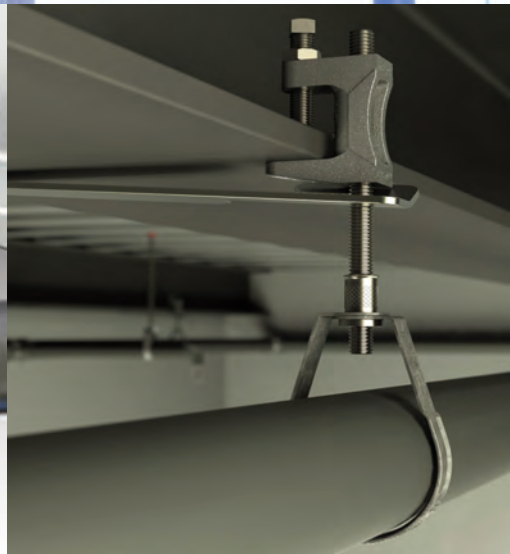


Fire protection solutions





Eaton and Cooper united.
**Energizing a world
that demands more.**

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As a global diversified power management company, we help customers worldwide manage the power needed for buildings, aircraft, trucks, cars, machinery and businesses.

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- **Aerospace solutions** that make aircraft lighter, safer and less costly to operate, and help airports operate more efficiently
- **Vehicle drivetrain and powertrain solutions** that deliver more power to cars, trucks and buses, while reducing fuel consumption and emissions

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With 2012 sales of \$16.3 billion, Eaton has approximately 103,000 employees around the world and sells products in more than 175 countries.



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- Backup power protection
- Solutions for harsh and hazardous environments
- Lighting and security
- Structural solutions and wiring devices
- Control and automation
- Engineering services

Eaton is positioned through its global solutions to answer today's most critical electrical power management challenges. With 100 years of electrical experience behind us, we're energized by the challenge of powering up a world that demands twice as much energy as today. We're anticipating needs, engineering products, and creating solutions to energize our markets today and in the future.

We are dedicated to ensuring that reliable, efficient and safe power is available when it's needed most.

Eaton.com

Introduction

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 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 OPA-0300 Seismic Bracing Guidelines

Our Fire Protection Solutions 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 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 Guidelines OPA-0300. These resources and other valuable information can be found online at www.bline.com.

NOTICE

Eaton's B-Line Business 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, we are 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.cooperbline.com/fireprotection

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

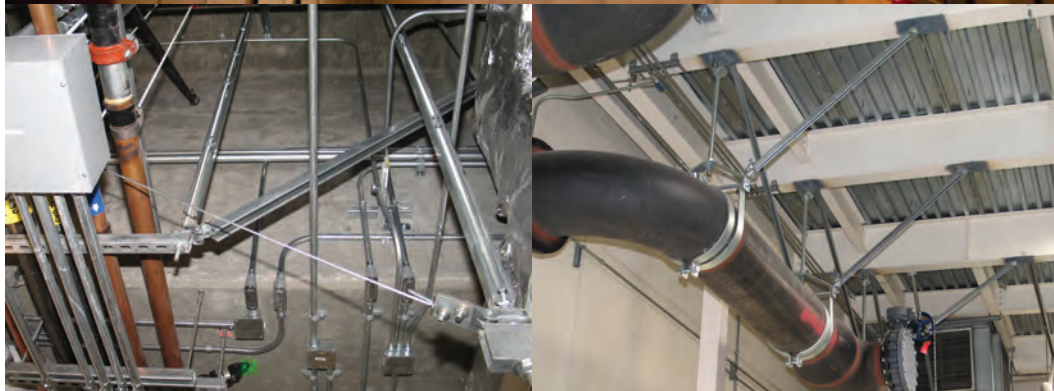
Seismic Restraints System

SMSG-13

Seismic restraints system guidelines

OPA-0300-10

for mechanical, electrical, plumbing
and fire sprinkler systems



B-Line
by **FAT-N**

Many TOLCO brand products are included in our OSHPD pre-approved seismic guidelines.
For specific information please visit www.cooperbline.com/fireprotection to view the OSHPD OPA - 300 catalog.

TOLBrace Fire Protection

Software

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

TOLBrace™ 7.0 includes a feature that will automatically update your software, via the internet, when new products are added; when there are updates to codes and standards, and any necessary software upgrades.

TOLBrace software assists a Fire Sprinkler system designer with the following:

- Seismic force factor calculations (Fp)
- 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 with the click of a mouse!

TOLBrace follows the requirements of:

- NFPA 13, 1999, 2002, 2007 & 2010
- Uniform Building Code
- International Building Code
- National Building Code of Canada
- California Office of Statewide Health Planning & Development (OSHPD)

Seismic Bracing Services & Products for Mechanical, Electrical and Plumbing Systems

In addition to our long reputation as a provider of sway bracing products and software for the Fire Sprinkler Industry, we also provides a line of products and services directed to the installers of all other non-structural building systems. We provide:

- Pre-project bid assistance to contractors
- Assist building owner, architect and design engineer with code compliance and design questions
- Review and updates to product specifications
- Pre-Approved (OSHPD) and/or Project Specific Engineered
- Seismic Restraint Details
- Layout of Seismic Restraints on Project Drawings
- Product in "kit" or "bulk" shipments to meet all project management and budget requirements
- Installer training
- Post installation jobsite inspection

For more information, visit www.cooperbline.com/tolbrace.



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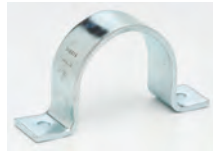
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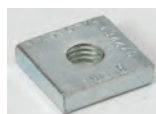
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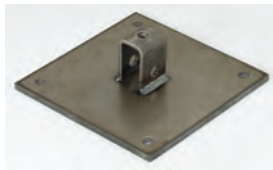
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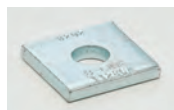
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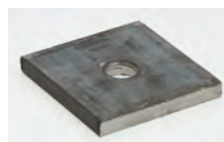
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Other Products (Refer to Pipe Hanger Catalog at www.bline.com for more information)

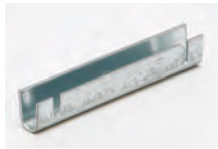


Fig. 1CBS
Clevis Pipe Spacer



B3170CT
(TOLCO 202)
Copper Tubing
Adjustable Swivel Ring



B3170CTC
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Plastic Coated
Adjustable Swivel Ring



B3198R
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Pipe Clamp



B3198RCT
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Pipe Clamp



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B3180
(TOLCO 20)
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Adjustable Pipe
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B3089
(TOLCO 319)
Pipe Support
Adjuster



B3090
(TOLCO 318)
Pipe Saddle
Support
With U-Bolt



B3095
(TOLCO 317)
Pipe Saddle
Support



B3097
(TOLCO 311)
Pipe Saddle
With Strap



B3195
(TOLCO 84)
I.P.S. Isolator



B3098
(TOLCO 313)
Adjustable Pipe
Support w/U-Bolt



B3068
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Light Duty Welded
Bracket



B3064
Adjustable Strut
Bracket



B3067
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Heavy Duty
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Fig. 981
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Universal Swivel
Sway Brace
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(For bracing of CPVC pipe)



B3082
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Single Lug
Concrete Plate



B3086
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Clevis Concrete
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(TOLCO 123)
Toggle Bolt



AWA
(TOLCO 209)
Wedge Anchor



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(TOLCO 333)
Extension Piece



B3223
Offset Eye Socket



SHE
Isolation Spring
Hanger



RH
Neoprene Hanger



HSL/HS
Vibration Spring
Hanger



HESL/HES
Combination Spring
& Neoprene

Beam Clamps

B3037 - Z-Purlin Malleable C-Clamp

Material: Malleable Iron

Function: Designed for attaching a 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)

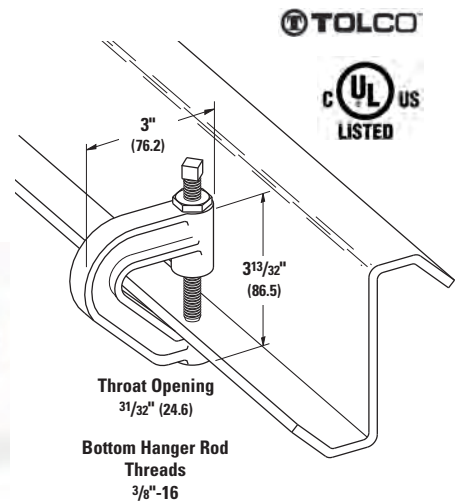
Design Load: 400 Lbs. (1.78kN)

Setscrew Torque: Per MSS SP-58 14.2.5

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 (TOLCO Fig. 68)

Size Range: 3/8"-16 thru 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 3/8"-16 and 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 B-Line for alternative finishes and materials.

Order By: Figure number, rod size and finish

Setscrew Torque: Per MSS SP-58 14.2.5

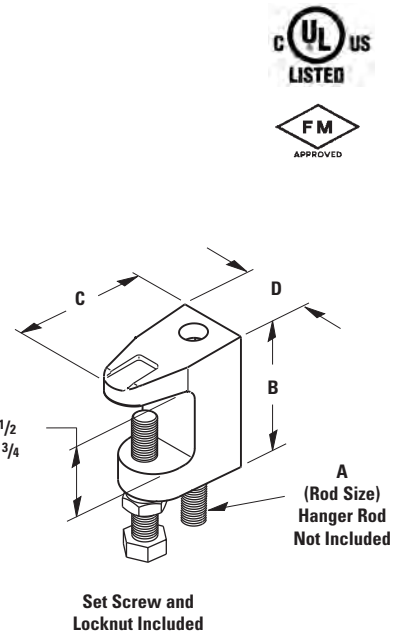
3/8" -16 set screws = 5 ft./lbs. (7 Nm)

1/2" -13 set screws = 11 ft./lbs. (15 Nm)

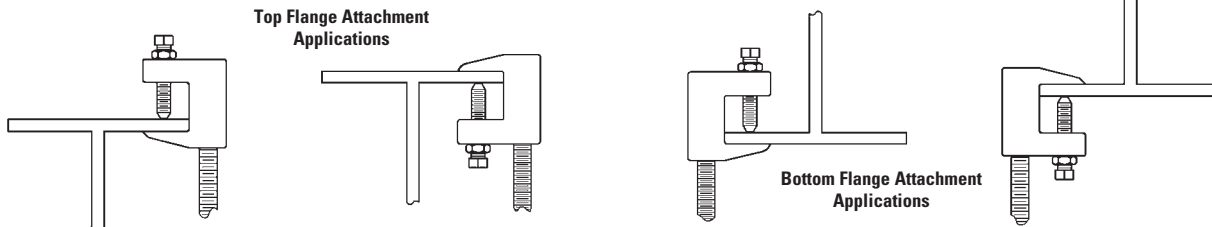
5/8" -11 set screws = 21 ft./lbs. (28 Nm)

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

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



Beam Clamps



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)
B3033-3/8	3/8"-16	3/8"-16 x 2"	2 1/4" (57.1)	2" (50.8)	1 1/8" (28.6)	4" (100)	54 (24.5)
B3033-1/2	1/2"-13	1/2"-13 x 2 1/2"	2 5/16" (58.7)	2 3/16" (55.6)	1 1/4" (31.7)	8" (200)	51 (23.1)
B3033-5/8	5/8"-11	1/2"-13 x 2 1/2"	2 5/8" (66.7)	2 1/2" (63.5)	1 3/8" (34.9)	8" (200)	70 (31.7)
B3033-3/4	3/4"-10	5/8"-11 x 2 1/2"	2 11/16" (68.3)	2 1/2" (63.5)	1 7/16" (36.5)	10" (250)	98 (44.4)

B3034 - C-Clamp

Size Range: 3/8"-16 thru 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 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 3/8"-16 and 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. 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. 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 B-Line for alternative finishes and materials.

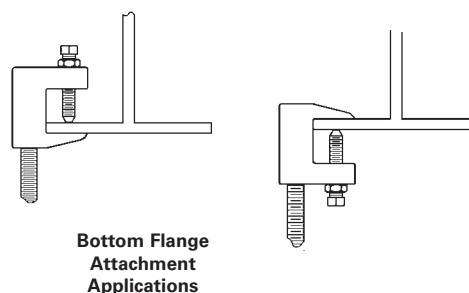
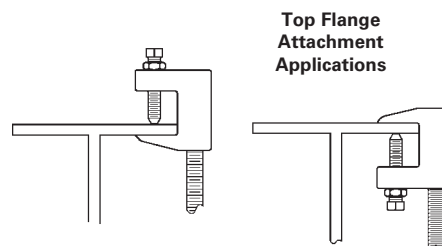
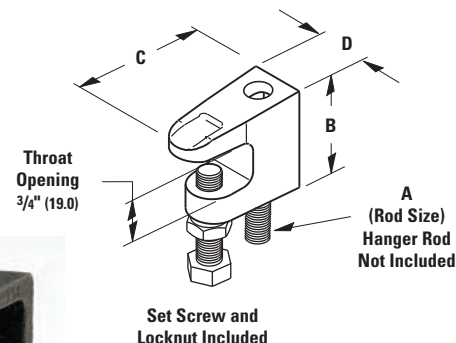
Order By: Figure number, rod size and finish

Setscrew Torque: Per MSS SP-58 14.2.5

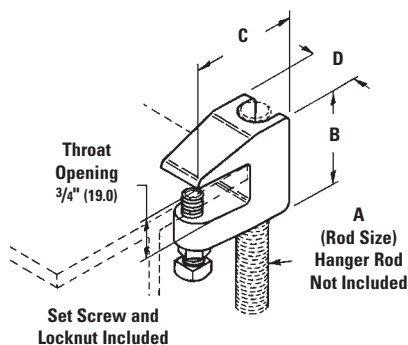
3/8" -16 set screws = 5 ft./lbs. (7 Nm)

1/2" -13 set screws = 11 ft./lbs. (15 Nm)

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



B3034-5/8" and B3034-3/4" 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)			Lbs.	(kg)
B3034-3/8	3/8"-16	3/8"-16 x 1 1/2"	1 5/8"	(41.3)	2"	(50.8)	7/8"	(19.0)	4"	(100)	30	(13.6)
B3034-1/2	1/2"-13	1/2"-13 x 1 1/2"	1 13/16"	(46.0)	2 3/16"	(55.6)	1 3/16"	(30.2)	8"	(200)	47	(21.3)
B3034-5/8	5/8"-11	1/2"-13 x 2"	1 3/4"	(44.5)	2 1/8"	(54.0)	1 1/4"	(31.7)	--	--	58	(26.3)
B3034-3/4	3/4"-10	1/2"-13 x 2"	2"	(50.8)	2 1/4"	(57.2)	1 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.

Beam Clamps



Fig. 68S - Reversible Malleable Beam Clamp 3/4" (19.0mm) Throat Opening

Fig. 68W - Reversible Malleable Beam Clamp 1 1/4" (31.7mm) Throat Opening (bottom of page)

Size Range: 3/8"-16 rod sizes thru 7/8"-9 rod sizes

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 3/4" (19.0mm) on Fig. 68S or 1 1/4" (31.7mm) on Fig. 68W.

Features: 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. The rear window design permits inspection of thread engagement.

Approvals: Factory Mutual Engineering Approved. Underwriters Laboratories Listed. Conforms to Federal Specification WW-H-171E, Type 23 and Manufacturers Standardization Society SP-58, Type 19.

Fig. 68S-3/8 is **cULus** Listed to support up to 4" (100mm) pipe with the set screw in the down position and up to 3" (80mm) pipe with the set screw in the up position.

Fig. 68S-1/2 is **cULus** Listed to support up to 8" (200mm) pipe with the set screw in the down position and up to 6" (150mm) pipe with the set screw in the up position.

Fig. 68W-3/8 is **cULus** Listed to support up to 4" (100mm) pipe with the set screw in the down position and up to 4" (100mm) pipe with the set screw in the up position.

Fig. 68W-1/2 is **cULus** Listed to support up to 6" (150mm) pipe with the set screw in the down position and up to 6" (150mm) pipe with the set screw in the up position.

Factory Mutual Engineering Approved (FM) only with the set screw in the down position.

(OSHPD). For additional load spacing and placement information relating OSHPD projects, please refer to the Seismic Restraint System Guidelines.

Finish: Plain. Contact B-Line for Electro-Galvanized or HDG finishes.

Order By: Part number and finish

Setscrew Torque: Per MSS SP-58 14.2.5

3/8" -16 set screws = 5 ft./lbs. (7 Nm)

1/2" -13 set screws = 11 ft./lbs. (15 Nm)

5/8" -11 set screws = 21 ft./lbs. (28 Nm)

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

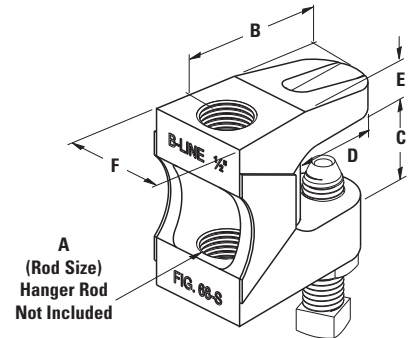


Fig. 68S

Set Screw and Locknut Included

D = Depth of Throat

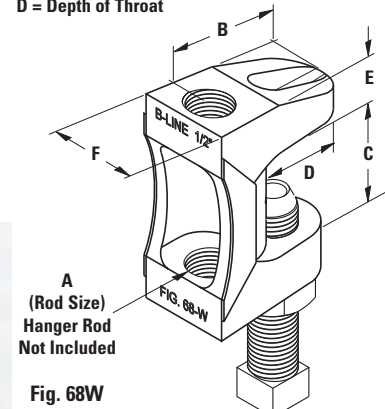


Fig. 68W

Set Screw and Locknut Included



Fig. 68S



Fig. 68W

Fig. 68S

Part No.	Rod Size A	B in. (mm)	C Min. in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	Max Rec. Load Set Screw Up Lbs. (kN)	Max Rec. Load Set Screw Down Lbs. (kN)	Approx. Wt./100 Lbs. (kg)
68S-3/8	3/8"-16	19/16" (39.7)	3/4" (19.0)	1 1/8" (28.6)	7/16" (11.1)	7/8" (22.2)	610 (2.71)	610 (2.71)	32 (14.5)
68S-1/2	1/2"-13	15/8" (41.3)	3/4" (19.0)	1" (25.4)	7/16" (11.1)	1 1/8" (28.6)	750 (3.33)	1130 (5.02)	54 (24.5)
68S-5/8	5/8"-11	19/16" (39.7)	3/4" (19.0)	1" (25.4)	9/16" (14.3)	1 1/8" (28.6)	750 (3.33)	1130 (5.02)	50 (22.7)
68S-3/4	3/4"-10	13/4" (44.4)	3/4" (19.0)	1 1/8" (28.6)	9/16" (14.3)	1 1/4" (31.7)	750 (3.33)	1130 (5.02)	81 (36.7)
68S-7/8	7/8"-9	13/4" (44.4)	3/4" (19.0)	1 1/8" (28.6)	9/16" (14.3)	1 5/16" (33.3)	750 (3.33)	1130 (5.02)	75 (34.0)

Fig. 68W

Part No.	Rod Size A	B in. (mm)	C Min. in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	Max Rec. Load Set Screw Up Lbs. (kN)	Max Rec. Load Set Screw Down Lbs. (kN)	Approx. Wt./100 Lbs. (kg)
68W-3/8	3/8"-16	19/16" (39.7)	1 1/4" (31.7)	1 1/8" (28.6)	7/16" (11.1)	7/8" (22.2)	610 (2.71)	610 (2.71)	41 (18.6)
68W-1/2	1/2"-13	19/16" (39.7)	1 1/4" (31.7)	1" (25.4)	5/8" (15.9)	1 1/8" (28.6)	750 (3.33)	1130 (5.02)	66 (29.9)
68W-5/8	5/8"-11	1 1/2" (38.1)	1 1/4" (31.7)	1" (25.4)	9/16" (14.3)	1 1/8" (28.6)	750 (3.33)	1130 (5.02)	68 (30.8)
68W-3/4	3/4"-10	13/4" (44.4)	1 1/4" (31.7)	1 1/8" (28.6)	3/8" (19.5)	1 1/4" (31.7)	750 (3.33)	1130 (5.02)	110 (49.9)
68W-7/8	7/8"-9	13/4" (44.4)	1 1/4" (31.7)	1 1/8" (28.6)	9/16" (14.3)	1 5/16" (33.3)	750 (3.33)	1130 (5.02)	98 (44.4)

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

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

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).

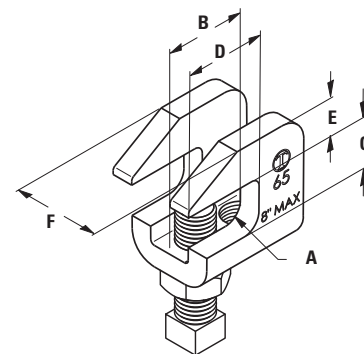
Features: All steel construction eliminates structural deficiencies associated with casting type beam clamps. May be used on top or bottom flange of beam. (Beveled lip allows hanging from top flange where clearance is limited.) May be installed with set screw in up or down position. Offset design permits 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. Contact B-Line 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)

Fig. 65XT- $\frac{3}{8}$ - Beam Clamp

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

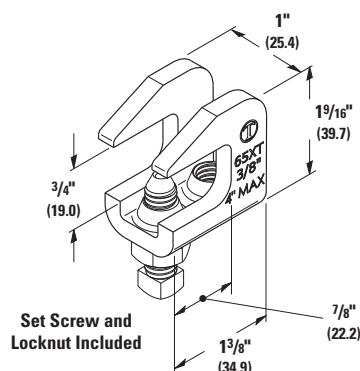
Weight: Approx. Wt./100 - 28.0 Lbs. (12.7kg)

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.



Set Screw and Locknut Included



Beam Clamps

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

TOLCO



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

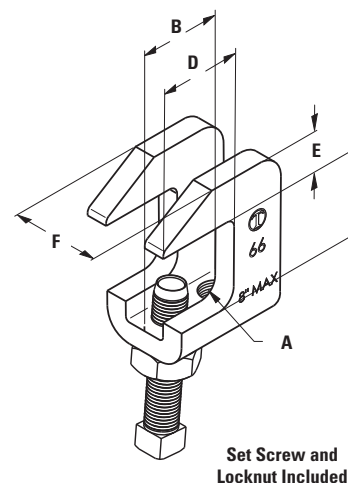
Function: Recommended for hanging from steel beam where flange thickness does not exceed 1 1/4" (31.7mm).

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. Contact B-Line for alternative finishes and materials.

Order By: Figure number and finish



Part No.	Rod Size A	B in. (mm)	C in. (mm)	D in. (mm)	E 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 in. (mm)	Approx. Wt./100 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)

Fig. 67SS - Stainless Steel Reversible C-Type Beam Clamp 3/4" (19.0mm) Throat Opening

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

Size Range: 3/8"-16 and 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 3/4" (19.0mm) for Fig. 67SS or 1 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: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). Conforms to Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 19. Meets or 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

Order By: Figure number and stainless steel type.

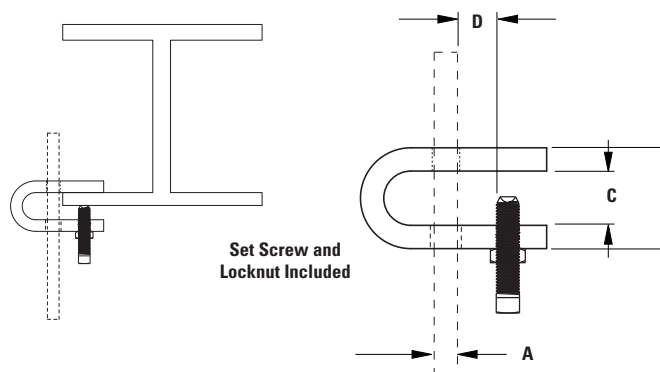
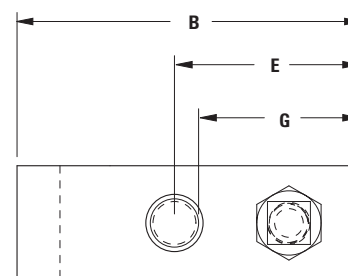


Fig. 67SS

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

Part No.	F in. (mm)	G in. (mm)	Approx. Wt./100 Lbs. (kg)
67SS-3/8	1 5/8" (41.3)	1 1/8" (28.6)	84 (38.1)
67SS-1/2	1 5/8" (41.3)	1 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-3/8	3/8"-16	1/2" - 4" (15 - 100)	2 1/16" (52.4)	1 1/8" (28.6)	3/4" (19.0)	1 1/4" (31.7)
68SS-1/2	1/2"-13	5" - 8" (125 - 200)	2 1/4" (57.1)	1 1/4" (31.7)	13/16" (20.6)	1 1/4" (31.7)

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



Beam Clamps

Fig. 69 - Beam Clamp Retaining Strap (B-Line B3367)

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 will provide a more secure reliable installation.

Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). Approved for use with any listed beam clamp.

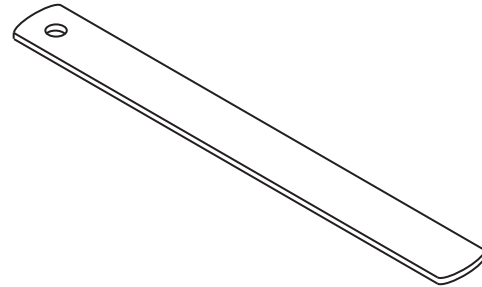
Finish: Pre-Galvanized

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

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

For Use With: Any B-Line or TOLCO beam clamp.

TOLCO



Part No.	Hole Dia. D		Length
	in.	(mm)	
69- $\frac{3}{8}$ -L	$\frac{7}{16}$ "	(30.1)	Specify
69- $\frac{1}{2}$ -L	$\frac{9}{16}$ "	(30.1)	Specify
69- $\frac{5}{8}$ -L	$\frac{11}{16}$ "	(50.8)	Specify
69- $\frac{3}{4}$ -L	$\frac{13}{16}$ "	(63.5)	Specify

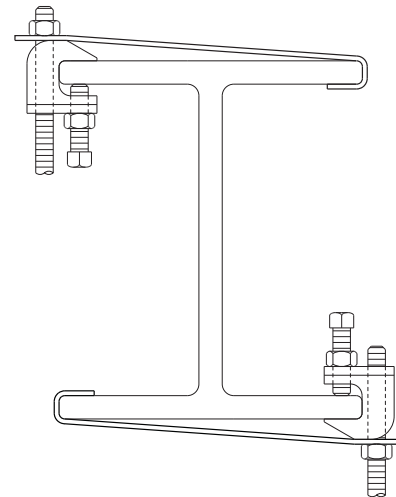


Fig. 69R - Retrofit Capable Beam Clamp Retaining Strap

Size Range: 3/8"-16 & 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 beam clamp.

Finish: Pre-Galvanized

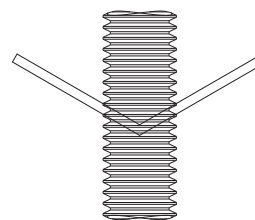
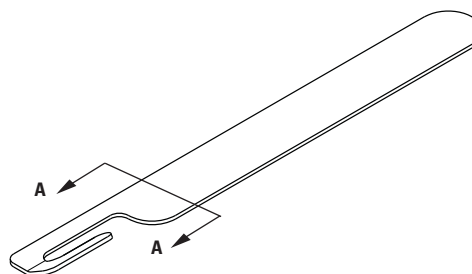
Order By: Figure number, length, and finish.

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

For Use With: Any B-Line or TOLCO beam clamp.

* Patent #5,947,424

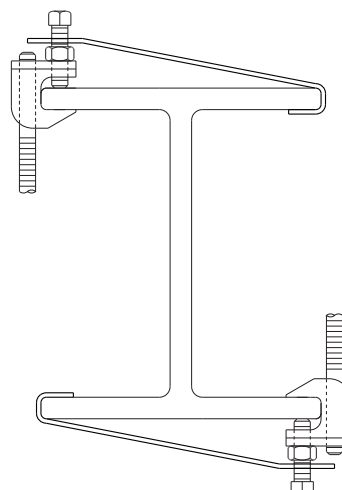
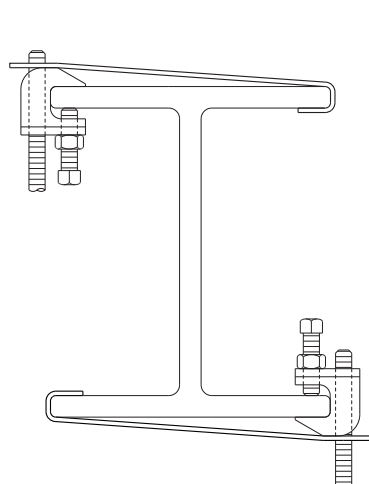
Component of State of
California OSHPD Approved
Seismic Restraints System



A - A



Part No.	Slot Width		Length
	in.	(mm)	
69R-3/8-L	7/16"	(30.1)	Specify
69R-1/2-L	9/16"	(30.1)	Specify



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

Beam Clamps

B3042T - Bar Joist Hanger (TOLCO Fig. 61T)

TOLCO



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

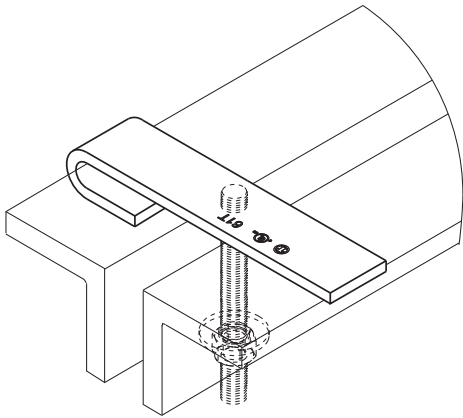
Material: Steel

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

Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) for up to 4" (100mm) pipe with 3/8"-16 rod, up to 6" (150mm) pipe with 1/2"-13 rod.

Finish: Plain. Contact B-Line for alternative finishes and materials.

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



Part No.	Rod Size Size	For Pipe Size in. (mm)	Approx. Wt./100	
			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)

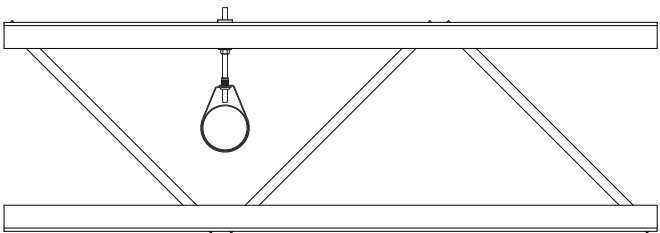
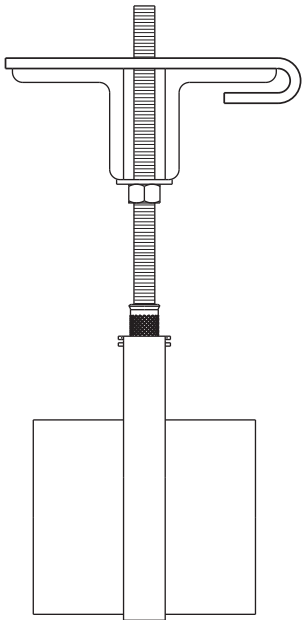


Fig. 130 - Composite Wood Joist Clamp (B-Line Fig. B3052)

Size Range: 130-1 = TJI 35
130-2 = —
130-3 = TJI 25
130-4 = TJI 55 & 65
130-5 = TJI 75
130-6 = TJI 96

Material: Steel

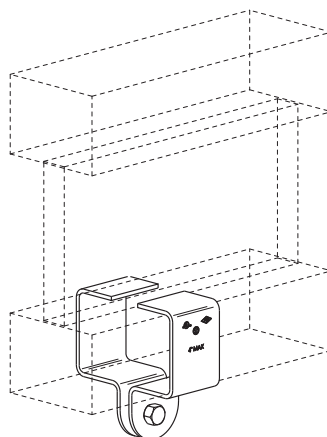
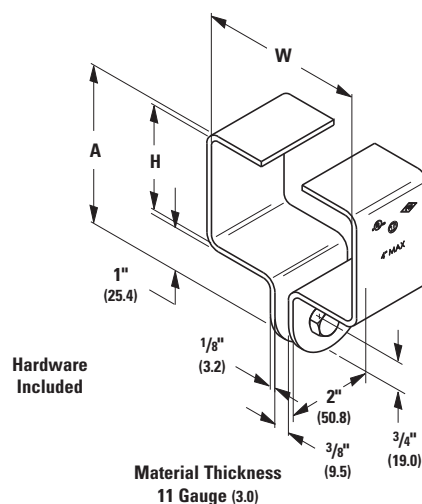
Function: Designed for attachment to composite wood joist beams. Use with eye rods, eye sockets, or angle bracket.

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 in. (mm)	H in. (mm)	W in. (mm)	Approx. Wt./100 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 l-rods are required for 5" (125mm) and 6" (150mm) pipe sizes

Pipe Hangers

B3100 - Clevis Hanger for NFPA Sizes 3/4" (20mm) thru 2" (50mm)

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.

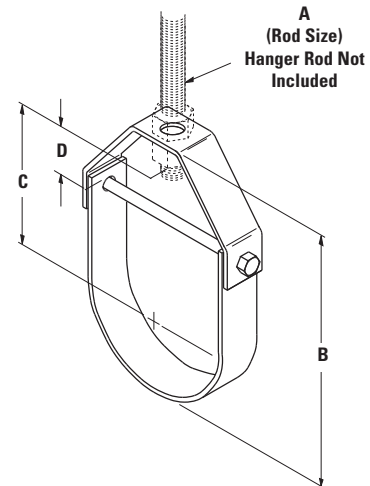
Designed to meet or exceed requirements of FM DS 2-0.



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		Rod Size A	B		C		D		Approx. Wt./100	
	in.	(mm)		in.	(mm)	in.	(mm)	in.	(mm)	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)



Fig. 200 - "Trimline" Adjustable Band Hanger (B-Line Fig. B3170NF)

Fig. 200F - "Trimline" Adjustable Band Hanger with Felt Lining (B-Line Fig. B3170NFF)

Fig. 200C - "Trimline" Adjustable Band Hanger with Plastic Coated (B-Line Fig. B3170NFC)

Fig. 200S - "Trimline" Adjustable Band Hanger with Non-Captured Nut

Size Range:

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

Material: Steel, Pre-Galvanized to G90 specifications

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)) Flared edges ease installation for all pipe types and protect CPVC plastic pipe from abrasion. Captured design keeps adjusting nut from separating with hanger. Hanger is easily installed around pipe.
- For hanger with non-captured nut order Fig. 200S.
- (2 1/2" (65mm) thru 8" (200mm)) Spring tension on nut holds it securely in hanger before installation. Adjusting nut is easily removed.

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: Figure number and pipe size

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

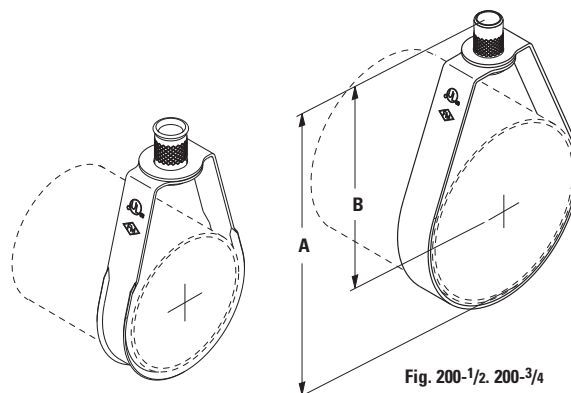


Fig. 200-1 to 200-2

Fig. 200-1/2. 200-3/4

Fig. 200-2 1/2 to 200-8



Fig. 200C



Fig. 200F



Fig. 200



Fig. 200S

Part No.	Pipe Size in. (mm)	Rod Size	A in. (mm)	B in. (mm)	Approx. Wt./100 lbs. (kg)
200-1/2	1/2" (15)	3/8"-16	3 1/8" (79.4)	2 5/8" (66.7)	11 (5.0)
200-3/4	3/4" (20)	3/8"-16	3 1/8" (79.4)	2 1/2" (63.5)	11 (5.0)
200-1	1" (25)	3/8"-16	3 3/8" (85.7)	2 5/8" (66.7)	12 (5.5)
200-1 1/4	1 1/4" (32)	3/8"-16	3 3/4" (94.0)	2 7/8" (73.0)	13 (5.9)
200-1 1/2	1 1/2" (40)	3/8"-16	3 7/8" (98.4)	2 7/8" (73.0)	14 (6.4)
200-2	2" (50)	3/8"-16	4 1/2" (114.3)	3" (76.3)	15 (6.9)
200-2 1/2	2 1/2" (65)	3/8"-16	5 5/8" (142.9)	4 1/8" (104.7)	27 (12.3)
200-3	3" (75)	3/8"-16	5 7/8" (149.1)	4" (101.6)	29 (13.3)
200-3 1/2	3 1/2" (90)	3/8"-16	7 3/8" (187.3)	5 1/4" (133.3)	34 (15.6)
200-4	4" (100)	3/8"-16	7 3/8" (187.3)	5" (127.0)	35 (16.0)
200-5	5" (125)	1/2"-13	9 1/8" (231.8)	6 1/4" (158.7)	66 (30.2)
200-6	6" (150)	1/2"-13	10 1/8" (257.2)	6 3/4" (171.4)	73 (33.4)
200-8	8" (200)	1/2"-13	13 1/8" (333.4)	8 3/4" (222.2)	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

Fig. 2 - Adjustable Band Hanger (B-Line B3170)

Fig. 2F - Adjustable Band Hanger Felt Lined for Copper Tubing (B-Line B3170F)

Size Range:

Fig. 2 - 2 1/2" (65mm) thru 6" (150mm) pipe

Fig. 2F - 2 1/2" (65mm) thru 6" (150mm) pipe

Material: Pre-Galvanized Steel

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

Fig. 2NFPA accommodates the reduced rod schedule of the National Fire Protection Association Pamphlet 13.

Approvals: Factory Mutual Engineering Approved. Underwriters Laboratories Listed. Conforms to Federal Specification WW-H-171E & A-A-1192A Type 10 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 10.

Standard Finish: Pre-Galvanized

Note: Available in Stainless Steel material.

Order By: Part number and finish.



Fig. 2

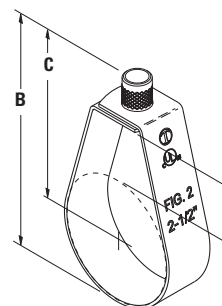


Fig. 2F

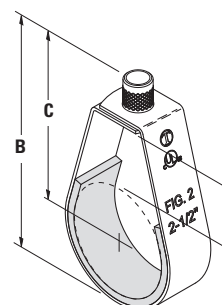


Fig. 2

Nominal Part No.	Pipe Size in. (mm)	Rod Size A	B in. (mm)	C in. (mm)	D in. (mm)	Max. Rec. Load lbs. (kN)	Approx Wt./100 lbs. (kg)
2-2 1/2	2 1/2" (65)	1/2"-13 *	5 3/4" (146.0)	4 1/4" (107.9)	1 5/8" (41.3)	600 (2.67)	41 (18.6)
2-3	3" (75)	1/2"-13 *	6" (152.4)	4 1/8" (104.8)	1 1/4" (31.7)	600 (2.67)	45 (20.4)
2-3 1/2	3 1/2" (90)	1/2"-13 *	7 3/8" (187.3)	5 1/4" (133.3)	2 1/8" (54.0)	600 (2.67)	52 (23.6)
2-4	4" (100)	5/8"-11 *	7 3/8" (187.3)	5" (127.0)	1 5/8" (41.3)	1000 (4.45)	59 (27.6)
2-5	5" (125)	5/8"-11 **	9" (228.6)	6 1/8" (155.6)	2 1/4" (57.1)	1250 (5.56)	97 (44.0)
2-6	6" (150)	3/4"-10 **	9 3/8" (238.1)	6 1/2" (165.1)	1 7/8" (47.6)	1250 (5.56)	139 (63.0)

Fig. 2F

Nominal Part No.	Pipe Size in. (mm)	Rod Size A	B in. (mm)	C in. (mm)	D in. (mm)	Max. Rec. Load lbs. (kN)	Approx Wt./100 lbs. (kg)
2F-2 1/2	2 1/2" (65)	1/2"-13 *	5 3/4" (146.0)	4 1/4" (107.9)	1 5/8" (41.3)	600 (2.67)	41 (18.6)
2F-3	3" (75)	1/2"-13 *	6" (152.4)	4 1/8" (104.8)	1 1/4" (31.7)	600 (2.67)	45 (20.4)
2F-3 1/2	3 1/2" (90)	1/2"-13 *	7 3/8" (187.3)	5 1/4" (133.3)	2 1/8" (54.0)	600 (2.67)	52 (23.6)
2F-4	4" (100)	5/8"-11 *	7 3/8" (187.3)	5" (127.0)	1 5/8" (41.3)	1000 (4.45)	59 (27.6)
2F-5	5" (125)	5/8"-11 **	9" (228.6)	6 1/8" (155.6)	2 1/4" (57.1)	1250 (5.56)	97 (44.0)
2F-6	6" (150)	3/4"-10 **	9 3/8" (238.1)	6 1/2" (165.1)	1 7/8" (47.6)	1250 (5.56)	139 (63.0)

* 3/8" nut is used when requested.

** 1/2" nut is used when requested.

Fig. 200M - "Trimline" Adjustable Band Hanger for Metric Rod

Size Range:

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

Material: Steel, Pre-Galvanized to G90 specifications

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)) Flared edges ease installation for all pipe types and protect CPVC plastic pipe from abrasion. Captured design keeps adjusting nut from separating with hanger. Hanger is easily installed around pipe.
- (2 1/2" (65mm) thru 8" (200mm)) Spring tension on nut holds it securely in hanger before installation. Adjusting nut is easily removed.

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 (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.

Order By: Figure number and pipe size

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

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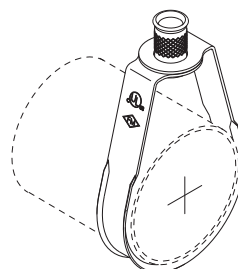


Fig. 200-1 to 200-2

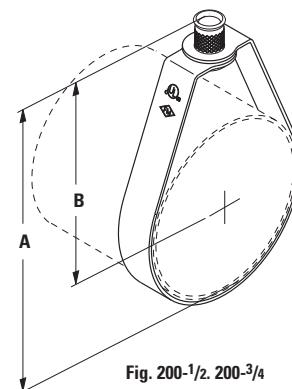


Fig. 200-1/2, 200-3/4
Fig. 200-2 1/2 to 200-8



Part No.	Pipe Size in. (mm)	Rod Size	A		B		Approx. Wt./100	
			in.	(mm)	in.	(mm)	lbs.	(kg)
200M8-1/2	1/2" (15)	M8	3 1/8"	(79.4)	2 5/8"	(66.7)	11	(5.0)
200M10-1/2	1/2" (15)	M10	3 1/8"	(79.4)	2 5/8"	(66.7)	11	(5.0)
200M8-3/4	3/4" (20)	M8	3 1/8"	(79.4)	2 1/2"	(63.5)	11	(5.0)
200M10-3/4	3/4" (20)	M10	3 1/8"	(79.4)	2 1/2"	(63.5)	11	(5.0)
200M8-1	1" (25)	M8	3 3/8"	(85.7)	2 5/8"	(66.7)	12	(5.5)
200M10-1	1" (25)	M10	3 3/8"	(85.7)	2 5/8"	(66.7)	12	(5.5)
200M8-1 1/4	1 1/4" (32)	M8	3 3/4"	(94.0)	2 7/8"	(73.0)	13	(5.9)
200M10-1 1/4	1 1/4" (32)	M10	3 3/4"	(94.0)	2 7/8"	(73.0)	13	(5.9)
200M8-1 1/2	1 1/2" (40)	M8	3 7/8"	(98.4)	2 7/8"	(73.0)	14	(6.4)
200M10-1 1/2	1 1/2" (40)	M10	3 7/8"	(98.4)	2 7/8"	(73.0)	14	(6.4)
200M8-2	2" (50)	M8	4 1/2"	(114.3)	3"	(76.3)	15	(6.9)
200M10-2	2" (50)	M10	4 1/2"	(114.3)	3"	(76.3)	15	(6.9)
200M-2 1/2	2 1/2" (65)	M10	5 5/8"	(142.9)	4 1/8"	(104.7)	27	(12.3)
200M-3	3" (75)	M10	5 7/8"	(149.1)	4"	(101.6)	29	(13.3)
200M-3 1/2	3 1/2" (90)	M10	7 3/8"	(187.3)	5 1/4"	(133.3)	34	(15.6)
200M-4	4" (100)	M10	7 3/8"	(187.3)	5"	(127.0)	35	(16.0)
200M-5	5" (125)	M12	9 1/8"	(231.8)	6 1/4"	(158.7)	66	(30.2)
200M-6	6" (150)	M12	10 1/8"	(257.2)	6 3/4"	(171.4)	73	(33.4)
200M-8	8" (200)	M12	13 1/8"	(333.4)	8 3/4"	(222.2)	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

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

TOLCO



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

Material: Steel — Pre-Galvanized to G40 Spec

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 3/8"-16 or 1/2"-13 adjusting threaded ring nut.

