UL Listed hex head self threading screws\* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

**Finish:** Pre-Galvanized

**Order By:** Figure number and pipe size

\* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.



| Part No. | CPVC<br>Pipe Size<br>in. (mm) | A<br>in. (mm)   | B<br>in. (mm)   | C<br>in. (mm)  | Max. Hanger<br>Spacing<br>Ft. (m) | Fastener Hex<br>Head Size<br>in. (mm) | Approx.<br>Wt./100<br>Lbs. (kg) |
|----------|-------------------------------|-----------------|-----------------|----------------|-----------------------------------|---------------------------------------|---------------------------------|
| 23-3/4   | 3/4" (20)                     | 3 1/8" (79.4)   | 1 9/16" (39.7)  | 1 3/16" (30.2) | 5 1/2 (1.67)                      | 5/16" (7.9)                           | 9 (4.1)                         |
| 23-1     | 1" (25)                       | 3 3/8" (85.7)   | 1 11/16" (42.9) | 1 3/16" (30.2) | 6 (1.83)                          | 5/16" (7.9)                           | 9 (4.1)                         |
| 23-1 1/4 | 1 1/4" (32)                   | 4 3/16" (106.4) | 2 3/32" (53.1)  | 1 3/16" (30.2) | 6 1/2 (1.98)                      | 5/16" (7.9)                           | 11 (5.0)                        |
| 23-1 1/2 | 1 1/2" (40)                   | 4 7/16" (112.7) | 2 7/32" (56.3)  | 1 3/16" (30.2) | 7 (2.13)                          | 5/16" (7.9)                           | 12 (5.4)                        |
| 23-2     | 2" (50)                       | 4 7/8" (123.8)  | 2 7/16" (61.9)  | 1 3/16" (30.2) | 8 (2.44)                          | 5/16" (7.9)                           | 15 (6.8)                        |
| 23-2 1/2 | 2 1/2" (65)                   | 5 3/8" (136.5)  | 2 11/16" (68.3) | 1 3/16" (30.2) | Consult Factory                   | 5/16" (7.9)                           | 22 (10.0)                       |
| 23-3     | 3" (80)                       | 6" (152.4)      | 3" (76.2)       | 1 3/16" (30.2) | Consult Factory                   | 5/16" (7.9)                           | 25 (11.3)                       |

### Reduced Spacing For IPS Pipe

| Part No. | IPS<br>Pipe Size<br>in. (mm) | Max. Hanger<br>Spacing<br>Ft. (m) |
|----------|------------------------------|-----------------------------------|
| 23-3/4   | 3/4" (20)                    | 1'-9" (1.67)                      |
| 23-1     | 1" (25)                      | 1'-10" (1.83)                     |
| 23-1 1/4 | 1 1/4" (32)                  | 2'-4" (1.98)                      |
| 23-1 1/2 | 1 1/2" (40)                  | 2'-9" (2.13)                      |
| 23-2     | 2" (50)                      | 3'-6" (2.44)                      |
| 23-2 1/2 | 2 1/2" (65)                  | Consult Factory                   |
| 23-3     | 3" (80)                      | Consult Factory                   |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 24 - Hanger for CPVC Plastic Pipe & IPS Steel Pipe Double Fastener Strap Side Mounted (B-Line B3183)



**Size Range:** 3/4" (20mm) thru 2" (50mm) CPVC pipe

**Material:** Pre-Galvanized Steel

**Function:** Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. Can be installed on the top or on the bottom of a beam.

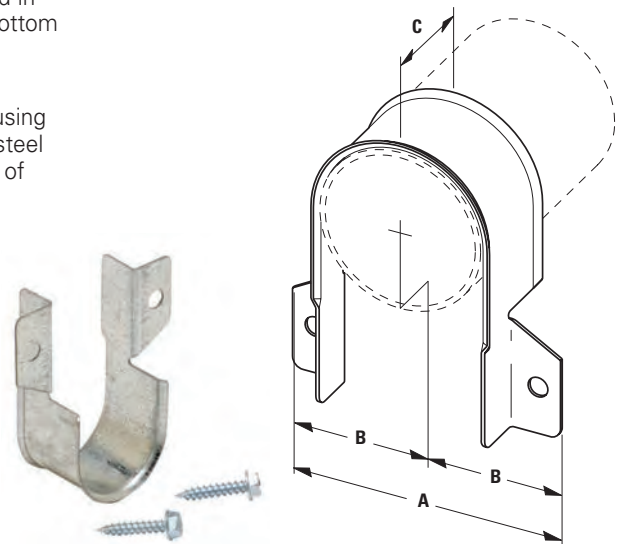
**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.912mm) steel using (2) 1/4" x 1" tek type screws. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Features:** Fig. 24 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. Easily attaches to the building structure using the two UL Listed hex head self threading screws\* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

**Finish:** Pre-Galvanized

**Order By:** Figure number and pipe size

\* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.



| Part No. | CPVC<br>Pipe Size<br>in. (mm) | A<br>in. (mm)   | B<br>in. (mm)   | C<br>in. (mm)  | Max. Hanger<br>Spacing<br>Ft. (m) | Fastener Hex<br>Head Size<br>in. (mm) | Approx.<br>Wt./100<br>Lbs. (kg) |
|----------|-------------------------------|-----------------|-----------------|----------------|-----------------------------------|---------------------------------------|---------------------------------|
| 24-3/4   | 3/4" (20)                     | 2 5/16" (58.7)  | 1 5/32" (27.8)  | 1 3/16" (30.2) | 5 1/2 (1.67)                      | 5/16" (7.9)                           | 9 (4.1)                         |
| 24-1     | 1" (25)                       | 2 5/8" (66.7)   | 1 5/16" (33.3)  | 1 3/16" (30.2) | 6 (1.83)                          | 5/16" (7.9)                           | 9 (4.1)                         |
| 24-1 1/4 | 1 1/4" (32)                   | 3" (76.2)       | 1 1/2" (38.1)   | 1 3/16" (30.2) | 6 1/2 (1.98)                      | 5/16" (7.9)                           | 11 (5.0)                        |
| 24-1 1/2 | 1 1/2" (40)                   | 3 1/4" (82.5)   | 1 5/8" (42.3)   | 1 3/16" (30.2) | 7 (2.13)                          | 5/16" (7.9)                           | 12 (5.4)                        |
| 24-2     | 2" (50)                       | 3 11/16" (93.7) | 1 27/32" (43.6) | 1 3/16" (30.2) | 8 (2.44)                          | 5/16" (7.9)                           | 15 (6.8)                        |

### Reduced Spacing For IPS Pipe

| Part No. | IPS<br>Pipe Size<br>in. (mm) | Max. Hanger<br>Spacing<br>Ft. (m) |
|----------|------------------------------|-----------------------------------|
| 24-3/4   | 3/4" (20)                    | 1'-9" (1.67)                      |
| 24-1     | 1" (25)                      | 1'-10" (1.83)                     |
| 24-1 1/4 | 1 1/4" (32)                  | 2-4" (1.98)                       |
| 24-1 1/2 | 1 1/2" (40)                  | 2-9" (2.13)                       |
| 24-2     | 2" (50)                      | 3-6" (2.44)                       |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

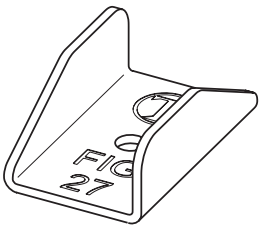
TOLCO Fig. 27B - Speed Nut

**Size Range:** — Fits screws supplied with all CPVC hangers.

**Material:** — Steel

**Finish:** — Pre-Galvanized (Zinc)

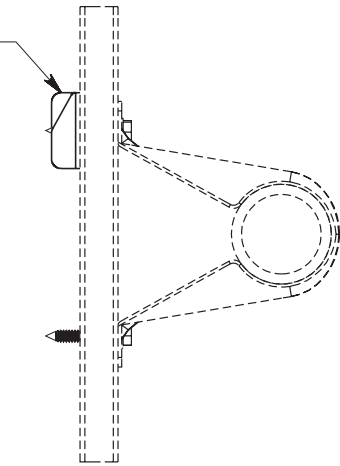
**Function:** — To be used anywhere a screw cannot achieve full embedment due to thickness of wood structural material when installed. Fig. 27B allows full pull out load capacity of screws when installed to the standard screws supplied with all CPVC hangers (Fig. 22, Fig. 22L2, Fig. 23, Fig. 24, Fig. 28, Fig. 28M, Fig. 29, and B3184).



| Part No. | Approx. Wt./100 |       |
|----------|-----------------|-------|
|          | lbs.            | (kg)  |
| 27B      | 1.2             | (0.5) |

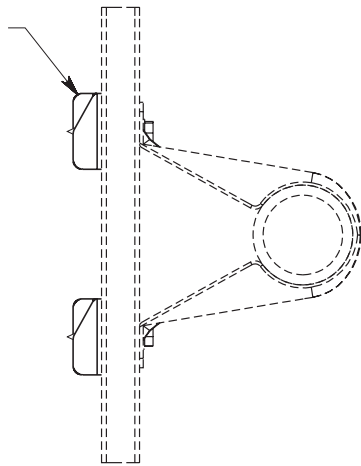


Fig. 27B  
(1) Required High  
Side of Hanger  
Application

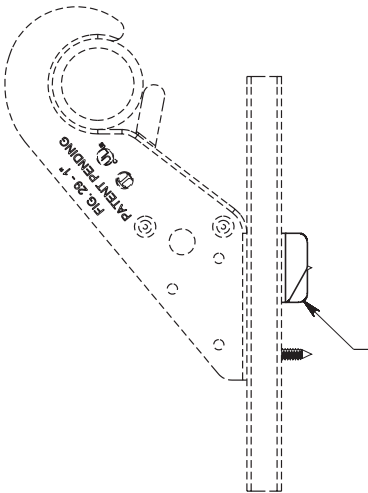


Hanger Application

Fig. 27B  
(2) Required

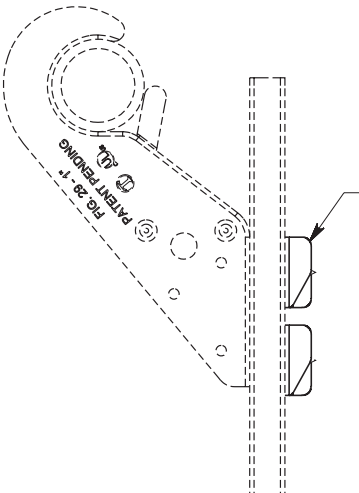


Hanger and Restraint  
Application



Hanger Application

Fig. 27B  
(1) Required High Side of  
Hanger Application



Hanger and Restraint  
Application

Fig. 27B  
(2) Required

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# TOLCO Fig. 28 - "Stand-Off" Hanger & Restrainer for CPVC Plastic Pipe & IPS Steel Pipe

**Size Range:** — 3/4" (20mm) through 2" (50mm)

**Material:** — Steel, Pre-Galvanized

**Function:** — Designed to be used as a hanger and restrainer for CPVC piping where the "stand-off" design will ease installation by eliminating the need for wood blocking.

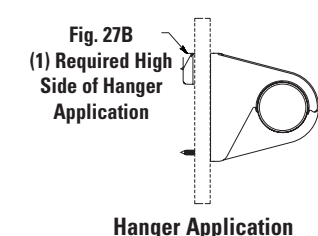
## Features:

- Flared edge design protects CPVC pipe from any rough or abrasive surfaces.
- Unique twist and lock design holds pipe firmly in place and allows retrofit type of installation.
- The "Stand-Off" design eliminates the need for wood block extension.
- Can be installed on horizontal or vertical piping regardless of mounting surface orientation.
- Attaches easily to wood structure with two hex head self-threading screws furnished with product.
- Installs easily using rechargeable electrical driver with 5/16" (7.9mm) extension socket eliminating impact tool damage to pipe.
- Attaches easily to steel, minimum 18 gauge (1.024mm) with (2) 1/4" x 1" tek type self drilling tapping screws.
- UL Listed as a hanger and a restrainer for fire sprinkler piping.

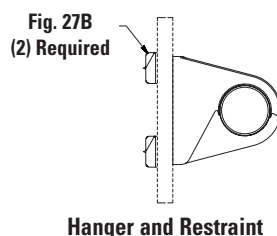
**Approvals:** — Underwriters Laboratory Listed in the USA (UL) and Canada (cUL) to support automatic fire sprinkler systems. May be installed into wood using fasteners supplied with product, or into minimum 18 gauge steel using (2) 1/4" x 1" tek type screws. Meets and exceeds the requirements of NFPA 13, 13R and 13D. Fig. 28 satisfies the UL vertical restraint requirement where needed. UL Listed as a hanger and vertical restraint when installed on 3/8" (9.5mm) composite wood material. Use two Fig. 27B (page 36) Speed Nuts when used as a hanger and restraint. Use one Fig. 27B Speed Nut on the upper installed screw when used as a hanger only.

**Order by:** — Figure number and pipe size.

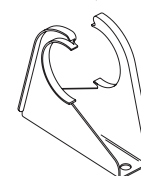
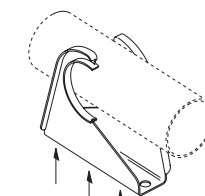
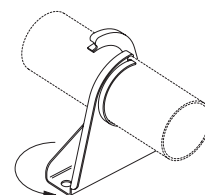
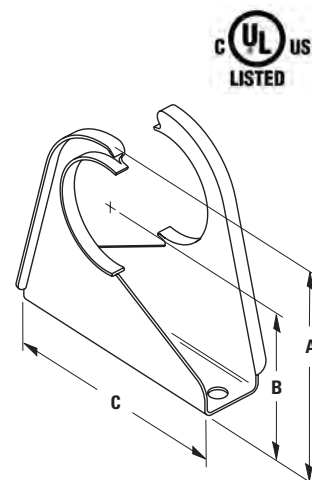
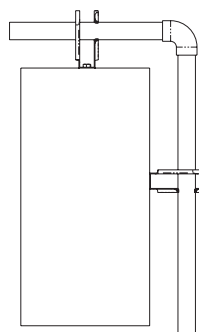
Pat. # 7,455,268, Pat. # 7,832,248



Hanger Application



Hanger and Restraint Application



| Part No. | CPVC Pipe Size<br>in. (mm) | A<br>in. (mm)  | B<br>in. (mm)   | C<br>in. (mm) | Max Hanger Spacing<br>Ft. (m) | Approx. Wt./100 lbs. (kg) |
|----------|----------------------------|----------------|-----------------|---------------|-------------------------------|---------------------------|
| 28-3/4   | 3/4" (20)                  | 3 1/32" (77.0) | 2" (50.8)       | 3 1/2" (88.9) | 5 1/2 (1.67)                  | 18 (8.1)                  |
| 28-1     | 1" (25)                    | 3 5/16" (84.1) | 2 3/16" (55.6)  | 3 1/2" (88.9) | 6 (1.83)                      | 21 (9.5)                  |
| 28-1 1/4 | 1 1/4" (32)                | 3 3/8" (92.1)  | 2 3/8" (60.3)   | 3 1/2" (88.9) | 6 1/2 (1.98)                  | 23 (10.4)                 |
| 28-1 1/2 | 1 1/2" (40)                | 4" (101.6)     | 2 1/2" (63.5)   | 3 1/2" (88.9) | 7 (2.13)                      | 31 (14.0)                 |
| 28-2     | 2" (50)                    | 4 1/2" (114.3) | 2 11/16" (68.3) | 3 5/8" (92.1) | 8 (2.44)                      | 34 (15.4)                 |

## Reduced Spacing For IPS Pipe

| Part No. | IPS Pipe Size<br>in. (mm) | Max. Hanger Spacing<br>Ft. (m) |
|----------|---------------------------|--------------------------------|
| 28-3/4   | 3/4" (20)                 | 1'-9" (1.67)                   |
| 28-1     | 1" (25)                   | 1'-10" (1.83)                  |
| 28-1 1/4 | 1 1/4" (32)               | 2'-4" (1.98)                   |
| 28-1 1/2 | 1 1/2" (40)               | 2'-9" (2.13)                   |
| 28-2     | 2" (50)                   | 3'-6" (2.44)                   |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 28M - Offset Hanger & Restrainer for CPVC Plastic Pipe and IPS Steel Pipe

**Size Range:** 3/4" (20mm) thru 2" (32mm)

**Material:** Steel, Pre-Galvanized

**Function:** Designed to be used as a hanger and restrainer for CPVC piping or steel piping where the "stand-off" design will ease installation by eliminating the need for wood blocking.

### Features:

- Flared edge design protects CPVC pipe from any rough or abrasive surfaces
- Unique snap-on design holds pipe firmly in place and allows retrofit type of installation
- The "Stand-Off" design eliminates the need for wood block extension
- Can be installed on horizontal or vertical piping regardless of mounting surface orientation
- Attaches easily to wood structure with two hex head self-threading screws furnished with product
- Installs easily using rechargeable electrical driver with 5/16" (7.9mm) extension socket eliminating impact tool damage to pipe
- Attaches easily to steel, minimum 18 gauge (1.024mm) with (2) 1/4" x 1" tek type self drilling tapping screws
- (cULus) Listed as a hanger and a restrainer for fire sprinkler piping

**Installation Note:** When installed in wood structural members and threads from the #10 x 1" screws are exposed, use Fig. 27B (page 36) speed nut to secure

**Approvals:** Underwriters Laboratory Listed in the USA (UL) and Canada (cUL) to support automatic fire sprinkler systems. May be installed into wood using fasteners screws. Meets and exceeds the requirements of NFPA 13, 13R and 13D. Fig. 28M satisfies the UL vertical restraint requirements where needed.

**Order By:** Figure number and pipe size

Patent #7,744,042

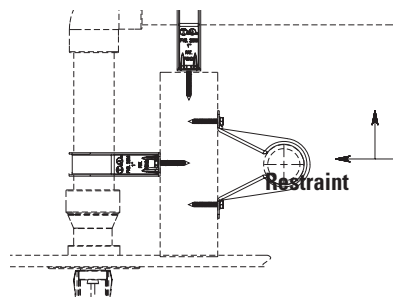
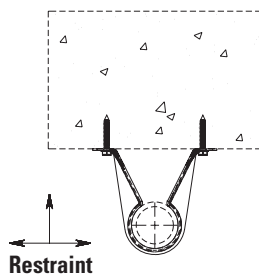
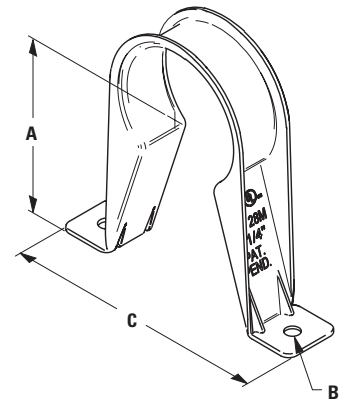
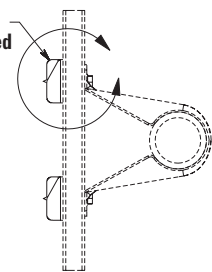


Fig. 27B  
(2) Required



Hanger and Restraint  
Application

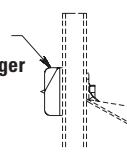
| Part No.  | CPVC Pipe Size<br>in. (mm) | A<br>in. (mm)  | Hole Dia. B<br>in. (mm) | C<br>in. (mm)   | Max Spacing*<br>in. (mm) | Approx. Wt./100<br>lbs. (kg) |
|-----------|----------------------------|----------------|-------------------------|-----------------|--------------------------|------------------------------|
| 28M-3/4   | 3/4" (20)                  | 2" (50.8)      | 3/16" (4.8)             | 3 5/16" (84.1)  | 5'-6" (1676)             | 9 (4.1)                      |
| 28M-1     | 1" (25)                    | 2 1/8" (54.0)  | 3/16" (4.8)             | 3 1/2" (88.9)   | 6'-0" (1829)             | 12 (5.4)                     |
| 28M-1 1/4 | 1 1/4" (32)                | 2 5/16" (58.7) | 3/16" (4.8)             | 3 1/2" (88.9)   | 6'-6" (1981)             | 13 (5.9)                     |
| 28M-1 1/2 | 1 1/2" (49)                | 2 7/16" (61.9) | 3/16" (4.8)             | 3 7/8" (98.4)   | 7'-0" (2133)             | 14 (6.3)                     |
| 28M-2     | 2" (50)                    | 2 5/8" (66.7)  | 3/16" (4.8)             | 4 7/16" (112.7) | 8'-0" (2438)             | 15 (6.8)                     |

\* Required per NFPA 13 for CPVC plastic pipe

### Reduced Spacing For IPS Pipe

| Part No. | IPS Pipe Size<br>in. (mm) | Max. Hanger Spacing<br>Ft. (m) |
|----------|---------------------------|--------------------------------|
| 28-3/4   | 3/4" (20)                 | 1'-9" (1.67)                   |
| 28-1     | 1" (25)                   | 1'-10" (1.83)                  |
| 28-1 1/4 | 1 1/4" (32)               | 2-4" (1.98)                    |
| 28-1 1/2 | 1 1/2" (40)               | 2-9" (2.13)                    |
| 28-2     | 2" (50)                   | 3-6" (2.44)                    |

Fig. 27B  
(1) Required  
High Side of Hanger



Detail A  
Hanger Application

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# TOLCO Fig. 29 - double offset hanger & restrainer for CPVC plastic pipe & IPS steel pipe

**Size Range:** Available in 3/4" (20mm) and 1" (25mm) pipe sizes

**Material:** Pre-Galvanized Steel

**Function:** Intended to perform as a hanger and restrainer for CPVC, plastic fire sprinkler pipe. Provides double offset 1 1/2" (20mm) x 1 1/2" (20mm) from mounting surface. This design will ease installation by eliminating the need for wood block extension and allow retro-fit attachment of hanger to sprinkler pipe.

## Features:

- Thumb tab provides protection to restrain pipe in rough job site conditions. Tab is not required to be bent for listed installation.
- Offset edge eliminates abrasion.
- Attaches easily to wood structure with two special #10 x 1" hex head self-threading screws furnished with product.
- Can be used as a single offset hanger by aligning "dimples" with top of mounting surface and utilizing two fasteners in two of the three holes provided.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) as a hanger and restrainer to support fire sprinkler systems. Meets and exceeds requirements of NFPA 13, 13R and 13D.

**Finish:** Pre-Galvanized

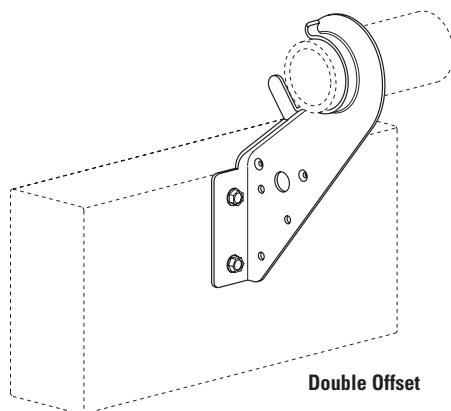
**Order By:** Figure number and pipe size.

Patent # US2008/0129040A1

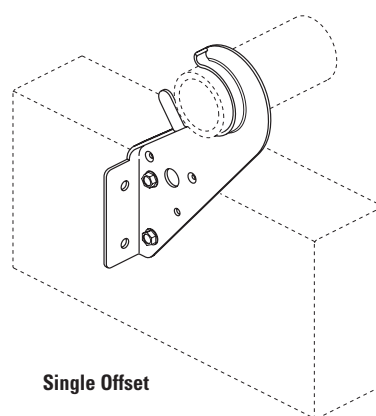
| Part No. | CPVC<br>Pipe size<br>in. (mm) | Max Hanger<br>Spacing<br>Ft. (m) | Approx.<br>Wt./100<br>lbs. (kg) |
|----------|-------------------------------|----------------------------------|---------------------------------|
| 29-3/4   | 3/4" (20)                     | 5'-6" (1.67)                     | 18 (8.1)                        |
| 29-1     | 1" (25)                       | 6'-0" (1.83)                     | 19 (8.6)                        |

## Reduced Spacing For IPS Pipe

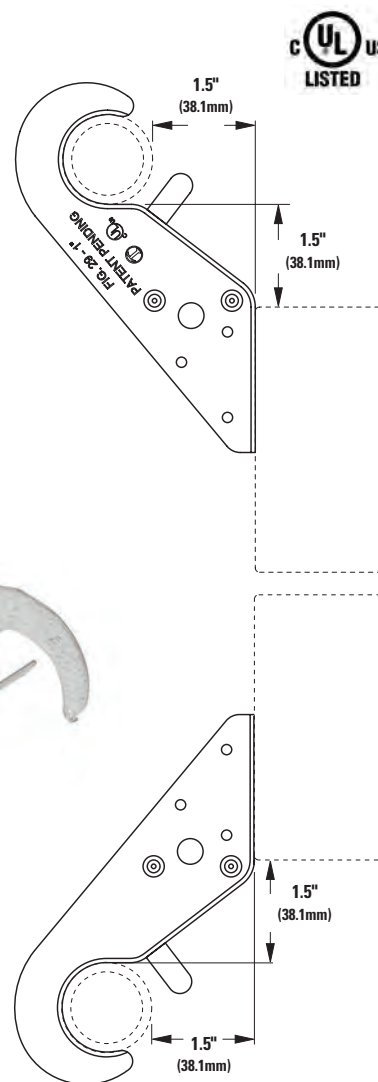
| Part No. | IPS<br>Pipe Size<br>in. (mm) | Max. Hanger<br>Spacing<br>Ft. (m) |
|----------|------------------------------|-----------------------------------|
| 29-3/4   | 3/4" (20)                    | 1'-9" (1.67)                      |
| 29-1     | 1" (25)                      | 1'-10" (1.83)                     |



Double Offset



Single Offset



Install using a rechargeable electric drill fitted with a 5/16" (7.9mm) socket attachment with the special hex head self-tapping screws provided. Install screws until they bottom out. Pipe can be "snapped" into hanger before or after installation of the screws to the mounting surface. "Thumb tab" may be bent up to provide additional protection to the pipe, but is not required for performance of the hanger / restrainer function.

# CPVC Clamps

## B3184 - Offset Hanger for CPVC Plastic Pipe and IPS Pipe

**Size Range:** 3/4" (20mm) thru 2" (50mm)

**Material:** Pre-Galvanized Steel

**Function:** Designed to be used as a hanger for CPVC piping or steel piping where the "stand-off" design will ease installation by eliminating the need for wood blocking.

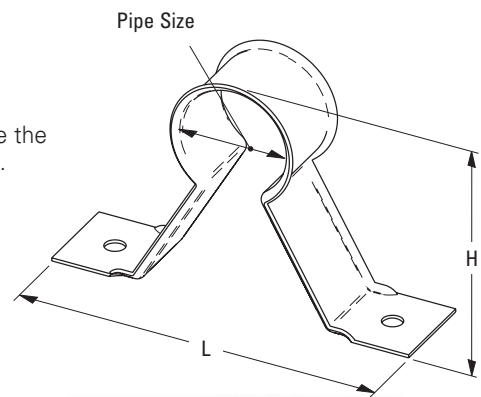
### Features:

- Flared edge design protects CPVC pipe from any rough or abrasive surfaces
- The "Stand-Off" design eliminates the need for wood block extension
- Can be installed on horizontal or vertical piping regardless of mounting surface orientation
- Attaches easily to wood structure with two hex head self-threading screws furnished with product
- **cULus** Listed as a hanger for fire sprinkler piping

**Installation Note:** When installed in wood structural members and threads from the #10 x 1" screws are exposed, use Fig. 27B speed nut to secure

**Approvals:** Underwriters Laboratory Listed in the USA (**UL**) and Canada (**cUL**) 3/4" (20mm) thru 2" (50mm) to support automatic fire sprinkler systems. May be installed into wood using fasteners screws. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Order By:** Part number and pipe size



| Part No.    | CPVC Pipe Size<br>in. (mm) | H Overall<br>in. (mm) | L Overall<br>in. (mm) | Max. Hanger<br>Spacing<br>ft. (m) | Fastener Hex<br>Head Size<br>in. (mm) | Approx.<br>Wt./100<br>Lbs. (kg) |
|-------------|----------------------------|-----------------------|-----------------------|-----------------------------------|---------------------------------------|---------------------------------|
| B3184-3/4   | 3/4" (20)                  | 2 9/16" (65.1)        | 4 1/4" (107.9)        | 5 1/2 (1.67)                      | 5/16" (7.9)                           | 9.0 (4.1)                       |
| B3184-1     | 1" (25)                    | 2 13/16" (71.4)       | 4 1/2" (114.3)        | 6 (1.83)                          | 5/16" (7.9)                           | 10.0 (4.5)                      |
| B3184-1 1/4 | 1 1/4" (32)                | 3 3/16" (81.0)        | 4 5/8" (117.5)        | 6 1/2 (1.98)                      | 5/16" (7.9)                           | 12.0 (5.4)                      |
| B3184-1 1/2 | 1 1/2" (40)                | 3 7/16" (87.3)        | 5" (127.0)            | 7 (2.13)                          | 5/16" (7.9)                           | 12.0 (5.4)                      |
| B3184-2     | 2" (50)                    | 3 7/8" (98.4)         | 5" (127.0)            | 8 (2.44)                          | 5/16" (7.9)                           | 15.0 (6.8)                      |



## TOLCO™ Fig. 75 - Swivel Attachment

**Size Range:** — 3/8"-16 Rod Attachment

**Material:** Steel

**Function:** Three recommended applications for this product:

- May be used as a branch line restraint for structural attachment to anchor bolt, beam clamp, etc.
- May be used as an upper attachment with short hanger rod to omit seismic bracing.
- May be used in a pitched or sloped roof application, to meet requirements of NFPA 13 (2010) 9.1.2.6.

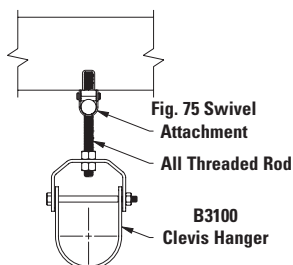
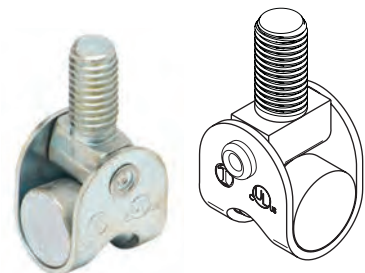
**Approvals:** Underwriters Laboratories Listed in the USA (**UL**) and Canada (**cUL**) to support up to 4" (100mm) pipe.

**Finish:** Electro-Galvanized

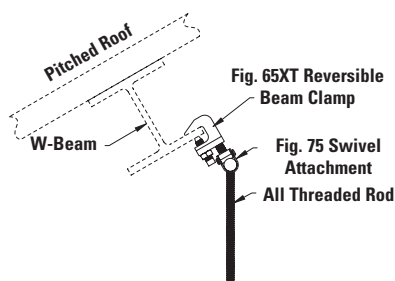
**Weight:** Approx. Wt./100 - 13.3 Lbs. (6.0kg)

**Order By:** Part number

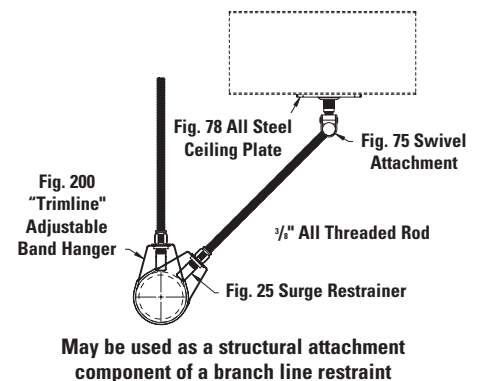
Patent: #7,887,248



May be used as an upper attachment with short hanger rod to omit seismic bracing



May be used with a pitched roof application, to meet requirements of NFPA 13 (2010-2016) Sec. 9.1.2.6.



## TOLCO Fig. 3000 - CPVC and steel sway brace attachment

**Size Range:** Pipe size to be braced: in 1" (25mm) thru 3" (80mm) except 65mm pipe sizes

Pipe size used for bracing 1" (25mm) Schedule 40 IPS

**Material:** Steel

**Function:** For bracing CPVC and steel pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system: Fig. 3000 is used in conjunction with a Fig. 900 Series fitting and joined together with bracing pipe per NFPA 13, forming a complete sway brace assembly.

**Features:** The Fig. 3000 is UL Listed as a sway brace for bracing 1" (25mm) through 3" (80mm) CPVC and (IPS) steel sprinkler pipe, except 65mm diameter pipe. The unique design does not compress the CPVC pipe, and the brace pipe to system pipe offset keeps the brace pipe from leaving harmful residue and oils on the CPVC pipe. Field adjustable, making critical pre-engineering of bracing pipe length unnecessary and requires no threading of bracing pipe. Comes assembled and ready for installation. Has a built-in visual verification of correct installation. See the following installation note.

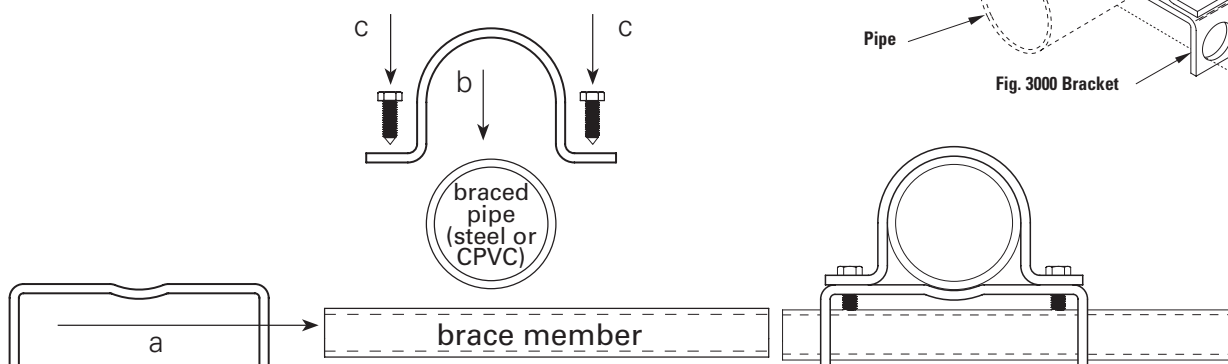
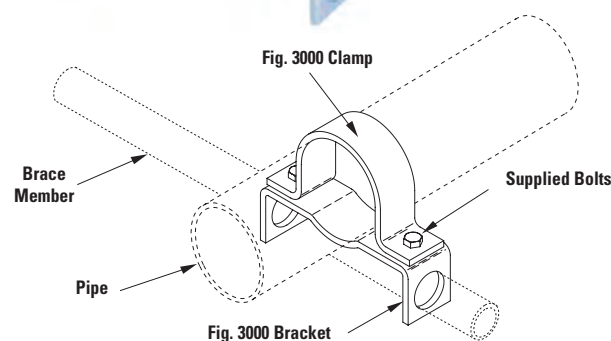
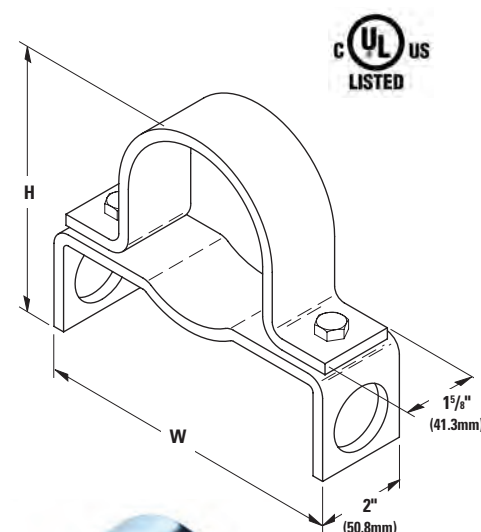
**Installation Instructions:** Slide the Fig. 3000 bracket over the brace member. Place the Fig. 3000 clamp over the pipe being braced, align the holes, and tighten the supplied bolts until the underside of the bolt bottoms out against the Fig. 3000 clamp. The sway brace fitting is intended to be used with any Tolco 900 series transitional or 800 series structural attachments.

Note: Brace member may be over or under the braced pipe.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). UL Listed for the following sprinkler type pipes: Sch. 40 (and as brace member), Sch. 10, CPVC, DIN 2448, KSD 3562 (and as brace member), KSD 3507.

**Finish:** Electro-Galvanized

**Order By:** Figure number and pipe size.



| Part No.                           | CPVC or Steel<br>Pipe Size<br>in. (mm) | H<br>Height<br>in. (mm)                  | W<br>Width<br>in. (mm)                  | Max. Design Load<br>UL Listed<br>Lbs. (kN) | Approx.<br>Wt./100<br>Lbs. (kg) |
|------------------------------------|----------------------------------------|------------------------------------------|-----------------------------------------|--------------------------------------------|---------------------------------|
| 3000-1                             | 1" (25)                                | 3 <sup>7</sup> / <sub>10</sub> " (94.0)  | 4 <sup>3</sup> / <sub>4</sub> " (120.7) | 700 (3.11)                                 | 120 (54.4)                      |
| 3000-1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>4</sub> " (32)   | 4" (101.6)                               | 5" (127.0)                              | 700 (3.11)                                 | 129 (58.5)                      |
| 3000-1 <sup>1</sup> / <sub>2</sub> | 1 <sup>1</sup> / <sub>2</sub> " (40)   | 4 <sup>3</sup> / <sub>10</sub> " (109.2) | 5 <sup>1</sup> / <sub>4</sub> " (133.4) | 700 (3.11)                                 | 136 (61.6)                      |
| 3000-2                             | 2" (50)                                | 4 <sup>7</sup> / <sub>10</sub> " (119.4) | 6 <sup>1</sup> / <sub>2</sub> " (165.1) | 700 (3.11)                                 | 204 (92.5)                      |
| 3000-2 <sup>1</sup> / <sub>2</sub> | 2 <sup>1</sup> / <sub>2</sub> " (65)   | 5 <sup>4</sup> / <sub>25</sub> " (131.1) | 7" (177.8)                              | 700 (3.11)                                 | 226 (102.5)                     |
| 3000-3                             | 3" (80)                                | 5 <sup>4</sup> / <sub>5</sub> " (147.3)  | 7 <sup>1</sup> / <sub>2</sub> " (190.5) | 700 (3.11)                                 | 252 (114.3)                     |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

**Fig. 74 - TOLCO Structural Attachment for Branch Line Restraint Assembly (UL Listed)**

**Size Range:** 3/8" and 1/2" all threaded rod (ATR)

**Material:** Steel

**Function:** Structural attachment for restraint (sway brace) or hanger assembly

**Features:** The Fig. 74 has multiple sized fastener holes to accommodate multiple types of fasteners for various types of structures (concrete, wood and steel) see table below. Barrel rolls freely to allow installation angles from 0° to 90° from the mounting surface. Multiple holes to allow various fasteners to attach to the structure. Larger hole accommodates 3/8" (9.5mm) fastener, and smaller hole accommodates 1/4" (6.4mm) or #10 fasteners. It is UL listed both as a restraint and as a hanger attachment for up to 4" (IPS) pipe size.

**Installation Instructions:** Install all threaded rod (ATR), (brace member) to TOLCO™ Fig. 74 structural attachment. Bottom out 1/2" ATR in barrel nut or thread 3/8" ATR through to back side of barrel nut for proper engagement. Install Fig. 74 structural attachment to the building structure. Follow fastener manufacturer and NFPA 13 guidelines to install appropriate fastener for the structural type (i.e. concrete, wood, steel). For more information visit our website for the most up to date instructions sheets.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL).

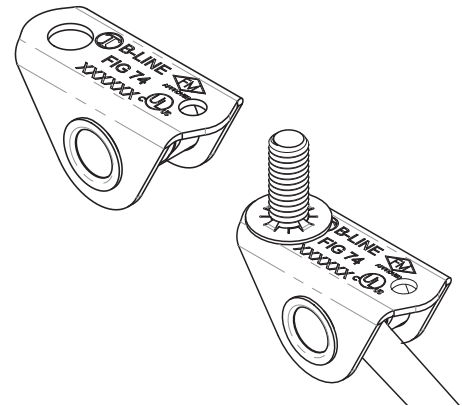
For FM Approval information refer to FM Approved page 43.

**Finish:** Zinc plated.

**Order By:** Figure number.



**Structural Attachment for Branch Line Restraint**



**UL listed maximum allowable loads (horizontal)**

| Product              | Sch. 10, Sch. 40, Dynaflow & CPVC |                      |
|----------------------|-----------------------------------|----------------------|
|                      | 3/8" Rod (9.5mm)                  | 1/2" Rod (12.7mm)    |
| Fig. 74 (sway brace) | 300 lbs. (1.344 kN)               | 300 lbs. (1.344 kN)  |
| Fig. 74 (hanger)     | 1500 lbs. (6.672 kN)              | 1500 lbs. (6.672 kN) |

**Fasteners to use with Fig 76 (Up to 2" IPS pipe size) per NFPA 13**

| Structure Type | Fastener Type          | Fastener Diameter | Fastener Embedment | NFPA 13 (2013 & 2016) Reference           |
|----------------|------------------------|-------------------|--------------------|-------------------------------------------|
| Concrete       | Through Bolt           | 3/8"              | N/A                | 9.1.3.10.1                                |
| Concrete       | Post Installed Anchors | Various           | Various            | 9.1.3 - 9.1.3.8                           |
| Steel          | Through Bolt           | 3/8"              | N/A                | 9.1.4.5.1                                 |
| Steel          | Beam Clamp             | 3/8"              | N/A                | UL Listed Beam Clamp with Retaining Strap |
| Wood           | (1) 3/8" lag screw     | 3/8"              | 2 1/2"             | 9.1.5.3.1                                 |
| Wood           | (2) #10 wood screws    | #10               | 1"                 |                                           |

**All Thread Rod Maximum Restraint Lengths**

| Rod Size (in) | Root Dia. (in) | Least Radius of Gyration r (in) | Maximum Unbraced Length L - (in.) |         |         |          | Max. Horizontal Load @ 45° (lbs.)** |         |         |          |
|---------------|----------------|---------------------------------|-----------------------------------|---------|---------|----------|-------------------------------------|---------|---------|----------|
|               |                |                                 | L/r=100                           | L/r=200 | L/r=300 | L/r=400† | L/r=100                             | L/r=200 | L/r=300 | L/r=400† |
| 3/8           | 0.300          | 0.075                           | 7                                 | 14      | 22      | 30       | 300                                 | 186     | 82      | 44       |
| 1/2           | 0.404          | 0.101                           | 10                                | 20      | 30      | 40       | 300†                                | 300†    | 152     | 85       |

† L/r = 400 NFPA 13 2010, Sec 9.3.6.1 (5) † L/r = 400 NFPA 13 2013 & 2016, Sec 9.3.6.1 (5) & NFPA (2016) TABLE 9.3.11.8(a)(b)(c)(d)(e)(f)

\*\*Per NFPA 13 (2013) Table 9.3.5.11.8 (a)(b)(c), consult for maximum allowable load information on ATR.

†Max load governed by Fig. 74/77 Max horizontal load.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

Updated 5-24-21

**Fig. 74 - TOLCO Structural Attachment for Sway Brace Assembly (FM Approved)****Size Range:** 3/8" and 1/2" all threaded rod (ATR)**Material:** Steel**Function:** Structural attachment for restraint (sway brace) assembly

**Features:** The Fig. 74 has multiple sized fastener holes to accommodate multiple types of fasteners for various types of structures (concrete, wood and steel) see table below. Barrel rolls freely to allow installation angles from 0° to 90° from the mounting surface. Multiple holes to allow various fasteners to attach to the structure. Larger hole accommodates 3/8" (9.5mm) fastener, and smaller hole accommodates 1/4" (6.4mm) or #10 fasteners. It is UL listed both as a restraint and as a hanger attachment for up to 4" (IPS) pipe size.

**Installation Instructions:** Install all threaded rod (ATR), (brace member) to TOLCO™ Fig. 74 structural attachment. Bottom out 1/2" ATR in barrel nut or thread 3/8" ATR through to back side of barrel nut for proper engagement. Install Fig. 74 structural attachment to the building structure. Follow fastener manufacturer and NFPA 13 guidelines to install appropriate fastener for the structural type (i.e. concrete, wood, steel). For more information visit our website for the most up to date instructions sheets.

**Approvals:** Approved by FM.

For UL Listed information refer to UL Listed page 42.

**Finish:** Zinc plated.**Order By:** Figure number.**Maximum Allowable Loads (FM Approved)**

| Part No. | 30°-44°       |               | 45°-59°       |               | 60°-74°       |               | 75°-90°       |               |
|----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|          | 3/8" Rod lbs. | 1/2" Rod lbs. | 3/8" Rod lbs. | 1/2" Rod lbs. | 3/8" Rod lbs. | 1/2" Rod lbs. | 3/8" Rod lbs. | 1/2" Rod lbs. |
| Fig. 74  | 790           | 790           | 810           | 810           | 620           | 620           | 680           | 680           |

Loads shown are axial ASD loads.

**Fasteners to use with Fig 76 (Up to 2" IPS pipe size) per NFPA 13**

| Structure Type | Fastener Type          | Fastener Diameter | Fastener Embedment | NFPA 13 (2013 & 2016) Reference             |
|----------------|------------------------|-------------------|--------------------|---------------------------------------------|
| Concrete       | Through Bolt           | 3/8"              | N/A                | 9.1.3.10.1                                  |
| Concrete       | Post Installed Anchors | Various           | Various            | 9.1.3 - 9.1.3.8                             |
| Steel          | Through Bolt           | 3/8"              | N/A                | 9.1.4.5.1                                   |
| Steel          | Beam Clamp             | 3/8"              | N/A                | FM Approved Beam Clamp with Retaining Strap |
| Wood           | (1) 3/8" lag screw     | 3/8"              | 2 1/2"             | 9.1.5.3.1                                   |
| Wood           | (2) #10 wood screws    | #10               | 1"                 |                                             |

**All Thread Rod Maximum Restraint Lengths**

| Rod Size (in) | Root Dia. (in) | Least Radius of Gyration r (in) | Maximum Unbraced Length L - (in.) |         |         |          | Max. Horizontal Load @ 45° (lbs.)** |         |         |          |
|---------------|----------------|---------------------------------|-----------------------------------|---------|---------|----------|-------------------------------------|---------|---------|----------|
|               |                |                                 | I/r=100                           | I/r=200 | I/r=300 | I/r=400† | I/r=100                             | I/r=200 | I/r=300 | I/r=400† |
| 3/8           | 0.300          | 0.075                           | 7                                 | 14      | 22      | 30       | 300                                 | 186     | 82      | 44       |
| 1/2           | 0.404          | 0.101                           | 10                                | 20      | 30      | 40       | 300†                                | 300†    | 152     | 85       |

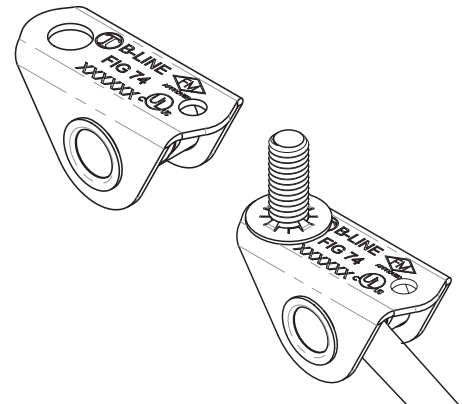
† I/r = 400 NFPA 13 2010, Sec 9.3.6.1 (5) † I/r = 400 NFPA 13 2013 &amp; 2016, Sec 9.3.6.1 (5) &amp; NFPA (2016) TABLE 9.3.11.8(a)(b)(c)(d)(e)(f)

\*\*Per NFPA 13 (2013) Table 9.3.5.11.8 (a)(b)(c), consult for maximum allowable load information on ATR.

†Max load governed by Fig. 74/77 Max horizontal load.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

**Structural Attachment for Restraint (Sway Brace)**

## TOLCO Fig. 77 - System Piping Attachment for Restraint Assembly (UL Listed) For CPVC & Steel Pipe

**Size Range:** 3/8" and 1/2" all threaded rod (ATR)

**Material:** Steel

**Function:** System attachment for restraint (sway brace) assembly

**Features:** The Fig. 77 is UL Listed to be used with both (IPS) steel and CPVC fire sprinkler pipe, in 1" through 2" diameters. It fits multiple rod diameters allowing for field adjustment if longer brace material is needed. Its sturdy break-off bolt will not strip and verifies proper installation. Its snap on design has many advantages. It can be installed with one-hand, can easily position the brace all thread rod over the top of the pipe being braced or underneath the pipe being braced to accommodate the desired brace angle. It can be fixed in place or moved to a new location by sliding along the pipe or snapping on or off and relocating. An entire prefabricated assembly (Fig. 74 & 77 joined with ATR) can be pre-assembled to save time and labor and later be field installed and adjusted to fit.

**Installation Instructions:** Install TOLCO™ Fig. 77 system attachment to sprinkler pipe branch line to be restrained. You can position with the rod engagement either above or below the sprinkler pipe. Rod must extend a min. of 1" (25.4) past the edge of the Fig. 77. The attachment can be slid along the pipe to position close to where the Fig. 74 structural attachment will be fastened to the structure. The snap on design allows maximum adjustability during this stage of the installation process. Engage ATR (previously attached to the Fig. 74 structural attachment to the rod engagement portion of the Fig. 77 system attachment. Tighten set bolt on Fig. 77 system attachment until head breaks off verifying proper installation torque. For more information visit our website for the most up to date instructions sheets.

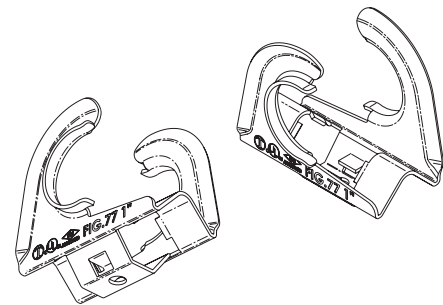
**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). For FM Approved information refer to FM Approved page 45.

**Finish:** Pre-Galvanized.

**Order By:** Figure number and pipe size.



Pipe Attachment for Branch Line Restraint  
US Patent No. 9,797,527



| Part No. | Pipe Size<br>in. (mm) | Max.Design Loads (UL Listed) |                       |
|----------|-----------------------|------------------------------|-----------------------|
|          |                       | 3/8" Rod<br>lbs. (kN)        | 1/2" Rod<br>lbs. (kN) |
| 77-1     | 1 (25)                | 300 (1.33)                   | 300 (1.33)            |
| 77-1 1/4 | 1 1/4 (32)            |                              |                       |
| 77-1 1/2 | 1 1/2 (40)            |                              |                       |
| 77-2     | 2 (50)                |                              |                       |

\* These loads apply to IPS steel, Sch.10, Sch. 40, engineered lightwall piping, and CPVC plastic pipe. Loads shown are axial ASD loads.

§ All other trademarks are property of their respective owners.



### All Thread Rod Maximum Restraint Lengths

| Rod Size<br>in. | Root Dia.<br>in. (mm) | Least Radius of Gyration<br>r<br>in. (mm) | Maximum Unbraced Length L - (in.) |                     |                     |                      | Max. Horizontal Load @ 45° (lbs.)** |                      |                      |                       |
|-----------------|-----------------------|-------------------------------------------|-----------------------------------|---------------------|---------------------|----------------------|-------------------------------------|----------------------|----------------------|-----------------------|
|                 |                       |                                           | I/r=100<br>in. (mm)               | I/r=200<br>in. (mm) | I/r=300<br>in. (mm) | I/r=400†<br>in. (mm) | I/r=100<br>lbs. (kN)                | I/r=200<br>lbs. (kN) | I/r=300<br>lbs. (kN) | I/r=400†<br>lbs. (kN) |
| 3/8-16          | 0.300 (7.6)           | 0.075 (1.9)                               | 7 (177.8)                         | 14 (355.6)          | 22 (558.8)          | 30 (763.0)           | 300 (1.33)                          | 186 (0.82)           | 82 (0.36)            | 44 (0.19)             |
| 1/2-13          | 0.404 (10.2)          | 0.101 (2.5)                               | 10 (254.0)                        | 20 (508.0)          | 30 (762.0)          | 40 (1016.0)          | 300† (1.33)†                        | 300† (1.33)†         | 152 (0.67)           | 85 (0.38)             |

† I/r = 400 NFPA 13 2010, Sec 9.3.6.1 (5) † I/r = 400 NFPA 13 2013 & 2016, Sec 9.3.6.1 (5) & NFPA (2016) TABLE 9.3.11.8(a)(b)(c)(d)(e)(f)

\*\*Per NFPA 13 (2013) Table 9.3.5.11.8 (a)(b)(c), consult for maximum allowable load information on ATR.

†Max load governed by Fig. 74/77 Max horizontal load.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

Updated 5-24-21

## TOLCO Fig. 77 - System Piping Attachment for Sway Brace Assembly (FM Approved) For CPVC & Steel Pipe

**Size Range:** 3/8" and 1/2" all threaded rod (ATR)

**Material:** Steel

**Function:** System attachment for restraint

**Features:** The Fig. 77 is to be used with both (IPS) steel and CPVC fire sprinkler pipe, in 1" through 2" diameters. It fits multiple rod diameters allowing for field adjustment if longer brace material is needed. Its sturdy break-off bolt will not strip and verifies proper installation. Its snap on design has many advantages. It can be installed with one-hand, can easily position the brace all thread rod over the top of the pipe being braced or underneath the pipe being braced to accommodate the desired brace angle. It can be fixed in place or moved to a new location by sliding along the pipe or snapping on or off and relocating. An entire prefabricated assembly (Fig. 74 & 77 joined with ATR) can be pre-assembled to save time and labor and later be field installed and adjusted to fit.

**Installation Instructions:** Install TOLCO™ Fig. 77 system attachment to sprinkler pipe branch line to be restrained. It can be positioned with the rod engagement either above or below the sprinkler pipe. Rod must extend a min. of 1" past the edge of the Fig. 77. The attachment can be slid along the pipe to position close to where the Fig. 74 structural attachment will be fastened to the structure. The snap on design allows maximum adjustability during this stage of the installation process. Engage ATR (previously attached to the Fig. 74 structural attachment to the rod engagement portion of the Fig. 77 system attachment. Tighten set bolt on Fig. 77 system attachment until head breaks off verifying proper installation torque. For more information visit our website for the most up to date instructions sheets.

**Approvals:** Approved by FM.

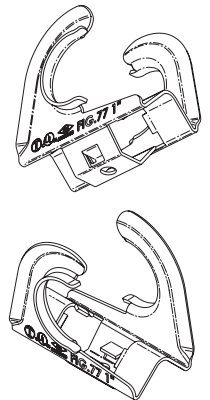
For UL Listed information refer to UL Listed page 44.

**Finish:** Pre-Galvanized.

**Order By:** Figure number and pipe size.



Pipe Attachment for Restraint (Sway Brace)  
US Patent No. 9,797,527



| Part No. | Pipe Size<br>in. (mm) | Maximum Allowable Loads (FM Approved)* |                       |                       |                       |                       |                       |                       |                       |
|----------|-----------------------|----------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|          |                       | 30°-44°                                |                       | 45°-59°               |                       | 60°-74°               |                       | 75°-90°               |                       |
|          |                       | 3/8" Rod<br>lbs. (kN)                  | 1/2" Rod<br>lbs. (kN) | 3/8" Rod<br>lbs. (kN) | 1/2" Rod<br>lbs. (kN) | 3/8" Rod<br>lbs. (kN) | 1/2" Rod<br>lbs. (kN) | 3/8" Rod<br>lbs. (kN) | 1/2" Rod<br>lbs. (kN) |
| 77-1     | 1 (25)                | 140 (0.62)                             | 160 (0.71)            | 200 (0.89)            | 230 (1.02)            | 250 (1.11)            | 280 (1.24)            | 280 (1.24)            | 320 (1.42)            |
| 77-1 1/4 | 1 1/4 (32)            | 140 (0.62)                             | 170 (0.75)            | 200 (0.89)            | 250 (1.11)            | 250 (1.11)            | 300 (1.33)            | 280 (1.24)            | 340 (1.51)            |
| 77-1 1/2 | 1 1/2 (40)            | 130 (0.58)                             | 160 (0.62)            | 190 (0.84)            | 230 (1.02)            | 230 (1.02)            | 280 (1.24)            | 260 (1.15)            | 320 (1.42)            |
| 77-2     | 2 (50)                | 120 (0.53)                             | 150 (0.67)            | 170 (0.75)            | 210 (0.93)            | 210 (0.93)            | 260 (1.15)            | 240 (1.07)            | 290 (1.29)            |

\* Loads shown are axial ASD loads.

### All Thread Rod Maximum Restraint Lengths

| Rod Size<br>in. | Root Dia.<br>in. (mm) | Least Radius of Gyration<br>r<br>in. (mm) | Maximum Unbraced Length L - (in.) |                     |                      |                       | Max. Horizontal Load @ 45° (lbs.)** |                      |                       |                        |
|-----------------|-----------------------|-------------------------------------------|-----------------------------------|---------------------|----------------------|-----------------------|-------------------------------------|----------------------|-----------------------|------------------------|
|                 |                       |                                           | L/r=100<br>in. (mm)               | L/r=200<br>in. (mm) | L/r=300Δ<br>in. (mm) | L/r=400†Δ<br>in. (mm) | L/r=100<br>lbs. (kN)                | L/r=200<br>lbs. (kN) | L/r=300Δ<br>lbs. (kN) | L/r=400†Δ<br>lbs. (kN) |
| 3/8-16          | 0.300 (7.6)           | 0.075 (1.9)                               | 7 (177.8)                         | 14 (355.6)          | 22 (558.8)           | 30 (763.0)            | 300 (1.33)                          | 186 (0.82)           | 82 (0.36)             | 44 (0.19)              |
| 1/2-13          | 0.404 (10.2)          | 0.101 (2.5)                               | 10 (254.0)                        | 20 (508.0)          | 30 (762.0)           | 40 (1016.0)           | 300† (1.33)†                        | 300† (1.33)†         | 152 (0.67)            | 85 (0.38)              |

† L/r = 400 NFPA 13 2010, Sec 9.3.6.1 (5) † L/r = 400 NFPA 13 2013 & 2016, Sec 9.3.6.1 (5) & NFPA (2016) TABLE 9.3.11.8(a)(b)(c)(d)(e)(f)

\*\*Per NFPA 13 (2013) Table 9.3.5.11.8 (a)(b)(c), consult for maximum allowable load information on ATR.

†Max load governed by Fig. 74/77 Max horizontal load.

Δ L/r = 300 for bracing

Δ L/r = 400 for restraint

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

Updated 5-24-21

# Pipe Supports

## B3088 - Base Stand

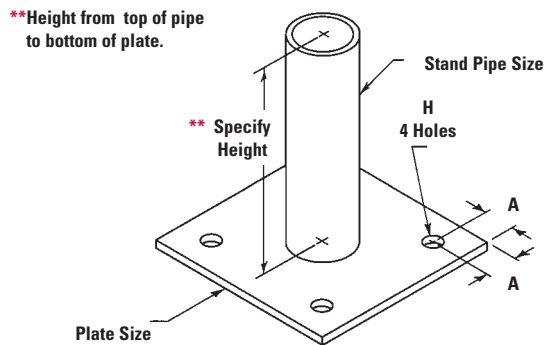
**Size Range:** 3/4" (20mm) thru 6" (150mm) pipe

**Material:** Steel

**Function:** Designed as an unthreaded base stand for pipe supports B3090, B3094, B3095, B3096, B3097 and B3098.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, height and finish.



