TOLCO™ fire protection solutions







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Powering Business Worldwide



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

To learn more go to: Eaton.com/whatmatters

EATON
Powering Business Worldwide

We make what matters work.

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

Products & Services

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

Fire Protection Team

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

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

Product Certifications

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

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

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

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

For additional support, contact your TOLCO seismic bracing specialist at, tolcosupport@eaton.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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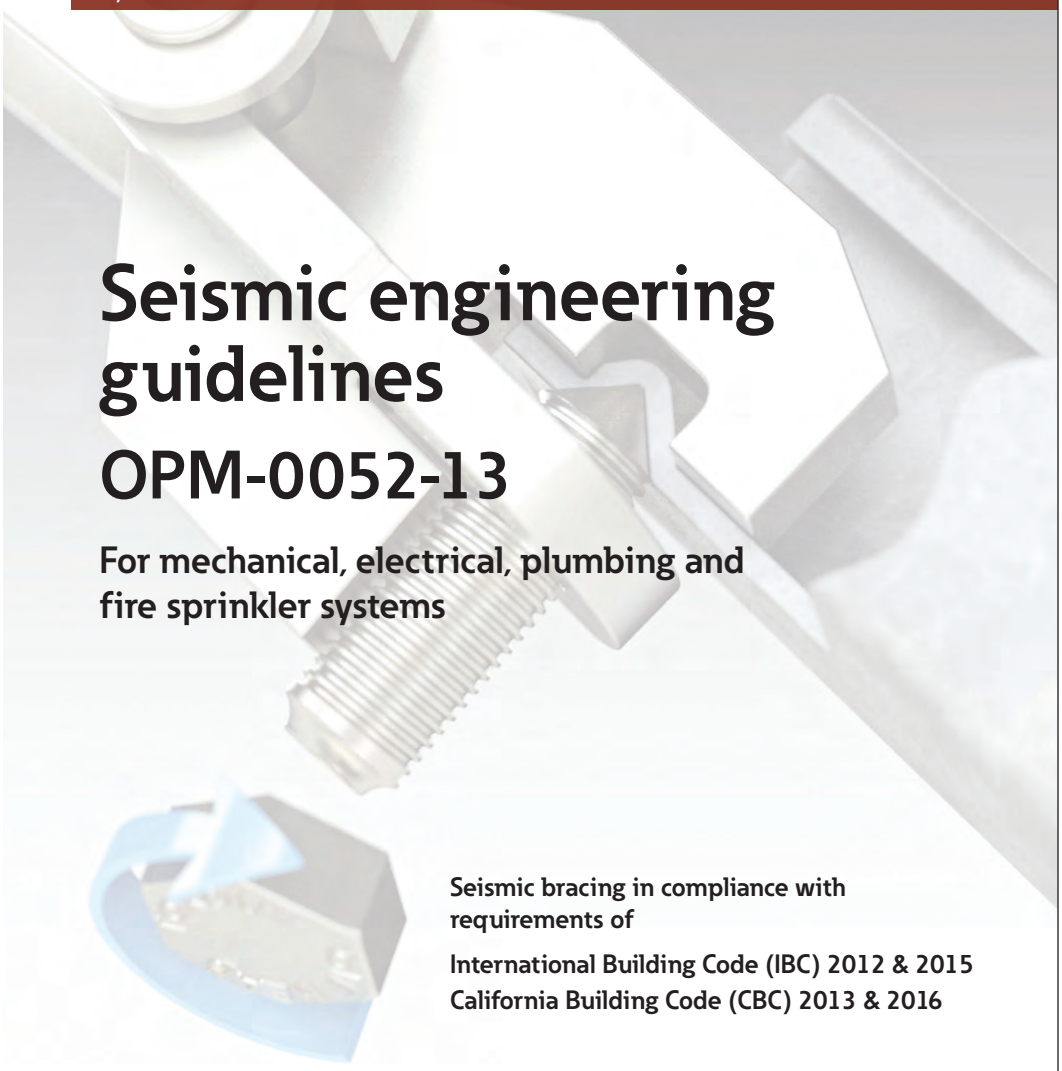
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OSHPD Pre-Approved
Seismic Restraints
Systems Guidelines

SEG-17

B-LINE SERIES



Seismic engineering guidelines

OPM-0052-13

For mechanical, electrical, plumbing and fire sprinkler systems

Seismic bracing in compliance with requirements of

International Building Code (IBC) 2012 & 2015
California Building Code (CBC) 2013 & 2016

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

TOLBrace™ Fire Protection

Software



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

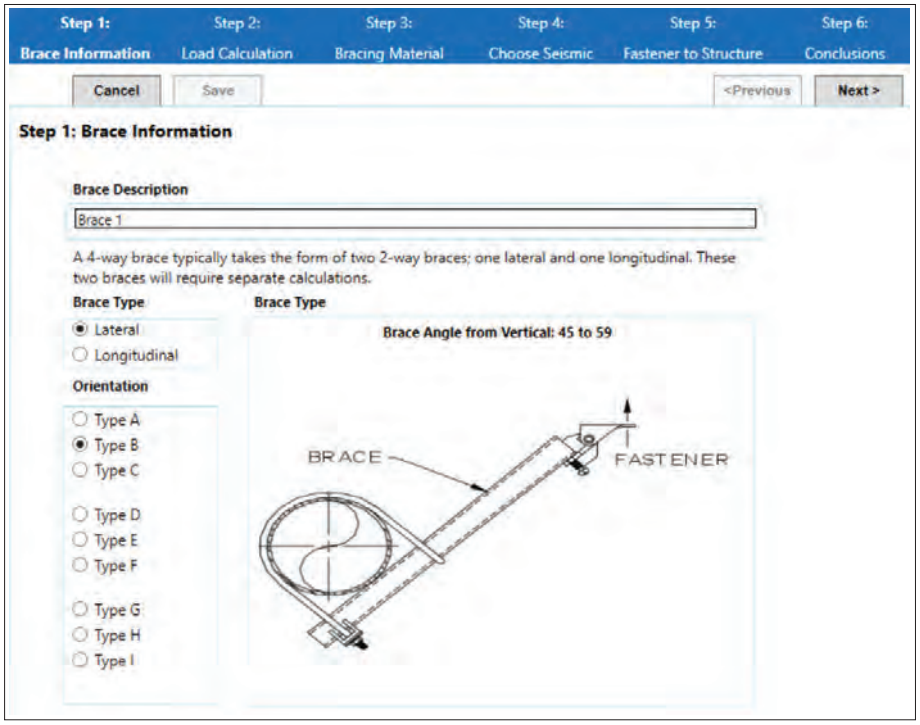
TOLBrace™ includes a feature that will automatically update your software when new products are added, when there are updates to codes and standards, and/or any necessary software upgrades.

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

- Seismic force factor calculations (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

TOLBrace follows the requirements of:

- NFPA 13, 1999, 2002, 2007, 2010, 2013, & 2016
- Uniform Building Code
- International Building Code
- National Building Code of Canada
- California Office of Statewide Health Planning & Development (OSHPD)



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

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◆ ***DURA-COPPER™ Finish***

Pipe Clamps



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B3140
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† DDI™, Wood-Knocker™ & Bang-IT™ are registered trademarks used by DeWalt.

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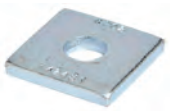
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HHN
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FW
Flat Washer
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LW
Lock Washer
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FFW
Flat Fender Washer
Page 104

Other Products www.eaton.com/pipehangers



B3170CT
Copper Tubing
Adjustable
Swivel Ring



B3170CTC
Copper Tubing
Plastic Coated
Adjustable
Swivel Ring



B3198R
Extension Split
Pipe Clamp



B3198RCT
Copper Tubing
Extension Split
Pipe Clamp



B3180FL
Flush Mount
Pipe Strap



B3180
Extended Leg
Pipe Strap



B3148
Offset
Pipe Clamp



B3096
Adjustable Pipe
Saddle Support



B3089
Pipe Support
Adjuster



B3090
Pipe Saddle
Support
With U-Bolt



B3095
Pipe Saddle
Support



B3097
Pipe Saddle
With Strap



B3098
Adjustable
Pipe Support
w/U-Bolt



B3082
Rod Beam
Attachment



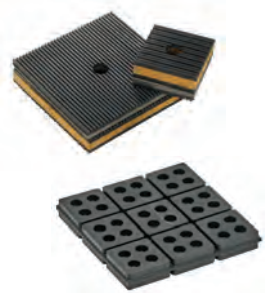
B3203
Extension Piece



B3223
Offset Eye
Socket



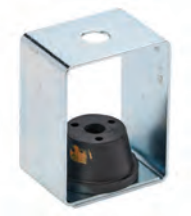
ATB
(TOLCO 123)
Toggle Bolt



Vibration Pads



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



RH & RHD Type
Neoprene Hanger
1/4″ & 1/2″ Deflection



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



Isolator/Restraints



Neoprene Mounts
Seismic Restraints

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.

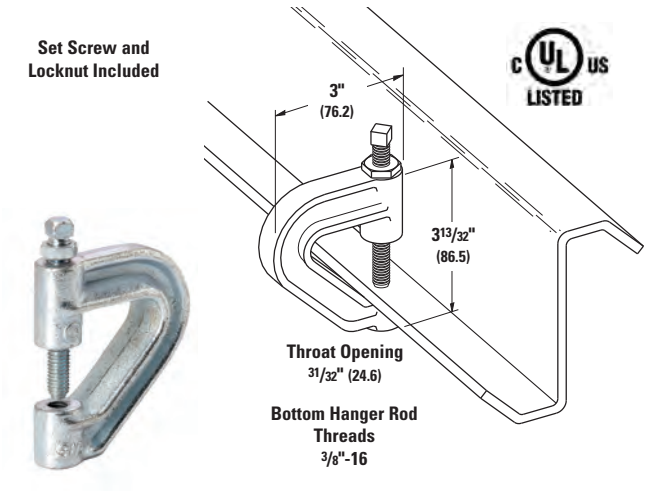
Finish: Plain or Electro-Galvanized

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.



B3033 - Wide Jaw Reversible 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: 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.