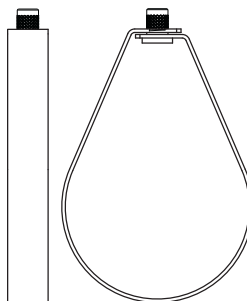
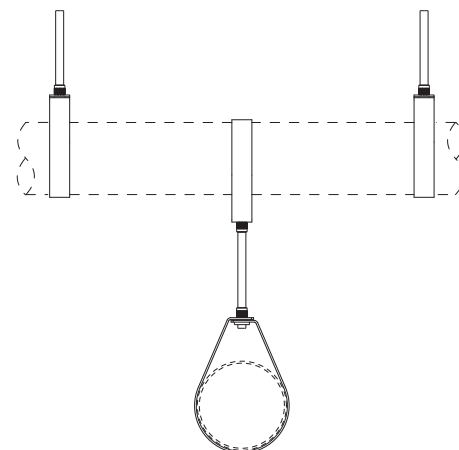
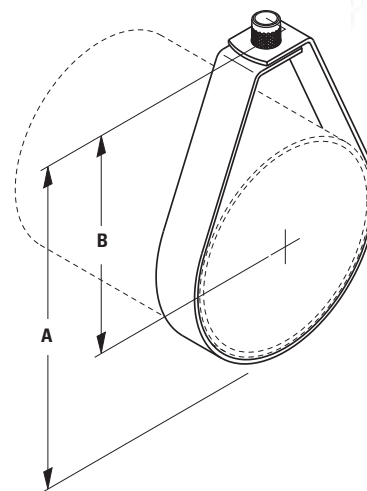
Approvals: Underwriters Laboratories listed in the USA (**UL**) and Canada** (**cUL**). Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 10 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 10.

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.



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

B3198H - Hinged Extension Split Pipe Clamp (TOLCO Fig. 302)

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

Material: Malleable Iron

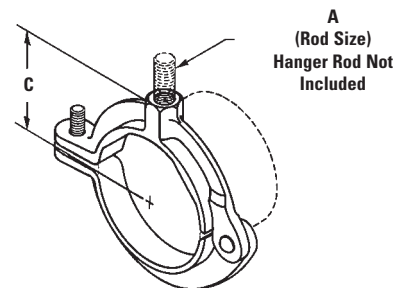
Function: Designed for suspending non-insulated pipe horizontally or vertically.

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.

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Part No.	Pipe Size		Rod Size		C		Design Load		Approx. Wt./100	
	in.	(mm)	A		in.	(mm)	Lbs.	kN	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 (TOLCO Fig. 301CT)

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

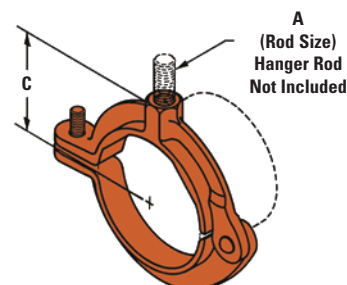
Material: Malleable Iron

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		Rod Size		C		Design Load		Approx. Wt./100	
	in.	(mm)	A		in.	(mm)	Lbs.	(kN)	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



Fig. 120 - "U" Hanger

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

Material: Steel

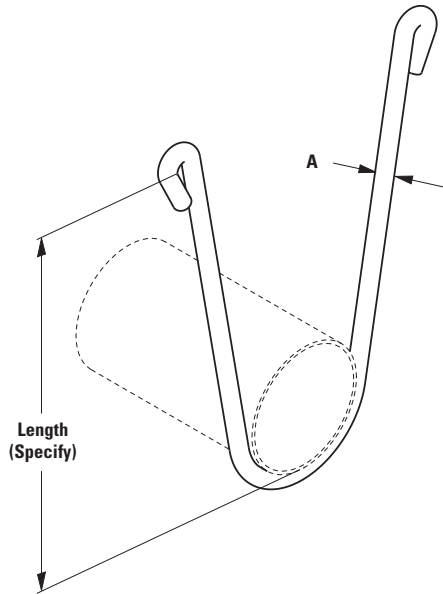
Function: Used to support piping from wood beams where no contraction is expected. Used extensively in automatic fire sprinkler systems.

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

Maximum Temperature: 750°F (399°C)

Finish: Plain. Contact B-Line for alternative finishes and materials.

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



Part No.	Pipe Size		A		Fastener Size
	in.	(mm)	in.	(mm)	
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

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

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

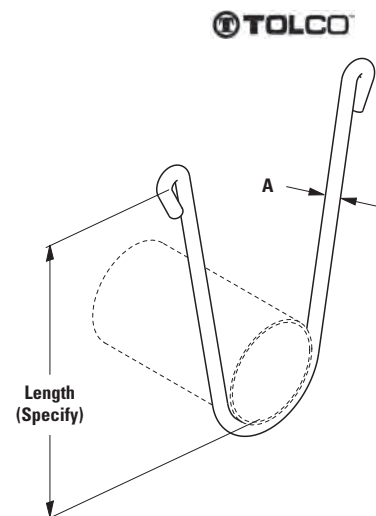
Material: Steel

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

Finish: Plain. Contact B-Line 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-3/4	3/4"	(20)	5/16"	(7.9)	16 x 2*
120MJ-1	1"	(25)	5/16"	(7.9)	16 x 2*
120MJ-1 1/4	1 1/4"	(32)	5/16"	(7.9)	16 x 2*
120MJ-1 1/2	1 1/2"	(40)	5/16"	(7.9)	16 x 2*
120MJ-2	2"	(50)	5/16"	(7.9)	16 x 2*
120MJ-2 1/2	2 1/2"	(65)	3/8"	(9.5)	3/8 x 2 1/2**
120MJ-3	3"	(80)	3/8"	(9.5)	3/8 x 2 1/2**
120MJ-3 1/2	3 1/2"	(90)	3/8"	(9.5)	3/8 x 2 1/2**
120MJ-4	4"	(100)	3/8"	(9.5)	1/2 x 3**
120MJ-5	5"	(125)	1/2"	(12.7)	1/2 x 3**
120MJ-6	6"	(150)	1/2"	(12.7)	1/2 x 3**
120MJ-8	8"	(200)	1/2"	(12.7)	5/8 x 3**



* Drive Screw

** Lag Bolt

Fig. 120W - Wrap Around "U" Hanger

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

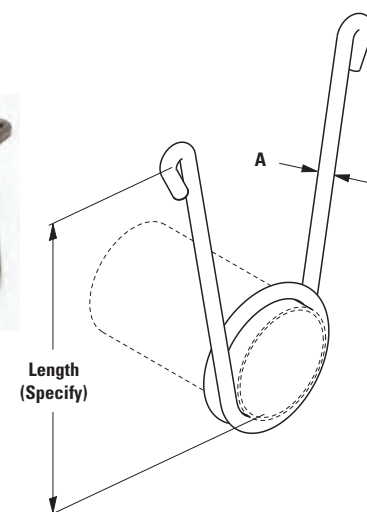
Material: Steel

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 B-Line 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-3/4	3/4"	(20)	5/16"	(7.9)	16 x 2*
120W-1	1"	(25)	5/16"	(7.9)	16 x 2*
120W-1 1/4	1 1/4"	(32)	5/16"	(7.9)	16 x 2*
120W-1 1/2	1 1/2"	(40)	5/16"	(7.9)	16 x 2*
120W-2	2"	(50)	5/16"	(7.9)	16 x 2*



* Drive Screw

Pipe Hangers

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

TOLCO®



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 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 (2010) 9.3.6.3.

Finish: Plain and Galvanized. Contact B-Line 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)

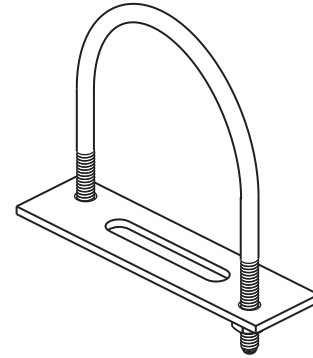
Type 6 — (5" (125mm) and 6" (150mm) pipe size)

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

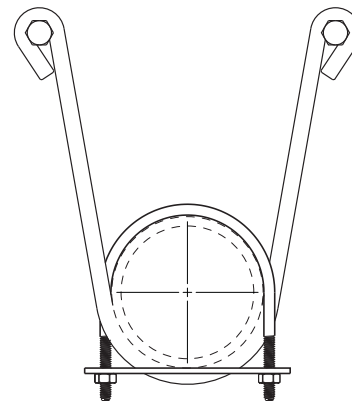
5/16" (7.9mm) rod for up to 2" (50mm) pipe

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 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)



B3373 - Standard Riser Clamp (TOLCO Fig. 6)

B3373C - PVC Coated Standard Riser Clamp (TOLCO Fig. 6PVC)

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, 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)

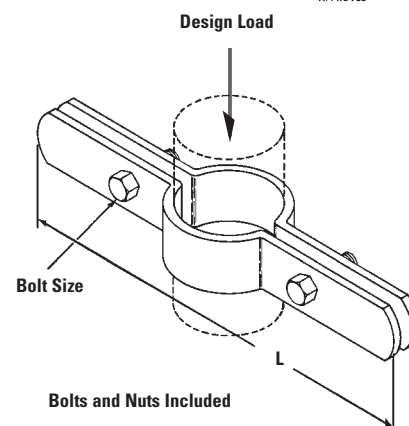
Finish: Plain. Contact B-Line for alternative finishes and materials.

Order By:

Figure number, pipe size and finish.

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

TOLCO



B3373C



Part No.	Pipe Size		L		Bolt Size	Approx. Wt./100	
	in.	(mm)	in.	(mm)		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



B3132 - Two-Bolt Underground Clamp (TOLCO Fig. 9)

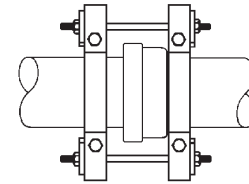
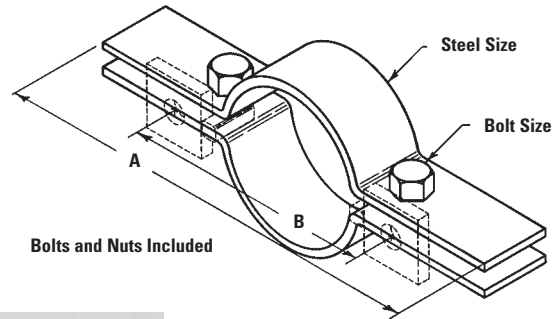
Size Range: 4" (100mm) thru 24" (600mm) A.W.W.A. pipe

Material: Steel

Function: Clamp is used for underground A.W.W.A. cast iron and ductile iron water pipe to prevent joints from separating. The O.D. of the A.W.W.A. pipe is shown in the data table.

Finish: Plain. Contact B-Line for alternative finishes and materials.

Order By: Figure number, pipe size and outside diameter of pipe. Order B3132W lugs, tie rods and hex nuts separately.



Part No.	Pipe Size in. (mm)	A in. (mm)	B in. (mm)	Clamp I.D. in. (mm)	Steel Size in. (mm)	Bolt Size	Approx. Wt./100 Lbs. (kg)
B3132-4	4" (100)	12 ⁷ / ₈ " (327.0)	9 ³ / ₄ " (247.6)	5" (127.0)	1/2" x 2" (12.7 x 50.8)	5/8"-11 x 3"	864 (391.9)
B3132-6	6" (150)	14 ³ / ₄ " (374.6)	12" (304.8)	7 ¹ / ₁₆ " (179.4)	1/2" x 2" (12.7 x 50.8)	5/8"-11 x 3"	1020 (462.6)
B3132-8	8" (200)	17 ¹ / ₄ " (438.1)	14 ¹ / ₄ " (361.9)	9 ³ / ₁₆ " (233.4)	1/2" x 2" (12.7 x 50.8)	5/8"-11 x 3"	1222 (554.3)
B3132-10	10" (250)	19 ³ / ₈ " (492.1)	16 ¹ / ₂ " (419.1)	11 ³ / ₈ " (288.9)	1/2" x 2" (12.7 x 50.8)	5/8"-11 x 3"	1409 (639.1)
B3132-12	12" (300)	21 ⁷ / ₈ " (555.6)	18 ⁷ / ₈ " (479.4)	13 ¹ / ₂ " (342.9)	1/2" x 2" (12.7 x 50.8)	5/8"-11 x 3"	1608 (729.4)
B3132-14	14" (350)	26" (660.4)	22 ¹ / ₄ " (565.1)	15 ³ / ₄ " (400.0)	3/4" x 3" (19.0 x 76.2)	7/8"-9 x 4 ¹ / ₂ "	4359 (1977.2)
B3132-16	16" (400)	28 ³ / ₈ " (720.7)	24 ⁵ / ₈ " (625.5)	17 ⁷ / ₈ " (454.0)	3/4" x 4" (19.0 x 101.6)	1"-8 x 4 ¹ / ₂ "	6403 (2904.4)
B3132-18	18" (450)	31 ³ / ₈ " (796.9)	27 ⁵ / ₈ " (701.7)	20" (508.0)	3/4" x 4" (19.0 x 101.6)	1 ¹ / ₄ "-7 x 5"	7293 (3308.1)
B3132-20	20" (500)	33 ¹ / ₂ " (850.9)	29 ³ / ₄ " (755.6)	22 ¹ / ₈ " (562.0)	3/4" x 4 ¹ / ₂ " (19.0 x 114.3)	1 ¹ / ₄ "-7 x 5"	8778 (3981.7)
B3132-24	24" (600)	39" (990.6)	35 ¹ / ₄ " (895.3)	26 ³ / ₈ " (669.9)	3/4" x 5" (19.0 x 127.0)	1 ¹ / ₄ "-6 x 5 ¹ / ₂ "	11659 (5288.5)

B3132W - Lug Washer (TOLCO Fig. 9X)

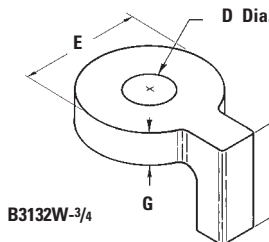
Size Range: 3/4" (20mm) thru 1¹/₂" (40mm) rod

Material: Cast Iron

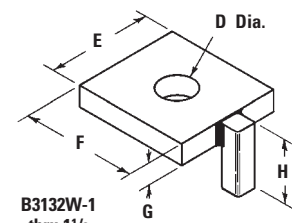
Function: Used with B3132 to secure tie rods. The projecting lug bears against the clamp bolt to prevent washer and tie rod from slipping off clamp.

Finish: Plain. Contact B-Line for alternative finishes and materials.

Order By: Figure number, rod size and finish



B3132W-3/4



B3132W-1
thru 1¹/₂



Part No.	Tie Rod Size	Use With Pipe Size in. (mm)	Dia. in. (mm)	E in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	Approx. Wt./100 Lbs. (kg)
B3132W-3/4	3/4"-10	4"-12" (100-300)	7/8" (22.2)	2 ³ / ₈ " (60.3)	-- --	5/8" (15.9)	1 ⁵ / ₈ " (41.3)	74 (33.7)
B3132W-1	1"-8	14"-16" (350-400)	1 ¹ / ₈ " (28.6)	3 ¹ / ₂ " (88.9)	3 ¹ / ₂ " (88.9)	5/8" (15.9)	2 ¹ / ₂ " (63.5)	207 (93.9)
B3132W-1 ¹ / ₄	1 ¹ / ₄ "-7	18" (450)	1 ³ / ₈ " (34.9)	3 ¹ / ₂ " (88.9)	4" (101.6)	5/8" (15.9)	3 ¹ / ₂ " (63.5)	236 (107.0)
B3132W-1 ³ / ₈	1 ³ / ₈ "-6	20" (500)	1 ¹ / ₂ " (38.1)	4" (101.6)	4 ¹ / ₄ " (107.9)	5/8" (15.9)	4" (101.6)	231 (104.8)
B3132W-1 ¹ / ₂	1 ¹ / ₂ "-6	24" (600)	1 ⁵ / ₈ " (41.3)	4" (101.6)	4 ³ / ₄ " (120.6)	5/8" (15.9)	4" (101.6)	259 (117.5)

B3134 - Double Bolt Underground Socket Clamp (TOLCO Fig. 14)

Size Range: 4" (100mm) thru 24" (600mm) A.W.W.A. pipe

Material: Steel

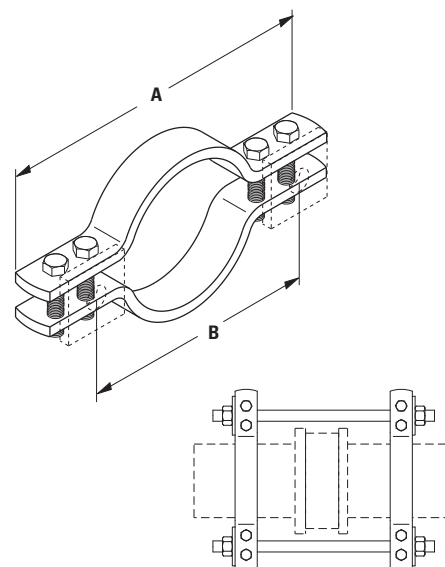
Function: Clamp is used for underground A.W.W.A. cast iron and ductile iron water pipe to prevent joints from separating. The O.D. of the A.W.W.A. pipe is shown in the data table.

Approvals: Conforms to National Fire Protection Association (NFPA) Pamphlet 24, 4" (100mm) thru 12" (300mm) pipe sizes.

Finish: Plain. Contact B-Line for alternative finishes and materials.

Order By: Figure number, pipe size and outside diameter of pipe.

Order B3134W plate washers, tie rods and hex nuts separately.



Part No.	Pipe Size in. (mm)	A in. (mm)	B in. (mm)	Bolt Size	B3134 Washer Size	Approx. Wt./100 lbs. (kg)
B3134-4	4.80" (121.9)	14 ¹ / ₁₆ " (357.2)	9 ⁵ / ₁₆ " (236.5)	5/8"-11	B3134W-3/4	1275 (578.3)
B3134-6	6.90" (175.3)	16 ⁷ / ₁₆ " (417.5)	11 ¹¹ / ₁₆ " (298.9)	5/8"-11	B3134W-3/4	1455 (660.0)
B3134-8	9.05" (229.9)	19 ⁵ / ₈ " (498.5)	14 ⁷ / ₈ " (442.6)	5/8"-11	B3134W-3/4	2350 (1065.9)
B3134-10	11.10" (281.9)	21 ¹³ / ₁₆ " (554.0)	17 ¹ / ₁₆ " (433.4)	3/4"-10	B3134W-3/4	2925 (1326.8)
B3134-12	13.20" (335.3)	24 ¹ / ₂ " (622.3)	19 ¹ / ₄ " (488.9)	7/8"-9	B3134W-1	4030 (1828.0)
B3134-14	15.30" (388.6)	26 ¹⁵ / ₁₆ " (684.2)	21 ¹¹ / ₁₆ " (550.9)	7/8"-9	B3134W-1	5385 (2442.6)
B3134-16	17.40" (441.9)	30 ³ / ₄ " (781.0)	24 ³ / ₄ " (628.6)	1"-8	B3134W-1 ¹ / ₈	7645 (3467.8)
B3134-18	19.50" (495.3)	34 ⁵ / ₁₆ " (871.5)	27 ⁵ / ₁₆ " (693.7)	1 ¹ / ₄ "-7	B3134W-1 ¹ / ₄	9425 (4275.2)
B3134-20	21.60" (548.6)	36 ⁵ / ₈ " (930.3)	29 ⁵ / ₈ " (752.5)	1 ¹ / ₄ "-7	B3134W-1 ¹ / ₂	10975 (4978.2)
B3134-24	25.80" (655.3)	42 ¹ / ₈ " (1070.0)	34 ³ / ₈ " (873.1)	1 ¹ / ₂ "-6	B3134W-1 ¹ / ₂	14865 (6742.6)

B3134W - Plate Washer (TOLCO Fig. 14X)

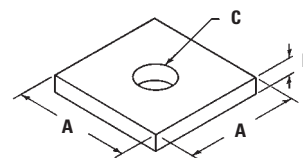
Size Range: 3/4"-10 thru 1¹/₂"-6 rod

Material: Steel

Function: Used with B3134 to secure tie rods.

Finish: Plain. Contact B-Line for alternative finishes and materials.

Order By: Figure number, rod size and finish



Part No.	Tie Rod Size	A in. (mm)	B in. (mm)	Hole Size C in. (mm)	Approx. Wt./100 lbs. (kg)
B3132W-3/4	3/4"-10	3" (76.2)	1/2" (12.7)	7/8" (22.2)	120 (54.4)
B3132W-1	1"-8	3 ¹ / ₂ " (88.9)	1/2" (12.7)	1 ¹ / ₈ " (28.6)	157 (71.2)
B3132W-1 ¹ / ₈	1 ¹ / ₈ "-7	3 ¹ / ₂ " (88.9)	5/8" (15.9)	1 ¹ / ₄ " (31.7)	194 (88.0)
B3132W-1 ¹ / ₄	1 ¹ / ₄ "-7	3 ¹ / ₂ " (88.9)	3/4" (19.0)	1 ³ / ₈ " (35.8)	230 (104.3)
B3132W-1 ¹ / ₂	1 ¹ / ₂ "-6	3 ¹ / ₂ " (88.9)	3/4" (19.0)	1 ⁵ / ₈ " (41.2)	240 (108.8)



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

Pipe Clamps

B3140 - Standard Pipe Clamp (TOLCO Fig. 4)

B3140C - Standard Pipe Clamp PVC Coated (TOLCO Fig. 4PVC)

TOLCO



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 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.

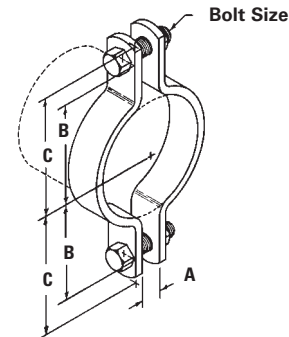
Note: For piping that requires sway bracing refer to Fig. 4A.

Maximum Temperature: — 750°F (399°C)

Finish: Plain. Contact B-Line 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

Part No.	Pipe Size in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	Bolt Size	Approx. Wt./100 lbs. (kg)
B3140-1/2	1/2" (15)	3/8" (9.5)	31/32" (24.6)	17/32" (38.9)	5/16"-18	30 (13.6)
B3140-3/4	3/4" (20)	9/16" (14.3)	13/32" (27.8)	121/32" (42.0)	5/16"-18	31 (14.0)
B3140-1	1" (25)	9/16" (14.3)	15/16" (33.3)	17/8" (47.6)	5/16"-18	33 (14.5)
B3140-1 1/4	1 1/4" (32)	17/32" (13.5)	17/16" (36.5)	2" (50.8)	5/16"-18	39 (17.7)
B3140-1 1/2	1 1/2" (40)	19/32" (15.1)	121/32" (42.0)	27/32" (56.4)	5/16"-18	41 (18.6)
B3140-2	2" (50)	9/16" (14.3)	2 1/8" (54.0)	23/4" (69.8)	1/2"-13	118 (53.5)
B3140-2 1/2	2 1/2" (65)	5/8" (15.9)	221/32" (67.5)	39/32" (83.3)	1/2"-13	130 (58.9)
B3140-3	3" (75)	5/8" (15.9)	2 5/16" (74.6)	39/16" (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)	325/32" (96.0)	1/2"-13	158 (71.6)
B3140-4	4" (100)	3/4" (19.0)	39/16" (90.5)	45/16" (109.5)	5/8"-11	239 (108.4)
B3140-5	5" (125)	3/4" (19.0)	4 1/8" (104.8)	47/8" (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)

Figure 4B Pipe Clamp (B-Line B386)

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

Material: Steel

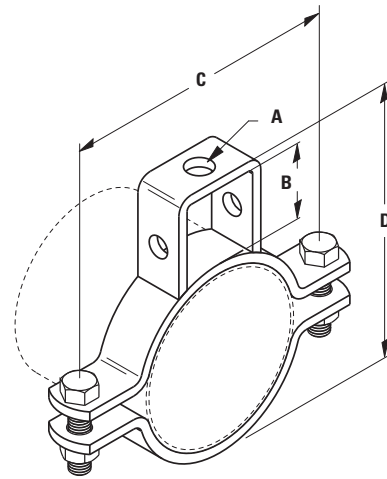
Function: Recommended for the suspension of non-insulated pipe or insulated pipe with B3151 (Fig. 220) shields.

Approvals: Underwriter's Laboratories Listed in the USA (UL) and Canada (cUL) for 3/4" (20mm) thru 8" (200mm) pipe.

Standard Finish: Plain or Electro-Plated, Contact B-Line for alternative finishes and materials.

Order By: Figure number and finish.

TOLCO



Part No.	Pipe Size in. (mm)	Rod Size A	B in. (mm)	C in. (mm)	D in. (mm)	Bolt Size	Design Load Lbs. (kN)	Approx. Wt./100 Lbs. (kg)
4B-3/4	3/4" (20)	3/8"-16	1" (25.4)	2 7/8" (73.0)	2 5/8" (66.7)	5/16"-18	330 (1.47)	56 (25.4)
4B-1	1" (25)	3/8"-16	1" (25.4)	3 1/4" (82.5)	2 15/16" (74.6)	5/16"-18	330 (1.47)	60 (27.2)
4B-1 1/4	1 1/4" (32)	3/8"-16	1" (25.4)	3 9/16" (90.6)	3 1/4" (82.5)	5/16"-18	330 (1.47)	74 (33.5)
4B-1 1/2	1 1/2" (40)	3/8"-16	1" (25.4)	3 13/16" (96.8)	3 7/16" (87.3)	5/16"-18	330 (1.47)	79 (35.8)
4B-2	2" (50)	3/8"-16	1 1/2" (38.1)	5 1/8" (130.2)	4 5/8" (117.5)	5/16"-18	440 (1.78)	156 (70.7)
4B-2 1/2	2 1/2" (65)	1/2"-13	1 3/4" (44.4)	5 5/8" (142.9)	5 3/8" (136.5)	3/8"-16	440 (1.78)	176 (79.8)
4B-3	3" (80)	1/2"-13	1 7/8" (47.6)	6 3/4" (171.4)	6 1/8" (155.5)	3/8"-16	660 (2.93)	198 (89.9)
4B-3 1/2	3 1/2" (90)	1/2"-13	2" (50.8)	7 1/4" (184.1)	6 3/4" (171.4)	3/8"-16	660 (2.93)	219 (99.3)
4B-4	4" (100)	5/8"-11	2" (50.8)	8 5/8" (219.1)	7 1/4" (184.1)	1/2"-13	800 (3.56)	288 (130.6)
4B-5	5" (125)	5/8"-11	2" (50.8)	9 7/8" (250.8)	8 5/16" (211.1)	5/8"-11	980 (4.36)	390 (176.9)
4B-6	6" (150)	3/4"-10	2 1/8" (54.0)	10 15/16" (277.8)	9 1/2" (241.3)	5/8"-11	980 (4.36)	448 (203.2)
4B-8	8" (200)	7/8"-9	2 1/8" (54.0)	13 7/16" (341.2)	11 1/2" (292.1)	3/4"-10	1200 (5.34)	691 (313.4)

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

Pipe Clamps

B2400 - Standard Pipe Strap (TOLCO Fig. 2STR)

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

Material: Steel

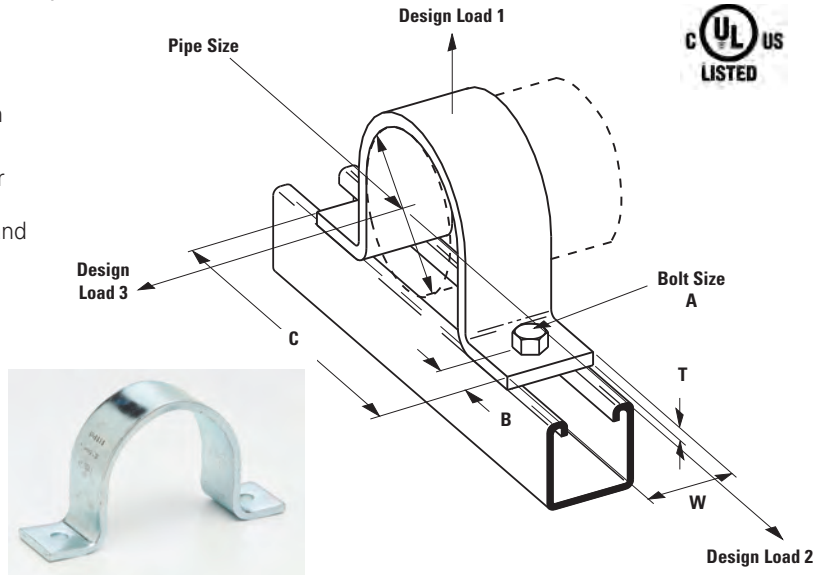
Function: Designed for supporting pipe runs from strut supports.

Approvals: Underwriters Laboratories Listed 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.

Finish: Electro-Galvanized. Contact B-Line 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	A	B	C	T	W
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	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 9/32" (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)

Part No.	Design Load 1	Design Load 2	Design Load 3	Approx. Wt./100
	Lbs. (kN)	Lbs. (kN)	Lbs. (kN)	Lbs. (kg)
B2400-1/2	600 (2.67)	150 (.67)	105 (.47)	23 (10.4)
B2400-3/4	600 (2.67)	150 (.67)	105 (.47)	26 (11.8)
B2400-1	600 (2.67)	150 (.67)	120 (.53)	31 (14.0)
B2400-1 1/4	600 (2.67)	150 (.67)	120 (.53)	36 (16.3)
B2400-1 1/2	600 (2.67)	150 (.67)	120 (.53)	39 (17.7)
B2400-2	1200 (5.34)	480 (2.14)	180 (.80)	93 (42.2)
B2400-2 1/2	1200 (5.34)	480 (2.14)	180 (.80)	106 (48.1)
B2400-3	1200 (5.34)	480 (2.14)	300 (1.33)	132 (59.9)
B2400-3 1/2	1200 (5.34)	480 (2.14)	300 (1.33)	151 (68.5)
B2400-4	1500 (6.67)	600 (2.67)	450 (2.00)	160 (72.6)
B2400-5	1500 (6.67)	600 (2.67)	450 (2.00)	192 (87.1)
B2400-6	1500 (6.67)	600 (2.67)	450 (2.00)	219 (99.3)
B2400-8	2000 (8.90)	800 (3.56)	600 (2.67)	297 (134.7)

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



Fig. 22 - Hanger for CPVC Plastic Pipe & IPS Steel Pipe
Single Fastener Strap (B-Line B3181)**

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.

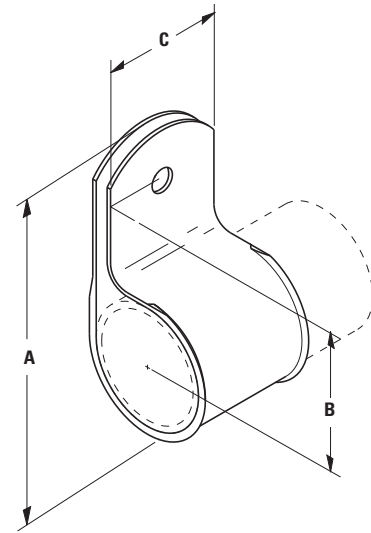
Features: Fig. 22 incorporates features which protect the pipe and ease installation. The flared edge design protects CPVC pipe from any rough surface. It is easily attached to the building structure using the special UL Listed hex head self threading screw* furnished with the product. It is recommended 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.

** With reduced spacing, consult factory.



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

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

Pipe Clamps

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

TOLCO



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. 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.

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.

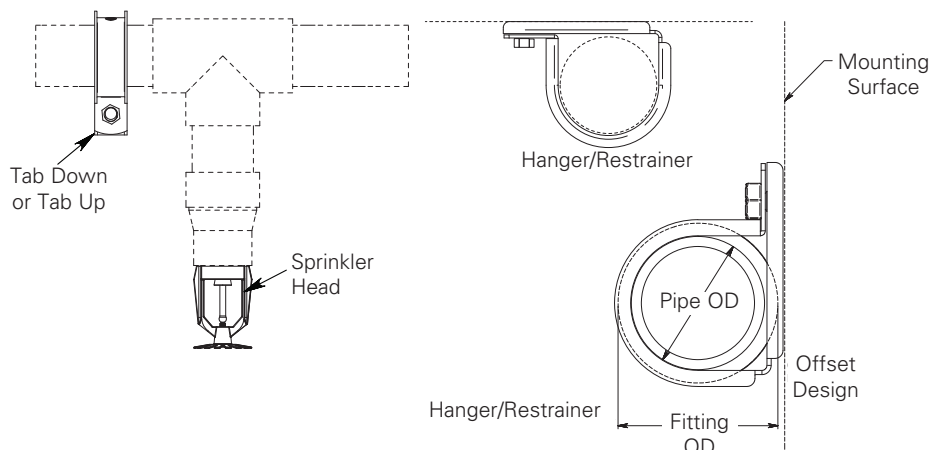
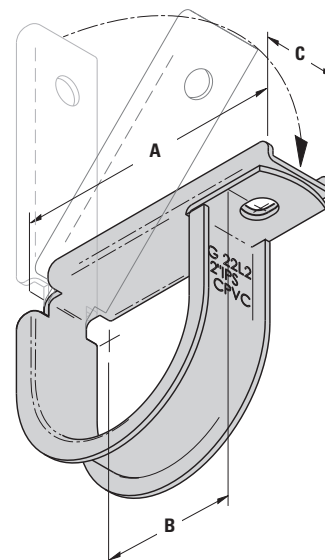
For Wood Installation — Test results have shown that #14 x 1 1/2" wood screws will support the required load for cUL us.

For Steel Installation — Test results have shown that 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 Pipe Size in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	Max. Hanger Spacing - CPVC Ft. (m)	Max. Hanger Spacing - Steel Ft. (m)	Approx. Wt./100 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)

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.

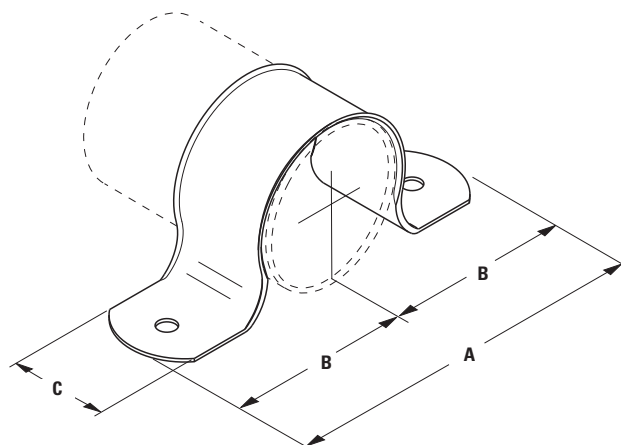
Features: Fig. 23 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. It also incorporates snap restrainers allowing easier and faster installation. Easily attaches to the building structure using the two UL Listed 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.

** With reduced spacing, consult factory.



Part No.	CPVC Pipe Size in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	Max. Hanger Spacing Ft. (m)	Fastener Hex Head Size in. (mm)	Approx. Wt./100 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)

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

Pipe Clamps

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

TOLCO



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.

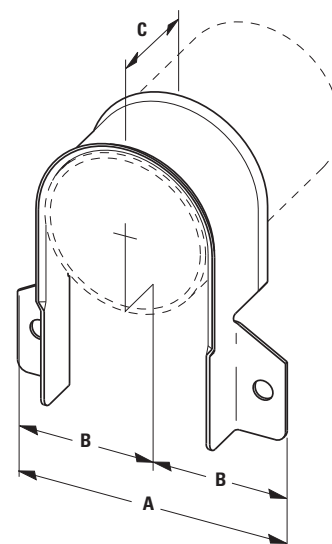
Features: Fig. 24 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. Easily attaches to the building structure using the two UL Listed hex head self threading screws* furnished with the product. It is recommended that 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.

** With reduced spacing, consult factory.



Part No.	CPVC Pipe Size in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	Max. Hanger Spacing Ft. (m)	Fastener Hex Head Size in. (mm)	Approx. Wt./100 Lbs. (kg)
24-3/4	3/4" (20)	25/16" (58.7)	15/32" (27.8)	13/16" (30.2)	5 1/2 (1.67)	5/16" (7.9)	9 (4.1)
24-1	1" (25)	25/8" (66.7)	15/16" (33.3)	13/16" (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)	13/16" (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)	13/16" (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)	13/16" (30.2)	8 (2.44)	5/16" (7.9)	15 (6.8)

Fig. 25 - Surge Restrainer

Size Range: — One size fits 3/4" (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, 2010 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 3/4" (20mm) thru 2" (40mm).

Patent #5,344,108

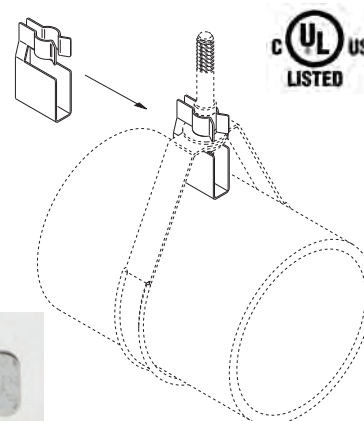


Fig. 27B - Speed Nut

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, 23, 24, 28, 28M, 29, and B3184).

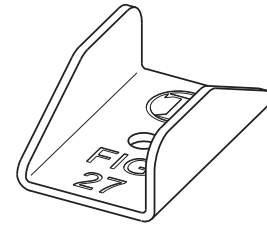


Fig. 27B
(1) Required High
Side of Hanger
Application

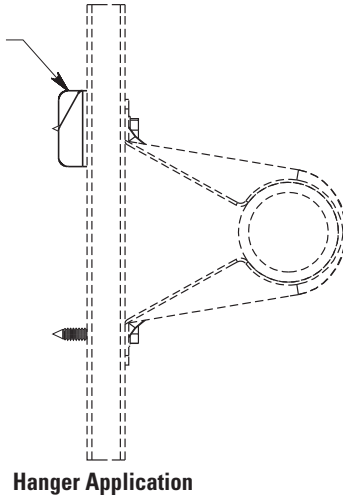
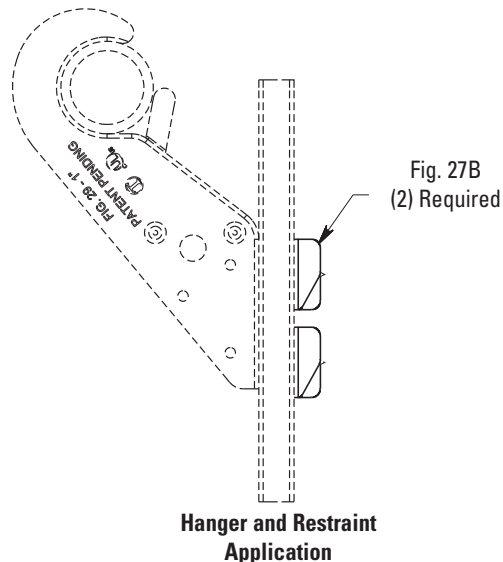
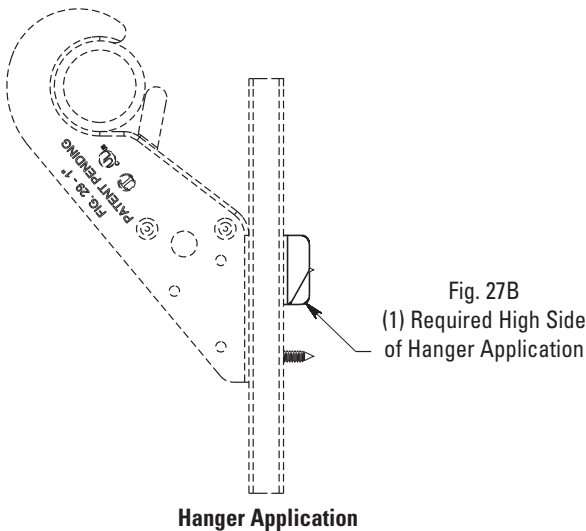
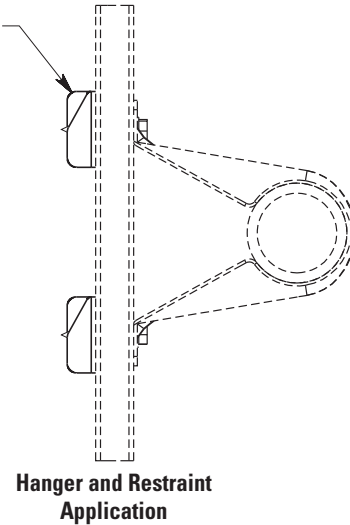


Fig. 27B
(2) Required



Pipe Clamps

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

TOLCO



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:

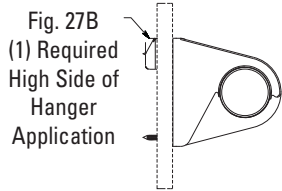
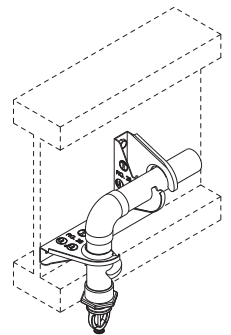
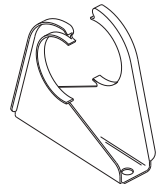
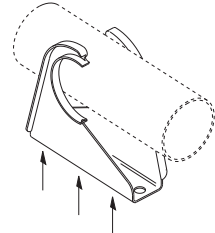
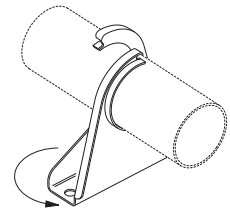
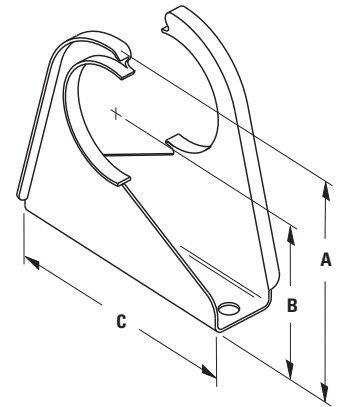
- Flared edge design protects CPVC pipe from any rough or abrasive surfaces.
- Unique twist and lock design holds pipe firmly in place and allows retrofit type of installation.
- The "Stand-Off" design eliminates the need for wood block extension.
- Can be installed on horizontal or vertical piping regardless 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 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.

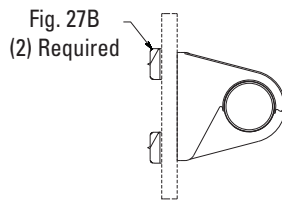
Order by: — Figure number and pipe size.

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

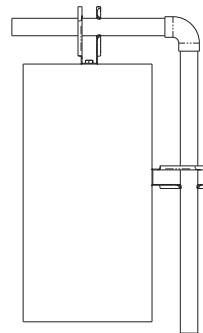
** With reduced spacing, consult factory.



Hanger Application



Hanger and Restraint Application



Part No.	Pipe Size	A	B	C	Max Hanger Spacing	Approx. Wt./100 lbs. (kg)
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	Ft. (m)	
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 5/8" (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)

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

TOLCO



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 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

** With reduced spacing, consult factory.

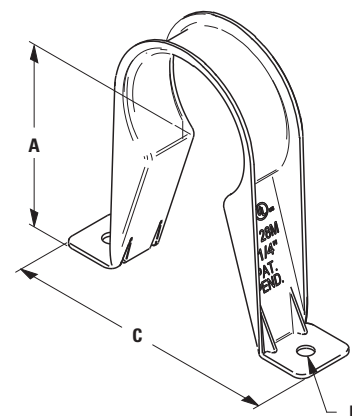
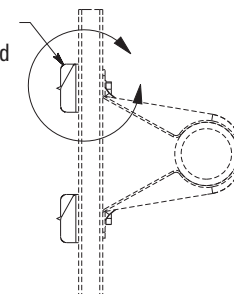
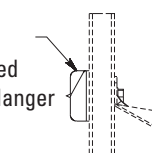


Fig. 27B
(2) Required

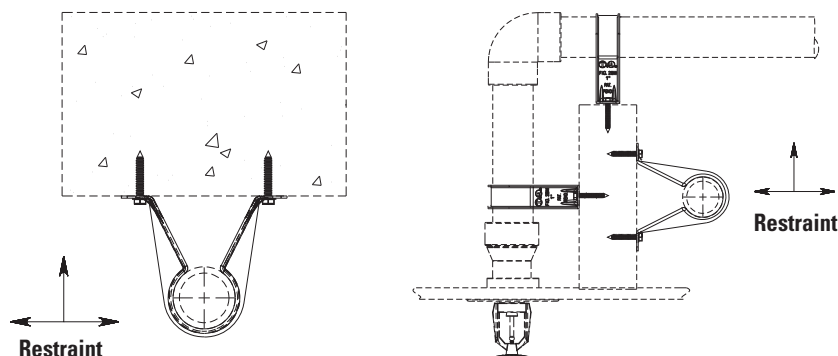


Hanger and Restraint Application

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



**Detail A
Hanger Application**



Part No.	Pipe Size in. (mm)	A in. (mm)	Hole Dia. B in. (mm)	C in. (mm)	Max Spacing* in. (mm)	Approx. Wt./100 lbs. (kg)
28M-3/4	3/4" (20)	2" (50.8)	3/16" (4.8)	35/16" (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

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

Pipe Clamps

Fig. 29 - Double Offset Hanger & Restrainer for CPVC Plastic Pipe & IPS Steel Pipe**

TOLCO



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.