**Note:** See Pipe Hangers & Supports catalog for attachments

| Part No.    | Plate Size<br>in. | (mm)                   | Stand Pipe Size<br>in. (mm) | A<br>in. (mm) | Dia. H<br>in. (mm) |
|-------------|-------------------|------------------------|-----------------------------|---------------|--------------------|
| B3088-3/4   | 1/4" x 6" x 6"    | (6.3 x 152.4 x 152.4)  | 3/4" (20)                   | 7/8" (22.2)   | 3/4" (14.3)        |
| B3088-1     | 1/4" x 6" x 6"    | (6.3 x 152.4 x 152.4)  | 1" (25)                     | 7/8" (22.2)   | 3/4" (14.3)        |
| B3088-1 1/4 | 1/4" x 6" x 6"    | (6.3 x 152.4 x 152.4)  | 1 1/4" (32)                 | 7/8" (22.2)   | 3/4" (14.3)        |
| B3088-1 1/2 | 1/4" x 6" x 6"    | (6.3 x 152.4 x 152.4)  | 1 1/2" (40)                 | 7/8" (22.2)   | 3/4" (14.3)        |
| B3088-2     | 1/4" x 6" x 6"    | (6.3 x 152.4 x 152.4)  | 2" (50)                     | 7/8" (22.2)   | 3/4" (14.3)        |
| B3088-2 1/2 | 3/8" x 8" x 8"    | (9.5 x 203.2 x 203.2)  | 2 1/2" (65)                 | 1 1/4" (31.7) | 13/16" (14.3)      |
| B3088-3     | 3/8" x 12" x 12"  | (9.5 x 203.2 x 203.2)  | 3" (80)                     | 1 1/2" (38.1) | 13/16" (20.6)      |
| B3088-4     | 1/2" x 12" x 12"  | (12.7 x 304.8 x 304.8) | 4" (100)                    | 1 1/2" (38.1) | 15/16" (23.8)      |
| B3088-6     | 1/2" x 18" x 18"  | (12.7 x 304.8 x 304.8) | 6" (150)                    | 1 1/2" (38.1) | 1 1/8" (28.6)      |

| Part No.    | Approx. Wt./100*<br>Lbs. (kg) |
|-------------|-------------------------------|
| B3088-3/4   | 420 (190.5)                   |
| B3088-1     | 480 (216.0)                   |
| B3088-1 1/4 | 590 (267.6)                   |
| B3088-1 1/2 | 655 (297.1)                   |
| B3088-2     | 1211 (549.3)                  |
| B3088-2 1/2 | 2376 (1077.7)                 |
| B3088-3     | 3137 (1422.9)                 |
| B3088-4     | 4338 (1967.7)                 |
| B3088-6     | 7378 (3346.6)                 |

\*Based on a height of 18" (457.2mm).

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

**B3088T - Threaded Base Stand**

**Size Range:** 1" (25mm) thru 6" (150mm) pipe

**Material:** Steel

**Function:** Designed as a threaded base stand where vertical adjustment is required for pipe supports B3089, B3092, and B3093.

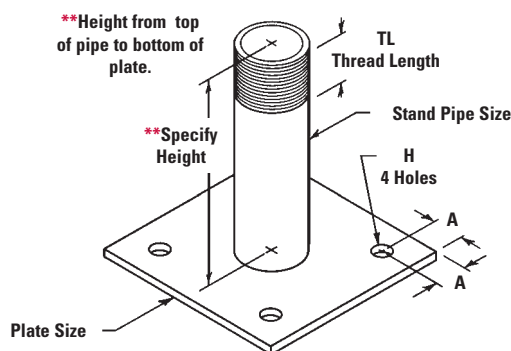
**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, height and finish.

**Approvals:** Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

Refer to pages 15.1 - 15.3B in Seismic Engineering Guidelines OPM-0052-13.

**Note:** Match B3088T part number with dimension 'D' from B3092, and B3093 charts.



**Note:** See Pipe Hangers & Supports catalog for attachments

| Part No.     | Plate Size<br>in. | (mm)                   | Stand Pipe Size<br>in. | (mm)  | A<br>in. | (mm)   | Dia. H<br>in. | (mm)   | TL<br>in. | (mm)   |
|--------------|-------------------|------------------------|------------------------|-------|----------|--------|---------------|--------|-----------|--------|
| B3088T-1     | 1/4" x 6" x 6"    | (6.3 x 152.4 x 152.4)  | 1"                     | (25)  | 7/8"     | (22.2) | 3/4"          | (19.0) | 1 1/2"    | (38.1) |
| B3088T-1 1/4 | 1/4" x 6" x 6"    | (6.3 x 152.4 x 152.4)  | 1 1/4"                 | (32)  | 7/8"     | (22.2) | 3/4"          | (19.0) | 1 1/2"    | (38.1) |
| B3088T-1 1/2 | 1/4" x 6" x 6"    | (6.3 x 152.4 x 152.4)  | 1 1/2"                 | (40)  | 7/8"     | (22.2) | 3/4"          | (19.0) | 1 1/2"    | (38.1) |
| B3088T-2     | 1/4" x 6" x 6"    | (6.3 x 152.4 x 152.4)  | 2"                     | (50)  | 7/8"     | (22.2) | 3/4"          | (19.0) | 1 1/2"    | (38.1) |
| B3088T-2 1/2 | 3/8" x 8" x 8"    | (9.5 x 203.2 x 203.2)  | 2 1/2"                 | (65)  | 1 1/4"   | (31.7) | 13/16"        | (20.6) | 1 1/2"    | (38.1) |
| B3088T-3     | 3/8" x 12" x 12"  | (9.5 x 304.8 x 304.8)  | 3"                     | (80)  | 1 1/2"   | (38.1) | 13/16"        | (20.6) | 1 1/2"    | (38.1) |
| B3088T-4     | 1/2" x 12" x 12"  | (12.7 x 304.8 x 304.8) | 4"                     | (100) | 1 1/2"   | (38.1) | 15/16"        | (23.8) | 2"        | (50.8) |

| Part No.     | Approx. Wt./100*<br>Lbs. | (kg)     |
|--------------|--------------------------|----------|
| B3088T-1     | 495                      | (224.5)  |
| B3088T-1 1/4 | 583                      | (264.4)  |
| B3088T-1 1/2 | 649                      | (294.4)  |
| B3088T-2     | 785                      | (356.1)  |
| B3088T-2 1/2 | 1524                     | (691.3)  |
| B3088T-3     | 2624                     | (1190.2) |
| B3088T-4     | 3594                     | (1630.2) |

\*Based on a height of 18" (457.2mm).

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Pipe Supports

## B3088S - Seismic Base Stand

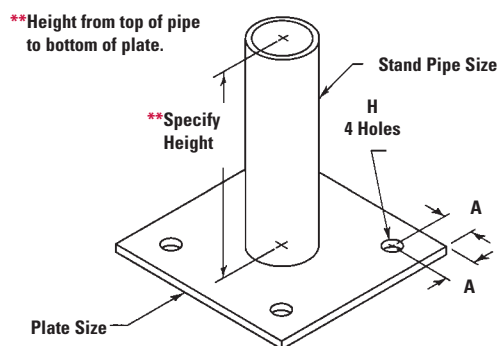
**Size Range:** 3/4" (20mm) thru 4" (100mm) pipe

**Material:** Steel

**Function:** Designed as an unthreaded base stand for pipe supports, B3090, B3094, B3095, B3096, B3097 and B3098, to meet requirements of 12X anchor diameter hole spacing for seismic applications. The standard B3088-3 & B3088-6 already meet this requirement.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, height and finish.



**Note:** See Pipe Hangers & Supports catalog for attachments

| Part No.     | Plate Size               |                        | Stand Pipe Size |      | A             |      | Dia. H        |      |
|--------------|--------------------------|------------------------|-----------------|------|---------------|------|---------------|------|
|              | in.                      | (mm)                   | in.             | (mm) | in.           | (mm) | in.           | (mm) |
| B3088S-3/4   | 1/4" x 8" x 8"           | (6.3 x 203.2 x 203.2)  | 3/4" (20)       |      | 1" (25.4)     |      | 9/16" (14.3)  |      |
| B3088S-1     | 1/4" x 8" x 8"           | (6.3 x 203.2 x 203.2)  | 1" (25)         |      | 1" (25.4)     |      | 9/16" (14.3)  |      |
| B3088S-1 1/4 | 1/4" x 8" x 8"           | (6.3 x 203.2 x 203.2)  | 1 1/4" (20)     |      | 1" (25.4)     |      | 9/16" (14.3)  |      |
| B3088S-1 1/2 | 1/4" x 8" x 8"           | (6.3 x 203.2 x 203.2)  | 1 1/2" (32)     |      | 1" (25.4)     |      | 9/16" (14.3)  |      |
| B3088S-2     | 1/4" x 8" x 8"           | (6.3 x 203.2 x 203.2)  | 2" (50)         |      | 1" (25.4)     |      | 9/16" (14.3)  |      |
| B3088S-2 1/2 | 3/8" x 8 1/2" x 8 1/2"   | (9.5 x 215.9 x 215.9)  | 2 1/2" (65)     |      | 1 1/4" (31.7) |      | 9/16" (14.3)  |      |
| B3088S-4     | 1/2" x 13 1/2" x 13 1/2" | (12.7 x 342.9 x 342.9) | 4" (100)        |      | 1 1/2" (38.1) |      | 15/16" (23.8) |      |

| Part No.    | Approx. Wt./100* |          |
|-------------|------------------|----------|
|             | Lbs.             | (kg)     |
| B3088-3/4   | 618              | (280.3)  |
| B3088-1     | 708              | (321.1)  |
| B3088-1 1/4 | 798              | (362.0)  |
| B3088-1 1/2 | 858              | (389.2)  |
| B3088-2     | 993              | (450.4)  |
| B3088-2 1/2 | 1638             | (743.0)  |
| B3088-4     | 4202             | (1906.0) |

\* Based on a height of 18" (457.2mm).

## B3088ST - Threaded Seismic Base Stand

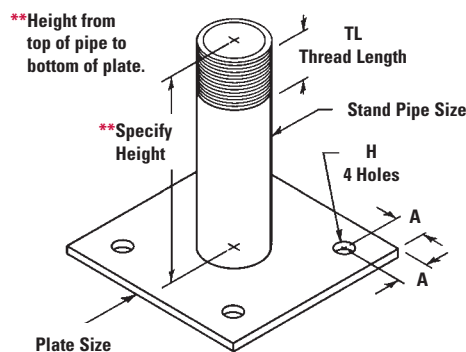
**Size Range:** 1" (25mm) thru 4" (100mm) pipe

**Material:** Steel

**Function:** Designed as a threaded base stand where vertical adjustment is required for pipe supports B3089, B3092, and B3093, to meet requirements of 12X anchor diameter hole spacing for seismic applications. The standard B3088-3 & B3088-6 already meet this requirement.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, height and finish.



**Note:** Match B3088TS part number with dimension 'D' from B3092, and B3093 charts.

| Part No.      | Plate Size<br>in.        | (mm)                   | Stand Pipe Size<br>in. | (mm)  | A<br>in. | (mm)   | Dia. H<br>in. | (mm)   | TL<br>in. | (mm)   |
|---------------|--------------------------|------------------------|------------------------|-------|----------|--------|---------------|--------|-----------|--------|
| B3088ST-1     | 1/4" x 8" x 8"           | (6.3 x 203.2 x 203.2)  | 1"                     | (25)  | 1"       | (25.4) | 9/16"         | (14.3) | 1 1/2"    | (38.1) |
| B3088ST-1 1/4 | 1/4" x 8" x 8"           | (6.3 x 203.2 x 203.2)  | 1 1/4"                 | (32)  | 1"       | (25.4) | 9/16"         | (14.3) | 1 1/2"    | (38.1) |
| B3088ST-1 1/2 | 1/4" x 8" x 8"           | (6.3 x 203.2 x 203.2)  | 1 1/2"                 | (40)  | 1"       | (25.4) | 9/16"         | (14.3) | 1 1/2"    | (38.1) |
| B3088ST-2     | 1/4" x 8" x 8"           | (6.3 x 203.2 x 203.2)  | 2"                     | (50)  | 1"       | (25.4) | 9/16"         | (14.3) | 1 1/2"    | (38.1) |
| B3088ST-2 1/2 | 3/8" x 8 1/2" x 8 1/2"   | (9.5 x 215.9 x 215.9)  | 2 1/2"                 | (65)  | 1 1/4"   | (31.7) | 9/16"         | (14.3) | 1 1/2"    | (38.1) |
| B3088ST-4     | 1/2" x 13 1/2" x 13 1/2" | (12.7 x 342.9 x 342.9) | 4"                     | (100) | 1 1/2"   | (38.1) | 15/16"        | (23.8) | 2"        | (50.8) |

| Part No.      | Approx. Wt./100*<br>Lbs. | (kg)     |
|---------------|--------------------------|----------|
| B3088ST-1     | 708                      | (321.1)  |
| B3088ST-1 1/4 | 798                      | (362.0)  |
| B3088ST-1 1/2 | 858                      | (389.2)  |
| B3088ST-2     | 993                      | (450.4)  |
| B3088ST-2 1/2 | 1638                     | (743.0)  |
| B3088ST-4     | 4202                     | (1906.0) |

\*Based on a height of 18" (457.2mm).

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Pipe Supports

## B3092 - Adjustable Pipe Saddle Support with Yoke

**Size Range:** 3/4" (20mm) thru 36" (900mm) pipe

**Material:** Steel with cast iron reducer

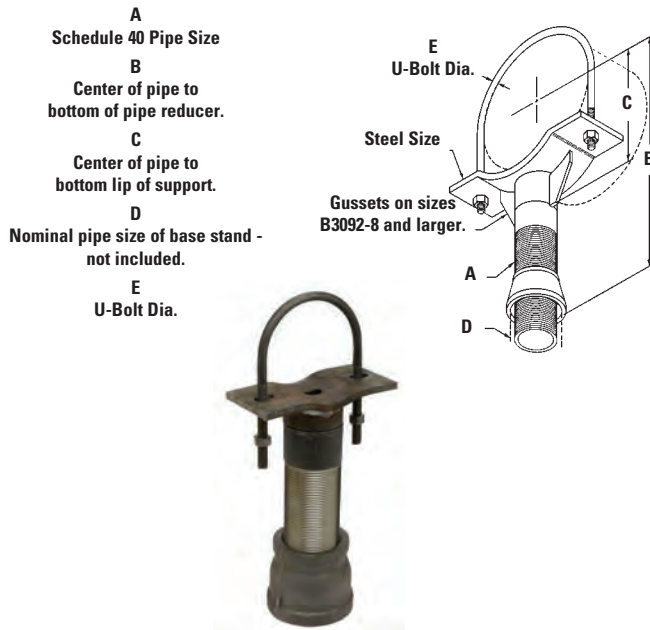
**Function:** Designed to support horizontal pipe from floor stanchion where vertical adjustment is required. U-bolt and hex nuts are provided to hold pipe securely to saddle. To complete floor stanchion, use with B3088T (page 42) threaded pipe stand.

**Approvals:** Conforms to Federal Specification WW-H-171E & A-A-1192A and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 37.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish

**Notes:** Order with B3088T for complete stanchion support. 4" (100mm) thru 12" (300mm) fits both steel and ductile iron pipe. For other ductile iron pipe sizes specify B3092DI - size. 3" (80mm) Ductile Iron uses B3092-3 1/2



| Part No.    | Pipe Size<br>in. (mm) | Maximum O.D. of Pipe<br>in. (mm) | A<br>in. (mm) | Minimum<br>in. (mm) | B<br>in. (mm)     | Maximum<br>in. (mm) |
|-------------|-----------------------|----------------------------------|---------------|---------------------|-------------------|---------------------|
| B3092-3/4   | 3/4" (19)             | 1 3/8" (34.9)                    | 3/4" (19)     | 5 3/4" (146.0)      | 10 1/4" (260.3)   |                     |
| B3092-1     | 1" (25)               | 1 3/8" (34.9)                    | 3/4" (19)     | 5 29/32" (150.0)    | 10 13/32" (264.3) |                     |
| B3092-1 1/4 | 1 1/4" (32)           | 1 11/16" (42.9)                  | 3/4" (19)     | 6 5/64" (154.4)     | 10 37/64" (268.7) |                     |
| B3092-1 1/2 | 1 1/2" (38)           | 2" (50.8)                        | 3/4" (19)     | 6 1/4" (158.7)      | 10 3/4" (273.0)   |                     |
| B3092-2     | 2" (50)               | 2 7/16" (61.9)                   | 3/4" (19)     | 6 7/16" (163.5)     | 10 15/16" (277.8) |                     |
| B3092-2 1/2 | 2 1/2" (65)           | 2 7/8" (73.0)                    | 1 1/2" (40)   | 6 7/8" (174.6)      | 11 3/8" (288.9)   |                     |
| B3092-3     | 3" (80)               | 3 1/2" (88.9)                    | 1 1/2" (40)   | 7 3/16" (182.6)     | 11 11/16" (296.9) |                     |
| B3092-3 1/2 | 3 1/2" (90)           | 4" (101.6)                       | 1 1/2" (40)   | 7 7/16" (188.9)     | 11 15/16" (303.2) |                     |
| B3092-4     | 4" (100)              | 4 7/8" (123.8)                   | 2 1/2" (65)   | 7 13/16" (198.4)    | 12 5/16" (312.7)  |                     |
| B3092-5     | 5" (125)              | 5 5/8" (142.9)                   | 2 1/2" (65)   | 8 9/32" (210.3)     | 12 25/32" (324.6) |                     |
| B3092-6     | 6" (150)              | 6 29/32" (175.4)                 | 2 1/2" (65)   | 9 1/16" (230.2)     | 13 9/16" (344.5)  |                     |
| B3092-8     | 8" (200)              | 9 1/8" (231.8)                   | 2 1/2" (65)   | 10 1/2" (266.7)     | 15" (381.0)       |                     |

| Part No.    | C<br>in. (mm)   | D (Not Supplied)<br>in. (mm) | E<br>in. (mm) | Saddle Steel Size<br>in. (mm) | Approx. Wt./100<br>Lbs. (kg) |
|-------------|-----------------|------------------------------|---------------|-------------------------------|------------------------------|
| B3092-3/4   | 2" (50.8)       | 1 1/2" (38)                  | 1/4" (6.4)    | 1/4" x 1 1/2" (6.3 x 38.1)    | 247 (112.0)                  |
| B3092-1     | 2 5/32" (54.8)  | 1 1/2" (38)                  | 1/4" (6.4)    | 1/4" x 1 1/2" (6.3 x 38.1)    | 257 (116.6)                  |
| B3092-1 1/4 | 2 1/64" (59.1)  | 1 1/2" (38)                  | 3/8" (9.5)    | 1/4" x 2" (6.3 x 50.8)        | 289 (131.1)                  |
| B3092-1 1/2 | 2 1/2" (63.5)   | 1 1/2" (38)                  | 3/8" (9.5)    | 1/4" x 2" (6.3 x 50.8)        | 306 (138.8)                  |
| B3092-2     | 2 11/16" (68.3) | 1 1/2" (38)                  | 3/8" (9.5)    | 1/4" x 2" (6.3 x 50.8)        | 326 (147.9)                  |
| B3092-2 1/2 | 3 1/8" (79.4)   | 2 1/2" (65)                  | 1/2" (12.7)   | 1/4" x 3" (6.3 x 76.2)        | 651 (295.3)                  |
| B3092-3     | 3 7/16" (87.3)  | 2 1/2" (65)                  | 1/2" (12.7)   | 1/4" x 3" (6.3 x 76.2)        | 716 (324.8)                  |
| B3092-3 1/2 | 3 11/16" (93.7) | 2 1/2" (65)                  | 1/2" (12.7)   | 1/4" x 3" (6.3 x 76.2)        | 717 (325.2)                  |
| B3092-4     | 4 1/4" (107.9)  | 3" (80)                      | 1/2" (12.7)   | 3/8" x 3 1/2" (9.5 x 88.9)    | 1286 (583.3)                 |
| B3092-5     | 4 9/16" (115.9) | 3" (80)                      | 1/2" (12.7)   | 3/8" x 3 1/2" (9.5 x 88.9)    | 1321 (599.2)                 |
| B3092-6     | 5 1/2" (139.7)  | 3" (80)                      | 5/8" (15.9)   | 1/2" x 3 1/2" (12.7 x 88.9)   | 1595 (723.5)                 |
| B3092-8     | 7" (177.8)      | 3" (80)                      | 5/8" (15.9)   | 1/2" x 3 1/2" (12.7 x 88.9)   | 1815 (823.3)                 |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## B3093 - Adjustable Pipe Saddle Support

**Size Range:** 1" (25mm) thru 36" (900mm) pipe

**Material:** Steel with cast iron reducer

**Function:** Designed to support horizontal pipe from floor stanchion where vertical adjustment is required. U-bolt and hex nuts are provided to hold pipe securely to saddle. To complete floor stanchion, use with B3088T (page 42) threaded pipe stand.

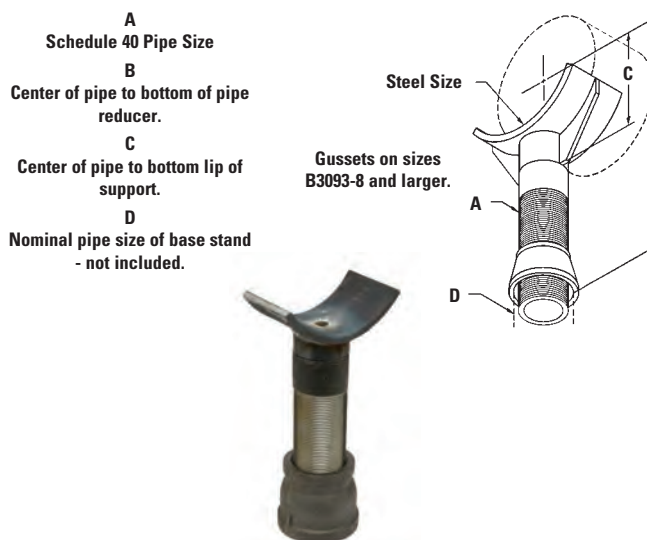
**Approvals:** Conforms to Federal Specification

WW-H-171E & A-A-1192A, Type 38 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 37.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish

**Note:** Order with B3088T for complete stanchion support.



| Part No.                            | Pipe Size<br>in. (mm)                | Maximum O.D. of Pipe<br>in. (mm)         | A<br>in. (mm)                        | Minimum<br>in. (mm)                       | B<br>in. (mm)                               | Maximum<br>in. (mm)                       | C<br>in. (mm) |
|-------------------------------------|--------------------------------------|------------------------------------------|--------------------------------------|-------------------------------------------|---------------------------------------------|-------------------------------------------|---------------|
| B3093-1                             | 1" (25)                              | 1 <sup>5</sup> / <sub>16</sub> " (33.3)  | <sup>3</sup> / <sub>4</sub> " (20)   | 5 <sup>2</sup> / <sub>32</sub> " (143.6)  | 10 <sup>5</sup> / <sub>32</sub> " (257.9)   | 1 <sup>29</sup> / <sub>32</sub> " (48.4)  |               |
| B3093-1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>4</sub> " (32) | 1 <sup>11</sup> / <sub>16</sub> " (42.9) | <sup>3</sup> / <sub>4</sub> " (20)   | 5 <sup>53</sup> / <sub>64</sub> " (148.0) | 10 <sup>21</sup> / <sub>64</sub> " (2262.3) | 2 <sup>5</sup> / <sub>64</sub> " (52.8)   |               |
| B3093-1 <sup>1</sup> / <sub>2</sub> | 1 <sup>1</sup> / <sub>2</sub> " (40) | 1 <sup>29</sup> / <sub>32</sub> " (48.4) | <sup>3</sup> / <sub>4</sub> " (20)   | 6" (152.4)                                | 10 <sup>1</sup> / <sub>2</sub> " (266.7)    | 2 <sup>1</sup> / <sub>4</sub> " (58.1)    |               |
| B3093-2                             | 2" (50)                              | 2 <sup>3</sup> / <sub>8</sub> " (60.3)   | <sup>3</sup> / <sub>4</sub> " (20)   | 6 <sup>3</sup> / <sub>16</sub> " (157.2)  | 10 <sup>11</sup> / <sub>16</sub> " (271.5)  | 2 <sup>7</sup> / <sub>16</sub> " (61.9)   |               |
| B3093-2 <sup>1</sup> / <sub>2</sub> | 2 <sup>1</sup> / <sub>2</sub> " (65) | 2 <sup>7</sup> / <sub>8</sub> " (73.0)   | 1 <sup>1</sup> / <sub>2</sub> " (40) | 6 <sup>5</sup> / <sub>16</sub> " (160.3)  | 10 <sup>13</sup> / <sub>16</sub> " (274.6)  | 2 <sup>9</sup> / <sub>16</sub> " (65.1)   |               |
| B3093-3                             | 3" (80)                              | 3 <sup>1</sup> / <sub>2</sub> " (88.9)   | 1 <sup>1</sup> / <sub>2</sub> " (40) | 6 <sup>5</sup> / <sub>8</sub> " (168.3)   | 11 <sup>1</sup> / <sub>8</sub> " (282.6)    | 2 <sup>7</sup> / <sub>8</sub> " (73.0)    |               |
| B3093-3 <sup>1</sup> / <sub>2</sub> | 3 <sup>1</sup> / <sub>2</sub> " (90) | 4" (101.6)                               | 1 <sup>1</sup> / <sub>2</sub> " (40) | 6 <sup>7</sup> / <sub>8</sub> " (174.6)   | 11 <sup>3</sup> / <sub>8</sub> " (288.9)    | 3 <sup>1</sup> / <sub>8</sub> " (79.4)    |               |
| B3093-4                             | 4" (100)                             | 4 <sup>7</sup> / <sub>8</sub> " (123.8)  | 2 <sup>1</sup> / <sub>2</sub> " (65) | 7 <sup>1</sup> / <sub>4</sub> " (184.1)   | 11 <sup>3</sup> / <sub>4</sub> " (298.4)    | 3 <sup>1</sup> / <sub>2</sub> " (88.9)    |               |
| B3093-5                             | 5" (125)                             | 5 <sup>9</sup> / <sub>16</sub> " (141.3) | 2 <sup>1</sup> / <sub>2</sub> " (65) | 7 <sup>25</sup> / <sub>32</sub> " (197.6) | 12 <sup>9</sup> / <sub>32</sub> " (311.9)   | 4 <sup>1</sup> / <sub>32</sub> " (102.4)  |               |
| B3093-6                             | 6" (150)                             | 7" (177.8)                               | 2 <sup>1</sup> / <sub>2</sub> " (65) | 8 <sup>7</sup> / <sub>16</sub> " (214.3)  | 12 <sup>15</sup> / <sub>16</sub> " (328.6)  | 4 <sup>11</sup> / <sub>16</sub> " (119.1) |               |
| B3093-8                             | 8" (200)                             | 9 <sup>1</sup> / <sub>8</sub> " (231.8)  | 2 <sup>1</sup> / <sub>2</sub> " (65) | 10 <sup>1</sup> / <sub>4</sub> " (260.3)  | 14 <sup>3</sup> / <sub>4</sub> " (374.6)    | 6 <sup>1</sup> / <sub>2</sub> " (165.1)   |               |

| Part No.                            | D (Base Stand<br>Not Supplied)<br>in. (mm) | Saddle Steel Size<br>in. (mm)                                                | Approx. Wt./100<br>Complete<br>Lbs. (kg) | Saddle Only<br>Lbs. (kg) |
|-------------------------------------|--------------------------------------------|------------------------------------------------------------------------------|------------------------------------------|--------------------------|
| B3093-1                             | 1 <sup>1</sup> / <sub>2</sub> " (40)       | <sup>1</sup> / <sub>4</sub> " x 1 <sup>3</sup> / <sub>4</sub> " (6.3 x 44.4) | 189 (85.7)                               | 49 (22.2)                |
| B3093-1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>2</sub> " (40)       | <sup>1</sup> / <sub>4</sub> " x 1 <sup>3</sup> / <sub>4</sub> " (6.3 x 44.4) | 221 (100.2)                              | 81 (36.7)                |
| B3093-1 <sup>1</sup> / <sub>2</sub> | 1 <sup>1</sup> / <sub>2</sub> " (40)       | <sup>1</sup> / <sub>4</sub> " x 1 <sup>3</sup> / <sub>4</sub> " (6.3 x 44.4) | 228 (103.4)                              | 88 (39.9)                |
| B3093-2                             | 1 <sup>1</sup> / <sub>2</sub> " (40)       | <sup>1</sup> / <sub>4</sub> " x 1 <sup>3</sup> / <sub>4</sub> " (6.3 x 44.4) | 234 (106.1)                              | 94 (42.6)                |
| B3093-2 <sup>1</sup> / <sub>2</sub> | 2 <sup>1</sup> / <sub>2</sub> " (65)       | <sup>1</sup> / <sub>4</sub> " x 3" (6.3 x 76.2)                              | 567 (257.2)                              | 167 (75.8)               |
| B3093-3                             | 2 <sup>1</sup> / <sub>2</sub> " (65)       | <sup>1</sup> / <sub>4</sub> " x 3" (6.3 x 76.2)                              | 576 (261.3)                              | 176 (79.9)               |
| B3093-3 <sup>1</sup> / <sub>2</sub> | 2 <sup>1</sup> / <sub>2</sub> " (65)       | <sup>1</sup> / <sub>4</sub> " x 3" (6.3 x 76.2)                              | 588 (266.7)                              | 188 (85.3)               |
| B3093-4                             | 3" (80)                                    | <sup>1</sup> / <sub>4</sub> " x 4" (6.3 x 101.6)                             | 1064 (482.6)                             | 364 (165.1)              |
| B3093-5                             | 3" (80)                                    | <sup>1</sup> / <sub>4</sub> " x 4" (6.3 x 101.6)                             | 1081 (490.3)                             | 381 (172.8)              |
| B3093-6                             | 3" (80)                                    | <sup>3</sup> / <sub>8</sub> " x 4" (9.5 x 101.6)                             | 1234 (559.7)                             | 534 (242.2)              |
| B3093-8                             | 3" (80)                                    | <sup>3</sup> / <sub>8</sub> " x 4" (9.5 x 101.6)                             | 1496 (678.6)                             | 796 (361.1)              |

Note:

4" (100) thru 12" (300) fits both steel and ductile iron pipe.

For other ductile iron pipe sizes specify B3093DI - size.

3" (80) Ductile Iron uses B3093-3<sup>1</sup>/<sub>2</sub>

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 828 - universal sway brace attachment to steel (UL listed)

**Size Range:** One size accommodates all Fig. 900 Series sway brace attachments. Fits from  $\frac{3}{8}$ " (9.4mm) to  $\frac{7}{8}$ " (22.2mm) thick steel structure. For thicknesses less than  $\frac{3}{8}$ " (9.4mm) refer to Fig. 825 and Fig. 825A.

**Material:** Steel

**Function:** To attach sway bracing and/or hangers to various types of steel structural members.

**Features:** Permits secure non-friction connection without drilling or welding. Unique design allows offset placement on wide flange beam, C-channel, open web, welded steel trusses, etc. Secures brace to structure either across or along the beam. Break-off set bolts allow for visual verification of proper installation torque.

**Approvals:** Underwriters Laboratories Listed in the USA and Canada (cULus). Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For FM Approval information refer to FM Approved page 53.

**Installation Instructions:** The Fig. 828 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Slide the Fig. 828 on the flange of the beam, truss, or girder. Be sure the attachment is fully engaged to the rear of the opening. Tighten the cone point set screws until the heads break off. Remove the flange nut from the carriage bolt. Install a TOLCO swivel fitting (Fig. 909, 910, 980, \*986). Use flange nut to secure the swivel fitting.

\*Not UL listed when used in combination with Fig. 986

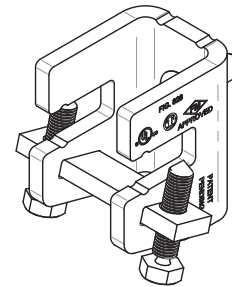
**Finish:** Plain or Electro-Galvanized

**Approx. Weight/100:** 341 Lbs. (154.7 kg)

**Order By:** Figure number and finish

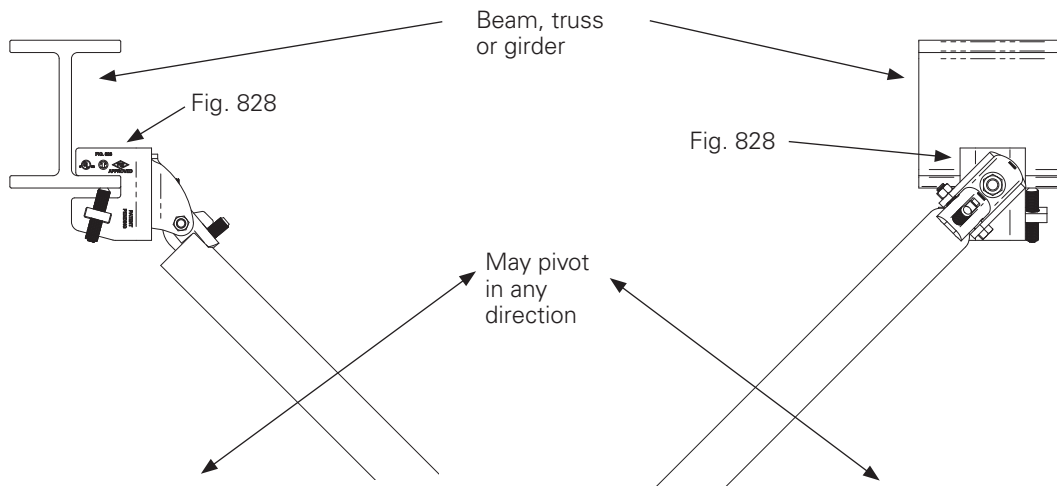
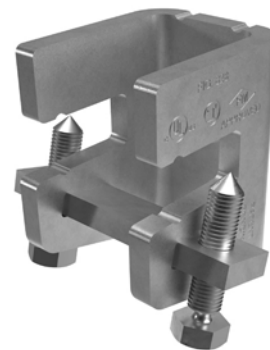
*Patent Pending*

**Note:** Retaining strap not required.



Set Screws and 1/2" Attachment Bolt and Nut Included

| Flange thickness | Maximum UL Rated load |
|------------------|-----------------------|
| .375" – .499"    | 1090 lbs. (4.84kN)    |
| .500" – .875"    | 1370 lbs. (6.09kN)    |



Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

## TOLCO Fig. 828 - Universal sway brace attachment to steel (FM approved)

**Size Range:** One size accommodates all Fig. 900 Series sway brace attachments. Fits from  $\frac{3}{8}$ " (9.4mm) to  $\frac{7}{8}$ " (22.2mm) thick steel structure. For thicknesses less than  $\frac{3}{8}$ " (9.4mm) refer to Fig. 825.

**Material:** Steel

**Function:** To attach sway bracing and/or hangers to various types of steel structural members.

**Features:** Permits secure non-friction connection without drilling or welding. Unique design allows offset placement on wide flange beam, C-channel, open web, welded steel trusses, etc. Secures brace to structure either across or along the beam. Break-off set bolts allow for visual verification of proper installation torque.

**Approvals:** Factory Mutual Approved (FM). Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For UL Listed information refer to UL Listed page 52.

**Installation Instructions:** The Fig. 828 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO™ transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 or FM guidelines should be followed.

**To Install:** Slide the Fig. 828 on the flange of the beam, truss, or girder. Be sure the attachment is fully engaged to the rear of the opening. Tighten the cone point set screws until the heads break off. Remove the flange nut from the carriage bolt. Install a TOLCO swivel fitting (Fig. 909, 910, 980, \*986). Use flange nut to secure the swivel fitting.

\*Not UL listed when used in combination with Fig. 986

**Finish:** Plain or Electro-Galvanized

**Approx. Weight/100:** 341 Lbs. (154.7kg)

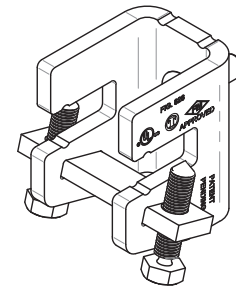
**Order By:** Figure number and finish

*Patent Pending*

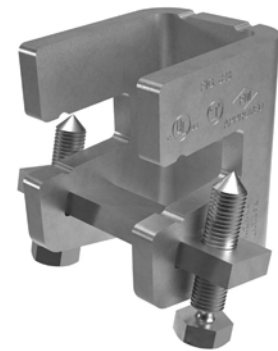
Designed to meet or exceed requirements of FM DS 2-8.

**Note:** Retaining strap not required.

OPM



Set Screws  
and  
1/2" Attachment  
Bolt and Nut  
Included



Seismic Bracing

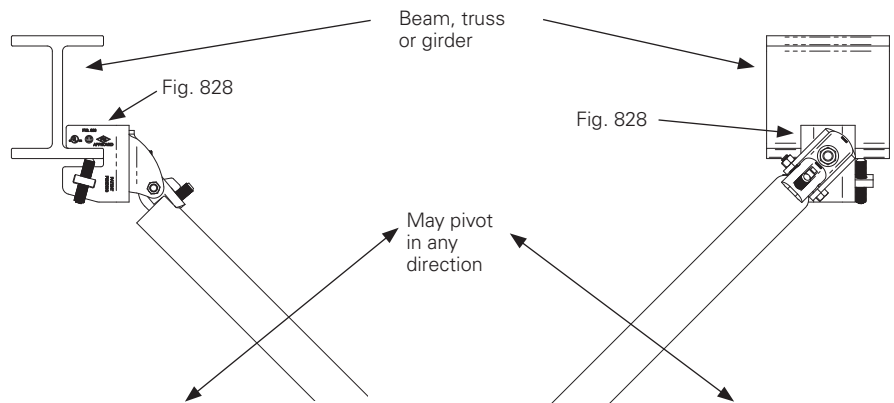
### FM Approved Allowable Horizontal Load With Brace Perpendicular To Beam

| Brace Angle (degrees from vertical) |           |            |            |
|-------------------------------------|-----------|------------|------------|
| 30°-44°                             | 45°-59°   | 60°-74°    | 75°-90°    |
| 980                                 | 2220      | 3340       | 4040       |
| (4.350kN)                           | (9.780kN) | (14.850kN) | (17.970kN) |

### FM Approved Allowable Horizontal Load With Brace Parallel To Beam

| Brace Angle (degrees from vertical) |           |           |           |
|-------------------------------------|-----------|-----------|-----------|
| 30°-44°                             | 45°-59°   | 60°-74°   | 75°-90°   |
| 820                                 | 1270      | 1490      | 1650      |
| (3.640kN)                           | (5.640kN) | (6.620kN) | (7.330kN) |

FM Approved design loads are based on ASD design method.



Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

## TOLCO Fig. 825 - bar joist sway brace attachment to steel (UL listed)

**Size Range:** One size accommodates all Fig. 900 Series sway brace attachments.

**Material:** Steel

**Function:** To attach sway bracing and hanger assemblies to steel members.

**Features:** This product's design incorporates a concentric attachment point which is critical to the performance of structural seismic connections. NFPA 13 indicates the importance of concentric loading of connections and fasteners. Permits secure non-friction connection without drilling or welding. Unique design reinforces point of connection to joist. Break off head set bolt design assures verification of proper installation torque (min. 31 ft.-lbs.).

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). UL listed with Fig. 909, 910, and 980 series attachments and the following brace member type pipes: Sch. 40, KSD 3562. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHDP). For additional load, spacing and placement information relating to OSHDP projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For FM Approval information refer to FM Approved page 55.

**Installation Instructions:** Fig. 825 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO™ transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment, to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Place the Fig. 825 on the steel beam, tighten the cone point set bolts until heads break off. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional fitting. Transitional fitting attachment can pivot for adjustment to proper brace angle.

**Finish:** Plain, Electro-Galvanized and HDG

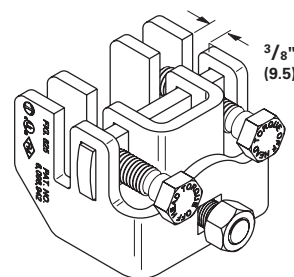
**Approx. Wt./100:** 247.5 Lbs. (112.2kg)

**Order By:** Figure number and finish

US Patent #6,098,942

Canada Patent #2,286,659

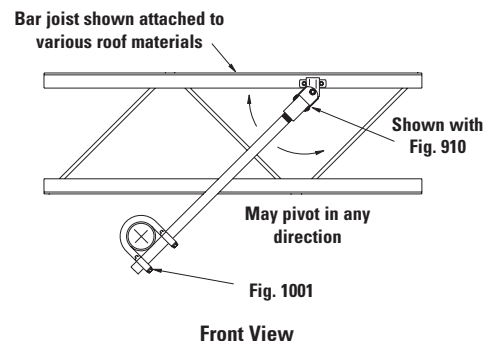
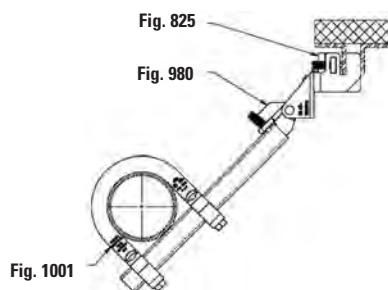
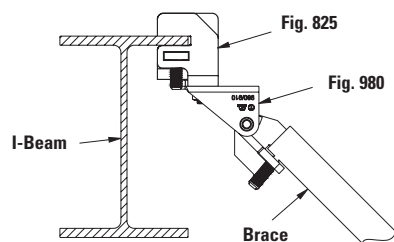
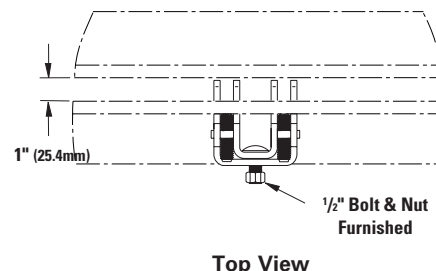
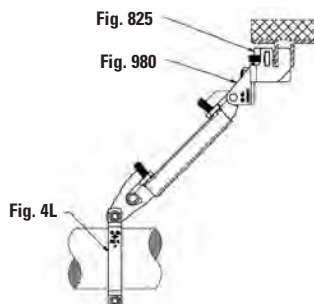
Retaining strap not required.



Set Bolts & Hardware Included

| Maximum Design Load |           |
|---------------------|-----------|
| 825W/909-1370 lbs   | (5.78 KN) |
| 825W/910-1500 lbs   | (7.11 KN) |
| 825W/980-1600 lbs   | (8.45 KN) |

UL Listed as Hanger Attachment for 6" (150mm) pipe at Maximum Spacing



Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

Updated 5-24-21

## TOLCO Fig. 825 - bar joist sway brace attachment to steel (FM approved)

**Size Range:** One size accommodates all Fig. 900 Series sway brace attachments.

**Material:** Steel

**Function:** To attach sway bracing and hanger assemblies to steel members.

**Features:** This product's design incorporates a concentric attachment point which is critical to the performance of structural seismic connections. NFPA 13 indicates the importance of concentric loading of connections and fasteners. Permits secure non-friction connection without drilling or welding. Unique design reinforces point of connection to joist. Break off head set bolt design assures verification of proper installation torque (min. 31 ft.-lbs.).

**Approvals:** Approved by Factory Mutual Engineering (FM). Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For UL Listed information refer to UL Listed page 54.

**Installation Instructions:** Fig. 825 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO™ transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment, to form a complete bracing assembly. NFPA 13 or FM guidelines should be followed.

**To Install:** Place the Fig. 825 on the steel beam, tighten the cone point set bolts until heads break off. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional fitting. Transitional fitting attachment can pivot for adjustment to proper brace angle.

**Finish:** Plain, Electro-Galvanized and HDG

**Approx. Wt./100:** 247.5 Lbs. (112.2kg)

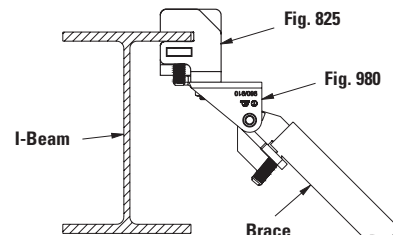
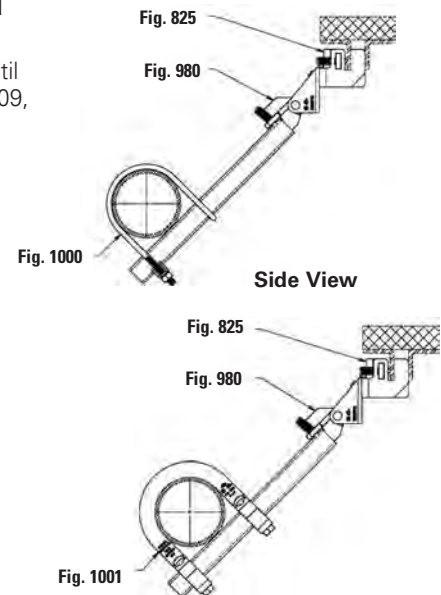
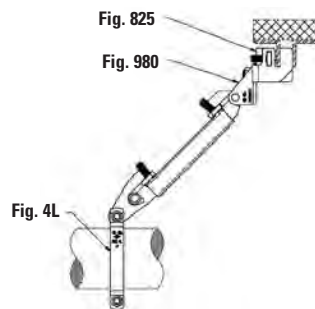
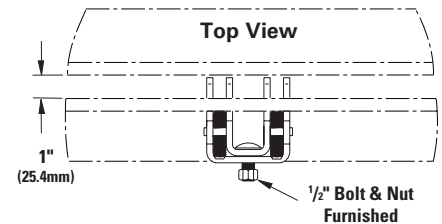
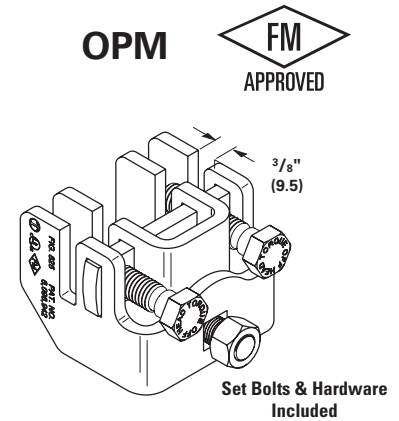
**Order By:** Figure number and finish

US Patent #6,098,942,  
Canada Patent #2,286,659

Designed to meet or exceed requirements of FM DS 2-8.

Retaining strap not required.

FM Approved design loads are based on ASD design method.



|                  |                                       | FM Approved Design Loads |                |                |                |
|------------------|---------------------------------------|--------------------------|----------------|----------------|----------------|
|                  |                                       | 30°-44°                  | 45°-59°        | 60°-74°        | 75°-90°        |
|                  |                                       | lbs. / (kN)              | lbs. / (kN)    | lbs. / (kN)    | lbs. / (kN)    |
| Maximum<br>3/8\" | Perpendicular to<br>Structural Member | 990<br>(4.40)            | 1360<br>(6.05) | 1670<br>(7.43) | 1860<br>(8.27) |
| Maximum<br>3/8\" | Parallel to<br>Structural Member      | 460<br>(2.04)            | 630<br>(2.80)  | 770<br>(3.42)  | 860<br>(3.82)  |

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Seismic Bracing

## TOLCO Fig. 825A - bar joist sway brace attachment to steel

**Size Range:** One size accommodates all Fig. 900 Series sway brace attachments.

**Material:** Steel

**Function:** To attach sway bracing and/or hanger to steel structural members.

**Features:** This product's design incorporates a concentric attachment point which is critical to the performance of structural seismic connections. NFPA 13 indicates the importance of concentric loading of connections and fasteners. Permits secure non-friction connection without drilling or welding. Unique design reinforces point of connection to joist. Break off head bolt design assures verification of proper installation.

**Approvals:** Underwriters Laboratories Listed in the USA (**UL**) and Canada (**cUL**). UL listed with Fig. 909, 910, and 980 series attachments and the following brace member type pipes: Sch. 40, KSD 3562. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (**OSHPD**). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Installation Instructions:** Fig. 825A is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO™ transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Place the Fig. 825A on the steel beam, tighten the cone point set bolts until heads break off. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional fitting. Transitional fitting attachment can pivot for adjustment to proper brace angle.

**Finish:** Plain or Electro-Galvanized

**Approx. Wt./100:** 154.5 Lbs. (70.1kg)

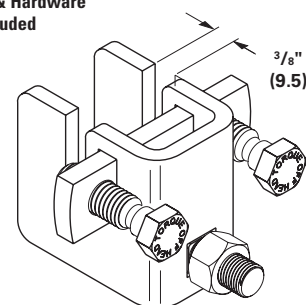
**Order By:** Figure number and finish

Patent #6,098,942

Retaining strap not required.



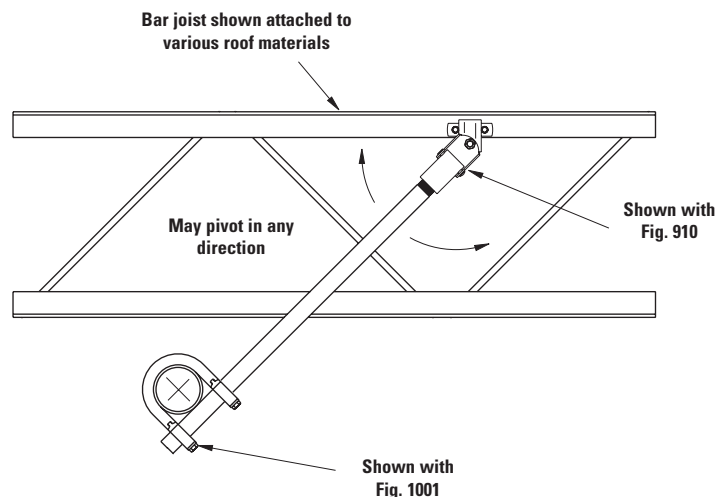
Set Bolts & Hardware Included



### Maximum Design Load

825A 700 lbs. (3.11kN)

**UL Listed as Hanger Attachment for 8" (200mm) Pipe at Maximum Spacing**



Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

Updated 5-24-21

## TOLCO Fig. 906 - sway brace multi-fastener adapter

**Material:** Steel



**Application:** Allows sway brace fittings to develop greater load carrying ability by providing multiple fastener attachments for steel and wood. The National Fire Protection (NFPA) provides information on fastener loads to various structures. Refer to NFPA 13 (2016) 9.3.5.9.1.

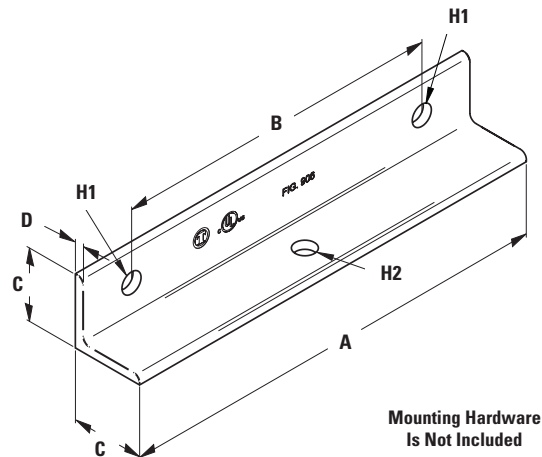
**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) only when used with TOLCO™ Fig. 900 Series Earthquake Brace Attachments. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Installation Instructions:** Fig. 906 is a multiple fastener structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Attach the Fig. 906 to the structural surface as per fastener design guidelines. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional fitting. Transitional fitting attachment can pivot for adjustment to proper brace angle.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and specify dimensions H1 and H2.



| Part Number | A<br>in. (mm) | B<br>in. (mm) | C<br>in. (mm) | D<br>in. (mm) | H1      | H2      | Approx. Wt./100<br>Lbs. (kg) |
|-------------|---------------|---------------|---------------|---------------|---------|---------|------------------------------|
| 906         | 12" (305.0)   | 9" (228.6)    | 2.5" (63.5)   | 1/4" (6.3)    | Specify | Specify | 394 (178.7)                  |
| 906-12      | 15" (381.0)   | 12" (304.8)   | 2.5" (63.5)   | 1/4" (6.3)    | Specify | Specify | 494 (224.1)                  |

Load Note: Actual design load determined by anchor and concrete strength, not to exceed the UL Listed maximum load of 1200 lbs (5.33kN).  
Load is for Fig. 906. If combined load of anchors is less, must reduce to anchor maximum capacity.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Seismic Bracing

## TOLCO Fig. 800 - adjustable sway brace attachment to steel (UL listed)

**Size Range:** 4" (101.6mm) thru 18" (457.2mm) beam width

**Material:** Steel

**Function:** Seismic brace attachment to steel.

**Features:** This product's design incorporates a concentric attachment point which is critical to the performance of structural seismic connections. NFPA 13 indicates the importance of concentric loading of connections and fasteners. Permits secure connection to steel where drilling and/or welding of brace connection could present structural issues.

**Installation Instructions:** Fig. 800 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO™ transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Place the Fig. 800 on the steel beam, tighten the cone point set bolts on flange until the heads break off. Tighten hex head bolts into clamp body until lock washers are fully flat. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional fitting. Transitional fitting attachment can pivot for adjustment to proper brace angle.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). UL listed with Fig. 909, 910, 980, 909 series attachments and the following brace member type pipes: Sch. 40, KSD 3562. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

For FM Approval information refer to FM Approved page 59.

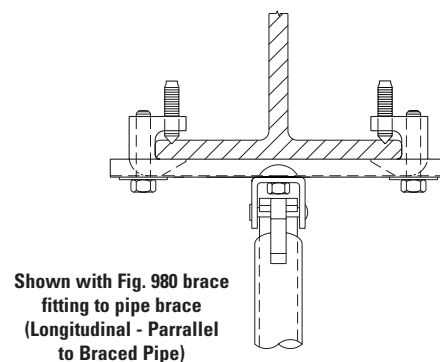
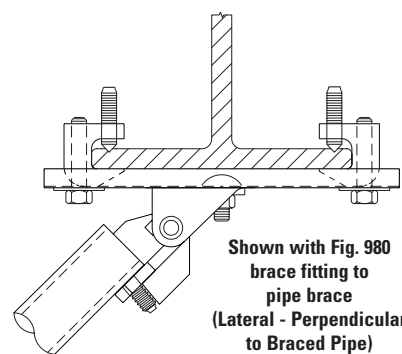
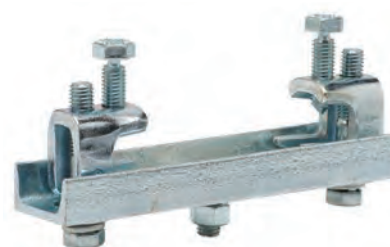
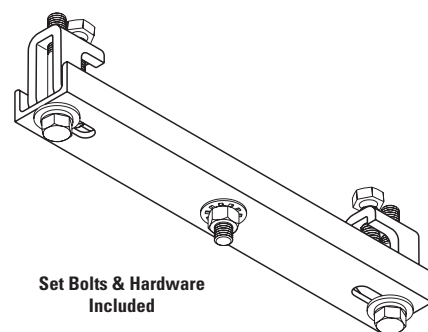
**Finish:** Plain, Electro-Galvanized and Hot Dip Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, type number and size number.  
Example: FIG. 800 TYPE2X14-16

| Type      | Fits Beam Flange Thickness<br>in. (mm) |
|-----------|----------------------------------------|
| 800 TYPE1 | Up to 3/4" (Up to 19.0)                |
| 800 TYPE2 | 3/4" to 1 1/4" (19.0 to 31.7)          |

| Fits Flange Width Range |         |               | Max.Design Loads (cULus)<br>Along or Across Beam |                       |                       |
|-------------------------|---------|---------------|--------------------------------------------------|-----------------------|-----------------------|
| Part #                  | in.     | (mm)          | Fig. 909<br>lbs. (kN)                            | Fig. 910<br>lbs. (kN) | Fig. 980<br>lbs. (kN) |
| 800-1                   | 4"-6"   | (101.6-152.4) | 1270~ (5.65)                                     | 1400~ (6.23)          | 1400~ (6.23)          |
| 800-2                   | 6"-8"   | (152.4-203.2) |                                                  |                       |                       |
| 800-3                   | 8"-10"  | (203.2-254.0) |                                                  |                       |                       |
| 800-4                   | 10"-12" | (254.0-304.8) |                                                  |                       |                       |
| 800-5                   | 12"-14" | (304.8-355.6) | 1270~ (5.65)                                     | 1300~ (5.78)          | 1300~ (5.78)          |
| 800-6                   | 14"-16" | (355.6-406.4) | 900~ (4.00)                                      | 900~ (4.00)           | 900~ (4.00)           |
| 800-7                   | 16"-18" | (406.4-457.2) |                                                  |                       |                       |

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 800 - adjustable sway brace attachment to steel (FM approved)

**Size Range:** 4" (101.6mm) thru 18" (457.2mm) beam width

**Material:** Steel

**Function:** Seismic brace attachment to steel.

**Features:** This product's design incorporates a concentric attachment point which is critical to the performance of structural seismic connections. NFPA 13 indicates the importance of concentric loading of connections and fasteners. Permits secure connection to steel where drilling and/or welding of brace connection could present structural issues.

**Installation Instructions:** Fig. 800 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO™ transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Place the Fig. 800 on the steel beam, tighten the cone point set bolts on flange until the heads break off. Tighten hex head bolts into clamp body until lock washers are fully flat. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional fitting. Transitional fitting attachment can pivot for adjustment to proper brace angle.

**Approvals:** Approved by Factory Mutual Engineering (FM).

Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

For UL Listed information refer to UL Listed page 58.

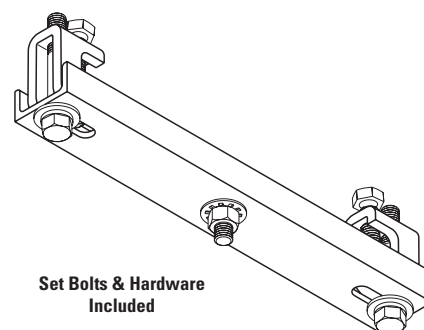
**Finish:** Plain, Hot Dip Galvanized or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, type number and size number.

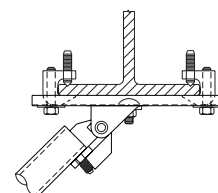
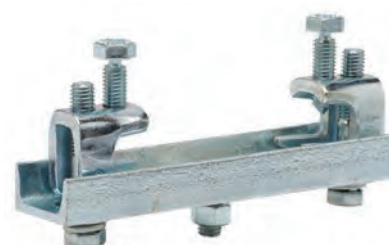
Example: FIG. 800 TYPE2X14-16

Designed to meet or exceed requirements of FM DS 2-8.

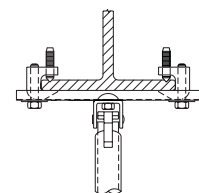
OPM



Set Bolts & Hardware Included



Shown with Fig. 980 brace fitting to pipe brace (Lateral - Perpendicular to Braced Pipe)



Shown with Fig. 980 brace fitting to pipe brace (Longitudinal - Parallel to Braced Pipe)

| Type      | Fits Beam<br>Flange Thickness<br>in. (mm) | Max.Design Loads (FM)*                  |                      |                      |                      |                                                   |                      |                      |                      |
|-----------|-------------------------------------------|-----------------------------------------|----------------------|----------------------|----------------------|---------------------------------------------------|----------------------|----------------------|----------------------|
|           |                                           | Lateral - Parallel to Structural Member |                      |                      |                      | Longitudinal - Perpendicular to Structural Member |                      |                      |                      |
|           |                                           | 30°-44°<br>lbs./(kN)                    | 45°-59°<br>lbs./(kN) | 60°-74°<br>lbs./(kN) | 75°-90°<br>lbs./(kN) | 30°-44°<br>lbs./(kN)                              | 45°-59°<br>lbs./(kN) | 60°-74°<br>lbs./(kN) | 75°-90°<br>lbs./(kN) |
| 800 TYPE1 | Up to 3/4" (Up to 19.0)                   | 1430<br>(6.36)                          | 1970<br>(8.76)       | 1980<br>(8.81)       | NR<br>(NR)           | 930<br>(4.13)                                     | 1310<br>(5.82)       | 1610<br>(7.16)       | 1800<br>(8.00)       |
| 800 TYPE2 | 3/4" to 1 1/4" (19.0 to 31.7)             | NR<br>(NR)                              | NR<br>(NR)           | NR<br>(NR)           | NR<br>(NR)           | NR<br>(NR)                                        | NR<br>(NR)           | NR<br>(NR)           | NR<br>(NR)           |

|       | Fits<br>Flange Width Range |               |
|-------|----------------------------|---------------|
|       | in.                        | (mm)          |
| 4-6   | 4"-6"                      | (101.6-152.4) |
| 6-8   | 6"-8"                      | (152.4-203.2) |
| 8-10  | 8"-10"                     | (203.2-254.0) |
| 10-12 | 10"-12"                    | (254.0-304.8) |
| 12-14 | 12"-14"                    | (304.8-355.6) |
| 14-16 | 14"-16"                    | (355.6-406.4) |
| 16-18 | 16"-18"                    | (406.4-457.2) |

\* The loads listed are axial loads on the brace. The horizontal load capacity, H, of the brace is:  $H = F \times \sin \theta$ , where  $\theta$  is the installation angle measured from the vertical.