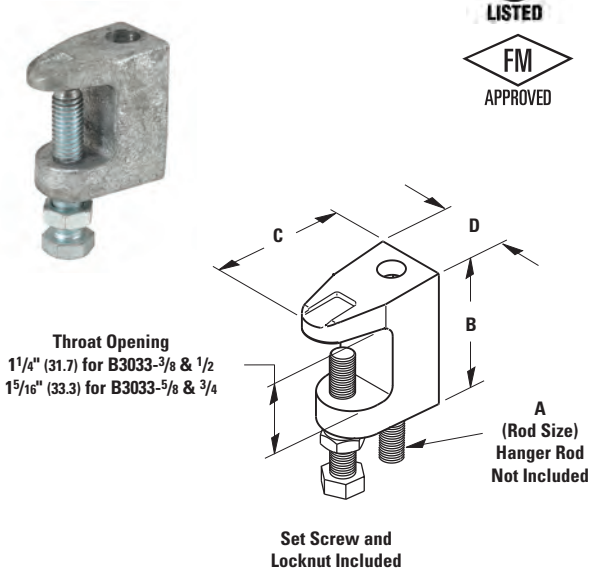
Approvals: Underwriters Laboratories Listed **(cULus)** and Factory Mutual Engineering Approved **(FM)** for 3/8"-16 and 1/2"-13 rod sizes. Conforms to Federal Specification WW-H-171E Type 19 & A-A-1192A, Type 19 & 23 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 19 & 23. Factory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

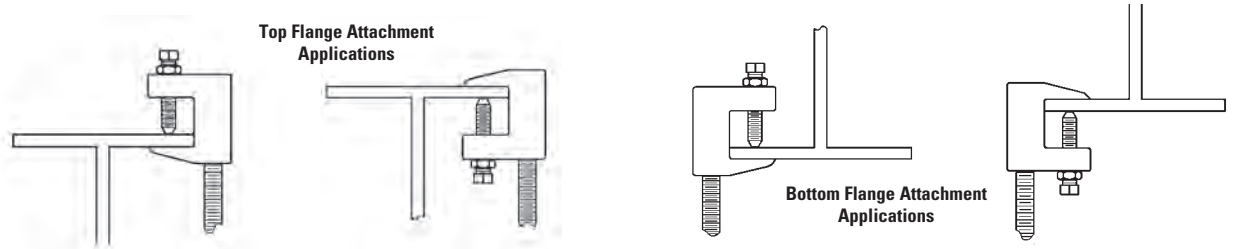
Finish: Plain. Contact customer service for alternative finishes and materials.

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.





Part No.	Rod Size A	Set Screw Size	B in.	B (mm)	C in.	C (mm)	D in.	D (mm)	Maximum Iron Pipe Size Per UL in.	Maximum Iron Pipe Size Per UL (mm)	Approx. Wt./100 Lbs.	Approx. Wt./100 (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)

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

B3034 - C-Clamp

Size Range: 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).

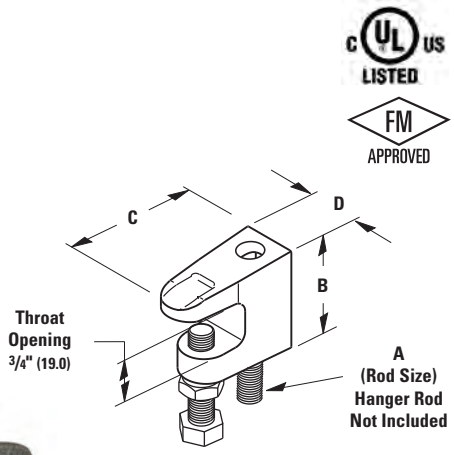
Features: May be used on top or bottom flange of the beam. Beveled lip allows hanging from top flange where clearance is limited. May be installed with the set screw in the up or down position. Offset design permits unlimited rod adjustment by allowing the rod to be threaded completely through the clamp.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

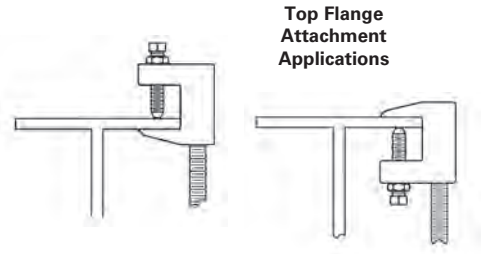
Finish: Plain. Contact customer service for alternative finishes and materials.

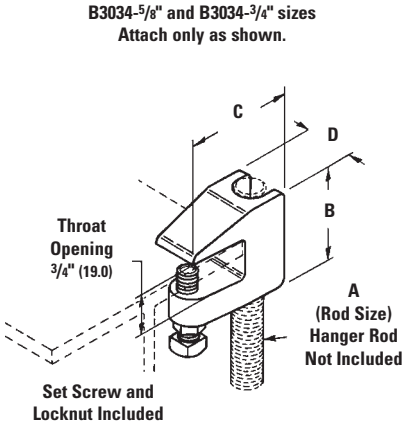
Order By: Figure number, rod size and finish

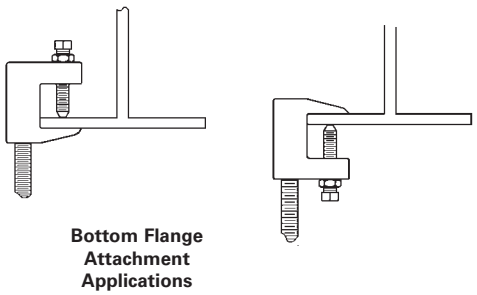
Setscrew Torque: Per MSS SP-58 14.2.5
3/8" -16 set screws = 5 ft./lbs. (7 Nm)
1/2" -13 set screws = 11 ft./lbs. (15 Nm)
Caution should be taken not to over-tighten set screws.











Part No.	Rod Size A	Set Screw Size	B		C		D		Maximum Iron Pipe Size Per UL		Approx. Wt./100	
			in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	Lbs.	(kg)
B3034-3/8	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.

TOLCO™ Fig. 68S - Reversible Malleable Beam Clamp 3/4" (19.0mm) Throat Opening
TOLCO™ Fig. 68W - Reversible Malleable Beam Clamp 1 1/4" (31.7mm) Throat Opening

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.

Finish: Plain. Contact customer service 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.

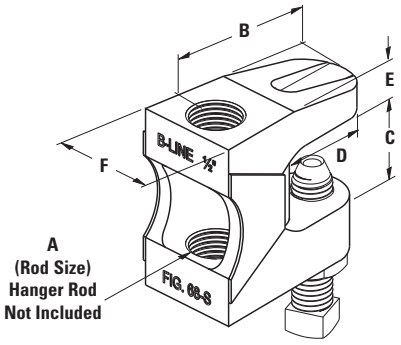


Fig. 68S

Set Screw and Locknut Included

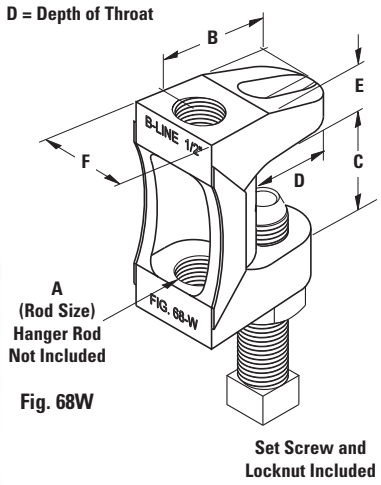


Fig. 68W

Set Screw and Locknut Included

Fig. 68S



Fig. 68W



Fig. 68S

Part No.	Rod Size A	B in.	B (mm)	C Min. in.	C Min. (mm)	D in.	D (mm)	E in.	E (mm)	F in.	F (mm)	Max Rec. Load Set Screw Up Lbs.	Max Rec. Load Set Screw Up (kN)	Max Rec. Load Set Screw Down Lbs.	Max Rec. Load Set Screw Down (kN)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
68S-3/8	3/8"-16	1 9/16"	(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	1 5/8"	(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	1 9/16"	(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	1 3/4"	(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	1 3/4"	(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.	B (mm)	C Min. in.	C Min. (mm)	D in.	D (mm)	E in.	E (mm)	F in.	F (mm)	Max Rec. Load Set Screw Up Lbs.	Max Rec. Load Set Screw Up (kN)	Max Rec. Load Set Screw Down Lbs.	Max Rec. Load Set Screw Down (kN)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
68W-3/8	3/8"-16	1 9/16"	(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	1 9/16"	(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	1 3/4"	(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	1 3/4"	(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)

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

TOLCO™ Fig. 65 - Reversible Steel C-Type Beam Clamp 3/4" (19.0mm) Throat Opening

Size Range:

Fig. 65 - 1/2"-13 rod sizes, and 5/8"-11 rod sizes
Fig. 65XT - 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 3/4" (19.0mm).

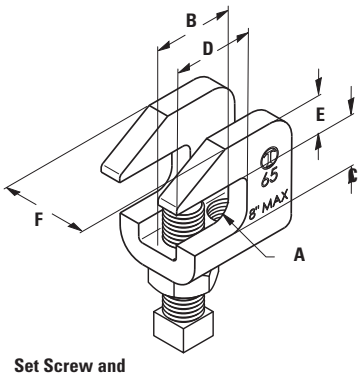
Features: All steel construction eliminates structural deficiencies associated with casting type beam clamps. May be used on top or bottom flange of beam. (Beveled lip allows hanging from top flange where clearance is limited.) May be installed with set screw in up or down position. Offset design permits 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,
3/8"-16 rod will support 1/2" (15mm) thru 4" (100mm) pipe
1/2"-13 rod will support thru 8" (200mm) pipe

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

Order By: Figure number and finish

Fig. 65 Patent #4,570,885



Set Screw and Locknut Included





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

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

TOLCO™ Fig. 65XT - Reversible Steel C-Type Beam Clamp 3/4" (19.0mm) Throat Opening

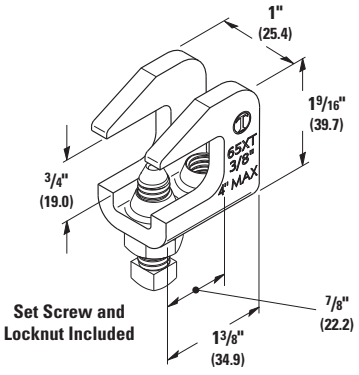
Feature: Extruded holes allows for more thread engagement of threaded rod and set screw.