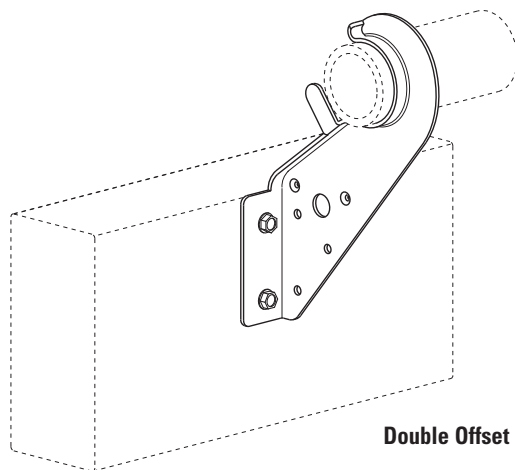
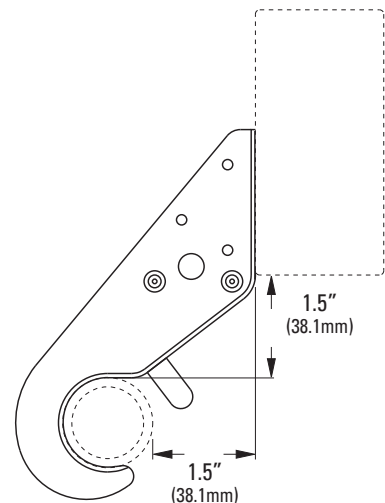
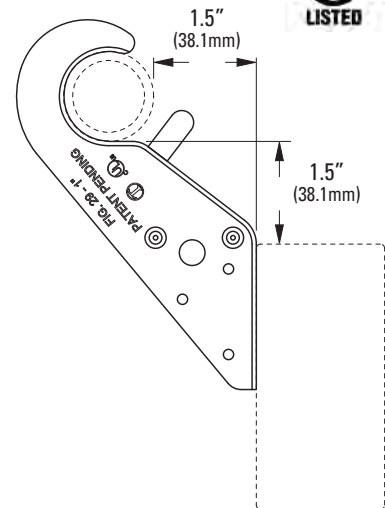
Approvals: Underwriters Laboratories Listed in the USA (**UL**) and Canada (**cUL**) as a hanger and restrainer to support fire sprinkler systems. Meets and exceeds requirements of NFPA 13, 13R and 13D.

Finish: Pre-Galvanized

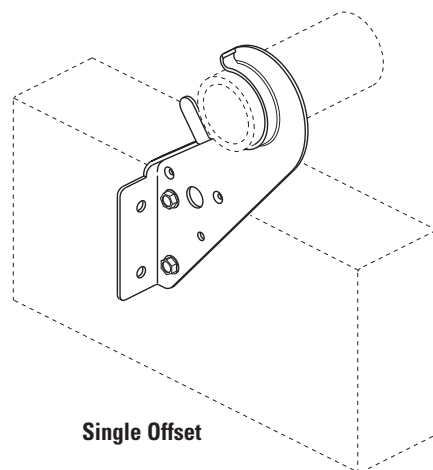
Order By: Figure number and pipe size.

Patent Pending

** With reduced spacing, consult factory.



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.

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

TOLCO®



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:

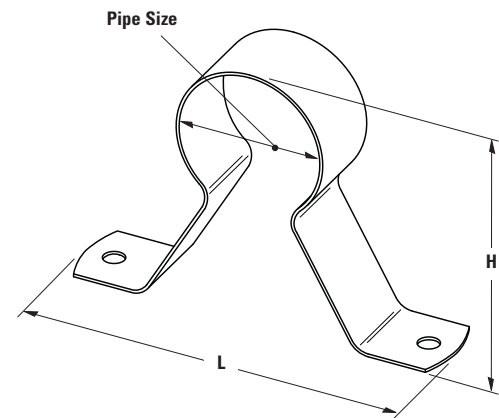
- Flared edge design protects CPVC pipe from any rough or abrasive surfaces
- The stand-off design eliminates the need for wood block extension
- Can be installed on horizontal or vertical piping regardless of mounting surface orientation
- Attaches easily to wood structure with two hex head self-threading 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: Figure number and pipe size

Patent # 7,744,042



Part No.	CPVC Pipe Size in. (mm)	L Overall in. (mm)	H Overall in. (mm)	Max. Hanger Spacing ft. (m)	Fastener Hex Head Size in. (mm)	Approx. Wt./100 Lbs. (kg)
B3184-3/4	3/4" (20)	29/16" (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)

This product is cULus Listed as a hanger ONLY.

For hanger and restraint applications, please refer to B-Line Fig. 28 (page 39) or Fig. 28M (page 40).

Pipe Supports

B3088 - Base Stand (TOLCO Fig. 316)

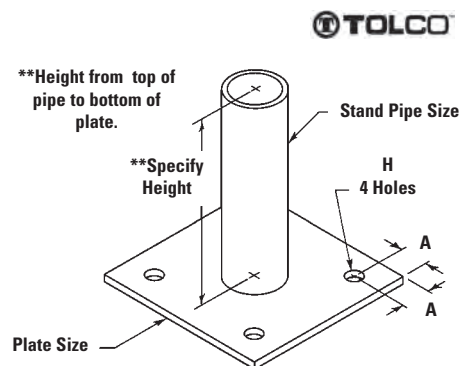
Size Range: 3/4" (20mm) thru 6" (150mm) pipe

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 B-Line for alternative finishes and materials.

Order By: Figure number, height and finish.



Note: Match B3088 part number with dimension 'D' from B3090, B3094, B3095, B3096, B3097 or B3098 charts.

Part No.	Plate Size		Stand Pipe Size		A		Dia. H		Approx. Wt./100*	
	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	Lbs.	(kg)
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)	420	(190.5)
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)	480	(216.0)
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)	590	(267.6)
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)	655	(297.1)
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)	1211	(549.3)
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)	2376	(1077.7)
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)	3137	(1422.9)
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)	4338	(1967.7)
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)	7378	(3346.6)

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

B3088T - Threaded Base Stand (TOLCO Fig. 316T)

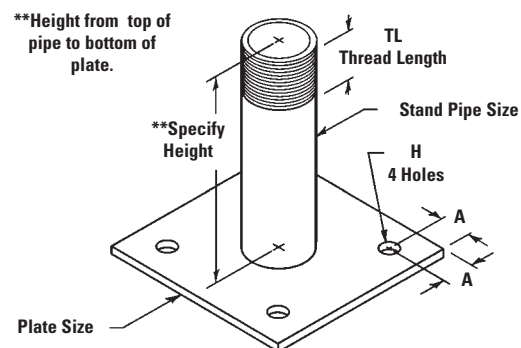
Size Range: 1" (25mm) thru 6" (150mm) pipe

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 B-Line for alternative finishes and materials.

Order By: Figure number, height and finish.



Note: Match B3088T part number with dimension 'D' from B3089, B3092, and B3093 charts.

Part No.	Plate Size		Stand Pipe Size		A		Dia. H		TL		Approx. Wt./100*	
	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	Lbs.	(kg)
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)	495	(224.5)
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)	583	(264.4)
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)	649	(294.4)
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)	785	(356.1)
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)	1524	(691.3)
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)	2624	(1190.2)
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)	3594	(1630.2)
B3088T-6	1/2" x 18" x 18"	(12.7 x 457.2 x 457.2)	6"	(150)	1 1/2"	(38.1)	1 1/8"	(28.6)	2"	(50.8)	7346	(3332.1)

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

B3088S - Seismic Base Stand

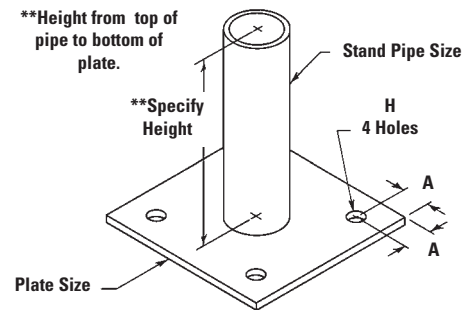
Size Range: 3/4" (20mm) thru 4" (100mm) pipe

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 B-Line for alternative finishes and materials.

Order By: Figure number, height and finish.



Note: Match B3088S part number with dimension 'D' from B3090, B3094, B3095, B3096, B3097 or B3098 charts.

Part No.	Plate Size in. (mm)	Stand Pipe Size in. (mm)	A in. (mm)	Dia. H in. (mm)	Approx. Wt./100* Lbs. (kg)
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)	618 (280.3)
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)	708 (321.1)
B3088S-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)	798 (362.0)
B3088S-1 1/2	1/4" x 8" x 8" (6.3 x 203.2 x 203.2)	1 1/2" (38)	1" (25.4)	9/16" (14.3)	858 (389.2)
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)	993 (450.4)
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)	1638 (743.0)
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)	4202 (1906.0)

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

B3088ST - Threaded Seismic Base Stand

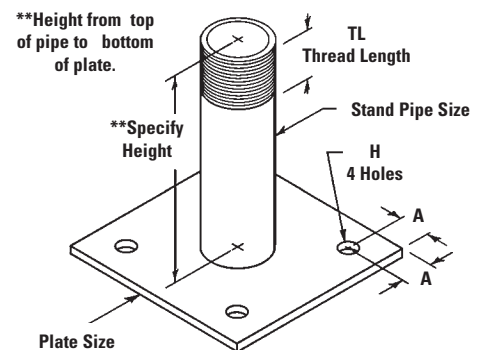
Size Range: 1" (25mm) thru 4" (100mm) pipe

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 B-Line for alternative finishes and materials.

Order By: Figure number, height and finish.



Note: Match B3088TS part number with dimension 'D' from B3089, B3092, and B3093 charts.

Part No.	Plate Size in. (mm)	Stand Pipe Size in. (mm)	A in. (mm)	Dia. H in. (mm)	TL in. (mm)	Approx. Wt./100* Lbs. (kg)
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)	708 (321.1)
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)	798 (362.0)
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)	858 (389.2)
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)	993 (450.4)
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)	1638 (743.0)
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)	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 (TOLCO Fig. 318A)

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 44) threaded pipe stand.

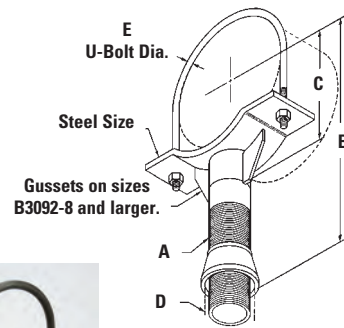
Approvals: Conforms to Federal Specification WW-H-171E & A-A-1192A and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 37.

Finish: Plain. Contact B-Line 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 B3092D1 - size. 3" (80mm) Ductile Iron uses B3092-3 1/2

A
Schedule 40 Pipe Size
B
Center of pipe to
bottom of pipe reducer.
C
Center of pipe to
bottom lip of support.
D
Nominal pipe size of base stand -
not included.
E
U-Bolt Dia.



Part No.	Pipe Size in. (mm)	Maximum O.D. of Pipe in. (mm)	A in. (mm)	Minimum in. (mm)	B in. (mm)	Maximum 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 in. (mm)	D (Not Supplied) in. (mm)	E in. (mm)	Saddle Steel Size in. (mm)	Approx. Wt./100 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 21/64" (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)

B3093 - Adjustable Pipe Saddle Support (TOLCO Fig. 317A)

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 44) 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 B-Line for alternative finishes and materials.

Order By: Figure number and finish

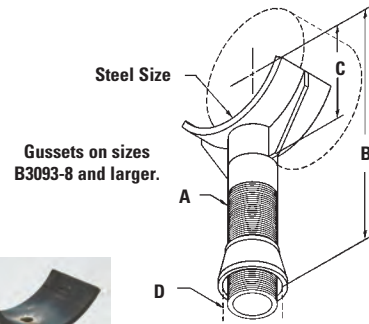
Note: Order with B3088T for complete stanchion support.

A
Schedule 40 Pipe Size

B
Center of pipe to bottom of pipe reducer.

C
Center of pipe to bottom lip of support.

D
Nominal pipe size of base stand - not included.



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

Part No.	D (Base Stand Not Supplied) in. (mm)	Saddle Steel Size in. (mm)	Approx. Wt./100	
			Complete Lbs. (kg)	Saddle Only Lbs. (kg)
B3093-1	1 ¹ / ₂ " (40)	1/4" x 1 ³ / ₄ " (6.3 x 44.4)	189 (85.7)	49 (22.2)
B3093-1 ¹ / ₄	1 ¹ / ₂ " (40)	1/4" x 1 ³ / ₄ " (6.3 x 44.4)	221 (100.2)	81 (36.7)
B3093-1 ¹ / ₂	1 ¹ / ₂ " (40)	1/4" x 1 ³ / ₄ " (6.3 x 44.4)	228 (103.4)	88 (39.9)
B3093-2	1 ¹ / ₂ " (40)	1/4" x 1 ³ / ₄ " (6.3 x 44.4)	234 (106.1)	94 (42.6)
B3093-2 ¹ / ₂	2 ¹ / ₂ " (65)	1/4" x 3" (6.3 x 76.2)	567 (257.2)	167 (75.8)
B3093-3	2 ¹ / ₂ " (65)	1/4" x 3" (6.3 x 76.2)	576 (261.3)	176 (79.9)
B3093-3 ¹ / ₂	2 ¹ / ₂ " (65)	1/4" x 3" (6.3 x 76.2)	588 (266.7)	188 (85.3)
B3093-4	3" (80)	1/4" x 4" (6.3 x 101.6)	1064 (482.6)	364 (165.1)
B3093-5	3" (80)	1/4" x 4" (6.3 x 101.6)	1081 (490.3)	381 (172.8)
B3093-6	3" (80)	3/8" x 4" (9.5 x 101.6)	1234 (559.7)	534 (242.2)
B3093-8	3" (80)	3/8" 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 B3093-3¹/₂

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

Seismic Bracing

Fig. 75 - Swivel Attachment

Size Range: — 3/8"-16 Rod Attachment

Material: Steel

Function: 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 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: Figure number

Patent: #7,887,248

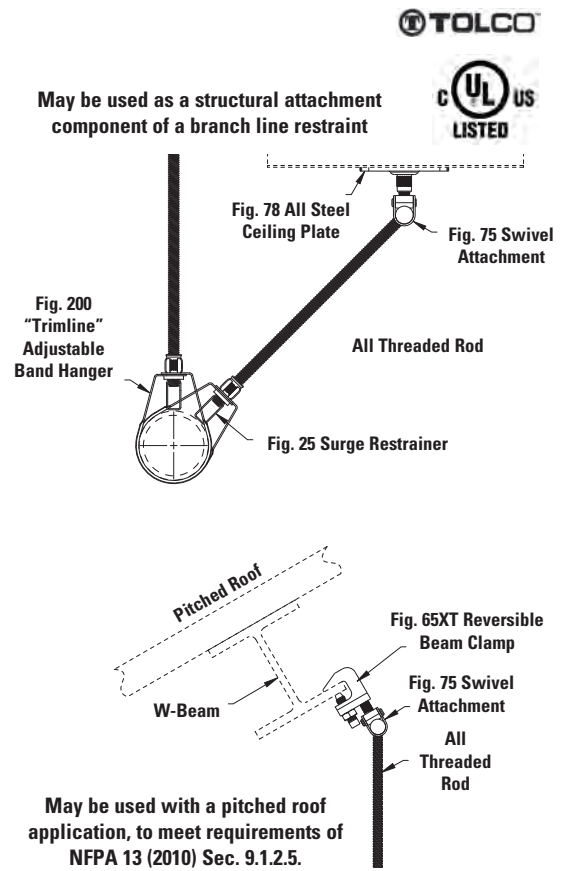
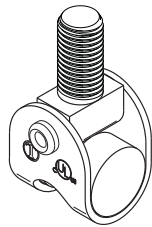


Fig. 98 - Rod Stiffener

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

Size Range: Secures 3/8"-16 thru 7/8"-9 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.

Approvals: Included in our Seismic Restraints Catalog 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 the TOLCO Seismic Restraint Systems Guidelines

Finish: Electro Galvanized. Contact B-Line for alternative finishes and materials.

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

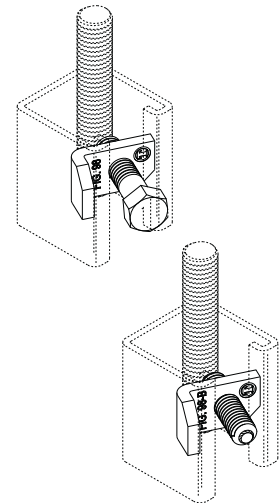
Order By: Figure number



Fig. 98



Fig. 98B



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

Notes:

- 1.) Rod stiffeners are required only on hanger and trapeze assemblies that have seismic bracing attached at or within 4" (101.6mm) 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.

Fig. 4A - Pipe Clamp for Sway Bracing

Size Range: 4" (100mm) thru 8" (200mm) pipe. For sizes smaller than 4" (100mm) use B3140.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.

Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) 4" (100mm) 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. Contact B-Line for alternative finishes and materials.

Order By: Figure number, pipe size and finish

Note: Please refer to Fig. 4L for longitudinal brace applications for 2" (50mm) - 8" (200mm) pipe sizes.

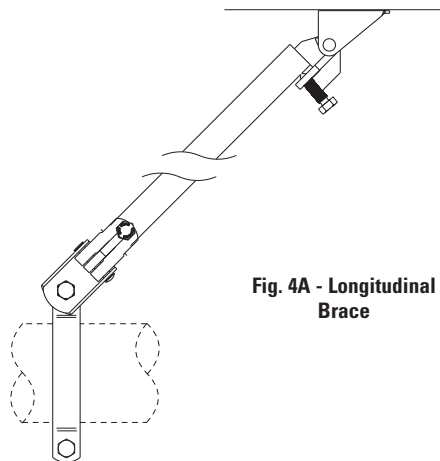
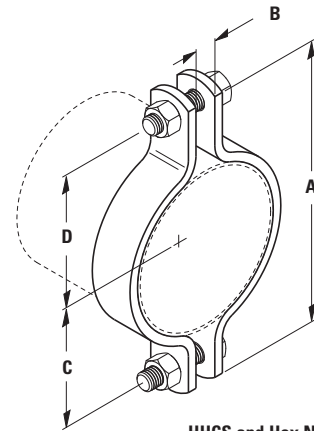


Fig. 4A - Longitudinal Brace

Part No.	Pipe Size in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	Bolt Size	Max. Horizontal Design Load lbs. (kN)	Approx. Wt./100 lbs. (kg)
4A-4	4" (100)	8 1/2" (215.9)	9/16" (14.3)	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)	9/16" (14.3)	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)	5/8" (15.9)	5" (127.0)	5 1/8" (130.2)	1/2"-13	2015 (8.96)	513 (232.7)
4A-8	8" (200)	13 1/4" (336.5)	3/4" (19.0)	6 11/16" (169.9)	6 1/8" (155.6)	1/2"-13	2015 (8.96)	601 (272.6)

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

Seismic Bracing

Fig. 4L - Longitudinal In-Line Sway Brace Attachment

TOLCO



Size Range: 2 1/2" (65mm) through 8" (200mm) IPS.

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) through 8" (200mm) pipe. For FM Approval information refer to page 51.

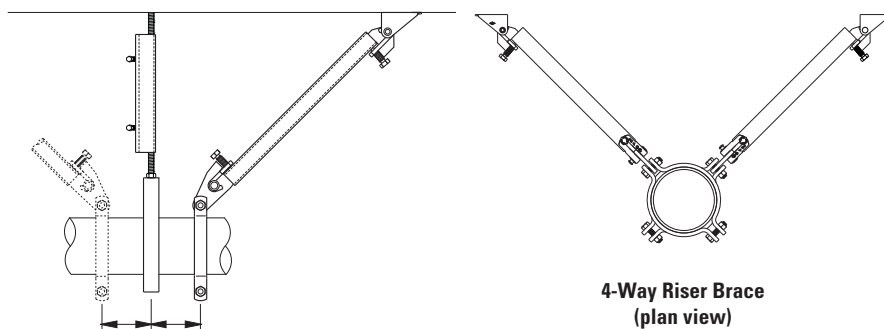
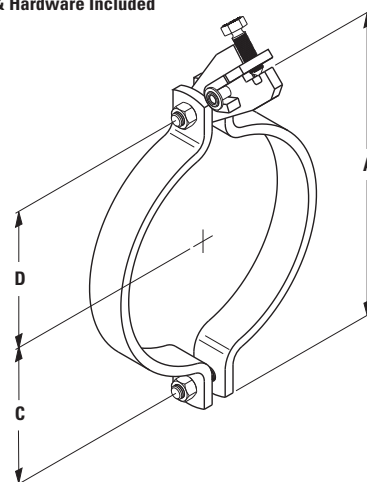
Installation Instructions: Fig. 4L is the "braced pipe" attachment component of a longitudinal sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component to form a complete bracing assembly. NFPA 13 guidelines should be followed.

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. Contact B-Line for alternative finishes and materials.

Order By: Figure number, pipe size and finish.

Set Bolt & Hardware Included



Longitudinal Brace

4-Way Riser Brace
(plan view)



Part No.	Pipe Size in. (mm)	A in. (mm)	C in. (mm)	D in. (mm)	Bolt Size	Max. Rec. Load (cULuc) lbs. (kN)	Approx. Wt./100 lbs. (kg)
4L-2 1/2	2 1/2" (65)	6 7/16" (163.5)	2 1/2" (63.5)	2 3/4" (69.8)	1/2"-13	2015 (8.96)	253 (114.7)
4L-3	3" (80)	7" (177.8)	2 3/4" (69.8)	3 1/16" (77.8)	1/2"-13	2015 (8.96)	268 (121.5)
4L-4	4" (100)	8 1/2" (215.9)	3 3/8" (85.7)	3 11/16" (93.7)	1/2"-13	2015 (8.96)	348 (157.8)
4L-5	5" (125)	9 3/4" (247.6)	3 7/8" (98.4)	4 3/8" (111.1)	1/2"-13	2015 (8.96)	380 (172.3)
4L-6	6" (150)	11 1/2" (292.1)	5" (127.0)	5 1/8" (130.2)	1/2"-13	2015 (8.96)	640 (290.3)
4L-8	8" (200)	13 1/4" (336.5)	5 5/8" (142.8)	5 5/8" (142.9)	1/2"-13	2015 (8.96)	728 (330.2)

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

Fig. 4L - Longitudinal In-Line Sway Brace Attachment

Size Range: 2 1/2" (65mm) through 8" (200mm) IPS.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.

Approvals: Approved by Factory Mutual Engineering (FM), 2 1/2" (65mm) through 8" (200mm) pipe.

For UL Listed information refer to page 50.

Installation Instructions: Fig. 4L is the "braced pipe" attachment component of a longitudinal 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.

Finish: Plain. Contact B-Line for alternative finishes and materials.

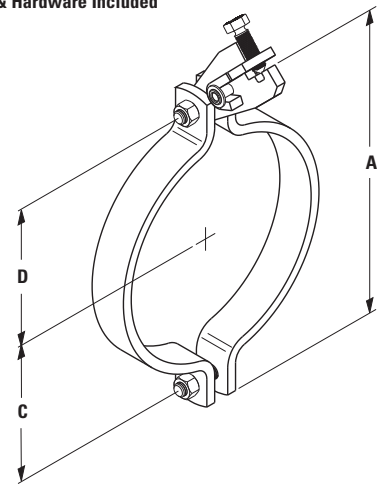
Order By: Figure number, pipe size and finish.

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

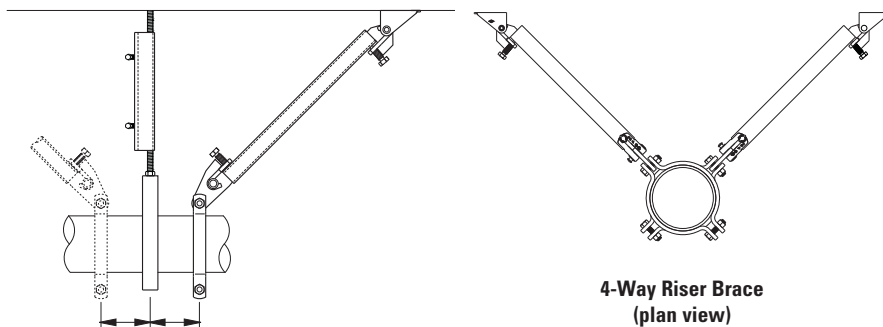
TOLCO



Set Bolt & Hardware Included



Seismic Bracing



Longitudinal Brace

4-Way Riser Brace
(plan view)



Part No.	Pipe Size	A		C		D	Bolt Size	Max. Rec. Load (FM)				Approx. Wt./100
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	30°-44°			45°-59°	60°-74°	75°-90°		
	lbs. (kg)	lbs. (kg)	lbs. (kg)	lbs. (kg)	lbs. (kg)	lbs. (kg)	lbs. (kg)	lbs. (kg)	lbs. (kg)	lbs. (kg)	lbs. (kg)	
4L-2 1/2	2 1/2" (65)	6 7/16" (163.5)	2 1/2" (63.5)	2 3/4" (69.8)	1/2"-13	1030 (4.58)	1180 (5.24)	1420 (6.31)	1590 (7.07)	253 (114.7)		
4L-3	3" (80)	7" (177.8)	2 3/4" (69.8)	3 1/16" (77.8)	1/2"-13	1030 (4.58)	1180 (5.24)	1420 (6.31)	1590 (7.07)	268 (121.5)		
4L-4	4" (100)	8 1/2" (215.9)	3 3/8" (85.7)	3 11/16" (93.7)	1/2"-13	530 (2.36)	730 (3.25)	890 (3.96)	990 (4.40)	348 (157.8)		
4L-5	5" (125)	9 3/4" (247.6)	3 7/8" (98.4)	4 3/8" (111.1)	1/2"-13	530 (2.36)	730 (3.25)	890 (3.96)	990 (4.40)	380 (172.3)		
4L-6	6" (150)	11 1/2" (292.1)	5" (127.0)	5 1/8" (130.2)	1/2"-13	530 (2.36)	730 (3.25)	890 (3.96)	990 (4.40)	640 (290.3)		
4L-8	8" (200)	13 1/4" (336.5)	5 5/8" (142.8)	5 5/8" (142.9)	1/2"-13	490 (2.18)	680 (3.02)	830 (3.69)	930 (4.13)	728 (330.2)		

FM Approved when used with 1", 1 1/4", 1 1/2" or 2" Sch. 40 brace pipe.

FM Approved design loads are based on ASD design method.

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

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

Seismic Bracing

Fig. 4LA - TOLCO™ In-Line Sway Brace Attachment

Size Range: 1" (25mm) through 12" (300mm) IPS.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.

Approvals: For FM Approval information refer to page 53.
Underwriters Laboratories Listed in the USA and Canada (cULus).
See allowable loads in chart below.

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.

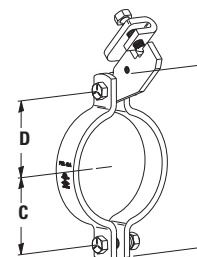
Finish: Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

Order By: Figure number, pipe size and finish.

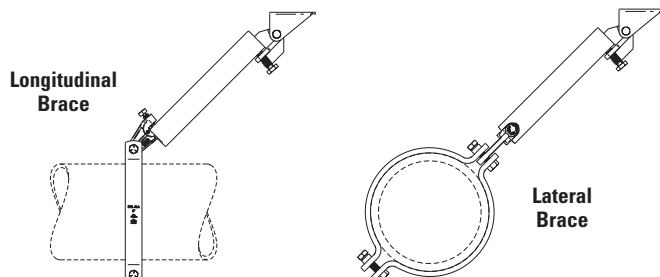
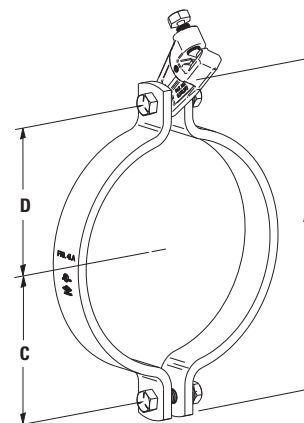
TOLCO



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)			Longitudinal	Lateral	lbs.	(kg)
4LA-1	1"	(25)	319/32"	(91.2)	15/16"	(33.5)	15/16"	(33.5)	3/8"-16	1000	(4.45)	NA (NA)	119	(54.0)
4LA-11/4	1 1/4"	(32)	329/32"	(99.3)	13/8"	(35.3)	13/8"	(35.3)	3/8"-16	1000	(4.45)	NA (NA)	123	(55.8)
4LA-11/2	1 1/2"	(40)	45/32"	(105.7)	1 1/2"	(38.5)	1 1/2"	(38.5)	3/8"-16	1000	(4.45)	NA (NA)	127	(57.6)
4LA-2	2"	(50)	511/32"	(135.6)	21/32"	(51.9)	21/16"	(51.9)	3/8"-16	1000	(4.45)	NA (NA)	142	(64.4)
4LA-21/2	2 1/2"	(65)	527/32"	(148.7)	25/16"	(58.5)	25/16"	(58.5)	3/8"-16	1000	(4.45)	NA (NA)	173	(78.5)
4LA-3	3"	(80)	6 1/2"	(164.9)	25/8"	(66.6)	25/8"	(66.6)	3/8"-16	1000	(4.45)	1000 (4.45)	187	(84.8)
4LA-31/2	3 1/2"	(90)	7.407"	(188.1)	27/8"	(73.1)	27/8"	(73.1)	3/8"-16	1000	(4.45)	1000 (4.45)	198	(89.8)
4LA-4	4"	(100)	713/32"	(190.8)	31/8"	(79.5)	31/8"	(79.5)	3/8"-16	1000	(4.45)	1000 (4.45)	209	(94.8)
4LA-6	6"	(150)	105/8"	(269.9)	49/16"	(115.9)	49/16"	(115.9)	1/2"-13	1600	(7.12)	1600 (7.12)	521	(236.3)
4LA-8	8"	(200)	1213/16"	(325.5)	59/16"	(143.7)	521/32"	(143.7)	1/2"-13	2015	(7.12)	2015 (7.12)	629	(285.3)
4LA-10	10"	(250)	161/2"	(419.1)	71/4"	(184.2)	71/4"	(184.2)	1/2"-13	NA	(NA)	NA (NA)	1320	(598.7)
4LA-12	12"	(300)	181/2"	(469.9)	81/4"	(209.6)	81/4"	(209.6)	1/2"-13	NA	(NA)	NA (NA)	1496	(678.6)

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

Fig. 4LA - In-Line Sway Brace Attachment

Size Range: 1" (25mm) through 12" (300mm) IPS.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.

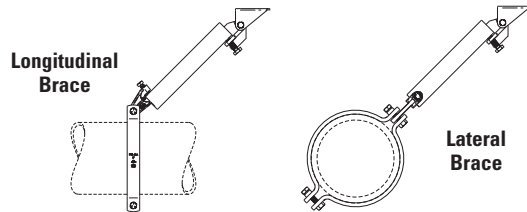
Approvals: Approved by Factory Mutual Engineering (FM), 1" (25mm) through 12" (300mm) pipe.
For UL Listed information refer to page 52.

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.

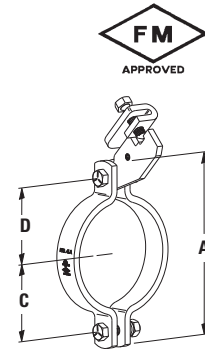
To Install: Place the Fig. 4LA pipe clamp component over the pipe to be braced and tighten down the break-off nuts until the hex head portion breaks off to verify correct installation torque. Next engage brace member (pipe or strut) with jaw component and tighten break-off head bolt until the hex head 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 B-Line for alternative finishes and materials.

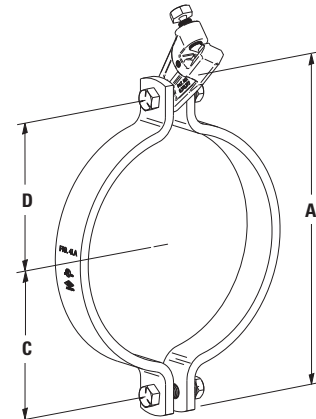
Order By: Figure number, pipe size and finish.



4LA-1 thru 4LA-4



4LA-6 thru 4LA-12



Pipe						FM Max. Rec. Load Longitudinal & Lateral**					Approx.
Part No.	Size in. (mm)	A in. (mm)	C in. (mm)	D in. (mm)	Bolt Size	30°-44° lbs. (kN)	45°-59° lbs. (kN)	60°-74° lbs. (kN)	75°-90° lbs. (kN)	Wt./100 lbs. (kg)	
4LA-1	1" (25)	3 ¹⁹ / ₃₂ " (91.2)	1 ⁵ / ₁₆ " (33.5)	1 ⁵ / 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)	3 ²⁹ / 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)	4 ⁵ / 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)	5 ¹¹ / 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)	5 ²⁷ / 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)	1/2"-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)	1/2"-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)	1/2"-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)	1/2"-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 Business seismic bracing components are designed to be compatible only with other B-Line bracing components, resulting in a listed seismic bracing assembly. B-Line's warranty for seismic bracing components will be the warranty provided in B-Line's standard terms and conditions of sale made available by B-Line, except that, in addition to the other exclusions from B-Line's warranty, Eaton's B-line Business makes no warranty relating to B-Line's seismic bracing components that are combined with products not provided by Eaton's B-Line Business.

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

Seismic Bracing

Fig. 800 - Adjustable Sway Brace Attachment to Steel

TOLCO®



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.

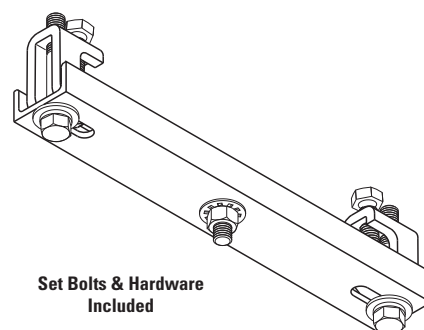
Installation Instructions: Fig. 800 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 guidelines 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). For FM Approval information refer to page 55.

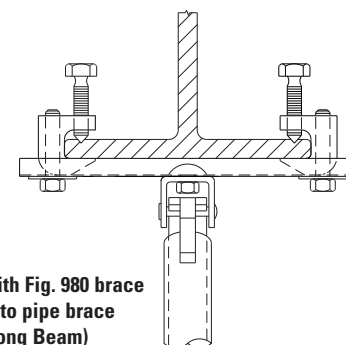
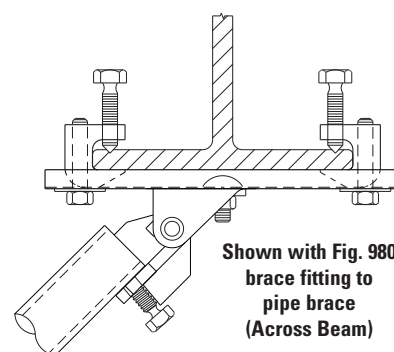
Finish: Plain. Contact B-Line for alternative finishes and materials.

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



Part No.	Fits Beam Flange		Max.Design Loads (cULus)	
	in.	(mm)	Along Beam lbs. (kN)	Across Beam lbs. (kN)
800-1	4" - 6"	(101.6-152.4)	1265 (5.62)	2015 (8.96)
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)		
800-6	14" - 16"	(355.6-406.4)		
800-7	16" - 18"	(406.4-457.2)		

Type	Fits Beam Flange Thickness		Max.Design Loads (cULus)	
	in.	(mm)	Along Beam lbs. (kN)	Across Beam lbs. (kN)
1	Up to 3/4"	(Up to 19.0)	1265 (5.62)	2015 (8.96)
2	3/4" to 1 1/4"	(19.0 to 31.7)	1265 (5.62)	2015 (8.96)



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

Fig. 800 - Adjustable Sway Brace Attachment to Steel

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.

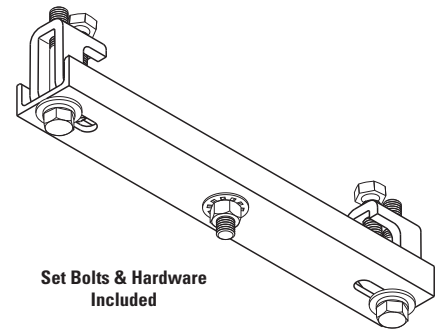
Approvals: Approved by Factory Mutual Engineering (FM). For UL Listed information refer to page 54.

Finish: Plain. Contact B-Line for alternative finishes and materials.

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

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

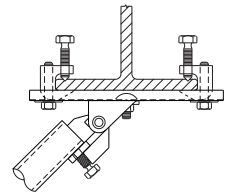
TOLCO



Set Bolts & Hardware Included

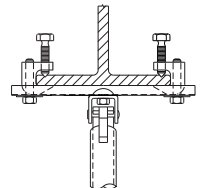


Part No.	Fits Beam Flange Width		Max.Design Loads (FM)*							
			Lateral - Parallel to Structural Member				Longitudinal - Perpendicular to Structural Member			
	in.	(mm)	30°-44° lbs./(kN)	45°-59° lbs./(kN)	60°-74° lbs./(kN)	75°-90° lbs./(kN)	30°-44° lbs./(kN)	45°-59° lbs./(kN)	60°-74° lbs./(kN)	75°-90° lbs./(kN)
800-1	4" - 6"	(101.6-152.4)								
800-2	6" - 8"	(152.4-203.2)								
800-3	8" - 10"	(203.2-254.0)								
800-4	10" - 12"	(254.0-304.8)	1430 (6.36)	1970 (8.76)	1980 (8.81)	NR (NR)	930 (4.13)	1310 (5.82)	1610 (7.16)	1800 (8.00)
800-5	12" - 14"	(304.8-355.6)								
800-6	14" - 16"	(355.6-406.4)								
800-7	16" - 18"	(406.4-457.2)								



Shown with Fig. 980
brace fitting to pipe brace
(Along Beam)

Type	Fits Beam Flange Thickness		Max.Design Loads (FM)*							
			Lateral - Parallel to Structural Member				Longitudinal - Perpendicular to Structural Member			
	in.	(mm)	30°-44° lbs./(kN)	45°-59° lbs./(kN)	60°-74° lbs./(kN)	75°-90° lbs./(kN)	30°-44° lbs./(kN)	45°-59° lbs./(kN)	60°-74° lbs./(kN)	75°-90° lbs./(kN)
1	Up to 3/4"	(Up to 19.0)	1430 (6.36)	1970 (8.76)	1980 (8.81)	NR (NR)	930 (4.13)	1310 (5.82)	1610 (7.16)	1800 (8.00)
2	3/4" to 1 1/4"	(19.0 to 31.7)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)	NR (NR)



Shown with Fig. 980
brace fitting to pipe brace
(Across Beam)

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

FM Approved design loads are based on ASD design method.

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

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

Seismic Bracing

Fig. 825 - Bar Joist Sway Brace Attachment To Steel



Size Range: One size accommodates all Fig. 900 Series sway brace attachments. Maximum Horizontal Design Load 2015 lbs (8.96kN).

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). For FM Approval information refer to page 57.

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.

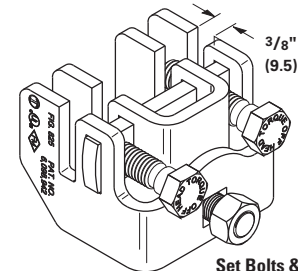
To Install: Place the Fig. 825 on the steel beam, tighten the cone point set bolts until heads break off. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional fitting. Transitional fitting attachment can pivot for adjustment to proper brace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

Finish: Plain, Electro-Galvanized and HDG

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

Order By: Figure number and finish

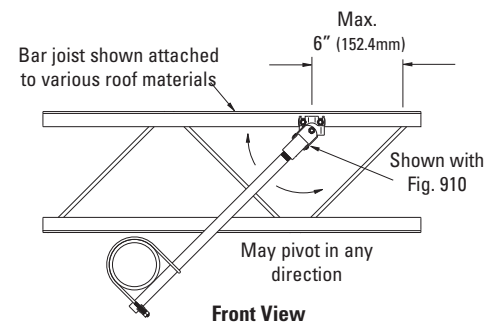
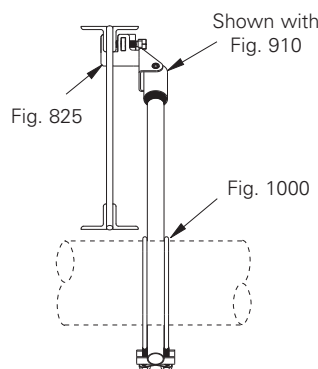
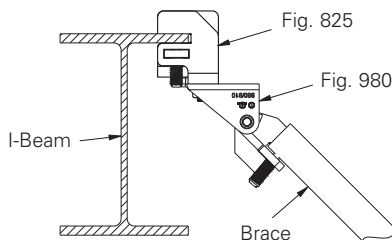
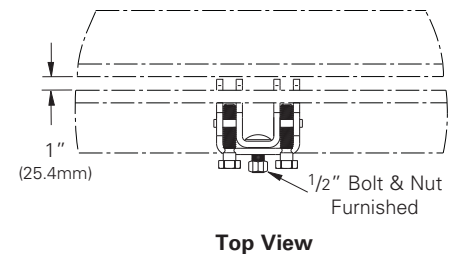
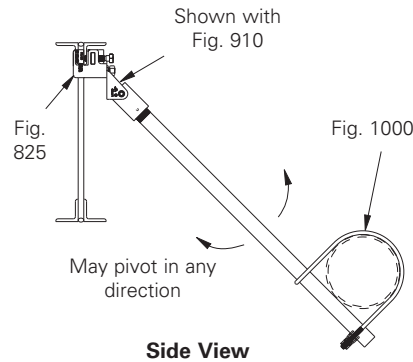
US Patent #6,098,942,
Canada Patent #2,286,659



Set Bolts & Hardware Included

Maximum Design Load 2015 lbs. (8.96kN)

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



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

Fig. 825 - 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 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). For UL Listed information refer to page 56.

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.

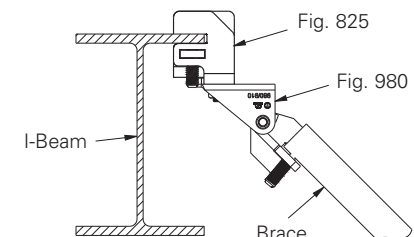
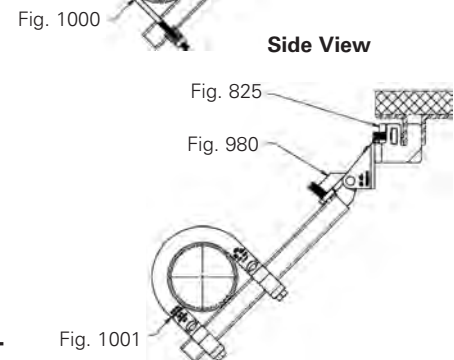
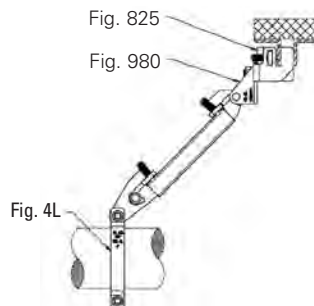
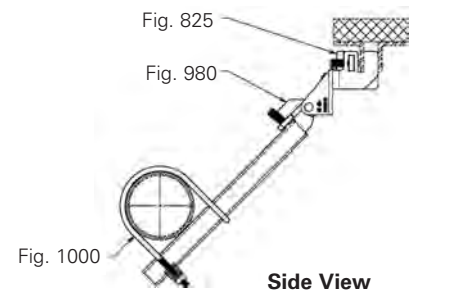
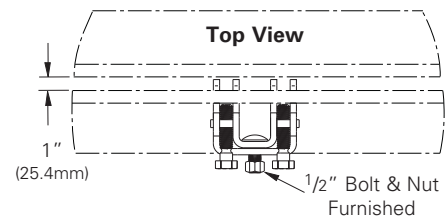
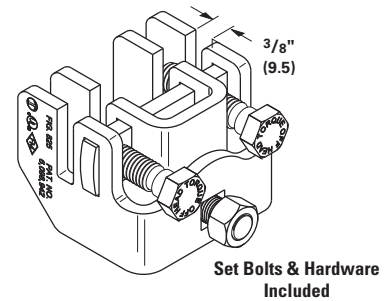
Finish: Plain, Electro-Galvanized and HDG

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

Order By: Figure number and finish
US Patent #6,098,942,
Canada Patent #2,286,659

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

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 3/8" Thick Flange	Perpendicular to Structural Member	990 (4.40)	1360 (6.05)	1670 (7.43)	1860 (8.27)
Maximum 3/8" Thick Flange	Parallel to Structural Member	460 (2.04)	630 (2.80)	770 (3.42)	860 (3.82)

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

Seismic Bracing

Fig. 828 - Universal Sway Brace Attachment to Steel

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 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, I-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 (UL) and Canada (cUL). For FM Approval information refer to page 59.