FM Approved design loads are based on ASD design method.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Seismic Bracing

## Fig. 980 - TOLCO Universal swivel sway brace attachment - $\frac{3}{8}$ "-16 to $\frac{3}{4}$ "-10 rods

## Fig. 980H - TOLCO Universal swivel sway brace attachment - $\frac{7}{8}$ "-9 to $1\frac{1}{4}$ "-7

**Size Range:** One size fits bracing pipe 1" (25mm) thru 2" (50mm), B-Line series 12 gauge (2.6mm) channel.

**Material:** Carbon steel

**Function:** Multi-functional attachment to structure or braced pipe fitting.

**Features:** This product's design incorporates a concentric attachment opening which is critical to the performance of structural seismic connections and in accordance with NFPA 13, 2019 Section 18.5.11.5. The Fig. 980 mounts to any surface angle and the break off bolt head assures verification of proper installation.

**Installation:** Fig.980 is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO™ "braced pipe" attachment, Fig. 1001, 2002, 3000, 4L or approved attachment to pipe to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Place the Fig. 980 onto the "bracing pipe". Tighten the set bolt until the head breaks off. Attachment can pivot for adjustment to proper brace angle.

**Approvals:** —Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). UL Listed for the following brace member type pipes: Sch. 40, KSD 3562. Ask the factory for additional information as it may vary by product size. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For FM Approval information refer to FM Approved page 61.

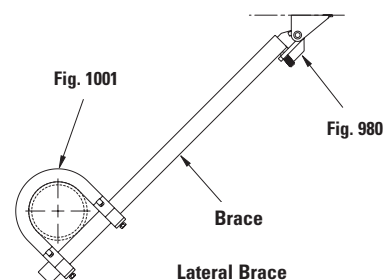
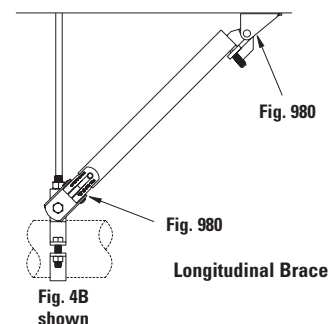
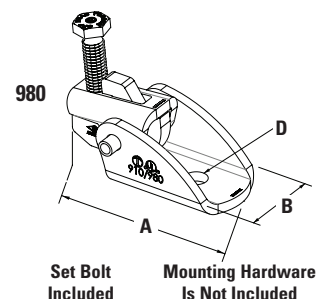
**Note:** Fig. 980 Swivel Attachment and Fig. 1001, 2002, 3000, 4L, or approved attachment to pipe make up a sway brace system of UL Listed attachments and bracing materials which satisfies the requirements of Underwriters Laboratories and the National Fire Protection Association (NFPA)

**Finish:** Plain, Electro-Galvanized or Stainless Steel.

Contact customer service for alternative finishes.

**Order By:** Figure number and finish.

Pat. #6,273,372, Pat. #6,517,030, Pat. #6,953,174,  
Pat. #6,708,930, Pat. #7,191,987, Pat. #7,441,730,  
Pat. #7,669,806



| Catalog #            | A<br>in. (mm)           | B<br>in. (mm)          | D**<br>in. (mm)        | Max. Design<br>Load (cULus)<br>lbs./kN                | Approx.Wt./100<br>lbs. (kg) |
|----------------------|-------------------------|------------------------|------------------------|-------------------------------------------------------|-----------------------------|
| *980- $\frac{3}{8}$  | $4\frac{9}{16}$ (114.9) | $2\frac{1}{16}$ (52.4) | $\frac{7}{16}$ (11.1)  | 1600 (7.12)                                           | 149 (67.6)                  |
| *980- $\frac{1}{2}$  |                         |                        | $\frac{9}{16}$ (14.3)  | 2100 (9.34)                                           | 148 (67.1)                  |
| *980- $\frac{5}{8}$  |                         |                        | $\frac{11}{16}$ (17.5) | 2100 (9.34)                                           | 147 (66.7)                  |
| *980- $\frac{3}{4}$  |                         |                        | $\frac{13}{16}$ (20.6) | 2100 (9.34)                                           | 146 (66.2)                  |
| 980H- $\frac{7}{8}$  | $6\frac{3}{4}$ (171.4)  | $3\frac{1}{2}$ (88.9)  | $\frac{15}{16}$ (23.8) | Fig. 980H<br>is not<br>UL Listed<br>or FM<br>Approved | 402 (182.3)                 |
| 980H-1               |                         |                        | $1\frac{1}{16}$ (27.0) |                                                       | 400 (181.4)                 |
| 980H- $1\frac{1}{8}$ |                         |                        | $1\frac{3}{16}$ (30.2) |                                                       | 397 (180.1)                 |
| 980H- $1\frac{1}{4}$ |                         |                        | $1\frac{5}{16}$ (33.3) |                                                       | 390 (176.9)                 |

\* Sizes available in stainless steel (980S- $\frac{3}{8}$ , 980S- $\frac{1}{2}$ , 980S- $\frac{5}{8}$ , and 980S- $\frac{3}{4}$ ) and have the same UL rating as what is listed.

\*\* Mounting attachment hole size.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

**Fig. 980 - TOLCO Universal swivel sway brace attachment -  $\frac{3}{8}$ "-16 to  $\frac{3}{4}$ "-10 rods**  
**Fig. 980H - TOLCO Universal swivel sway brace attachment -  $\frac{7}{8}$ "-9 to  $1\frac{1}{4}$ "-7**

**Size Range:** One size fits bracing pipe 1" (25mm) thru 2" (50mm), B-Line series 12 gauge (2.6mm) channel.

**Material:** Carbon steel

**Function:** Multi-functional attachment to structure or braced pipe fitting.

**Features:** This product's design incorporates a concentric attachment opening which is critical to the performance of structural seismic connections and in accordance with NFPA 13, 2019 Section 18.5.11.5. The Fig. 980 mounts to any surface angle and the break off bolt head assures verification of proper installation.

**Installation:** Fig.980 is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO™ "braced pipe" attachment, Fig. 1000, 1001, 3000, 4L, or other TOLCO approved attachment to pipe to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Place the Fig. 980 onto the "bracing pipe". Tighten the set bolt until the head breaks off. Attachment can pivot for adjustment to proper brace angle.

**Approvals:** —Approved by Factory Mutual Engineering (FM). Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For UL Listed information refer to UL Listed page 60.

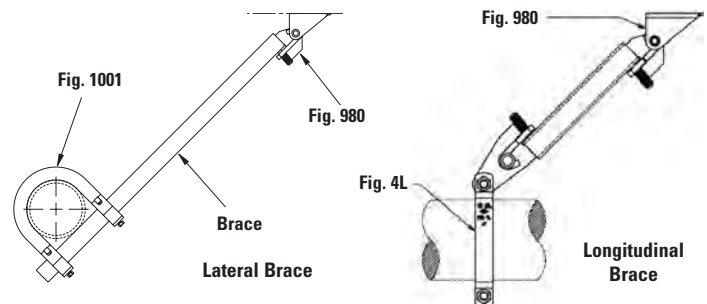
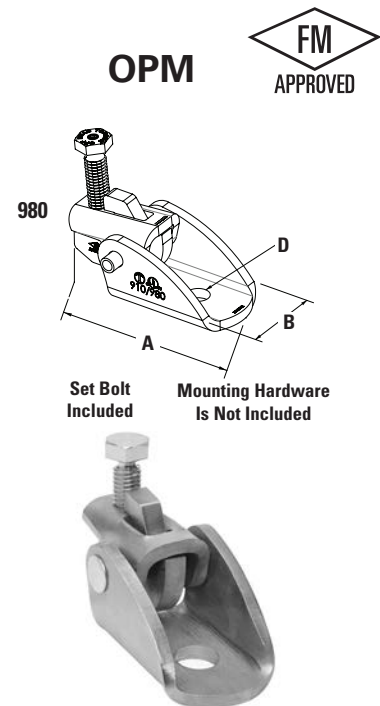
**Note:** Fig. 980 Swivel Attachment and Fig. 1000, 1001, 4L or other TOLCO approved attachment to pipe that make up a sway brace system of bracing materials which satisfies the requirements of Factory Mutual Engineering and the National Fire Protection Association (NFPA)

**Finish:** Plain, Electro-Galvanized or Stainless Steel.  
Contact customer service for alternative finishes.

**Order By:** Figure number and finish.

Pat. #6,273,372, Pat. #6,517,030, Pat. #6,953,174,  
Pat. #6,708,930, Pat. #7,191,987, Pat. #7,441,730,  
Pat. #7,669,806

Designed to meet or exceed requirements of FM DS 2-8.



| Catalog #            | A                       |                        | B   |      | D**                    |                                              | Max. Design Load*** (FM) |                       |                       |                       | Approx.Wt./100<br>lbs. (kg) |
|----------------------|-------------------------|------------------------|-----|------|------------------------|----------------------------------------------|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------------|
|                      | in.                     | (mm)                   | in. | (mm) | in.                    | (mm)                                         | 30°-44°<br>lbs./ (kN)    | 45°-59°<br>lbs./ (kN) | 60°-74°<br>lbs./ (kN) | 75°-90°<br>lbs./ (kN) |                             |
| 980- $\frac{3}{8}$   | $4\frac{9}{16}$ (114.9) | $2\frac{1}{16}$ (52.4) |     |      | $\frac{7}{16}$ (11.1)  |                                              |                          |                       |                       |                       | 149 (67.6)                  |
| 980- $\frac{1}{2}$   |                         |                        |     |      | $\frac{9}{16}$ (14.3)  |                                              |                          |                       |                       |                       | 148 (67.1)                  |
| 980- $\frac{5}{8}$   |                         |                        |     |      | $\frac{11}{16}$ (17.5) |                                              |                          |                       |                       |                       | 147 (66.7)                  |
| 980- $\frac{3}{4}$   |                         |                        |     |      | $\frac{13}{16}$ (20.6) |                                              |                          |                       |                       |                       | 146 (66.2)                  |
| 980H- $\frac{7}{8}$  | $6\frac{3}{4}$ (171.4)  | $3\frac{1}{2}$ (88.9)  |     |      | $\frac{15}{16}$ (23.8) |                                              |                          |                       |                       |                       | 402 (182.3)                 |
| 980H-1               |                         |                        |     |      | $1\frac{1}{16}$ (27.0) | Fig. 980H is not UL Listed<br>or FM Approved |                          |                       |                       |                       | 400 (181.4)                 |
| 980H- $1\frac{1}{8}$ |                         |                        |     |      | $1\frac{3}{16}$ (30.2) |                                              |                          |                       |                       |                       | 397 (180.1)                 |
| 980H- $1\frac{1}{4}$ |                         |                        |     |      | $1\frac{5}{16}$ (33.3) |                                              |                          |                       |                       |                       | 390 (176.9)                 |

\*\* Mounting attachment hole size.

\*\*\* Installed with 1" or  $1\frac{1}{4}$ " schedule 40 brace pipe.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Seismic Bracing

## TOLCO Fig. 909 - no-thread swivel sway brace attachment (UL listed)

**Size Range:** 1" (25mm) bracing pipe. For brace pipe sizes larger than 1" (25mm), use Fig. 980. Available with holes for 3/8", 1/2" or 5/8" attachment.

**Material:** Steel, hardened cone point set bolt

**Function:** The structural component of a sway and seismic bracing system.

**Features:** This product's design incorporates a concentric attachment opening which is critical to the performance of structural seismic connections. NFPA 13 indicates clearly that fastener table load values are based only on concentric loading. No threading of the bracing pipe is required. Open design allows for easy inspection of pipe engagement.

**ApJ54plication Note:** Fig. 909 is used in conjunction with the Fig. 1001 or Fig. 4L or other approved TOLCO attachment to pipe, and joined together with bracing pipe. Sway brace assemblies are intended to be installed in accordance with NFPA 13. The required type, number and size of fasteners used for the structure attachment fitting shall be in accordance with NFPA 13.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). UL Listed for the following brace member type pipes: Sch. 40, KSD 3562. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHDP). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Installation Instructions:** Place Fig. 909 onto the bracing pipe. Tighten the set screw until the head bottoms out on surface. When using in combination with a Fig. 825A, Fig. 825, Fig. 828, or Fig. 906, refer to those instruction sheets, otherwise select an anchor that is sized appropriately for the intended use and follow anchor manufacturer's instructions regarding structural thickness and embedment requirements. The required type, number and size of fasteners used for the structure attachment fitting shall be in accordance with NFPA 13. Once the anchor is installed per the manufacturer's direction, secure the Fig. 909 to the anchor. Attachment can pivot for adjustment to proper brace angle.

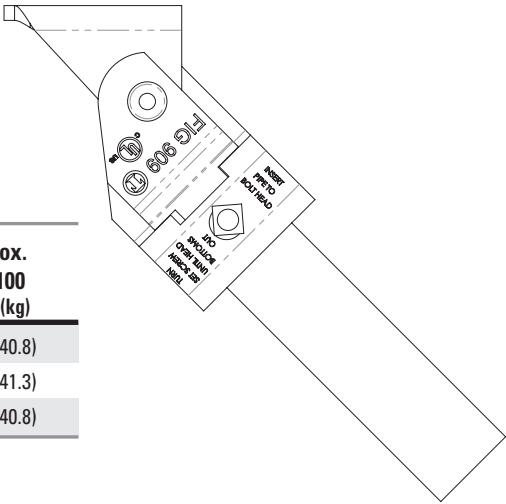
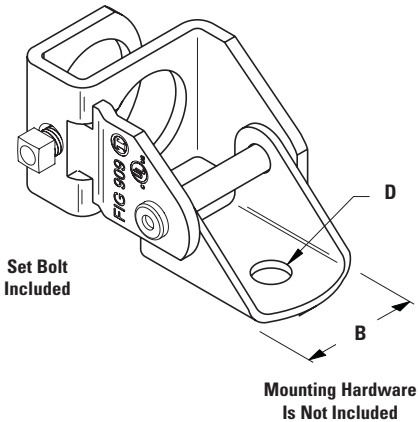
**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, fastener attachment size and finish.

| Part Number | Mounting Hole D<br>in. (mm) | Brace Pipe Size<br>in. (mm) | B<br>in. (mm) | Max. Design Load<br>lbs. (kN) | Approx. Wt./100<br>lbs. (kg) |
|-------------|-----------------------------|-----------------------------|---------------|-------------------------------|------------------------------|
| 909-3/8     | 7/16" (11.1)                | 1" (25)                     | 1 5/8" (41.3) | 1370 (6.09)                   | 90 (40.8)                    |
| 909-1/2 *   | 17/32" (13.5)               | 1" (25)                     | 1 5/8" (41.3) | 1370 (6.09)                   | 91 (41.3)                    |
| 909-5/8     | 11/16" (17.5)               | 1" (25)                     | 1 5/8" (41.3) | 1370 (6.09)                   | 90 (40.8)                    |

\* Standard size.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 910 - threaded swivel sway brace attachment (UL listed)

**Size Range:** 1" (25mm) bracing pipe. For brace pipe sizes larger than 1" (25mm), use Fig. 980. Available with holes for 1/2" fastener attachment.

**Material:** Steel

**Function:** The Fig. 910, is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a 1" "bracing pipe", and TOLCO™ "braced pipe" attachment to form a complete bracing assembly. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions

**Features:** This product's design incorporates a concentric attachment opening which is critical to the performance of structural seismic connections. NFPA 13 (2010) 9.3.5.8.4 and (2013-2016) 9.3.5.11.5 indicates that fastener table load values are based only on concentric loading. Universal swivel design allows Fig. 910 to be attached at any surface angle.

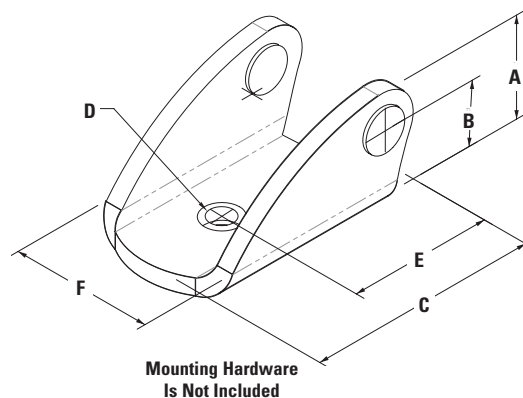
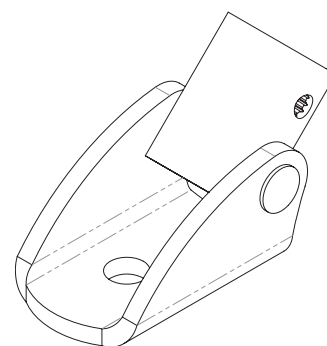
**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). (cUL). UL Listed for the following brace member type pipes: Sch. 40. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Installation Instructions:** Thread the 1" brace pipe into the Fig. 910 until pipe threads are visible through inspection site hole. When using in combination with a Fig. 825A, Fig. 825, Fig. 828, or Fig. 906 refer to those instruction sheets, otherwise select an anchor that is sized appropriately for the intended use and follow anchor manufacturer's instructions regarding structural thickness and embedment requirements. The required type, number and size of fasteners used for the structure attachment fitting shall be in accordance with NFPA 13. Once the anchor is installed per the manufacturer's direction, secure the Fig. 910 to the anchor. Attachment can pivot for adjustment to proper brace angle.

**Note:** Fig. 910 swivel attachment and Fig. 1001, 2002, 3000 or 4L pipe clamps make up a sway brace system of UL Listed attachments and bracing materials which satisfies the requirements of Underwriters Laboratories and the National Fire Protection Association (NFPA).

**Finish:** Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, pipe size and finish.



| Part Number | Brace Pipe Size<br>in. (mm) | A<br>in. (mm)  | B<br>in. (mm) | C<br>in. (mm)   | Mounting Hole D<br>in. (mm) | E<br>in. (mm)   | F<br>in. (mm) | Max. Design Load<br>lbs. (kN) | Approx. Wt./100<br>lbs. (kg) |
|-------------|-----------------------------|----------------|---------------|-----------------|-----------------------------|-----------------|---------------|-------------------------------|------------------------------|
| 910-1 X 1/2 | 1" (25)                     | 1 7/10" (43.2) | 1 1/5" (30.5) | 2 15/16" (74.7) | 9/16" (14.3)                | 1 11/16" (42.9) | 2 1/20" (52)  | 1600 (8.96)                   | 105 (47.6)                   |

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Seismic Bracing

## TOLCO Fig. 907 - multi-angle attachment

**Size Range:** 1" (25.4mm) x 1" (25.4mm), 1" (25.4mm) x 1¼" (31.7mm) and 1¼" (25.4mm) x 1¼" (25.4mm) bracing pipe.

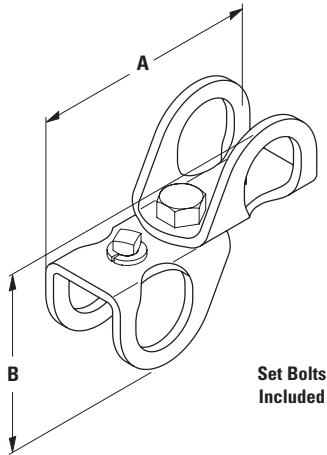
**Material:** Steel, hardened cone (or cup) point set bolt

**Function:** For attaching two pieces of pipe together at various angles.

**To Install:** Attach the Fig. 907 over one piece of pipe and adjust to desired position. Tighten set bolt until head bottoms out on surface, then repeat the process for the second pipe.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, bracing pipe sizes and finish.



| Part Number | Brace Pipe Size<br>in. (mm) | A<br>in. (mm) | B<br>in. (mm) | Max. Design Load<br>lbs. (kN) | Approx. Wt./100<br>lbs. (kg) |
|-------------|-----------------------------|---------------|---------------|-------------------------------|------------------------------|
| 907-1 X 1   | 1" x 1" (25 x 25)           | 4¾" (120.6)   | 4¾" (120.6)   | 655 (2.91)                    | 103 (46.7)                   |
| 907-1 X 1¼  | 1" x 1¼" (25 x 32)          | 5⅜" (128.6)   | 4⅜" (122.2)   | 655 (2.91)                    | 107 (48.5)                   |
| 907-1¼ X 1¼ | 1¼" x 1¼" (32 x 32)         | 5⅜" (136.5)   | 5¼" (133.1)   | 655 (2.91)                    | 109 (49.4)                   |

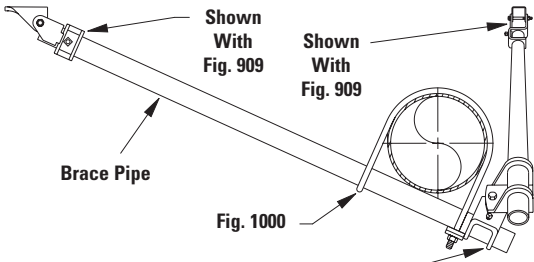
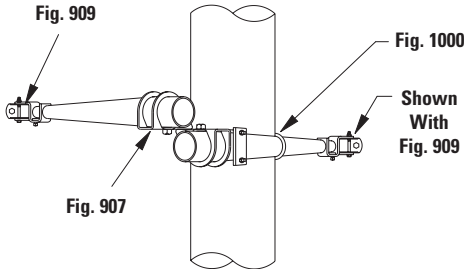


Fig. 907 Can Be Attached On Either Side Of The Pipe Being Braced



4-Way Riser Brace

Eaton’s B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 975 - straight sway brace fitting (UL listed)

**Size Range:** 1" (25mm) bracing pipe. For brace pipe sizes larger than 1" (25mm), use Fig. 980. Available with holes for 1/2", 5/8", or 3/4" fastener attachment.

**Material:** Steel

**Function:** The Fig. 975 is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a 1" "bracing pipe" and TOLCO™ "braced pipe" attachment to form a complete bracing assembly. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions

**Features:** Open design allows for easy checking of thread engagement.

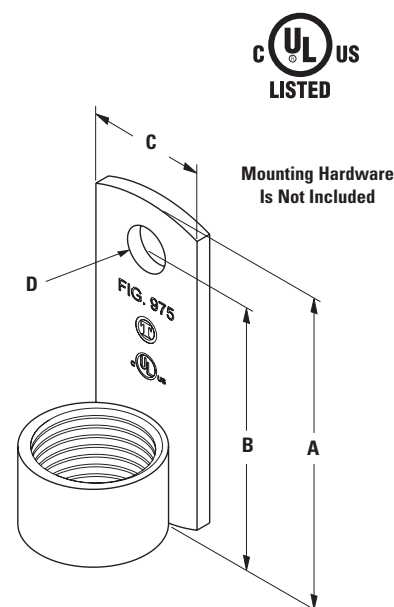
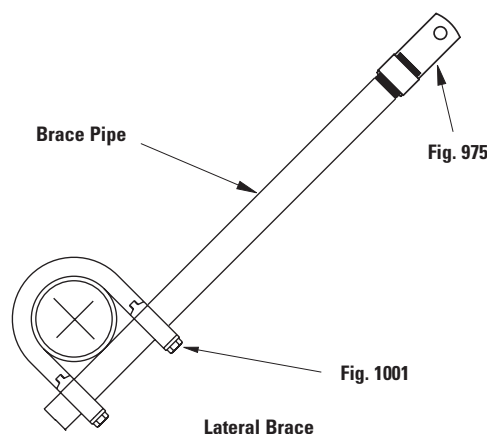
**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). UL Listed for the following brace member type pipes: Sch. 40.

**Installation:** Thread the Fig. 975 onto the 1" threaded bracing pipe. When using in combination with the Fig. 906, refer to that instruction sheet, otherwise select an anchor that is sized appropriately for the intended use and follow anchor manufacturer's instructions regarding structural thickness and embedment requirements. The required type, number and size of fasteners used for the structure attachment fitting shall be in accordance with NFPA 13. Once the anchor is installed per the manufacturer's direction, secure the Fig. 975 to the anchor. Attachment can pivot for adjustment to proper brace angle. (Bending of plate not permitted).

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish.

**Note:** Bending of this fitting alters the material strength and voids the cULus Listing. Use Fig. 980, 910, 909, or any other TOLCO fitting when angled fitting is required.



| Part Number | Brace Pipe Size<br>in. (mm) | A<br>in. (mm) | B<br>in. (mm) | C<br>in. (mm) | Mounting Hole<br>D<br>in. (mm) | Max. Design Load<br>lbs. (kN) | Approx. Wt./100<br>lbs. (kg) |
|-------------|-----------------------------|---------------|---------------|---------------|--------------------------------|-------------------------------|------------------------------|
| 975-1/2 *   | 1" (25)                     | 4" (101.6)    | 3 1/2" (88.9) | 1 1/2" (38.1) | 9/16" (14.3)                   | 2100 (9.34)                   | 88 (39.9)                    |
| 975-5/8     | 1" (25)                     | 4" (101.6)    | 3 1/2" (88.9) | 1 1/2" (38.1) | 11/16" (17.5)                  | 2100 (9.34)                   | 87 (39.4)                    |
| 975-3/4     | 1" (25)                     | 4" (101.6)    | 3 1/2" (88.9) | 1 1/2" (38.1) | 13/16" (20.6)                  | 2100 (9.34)                   | 86 (39.0)                    |

\* Standard size.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Seismic Bracing

## TOLCO Fig. 1001 - sway brace attachment (UL listed)

**Size Range:** Pipe size to be braced: 1" (25mm) thru 8" (200mm) IPS.  
Pipe size used for bracing: 1" (25mm) and 1¼" (32mm) Schedule 40 IPS.

**Material:** Steel

**Function:** For bracing pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system: Fig. 1001 is used in conjunction with a Fig. 900 Series fitting and joined together with bracing pipe per NFPA 13, forming a complete sway brace assembly.

**Features:** Can be used to brace schedule 7 through schedule 40 IPS. Field adjustable, making critical pre-engineering of bracing pipe length unnecessary. Unique design requires no threading of bracing pipe. Comes assembled and ready for installation. Fig. 1001 has built-in visual verification of correct installation. See installation note below.

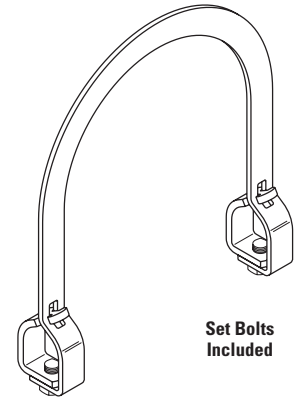
**Installation Note:** Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set bolts until heads bottom out. A minimum of 1" (25mm) pipe extension is recommended. Brace pipe can be installed on top or bottom of pipe to be braced.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). UL Listed for the following sprinkler type pipes: Sch. 40 (and as brace member), Sch. 10, Bull Moose Eddy Flow, Wheatland Mega Flow, DIN 2448, KSD 3562 (and as brace member), KSD 3507. Ask the factory for additional information as it may vary by product size. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For FM Approval information refer to FM Approved page 67.

**Finish:** Plain, Electro-Galvanized or Hot Dip Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1¼" (32mm)), and finish.

OPM  LISTED



Set Bolts  
Included



| Pipe<br>Size<br><br>in. (mm) | Part Number & Approx. Wt./100 |               |                       |               | Design Load - Lbs.           |                     |                     |
|------------------------------|-------------------------------|---------------|-----------------------|---------------|------------------------------|---------------------|---------------------|
|                              | 1" (25mm) Brace Pipe          |               | 1¼" (32mm) Brace Pipe |               | For Brace Pipe Size 1" / 1¼" |                     |                     |
|                              |                               | Lbs. (kg)     |                       | Lbs. (kg)     | Sch. 7<br>1" / 1¼"           | Sch. 10<br>1" / 1¼" | Sch. 40<br>1" / 1¼" |
| 1" (25)                      | 1001-1 X 1                    | 104.6 (47.4)  | 1001-1 X 1¼           | 122.2 (55.4)  | — / —                        | — / —               | 1000 / 1000         |
| 1¼" (32)                     | 1001-1¼ X 1                   | 105.2 (47.7)  | 1001-1¼ X 1¼          | 122.6 (55.6)  | 1000 / 1000                  | 1000 / 1000         | 1000 / 1000         |
| 1½" (40)                     | 1001-1½ X 1                   | 107.0 (48.5)  | 1001-1½ X 1¼          | 124.7 (56.6)  | 1500 / 1500                  | 1500 / 1500         | 1500 / 1500         |
| 2" (50)                      | 1001-2 X 1                    | 112.6 (51.1)  | 1001-2 X 1¼           | 129.2 (58.6)  | 1500 / 1500                  | 1500 / 1500         | 1500 / 1500         |
| *2½" (65)                    | 1001-2½ X 1*                  | 136.3 (61.8)  | 1001-2½ X 1¼*         | 154.4 (70.0)  | 2000 / 2000                  | 2000 / 2000         | 2000 / 2000         |
| 3" (80)                      | 1001-3 X 1                    | 145.0 (65.8)  | 1001-3 X 1¼           | 163.1 (74.0)  | 2000 / 2000                  | 2000 / 2000         | 2000 / 2000         |
| 4" (100)                     | 1001-4 X 1                    | 158.6 (71.9)  | 1001-4 X 1¼           | 176.7 (80.1)  | 2000 / 2000                  | 2000 / 2000         | 2000 / 2000         |
| 5" (100)                     | 1001-5 X 1                    | 173.2 (78.6)  | 1001-5 X 1¼           | 191.4 (86.8)  | — / —                        | 2000 / 2000         | 2000 / 2000         |
| *6" (150)                    | 1001-6 X 1*                   | 190.0 (85.2)  | 1001-6 X 1¼*          | 206.0 (93.4)  | 2000 / 2000                  | 2000 / 2000         | 2000 / 2000         |
| *8" (200)                    | 1001-8 X 1*                   | 217.4 (111.5) | 1001-8 X 1¼*          | 265.3 (120.3) | — / —                        | 2000 / 2000         | 2000 / 2000         |

\*Note: Metric sizes available for 65mm, 150mm, 200mm pipe size with 25mm and 32mm brace pipe size. Contact the factory.

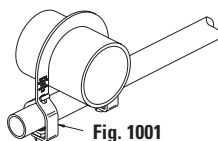
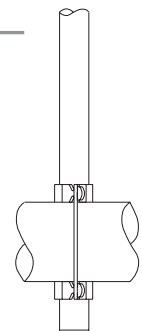
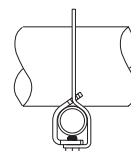
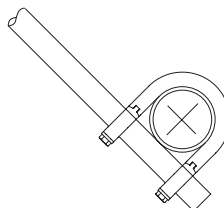


Fig. 1001



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 1001 - sway brace attachment (FM approved)

**Size Range:** Pipe size to be braced: 1" (25mm) thru 8" (200mm) IPS. Pipe size used for bracing: 1" (25mm) and 1 1/4" (32mm) Schedule 40 IPS.

**Material:** Steel

**Function:** For bracing pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system: Fig. 1001 is used in conjunction with a Fig. 900 Series fitting and joined together with bracing pipe per NFPA 13, forming a complete sway brace assembly.

**Features:** Can be used to brace schedule 7 through schedule 40 IPS. Field adjustable, making critical pre-engineering of bracing pipe length unnecessary. Unique design requires no threading of bracing pipe. Can be used as a component of a four-way riser brace. Comes assembled and ready for installation. Fig. 1001 has built-in visual verification of correct installation. See installation note below.

**Installation Note:** Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set bolts until heads bottom out. A minimum of 1" (25mm) pipe extension is recommended. Brace pipe can be installed on top or bottom of pipe to be braced.

**Approvals:** Approved by Factory Mutual Engineering (FM). Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For UL Listed information refer to UL Listed page 66.

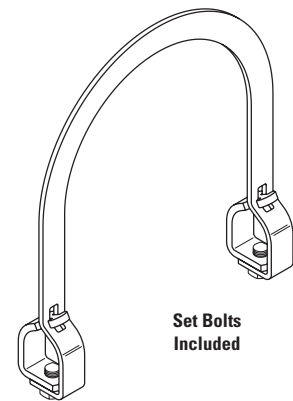
**Finish:** Plain, Electro-Galvanized or Hot Dip Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1 1/4" (32mm)), and finish.

**Important Note:** Fig. 1001 is precision manufactured to perform its function as a critical component of a complete bracing assembly. To ensure performance, the FM Approval requires that Fig. 1001 must be used only with other TOLCO™ bracing products. **The Fig. 1001 is not intended for use with the Fig. 907 4-way Longitudinal Brace Attachment.**

Designed to meet or exceed requirements of FM DS 2-8.

OPM



| Pipe Size<br>in. (mm) | Part Number & Approx. Wt./100 |               |                            |               | Design Load - For Sch. 7, Sch. 10, & Sch. 40 Pipe                     |                      |                      |                      |                      |                      |                      |                      |
|-----------------------|-------------------------------|---------------|----------------------------|---------------|-----------------------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                       | 1" (25mm) Brace Pipe          |               | 1 1/4" (32mm) Brace Pipe   |               | Allowable Horizontal Capacity (lbf) Per Installation <sup>1,2,3</sup> |                      |                      |                      |                      |                      |                      |                      |
|                       | Lbs.                          | (kg)          | Lbs.                       | (kg)          | 30°-44°<br>Lbs. (kN)                                                  | 45°-59°<br>Lbs. (kN) | 60°-74°<br>Lbs. (kN) | 75°-90°<br>Lbs. (kN) | 30°-44°<br>Lbs. (kN) | 45°-59°<br>Lbs. (kN) | 60°-74°<br>Lbs. (kN) | 75°-90°<br>Lbs. (kN) |
| 1" (25)               | <b>1001-1 X 1</b>             | 104.6 (47.4)  | <b>1001-1 X 1 1/4</b>      | 122.2 (55.4)  | 1800 (8.01)                                                           | 2550 (11.34)         | 3120 (13.88)         | 3490 (15.52)         |                      |                      |                      |                      |
| 1 1/4" (32)           | <b>1001-1 1/4 X 1</b>         | 105.2 (47.7)  | <b>1001-1 1/4 X 1 1/4</b>  | 122.6 (55.6)  | 1230 (5.47)                                                           | 1740 (7.74)          | 2140 (9.52)          | 2380 (10.59)         |                      |                      |                      |                      |
| 1 1/2" (40)           | <b>1001-1 1/2 X 1</b>         | 107.0 (48.5)  | <b>1001-1 1/2 X 1 1/4</b>  | 124.7 (56.6)  | 1230 (5.47)                                                           | 1740 (7.74)          | 2140 (9.52)          | 2380 (10.59)         |                      |                      |                      |                      |
| 2" (50)               | <b>1001-2 X 1</b>             | 112.6 (51.1)  | <b>1001-2 X 1 1/4</b>      | 129.2 (58.6)  | 1230 (5.47)                                                           | 1740 (7.74)          | 2140 (9.52)          | 2380 (10.59)         |                      |                      |                      |                      |
| *2 1/2" (65)          | <b>1001-2 1/2 X 1*</b>        | 136.3 (61.8)  | <b>1001-2 1/2 X 1 1/4*</b> | 154.4 (70.0)  | 800 (3.56)                                                            | 1130 (5.03)          | 1380 (6.14)          | 1540 (6.85)          |                      |                      |                      |                      |
| 3" (80)               | <b>1001-3 X 1</b>             | 145.0 (65.8)  | <b>1001-3 X 1 1/4</b>      | 163.1 (74.0)  | 850 (3.78)                                                            | 1200 (5.34)          | 1470 (6.54)          | 1640 (7.30)          |                      |                      |                      |                      |
| 4" (100)              | <b>1001-4 X 1</b>             | 158.6 (71.9)  | <b>1001-4 X 1 1/4</b>      | 176.7 (80.1)  | 850 (3.78)                                                            | 1200 (5.34)          | 1470 (6.54)          | 1640 (7.30)          |                      |                      |                      |                      |
| 5" (100)              | <b>1001-5 X 1</b>             | 173.2 (78.6)  | <b>1001-5 X 1 1/4</b>      | 191.4 (86.8)  | 510 (2.27)                                                            | 730 (3.25)           | 890 (3.96)           | 990 (4.40)           |                      |                      |                      |                      |
| *6" (150)             | <b>1001-6 X 1*</b>            | 190.0 (85.2)  | <b>1001-6 X 1 1/4*</b>     | 206.0 (93.4)  | 510 (2.27)                                                            | 730 (3.25)           | 890 (3.96)           | 990 (4.40)           |                      |                      |                      |                      |
| *8" (200)             | <b>1001-8 X 1*</b>            | 217.4 (111.5) | <b>1001-8 X 1 1/4*</b>     | 265.3 (120.3) | 510 (2.27)                                                            | 730 (3.25)           | 890 (3.96)           | 990 (4.40)           |                      |                      |                      |                      |

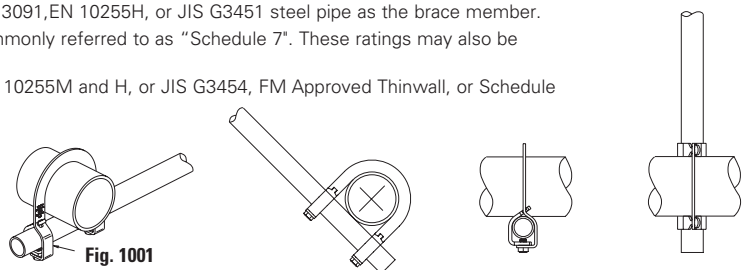
<sup>1</sup> FM Approved when used with 1 or 1 1/4 inch NPS Schedule 40 GB/T 3091, EN 10255H, or JIS G3451 steel pipe as the brace member.

<sup>2</sup> Load rating for LWV above refers to FM Approved Lightwall Pipe commonly referred to as "Schedule 7". These ratings may also be applied when EN 10220 and GB/T 8163 steel pipe.

<sup>3</sup> Load rating for Schedule 10 above may be applied to GB/T 3092, EN 10255M and H, or JIS G3454, FM Approved Thinwall, or Schedule 40 steel pipes.

Note: See UL load ratings in UL Listed Design Load chart shown under drawing.

\*Note: Metric sizes available for 65mm, 150mm, 200mm pipe size with 25mm and 32mm brace pipe size. Contact the factory.



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Seismic Bracing

## TOLCO Fig. 1000 - "Fast Clamp" branch line restraint attachment (UL listed)

**Size Range:** Pipe size to be braced: 1" (25mm) thru 4" (100mm) 40 IPS.  
Pipe size used for bracing: 1" (25mm) and 1¼" (32mm) Schedule 40 IPS.  
For pipe sizes larger than 2" (50mm) please refer to TOLCO™ Fig. 1001.

**Material:** Steel

**Function:** A restraint device intended for lateral bracing.

**Features:** Field adjustable, making critical pre-engineering of bracing pipe unnecessary. Unique design requires no threading of bracing pipe. Steel leaf spring insert provided to assure installer and inspector necessary minimum torque has been achieved.

**Installation:** Fig. 1000 is the "braced pipe" attachment component of a lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component, Fig. 980, 910, 909 or other approved TOLCO component to form a complete bracing assembly. Follow NFPA 13 guidelines.

**To Install:** Place the Fig. 1000 over the pipe to be braced, insert bracing pipe through opening leaving a minimum of 1" extension. Brace pipe can be installed on top or bottom of pipe to be braced. Tighten hex nuts until leaf spring is flat. It is recommended that the brace angle be adjusted before hex nuts are fully tightened.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). Approved for use with engineered light wall sprinkler pipe up to 2" as a restraint device. Torque requirement is 6-8 ft./lbs. (8-10Nm). Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

For FM Approval information refer to FM Approved page 69.

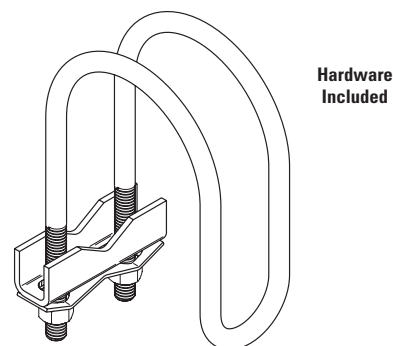
**Application Note:** Position Fast Clamp and tighten two hex nuts until leaf spring flattens. A minimum of 1" pipe extension beyond the Fig. 1000 is recommended.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

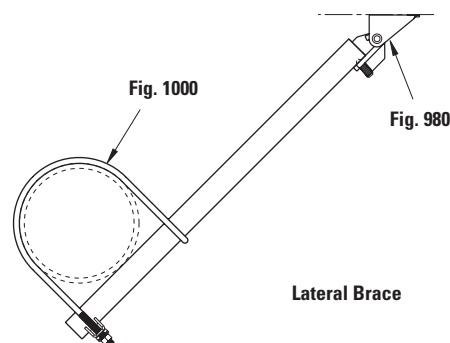
**Order By:** Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1¼" (32mm)) , and finish.

| Pipe Size<br>in. (mm) | Part Number & Approx. Wt./100 |             |                       |             |
|-----------------------|-------------------------------|-------------|-----------------------|-------------|
|                       | 1" (24mm) Brace Pipe          |             | 1¼" (32mm) Brace Pipe |             |
|                       |                               | Lbs. (kg)   |                       | Lbs. (kg)   |
| 1" (25)               | 1000-1 X 1                    | 71.6 (32.5) | 1000-1 X 1¼           | 75.8 (34.4) |
| 1¼" (32)              | 1000-1¼ X 1                   | 74.8 (33.9) | 1000-1¼ X 1¼          | 79.1 (35.9) |
| 1½" (40)              | 1000-1½ X 1                   | 77.8 (35.3) | 1000-1½ X 1¼          | 82.1 (37.2) |
| 2" (50)               | 1000-2 X 1                    | 84.1 (38.1) | 1000-2 X 1¼           | 88.4 (40.1) |

**UL Listed Design Load**  
1" (25mm) thru 2" (50mm) pipe size 650 Lbs. (2.89kN)



Hardware Included



Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

## TOLCO Fig. 1000 - "Fast Clamp" sway brace attachment (FM approved)

**Size Range:** Pipe size to be braced: 1" (25mm) thru 4" (100mm) 40 IPS.  
 Pipe size used for bracing: 1" (25mm) and 1 1/4" (32mm) Schedule 40 IPS.  
 For pipe sizes larger than 4" (100mm) please refer to TOLCO™ Fig. 1001.

**Material:** Steel

**Function:** For bracing pipe against sway and seismic disturbance.

**Features:** Field adjustable, making critical pre-engineering of bracing pipe unnecessary. Unique design requires no threading of bracing pipe. Steel leaf spring insert provided to assure installer and inspector necessary minimum torque has been achieved.

**Installation:** Fig. 1000 is the "braced pipe" attachment component of a lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component, Fig. 980 or other approved TOLCO seismic brace to form a complete bracing assembly. Follow NFPA 13 guidelines.

**To Install:** Place the Fig. 1000 over the pipe to be braced, insert bracing pipe through opening leaving a minimum of 1" extension. Brace pipe can be installed on top or bottom of pipe to be braced. Tighten hex nuts until leaf spring is flat. It is recommended that the brace angle be adjusted before hex nuts are fully tightened.

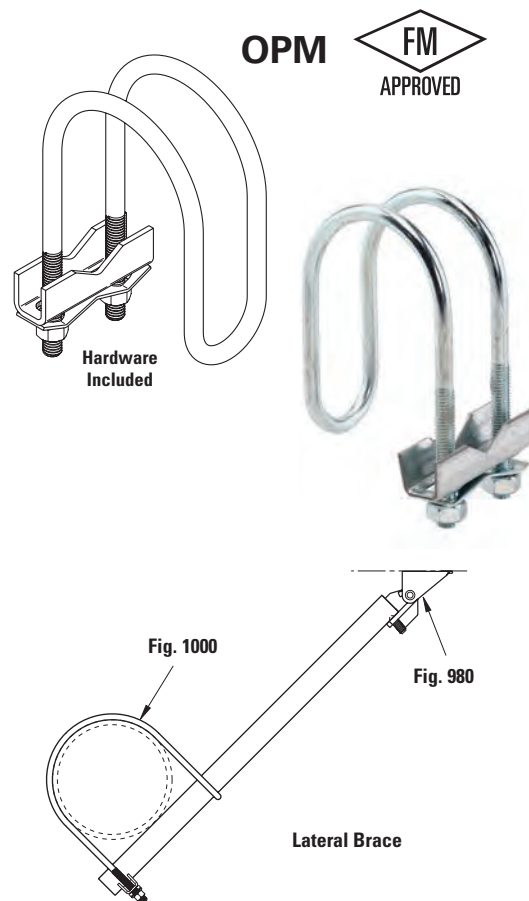
**Approvals:** Approved by Factory Mutual Engineering (FM). Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For UL Listed information refer to UL Listed page 68.

**Application Note:** Position Fast Clamp and tighten two hex nuts until leaf spring flattens. A minimum of 1" pipe extension beyond the Fig. 1000 is recommended.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1 1/4" (32mm)), and finish.

Designed to meet or exceed requirements of FM DS 2-8.



| Pipe Size<br>in. (mm) | Part Number & Approx. Wt./100     |              |                                       |              | Design Load - Allowable Horizontal Capacity (lbf) Per Installation <sup>1,2,3</sup> |                      |                      |                      |
|-----------------------|-----------------------------------|--------------|---------------------------------------|--------------|-------------------------------------------------------------------------------------|----------------------|----------------------|----------------------|
|                       | 1" (24mm) Brace Pipe<br>Lbs. (kg) |              | 1 1/4" (32mm) Brace Pipe<br>Lbs. (kg) |              | 30°-44°<br>Lbs. (kN)                                                                | 45°-59°<br>Lbs. (kN) | 60°-74°<br>Lbs. (kN) | 75°-90°<br>Lbs. (kN) |
| 1" (25)               | <b>1000-1 X 1</b>                 | 71.6 (32.5)  | <b>1000-1 X 1 1/4</b>                 | 75.8 (34.4)  | 200 (0.89)                                                                          | 280 (1.24)           | 340 (1.51)           | 380 (1.69)           |
| 1 1/4" (32)           | <b>1000-1 1/4 X 1</b>             | 74.8 (33.9)  | <b>1000-1 1/4 X 1 1/4</b>             | 79.1 (35.9)  | 200 (0.89)                                                                          | 280 (1.24)           | 340 (1.51)           | 380 (1.69)           |
| 1 1/2" (40)           | <b>1000-1 1/2 X 1</b>             | 77.8 (35.3)  | <b>1000-1 1/2 X 1 1/4</b>             | 82.1 (37.2)  | 200 (0.89)                                                                          | 280 (1.24)           | 340 (1.51)           | 380 (1.69)           |
| 2" (50)               | <b>1000-2 X 1</b>                 | 84.1 (38.1)  | <b>1000-2 X 1 1/4</b>                 | 88.4 (40.1)  | 200 (0.89)                                                                          | 280 (1.24)           | 340 (1.51)           | 380 (1.69)           |
| 2 1/2" (65)           | <b>1000-2 1/2 X 1</b>             | 90.2 (40.9)  | <b>1000-2 1/2 X 1 1/4</b>             | 94.6 (42.9)  | 200 (0.89)                                                                          | 280 (1.24)           | 340 (1.51)           | 380 (1.69)           |
| 3" (80)               | <b>1000-3 X 1</b>                 | 97.3 (44.1)  | <b>1000-3 X 1 1/4</b>                 | 101.7 (46.1) | 230 (1.02)                                                                          | 320 (1.42)           | 400 (1.78)           | 450 (2.00)           |
| 3 1/2" (90)           | <b>1000-3 1/2 X 1</b>             | 104.0 (47.2) | <b>1000-3 1/2 X 1 1/4</b>             | 108.4 (49.2) | 230 (1.02)                                                                          | 320 (1.42)           | 400 (1.78)           | 450 (2.00)           |
| 4" (100)              | <b>1000-4 X 1</b>                 | 110.3 (50.0) | <b>1000-4 X 1 1/4</b>                 | 114.6 (52.0) | 230 (1.02)                                                                          | 320 (1.42)           | 400 (1.78)           | 450 (2.00)           |

<sup>1</sup> FM Approved when used with 1, 1 1/4, 1 1/2, or 2 inch NPS Schedule 40 GB/T 3091, EN 10255H, or JIS G3451 steel pipe as the brace member.

<sup>2</sup> Load rating for LW above refers to FM Approved Lightwall Pipe commonly referred to as "Schedule 7". These ratings may also be applied when EN 10220 and GB/T 8163 steel pipe.

<sup>3</sup> Load rating for Schedule 10 above may be applied to GB/T 3092, EN 10255M and H, or JIS G3454, FM Approved Thinwall, or Schedule 40 steel pipes.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 2002 - sway brace attachment (UL listed)

**Size Range:** Pipe size to be braced: 2½" (65mm) thru 8" (200mm) all steel schedules. Consult factory when bracing other than steel. The Fig. 2002 accepts brace pipe sizes 1½" (40mm) and 2" (50mm) steel schedule 40.

**Material:** Steel

**Function:** For bracing pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system: Fig. 2002 is used in conjunction with a TOLCO™ Fig. 980 sway brace attachment and joined together with bracing pipe. Install per NFPA 13.

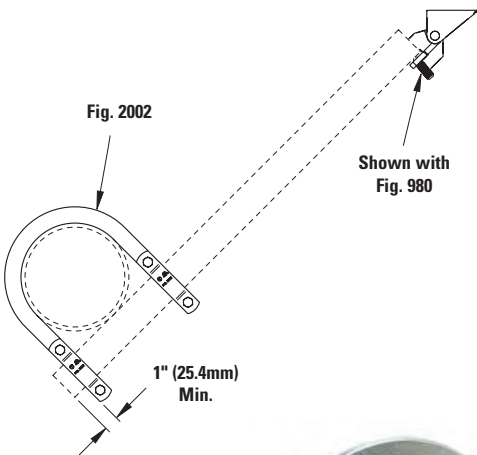
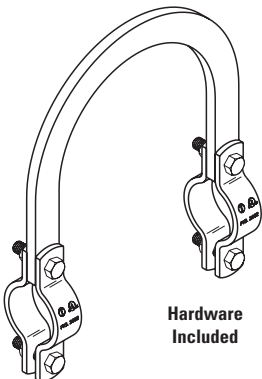
**Features:** Easy verification of proper installation by tightening bolts until ears touch.

**Installation:** Place Fig. 2002 over pipe to be braced. Slide bracing pipe through attachment and tighten hex nuts until ears touch.

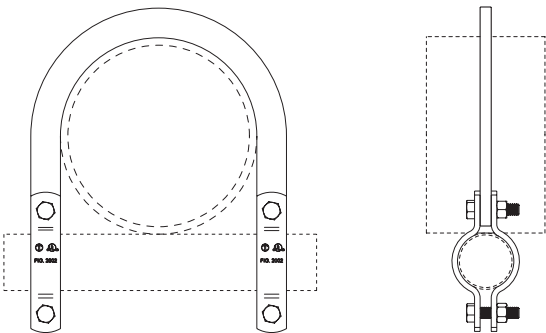
**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). UL Listed for the following sprinkler type pipes: Sch. 40 (and as brace member), Sch. 10, Bull Moose Eddy Flow, Wheatland Mega Flow, DIN 2448, KSD 3562 (and as brace member), KSD 3507. Ask the factory for additional information as it may vary by product size.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, pipe size to be braced, pipe size used for bracing (1½" (40mm) or 2" (50mm)) and finish.



| Pipe Size<br>in. (mm) | Part Number & Approx. Wt./100 |             |                      |               | Design Load |        |
|-----------------------|-------------------------------|-------------|----------------------|---------------|-------------|--------|
|                       | 1½" (32mm) Brace Pipe         | Lbs. (kg)   | 2" (50mm) Brace Pipe | Lbs. (kg)     | Lbs. (kg)   | (kN)   |
| 2½" (65)              | 2002-2½ X 1½                  | 260 (117.9) | 2002-2½ X 2          | 283.3 (128.6) | 2000        | (8.89) |
| 3" (80)               | 2002-3 X 1½                   | 276 (125.2) | 2002-3 X 2           | 299.4 (135.8) | 2000        | (8.89) |
| 4" (100)              | 2002-4 X 1½                   | 303 (137.4) | 2002-4 X 2           | 326.8 (148.2) | 2000        | (8.89) |
| 6" (150)              | 2002-6 X 1½                   | 361 (163.7) | 2002-6 X 2           | 385.0 (174.6) | 2000        | (8.89) |
| 8" (200)              | 2002-8 X 1½                   | 416 (188.7) | 2002-8 X 2           | 439.7 (199.4) | 2000        | (8.89) |



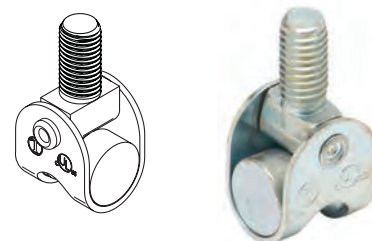
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 75 - swivel attachment

**Function:** Three recommended applications for this product:

- May be used as a branch line restraint for structural attachment to anchor bolt, beam clamp, etc.
- May be used as an upper attachment with short hanger rod to omit seismic bracing.
- May be used in a pitched or sloped roof application, to meet requirements of NFPA 13 (2010) 9.1.2.6.

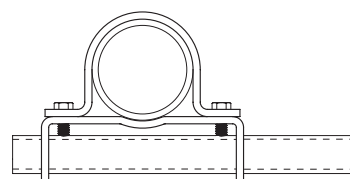
Refer to page 40 for more information and sizing.



## TOLCO Fig. 3000 - CPVC sway brace attachment

**Function:** For bracing CPVC and steel pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system: Fig. 3000 is used in conjunction with a Fig. 900 Series fitting and joined together with bracing pipe per NFPA 13, forming a complete sway brace assembly.

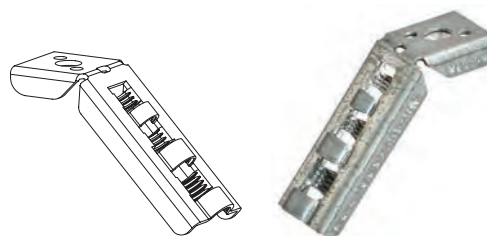
Refer to page 41 for more information and sizing.



## Fig. 76 - TOLCO structural attachment for branch line restraint assembly (UL listed) structural attachment for sway brace assembly (FM)

**Function:** Structural attachment for branch line restraint or sway brace assembly

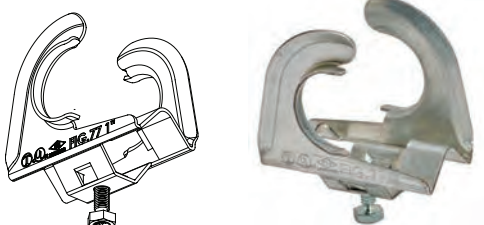
Refer to pages 42 for UL Listed information and sizing.  
Refer to pages 43 for FM information and sizing.



## Fig. 77 - TOLCO structural attachment for branch line restraint assembly (UL listed) structural attachment for sway brace assembly (FM)

**Function:** System attachment for branch line restraint or sway brace assembly

Refer to pages 44 for UL Listed information and sizing.  
Refer to pages 45 for FM information and sizing.



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Seismic Bracing

## TOLCO Fig. 98 - Rod Stiffener

## TOLCO Fig. 98B - Rod Stiffener with Break-Off Bolt Head

**Size Range:** Secures  $\frac{3}{8}$ "-16 thru  $\frac{7}{8}$ "-9 hanger rod

**Material:** Steel

**Function:** Secures channel to hanger rod for vertical seismic bracing.

**Approvals:** Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (**OSHPD**). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines OPM-0052-13.

**Finish:** Electro Galvanized. Contact customer service for alternative finishes and materials.

**Weight:** Approx. Wt./100: Fig. 98 - 11.8 Lbs. (5.3kg)  
Fig. 98B - 12.7 Lbs. (5.7kg)

**Order By:** Figure number

OPM



Fig. 98

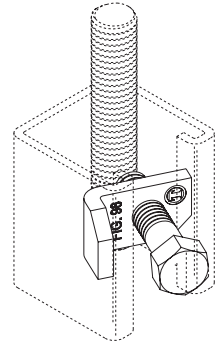
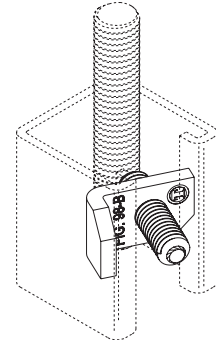


Fig. 98B



## Fig. SC228 - Hanger Rod Stiffener

**Size Range:** Secures  $\frac{3}{8}$ "-16 thru  $\frac{5}{8}$ "-11 hanger rod

**Material:** Steel

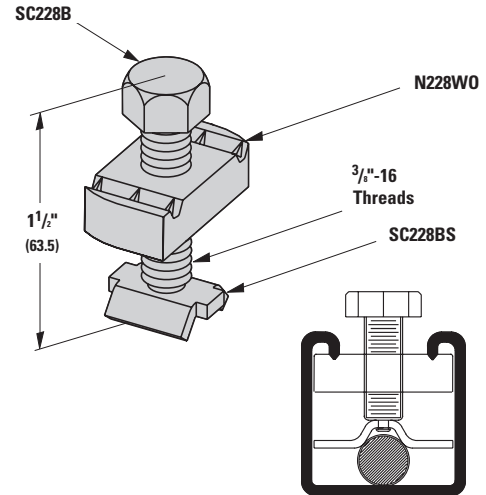
**Function:** Secures channel to hanger rod for vertical seismic bracing. Slight distortion of the channel (strut) may occur upon installation of rod stiffeners.

**Finish:** Electro Galvanized. Contact customer service for alternative finishes and materials.

**Weight:** Approx. Wt./100: 21.0 Lbs. (9.5kg)

**Order By:** Figure part number

**Note:** Order channel separately



## Rod Stiffener Requirements

| Rod Size        | Maximum Rod Length Without Rod Stiffener | Maximum Spacing Between Rod Stiffeners |
|-----------------|------------------------------------------|----------------------------------------|
| $\frac{3}{8}$ " | 19" (482mm)                              | 13" (330mm)                            |
| $\frac{1}{2}$ " | 25" (635mm)                              | 18" (457mm)                            |
| $\frac{5}{8}$ " | 31" (787mm)                              | 23" (584mm)                            |
| $\frac{3}{4}$ " | 37" (940mm)                              | 28" (711mm)                            |
| $\frac{7}{8}$ " | 43" (1092mm)                             | 33" (838mm)                            |
| 1"*             | 50" (1270mm)                             | 38" (965mm)                            |
| 1 1/4"*         | 60" (1524mm)                             | 43" (1092mm)                           |

\* Use with SC228 only.