Finish: Plain or Electro-Galvanized

Order By: Figure number and finish

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

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



Set Screw and Locknut Included



Part No.	For Rod Size	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
65XT	3/8"-16	28.0	(12.7)

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

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

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

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

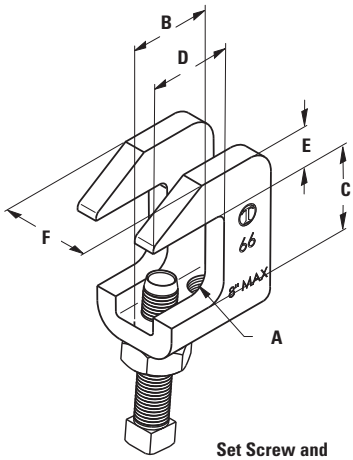
Function: Recommended for hanging from steel beam where flange thickness does not exceed 1 1/4" (31.7mm).

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

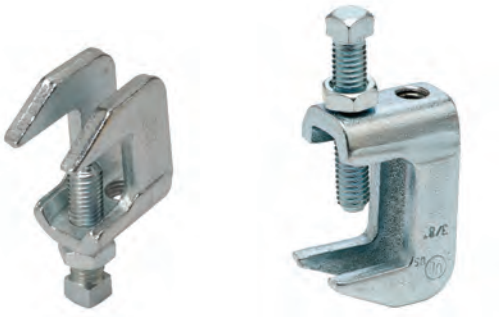
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL).** Exceeds requirements of the National Fire Protection Association **(NFPA**), pamphlet 13,
3/8"-16 rod will support 1/2" (15mm) thru 4" (100mm) pipe
1/2"-13 rod will support thru 8" (200mm) pipe

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

Order By: Figure number and finish



Set Screw and Locknut Included



Part No.	Rod Size A	B in.	B (mm)	C in.	C (mm)	D in.	D (mm)	E in.	E (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.	F (mm)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
66-3/8	1"	(25.4)	28	(12.7)
66-1/2	1 1/4"	(31.7)	55	(24.9)
66-5/8	1 1/4"	(31.7)	55	(24.9)

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

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

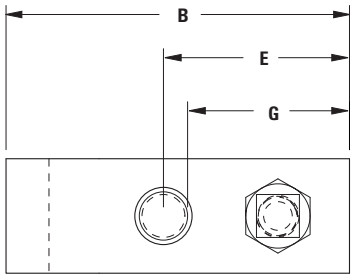
Features: All steel construction eliminates structural deficiencies associated with casting type beam clamps. May be used on top or bottom flange of beam. May be installed with set screw in up or down position. Offset design permits unlimited rod adjustment by allowing the rod to be threaded completely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

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

3/8"-16 rod will support 1/2" (15mm) thru 4" (100mm) pipe at maximum NFPA 13 spacing

1/2"-13 rod will support thru 8" (200mm) pipe at maximum NFPA 13 spacing

Order By: Figure number and stainless steel type.



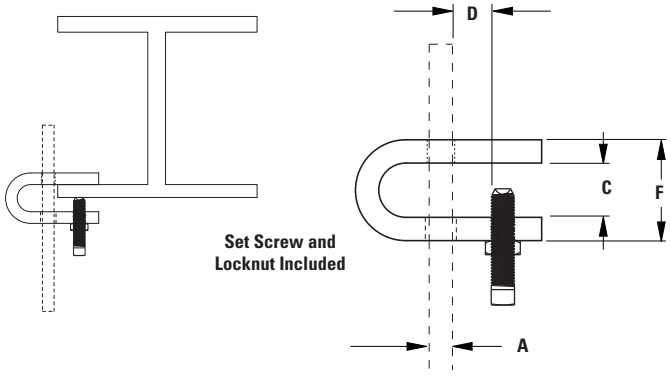


Fig. 67SS

Part No.	Rod Size A	Pipe Size in.	Pipe Size (mm)	B in.	B (mm)	C in.	C (mm)	D in.	D (mm)	E in.	E (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.	F (mm)	G in.	G (mm)	Approx. Wt./100 Lbs.	Approx. Wt./100 (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.	Pipe Size (mm)	B in.	B (mm)	C in.	C (mm)	D in.	D (mm)	E in.	E (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.	F (mm)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
68SS-3/8	2"	(50.8)	84	(38.1)
68SS-1/2	2 1/4"	(57.1)	170	(77.1)



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

TOLCO™ Fig. 69 - Beam Clamp Retaining Strap

Size Range: 3/8"-16 thru 3/4"-10 rod
4" (101.6mm) thru 16" (406.4mm) lengths
Note: longer lengths are available consult factory

Material: Pre-Galvanized Steel

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

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

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

Finish: Pre-Galvanized

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

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

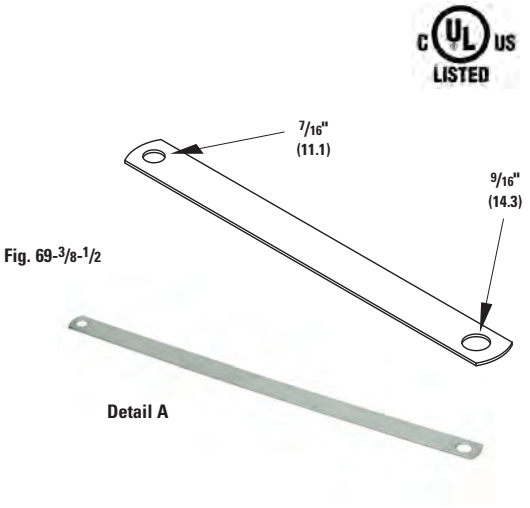


Fig. 69-3/8-1/2

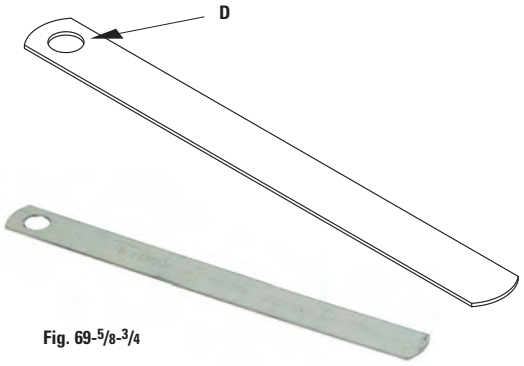
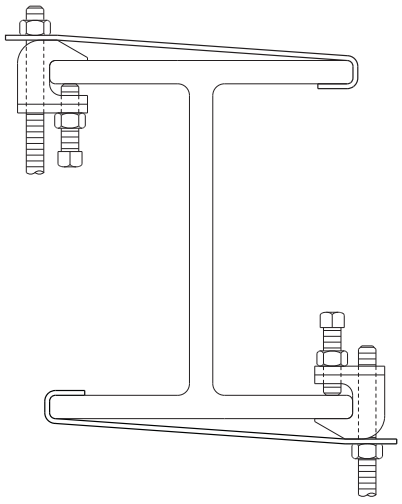


Fig. 69-5/8-3/4

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



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

TOLCO™ 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.

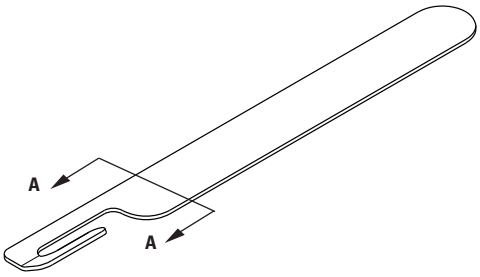
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL).** Approved for use with any listed B-Line series or Tolco beam clamp.

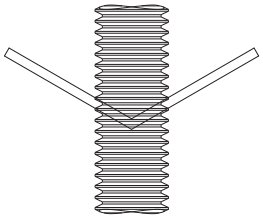
Finish: Pre-Galvanized

Order By: Figure number, length, and finish.

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

*** Patent #5,947,424**

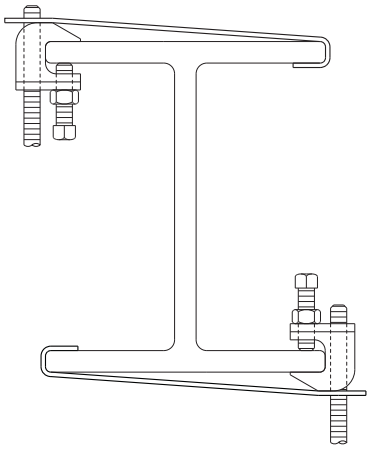


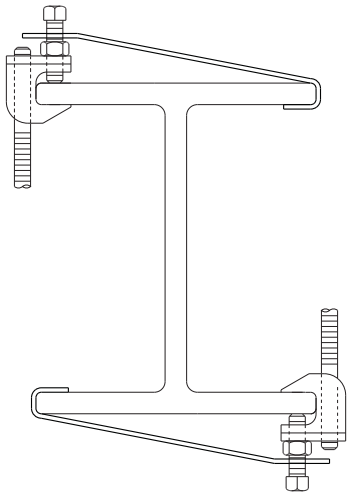


A - A



Part No.	Slot Width in.	Slot Width (mm)	For Use With	Length
69R-3/8-L	7/16"	(11.1)	B3033-3/8, B3034-3/8, 65-3/8, 65XT-3/8, 66-3/8	Specify
69R-1/2-L	9/16"	(14.3)	B3033-1/2, B3034-1/2, 65-1/2, 66-1/2	Specify





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

B3042T - Bar Joist Hanger

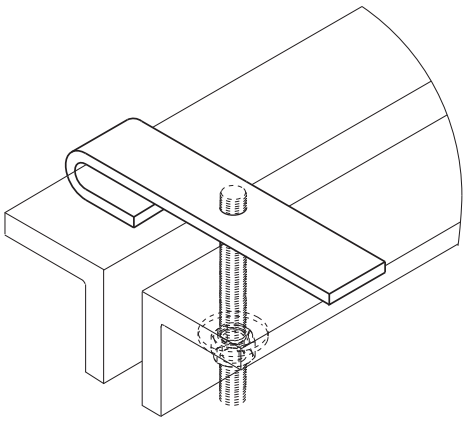
Size Range: 3/8"-16 and 1/2"-13 rod

Material: Steel

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

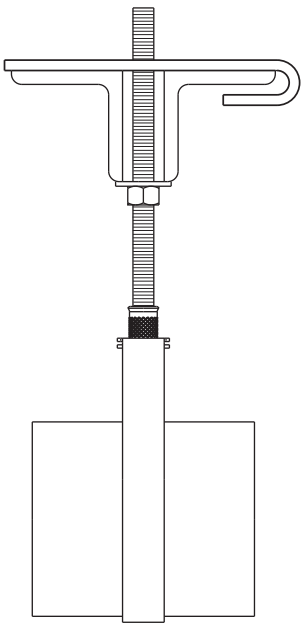
Finish: Plain. Contact customer service for alternative finishes and materials.