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: Place 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 bolts (A) until the heads break off. Tighten the cone point set bolt (B) until the head breaks off. Remove the flange nut from set bolt (B). Install a TOLCO swivel fitting (Fig. 980, 910, 909, or any other TOLCO approved transitional fitting). Use flange nut to secure the swivel fitting.

Finish: Plain or Electro-Galvanized

Approx. Weight/100: 275 Lbs. (124.7kg)

Order By: Figure number and finish

Patent #6,098,942, #8,534,625

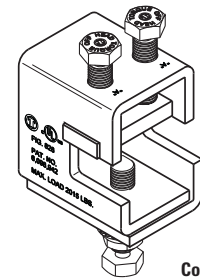
Canada Patent #2,286,659

Patent Pending

TOLCO



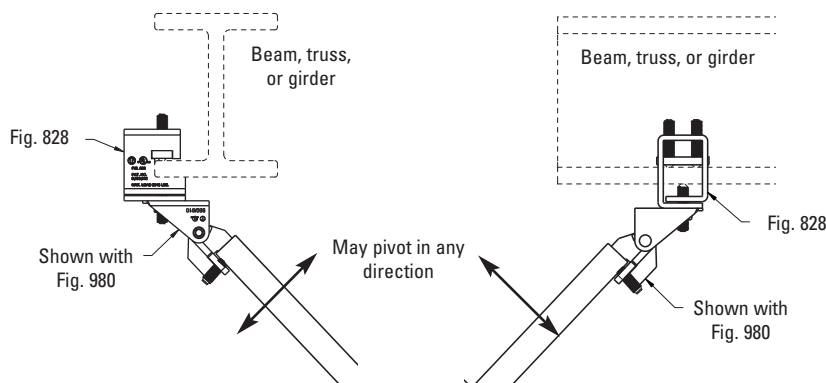
Cone Point
Set Bolts A



Set Bolts
Included

Cone Point
Set Bolt B

UL Horizontal Design Load
Maximum Design Load Across Beam 2015 lbs. (8.96kN)
Maximum Design Load Along Beam 2015 lbs. (8.96kN)



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

Fig. 828 - Universal Sway Brace Attachment to Steel

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

Material: Steel

Function: To attach sway bracing 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, I-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).

For UL Listed information refer to page 58.

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: Place 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 bolts (A) until the heads break off. Tighten the cone point set bolt (B) until the head breaks off. Remove the flange nut from set bolt (B). Install a TOLCO swivel fitting Fig. 980 or any other TOLCO approved transitional fitting). Use flange nut to secure the swivel fitting.

Finish: Plain or Electro-Galvanized

Approx. Weight/100: 275 Lbs. (124.7kg)

Order By: Figure number and finish

Patent #6,098,942, #8,534,625

Canada Patent #2,286,659

Patent Pending

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

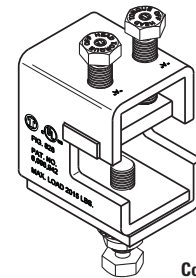
TOLCO



Cone Point
Set Bolts A

Set Bolts
Included

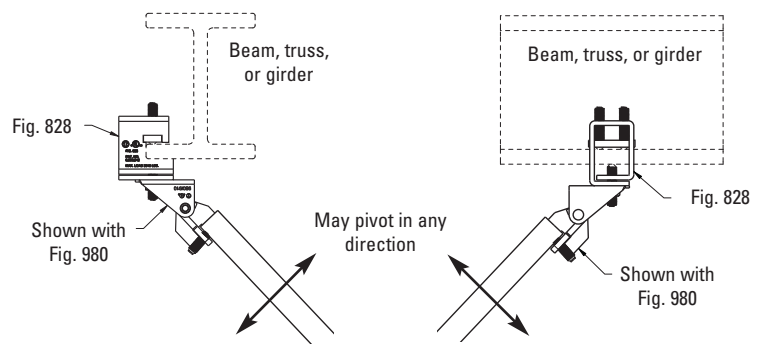
Cone Point
Set Bolt B



FM Approved Allowable Horizontal Load*				
With Brace Perpendicular To Beam				
Brace Angle (degrees from vertical)				
30°-44°	45°-59°	60°-74°	75°-90°	
1570	2220	1210	700	
(6.98kN)	(9.87kN)	(5.38kN)	(3.11kN)	

FM Approved Allowable Horizontal Load*				
With Brace Parallel To Beam				
Brace Angle (degrees from vertical)				
30°-44°	45°-59°	60°-74°	75°-90°	
690	970	1210	1330	
(3.07kN)	(4.31kN)	(5.38kN)	(5.91kN)	

FM Approved design loads are based on ASD design method.



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

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

Seismic Bracing

Fig. 825A - Bar Joist Sway Brace Attachment To Steel

TOLCO



Size Range: One size accommodates all Fig. 900 Series sway brace attachments. Maximum Horizontal Design Load 1600 lbs (7.11kN).

Material: Steel

Function: To attach sway bracing to steel open web 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).

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.

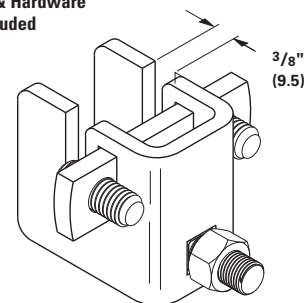
Finish: Plain or Electro-Galvanized

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

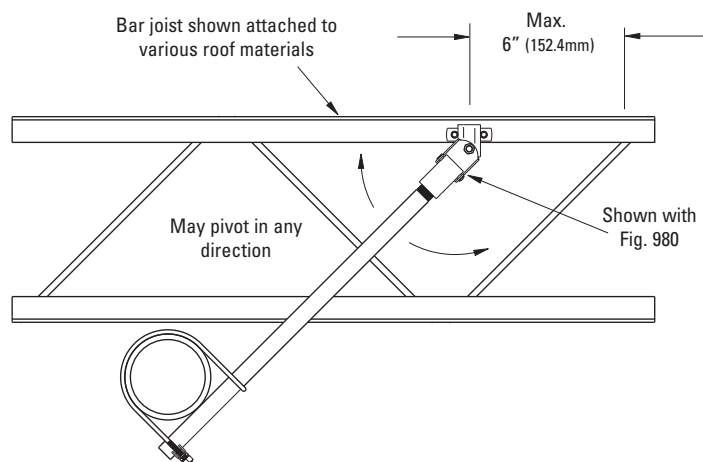
Order By: Figure number and finish

Patent #6,098,942

Set Bolts & Hardware
Included



Maximum Design Load
1600 lbs.



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

Fig. 906 - Sway Brace Multi-Fastener Adapter

TOLCO



Size Range: UL listed or FM Approved Fig. 906 Series Earthquake Brace Attachment.

Material: Steel

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

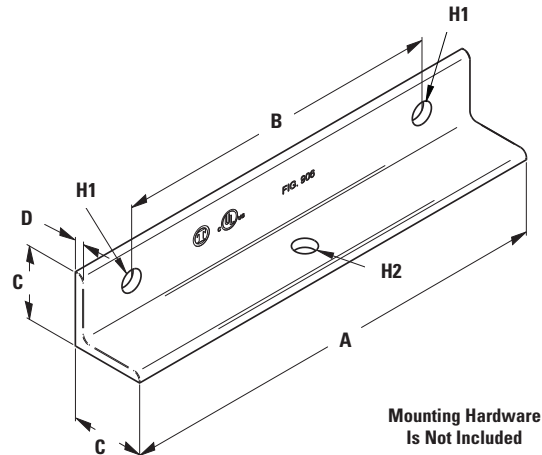
Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL) only when used with TOLCO Fig. 900 Series Earthquake Brace Attachments.

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 B-Line for alternative finishes and materials.

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



Part Number	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	H1	H2	Approx. Wt./100 Lbs. (kg)
906	12" (305.0)	9" (228.6)	2" (50.8)	1/4" (6.3)	Specify	Specify	307 (139.3)

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

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

Seismic Bracing



Fig. 907 - Multi-Angle Attachment

Size Range: 1" (25.4mm) x 1" (25.4mm), 1" (25.4mm) x 1 1/4" (31.7mm) and 1 1/4" (25.4mm) x 1 1/4" (25.4mm) bracing pipe.

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

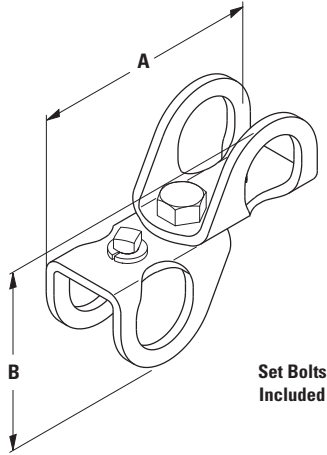
Function: For attaching two pieces of pipe together at various angles. Can be used as OSHPD Pre-Approved Seismic Bracing assembly.

Approvals: Included in our Seismic Restraints Catalog 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 the TOLCO Seismic Restraint Systems Guidelines.

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 B-Line for alternative finishes and materials.

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



Part Number	Brace Pipe Size		A		B		Max. Design Load		Approx. Wt./100	
	in.	(mm)	in.	(mm)	in.	(mm)	lbs.	(kN)	lbs.	(kg)
907-1 X 1	1" x 1"	(25 x 25)	4 ³ / ₄ "	(120.6)	4 ³ / ₄ "	(120.6)	655	(2.91)	103	(46.7)
907-1 X 1 1/4	1" x 1 1/4"	(25 x 32)	5 ³ / ₁₆ "	(128.6)	4 ¹³ / ₁₆ "	(122.2)	655	(2.91)	107	(48.5)
907-1 1/4 X 1 1/4	1 1/4" x 1 1/4"	(32 x 32)	5 ³ / ₈ "	(136.5)	5 1/4"	(133.1)	655	(2.91)	109	(49.4)

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

Fig. 909 - No-Thread Swivel Sway Brace Attachment



Size Range: 1" (25mm) bracing pipe. For brace pipe sizes larger than 1" (25mm), use Fig. 980. Available with holes for 1/2"-13 thru 3/4"-10 fastener 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.

Application Note: Fig. 909 is used in conjunction with the Fig. 1000, Fig. 1001, Fig. 4A 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.

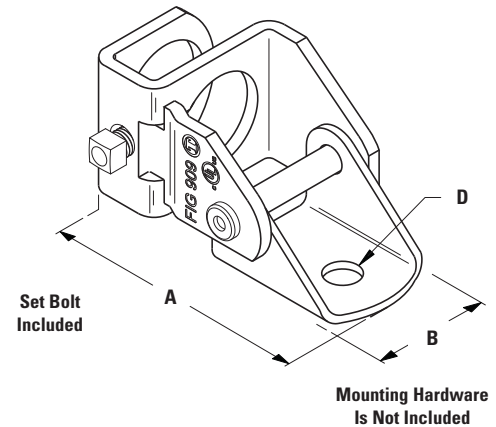
Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL).

Installation Instructions: Fig. 909 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, 4A, or other approved TOLCO attachment to pipe to form a complete bracing assembly. NFPA 13 guidelines should be followed.

To Install: Place the Fig. 909 onto the bracing pipe. Tighten the set bolt until the head bottoms out on surface. Attachment can pivot for adjustment to proper brace angle.

Finish: Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

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



Part Number	Mounting Hole D in. (mm)	Brace Pipe Size in. (mm)	A in. (mm)	B in. (mm)	Max. Design Load lbs. (kN)	Approx. Wt./100 lbs. (kg)
909-1/2 *	17/32" (13.5)	1" (25)	6" (152.4)	15/8" (41.3)	2015 (8.96)	91 (41.3)
909-5/8	11/16" (17.5)	1" (25)	6" (152.4)	15/8" (41.3)	2015 (8.96)	90 (40.8)
909-3/4	13/16" (20.6)	1" (25)	6" (152.4)	15/8" (41.3)	2015 (8.96)	89 (40.4)

* Standard size.

Important! - For load information when using 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 pages AL1 thru AL21.

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

Seismic Bracing

Fig. 910 - Threaded Swivel Sway Brace Attachment

TOLCO



Size Range: 1" (25mm) bracing pipe. For brace pipe sizes larger than 1" (25mm), use Fig. 980. Available with holes for 1/2"-13 thru 3/4"-10 fastener attachment.

Material: Steel

Function: For bracing pipe against sway and seismic disturbances. The building attachment component of a sway brace system; the Fig. 910 is used in conjunction with the Fig. 1001, Fig. 1000 or with a Fig. 4A, Fig. 4L, or Fig. 4LA pipe clamp and joined together with a brace pipe per NFPA 13.

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 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). Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development (OSHPD, OPA-0300). For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

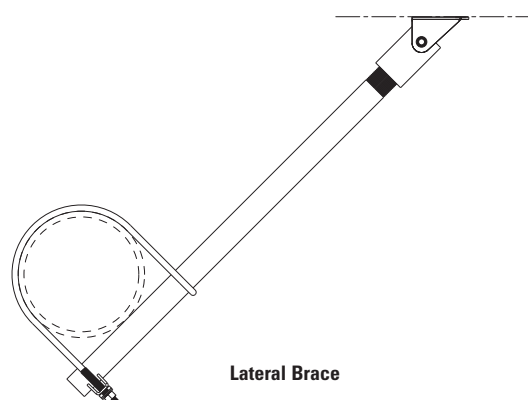
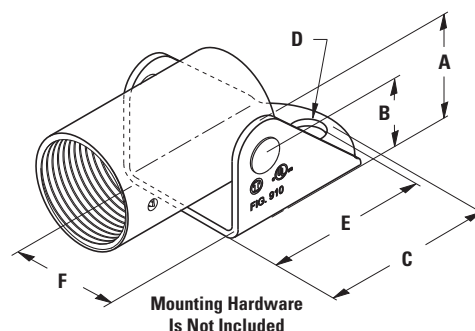
Installation Instructions: Fig. 910 is a structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe", and TOLCO "braced pipe" attachment, Fig. 1000, Fig. 1001, Fig. 4A, Fig. 4L or Fig. 4LA to form a complete bracing assembly. Follow NFPA 13 and/or OSHPD guidelines.

To Install: Thread the pipe into the Fig. 910 until pipe threads are visible through inspection site hole. Attachment can pivot for adjustment to proper brace angle.

Note: Fig. 910 swivel attachment and Fig. 1001, Fig. 1000, Fig. 4A Fig. 4L, or Fig. 4LA 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 B-Line for alternative finishes and materials.

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



Part Number	Brace Pipe Size in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	Mounting Hole D in. (mm)	E in. (mm)	F in. (mm)	Max. Design Load lbs. (kN)	Approx. Wt./100 lbs. (kg)
910-1 X 1 1/2	1" (25)	2" (50.8)	1 1/2" (38.1)	3" (76.2)	9/16" (14.3)	2 5/16" (58.7)	2" (50.8)	1600 (8.96)	88 (39.9)
910-1 X 5/8	1" (25)	2" (50.8)	1 1/2" (38.1)	3" (76.2)	1 1/16" (17.5)	2 5/16" (58.7)	2" (50.8)	1600 (8.96)	87 (39.4)
910-1 X 3/4	1" (25)	2" (50.8)	1 1/2" (38.1)	3" (76.2)	1 3/16" (20.6)	2 5/16" (58.7)	2" (50.8)	1600 (8.96)	86 (39.0)

Important! - For load information when using Fig. 910 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 pages AL1 thru AL21.

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

Fig. 975 - Straight Sway Brace Fitting

Size Range: 1" (25mm) bracing pipe. For brace pipe sizes larger than 1" (25mm), use Fig. 980. Available with holes for 1/2"-13 thru 3/4"-10 fastener attachment.

Material: Steel

Function: For bracing pipe against sway and seismic disturbances. The building attachment component of a sway brace system; the Fig. 975 is used in conjunction with the Fig. 1000, Fig. 1001 or with any approved TOLCO seismic bracing attachment to pipe and joined together with a brace pipe per NFPA 13.

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

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

Installation: Fig. 975 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, 4A or any approved TOLCO seismic bracing attachment to pipe to form a complete bracing assembly. NFPA 13 guidelines should be followed.

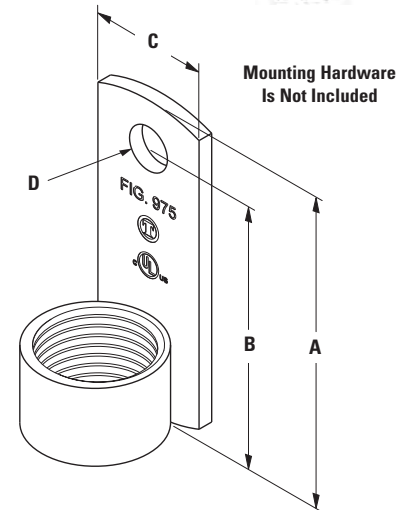
To Install: Thread the Fig. 975 onto the threaded bracing pipe. Attachment can pivot for adjustment to proper brace angle. Bending of plate not permitted.

Finish: Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

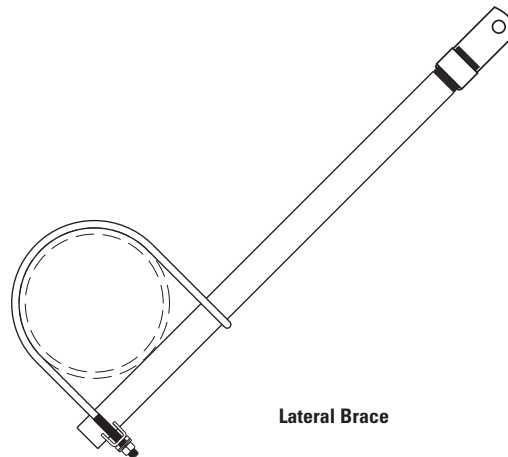
Order By: Figure number and finish.

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.

TOLCO



Seismic Bracing



Part Number	Brace Pipe Size in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	Mounting Hole D in. (mm)	Max. Design Load lbs. (kN)	Approx. Wt./100 lbs. (kg)
975-1/2 *	1" (25)	4" (101.6)	3 1/2" (88.9)	1 1/2" (38.1)	9/16" (14.3)	2015 (8.96)	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)	2015 (8.96)	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)	2015 (8.96)	86 (39.0)

* Standard size.

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

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

Seismic Bracing

Fig. 980 - Universal Swivel Sway Brace Attachment - 3/8" to 3/4"

TOLCO



Size Range: One size fits bracing pipe 1" (25mm) thru 2" (50mm), B-Line 12 gauge (2.6mm) channel, and all structural steel up to 1/4" (31.7mm) thick.

Material: 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. NFPA 13 indicates clearly that fastener table load values are based only on concentric loading. Mounts to any surface angle. 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, 2002, 4L, 4A 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).

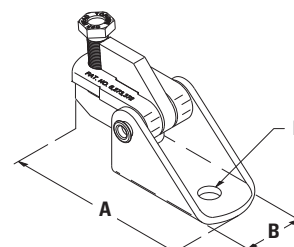
For FM Approval information refer to page 67.

Note: Fig. 980 Swivel Attachment and Fig. 1001, 1000, 2002, 4A or approved attachment to pipe that 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)

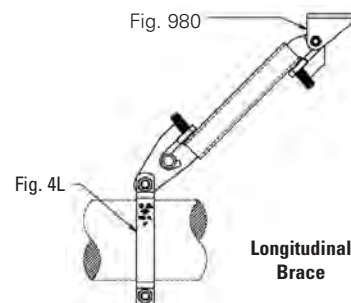
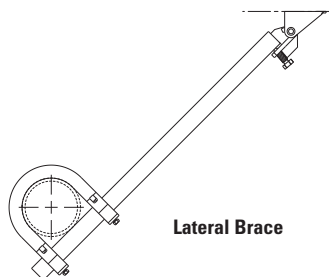
Finish: Plain, Electro-Galvanized or Stainless Steel. Contact B-Line for alternative finishes.

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**



**Set Bolt
Included
Mounting Hardware
Is Not Included**



Part Number	Mtg. Hdw. Size in. (mm)	A in. (mm)	B in. (mm)	Mounting Hole D in. (mm)	Max. Design Load (cULus) in. (mm)	Approx. Wt./100 lbs. (kg)
980-3/8	3/8" (9.5)	5 1/4" (133.3)	17/8" (47.6)	13/32" (10.3)	2015 (8.96)	149 (67.6)
980-1/2 *	1/2" (12.7)	5 1/4" (133.3)	17/8" (47.6)	17/32" (13.5)	2015 (8.96)	148 (67.1)
980-5/8	5/8" (15.9)	5 1/4" (133.3)	17/8" (47.6)	11/16" (17.5)	2015 (8.96)	147 (66.7)
980-3/4	3/4" (19.0)	5 1/4" (133.3)	17/8" (47.6)	13/16" (20.5)	2015 (8.96)	146 (66.2)

* Standard size.

Important! - For load information when using Fig. 980 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 pages AL1 thru AL21.

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

Fig. 980 - Universal Swivel Sway Brace Attachment - 3/8" to 3/4"



Size Range: One size fits bracing pipe 1" (25mm) thru 2" (50mm), B-Line 12 gauge (2.6mm) channel, and all structural steel up to 1/4" (31.7mm) thick.

Material: 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. NFPA 13 indicates clearly that fastener table load values are based only on concentric loading. Mounts to any surface angle. 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, 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).

For UL Listed information refer to page 66.

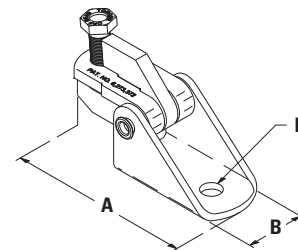
Note: Fig. 980 Swivel Attachment and Fig. 1000, 1001, 4L or other TOLCO approved attachment to pipe that make up a sway brace system of UL Listed attachments and bracing materials which satisfies the requirements of Underwriters Laboratories and the National Fire Protection Association (NFPA)

Finish: Plain, Electro-Galvanized or Stainless Steel. Contact B-Line for alternative finishes.

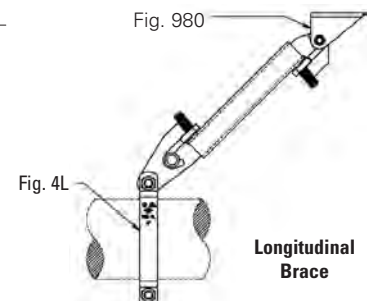
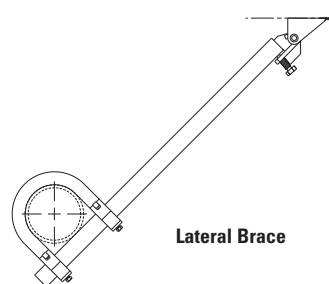
Order By: Figure number and finish.

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.



**Set Bolt Included
Mounting Hardware Is Not Included**



Part Number	Mtg. Hdw. Size in. (mm)	Mounting Hole			Max. Design Load** (FM)				Approx. Wt./100 lbs. (kg)
		A in. (mm)	B in. (mm)	D in. (mm)	30° - 44° lbs./(kN)	45° - 59° lbs./(kN)	60° - 74° lbs./(kN)	75° - 90° lbs./(kN)	
980-3/8	3/8" (9.5)	5 1/4" (133.3)	1 7/8" (47.6)	13/32" (10.3)					149 (67.6)
980-1/2 *	1/2" (12.7)	5 1/4" (133.3)	1 7/8" (47.6)	17/32" (13.5)	1320	1970	2310	2550	148 (67.1)
980-5/8	5/8" (15.9)	5 1/4" (133.3)	1 7/8" (47.6)	1 1/16" (17.5)	(5.87)	(8.76)	(10.27)	(11.34)	147 (66.7)
980-3/4	3/4" (19.0)	5 1/4" (133.3)	1 7/8" (47.6)	1 3/16" (20.5)					146 (66.2)

* Standard size.

** Installed with 1" or 1 1/4" Schedule 40 brace pipe.

FM Approved design loads are based on ASD design method.

Important! - For load information when using Fig. 980 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 pages AL1 thru AL21.

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

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

Seismic Bracing

Fig. 1000 - "Fast Clamp" Sway Brace Attachment

TOLCO



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: 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.

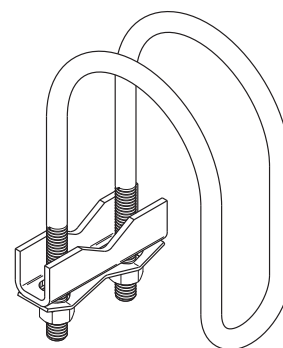
Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). Approved for use with Allied Dyna Flow sprinkler pipe up to 2" as a restraint device. Maximum horizontal design load is 655 lbs. (2.91kN) Torque requirement is 6-8 ft./lbs. (8-10Nm).

For FM Approval information refer to 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 B-Line for alternative finishes and materials.

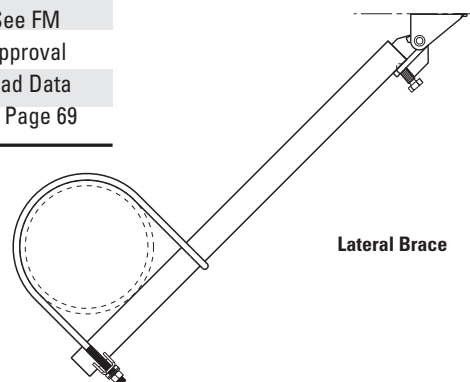
Order By: Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1 1/4" (32mm)) , and finish.



Hardware
Included

UL Listed Design Load
1" (25mm) thru 2" (50mm) pipe size
655 lbs. (2.91kN)

Pipe Size in. (mm)	Part Number & Approx. Wt./100				Design Load Lbs. (kN)
	1" (24mm) Brace Pipe		1 1/4" (32mm) Brace Pipe		
		Lbs. (kg)		Lbs. (kg)	
1" (25)	1000-1 X 1	71.6 (32.5)	1000-1 X 1 1/4	75.8 (34.4)	655 (2.91)
1 1/4" (32)	1000-1 1/4 X 1	74.8 (33.9)	1000-1 1/4 X 1 1/4	79.1 (35.9)	655 (2.91)
1 1/2" (40)	1000-1 1/2 X 1	77.8 (35.3)	1000-1 1/2 X 1 1/4	82.1 (37.2)	655 (2.91)
2" (50)	1000-2 X 1	84.1 (38.1)	1000-2 X 1 1/4	88.4 (40.1)	655 (2.91)
2 1/2" (65)	1000-2 1/2 X 1	90.2 (40.9)	1000-2 1/2 X 1 1/4	94.6 (42.9)	See FM
3" (80)	1000-3 X 1	97.3 (44.1)	1000-3 X 1 1/4	101.7 (46.1)	Approval
3 1/2" (90)	1000-3 1/2 X 1	104.0 (47.2)	1000-3 1/2 X 1 1/4	108.4 (49.2)	Load Data
4" (100)	1000-4 X 1	110.3 (50.0)	1000-4 X 1 1/4	114.6 (52.0)	On Page 69



Lateral Brace

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

Fig. 1000 - "Fast Clamp" Sway Brace Attachment

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. * Maximum horizontal design load is 655 lbs. (2.91kN) Torque requirement is 6-8 ft./lbs. (8-10Nm).

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).

For UL Listed information refer to page 68.

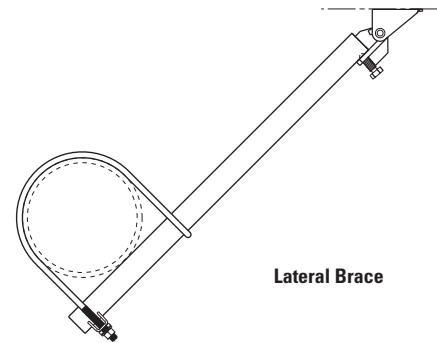
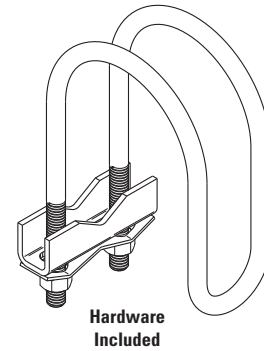
Application Note: Position Fast Clamp and tighten two hex nuts until leaf spring flattens. A minimum of 1" pipe extension beyond the Fig. 1000 is recommended.

Finish: Plain or Electro-Galvanized. Contact B-Line 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.

TOLCO



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

¹ 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.

² 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.

³ 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 Business seismic bracing components are designed to be compatible only with other B-Line bracing components, resulting in a listed seismic bracing assembly. B-Line's warranty for seismic bracing components will be the warranty provided in B-Line's standard terms and conditions of sale made available by B-Line, except that, in addition to the other exclusions from B-Line's warranty, Eaton's B-line Business makes no warranty relating to B-Line's seismic bracing components that are combined with products not provided by Eaton's B-Line Business.

Seismic Bracing

Fig. 1001 - Sway Brace Attachment

TOLCO®



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 schedules 7 through 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.

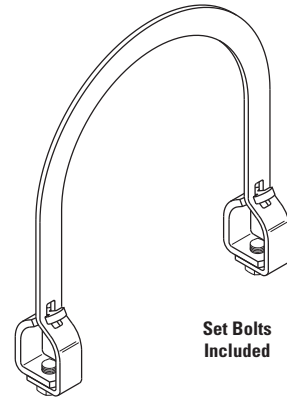
Installation Note: Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set bolts until heads bottom out. A minimum of 1" (25mm) pipe extension is recommended. Brace pipe can be installed on top or bottom of pipe to be braced.

Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL).
For FM Approval information refer to page 71.

Finish: Plain or Electro-Galvanized. Contact B-Line 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 UL Listing requires that Fig. 1001 must be used only with other TOLCO bracing products.



Set Bolts
Included



Pipe Size in. (mm)	Part Number & Approx. Wt./100				Design Load - Lbs.		
	1" (24mm) Brace Pipe		1 1/4" (32mm) Brace Pipe		For Brace Pipe Size 1" / 1 1/4"		
		Lbs. (kg)		Lbs. (kg)	Sch. 7 1" / 1 1/4"	Sch. 10 1" / 1 1/4"	Sch. 40 1" / 1 1/4"
1" (25)	1001-1 X 1	100.0 (45.3)	1001-1 X 1 1/4	118.0 (53.5)	-- / --	1000 / 1000	1000 / 1000
1 1/4" (32)	1001-1 1/4 X 1	100.0 (45.3)	1001-1 1/4 X 1 1/4	114.0 (51.7)	1000 / 1000	1000 / 1000	1000 / 1000
1 1/2" (40)	1001-1 1/2 X 1	100.0 (45.3)	1001-1 1/2 X 1 1/4	115.0 (52.1)	1000 / 1000	1500 / 1500	1500 / 1500
2" (50)	1001-2 X 1	108.0 (49.0)	1001-2 X 1 1/4	121.0 (54.8)	1000 / 1000	2015 / 2015	2015 / 2015
2 1/2" (65)	1001-2 1/2 X 1	138.6 (62.8)	1001-2 1/2 X 1 1/4	160.4 (72.7)	1600 / 1600	2015 / 2765	2015 / 2765
3" (80)	1001-3 X 1	147.2 (66.7)	1001-3 X 1 1/4	168.7 (76.5)	1600 / 1600	2015 / 2765	2015 / 2765
4" (100)	1001-4 X 1	160.9 (73.0)	1001-4 X 1 1/4	182.4 (82.7)	1600 / 1600	2015 / 2765	2015 / 2765
6" (150)	1001-6 X 1	190.0 (86.2)	1001-6 X 1 1/4	211.4 (95.9)	1600 / 1600	2015 / 2765	2015 / 2765
8" (200)	1001-8 X 1	217.4 (98.6)	1001-8 X 1 1/4	238.8 (108.3)	1600 / 1600	2015 / 2765	2015 / 2765

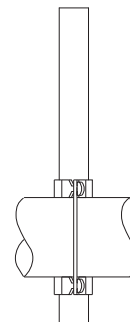
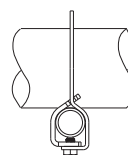
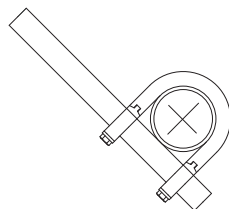
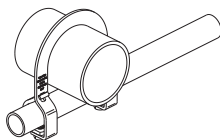


Fig. 1001 - Sway Brace Attachment



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 schedules 7 through 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.

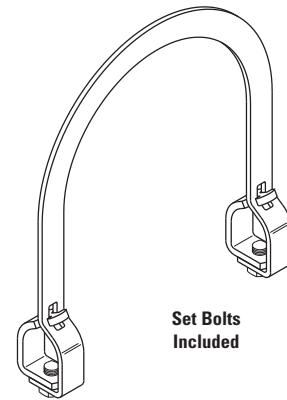
Approvals: Approved by Factory Mutual Engineering (FM).
For UL Listed information refer to page 70.

Finish: Plain or Electro-Galvanized. Contact B-Line 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.

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



Set Bolts
Included



Pipe Size in. (mm)	Part Number & Approx. Wt./100				Design Load - For Sch. 7, Sch. 10, & Sch. 40 Pipe			
	1" (24mm) Brace Pipe		1 1/4" (32mm) Brace Pipe		Allowable Horizontal Capacity (lbf) Per Installation ^{1,2,3}			
	Lbs. (kg)	Lbs. (kg)	Lbs. (kg)	Lbs. (kg)	30°-44° Lbs. (kN)	45°-59° Lbs. (kN)	60°-74° Lbs. (kN)	75°-90° Lbs. (kN)
1" (25)	1001-1 X 1	100.0 (45.3)	1001-1 X 1 1/4	118.0 (53.5)	1800 (8.00)	2550 (11.34)	3120 (13.88)	3490 (25.52)
1 1/4" (32)	1001-1 1/4 X 1	100.0 (45.3)	1001-1 1/4 X 1 1/4	114.0 (51.7)	1230 (5.47)	1740 (7.74)	2140 (9.52)	2380 (10.58)
1 1/2" (40)	1001-1 1/2 X 1	100.0 (45.3)	1001-1 1/2 X 1 1/4	115.0 (52.1)	1230 (5.47)	1740 (7.74)	2140 (9.52)	2380 (10.58)
2" (50)	1001-2 X 1	108.0 (49.0)	1001-2 X 1 1/4	121.0 (54.9)	1230 (5.47)	1740 (7.74)	2140 (9.52)	2380 (10.58)
2 1/2" (65)	1001-2 1/2 X 1	138.6 (62.8)	1001-2 1/2 X 1 1/4	160.4 (72.7)	800 (3.56)	1130 (5.02)	1380 (6.14)	1540 (6.85)
3" (80)	1001-3 X 1	147.2 (66.7)	1001-3 X 1 1/4	168.7 (76.5)	850 (3.78)	1200 (5.34)	1470 (6.54)	1640 (7.29)
4" (100)	1001-4 X 1	160.9 (73.0)	1001-4 X 1 1/4	182.4 (82.7)	850 (3.78)	1200 (5.34)	1470 (6.54)	1640 (7.29)
6" (150)	1001-6 X 1	190.0 (86.2)	1001-6 X 1 1/4	211.4 (95.9)	510 (2.27)	730 (3.25)	890 (3.96)	990 (4.40)
8" (200)	1001-8 X 1	217.4 (98.6)	1001-8 X 1 1/4	238.8 (108.3)	510 (2.27)	730 (3.25)	890 (3.96)	990 (4.40)

¹ 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.

² 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.

³ 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.



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

Seismic Bracing

Fig. 2002 - Sway Brace Attachment

TOLCO



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 pipes sizes 1½" (40mm) and 2" (50mm) steel schedule 10 through 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.

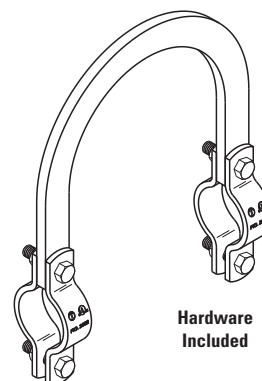
Installation: Place Fig. 2002 over pipe to be braced. Slide bracing pipe through attachment and tighten hex nuts until ears touch.

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

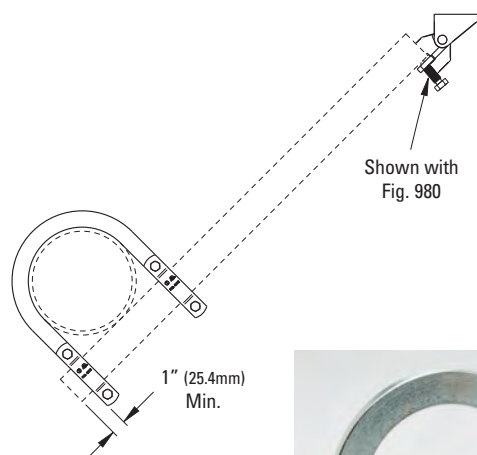
Finish: Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

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

Important Note: Fig. 2002 is precision manufactured to perform its function as a critical component of a complete bracing assembly. To ensure performance, the UL Listing requires that the Fig. 2002 must be used only with other TOLCO bracing products.



Hardware Included

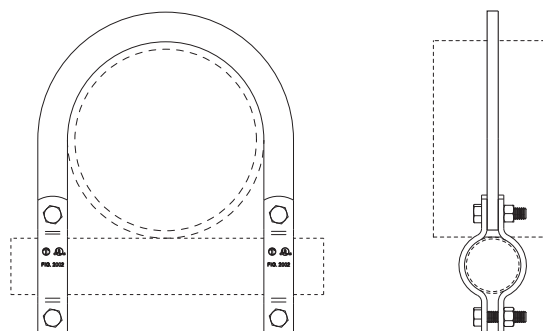


Shown with Fig. 980



Pipe Size in. (mm)	Part Number & Approx. Wt./100				Design Load	
	1½" (32mm) Brace Pipe			2" (50mm) Brace Pipe		
		Lbs.	(kg)		Lbs.	(kg)
						Lbs. (kN)
2½" (65)	2002-2½ X 1½	224.9	(102.0)	2002-2½ X 2	283.3 (128.6)	2015 (8.96)
3" (80)	2002-3 X 1½	241.0	(109.3)	2002-3 X 2	299.4 (135.8)	2015 (8.96)
4" (100)	2002-4 X 1½	268.4	(121.7)	2002-4 X 2	326.8 (148.2)	2015 (8.96)
6" (150)	2002-6 X 1½	326.6	(148.1)	2002-6 X 2	385.0 (174.6)	2015 (8.96)
8" (200)	2002-8 X 1½	381.3	(172.9)	2002-8 X 2	439.7 (199.4)	2015 (8.96)

** See load ratings in UL Listed Design Load chart.



[illegible]

Concrete Inserts

Fig. 109A - Concrete Deck Insert - Hanger Application

TOLCO



Size Range: 3/8"-16 thru 7/8"-9 rod

Material: Steel

Function: For use in metal deck formed concrete to attach hanger rods. Allows for pre-positioning of hanger rods in poured concrete decks.

Approvals: 3/8" - 5/8" rod size is Underwriters Laboratories Listed in the USA (UL) and Canada (cUL).

Finish: Plate: Plain Steel. Rod: Electro-Galvanized. Contact B-Line for alternative finishes and materials.

Order By: Figure number, rod size and finish. Contact B-Line for custom rod lengths.

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.

Concrete Inserts

Standard Bolt Length
8" (203.2mm)

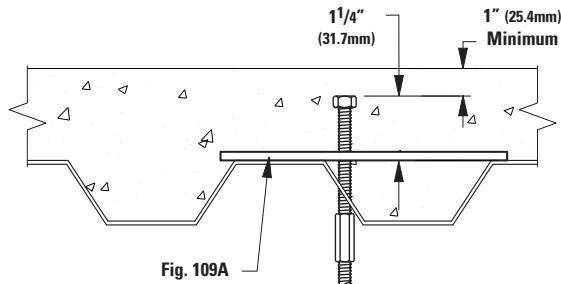
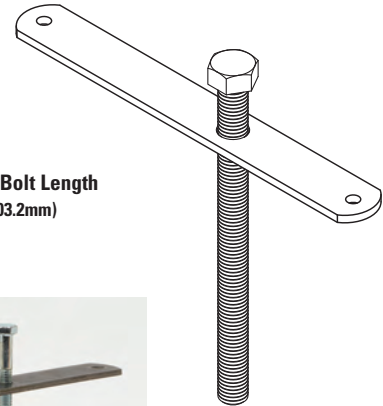


Fig. 109A

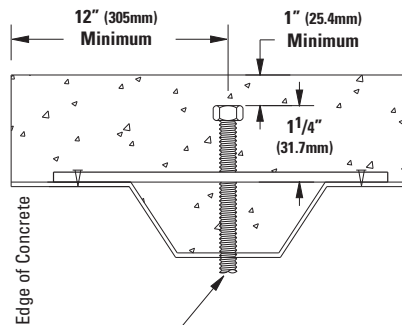


Fig. 109A

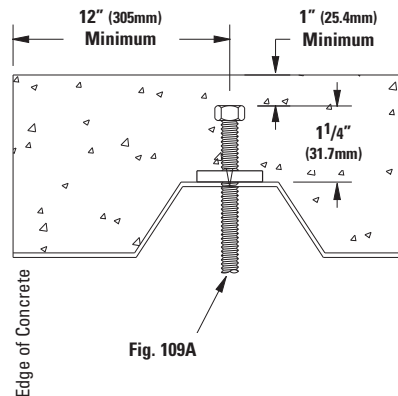


Fig. 109A

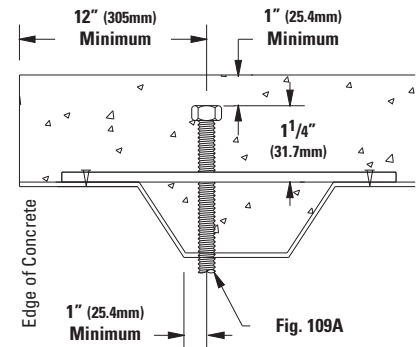


Fig. 109A

Part No.	Rod Size	Max. Pipe Size in. (mm)	Max. Hanger Spacing in. (m)	Approx. Wt./100 lbs. (kg)
109A-3/8	3/8"-16	4" (101.6)	15'-0" (4.57)	67.0 (30.4)
109A-1/2	1/2"-13	8" (203.2)	15'-0" (4.57)	69.0 (31.3)
109A-5/8	5/8"-11	Contact B-Line		71.0 (32.2)
109A-3/4	3/4"-10	Contact B-Line		213.0 (96.6)
109A-7/8	7/8"-9	Contact B-Line		217.0 (98.4)

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 4 1/2" (114.3mm) for 3/8" and 6" (1152.4mm) for 1/2"

Fig. 109A - Concrete Deck Insert - Brace Application

Size Range: 3/8"-16 thru 7/8"-9 rod

Material: Steel

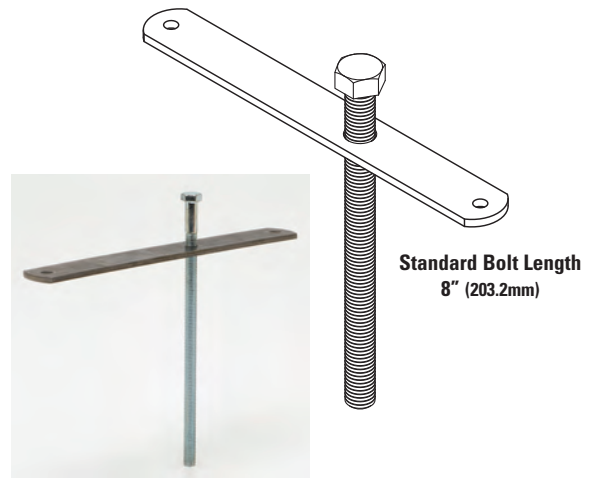
Function: For use in metal deck formed concrete to attach hanger rods. Allows for pre-positioning of hanger rods in poured concrete decks.

Finish: Plate: Plain Steel. Rod: Electro-Galvanized. Contact B-Line for alternative finishes and materials.