### Notes:

- 1.) Rod stiffeners are required only on hanger and trapeze assemblies that have seismic bracing attached at or within 6" (152.4mm) of the rod. A minimum of two rod stiffeners (Figure 98, 98B, or SC228) must be installed.
- 2.) Recommended torque on Figure 98 and SC228 is 8 ft-lbs. (10.8Nm) or finger tight and one full turn with a wrench. Figure 98B has the break off bolt head.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.



## TOLCO Fig. 4A - Pipe Clamp for Sway Bracing

**Size Range:** 2 1/2" (65mm) thru 8" (200mm) pipe. For sizes smaller than 2 1/2" (65mm) use Fig. 4LA.

**Material:** Steel

**Function:** For bracing pipe against sway and seismic disturbance.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) 2 1/2" (65mm) thru 8" (200mm).

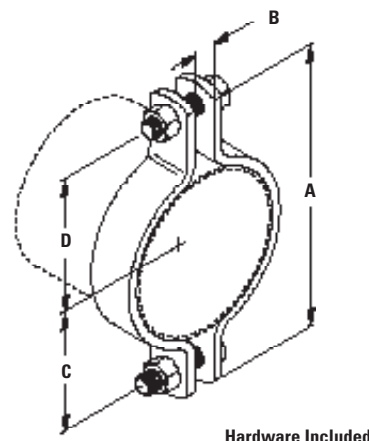
**Installation Instructions:** Fig. 4A is the "braced pipe" attachment component of a longitudinal, lateral or riser brace assembly. It is intended to be combine with the "bracing pipe" and TOLCO transitional and structural attachment component(s) to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Place the Fig. 4A over the pipe to be braced. Attach TOLCO transitional fitting, either Fig. 980, 910 or 909, to the clamp ears. Tighten bolts and nuts; torque requirement is a minimum of 50 ft./lbs. (68Nm). Transitional fitting attachment can pivot for adjustment to proper brace angle.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

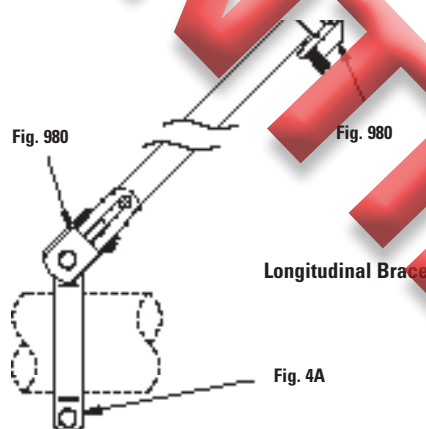
**Order By:** Figure number, pipe size and finish

**Note:** Please refer to Fig. 4LA for longitudinal brace applications for 1" (25mm) - 12" (300mm) pipe sizes.



Hardware Included

For  
Lateral Brace  
Refer to 4LA



| Part No. | Pipe Size<br>in. (mm) | A<br>in. (mm)   | C<br>in. (mm)    | D<br>in. (mm)   | Bolt Size | Max. Horizontal<br>Design Load (UL)<br>lbs. (kN) | Approx.<br>Wt./100<br>lbs. (kg) |
|----------|-----------------------|-----------------|------------------|-----------------|-----------|--------------------------------------------------|---------------------------------|
| 4A-2 1/2 | 2 1/2" (100)          | 7" (177.8)      | 2 11/16" (68.3)  | 3" (76.2)       | 1/2"-13   | 1000 (4.45)                                      | 134 (60.8)                      |
| 4A-3     | 3" (80)               | 7 1/2" (190.5)  | 3" (76.2)        | 3 5/16" (84.1)  | 1/2"-13   | 1000 (4.45)                                      | 150 (69.0)                      |
| 4A-4     | 4" (100)              | 8 1/2" (215.9)  | 3 3/8" (85.7)    | 3 11/16" (93.7) | 1/2"-13   | 1600 (7.11)                                      | 221 (100.2)                     |
| 4A-5     | 5" (125)              | 9 3/4" (247.6)  | 3 7/8" (98.4)    | 4 3/8" (111.1)  | 1/2"-13   | 1600 (7.11)                                      | 253 (114.7)                     |
| 4A-6     | 6" (150)              | 11 1/2" (292.1) | 5" (127.0)       | 5 1/8" (130.2)  | 1/2"-13   | 2015 (8.96)                                      | 513 (232.7)                     |
| 4A-8     | 8" (200)              | 13 3/4" (336.5) | 6 11/16" (169.9) | 6 1/8" (155.6)  | 1/2"-13   | 2015 (8.96)                                      | 601 (272.6)                     |

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Seismic Bracing

## TOLCO Fig. 4L - sway brace attachment (UL listed)

**Size Range:** 1" (25mm) through 8" (200mm) IPS. 10" (250mm) and 12" (300mm) not UL listed

**Material:** Steel and stainless steel.

**Function:** For bracing pipe against sway and seismic disturbance.

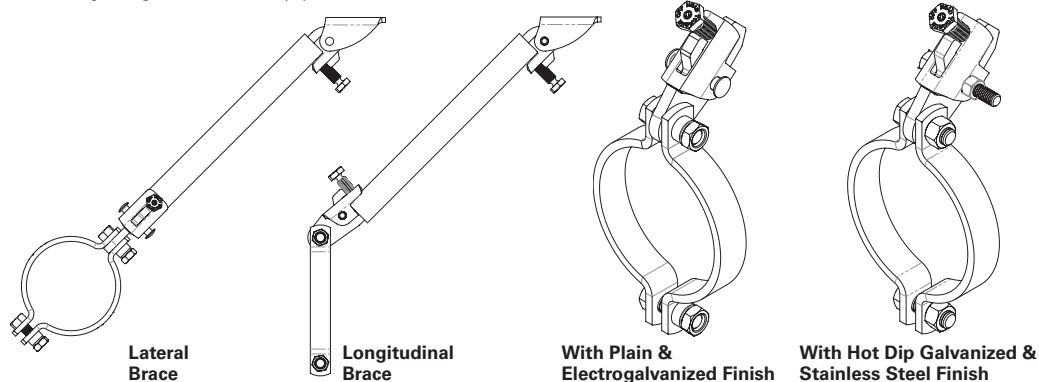
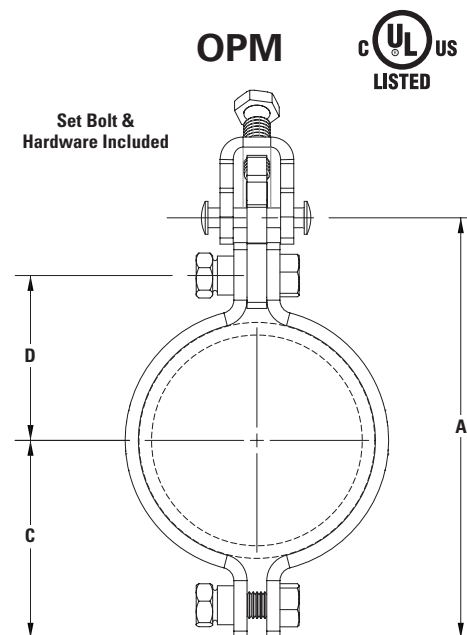
**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) 1" (25mm) through 8" (200mm) pipe. UL Listed for the following sprinkler type pipes: Sch. 40, Sch. 10, Bull Moose Eddy Flow, Wheatland Mega Flow, DIN 2448, KSD 3562, KSD 3507. Ask the factory for additional information as it may vary by product size. For FM Approval information refer to FM Approved page 75. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Installation Instructions:** Fig. 4L is the "braced pipe" attachment component of a longitudinal and lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component to form a complete bracing assembly. NFPA 13 guidelines should be followed. (For complete detailed instructions see instruction sheet [IL309015EN](#)).

**To Install:** Place the Fig. 4L over the pipe to be braced and tighten bolts. Then engage "bracing pipe" into jaw opening and tighten set bolt until head snaps off. Jaw attachment can pivot for adjustment to proper brace angle.

**Finish:** Plain, Electrogalvanized, Hot Dip Galvanized or Stainless Steel (only for 4" & 6" sizes).

**Order By:** Figure number, pipe size and finish.



| Part No.                         | Nom Pipe Size<br>in.          | (mm)  | A (Max)<br>in.                 | C<br>in.                       | D<br>in.                      | Bolt Size<br>in. | UL Max. Rec. Load<br>Logitudinal<br>lbs. | Lateral<br>lbs. | PLN & EG.<br>Approx.<br>Wt./100 lbs. |
|----------------------------------|-------------------------------|-------|--------------------------------|--------------------------------|-------------------------------|------------------|------------------------------------------|-----------------|--------------------------------------|
| 4L-1                             | 1                             | (25)  | 5                              | 2                              | 1 <sup>3</sup> / <sub>8</sub> | 1/2-13           | 1000                                     | 1000            | 176                                  |
| 4L-1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>4</sub> | (32)  | 5 <sup>2</sup> / <sub>7</sub>  | 2 <sup>1</sup> / <sub>16</sub> | 1 <sup>5</sup> / <sub>8</sub> | 1/2-13           | 1000                                     | 1000            | 182                                  |
| 4L-1 <sup>1</sup> / <sub>2</sub> | 1 <sup>1</sup> / <sub>2</sub> | (40)  | 5 <sup>1</sup> / <sub>2</sub>  | 2 <sup>1</sup> / <sub>3</sub>  | 1 <sup>2</sup> / <sub>3</sub> | 1/2-13           | 1000                                     | 1000            | 187                                  |
| 4L-2                             | 2                             | (50)  | 6 <sup>2</sup> / <sub>7</sub>  | 2 <sup>2</sup> / <sub>3</sub>  | 2                             | 1/2-13           | 1600                                     | 1000            | 204                                  |
| 4L-2 <sup>1</sup> / <sub>2</sub> | 2 <sup>1</sup> / <sub>2</sub> | —     | 6 <sup>7</sup> / <sub>9</sub>  | 3                              | 2 <sup>1</sup> / <sub>3</sub> | 1/2-13           | 2000                                     | 1000            | 217                                  |
| 4L-65mm                          | —                             | (65)  | 6 <sup>7</sup> / <sub>9</sub>  | 3                              | 2 <sup>1</sup> / <sub>3</sub> | 1/2-13           | 700                                      | 1000            | 214                                  |
| 4L-3                             | 3                             | (80)  | 7 <sup>3</sup> / <sub>7</sub>  | 3 <sup>1</sup> / <sub>4</sub>  | 2 <sup>5</sup> / <sub>8</sub> | 1/2-13           | 2000                                     | 1000            | 323                                  |
| 4L-3 <sup>1</sup> / <sub>2</sub> | 3 <sup>1</sup> / <sub>2</sub> | (90)  | 8                              | 3 <sup>1</sup> / <sub>2</sub>  | 2 <sup>7</sup> / <sub>8</sub> | 1/2-13           | 2000                                     | 1000            | 343                                  |
| 4L-4***                          | 4                             | (100) | 8 <sup>3</sup> / <sub>7</sub>  | 3 <sup>3</sup> / <sub>4</sub>  | 3 <sup>1</sup> / <sub>8</sub> | 1/2-13           | 2000**                                   | 1000            | 253                                  |
| 4L-5                             | 5                             | —     | 9 <sup>5</sup> / <sub>9</sub>  | 4 <sup>3</sup> / <sub>8</sub>  | 3 <sup>5</sup> / <sub>8</sub> | 1/2-13           | 2000**                                   | 1600*           | 314                                  |
| 4L-125mm                         | —                             | (125) | 9 <sup>5</sup> / <sub>9</sub>  | 4 <sup>3</sup> / <sub>8</sub>  | 3 <sup>5</sup> / <sub>8</sub> | 1/2-13           | 1200                                     | 1600*           | 314                                  |
| 4L-6***                          | 6                             | —     | 11 <sup>3</sup> / <sub>7</sub> | 5 <sup>1</sup> / <sub>3</sub>  | 4 <sup>4</sup> / <sub>7</sub> | 1/2-13           | 2000                                     | 1600*           | 540                                  |
| 4L-150mm                         | —                             | (150) | 11 <sup>3</sup> / <sub>7</sub> | 5 <sup>1</sup> / <sub>3</sub>  | 4 <sup>4</sup> / <sub>7</sub> | 1/2-13           | 1200                                     | 1600*           | 538                                  |
| 4L-8                             | 8                             | —     | 13 <sup>3</sup> / <sub>5</sub> | 6 <sup>2</sup> / <sub>5</sub>  | 5 <sup>2</sup> / <sub>3</sub> | 1/2-13           | 2000                                     | 2100*           | 645                                  |
| 4L-200mm                         | —                             | (200) | 13 <sup>3</sup> / <sub>5</sub> | 6 <sup>2</sup> / <sub>5</sub>  | 5 <sup>2</sup> / <sub>3</sub> | 1/2-13           | 1400                                     | 2100*           | 643                                  |
| 4L-10****                        | 10                            | (254) | 17 <sup>3</sup> / <sub>5</sub> | 8 <sup>1</sup> / <sub>4</sub>  | 7 <sup>1</sup> / <sub>4</sub> | 1/2-13           | NA                                       | NA              | 1349                                 |
| 4L-12****                        | 12                            | (300) | 19 <sup>3</sup> / <sub>5</sub> | 9 <sup>1</sup> / <sub>4</sub>  | 8 <sup>1</sup> / <sub>4</sub> | 1/2-13           | NA                                       | NA              | 1526                                 |

\* Only UL listed as a lateral brace for use with a 1" (25mm) pipe as the brace member.

\*\* Only UL listed as a longitudinal brace for use with a 1" (25mm) thru 1<sup>1</sup>/<sub>2</sub>" (40mm) pipe as the brace member.

\*\*\* Fig 4L-4 and Fig 4L-6 are only sizes available in stainless steel 316.

\*\*\*\* FM approved not UL listed.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

Updated 4-2-21

## TOLCO Fig. 4L - sway brace attachment (FM approved)

**Size Range:** 1" (25mm) through 12" (300mm) IPS.

**Material:** Steel.

**Function:** For bracing pipe against sway and seismic disturbance.

**Approvals:** Approved by Factory Mutual Engineering (FM), 1" (25mm) through 12" (300mm) pipe. For UL Listed information refer to UL Listed page 74. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Installation Instructions:** Fig. 4L is the "braced pipe" attachment component of a longitudinal and lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO™ structural attachment component to form a complete bracing assembly. NFPA 13 and/or FM guidelines should be followed.

**To Install:** Place the Fig. 4L over the pipe to be braced and tighten bolts. Then engage "bracing pipe" into jaw opening and tighten set bolt until head snaps off. Jaw attachment can pivot for adjustment to proper brace angle. (For complete detailed instructions see instruction sheet [IL309015EN](#)).

**Finish:** Plain, Electrogalvanized.

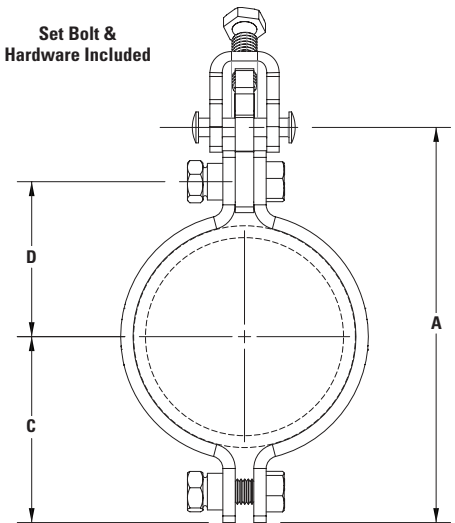
**Order By:** Figure number, pipe size and finish.

Designed to meet or exceed requirements of FM DS 2-8.

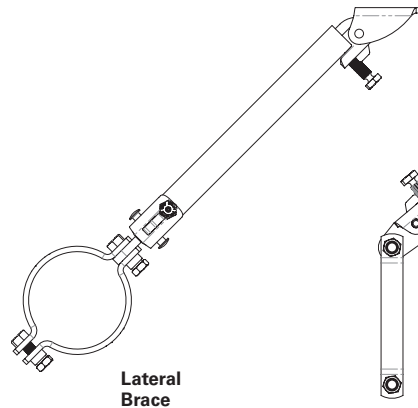
OPM



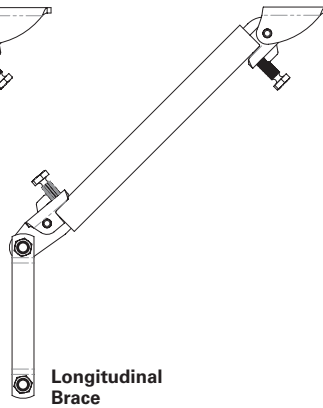
Set Bolt &  
Hardware Included



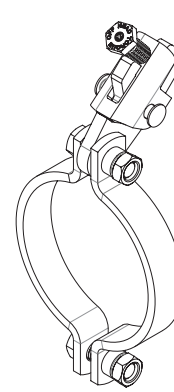
Seismic Bracing



Lateral  
Brace



Longitudinal  
Brace



With Plain &  
Electrogalvanized Finish



| Part No. | Nom Pipe<br>Size<br>in. (mm) | A<br>(Max)<br>in. | C<br>in. | D<br>in. | Bolt<br>Size<br>in. | FM Max. Rec. Load<br>Longitudinal |                      |                      |                      | FM Max. Rec. Load<br>Lateral |                      |                      |                      | Approx.<br>Wt./100<br>lbs. |
|----------|------------------------------|-------------------|----------|----------|---------------------|-----------------------------------|----------------------|----------------------|----------------------|------------------------------|----------------------|----------------------|----------------------|----------------------------|
|          |                              |                   |          |          |                     | 30°-44°<br>lbs. (kN)              | 45°-59°<br>lbs. (kN) | 60°-74°<br>lbs. (kN) | 75°-90°<br>lbs. (kN) | 30°-44°<br>lbs. (kN)         | 45°-59°<br>lbs. (kN) | 60°-74°<br>lbs. (kN) | 75°-90°<br>lbs. (kN) |                            |
| 4L-1     | 1 (25)                       | 5                 | 2        | 1 3/8    | 1/2-13              | 1060 (4.72)                       | 1160 (5.16)          | 1400 (6.23)          | 1500 (6.68)          | 1370 (6.10)                  | 1940 (8.63)          | 2380 (10.59)         | 2650 (11.79)         | 176                        |
| 4L-1 1/4 | 1 1/4 (32)                   | 5 7/8             | 2 1/8    | 1 5/8    | 1/2-13              | 1060 (4.72)                       | 1160 (5.16)          | 1400 (6.23)          | 1500 (6.68)          | 1370 (6.10)                  | 1940 (8.63)          | 2380 (10.59)         | 2650 (11.79)         | 182                        |
| 4L-1 1/2 | 1 1/2 (40)                   | 5 1/2             | 2 1/3    | 1 2/3    | 1/2-13              | 740 (3.30)                        | 1020 (4.54)          | 1250 (5.57)          | 920 (4.10)           | 1370 (6.10)                  | 1940 (8.63)          | 2380 (10.59)         | 2650 (11.79)         | 187                        |
| 4L-2     | 2 (50)                       | 6 7/8             | 2 2/3    | 2        | 1/2-13              | 740 (3.30)                        | 1020 (4.54)          | 1250 (5.57)          | 920 (4.10)           | 1420 (6.32)                  | 1990 (8.86)          | 2440 (10.86)         | 2720 (12.10)         | 204                        |
| 4L-2 1/2 | 2 1/2 (63)                   | 6 7/8             | 3        | 2 1/3    | 1/2-13              | 520 (2.32)                        | 650 (2.90)           | 790 (3.52)           | 1040 (4.63)          | 1410 (6.28)                  | 1990 (8.86)          | 2440 (10.86)         | 2720 (12.10)         | 220                        |
| 4L-65mm  | — (65)                       | 6 7/8             | 3        | 2 1/3    | 1/2-13              | 520 (2.32)                        | 650 (2.90)           | 790 (3.52)           | 1040 (4.63)          | 1410 (6.28)                  | 1990 (8.86)          | 2440 (10.86)         | 2720 (12.10)         | 218                        |
| 4L-3     | 3 (80)                       | 7 3/4             | 3 1/4    | 2 5/8    | 1/2-13              | 520 (2.32)                        | 650 (2.90)           | 790 (3.52)           | 1040 (4.63)          | 1410 (6.28)                  | 1990 (8.86)          | 2440 (10.86)         | 2720 (12.10)         | 323                        |
| 4L-3 1/2 | 3 1/2 (90)                   | 8                 | 3 1/2    | 2 7/8    | 1/2-13              | 520 (2.32)                        | 650 (2.90)           | 790 (3.52)           | 1040 (4.63)          | 1410 (6.28)                  | 1990 (8.86)          | 2440 (10.86)         | 2720 (12.10)         | 343                        |
| 4L-4     | 4 (100)                      | 8 3/4             | 3 3/4    | 3 1/8    | 1/2-13              | 520 (2.32)                        | 650 (2.90)           | 790 (3.52)           | 1040 (4.63)          | 1410 (6.28)                  | 1990 (8.86)          | 2440 (10.86)         | 2720 (12.10)         | 253                        |
| 4L-5     | 5 (125)                      | 9 5/8             | 4 3/8    | 3 5/8    | 1/2-13              | 520 (2.32)                        | 650 (2.90)           | 790 (3.52)           | 1040 (4.63)          | 1410 (6.28)                  | 1990 (8.86)          | 2440 (10.86)         | 2720 (12.10)         | 313                        |
| 4L-125mm | — (125)                      | 9 5/8             | 4 3/8    | 3 5/8    | 1/2-13              | 520 (2.32)                        | 650 (2.90)           | 790 (3.52)           | 1040 (4.63)          | 1410 (6.28)                  | 1990 (8.86)          | 2440 (10.86)         | 2720 (12.10)         | 312                        |
| 4L-6     | 6 (150)                      | 11 3/4            | 5 1/3    | 4 7/8    | 1/2-13              | 870 (3.87)                        | 1200 (5.34)          | 1460 (6.50)          | 1630 (7.26)          | 1560 (6.94)                  | 2210 (9.84)          | 2710 (12.06)         | 3020 (13.44)         | 540                        |
| 4L-150mm | — (150)                      | 11 3/4            | 5 1/3    | 4 7/8    | 1/2-13              | 870 (3.87)                        | 1200 (5.34)          | 1460 (6.50)          | 1630 (7.26)          | 1560 (6.94)                  | 2210 (9.84)          | 2710 (12.06)         | 3020 (13.44)         | 538                        |
| 4L-8     | 8 (200)                      | 13 3/5            | 6 2/5    | 5 2/3    | 1/2-13              | 1190 (5.30)                       | 1440 (6.41)          | 1580 (7.03)          | 1750 (7.79)          | 1560 (6.94)                  | 2210 (9.84)          | 2710 (12.06)         | 3020 (13.44)         | 645                        |
| 4L-200mm | — (200)                      | 13 3/5            | 6 2/5    | 5 2/3    | 1/2-13              | 1190 (5.30)                       | 1440 (6.41)          | 1580 (7.03)          | 1750 (7.79)          | 1560 (6.94)                  | 2210 (9.84)          | 2710 (12.06)         | 3020 (13.44)         | 643                        |
| 4L-10    | 10 (254)                     | 17 3/5            | 8 1/4    | 7 1/4    | 1/2-13              | 1620 (7.21)                       | 1660 (7.38)          | 1570 (6.98)          | 1740 (7.74)          | 1620 (7.21)                  | 2300 (10.23)         | 2820 (12.54)         | 3140 (13.97)         | 1349                       |
| 4L-12    | 12 (300)                     | 19 3/5            | 9 1/4    | 8 1/4    | 1/2-13              | 1620 (7.21)                       | 1660 (7.38)          | 1570 (6.98)          | 1740 (7.74)          | 1620 (7.21)                  | 2300 (10.23)         | 2820 (12.54)         | 3140 (13.97)         | 1526                       |

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

Updated 4-2-21

# Seismic Bracing

## TOLCO Fig. 4LA - In-Line Sway Brace Attachment (UL Listed)

**Size Range:** 1" (25mm) through 8" (200mm) IPS.

**Material:** Steel

**Function:** For bracing pipe against sway and seismic disturbance.

**Approvals:** For FM Approval information refer to FM Approved page 77.

Underwriters Laboratories Listed in the USA and Canada (cULus).

Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD).

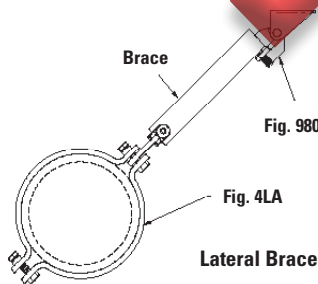
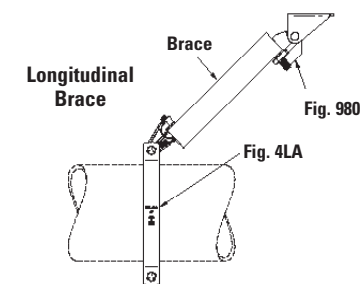
For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Installation Instructions:** Fig. 4LA can be used as the system attachment component of a longitudinal or lateral brace assembly. It is intended to be combined with the "bracing member" and TOLCO™ transitional attachment and structural attachment to form a complete bracing assembly. For fire sprinkler applications NFPA 13 guidelines should be followed.

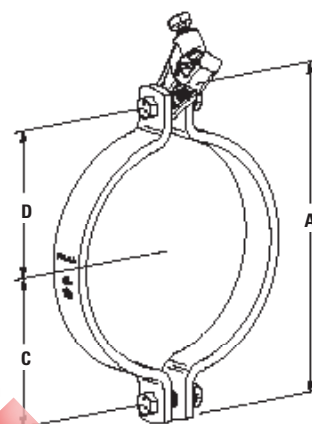
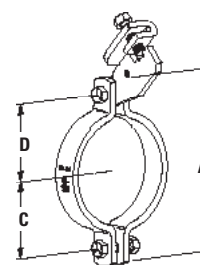
**To Install:** Place the Fig. 4LA pipe clamp component over the pipe to be braced and tighten down the break-off nuts until the hex head portion breaks off to verify correct installation torque. Next engage brace member (pipe or strut) with jaw component and tighten break-off head bolt until the hex head breaks off to verify correct installation torque. Pivot jaw for correct angle and attach to structure using TOLCO brand transitional attachment and structural attachment.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, pipe size and finish.



4LA-1 thru 4LA-4



4LA-6 thru 4LA-12

| Part No.                          | Pipe Size                            | A                                            |                                            | C                                           |                                    | D            |             | Bolt Size    | UL Max. Rec. Load |  | Approx. Wt./100 |
|-----------------------------------|--------------------------------------|----------------------------------------------|--------------------------------------------|---------------------------------------------|------------------------------------|--------------|-------------|--------------|-------------------|--|-----------------|
|                                   | in. (mm)                             | in. (mm)                                     | in. (mm)                                   | in. (mm)                                    | in. (mm)                           | Longitudinal | Lateral     |              |                   |  |                 |
|                                   |                                      | lbs. (kN)                                    | lbs. (kN)                                  | lbs. (kg)                                   |                                    |              |             |              |                   |  |                 |
| 4LA-1                             | 1" (25)                              | 319 <sup>32</sup> / <sub>32</sub> " (91.2)   | 15 <sup>16</sup> / <sub>16</sub> " (33.5)  | 15 <sup>16</sup> / <sub>16</sub> " (33.5)   | 3 <sup>8</sup> / <sub>8</sub> "-16 | 1000 (4.45)  | NA (NA)     | 119 (54.0)   |                   |  |                 |
| 4LA-1 <sup>1</sup> / <sub>4</sub> | 1 <sup>1</sup> / <sub>4</sub> " (32) | 329 <sup>32</sup> / <sub>32</sub> " (99.3)   | 13 <sup>8</sup> / <sub>8</sub> " (35.3)    | 13 <sup>8</sup> / <sub>8</sub> " (35.3)     | 3 <sup>8</sup> / <sub>8</sub> "-16 | 1000 (4.45)  | NA (NA)     | 123 (55.8)   |                   |  |                 |
| 4LA-1 <sup>1</sup> / <sub>2</sub> | 1 <sup>1</sup> / <sub>2</sub> " (40) | 45 <sup>32</sup> / <sub>32</sub> " (105.7)   | 1 <sup>1</sup> / <sub>2</sub> " (38.5)     | 1 <sup>1</sup> / <sub>2</sub> " (38.5)      | 3 <sup>8</sup> / <sub>8</sub> "-16 | 1000 (4.45)  | NA (NA)     | 127 (57.6)   |                   |  |                 |
| 4LA-2                             | 2" (50)                              | 511 <sup>32</sup> / <sub>32</sub> " (135.6)  | 21 <sup>32</sup> / <sub>32</sub> " (51.9)  | 21 <sup>16</sup> / <sub>16</sub> " (51.9)   | 3 <sup>8</sup> / <sub>8</sub> "-16 | 1000 (4.45)  | NA (NA)     | 142 (64.4)   |                   |  |                 |
| 4LA-2 <sup>1</sup> / <sub>2</sub> | 2 <sup>1</sup> / <sub>2</sub> " (65) | 527 <sup>32</sup> / <sub>32</sub> " (148.7)  | 25 <sup>16</sup> / <sub>16</sub> " (58.5)  | 25 <sup>16</sup> / <sub>16</sub> " (58.5)   | 3 <sup>8</sup> / <sub>8</sub> "-16 | 1000 (4.45)  | NA (NA)     | 173 (78.5)   |                   |  |                 |
| 4LA-3                             | 3" (80)                              | 61 <sup>2</sup> / <sub>2</sub> " (164.9)     | 25 <sup>8</sup> / <sub>8</sub> " (66.6)    | 25 <sup>8</sup> / <sub>8</sub> " (66.6)     | 3 <sup>8</sup> / <sub>8</sub> "-16 | 1000 (4.45)  | 1000 (4.45) | 187 (84.8)   |                   |  |                 |
| 4LA-3 <sup>1</sup> / <sub>2</sub> | 3 <sup>1</sup> / <sub>2</sub> " (90) | 7.407" (188.1)                               | 27 <sup>8</sup> / <sub>8</sub> " (73.1)    | 27 <sup>8</sup> / <sub>8</sub> " (73.1)     | 3 <sup>8</sup> / <sub>8</sub> "-16 | 1000 (4.45)  | 1000 (4.45) | 198 (89.8)   |                   |  |                 |
| 4LA-4                             | 4" (100)                             | 713 <sup>32</sup> / <sub>32</sub> " (190.8)  | 31 <sup>8</sup> / <sub>8</sub> " (79.5)    | 31 <sup>8</sup> / <sub>8</sub> " (79.5)     | 3 <sup>8</sup> / <sub>8</sub> "-16 | 1000 (4.45)  | 1000 (4.45) | 209 (94.8)   |                   |  |                 |
| 4LA-6                             | 6" (150)                             | 105 <sup>8</sup> / <sub>8</sub> " (269.9)    | 49 <sup>16</sup> / <sub>16</sub> " (115.9) | 49 <sup>16</sup> / <sub>16</sub> " (115.9)  | 1 <sup>2</sup> / <sub>2</sub> "-13 | 1600 (7.12)  | 1600 (7.12) | 521 (236.3)  |                   |  |                 |
| 4LA-8                             | 8" (200)                             | 1213 <sup>16</sup> / <sub>16</sub> " (325.5) | 59 <sup>16</sup> / <sub>16</sub> " (143.7) | 521 <sup>32</sup> / <sub>32</sub> " (143.7) | 1 <sup>2</sup> / <sub>2</sub> "-13 | 2015 (7.12)  | 2015 (7.12) | 629 (285.3)  |                   |  |                 |
| 4LA-10*                           | 10" (250)                            | 161 <sup>2</sup> / <sub>2</sub> " (419.1)    | 71 <sup>4</sup> / <sub>4</sub> " (184.2)   | 71 <sup>4</sup> / <sub>4</sub> " (184.2)    | 1 <sup>2</sup> / <sub>2</sub> "-13 | NA (NA)      | NA (NA)     | 1320 (598.7) |                   |  |                 |
| 4LA-12*                           | 12" (300)                            | 181 <sup>2</sup> / <sub>2</sub> " (469.9)    | 81 <sup>4</sup> / <sub>4</sub> " (209.6)   | 81 <sup>4</sup> / <sub>4</sub> " (209.6)    | 1 <sup>2</sup> / <sub>2</sub> "-13 | NA (NA)      | NA (NA)     | 1496 (678.6) |                   |  |                 |

\* FM Approved but not UL Listed.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 4LA - In-Line Sway Brace Attachment (FM Approved)

**Size Range:** 1" (25mm) through 12" (300mm) IPS.

**Material:** Steel

**Function:** For bracing pipe against sway and seismic disturbance.

**Approvals:** Approved by Factory Mutual Engineering (FM), 1" (25mm) through 12" (300mm) pipe.

For UL Listed information refer to UL Listed page 76.

Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD).

For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Installation Instructions:** Fig. 4LA can be used as the system attachment component of a longitudinal or lateral brace assembly. It is intended to be combined with the "bracing member" and TOLCO™ transitional attachment and structural attachment to form a complete bracing assembly. For fire sprinkler applications NFPA 13 guidelines should be followed.

**To Install:** Place the Fig. 4LA pipe clamp component over the pipe to be braced and tighten down the break off nuts until the hex head portion breaks off to verify correct installation torque. Next engage brace member (pipe or strut) with jaw component and tighten break-off head bolt until the hex head breaks off to verify correct installation torque. Pivot jaw for correct angle and attach to structure using TOLCO brand transitional attachment and structural attachment.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

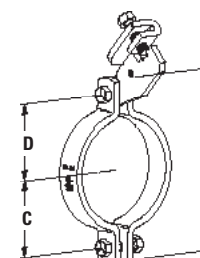
**Order By:** Figure number, pipe size and finish.



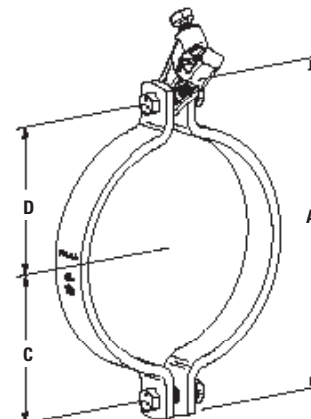
OPM



4LA-1 thru 4LA-4



4LA-6 thru 4LA-12



| Part No.  | Pipe Size<br>in. (mm) | A        |         | C      |         | D       |         | Bolt Size | FM Max. Rec. Load<br>Longitudinal & Lateral** |                      |                      |                      | Approx.<br>Wt./100<br>lbs. (kg) |
|-----------|-----------------------|----------|---------|--------|---------|---------|---------|-----------|-----------------------------------------------|----------------------|----------------------|----------------------|---------------------------------|
|           |                       | in.      | (mm)    | in.    | (mm)    | in.     | (mm)    |           | 30°-44°<br>lbs. (kN)                          | 45°-59°<br>lbs. (kN) | 60°-74°<br>lbs. (kN) | 75°-90°<br>lbs. (kN) |                                 |
| 4LA-1     | 1" (25)               | 319/32   | (91.2)  | 15/16  | (33.5)  | 15/16   | (33.5)  | 3/8"-16   | 680 (3.02)                                    | 970 (4.31)           | 1190 (5.29)          | 1320 (5.87)          | 119 (54.0)                      |
| 4LA-1 1/4 | 1 1/4" (32)           | 329/32   | (99.3)  | 1 3/8  | (35.3)  | 1 3/8   | (35.3)  | 3/8"-16   | 680 (3.02)                                    | 970 (4.31)           | 1190 (5.29)          | 1320 (5.87)          | 123 (55.8)                      |
| 4LA-1 1/2 | 1 1/2" (40)           | 45/32    | (105.7) | 1 1/2  | (38.5)  | 1 1/2   | (38.5)  | 3/8"-16   | 680 (3.02)                                    | 970 (4.31)           | 1190 (5.29)          | 1320 (5.87)          | 127 (57.6)                      |
| 4LA-2     | 2" (50)               | 511/32   | (135.6) | 2 1/32 | (51.9)  | 2 1/16  | (51.9)  | 3/8"-16   | 680 (3.02)                                    | 970 (4.31)           | 1190 (5.29)          | 1320 (5.87)          | 142 (64.4)                      |
| 4LA-2 1/2 | 2 1/2" (65)           | 527/32   | (148.7) | 2 5/16 | (58.5)  | 2 5/16  | (58.5)  | 3/8"-16   | 680 (3.02)                                    | 970 (4.31)           | 1190 (5.29)          | 1320 (5.87)          | 173 (78.5)                      |
| 4LA-3     | 3" (80)               | 6 1/2    | (164.9) | 2 5/8  | (66.6)  | 2 5/8   | (66.6)  | 3/8"-16   | 680 (3.02)                                    | 970 (4.31)           | 1190 (5.29)          | 1320 (5.87)          | 187 (84.8)                      |
| 4LA-3 1/2 | 3 1/2" (90)           | 7.407    | (188.1) | 2 7/8  | (73.1)  | 2 7/8   | (73.1)  | 3/8"-16   | 680 (3.02)                                    | 970 (4.31)           | 1190 (5.29)          | 1320 (5.87)          | 198 (89.8)                      |
| 4LA-4     | 4" (100)              | 7 13/32  | (190.8) | 3 1/8  | (79.5)  | 3 1/8   | (79.5)  | 3/8"-16   | 680 (3.02)                                    | 970 (4.31)           | 1190 (5.29)          | 1320 (5.87)          | 209 (94.8)                      |
| 4LA-6     | 6" (150)              | 10 5/8   | (269.9) | 4 9/16 | (115.9) | 4 9/16  | (115.9) | 1 1/2"-13 | 1620 (7.20)                                   | Note 1               | Note 3               | Note 5               | 521 (236.3)                     |
| 4LA-8     | 8" (200)              | 12 13/16 | (325.5) | 5 9/16 | (143.7) | 5 21/32 | (143.7) | 1 1/2"-13 | 1620 (7.20)                                   | Note 2               | Note 4               | Note 6               | 629 (285.3)                     |
| 4LA-10    | 10" (250)             | 16 1/2   | (419.1) | 7 1/4  | (184.2) | 7 1/4   | (184.2) | 1 1/2"-13 | 1620 (7.20)                                   | Note 2               | Note 4               | Note 6               | 1320 (598.7)                    |
| 4LA-12    | 12" (300)             | 18 1/2   | (469.9) | 8 1/4  | (209.6) | 8 1/4   | (209.6) | 1 1/2"-13 | 1620 (7.20)                                   | Note 2               | Note 4               | Note 6               | 1496 (678.6)                    |

\*\* Longitudinal and Lateral Loads are the same except where noted in chart.

Note 1: Longitudinal Load 2260 lbs. (10.05kN) - Lateral Load 2300 lbs. (10.23kN)

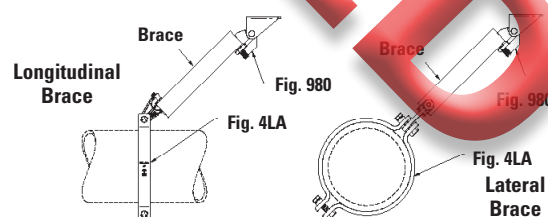
Note 2: Longitudinal Load 1660 lbs. (7.38kN) - Lateral Load 2300 lbs. (10.23kN)

Note 3: Longitudinal Load 2010 lbs. (8.94kN) - Lateral Load 2820 lbs. (12.54kN)

Note 4: Longitudinal Load 1570 lbs. (6.98kN) - Lateral Load 2820 lbs. (12.54kN)

Note 5: Longitudinal Load 2220 lbs. (9.87kN) - Lateral Load 3140 lbs. (13.96kN)

Note 6: Longitudinal Load 1740 lbs. (7.74kN) - Lateral Load 3140 lbs. (13.96kN)



Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Seismic Bracing

## TOLCO Figure 4B pipe clamp

**Size Range:** ¾" (20mm) to 8" (200mm) pipe

**Material:** Steel

**Function:** For bracing pipe against sway and seismic disturbance

**Approvals:** Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Standard Finish:** Plain or Electro-Plated, Contact customer service for alternative finishes and materials.

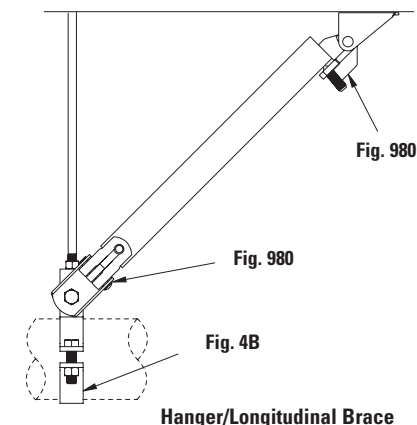
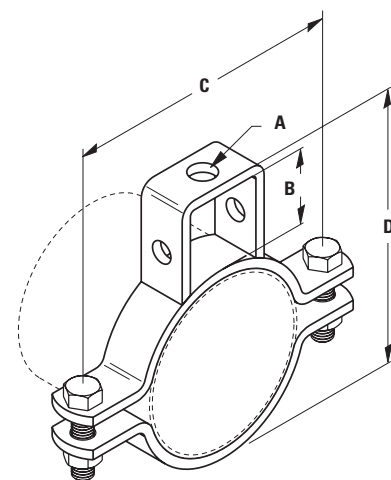
**Ordering:** Specify part number and finish.

**Installation Instructions:** Fig. 4B is the "braced pipe" attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and transitional and structural attachment component(s) to form a complete bracing assembly. OSHPD guidelines should be followed.

**To Install:** Place the Fig. 4B over the pipe to be braced. Attach other transitional fitting, Fig. 909, 910, 980, or 990. Tighten bolts and nuts. Transitional fitting attachment can pivot for adjustment to proper brace angle.



## OPM



| Part No. | Pipe Size<br>in. (mm) | Rod Size<br>A | B<br>in. (mm) | C<br>in. (mm) | D<br>in. (mm) | Bolt Size | Approx. Wt./100<br>Lbs. (kg) |
|----------|-----------------------|---------------|---------------|---------------|---------------|-----------|------------------------------|
| 4B-¾     | ¾" (20)               | ¾"-16         | 1" (25.4)     | 2⅞" (73.0)    | 2⅝" (66.7)    | ⅝"-18     | 56 (25.4)                    |
| 4B-1     | 1" (25)               | ¾"-16         | 1" (25.4)     | 3¼" (82.5)    | 2⅝" (74.6)    | ⅝"-18     | 60 (27.2)                    |
| 4B-1¼    | 1¼" (32)              | ¾"-16         | 1" (25.4)     | 3⅞" (90.6)    | 3¼" (82.5)    | ⅝"-18     | 74 (33.5)                    |
| 4B-1½    | 1½" (40)              | ¾"-16         | 1" (25.4)     | 3⅞" (96.8)    | 3⅞" (87.3)    | ⅝"-18     | 79 (35.8)                    |
| 4B-2     | 2" (50)               | ¾"-16         | 1½" (38.1)    | 5⅞" (130.2)   | 4⅝" (117.5)   | ⅝"-18     | 156 (70.7)                   |
| 4B-2½    | 2½" (65)              | 1½"-13        | 1¾" (44.4)    | 5⅞" (142.9)   | 5⅞" (136.5)   | ¾"-16     | 176 (79.8)                   |
| 4B-3     | 3" (80)               | 1½"-13        | 1⅞" (47.6)    | 6¾" (171.4)   | 6⅞" (155.5)   | ¾"-16     | 198 (89.9)                   |
| 4B-3½    | 3½" (90)              | 1½"-13        | 2" (50.8)     | 7¼" (184.1)   | 6¾" (171.4)   | ¾"-16     | 219 (99.3)                   |
| 4B-4     | 4" (100)              | ⅝"-11         | 2" (50.8)     | 8⅝" (219.1)   | 7¼" (184.1)   | ½"-13     | 288 (130.6)                  |
| 4B-5     | 5" (125)              | ⅝"-11         | 2" (50.8)     | 9⅞" (250.8)   | 8⅝" (211.1)   | ⅝"-11     | 390 (176.9)                  |
| 4B-6     | 6" (150)              | ¾"-10         | 2⅞" (54.0)    | 10⅝" (277.8)  | 9½" (241.3)   | ⅝"-11     | 448 (203.2)                  |
| 4B-8     | 8" (200)              | ⅞"-9          | 2⅞" (54.0)    | 13⅞" (341.2)  | 11½" (292.1)  | ¾"-10     | 691 (313.4)                  |

Refer to OPM-0052-13 for approved loads.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

**AWSD Series - Power Stud+<sup>®†</sup> SD2 seismic wedge anchors****Features:**

- Fully threaded, torque-controlled, wedge anchor which is designed for consistent performance in cracked and uncracked concrete.
- For use in concrete, structural sand lightweight concrete, and concrete over metal deck.
- Nominal drill bit size is the same as the anchor diameter.
- ICC-ES listed, ESR-2502, Category 1
- Zinc plated carbon steel body with stainless steel expansion clip from premium performance.
- Qualified for seismic and wind loading.

**Approvals:** Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**ICC-ES** Certified. See ICC-ESR-2502

**UL** (Underwriters Laboratories) Listed

**FM** (Factory Mutual) Approved

Refer to pages 11-20 through 11-23 in Seismic Engineering Guidelines OPM-0052-13 for approval OSHPD structural attachment data.

**OPM**

| Seismic Wedge Anchor - Data           | 3/8"-16               | 1/2"-13               | 5/8"-11               | 3/4"-10                 |
|---------------------------------------|-----------------------|-----------------------|-----------------------|-------------------------|
| ANSI Drill Bit Size (in. - mm)        | 3/8" - (9.5mm)        | 1/2" - (12.7mm)       | 5/8" - (15.9mm)       | 3/4" - (19.0mm)         |
| Fixture Clearance Hole (in. - mm)     | 7/16" - (11.1mm)      | 9/16" - (14.3mm)      | 11/16" - (17.5mm)     | 13/16" - (20.6mm)       |
| Minimum Hole Depth (in. - mm)         | 2 5/8" - (66.7mm)     | 2 3/4" - (69.8mm)     | 4 1/4" - (107.9mm)    | 5" - (127.0mm)          |
| Minimum Concrete Thickness (in. - mm) | 4" - (101.6mm)        | 4 1/2" - (114.3mm)    | 5 3/4" - (146.0mm)    | 7" - (177.8mm)          |
| Max. Tightening Torque (lbs-ft - N•m) | 20 lbs-ft - (27.1N•m) | 40 lbs-ft - (54.2N•m) | 60 lbs-ft - (81.3N•m) | 110 lbs-ft - (149.1N•m) |
| Min. Embedment Depth (in. - mm)       | 2 3/8" - (60.3mm)     | 2 1/2" - (63.5mm)     | 3 7/8" - (98.4mm)     | 4 1/2" - (114.3mm)      |

For loading information, refer to the ICC-ES ESR-2502 evaluation report.

| Wedge Anchor<br>Part No. | Anchor Size          |  | Length         |  | Thread Length  |  | Wt./100      |  |
|--------------------------|----------------------|--|----------------|--|----------------|--|--------------|--|
|                          | Diameter<br>in. (mm) |  | in. (mm)       |  | in. (mm)       |  | Lbs. (kg)    |  |
| <b>AWSD-37-300</b>       | 3/8" (9.5)           |  | 3" (76.2)      |  | 1 3/4" (44.4)  |  | 11.4 (5.2)   |  |
| <b>AWSD-37-350</b>       | 3/8" (9.5)           |  | 3 1/2" (88.9)  |  | 2 1/4" (57.1)  |  | 12.2 (5.5)   |  |
| <b>AWSD-37-375</b>       | 3/8" (9.5)           |  | 3 3/4" (95.2)  |  | 2 1/2" (63.5)  |  | 13.2 (6.0)   |  |
| <b>AWSD-37-500</b>       | 3/8" (9.5)           |  | 5" (127.0)     |  | 3 3/4" (95.2)  |  | 16.0 (7.2)   |  |
| <b>AWSD-50-375</b>       | 1/2" (12.7)          |  | 3 3/4" (95.2)  |  | 2 1/8" (54.0)  |  | 23.0 (10.4)  |  |
| <b>AWSD-50-450</b>       | 1/2" (12.7)          |  | 4 1/2" (114.3) |  | 2 7/8" (73.0)  |  | 26.6 (12.0)  |  |
| <b>AWSD-50-550</b>       | 1/2" (12.7)          |  | 5 1/2" (139.7) |  | 3 7/8" (98.4)  |  | 34.0 (15.4)  |  |
| <b>AWSD-50-700</b>       | 1/2" (12.7)          |  | 7" (177.8)     |  | 5 3/8" (136.5) |  | 38.0 (17.2)  |  |
| <b>AWSD-62-475</b>       | 5/8" (15.9)          |  | 4 3/4" (120.6) |  | 2 7/8" (73.0)  |  | 50.3 (22.8)  |  |
| <b>AWSD-62-500</b>       | 5/8" (15.9)          |  | 5" (127.0)     |  | 3 1/8" (79.4)  |  | 52.0 (23.6)  |  |
| <b>AWSD-62-600</b>       | 5/8" (15.9)          |  | 6" (152.4)     |  | 4 1/8" (104.8) |  | 58.8 (26.7)  |  |
| <b>AWSD-62-700</b>       | 5/8" (15.9)          |  | 7" (177.8)     |  | 5 1/8" (130.2) |  | 65.2 (29.6)  |  |
| <b>AWSD-75-550</b>       | 3/4" (19.0)          |  | 5 1/2" (139.7) |  | 3 1/4" (82.5)  |  | 81.5 (36.9)  |  |
| <b>AWSD-75-625</b>       | 3/4" (19.0)          |  | 6 1/4" (158.7) |  | 4" (101.6)     |  | 94.0 (42.6)  |  |
| <b>AWSD-75-700</b>       | 3/4" (19.0)          |  | 7" (177.8)     |  | 4 3/4" (120.6) |  | 106.5 (48.3) |  |

<sup>†</sup> Power Stud+<sup>®</sup> SD2 is a registered trademark used by DeWalt.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Concrete Anchors

## TOLCO Fig. 109DD - DDI+™† - concrete deck insert - hanger application

**Size Range:** 3/8"-16 thru 7/8"-9 rod

**Material:** Steel

**Function:** For use in concrete filled metal deck (20 GA. min.) assemblies (i.e. pan deck, Q-deck) applications. After installation, the threaded male hanger of the insert protrudes below the surface of the deck. The threaded bolt offers adjustability for precise height requirements and guarantees the minimum embedment depth. The longer plate enables a variety of installation locations across the deck. Pre-mounted drill screws included for installation.

**Approvals:** International Code Council, Evaluation Service (ICC-ES), ESR-3958 for concrete, for 3/8"-16 thru 5/8"-11" anchor sizes.

Approved for seismic and wind loading.

**UL** (Underwriters Laboratories) Listed

**FM** (Factory Mutual) Approved

**Finish:** Plate: Plain Steel. Rod: Electro-Galvanized.

**Order By:** Figure number, rod size and finish.

Applications Per NFPA 13 (2010): UL Listed as a component of a hanger assembly per Section 9.1.1.4.1

See dimensions and installation Detail below.

**Note:** Fig. 109DD replaces Fig. 109A which has been discontinued.

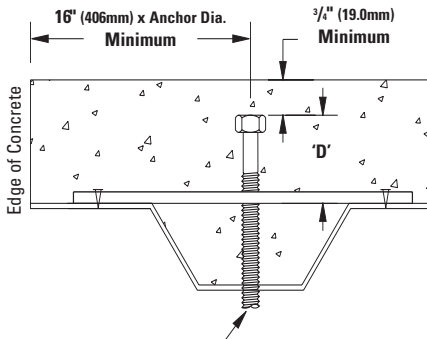
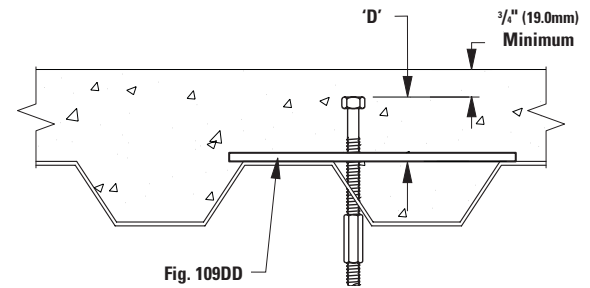
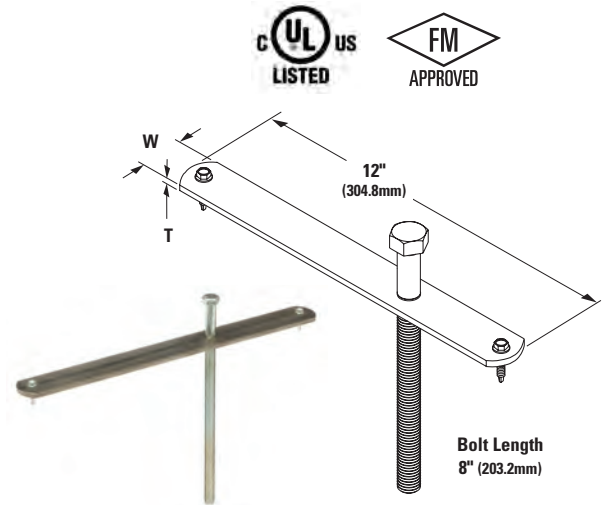


Fig. 109DD

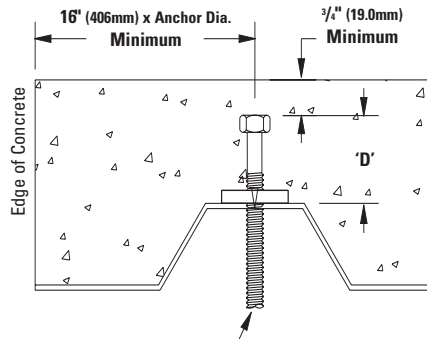


Fig. 109DD

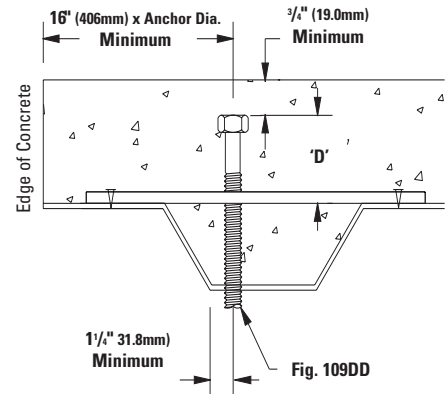


Fig. 109DD

| Part No.  | Rod Size | T<br>in. (mm) | W<br>in. (mm) | Max. Vertical Load<br>lbs. (kn) | 'D' Min. Anchor Embedment Depth<br>in. (mm) | Approx. Wt./100<br>lbs. (kg) |
|-----------|----------|---------------|---------------|---------------------------------|---------------------------------------------|------------------------------|
| 109DD-3/8 | 3/8"-16  | 3/16" (4.7)   | 1 1/4" (31.7) | 467 (2.08)                      | 2 1/2" (63.5)                               | 98.1 (44.5)                  |
| 109DD-1/2 | 1/2"-13  | 3/16" (4.7)   | 1 1/4" (31.7) | 680 (3.02)                      | 2 1/2" (63.5)                               | 112.8 (51.1)                 |
| 109DD-5/8 | 5/8"-11  | 3/16" (4.7)   | 1 1/4" (31.7) | 647 (2.88)                      | 2 1/2" (63.5)                               | 139.3 (63.2)                 |
| 109DD-3/4 | 3/4"-10  | 3/8" (9.5)    | 2" (50.8)     | 612 (2.72)                      | 2 1/2" (63.5)                               | 112.8 (51.1)                 |
| 109DD-7/8 | 7/8"-9   | 3/8" (9.5)    | 2" (50.8)     | 577 (2.56)                      | 2 1/2" (63.5)                               | 381.2 (172.9)                |

### NOTES:

1. Mounting holes are standard. If the plate is not mechanically secured to the deck ribs, a jam nut is required to prevent the anchor bolt from laying over when concrete is poured. There is no structural strength added from the use of a mechanical fastener to hold the product in place before the pour.
2. Minimum spacing between inserts shall be not less than 3 times the embedment depth or 12 times the anchor diameter (whichever is greater)

† DDI+™ is a registered trademark used by DEWALT®

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 109DD-DDI+™† - concrete deck insert - brace application

**Size Range:** 3/8"-16 thru 7/8"-9 rod

**Material:** Steel

**Function:** For use in concrete filled metal deck (20 GA. min.) assemblies (i.e. pan deck, Q-deck) applications. After installation, the threaded male hanger of the insert protrudes below the surface of the deck. The threaded bolt offers adjustability for precise height requirements and guarantees the minimum embedment depth. The longer plate enables a variety of installation locations across the deck. Pre-mounted drill screws included for installation.

**Approvals:** International Code Council, Evaluation Service (ICC-ES), ESR-3958 for concrete, for 3/8"-16 thru 5/8"-11" anchor sizes. Approved for seismic and wind loading.

**UL** (Underwriters Laboratories) Listed

**FM** (Factory Mutual) Approved

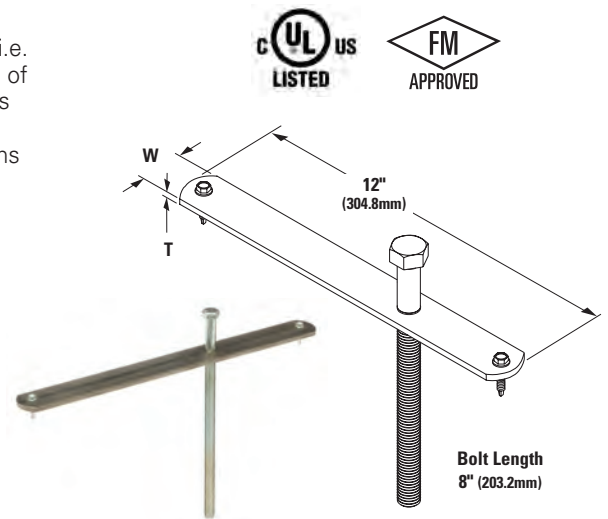
**Finish:** Plate: Plain Steel. Rod: Electro-Galvanized.

**Order By:** Figure number, rod size and finish.

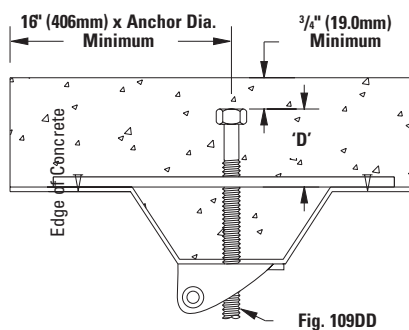
Applications Per NFPA 13 (2010): UL Listed as a component of a hanger assembly per Section 9.1.1.4.1

See dimensions and installation Detail below.

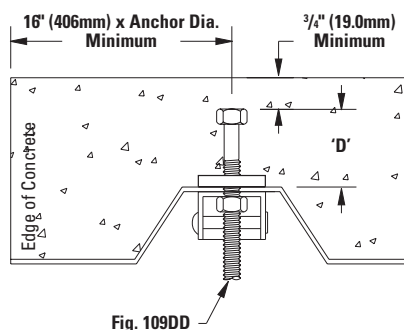
**Note:** Fig. 109DD replaces Fig. 109A which has been discontinued.