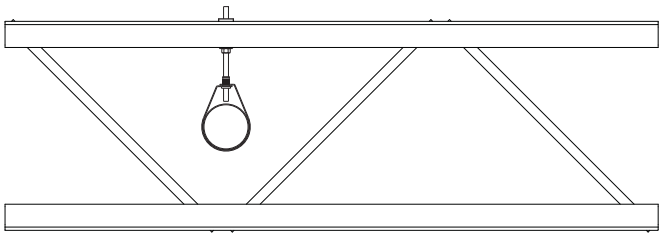
Order By: Figure number, rod size, width and thickness of bar joist, and finish.





Part No.	Rod Size 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)





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

TOLCO™ Fig. 130 - Composite Wood Joist Clamp

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

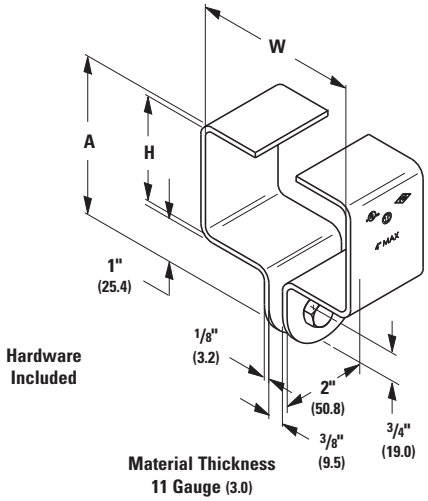
Material: Steel

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

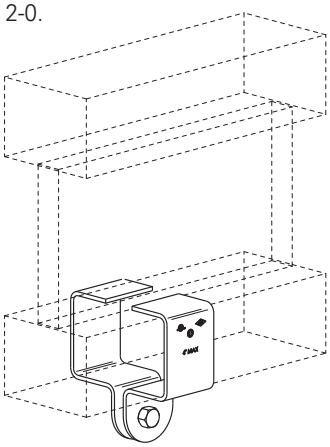
Approvals: Sizes 1 - 6 are Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** list through 4" (100mm) pipe. All Fig. 130 Beam Clamps meet requirements of Factory Mutual Engineering **(FM)** and NFPA 13, through 4" (100mm) pipe.

Finish: Electro-Galvanized or Hot-Dip Galvanized

Order By: Figure number and finish.



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





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

'H' and 'W' are beam dimensions.
† Larger bolts and I-rods are required for 5" (125mm) and 6" (150mm) pipe sizes

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

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

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

Material: Steel

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

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

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

Maximum Temperature: 650°F (343°C).

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

Order By: Figure number and finish.
For pipe sizes under 2 1/2" (65mm) order B3100 Clevis Hanger, see chart below.

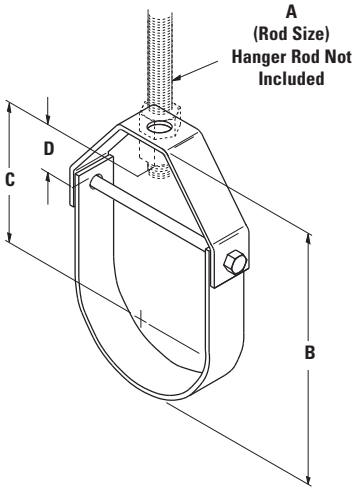
Designed to meet or exceed requirements of FM DS 2-0.



B
Overall Height.

C
Bottom of hanger rod nut to center of pipe.

D
Bottom of hanger rod nut to top clevis bolt.



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

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

TOLCO™ Fig. 1CBS - Clevis Bolt Spacer

OPM

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

Material: Steel

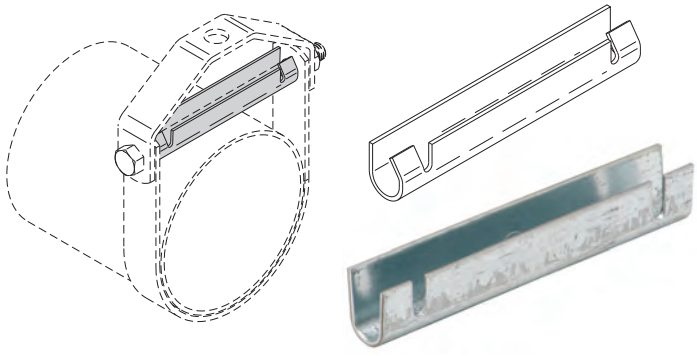
Function: Used as a spacer at a seismic brace location to keep clevis hanger from collapsing during seismic event.

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

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

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

Order By: Figure number and finish.



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

TOLCO™ Fig. 25 - Surge Restrainer

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

Material: — Pre-Galvanized Steel

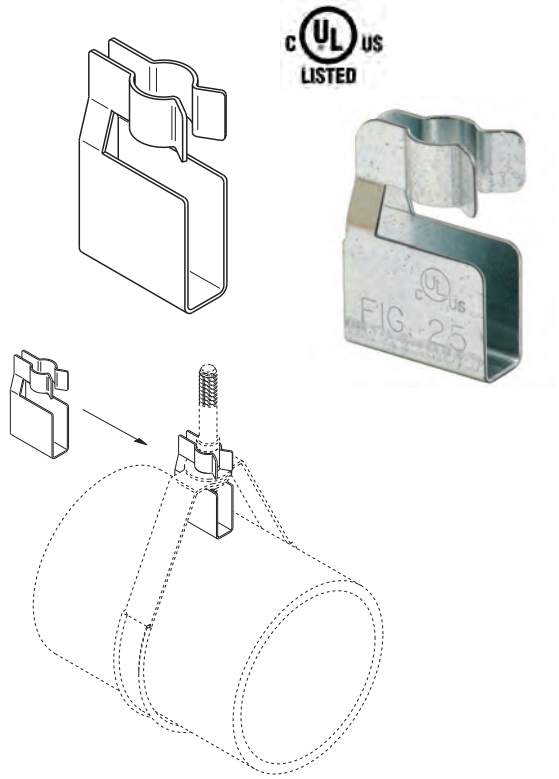
Function: — Designed to be used in conjunction with Fig. 200 band hangers to restrict the upward movement of piping as it occurs during sprinkler head activation or earthquake type activity. The surge restrainer is easily and efficiently installed by snapping into a locking position on the band hanger.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

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

Finish: Pre-Galvanized

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

Patent #5,344,108



Part No.	Approx. Wt./100 lbs.	(kg)
25	4.8	(2.2)

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

TOLCO™ Fig. 200 - "Trimline" Adjustable Band Hanger
TOLCO™ Fig. 200F - "Trimline" Adjustable Band Hanger with Felt Lining for Copper Tubing
TOLCO™ Fig. 200C - "Trimline" Adjustable Band Hanger with Plastic Coated
TOLCO™ Fig. 200S - "Trimline" Adjustable Band Hanger with Removable Nut (For sizes 1" thru 2")

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

Material: Steel, Pre-Galvanized

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

Features:

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

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

Maximum Temperature: 650°F (343°C)

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

Order By: Part number and pipe size

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

A
Overall Height

B
Center of pipe to top of knurled hanger rod nut.

D
Top of pipe to bottom of hanger rod nut.

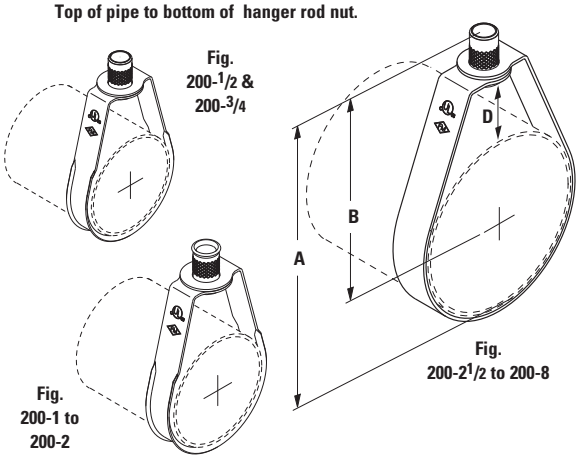




Fig. 200C
200C-1 1/2 shown



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



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



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

Part No.**	Pipe Size in.	(mm)	Rod Size in.	mm**	A in.	(mm)	B in.	(mm)	D in.	(mm)	Max. Rec. Load lbs.	(kN)	Approx. Wt./100 lbs.	(kg)
200-1/2	1/2"	(15)	3/8"-16	M8 or M10	3 1/8"	(79.4)	2 5/8"	(66.7)	1 11/32"	(34.1)	400	(1.78)	11	(5.0)
200-3/4	3/4"	(20)	3/8"-16	M8 or M10	3 1/8"	(79.4)	2 1/2"	(63.5)	1 1/16"	(27.0)	400	(1.78)	11	(5.0)
200-1	1"	(25)	3/8"-16	M8 or M10	3 3/8"	(85.7)	2 5/8"	(66.7)	1 1/8"	(28.6)	400	(1.78)	12	(5.5)
200-1 1/4	1 1/4"	(32)	3/8"-16	M8 or M10	3 3/4"	(94.0)	2 7/8"	(73.0)	1 5/32"	(29.3)	400	(1.78)	13	(5.9)
200-1 1/2	1 1/2"	(40)	3/8"-16	M8 or M10	3 7/8"	(98.4)	2 7/8"	(73.0)	1 3/16"	(30.2)	400	(1.78)	14	(6.4)
200-2	2"	(50)	3/8"-16	M8 or M10	4 1/2"	(114.3)	3"	(76.3)	1 3/16"	(30.2)	400	(1.78)	15	(6.9)
200-2 1/2	2 1/2"	(65)	3/8"-16	M10	5 5/8"	(142.9)	4 1/8"	(104.7)	1 7/16"	(36.5)	600	(2.67)	27	(12.3)
200-3	3"	(75)	3/8"-16	M10	5 7/8"	(149.1)	4"	(101.6)	1 1/4"	(31.7)	600	(2.67)	29	(13.3)
200-3 1/2	3 1/2"	(90)	3/8"-16	M10	7 3/8"	(187.3)	5 1/4"	(133.3)	2 3/16"	(55.6)	600	(2.67)	34	(15.6)
200-4	4"	(100)	3/8"-16	M10	7 3/8"	(187.3)	5"	(127.0)	1 3/8"	(34.9)	1000	(4.45)	35	(16.0)
200-5	5"	(125)	1/2"-13	M12	9 1/8"	(231.8)	6 1/4"	(158.7)	3 11/32"	(84.9)	1250	(5.56)	66	(30.2)
200-6	6"	(150)	1/2"-13	M12	10 1/8"	(257.2)	6 3/4"	(171.4)	2 7/32"	(56.3)	1250	(5.56)	73	(33.4)
200-8	8"	(200)	1/2"-13	M12	13 1/8"	(333.4)	8 3/4"	(222.2)	3 7/32"	(81.7)	1250	(5.56)	136	(62.3)

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

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

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

Material: Steel — Pre-Galvanized

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

Features: Furnished with 3/8"-16 or 1/2"-13 adjusting threaded ring nut.