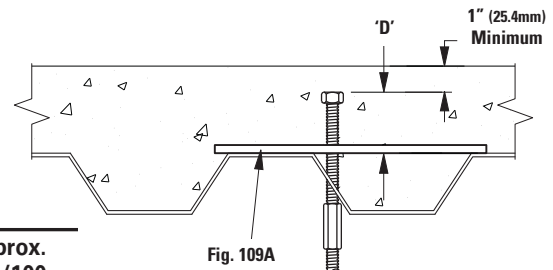
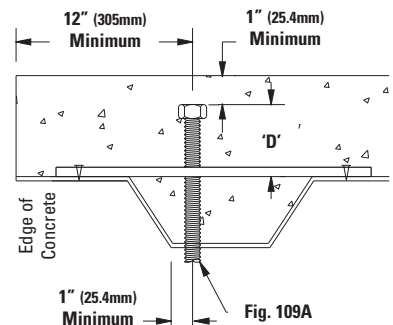
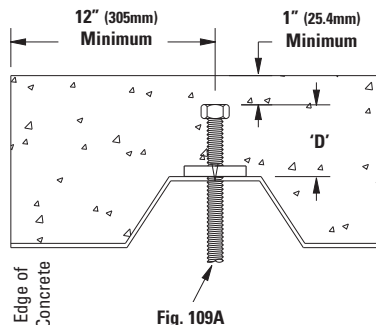
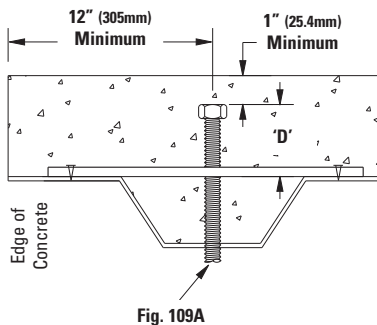
Order By: Figure number, rod size and finish. Contact B-Line for custom rod lengths.

Qualifies as an acceptable alternate seismic brace fastener per Section 9.3.5.9.6 Certification calculations for this application are available upon request. See dimensions and installation Detail below.

TOLCO



Concrete Inserts



Part No.	Rod Size	Max. Horizontal Load Brace At 45°		'D' Min. Anchor Embedment Depth		Approx. Wt./100	
		lbs.	(kN)	in.	(mm)	lbs.	(kg)
109A-3/8	3/8"-16	560	(2.49)	2 5/8"	(66.7)	67.0	(30.4)
109A-1/2	1/2"-13	660	(2.93)	2 5/8"	(66.7)	69.0	(31.3)
109A-5/8	5/8"-11	680	(3.02)	2 5/8"	(66.7)	71.0	(32.2)
109A-3/4	3/4"-10	700	(3.11)	2 5/8"	(66.7)	213.0	(96.6)
109A-7/8	7/8"-9	700	(3.11)	2 5/8"	(66.7)	217.0	(98.4)

Seismic bracing design load calculated in compliance with the requirements of IBC 2009 / CBC 2010.

Part No.	Rod Size	Max. Horizontal Load Brace At 45°		'D' Min. Anchor Embedment Depth		Approx. Wt./100	
		lbs.	(kN)	in.	(mm)	lbs.	(kg)
109A-3/8	3/8"-16	337	(1.50)	2 5/8"	(66.7)	67.0	(30.4)
109A-1/2	1/2"-13	395	(1.75)	2 5/8"	(66.7)	69.0	(31.3)
109A-5/8	5/8"-11	395	(1.75)	2 5/8"	(66.7)	71.0	(32.2)
109A-3/4	3/4"-10	395	(1.75)	2 5/8"	(66.7)	213.0	(96.6)
109A-7/8	7/8"-9	395	(1.75)	2 5/8"	(66.7)	217.0	(98.4)

Seismic bracing design load calculated in compliance with the requirements of IBC 2012 / CBC 2013.

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

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 4 1/2" (114.3mm) for 3/8" and 6" (152.4mm) for 1/2"

Concrete Inserts

Fig. 109AF - Concrete Insert - Hanger Application (B-Line B2501)



Size Range: 3/8"-16 thru 7/8"-9 rod

Material: Steel

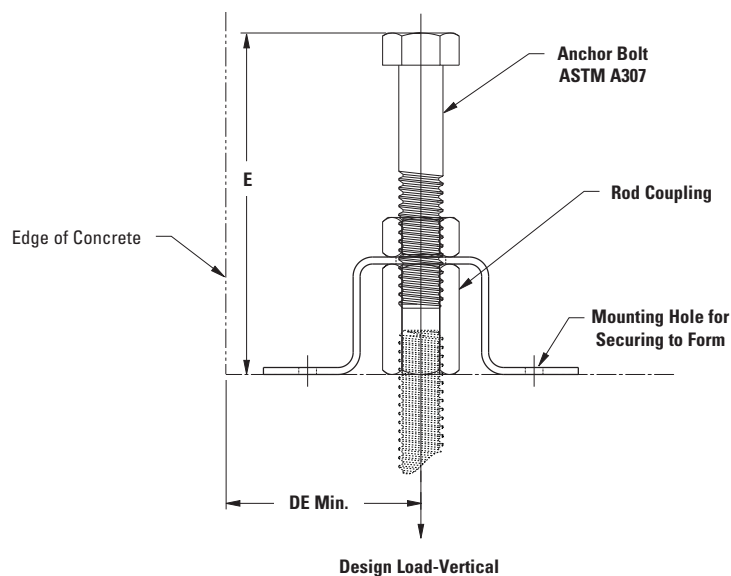
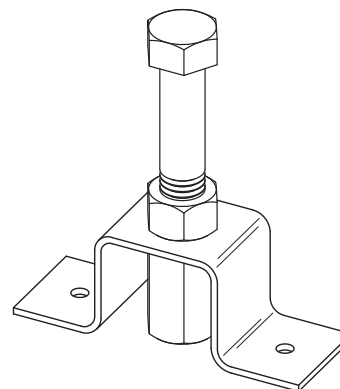
Function: Designed to be embedded in concrete to provide a point of support.

Finish: Electro-Galvanized anchor bolt with Electro-Galvanized hardware and plate.

Order By: Figure number, rod size and finish.

Note: The hex or jam nut has NO value in determining the loads. Their function is to assist in locking the coupling snug to the bottom of the deck form preventing the concrete from leaking into the coupling threads. Any other suitable locking device may be substituted if desired.

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.



Part No.	Rod Size	Max. Pipe Size (IPS)	Embedment Depth E	DE Min.	Approx. Wt./100
		in. (mm)	in. (mm)	in. (mm)	Lbs. (kg)
109AF-3/8	3/8"-16	4 (100)	3 1/2" (88.9)	2" (50.8)	38.1 (17.3)
109AF-1/2	1/2"-13	8 (200)	3 1/2" (88.9)	2" (50.8)	54.7 (24.8)
109AF-5/8	5/8"-11	12 (300)	4" (101.6)	2" (50.8)	82.2 (37.3)

Fig. 109AF - Concrete Insert - Brace Application (B-Line B2501)

TOLCO

Size Range: 3/8"-16 thru 7/8"-9 rod

Material: Steel

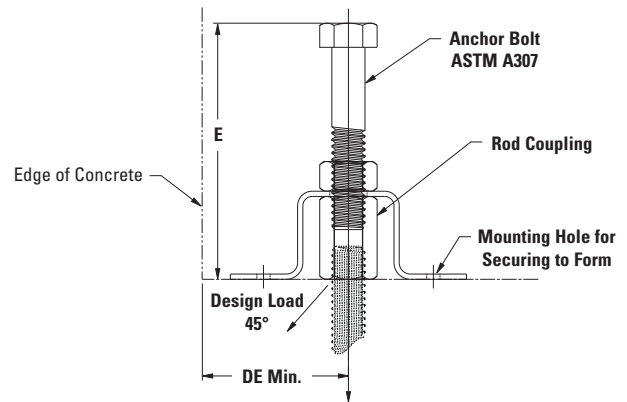
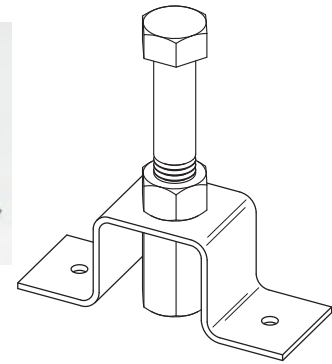
Function: Designed to be embedded in concrete to provide a point of support.

Finish: Electro-Galvanized anchor bolt with Electro-Galvanized hardware and plate.

Order By: Figure number, rod size and finish.

Note: The hex or jam nut has NO value in determining the loads. Their function is to assist in locking the coupling snug to the bottom of the deck form preventing the concrete from leaking into the coupling threads. Any other suitable locking device may be substituted if desired.

Qualifies as an acceptable alternate seismic brace fastener per Section 9.3.5.9.6 Certification calculations for this application are available upon request. See dimensions and installation Detail below.



Part No.	Rod Size	Max. Horizontal Seismic Load With Brace At 45°		Embedment Depth E		DE Min.		Approx. Wt./100	
		in.	(mm)	in.	(mm)	in.	(mm)	Lbs.	(kg)
109AF-3/8	3/8"-16	925	(4.11)	3 1/2"	(88.9)	2"	(50.8)	38.1	(17.3)
109AF-1/2	1/2"-13	925	(4.11)	3 1/2"	(88.9)	2"	(50.8)	54.7	(24.8)
109AF-1/2	1/2"-13	950	(4.22)	4"	(101.6)	2"	(50.8)	54.7	(24.8)
109AF-5/8	5/8"-11	1250	(5.56)	4"	(101.6)	2"	(50.8)	82.2	(37.3)
109AF-5/8	5/8"-11	1424	(6.33)	5"	(127.0)	2"	(50.8)	82.2	(37.3)
109AF-3/4	3/4"-10	1275	(5.67)	4"	(101.6)	2"	(50.8)	113.8	(51.6)
109AF-3/4	3/4"-10	1424	(6.33)	6"	(152.4)	2"	(50.8)	113.8	(51.6)
109AF-7/8	7/8"-9	1330	(5.91)	4"	(101.6)	2"	(50.8)	130.6	(59.2)
109AF-7/8	7/8"-9	1424	(6.33)	7"	(177.8)	2"	(50.8)	130.6	(59.2)

Seismic bracing design load calculated in compliance with the requirements of IBC 2009 / CBC 2010.

Part No.	Rod Size	Max. Horizontal Seismic Load With Brace At 45°		Embedment Depth E		DE Min.		Approx. Wt./100	
		in.	(mm)	in.	(mm)	in.	(mm)	Lbs.	(kg)
109AF-3/8	3/8"-16	781	(3.47)	3 1/2"	(88.9)	2"	(50.8)	38.1	(17.3)
109AF-1/2	1/2"-13	781	(3.47)	3 1/2"	(88.9)	2"	(50.8)	54.7	(24.8)
109AF-1/2	1/2"-13	807	(3.59)	4"	(101.6)	2"	(50.8)	54.7	(24.8)
109AF-5/8	5/8"-11	999	(4.44)	4"	(101.6)	2"	(50.8)	82.2	(37.3)
109AF-5/8	5/8"-11	1275	(5.67)	5"	(127.0)	2"	(50.8)	82.2	(37.3)
109AF-3/4	3/4"-10	1029	(4.57)	4"	(101.6)	2"	(50.8)	113.8	(51.6)
109AF-3/4	3/4"-10	1424	(6.33)	6"	(152.4)	2"	(50.8)	113.8	(51.6)
109AF-7/8	7/8"-9	1074	(4.78)	4"	(101.6)	2"	(50.8)	130.6	(59.2)
109AF-7/8	7/8"-9	1424	(6.33)	7"	(177.8)	2"	(50.8)	130.6	(59.2)

Seismic bracing design load calculated in compliance with the requirements of IBC 2012 / CBC 2013.

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

Concrete Inserts

B2500 - Light Duty Spot Insert (TOLCO Fig. 310)

Material: Steel

Function: Designed to be embedded in concrete to attach 1/4"-20 to 7/8"-9 hanger rods.

How to Install: Attach concrete insert to forms and install reinforcing rods as required. After forms are dismantled, the knockout can be removed from the insert. The N2500 insert nut can be installed and the rod fastened to the nut. The rod should touch the inside top of the insert but should not be forced further to avoid damaging the insert.

Approvals: Underwriters Laboratories Listed for maximum pipe size 6" (150). Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 19 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 18.

Weight: Approx. Wt./100 - 46 Lbs. (20.8kg)

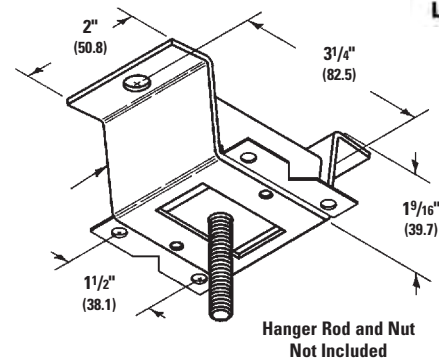
Finish: Electro-Galvanized.

Order By: Figure number and finish.
(Order N2500 nuts separately).

Design Load: Loading based on a straight pull of 600 Lbs. (2.67kN).

Note: Before installation ensure that concrete is sufficient to carry the load.

TOLCO



Material Thickness
12 Gauge (2.6)



N2500 - Steel Insert Nut (TOLCO Fig. 310N)

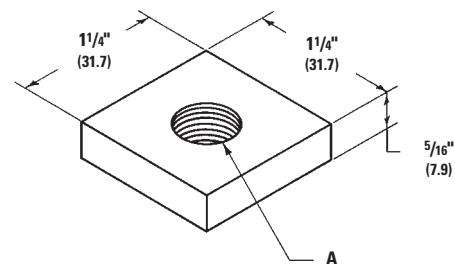
Size Range: 1/4"-20 through 7/8"-9.

Material: Steel

Function: Designed for use with B2500 spot insert shown above.

Finish: Plain or Electro-Galvanized.

Order By: Figure number and size.



Part No.	Tap Size A	Approx. Wt./100	
		Lbs.	(kg)
N2500-1/4	1/4"-20	14	(6.3)
N2500-3/8	3/8"-16	13	(5.9)
N2500-1/2	1/2"-13	12	(5.4)
N2500-5/8	5/8"-11	11	(5.0)
N2500-3/4	3/4"-10	11	(5.0)
N2500-7/8	7/8"-9	10	(4.5)

B3014 - Malleable Iron Insert (TOLCO Fig. 309)

Material: Malleable Iron

Function: Designed to be embedded in concrete to attach $\frac{3}{8}$ "-16 to $\frac{7}{8}$ "-9 hanger rods.

How to Install: Attach concrete insert to forms and install reinforcing rods as required. After forms are dismantled, the B3014N nut can be installed and the rod fastened to the nut. The rod should touch the inside top of the insert.

Approvals: Underwriters Laboratories Listed when used with B3014N Insert Nut. Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 18 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 18.

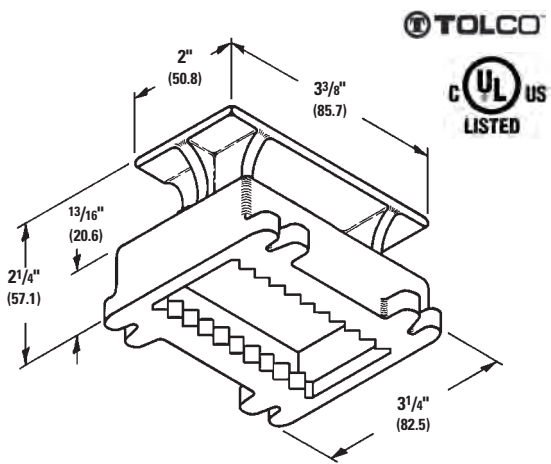
Weight: Approx. Wt./100 - 166 Lbs. (75.3kg)

Finish: Plain or Electro-Galvanized.

Order By: Figure number and finish.
(Order B3014N nuts separately).

Design Load: Design Loads based on B3014N malleable iron insert nut below.

Note: Before installation ensure that concrete is sufficient to carry the load.



Horizontal Adjustment:

For $\frac{3}{8}$ "-16, $\frac{1}{2}$ "-13, $\frac{5}{8}$ "-11 rods - Adjustment is $\frac{13}{16}$ " (44.4)

For $\frac{3}{4}$ "-10, $\frac{7}{8}$ "-9 rods - Adjustment is $\frac{13}{16}$ " (30.2)



B3014N - Malleable Iron Insert Nut (TOLCO Fig. 309N)

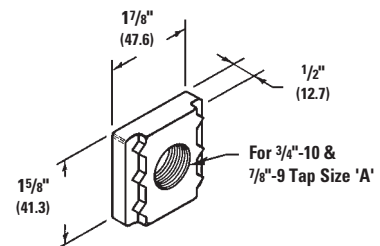
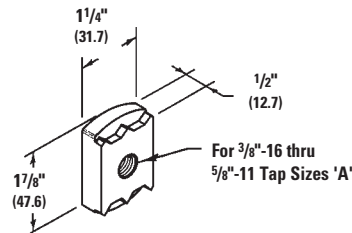
Size Range: $\frac{3}{8}$ "-20 through $\frac{7}{8}$ "-9.

Material: Malleable Iron

Standard Finish: Plain or Electro-Galvanized

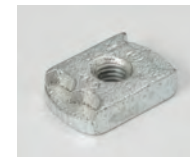
Service: Designed for use with the B3014 malleable iron insert shown above.

Ordering: Figure number and finish.



Part No.	Tap Size 'A'	UL Max. Pipe Size	Design Load* Lbs. (kN)	Approx. Wt./100 Lbs. (kg)
B3014N-3/8	3/8"-16	4"	730 (3.25)	22 (10.0)
B3014N-1/2	1/2"-13	8"	1350 (6.00)	22 (10.0)
B3014N-5/8	5/8"-11	10"	1400 (6.23)	20 (9.1)
B3014N-3/4	3/4"-10	10"	1400 (6.23)	29 (13.1)
B3014N-7/8	7/8"-9	10"	1400 (6.23)	29 (13.1)

* When used with B3014 Malleable Iron Insert.



Brackets



B3065 - Welded Bracket - Light Duty (TOLCO Fig. 30L)

Max. Recommended Load: 750 lbs. (3.33kN)

Material: Steel

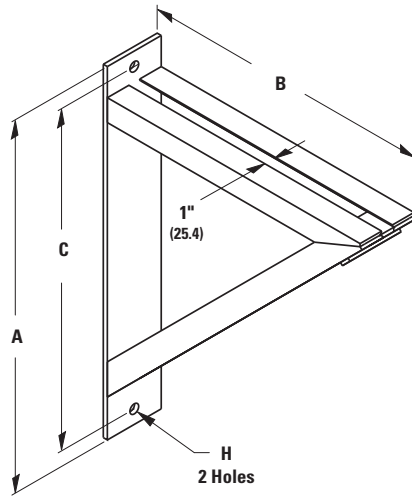
Function: Recommended for supporting pipe on top or hanging through support bracket outward from mounting surface.

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.	Mtg. Hole H		A		B		C	
	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
B3065-1	9/16"	(14.3)	13"	(330.2)	9"	(228.6)	11 1/2"	(292.1)
B3065-2	9/16"	(14.3)	17"	(431.8)	13"	(330.2)	15 1/2"	(393.7)
B3065-3	9/16"	(14.3)	23"	(584.2)	19"	(482.6)	21 1/2"	(546.1)

Part No.	Design Load		Approx. Wt./100	
	Lbs.	(kN)	Lbs.	(kg)
B3065-1	750	(3.33)	571	(259.0)
B3065-2	750	(3.33)	769	(348.8)
B3065-3	750	(3.33)	1057	(479.4)

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

B3066 - Welded Bracket - Medium Duty (TOLCO Fig. 30M)

Max. Recommended Load: 1500 lbs. (6.67kN)

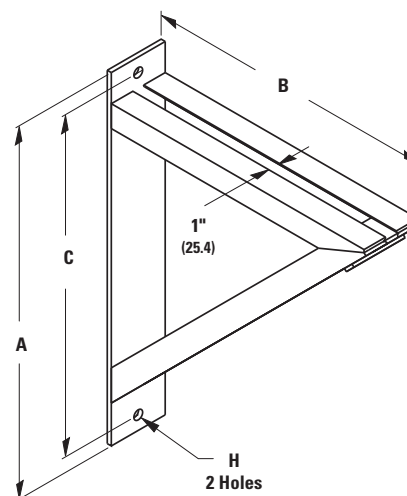
Material: Steel

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 B-Line for alternative finishes and materials.

Order By: Figure number and finish



Part No.	Mtg. Hole H		A		B		C	
	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
B3066-0	13/16"	(20.6)	18"	(457.2)	12"	(304.8)	15 1/2"	(393.7)
B3066-1	13/16"	(20.6)	24"	(609.6)	18"	(457.2)	21 1/2"	(546.1)
B3066-2	13/16"	(20.6)	30"	(762.0)	24"	(609.6)	27 1/2"	(698.5)

Part No.	Design Load		Approx. Wt./100	
	Lbs.	(kN)	Lbs.	(kg)
B3066-0	1500	(6.67)	1577	(715.3)
B3066-1	1500	(6.67)	2578	(1169.4)
B3066-2	1500	(6.67)	4446	(2016.7)

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

Brackets

TOLCO®

B3069W - Welded Knee Bracket (TOLCO Fig. 31-M)

Size Range: 1/2" (15mm) thru 8" (200mm) pipe

Material: Steel

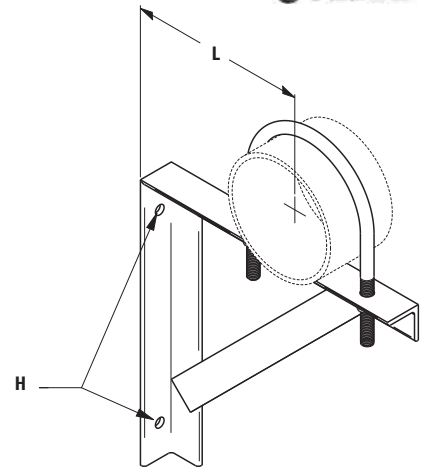
Function: Recommended for suspending pipe outward from mounting surface.

Finish: Plain or Electro-Galvanized. Contact B-Line 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 in. (mm)	Hole Size H in. (mm)	Max. Rec. Load Lbs. (kN)
B3069W-1/2-**-	1/2" (15)	9/16" (14.3)	1000 (4.45)
B3069W-3/4-**-	3/4" (20)	9/16" (14.3)	1000 (4.45)
B3069W-1-**-	1" (25)	9/16" (14.3)	1000 (4.45)
B3069W-1 1/4-**-	1 1/4" (32)	9/16" (14.3)	1000 (4.45)
B3069W-1 1/2-**-	1 1/2" (40)	9/16" (14.3)	1000 (4.45)
B3069W-2-**-	2" (50)	9/16" (14.3)	1000 (4.45)
B3069W-2 1/2-**-	2 1/2" (65)	9/16" (14.3)	1000 (4.45)
B3069W-3-**-	3" (80)	9/16" (14.3)	1000 (4.45)
B3069W-3 1/2-**-	3 1/2" (90)	9/16" (14.3)	1000 (4.45)
B3069W-4-**-	4" (100)	1 1/16" (17.5)	1000 (4.45)
B3069W-5-**-	5" (125)	1 1/16" (17.5)	1000 (4.45)
B3069W-6-**-	6" (150)	1 1/16" (17.5)	1000 (4.45)
B3069W-8-**-	8" (200)	1 1/16" (17.5)	1000 (4.45)



** Length to be specified as shown on the drawing.

B3069E - "O" Bracket (TOLCO Fig. 31-O)

Size Range: 1/2" (15mm) thru 8" (200mm) pipe

Material: Carbon Steel

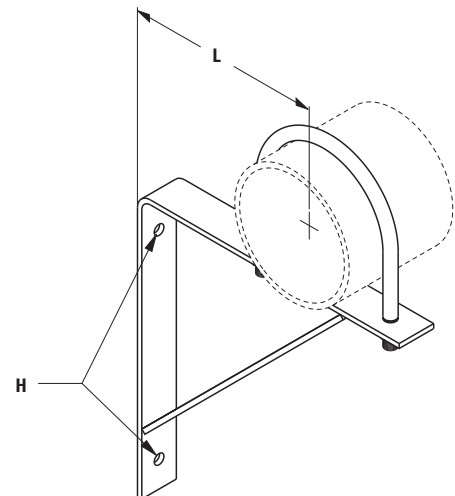
Function: Recommended for suspending pipe outward from mounting surface.

Finish: Plain or Electro-Galvanized. Contact B-Line 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 in. (mm)	Hole Size H in. (mm)	Max. Rec. Load Lbs. (kN)
B3069E-1/2-**-	1/2" (15)	9/16" (14.3)	450 (2.00)
B3069E-3/4-**-	3/4" (20)	9/16" (14.3)	450 (2.00)
B3069E-1-**-	1" (25)	9/16" (14.3)	450 (2.00)
B3069E-1 1/4-**-	1 1/4" (32)	9/16" (14.3)	450 (2.00)
B3069E-1 1/2-**-	1 1/2" (40)	9/16" (14.3)	450 (2.00)
B3069E-2-**-	2" (50)	9/16" (14.3)	450 (2.00)
B3069E-2 1/2-**-	2 1/2" (65)	9/16" (14.3)	450 (2.00)
B3069E-3-**-	3" (80)	9/16" (14.3)	450 (2.00)
B3069E-3 1/2-**-	3 1/2" (90)	9/16" (14.3)	450 (2.00)
B3069E-4-**-	4" (100)	1 1/16" (17.5)	450 (2.00)
B3069E-5-**-	5" (125)	1 1/16" (17.5)	450 (2.00)
B3069E-6-**-	6" (150)	1 1/16" (17.5)	450 (2.00)
B3069E-8-**-	8" (200)	1 1/16" (17.5)	450 (2.00)



** Length to be specified as shown on the drawing.

Fig. 78 - All Steel Ceiling Plate

Size Range: 3/8"-16 rod

Material: Pre-Galvanized Steel

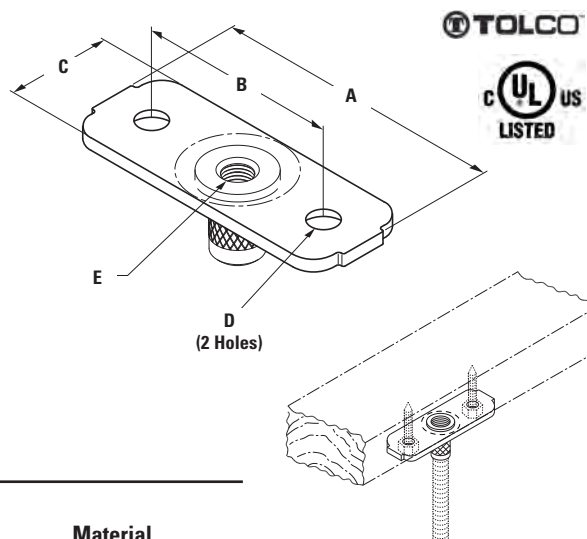
Function: Attachment to wood beams, ceilings, metal decks or walls. Can also be welded to steel beams.

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 B-Line 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 in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	Hole Dia. D in. (mm)	Thread Size E	Approx. Wt./100 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)

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)

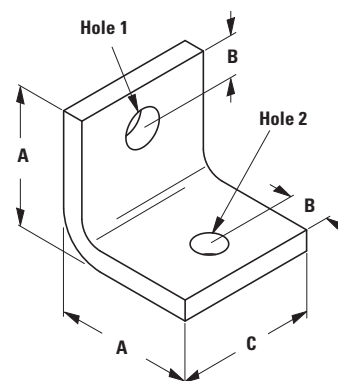
Material: Steel

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 B-Line for alternative finishes and materials.

Order By: Figure number and finish



Part No.	Pipe Size in. (mm)	Rod Size	A in. (mm)	B in. (mm)	C in. (mm)	Hole 1 in. (mm)	Hole 2 in. (mm)	Approx. Wt./100 Lbs. (kg)
51-1/2-2	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)
51-2 1/2-4	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)
51-5-6	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)
51-8	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

Fig. 50 - Side Beam Bracket

Size Range: 3/8"-16 thru 7/8"-9 rod

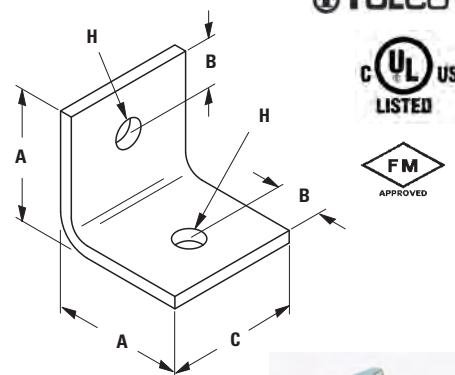
Material: Steel

Function: Recommended for attaching hanger rod to side of beams or walls.

Approvals: 3/8"-16 - Underwriters Laboratories Listed in the USA (UL) and Canada (cUL), and Factory Mutual Engineering approved.

Finish: Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

Order By: Figure number, rod size and finish



Part No.	Rod Size	A in. (mm)	B in. (mm)	C in. (mm)	Hole Size H in. (mm)	Approx. Wt./100 Lbs. (kg)
50-3/8	3/8"-16	2" (50.8)	3/4" (19.0)	2" (50.8)	7/16" (11.1)	35 (15.9)
50-1/2	1/2"-13	2" (50.8)	3/4" (19.0)	2" (50.8)	9/16" (14.3)	35 (15.9)
50-5/8	5/8"-11	2" (50.8)	3/4" (19.0)	2" (50.8)	11/16" (17.5)	32 (14.5)
50-3/4	3/4"-10	2 1/2" (63.5)	3/4" (19.0)	2 1/2" (63.5)	13/16" (20.6)	110 (49.9)
50-7/8	7/8"-9	2 1/2" (63.5)	3/4" (19.0)	2 1/2" (63.5)	15/16" (23.8)	100 (45.3)

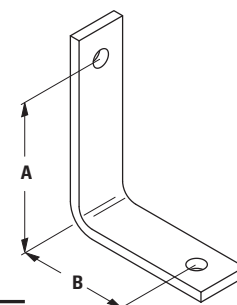
B3061 - Angle Bracket (TOLCO Fig. 42)

Material: Steel

Function: — Recommended for supporting pipe at various distances from wall or column.

Finish: Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

Order By: Figure number and finish



Part No.	Size in.	A in. (mm)	B in. (mm)	Hole Size in. (mm)	Max. Rec. Load Lbs. (kN)	Approx. Wt./100 Lbs. (kg)
B3061-1	1	3" (76.2)	2" (50.8)	7/16" (11.1)	180 (0.80)	46 (20.8)
B3061-2	2	4" (101.6)	3" (76.1)	7/16" (11.1)	180 (0.80)	65 (29.5)
B3061-3	3	3" (76.2)	2" (50.8)	9/16" (14.3)	390 (1.73)	85 (38.5)
B3061-4	4	4" (101.6)	3" (76.1)	9/16" (14.3)	390 (1.73)	115 (52.1)

Fig. 56 - Tapped Side Beam Connector (Stainless Steel)

Size Range: 1/2" (15mm) thru 4" (100mm) pipe (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 approved for 1/2" (15mm) thru 4" (100mm) pipe.

Weight: Approx. Wt./100 - 20.0 Lbs. (9.1kg)

Order By: Figure number

Note: Available only in Stainless Steel materials.

Per NFPA 13: 1/2" (15mm) thru 2" (50mm) pipe use 3/8"-16 fastener;
2 1/2" (65mm) thru 4" (100mm) pipe, use 1/2"-13 fastener.

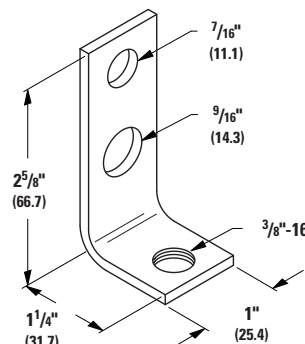


Fig. 58 - Threaded Side Beam Bracket

Size Range: 3/8"-16 rod, pipe sizes 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 3/8" and 1/2" fastener bolts. Per NFPA 13: 1/2" (15mm) thru 2" (50mm) pipe requires 3/8" fastener, 2 1/2" (65mm) thru 4" (100mm) pipe requires 1/2" fastener.*

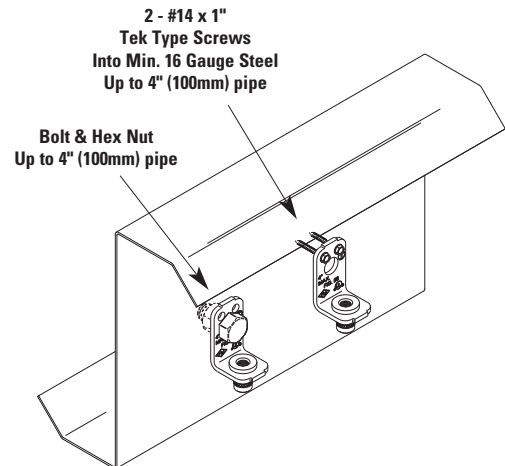
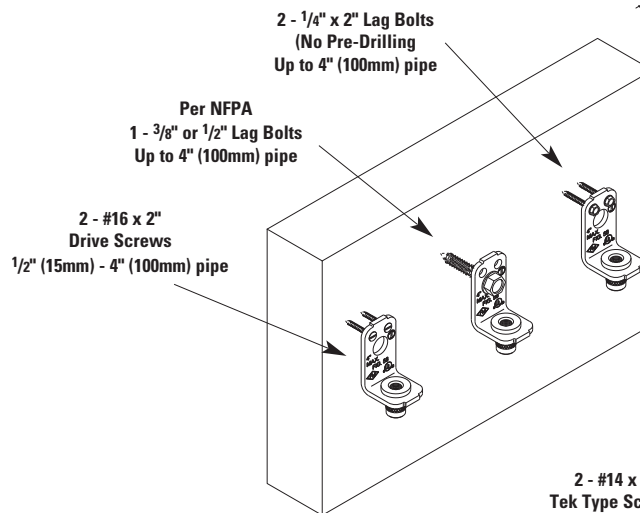
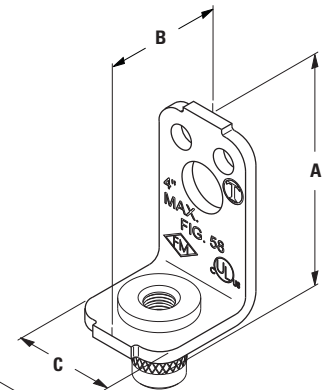
Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL), and Factory Mutual Engineering approved thru 4" (100mm) pipe.

Finish: Pre-Galvanized

Order By: Figure number and finish

***Note:** Additionally UL has listed the Fig. 58 with fasteners as shown in table below.

TOLCO



UL Listed Fastener Table			
Pipe Size	Qty	Fastener Type	Material
2"	2	#16 x 2" Drive screws	Wood
2"	1	3/8" Lag bolt	Wood
2 1/2" - 4"	1	1/2" Lag bolt	Wood
3 1/2"	2	1/4" x 1 1/2" Lag bolts	Wood
4"	2	1/4" x 2" Lag bolts **	Wood
4"	2	1/4" x 1" Tek screws	Metal (15 gauge)
4"	2	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 in. (mm)	Rod Size	A in. (mm)	B in. (mm)	C in. (mm)	Approx. Wt./100 Lbs. (kg)
58	1/2" - 4" (15 - 100)	3/8"-16	2 3/4" (69.8)	1 1/2" (38.1)	1 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.

Upper Attachments

Fig. 75 - Swivel Attachment



Size Range: — 3/8"-16 Rod Attachment

Material: Steel

Function: 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 in a pitched or sloped roof application, to meet requirements of NFPA 13 (2010) 9.1.2.6.

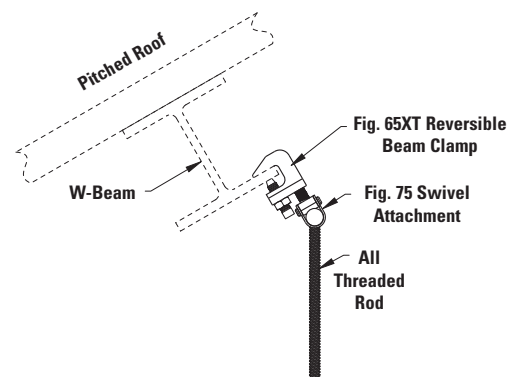
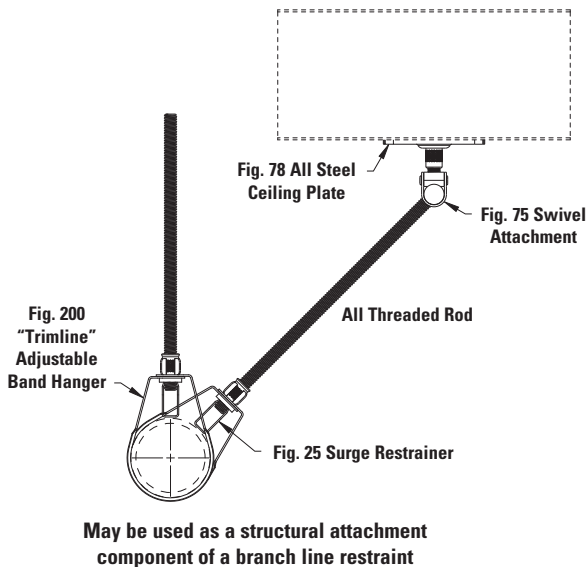
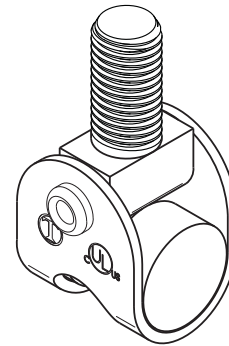
Approvals: Underwriters Laboratories Listed in the USA (**UL**) and Canada (**cUL**) to support up to 4" (100mm) pipe.

Finish: Electro-Galvanized

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

Order By: Figure number

Patent: #7,887,248



May be used with a pitched roof application, to meet requirements of NFPA 13 (2010) Sec. 9.1.2.5.

B3083 - Welded Beam Attachment (TOLCO Fig. 305)

B3083WO - Welded Beam Attachment Without Pin (TOLCO Fig. 304)

Size Range: 3/8"-16 thru 2"-4 1/2 rod

Material: Steel (Stainless steel available)

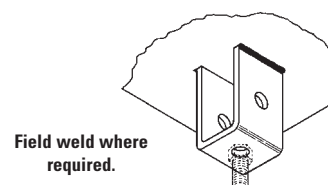
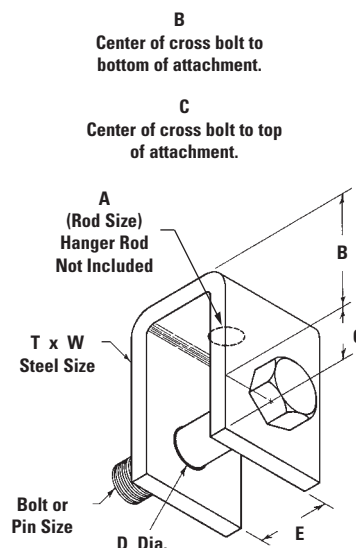
Function: Designed for attaching hanger rod to the bottom of structural steel where heavy loads and large hanger rod sizes are required. Can be welded in place in either the upright or inverted position. When using B3083WO, attach hanger rod to bolt or pin with a B3200 weldless eye nut or B3210 and B3211 series eye rods.

Approvals: Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 22 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 22.

Finish: Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

Order By: Figure number (with or without hardware) and finish.

Note: When ordering with hardware for sizes 3/8 thru 1 1/8, hex head cap screws and hex nuts will be supplied. For 1 1/4 thru 2, clevis pin and cotter pins will be supplied. Must be specified with or without hardware.



B3083



B3083WO



Part No.	Rod Size A	Pin or Bolt Size in. (mm)	Design Load		Approx. Wt./100	
			650° F (349°C) Lbs. (kN)	750°F (399°C) Lbs. (kN)	W/O Hardware Lbs. (kg)	With Hardware Lbs. (kg)
B3083-3/8	3/8"-16	1/2" (12.7)	730 (3.25)	572 (2.54)	89 (40.3)	110 (49.9)
B3083-1/2	1/2"-13	5/8" (15.9)	1350 (6.00)	1057 (4.70)	87 (39.4)	123 (55.8)
B3083-5/8	5/8"-11	3/4" (19.0)	2160 (9.61)	1692 (7.52)	84 (38.1)	140 (63.5)
B3083-3/4	3/4"-10	7/8" (22.2)	3230 (14.37)	2530 (11.25)	173 (78.4)	268 (121.5)
B3083-7/8	7/8"-9	1" (25.4)	4480 (19.93)	3508 (15.60)	234 (106.1)	376 (170.4)

Part No.	B		C		Dia. D		E		T x W	
	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
B3083-3/8	2"	(50.8)	7/8"	(22.2)	9/16"	(14.3)	1 1/4"	(31.7)	1/4" x 2"	(6.3 x 50.8)
B3083-1/2	2"	(50.8)	7/8"	(22.2)	1 1/16"	(17.5)	1 1/4"	(31.7)	1/4" x 2"	(6.3 x 50.8)
B3083-5/8	2"	(50.8)	7/8"	(22.2)	13/16"	(20.6)	1 1/4"	(31.7)	1/4" x 2"	(6.3 x 50.8)
B3083-3/4	2"	(50.8)	1 1/8"	(28.6)	15/16"	(23.8)	1 1/2"	(38.1)	3/8" x 2 1/2"	(9.5 x 63.5)
B3083-7/8	3"	(76.2)	1 1/4"	(31.7)	1 1/8"	(28.6)	2"	(50.8)	3/8" x 2 1/2"	(9.5 x 63.5)

For larger sizes consult full line pipe hanger catalog.

Upper Attachments



B3085 - Rod Attachment Concrete Plate (TOLCO Fig. 35)

Size Range: 3/8"-16 thru 2"-4 1/2 rod

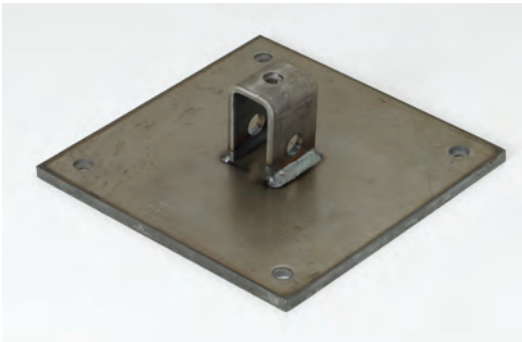
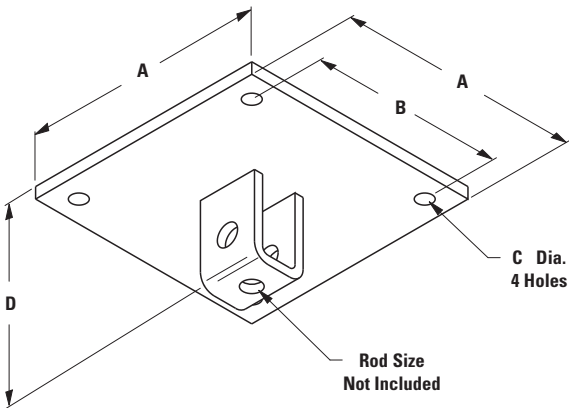
Material: Steel

Function: Structural attachment to concrete ceiling where vertical attachment is desired. Attach hanger rod directly to support bracket.

Finish: Plain. Contact B-Line for alternative finishes and materials.

Order By: Figure number and finish

Note: Design load is based off rod sizes. Before installation ensure that concrete and anchorage are sufficient to carry the load.



Upper Attachments

Part No.	Rod Size	A		B		C		D	
		in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
B3085-3/8	3/8"-16	10"	(254.0)	8"	(203.2)	9/16"	(14.3)	3 1/4"	(82.5)
B3085-1/2	1/2"-13	10"	(254.0)	8"	(203.2)	9/16"	(14.3)	3 1/4"	(82.5)
B3085-5/8	5/8"-11	10"	(254.0)	8"	(203.2)	9/16"	(14.3)	3 1/2"	(88.9)
B3085-3/4	3/4"-10	10"	(254.0)	8"	(203.2)	1 1/16"	(17.5)	3 5/8"	(92.1)
B3085-7/8	7/8"-9	10"	(254.0)	8"	(203.2)	1 1/16"	(17.5)	4 3/4"	(120.6)

Part No.	Max. Rec. Load*		Approx. Wt./100	
	Lbs.	(kN)	Lbs.	(kg)
B3085-3/8	610	(2.71)	1155	(523.9)
B3085-1/2	1130	(5.02)	1160	(526.2)
B3085-5/8	1810	(8.05)	1505	(682.6)
B3085-3/4	2710	(12.05)	1605	(728.0)
B3085-7/8	3770	(16.77)	1665	(755.2)

* Based on allowable stresses shown in the ANSI code for pressure piping. For larger sizes consult full line pipe hanger catalog.

B3084 - Single Lug Concrete Plate (TOLCO Fig. 33)

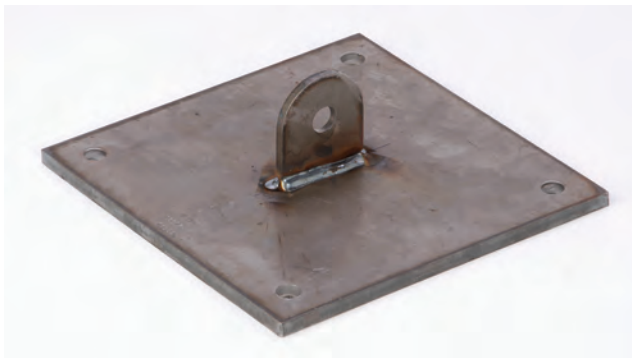
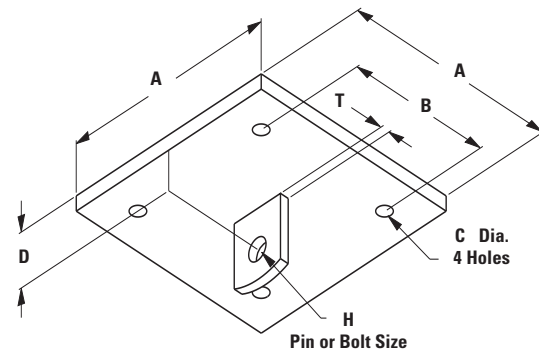
Size Range: 1/2"-13 thru 2"-4 1/2 rod

Material: Steel

Function: Structural attachment to concrete ceiling.
Use with B3201 bridge clevis to attach to center lug.