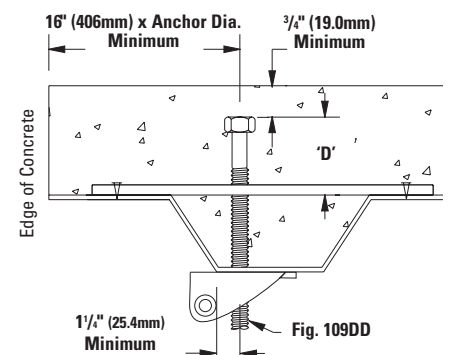
Concrete Anchors



Detail 1



Detail 2



Detail 3

| Part No.  | Rod Size | T<br>in. (mm) | W<br>in. (mm) | Details 1 & 2<br>Max. Horizontal Load<br>Brace At 45°<br>lbs. (kN) | Detail 3<br>Max. Horizontal Load<br>Brace At 45°<br>lbs. (kN) | 'D' Min. Anchor<br>Embedment Depth<br>in. (mm) | Approx.<br>Wt./100<br>lbs. (kg) |
|-----------|----------|---------------|---------------|--------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------|---------------------------------|
| 109DD-3/8 | 3/8"-16  | 3/16" (4.7)   | 1 1/4" (31.7) | 311 (1.38)                                                         | 257 (1.14)                                                    | 2 1/2" (63.5)                                  | 98.1 (44.5)                     |
| 109DD-1/2 | 1/2"-13  | 3/16" (4.7)   | 1 1/4" (31.7) | 424 (1.89)                                                         | 332 (1.48)                                                    | 2 1/2" (63.5)                                  | 112.8 (51.1)                    |
| 109DD-5/8 | 5/8"-11  | 3/16" (4.7)   | 1 1/4" (31.7) | 482 (2.14)                                                         | 363 (1.61)                                                    | 2 1/2" (63.5)                                  | 139.3 (63.2)                    |
| 109DD-3/4 | 3/4"-10  | 3/8" (9.5)    | 2" (50.8)     | 482 (2.14)                                                         | 363 (1.61)                                                    | 2 1/2" (63.5)                                  | 338.7 (153.6)                   |
| 109DD-7/8 | 7/8"-9   | 3/8" (9.5)    | 2" (50.8)     | 482 (2.14)                                                         | 363 (1.61)                                                    | 2 1/2" (63.5)                                  | 381.2 (172.9)                   |

Seismic bracing design load calculated in compliance with the requirements of IBC 2015 / CBC 2016.

### NOTES:

1. Mounting holes are standard. If the plate is not mechanically secured to the deck ribs, a jam nut is required to prevent the anchor bolt from laying over when concrete is poured. There is no structural strength added from the use of a mechanical fastener to hold the product in place before the pour.
2. Minimum spacing between inserts shall be not less than 3 times the embedment depth or 12 times the anchor diameter (whichever is greater)

† DDI+™ is a registered trademark used by DEWALT®

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Concrete Anchors

## ACPW Series - Wood-Knocker™ II

### Features:

- Wood-Knocker™ II concrete inserts are installed onto wooden forms used to support newly poured concrete floor slabs, roof slabs or walls.
- When the forms are stripped, the color-coded flange is visibly embedded in the concrete surface.
- The unique, six sided impact plate offers resistance to rotation within the concrete as threaded rod is being installed.
- Suitable for overhead installations such as suspending cable tray, pipe hangers, strut and conduit.
- Color coded by size for all trades.
- UL and FM approved.
- Lowest installation cost.

**Approvals:** Qualified for static, wind, and seismic loading in concrete. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**ICC-ES** Certified. See ICC-ESR-3657

**UL** (Underwriters Laboratories) Listed

**FM** (Factory Mutual) Approved

Refer to pages 11-26 through 11-27 in Seismic Engineering Guidelines OPM-0052-13 for approval OSHPD structural attachment data.



**OPM**



**ACPW-50-2 shown**



| Catalog Number     | Rod Diameter | Color  |
|--------------------|--------------|--------|
| <b>ACPW-25-2</b>   | 1/4"         | Brown  |
| <b>ACPW-37-2</b>   | 3/8"         | Green  |
| <b>ACPW-3750-2</b> | 3/8"-1/2"    | Gray   |
| <b>ACPW-50-2</b>   | 1/2"         | Yellow |
| <b>ACPW-62-2</b>   | 5/8"         | Red    |
| <b>ACPW-75-2</b>   | 3/4"         | Purple |

| Wood Knocker™ - Data          | 1/4"    | 3/8"    | 1/2"    | 5/8"    | 3/4"    |
|-------------------------------|---------|---------|---------|---------|---------|
| Insert Thread Length (in.)    | 3/8     | 5/8     | 11/16   | 15/16   | 1 1/8   |
| Plastic Flange Diameter (in.) | 1 3/8   | 1 3/8   | 1 3/8   | 1 5/8   | 1 5/8   |
| Thread Size (UNC)             | 1/4"-20 | 3/8"-16 | 1/2"-13 | 5/8"-11 | 3/4"-10 |
| Overall Length (in.)          | 1 7/8   | 1 7/8   | 1 7/8   | 1 7/8   | 1 7/8   |
| Min. Insert Spacing (in.)     | 9       | 9       | 9       | 12      | 12      |
| Min. End Distance (in.)       | 6       | 6       | 6       | 9       | 9       |
| Load Capacity Tension (lbs) * | 930     | 1200    | 1200    | 1160    | 1160    |
| Load Capacity Shear (lbs) *   | 370     | 1330    | 1840    | 2800    | 2800    |

\* Based on normal weight concrete with minimum compression strength of 3000 psi. Allowable load capacities are calculated using applied safety factor of 4.0. For additional loading information contact factory.  
Minimum embedment depth is 2".

† Wood-Knocker™ is a registered trademark used by DeWalt.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## ACPD Series - Bang-It™ + anchors

### Features:

- Bang-It™ concrete inserts are designed for installation in and through metal composite deck used to support newly poured concrete floors or roof slabs.
- After installation, the protective sleeve of the insert protrudes below the surface of the deck, allowing overhead attachment of threaded rod.
- The unique, six sided impact plate offers resistance to rotation within the concrete as threaded rod is being installed.
- Suitable for overhead installations such as suspending cable tray, pipe hangers, strut and conduit.
- Color coded by size for all trades.
- Lowest installation cost.

**Approvals:** Qualified for static, wind, and seismic loading in concrete. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (**OSHPD**). For additional load, spacing and placement information

relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**ICC-ES** Certified. See ICC-ESR-3657

**UL** (Underwriters Laboratories) Listed

**FM** (Factory Mutual) Approved

Refer to pages 11-28 through 11-32 in Seismic Engineering Guidelines OPM-0052-13 for approval OSHPD structural attachment data.



**OPM**



Concrete Anchors

| Catalog Number | Rod Diameter | Color  |
|----------------|--------------|--------|
| ACPD-25        | 1/4"         | Brown  |
| ACPD-37        | 3/8"         | Green  |
| ACPD-3750-2    | 3/8"-1/2"    | Gray   |
| ACPD-50        | 1/2"         | Yellow |
| ACPD-62        | 5/8"         | Red    |
| ACPD-75        | 3/4"         | Purple |

| Catalog Number | Description                                  |
|----------------|----------------------------------------------|
| ACPD-HS813-2   | 13/16" Carbide Hole Saw for 1/4", 3/8", 1/2" |
| ACPD-HS1188-2  | 1 3/16" Carbide Hole Saw for 5/8", 3/4"      |



| Bang-It™ - Data                 | 1/4"    | 3/8"    | 1/2"    | 5/8"    | 3/4"    |
|---------------------------------|---------|---------|---------|---------|---------|
| Metal Hole Saw Diameter (in.)   | 13/16   | 13/16   | 13/16   | 1 3/16  | 1 3/16  |
| Drilling Speed (rpm)            | 700-900 | 700-900 | 700-900 | 500-700 | 500-700 |
| Insert Thread Length (in.)      | 3/8     | 5/8     | 1 1/16  | 1 5/16  | 1 1/8   |
| Length of Sleeve (in.)          | 3 3/8   | 3 3/8   | 3 3/8   | 3 3/8   | 3 3/8   |
| Thread Size (UNC)               | 1/4"-20 | 3/8"-16 | 1/2"-13 | 5/8"-11 | 3/4"-10 |
| Embedment Depth (in.)           | 2       | 2       | 2       | 2       | 2       |
| Upper Deck Tension Load (lbs) * | 1115    | 1915    | 2370    | 2935    | 2935    |
| Lower Deck Tension Load (lbs) * | 830     | 830     | 830     | 930     | 990     |
| Upper Deck Shear Load (lbs) *   | 835     | 1115    | 1115    | 1115    | 1115    |
| Lower Deck Shear Load (lbs) *   | 625     | 840     | 840     | 840     | 840     |

\* Based on sand lightweight and normal weight concrete with minimum compression strength of 3000 psi over steel deck. Allowable load capacities are calculated using applied safety factor of 4.0. For additional loading information contact factory.

Minimum insert spacing of 6", minimum end spacing 6".

† Bang-It™ is a registered trademark used by DeWalt

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Concrete Anchors

## ACB Series - concrete screw bolts

### Features:

- For use in racking, shelving, material handling, structural anchorage, masonry AND food & beverage facilities.
- One piece heavy-duty anchor with a finished hex-head.
- Fits standard fixture hole dimensions in fabricated steel.
- Fast installation and immediate loading reduces downtime.
- For proper performance, screw anchors must be installed with the corresponding bits. The bits have a matched tolerance range designed to provide optimum performance.



| Concrete Screw Bolts - Data               | 1/4"                              | 3/8"                              |
|-------------------------------------------|-----------------------------------|-----------------------------------|
| ACB Drill Bit Size (in. - mm)             | 1/4" - (6.3mm)                    | 3/8" - (9.5mm)                    |
| Concrete Screw Tolerance Range (in. - mm) | 0.255" - 0.259" - (6.5mm - 6.6mm) | 0.385" - 0.389" - (9.8mm - 9.9mm) |
| Min. Embedment Depth (in. - mm)           | 1" - (25.4mm)                     | 1 1/2" - (38.1mm)                 |
| Load Capacity Tension (lbs - kN) *        | 335 lbs. - (1.49kN)               | 630 lbs. - (2.80kN)               |
| Load Capacity Shear (lbs - kN) *          | 520 lbs. - (2.31kN)               | 1170 lbs. - (5.20kN)              |

\* Based on concrete compression strength of 4000 psi in uncracked concrete using applied safety factor of 4.0. For additional loading information contact factory.

For ultimate strength design data in cracked and uncracked concrete, refer to ICC-ES ESR-3889 evaluation report.

| Concrete Bolt Part No. | Diameter in. (mm) | Length in. (mm) | Thread Length in. (mm) | Wt./100 Lbs. (kg) |
|------------------------|-------------------|-----------------|------------------------|-------------------|
| ACB-25-175-2           | 1/4" (6.3)        | 1 3/4" (44.4)   | 1 5/8" (41.3)          | 3.5 (1.6)         |
| ACB-25-225-2           | 1/4" (6.3)        | 2 1/4" (57.1)   | 2" (50.8)              | 4.2 (1.9)         |
| ACB-25-300-2           | 1/4" (6.3)        | 3" (76.2)       | 2 3/4" (69.8)          | 5.0 (2.3)         |
| ACB-37-175-2           | 3/8" (9.5)        | 1 3/4" (44.4)   | 1 1/2" (38.1)          | 7.8 (3.5)         |
| ACB-37-250-2           | 3/8" (9.5)        | 2 1/2" (63.5)   | 2 1/4" (57.1)          | 10.2 (4.6)        |
| ACB-37-300-2           | 3/8" (9.5)        | 3" (76.2)       | 2 3/4" (69.8)          | 11.6 (5.3)        |
| ACB-37-400-2           | 3/8" (9.5)        | 4" (101.6)      | 3 3/4" (95.2)          | 14.8 (6.7)        |

## ATM Series - self-tapping machine screw anchors

### Features:

- For use in normal-weight concrete, structural sand lightweight concrete and concrete over metal deck.
- Anchor design allows for shallow embedment and mechanically interlocks with base material.
- Internally threaded anchor for easy adjustment and removability of threaded rod or bolt.
- Fast anchor installation with a powered impact wrench.
- Suitable for overhead applications such as suspending cable tray, strut, pipe hangers and conduit.
- Made of Zinc Plated carbon steel.
- Setting tool included.

• **Approvals: ICC-ES** certified. See ICC-ESR-2272.

**FM** (Factory Mutual) Approved



| Part No. | Anchor Thread Size | Thread Length in. (mm) | Wt./100 lbs. (kg) |
|----------|--------------------|------------------------|-------------------|
| ATM-37   | 3/8"-16            | 1 1/16" (17.6)         | 5.2 (2.3)         |

| Self-Tapping Machine Screw Anchor - Data | 3/8"                 |
|------------------------------------------|----------------------|
| ANSI Drill Bit Size (in. - mm)           | 1/2" - (12.7mm)      |
| Minimum Concrete Thickness (in. - mm)    | 4" - (101.6mm)       |
| Max. Tightening Torque (lbs-ft - N•m)    | 8 lbs-ft - (10.8N•m) |
| Min. Embedment Depth (in. - mm)          | 1 3/8" - (41.3mm)    |
| Load Capacity Tension (lbs - kN) **      | 540 lbs - (2.40kN)   |
| Load Capacity Shear (lbs - kN) **        | 825 lbs - (3.67kN)   |

\*\*Based on concrete compression strength of 4000 psi in uncracked concrete using applied safety factor of 4.0. For additional loading information contact factory. For ultimate strength design data in cracked and uncracked concrete, refer to ICC-ES ESR-2272 evaluation report.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## B3068 - Welded bracket - light duty

**Material:** Steel

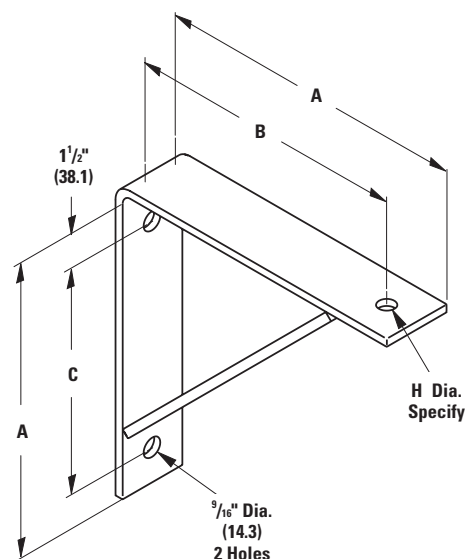
**Function:** Recommended for suspending pipe outward from mounting surface.

**Approvals:** Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 32 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 31.

**Finish:** Plain or Electro-Galvanized.

Contact customer service for alternative finishes and materials.

**Order By:** Part number, hole size 'H', and finish



| Part No. | A   |         | B   |         | C       |         | H Dia.  |           | Design Load * | Approx. Wt./100 |
|----------|-----|---------|-----|---------|---------|---------|---------|-----------|---------------|-----------------|
|          | in. | (mm)    | in. | (mm)    | in.     | (mm)    | in.     | (mm)      |               |                 |
| B3068-1  | 9"  | (228.6) | 8"  | (203.2) | 6 1/2"  | (165.1) | Specify | (Specify) | 275 (1.22)    | 360 (163.3)     |
| B3068-2  | 13" | (330.2) | 12" | (304.8) | 10 1/2" | (266.7) | Specify | (Specify) | 275 (1.22)    | 582 (264.0)     |
| B3068-3  | 19" | (482.6) | 18" | (457.2) | 16 1/2" | (419.1) | Specify | (Specify) | 275 (1.22)    | 860 (390.1)     |

\* Design load based on a safety factor of 5 and reduced by 250 lbs per NFPA.

## B3065 - Welded bracket - light duty

**Max. Recommended Load:** 275 lbs. (1.22kN)

**Material:** Steel

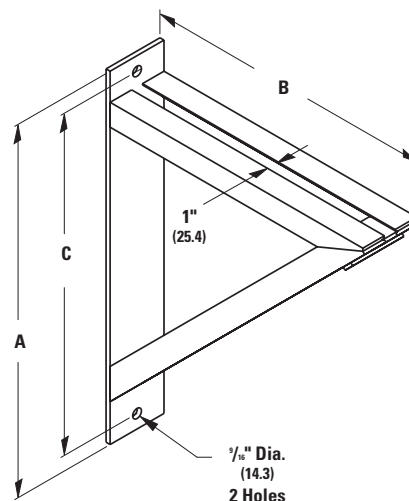
**Function:** Recommended for supporting pipe on top or hanging through support bracket outward from mounting surface.

**Approvals:** Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 32 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 31.

**Finish:** Plain

**Note:** Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

**Order By:** Figure number and finish



| Part No. | A   |         | B   |         | C       |         | Design Load * |        | Approx. Wt./100 |
|----------|-----|---------|-----|---------|---------|---------|---------------|--------|-----------------|
|          | in. | (mm)    | in. | (mm)    | in.     | (mm)    | Lbs.          | (kN)   |                 |
| B3065-1  | 13" | (330.2) | 9"  | (228.6) | 11 1/2" | (292.1) | 275           | (1.22) | 571 (259.0)     |
| B3065-2  | 17" | (431.8) | 13" | (330.2) | 15 1/2" | (393.7) | 275           | (1.22) | 769 (348.8)     |
| B3065-3  | 23" | (584.2) | 19" | (482.6) | 21 1/2" | (546.1) | 275           | (1.22) | 1057 (479.4)    |

\* Design load based on a safety factor of 5 and reduced by 250 lbs per NFPA.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Brackets

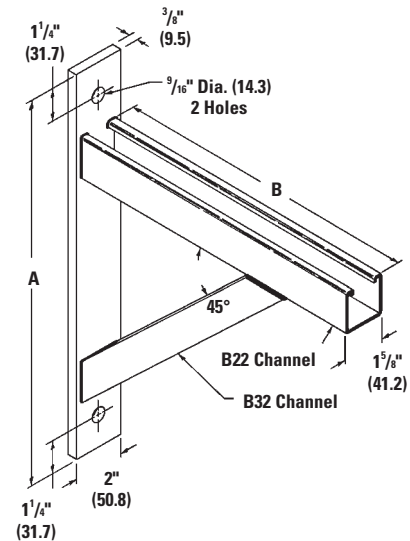
## B3064 - Adjustable strut bracket

**Material:** Steel

**Function:** Designed for supporting pipe from walls or structures where lateral adjustment is required.

**Standard Finish:** Plain or Electro-Galvanized

**Order By:** Part number and finish.



| Part No. | A   |         | B   |         | Design Load * |        | Approx. Wt./100 |         |
|----------|-----|---------|-----|---------|---------------|--------|-----------------|---------|
|          | in. | (mm)    | in. | (mm)    | Lbs.          | (kN)   | Lbs.            | (kg)    |
| B3064-1  | 15" | (381.0) | 12" | (304.8) | 590           | (2.62) | 660             | (299.4) |
| B3064-2  | 21" | (533.4) | 18" | (457.2) | 310           | (1.38) | 1004            | (455.4) |
| B3064-3  | 27" | (685.8) | 24" | (609.6) | 170           | (0.75) | 1346            | (610.5) |

\* Design load based on a safety factor of 5 and reduced by 250 lbs per NFPA.

## B3066 - Welded bracket - medium duty

**Max. Recommended Load:** 800 lbs. (3.56kN)

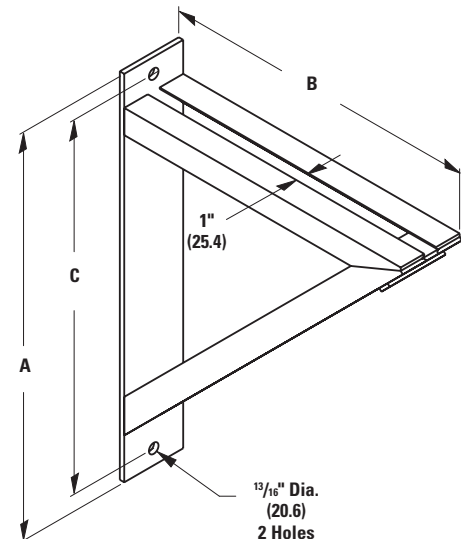
**Material:** Steel

**Function:** Recommended for supporting pipe on top or hanging through support bracket outward from mounting surface.

**Approvals:** Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 33 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 32.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish



| Part No. | A   |         | B   |         | C       |         | Design Load * |        | Approx. Wt./100 |          |
|----------|-----|---------|-----|---------|---------|---------|---------------|--------|-----------------|----------|
|          | in. | (mm)    | in. | (mm)    | in.     | (mm)    | Lbs.          | (kN)   | Lbs.            | (kg)     |
| B3066-0  | 18" | (457.2) | 12" | (304.8) | 15 1/2" | (393.7) | 800           | (3.56) | 1577            | (715.3)  |
| B3066-1  | 24" | (609.6) | 18" | (457.2) | 21 1/2" | (546.1) | 800           | (3.56) | 2578            | (1169.4) |
| B3066-2  | 30" | (762.0) | 24" | (609.6) | 27 1/2" | (698.5) | 800           | (3.56) | 4446            | (2016.7) |

\* Design load based on a safety factor of 5 and reduced by 250 lbs per NFPA.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## B3067 - Welded bracket - heavy duty

**Max. Recommended Load:** 3000 lbs. (13.34kN)

**Material:** Steel

**Function:** Recommended for supporting pipe on top or hanging through support bracket outward from mounting surface.

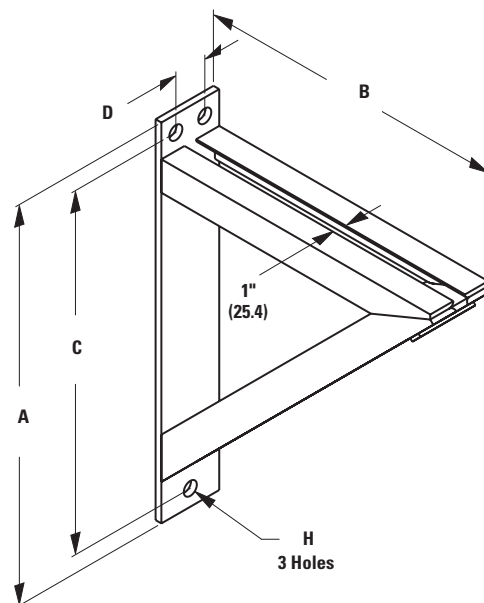
**Approvals:** Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 33 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 33.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Part number and finish



**B3067-0  
Shown**



Only one hole in top for B3067-0

| Part No.       | Mtg. Hole H<br>in. (mm) | A<br>in. (mm) | B<br>in. (mm) | C<br>in. (mm)   | D<br>in. (mm) |
|----------------|-------------------------|---------------|---------------|-----------------|---------------|
| <b>B3067-0</b> | 1 1/8" (28.6)           | 18" (457.2)   | 12" (304.8)   | 15 1/4" (387.3) | ** **         |
| <b>B3067-1</b> | 1 1/8" (28.6)           | 24" (609.6)   | 18" (457.2)   | 21 1/4" (539.7) | 2 1/2" (63.5) |
| <b>B3067-2</b> | 1 1/8" (28.6)           | 30" (762.0)   | 24" (609.6)   | 27 1/4" (692.1) | 2 1/2" (63.5) |
| <b>B3067-3</b> | 1 1/8" (28.6)           | 36" (914.4)   | 30" (762.0)   | 33" (838.2)     | 2 1/2" (63.5) |
| <b>B3067-4</b> | 1 1/8" (28.6)           | 42" (1066.8)  | 36" (914.4)   | 39" (990.6)     | 3 1/2" (88.9) |
| <b>B3067-5</b> | 1 1/8" (28.6)           | 50" (1270.0)  | 42" (1066.8)  | 46" (1168.4)    | 3 1/2" (88.9) |

\*\* One Hole

| Part No.       | Design Load * |        | Approx. Wt./100 |          |
|----------------|---------------|--------|-----------------|----------|
|                | Lbs.          | (kN)   | Lbs.            | (kg)     |
| <b>B3067-0</b> | 1850          | (8.23) | 2195            | (995.6)  |
| <b>B3067-1</b> | 1850          | (8.23) | 4398            | (1994.9) |
| <b>B3067-2</b> | 1850          | (8.23) | 6294            | (2854.9) |
| <b>B3067-3</b> | 1850          | (8.23) | 7196            | (3264.1) |
| <b>B3067-4</b> | 1850          | (8.23) | 13197           | (5986.2) |
| <b>B3067-5</b> | 1850          | (8.23) | 15795           | (7164.6) |

\* Design load based on a safety factor of 5 and reduced by 250 lbs per NFPA.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Brackets

## B3069W - Welded knee bracket

**Size Range:** 1/2" (15mm) thru 8" (200mm) pipe

**Material:** Steel

**Function:** Recommended for suspending pipe outward from mounting surface.

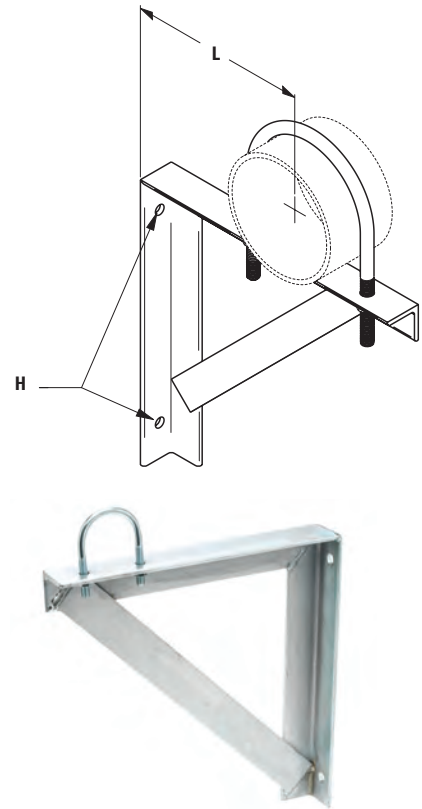
**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Note:** Maximum "L" dimension 16" (406.4mm).

**Order By:** Figure number, pipe size, (\*\*) "L" dimension and finish

| Part No.         | Pipe Size<br>in. (mm) | Hole Size H<br>in. (mm) | Max. Rec. Load ***<br>Lbs. (kN) |
|------------------|-----------------------|-------------------------|---------------------------------|
| B3069W-1/2-**-   | 1/2" (15)             | 9/16" (14.3)            | 450 (2.00)                      |
| B3069W-3/4-**-   | 3/4" (20)             | 9/16" (14.3)            | 450 (2.00)                      |
| B3069W-1-**-     | 1" (25)               | 9/16" (14.3)            | 450 (2.00)                      |
| B3069W-1 1/4-**- | 1 1/4" (32)           | 9/16" (14.3)            | 450 (2.00)                      |
| B3069W-1 1/2-**- | 1 1/2" (40)           | 9/16" (14.3)            | 450 (2.00)                      |
| B3069W-2-**-     | 2" (50)               | 9/16" (14.3)            | 450 (2.00)                      |
| B3069W-2 1/2-**- | 2 1/2" (65)           | 9/16" (14.3)            | 450 (2.00)                      |
| B3069W-3-**-     | 3" (80)               | 9/16" (14.3)            | 450 (2.00)                      |
| B3069W-3 1/2-**- | 3 1/2" (90)           | 9/16" (14.3)            | 450 (2.00)                      |
| B3069W-4-**-     | 4" (100)              | 1 1/16" (17.5)          | 450 (2.00)                      |
| B3069W-5-**-     | 5" (125)              | 1 1/16" (17.5)          | 450 (2.00)                      |
| B3069W-6-**-     | 6" (150)              | 1 1/16" (17.5)          | 450 (2.00)                      |
| B3069W-8-**-     | 8" (200)              | 1 1/16" (17.5)          | 450 (2.00)                      |

\*\*\* Load based on a safety factor of 5 and reduced by 250 lbs per NFPA.



\*\* Length to be specified as shown on the drawing.

## B3069E - "O" Bracket

**Size Range:** 1/2" (15mm) thru 8" (200mm) pipe

**Material:** Carbon Steel

**Function:** Recommended for suspending pipe outward from mounting surface.

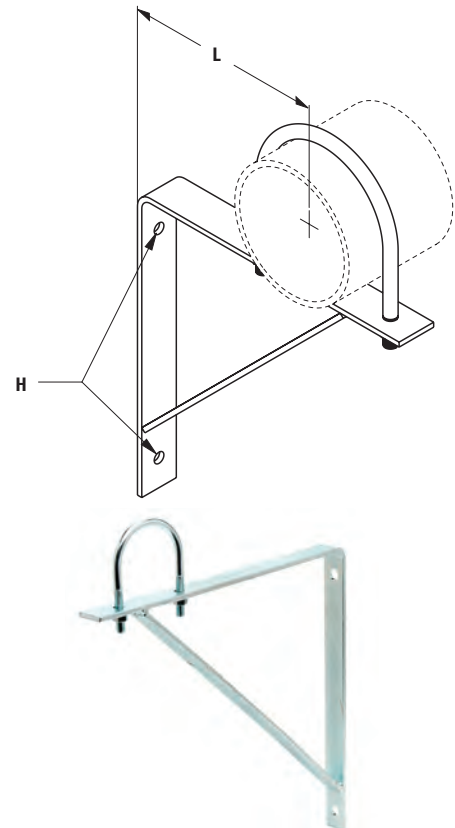
**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Note:** Maximum "L" dimension 16" (406.4mm).

**Order By:** Figure number, pipe size, (\*\*) "L" dimension and finish

| Part No.         | Pipe Size<br>in. (mm) | Hole Size H<br>in. (mm) | Max. Rec. Load ***<br>Lbs. (kN) |
|------------------|-----------------------|-------------------------|---------------------------------|
| B3069E-1/2-**-   | 1/2" (15)             | 9/16" (14.3)            | 65 (0.29)                       |
| B3069E-3/4-**-   | 3/4" (20)             | 9/16" (14.3)            | 65 (0.29)                       |
| B3069E-1-**-     | 1" (25)               | 9/16" (14.3)            | 65 (0.29)                       |
| B3069E-1 1/4-**- | 1 1/4" (32)           | 9/16" (14.3)            | 65 (0.29)                       |
| B3069E-1 1/2-**- | 1 1/2" (40)           | 9/16" (14.3)            | 65 (0.29)                       |
| B3069E-2-**-     | 2" (50)               | 9/16" (14.3)            | 65 (0.29)                       |
| B3069E-2 1/2-**- | 2 1/2" (65)           | 9/16" (14.3)            | 65 (0.29)                       |
| B3069E-3-**-     | 3" (80)               | 9/16" (14.3)            | 65 (0.29)                       |
| B3069E-3 1/2-**- | 3 1/2" (90)           | 9/16" (14.3)            | 65 (0.29)                       |
| B3069E-4-**-     | 4" (100)              | 1 1/16" (17.5)          | 65 (0.29)                       |
| B3069E-5-**-     | 5" (125)              | 1 1/16" (17.5)          | 65 (0.29)                       |
| B3069E-6-**-     | 6" (150)              | 1 1/16" (17.5)          | 65 (0.29)                       |
| B3069E-8-**-     | 8" (200)              | 1 1/16" (17.5)          | 65 (0.29)                       |

\*\*\* Load based on a safety factor of 5 and reduced by 250 lbs per NFPA.



\*\* Length to be specified as shown on the drawing.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO Fig. 78 - all steel ceiling plate

**Size Range:** 3/8"-16 rod

**Material:** Pre-Galvanized Steel

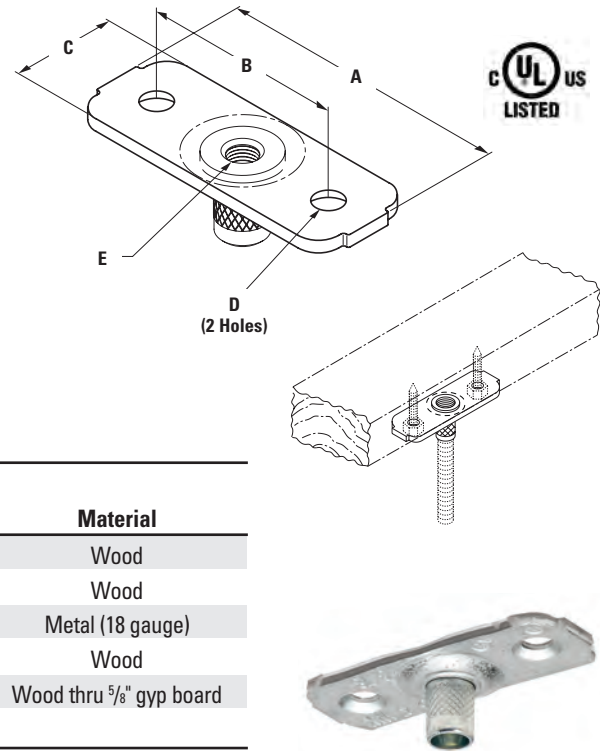
**Function:** Attachment to wood beams, ceilings, metal decks or walls. Can also be welded to steel beams.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). Additionally, UL has listed the Fig. 78 with fasteners as shown in the table below.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, rod size and finish

Patent #5,702,077



| UL Listed Fastener Table |     |                                                        |                          |  |
|--------------------------|-----|--------------------------------------------------------|--------------------------|--|
| Pipe Size                | Qty | Fastener Type                                          | Material                 |  |
| 1/2" - 2"                | 2   | #14 x 1 1/4" A-point hex-washer-head sheet metal screw | Wood                     |  |
| 2 1/2" - 4"              | 2   | 1/4" x 1 1/2" wood screws*                             | Wood                     |  |
| 1/2" - 2"                | 2   | 1/4" x 1" tek screws                                   | Metal (18 gauge)         |  |
| 1/2" - 2"                | 2   | #14 x 1 1/4" A-point hex-washer-head sheet metal screw | Wood                     |  |
| 1/2" - 2"                | 2   | #14 x 2" A-point-hex-washer-head sheet metal screw     | Wood thru 5/8" gyp board |  |

\* No pre-drilling

Larger pipe sizes can be hung with reduced spacing.

| Part No. | Pipe Size<br>in. (mm) | A<br>in. (mm) | B<br>in. (mm) | C<br>in. (mm) | Hole Dia. D<br>in. (mm) | Thread Size<br>E | Approx. Wt./100<br>Lbs. (kg) |
|----------|-----------------------|---------------|---------------|---------------|-------------------------|------------------|------------------------------|
| 78-3/8   | 1/2" - 2" (15 - 60)   | 3" (76.2)     | 2 1/8" (54.0) | 1 1/8" (28.6) | 5/16" (7.9)             | 3/8"-16          | 15 (6.8)                     |

## TOLCO Fig. 51 - side beam bracket for NFPA rod & fastener sizing

**Size Range:** 3/8"-16 thru 1/2"-13 rod, 1/2" (15mm) thru 8" pipe (200mm)

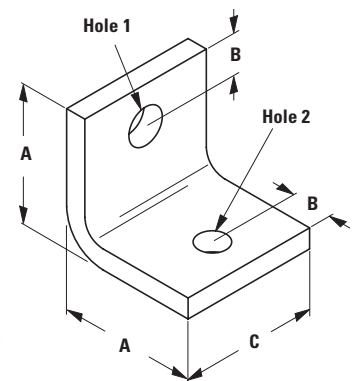
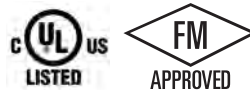
**Material:** Steel

**Function:** Recommended for attaching hanger rod to side of beams or walls. Designed to accommodate current rod schedule and fastener requirements per National Fire Protection Association (NFPA) Pamphlet 13.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL), and Factory Mutual Engineering approved.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish



| Part No.         | Pipe Size<br>in. (mm)  | Rod<br>Size | A<br>in. (mm) | B<br>in. (mm) | C<br>in. (mm) | Hole 1<br>in. (mm) | Hole 2<br>in. (mm) | Approx. Wt./100<br>Lbs. (kg) |
|------------------|------------------------|-------------|---------------|---------------|---------------|--------------------|--------------------|------------------------------|
| 51NFPA-3/8x3/8   | 1/2" - 2" (15 - 60)    | 3/8"-16     | 2" (50.8)     | 3/4" (19.0)   | 2" (50.8)     | 7/16" (11.1)       | 7/16" (11.1)       | 35 (15.9)                    |
| 51NFPA-3/8x1/2   | 2 1/2" - 4" (65 - 100) | 3/8"-16     | 2" (50.8)     | 3/4" (19.0)   | 2" (50.8)     | 9/16" (14.3)       | 7/16" (11.1)       | 34 (15.4)                    |
| 51NFPA-1/2x1 1/2 | 5" - 6" (125 - 150)    | 1/2"-13     | 2 1/2" (63.5) | 3/4" (19.0)   | 2 1/2" (63.5) | 9/16" (14.3)       | 9/16" (14.3)       | 71 (32.2)                    |
| 51NFPA-1/2x5/8   | 8" (200)               | 1/2"-13     | 2 1/2" (63.5) | 3/4" (19.0)   | 2 1/2" (63.5) | 1 1/16" (17.5)     | 9/16" (14.3)       | 70 (31.7)                    |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Upper Attachments

## TOLCO Fig. 50 - side beam bracket

**Size Range:**  $\frac{3}{8}$ "-16 thru  $\frac{7}{8}$ "-9 rod

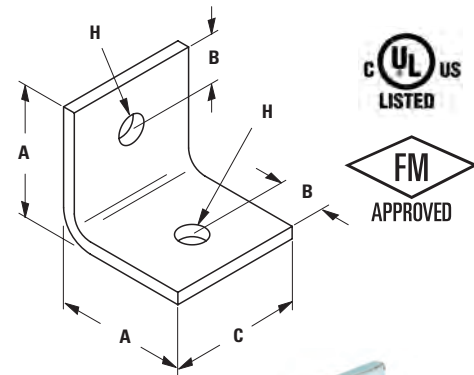
**Material:** Steel

**Function:** Recommended for attaching hanger rod to side of beams or walls.

**Approvals:**  $\frac{3}{8}$ "-16 - Underwriters Laboratories Listed in the USA (UL) and Canada (cUL), and Factory Mutual Engineering (FM) approved.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, rod size and finish



| Part No.          | Rod Size           | A<br>in. (mm)            | B<br>in. (mm)          | C<br>in. (mm)            | Hole Size H<br>in. (mm)  | Approx. Wt./100<br>Lbs. (kg) |
|-------------------|--------------------|--------------------------|------------------------|--------------------------|--------------------------|------------------------------|
| 50- $\frac{3}{8}$ | $\frac{3}{8}$ "-16 | 2" (50.8)                | $\frac{3}{4}$ " (19.0) | 2" (50.8)                | $\frac{7}{16}$ " (11.1)  | 35 (15.9)                    |
| 50- $\frac{1}{2}$ | $\frac{1}{2}$ "-13 | 2" (50.8)                | $\frac{3}{4}$ " (19.0) | 2" (50.8)                | $\frac{9}{16}$ " (14.3)  | 35 (15.9)                    |
| 50- $\frac{5}{8}$ | $\frac{5}{8}$ "-11 | 2" (50.8)                | $\frac{3}{4}$ " (19.0) | 2" (50.8)                | $\frac{11}{16}$ " (17.5) | 32 (14.5)                    |
| 50- $\frac{3}{4}$ | $\frac{3}{4}$ "-10 | 2 $\frac{1}{2}$ " (63.5) | $\frac{3}{4}$ " (19.0) | 2 $\frac{1}{2}$ " (63.5) | $\frac{13}{16}$ " (20.6) | 110 (49.9)                   |
| 50- $\frac{7}{8}$ | $\frac{7}{8}$ "-9  | 2 $\frac{1}{2}$ " (63.5) | $\frac{3}{4}$ " (19.0) | 2 $\frac{1}{2}$ " (63.5) | $\frac{15}{16}$ " (23.8) | 100 (45.3)                   |



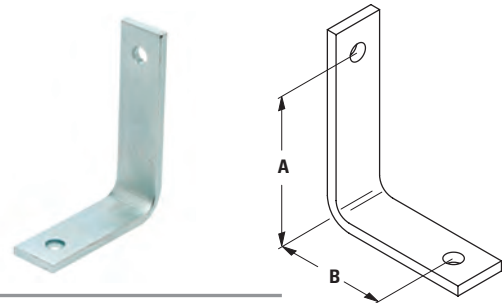
## B3061 - Angle bracket

**Material:** Steel

**Function:** — Recommended for supporting pipe at various distances from wall or column.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish



| Part No. | Size<br>in. | A<br>in. (mm) | B<br>in. (mm) | Hole Size<br>in. (mm)   | Max. Rec. Load<br>Lbs. (kN) | Approx. Wt./100<br>Lbs. (kg) |
|----------|-------------|---------------|---------------|-------------------------|-----------------------------|------------------------------|
| B3061-1  | 1           | 3" (76.2)     | 2" (50.8)     | $\frac{7}{16}$ " (11.1) | 180 (0.80)                  | 46 (20.8)                    |
| B3061-2  | 2           | 4" (101.6)    | 3" (76.1)     | $\frac{7}{16}$ " (11.1) | 180 (0.80)                  | 65 (29.5)                    |
| B3061-3  | 3           | 3" (76.2)     | 2" (50.8)     | $\frac{9}{16}$ " (14.3) | 390 (1.73)                  | 85 (38.5)                    |
| B3061-4  | 4           | 4" (101.6)    | 3" (76.1)     | $\frac{9}{16}$ " (14.3) | 390 (1.73)                  | 115 (52.1)                   |

## TOLCO Fig. 56 - tapped side beam connector (stainless steel)

**Size Range:**  $\frac{1}{2}$ " (15mm) thru 4" (100mm) pipe ( $\frac{3}{8}$ "-16 rod)

**Material:** Stainless Steel Type 304 or 316

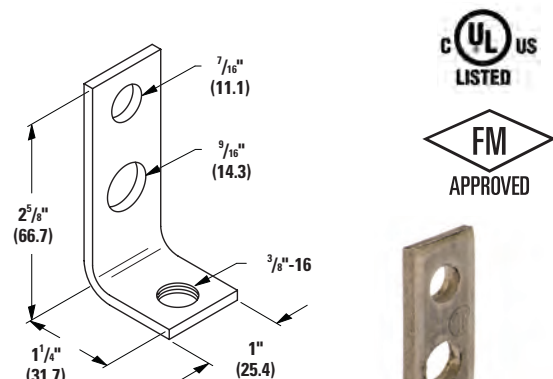
**Function:** Recommended for attaching hanger rod to steel or wood beams. Tapped hole allows easy adjustment of hanger rod.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL), and Factory Mutual Engineering (FM) approved for  $\frac{1}{2}$ " (15mm) thru 4" (100mm) pipe.

**Order By:** Figure number

**Note:** Available only in Stainless Steel materials.

**Per NFPA 13:**  $\frac{1}{2}$ " (15mm) thru 2" (50mm) pipe use  $\frac{3}{8}$ "-16 fastener;  
2 $\frac{1}{2}$ " (65mm) thru 4" (100mm) pipe, use  $\frac{1}{2}$ "-13 fastener.



| Part No. | Approx. Wt./100<br>Lbs. (kg) |
|----------|------------------------------|
| 56       | 20 (9.1)                     |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

**TOLCO Fig. 58 - threaded side beam bracket**

**Size Range:**  $\frac{3}{8}$ "-16 rod, pipe sizes  $\frac{1}{2}$ " (15mm) thru 4" (100mm)

**Material:** Pre-Galvanized Steel

**Function:** Practical and economical bracket used to support piping from wood, concrete or steel beams.

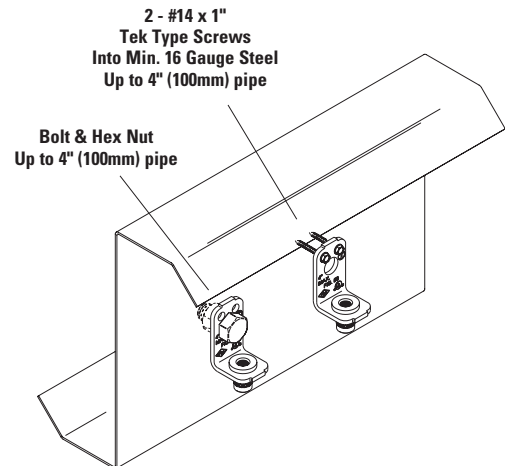
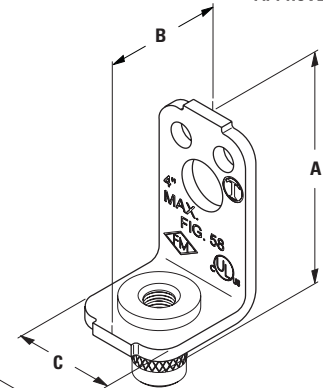
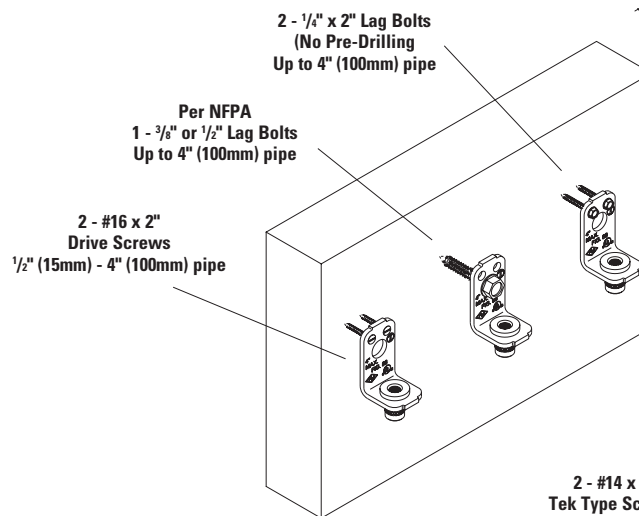
**Features:** Unique design allows rod to be easily threaded into bracket. Offset design permits unlimited rod adjustment. Center mounting hole will accept  $\frac{3}{8}$ " and  $\frac{1}{2}$ " fastener bolts. Per NFPA 13:  $\frac{1}{2}$ " (15mm) thru 2" (50mm) pipe requires  $\frac{3}{8}$ " fastener, 2 $\frac{1}{2}$ " (65mm) thru 4" (100mm) pipe requires  $\frac{1}{2}$ " fastener.\*

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL), and Factory Mutual Engineering approved thru 4" (100mm) pipe.

**Finish:** Pre-Galvanized

**Order By:** Figure number and finish

**\*Note:** Additionally UL has listed the Fig. 58 with fasteners as shown in table below.



**UL Listed Fastener Table**

| Pipe Size              | Qty | Fastener Type                                 | Material         |
|------------------------|-----|-----------------------------------------------|------------------|
| 2"                     | 2   | #16 x 2" Drive screws                         | Wood             |
| 2"                     | 1   | $\frac{3}{8}$ " Lag bolt                      | Wood             |
| 2 $\frac{1}{2}$ " - 4" | 1   | $\frac{1}{2}$ " Lag bolt                      | Wood             |
| 3 $\frac{1}{2}$ "      | 2   | $\frac{1}{4}$ " x 1 $\frac{1}{2}$ " Lag bolts | Wood             |
| 4"                     | 2   | $\frac{1}{4}$ " x 2" Lag bolts **             | Wood             |
| 4"                     | 2   | $\frac{1}{4}$ " x 1" Tek screws               | Metal (15 gauge) |
| 4"                     | 2   | $\frac{1}{4}$ " x 1" Tek screws               | Metal (16 gauge) |

\*\* No pre-drilling

Larger pipe sizes can be hung with reduced spacing.

| Part No. | Pipe Size<br>in. (mm)           | Rod Size           | A<br>in. (mm)            | B<br>in. (mm)            | C<br>in. (mm)            | Approx. Wt./100<br>Lbs. (kg) |
|----------|---------------------------------|--------------------|--------------------------|--------------------------|--------------------------|------------------------------|
| 58       | $\frac{1}{2}$ " - 4" (15 - 100) | $\frac{3}{8}$ "-16 | 2 $\frac{3}{4}$ " (69.8) | 1 $\frac{1}{2}$ " (38.1) | 1 $\frac{1}{8}$ " (28.6) | 14 (6.3)                     |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Threaded Accessories

## B3200 - Weldless Eye Nut

**Size Range:**  $\frac{3}{8}$ "-16 thru  $2\frac{1}{2}$ "-4 $\frac{1}{2}$  machine thread.

**Material:** Forged Steel

**Quality Assurance:** Conforms to the requirements of NCA 3800.

**Threads:** Tapped UNC Class 2B. Right hand threads are standard. Left hand threads supplied upon request (B3200L).

**Function:** Used on piping installations where high strength and swivel action are required. Left hand tap is also available.

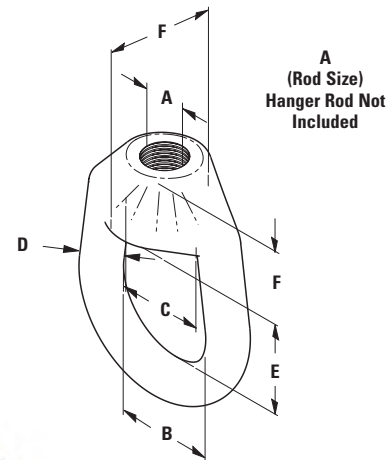
**Approvals:** Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 17 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 17.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish.

OPM



| Part No.             | Rod Size<br>A      | B<br>in. (mm)            | C<br>in. (mm)              | D<br>in. (mm)          | E<br>in. (mm)            | F<br>in. (mm)              | G<br>in. (mm)              |
|----------------------|--------------------|--------------------------|----------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| B3200- $\frac{3}{8}$ | $\frac{3}{8}$ "-16 | 1 $\frac{1}{2}$ " (38.1) | 1 $\frac{3}{16}$ " (30.2)  | $\frac{1}{2}$ " (12.7) | 2" (50.8)                | 1 $\frac{3}{8}$ " (34.9)   | 1 $\frac{11}{16}$ " (17.5) |
| B3200- $\frac{1}{2}$ | $\frac{1}{2}$ "-13 | 1 $\frac{1}{2}$ " (38.1) | 1 $\frac{3}{16}$ " (30.2)  | $\frac{1}{2}$ " (12.7) | 2" (50.8)                | 1 $\frac{3}{8}$ " (34.9)   | 1 $\frac{11}{16}$ " (17.5) |
| B3200- $\frac{5}{8}$ | $\frac{5}{8}$ "-11 | 1 $\frac{1}{2}$ " (38.1) | 1 $\frac{3}{16}$ " (30.2)  | $\frac{1}{2}$ " (12.7) | 2" (50.8)                | 1 $\frac{3}{8}$ " (34.9)   | 1 $\frac{11}{16}$ " (17.5) |
| B3200- $\frac{3}{4}$ | $\frac{3}{4}$ "-10 | 1 $\frac{1}{2}$ " (38.1) | 1 $\frac{3}{16}$ " (30.2)  | $\frac{1}{2}$ " (12.7) | 2" (50.8)                | 1 $\frac{3}{8}$ " (34.9)   | 1 $\frac{11}{16}$ " (17.5) |
| B3200- $\frac{7}{8}$ | $\frac{7}{8}$ "-9  | 2" (50.8)                | 1 $\frac{11}{16}$ " (42.9) | $\frac{3}{4}$ " (19.0) | 2 $\frac{5}{8}$ " (66.7) | 1 $\frac{15}{16}$ " (49.2) | 1" (25.4)                  |

| Part No.             | Design Load                |                            |  |  | Approx. Wt./100<br>Lbs. (kg) |  |
|----------------------|----------------------------|----------------------------|--|--|------------------------------|--|
|                      | 650°F (343°C)<br>Lbs. (kN) | 750°F (399°C)<br>Lbs. (kN) |  |  |                              |  |
| B3200- $\frac{3}{8}$ | 610 (2.71)                 | 540 (2.40)                 |  |  | 63 (28.6)                    |  |
| B3200- $\frac{1}{2}$ | 1130 (5.02)                | 1010 (4.49)                |  |  | 60 (27.2)                    |  |
| B3200- $\frac{5}{8}$ | 1810 (8.05)                | 1610 (7.16)                |  |  | 59 (26.7)                    |  |
| B3200- $\frac{3}{4}$ | 2710 (12.05)               | 2420 (10.76)               |  |  | 56 (25.4)                    |  |
| B3200- $\frac{7}{8}$ | 3770 (16.77)               | 3360 (14.94)               |  |  | 170 (77.1)                   |  |

For larger sizes consult full line pipe hanger catalog.

## B501 - Light weight u-bolt with 2 hex nuts

**Size Range:** Size 1/2" (15mm) thru 8" (200mm) pipe

**Material:** Carbon Steel

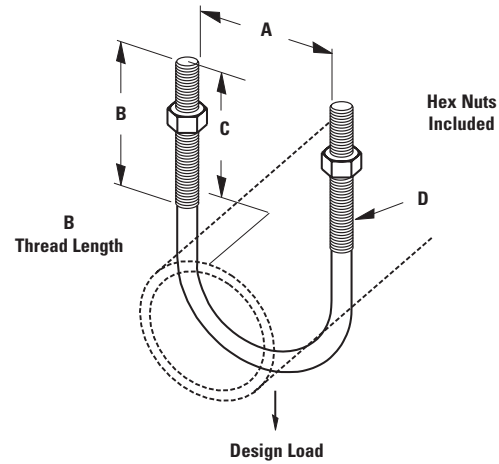
**Function:** Recommended for supporting or anchoring light pipe loads.

**Maximum Temperature:** 650°F (343°C)

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish.

**Note:** When furnished in Hot-Dip Galvanized finish, oversize tapped hex nuts must be used.



| Part No.   | A<br>in.<br>(mm) | B<br>in.<br>(mm) | C<br>in.<br>(mm) | D        | Design Load<br>Lbs. (kN) | Approx. Wt./100<br>Lbs. (kg) |
|------------|------------------|------------------|------------------|----------|--------------------------|------------------------------|
| B501-1/2   | 15/16" (23.8)    | 1 3/4" (44.4)    | 1 1/2" (38.1)    | 5/16"-18 | 600 (2.67)               | 12 (5.4)                     |
| B501-3/4   | 1 1/8" (28.6)    | 1 3/4" (44.4)    | 1 5/8" (41.3)    | 5/16"-18 | 600 (2.67)               | 13 (5.9)                     |
| B501-1     | 1 3/8" (29.9)    | 1 7/8" (47.6)    | 1 5/8" (41.3)    | 5/16"-18 | 900 (4.00)               | 14 (6.3)                     |
| B501-1 1/4 | 1 23/32" (43.6)  | 1 3/4" (44.4)    | 1 15/32" (37.3)  | 5/16"-18 | 900 (4.00)               | 15 (6.8)                     |
| B501-1 1/2 | 2" (50.8)        | 1 3/4" (44.4)    | 1 7/16" (36.5)   | 5/16"-18 | 900 (4.00)               | 16 (7.2)                     |
| B501-2     | 2 7/16" (61.9)   | 2 1/16" (52.4)   | 1 7/8" (47.6)    | 3/8"-16  | 1200 (5.34)              | 27 (12.2)                    |
| B501-2 1/2 | 2 15/16" (74.6)  | 2 1/16" (52.4)   | 1 13/16" (46.0)  | 3/8"-16  | 1200 (5.34)              | 32 (14.5)                    |
| B501-3     | 3 9/16" (90.5)   | 2" (50.8)        | 1 3/4" (44.4)    | 3/8"-16  | 1800 (8.00)              | 36 (16.3)                    |
| B501-3 1/2 | 4 3/32" (94.6)   | 2" (50.8)        | 1 23/32" (43.6)  | 3/8"-16  | 1800 (8.00)              | 38 (17.2)                    |
| B501-4     | 4 19/32" (116.7) | 2 1/4" (57.1)    | 1 21/32" (50.0)  | 3/8"-16  | 1800 (8.00)              | 42 (19.0)                    |
| B501-5     | 5 21/32" (143.6) | 2 1/4" (57.1)    | 2" (50.8)        | 1/2"-13  | 2400 (10.70)             | 92 (41.7)                    |
| B501-6     | 6 3/4" (171.4)   | 2 5/8" (66.7)    | 2 3/8" (60.3)    | 5/8"-11  | 2400 (10.70)             | 176 (79.8)                   |
| B501-8     | 8 3/4" (222.2)   | 2 5/8" (66.7)    | 2 3/8" (60.3)    | 5/8"-11  | 2400 (10.70)             | 191 (86.6)                   |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Threaded Accessories

## B3188 - Standard U-bolt with 4 hex nuts

## B3188C - Standard plastic coated U-bolt

**Size Range:** Size 1/2" (15mm) thru 30" (900mm) pipe

**Material:** Steel

**Function:** Recommended for support, anchor or guide of pipe.

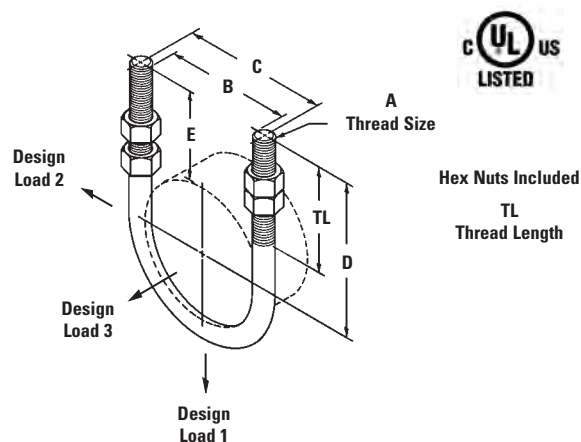
**Approvals:** Underwriters Laboratories Listed 3/4" (20mm) thru 12" (300mm). Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 24 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 24.

**Maximum Temperature:** 750°F (399°C)

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish. U-bolt can be furnished with longer tangents "D" or with longer threads "E". Consult factory.

**Note:** When furnished in Hot-Dip Galvanized finish, oversize tapped hex nuts must be used. B3188NS - Non-standard (NS) U-bolts are available upon request. Specify dimensions other than standard. B3188DI - For ductile iron pipe.



Hex Nuts Included  
TL  
Thread Length



**B3188C**  
Plastic Coated

| Part No.    | Pipe Size<br>in. (mm) | Thread Size | Thread Length<br>in. (mm) | TL<br>(mm) | B<br>in. (mm)    |
|-------------|-----------------------|-------------|---------------------------|------------|------------------|
| B3188-1/2   | 1/2" (15)             | 1/4"-20     | 2 1/8" (54.0)             |            | 1 5/16" (23.8)   |
| B3188-3/4   | 3/4" (20)             | 1/4"-20     | 2 1/8" (54.0)             |            | 1 1/8" (28.6)    |
| B3188-1     | 1" (25)               | 1/4"-20     | 2 1/8" (54.0)             |            | 1 3/8" (34.9)    |
| B3188-1 1/4 | 1 1/4" (32)           | 3/8"-16     | 2 1/8" (54.0)             |            | 1 11/16" (42.9)  |
| B3188-1 1/2 | 1 1/2" (40)           | 3/8"-16     | 2 1/2" (63.5)             |            | 2" (50.8)        |
| B3188-2     | 2" (50)               | 3/8"-16     | 2 1/2" (63.5)             |            | 2 7/16" (61.9)   |
| B3188-2 1/2 | 2 1/2" (65)           | 1/2"-13     | 3" (76.2)                 |            | 2 15/16" (74.6)  |
| B3188-3     | 3" (80)               | 1/2"-13     | 3" (76.2)                 |            | 3 9/16" (90.5)   |
| B3188-3 1/2 | 3 1/2" (90)           | 1/2"-13     | 3" (76.2)                 |            | 4 1/16" (103.2)  |
| B3188-4     | 4" (100)              | 1/2"-13     | 3" (76.2)                 |            | 4 9/16" (115.9)  |
| B3188-5     | 5" (125)              | 1/2"-13     | 3" (76.2)                 |            | 5 21/32" (143.6) |
| B3188-6     | 6" (150)              | 5/8"-11     | 3 3/4" (95.2)             |            | 6 3/4" (171.4)   |
| B3188-8     | 8" (200)              | 5/8"-11     | 3 3/4" (95.2)             |            | 8 3/4" (222.2)   |
| B3188-10    | 10" (250)             | 3/4"-10     | 4" (101.6)                |            | 10 7/8" (276.2)  |
| B3188-12    | 12" (300)             | 7/8"-9      | 4 1/4" (107.9)            |            | 12 7/8" (327.0)  |
| B3188-14    | 14" (350)             | 7/8"-9      | 4 1/4" (107.9)            |            | 14 1/8" (358.8)  |

For larger sizes consult full line pipe hanger catalog.