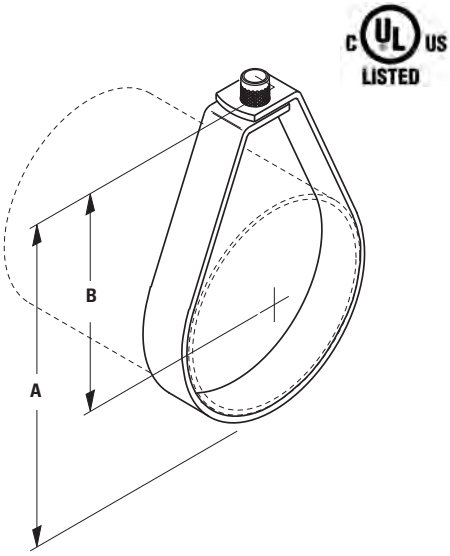
Approvals: Underwriters Laboratories listed in the USA **(UL)** and Canada **(cUL)**. Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 10 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 10.

Maximum Temperature: 650°F (343°C)

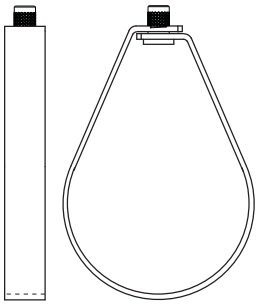
Finish: Pre-Galvanized

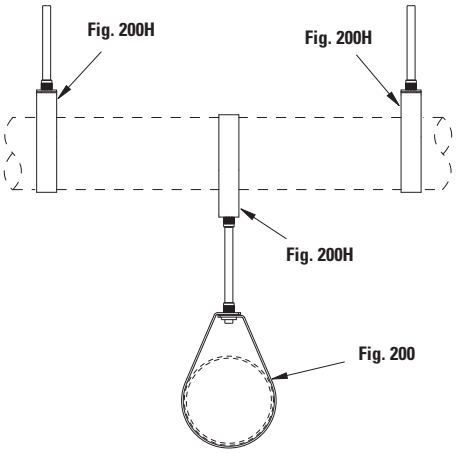
Order By: Figure number, pipe size and rod size.

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"	(1116.7)	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

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

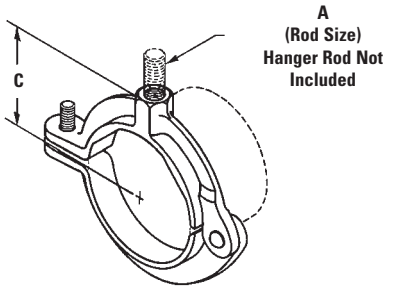
Material: Malleable Iron

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

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

Standard Finish: Plain or Electro-Galvanized

Order By: Figure number and finish.



Part No.	Pipe Size in.	(mm)	Rod Size A	C in.	(mm)	Design Load Lbs.	kN	Approx. Wt./100 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	1 1/16"	(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	1 11/32"	(34.1)	180	(.80)	13	(5.9)
B3198H-1 1/4	1 1/4"	(32)	3/8"-16	1 19/32"	(39.7)	180	(.80)	18	(8.1)
B3198H-1 1/2	1 1/2"	(40)	3/8"-16	1 23/32"	(43.6)	180	(.80)	21	(9.5)
B3198H-2	2"	(50)	3/8"-16	2"	(50.8)	180	(.80)	44	(19.9)
B3198H-2 1/2	2 1/2"	(65)	1/2"-13	2 11/32"	(59.5)	300	(1.33)	73	(33.1)
B3198H-3	3"	(80)	1/2"-13	2 23/32"	(69.0)	300	(1.33)	95	(43.1)



B3198HCT - Hinged Extension Split Pipe Clamp

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

Material: Malleable Iron

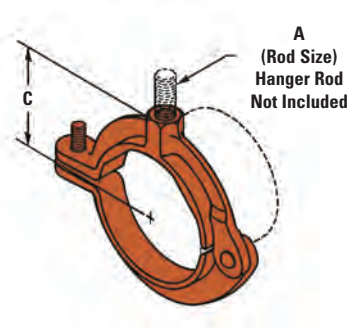
Function: A rigid support to suspend tubing horizontally or vertically.

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

Standard Finish: DURA-COPPER™

Order By: Figure number and finish.





Part No.	Tubing Size in.	(mm)	Rod Size A	C in.	(mm)	Design Load Lbs.	(kN)	Approx. Wt./100 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-1 1/4	1 1/4"	(32)	3/8"-16	1 1/8"	(28.6)	180	(.80)	14	(6.3)
B3198HCT-1 1/2	1 1/2"	(40)	3/8"-16	1 9/16"	(39.7)	180	(.80)	18	(8.1)
B3198HCT-2	2"	(50)	3/8"-16	1 7/8"	(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.

TOLCO™ Fig. 120 - "U" Hanger

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

Material: Steel

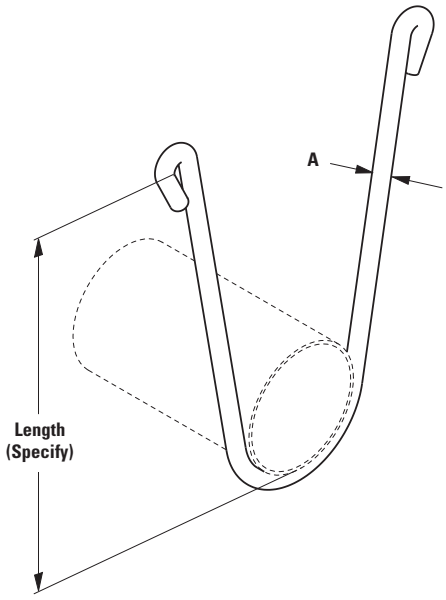
Function: Used to support piping from wood beams where no contraction is expected. Used extensively in automatic fire sprinkler systems.

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

Maximum Temperature: 750°F (399°C)

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

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





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

* Drive Screw
** Lag Bolt

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

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

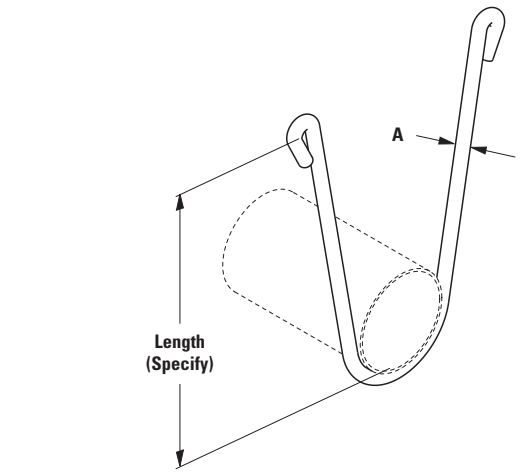
Size Range: Size 3/4" (20mm) thru 8" (200mm) pipe

Material: Steel

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

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

Order By: Figure number, side length and finish





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

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

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

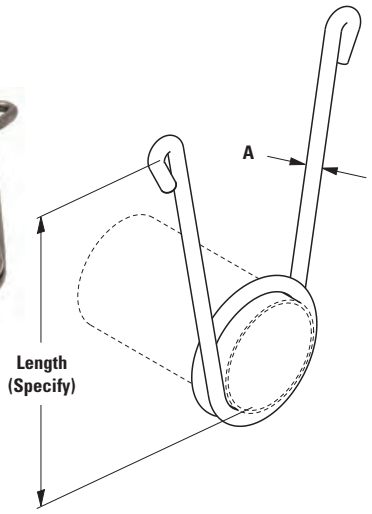
Material: Steel

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 customer service for alternative finishes and materials.

Order By: Figure number, side length and finish





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

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

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

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

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

Material: Steel

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

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

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

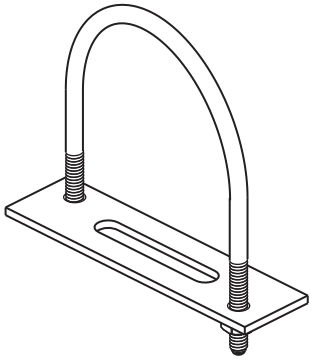
Finish: Plain and Galvanized. Contact customer service for alternative finishes and materials.

Order By: Figure number, type numbers and pipe size

Ordering Note: Order by the following type and pipe size:
Type 1 — (1" (25mm) and 1 1/4" (32mm) pipe size)
Type 2 — (1 1/2" (40mm) and 2" (50mm) pipe size)
Type 3 — (2 1/2" (65mm) and 3" (80mm) pipe size)
Type 4 — (4" (100mm) pipe size)
Type 6 — (5" (125mm) and 6" (150mm) pipe size)

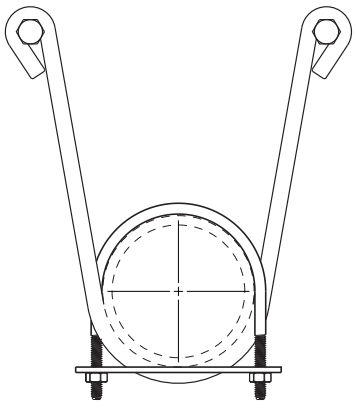
Important Note: The bracing slot feature is sized to fit the U-Hanger rod schedule as required by NFPA 13 as follows:

5/16" (7.9mm) rod for up to 2" (50mm) pipe
3/8" (9.5mm) rod for 2 1/2" (65mm) - 6" (160mm) pipe
For other rod size requirements consult factory.