Finish: Plain. Contact B-Line for alternative finishes and materials.

Order By: Figure number, rod size and finish



Part No.	Rod Size	A		B		C		D		H		T	
		in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
B3084-1/2	1/2"-13	10"	(254.0)	8"	(203.2)	9/16"	(14.3)	17/8"	(47.6)	5/8"	(15.9)	1/4"	(6.3)
B3084-5/8	5/8"-11	10"	(254.0)	8"	(203.2)	9/16"	(14.3)	2"	(50.8)	3/4"	(19.0)	1/4"	(6.3)
B3084-3/4	3/4"-10	10"	(254.0)	8"	(203.2)	11/16"	(17.5)	2"	(50.8)	7/8"	(22.2)	3/8"	(9.5)
B3084-7/8	7/8"-9	10"	(254.0)	8"	(203.2)	11/16"	(17.5)	2 3/4"	(69.8)	1"	(25.4)	3/8"	(9.5)

Part No.	Max. Rec. Load*		Approx. Wt./100	
	Lbs.	(kN)	Lbs.	(kg)
B3084-1/2	1130	(5.02)	1115	(505.7)
B3084-5/8	1810	(8.05)	1465	(654.5)
B3084-3/4	2710	(12.05)	1478	(670.4)
B3084-7/8	3770	(16.77)	2195	(995.6)

* Based on allowable stresses shown in the ANSI code for pressure piping.
For larger sizes consult full line pipe hanger catalog.

Threaded Accessories



B3200 - Weldless Eye Nut (TOLCO Fig. 330)

Size Range: 3/8"-16 thru 2 1/2"-4 1/2" machine thread.

Material: Forged Steel

Quality Assurance: Conforms to the requirements of NCA 3800.

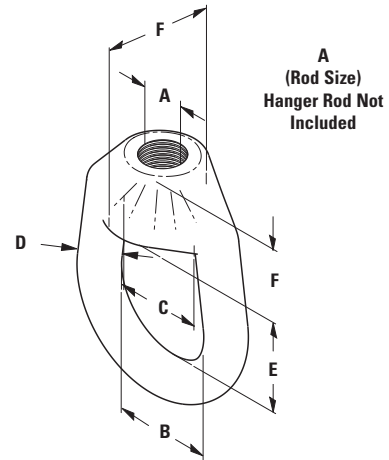
Threads: Tapped UNC Class 2B. Right hand threads are standard. Left hand threads supplied upon request (B3200L).

Function: Used on piping installations where high strength and swivel action are required. Left hand tap is also available.

Approvals: 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 B-Line for alternative finishes and materials.

Order By: Figure number and finish.



Part No.	Rod Size	B		C		D		E		F		G	
	A	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
B3200-3/8	3/8"-16	1 1/2"	(38.1)	1 3/16"	(30.2)	1/2"	(12.7)	2"	(50.8)	1 3/8"	(34.9)	1 1/16"	(17.5)
B3200-1/2	1/2"-13	1 1/2"	(38.1)	1 3/16"	(30.2)	1/2"	(12.7)	2"	(50.8)	1 3/8"	(34.9)	1 1/16"	(17.5)
B3200-5/8	5/8"-11	1 1/2"	(38.1)	1 3/16"	(30.2)	1/2"	(12.7)	2"	(50.8)	1 3/8"	(34.9)	1 1/16"	(17.5)
B3200-3/4	3/4"-10	1 1/2"	(38.1)	1 3/16"	(30.2)	1/2"	(12.7)	2"	(50.8)	1 3/8"	(34.9)	1 1/16"	(17.5)
B3200-7/8	7/8"-9	2"	(50.8)	1 11/16"	(42.9)	3/4"	(19.0)	2 5/8"	(66.7)	1 15/16"	(49.2)	1"	(25.4)

Part No.	Design Load				Approx. Wt./100	
	650°F (343°C)		750°F (399°C)			
	Lbs.	(kN)	Lbs.	(kN)	Lbs.	(kg)
B3200-3/8	610	(2.71)	540	(2.40)	63	(28.6)
B3200-1/2	1130	(5.02)	1010	(4.49)	60	(27.2)
B3200-5/8	1810	(8.05)	1610	(7.16)	59	(26.7)
B3200-3/4	2710	(12.05)	2420	(10.76)	56	(25.4)
B3200-7/8	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 (TOLCO Fig. 111)

Size Range: Size 1/2" (15mm) thru 8" (200mm) pipe

Material: Carbon Steel

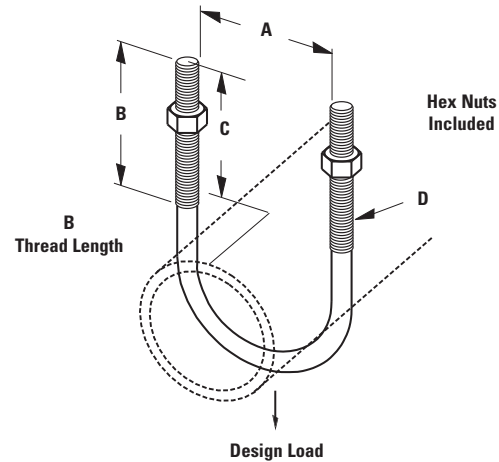
Function: Recommended for supporting or anchoring light pipe loads.

Maximum Temperature: 650°F (343°C)

Finish: Plain or Electro-Galvanized. Contact B-Line 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		B		C		D	Design Load		Approx. Wt./100	
	in.	(mm)	in.	(mm)	in.	(mm)		Lbs.	(kN)	Lbs.	(kg)
B501-1/2	15/16"	(23.8)	13/4"	(44.4)	1 1/2"	(38.1)	5/16"-18	600	(2.67)	12	(5.4)
B501-3/4	1 1/8"	(28.6)	13/4"	(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 (TOLCO Fig. 110)

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.

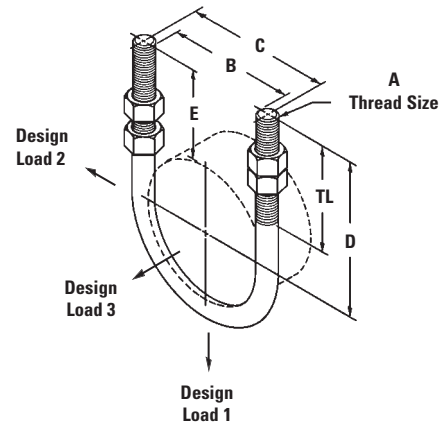
Maximum Temperature: 750°F (399°C)

Finish: Plain or Electro-Galvanized. Contact B-Line 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.



TOLCO



Hex Nuts Included

TL
Thread Length



B3188C
Plastic Coated

Part No.	Pipe Size		Thread Size	Thread Length TL		B	
	in.	(mm)		in.	(mm)	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 (TOLCO Fig. 110) cont.



Part No.	C		Tangent D		E		Approx. Wt./100	
	in.	(mm)	in.	(mm)	in.	(mm)	Lbs.	(kg)
B3188-1/2	1 ³ / ₁₆ "	(30.2)	2 ³ / ₄ "	(69.8)	2 ⁵ / ₁₆ "	(58.7)	10	(4.5)
B3188-3/4	1 ³ / ₈ "	(34.9)	2 ³ / ₄ "	(69.8)	2 ⁷ / ₃₂ "	(56.3)	11	(5.0)
B3188-1	1 ⁵ / ₈ "	(41.3)	2 ³ / ₄ "	(69.8)	2 ³ / ₃₂ "	(53.2)	11	(5.0)
B3188-1 ¹ / ₄	2 ³ / ₃₂ "	(53.2)	2 ⁷ / ₈ "	(73.0)	2 ¹ / ₃₂ "	(51.6)	28	(12.7)
B3188-1 ¹ / ₂	2 ³ / ₈ "	(60.3)	3"	(76.2)	2 ¹ / ₁₆ "	(52.4)	29	(13.1)
B3188-2	2 ¹³ / ₁₆ "	(71.4)	3 ¹ / ₄ "	(82.5)	2 ¹ / ₁₆ "	(52.4)	31	(14.0)
B3188-2 ¹ / ₂	3 ⁷ / ₁₆ "	(87.3)	3 ³ / ₄ "	(95.2)	2 ⁵ / ₁₆ "	(58.7)	72	(32.6)
B3188-3	4 ¹ / ₁₆ "	(103.2)	4"	(101.6)	2 ¹ / ₄ "	(57.1)	79	(35.8)
B3188-3 ¹ / ₂	4 ⁹ / ₁₆ "	(115.9)	4 ¹ / ₄ "	(107.9)	2 ¹ / ₄ "	(57.1)	84	(38.1)
B3188-4	5 ¹ / ₁₆ "	(128.6)	4 ¹ / ₂ "	(114.3)	2 ¹ / ₄ "	(57.1)	94	(42.6)
B3188-5	6 ⁵ / ₃₂ "	(156.3)	5"	(127.0)	2 ⁷ / ₃₂ "	(56.3)	104	(47.2)
B3188-6	7 ³ / ₈ "	(187.3)	6 ¹ / ₈ "	(155.6)	2 ¹³ / ₁₆ "	(71.4)	203	(92.1)
B3188-8	9 ³ / ₈ "	(238.1)	7 ¹ / ₈ "	(181.0)	2 ¹³ / ₁₆ "	(71.4)	241	(109.3)
B3188-10	11 ⁵ / ₈ "	(295.3)	8 ³ / ₈ "	(212.7)	3 ¹ / ₄ "	(82.5)	412	(186.9)
B3188-12	13 ³ / ₄ "	(349.2)	9 ⁵ / ₈ "	(244.5)	3 ¹ / ₄ "	(82.5)	661	(299.8)
B3188-14	15"	(381.0)	10 ¹ / ₄ "	(260.3)	3"	(76.2)	707	(320.7)

Part No.	Design Load 1		Design Load 2		Design Load 3	
	650°F (343°C) Lbs. (kN)	750°F (399°C) Lbs. (kN)	650°F (343°C) Lbs. (kN)	650°F (343°C) Lbs. (kN)	650°F (343°C) Lbs. (kN)	650°F (343°C) 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 ¹ / ₄	1460 (6.49)	1144 (5.09)	365 (1.62)	600 (2.67)		
B3188-1 ¹ / ₂	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 ¹ / ₂	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 ¹ / ₂	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.

Threaded Accessories



B3205 - Threaded Rod (right-hand threads - both ends) (TOLCO Fig. 103)

B3205L - Threaded Rod (right & left hand threads)

Size Range: 3/8"-16 thru 3"-4 rod

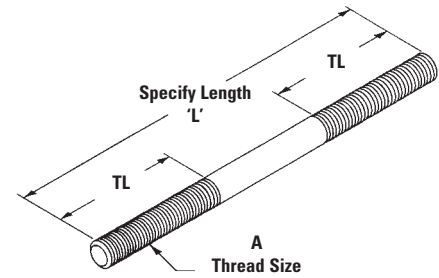
Material: Steel

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 B-Line for alternative finishes and materials.

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



Part No.	Thread Size A	Standard Thread Length TL in. (mm)	Design Load		750°F (399°C) Lbs. (kN)
			650°F (343°C) 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. 100)

Fig. 99 - All Threaded Rod Cut To Length

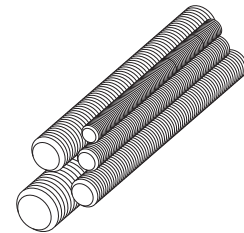
Size Range: 3/8"-16 thru 1 1/2"-6 rod in 120" lengths or cut to length

Material: Steel

Maximum Temperature: 750°F (399°C)

Finish: Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

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



Part No. - Size x Length		Threads 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.

Fig. 98 - Rod Stiffener

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

Size Range: Secures 3/8"-16 thru 7/8"-9 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.

Approvals: Included in our Seismic Restraints Catalog 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 the TOLCO Seismic Restraint Systems Guidelines

Finish: Electro Galvanized. Contact B-Line 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

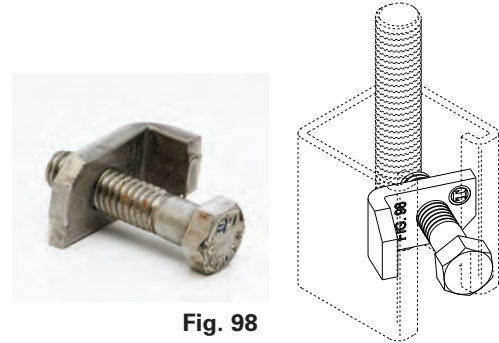


Fig. 98



Fig. 98B

Rod Stiffener Requirements

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

Notes:

- 1.) Rod stiffeners are required only on hanger and trapeze assemblies that have seismic bracing attached at or within 4" (101.6mm) 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.

Threaded Accessories



B3214 - Tie Bolt (TOLCO Fig. 106)

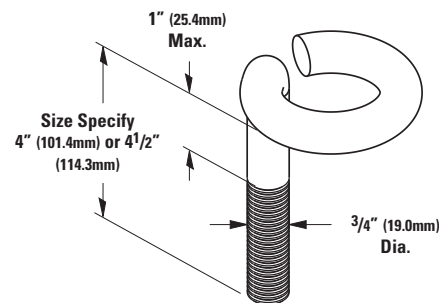
Material: Steel

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.

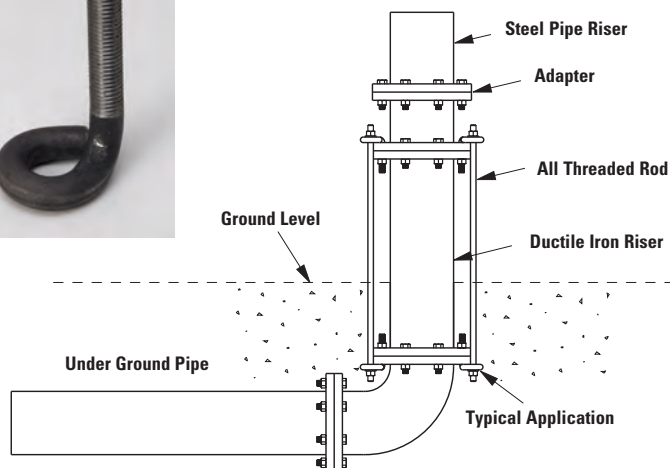
Approvals: As shown in NFPA Pamphlet 24, Installation of Private Fire Service Maintenance 4" (100mm) - 12" (300mm) pipe size.

Finish: Plain. Contact B-Line for alternative finishes and materials.

Order By: Figure number, length and finish.
Custom lengths for thicker flange available.



Part No.	Length		Approx. Wt./100	
	in.	(mm)	Lbs.	(kg)
B3214-4	4"	(101.6)	107.5	(48.5)
B3214-4 1/2	4 1/2"	(114.3)	113.7	(51.6)



B3213 - Coach Screw Rod (TOLCO Fig. 105)

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

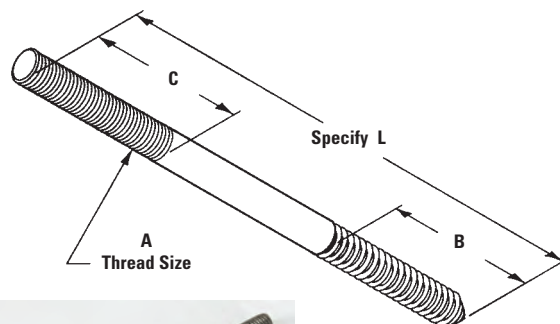
Material: Steel

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 B-Line for alternative finishes and materials.

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



Part No.	Thread Size A	Standard Rod Lengths L		Coach Screw Thread Length B		Rod Thread Length C		Design Load	
		in.	(mm)	in.	(mm)	in.	(mm)	Lbs.	(kg)
B3213-3/8 x 'L'	3/8"-16	*3 1/2"	8" (88.9, 203.2)	2"	(50.8)	2"	(50.8)	390	(1.73)
B3213-1/2 x 'L'	1/2"-13	*3 1/2"	8" (88.9, 203.2)	2 1/2"	(63.5)	2 1/2"	(63.5)	640	(2.84)

*3/8 x 3 1/2 and 1/2 x 3 1/2 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.

B3210 - Eye Rod (right-hand threads) (TOLCO Fig. 102)

B3210L - Eye Rod (Left & right hand threads)

B3211 - Welded Eye Rod (right-hand threads) (TOLCO Fig. 101)

B3211L - Welded Eye Rod (Left & right hand threads)

Size Range: 3/8"-16 thru 2"-4 1/2 rod

Material: Steel

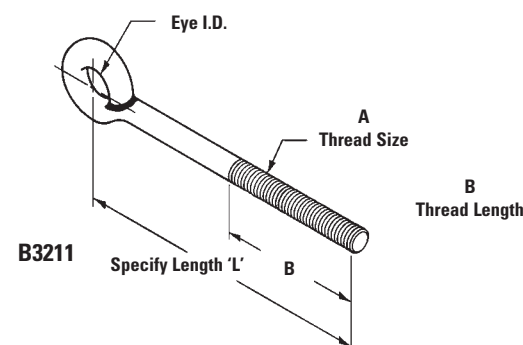
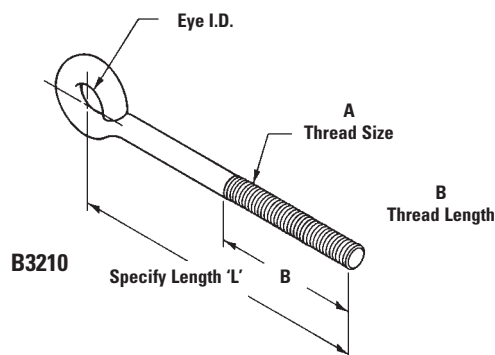
Function: Designed for use as support hanger rod that may be attached directly to structure or to other pipe support product. The welded eye allows for heavier loads.

Approvals: Conforms to the requirements of NFPA13.

Finish: Plain. Contact B-Line 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		B3211	
					650°F (343°C)	650°F (343°C)	650°F (343°C)	750°F (399°C)
					Lbs. (kN)	Lbs. (kN)	Lbs. (kN)	Lbs. (kN)
B3210-3/8 x 'L'	B3211-3/8 x 'L'	3/8"-16	2 1/2" (63.5)	1/2" (12.7)	240 (1.07)	730 (3.25)	572 (2.54)	
B3210-1/2 x 'L'	B3211-1/2 x 'L'	1/2"-13	2 1/2" (63.5)	5/8" (15.9)	440 (1.96)	1350 (6.00)	1057 (4.70)	
B3210-5/8 x 'L'	B3211-5/8 x 'L'	5/8"-11	2 1/2" (63.5)	3/4" (19.0)	705 (3.13)	2160 (9.61)	1692 (7.52)	
B3210-3/4 x 'L'	B3211-3/4 x 'L'	3/4"-10	3" (76.2)	7/8" (22.2)	1050 (4.67)	3230 (14.37)	2530 (11.25)	
B3210-7/8 x 'L'	B3211-7/8 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.

Threaded Accessories



B3210X - Linked Eye Rods (Right-hand threads-both ends) (TOLCO Fig. 102L)

B3210XL - Linked Eye Rods (Left & right threads)

B3211X - Linked Welded Eye Rods (Right-hand threads-both ends) (TOLCO Fig. 101L)

B3211XL - Linked Welded Eye Rods (Left & right threads)

Size Range: 3/8"-16 thru 2"-4 1/2" rod

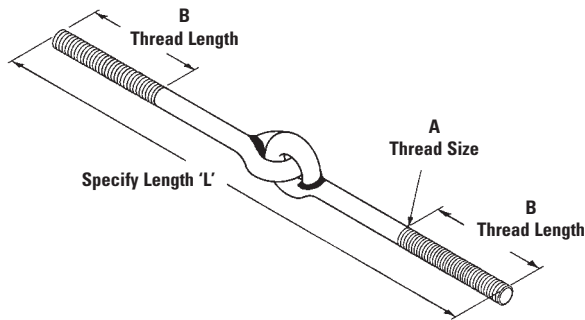
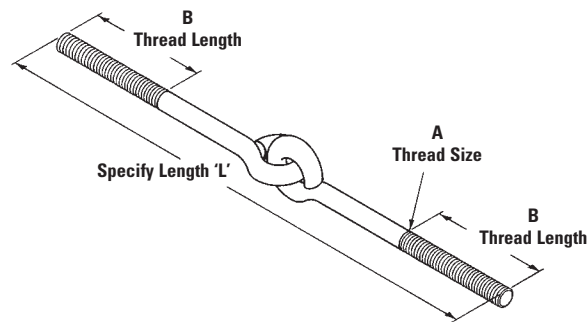
Material: Steel

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 B-Line 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)	B3211 650°F (343°C) Lbs. (kN)	B3211 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 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.

B3212 - J-Bolt (TOLCO Fig. 104)

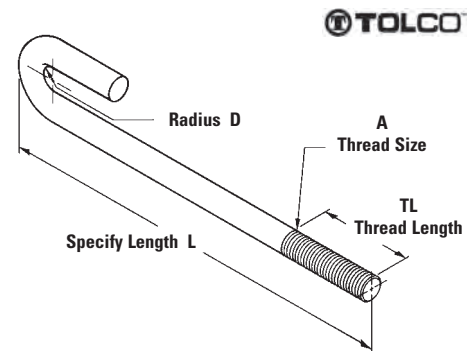
Size Range: 3/8"-16 thru 7/8"-19 rod

Material: Steel

Function: Designed to be hooked or hung from beam flange or purlin.

Finish: Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

Order By: Figure number, length and finish



Part No.	Thread Size A	Thread Length in. (mm)	TL (mm)	Radius D in. (mm)	Design Load 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)

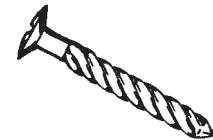
DS 16 x 2 - Drive Screw (Formally TOLCO Fig. 125)

Material: Steel

Function: Equivalent to a nail, but has greater holding power

Finish: Plain and Electro-Galvanized

Order By: Figure number and finish



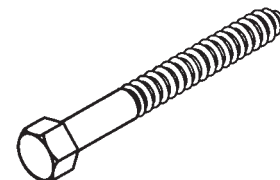
B3228 - Hex Head Lag Bolt (TOLCO Fig. 126)

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.

Finish: Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

Order By: Figure number, bolt size, length and finish



Length	Bolt Diameter and Wt./C							
	1/4" (6.3)	3/8" (9.5)	1/2" (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.

Threaded Accessories



B655 - Steel Rod Coupling (TOLCO Fig. 70)

B656 - Steel Reducing Rod Coupling (TOLCO Fig. 70R)

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.

Finish: Electro-Galvanized. Contact B-Line for alternative finishes and materials.

Order By: Figure number and finish

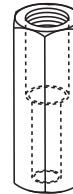
Part No.	For Rod Size	Length in. (mm)	Design Load		Approx. Wt./100	
			Lbs.	(kN)	Lbs.	(kg)
B655-1/4	1/4"-20	7/8" (22.2)	300	(1.33)	1.9	(0.86)
B655-3/8	3/8"-16	1 1/8" (28.6)	730	(3.25)	3.6	(1.63)
B655-1/2	1/2"-13	1 3/4" (44.4)	1350	(6.00)	11.3	(5.12)
B655-5/8	5/8"-11	2 1/8" (54.0)	2160	(9.61)	17.6	(7.98)
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 in. (mm)	Design Load		Approx. Wt./100	
			Lbs.	(kN)	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 1/4" (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 (TOLCO Fig. 71)

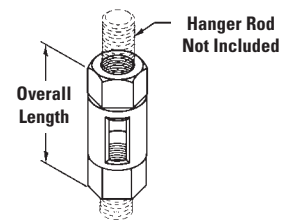
Size Range: 3/8"-16 thru 1"-8 rod

Material: Malleable Iron

Function: Used for coupling two threaded rods together of equal rod sizes, with inspection hole.

Finish: Electro-Galvanized. Contact B-Line for alternative finishes and materials.

Order By: Figure number and finish



Part No.	For Rod Size	Overall Length		Design Load		Approx. Wt./100	
		in.	(mm)	Lbs.	(kN)	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 3/16"	(55.6)	4480	(19.93)	91	(41.3)
B3220-1	1"-8	2 3/4"	(69.8)	5900	(26.24)	100	(45.3)

B3248 - Steel Washer Plate (TOLCO Fig. 118)

Size Range: 3/8" thru 1" rod sizes

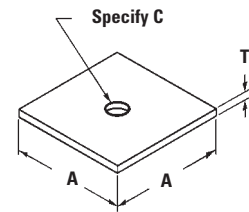
Material: Steel

Function: Heavy duty washer for use on top of channels or angles to support hanger rod.

Finish: Plain. Contact B-Line for alternative finishes and materials.

Order By: Figure number size and finish

TOLCO®



Part No.	Rod Size C	A		T		Approx. Wt./100	
		in.	(mm)	in.	(mm)	Lbs.	(kg)
B3248-3/8	3/8"-16	2"	(50.8)	1/4"	(6.3)	27	(12.2)
B3248-1/2	1/2"-13	2"	(50.8)	1/4"	(6.3)	27	(12.2)
B3248-5/8	5/8"-11	2 1/2"	(63.5)	1/4"	(6.3)	47	(21.3)
B3248-3/4	3/4"-10	2 1/2"	(63.5)	3/8"	(9.5)	52	(23.6)
B3248-7/8	7/8"-9	3"	(76.2)	3/8"	(9.5)	85	(38.5)
B3248-1	1"-8	4"	(101.6)	3/8"	(9.5)	160	(72.6)



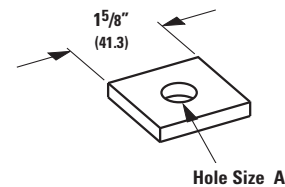
B200 - Series Square Washer (TOLCO F13 - F17)

Material: Steel

Standard Finish: Electro-Galvanized

Service: Designed as a washer to suspend hanger rods.

Order by: Figure number and finish.



Part No.	Hole Size A		Bolt Size	Thickness		Approx. Wt./100	
	in.	(mm)		in.	(mm)	Lbs.	(kg)
B200	3/8"	(9.5)	5/16"-18	1/4"	(6.3)	18	(8.1)
B201	7/16"	(11.1)	3/8"-16	1/4"	(6.3)	18	(8.1)
B202	9/16"	(14.2)	1/2"-13	1/4"	(6.3)	17	(7.7)
B202-1	1 1/16"	(17.4)	5/8"-11	1/4"	(6.3)	16	(7.2)
B202-2	1 3/16"	(20.6)	3/4"-10	1/4"	(6.3)	15	(6.8)



B3234 - Bevel Washer (TOLCO Fig. 116)

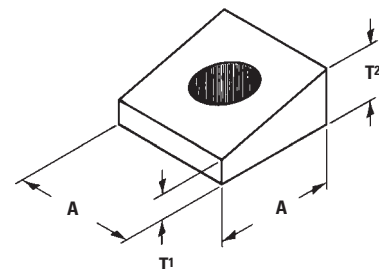
Size Range: 3/8"-16 thru 7/8"-9 bolt

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 B-Line for alternative finishes and materials.

Order By: Figure number size and finish



Part No.	For Bolt Size	A		T ¹		T ²		Approx. Wt./100	
		in.	(mm)	in.	(mm)	in.	(mm)	Lbs.	(kg)
B3234-3/8	3/8"-16	1 1/4"	(31.7)	5/32"	(3.9)	11/32"	(8.7)	9	(4.1)
B3234-1/2	1/2"-13	1 1/4"	(31.7)	5/32"	(3.9)	11/32"	(8.7)	9	(4.1)
B3234-5/8	5/8"-11	1 1/2"	(38.1)	5/32"	(3.9)	13/32"	(10.3)	14	(6.3)
B3234-3/4	3/4"-10	1 1/2"	(38.1)	7/32"	(5.5)	15/32"	(11.9)	16	(7.2)
B3234-7/8	7/8"-9	2"	(50.8)	7/32"	(5.5)	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.

Threaded Accessories



HN - Standard Hex Nut (TOLCO Fig. 113)

Size Range: 1/4"-20 thru 7/8"-9

Material: Steel

Finish: Plain or Electro-Galvanized.

Contact B-Line for alternative finishes and materials.

Order By: Figure number size and finish



Part Number	For Rod Size	Width Across Flats		Width Across Points		Thickness		Approx. Wt./100	
		in.	(mm)	in.	(mm)	in.	(mm)	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)	15/16"	(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 (TOLCO Fig. 114)

Size Range: 1/4"-20 thru 7/8"-9

Material: Steel

Finish: Plain or Electro-Galvanized.

Contact B-Line for alternative finishes and materials.

Order By: Figure number size and finish



Part Number	For Rod Size	Width Across Flats		Width Across Points		Thickness		Approx. Wt./100	
		in.	(mm)	in.	(mm)	in.	(mm)	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	1 1/16"	(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)



FW - Flat Washer (TOLCO Fig. 115)

Size Range: 1/4"-20 thru 1"-8 rods

Material: Steel

Finish: Plain or Electro-Galvanized.

Contact B-Line for alternative finishes and materials.

Order By: Figure number size and finish



Part Number	For Rod Size	Outside Diameter		Approx. Wt./100	
		in.	(mm)	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 (TOLCO Fig. 117)

Size Range: 1/4"-20 thru 1"-8 rods

Material: Steel

Finish: Plain or Electro-Galvanized.

Note: Available in Hot Dip Galvanized finish or Stainless Steel materials.

Order By: Figure number size and finish



Part Number	For Rod Size	Outside Diameter		Approx. Wt./100	
		in.	(mm)	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 (TOLCO Fig. 119)

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 B-Line for alternative finishes and materials.

Order By: Figure number and size



Part Number	For Rod Size	Inside Diameter	Outside Diameter	Approx. Wt./100	
		in. (mm)	in. (mm)	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.

Anchor Load Charts

NFPA 13-16 AWSD / Powers Power-Stud+® SD2 Seismic Wedge Anchors In 3000 psi Sand Lightweight Concrete

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) ^{1,2}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2.375	101	222	270	156	222	175	84	118	145
1/2	3.750	216	491	605	349	491	374	182	257	315
5/8	3.875	252	594	741	428	594	437	216	306	375
3/4	4.500	311	728	907	523	728	539	266	376	461

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) ^{1,2}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2.375	121	243	265	153	243	210	107	151	185
1/2	3.750	161	541	592	342	541	452	235	333	407
5/8	3.875	306	658	724	418	658	530	283	401	491
3/4	4.500	378	806	886	512	806	654	348	492	602

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) ^{1,2}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2.375	101	222	270	156	222	175	84	118	145
1/2	3.750	216	491	605	349	491	374	182	257	315
5/8	3.875	252	594	741	428	594	437	216	306	375
3/4	4.500	311	728	907	523	728	539	266	376	461

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Power-Stud+® is a registered trademark used by Power® Fasteners, Inc.

NFPA 13-16 AWSD / Powers Power-Stud+® SD2 Seismic Wedge Anchors In 3000 psi Normal Weight Cracked Concrete

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Normal Weight Cracked Concrete (lbs.)^{1,2}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		Pr 3.275	Pr 1.156	Pr 0.844	Pr 1.461	Pr 1.156	Pr 1.891	Pr 3.478	Pr 2.469	Pr 2.008
3/8	2.375	145	310	373	215	310	251	118	167	205
1/2	3.750	299	632	756	436	632	517	242	342	419
5/8	3.875	353	777	945	545	777	611	292	413	506
3/4	4.500	434	950	1151	664	950	752	358	506	620

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Normal Weight Cracked Concrete (lbs.)^{1,2}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		Pr 2.626	Pr 1.002	Pr 0.873	Pr 1.513	Pr 1.002	Pr 1.516	Pr 2.460	Pr 1.740	Pr 1.420
3/8	2.375	173	338	366	211	338	300	149	211	259
1/2	3.750	356	687	742	428	687	617	304	430	526
5/8	3.875	423	852	926	534	852	733	373	527	646
3/4	4.500	521	1039	1128	651	1039	902	456	645	790

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Normal Weight Cracked Concrete (lbs.)^{1,2}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		Pr 3.275	Pr 1.156	Pr 0.844	Pr 1.461	Pr 1.156	Pr 1.891	Pr 3.478	Pr 2.459	Pr 2.008
3/8	2.375	145	310	373	215	310	251	118	167	205
1/2	3.750	299	632	756	436	632	517	242	342	419
5/8	3.875	353	777	945	545	777	611	292	413	506
3/4	4.500	434	950	1151	664	950	752	358	506	620

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Power-Stud+® is a registered trademark used by Power® Fasteners, Inc.

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

Anchor Load Charts

NFPA 13-16 AWSD / Powers Power-Stud+® SD2 Seismic Wedge Anchors In 4000 psi Normal Weight Cracked Concrete

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 4000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2.375	157	329	393	227	329	271	126	179	219
1/2	3.750	335	688	813	470	688	581	267	377	462
5/8	3.875	398	852	1025	592	852	689	324	458	561
3/4	4.500	489	1040	1247	720	1040	847	397	561	688

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 4000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2.375	187	358	386	223	358	323	158	224	274
1/2	3.750	398	744	800	462	744	689	332	469	574
5/8	3.875	475	929	1005	580	929	823	410	579	709
3/4	4.500	584	1132	1224	706	1132	1011	500	707	866

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 4000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2.375	157	329	393	227	329	271	126	179	219
1/2	3.750	335	688	813	470	688	581	267	377	462
5/8	3.875	398	852	1025	592	852	689	324	458	561
3/4	4.500	489	1040	1247	720	1040	847	397	561	688

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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NFPA 13-16 AWSD / Powers Power-Stud+® SD2 Seismic Wedge Anchors In 5000 psi Normal Weight Cracked Concrete

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 5000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2.375	166	344	408	235	344	288	133	188	230
1/2	3.750	366	732	858	495	732	634	287	406	497
5/8	3.875	435	912	1087	628	912	754	350	496	607
3/4	4.500	536	1112	1322	763	1112	928	429	607	743

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 5000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2.375	197	373	401	231	373	342	166	234	287
1/2	3.750	432	789	844	488	789	748	354	500	612
5/8	3.875	518	991	1068	617	991	898	439	621	761
3/4	4.500	637	1206	1298	750	1206	1103	536	758	928

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 5000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2.375	166	344	408	235	344	288	133	188	230
1/2	3.750	366	732	858	495	732	634	287	406	497
5/8	3.875	435	912	1087	628	912	754	350	496	607
3/4	4.500	536	1112	1322	763	1112	928	429	607	743

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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

Anchor Load Charts

NFPA 13-16 AWSD / Powers Power-Stud+® SD2 Seismic Wedge Anchors In 6000 psi Normal Weight Cracked Concrete

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 6000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2.375	174	356	420	243	356	302	138	196	240
1/2	3.750	392	768	895	517	768	680	304	430	527
5/8	3.875	468	962	1139	658	962	811	373	527	646
3/4	4.500	576	1172	1383	798	1172	997	456	645	790

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 6000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2.375	207	385	413	238	385	358	172	243	297
1/2	3.750	462	826	881	509	826	799	372	526	644
5/8	3.875	556	1042	1119	646	1042	963	464	656	804
3/4	4.500	682	1267	1360	785	1267	1181	566	800	979

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 6000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2.375	174	356	420	243	356	302	138	196	240
1/2	3.750	392	768	895	517	768	680	304	430	527
5/8	3.875	468	962	1139	658	962	811	373	527	646
3/4	4.500	576	1172	1383	798	1172	997	456	645	790

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Power-Stud+® is a registered trademark used by Power® Fasteners, Inc.

NFPA 13-16 Wood-Knocker™ In 3000 psi Sand Lightweight Concrete

Wood-Knocker™ in 3000 psi Sand Lightweight Concrete (lbs.)^{1,2}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2	160	310	359	207	310	277	123	174	213
1/2	2	174	366	438	253	366	301	140	198	243
5/8	2	174	366	438	253	366	301	140	198	243
3/4	2	174	366	438	253	366	301	140	198	243

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 3000 psi Sand Lightweight Concrete (lbs.)^{1,2}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2	187	332	354	204	332	325	150	212	260
1/2	2	207	399	430	248	399	358	176	249	305
5/8	2	207	399	430	248	399	358	176	249	305
3/4	2	207	399	430	248	399	358	176	249	305

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 3000 psi Sand Lightweight Concrete (lbs.)^{1,2}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2	160	310	359	207	310	277	123	174	213
1/2	2	174	366	438	253	366	301	140	198	243
5/8	2	174	366	438	253	366	301	140	198	243
3/4	2	174	366	438	253	366	301	140	198	243

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood Knocker™ is a registered trademark used by Power® Fasteners, Inc.

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

Anchor Load Charts

NFPA 13-16 Wood-Knocker™ In 3000 psi Normal Weight Cracked Concrete

Wood-Knocker™ in 3000 psi Normal Weight Concrete (lbs.) ^{1,2}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2	180	335	384	222	335	312	135	192	235
1/2	2	204	431	516	298	431	354	165	233	286
5/8	2	204	431	516	298	431	354	165	233	286
3/4	2	204	431	516	298	431	354	165	233	286

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 3000 psi Normal Weight Concrete (lbs.) ^{1,2}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2	210	358	379	219	358	363	163	230	282
1/2	2	243	469	506	292	469	422	208	293	359
5/8	2	243	469	506	292	469	422	208	293	359
3/4	2	243	469	506	292	469	422	208	293	359

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 3000 psi Normal Weight Concrete (lbs.) ^{1,2}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2	180	335	384	222	335	312	135	192	235
1/2	2	204	431	516	298	431	354	165	233	286
5/8	2	204	431	516	298	431	354	165	233	286
3/4	2	204	431	516	298	431	354	165	233	286

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood Knocker™ is a registered trademark used by Power® Fasteners, Inc.

NFPA 13-16 Wood-Knocker™ In 4000 psi Normal Weight Cracked Concrete

Wood-Knocker™ in 4000 psi Normal Weight Concrete (lbs.) ^{1,2}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		Pr 3.275	Pr 1.156	Pr 0.844	Pr 1.461	Pr 1.156	Pr 1.891	Pr 3.478	Pr 2.469	Pr 2.008
3/8	2	199	358	406	234	358	345	147	208	254
1/2	2	232	480	570	329	480	401	185	262	321
5/8	2	236	498	595	344	498	408	191	270	330
3/4	2	236	498	595	344	498	408	191	270	330

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 4000 psi Normal Weight Concrete (lbs.) ^{1,2}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		Pr 2.626	Pr 1.002	Pr 0.873	Pr 1.513	Pr 1.002	Pr 1.516	Pr 2.460	Pr 1.740	Pr 1.420
3/8	2	230	380	401	231	380	399	174	246	302
1/2	2	275	521	560	323	521	477	231	327	401
5/8	2	281	542	585	337	542	487	240	339	415
3/4	2	281	542	585	337	542	487	240	339	415

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 4000 psi Normal Weight Concrete (lbs.) ^{1,2}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		Pr 3.275	Pr 1.156	Pr 0.844	Pr 1.461	Pr 1.156	Pr 1.891	Pr 3.478	Pr 2.459	Pr 2.008
3/8	2	199	358	406	234	358	345	147	208	254
1/2	2	232	480	570	329	480	401	185	262	321
5/8	2	236	498	595	344	498	408	191	270	330
3/4	2	236	498	595	344	498	408	191	270	330

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood Knocker™ is a registered trademark used by Power® Fasteners, Inc.

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

Anchor Load Charts

NFPA 13-16 Wood-Knocker™ In 5000 psi Normal Weight Cracked Concrete

Wood-Knocker™ in 5000 psi Normal Weight Concrete (lbs.) ^{1,2}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2	215	375	422	244	375	372	156	220	269
1/2	2	253	512	602	348	512	438	200	282	346
5/8	2	264	557	666	384	557	457	213	301	369
3/4	2	264	557	666	384	557	457	213	301	369

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 5000 psi Normal Weight Concrete (lbs.) ^{1,2}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2	247	397	417	241	397	428	183	259	317
1/2	2	299	553	593	342	553	519	247	349	428
5/8	2	314	605	654	377	605	544	268	379	464
3/4	2	314	605	654	377	605	544	268	379	464

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 5000 psi Normal Weight Concrete (lbs.) ^{1,2}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2	215	375	422	244	375	372	156	220	269
1/2	2	253	512	602	348	512	438	200	282	346
5/8	2	264	557	666	384	557	457	213	301	369
3/4	2	264	557	666	384	557	457	213	301	369

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood Knocker™ is a registered trademark used by Power® Fasteners, Inc.

NFPA 13-16
Wood-Knocker™
In 6000 psi Normal Weight Cracked Concrete

Wood-Knocker™ in 6000 psi Normal Weight Concrete (lbs.)^{1,2}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2	228	389	435	251	389	394	163	230	282
1/2	2	271	538	629	363	538	470	212	299	367
5/8	2	289	610	729	421	610	500	233	330	404
3/4	2	289	610	729	421	610	500	233	330	404

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 6000 psi Normal Weight Concrete (lbs.)^{1,2}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2	261	410	430	248	410	452	190	269	329
1/2	2	320	579	619	357	579	554	260	368	450
5/8	2	344	663	716	413	663	596	293	415	508
3/4	2	344	663	716	413	663	596	293	415	508

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 6000 psi Normal Weight Concrete (lbs.)^{1,2}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2	228	389	435	251	389	394	163	230	282
1/2	2	271	538	629	363	538	470	212	299	367
5/8	2	289	610	729	421	610	500	233	330	404
3/4	2	289	610	729	421	610	500	233	330	404

¹ Values calculated in accordance with NFPA 13-16 Annex E.7 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood Knocker™ is a registered trademark used by Power® Fasteners, Inc.

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

Anchor Load Charts

ASCE 7-10 AWSD / Powers Power-Stud+® SD2 Seismic Wedge Anchors In 3000 psi Sand Lightweight Concrete

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) ^{1,2,3}										
Tolco Figure 980										
Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		Pr 3.275	Pr 1.156	Pr 0.844	Pr 1.461	Pr 1.156	Pr 1.891	Pr 3.478	Pr 2.469	Pr 2.008
3/8	2.375	81	178	216	125	178	140	67	94	116
1/2	3.750	173	393	484	279	393	299	145	206	252
5/8	3.875	202	475	593	342	475	350	173	245	300
3/4	4.500	249	582	725	419	582	431	213	301	369

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) ^{1,2,3}										
Tolco Figure 909										
Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		Pr 2.626	Pr 1.002	Pr 0.873	Pr 1.513	Pr 1.002	Pr 1.516	Pr 2.460	Pr 1.740	Pr 1.420
3/8	2.375	97	195	212	122	195	168	85	121	148
1/2	3.750	209	433	473	273	433	361	188	266	326
5/8	3.875	245	526	579	334	526	424	227	321	393
3/4	4.500	302	645	709	409	645	523	278	393	482

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) ^{1,2,3}										
Tolco Figure 910										
Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		Pr 3.275	Pr 1.156	Pr 0.844	Pr 1.461	Pr 1.156	Pr 1.891	Pr 3.478	Pr 2.459	Pr 2.008
3/8	2.375	81	178	216	125	178	140	67	94	116
1/2	3.750	173	393	484	279	393	299	145	206	252
5/8	3.875	202	475	593	342	475	350	173	245	300
3/4	4.500	249	582	725	419	582	431	213	301	369

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Power-Stud+® is a registered trademark used by Power® Fasteners, Inc.

ASCE 7-10 AWSD / Powers Power-Stud+® SD2 Seismic Wedge Anchors In 3000 psi Normal Weight Cracked Concrete

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Normal Weight Cracked Concrete (lbs.)^{1,2,3}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2.375	116	248	299	172	248	201	95	134	164
1/2	3.750	239	505	604	349	505	414	193	273	335
5/8	3.875	282	622	756	436	622	489	234	330	404
3/4	4.500	347	760	921	532	760	602	286	405	496

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Normal Weight Cracked Concrete (lbs.)^{1,2,3}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2.375	139	271	293	169	271	240	119	169	207
1/2	3.750	285	550	593	343	550	494	243	344	421
5/8	3.875	339	681	741	428	681	587	298	422	517
3/4	4.500	417	831	903	521	831	722	365	516	632

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Normal Weight Cracked Concrete (lbs.)^{1,2,3}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2.375	116	248	299	172	248	201	95	134	164
1/2	3.750	239	505	604	349	505	414	193	273	335
5/8	3.875	282	622	756	436	622	489	234	330	404
3/4	4.500	347	760	921	532	760	602	286	405	496

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Power-Stud+® is a registered trademark used by Power® Fasteners, Inc.