**B3188 - Standard U-Bolt with 4 Hex Nuts** cont'd.

| Part No.                            | C<br>in. (mm)                            | Tangent D<br>in. (mm)                    | E<br>in. (mm)                            | Approx. Wt./100<br>Lbs. (kg) |
|-------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|------------------------------|
| B3188-1/2                           | 1 <sup>3</sup> / <sub>16</sub> " (30.2)  | 2 <sup>3</sup> / <sub>4</sub> " (69.8)   | 2 <sup>5</sup> / <sub>16</sub> " (58.7)  | 10 (4.5)                     |
| B3188-3/4                           | 1 <sup>3</sup> / <sub>8</sub> " (34.9)   | 2 <sup>3</sup> / <sub>4</sub> " (69.8)   | 2 <sup>7</sup> / <sub>32</sub> " (56.3)  | 11 (5.0)                     |
| B3188-1                             | 1 <sup>5</sup> / <sub>8</sub> " (41.3)   | 2 <sup>3</sup> / <sub>4</sub> " (69.8)   | 2 <sup>3</sup> / <sub>32</sub> " (53.2)  | 11 (5.0)                     |
| B3188-1 <sup>1</sup> / <sub>4</sub> | 2 <sup>3</sup> / <sub>32</sub> " (53.2)  | 2 <sup>7</sup> / <sub>8</sub> " (73.0)   | 2 <sup>1</sup> / <sub>32</sub> " (51.6)  | 28 (12.7)                    |
| B3188-1 <sup>1</sup> / <sub>2</sub> | 2 <sup>3</sup> / <sub>8</sub> " (60.3)   | 3" (76.2)                                | 2 <sup>1</sup> / <sub>16</sub> " (52.4)  | 29 (13.1)                    |
| B3188-2                             | 2 <sup>13</sup> / <sub>16</sub> " (71.4) | 3 <sup>1</sup> / <sub>4</sub> " (82.5)   | 2 <sup>1</sup> / <sub>16</sub> " (52.4)  | 31 (14.0)                    |
| B3188-2 <sup>1</sup> / <sub>2</sub> | 3 <sup>7</sup> / <sub>16</sub> " (87.3)  | 3 <sup>3</sup> / <sub>4</sub> " (95.2)   | 2 <sup>5</sup> / <sub>16</sub> " (58.7)  | 72 (32.6)                    |
| B3188-3                             | 4 <sup>1</sup> / <sub>16</sub> " (103.2) | 4" (101.6)                               | 2 <sup>1</sup> / <sub>4</sub> " (57.1)   | 79 (35.8)                    |
| B3188-3 <sup>1</sup> / <sub>2</sub> | 4 <sup>9</sup> / <sub>16</sub> " (115.9) | 4 <sup>1</sup> / <sub>4</sub> " (107.9)  | 2 <sup>1</sup> / <sub>4</sub> " (57.1)   | 84 (38.1)                    |
| B3188-4                             | 5 <sup>1</sup> / <sub>16</sub> " (128.6) | 4 <sup>1</sup> / <sub>2</sub> " (114.3)  | 2 <sup>1</sup> / <sub>4</sub> " (57.1)   | 94 (42.6)                    |
| B3188-5                             | 6 <sup>5</sup> / <sub>32</sub> " (156.3) | 5" (127.0)                               | 2 <sup>7</sup> / <sub>32</sub> " (56.3)  | 104 (47.2)                   |
| B3188-6                             | 7 <sup>3</sup> / <sub>8</sub> " (187.3)  | 6 <sup>1</sup> / <sub>8</sub> " (155.6)  | 2 <sup>13</sup> / <sub>16</sub> " (71.4) | 203 (92.1)                   |
| B3188-8                             | 9 <sup>3</sup> / <sub>8</sub> " (238.1)  | 7 <sup>1</sup> / <sub>8</sub> " (181.0)  | 2 <sup>13</sup> / <sub>16</sub> " (71.4) | 241 (109.3)                  |
| B3188-10                            | 11 <sup>5</sup> / <sub>8</sub> " (295.3) | 8 <sup>3</sup> / <sub>8</sub> " (212.7)  | 3 <sup>1</sup> / <sub>4</sub> " (82.5)   | 412 (186.9)                  |
| B3188-12                            | 13 <sup>3</sup> / <sub>4</sub> " (349.2) | 9 <sup>5</sup> / <sub>8</sub> " (244.5)  | 3 <sup>1</sup> / <sub>4</sub> " (82.5)   | 661 (299.8)                  |
| B3188-14                            | 15" (381.0)                              | 10 <sup>1</sup> / <sub>4</sub> " (260.3) | 3" (76.2)                                | 707 (320.7)                  |

| Part No.                            | Design Load 1              |                            | Design Load 2              |                            | Design Load 3              |                            |
|-------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
|                                     | 650°F (343°C)<br>Lbs. (kN) | 750°F (399°C)<br>Lbs. (kN) | 650°F (343°C)<br>Lbs. (kN) | 650°F (343°C)<br>Lbs. (kN) | 650°F (343°C)<br>Lbs. (kN) | 650°F (343°C)<br>Lbs. (kN) |
| B3188-1/2                           | 580 (2.58)                 | 454 (2.02)                 | 145 (0.64)                 | 180 (0.80)                 | —                          | —                          |
| B3188-3/4                           | 580 (2.58)                 | 454 (2.02)                 | 145 (0.64)                 | 300 (1.33)                 | —                          | —                          |
| B3188-1                             | 580 (2.58)                 | 454 (2.02)                 | 145 (0.64)                 | 480 (2.13)                 | —                          | —                          |
| B3188-1 <sup>1</sup> / <sub>4</sub> | 1460 (6.49)                | 1144 (5.09)                | 365 (1.62)                 | 600 (2.67)                 | —                          | —                          |
| B3188-1 <sup>1</sup> / <sub>2</sub> | 1460 (6.49)                | 1144 (5.09)                | 365 (1.62)                 | 600 (2.67)                 | —                          | —                          |
| B3188-2                             | 1460 (6.49)                | 1144 (5.09)                | 365 (1.62)                 | 720 (3.20)                 | —                          | —                          |
| B3188-2 <sup>1</sup> / <sub>2</sub> | 2700 (12.01)               | 2114 (9.40)                | 675 (3.00)                 | 720 (3.20)                 | —                          | —                          |
| B3188-3                             | 2700 (12.01)               | 2114 (9.40)                | 675 (3.00)                 | 900 (4.00)                 | —                          | —                          |
| B3188-3 <sup>1</sup> / <sub>2</sub> | 2700 (12.01)               | 2114 (9.40)                | 675 (3.00)                 | 900 (4.00)                 | —                          | —                          |
| B3188-4                             | 2700 (12.01)               | 2114 (9.40)                | 675 (3.00)                 | 900 (4.00)                 | —                          | —                          |
| B3188-5                             | 2700 (12.01)               | 2114 (9.40)                | 675 (3.00)                 | 1080 (4.80)                | —                          | —                          |
| B3188-6                             | 4320 (19.21)               | 3382 (15.04)               | 1080 (4.80)                | 1080 (4.80)                | —                          | —                          |
| B3188-8                             | 4320 (19.21)               | 3382 (15.04)               | 1080 (4.80)                | —                          | —                          | —                          |
| B3188-10                            | 6460 (28.73)               | 5060 (22.50)               | 1615 (7.18)                | —                          | —                          | —                          |
| B3188-12                            | 9960 (44.30)               | 7016 (31.21)               | 2490 (11.07)               | —                          | —                          | —                          |
| B3188-14                            | 9960 (44.30)               | 7016 (31.21)               | 2490 (11.07)               | —                          | —                          | —                          |

For larger sizes consult full line pipe hanger catalog.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Threaded Accessories

## B3205 - Threaded rod (right-hand threads - both ends)

## B3205L - Threaded rod (right & left hand threads)

**Size Range:** 3/8"-16 thru 7/8"-9 rod

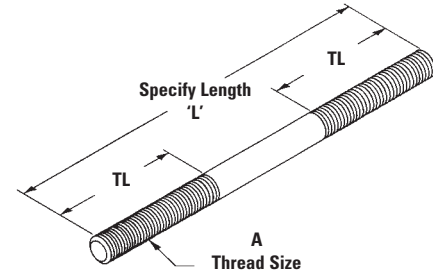
**Material:** Steel

**Function:** Recommended for use as a hanger support in hanger assemblies. Rod is threaded on both ends with right hand threads of the length shown. Also available with left and right hand threads - specify Fig. B3205L when ordering.

**Maximum Temperature:** 750°F (399°C)

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, rod size, length and finish



| Part No.        | Thread Size<br>A | Standard<br>Thread Length TL<br>in. (mm) | Design Load                |  | 750°F (399°C)<br>Lbs. (kN) |
|-----------------|------------------|------------------------------------------|----------------------------|--|----------------------------|
|                 |                  |                                          | 650°F (343°C)<br>Lbs. (kN) |  |                            |
| B3205-3/8 x 'L' | 3/8"-16          | 2 1/2" (63.5)                            | 730 (3.25)                 |  | 572 (2.54)                 |
| B3205-1/2 x 'L' | 1/2"-13          | 2 1/2" (63.5)                            | 1350 (6.00)                |  | 1057 (4.70)                |
| B3205-5/8 x 'L' | 5/8"-11          | 2 1/2" (63.5)                            | 2160 (9.61)                |  | 1692 (7.52)                |
| B3205-3/4 x 'L' | 3/4"-10          | 3" (76.2)                                | 3230 (14.37)               |  | 2530 (11.25)               |
| B3205-7/8 x 'L' | 7/8"-9           | 3 1/2" (88.9)                            | 4480 (19.93)               |  | 3508 (15.60)               |

For larger sizes consult full line pipe hanger catalog.

## ATR - All threaded rod - 120" (3.05m) lengths

## TOLCO Fig. 99 - all threaded rod cut to length

**Size Range:** 1/4"-20 thru 7/8"-9 rod in 120" lengths or cut to length

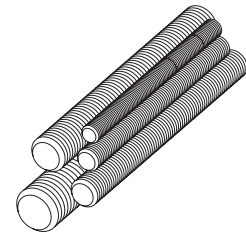
**Material:** Steel

**Maximum Temperature:** 750°F (399°C)

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Approvals:** Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Order By:** Figure number, rod size, length and finish



OPM



| Part No. - Size x Length |                  | Threads<br>Per Inch | Recommended Load |         | Approx. Wt./100 Ft. |         |
|--------------------------|------------------|---------------------|------------------|---------|---------------------|---------|
| ATR                      | Fig. 99          |                     | Lbs.             | (kN)    | Lbs.                | (kg)    |
| ATR 1/4" x 120           | 99-1/4" x length | 20                  | 240              | (1.07)  | 12                  | (5.44)  |
| ATR 3/8" x 120           | 99-3/8" x length | 16                  | 730              | (3.24)  | 29                  | (13.15) |
| ATR 1/2" x 120           | 99-1/2" x length | 13                  | 1350             | (6.00)  | 53                  | (24.04) |
| ATR 5/8" x 120           | 99-5/8" x length | 11                  | 2160             | (9.60)  | 89                  | (40.37) |
| ATR 3/4" x 120           | 99-3/4" x length | 10                  | 3230             | (14.37) | 123                 | (55.79) |
| ATR 7/8" x 120           | 99-7/8" x length | 9                   | 4480             | (19.93) | 170                 | (77.11) |

For larger sizes consult full line pipe hanger catalog.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## B3213 - Coach screw rod

**Size Range:**  $\frac{3}{8}$ "-16 rod thru  $\frac{1}{2}$ "-13 rod

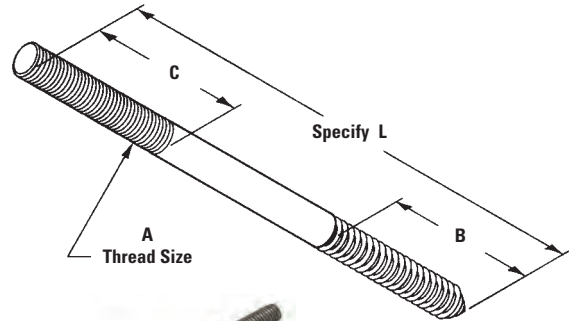
**Material:** Steel

**Function:** Typically used to suspend pipe from wood joists. Machine threaded on one end and lag threaded on the other end. It is recommended that pilot holes be pre-drilled to prevent beam from splitting and to aid in starting lag threads.

**Approvals:** Conforms to the requirements of NFPA13.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, rod size, length and finish



| Part No.                   | Thread Size A      | Standard Rod Lengths L<br>in. (mm)  | Coach Screw Thread Length B<br>in. (mm) | Rod Thread Length C<br>in. (mm) | Design Load<br>Lbs. (kg) |
|----------------------------|--------------------|-------------------------------------|-----------------------------------------|---------------------------------|--------------------------|
| B3213- $\frac{3}{8}$ x 'L' | $\frac{3}{8}$ "-16 | * $\frac{3}{2}$ ", 8" (88.9, 203.2) | 2" (50.8)                               | 2" (50.8)                       | 390 (1.73)               |
| B3213- $\frac{1}{2}$ x 'L' | $\frac{1}{2}$ "-13 | * $\frac{3}{2}$ ", 8" (88.9, 203.2) | 2 $\frac{1}{2}$ " (63.5)                | 2 $\frac{1}{2}$ " (63.5)        | 640 (2.84)               |

\* $\frac{3}{8}$  x  $\frac{3}{2}$  and  $\frac{1}{2}$  x  $\frac{3}{2}$  will have a coach screw thread length of 2" (50.8) and a rod thread length of 1" (25.4).  
Design Load is based on proper installation and solid wood.

## B3214 - Tie bolt

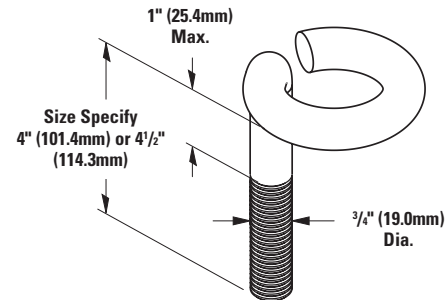
**Material:** Steel

**Function:** Recommended for securing the connection of steel pipe to ductile pipe first attach tie bolts to pipe flanges then connect tie rods. May be used in vertical or horizontal applications.

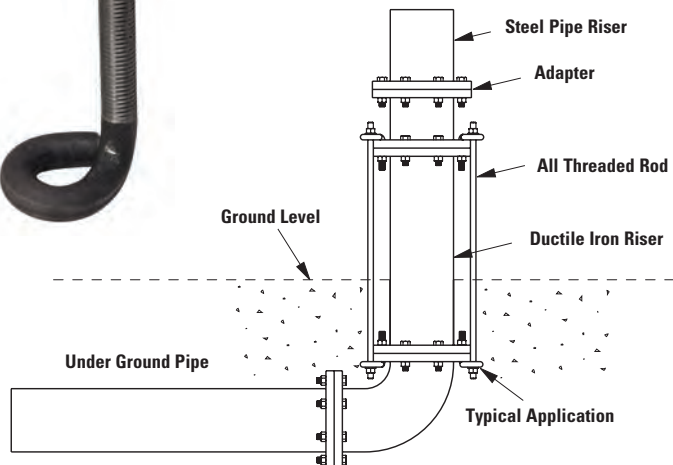
**Approvals:** As shown in NFPA Pamphlet 24, Installation of Private Fire Service Maintenance 4" (100mm) - 12" (300mm) pipe size.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, length and finish.  
Custom lengths for thicker flange available.



| Part No.              | Length<br>in. (mm)        | Approx. Wt./100<br>Lbs. (kg) |
|-----------------------|---------------------------|------------------------------|
| B3214-4               | 4" (101.6)                | 107.5 (48.5)                 |
| B3214-4 $\frac{1}{2}$ | 4 $\frac{1}{2}$ " (114.3) | 113.7 (51.6)                 |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Threaded Accessories

## B3212 - J-bolt

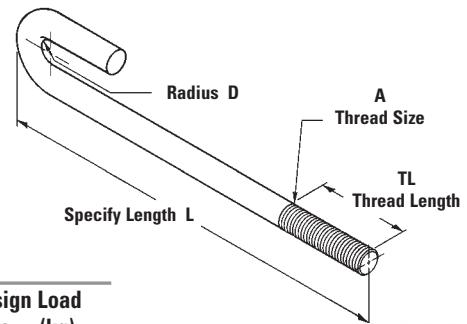
**Size Range:** 3/8"-16 thru 7/8"-19 rod

**Material:** Steel

**Function:** Designed to be hooked or hung from beam flange or purlin.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, length and finish



| Part No.        | Thread Size<br>A | Thread Length<br>in. (mm) | TL<br>(mm) | Radius D<br>in. (mm) | Design Load<br>Lbs. (kg) |
|-----------------|------------------|---------------------------|------------|----------------------|--------------------------|
| B3212-3/8 x 'L' | 3/8"-16          | 2" (50.8)                 |            | 1/2" (12.7)          | 240 (1.07)               |
| B3212-1/2 x 'L' | 1/2"-13          | 2" (50.8)                 |            | 5/8" (15.9)          | 440 (1.96)               |
| B3212-5/8 x 'L' | 5/8"-11          | 2 1/2" (63.5)             |            | 3/4" (19.0)          | 705 (3.13)               |
| B3212-3/4 x 'L' | 3/4"-10          | 2 1/2" (63.5)             |            | 7/8" (22.2)          | 1050 (4.67)              |
| B3212-7/8 x 'L' | 7/8"-9           | 2 1/2" (63.5)             |            | 1" (25.4)            | 1470 (6.54)              |



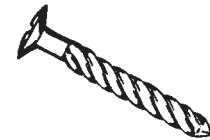
## DS 16 x 2 - Drive screw

**Material:** Steel

**Function:** Equivalent to a nail, but has greater holding power

**Finish:** Plain and Electro-Galvanized

**Order By:** Figure number and finish



## B3228 - Hex head lag bolt

**Material:** Steel

**Function:** Designed to fasten metal to wood. Lag screws are made with hex heads in lengths of 6" (152.5mm) or shorter and square heads in lengths longer than 6" (152.5mm). Both types have coarse lag threads and gimlet points and are available in diameters of 1/4"(6.3mm) to 5/8"(15.9mm) inclusive. Square-head lag screws are also available in 3/4"(19.0mm), 7/8"(22.2mm) and 1"(25.4mm) diameters.

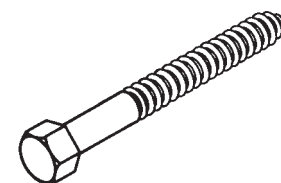
**Approvals:** Qualified for static, wind, and seismic loading in concrete. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, bolt size, length and finish

OPM

| Length 1/4" |         | (6.3) |       | 3/8" |       | (9.5) |        | 1/2" |        | Bolt Diameter and Wt./C<br>(12.7) |        | 5/8" |  | (15.9) |  | 3/4" |  | (19.0) |  |
|-------------|---------|-------|-------|------|-------|-------|--------|------|--------|-----------------------------------|--------|------|--|--------|--|------|--|--------|--|
| 1 1/2"      | (38.1)  | 2.3   | (1.0) | 6.0  | (2.7) | 11.8  | (5.3)  | 19.4 | (8.8)  | 32.3                              | (14.6) |      |  |        |  |      |  |        |  |
| 2"          | (50.8)  | 2.8   | (1.3) | 7.0  | (3.2) | 14.4  | (6.5)  | 23.2 | (10.5) | 38.3                              | (17.4) |      |  |        |  |      |  |        |  |
| 2 1/2"      | (63.5)  | 3.3   | (1.5) | 8.3  | (3.7) | 16.2  | (7.3)  | 27.0 | (12.2) | 44.0                              | (19.9) |      |  |        |  |      |  |        |  |
| 3"          | (76.2)  | 3.9   | (1.7) | 9.8  | (4.4) | 18.6  | (8.4)  | 31.0 | (14.0) | 47.7                              | (21.6) |      |  |        |  |      |  |        |  |
| 3 1/2"      | (88.9)  | 4.4   | (2.0) | 11.4 | (5.2) | 21.2  | (9.6)  | 34.8 | (15.8) | 56.3                              | (25.5) |      |  |        |  |      |  |        |  |
| 4"          | (101.6) | 5.0   | (2.2) | 12.5 | (5.7) | 23.3  | (10.5) | 37.6 | (17.0) | 58.5                              | (26.5) |      |  |        |  |      |  |        |  |
| 4 1/2"      | (114.3) | 5.7   | (2.6) | 14.0 | (6.3) | 26.1  | (11.8) | 42.6 | (19.3) | 64.0                              | (29.0) |      |  |        |  |      |  |        |  |
| 5"          | (127.0) | 6.3   | (2.8) | 15.4 | (7.0) | 29.0  | (13.1) | 45.5 | (20.6) | 68.0                              | (30.8) |      |  |        |  |      |  |        |  |
| 5 1/2"      | (139.7) | 7.0   | (3.2) | 16.4 | (7.4) | 31.5  | (14.3) | 49.3 | (22.3) | 74.0                              | (33.5) |      |  |        |  |      |  |        |  |
| 6"          | (152.4) | 7.4   | (3.3) | 18.3 | (8.3) | 34.0  | (15.4) | 53.0 | (24.0) | 77.0                              | (34.9) |      |  |        |  |      |  |        |  |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## B655 - Steel rod coupling B656 - Steel reducing rod coupling

OPM

**Size Range:** 1/4"-20 thru 1"-8 rod

**Material:** Steel

**Function:** Used for coupling two threaded rods together of equal or reduced rod sizes, with or without inspection hole.

**Approvals:** Qualified for static, wind, and seismic loading in concrete. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (**OSHPD**). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Finish:** Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish

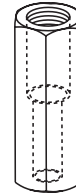
| Part No. | For Rod Size | Length<br>in. (mm) | Design Load<br>Lbs. (kN) | Approx. Wt./100<br>Lbs. (kg) |
|----------|--------------|--------------------|--------------------------|------------------------------|
| B655-1/4 | 1/4"-20      | 7/8" (22.2)        | 300 (1.33)               | 1.9 (0.86)                   |
| B655-3/8 | 3/8"-16      | 1 1/8" (28.6)      | 730 (3.25)               | 3.6 (1.63)                   |
| B655-1/2 | 1/2"-13      | 1 3/4" (44.4)      | 1350 (6.00)              | 11.3 (5.12)                  |
| B655-5/8 | 5/8"-11      | 2 1/8" (54.0)      | 2160 (9.61)              | 17.6 (7.98)                  |
| B655-3/4 | 3/4"-10      | 2 1/4" (57.1)      | 3230 (14.37)             | 28.1 (12.74)                 |
| B655-7/8 | 7/8"-9       | 2 1/2" (63.5)      | 4480 (19.93)             | 57.2 (25.94)                 |
| B655-1   | 1"-8         | 2 3/4" (69.8)      | 5900 (26.24)             | 73.7 (33.43)                 |



B655



| Part No.       | For Rod Size      | Length<br>in. (mm) | Design Load<br>Lbs. (kN) | Approx. Wt./100<br>Lbs. (kg) |
|----------------|-------------------|--------------------|--------------------------|------------------------------|
| B656-3/8 x 1/4 | 3/8"-16 & 1/4"-20 | 1" (25.4)          | 300 (1.33)               | 3.7 (1.68)                   |
| B656-1/2 x 3/8 | 1/2"-13 & 3/8"-16 | 1 1/4" (31.7)      | 730 (3.25)               | 6.6 (2.99)                   |
| B656-5/8 x 1/2 | 5/8"-11 & 1/2"-13 | 1 3/4" (31.7)      | 1350 (6.00)              | 11.6 (5.26)                  |
| B656-3/4 x 5/8 | 3/4"-10 & 5/8"-11 | 1 1/2" (38.1)      | 2160 (9.61)              | 20.6 (9.34)                  |
| B656-7/8 x 3/4 | 7/8"-9 & 3/4"-10  | 1 3/4" (44.4)      | 3230 (14.37)             | 39.4 (17.87)                 |



B656



## B3220 - Malleable iron rod coupling

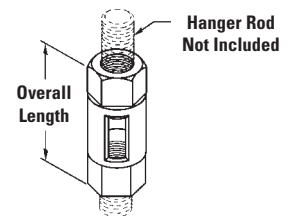
**Size Range:** 1/4"-20 thru 1"-8 rod

**Material:** Malleable Iron

**Function:** Used for coupling two threaded rods together of equal rod sizes, with inspection hole.

**Finish:** Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and finish



| Part No.        | For Rod Size       | Overall Length<br>in. (mm) | Design Load<br>Lbs. (kN) | Approx. Wt./100<br>Lbs. (kg) |
|-----------------|--------------------|----------------------------|--------------------------|------------------------------|
| B3220-1/4       | 1/4"-20            | 1 3/8" (34.9)              | 300 (1.33)               | 6 (2.7)                      |
| B3220-3/8 x 1/4 | 3/8"-16 to 1/4"-20 | 1 5/8" (41.3)              | 300 (1.33)               | 11 (5.0)                     |
| B3220-3/8       | 3/8"-16            | 1 5/8" (41.3)              | 730 (3.25)               | 10 (4.5)                     |
| B3220-1/2 x 3/8 | 1/2"-13 to 3/8"-16 | 2 1/8" (54.0)              | 730 (3.25)               | 20 (9.1)                     |
| B3220-1/2       | 1/2"-13            | 2 1/8" (54.0)              | 1350 (6.00)              | 20 (9.1)                     |
| B3220-5/8       | 5/8"-11            | 2 1/2" (63.5)              | 2160 (9.61)              | 32 (14.5)                    |
| B3220-3/4       | 3/4"-10            | 2 5/8" (66.7)              | 3230 (14.37)             | 42 (19.0)                    |
| B3220-7/8       | 7/8"-9             | 3 7/16" (55.6)             | 4480 (19.93)             | 91 (41.3)                    |
| B3220-1         | 1"-8               | 2 3/4" (69.8)              | 5900 (26.24)             | 100 (45.3)                   |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Threaded Accessories

## B3210 - Eye rod (right-hand threads)

## B3210L - Eye rod (left & right hand threads)

## B3211 - Welded eye rod (right-hand threads)

## B3211L - Welded eye rod (left & right hand threads)

**Size Range:**  $\frac{3}{8}$ "-16 thru  $\frac{7}{8}$ "-9 rod

**Material:** Steel

**Function:** Designed for use as support hanger rod that may be attached directly to structure or to other pipe support product. The welded eye allows for heavier loads.

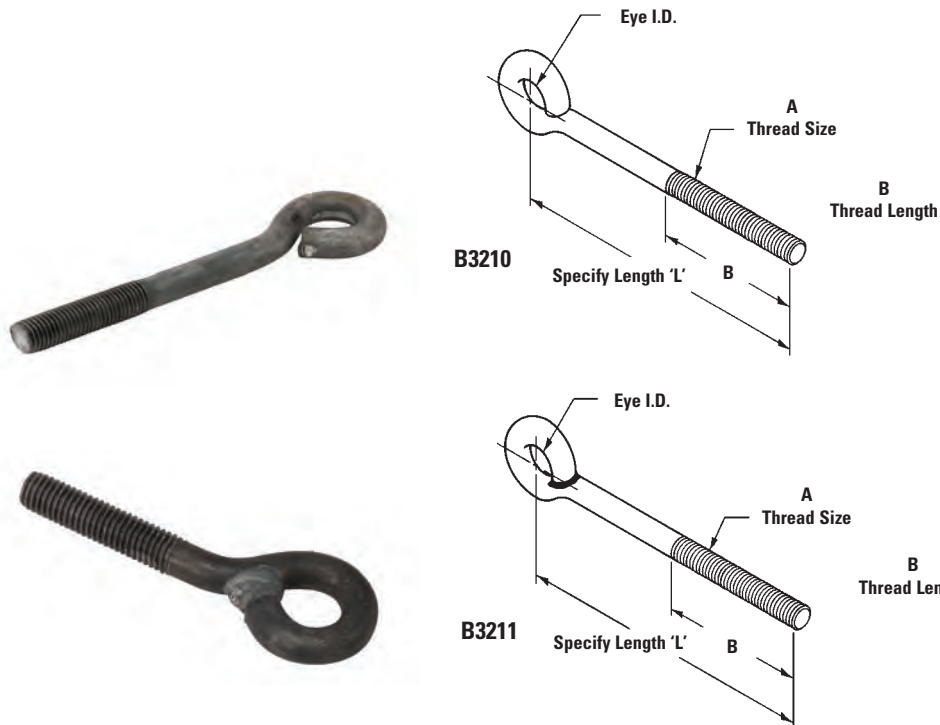
**Approvals:** Conforms to the requirements of NFPA13.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, rod size, length and finish

**Important Note:** The Eye I.D. dimension may be larger if needed.

Contact B-line if larger Eye I.D. dimension is required.



| Part No.                   |                            | Thread Size A      | Thread Length B in. (mm) | Eye I.D. in. (mm)      | Design Load                   |                               |                               |  |
|----------------------------|----------------------------|--------------------|--------------------------|------------------------|-------------------------------|-------------------------------|-------------------------------|--|
|                            |                            |                    |                          |                        | B3210 650°F (343°C) Lbs. (kN) | B3211 650°F (343°C) Lbs. (kN) | B3211 750°F (399°C) Lbs. (kN) |  |
| B3210- $\frac{3}{8}$ x 'L' | B3211- $\frac{3}{8}$ x 'L' | $\frac{3}{8}$ "-16 | 2 $\frac{1}{2}$ " (63.5) | $\frac{1}{2}$ " (12.7) | 240 (1.07)                    | 730 (3.25)                    | 572 (2.54)                    |  |
| B3210- $\frac{1}{2}$ x 'L' | B3211- $\frac{1}{2}$ x 'L' | $\frac{1}{2}$ "-13 | 2 $\frac{1}{2}$ " (63.5) | $\frac{5}{8}$ " (15.9) | 440 (1.96)                    | 1350 (6.00)                   | 1057 (4.70)                   |  |
| B3210- $\frac{5}{8}$ x 'L' | B3211- $\frac{5}{8}$ x 'L' | $\frac{5}{8}$ "-11 | 2 $\frac{1}{2}$ " (63.5) | $\frac{3}{4}$ " (19.0) | 705 (3.13)                    | 2160 (9.61)                   | 1692 (7.52)                   |  |
| B3210- $\frac{3}{4}$ x 'L' | B3211- $\frac{3}{4}$ x 'L' | $\frac{3}{4}$ "-10 | 3" (76.2)                | $\frac{7}{8}$ " (22.2) | 1050 (4.67)                   | 3230 (14.37)                  | 2530 (11.25)                  |  |
| B3210- $\frac{7}{8}$ x 'L' | B3211- $\frac{7}{8}$ x 'L' | $\frac{7}{8}$ "-9  | 3 $\frac{1}{2}$ " (88.9) | 1" (25.4)              | 1470 (6.54)                   | 4480 (19.93)                  | 3508 (15.60)                  |  |

For larger sizes consult full line pipe hanger catalog.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## B3210X - Linked eye rods (right-hand threads-both ends)

## B3210XL - Linked eye rods (left & right threads)

## B3211X - Linked welded eye rods (right-hand threads-both ends)

## B3211XL - Linked welded eye rods (left & right threads)

**Size Range:** 3/8"-16 thru 7/8"-9 rod

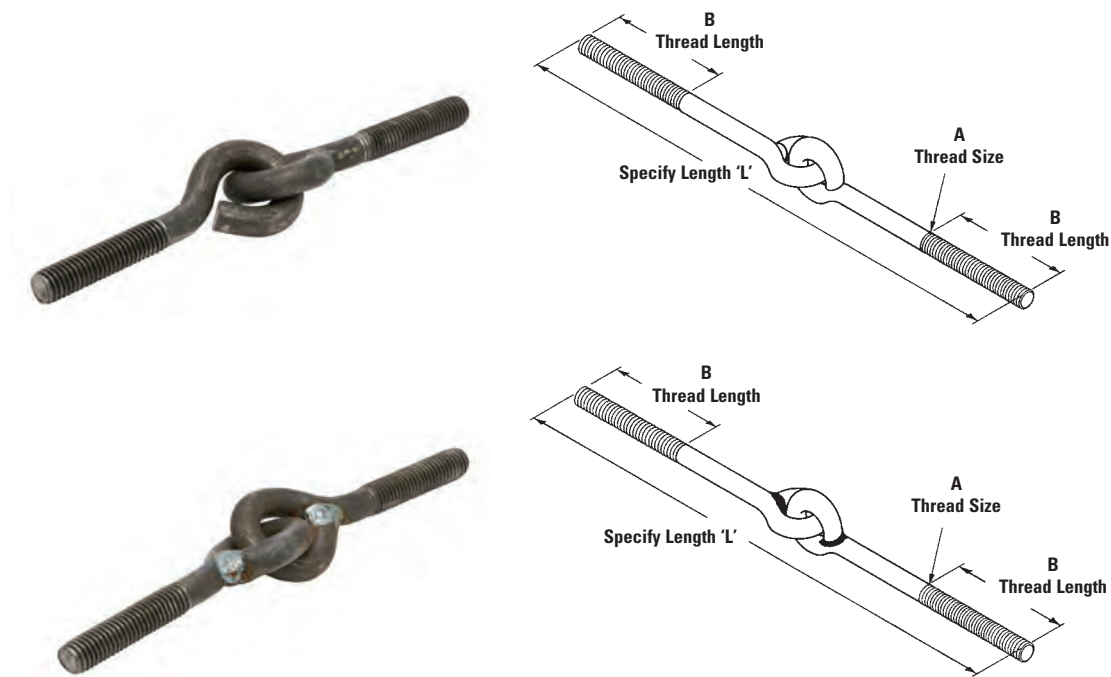
**Material:** Steel

**Function:** Designed for use in a hanger assembly where universal movement is necessary. The welded eye rods allow for heavier loads.

**Approvals:** Conforms to the requirements of NFPA13.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number, rod size, length, and finish.



| Part No.        |                 | Thread Size A | Thread Length B in. (mm) | Eye I.D. in. (mm) | Design Load                   |                         |                               |                         |
|-----------------|-----------------|---------------|--------------------------|-------------------|-------------------------------|-------------------------|-------------------------------|-------------------------|
|                 |                 |               |                          |                   | B3210 650°F (343°C) Lbs. (kN) | 650°F (343°C) Lbs. (kN) | B3211 750°F (399°C) Lbs. (kN) | 750°F (399°C) Lbs. (kN) |
| B3210X-3/8 x L' | B3211X-3/8 x L' | 3/8"-16       | 2 1/2" (63.5)            | 1/2" (12.7)       | 240 (1.07)                    | 730 (3.25)              | 572 (2.54)                    |                         |
| B3210X-1/2 x L' | B3211X-1/2 x L' | 1/2"-13       | 2 1/2" (63.5)            | 5/8" (15.9)       | 440 (1.96)                    | 1350 (6.00)             | 1057 (4.70)                   |                         |
| B3210X-5/8 x L' | B3211X-5/8 x L' | 5/8"-11       | 2 1/2" (63.5)            | 3/4" (19.0)       | 705 (3.13)                    | 2160 (9.61)             | 1692 (7.52)                   |                         |
| B3210X-3/4 x L' | B3211X-3/4 x L' | 3/4"-10       | 3" (76.2)                | 7/8" (22.2)       | 1050 (4.67)                   | 3230 (14.37)            | 2530 (11.25)                  |                         |
| B3210X-7/8 x L' | B3211X-7/8 x L' | 7/8"-9        | 3 1/2" (88.9)            | 1" (25.4)         | 1470 (6.54)                   | 4480 (19.93)            | 3508 (15.60)                  |                         |

For larger sizes consult full line pipe hanger catalog.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Threaded Accessories

## B3248 - Steel washer plate

**Size Range:**  $\frac{3}{8}$ " thru 1" rod sizes

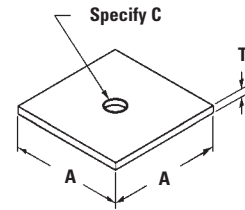
**Material:** Steel

**Function:** Heavy duty washer for use on top of channels or angles to support hanger rod.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number size and finish

| Part No.             | Rod Size<br>C      | A<br>in. (mm)            | T<br>in. (mm)         | Approx. Wt./100<br>Lbs. (kg) |        |
|----------------------|--------------------|--------------------------|-----------------------|------------------------------|--------|
| B3248- $\frac{3}{8}$ | $\frac{3}{8}$ "-16 | 2" (50.8)                | $\frac{1}{4}$ " (6.3) | 27                           | (12.2) |
| B3248- $\frac{1}{2}$ | $\frac{1}{2}$ "-13 | 2" (50.8)                | $\frac{1}{4}$ " (6.3) | 27                           | (12.2) |
| B3248- $\frac{5}{8}$ | $\frac{5}{8}$ "-11 | 2 $\frac{1}{2}$ " (63.5) | $\frac{1}{4}$ " (6.3) | 47                           | (21.3) |
| B3248- $\frac{3}{4}$ | $\frac{3}{4}$ "-10 | 2 $\frac{1}{2}$ " (63.5) | $\frac{3}{8}$ " (9.5) | 52                           | (23.6) |
| B3248- $\frac{7}{8}$ | $\frac{7}{8}$ "-9  | 3" (76.2)                | $\frac{3}{8}$ " (9.5) | 85                           | (38.5) |
| B3248-1              | 1"-8               | 4" (101.6)               | $\frac{3}{8}$ " (9.5) | 160                          | (72.6) |



## B200 - Series square washer

**Material:** Steel

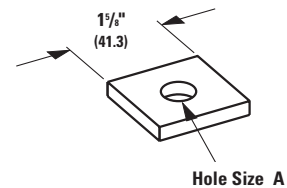
**Standard Finish:** Electro-Galvanized

**Service:** Designed as a washer to suspend hanger rods.

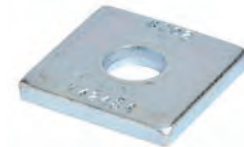
**Approvals:** Qualified for static, wind, and seismic loading in concrete. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Order by:** Figure number and finish.

OPM



| Part No. | Hole Size A<br>in. (mm)  | Bolt Size           | Thickness<br>in. (mm) | Approx. Wt./100<br>Lbs. (kg) |       |
|----------|--------------------------|---------------------|-----------------------|------------------------------|-------|
| B200     | $\frac{3}{8}$ " (9.5)    | $\frac{5}{16}$ "-18 | $\frac{1}{4}$ " (6.3) | 18                           | (8.1) |
| B201     | $\frac{7}{16}$ " (11.1)  | $\frac{3}{8}$ "-16  | $\frac{1}{4}$ " (6.3) | 18                           | (8.1) |
| B202     | $\frac{9}{16}$ " (14.2)  | $\frac{1}{2}$ "-13  | $\frac{1}{4}$ " (6.3) | 17                           | (7.7) |
| B202-1   | $\frac{11}{16}$ " (17.4) | $\frac{5}{8}$ "-11  | $\frac{1}{4}$ " (6.3) | 16                           | (7.2) |
| B202-2   | $\frac{13}{16}$ " (20.6) | $\frac{3}{4}$ "-10  | $\frac{1}{4}$ " (6.3) | 15                           | (6.8) |



## B3234 - Bevel Washer

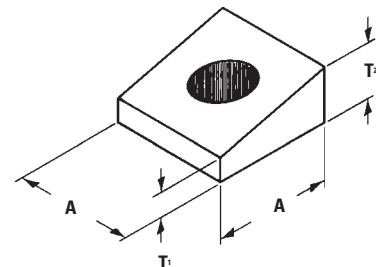
**Size Range:**  $\frac{3}{8}$ "-16 thru  $\frac{7}{8}$ "-9 bolt

**Material:** Malleable Iron

**Function:** Designed to match taper of flange of I-beam or channel to permit right angle fastening of bolt.

**Finish:** Plain. Contact customer service for alternative finishes and materials.

**Order By:** Figure number size and finish



| Part No.             | For Bolt<br>Size   | A<br>in. (mm)            | T <sup>1</sup><br>in. (mm) | T <sup>2</sup><br>in. (mm) | Approx. Wt./100<br>Lbs. (kg) |        |
|----------------------|--------------------|--------------------------|----------------------------|----------------------------|------------------------------|--------|
| B3234- $\frac{3}{8}$ | $\frac{3}{8}$ "-16 | 1 $\frac{1}{4}$ " (31.7) | $\frac{5}{32}$ " (3.9)     | $\frac{11}{32}$ " (8.7)    | 9                            | (4.1)  |
| B3234- $\frac{1}{2}$ | $\frac{1}{2}$ "-13 | 1 $\frac{1}{4}$ " (31.7) | $\frac{5}{32}$ " (3.9)     | $\frac{11}{32}$ " (8.7)    | 9                            | (4.1)  |
| B3234- $\frac{5}{8}$ | $\frac{5}{8}$ "-11 | 1 $\frac{1}{2}$ " (38.1) | $\frac{5}{32}$ " (3.9)     | $\frac{13}{32}$ " (10.3)   | 14                           | (6.3)  |
| B3234- $\frac{3}{4}$ | $\frac{3}{4}$ "-10 | 1 $\frac{1}{2}$ " (38.1) | $\frac{7}{32}$ " (5.5)     | $\frac{15}{32}$ " (11.9)   | 16                           | (7.2)  |
| B3234- $\frac{7}{8}$ | $\frac{7}{8}$ "-9  | 2" (50.8)                | $\frac{7}{32}$ " (5.5)     | $\frac{9}{16}$ " (14.3)    | 33                           | (14.9) |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## HN - Standard hex nut

**Size Range:** 1/4"-20 thru 7/8"-9

**Material:** Steel

**Approvals:** Qualified for static, wind, and seismic loading in concrete. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Finish:** Plain or Electro-Galvanized.

Contact customer service for alternative finishes and materials.

**Order By:** Figure number size and finish

OPM



| Part Number | For Rod Size | Width Across Flats<br>in. (mm) | Width Across Points<br>in. (mm) | Thickness<br>in. (mm) | Approx. Wt./100 lbs. (kg) |
|-------------|--------------|--------------------------------|---------------------------------|-----------------------|---------------------------|
| HN-1/4      | 1/4"-20      | 7/16" (11.1)                   | 1/2" (12.7)                     | 7/32" (5.7)           | 0.7 (0.3)                 |
| HN-3/8      | 3/8"-16      | 9/16" (14.3)                   | 21/32" (16.6)                   | 21/64" (8.3)          | 1.6 (0.7)                 |
| HN-1/2      | 1/2"-13      | 3/4" (19.0)                    | 55/64" (21.8)                   | 7/16" (11.1)          | 3.7 (1.7)                 |
| HN-5/8      | 5/8"-11      | 15/16" (23.8)                  | 13/32" (27.8)                   | 35/64" (13.9)         | 7.3 (3.3)                 |
| HN-3/4      | 3/4"-10      | 1 1/8" (28.6)                  | 1 5/16" (33.3)                  | 41/64" (16.3)         | 12.0 (5.4)                |
| HN-7/8      | 7/8"-9       | 1 5/16" (33.3)                 | 1 33/64" (38.5)                 | 3/4" (19.0)           | 19.0 (8.6)                |

## HHN - Heavy hex nut

**Size Range:** 1/4"-20 thru 7/8"-9

**Material:** Steel

**Finish:** Plain or Electro-Galvanized.

Contact customer service for alternative finishes and materials.

**Order By:** Figure number size and finish



| Part Number | For Rod Size | Width Across Flats<br>in. (mm) | Width Across Points<br>in. (mm) | Thickness<br>in. (mm) | Approx. Wt./100 lbs. (kg) |
|-------------|--------------|--------------------------------|---------------------------------|-----------------------|---------------------------|
| HHN-1/4     | 1/4"-20      | 1/2" (12.7)                    | 37/64" (14.7)                   | 15/64" (5.9)          | 1.2 (0.5)                 |
| HHN-3/8     | 3/8"-16      | 11/16" (17.5)                  | 51/64" (20.2)                   | 23/64" (9.1)          | 3.1 (1.4)                 |
| HHN-1/2     | 1/2"-13      | 7/8" (22.2)                    | 1 1/8" (28.6)                   | 31/64" (12.3)         | 6.5 (2.9)                 |
| HHN-5/8     | 5/8"-11      | 1 1/16" (27.0)                 | 1 15/64" (31.3)                 | 39/64" (15.5)         | 12.0 (5.4)                |
| HHN-3/4     | 3/4"-10      | 1 1/4" (31.7)                  | 1 29/64" (36.9)                 | 47/64" (18.6)         | 19.0 (8.6)                |
| HHN-7/8     | 7/8"-9       | 1 7/16" (36.5)                 | 1 21/32" (42.6)                 | 55/64" (21.8)         | 30.0 (13.6)               |

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

# Threaded Accessories

## FW - Flat washer

OPM

**Size Range:** 1/4"-20 thru 1"-8 rods

**Material:** Steel

**Approvals:** Qualified for static, wind, and seismic loading in concrete. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number size and finish

| Part Number | For Rod Size | Outside Diameter in. (mm) | Approx. Wt./100 lbs. (kg) |
|-------------|--------------|---------------------------|---------------------------|
| FW-1/4      | 1/4"-20      | 3/4" (19.0)               | 0.7 (0.3)                 |
| FW-3/8      | 3/8"-16      | 1" (25.4)                 | 3.9 (1.7)                 |
| FW-1/2      | 1/2"-13      | 1 3/8" (34.9)             | 6.7 (3.0)                 |
| FW-5/8      | 5/8"-11      | 1 3/4" (44.4)             | 7.3 (3.3)                 |
| FW-3/4      | 3/4"-10      | 2" (50.8)                 | 11.0 (5.0)                |
| FW-7/8      | 7/8"-9       | 2 1/4" (57.1)             | 19.0 (8.6)                |
| FW-1        | 1"-8         | 2 1/2" (69.8)             | 22.0 (10.0)               |



## LW - Lock washer

**Size Range:** 1/4"-20 thru 1"-8 rods

**Material:** Steel

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number size and finish

| Part Number | For Rod Size | Outside Diameter in. (mm) | Approx. Wt./100 lbs. (kg) |
|-------------|--------------|---------------------------|---------------------------|
| LW-1/4      | 1/4"-20      | .49" (12.4)               | 0.3 (0.13)                |
| LW-3/8      | 3/8"-16      | .68" (17.3)               | 0.6 (0.27)                |
| LW-1/2      | 1/2"-13      | .88" (22.3)               | 1.3 (0.59)                |
| LW-5/8      | 5/8"-11      | 1.08" (27.4)              | 2.4 (1.09)                |
| LW-3/4      | 3/4"-10      | 1.27" (32.2)              | 3.8 (1.72)                |
| LW-7/8      | 7/8"-9       | 1.46" (37.1)              | 5.9 (2.67)                |
| LW-1        | 1"-8         | 1.66" (42.1)              | 8.8 (3.99)                |



## FFW - Flat fender washer

**Size Range:** 3/8"-16 and 1/2"-13 rods

**Material:** Steel

**Function:** To provide a greater bearing surface than standard washer.

**Finish:** Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

**Order By:** Figure number and size

| Part Number | For Rod Size | Inside Diameter in. (mm) | Outside Diameter in. (mm) | Approx. Wt./100 lbs. (kg) |
|-------------|--------------|--------------------------|---------------------------|---------------------------|
| FFW-3/8     | 3/8"-16      | 1/2" (12.7)              | 1 1/8" (28.6)             | 3.0 (1.3)                 |
| FFW-1/2     | 1/2"-13      | 9/16" (14.3)             | 2" (50.8)                 | 2.8 (1.3)                 |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.



## Reference Data - Seismic Anchor Load Chart Information

For load information when using Fig. 980, Fig. 910, or Fig. 909 with pre-installed or post-installed concrete anchors in compliance with NFPA 13 (2016) or ASCE 7-10, including prying factors, see load tables on the Eaton website at the following location:

[Eaton.com/seismic-resources](https://www.eaton.com/seismic-resources)

If you have any questions, contact [TolcoSupport@Eaton.com](mailto:TolcoSupport@Eaton.com)



**Load Chart For Threaded Rod (ATR)**

| Rod Size     | Root Area<br>Thread<br>In. <sup>2</sup> (cm <sup>2</sup> ) | Maximum Safe Loads |          |               |          |
|--------------|------------------------------------------------------------|--------------------|----------|---------------|----------|
|              |                                                            | 650°F (349°C)      |          | 750°F (399°C) |          |
|              |                                                            | Lbs.               | (kN)     | Lbs.          | (kN)     |
| 3/8"-16      | 0.068 (.43)                                                | 730                | (3.24)   | 572           | (2.54)   |
| 1/2"-13      | 0.126 (.81)                                                | 1350               | (6.00)   | 1057          | (4.70)   |
| 5/8"-11      | 0.202 (1.30)                                               | 2160               | (9.60)   | 1692          | (7.52)   |
| 3/4"-10      | 0.302 (1.95)                                               | 3230               | (14.37)  | 2530          | (11.25)  |
| 7/8"-9       | 0.419 (2.70)                                               | 4480               | (19.93)  | 3508          | (15.60)  |
| 1"-8         | 0.551 (3.55)                                               | 5900               | (26.24)  | 4620          | (20.55)  |
| 1 1/8"-7     | 0.693 (4.47)                                               | 7450               | (33.14)  | 5830          | (25.93)  |
| 1 1/4"-7     | 0.890 (5.74)                                               | 9500               | (42.25)  | 7440          | (33.09)  |
| 1 1/2"-6     | 1.29 (8.32)                                                | 13800              | (61.38)  | 10807         | (48.07)  |
| 1 3/4"-5     | 1.74 (11.22)                                               | 18600              | (82.73)  | 14566         | (64.79)  |
| 2"-4 1/2     | 2.30 (14.84)                                               | 24600              | (109.42) | 19625         | (87.29)  |
| 2 1/4"-4 1/2 | 3.02 (19.48)                                               | 32300              | (143.67) | 25295         | (112.51) |
| 2 1/2"-4     | 3.72 (24.00)                                               | 39800              | (177.03) | 31169         | (138.64) |
| 2 3/4"-4     | 4.62 (29.80)                                               | 49400              | (219.73) | 38687         | (172.08) |
| 3"-4         | 5.62 (36.26)                                               | 60100              | (267.32) | 47066         | (209.35) |
| 3 1/4"-8UN   | 6.72 (43.35)                                               | 71900              | (319.81) | 56307         | (250.45) |
| 3 1/2"-8UN   | 7.92 (51.09)                                               | 84700              | (376.74) | 66331         | (295.04) |
| 3 3/4"-8UN   | 9.21 (59.42)                                               | 98500              | (438.13) | 77139         | (338.64) |

Extracted from MSS SP-58, 2002, with permission of the publisher, the Manufacturers Standardization Society.

**Rod Size As Determined By Steel Pipe Size For Fire Protection**

| Steel Pipe<br>Size<br>In. (mm) | Maximum<br>Span<br>Ft. (m) | Rod<br>Size |
|--------------------------------|----------------------------|-------------|
| 1"-1 1/4" (25-30)              | 12 (3.66)                  | 3/8"-16     |
| 1 1/2"-4" (40-100)             | 15 (4.57)                  | 3/8"-16     |
| 5"-8" (125-200)                | 15 (4.57)                  | 1/2"-13     |
| 10"-12" (250-300)              | 15 (4.57)                  | 5/8"-11     |

Based on NFPA 13-1999, Table 6-2.2 & Table 6-1.4.1

**Rod Size As Determined By Copper Tubing Size For Fire Protection**

| Copper Tubing<br>Size<br>In. (mm) | Maximum<br>Span<br>Ft. (m) | Rod<br>Size |
|-----------------------------------|----------------------------|-------------|
| 3/4"-1" (20-35)                   | 8 (2.44)                   | 3/8"-16     |
| 1 1/4"-1 1/2" (32-40)             | 15 (3.05)                  | 3/8"-16     |
| 2"-3" (50-80)                     | 15 (3.66)                  | 3/8"-16     |
| 3 1/2"-4" (90-100)                | 15 (4.57)                  | 3/8"-16     |
| 5"-8" (125-200)                   | 15 (4.57)                  | 1/2"-13     |

Based on NFPA 13-1999, Table 6-2.2 & Table 6-1.4.1

# Reference Data

## Schedule 40 steel pipe data

| Nominal Pipe Size |       | Pipe O.D. |         | Wall Thickness |        | Weight of Pipe |         | Weight of Pipe Filled With Water |         | Maximum Span* |        | Recommended Hanger Rod Sizes |
|-------------------|-------|-----------|---------|----------------|--------|----------------|---------|----------------------------------|---------|---------------|--------|------------------------------|
| In.               | mm    | In.       | mm      | In.            | mm     | Lbs./Ft.       | kg/m    | Lbs./Ft.                         | kg/m    | Ft.           | Meter  |                              |
| 3/8"              | (10)  | .675      | (17.1)  | .091           | (2.3)  | .6             | (.9)    | .7                               | (1.0)   | 7             | (2.13) | 3/8"-16                      |
| 1/2"              | (15)  | .840      | (21.3)  | .109           | (2.7)  | .8             | (1.2)   | .9                               | (1.3)   | 7             | (2.13) | 3/8"-16                      |
| 3/4"              | (20)  | 1.050     | (26.7)  | .113           | (2.9)  | 1.1            | (1.7)   | 1.3                              | (2.0)   | 7             | (2.13) | 3/8"-16                      |
| 1"                | (25)  | 1.315     | (33.4)  | .133           | (3.4)  | 1.7            | (2.5)   | 2.1                              | (3.0)   | 7             | (2.13) | 3/8"-16                      |
| 1 1/4"            | (32)  | 1.660     | (42.1)  | .140           | (3.5)  | 2.3            | (3.4)   | 2.9                              | (4.3)   | 7             | (2.13) | 3/8"-16                      |
| 1 1/2"            | (40)  | 1.900     | (48.2)  | .145           | (3.7)  | 2.7            | (4.0)   | 3.6                              | (5.3)   | 9             | (2.74) | 3/8"-16                      |
| 2"                | (50)  | 2.375     | (60.3)  | .154           | (3.9)  | 3.6            | (5.4)   | 5.0                              | (7.5)   | 10            | (3.05) | 3/8"-16                      |
| 2 1/2"            | (65)  | 2.875     | (73.0)  | .203           | (5.1)  | 5.8            | (8.6)   | 7.9                              | (11.7)  | 11            | (3.35) | 1/2"-13                      |
| 3"                | (80)  | 3.500     | (88.9)  | .216           | (5.5)  | 7.6            | (11.2)  | 10.8                             | (15.9)  | 12            | (3.66) | 1/2"-13                      |
| 3 1/2"            | (90)  | 4.000     | (101.6) | .226           | (5.7)  | 9.1            | (13.5)  | 13.4                             | (19.8)  | 13            | (3.96) | 1/2"-13                      |
| 4"                | (100) | 4.500     | (114.3) | .237           | (6.0)  | 10.8           | (16.0)  | 16.3                             | (24.2)  | 14            | (4.27) | 5/8"-11                      |
| 5"                | (125) | 5.563     | (141.3) | .258           | (6.5)  | 14.6           | (21.7)  | 23.2                             | (34.6)  | 16            | (4.87) | 5/8"-11                      |
| 6"                | (150) | 6.625     | (168.3) | .280           | (7.1)  | 19.0           | (28.2)  | 31.5                             | (46.8)  | 17            | (5.18) | 3/4"-10                      |
| 8"                | (200) | 8.625     | (219.1) | .322           | (8.2)  | 28.5           | (42.5)  | 50.1                             | (74.6)  | 19            | (5.79) | 3/4"-10                      |
| 10"               | (250) | 10.750    | (273.0) | .365           | (9.3)  | 40.5           | (60.2)  | 74.6                             | (110.9) | 22            | (6.69) | 7/8"-9                       |
| 12"               | (300) | 12.750    | (323.8) | .406           | (10.3) | 51.1           | (75.9)  | 102.1                            | (151.9) | 23            | (7.01) | 7/8"-9                       |
| 14"               | (350) | 14.000    | (355.6) | .437           | (11.1) | 63.0           | (93.7)  | 121.5                            | (180.7) | 25            | (7.62) | 1"-8                         |
| 16"               | (400) | 16.000    | (406.4) | .500           | (12.7) | 83.0           | (123.5) | 159.5                            | (237.3) | 27            | (8.23) | 1"-8                         |
| 18"               | (450) | 18.000    | (457.2) | .563           | (14.3) | 105.0          | (156.2) | 202.2                            | (300.8) | 28            | (8.53) | 1"-8                         |
| 20"               | (500) | 20.000    | (508.0) | .593           | (15.1) | 123.0          | (183.0) | 243.4                            | (361.8) | 30            | (9.14) | 1 1/4"-7                     |
| 24"               | (600) | 24.000    | (609.6) | .687           | (17.4) | 171.0          | (254.5) | 345.2                            | (513.7) | 32            | (9.75) | 1 1/4"-7                     |

Based on ASTM A53-86.

1 cubic ft. of water weighs 62.41 lbs.

1 gallon (U.S.) weighs 8.335 lbs.

1 cubic meter of water weighs 999.97 kg.

1 liter weighs .999 kg.

Based on MSS SP-69 Table 3 & 4.

\*Many codes require pipe hangers to be spaced every 10' (3.048 meters) regardless of size. Check local codes.

Spacing and capacities are based on water filled pipe. Closer hanger spacing may be required where additional valves and fittings increase the load.

## CPVC Fire Sprinkler Pipe Data

| Nominal Pipe Size |      | Pipe O.D. |        | Average Wall Thickness |       | Average Inside Diameter |        | Weight of CPVC Pipe |         | Weight of CPVC Pipe Filled With Water |         |
|-------------------|------|-----------|--------|------------------------|-------|-------------------------|--------|---------------------|---------|---------------------------------------|---------|
| In.               | mm   | In.       | mm     | In.                    | mm    | In.                     | mm     | Lbs./Ft.            | kg/m    | Lbs./Ft.                              | kg/m    |
| 3/4"              | (20) | 1.050     | (26.7) | .083                   | (2.1) | 0.874                   | (22.2) | 0.168               | (0.250) | 0.428                                 | (0.637) |
| 1"                | (25) | 1.315     | (33.4) | .102                   | (2.6) | 1.101                   | (27.9) | 0.262               | (0.390) | 0.674                                 | (1.003) |
| 1 1/4"            | (32) | 1.660     | (42.1) | .128                   | (3.2) | 1.394                   | (35.4) | 0.418               | (0.622) | 1.079                                 | (1.606) |
| 1 1/2"            | (40) | 1.900     | (48.2) | .146                   | (3.7) | 1.598                   | (40.6) | 0.548               | (0.815) | 1.417                                 | (2.109) |
| 2"                | (50) | 2.375     | (60.3) | .181                   | (4.6) | 2.003                   | (50.9) | 0.859               | (1.278) | 2.222                                 | (3.307) |
| 2 1/2"            | (65) | 2.875     | (73.0) | .218                   | (5.5) | 2.423                   | (61.5) | 1.257               | (1.870) | 3.252                                 | (4.839) |
| 3"                | (80) | 3.500     | (88.9) | .267                   | (6.8) | 2.950                   | (74.9) | 1.867               | (2.778) | 4.827                                 | (7.183) |

Dimensions and tolerances per ASTM F442.

1 cubic ft. of water weighs 62.41 lbs.

1 cubic meter of water weighs 999.97 kg.