Part No.	Type	Pipe Size 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
B3373C - PVC Coated Standard Riser Clamp

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

Material: Steel

Function: Used for supporting vertical piping.

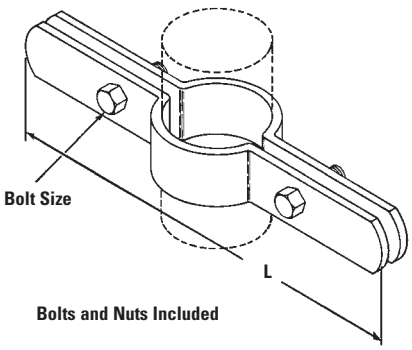
Approvals: Underwriters Laboratories Listed in the USA **(UL)**, Canada **(cUL)** 3/4" (20mm) - 8" (200mm). Factory Mutual Engineering Approved **(FM)**, 3/4" (20mm) thru 8" (200mm). Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 8, and Manufacturers Standardization Society ANSI/MSS SP-69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

Maximum Temperature: 650°F (343°C)

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

Order By:
Figure number, pipe size and finish.

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



Bolts and Nuts Included

B3373C





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

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

B3140 - Standard Pipe Clamp
B3140C - Standard Pipe Clamp PVC Coated
B3140F - Standard Pipe Clamp Felt Lined

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

Material: Steel

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

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

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

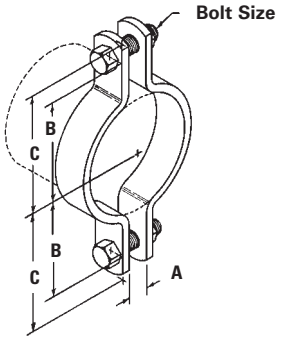
Maximum Temperature: — 750°F (399°C)

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

Order By: Figure number, pipe size and finish.

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

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





B3140



B3140C



B3140F

Part No.	Pipe Size 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)	1 17/32"	(38.9)	5/16"-18	30	(13.6)
B3140-3/4	3/4"	(20)	9/16"	(14.3)	1 3/32"	(27.8)	1 21/32"	(42.0)	5/16"-18	31	(14.0)
B3140-1	1"	(25)	9/16"	(14.3)	1 5/16"	(33.3)	1 7/8"	(47.6)	5/16"-18	33	(14.5)
B3140-1 1/4	1 1/4"	(32)	17/32"	(13.5)	1 7/16"	(36.5)	2"	(50.8)	5/16"-18	39	(17.7)
B3140-1 1/2	1 1/2"	(40)	19/32"	(15.1)	1 21/32"	(42.0)	2 7/32"	(56.4)	5/16"-18	41	(18.6)
B3140-2	2"	(50)	9/16"	(14.3)	2 1/8"	(54.0)	2 3/4"	(69.8)	1/2"-13	118	(53.5)
B3140-2 1/2	2 1/2"	(65)	5/8"	(15.9)	2 21/32"	(67.5)	3 9/32"	(83.3)	1/2"-13	130	(58.9)
B3140-3	3"	(75)	5/8"	(15.9)	2 15/16"	(74.6)	3 9/16"	(90.5)	1/2"-13	150	(68.0)
B3140-3 1/2	3 1/2"	(90)	5/8"	(15.9)	3 5/32"	(80.1)	3 25/32"	(96.0)	1/2"-13	158	(71.6)
B3140-4	4"	(100)	3/4"	(19.0)	3 9/16"	(90.5)	4 5/16"	(109.5)	5/8"-11	239	(108.4)
B3140-5	5"	(125)	3/4"	(19.0)	4 1/8"	(104.8)	4 7/8"	(123.8)	5/8"-11	272	(123.4)
B3140-6	6"	(150)	7/8"	(22.2)	4 15/16"	(125.4)	5 13/16"	(147.6)	3/4"-10	541	(245.4)
B3140-8	8"	(200)	1"	(25.4)	6 1/16"	(154.0)	6 15/16"	(176.2)	3/4"-10	642	(291.2)
B3140-10	10"	(250)	1"	(25.4)	7 3/8"	(187.3)	8 11/16"	(220.7)	7/8"-9	1366	(619.6)
B3140-12	12"	(300)	1"	(25.4)	8 7/16"	(214.3)	9 3/4"	(247.6)	7/8"-9	1543	(699.9)

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

B2400 - Standard Pipe Strap

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

Material: Steel

Function: Designed for supporting pipe runs from strut supports.

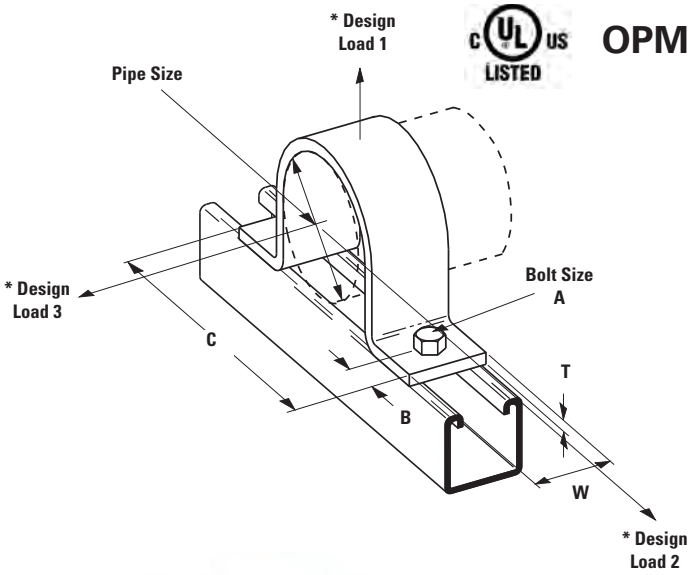
Approvals: Underwriters Laboratories Listed **(UL)**, Canada **(cUL)** for B2400-3/4" thru B2400-8". Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 26 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 26. Included in our Seismic Engineering Guidelines approved by the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

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

Order By: Figure number, pipe size and finish

Note: Ductile iron sizes available.
Special "B" dimensions available on request, consult factory.

OPM





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)	11/16"	(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)	11/16"	(17.4)	6 5/32"	(156.3)	1/4"	(6.3)	1 5/8"	(41.3)
B2400-3	3"	(80)	7/16"	(11.1)	11/16"	(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)	11/16"	(17.4)	7 9/32"	(184.9)	1/4"	(6.3)	1 5/8"	(41.3)
B2400-4	4"	(100)	9/16"	(14.3)	11/16"	(17.4)	7 25/32"	(197.6)	1/4"	(6.3)	1 5/8"	(41.3)
B2400-5	5"	(125)	9/16"	(14.3)	11/16"	(17.4)	8 7/8"	(225.4)	1/4"	(6.3)	1 5/8"	(41.3)
B2400-6	6"	(150)	9/16"	(14.3)	11/16"	(17.4)	9 15/16"	(252.4)	1/4"	(6.3)	1 5/8"	(41.3)
B2400-8	8"	(200)	9/16"	(14.3)	11/16"	(17.4)	11 31/32"	(304.0)	1/4"	(6.3)	1 5/8"	(41.3)

For larger sizes, consult the full line pipe hanger catalog.
* See OPM-0052-13 for design loads.

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

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

Material: Pre-Galvanized Steel

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

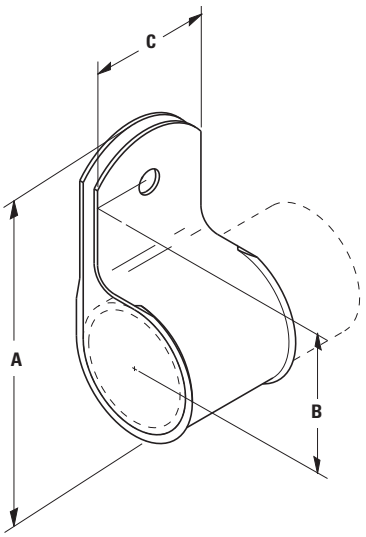
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (1) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA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

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

Finish: Pre-Galvanized

Order By: Figure number and pipe size.

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





Part No.	CPVC 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)	2 7/16"	(61.9)	1 5/16"	(33.3)	1 3/16"	(30.2)	5'-6"	(1.67)	5/16"	(7.9)	9	(4.1)
22-1	1"	(25)	2 11/16"	(68.3)	1 7/16"	(36.5)	1 3/16"	(30.2)	6'-0"	(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)	1 3/16"	(30.2)	6'-6"	(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)	1 3/16"	(30.2)	7'-0"	(2.13)	5/16"	(7.9)	12	(5.4)
22-2	2"	(50)	3 3/4"	(95.2)	2 1/8"	(54.6)	1 3/16"	(30.2)	8'-0"	(2.44)	5/16"	(7.9)	15	(6.8)

Reduced Spacing For IPS Pipe

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

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

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

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

Material: Pre-Galvanized Steel

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

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

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

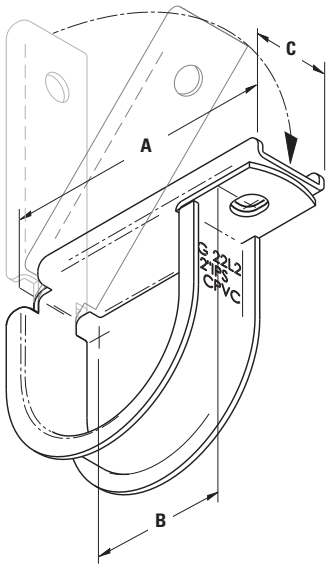
For Concrete Installation — UL requires a minimum test load of 340 lbs for CPVC hangers and 750 lbs for steel pipe hangers; verify anchors meet or exceed these requirements.