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

Anchor Load Charts

ASCE 7-10 AWSD / Powers Power-Stud+® SD2 Seismic Wedge Anchors In 4000 psi Normal Weight Cracked Concrete

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 4000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2.375	125	263	314	181	263	217	101	143	175
1/2	3.750	268	550	651	376	550	465	213	302	370
5/8	3.875	318	682	820	473	682	551	259	367	449
3/4	4.500	391	832	997	576	832	678	318	449	550

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ C_{ac} , slab thickness $\geq$ h_{min} , spacing $\geq$ $3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 4000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2.375	149	286	308	178	286	259	127	179	220
1/2	3.750	318	595	640	369	595	551	265	375	460
5/8	3.875	380	743	804	464	743	658	328	463	568
3/4	4.500	391	906	979	565	906	809	400	566	693

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ C_{ac} , slab thickness $\geq$ h_{min} , spacing $\geq$ $3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 4000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2.375	125	263	314	181	263	217	101	143	175
1/2	3.750	268	550	651	376	550	465	213	302	370
5/8	3.875	318	682	820	473	682	551	259	367	449
3/4	4.500	391	832	997	576	832	678	318	449	550

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ C_{ac} , slab thickness $\geq$ h_{min} , spacing $\geq$ $3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Power-Stud+® is a registered trademark used by Power® Fasteners, Inc.

ASCE 7-10 AWSD / Powers Power-Stud+® SD2 Seismic Wedge Anchors In 5000 psi Normal Weight Cracked Concrete

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 5000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2.375	133	275	326	188	275	230	106	150	184
1/2	3.750	293	585	687	396	585	507	230	325	398
5/8	3.875	348	730	870	502	730	603	280	396	486
3/4	4.500	428	890	1057	610	890	742	343	485	594

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 5000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2.375	158	298	321	185	298	274	133	187	230
1/2	3.750	346	631	676	390	631	599	283	400	490
5/8	3.875	415	793	854	493	793	718	351	497	609
3/4	4.500	509	965	1039	600	965	882	429	606	742

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 5000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2.375	133	275	326	188	275	230	106	150	184
1/2	3.750	293	585	687	396	585	507	230	325	398
5/8	3.875	348	730	870	502	730	603	280	396	486
3/4	4.500	428	890	1057	610	890	742	343	485	594

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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

Anchor Load Charts

ASCE 7-10 AWSD / Powers Power-Stud+® SD2 Seismic Wedge Anchors In 6000 psi Normal Weight Cracked Concrete

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 6000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2.375	139	285	336	194	285	242	111	156	192
1/2	3.750	314	615	716	413	615	544	243	344	421
5/8	3.875	375	770	911	526	770	649	298	422	517
3/4	4.500	461	938	1106	639	938	798	365	516	632

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 6000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2.375	165	308	330	191	308	286	137	194	238
1/2	3.750	369	661	705	407	661	640	297	421	515
5/8	3.875	445	833	896	517	833	770	371	525	643
3/4	4.500	546	1014	1088	628	1014	945	452	640	784

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Powers Power -Stud+® SD2) Seismic Wedge Anchor in 6000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2.375	139	285	336	194	285	242	111	156	192
1/2	3.750	314	615	716	413	615	544	243	344	421
5/8	3.875	375	770	911	526	770	649	298	422	517
3/4	4.500	461	938	1106	639	938	798	365	516	632

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 2502 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq$ Cac, slab thickness $\geq$ hmin, spacing $\geq$ 3hef

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Power-Stud+® is a registered trademark used by Power® Fasteners, Inc.

ASCE 7-10 Wood-Knocker™ In 3000 psi Sand Lightweight Concrete

Wood-Knocker™ in 3000 psi Sand Lightweight Concrete (lbs.) ^{1,2,3}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2	128	248	288	166	248	221	98	139	170
1/2	2	139	293	351	202	293	240	112	159	194
5/8	2	139	293	351	202	293	240	112	159	194
3/4	2	139	293	351	202	293	240	112	159	194

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 3000 psi Sand Lightweight Concrete (lbs.) ^{1,2,3}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2	150	266	283	164	266	260	120	170	208
1/2	2	165	319	344	199	319	287	141	200	244
5/8	2	165	319	344	199	319	287	141	200	244
3/4	2	165	319	344	199	319	287	141	200	244

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 3000 psi Sand Lightweight Concrete (lbs.) ^{1,2,3}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2	128	248	288	166	248	221	98	139	170
1/2	2	139	293	351	202	293	240	112	159	194
5/8	2	139	293	351	202	293	240	112	159	194
3/4	2	139	293	351	202	293	240	112	159	194

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood Knocker™ is a registered trademark used by Power® Fasteners, Inc.

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

Anchor Load Charts

ASCE 7-10 Wood-Knocker™ In 3000 psi Normal Weight Cracked Concrete

Wood-Knocker™ in 3000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2	144	268	308	178	268	249	108	153	188
1/2	2	163	345	412	238	345	283	132	187	229
5/8	2	163	345	412	238	345	283	132	187	229
3/4	2	163	345	412	238	345	283	132	187	229

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 3000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2	168	286	303	175	286	290	130	184	226
1/2	2	195	375	405	234	375	337	166	235	288
5/8	2	195	375	405	234	375	337	166	235	288
3/4	2	195	375	405	234	375	337	166	235	288

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 3000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2	144	268	308	178	268	249	108	153	188
1/2	2	163	345	412	238	345	283	132	187	229
5/8	2	163	345	412	238	345	283	132	187	229
3/4	2	163	345	412	238	345	283	132	187	229

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood Knocker™ is a registered trademark used by Power® Fasteners, Inc.

ASCE 7-10 Wood-Knocker™ In 4000 psi Normal Weight Cracked Concrete

Wood-Knocker™ in 4000 psi Normal Weight Cracked Concrete (lbs.)^{1,2,3}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2	159	286	325	187	286	276	117	166	203
1/2	2	185	384	456	263	384	321	148	210	257
5/8	2	189	398	476	275	398	327	152	216	264
3/4	2	189	398	476	275	398	327	152	216	264

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 4000 psi Normal Weight Cracked Concrete (lbs.)^{1,2,3}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2	184	304	321	185	304	319	139	197	241
1/2	2	220	417	448	259	417	381	185	262	321
5/8	2	225	433	468	270	433	389	192	271	332
3/4	2	225	433	468	270	433	389	192	271	332

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 4000 psi Normal Weight Cracked Concrete (lbs.)^{1,2,3}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2	159	286	325	187	286	276	117	166	203
1/2	2	185	384	456	263	384	321	148	210	257
5/8	2	189	398	476	275	398	327	152	216	264
3/4	2	189	398	476	275	398	327	152	216	264

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood Knocker™ is a registered trademark used by Power® Fasteners, Inc.

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

Anchor Load Charts

ASCE 7-10 Wood-Knocker™ In 5000 psi Normal Weight Cracked Concrete

Wood-Knocker™ in 5000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2	172	300	338	195	300	297	124	176	216
1/2	2	202	409	482	278	409	351	160	226	277
5/8	2	211	445	532	307	445	365	170	241	295
3/4	2	211	445	532	307	445	365	170	241	295

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 5000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2	198	318	334	193	318	342	146	207	253
1/2	2	240	442	474	274	442	415	198	280	342
5/8	2	251	484	523	302	484	435	214	303	371
3/4	2	251	484	523	302	484	435	214	303	371

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 5000 psi Normal Weight Cracked Concrete (lbs.) ^{1,2,3}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2	172	300	338	195	300	297	124	176	216
1/2	2	202	409	482	278	409	351	160	226	277
5/8	2	211	445	532	307	445	365	170	241	295
3/4	2	211	445	532	307	445	365	170	241	295

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood Knocker™ is a registered trademark used by Power® Fasteners, Inc.

ASCE 7-10 Wood-Knocker™ In 6000 psi Normal Weight Cracked Concrete

Wood-Knocker™ in 6000 psi Normal Weight Cracked Concrete (lbs.)^{1,2,3}

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.469	<i>Pr</i> 2.008
3/8	2	182	311	348	201	311	315	130	184	226
1/2	2	217	430	503	290	430	376	169	240	293
5/8	2	231	488	583	337	488	400	187	264	323
3/4	2	231	488	583	337	488	400	187	264	323

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 6000 psi Normal Weight Cracked Concrete (lbs.)^{1,2,3}

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 2.626	<i>Pr</i> 1.002	<i>Pr</i> 0.873	<i>Pr</i> 1.513	<i>Pr</i> 1.002	<i>Pr</i> 1.516	<i>Pr</i> 2.460	<i>Pr</i> 1.740	<i>Pr</i> 1.420
3/8	2	209	328	344	199	328	361	152	215	263
1/2	2	256	463	495	286	463	443	208	294	360
5/8	2	275	531	573	331	531	477	235	332	407
3/4	2	275	531	573	331	531	477	235	332	407

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood-Knocker™ in 6000 psi Normal Weight Cracked Concrete (lbs.)^{1,2,3}

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A	B	C	D	E	F	G	H	I
		<i>Pr</i> 3.275	<i>Pr</i> 1.156	<i>Pr</i> 0.844	<i>Pr</i> 1.461	<i>Pr</i> 1.156	<i>Pr</i> 1.891	<i>Pr</i> 3.478	<i>Pr</i> 2.459	<i>Pr</i> 2.008
3/8	2	182	311	348	201	311	315	130	184	226
1/2	2	217	430	503	290	430	376	169	240	293
5/8	2	231	488	583	337	488	400	187	264	323
3/4	2	231	488	583	337	488	400	187	264	323

¹ Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information

² Assumptions for table: seismic anchoring conditions, edge distance $\geq 8"$, slab thickness $\geq h_{min}$, spacing $\geq 3h_{ef}$

³ Anchor capacities increased by a factor of 1.2 per ASCE 7-10 Section 12.4.3.3

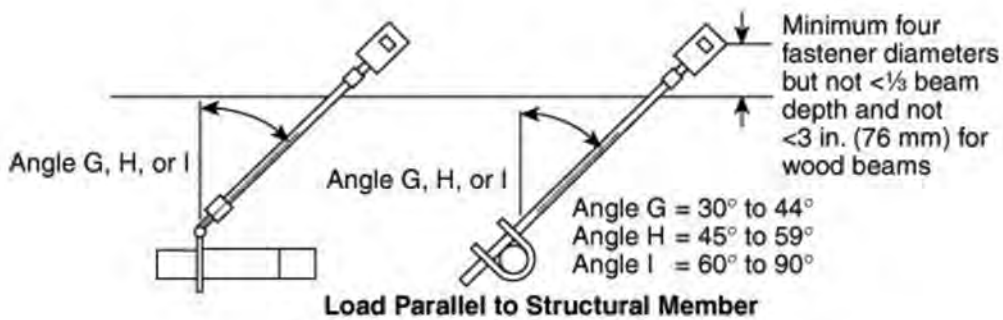
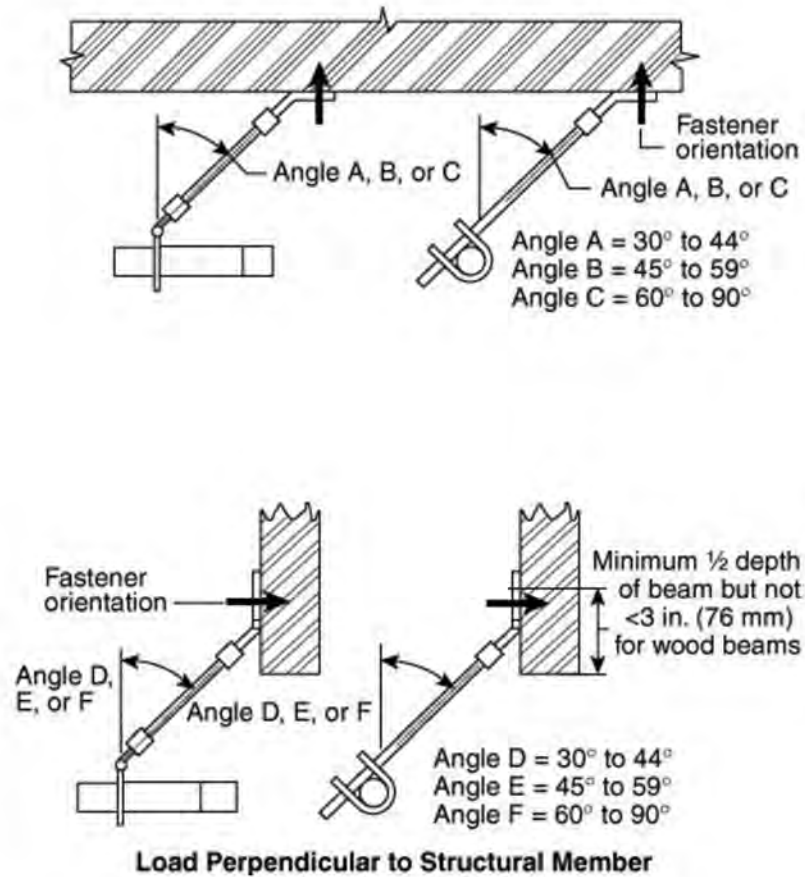
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

Wood Knocker™ is a registered trademark used by Power® Fasteners, Inc.

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

Anchor Load Charts

Table Figure 9.3.5.9.1
NFPA 13 2016



Reference Data - Metric Conversion Chart

To Convert From	To	Multiply By	To Convert From	To	Multiply By
Angle			Length		
degree	radian (rad)	1.745329 x 10 ⁻²	foot (ft)	meter (m)	3.048000 x 10 ⁻¹
radian (rad)	degree	5.729578 x 10 ⁺¹	inch (in)	meter (m)	2.540000 x 10 ⁻²
Area foot ² square meter (m ²) 9.290304 x 10 ⁻² inch ² square meter (m ²) 6.451600 x 10 ⁻⁴ circular mil square meter (m ²) 5.067075 x 10 ⁻¹⁰ sq. centimeter (cm ²) square inch (in ²) 1.550003 x 10 ⁻¹ square meter (m ²) foot ² 1.076391 x 10 ⁺¹ square meter (m ²) inch ² 1.550003 x 10 ⁺³ square meter (m ²) circular mil 1.973525 x 10 ⁺⁹			mil	meter (m)	2.540000 x 10 ⁻⁵
			inch (in)	micrometer (µm)	2.540000 x 10 ⁺⁴
			meter (m)	foot (ft)	3.280840
			meter (m)	inch (in)	3.937008 x 10 ⁺¹
			meter (m)	mil	3.937008 x 10 ⁺⁴
			micrometer (µm)	inch (in)	3.937008 x 10 ⁻⁵
			Volume		
			foot ³	cubic meter (m ³)	2.831685 x 10 ⁻²
inch ³	cubic meter (m ³)	1.638706 x 10 ⁻⁵			
cubic centimeter (cm ³)	cubic inch (in ³)	6.102374 x 10 ⁻²			
cubic meter (m ³)	foot ³	3.531466 x 10 ⁺¹			
cubic meter (m ³)	inch ³	6.102376 x 10 ⁺⁴			
gallon (U.S. liquid)	cubic meter (m ³)	3.785412 x 10 ⁻³			
Temperature degree Fahrenheit degree Celsius $t^{\circ}\text{C} = (t^{\circ}\text{F} - 32) / 1.8$ degree Celsius degree Fahrenheit $t^{\circ}\text{F} = 1.8 t^{\circ}\text{C} + 32$			Section Properties		
Force pounds-force (lbf) newtons (N) 4.448222			section modulus S (m ³)	S (in ³)	6.102374 x 10 ⁺⁴
Section Properties section modulus S (in ³) S (m ³) 1.638706 x 10 ⁻⁵ moment of inertia I (in ⁴) I (m ⁴) 4.162314 x 10 ⁻⁷ modulus of elasticity E (psi) E (Pa) 6.894757 x 10 ⁺³			moment of inertia I (m ⁴)	I (in ⁴)	2.402510 x 10 ⁺⁶
			modulus of elasticity E (Pa)	E (psi)	1.450377 x 10 ⁻⁴
To Convert From	To	Multiply By	Abbreviations		
Bending Moment or Torque			AISC	= American Institute of Steel Construction	
lbf•ft	newton meter (N•m)	1.355818	AISI	= American Iron & Steel Institute	
lbf•in	newton meter (N•m)	1.129848 x 10 ⁻¹	ANSI	= American National Standards Institute	
N•m	lbf•ft	7.375621 x 10 ⁻¹	ASTM	= American Society for Testing & Materials	
N•m	lbf•in	8.850748	AWWA	= American Water Works Association	
Mass ounce (avoirdupois) kilogram (kg) 2.834952 x 10 ⁻² pound (avoirdupois) kilogram (kg) 4.535924 x 10 ⁻¹ ton (short, 2000 lb) kilogram (kg) 9.071847 x 10 ⁺² ton (long, 2240 lb) kilogram (kg) 1.016047 x 10 ⁺³ kilogram (kg) ounce (avoirdupois) 3.527396 x 10 ⁺¹ kilogram (kg) pound (avoirdupois) 2.204622 kilogram (kg) ton (short 2000 lb) 1.102311 x 10 ⁻³ kilogram (kg) ton (long 2240 lb) 9.842064 x 10 ⁻⁴			Dia.	= Diameter	
			Ft.	= Feet	
			Ga.	= Gauge	
			I.D.	= Inside Diameter	
			In.	= Inch	
			Lbs.	= Pounds	
			Max.	= Maximum	
			Min.	= Minimum	
			MSS	= Manufacturers Standardization Society	
			NFPA	= National Fire Protection Association	
			O.D.	= Outside Diameter	
			Oz.	= Ounces	
			Pre-Galv.	= Pre-galvanized	
			psi	= Pounds Per Square Inch	
			PVC	= Polyvinyl Chloride	
			UL	= Underwriters' Laboratories, Inc.	
UNC	= Unified Coarse Threads				
UNCR	= Unified Coarse Threads (Rounded Root)				
Wt./C	= Weight per 100				
			Metric Symbols		
Mass Per Unit Length lb/ft kilogram per meter (kg/m) 1.488164 lb/in kilogram per meter (kg/m) 1.785797 x 10 ⁺¹ kg/m lb/ft 6.719689 x 10 ⁻¹ kg/m lb/in 5.599741 x 10 ⁻²			cm	= centimeter	
			kg	= kilogram	
			kN	= kilonewton	
			m	= meter	
			µm	= micrometer	
			mm	= millimeter	
			MPa	= megapascal	
			N	= newton	
Mass Per Unit Volume lb/ft ³ kilogram per cubic meter (kg/m ³) 1.601846 x 10 ⁺¹ lb/in ³ kilogram per cubic meter (kg/m ³) 2.767990 x 10 ⁺⁴ kg/m ³ lb/ft ³ 6.242797 x 10 ⁻² kg/m ³ lb/in ³ 3.612730 x 10 ⁻⁵ lbs/ft ³ lbs/in ³ 1.728000 x 10 ⁺³			Nm	= newton-meter	
			Pa	= pascal	
Mass Per Area Unit lb/ft ² kilogram per square meter (kg/m ²) 4.882428 kg/m ² pound per square foot (lb/ft ²) 2.048161 x 10 ⁻¹					
Pressure or Stress lbf/in ² (psi) pascal (Pa) 6.894757 x 10 ⁺³ kip/in ² (ksi) pascal (Pa) 6.894757 x 10 ⁺⁶ lbf/in ² (psi) megapascals (MPa) 6.894757 x 10 ⁻³ pascal (Pa) pound force per sq. inch (psi) 1.450377 x 10 ⁻⁴ pascal (Pa) kip per sq. inch (ksi) 1.450377 x 10 ⁻⁷ megapascals (MPa) lbf/in ² (psi) 1.450377 x 10 ⁺²					

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
1/16	.0052	.0085	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219
1/8	.0104	.0938	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271
3/16	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323
1/4	.0208	.1042	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375
5/16	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427
3/8	.0313	.1146	.1979	.2812	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479
7/16	.0365	.1198	.2031	.2891	.3724	.4557	.5391	.6224	.7057	.7891	.8724	.9557
1/2	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583
9/16	.0469	.1302	.2135	.2969	.3802	.4635	.5469	.6302	.7135	.7969	.8802	.9635
5/8	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688
11/16	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740
3/4	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792
13/16	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844
7/8	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896
15/16	.0781	.1615	.2448	.3281	.4118	.4948	.5781	.6615	.7448	.8221	.9115	.9948

Decimals of a Foot

Fraction	Decimal	Fraction	Decimal
1/32	.0312	17/32	.5312
1/16	.0625	9/16	.5625
3/32	.0937	19/32	.5937
1/8	.1250	5/8	.6250
5/32	.1562	21/32	.6562
3/16	.1875	11/16	.6875
7/32	.2187	23/32	.7187
1/4	.2500	3/4	.7500
9/32	.2812	25/32	.7812
5/16	.3125	13/16	.8125
11/32	.3437	27/32	.8437
3/8	.3750	7/8	.8750
13/32	.4062	29/32	.9062
7/16	.4375	15/16	.9375
15/32	.4687	31/32	.9687
1/2	.500		

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 Pipe Size In. mm	Class	O.D. of Ductile Iron Pipe		Wall Thickness		Weight of Pipe		Weight of Pipe Filled With Water	
		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 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 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

Reference Data

Copper Tubing (Type L) Data

Nominal Tubing Size		O.D. Size		Wall Thickness		Weight of Tubing		Weight of Tubing 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 Tubing Size		O.D. Size		Wall Thickness		Weight of Tubing		Weight of Tubing 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 Pipe Size		Pipe O.D.		Wall Thickness		Weight of Pipe		Weight of Pipe 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 Pipe Size		Pipe O.D.		Wall Thickness		Weight of Pipe		Weight of Pipe 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

Rod Size As Determined By Steel Pipe Size For Fire Protection

Steel Pipe Size		Maximum Span		Rod Size
In.	mm	Ft.	m	
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.

Rod Size As Determined By Copper Tubing Size For Fire Protection

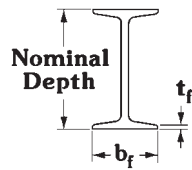
Copper Tubing Size		Maximum Span		Rod Size
In.	mm	Ft.	m	
3/4"-1"	(20-35)	8	(2.44)	3/8"-16
1 1/4"-1 1/2"	(32-40)	15	(3.05)	3/8"-16
2"-3"	(50-80)	15	(3.66)	3/8"-16
3 1/4"-4"	(90-100)	15	(4.57)	3/8"-16
5"-8"	(125-200)	15	(4.57)	1/2"-13

Based on NFPA 13.

Load Chart For Threaded Rod (ATR)

Rod Size	Root Area Thread		Maximum Safe Loads			
			650°F (349°C)		750°F (399°C)	
	In. ²	cm ²	Lbs.	kN	Lbs.	kN
3/8"-16	0.0678	(.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)

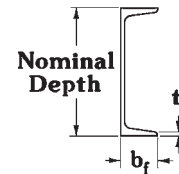
Extracted from MSS SP-58, 2002, with permission of the publisher, the Manufacturers Standardization Society.



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 ³ / ₈ "	(59)	0.260	(6.6)
S3 x 7.5	(S75 x 11.2)	2 ¹ / ₂ "	(63)	0.260	(6.6)
S4 x 7.7	(S100 x 11.5)	2 ⁵ / ₈ "	(68)	0.293	(7.4)
S4 x 9.5	(S100 x 14.1)	2 ³ / ₄ "	(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 ¹ / ₄ "	(83)	0.326	(8.3)
S6 x 12.5	(S150 x 18.6)	3 ³ / ₈ "	(85)	0.359	(9.1)
S6 x 17.25	(S150 x 25.7)	3 ¹¹ / ₁₆ "	(91)	0.359	(9.1)
S7 x 15.3	(S180 x 22.8)	3 ⁵ / ₈ "	(93)	0.392	(10.0)
S7 x 20	(S180 x 29.8)	3 ⁷ / ₈ "	(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 ¹ / ₈ "	(106)	0.425	(10.8)
S10 x 25.4	(S250 x 37.8)	4 ⁵ / ₈ "	(118)	0.491	(12.5)
S10 x 35	(S250 x 52)	4 ¹⁵ / ₁₆ "	(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 ¹ / ₁₆ "	(129)	0.544	(13.8)
S12 x 40.8	(S310 x 60.7)	5 ¹ / ₄ "	(133)	0.659	(16.7)
S12 x 50	(S310 x 74)	5 ¹ / ₂ "	(139)	0.659	(16.7)
S15 x 42.9	(S380 x 64)	5 ¹ / ₂ "	(140)	0.622	(15.8)
S15 x 50	(S380 x 74)	5 ⁵ / ₈ "	(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 ¹ / ₄ "	(159)	0.691	(17.6)
S20 x 66	(S510 x 98.2)	6 ¹ / ₄ "	(159)	0.795	(20.2)
S20 x 75	(S510 x 112)	6 ³ / ₈ "	(162)	0.795	(20.2)
S20 x 86	(S510 x 128)	7 ¹ / ₁₆ "	(179)	0.920	(23.4)
S20 x 96	(S510 x 143)	7 ³ / ₁₆ "	(183)	0.920	(23.4)
S24 x 80	(S610 x 119)	7"	(178)	0.870	(22.1)
S24 x 90	(S610 x 134)	7 ¹ / ₈ "	(181)	0.870	(22.1)
S24 x 100	(S610 x 149)	7 ¹ / ₄ "	(184)	0.870	(22.1)
S24 x 106	(S610 x 158)	7 ⁷ / ₈ "	(200)	1.090	(27.7)
S24 x 121	(S610 x 180)	8 ¹ / ₁₆ "	(204)	1.090	(27.7)

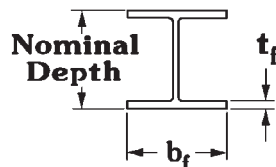
Dimensions taken from ASTM A6-86.



American Standard 'C' 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
C3 x 4.1	(C75 x 6.1)	1 ³ / ₈ "	(35)	0.273	(6.9)
C3 x 5	(C75 x 7.4)	1 ¹ / ₂ "	(37)	0.273	(6.9)
C3 x 6	(C75 x 8.9)	1 ⁵ / ₈ "	(40)	0.273	(6.9)
C4 x 5.4	(C100 x 8)	1 ⁹ / ₁₆ "	(40)	0.296	(7.5)
C4 x 7.25	(C100 x 10.8)	1 ³ / ₄ "	(44)	0.296	(7.5)
C5 x 6.7	(C130 x 10)	1 ³ / ₄ "	(44)	0.320	(8.1)
C5 x 9	(C130 x 13.4)	1 ⁷ / ₈ "	(47)	0.320	(8.1)
C6 x 8.2	(C150 x 12.2)	1 ¹⁵ / ₁₆ "	(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 ¹ / ₈ "	(54)	0.343	(8.7)
C7 x 9.8	(C180 x 14.6)	2 ¹ / ₁₆ "	(53)	0.366	(9.3)
C7 x 12.25	(C180 x 18.2)	2 ³ / ₁₆ "	(55)	0.366	(9.3)
C7 x 14.75	(C180 x 22)	2 ¹ / ₄ "	(57)	0.366	(9.3)
C8 x 11.5	(C200 x 17.1)	2 ¹ / ₄ "	(57)	0.390	(9.9)
C8 x 13.75	(C200 x 20.5)	2 ³ / ₈ "	(59)	0.390	(9.9)
C8 x 18.75	(C200 x 27.9)	2 ¹ / ₂ "	(63)	0.390	(9.9)
C9 x 13.4	(C230 x 19.9)	2 ⁷ / ₁₆ "	(61)	0.413	(10.5)
C9 x 15	(C230 x 22)	2 ¹ / ₂ "	(63)	0.413	(10.5)
C9 x 20	(C230 x 30)	2 ⁵ / ₈ "	(67)	0.413	(10.5)
C10 x 15.3	(C250 x 22.8)	2 ⁵ / ₈ "	(67)	0.436	(11.1)
C10 x 20	(C250 x 30)	2 ³ / ₄ "	(69)	0.436	(11.1)
C10 x 25	(C250 x 37)	2 ⁷ / ₈ "	(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 ¹⁵ / ₁₆ "	(74)	0.501	(12.7)
C12 x 25	(C310 x 37)	3"	(76)	0.501	(12.7)
C12 x 30	(C310 x 45)	3 ¹ / ₈ "	(80)	0.501	(12.7)
C15 x 33.9	(C380 x 50.4)	3 ³ / ₈ "	(86)	0.650	(16.5)
C15 x 40	(C380 x 60)	3 ¹ / ₂ "	(89)	0.650	(16.5)
C15 x 50	(C380 x 74)	3 ³ / ₄ "	(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 ¹ / ₈ "	(106)	0.625	(15.8)
C18 x 58	(C460 x 86.3)	4 ¹ / ₄ "	(112)	0.625	(15.8)

Reference Data



Wide Flange I-Beams

Designation Nominal Depth & Weight		Flange Width b_f		Flange thickness t_f	
In. x Lbs./Ft.	(mm x kg/m)	in.	mm	in.	mm
W4 x 13	(W100 x 19.3)	4 ¹ / ₁₆ "	(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 ¹⁵ / ₁₆ "	(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 ¹ / ₁₆ "	(154)	0.455	(11.6)
W8 x 10	(W200 x 15.0)	3 ¹⁵ / ₁₆ "	(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 ¹ / ₄ "	(133)	0.330	(8.4)
W8 x 21	(W200 x 31.3)	5 ¹ / ₄ "	(133)	0.400	(10.2)
W8 x 24	(W200 x 35.9)	6 ¹ / ₂ "	(165)	0.400	(10.2)
W8 x 28	(W200 x 41.7)	6 ¹ / ₂ "	(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 ¹ / ₁₆ "	(205)	0.560	(14.2)
W8 x 48	(W200 x 71)	8 ¹ / ₈ "	(206)	0.685	(17.4)
W8 x 58	(W200 x 86)	8 ¹ / ₄ "	(209)	0.810	(20.6)
W8 x 67	(W200 x 100)	8 ¹ / ₄ "	(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 ³ / ₄ "	(146)	0.360	(9.1)
W10 x 26	(W250 x 38.5)	5 ³ / ₄ "	(147)	0.440	(11.2)
W10 x 30	(W250 x 44.8)	5 ¹³ / ₁₆ "	(148)	0.510	(13.0)
W10 x 33	(W250 x 49.1)	7 ¹⁵ / ₁₆ "	(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 ¹ / ₁₆ "	(255)	0.615	(15.6)
W10 x 60	(W250 x 89)	10 ¹ / ₁₆ "	(256)	0.680	(17.3)
W10 x 68	(W250 x 101)	10 ¹ / ₈ "	(257)	0.770	(19.6)
W10 x 77	(W250 x 115)	10 ³ / ₁₆ "	(259)	0.870	(22.1)
W10 x 88	(W250 x 131)	10 ¹ / ₄ "	(261)	0.990	(25.1)
W10 x 100	(W250 x 149)	10 ³ / ₈ "	(263)	1.120	(28.4)
W10 x 112	(W250 x 167)	10 ⁷ / ₁₆ "	(265)	1.250	(31.8)

Designation Nominal Depth & Weight		Flange Width b_f		Flange thickness t_f	
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 ¹ / ₂ "	(165)	0.380	(9.7)
W12 x 30	(W310 x 44.5)	6 ¹ / ₂ "	(165)	0.440	(11.2)
W12 x 35	(W310 x 52)	6 ⁹ / ₁₆ "	(167)	0.520	(13.2)
W12 x 40	(W310 x 60)	8"	(203)	0.515	(13.1)
W12 x 45	(W310 x 67)	8 ¹ / ₁₆ "	(205)	0.575	(14.6)
W12 x 50	(W310 x 74)	8 ¹ / ₁₆ "	(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 ¹ / ₁₆ "	(307)	0.735	(18.7)
W12 x 87	(W310 x 129)	12 ¹ / ₈ "	(308)	0.810	(20.6)
W12 x 96	(W310 x 143)	12 ¹ / ₈ "	(308)	0.900	(22.9)
W12 x 106	(W310 x 158)	12 ¹ / ₄ "	(310)	0.990	(25.1)
W12 x 120	(W310 x 179)	12 ⁵ / ₁₆ "	(313)	1.105	(28.1)
W12 x 136	(W310 x 202)	12 ³ / ₈ "	(315)	1.250	(31.8)
W12 x 152	(W310 x 226)	12 ¹ / ₂ "	(317)	1.400	(35.6)
W12 x 170	(W310 x 253)	12 ⁹ / ₁₆ "	(319)	1.560	(39.6)
W12 x 190	(W310 x 283)	12 ¹¹ / ₁₆ "	(322)	1.735	(44.1)
W12 x 210	(W310 x 313)	12 ³ / ₄ "	(325)	1.900	(48.3)
W12 x 230	(W310 x 342)	12 ⁷ / ₈ "	(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 ³ / ₄ "	(172)	0.385	(9.8)
W14 x 34	(W360 x 51)	6 ³ / ₄ "	(172)	0.455	(11.6)
W14 x 38	(W360 x 57)	6 ³ / ₄ "	(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 ¹ / ₁₆ "	(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 ¹ / ₁₆ "	(256)	0.785	(19.9)
W14 x 82	(W360 x 122)	10 ¹ / ₈ "	(257)	0.855	(21.7)
W14 x 90	(W360 x 134)	14 ¹ / ₂ "	(369)	0.710	(18.0)

Dimensions taken from ASTM A6-86.

(Continued on next page)

Wide Flange I-Beams (Continued)

Designation Nominal Depth & Weight		Flange Width b _f		Flange thickness t _f	
In. x Lbs./Ft.	(mm x kg/m)	In.	mm	In.	mm
W14 x 99	(W360 x 147)	14 ⁹ / ₁₆ "	(370)	0.780	(19.8)
W14 x 109	(W360 x 162)	14 ⁵ / ₈ "	(371)	0.860	(21.8)
W14 x 120	(W360 x 179)	14 ¹¹ / ₁₆ "	(373)	0.940	(23.9)
W14 x 132	(W360 x 196)	14 ³ / ₄ "	(374)	1.030	(26.2)
W14 x 145	(W360 x 216)	15 ¹ / ₂ "	(394)	1.090	(27.7)
W14 x 159	(W360 x 237)	15 ⁹ / ₁₆ "	(395)	1.190	(30.2)
W14 x 176	(W360 x 262)	15 ⁵ / ₈ "	(397)	1.310	(33.3)
W14 x 193	(W360 x 287)	15 ³ / ₄ "	(400)	1.440	(36.6)
W14 x 211	(W360 x 314)	15 ³ / ₄ "	(400)	1.560	(39.6)
W14 x 233	(W360 x 347)	15 ⁷ / ₈ "	(403)	1.720	(43.7)
W14 x 257	(W360 x 382)	16"	(406)	1.890	(48.0)
W14 x 283	(W360 x 421)	16 ¹ / ₈ "	(409)	2.070	(52.6)
W14 x 311	(W360 x 463)	16 ¹ / ₄ "	(413)	2.260	(57.4)
W14 x 342	(W360 x 509)	16 ³ / ₈ "	(416)	2.470	(62.7)
W14 x 370	(W360 x 551)	16 ¹ / ₂ "	(419)	2.660	(67.6)
W14 x 398	(W360 x 592)	16 ⁹ / ₁₆ "	(421)	2.845	(72.3)
W14 x 426	(W360 x 634)	16 ¹¹ / ₁₆ "	(424)	3.035	(77.1)
W16 x 26	(W410 x 38.8)	5 ¹ / ₂ "	(140)	0.345	(8.8)
W16 x 31	(W410 x 46.1)	5 ¹ / ₂ "	(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 ¹ / ₁₆ "	(179)	0.630	(16.0)
W16 x 57	(W410 x 85)	7 ¹ / ₈ "	(181)	0.715	(18.2)
W16 x 67	(W410 x 100)	10 ¹ / ₄ "	(260)	0.665	(16.9)
W16 x 77	(W410 x 114)	10 ⁵ / ₁₆ "	(262)	0.760	(19.3)
W16 x 89	(W410 x 132)	10 ³ / ₈ "	(263)	0.875	(22.2)
W16 x 100	(W410 x 149)	10 ⁷ / ₁₆ "	(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 ¹ / ₁₆ "	(154)	0.605	(15.4)
W18 x 50	(W460 x 74)	7 ¹ / ₂ "	(190)	0.570	(14.5)
W18 x 55	(W460 x 82)	7 ¹ / ₂ "	(190)	0.630	(16.0)
W18 x 60	(W460 x 89)	7 ⁹ / ₁₆ "	(192)	0.695	(17.7)
W18 x 65	(W460 x 97)	7 ⁹ / ₁₆ "	(192)	0.750	(19.0)
W18 x 71	(W460 x 106)	7 ⁵ / ₈ "	(193)	0.810	(20.6)
W18 x 76	(W460 x 113)	11"	(279)	0.680	(17.3)
W18 x 86	(W460 x 128)	11 ¹ / ₁₆ "	(281)	0.770	(19.6)
W18 x 97	(W460 x 144)	11 ¹ / ₈ "	(282)	0.870	(22.1)
W18 x 106	(W460 x 158)	11 ³ / ₁₆ "	(284)	0.940	(23.9)
W18 x 119	(W460 x 177)	11 ¹ / ₄ "	(286)	1.060	(26.9)
W21 x 44	(W530 x 66)	6 ¹ / ₂ "	(165)	0.450	(11.4)
W21 x 50	(W530 x 74)	6 ¹ / ₂ "	(165)	0.535	(13.6)
W21 x 57	(W530 x 85)	6 ⁹ / ₁₆ "	(167)	0.650	(16.5)
W21 x 62	(W530 x 92)	8 ¹ / ₄ "	(209)	0.615	(15.6)
W21 x 68	(W530 x 101)	8 ¹ / ₄ "	(209)	0.685	(17.4)

Dimensions taken from ASTM A6-86.

Designation Nominal Depth & Weight		Flange Width b _f		Flange thickness t _f	
In. x Lbs./Ft.	(mm x kg/m)	In.	mm	In.	mm
W21 x 73	(W530 x 109)	8 ¹ / ₄ "	(209)	0.740	(18.8)
W21 x 83	(W530 x 123)	8 ⁷ / ₈ "	(213)	0.835	(21.2)
W21 x 93	(W530 x 138)	8 ⁷ / ₁₆ "	(214)	0.930	(23.6)
W21 x 101	(W530 x 150)	12 ¹ / ₄ "	(311)	0.800	(20.3)
W21 x 111	(W530 x 165)	12 ³ / ₈ "	(314)	0.875	(22.2)
W21 x 122	(W530 x 182)	12 ³ / ₈ "	(314)	0.960	(24.4)
W21 x 132	(W530 x 196)	12 ⁷ / ₁₆ "	(316)	0.035	(26.3)
W21 x 147	(W530 x 219)	12 ¹ / ₂ "	(317)	0.150	(29.2)
W24 x 55	(W610 x 82)	7"	(178)	0.505	(12.8)
W24 x 62	(W610 x 92)	7 ¹ / ₁₆ "	(179)	0.590	(15.0)
W24 x 68	(W610 x 101)	8 ¹⁵ / ₁₆ "	(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 ¹ / ₁₆ "	(230)	1.875	(22.2)
W24 x 104	(W610 x 155)	12 ³ / ₄ "	(324)	1.750	(19.0)
W24 x 117	(W610 x 174)	12 ³ / ₄ "	(324)	0.850	(21.6)
W24 x 131	(W610 x 195)	12 ⁷ / ₈ "	(327)	0.960	(24.4)
W24 x 146	(W610 x 217)	12 ⁷ / ₈ "	(327)	1.090	(27.7)
W24 x 162	(W610 x 241)	12 ¹⁵ / ₁₆ "	(328)	1.220	(31.0)
W27 x 84	(W690 x 125)	9 ¹⁵ / ₁₆ "	(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 ¹ / ₁₆ "	(255)	0.930	(23.6)
W27 x 146	(W690 x 217)	13 ¹⁵ / ₁₆ "	(354)	0.975	(24.8)
W27 x 161	(W690 x 240)	14"	(355)	1.080	(27.4)
W27 x 178	(W690 x 265)	14 ¹ / ₁₆ "	(357)	1.190	(30.2)
W30 x 99	(W760 x 147)	10 ⁷ / ₁₆ "	(265)	0.670	(17.0)
W30 x 108	(W760 x 161)	10 ¹ / ₂ "	(267)	0.760	(19.3)
W30 x 116	(W760 x 173)	10 ¹ / ₂ "	(267)	0.850	(21.6)
W30 x 124	(W760 x 185)	10 ¹ / ₂ "	(267)	0.930	(23.6)
W30 x 132	(W760 x 196)	10 ⁹ / ₁₆ "	(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 ¹ / ₈ "	(384)	1.315	(33.4)
W33 x 118	(W840 x 176)	11 ¹ / ₂ "	(292)	0.740	(18.8)
W33 x 130	(W840 x 193)	11 ¹ / ₂ "	(292)	0.855	(21.7)
W33 x 141	(W840 x 210)	11 ¹ / ₂ "	(292)	0.960	(24.4)
W33 x 152	(W840 x 226)	11 ⁹ / ₁₆ "	(294)	1.055	(26.8)
W33 x 201	(W840 x 299)	15 ³ / ₄ "	(400)	1.150	(29.2)
W36 x 135	(W920 x 201)	11 ¹⁵ / ₁₆ "	(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 ¹ / ₁₆ "	(306)	1.180	(30.0)
W36 x 194	(W920 x 289)	12 ¹ / ₈ "	(308)	1.260	(32.0)
W36 x 210	(W920 x 313)	12 ³ / ₁₆ "	(309)	1.360	(34.5)

Reference Data

Trapeze Hangers Using B-Line 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" B26SH	1 1/2" x 1 1/2" x 3/16" B26SH	1 1/2" x 1 1/2" x 3/16" B26SH	2" x 1 1/2" x 3/16" B22SH
24"	(609.6)	1 1/2" x 1 1/2" x 3/16" B26SH	2" x 1 1/2" x 3/16" B22SH	2" x 1 1/2" x 3/16" B22SH	2" x 1 1/2" x 3/16" B22SH
30"	(762.0)	2" x 1 1/2" x 3/16" B22SH	2" x 1 1/2" x 3/16" B22SH	2" x 1 1/2" x 3/16" B22SH	2" x 1 1/2" x 3/16" B22SH
36"	(914.4)	2" x 1 1/2" x 3/16" B22SH	2" x 1 1/2" x 3/16" B22SH	2 1/2" x 1 1/2" x 3/16" B12SH	2 1/2" x 1 1/2" x 3/16" B12SH
48"	(1219.2)	2 1/2" x 1 1/2" x 3/16" B12SH	2 1/2" x 1 1/2" x 3/16" B12SH	2 1/2" x 1 1/2" x 3/16" B12SH	3" x 2" x 3/16" B11SH
60"	(1524.0)	2 1/2" x 1 1/2" x 3/16" B12SH	2 1/2" x 1 1/2" x 3/16" B12SH	3" x 2" x 3/16" B11SH	3" x 2" x 3/16" B11SH
72"	(1828.8)	2 1/2" x 1 1/2" x 3/16" B12SH	3" x 2" x 3/16" B11SH	3" x 2" x 3/16" B11SH	3" x 2" x 1/4" B11SH
84"	(2133.6)	3" x 2" x 3/16" B11SH	3" x 2" x 3/16" B11SH	3" x 2" x 1/4" B11SH	3" x 2" x 1/4" B11SH
96"	(2438.4)	3" x 2" x 3/16" B11SH	3" x 2" x 1/4" B11SH	3" x 2" x 1/4" B11SH	3 1/2" x 2 1/2" x 5/16" B12SHA
108"	(2743.2)	3" x 2" x 3/16" B11SH	3" x 2" x 1/4" B11SH	3 1/2" x 2 1/2" x 5/16" B12SHA	3 1/2" x 2 1/2" x 5/16" B12SHA
120"	(3048.0)	3" x 2" x 1/4" B11SH	3" x 2" x 1/4" B11SH	3 1/2" x 2 1/2" x 5/16" B12SHA	3 1/2" x 2 1/2" x 5/16" B12SHA

Based on NFPA 13.