## AWWA Ductile iron pipe data

| Nominal<br>Pipe Size |        | Class | O.D. of<br>Ductile Iron Pipe |          | Wall<br>Thickness |        | Weight of Pipe |         | Weight of Pipe<br>Filled With Water |          |
|----------------------|--------|-------|------------------------------|----------|-------------------|--------|----------------|---------|-------------------------------------|----------|
| In.                  | mm     |       | In.                          | mm       | In.               | mm     | Lbs./Ft.       | kg/m    | Lbs./Ft.                            | kg/m     |
| 3"                   | (80)   | 53    | 3.96                         | (100.6)  | .31               | (7.9)  | 11.2           | (16.6)  | 15.0                                | (22.2)   |
| 4"                   | (100)  | 53    | 4.80                         | (121.9)  | .32               | (8.1)  | 14.2           | (21.1)  | 20.1                                | (29.9)   |
| 6"                   | (150)  | 53    | 6.90                         | (175.2)  | .34               | (8.6)  | 22.0           | (32.7)  | 35.1                                | (52.2)   |
| 8"                   | (200)  | 53    | 9.05                         | (229.9)  | .36               | (9.1)  | 31.0           | (46.1)  | 54.0                                | (80.3)   |
| 10"                  | (250)  | 53    | 11.10                        | (281.9)  | .38               | (9.6)  | 40.4           | (60.1)  | 76.8                                | (114.2)  |
| 12"                  | (300)  | 53    | 13.20                        | (335.3)  | .40               | (10.1) | 50.7           | (75.4)  | 103.0                               | (153.2)  |
| 14"                  | (350)  | 53    | 15.30                        | (388.6)  | .42               | (10.6) | 62.4           | (92.8)  | 133.5                               | (198.6)  |
| 16"                  | (400)  | 53    | 17.40                        | (441.9)  | .43               | (10.9) | 72.8           | (108.3) | 165.9                               | (246.8)  |
| 18"                  | (450)  | 53    | 19.50                        | (495.3)  | .44               | (11.1) | 83.6           | (124.4) | 201.5                               | (299.8)  |
| 20"                  | (500)  | 53    | 21.60                        | (548.6)  | .45               | (11.4) | 95.2           | (141.7) | 241.0                               | (358.7)  |
| 24"                  | (600)  | 53    | 25.80                        | (655.3)  | .47               | (11.9) | 119.2          | (177.4) | 329.4                               | (490.2)  |
| 30"                  | (750)  | 53    | 32.00                        | (812.8)  | .51               | (12.9) | 161.3          | (240.0) | 487.8                               | (597.1)  |
| 36"                  | (900)  | 53    | 38.30                        | (972.8)  | .58               | (14.7) | 219.5          | (326.6) | 688.8                               | (1025.0) |
| 42"                  | (1050) | 53    | 44.50                        | (1130.3) | .65               | (16.5) | 285.2          | (424.4) | 920.1                               | (1369.2) |
| 48"                  | (1200) | 53    | 50.80                        | (1290.3) | .72               | (18.3) | 360.3          | (536.2) | 1189.2                              | (1769.7) |
| 54"                  | (1350) | 53    | 57.10                        | (1450.3) | .81               | (20.6) | 455.0          | (677.1) | 1502.2                              | (2135.5) |

Based on AWWA C108-70, Table 8.2.

Add flange weight for flanged cast iron pipe.

## Ductile Iron Pipe Size

| Ductile Iron<br>Pipe Size |       | B3110 | B3114 | B3120 | B3122 | B3122A | B3124      | B3126      | B3117SL    |
|---------------------------|-------|-------|-------|-------|-------|--------|------------|------------|------------|
| In.                       | mm    |       |       |       |       |        |            |            |            |
| 3"                        | (80)  | 3 1/2 | 3 1/2 | 3 1/2 | 3 1/2 | 3 1/2  | 2 to 3 1/2 | 2 to 3 1/2 | 2 to 3 1/2 |
| 4"                        | (100) | 4     | 4     | 4     | 4     | 4      | 4 to 6     | 4 to 6     | 4 to 6     |
| 6"                        | (150) | 6     | 6     | 6     | 6     | 6      | 4 to 6     | 4 to 6     | 4 to 6     |
| 8"                        | (200) | 10    | 8     | 8     | 8     | 8      | 8 to 10    | 8 to 10    | 8 to 10    |
| 10"                       | (250) | 12    | 10    | 10    | 10    | 10     | 8 to 10    | 8 to 10    | 8 to 10    |
| 12"                       | (300) | 12    | 12    | 12    | 12    | 12     | 12 to 14   | 12 to 14   | 12 to 14   |
| 14"                       | (350) | 16    | 14    | 14    | 14    | 14     | 12 to 14   | 12 to 14   | 12 to 14   |
| 16"                       | (400) | 18    | 16    | 16    | 16    | 16     | 16 to 20   | 16 to 20   | 16 to 20   |
| 18"                       | (450) | 20    | 18    | 18    | 18    | 18     | 16 to 20   | 16 to 20   | 16 to 20   |
| 20"                       | (500) | 24    | 20    | 20    | 20    | 20     | 16 to 20   | 16 to 20   | 16 to 20   |
| 24"                       | (600) | 30    | 24    | 24    | 24    | 24     | —          | —          | 24         |

| Ductile Iron<br>Pipe Size |       | B3118SL    | B3119SL    | B218 | B219   | B379 | B479 | B3114R | B3117R     |
|---------------------------|-------|------------|------------|------|--------|------|------|--------|------------|
| In.                       | mm    |            |            |      |        |      |      |        |            |
| 3"                        | (80)  | 2 to 3 1/2 | 2 to 3 1/2 | B218 | B219-1 | —    | —    | 3 1/2  | 2 to 3 1/2 |
| 4"                        | (100) | 4 to 6     | 4 to 6     | B218 | B219-2 | —    | —    | 4      | 4 to 6     |
| 6"                        | (150) | 4 to 6     | 4 to 6     | B218 | B219-3 | B379 | —    | 6      | 4 to 6     |
| 8"                        | (200) | 8 to 10    | 8 to 10    | —    | B219-4 | B379 | —    | 8      | 8 to 10    |
| 10"                       | (250) | 8 to 10    | 8 to 10    | —    | B219-4 | B379 | —    | 10     | 8 to 10    |
| 12"                       | (300) | 12 to 14   | 12 to 14   | —    | B219-5 | B379 | —    | 12     | 12 to 14   |
| 14"                       | (350) | 12 to 14   | 12 to 14   | —    | —      | B379 | —    | 14     | 12 to 14   |
| 16"                       | (400) | 16 to 20   | 16 to 20   | —    | —      | B379 | B479 | 16     | 16 to 20   |
| 18"                       | (450) | 16 to 20   | 16 to 20   | —    | —      | —    | B479 | 18     | 16 to 20   |
| 20"                       | (500) | 16 to 20   | 16 to 20   | —    | —      | —    | B479 | 20     | 16 to 20   |
| 24"                       | (600) | 24         | 24         | —    | —      | —    | B479 | 24     | 24         |

## Copper tubing (type L) data

| Nominal<br>Tubing Size |       | O.D. Size |         | Wall<br>Thickness |       | Weight of Tubing |         | Weight of Tubing<br>Filled With Water |         |
|------------------------|-------|-----------|---------|-------------------|-------|------------------|---------|---------------------------------------|---------|
| In.                    | mm    | In.       | mm      | In.               | mm    | Lbs./Ft.         | kg/m    | Lbs./Ft.                              | kg/m    |
| 1/4"                   | (6)   | .375      | (9.5)   | .030              | (.7)  | .12              | (.17)   | .15                                   | (.21)   |
| 3/8"                   | (10)  | .500      | (12.7)  | .035              | (.9)  | .20              | (.30)   | .26                                   | (.39)   |
| 1/2"                   | (15)  | .625      | (15.9)  | .040              | (1.0) | .28              | (.41)   | .38                                   | (.56)   |
| 5/8"                   | (17)  | .750      | (19.0)  | .042              | (1.0) | .36              | (.53)   | .51                                   | (.75)   |
| 3/4"                   | (20)  | .875      | (22.2)  | .045              | (1.1) | .45              | (.67)   | .66                                   | (.98)   |
| 1"                     | (25)  | 1.125     | (28.6)  | .050              | (1.3) | .65              | (.97)   | 1.01                                  | (1.50)  |
| 1 1/4"                 | (32)  | 1.375     | (34.9)  | .055              | (1.4) | .88              | (1.31)  | 1.42                                  | (2.11)  |
| 1 1/2"                 | (40)  | 1.625     | (41.3)  | .060              | (1.5) | 1.14             | (1.69)  | 1.91                                  | (2.83)  |
| 2"                     | (50)  | 2.125     | (54.0)  | .070              | (1.8) | 1.75             | (2.60)  | 3.09                                  | (4.59)  |
| 2 1/2"                 | (65)  | 2.625     | (66.7)  | .080              | (2.0) | 2.48             | (3.69)  | 4.54                                  | (6.75)  |
| 3"                     | (80)  | 3.125     | (79.4)  | .090              | (2.3) | 3.33             | (4.95)  | 6.28                                  | (9.34)  |
| 3 1/2"                 | (90)  | 3.625     | (92.1)  | .100              | (2.5) | 4.29             | (6.38)  | 8.28                                  | (12.32) |
| 4"                     | (100) | 4.125     | (104.8) | .110              | (2.8) | 5.38             | (8.00)  | 10.57                                 | (15.72) |
| 5"                     | (125) | 5.125     | (130.2) | .125              | (3.2) | 7.61             | (11.32) | 15.69                                 | (23.34) |
| 6"                     | (150) | 6.125     | (155.6) | .140              | (3.5) | 10.20            | (15.18) | 21.81                                 | (32.46) |
| 8"                     | (200) | 8.125     | (206.4) | .200              | (5.1) | 19.29            | (28.70) | 39.49                                 | (58.89) |

Dimensions taken from ASTM B88-83.

## Copper tubing (type K) data

| Nominal<br>Tubing Size |       | O.D. Size |         | Wall<br>Thickness |       | Weight of Tubing |         | Weight of Tubing<br>Filled With Water |         |
|------------------------|-------|-----------|---------|-------------------|-------|------------------|---------|---------------------------------------|---------|
| In.                    | mm    | In.       | mm      | In.               | mm    | Lbs./Ft.         | kg/m    | Lbs./Ft.                              | kg/m    |
| 1/4"                   | (6)   | .375      | (9.5)   | .035              | (.9)  | .14              | (.21)   | .17                                   | (.25)   |
| 3/8"                   | (10)  | .500      | (12.7)  | .049              | (1.2) | .27              | (.40)   | .32                                   | (.47)   |
| 1/2"                   | (15)  | .625      | (15.9)  | .049              | (1.2) | .34              | (.50)   | .43                                   | (.63)   |
| 5/8"                   | (17)  | .750      | (19.0)  | .049              | (1.2) | .42              | (.62)   | .56                                   | (.83)   |
| 3/4"                   | (20)  | .875      | (22.2)  | .065              | (1.6) | .64              | (.95)   | .83                                   | (1.23)  |
| 1"                     | (25)  | 1.125     | (28.6)  | .065              | (1.6) | .84              | (1.25)  | 1.18                                  | (1.75)  |
| 1 1/4"                 | (32)  | 1.375     | (34.9)  | .065              | (1.6) | 1.04             | (1.55)  | 1.57                                  | (2.34)  |
| 1 1/2"                 | (40)  | 1.625     | (41.3)  | .072              | (1.8) | 1.36             | (2.02)  | 2.10                                  | (3.12)  |
| 2"                     | (50)  | 2.125     | (54.0)  | .083              | (2.1) | 2.06             | (3.06)  | 3.37                                  | (5.01)  |
| 2 1/2"                 | (65)  | 2.625     | (66.7)  | .095              | (2.4) | 2.92             | (4.34)  | 4.92                                  | (7.31)  |
| 3"                     | (80)  | 3.125     | (79.4)  | .109              | (2.8) | 4.00             | (5.95)  | 6.96                                  | (10.35) |
| 3 1/2"                 | (90)  | 3.625     | (92.1)  | .120              | (3.0) | 5.12             | (7.62)  | 9.02                                  | (13.42) |
| 4"                     | (100) | 4.125     | (104.8) | .134              | (3.4) | 6.51             | (9.69)  | 11.57                                 | (17.22) |
| 5"                     | (125) | 5.125     | (130.2) | .160              | (4.0) | 9.67             | (14.39) | 17.67                                 | (26.29) |
| 6"                     | (150) | 6.125     | (155.6) | .192              | (4.9) | 13.87            | (20.60) | 25.07                                 | (37.27) |
| 8"                     | (200) | 8.125     | (206.4) | .271              | (6.9) | 25.90            | (38.50) | 45.40                                 | (67.52) |

Dimensions taken from ASTM B88-83.

1 cubic ft. of water weighs 62.41 lbs.

1 cubic meter of water weighs 999.97 kg.

1 gallon (U.S.) weighs 8.335 lbs.

1 liter weighs .999 kg.

## Schedule 40 PVC plastic pipe data

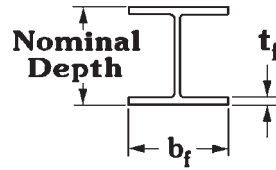
| Nominal<br>Pipe Size |       | Pipe O.D. |         | Wall<br>Thickness |        | Weight of Pipe |         | Weight of Pipe<br>Filled With Water |         |
|----------------------|-------|-----------|---------|-------------------|--------|----------------|---------|-------------------------------------|---------|
| In.                  | mm    | In.       | mm      | In.               | mm     | Lbs./Ft.       | kg/m    | Lbs./Ft.                            | kg/m    |
| 1/8"                 | (3)   | .405      | (10.3)  | .068              | (1.7)  | .04            | (.06)   | .06                                 | (.09)   |
| 1/4"                 | (6)   | .540      | (13.7)  | .088              | (2.2)  | .07            | (.11)   | .11                                 | (.17)   |
| 3/8"                 | (10)  | .675      | (17.1)  | .091              | (2.3)  | .10            | (.14)   | .18                                 | (.26)   |
| 1/2"                 | (15)  | .840      | (21.3)  | .109              | (2.7)  | .15            | (.20)   | .25                                 | (.40)   |
| 3/4"                 | (20)  | 1.050     | (26.7)  | .113              | (2.9)  | .20            | (.30)   | .40                                 | (.60)   |
| 1"                   | (25)  | 1.315     | (33.4)  | .133              | (3.4)  | .30            | (.40)   | .70                                 | (.90)   |
| 1 1/4"               | (32)  | 1.660     | (42.1)  | .140              | (3.5)  | .40            | (.60)   | 1.00                                | (1.50)  |
| 1 1/2"               | (40)  | 1.900     | (48.2)  | .145              | (3.7)  | .50            | (.70)   | 1.40                                | (2.00)  |
| 2"                   | (50)  | 2.375     | (60.3)  | .154              | (3.9)  | .60            | (.90)   | 2.00                                | (3.00)  |
| 2 1/2"               | (65)  | 2.875     | (73.0)  | .203              | (5.1)  | 1.00           | (1.50)  | 3.10                                | (4.51)  |
| 3"                   | (80)  | 3.500     | (88.9)  | .216              | (5.5)  | 1.30           | (2.00)  | 4.50                                | (6.70)  |
| 3 1/2"               | (90)  | 4.000     | (101.6) | .226              | (5.7)  | 1.60           | (2.40)  | 5.90                                | (8.70)  |
| 4"                   | (100) | 4.500     | (114.3) | .237              | (6.0)  | 1.90           | (2.80)  | 7.40                                | (11.00) |
| 5"                   | (125) | 5.563     | (141.3) | .258              | (6.5)  | 2.80           | (4.10)  | 11.40                               | (17.00) |
| 6"                   | (150) | 6.625     | (168.3) | .280              | (7.1)  | 3.30           | (4.90)  | 15.40                               | (23.00) |
| 8"                   | (200) | 8.625     | (219.1) | .322              | (8.2)  | 5.30           | (7.80)  | 26.90                               | (39.90) |
| 10"                  | (250) | 10.750    | (273.0) | .366              | (9.3)  | 7.50           | (11.10) | 41.60                               | (61.80) |
| 12"                  | (300) | 12.750    | (323.8) | .406              | (10.3) | 10.00          | (14.90) | 58.50                               | (87.00) |

## Schedule 80 PVC plastic pipe data

| Nominal<br>Pipe Size |       | Pipe O.D. |         | Wall<br>Thickness |        | Weight of Pipe |         | Weight of Pipe<br>Filled With Water |         |
|----------------------|-------|-----------|---------|-------------------|--------|----------------|---------|-------------------------------------|---------|
| In.                  | mm    | In.       | mm      | In.               | mm     | Lbs./Ft.       | kg/m    | Lbs./Ft.                            | kg/m    |
| 1/8"                 | (3)   | .405      | (10.3)  | .095              | (2.4)  | .05            | (.08)   | .06                                 | (.10)   |
| 1/4"                 | (6)   | .540      | (13.7)  | .119              | (3.0)  | .09            | (.14)   | .12                                 | (.18)   |
| 3/8"                 | (10)  | .675      | (17.1)  | .126              | (3.2)  | .10            | (.19)   | .16                                 | (.28)   |
| 1/2"                 | (15)  | .840      | (21.3)  | .147              | (3.7)  | .10            | (.20)   | .20                                 | (.30)   |
| 3/4"                 | (20)  | 1.050     | (26.7)  | .154              | (3.9)  | .20            | (.40)   | .40                                 | (.70)   |
| 1"                   | (25)  | 1.315     | (33.4)  | .179              | (4.5)  | .40            | (.50)   | .70                                 | (.90)   |
| 1 1/4"               | (32)  | 1.660     | (42.1)  | .191              | (4.8)  | .50            | (.80)   | 1.00                                | (1.60)  |
| 1 1/2"               | (40)  | 1.900     | (48.2)  | .200              | (5.1)  | .60            | (.90)   | 1.30                                | (2.00)  |
| 2"                   | (50)  | 2.375     | (60.3)  | .218              | (5.5)  | .90            | (1.30)  | 2.20                                | (3.20)  |
| 2 1/2"               | (65)  | 2.875     | (73.0)  | .276              | (7.0)  | 1.30           | (2.00)  | 3.10                                | (4.70)  |
| 3"                   | (80)  | 3.500     | (88.9)  | .300              | (7.6)  | 1.80           | (2.70)  | 4.60                                | (6.90)  |
| 3 1/2"               | (90)  | 4.000     | (101.6) | .318              | (8.1)  | 2.20           | (3.20)  | 6.00                                | (8.90)  |
| 4"                   | (100) | 4.500     | (114.3) | .337              | (8.5)  | 2.60           | (3.90)  | 7.60                                | (11.30) |
| 5"                   | (125) | 5.563     | (141.3) | .375              | (9.5)  | 4.10           | (6.10)  | 12.00                               | (17.80) |
| 6"                   | (150) | 6.625     | (168.3) | .432              | (11.0) | 5.00           | (7.50)  | 16.30                               | (24.30) |
| 8"                   | (200) | 8.625     | (219.1) | .500              | (12.7) | 8.00           | (11.90) | 27.80                               | (41.30) |
| 10"                  | (250) | 10.750    | (273.0) | .593              | (15.0) | 11.90          | (17.70) | 43.20                               | (77.60) |
| 12"                  | (300) | 12.750    | (323.8) | .687              | (17.4) | 16.30          | (24.30) | 60.30                               | (89.80) |

1 cubic ft. of water weighs 62.41 lbs.  
1 cubic meter of water weighs 999.97 kg.  
1 gallon (U.S.) weighs 8.335 lbs.  
1 liter weighs .999 kg.

# Reference Data



## Wide flange I-beams

| Designation            |               | Flange Width                      |       | Flange thickness |        |
|------------------------|---------------|-----------------------------------|-------|------------------|--------|
| Nominal Depth & Weight |               | b <sub>f</sub>                    |       | t <sub>f</sub>   |        |
| In. x Lbs./Ft.         | (mm x kg/m)   | in.                               | mm    | in.              | mm     |
| W4 x 13                | (W100 x 19.3) | 4 <sup>1</sup> / <sub>16</sub> "  | (103) | 0.345            | (8.8)  |
| W5 x 16                | (W130 x 23.8) | 5"                                | (127) | 0.360            | (9.1)  |
| W5 x 19                | (W130 x 28.1) | 5"                                | (128) | 0.430            | (10.9) |
| W6 x 9                 | (W150 x 13.5) | 3 <sup>15</sup> / <sub>16</sub> " | (100) | 0.215            | (5.5)  |
| W6 x 12                | (W150 x 18.0) | 4"                                | (101) | 0.280            | (7.1)  |
| W6 x 16                | (W150 x 24.0) | 4"                                | (101) | 0.405            | (10.3) |
| W6 x 20                | (W150 x 29.8) | 6"                                | (153) | 0.365            | (9.3)  |
| W6 x 25                | (W150 x 37.1) | 6 <sup>1</sup> / <sub>16</sub> "  | (154) | 0.455            | (11.6) |
| W8 x 10                | (W200 x 15.0) | 3 <sup>15</sup> / <sub>16</sub> " | (100) | 0.205            | (5.2)  |
| W8 x 13                | (W200 x 19.3) | 4"                                | (101) | 0.255            | (6.5)  |
| W8 x 15                | (W200 x 22.5) | 4"                                | (101) | 0.315            | (8.0)  |
| W8 x 18                | (W200 x 26.6) | 5 <sup>1</sup> / <sub>4</sub> "   | (133) | 0.330            | (8.4)  |
| W8 x 21                | (W200 x 31.3) | 5 <sup>1</sup> / <sub>4</sub> "   | (133) | 0.400            | (10.2) |
| W8 x 24                | (W200 x 35.9) | 6 <sup>1</sup> / <sub>2</sub> "   | (165) | 0.400            | (10.2) |
| W8 x 28                | (W200 x 41.7) | 6 <sup>1</sup> / <sub>2</sub> "   | (166) | 0.465            | (11.8) |
| W8 x 31                | (W200 x 46.1) | 8"                                | (203) | 0.435            | (11.0) |
| W8 x 35                | (W200 x 52)   | 8"                                | (203) | 0.495            | (12.6) |
| W8 x 40                | (W200 x 59)   | 8 <sup>1</sup> / <sub>16</sub> "  | (205) | 0.560            | (14.2) |
| W8 x 48                | (W200 x 71)   | 8 <sup>3</sup> / <sub>8</sub> "   | (206) | 0.685            | (17.4) |
| W8 x 58                | (W200 x 86)   | 8 <sup>1</sup> / <sub>4</sub> "   | (209) | 0.810            | (20.6) |
| W8 x 67                | (W200 x 100)  | 8 <sup>1</sup> / <sub>4</sub> "   | (210) | 0.935            | (23.7) |
| W10 x 12               | (W250 x 17.9) | 4"                                | (101) | 0.210            | (5.3)  |
| W10 x 15               | (W250 x 22.3) | 4"                                | (101) | 0.270            | (6.9)  |
| W10 x 17               | (W250 x 25.3) | 4"                                | (101) | 0.330            | (8.4)  |
| W10 x 19               | (W250 x 28.4) | 4"                                | (101) | 0.395            | (10.0) |
| W10 x 22               | (W250 x 32.7) | 5 <sup>3</sup> / <sub>4</sub> "   | (146) | 0.360            | (9.1)  |
| W10 x 26               | (W250 x 38.5) | 5 <sup>3</sup> / <sub>4</sub> "   | (147) | 0.440            | (11.2) |
| W10 x 30               | (W250 x 44.8) | 5 <sup>13</sup> / <sub>16</sub> " | (148) | 0.510            | (13.0) |
| W10 x 33               | (W250 x 49.1) | 7 <sup>15</sup> / <sub>16</sub> " | (202) | 0.435            | (11.0) |
| W10 x 39               | (W250 x 58)   | 8"                                | (203) | 0.530            | (13.5) |
| W10 x 45               | (W250 x 67)   | 8"                                | (203) | 0.620            | (15.7) |
| W10 x 49               | (W250 x 73)   | 10"                               | (254) | 0.560            | (14.2) |
| W10 x 54               | (W250 x 80)   | 10 <sup>1</sup> / <sub>16</sub> " | (255) | 0.615            | (15.6) |
| W10 x 60               | (W250 x 89)   | 10 <sup>1</sup> / <sub>16</sub> " | (256) | 0.680            | (17.3) |
| W10 x 68               | (W250 x 101)  | 10 <sup>1</sup> / <sub>8</sub> "  | (257) | 0.770            | (19.6) |
| W10 x 77               | (W250 x 115)  | 10 <sup>3</sup> / <sub>16</sub> " | (259) | 0.870            | (22.1) |
| W10 x 88               | (W250 x 131)  | 10 <sup>1</sup> / <sub>4</sub> "  | (261) | 0.990            | (25.1) |
| W10 x 100              | (W250 x 149)  | 10 <sup>3</sup> / <sub>8</sub> "  | (263) | 1.120            | (28.4) |
| W10 x 112              | (W250 x 167)  | 10 <sup>7</sup> / <sub>16</sub> " | (265) | 1.250            | (31.8) |

| Designation            |               | Flange Width                       |       | Flange thickness |        |
|------------------------|---------------|------------------------------------|-------|------------------|--------|
| Nominal Depth & Weight |               | b <sub>f</sub>                     |       | t <sub>f</sub>   |        |
| In. x Lbs./Ft.         | (mm x kg/m)   | in.                                | mm    | in.              | mm     |
| W12 x 14               | (W310 x 21.0) | 4"                                 | (101) | 0.225            | (5.7)  |
| W12 x 16               | (W310 x 23.8) | 4"                                 | (101) | 0.265            | (6.7)  |
| W12 x 19               | (W310 x 28.3) | 4"                                 | (101) | 0.350            | (8.9)  |
| W12 x 22               | (W310 x 32.7) | 4"                                 | (101) | 0.425            | (10.8) |
| W12 x 26               | (W310 x 38.7) | 6 <sup>1</sup> / <sub>2</sub> "    | (165) | 0.380            | (9.7)  |
| W12 x 30               | (W310 x 44.5) | 6 <sup>1</sup> / <sub>2</sub> "    | (165) | 0.440            | (11.2) |
| W12 x 35               | (W310 x 52)   | 6 <sup>9</sup> / <sub>16</sub> "   | (167) | 0.520            | (13.2) |
| W12 x 40               | (W310 x 60)   | 8"                                 | (203) | 0.515            | (13.1) |
| W12 x 45               | (W310 x 67)   | 8 <sup>1</sup> / <sub>16</sub> "   | (205) | 0.575            | (14.6) |
| W12 x 50               | (W310 x 74)   | 8 <sup>1</sup> / <sub>16</sub> "   | (205) | 0.640            | (16.3) |
| W12 x 53               | (W310 x 79)   | 10"                                | (254) | 0.575            | (14.6) |
| W12 x 58               | (W310 x 86)   | 10"                                | (254) | 0.640            | (16.3) |
| W12 x 65               | (W310 x 97)   | 12"                                | (306) | 0.605            | (15.4) |
| W12 x 72               | (W310 x 107)  | 12"                                | (306) | 0.670            | (17.0) |
| W12 x 79               | (W310 x 117)  | 12 <sup>1</sup> / <sub>16</sub> "  | (307) | 0.735            | (18.7) |
| W12 x 87               | (W310 x 129)  | 12 <sup>1</sup> / <sub>8</sub> "   | (308) | 0.810            | (20.6) |
| W12 x 96               | (W310 x 143)  | 12 <sup>1</sup> / <sub>8</sub> "   | (308) | 0.900            | (22.9) |
| W12 x 106              | (W310 x 158)  | 12 <sup>1</sup> / <sub>4</sub> "   | (310) | 0.990            | (25.1) |
| W12 x 120              | (W310 x 179)  | 12 <sup>5</sup> / <sub>16</sub> "  | (313) | 1.105            | (28.1) |
| W12 x 136              | (W310 x 202)  | 12 <sup>3</sup> / <sub>8</sub> "   | (315) | 1.250            | (31.8) |
| W12 x 152              | (W310 x 226)  | 12 <sup>1</sup> / <sub>2</sub> "   | (317) | 1.400            | (35.6) |
| W12 x 170              | (W310 x 253)  | 12 <sup>9</sup> / <sub>16</sub> "  | (319) | 1.560            | (39.6) |
| W12 x 190              | (W310 x 283)  | 12 <sup>11</sup> / <sub>16</sub> " | (322) | 1.735            | (44.1) |
| W12 x 210              | (W310 x 313)  | 12 <sup>3</sup> / <sub>4</sub> "   | (325) | 1.900            | (48.3) |
| W12 x 230              | (W310 x 342)  | 12 <sup>7</sup> / <sub>8</sub> "   | (328) | 2.070            | (52.6) |
| W12 x 252              | (W310 x 375)  | 13"                                | (330) | 2.250            | (57.2) |
| W14 x 22               | (W360 x 32.9) | 5"                                 | (127) | 0.335            | (8.5)  |
| W14 x 26               | (W360 x 39.0) | 5"                                 | (127) | 0.420            | (10.7) |
| W14 x 30               | (W360 x 44.8) | 6 <sup>3</sup> / <sub>4</sub> "    | (172) | 0.385            | (9.8)  |
| W14 x 34               | (W360 x 51)   | 6 <sup>3</sup> / <sub>4</sub> "    | (172) | 0.455            | (11.6) |
| W14 x 38               | (W360 x 57)   | 6 <sup>3</sup> / <sub>4</sub> "    | (172) | 0.515            | (13.1) |
| W14 x 43               | (W360 x 64)   | 8"                                 | (203) | 0.530            | (13.5) |
| W14 x 48               | (W360 x 72)   | 8"                                 | (203) | 0.595            | (15.1) |
| W14 x 53               | (W360 x 79)   | 8 <sup>1</sup> / <sub>16</sub> "   | (205) | 0.660            | (16.8) |
| W14 x 61               | (W360 x 91)   | 10"                                | (254) | 0.645            | (16.4) |
| W14 x 68               | (W360 x 101)  | 10"                                | (254) | 0.720            | (18.3) |
| W14 x 74               | (W360 x 110)  | 10 <sup>1</sup> / <sub>16</sub> "  | (256) | 0.785            | (19.9) |
| W14 x 82               | (W360 x 122)  | 10 <sup>1</sup> / <sub>8</sub> "   | (257) | 0.855            | (21.7) |
| W14 x 90               | (W360 x 134)  | 14 <sup>1</sup> / <sub>2</sub> "   | (369) | 0.710            | (18.0) |

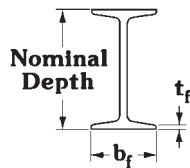
Dimensions taken from ASTM A6-86.

(Continued on next page)

## Wide flange I-beams (Continued)

| Designation<br>Nominal Depth & Weight<br>In. x Lbs./Ft. (mm x kg/m) |               | Flange Width<br>b <sub>f</sub><br>In. mm |  | Flange thickness<br>t <sub>f</sub><br>In. mm |  |
|---------------------------------------------------------------------|---------------|------------------------------------------|--|----------------------------------------------|--|
| W14 x 99                                                            | (W360 x 147)  | 14 <sup>9</sup> / <sub>16</sub> " (370)  |  | 0.780 (19.8)                                 |  |
| W14 x 109                                                           | (W360 x 162)  | 14 <sup>5</sup> / <sub>8</sub> " (371)   |  | 0.860 (21.8)                                 |  |
| W14 x 120                                                           | (W360 x 179)  | 14 <sup>11</sup> / <sub>16</sub> " (373) |  | 0.940 (23.9)                                 |  |
| W14 x 132                                                           | (W360 x 196)  | 14 <sup>3</sup> / <sub>4</sub> " (374)   |  | 1.030 (26.2)                                 |  |
| W14 x 145                                                           | (W360 x 216)  | 15 <sup>1</sup> / <sub>2</sub> " (394)   |  | 1.090 (27.7)                                 |  |
| W14 x 159                                                           | (W360 x 237)  | 15 <sup>9</sup> / <sub>16</sub> " (395)  |  | 1.190 (30.2)                                 |  |
| W14 x 176                                                           | (W360 x 262)  | 15 <sup>5</sup> / <sub>8</sub> " (397)   |  | 1.310 (33.3)                                 |  |
| W14 x 193                                                           | (W360 x 287)  | 15 <sup>3</sup> / <sub>4</sub> " (400)   |  | 1.440 (36.6)                                 |  |
| W14 x 211                                                           | (W360 x 314)  | 15 <sup>3</sup> / <sub>4</sub> " (400)   |  | 1.560 (39.6)                                 |  |
| W14 x 233                                                           | (W360 x 347)  | 15 <sup>7</sup> / <sub>8</sub> " (403)   |  | 1.720 (43.7)                                 |  |
| W14 x 257                                                           | (W360 x 382)  | 16" (406)                                |  | 1.890 (48.0)                                 |  |
| W14 x 283                                                           | (W360 x 421)  | 16 <sup>1</sup> / <sub>8</sub> " (409)   |  | 2.070 (52.6)                                 |  |
| W14 x 311                                                           | (W360 x 463)  | 16 <sup>1</sup> / <sub>4</sub> " (413)   |  | 2.260 (57.4)                                 |  |
| W14 x 342                                                           | (W360 x 509)  | 16 <sup>3</sup> / <sub>8</sub> " (416)   |  | 2.470 (62.7)                                 |  |
| W14 x 370                                                           | (W360 x 551)  | 16 <sup>1</sup> / <sub>2</sub> " (419)   |  | 2.660 (67.6)                                 |  |
| W14 x 398                                                           | (W360 x 592)  | 16 <sup>9</sup> / <sub>16</sub> " (421)  |  | 2.845 (72.3)                                 |  |
| W14 x 426                                                           | (W360 x 634)  | 16 <sup>11</sup> / <sub>16</sub> " (424) |  | 3.035 (77.1)                                 |  |
| W16 x 26                                                            | (W410 x 38.8) | 5 <sup>1</sup> / <sub>2</sub> " (140)    |  | 0.345 (8.8)                                  |  |
| W16 x 31                                                            | (W410 x 46.1) | 5 <sup>1</sup> / <sub>2</sub> " (140)    |  | 0.440 (11.2)                                 |  |
| W16 x 36                                                            | (W410 x 53)   | 7" (178)                                 |  | 0.430 (10.9)                                 |  |
| W16 x 40                                                            | (W410 x 60)   | 7" (178)                                 |  | 0.505 (12.8)                                 |  |
| W16 x 45                                                            | (W410 x 67)   | 7" (178)                                 |  | 0.565 (14.4)                                 |  |
| W16 x 50                                                            | (W410 x 75)   | 7 <sup>1</sup> / <sub>16</sub> " (179)   |  | 0.630 (16.0)                                 |  |
| W16 x 57                                                            | (W410 x 85)   | 7 <sup>1</sup> / <sub>8</sub> " (181)    |  | 0.715 (18.2)                                 |  |
| W16 x 67                                                            | (W410 x 100)  | 10 <sup>1</sup> / <sub>4</sub> " (260)   |  | 0.665 (16.9)                                 |  |
| W16 x 77                                                            | (W410 x 114)  | 10 <sup>5</sup> / <sub>16</sub> " (262)  |  | 0.760 (19.3)                                 |  |
| W16 x 89                                                            | (W410 x 132)  | 10 <sup>3</sup> / <sub>8</sub> " (263)   |  | 0.875 (22.2)                                 |  |
| W16 x 100                                                           | (W410 x 149)  | 10 <sup>7</sup> / <sub>16</sub> " (265)  |  | 0.985 (25.0)                                 |  |
| W18 x 35                                                            | (W460 x 52)   | 6" (152)                                 |  | 0.425 (10.8)                                 |  |
| W18 x 40                                                            | (W460 x 60)   | 6" (152)                                 |  | 0.525 (13.3)                                 |  |
| W18 x 46                                                            | (W460 x 68)   | 6 <sup>1</sup> / <sub>16</sub> " (154)   |  | 0.605 (15.4)                                 |  |
| W18 x 50                                                            | (W460 x 74)   | 7 <sup>1</sup> / <sub>2</sub> " (190)    |  | 0.570 (14.5)                                 |  |
| W18 x 55                                                            | (W460 x 82)   | 7 <sup>1</sup> / <sub>2</sub> " (190)    |  | 0.630 (16.0)                                 |  |
| W18 x 60                                                            | (W460 x 89)   | 7 <sup>9</sup> / <sub>16</sub> " (192)   |  | 0.695 (17.7)                                 |  |
| W18 x 65                                                            | (W460 x 97)   | 7 <sup>9</sup> / <sub>16</sub> " (192)   |  | 0.750 (19.0)                                 |  |
| W18 x 71                                                            | (W460 x 106)  | 7 <sup>5</sup> / <sub>8</sub> " (193)    |  | 0.810 (20.6)                                 |  |
| W18 x 76                                                            | (W460 x 113)  | 11" (279)                                |  | 0.680 (17.3)                                 |  |
| W18 x 86                                                            | (W460 x 128)  | 11 <sup>1</sup> / <sub>16</sub> " (281)  |  | 0.770 (19.6)                                 |  |
| W18 x 97                                                            | (W460 x 144)  | 11 <sup>1</sup> / <sub>8</sub> " (282)   |  | 0.870 (22.1)                                 |  |
| W18 x 106                                                           | (W460 x 158)  | 11 <sup>3</sup> / <sub>16</sub> " (284)  |  | 0.940 (23.9)                                 |  |
| W18 x 119                                                           | (W460 x 177)  | 11 <sup>1</sup> / <sub>4</sub> " (286)   |  | 1.060 (26.9)                                 |  |
| W21 x 44                                                            | (W530 x 66)   | 6 <sup>1</sup> / <sub>2</sub> " (165)    |  | 0.450 (11.4)                                 |  |
| W21 x 50                                                            | (W530 x 74)   | 6 <sup>1</sup> / <sub>2</sub> " (165)    |  | 0.535 (13.6)                                 |  |
| W21 x 57                                                            | (W530 x 85)   | 6 <sup>9</sup> / <sub>16</sub> " (167)   |  | 0.650 (16.5)                                 |  |
| W21 x 62                                                            | (W530 x 92)   | 8 <sup>1</sup> / <sub>4</sub> " (209)    |  | 0.615 (15.6)                                 |  |
| W21 x 68                                                            | (W530 x 101)  | 8 <sup>1</sup> / <sub>4</sub> " (209)    |  | 0.685 (17.4)                                 |  |
| W21 x 73                                                            | (W530 x 109)  | 8 <sup>1</sup> / <sub>4</sub> " (209)    |  | 0.740 (18.8)                                 |  |
| W21 x 83                                                            | (W530 x 123)  | 8 <sup>7</sup> / <sub>8</sub> " (213)    |  | 0.835 (21.2)                                 |  |
| W21 x 93                                                            | (W530 x 138)  | 8 <sup>7</sup> / <sub>16</sub> " (214)   |  | 0.930 (23.6)                                 |  |
| W21 x 101                                                           | (W530 x 150)  | 12 <sup>1</sup> / <sub>4</sub> " (311)   |  | 0.800 (20.3)                                 |  |
| W21 x 111                                                           | (W530 x 165)  | 12 <sup>3</sup> / <sub>8</sub> " (314)   |  | 0.875 (22.2)                                 |  |
| W21 x 122                                                           | (W530 x 182)  | 12 <sup>3</sup> / <sub>8</sub> " (314)   |  | 0.960 (24.4)                                 |  |
| W21 x 132                                                           | (W530 x 196)  | 12 <sup>7</sup> / <sub>16</sub> " (316)  |  | 0.035 (26.3)                                 |  |
| W21 x 147                                                           | (W530 x 219)  | 12 <sup>1</sup> / <sub>2</sub> " (317)   |  | 0.150 (29.2)                                 |  |
| W24 x 55                                                            | (W610 x 82)   | 7" (178)                                 |  | 0.505 (12.8)                                 |  |
| W24 x 62                                                            | (W610 x 92)   | 7 <sup>1</sup> / <sub>16</sub> " (179)   |  | 0.590 (15.0)                                 |  |
| W24 x 68                                                            | (W610 x 101)  | 8 <sup>15</sup> / <sub>16</sub> " (227)  |  | 0.585 (14.9)                                 |  |
| W24 x 76                                                            | (W610 x 113)  | 9" (228)                                 |  | 0.680 (17.3)                                 |  |
| W24 x 84                                                            | (W610 x 125)  | 9" (228)                                 |  | 0.770 (19.6)                                 |  |
| W24 x 94                                                            | (W610 x 140)  | 9 <sup>1</sup> / <sub>16</sub> " (230)   |  | 1.875 (22.2)                                 |  |
| W24 x 104                                                           | (W610 x 155)  | 12 <sup>3</sup> / <sub>4</sub> " (324)   |  | 1.750 (19.0)                                 |  |
| W24 x 117                                                           | (W610 x 174)  | 12 <sup>3</sup> / <sub>4</sub> " (324)   |  | 0.850 (21.6)                                 |  |
| W24 x 131                                                           | (W610 x 195)  | 12 <sup>7</sup> / <sub>8</sub> " (327)   |  | 0.960 (24.4)                                 |  |
| W24 x 146                                                           | (W610 x 217)  | 12 <sup>7</sup> / <sub>8</sub> " (327)   |  | 1.090 (27.7)                                 |  |
| W24 x 162                                                           | (W610 x 241)  | 12 <sup>15</sup> / <sub>16</sub> " (328) |  | 1.220 (31.0)                                 |  |
| W27 x 84                                                            | (W690 x 125)  | 9 <sup>15</sup> / <sub>16</sub> " (252)  |  | 0.640 (16.3)                                 |  |
| W27 x 94                                                            | (W690 x 140)  | 10" (254)                                |  | 0.745 (18.9)                                 |  |
| W27 x 102                                                           | (W690 x 152)  | 10" (254)                                |  | 0.830 (21.1)                                 |  |
| W27 x 114                                                           | (W690 x 170)  | 10 <sup>1</sup> / <sub>16</sub> " (255)  |  | 0.930 (23.6)                                 |  |
| W27 x 146                                                           | (W690 x 217)  | 13 <sup>15</sup> / <sub>16</sub> " (354) |  | 0.975 (24.8)                                 |  |
| W27 x 161                                                           | (W690 x 240)  | 14" (355)                                |  | 1.080 (27.4)                                 |  |
| W27 x 178                                                           | (W690 x 265)  | 14 <sup>1</sup> / <sub>16</sub> " (357)  |  | 1.190 (30.2)                                 |  |
| W30 x 99                                                            | (W760 x 147)  | 10 <sup>7</sup> / <sub>16</sub> " (265)  |  | 0.670 (17.0)                                 |  |
| W30 x 108                                                           | (W760 x 161)  | 10 <sup>1</sup> / <sub>2</sub> " (267)   |  | 0.760 (19.3)                                 |  |
| W30 x 116                                                           | (W760 x 173)  | 10 <sup>1</sup> / <sub>2</sub> " (267)   |  | 0.850 (21.6)                                 |  |
| W30 x 124                                                           | (W760 x 185)  | 10 <sup>1</sup> / <sub>2</sub> " (267)   |  | 0.930 (23.6)                                 |  |
| W30 x 132                                                           | (W760 x 196)  | 10 <sup>9</sup> / <sub>16</sub> " (268)  |  | 1.000 (25.4)                                 |  |
| W30 x 173                                                           | (W760 x 257)  | 15" (381)                                |  | 1.065 (27.1)                                 |  |
| W30 x 191                                                           | (W760 x 284)  | 15" (381)                                |  | 1.185 (30.1)                                 |  |
| W30 x 211                                                           | (W760 x 314)  | 15 <sup>1</sup> / <sub>8</sub> " (384)   |  | 1.315 (33.4)                                 |  |
| W33 x 118                                                           | (W840 x 176)  | 11 <sup>1</sup> / <sub>2</sub> " (292)   |  | 0.740 (18.8)                                 |  |
| W33 x 130                                                           | (W840 x 193)  | 11 <sup>1</sup> / <sub>2</sub> " (292)   |  | 0.855 (21.7)                                 |  |
| W33 x 141                                                           | (W840 x 210)  | 11 <sup>1</sup> / <sub>2</sub> " (292)   |  | 0.960 (24.4)                                 |  |
| W33 x 152                                                           | (W840 x 226)  | 11 <sup>9</sup> / <sub>16</sub> " (294)  |  | 1.055 (26.8)                                 |  |
| W33 x 201                                                           | (W840 x 299)  | 15 <sup>3</sup> / <sub>4</sub> " (400)   |  | 1.150 (29.2)                                 |  |
| W36 x 135                                                           | (W920 x 201)  | 11 <sup>15</sup> / <sub>16</sub> " (303) |  | 0.790 (20.1)                                 |  |
| W36 x 150                                                           | (W920 x 223)  | 12" (305)                                |  | 0.940 (23.9)                                 |  |
| W36 x 160                                                           | (W920 x 238)  | 12" (305)                                |  | 1.020 (25.9)                                 |  |
| W36 x 170                                                           | (W920 x 253)  | 12" (305)                                |  | 1.100 (27.9)                                 |  |
| W36 x 182                                                           | (W920 x 271)  | 12 <sup>1</sup> / <sub>16</sub> " (306)  |  | 1.180 (30.0)                                 |  |
| W36 x 194                                                           | (W920 x 289)  | 12 <sup>1</sup> / <sub>8</sub> " (308)   |  | 1.260 (32.0)                                 |  |
| W36 x 210                                                           | (W920 x 313)  | 12 <sup>3</sup> / <sub>16</sub> " (309)  |  | 1.360 (34.5)                                 |  |

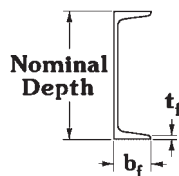
Dimensions taken from ASTM A6-86.



## American Standard 'S' shape I-beams

| Designation            |               | Flange Width                      |       | Flange thickness |        |
|------------------------|---------------|-----------------------------------|-------|------------------|--------|
| Nominal Depth & Weight |               | $b_f$                             |       | $t_f$            |        |
| In. x Lbs./Ft.         | (mm x kg/m)   | in.                               | mm    | in.              | mm     |
| S3 x 5.7               | (S75 x 8.5)   | 2 <sup>3</sup> / <sub>8</sub> "   | (59)  | 0.260            | (6.6)  |
| S3 x 7.5               | (S75 x 11.2)  | 2 <sup>1</sup> / <sub>2</sub> "   | (63)  | 0.260            | (6.6)  |
| S4 x 7.7               | (S100 x 11.5) | 2 <sup>5</sup> / <sub>8</sub> "   | (68)  | 0.293            | (7.4)  |
| S4 x 9.5               | (S100 x 14.1) | 2 <sup>3</sup> / <sub>4</sub> "   | (71)  | 0.293            | (7.4)  |
| S5 x 10                | (S130 x 15)   | 3"                                | (76)  | 0.326            | (8.3)  |
| S5 x 14.75             | (S130 x 22)   | 3 <sup>1</sup> / <sub>4</sub> "   | (83)  | 0.326            | (8.3)  |
| S6 x 12.5              | (S150 x 18.6) | 3 <sup>3</sup> / <sub>8</sub> "   | (85)  | 0.359            | (9.1)  |
| S6 x 17.25             | (S150 x 25.7) | 3 <sup>11</sup> / <sub>16</sub> " | (91)  | 0.359            | (9.1)  |
| S7 x 15.3              | (S180 x 22.8) | 3 <sup>5</sup> / <sub>8</sub> "   | (93)  | 0.392            | (10.0) |
| S7 x 20                | (S180 x 29.8) | 3 <sup>7</sup> / <sub>8</sub> "   | (98)  | 0.392            | (10.0) |
| S8 x 18.4              | (S200 x 27.4) | 4"                                | (102) | 0.425            | (10.8) |
| S8 x 23                | (S200 x 34)   | 4 <sup>1</sup> / <sub>8</sub> "   | (106) | 0.425            | (10.8) |
| S10 x 25.4             | (S250 x 37.8) | 4 <sup>5</sup> / <sub>8</sub> "   | (118) | 0.491            | (12.5) |
| S10 x 35               | (S250 x 52)   | 4 <sup>15</sup> / <sub>16</sub> " | (126) | 0.491            | (12.5) |
| S12 x 31.8             | (S310 x 47.3) | 5"                                | (127) | 0.544            | (13.8) |
| S12 x 35               | (S310 x 52)   | 5 <sup>1</sup> / <sub>16</sub> "  | (129) | 0.544            | (13.8) |
| S12 x 40.8             | (S310 x 60.7) | 5 <sup>1</sup> / <sub>4</sub> "   | (133) | 0.659            | (16.7) |
| S12 x 50               | (S310 x 74)   | 5 <sup>1</sup> / <sub>2</sub> "   | (139) | 0.659            | (16.7) |
| S15 x 42.9             | (S380 x 64)   | 5 <sup>1</sup> / <sub>2</sub> "   | (140) | 0.622            | (15.8) |
| S15 x 50               | (S380 x 74)   | 5 <sup>5</sup> / <sub>8</sub> "   | (143) | 0.622            | (15.8) |
| S18 x 54.7             | (S460 x 81.4) | 6"                                | (152) | 0.691            | (17.6) |
| S18 x 70               | (S460 x 104)  | 6 <sup>1</sup> / <sub>4</sub> "   | (159) | 0.691            | (17.6) |
| S20 x 66               | (S510 x 98.2) | 6 <sup>1</sup> / <sub>4</sub> "   | (159) | 0.795            | (20.2) |
| S20 x 75               | (S510 x 112)  | 6 <sup>3</sup> / <sub>8</sub> "   | (162) | 0.795            | (20.2) |
| S20 x 86               | (S510 x 128)  | 7 <sup>1</sup> / <sub>16</sub> "  | (179) | 0.920            | (23.4) |
| S20 x 96               | (S510 x 143)  | 7 <sup>3</sup> / <sub>16</sub> "  | (183) | 0.920            | (23.4) |
| S24 x 80               | (S610 x 119)  | 7"                                | (178) | 0.870            | (22.1) |
| S24 x 90               | (S610 x 134)  | 7 <sup>1</sup> / <sub>8</sub> "   | (181) | 0.870            | (22.1) |
| S24 x 100              | (S610 x 149)  | 7 <sup>1</sup> / <sub>4</sub> "   | (184) | 0.870            | (22.1) |
| S24 x 106              | (S610 x 158)  | 7 <sup>7</sup> / <sub>8</sub> "   | (200) | 1.090            | (27.7) |
| S24 x 121              | (S610 x 180)  | 8 <sup>1</sup> / <sub>16</sub> "  | (204) | 1.090            | (27.7) |

Dimensions taken from ASTM A6-86.



### American Standard 'C' Shape I-Beams

| Designation<br>Nominal Depth & Weight<br>In. x Lbs./Ft.(mm x kg/m) |               | Flange Width<br>$b_f$<br>in. mm   |       | Flange thickness<br>$t_f$<br>in. mm |        |
|--------------------------------------------------------------------|---------------|-----------------------------------|-------|-------------------------------------|--------|
| C3 x 4.1                                                           | (C75 x 6.1)   | 1 <sup>3</sup> / <sub>8</sub> "   | (35)  | 0.273                               | (6.9)  |
| C3 x 5                                                             | (C75 x 7.4)   | 1 <sup>1</sup> / <sub>2</sub> "   | (37)  | 0.273                               | (6.9)  |
| C3 x 6                                                             | (C75 x 8.9)   | 1 <sup>5</sup> / <sub>8</sub> "   | (40)  | 0.273                               | (6.9)  |
| C4 x 5.4                                                           | (C100 x 8)    | 1 <sup>9</sup> / <sub>16</sub> "  | (40)  | 0.296                               | (7.5)  |
| C4 x 7.25                                                          | (C100 x 10.8) | 1 <sup>3</sup> / <sub>4</sub> "   | (44)  | 0.296                               | (7.5)  |
| C5 x 6.7                                                           | (C130 x 10)   | 1 <sup>3</sup> / <sub>4</sub> "   | (44)  | 0.320                               | (8.1)  |
| C5 x 9                                                             | (C130 x 13.4) | 1 <sup>7</sup> / <sub>8</sub> "   | (47)  | 0.320                               | (8.1)  |
| C6 x 8.2                                                           | (C150 x 12.2) | 1 <sup>15</sup> / <sub>16</sub> " | (48)  | 0.343                               | (8.7)  |
| C6 x 10.5                                                          | (C150 x 15.6) | 2"                                | (51)  | 0.343                               | (8.7)  |
| C6 x 13                                                            | (C150 x 19.3) | 2 <sup>1</sup> / <sub>8</sub> "   | (54)  | 0.343                               | (8.7)  |
| C7 x 9.8                                                           | (C180 x 14.6) | 2 <sup>1</sup> / <sub>16</sub> "  | (53)  | 0.366                               | (9.3)  |
| C7 x 12.25                                                         | (C180 x 18.2) | 2 <sup>3</sup> / <sub>16</sub> "  | (55)  | 0.366                               | (9.3)  |
| C7 x 14.75                                                         | (C180 x 22)   | 2 <sup>1</sup> / <sub>4</sub> "   | (57)  | 0.366                               | (9.3)  |
| C8 x 11.5                                                          | (C200 x 17.1) | 2 <sup>1</sup> / <sub>4</sub> "   | (57)  | 0.390                               | (9.9)  |
| C8 x 13.75                                                         | (C200 x 20.5) | 2 <sup>3</sup> / <sub>8</sub> "   | (59)  | 0.390                               | (9.9)  |
| C8 x 18.75                                                         | (C200 x 27.9) | 2 <sup>1</sup> / <sub>2</sub> "   | (63)  | 0.390                               | (9.9)  |
| C9 x 13.4                                                          | (C230 x 19.9) | 2 <sup>7</sup> / <sub>16</sub> "  | (61)  | 0.413                               | (10.5) |
| C9 x 15                                                            | (C230 x 22)   | 2 <sup>1</sup> / <sub>2</sub> "   | (63)  | 0.413                               | (10.5) |
| C9 x 20                                                            | (C230 x 30)   | 2 <sup>5</sup> / <sub>8</sub> "   | (67)  | 0.413                               | (10.5) |
| C10 x 15.3                                                         | (C250 x 22.8) | 2 <sup>5</sup> / <sub>8</sub> "   | (67)  | 0.436                               | (11.1) |
| C10 x 20                                                           | (C250 x 30)   | 2 <sup>3</sup> / <sub>4</sub> "   | (69)  | 0.436                               | (11.1) |
| C10 x 25                                                           | (C250 x 37)   | 2 <sup>7</sup> / <sub>8</sub> "   | (73)  | 0.436                               | (11.1) |
| C10 x 30                                                           | (C250 x 45)   | 3"                                | (76)  | 0.436                               | (11.1) |
| C12 x 20.7                                                         | (C310 x 30.8) | 2 <sup>15</sup> / <sub>16</sub> " | (74)  | 0.501                               | (12.7) |
| C12 x 25                                                           | (C310 x 37)   | 3"                                | (76)  | 0.501                               | (12.7) |
| C12 x 30                                                           | (C310 x 45)   | 3 <sup>1</sup> / <sub>8</sub> "   | (80)  | 0.501                               | (12.7) |
| C15 x 33.9                                                         | (C380 x 50.4) | 3 <sup>3</sup> / <sub>8</sub> "   | (86)  | 0.650                               | (16.5) |
| C15 x 40                                                           | (C380 x 60)   | 3 <sup>1</sup> / <sub>2</sub> "   | (89)  | 0.650                               | (16.5) |
| C15 x 50                                                           | (C380 x 74)   | 3 <sup>3</sup> / <sub>4</sub> "   | (94)  | 0.650                               | (16.5) |
| C18 x 42.7                                                         | (C460 x 63.5) | 4"                                | (102) | 0.625                               | (15.8) |
| C18 x 45.8                                                         | (C460 x 68.1) | 4"                                | (102) | 0.625                               | (15.8) |
| C18 x 51.9                                                         | (C460 x 77.2) | 4 <sup>1</sup> / <sub>8</sub> "   | (106) | 0.625                               | (15.8) |
| C18 x 58                                                           | (C460 x 86.3) | 4 <sup>1</sup> / <sub>4</sub> "   | (112) | 0.625                               | (15.8) |

## Trapeze hangers using B-Line series strut or angle iron

| Trapeze Length |          | Nominal Pipe Size                |                                  |                                   |                                   |
|----------------|----------|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|
| in.            | (mm)     | 2 1/2" (65) or less              | 3" (80)                          | 3 1/2" (90)                       | 4" (100)                          |
| 18"            | (457.2)  | 1 1/2" x 1 1/2" x 3/16"<br>B26SH | 1 1/2" x 1 1/2" x 3/16"<br>B26SH | 1 1/2" x 1 1/2" x 3/16"<br>B26SH  | 2" x 1 1/2" x 3/16"<br>B22SH      |
| 24"            | (609.6)  | 1 1/2" x 1 1/2" x 3/16"<br>B26SH | 2" x 1 1/2" x 3/16"<br>B22SH     | 2" x 1 1/2" x 3/16"<br>B22SH      | 2" x 1 1/2" x 3/16"<br>B22SH      |
| 30"            | (762.0)  | 2" x 1 1/2" x 3/16"<br>B22SH     | 2" x 1 1/2" x 3/16"<br>B22SH     | 2" x 1 1/2" x 3/16"<br>B22SH      | 2" x 1 1/2" x 3/16"<br>B22SH      |
| 36"            | (914.4)  | 2" x 1 1/2" x 3/16"<br>B22SH     | 2" x 1 1/2" x 3/16"<br>B22SH     | 2 1/2" x 1 1/2" x 3/16"<br>B12SH  | 2 1/2" x 1 1/2" x 3/16"<br>B12SH  |
| 48"            | (1219.2) | 2 1/2" x 1 1/2" x 3/16"<br>B12SH | 2 1/2" x 1 1/2" x 3/16"<br>B12SH | 2 1/2" x 1 1/2" x 3/16"<br>B12SH  | 3" x 2" x 3/16"<br>B11SH          |
| 60"            | (1524.0) | 2 1/2" x 1 1/2" x 3/16"<br>B12SH | 2 1/2" x 1 1/2" x 3/16"<br>B12SH | 3" x 2" x 3/16"<br>B11SH          | 3" x 2" x 3/16"<br>B11SH          |
| 72"            | (1828.8) | 2 1/2" x 1 1/2" x 3/16"<br>B12SH | 3" x 2" x 3/16"<br>B11SH         | 3" x 2" x 3/16"<br>B11SH          | 3" x 2" x 1/4"<br>B11SH           |
| 84"            | (2133.6) | 3" x 2" x 3/16"<br>B11SH         | 3" x 2" x 3/16"<br>B11SH         | 3" x 2" x 1/4"<br>B11SH           | 3" x 2" x 1/4"<br>B11SH           |
| 96"            | (2438.4) | 3" x 2" x 3/16"<br>B11SH         | 3" x 2" x 1/4"<br>B11SH          | 3" x 2" x 1/4"<br>B11SH           | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA |
| 108"           | (2743.2) | 3" x 2" x 3/16"<br>B11SH         | 3" x 2" x 1/4"<br>B11SH          | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA |
| 120"           | (3048.0) | 3" x 2" x 1/4"<br>B11SH          | 3" x 2" x 1/4"<br>B11SH          | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA |

Based on NFPA 13-1999, Table 6-1.1.3 (a) &amp; Table 6-1.1.3 (b).