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

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

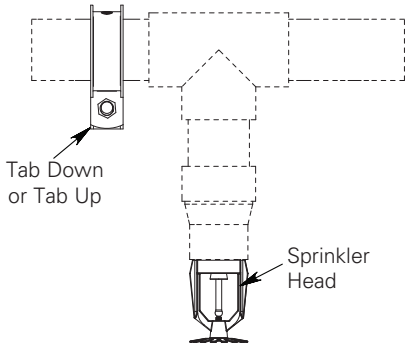
Finish: Pre-Galvanized

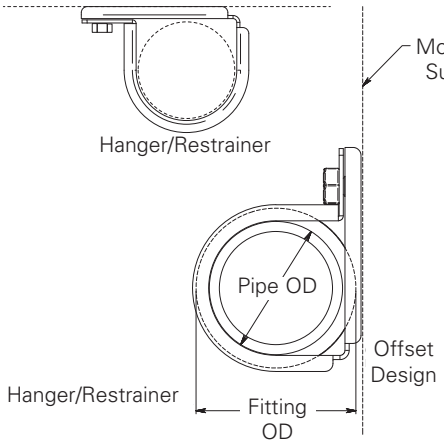
Order By: Part number





Patent Pending







Part No.	CPVC or Steel 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)	15/16"	(23.8)	3/4"	(19.0)	5 1/2	(1.67)	NA	(NA)	9	(4.1)
22L2-1	1"	(25)	2 1/2"	(63.5)	1 1/8"	(28.6)	3/4"	(19.0)	6	(1,83)	12	(3.66)	9	(4.1)
22L2-1 1/4	1 1/4"	(32)	2 13/16"	(71.4)	1 1/4"	(31.7)	3/4"	(19.0)	6 1/2	(1.98)	12	(3.66)	11	(5.0)
22L2-1 1/2	1 1/2"	(40)	3 1/8"	(79.4)	1 7/16"	(36.5)	3/4"	(19.0)	7	(2.13)	15	(4.57)	12	(5.4)
22L2-2	2"	(50)	3 9/16"	(90.5)	1 5/8"	(41.3)	3/4"	(19.0)	8	(2.44)	15	(4.57)	15	(6.8)

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

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

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

Material: Pre-Galvanized Steel

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

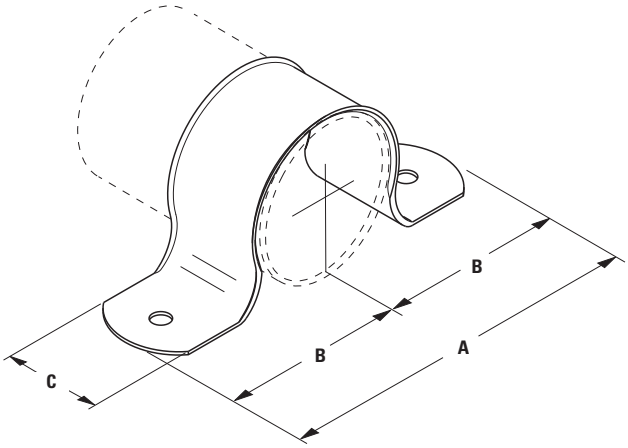
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** sizes 3/4" (20mm) thru 2" (50mm) to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (2) 1/4" x 1" tek type screw. Meets and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

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

Finish: Pre-Galvanized

Order By: Figure number and pipe size

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





Part No.	CPVC 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)

Reduced Spacing For IPS Pipe

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

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

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

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

Material: Pre-Galvanized Steel

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

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

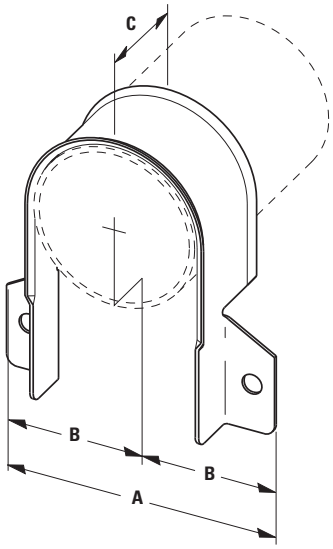
Features: Fig. 24 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. Easily attaches to the building structure using the two UL Listed hex head self threading screws* furnished with the product. It is recommended that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

Finish: Pre-Galvanized

Order By: Figure number and pipe size

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





Part No.	CPVC 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)	2 5/16"	(58.7)	1 5/32"	(27.8)	1 3/16"	(30.2)	5 1/2	(1.67)	5/16"	(7.9)	9	(4.1)
24-1	1"	(25)	2 5/8"	(66.7)	1 5/16"	(33.3)	1 3/16"	(30.2)	6	(1.83)	5/16"	(7.9)	9	(4.1)
24-1 1/4	1 1/4"	(32)	3"	(76.2)	1 1/2"	(38.1)	1 3/16"	(30.2)	6 1/2	(1.98)	5/16"	(7.9)	11	(5.0)
24-1 1/2	1 1/2"	(40)	3 1/4"	(82.5)	1 5/8"	(42.3)	1 3/16"	(30.2)	7	(2.13)	5/16"	(7.9)	12	(5.4)
24-2	2"	(50)	3 11/16"	(93.7)	1 27/32"	(43.6)	1 3/16"	(30.2)	8	(2.44)	5/16"	(7.9)	15	(6.8)

Reduced Spacing For IPS Pipe

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

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

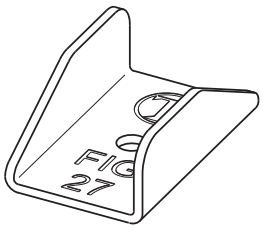
TOLCO™ Fig. 27B - Speed Nut

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

Material: — Steel

Finish: — Pre-Galvanized (Zinc)

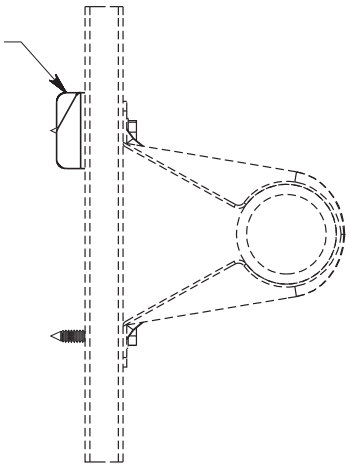
Function: — To be used anywhere a screw cannot achieve full embedment due to thickness of wood structural material when installed. Fig. 27B allows full pull out load capacity of screws when installed to the standard screws supplied with all CPVC hangers (Fig. 22, Fig. 22L2, Fig. 23, Fig. 24, Fig. 28,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



Part No.
27B

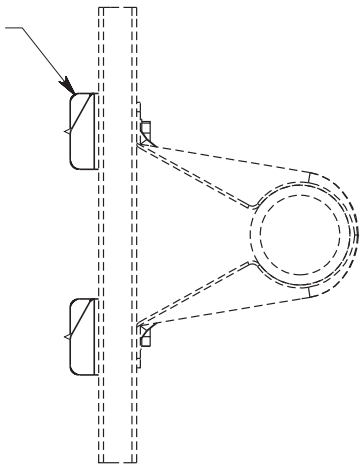


Fig. 27B
(1) Required High Side of Hanger Application



Hanger Application

Fig. 27B
(2) Required



Hanger and Restraint Application

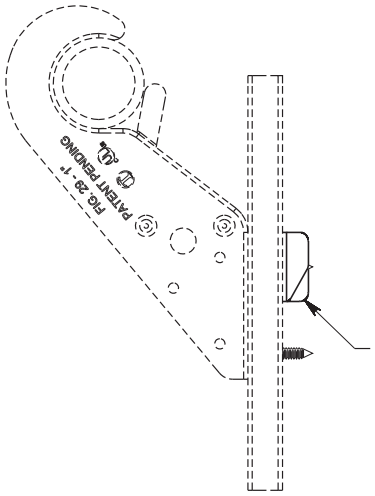


Fig. 27B
(1) Required High Side of Hanger Application

Hanger Application

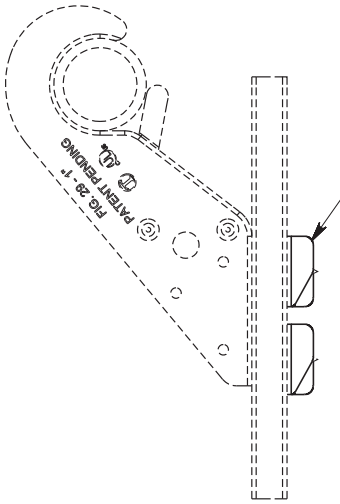


Fig. 27B
(2) Required

Hanger and Restraint Application

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

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

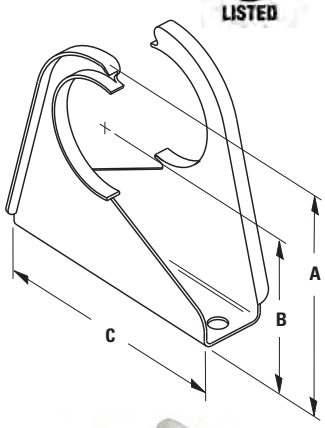
Size Range: — 3/4" (20mm) through 2" (50mm)

Material: — Steel, Pre-Galvanized

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

Features:

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

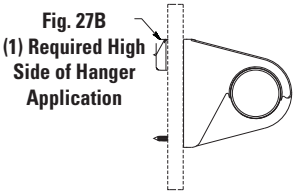




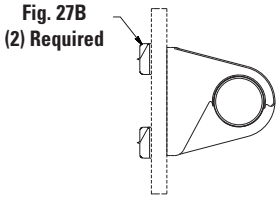
Approvals: — Underwriters Laboratory Listed in the USA **(UL)** and Canada **(cUL)** to support automatic fire sprinkler systems. May be installed into wood using fasteners supplied with product, or into minimum 18 gauge steel using (2) 1/4" x 1" tek type screws. Meets and exceeds the requirements of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

Order by: — Figure number and pipe size.