Trapeze Hangers Using B-Line Strut Or Angle Iron

Trapeze Length		Nominal Pipe Size			
in.	mm	5" (125)	6" (150)	8" (200)	10" (250)
18"	(457.2)	2" x 1 1/2" x 3/16" B22SH	2 1/2" x 1 1/2" x 3/16" B12SH	3" x 2" x 3/16" B11SH	3" x 2" x 1/4" B11SH
24"	(609.6)	2 1/2" x 1 1/2" x 3/16" B12SH	2 1/2" x 1 1/2" x 3/16" B12SH	3" x 2" x 3/16" B11SH	3" x 2" x 1/4" B11SH
30"	(762.0)	2 1/2" x 1 1/2" x 3/16" B12SH	3" x 2" x 3/16" B11SH	3" x 2" x 1/4" B11SH	3" x 2" x 1/4" B11SH
36"	(914.4)	3" x 2" x 3/16" B11SH	3" x 2" x 3/16" B11SH	3 1/2" x 2 1/2" x 1/4" B12SHA	3 1/2" x 2 1/2" x 5/16" B12SHA
48"	(1219.2)	3" x 2" x 3/16" B11SH	3" x 2" x 1/4" B11SH	3 1/2" x 2 1/2" x 5/16" B12SHA	4" x 3" x 5/16" B12SHA
60"	(1524.0)	3" x 2" x 1/4" B11SH	3 1/2" x 2 1/2" x 5/16" B12SHA	4" x 3" x 5/16" B12SHA	5" x 3 1/2" x 5/16" B11SHA
72"	(1828.8)	3 1/2" x 2 1/2" x 5/16" B12SHA	4" x 3" x 5/16" B12SHA	4" x 3" x 5/16" B12SHA	5" x 3 1/2" x 5/16" B11SHA
84"	(2133.6)	3 1/2" x 2 1/2" x 5/16" B12SHA	4" x 3" x 5/16" B12SHA	5" x 3 1/2" x 5/16" B11SHA	6" x 4" x 1/4" B12SHA4
96"	(2438.4)	3 1/2" x 2 1/2" x 5/16" B12SHA	4" x 3" x 5/16" B12SHA	5" x 3 1/2" x 5/16" B11SHA	6" x 4" x 1/4" B12SHA4
108"	(2743.2)	3 1/2" x 2 1/2" x 5/16" B12SHA	4" x 3" x 5/16" B12SHA	5" x 3 1/2" x 5/16" B11SHA	6" x 4" x 3/8" B11SHA4
120"	(3048.0)	4" x 3" x 5/16" B12SHA	5" x 3 1/2" x 5/16" B11SHA	6" x 4" x 1/4" B12SHA4	6" x 4" x 3/8" B11SHA4

Based on NFPA 13.

Reference Data

MSS To B-Line & Federal Specification Cross Reference

MSS SP-69 MSS SP-58	B-Line Part No.	A-A-1192A WW-H-171E
Type 1	B3100	Type 1
Type 1	B3100C	Type 1
Type 1	B3100F	Type 1
Type 1	B3102	Type 1
Type 1*	B3104	Type 12
Type 1	B3104CT	Type 12
Type 1	B3106	–
Type 1	B3108	Type 1
Type 1	B3109	–
Type 3	B3144	Type 3
Type 3	B3146	Type 3
Type 4	B3140	Type 4
Type 4	B3141	Type 4
Type 4	B3142	Type 4
Type 5	B3690	–
Type 5	B3690C	–
Type 5	B3690F	–
Type 6	B3171	Type 6
Type 8	B3373	Type 8
Type 8	B3373C	Type 8
Type 8	B3373CT	Type 8
Type 8	B3373CTC	Type 8
Type 10	200	Type 10
Type 10	200C	Type 10
Type 10	200F	Type 10
Type 10	200H	Type 10
Type 10	2	Type 10
Type 10	B3170CT	Type 10
Type 10	B3170CTC	Type 10
Type 10	2F	Type 10
Type 12	B3198H	Type 25
Type 12	B3198HCT	Type 25
Type 12	B3198R	Type 25
Type 12	B3198RCT	Type 25
Type 13	B3202	Type 13
Type 14	B3201	Type 14
Type 15	B3224	Type 15
Type 15	B3224CT	Type 15
Type 16	B3222	Type 16
Type 17	B3200	Type 17
Type 18	B22I, B32I, B52I	–
Type 18	B2500	Type 19
Type 18	B2503	–
Type 18	B2505-B2508	–
Type 18	B3014	Type 18
Type 19	65	Type 23
Type 19	65XT	Type 23
Type 19	66	Type 23
Type 19	67SS	–
Type 19	68S	Type 23
Type 19	68SS	–
Type 19	68W	Type 23
Type 19	B303-B309	Type 19

MSS SP-69 MSS SP-58	B-Line Part No.	A-A-1192A WW-H-171E
Type 19	B321	Type 19
Type 19	B3031	Type 19
Type 19 & 23	B3033	Type 19 & 23
Type 19 & 23	B3034	Type 19 & 23
Type 21	B3050	Type 21
Type 21	B3055	Type 21
Type 22	B3083	Type 22
Type 23	B351L	Type 23
Type 23	B3036L	Type 23
Type 23	B3037	Type 23
Type 24	B3188	Type 24
Type 24	B3188C	Type 24
Type 25	B3045	Type 53
Type 26	B2400	Type 26
Type 26	B3180	Type 26
Type 26	B3180FL	Type 26
Type 27	B3040	Type 54
Type 28	B3291, B3292 B3294, B3296 B3298	Type 28
Type 29	B3293, B3295 B3297	Type 29
Type 30	B3054	Type 30
Type 31	B3065	Type 32
Type 31	B3068	Type 32
Type 32	B3066	Type 33
Type 33	B3067	Type 34
Type 34	B3058	Type 35
Type 34	B3060	Type 35
Type 34	B3060L	Type 35
Type 34	B3062	Type 35
Type 34	B3070	Type 35
Type 35	B3891-B3897	Type 35
Type 35	B3991 & B3993	Type 35
Type 36	B3095	Type 37
Type 37	B3090	Type 38
Type 37	B3092	Type 38
Type 37	B3094	Type 38
Type 37	B3097	Type 38
Type 38	B3093	Type 39
Type 38	B3096	Type 39
Type 39A & 39B	B3160-B3165	Type 40A & 40B
Type 40	B3151	Type 41
Type 41	B3114	Type 42
Type 41	B3122	Type 42
Type 41	B3122A	Type 42
Type 43	B3110	Type 44
Type 44	B3117SL	Type 45
Type 44	B3120	Type 45
Type 45	B3119SL	Type 46
Type 46	B3118SL	Type 47
Type 48	B3262	Type 49
Type 49	B3264	Type 50
Type 57	B3080S & L	–

* For all finishes excluding plain.

Federal Specification To B-Line & MSS Cross Reference

A-A-1192A WW-H-171E	B-Line Part No.	MSS SP-69 MSS SP-58	A-A-1192A WW-H-171E	B-Line Part No.	MSS SP-69 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 B3294, B3296 B3298	Type 28
Type 1	B3104	Type 1	Type 28		
Type 1	B3108	Type 1		B3293, B3295 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 38	B3093	Type 38
Type 12	B3104CT	Type 1	Type 39	B3096	Type 38
Type 13	B3202	Type 13	Type 39		
Type 14	B3201	Type 14	Type 40A & 40B	B3160-3165	Type 39A & 39B
Type 15	B3224	Type 15	Type 41	B3151	Type 40
Type 15	B3224CT	Type 15	Type 42	B3114	Type 41
Type 16	B3222	Type 16	Type 42	B3122	Type 41
Type 17	B3200	Type 17	Type 42	B3122A	Type 41
Type 18	B3014	Type 18	Type 44	B3110	Type 43
Type 19	B303-B309	Type 19	Type 45	B3117SL	Type 44
Type 19	B321	Type 19	Type 45	B3120	Type 44
Type 19	B2500	Type 18	Type 46	B3119SL	Type 45
Type 19	B3031	Type 19	Type 47	B3118SL	Type 46
Type 19 & 23	B3033	Type 19 & 23	Type 49	B3262	Type 48
Type 19 & 23	B3034	Type 19 & 23	Type 50	B3264	Type 49
Type 21	B3050	Type 21	Type 53	B3045	Type 25
Type 21	B3055	Type 21	Type 54	B3040	Type 27
Type 22	B3083	Type 22			

* For all finishes excluding plain.

Reference Data

B-Line Compliances & Approvals

Part No.	ANSI/MSS SP-69 ANSI/MSS SP-58	A-A-1192A WW-H-171E	UL Listed	FM Approved
1NFPA	Type 1	Type 1	Yes	Yes
2	Type 10	Type 10	Yes	Yes
2F	Type 10	Type 10	Yes	Yes
4A	--	--	Yes	--
4B	--	--	Yes	--
4L	--	--	Yes	Yes
4LA	--	--	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	--
68W	Type 19 & 23	Type 19 & 23	Yes	Yes
69	--	--	Yes	--
69R	--	--	Yes	--
75	--	--	Yes	--
78	--	--	Yes	--
109A	--	--	Yes	--
109AF	--	--	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	--

Part No.	ANSI/MSS SP-69 ANSI/MSS SP-58	A-A-1192A WW-H-171E	UL Listed	FM Approved
909	--	--	Yes	--
910	--	--	Yes	--
975	--	--	Yes	--
980	--	--	Yes	Yes
980H	--	--	Yes	Yes
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	--
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	--	--

Note: Refer to the catalog page for specific sizes that are UL Listed and/or FM Approved.

Part No.	ANSI/MSS SP-69 ANSI/MSS SP-58	A-A-1192A WW-H-171E	UL Listed	FM Approved
B3096	Type 38	Type 39	--	--
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	--	--

[illegible]

Fire Protection Solutions

Reference Data - Crosses

TOLCO	B-Line	TOLCO	B-Line	TOLCO	B-Line
1 (Disc.)	B3100	31-0 (Disc.)	B3069E	109A	B3019
1A (Disc.)	B3108	32-1/2 thru 4 (Disc.)	B3147A-1/2 thru 4	109AF	B2501
1CBS	B3100PS (Disc.)	32-5 thru 34 (Disc.)	B3147B 5 thru 24	110 (Disc.)	B3188
1CI (Disc.)	B3102	33 (Disc.)	B3084	111 (Disc.)	B501
1F (Disc.)	B3100F	34 (Disc.)	B3086	113 (Disc.)	HN
1LD (Disc.)	B3104	35 (Disc.)	B3085	114 (Disc.)	HHN
1NFPA	1NFPA	40 (Disc.)	B3190	115 (Disc.)	FW
1PVC (Disc.)	B3100C	41 (Disc.)	B3191	116 (Disc.)	B3234
1U (Disc.)	1U (Disc.)	42 (Disc.)	B3061	117 (Disc.)	LW
1V (Disc.)	B3106	50	50	118 (Disc.)	B3248
1VT (Disc.)	B3106V	51	51	119 (Disc.)	FFW
2	B3170 (Disc.)	52 (Disc.)	B3070	120	120
2F	B3170F (Disc.)	56	56	120MJ	120MJ
2FWON (Disc.)	N/A	58	58	120RWA	120RWA
2WON	N/A	60 (Disc.)	N/A	120W	120W
3 (Disc.)	B3690	61 (Disc.)	B3042	122 (Disc.)	N/A
3F (Disc.)	B3690F	61T (Disc.)	B3042T	123 (Disc.)	Toggle Bolts
3PVC (Disc.)	B3690C	62 (Disc.)	B3050	124 (Disc.)	Toggle Bolt Head
4 (Disc.)	B3140	64 (Disc.)	B351L	125 (Disc.)	DS15x2
4A	4A	65	65	126 (Disc.)	N/A
4B	B386 (Disc.)	65XT	65XT	130	B3052 (Disc.)
4CI (Disc.)	B3141	66	66	150 (Disc.)	N/A
4F (Disc.)	B3140F	67SS	67SS	200	B3170NF (Disc.)
4H (Disc.)	B3142	68S	B3034	200C	B3170NFC (Disc.)
4L	4L	68SS	68SS	200F	B3170NFF (Disc.)
4LA	4LA	68W	B3033	200H	200H
4PVC (Disc.)	B3140C	69	B3367 (Disc.)	200R (Disc.)	B3170NF (Disc.)
5 (Disc.)	B3144	69R	69R	200WON (Disc.)	N/A
5H (Disc.)	B3146	70 (Disc.)	B655	202 (Disc.)	B3170CT
6 (Disc.)	B3373	70R (Disc.)	B656	203 (Disc.)	B3170NFC (Disc.)
6F (Disc.)	B3373F	70S (Disc.)	B655	207 (Disc.)	N/A
6PVC (Disc.)	B3373C	71 (Disc.)	B3220	209 (Disc.)	AWA
7 (Disc.)	B3148	75	75	219 (Disc.)	B3153
8 (Disc.)	B3149	78	78 & B3199	219 (Disc.)	B3155
9 (Disc.)	B3132	81 (Disc.)	B3104CT	220 (Disc.)	B3151
9X (Disc.)	B3132W-1 & 1 1/2	81PVC (Disc.)	B3104CTC	220 (Disc.)	B3154
14 (Disc.)	B3134	82 (Disc.)	B3373CT	260 (Disc.)	B3160
14X (Disc.)	B3134W	82PVC (Disc.)	B3373CTC	261 (Disc.)	B3161
20 (Disc.)	B3180	83 (Disc.)	B3195CT	262 (Disc.)	B3162
20S (Disc.)	B3180FL	84 (Disc.)	B3195	263 (Disc.)	B3163
21 (Disc.)	N/A	98	98	264 (Disc.)	B3164
22	B3181 (Disc.)	98B	98B	265 (Disc.)	B3165
22L2	22L2	99	ATR	301CT (Disc.)	B3198HCT
23	B3182 (Disc.)	100 (Disc.)	ATR	302 (Disc.)	B3198H
24	B3183 (Disc.)	101 (Disc.)	B3211	304 (Disc.)	B3083WO
25	25	101L (Disc.)	B3211X	305 (Disc.)	B3083
27B	27B	102 (Disc.)	B3210	306 (Disc.)	B3224
28	28	102L (Disc.)	B3210X	307 (Disc.)	B3222
28M	28M	103 (Disc.)	B3205	309 (Disc.)	B3014
29	29	104 (Disc.)	B3212	309N (Disc.)	B3014N
30 (Disc.)	B3068	105 (Disc.)	B3213	310 (Disc.)	B2500
30H (Disc.)	B3067	106 (Disc.)	B3214	310N (Disc.)	N2500
30L (Disc.)	B3065	107F (Disc.)	B2499	311 (Disc.)	B3097
30M (Disc.)	B3066			312 (Disc.)	B3096
31-M (Disc.)	B3069W			313 (Disc.)	B3098

TOLCO	B-Line	TOLCO	B-Line
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	Pipe Pier (Disc.)	DURA-BLOK
327 (Disc.)	B3117SL		
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 /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		
828	828		
906	906		

(Disc.) = Discontinued Item

Reference Data - Crosses

B-Line	TOLCO	B-Line	TOLCO	B-Line	TOLCO
1CBS	1CBS	907	907	B3014N	309N (Disc.)
1U (Disc.)	1U (Disc.)	909	909	B3019	109A
4A	4A	910	910	B3031	N/A
4B	4B	975	975	B3033	68, 68W
4L	4L	980	980	B3034	68S
4LA	4LA	980H	980H	B3036L	N/A
22	22	981	981	B3037	N/A
22L2	22L2	985	985	B3040	336 (Disc.)
23	23	986	986	B3042	61 (Disc.)
24	24	990	990	B3042T	61T (Disc.)
25	25	990H	990H	B3045	335 (Disc.)
27B	27B	991	991	B3050	62 (Disc.)
28	28	1000	1000	B3052 (Disc.)	130
28M	28M	1001	1001	B3054	329
29	29	2002	2002	B3055	N/A
50	60	ATR	99	B3058	N/A
51	51	ATR	100 (Disc.)	B3060	50
56	56	AWA	209 (Disc.)	B3060L	N/A
58	58	B22I	N/A	B3061	42 (Disc.)
65	65	B32I	N/A	B3062	N/A
65XT	65XT	B52I	N/A	B3064	N/A
66	66	B200	F13	B3065	30L (Disc.)
67S	67S	B201	F14	B3066	30M (Disc.)
67SS	67SS	B202	F15	B3067	30H (Disc.)
68SS	68SS	B202-1	F16	B3068	30 (Disc.)
68W	68W	B202-2	F17	B3069E	31-O (Disc.)
69	69	B218	ROL-12	B3069W	31-M (Disc.)
69R	69R	B219	ROL-13	B3070	52 (Disc.)
75	75	B303 - B309	N/A	B3080 L & S	343 (Disc.)
78	78	B312 Series	N/A	B3082	337 (Disc.)
98	98	B321 Series	N/A	B3083	305 (Disc.)
98B	98B	B351L	64 (Disc.)	B3083WO	304 (Disc.)
109A	109A	B379	ROL-14	B3084	33 (Disc.)
109AF	109AF	B386 (Disc.)	4B	B3085	35 (Disc.)
120	120	B479	ROL-14	B3086	34 (Disc.)
120MJ	120MJ	B501	111 (Disc.)	B3088	316 (Disc.)
120RWA	120RWA	B655	70 (Disc.)	B3088S	N/A
120W	120W	B656	70R (Disc.)	B3088ST	N/A
200	200	B1999	N/A	B3088T	316T
200C	200C	B2400	2STR	B3089	319 (Disc.)
200F	200H	B2417	N/A	B3090	318 (Disc.)
200H	200H	B2499	107F (Disc.)	B3092	318A (Disc.)
800	800	B2500	310 (Disc.)	B3093	317A (Disc.)
825	825	B2501 (Disc.)	109AF	B3094	314 (Disc.)
825A	825A	B2503	N/A	B3095	317 (Disc.)
828	828	B2505 - B2508	N/A	B3096	312 (Disc.)
906	906	B3014	309 (Disc.)	B3097	311 (Disc.)

(Disc.) = Discontinued Item

B-Line	TOLCO	B-Line	TOLCO	B-Line	TOLCO
B3098	313 (Disc.)	B3161	261 (Disc.)	B3224	306 (Disc.)
B3100	1 (Disc.)	B3162	262 (Disc.)	B3227 (Disc.)	N/A
B3100C	1PVC (Disc.)	B3163	263 (Disc.)	B3234	116 (Disc.)
B3100F	1F (Disc.)	B3164	264 (Disc.)	B3248	118 (Disc.)
B3100PS (Disc.)	1CBS	B3165	265 (Disc.)	B3256	405 (Disc.)
B3102	1CI	B3170 (Disc.)	2	B3257	406 (Disc.)
B3104	1LD (Disc.)	B3170CT	202 (Disc.)	B3262	506 (Disc.)
B3104C	N/A	B3170CTC	N/A	B3264	500 (Disc.)
B3104CT	81 (Disc.)	B3170F (Disc.)	2F	B3281 - B3287	420 (Disc.)
B3104CTC	81PVC (Disc.)	B3170NF (Disc.)	200	B3281 - B3287	421 (Disc.)
B3104F	N/A	B3170NF (Disc.)	200R (Disc.)	B3281 - B3287	422 (Disc.)
B3106	1V (Disc.)	B3170NFC (Disc.)	200C	B3281 - B3287	422C (Disc.)
B3106V	1VT (Disc.)	B3170NFF (Disc.)	200F	B3291 - B3298	N/A
B3108	1A (Disc.)	B3171	N/A	B3362 - B3365	N/A
B3109	N/A	B3175	N/A	B3367 (Disc.)	69
B3110	324 (Disc.)	B3175CT	N/A	B3373	6 (Disc.)
B3114	322 (Disc.)	B3180	20 (Disc.)	B3373C	6PVC (Disc.)
B3114R	N/A	B3180FL	20S (Disc.)	B3373CT	82 (Disc.)
B3117R	N/A	B3181 (Disc.)	22	B3373CTC	82PVC (Disc.)
B3117SL	327 (Disc.)	B3182 (Disc.)	23	B3373F	6F (Disc.)
B3118SL	328 (Disc.)	B3183 (Disc.)	24	B3380 - B3387	N/A
B3119SL	N/A	B3184	N/A	B3690	3 (Disc.)
B3120	325 (Disc.)	B3188	110 (Disc.)	B3690C	3PVC (Disc.)
B3122	326 (Disc.)	B3188C	N/A	B3690F	3F (Disc.)
B3122A	N/A	B3190	40 (Disc.)	B3891	425 (Disc.)
B3124	N/A	B3191	41 (Disc.)	B3891	426 (Disc.)
B3126	ROL-16	B3195	84 (Disc.)	B3891	429 (Disc.)
B3132	9 (Disc.)	B3195CT	83 (Disc.)	B3892	430 (Disc.)
B3132W-1 & 11/2	9X (Disc.)	B3198H	302 (Disc.)	B3894	N/A
B3134	14 (Disc.)	B3198HCT	301CT (Disc.)	B3895	N/A
B3134W	14X (Disc.)	B3199R	78	B3993-10	428 (Disc.)
B3140	4 (Disc.)	B3199RCT	N/A	B3393-10/B3393-10B	431 (Disc.)
B3140C	4PVC (Disc.)	B3200	330 (Disc.)	DS15x2	125 (Disc.)
B3140F	4F (Disc.)	B3201	332 (Disc.)	DURA-BLOK™	Pipe Pier (Disc.)
B3141	4CI (Disc.)	B3202	331 (Disc.)	FFW	119 (Disc.)
B3142	4H (Disc.)	B3203	333 (Disc.)	FW	115 (Disc.)
B3144	5 (Disc.)	B3205	103 (Disc.)	HHN	114 (Disc.)
B3146	5H (Disc.)	B3210	102 (Disc.)	HN	113 (Disc.)
B3147A-1/2 thru 4	32-1/2 thru 4 (Disc.)	B3210X	102L (Disc.)	ISO	N/A
B3147B 4 thru 24	32-5 thru 34 (Disc.)	B3211	101 (Disc.)	KwikClips™	N/A
B3148	7 (Disc.)	B3211X	101L (Disc.)	LW	117 (Disc.)
B3149	8 (Disc.)	B3212	104 (Disc.)	N2500	310N (Disc.)
B3151	220 (Disc.)	B3213	105 (Disc.)	Snap 'N Shields™ Clevis Hangers	N/A
B3153	219 (Disc.)	B3214	106 (Disc.)	Snap 'N Shields™	N/A
B3154	220 (Disc.)	B3220	71 (Disc.)	Toggle Bolts	123 (Disc.)
B3155	219 (Disc.)	B3222	307 (Disc.)		
B3160	260 (Disc.)	B3223	N/A		

(Disc.) = Discontinued Item

Reference Data - Crosses

Anvil/Grinnell®†	B-Line/TOLCO	Anvil/Grinnell®†	B-Line/TOLCO	Anvil/Grinnell®†	B-Line/TOLCO
14	B3040 (Fig. 336)	165	B3165 (Fig. 265)	438-1	Consult Factory
40	Consult Factory	167	B3151 (Fig. 220)	438-2	Consult Factory
47	B3084 (Fig. 33)	168	B3153 (Fig. 219)	438-3	Consult Factory
49	B3086 (Fig. 34)	171	B3114 (Fig. 322)	590	B3102 (Fig. 1CI)
51	B422	175	B3120 (Fig. 325)	594	B3134W (Fig. 14X)
52	B3085 (Fig. 35)	177	B3122 (Fig. 326)	595	B3134 (Fig. 14)
54	Consult Factory	178	B3264 (Fig. 500)	599	B3132W-1 & 1½ (Fig. 9X)
55	B3080 L & S (Fig. 343 LONG & FG 343 SHORT)	181	B3110 (Fig. 324)	600	B3132 (Fig. 9)
60	B3248 (Fig. 118)	191	B3098 (Fig. 313)	218, 229	B3054 (Fig. 329)
62	Consult Factory	192	B3096 (Fig. 312)		
63	Consult Factory	194	B3068 (Fig. 30)		
CT65	B3104CT (Fig. 81)	195	B3066 (Fig. 30M)		
66	B3083 (Fig. 305)/ B3083WO (Fig. 304)	199	B3067 (Fig. 30H)		
67	B3690 (Fig. 3)	202	B3060 (Fig. 50)		
68	Consult Factory	206	Fig. 51		
69	Fig. 200 (B3170NF)	212	B3140 (Fig. 4)		
69C	Fig. 200C (B3170NFC)	212FP	Fig. 4A		
89, 87	B3367 (Fig. 69)	216	B3142 (Fig. 4H)		
92	Fig. 65/Fig. 65XT	217	B3045 (Fig. 335)		
93	Fig. 66	227	B3042 (Fig. 61)		
95	B351L (Fig. 64)	230	B3202 (Fig. 331)		
100	B3149 (Fig. 8)	247	B3262 (Fig. 506)		
103	B3148 (Fig. 7)	248	B3210 (Fig. 102)		
110R	B3222 (Fig. 307)	248X	B3210X (Fig. 102L)		
112	Fig. 910	255	B3281 - B3287 (Fig. 422)		
114	B3224 (Fig. 306)	256	B3281 - B3287 (Fig. 421)		
CT121	B3373CT (Fig. 82)	257	B3891 (Fig. 426)		
CT138R	B3198HCT (Fig. 301CT)	259	B3090 (Fig. 318)		
128R	B3199 (Fig. 78)	260	B3100 (Fig. 1)		
133-134	B3050 (Fig. 62)	261	B3373 (Fig. 6)		
135	B655 (Fig. 70) & B3220 (Fig. 71)	262	B3180 (Fig. 20)		
136R	B656 (Fig. 70R)	264	B3093 (Fig. 317A)		
137	B3188 (Fig. 110)	271	B3117SL (Fig. 327)		
138R	B3198H (Fig. 302)	274	B3118SL (Fig. 328)		
140	B3205 (Fig. 103)	278	B3211 (Fig. 101)		
142	B3213 (Fig. 105)	278X	B3211X (Fig. 101L)		
146	ATR (Fig. 99 & Fig. 100)	280	B3891 (Fig. 426)		
157	B3203 (Fig. 333)	282	B3014 (FG 309) & B3014N (Fig. 309N)		
160	B3160 (Fig. 260)	285N	N2500 (Fig. 310N)		
161	B3161 (Fig. 261)	290	B3200 (Fig. 330)		
162	B3162 (Fig. 262)	295	B3144 (Fig. 5)		
163	B3163 (Fig. 263)	299	B3201 (Fig. 332)		
164	B3164 (Fig. 264)	300	B3108 (Fig. 1A)		
		436	Consult Factory		
		437	Consult Factory		

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Chart provides a cross reference to help determine equivalent products.

Reference Data - Crosses

Erico®†	B-Line/TOLCO	Erico®†	B-Line/TOLCO	Erico®†	B-Line/TOLCO
10	HN (Fig. 113)	360	B3054 (Fig. 329)	640-2	B3892
10H	HHN (Fig. 114)	361	B3050 (Fig. 62)	640-3	B3393-10/B3393-10B
11	FW (Fig. 115)	363	B3040 (Fig. 336)	651	B3281 - B3287 (Fig. 421)
12	FFW (Fig. 119)	367	B3045 (Fig. 335)	651	B3281 - B3287 (Fig. 421)
13	LW (Fig. 117)	370A	Fig. 109A (B3019)	700	B3148 (Fig. 7)
25	B655 (Fig. 70)	371	B3080 L & S (Fig. 343 LONG & Fig. 343 SHORT)	705	B3149 (Fig. 8)
25R	B656 (Fig. 70R)			720	B3095 (Fig. 317)
25S	B655S (Fig. 70S)	373	B3084 (Fig. 33)	721	B3090 (Fig. 318)
26	B3203 (Fig. 333)	374	B3086 (Fig. 34)	724	B3098 (Fig. 313)
30	B3202 (Fig. 331)	374A	B3085 (Fig. 35)	420	B3100C (Fig. 1PVC)
31	B3201 (Fig. 332)	400	B3100 (Fig. 1)	520	B3373C (Fig. 6PVC)
35	B3200 (Fig. 330)	400FL	B3100F (Fig. 1F)	107	Fig. 22
40	B3210 (Fig. 102)	402	B3104CT (Fig. 81)	108	Fig. 23
40W	B3211 (Fig. 101)	40	B3102 (Fig. 1CI)	109	Fig. 24
43	DS15x2 (Fig. 125)	410	B3104		
46	B3214 (Fig. 106)	41	B3108 (Fig. 1A)		
47	B3222 (Fig. 307)	418	B3690 (Fig. 3)		
50	ATR (Fig. 99 & 100)	418FL	B3690F (Fig. 3F)		
51	ATR (Fig. 99 & 100)	450	B3140 (Fig. 4)		
100	B3170 (Fig. 2)	451	B3142 (Fig. 4H)		
125	B3151 (Fig. 220)	452	B3144 (Fig. 5)		
130	Fig. 200	455	B3198H (Fig. 302)		
150	B3188 (Fig. 110)	456	B3198HCT (Fig. 301CT)		
200	B351L (Fig. 64)	457	B3190 (FFig. 40)		
255C	B3367 (Fig. 69)	458	B3191 (Fig. 41)		
282	B3014 (Fig. 309)	470	B3180 (Fig. 20)		
282N	B3014N (Fig. 309N)	510	B3373 (Fig. 6)		
300	B351L (Fig. 64)	511	B3373CT (FFig. 82)		
310	Fig. 66	516	B3132W-1 & 1½ (FFig. 9X)		
319	B3061 (Fig. 42)	517	B3132 (Fig. 9)		
320L	B3083WO (Fig. 304)	605	B3114 (FFig. 322)		
320W	B3083 (Fig. 305)	610	B3110 (Fig. 324)		
321	B3082 (Fig. 337)	615	B3120 (Fig. 325)		
325	B3060 (Fig. 50)	617	B3117SL (Fig. 327)		
326	B3070 (Fig. 52)	619	B3118SL (Fig. 328)		
335A	Fig. 975	620	B3122 (Fig. 326)		
335AB	Fig. 910	625	B3264 (Fig. 500)		
340	B3248 (Fig. 118)	630	B3160 (Fig. 260)		
348	B3068 (Fig. 30)	631	B3161 (Fig. 261)		
351	B3065 (Fig. 30L)	632	B3162 (Fig. 262)		
352	B3066 (Fig. 30M)	633	B3163 (Fig. 263)		
353	B3067 (Fig. 30H)	634	B3164 (Fig. 264)		
355	B2500 (Fig. 310)	635	B3165 (Fig. 265)		
355N	N2500 (Fig. 310N)	640	B3891 (Fig. 426)		
356	Fig. 130	640-1	B3891		
359	B3042 (Fig. 61)				

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Reference Data - Crosses

PHD®†	B-Line/TOLCO	PHD®†	B-Line/TOLCO	PHD®†	B-Line/TOLCO
10	ATR (Fig. 99 & 100)	490	B3114 (Fig. 322)	885	Fig 109A (B3019)
15	B3205 (Fig. 103)	508	B3198H (Fig. 302)	890	Fig. 975
20	ATR (Fig. 99 & 100)	512H	B3198HCT (Fig. 301CT)	900	B3083 (Fig. 305)
25	B3203 (Fig. 333)	520	B3140 (Fig. 4)	900-1	B3083WO (Fig. 304)
32	B3222 (Fig. 307)	522	B3142 (Fig. 4H)	903	B3085 (Fig. 35)
35	B3200 (Fig. 330)	525	B3144 (Fig. 5)	904	B3086 (Fig. 34)
38	B3201 (Fig. 332)	535	B3148 (Fig. 7)	910	B3061 (Fig. 42)
40	B3213 (Fig. 105)	545	B3149 (Fig. 8)	925	B3070 (Fig. 52)
44	B3224 (Fig. 306)	550	B3373 (Fig. 6)	930	B3248 (Fig. 118)
47W	AWA (Fig. 209)	552	B3373CT (Fig. 82)	936	B3080 L & S (Fig. 343 LONG & Fig. 343 SHORT)
48	DS15x2 (Fig. 125)	553	B3373C (Fig. 6PVC)	940	B3199 (Fig. 78)
50	B3210 (Fig. 102)	554	B3373CTC (Fig. 82PVC)	950	B3014 (Fig. 309)
55	B3211 (Fig. 101)	580	B3132 (Fig. 9)	950N	B3014N (Fig. 309N)
60	B3212 (Fig. 104)	585	B3132W-1 & 11/2 (Fig. 9X)	960	B3202 (Fig. 331)
70	B2499 (Fig. 107F)	590	B3134 (Fig. 14)	970	B3690 (Fig. 3)
80	Fig. 120	595	B3134W (Fig. 14X)	970F	B3690F (Fig. 3F)
90	B3188 (Fig. 110)	610, 620	B3050 (Fig. 62)	980	B3195 (Fig. 84)
95, 110	B501 (Fig. 111)	630	B3054 (Fig. 329)	982	B3195CT (Fig. 83)
100	B655 (Fig. 70)	635	B3040 (Fig. 336)		
104	B655S (Fig. 70S)	651	B3160 (Fig. 260)		
105	B656 (Fig. 70R)	653	B3161 (Fig. 261)		
110	HN (Fig. 113)	654	B3162 (Fig. 262)		
110H	HHN (Fig. 114)	655	B3163 (Fig. 263)		
130	FW (Fig. 115)	656	B3164 (Fig. 264)		
134	LW (Fig. 117)	658	B3165 (Fig. 265)		
135	B3234 (Fig. 116)	670-678	B3281 - B3287 (Fig. 421)		
136	FFW (Fig. 119)	690	B3891 (Fig. 426)		
151	B3170 (Fig. 2)	690-1	B3891		
160	B3153 (Fig. 219)	690-2	B3892		
170	B3151 (Fig. 220)	690-3	B3393-10/B3393-10B		
250	B351L (Fig. 64)	810	B3191 (Fig. 41)		
350	Fig. 65	820	B3190 (Fig. 40)		
359	B3367 (Fig. 69)	825	B3180 (Fig. 20)		
360	B3367 (Fig. 69)	830	B3180FL (Fig. 20S)		
420	B3102 (Fig. 1CI)	840	B3147A-1/2 thru 4 (Fig. 32-1/2 thru 4)		
430	B3108 (Fig. 1A)	840	B3147B 4 thru 24 (Fig. 32-5 thru 34)		
440	B3104	850	B3065 (Fig. 30L)		
450	B3100 (Fig. 1)	855	B3066 (Fig. 30M)		
450F	B3100F (Fig. 1F)	860	B3067 (Fig. 30H)		
450V	B3106 (Fig. 1V)	871	B3088T (Fig. 316T)		
453	B3100C (Fig. 1PVC)	875	B3093 (Fig. 317A)		
460	B3120 (Fig. 325)	876	B3092 (Fig. 318A)		
470	B3110 (Fig. 324)	880	B3095 (Fig. 317)		
480	B3122 (Fig. 326)	882	B3090 (Fig. 318)		
486	B3117SL (Fig. 327)				
487	B3118SL (Fig. 328)				

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Reference Data - Crosses

Super Strut®†	B-Line/TOLCO	Super Strut®†	B-Line/TOLCO	Super Strut®†	B-Line/TOLCO
164	B3180 (Fig. 20)	C790	B3151 (Fig. 220)		
452	B2500 (Fig. 310)	CF729A	B3120 (Fig. 325)		
540	B3060 (Fig. 50)	CI710	B3102 (Fig. 1CI)		
542	B3070 (Fig. 52)	CL710	B3104		
AB102	N2500 (Fig. 310N)	CT720	B3373CT (Fig. 82)		
AB201	Fig. 51	CTL710	B3104CT (Fig. 81)		
C475	Fig 109A (B3019)	CX710	B3108 (Fig. 1A)		
C704	B3191(Fig. 41)	E120	B3222 (Fig. 307)		
C704A	B3190 (Fig. 40)	E120A	B3200 (Fig. 330)		
C710	B3100 (Fig. 1)	E145	HN (Fig. 113)		
C710F	B3100F (Fig. 1F)	E147	FW (Fig. 115)		
C710P	B3100C (Fig. 1PVC)	EF147	FFW (Fig. 119)		
C720P	B3373C (Fig. 6PVC)	E148	LW (Fig. 117)		
C724	B3132 (Fig. 9)	E151	B3213 (Fig. 105)		
C725	B3140 (Fig. 4)	E151D	DS15x2 (Fig. 125)		
C726	B3144 (Fig. 5)	E156	B3210 (Fig. 102)		
C727	B3170 (Fig. 2)	E157	B3211 (Fig. 101)		
C729-2	B3110 (Fig. 324)	F111	B3201 (Fig. 332)		
C730C	B3117SL (Fig. 327)	F112	B3202 (Fig. 331)		
C730D	B3118SL (Fig. 328)	H104	ATR (Fig. 99 & 100)		
C736	B3068 (Fig. 30)	H115	B3188 (Fig. 110)		
C739H	B3067 (Fig. 30H)	H119	B655 (Fig. 70)		
C739M	B3066 (Fig. 30M)	H119R	B656 (Fig. 70R)		
C747	B3082 (Fig. 337)	HL115	B501 (Fig. 111)		
C755T-C757T	B3050 (Fig. 62)	M129	B3203 (Fig. 333)		
C769	B3045 (Fig. 335)	M718	B3198H (Fig. 302)		
C775L	B351L (Fig. 64)	M724R	B3199 (Fig. 78)		
C777	Fig. 65/Fig. 65XT	M732	B3054 (Fig. 329)		
C778	Fig. 66	M778	B3034 (Fig. 68S) & B3033 (Fig. 68V)		
C711	B3690 (Fig. 3)	PG794	B3281 - B3287 (Fig. 21)		
C711F	B3690F (Fig. 3F) B3690C (FG 3PVC)	RC729	B3122 (Fig. 326)		
C716	B3195CT (Fig. 83)	RCS	B3147A-1/2 thru 4 (Fig. 32-1/2 thru 4)		
C720	B3373 (Fig. 6)	RCS	B3147B 4 thru 24 (Fig. 32-5 thru 34)		
C720L	B3148 (Fig. 7)	U568	B3367 (Fig. 69)		
C780W/HW	B3083 (Fig. 305)	W724	B3132W-1 & 1 1/2 (Fig. 9X)		
C780W/O	B3083WO (Fig. 304)				
C781	B3248 (Fig. 118)				
C785	B3090 (Fig. 318)				
C786	B3093 (Fig. 317A)				
C789	B3160 (Fig. 260)				
C789A	B3160 (Fig. 260)				
C789B	B3162 (Fig. 262)				
C789C	B3163 (Fig. 263)				
C789D	B3164 (Fig. 264)				
C789E	B3165 (Fig. 265)				

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Reference Data - Crosses

Carpenter & Paterson®†	B-Line/TOLCO	Carpenter & Paterson®†	B-Line/TOLCO	Carpenter & Paterson®†	B-Line/TOLCO
6	B3042 (Fig. 61)	258	B3132W-1 & 1½ (Fig. 9X)		
12	B3222 (Fig. 307)	260	B3134W (Fig. 14X)		
14	B3040 (Fig. 336)	267	B3149 (Fig. 8)		
15	B3050 (Fig. 62)	276	B3201 (Fig. 332)		
18	B3367 (Fig. 69)	283	B3188 (Fig. 110)		
28	B3213 (Fig. 105)	293	B3054 (Fig. 329)		
31	B3212 (Fig. 104)	298	B3142 (Fig. 4H)		
33	B3210 (Fig. 102)	303	B3060 (Fig. 50)		
38	B3224 (Fig. 306)	304	B3144 (Fig. 5)		
39	B3120 (Fig. 325)	306	B3210X (Fig. 102L)		
44	Fig. 120	341	B3211X (Fig. 101L)		
53	B3118SL (Fig. 328)	351	B3160 (Fig. 260)		
59	Toggle Bolts (Fig. 123)	352	B3160 (Fig. 260)		
69	B3068 (Fig. 30)	353	B3162 (Fig. 262)		
84	B3066 (Fig. 30M)	354	B3163 (Fig. 263)		
85	B3199 (Fig. 78)	355	B3164 (Fig. 264)		
92	B3045 (Fig. 335)	356	B3165 (Fig. 265)		
93	B3211 (Fig. 101)	478	B3264 (Fig. 500)		
94	ATR (Fig. 99 & 100)	706	B3234 (Fig. 116)		
100	B3100 (Fig. 1)	800	B3170 (Fig. 2)		
102	B3248 (Fig. 118)	800	Fig. 200		
103	FW (Fig. 115)	100C.I.	B3102 (Fig. 1CI)		
109	B3122 (Fig. 326)	100CT	B3104CT (Fig. 81)		
114	B3180 (Fig. 20)	100EL	B3108 (Fig. 1A)		
123	B655 (Fig. 70)	100PVC	B3100C (Fig. 1PVC)		
125	B3090 (Fig. 318)	100PVC	B3104CTC (Fig. 81PVC)		
126	B3373 (Fig. 6)	123R	B656 (Fig. 70R)		
132	B3202 (Fig. 331)	123W	B3220 (Fig. 71)		
133	B3205 (Fig. 103)	126CT	B3373CT (Fig. 82)		
137	B3096 (Fig. 312)	126PVC	B3373C (Fig. 6PVC)		
139	B3067 (Fig. 30H)	158DB	B3134 (Fig. 14)		
140	B3110 (Fig. 324)	200VT	B3106 (Fig. 1V)		
152	B3061 (Fig. 42)	227S	B3191 (Fig. 41)		
158	B3132 (Fig. 9)	265P	B3151 (Fig. 220)		
165	HN (Fig. 113)	650-266-75	B3014N (Fig. 309N)		
166	DS15x2 (Fig. 125)	81CT	B3198HCT (Fig. 301CT)		
175	B3140 (Fig. 4)				
176	LW (Fig. 117)				
179	B3148 (Fig. 7)				
192	Fig. 65				
200	B3104				
220	B3080 L & S (Fig. 343 LONG & Fig. 343 SHORT)				
222	B501 (Fig. 111)				
227	B3190 (Fig. 40)				

† Mark shown is the property of its respective owner.
Chart provides a cross reference to help determine equivalent products.

Empire®†	B-Line/TOLCO	Empire®†	B-Line/TOLCO	Empire®†	B-Line/TOLCO
11	B3100 (Fig. 1)	110	B3104	1902	B3162 (Fig. 262)
11CI	B3102 (Fig. 1CI)	110CT	B3104CT (Fig. 81)	1903	B3163 (Fig. 263)
11V	B3106 (Fig. 1V)	110PC	B3100C (Fig. 1PVC)	1904	B3164 (Fig. 264)
11X	B3108 (Fig. 1A)	110PC	B3104CTC (Fig. 81PVC)	1905	B3165 (Fig. 265)
21L	B351L (Fig. 64)	114	B3224 (Fig. 306)	4000 Series	B3891 (Fig. 426)
22R	B3367 (Fig. 69)	131	B3200 (Fig. 330)		
26	B3210 (Fig. 102)	137	B3188 (Fig. 110)		
26W	B3211 (Fig. 101)	145	B3191 (Fig. 41)		
31	B3170 (Fig. 2)	146	B3190 (Fig. 40)		
31	Fig. 200	150	Fig. 130		
35	B3262 (Fig. 506)	155	B3040 (Fig. 336)		
41H	B3198H (Fig. 302)	156	B3045 (Fig. 335)		
41HCT	B3198HCT (Fig. 301CT)	157	B3203 (Fig. 333)		
47	B3222 (Fig. 307)	158	B3042 (Fig. 61)		
49PC	B3373C (Fig. 6PVC)	167	B3151 (Fig. 220)		
50	B3373 (Fig. 6)	180	B3180FL (Fig. 20S)		
50CT	B3373CT (Fig. 82)	189	B3144 (Fig. 5)		
50CTI or 49PC	B3373CTC (Fig. 82PVC)	202	B3060 (Fig. 50)		
51	B655 (Fig. 70)	212	B3140 (Fig. 4)		
51R	B656 (Fig. 70R)	216	B3142 (Fig. 4H)		
52	FW (Fig. 115)	218	B3050 (Fig. 62)		
52F	FFW (Fig. 119)	229	B3054 (Fig. 329)		
52L	LW (Fig. 117)	231	B3180 (Fig. 20)		
53	B3061 (Fig. 42)	256	B3281 - B3287 (Fig. 421)		
54	ATR (Fig. 99 & 100)	272	B3110 (Fig. 324)		
55	B3213 (Fig. 105)	273	B3122 (Fig. 326)		
56	HN (Fig. 113)	275	B3120 (Fig. 325)		
57	B3205 (Fig. 103)	277	B3114 (Fig. 322)		
59	DS15x2 (Fig. 125)	320	B3202 (Fig. 331)		
61	Fig. 66	420	B3095 (Fig. 317)		
62	Fig. 65/Fig. 65XT	422	B3096 (Fig. 312)		
67	B3086 (Fig. 34)	426	B3093 (Fig. 317A)		
68	B3085 (Fig. 35)	427	B3092 (Fig. 318A)		
69	B3080 L & S (Fig. 343 LONG & Fig. 343 SHORT)	427	B3090 (Fig. 318)		
72	B3234 (Fig. 116)	595	B3134 (Fig. 14)		
75	B3134W (Fig. 14X)	599	B3132W-1 & 1 1/2 (Fig. 9X)		
75	B3248 (Fig. 118)	600	B3132 (Fig. 9)		
77	B2499 (Fig. 107F)	801	B3066 (Fig. 30M)		
80	AWA (Fig. 209)	802	B3067 (Fig. 30H)		
81N	B3014N (Fig. 309N)	820	B3068 (Fig. 30)		
83	Toggle Bolts (Fig. 123)	909	B3201 (Fig. 332)		
95	B3148 (Fig. 7)	279S	B3117SL (Fig. 327)		
97	B3149 (Fig. 8)	280S	B3118SL (Fig. 328)		
		425 or 427	B3098 (Fig. 313)		
		1900	B3160 (Fig. 260)		
		1901	B3160 (Fig. 260)		

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