## Trapeze hangers using B-Line series strut or angle iron

| Trapeze Length |          | Nominal Pipe Size                 |                                   |                                   |                                   |
|----------------|----------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| in.            | (mm)     | 5" (125) or less                  | 6" (150)                          | 8" (200)                          | 10" (250)                         |
| 18"            | (457.2)  | 2" x 1 1/2" x 3/16"<br>B22SH      | 2 1/2" x 1 1/2" x 3/16"<br>B12SH  | 3" x 2" x 3/16"<br>B11SH          | 3" x 2" x 1/4"<br>B11SH           |
| 24"            | (609.6)  | 2 1/2" x 1 1/2" x 3/16"<br>B12SH  | 2 1/2" x 1 1/2" x 3/16"<br>B12SH  | 3" x 2" x 3/16"<br>B11SH          | 3" x 2" x 1/4"<br>B11SH           |
| 30"            | (762.0)  | 2 1/2" x 1 1/2" x 3/16"<br>B12SH  | 3" x 2" x 3/16"<br>B11SH          | 3" x 2" x 1/4"<br>B11SH           | 3" x 2" x 1/4"<br>B11SH           |
| 36"            | (914.4)  | 3" x 2" x 3/16"<br>B11SH          | 3" x 2" x 3/16"<br>B11SH          | 3 1/2" x 2 1/2" x 1/4"<br>B12SHA  | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA |
| 48"            | (1219.2) | 3" x 2" x 3/16"<br>B11SH          | 3" x 2" x 1/4"<br>B11SH           | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA | 4" x 3" x 5/16"<br>B12SHA         |
| 60"            | (1524.0) | 3" x 2" x 1/4"<br>B11SH           | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA | 4" x 3" x 5/16"<br>B12SHA         | 5" x 3 1/2" x 5/16"<br>B11SHA     |
| 72"            | (1828.8) | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA | 4" x 3" x 5/16"<br>B12SHA         | 4" x 3" x 5/16"<br>B12SHA         | 5" x 3 1/2" x 5/16"<br>B11SHA     |
| 84"            | (2133.6) | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA | 4" x 3" x 5/16"<br>B12SHA         | 5" x 3 1/2" x 5/16"<br>B11SHA     | 6" x 4" x 1/4"<br>B12SHA4         |
| 96"            | (2438.4) | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA | 4" x 3" x 5/16"<br>B12SHA         | 5" x 3 1/2" x 5/16"<br>B11SHA     | 6" x 4" x 1/4"<br>B12SHA4         |
| 108"           | (2743.2) | 3 1/2" x 2 1/2" x 5/16"<br>B12SHA | 4" x 3" x 5/16"<br>B12SHA         | 5" x 3 1/2" x 5/16"<br>B11SHA     | 6" x 4" x 3/8"<br>B11SHA4         |
| 120"           | (3048.0) | 4" x 3" x 5/16"<br>B12SHA         | 5" x 3 1/2" x 5/16"<br>B11SHA     | 6" x 4" x 1/4"<br>B12SHA4         | 6" x 4" x 3/8"<br>B11SHA4         |

Based on NFPA 13-1999, Table 6-1.1.3 (a) &amp; Table 6-1.1.3 (b).

## MSS To B-Line series & Federal Specification Cross Reference

| MSS SP-69<br>MSS SP-58 | B-Line series<br>Part No. | A-A-1192A<br>WW-H-171E | MSS SP-69<br>MSS SP-58 | B-Line series<br>Part No.             | A-A-1192A<br>WW-H-171E |
|------------------------|---------------------------|------------------------|------------------------|---------------------------------------|------------------------|
| Type 1                 | B3100                     | Type 1                 | Type 19                | B321                                  | Type 19                |
| Type 1                 | B3100C                    | Type 1                 | Type 19                | B3031                                 | Type 19                |
| Type 1                 | B3100F                    | Type 1                 | Type 19 & 23           | B3033                                 | Type 19 & 23           |
| Type 1                 | B3102                     | Type 1                 | Type 19 & 23           | B3034                                 | Type 19 & 23           |
| Type 1 *               | B3104                     | Type 12                | Type 21                | B3050                                 | Type 21                |
| Type 1                 | B3104CT                   | Type 12                | Type 21                | B3055                                 | Type 21                |
| Type 1                 | B3106                     | —                      | Type 22                | B3083                                 | Type 22                |
| Type 1                 | B3108                     | Type 1                 | Type 23                | B351L                                 | Type 23                |
| Type 1                 | B3109                     | —                      | Type 23                | B3036L                                | Type 23                |
| Type 3                 | B3144                     | Type 3                 | Type 23                | B3037                                 | Type 23                |
| Type 3                 | B3146                     | Type 3                 | Type 24                | B3188                                 | Type 24                |
| Type 4                 | B3140                     | Type 4                 | Type 24                | B3188C                                | Type 24                |
| Type 4                 | B3141                     | Type 4                 | Type 25                | B3045                                 | Type 53                |
| Type 4                 | B3142                     | Type 4                 | Type 26                | B2400                                 | Type 26                |
| Type 5                 | B3690                     | —                      | Type 26                | B3180                                 | Type 26                |
| Type 5                 | B3690C                    | —                      | Type 26                | B3180FL                               | Type 26                |
| Type 5                 | B3690F                    | —                      | Type 27                | B3040                                 | Type 54                |
| Type 6                 | B3171                     | Type 6                 | Type 28                | B3291, B3292<br>B3294, B3296<br>B3298 | Type 28                |
| Type 8                 | B3373                     | Type 8                 | Type 29                | B3293, B3295<br>B3297                 | Type 29                |
| Type 8                 | B3373C                    | Type 8                 | Type 30                | B3054                                 | Type 30                |
| Type 8                 | B3373CT                   | Type 8                 | Type 31                | B3065                                 | Type 32                |
| Type 8                 | B3373CTC                  | Type 8                 | Type 31                | B3068                                 | Type 32                |
| Type 10                | 200                       | Type 10                | Type 32                | B3066                                 | Type 33                |
| Type 10                | 200C                      | Type 10                | Type 33                | B3067                                 | Type 34                |
| Type 10                | 200F                      | Type 10                | Type 34                | B3058                                 | Type 35                |
| Type 10                | 200H                      | Type 10                | Type 34                | B3060                                 | Type 35                |
| Type 10                | 2                         | Type 10                | Type 34                | B3060L                                | Type 35                |
| Type 10                | B3170CT                   | Type 10                | Type 34                | B3062                                 | Type 35                |
| Type 10                | B3170CTC                  | Type 10                | Type 34                | B3070                                 | Type 35                |
| Type 10                | 2F                        | Type 10                | Type 35                | B3891-B3897                           | Type 35                |
| Type 12                | B3198H                    | Type 25                | Type 35                | B3991 & B3993                         | Type 35                |
| Type 12                | B3198HCT                  | Type 25                | Type 36                | B3095                                 | Type 37                |
| Type 12                | B3198R                    | Type 25                | Type 37                | B3090                                 | Type 38                |
| Type 12                | B3198RCT                  | Type 25                | Type 37                | B3092                                 | Type 38                |
| Type 13                | B3202                     | Type 13                | Type 37                | B3094                                 | Type 38                |
| Type 14                | B3201                     | Type 14                | Type 37                | B3097                                 | Type 38                |
| Type 15                | B3224                     | Type 15                | Type 38                | B3093                                 | Type 39                |
| Type 15                | B3224CT                   | Type 15                | Type 38                | B3096                                 | Type 39                |
| Type 16                | B3222                     | Type 16                | Type 39A & 39B         | B3160-B3165                           | Type 40A & 40B         |
| Type 17                | B3200                     | Type 17                | Type 40                | B3151                                 | Type 41                |
| Type 18                | B221, B321, B521          | —                      | Type 41                | B3114                                 | Type 42                |
| Type 18                | B2500                     | Type 19                | Type 41                | B3122                                 | Type 42                |
| Type 18                | B2503                     | —                      | Type 41                | B3122A                                | Type 42                |
| Type 18                | B2505-B2508               | —                      | Type 43                | B3110                                 | Type 44                |
| Type 18                | B3014                     | Type 18                | Type 44                | B3117SL                               | Type 45                |
| Type 19                | 65                        | Type 23                | Type 44                | B3120                                 | Type 45                |
| Type 19                | 65XT                      | Type 23                | Type 45                | B3119SL                               | Type 46                |
| Type 19                | 66                        | Type 23                | Type 46                | B3118SL                               | Type 47                |
| Type 19                | 67SS                      | —                      | Type 48                | B3262                                 | Type 49                |
| Type 19                | 68S                       | Type 23                | Type 49                | B3264                                 | Type 50                |
| Type 19                | 68SS                      | —                      | Type 57                | B3080S & L                            | —                      |
| Type 19                | 68W                       | Type 23                |                        |                                       |                        |
| Type 19                | B303-B309                 | Type 19                |                        |                                       |                        |

\* For all finishes excluding plain.

## Federal specification to B-Line series &amp; MSS cross reference

| A-A-1192A<br>WW-H-171E | B-Line series<br>Part No. | MSS SP-69<br>MSS SP-58 | A-A-1192A<br>WW-H-171E | B-Line series<br>Part No.             | MSS SP-69<br>MSS SP-58 |
|------------------------|---------------------------|------------------------|------------------------|---------------------------------------|------------------------|
| —                      | B3106                     | Type 1                 | Type 23                | 65 & 65XT                             | Type 19                |
| —                      | B3109                     | Type 1                 | Type 23                | 66                                    | Type 19                |
| —                      | B3690                     | Type 5                 | Type 23                | 68S & 68W                             | Type 19                |
| —                      | B3690C                    | Type 5                 | Type 23                | B351L                                 | Type 23                |
| —                      | B3690F                    | Type 5                 | Type 23                | B3036L                                | Type 23                |
| —                      | B22I, B32I, B52I          | Type 18                | Type 23                | B3037                                 | Type 23                |
| —                      | B2503                     | Type 18                | Type 24                | B3188                                 | Type 24                |
| —                      | B2505-B2508               | Type 18                | Type 24                | B3188C                                | Type 24                |
| —                      | 67SS                      | Type 19                | Type 25                | B3198H                                | Type 12                |
| —                      | 68SS                      | Type 19                | Type 25                | B3198HCT                              | Type 12                |
| —                      | B3080 S & L               | Type 57                | Type 25                | B3198R                                | Type 12                |
| Type 1                 | 1NFPA                     | Type 1                 | Type 25                | B3198RCT                              | Type 12                |
| Type 1                 | B3100                     | Type 1                 | Type 26                | B2400                                 | Type 26                |
| Type 1                 | B3100C                    | Type 1                 | Type 26                | B3180                                 | Type 26                |
| Type 1                 | B3100F                    | Type 1                 | Type 26                | B3180FL                               | Type 26                |
| Type 1                 | B3102                     | Type 1                 |                        | B3291, B3292<br>B3294, B3296<br>B3298 | Type 28                |
| Type 1                 | B3104                     | Type 1                 | Type 28                |                                       |                        |
| Type 1                 | B3108                     | Type 1                 |                        | B3293, B3295<br>B3297                 | Type 29                |
| Type 3                 | B3144                     | Type 3                 | Type 29                |                                       |                        |
| Type 3                 | B3146                     | Type 3                 | Type 30                | B3054                                 | Type 30                |
| Type 4                 | B3140                     | Type 4                 | Type 32                | B3065                                 | Type 31                |
| Type 4                 | B3141                     | Type 4                 | Type 32                | B3068                                 | Type 31                |
| Type 4                 | B3142                     | Type 4                 | Type 33                | B3066                                 | Type 32                |
| Type 6                 | B3171                     | Type 6                 | Type 34                | B3067                                 | Type 33                |
| Type 8                 | B3373                     | Type 8                 | Type 35                | B3058                                 | Type 34                |
| Type 8                 | B3373C                    | Type 8                 | Type 35                | B3060                                 | Type 34                |
| Type 8                 | B3373CT                   | Type 8                 | Type 35                | B3060L                                | Type 34                |
| Type 8                 | B3373CTC                  | Type 8                 | Type 35                | B3062                                 | Type 34                |
| Type 10                | 200                       | Type 10                | Type 35                | B3070                                 | Type 34                |
| Type 10                | 200C                      | Type 10                | Type 35                | B3891-B3897                           | Type 35                |
| Type 10                | 200F                      | Type 10                | Type 35                | B3991 & B3993                         | Type 35                |
| Type 10                | 200H                      | Type 10                | Type 37                | B3095                                 | Type 36                |
| Type 10                | 2 & 2F                    | Type 10                | Type 38                | B3090                                 | Type 37                |
| Type 10                | B3170CT                   | Type 10                | Type 38                | B3092                                 | Type 37                |
| Type 10                | B3170CTC                  | Type 10                | Type 38                | B3094                                 | Type 37                |
| Type 12                | B3104                     | Type 1 *               | Type 38                | B3097                                 | Type 37                |
| Type 12                | B3104C                    | Type 1 *               | Type 39                | B3093                                 | Type 38                |
| Type 12                | B3104CT                   | Type 1                 | Type 39                | B3096                                 | Type 38                |
| Type 13                | B3202                     | Type 13                | Type 40A & 40B         | B3160-3165                            | Type 39A & 39B         |
| Type 14                | B3201                     | Type 14                | Type 41                | B3151                                 | Type 40                |
| Type 15                | B3224                     | Type 15                | Type 42                | B3114                                 | Type 41                |
| Type 15                | B3224CT                   | Type 15                | Type 42                | B3122                                 | Type 41                |
| Type 16                | B3222                     | Type 16                | Type 42                | B3122A                                | Type 41                |
| Type 17                | B3200                     | Type 17                | Type 44                | B3110                                 | Type 43                |
| Type 18                | B3014                     | Type 18                | Type 45                | B3117SL                               | Type 44                |
| Type 19                | B303-B309                 | Type 19                | Type 45                | B3120                                 | Type 44                |
| Type 19                | B321                      | Type 19                | Type 46                | B3119SL                               | Type 45                |
| Type 19                | B2500                     | Type 18                | Type 47                | B3118SL                               | Type 46                |
| Type 19                | B3031                     | Type 19                | Type 49                | B3262                                 | Type 48                |
| Type 19 & 23           | B3033                     | Type 19 & 23           | Type 50                | B3264                                 | Type 49                |
| Type 19 & 23           | B3034                     | Type 19 & 23           | Type 53                | B3045                                 | Type 25                |
| Type 21                | B3050                     | Type 21                | Type 54                | B3040                                 | Type 27                |
| Type 21                | B3055                     | Type 21                |                        |                                       |                        |
| Type 22                | B3083                     | Type 22                |                        |                                       |                        |

\* For all finishes excluding plain.

# Reference Data

## B-Line series compliances & approvals

| Part No. | ANSI/MSS SP-69<br>ANSI/MSS SP-58 | A-A-1192A<br>WW-H-171E | UL<br>Listed | FM<br>Approved |
|----------|----------------------------------|------------------------|--------------|----------------|
| 1NFPA    | Type 1                           | Type 1                 | Yes          | Yes            |
| 2        | Type 10                          | Type 10                | Yes          | Yes            |
| 2F       | Type 10                          | Type 10                | Yes          | Yes            |
| 4B       | —                                | —                      | Yes          | —              |
| 4L       | —                                | —                      | Yes          | Yes            |
| 22       | —                                | —                      | Yes          | —              |
| 22L2     | —                                | —                      | Yes          | —              |
| 23       | —                                | —                      | Yes          | —              |
| 24       | —                                | —                      | Yes          | —              |
| 25       | —                                | —                      | Yes          | —              |
| 28       | —                                | —                      | Yes          | —              |
| 28M      | —                                | —                      | Yes          | —              |
| 29       | —                                | —                      | Yes          | —              |
| 50       | —                                | —                      | Yes          | Yes            |
| 51       | —                                | —                      | Yes          | Yes            |
| 56       | —                                | —                      | Yes          | Yes            |
| 58       | —                                | —                      | Yes          | Yes            |
| 65       | —                                | —                      | Yes          | —              |
| 65XT     | —                                | —                      | Yes          | Yes            |
| 66       | —                                | —                      | Yes          | —              |
| 67SS     | —                                | —                      | Yes          | —              |
| 68S      | Type 19 & 23                     | Type 19 & 23           | Yes          | Yes            |
| 68SS     | —                                | —                      | Yes          | —              |
| 68V      | Type 19 & 23                     | Type 19 & 23           | Yes          | Yes            |
| 69       | —                                | —                      | Yes          | —              |
| 69R      | —                                | —                      | Yes          | —              |
| 75       | —                                | —                      | Yes          | —              |
| 78       | —                                | —                      | Yes          | —              |
| 120RWA   | —                                | —                      | Yes          | —              |
| 130      | —                                | —                      | Yes          | Yes            |
| 200      | Type 10                          | Type 10                | Yes          | Yes            |
| 200C     | Type 10                          | Type 10                | —            | —              |
| 200F     | Type 10                          | Type 10                | —            | —              |
| 200H     | Type 10                          | Type 10                | Yes          | —              |
| 200M     | Type 10                          | Type 10                | Yes          | Yes            |
| 800      | —                                | —                      | Yes          | Yes            |
| 825      | —                                | —                      | Yes          | Yes            |
| 825A     | —                                | —                      | Yes          | —              |
| 828      | —                                | —                      | Yes          | Yes            |
| 906      | —                                | —                      | Yes          | —              |
| 909      | —                                | —                      | Yes          | —              |
| 910      | —                                | —                      | Yes          | —              |
| 975      | —                                | —                      | Yes          | —              |

| Part No.    | ANSI/MSS SP-69<br>ANSI/MSS SP-58 | A-A-1192A<br>WW-H-171E | UL<br>Listed | FM<br>Approved |
|-------------|----------------------------------|------------------------|--------------|----------------|
| 980         | —                                | —                      | Yes          | Yes            |
| 980H        | —                                | —                      | —            | —              |
| 1000        | —                                | —                      | Yes          | Yes            |
| 1001        | —                                | —                      | Yes          | Yes            |
| 2002        | —                                | —                      | Yes          | —              |
| B22I        | Type 18                          | —                      | —            | —              |
| B32I        | Type 18                          | —                      | —            | —              |
| B52I        | Type 18                          | —                      | —            | —              |
| B351L       | Type 23                          | Type 23                | Yes          | —              |
| B2400       | Type 26                          | Type 26                | Yes          | —              |
| B2500       | Type 18                          | Type 19                | Yes          | —              |
| B2501       | —                                | —                      | Yes          | —              |
| B2503       | Type 18                          | —                      | —            | —              |
| B2505-B2508 | Type 18                          | —                      | Yes          | —              |
| B3014       | Type 18                          | Type 18                | Yes          | —              |
| B3031       | Type 19                          | Type 19                | Yes          | —              |
| B3033       | Type 19 & 23                     | Type 19 & 23           | Yes          | Yes            |
| B3034       | Type 19 & 23                     | Type 19 & 23           | Yes          | Yes            |
| B3036L      | Type 23                          | Type 23                | Yes          | —              |
| B3037       | Type 23                          | Type 23                | Yes          | —              |
| B3040       | Type 27                          | Type 27                | —            | —              |
| B3042T      | —                                | —                      | Yes          | —              |
| B3045       | Type 25                          | Type 53                | —            | —              |
| B3050       | Type 21                          | Type 21                | —            | —              |
| B3054       | Type 30                          | Type 30                | Yes          | —              |
| B3055       | Type 21                          | Type 21                | —            | —              |
| B3058       | Type 34                          | Type 35                | —            | —              |
| B3060       | Type 34                          | Type 35                | —            | —              |
| B3060L      | Type 34                          | Type 35                | —            | —              |
| B3062       | Type 34                          | Type 35                | —            | —              |
| B3065       | Type 31                          | Type 32                | —            | —              |
| B3066       | Type 32                          | Type 33                | —            | —              |
| B3067       | Type 33                          | Type 34                | —            | —              |
| B3068       | Type 31                          | Type 32                | —            | —              |
| B3070       | Type 34                          | Type 35                | —            | —              |
| B3080S & L  | Type 57                          | —                      | —            | —              |
| B3083       | Type 22                          | Type 22                | —            | —              |
| B3090       | Type 37                          | Type 38                | —            | —              |
| B3092       | Type 37                          | Type 38                | —            | —              |
| B3093       | Type 38                          | Type 39                | —            | —              |
| B3094       | Type 37                          | Type 38                | —            | —              |
| B3095       | Type 36                          | Type 37                | —            | —              |
| B3096       | Type 38                          | Type 39                | —            | —              |

Note: Refer to the catalog page for specific sizes that are UL Listed and/or FM Approved.

| Part No.    | ANSI/MSS SP-69<br>ANSI/MSS SP-58 | A-A-1192A<br>WW-H-171E | UL<br>Listed | FM<br>Approved |
|-------------|----------------------------------|------------------------|--------------|----------------|
| B3097       | Type 37                          | Type 38                | —            | —              |
| B3100       | Type 1                           | Type 1                 | Yes          | Yes            |
| B3100C      | Type 1                           | Type 1                 | —            | —              |
| B3100F      | Type 1                           | Type 1                 | —            | —              |
| B3102       | Type 1                           | —                      | —            | —              |
| B3104       | Type 1 *                         | Type 12                | Yes          | —              |
| B3104C      | Type 1 *                         | Type 12                | —            | —              |
| B3104CT     | Type 1                           | Type 12                | —            | —              |
| B3104CTC    | Type 1                           | Type 12                | —            | —              |
| B3104F      | Type 1 *                         | Type 12                | —            | —              |
| B3106       | Type 1                           | —                      | —            | —              |
| B3108       | Type 1                           | Type 1                 | —            | —              |
| B3109       | Type 1                           | —                      | —            | —              |
| B3110       | Type 43                          | Type 44                | —            | —              |
| B3114       | Type 41                          | Type 42                | —            | —              |
| B3117SL     | Type 44                          | Type 45                | —            | —              |
| B3118SL     | Type 46                          | Type 47                | —            | —              |
| B3119SL     | Type 45                          | Type 46                | —            | —              |
| B3120       | Type 44                          | Type 45                | —            | —              |
| B3122       | Type 41                          | Type 42                | —            | —              |
| B3122A      | Type 41                          | Type 42                | —            | —              |
| B3140       | Type 4                           | Type 4                 | Yes          | Yes            |
| B3141       | Type 4                           | Type 4                 | —            | —              |
| B3142       | Type 4                           | Type 4                 | —            | —              |
| B3144       | Type 3                           | Type 3                 | —            | —              |
| B3146       | Type 3                           | Type 3                 | —            | —              |
| B3151       | Type 40                          | Type 41                | —            | —              |
| B3160-B3165 | Type 39A & 39B                   | Type 40A & 40B         | —            | —              |
| B3170CT     | Type 10                          | Type 10                | —            | —              |
| B3170CTC    | Type 10                          | Type 10                | —            | —              |
| B3180       | Type 26                          | Type 26                | —            | —              |
| B3180FL     | Type 26                          | Type 26                | —            | —              |
| B3184       | —                                | —                      | Yes          | —              |
| B3188       | Type 24                          | Type 24                | Yes          | —              |
| B3188C      | Type 24                          | Type 24                | —            | —              |
| B3198H      | Type 12                          | Type 25                | —            | —              |
| B3198HCT    | Type 12                          | Type 25                | —            | —              |
| B3198R      | Type 12                          | Type 25                | —            | —              |
| B3198RCT    | Type 12                          | Type 25                | —            | —              |
| B3200       | Type 17                          | Type 17                | —            | —              |
| B3201       | Type 14                          | Type 14                | —            | —              |
| B3202       | Type 13                          | Type 13                | —            | —              |

[illegible]

## B-Line series Fire Protection Solutions

# Reference Data - B-Line series to TOLCO cross

| B-Line series | TOLCO       | B-Line series | TOLCO        | B-Line series | TOLCO        |
|---------------|-------------|---------------|--------------|---------------|--------------|
| 1CBS          | 1CBS        | 909           | 909          | B3031         | N/A          |
| 1U (Disc.)    | 1U (Disc.)  | 910           | 910          | B3033         | 68, 68W      |
| 4A (Disc.)    | 4A (Disc.)  | 975           | 975          | B3034         | 68S          |
| 4B            | 4B          | 980           | 980          | B3036L        | N/A          |
| 4L            | 4L          | 980H          | 980H         | B3037         | N/A          |
| 4LA (Disc.)   | 4LA (Disc.) | 981           | 981          | B3040         | 336 (Disc.)  |
| 22            | 22          | 985           | 985          | B3042         | 61 (Disc.)   |
| 22L2          | 22L2        | 986           | 986          | B3042T        | 61T (Disc.)  |
| 23            | 23          | 990           | 990          | B3045         | 335 (Disc.)  |
| 24            | 24          | 990H          | 990H         | B3050         | 62 (Disc.)   |
| 25            | 25          | 991           | 991          | B3052 (Disc.) | 130          |
| 27B           | 27B         | 1000          | 1000         | B3054         | 329 (Disc.)  |
| 28            | 28          | 1001          | 1001         | B3055         | N/A          |
| 28M           | 28M         | 2002          | 2002         | B3058         | N/A          |
| 29            | 29          | ATR           | 99           | B3060         | 50           |
| 50            | 60          | ATR           | 100 (Disc.)  | B3060L        | N/A          |
| 51            | 51          | AWA           | 209 (Disc.)  | B3061         | 42 (Disc.)   |
| 56            | 56          | B22I          | N/A          | B3062         | N/A          |
| 58            | 58          | B32I          | N/A          | B3064         | N/A          |
| 65            | 65          | B52I          | N/A          | B3065         | 30L (Disc.)  |
| 65XT          | 65XT        | B200          | F13          | B3066         | 30M (Disc.)  |
| 66            | 66          | B201          | F14          | B3067         | 30H (Disc.)  |
| 67S           | 67S         | B202          | F15          | B3068         | 30 (Disc.)   |
| 67SS          | 67SS        | B202-1        | F16          | B3069E        | 31-O (Disc.) |
| 68SS          | 68SS        | B202-2        | F17          | B3069W        | 31-M (Disc.) |
| 68W           | 68W         | B218          | ROL-12       | B3070         | 52 (Disc.)   |
| 69            | 69          | B219          | ROL-13       | B3080 L & S   | 343 (Disc.)  |
| 69R           | 69R         | B303 - B309   | N/A          | B3082         | 337 (Disc.)  |
| 75            | 75          | B312 Series   | N/A          | B3083         | 305 (Disc.)  |
| 78            | 78          | B321 Series   | N/A          | B3083WO       | 304 (Disc.)  |
| 98            | 98          | B351L         | 64 (Disc.)   | B3084         | 33 (Disc.)   |
| 98B           | 98B         | B379          | ROL-14       | B3085         | 35 (Disc.)   |
| 109A          | 109A        | B386 (Disc.)  | 4B           | B3086         | 34 (Disc.)   |
| 109AF         | 109AF       | B479          | ROL-14       | B3088         | 316 (Disc.)  |
| 120           | 120         | B501          | 111 (Disc.)  | B3088S        | N/A          |
| 120MJ         | 120MJ       | B655          | 70 (Disc.)   | B3088ST       | N/A          |
| 120RWA        | 120RWA      | B656          | 70R (Disc.)  | B3088T        | 316T (Disc.) |
| 120W          | 120W        | B1999         | N/A          | B3089         | 319 (Disc.)  |
| 200           | 200         | B2400         | 2STR         | B3090         | 318 (Disc.)  |
| 200C          | 200C        | B2417         | N/A          | B3092         | 318A (Disc.) |
| 200F          | 200H        | B2499         | 107F (Disc.) | B3093         | 317A (Disc.) |
| 200H          | 200H        | B2500         | 310 (Disc.)  | B3094         | 314 (Disc.)  |
| 800           | 800         | B2501 (Disc.) | 109AF        | B3095         | 317 (Disc.)  |
| 825           | 825         | B2503         | N/A          | B3096         | 312 (Disc.)  |
| 825A          | 825A        | B2505 - B2508 | N/A          | B3097         | 311 (Disc.)  |
| 828           | 828         | B3014         | 309 (Disc.)  |               |              |
| 906           | 906         | B3014N        | 309N (Disc.) |               |              |
| 907           | 907         | B3019         | 109A         |               |              |

(Disc.) = Discontinued Item

## Reference Data - B-Line series to TOLCO cross

| B-Line series     | TOLCO                 | B-Line series    | TOLCO         | B-Line series                   | TOLCO             |
|-------------------|-----------------------|------------------|---------------|---------------------------------|-------------------|
| B3098             | 313 (Disc.)           | B3162            | 262 (Disc.)   | B3234                           | 116 (Disc.)       |
| B3100             | 1 (Disc.)             | B3163            | 263 (Disc.)   | B3248                           | 118 (Disc.)       |
| B3100C            | 1PVC (Disc.)          | B3164            | 264 (Disc.)   | B3256                           | 405 (Disc.)       |
| B3100F            | 1F (Disc.)            | B3165            | 265 (Disc.)   | B3257                           | 406 (Disc.)       |
| B3100PS (Disc.)   | 1CBS                  | B3170 (Disc.)    | 2             | B3262                           | 506 (Disc.)       |
| B3102             | 1CI (Disc.)           | B3170CT          | 202 (Disc.)   | B3264                           | 500 (Disc.)       |
| B3104             | 1LD (Disc.)           | B3170CTC         | N/A           | B3281 - B3287                   | 420 (Disc.)       |
| B3104C            | N/A                   | B3170F (Disc.)   | 2F            | B3281 - B3287                   | 421 (Disc.)       |
| B3104CT           | 81 (Disc.)            | B3170NF (Disc.)  | 200           | B3281 - B3287                   | 422 (Disc.)       |
| B3104CTC          | 81PVC (Disc.)         | B3170NF (Disc.)  | 200R (Disc.)  | B3281 - B3287                   | 422C (Disc.)      |
| B3104F            | N/A                   | B3170NFC (Disc.) | 200C          | B3291 - B3298                   | N/A               |
| B3106             | 1V (Disc.)            | B3170NFF (Disc.) | 200F          | B3362 - B3365                   | N/A               |
| B3106V            | 1VT (Disc.)           | B3171            | N/A           | B3367 (Disc.)                   | 69                |
| B3108             | 1A (Disc.)            | B3175            | N/A           | B3373                           | 6 (Disc.)         |
| B3109             | N/A                   | B3175CT          | N/A           | B3373C                          | 6PVC (Disc.)      |
| B3110             | 324 (Disc.)           | B3180            | 20 (Disc.)    | B3373CT                         | 82 (Disc.)        |
| B3114             | 322 (Disc.)           | B3180FL          | 20S (Disc.)   | B3373CTC                        | 82PVC (Disc.)     |
| B3114R            | N/A                   | B3181 (Disc.)    | 22            | B3373F                          | 6F (Disc.)        |
| B3117R            | N/A                   | B3182 (Disc.)    | 23            | B3380 - B3387                   | N/A               |
| B3117SL           | 327 (Disc.)           | B3183 (Disc.)    | 24            | B3690                           | 3 (Disc.)         |
| B3118SL           | 328 (Disc.)           | B3184            | N/A           | B3690C                          | 3PVC (Disc.)      |
| B3119SL           | N/A                   | B3188            | 110 (Disc.)   | B3690F                          | 3F (Disc.)        |
| B3120             | 325 (Disc.)           | B3188C           | N/A           | B3891                           | 425 (Disc.)       |
| B3122             | 326 (Disc.)           | B3190            | 40 (Disc.)    | B3891                           | 426 (Disc.)       |
| B3122A            | N/A                   | B3191            | 41 (Disc.)    | B3891                           | 429 (Disc.)       |
| B3124             | N/A                   | B3195            | 84 (Disc.)    | B3892                           | 430 (Disc.)       |
| B3126             | ROL-16                | B3195CT          | 83 (Disc.)    | B3894                           | N/A               |
| B3132             | 9 (Disc.)             | B3198H           | 302 (Disc.)   | B3895                           | N/A               |
| B3132W-1 & 11/2   | 9X (Disc.)            | B3198HCT         | 301CT (Disc.) | B3993-10                        | 428 (Disc.)       |
| B3134             | 14 (Disc.)            | B3199R           | 78            | B3393-10/B3393-10B              | 431 (Disc.)       |
| B3134W            | 14X (Disc.)           | B3199RCT         | N/A           | DS15x2                          | 125 (Disc.)       |
| B3140             | 4 (Disc.)             | B3200            | 330 (Disc.)   | DURA-BLOK™                      | Pipe Pier (Disc.) |
| B3140C            | 4PVC (Disc.)          | B3201            | 332 (Disc.)   | FFW                             | 119 (Disc.)       |
| B3140F            | 4F (Disc.)            | B3202            | 331 (Disc.)   | FW                              | 115 (Disc.)       |
| B3141             | 4CI (Disc.)           | B3203            | 333 (Disc.)   | HHN                             | 114 (Disc.)       |
| B3142             | 4H (Disc.)            | B3205            | 103 (Disc.)   | HN                              | 113 (Disc.)       |
| B3144             | 5 (Disc.)             | B3210            | 102 (Disc.)   | ISO                             | N/A               |
| B3146             | 5H (Disc.)            | B3210X           | 102L (Disc.)  | KwikClips™                      | N/A               |
| B3147A-1/2 thru 4 | 32-1/2 thru 4 (Disc.) | B3211            | 101 (Disc.)   | LW                              | 117 (Disc.)       |
| B3147B 4 thru 24  | 32-5 thru 34 (Disc.)  | B3211X           | 101L (Disc.)  | N2500                           | 310N (Disc.)      |
| B3148             | 7 (Disc.)             | B3212            | 104 (Disc.)   | Snap 'N Shields™ Clevis Hangers | N/A               |
| B3149             | 8 (Disc.)             | B3213            | 105 (Disc.)   | Snap 'N Shields™                | N/A               |
| B3151             | 220 (Disc.)           | B3214            | 106 (Disc.)   | Toggle Bolts                    | 123 (Disc.)       |
| B3153             | 219 (Disc.)           | B3220            | 71 (Disc.)    |                                 |                   |
| B3154             | 220 (Disc.)           | B3222            | 307 (Disc.)   |                                 |                   |
| B3155             | 219 (Disc.)           | B3223            | N/A           |                                 |                   |
| B3160             | 260 (Disc.)           | B3224            | 306 (Disc.)   |                                 |                   |
| B3161             | 261 (Disc.)           | B3227 (Disc.)    | N/A           |                                 |                   |

(Disc.) = Discontinued Item

# Reference Data - TOLCO to B-Line series cross

| TOLCO         | B-Line series    | TOLCO                 | B-Line series     | TOLCO          | B-Line series    |
|---------------|------------------|-----------------------|-------------------|----------------|------------------|
| 1 (Disc.)     | B3100            | 31-O (Disc.)          | B3069E            | 106 (Disc.)    | B3214            |
| 1A (Disc.)    | B3108            | 32-1/2 thru 4 (Disc.) | B3147A-1/2 thru 4 | 107F (Disc.)   | B2499            |
| 1CBS          | B3100PS (Disc.)  |                       |                   | 109A (Disc.)   | B3019 (Disc.)    |
| 1CI (Disc.)   | B3102            | 32-5 thru 34 (Disc.)  | B3147B 5 thru 24  | 109AF (Disc.)  | B2501            |
| 1F (Disc.)    | B3100F           |                       |                   | 110 (Disc.)    | B3188            |
| 1LD (Disc.)   | B3104            | 33 (Disc.)            | B3084             | 111 (Disc.)    | B501             |
| 1NFPA         | 1NFPA            | 34 (Disc.)            | B3086             | 113 (Disc.)    | HN               |
| 1PVC (Disc.)  | B3100C           | 35 (Disc.)            | B3085             | 114 (Disc.)    | HHN              |
| 1U (Disc.)    | 1U (Disc.)       | 40 (Disc.)            | B3190             | 115 (Disc.)    | FW               |
| 1V (Disc.)    | B3106            | 41 (Disc.)            | B3191             | 116 (Disc.)    | B3234            |
| 1VT (Disc.)   | B3106V           | 42 (Disc.)            | B3061             | 117 (Disc.)    | LW               |
| 2             | B3170 (Disc.)    | 50                    | 50                | 118 (Disc.)    | B3248            |
| 2F            | B3170F (Disc.)   | 51                    | 51                | 119 (Disc.)    | FFW              |
| 2FWON (Disc.) | N/A              | 52 (Disc.)            | B3070             | 120            | 120              |
| 2WON          | N/A              | 56                    | 56                | 120MJ          | 120MJ            |
| 3 (Disc.)     | B3690            | 58                    | 58                | 120RWA         | 120RWA           |
| 3F (Disc.)    | B3690F           | 60 (Disc.)            | N/A               | 120W           | 120W             |
| 3PVC (Disc.)  | B3690C           | 61 (Disc.)            | B3042             | 122 (Disc.)    | N/A              |
| 4 (Disc.)     | B3140            | 61T (Disc.)           | B3042T            | 123 (Disc.)    | Toggle Bolts     |
| 4A (Disc.)    | 4A (Disc.)       | 62 (Disc.)            | B3050             | 124 (Disc.)    | Toggle Bolt Head |
| 4B            | B386 (Disc.)     | 64 (Disc.)            | B351L             | 125 (Disc.)    | DS15x2           |
| 4CI (Disc.)   | B3141            | 65                    | 65                | 126 (Disc.)    | N/A              |
| 4F (Disc.)    | B3140F           | 65XT                  | 65XT              | 130            | B3052 (Disc.)    |
| 4H (Disc.)    | B3142            | 66                    | 66                | 150 (Disc.)    | N/A              |
| 4L            | 4L               | 67SS                  | 67SS              | 200            | B3170NF (Disc.)  |
| 4LA (Disc.)   | 4LA (Disc.)      | 68S                   | B3034             | 200C           | B3170NFC (Disc.) |
| 4PVC (Disc.)  | B3140C           | 68SS                  | 68SS              | 200F           | B3170NFF (Disc.) |
| 5 (Disc.)     | B3144            | 68W                   | B3033             | 200H           | 200H             |
| 5H (Disc.)    | B3146            | 69                    | B3367 (Disc.)     | 200R (Disc.)   | B3170NF (Disc.)  |
| 6 (Disc.)     | B3373            | 69R                   | 69R               | 200WON (Disc.) | N/A              |
| 6F (Disc.)    | B3373F           | 70 (Disc.)            | B655              | 202 (Disc.)    | B3170CT          |
| 6PVC (Disc.)  | B3373C           | 70R (Disc.)           | B656              | 203 (Disc.)    | B3170NFC (Disc.) |
| 7 (Disc.)     | B3148            | 70S (Disc.)           | B655              | 207 (Disc.)    | N/A              |
| 8 (Disc.)     | B3149            | 71 (Disc.)            | B3220             | 209 (Disc.)    | AWA              |
| 9 (Disc.)     | B3132            | 75                    | 75                | 219 (Disc.)    | B3153            |
| 9X (Disc.)    | B3132W-1 & 1 1/2 | 76                    | 76                | 219 (Disc.)    | B3155            |
| 14 (Disc.)    | B3134            | 77                    | 77                | 220 (Disc.)    | B3151            |
| 14X (Disc.)   | B3134W           | 78                    | 78 & B3199        | 220 (Disc.)    | B3154            |
| 20 (Disc.)    | B3180            | 81 (Disc.)            | B3104CT           | 260 (Disc.)    | B3160            |
| 20S (Disc.)   | B3180FL          | 81PVC (Disc.)         | B3104CTC          | 261 (Disc.)    | B3161            |
| 21 (Disc.)    | N/A              | 82 (Disc.)            | B3373CT           | 262 (Disc.)    | B3162            |
| 22            | B3181 (Disc.)    | 82PVC (Disc.)         | B3373CTC          | 263 (Disc.)    | B3163            |
| 22L2          | 22L2             | 83 (Disc.)            | B3195CT           | 264 (Disc.)    | B3164            |
| 23            | B3182 (Disc.)    | 84 (Disc.)            | B3195             | 265 (Disc.)    | B3165            |
| 24            | B3183 (Disc.)    | 98                    | 98                | 301CT (Disc.)  | B3198HCT         |
| 25            | 25               | 98B                   | 98B               | 302 (Disc.)    | B3198H           |
| 27B           | 27B              | 99                    | ATR               | 304 (Disc.)    | B3083WO          |
| 28            | 28               | 100 (Disc.)           | ATR               | 305 (Disc.)    | B3083            |
| 28M           | 28M              | 101 (Disc.)           | B3211             | 306 (Disc.)    | B3224            |
| 29            | 29               | 101L (Disc.)          | B3211X            | 307 (Disc.)    | B3222            |
| 30 (Disc.)    | B3068            | 102 (Disc.)           | B3210             | 309 (Disc.)    | B3014            |
| 30H (Disc.)   | B3067            | 102L (Disc.)          | B3210X            | 309N (Disc.)   | B3014N           |
| 30L (Disc.)   | B3065            | 103 (Disc.)           | B3205             | 310 (Disc.)    | B2500            |
| 30M (Disc.)   | B3066            | 104 (Disc.)           | B3212             | 310N (Disc.)   | N2500            |
| 31-M (Disc.)  | B3069W           | 105 (Disc.)           | B3213             | 311 (Disc.)    | B3097            |

# Reference Data - TOLCO to B-Line series cross

| TOLCO         | B-Line series          | TOLCO             | B-Line series |
|---------------|------------------------|-------------------|---------------|
| 312 (Disc.)   | B3096                  | 828               | 828           |
| 313 (Disc.)   | B3098                  | 906               | 906           |
| 314 (Disc.)   | B3094                  | 907               | 907           |
| 315 (Disc.)   | N/A                    | 909               | 909           |
| 316 (Disc.)   | B3088                  | 910               | 910           |
| 316T (Disc.)  | B3088T                 | 975               | 975           |
| 317 (Disc.)   | B3095                  | 980               | 980           |
| 317A (Disc.)  | B3093                  | 981               | 981           |
| 318 (Disc.)   | B3090                  | 985               | 985           |
| 318A (Disc.)  | B3092                  | 986               | 986           |
| 319 (Disc.)   | B3089                  | 990               | 990           |
| 322 (Disc.)   | B3114                  | 991               | 991           |
| 323 (Disc.)   | N/A                    | 1000              | 1000          |
| 324 (Disc.)   | B3110                  | 1001              | 1001          |
| 325 (Disc.)   | B3120                  | 2002              | 2002          |
| 326 (Disc.)   | B3122                  | 3000              | 3000          |
| 327 (Disc.)   | B3117SL                | Pipe Pier (Disc.) | DURA-BLOK     |
| 328 (Disc.)   | B3118SL                |                   |               |
| 329 (Disc.)   | B3054                  |                   |               |
| 330 (Disc.)   | B3200                  |                   |               |
| 331 (Disc.)   | B3202                  |                   |               |
| 332 (Disc.)   | B3201                  |                   |               |
| 333 (Disc.)   | B3203                  |                   |               |
| 335 (Disc.)   | B3045                  |                   |               |
| 336 (Disc.)   | B3040                  |                   |               |
| 337 (Disc.)   | B3082                  |                   |               |
| 343 (Disc.)   | B3080 L & S            |                   |               |
| 405 (Disc.)   | B3256                  |                   |               |
| 406 (Disc.)   | B3257                  |                   |               |
| 420 (Disc.)   | B3281 - B3287          |                   |               |
| 421 (Disc.)   | B3281 - B3287          |                   |               |
| 422 (Disc.)   | B3281 - B3287          |                   |               |
| 422C (Disc.)  | B3281 - B3287          |                   |               |
| 425 (Disc.)   | B3891                  |                   |               |
| 426 (Disc.)   | B3891                  |                   |               |
| 426A (Disc.)  | N/A                    |                   |               |
| 426AC (Disc.) | N/A                    |                   |               |
| 426AG (Disc.) | N/A                    |                   |               |
| 426C (Disc.)  | N/A                    |                   |               |
| 426G (Disc.)  | N/A                    |                   |               |
| 427 (Disc.)   | N/A                    |                   |               |
| 428 (Disc.)   | B3993-10               |                   |               |
| 429 (Disc.)   | B3891                  |                   |               |
| 430 (Disc.)   | B3892                  |                   |               |
| 431 (Disc.)   | B3393-10<br>/B3393-10B |                   |               |
| 432 (Disc.)   | N/A                    |                   |               |
| 433 (Disc.)   | N/A                    |                   |               |
| 434 (Disc.)   | N/A                    |                   |               |
| 500 (Disc.)   | B3264                  |                   |               |
| 506 (Disc.)   | B3262                  |                   |               |
| 800           | 800                    |                   |               |
| 825           | 825                    |                   |               |
| 825A          | 825A                   |                   |               |

(Disc.) = Discontinued Item

# Reference Data - Metric Conversion Chart

| To Convert From                        | To                                             | Multiply By                                    | To Convert From                       | To                                         | Multiply By                 |
|----------------------------------------|------------------------------------------------|------------------------------------------------|---------------------------------------|--------------------------------------------|-----------------------------|
| <b>Angle</b>                           |                                                |                                                | <b>Length</b>                         |                                            |                             |
| degree                                 | radian (rad)                                   | 1.745329 x 10 <sup>-2</sup>                    | foot (ft)                             | meter (m)                                  | 3.048000 x 10 <sup>-1</sup> |
| radian (rad)                           | degree                                         | 5.729578 x 10 <sup>+1</sup>                    | inch (in)                             | meter (m)                                  | 2.540000 x 10 <sup>-2</sup> |
| <b>Area</b>                            |                                                |                                                | mil                                   | meter (m)                                  | 2.540000 x 10 <sup>-5</sup> |
| foot <sup>2</sup>                      | square meter (m <sup>2</sup> )                 | 9.290304 x 10 <sup>-2</sup>                    | inch (in)                             | millimeter (mm)                            | 25.40000                    |
| inch <sup>2</sup>                      | square meter (m <sup>2</sup> )                 | 6.451600 x 10 <sup>-4</sup>                    | inch (in)                             | micrometer (µm)                            | 2.5400 x 10 <sup>4</sup>    |
| circular mil                           | square meter (m <sup>2</sup> )                 | 5.067075 x 10 <sup>-10</sup>                   | millimeter (mm)                       | inch (in)                                  | 0.0393701                   |
| sq. centimeter (cm <sup>2</sup> )      | square inch (in <sup>2</sup> )                 | 1.550003 x 10 <sup>-1</sup>                    | meter (m)                             | foot (ft)                                  | 3.280840                    |
| square meter (m <sup>2</sup> )         | foot <sup>2</sup>                              | 1.076391 x 10 <sup>+1</sup>                    | meter (m)                             | inch (in)                                  | 3.937008 x 10 <sup>+1</sup> |
| square meter (m <sup>2</sup> )         | inch <sup>2</sup>                              | 1.550003 x 10 <sup>+3</sup>                    | meter (m)                             | mil                                        | 3.937008 x 10 <sup>+4</sup> |
| square meter (m <sup>2</sup> )         | circular mil                                   | 1.973525 x 10 <sup>+9</sup>                    | micrometer (µm)                       | inch (in)                                  | 3.937008 x 10 <sup>-5</sup> |
| <b>Temperature</b>                     |                                                |                                                | <b>Volume</b>                         |                                            |                             |
| degree Fahrenheit                      | degree Celsius                                 | t <sup>°C</sup> = (t <sup>°F</sup> - 32) / 1.8 | foot <sup>3</sup>                     | cubic meter (m <sup>3</sup> )              | 2.831685 x 10 <sup>-2</sup> |
| degree Celsius                         | degree Fahrenheit                              | t <sup>°F</sup> = 1.8 t <sup>°C</sup> + 32     | inch <sup>3</sup>                     | cubic meter (m <sup>3</sup> )              | 1.638706 x 10 <sup>-5</sup> |
| <b>Force</b>                           |                                                |                                                | cubic centimeter (cm <sup>3</sup> )   | cubic inch (in <sup>3</sup> )              | 6.102374 x 10 <sup>-2</sup> |
| pounds-force (lbf)                     | newtons (N)                                    | 4.448222                                       | cubic meter (m <sup>3</sup> )         | foot <sup>3</sup>                          | 3.531466 x 10 <sup>+1</sup> |
| <b>Section Properties</b>              |                                                |                                                | cubic meter (m <sup>3</sup> )         | inch <sup>3</sup>                          | 6.102376 x 10 <sup>+4</sup> |
| section modulus S (in <sup>3</sup> )   | S (m <sup>3</sup> )                            | 1.638706 x 10 <sup>-5</sup>                    | gallon (U.S. liquid)                  | cubic meter (m <sup>3</sup> )              | 3.785412 x 10 <sup>-3</sup> |
| moment of inertia I (in <sup>4</sup> ) | I (m <sup>4</sup> )                            | 4.162314 x 10 <sup>-7</sup>                    |                                       |                                            |                             |
| modulus of elasticity E (psi)          | E (Pa)                                         | 6.894757 x 10 <sup>+3</sup>                    | section modulus S (m <sup>3</sup> )   | S (in <sup>3</sup> )                       | 6.102374 x 10 <sup>+4</sup> |
|                                        |                                                |                                                | moment of inertia I (m <sup>4</sup> ) | I (in <sup>4</sup> )                       | 2.402510 x 10 <sup>+6</sup> |
|                                        |                                                |                                                | modulus of elasticity E (Pa)          | E (psi)                                    | 1.450377 x 10 <sup>-4</sup> |
| To Convert From                        | To                                             | Multiply By                                    | Abbreviations                         |                                            |                             |
| <b>Bending Moment or Torque</b>        |                                                |                                                |                                       |                                            |                             |
| lbf•ft                                 | newton meter (N•m)                             | 1.355818                                       | AISC                                  | = American Institute of Steel Construction |                             |
| lbf•in                                 | newton meter (N•m)                             | 1.129848 x 10 <sup>-1</sup>                    | AISI                                  | = American Iron & Steel Institute          |                             |
| N•m                                    | lbf•ft                                         | 7.375621 x 10 <sup>-1</sup>                    | ANSI                                  | = American National Standards Institute    |                             |
| N•m                                    | lbf•in                                         | 8.850748                                       | ASTM                                  | = American Society for Testing & Materials |                             |
| <b>Mass</b>                            |                                                |                                                | AWWA                                  | = American Water Works Association         |                             |
| ounce (avoirdupois)                    | kilogram (kg)                                  | 2.834952 x 10 <sup>-2</sup>                    | Dia.                                  | = Diameter                                 |                             |
| pound (avoirdupois)                    | kilogram (kg)                                  | 4.535924 x 10 <sup>-1</sup>                    | Ft.                                   | = Feet                                     |                             |
| ton (short, 2000 lb)                   | kilogram (kg)                                  | 9.071847 x 10 <sup>+2</sup>                    | Ga.                                   | = Gauge                                    |                             |
| ton (long, 2240 lb)                    | kilogram (kg)                                  | 1.016047 x 10 <sup>+3</sup>                    | I.D.                                  | = Inside Diameter                          |                             |
| kilogram (kg)                          | ounce (avoirdupois)                            | 3.527396 x 10 <sup>+1</sup>                    | In.                                   | = Inch                                     |                             |
| kilogram (kg)                          | pound (avoirdupois)                            | 2.204622                                       | Lbs.                                  | = Pounds                                   |                             |
| kilogram (kg)                          | ton (short 2000 lb)                            | 1.102311 x 10 <sup>-3</sup>                    | Max.                                  | = Maximum                                  |                             |
| kilogram (kg)                          | ton (long 2240 lb)                             | 9.842064 x 10 <sup>-4</sup>                    | Min.                                  | = Minimum                                  |                             |
| <b>Mass Per Unit Length</b>            |                                                |                                                | MSS                                   | = Manufacturers Standardization Society    |                             |
| lb/ft                                  | kilogram per meter (kg/m)                      | 1.488164                                       | NFPA                                  | = National Fire Protection Association     |                             |
| lb/in                                  | kilogram per meter (kg/m)                      | 1.785797 x 10 <sup>+1</sup>                    | O.D.                                  | = Outside Diameter                         |                             |
| kg/m                                   | lb/ft                                          | 6.719689 x 10 <sup>-1</sup>                    | Oz.                                   | = Ounces                                   |                             |
| kg/m                                   | lb/in                                          | 5.599741 x 10 <sup>-2</sup>                    | Pre-Galv.                             | = Pre-galvanized                           |                             |
| <b>Mass Per Unit Volume</b>            |                                                |                                                | psi                                   | = Pounds Per Square Inch                   |                             |
| lb/ft <sup>3</sup>                     | kilogram per cubic meter (kg/m <sup>3</sup> )  | 1.601846 x 10 <sup>+1</sup>                    | PVC                                   | = Polyvinyl Chloride                       |                             |
| lb/in <sup>3</sup>                     | kilogram per cubic meter (kg/m <sup>3</sup> )  | 2.767990 x 10 <sup>+4</sup>                    | UL                                    | = Underwriters' Laboratories, Inc.         |                             |
| kg/m <sup>3</sup>                      | lb/ft <sup>3</sup>                             | 6.242797 x 10 <sup>-2</sup>                    | UNC                                   | = Unified Coarse Threads                   |                             |
| kg/m <sup>3</sup>                      | lb/in <sup>3</sup>                             | 3.612730 x 10 <sup>-5</sup>                    | UNCR                                  | = Unified Coarse Threads (Rounded Root)    |                             |
| lbs/ft <sup>3</sup>                    | lbs/in <sup>3</sup>                            | 1.728000 x 10 <sup>+3</sup>                    | Wt./C                                 | = Weight per 100                           |                             |
| <b>Mass Per Area Unit</b>              |                                                |                                                | Metric Symbols                        |                                            |                             |
| lb/ft <sup>2</sup>                     | kilogram per square meter (kg/m <sup>2</sup> ) | 4.882428                                       | cm                                    | = centimeter                               |                             |
| kg/m <sup>2</sup>                      | pound per square foot (lb/ft <sup>2</sup> )    | 2.048161 x 10 <sup>-1</sup>                    | kg                                    | = kilogram                                 |                             |
| <b>Pressure or Stress</b>              |                                                |                                                | kN                                    | = kilonewton                               |                             |
| lbf/in <sup>2</sup> (psi)              | pascal (Pa)                                    | 6.894757 x 10 <sup>+3</sup>                    | m                                     | = meter                                    |                             |
| kip/in <sup>2</sup> (ksi)              | pascal (Pa)                                    | 6.894757 x 10 <sup>+6</sup>                    | µm                                    | = micrometer                               |                             |
| lbf/in <sup>2</sup> (psi)              | megapascals (MPa)                              | 6.894757 x 10 <sup>-3</sup>                    | mm                                    | = millimeter                               |                             |
| pascal (Pa)                            | pound force per sq. inch (psi)                 | 1.450377 x 10 <sup>-4</sup>                    | MPa                                   | = megapascal                               |                             |
| pascal (Pa)                            | kip per sq. inch (ksi)                         | 1.450377 x 10 <sup>-7</sup>                    | N                                     | = newton                                   |                             |
| megapascals (MPa)                      | lbf/in <sup>2</sup> (psi)                      | 1.450377 x 10 <sup>+2</sup>                    | Nm                                    | = newton-meter                             |                             |
|                                        |                                                |                                                | Pa                                    | = pascal                                   |                             |

## Decimals of a Foot

| Inch            | 0"    | 1"    | 2"    | 3"    | 4"    | 5"    | 6"    | 7"    | 8"    | 9"    | 10"   | 11"   |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0               | .0000 | .0833 | .1667 | .2500 | .3330 | .4167 | .5000 | .5833 | .6667 | .7500 | .8333 | .9167 |
| $\frac{1}{16}$  | .0052 | .0085 | .1719 | .2552 | .3385 | .4219 | .5052 | .5885 | .6719 | .7552 | .8385 | .9219 |
| $\frac{1}{8}$   | .0104 | .0938 | .1771 | .2604 | .3438 | .4271 | .5104 | .5938 | .6771 | .7604 | .8438 | .9271 |
| $\frac{3}{16}$  | .0156 | .0990 | .1823 | .2656 | .3490 | .4323 | .5156 | .5990 | .6823 | .7656 | .8490 | .9323 |
| $\frac{1}{4}$   | .0208 | .1042 | .1875 | .2708 | .3542 | .4375 | .5208 | .6042 | .6875 | .7708 | .8542 | .9375 |
| $\frac{5}{16}$  | .0260 | .1094 | .1927 | .2760 | .3594 | .4427 | .5260 | .6094 | .6927 | .7760 | .8594 | .9427 |
| $\frac{3}{8}$   | .0313 | .1146 | .1979 | .2812 | .3646 | .4479 | .5313 | .6146 | .6979 | .7813 | .8646 | .9479 |
| $\frac{7}{16}$  | .0365 | .1198 | .2031 | .2891 | .3724 | .4557 | .5391 | .6224 | .7057 | .7891 | .8724 | .9557 |
| $\frac{1}{2}$   | .0417 | .1250 | .2083 | .2917 | .3750 | .4583 | .5417 | .6250 | .7083 | .7917 | .8750 | .9583 |
| $\frac{9}{16}$  | .0469 | .1302 | .2135 | .2969 | .3802 | .4635 | .5469 | .6302 | .7135 | .7969 | .8802 | .9635 |
| $\frac{5}{8}$   | .0521 | .1354 | .2188 | .3021 | .3854 | .4688 | .5521 | .6354 | .7188 | .8021 | .8854 | .9688 |
| $\frac{11}{16}$ | .0573 | .1406 | .2240 | .3073 | .3906 | .4740 | .5573 | .6406 | .7240 | .8073 | .8906 | .9740 |
| $\frac{3}{4}$   | .0625 | .1458 | .2292 | .3125 | .3958 | .4792 | .5625 | .6458 | .7292 | .8125 | .8958 | .9792 |
| $\frac{13}{16}$ | .0677 | .1510 | .2344 | .3177 | .4010 | .4844 | .5677 | .6510 | .7344 | .8177 | .9010 | .9844 |
| $\frac{7}{8}$   | .0729 | .1563 | .2396 | .3229 | .4063 | .4896 | .5729 | .6563 | .7396 | .8229 | .9063 | .9896 |
| $\frac{15}{16}$ | .0781 | .1615 | .2448 | .3281 | .4118 | .4948 | .5781 | .6615 | .7448 | .8221 | .9115 | .9948 |

## Fractions of a Inch

| Fraction        | Decimal | Fraction        | Decimal |
|-----------------|---------|-----------------|---------|
| $\frac{1}{32}$  | .0312   | $\frac{17}{32}$ | .5312   |
| $\frac{1}{16}$  | .0625   | $\frac{9}{16}$  | .5625   |
| $\frac{3}{32}$  | .0937   | $\frac{19}{32}$ | .5937   |
| $\frac{1}{8}$   | .1250   | $\frac{5}{8}$   | .6250   |
| $\frac{5}{32}$  | .1562   | $\frac{21}{32}$ | .6562   |
| $\frac{3}{16}$  | .1875   | $\frac{11}{16}$ | .6875   |
| $\frac{7}{32}$  | .2187   | $\frac{23}{32}$ | .7187   |
| $\frac{1}{4}$   | .2500   | $\frac{3}{4}$   | .7500   |
| $\frac{9}{32}$  | .2812   | $\frac{25}{32}$ | .7812   |
| $\frac{5}{16}$  | .3125   | $\frac{13}{16}$ | .8125   |
| $\frac{11}{32}$ | .3437   | $\frac{27}{32}$ | .8437   |
| $\frac{3}{8}$   | .3750   | $\frac{7}{8}$   | .8750   |
| $\frac{13}{32}$ | .4062   | $\frac{29}{32}$ | .9062   |
| $\frac{7}{16}$  | .4375   | $\frac{15}{16}$ | .9375   |
| $\frac{15}{32}$ | .4687   | $\frac{31}{32}$ | .9687   |
| $\frac{1}{2}$   | .5000   | 1               | 1.0000  |

| Part No.    | Page            | Part No.    | Page    | Part No. | Page    |
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| 1NFPA       | 21              | 906         | 57      | B3184    | 39      |
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| 4LA (Disc.) | 76 & 77 (Disc.) | 975         | 65      | B3198HCT | 25      |
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| 28M         | 38              | ACPW Series | 82      | B3210XL  | 101     |
| 29          | 40              | ATM Series  | 84      | B3211    | 100     |
| 50          | 90              | ATR         | 96      | B3211L   | 100     |
| 51NFPA      | 89              | AWSD Series | 79      | B3211X   | 101     |
| 56          | 90              | B200        | 102     | B3211XL  | 101     |
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| 200C        | 23              | B3088T      | 47      |          |         |
| 200F        | 23              | B3088ST     | 48      |          |         |
| 200H        | 24              | B3092       | 49      |          |         |
| 200S        | 23              | B3093       | 50      |          |         |
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| 825A        | 56              | B3140C      | 30      |          |         |

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