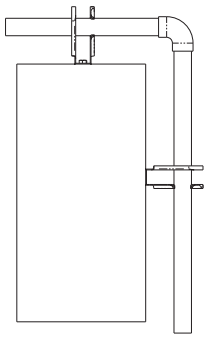
Pat. # 7,455,268, Pat. # 7,832,248

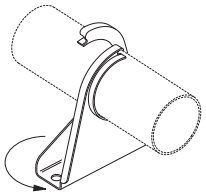


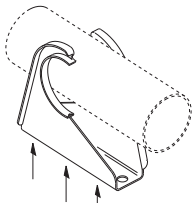
Hanger Application

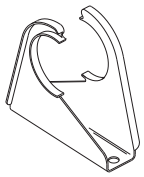


Hanger and Restraint Application





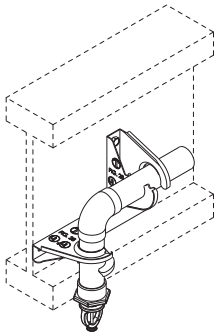




Part No.	CPVC Pipe Size in.	(mm)	A in.	(mm)	B in.	(mm)	C in.	(mm)	Max Hanger Spacing Ft.	(m)	Approx. Wt./100 lbs.	(kg)
28-3/4	3/4"	(20)	3 1/32"	(77.0)	2"	(50.8)	3 1/2"	(88.9)	5 1/2	(1.67)	18	(8.1)
28-1	1"	(25)	3 5/16"	(84.1)	2 3/16"	(55.6)	3 1/2"	(88.9)	6	(1.83)	21	(9.5)
28-1 1/4	1 1/4"	(32)	3 5/8"	(92.1)	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)

Reduced Spacing For IPS Pipe

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



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

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

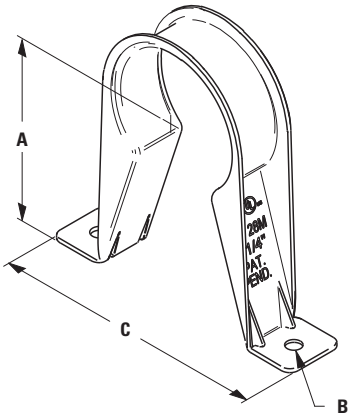
Size Range: 3/4" (20mm) thru 2" (32mm)

Material: Steel, Pre-Galvanized

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

Features:

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



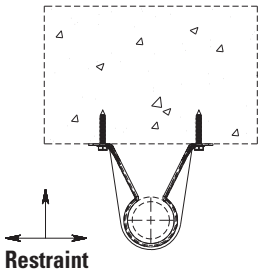
Installation Note: When installed in wood structural members and threads from the #10 x 1" screws are exposed, use Fig. 27B (page 36) speed nut to secure

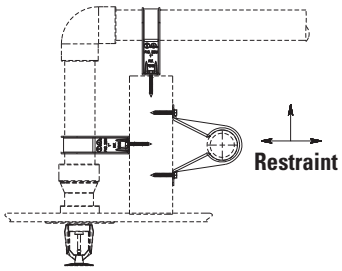
Approvals: Underwriters Laboratory Listed in the USA **(UL)** and Canada **(cUL)** to support automatic fire sprinkler systems.
May be installed into wood using fasteners screws.
Meets and exceeds the requirements of NFPA 13, 13R and 13D. Fig. 28M satisfies the UL vertical restraint requirements where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

Order By: Figure number and pipe size

Patent #7,744,042

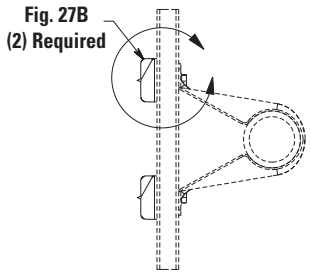






Part No.	CPVC Pipe Size in.	(mm)	A in.	(mm)	Hole Dia. B in.	(mm)	C in.	(mm)	Max Spacing* in.	(mm)	Approx. Wt./100 lbs.	(kg)
28M-3/4	3/4"	(20)	2"	(50.8)	3/16"	(4.8)	3 5/16"	(84.1)	5'-6"	(1676)	9	(4.1)
28M-1	1"	(25)	2 1/8"	(54.0)	3/16"	(4.8)	3 1/2"	(88.9)	6'-0"	(1829)	12	(5.4)
28M-1 1/4	1 1/4"	(32)	2 5/16"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

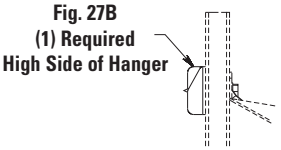
* Required per NFPA 13 for CPVC plastic pipe



Hanger and Restraint Application

Reduced Spacing For IPS Pipe

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



Detail A Hanger Application

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

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

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

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. If restraint is required, see Fig. 28M.

Features:

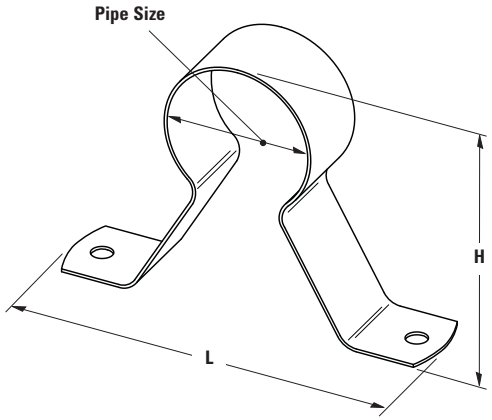
- Flared edge design protects CPVC pipe from any rough or abrasive surfaces
- The stand-off design eliminates the need for wood block extension
- Can be installed on horizontal or vertical piping regardless of mounting surface orientation
- Attaches easily to wood structure with two hex head self-threading 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 (page 36) 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)	2 9/16"	(65.1)	4 1/4"	(107.9)	5 1/2	(1.67)	5/16"	(7.9)	9.0	(4.1)
B3184-1	1"	(25)	2 13/16"	(71.4)	4 1/2"	(114.3)	6	(1,83)	5/16"	(7.9)	10.0	(4.5)
B3184-1 1/4	1 1/4"	(32)	3 3/16"	(81.0)	4 5/8"	(117.5)	6 1/2	(1.98)	5/16"	(7.9)	12.0	(5.4)
B3184-1 1/2	1 1/2"	(40)	3 7/16"	(87.3)	5"	(127.0)	7	(2.13)	5/16"	(7.9)	12.0	(5.4)
B3184-2	2"	(50)	3 7/8"	(98.4)	5"	(127.0)	8	(2.44)	5/16"	(7.9)	15.0	(6.8)

This product is cULus Listed as a hanger ONLY.
For hanger and restraint applications, please refer to Fig. 28 or Fig. 28M.

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

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

Material: Pre-Galvanized Steel

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

Features:

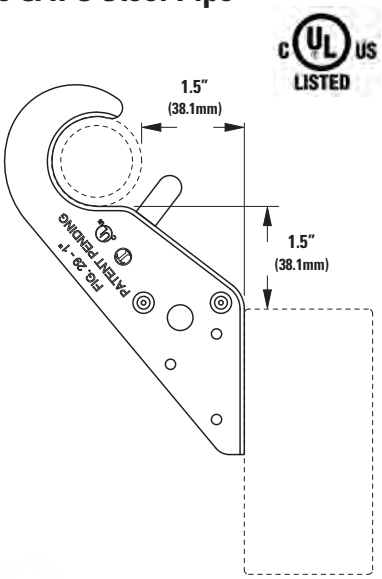
- Thumb tab provides protection to restrain pipe in rough job site conditions. Tab is not required to be bent for listed installation.
- Offset edge eliminates abrasion.
- Attaches easily to wood structure with two special #10 x 1" hex head self-threading screws furnished with product.
- Can be used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

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

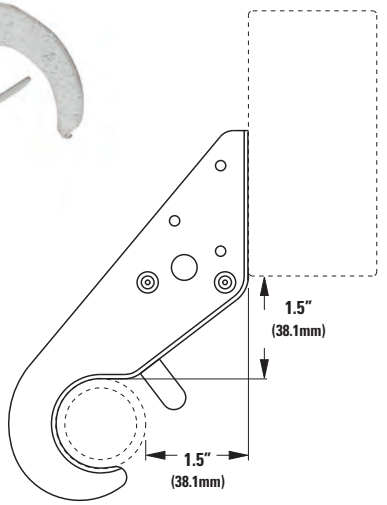
Finish: Pre-Galvanized

Order By: Figure number and pipe size.

Patent Pending



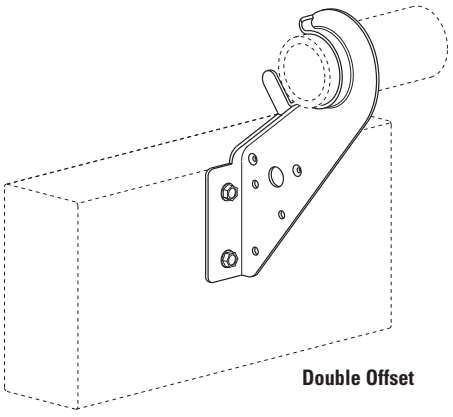




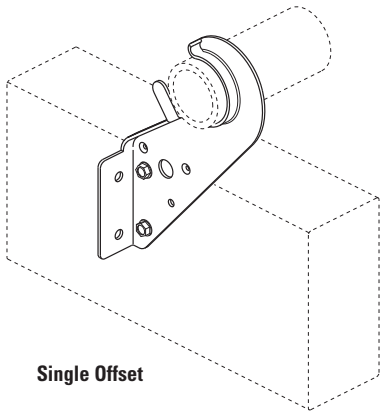
Part No.	CPVC Pipe size in.	(mm)	Max Hanger Spacing Ft.	(m)	Approx. Wt./100 lbs.	(kg)
29-3/4	3/4"	(20)	5'-6"	(1.67)	18	(8.1)
29-1	1"	(25)	6'-0"	(1.83)	19	(8.6)

Reduced Spacing For IPS Pipe

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



Double Offset



Single Offset

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

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

TOLCO™ Fig. 75 - Swivel Attachment

Size Range: — 3/8"-16 Rod Attachment

Material: Steel

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

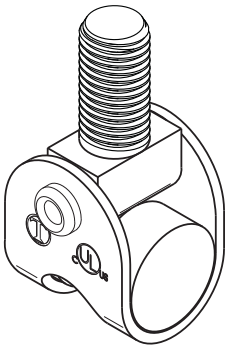
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** to support up to 4" (100mm) pipe.

Finish: Electro-Galvanized

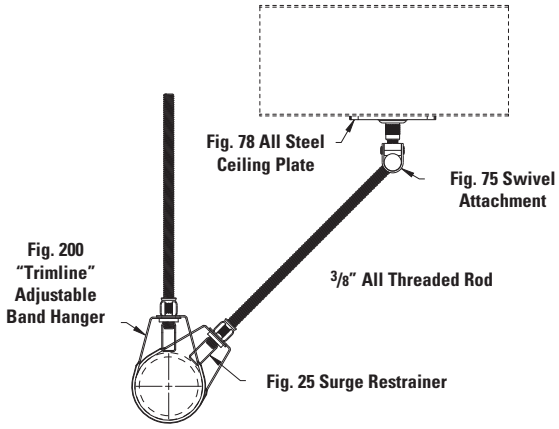
Weight: Approx. Wt./100 - 13.3 Lbs. (6.0kg)

Order By: Part number

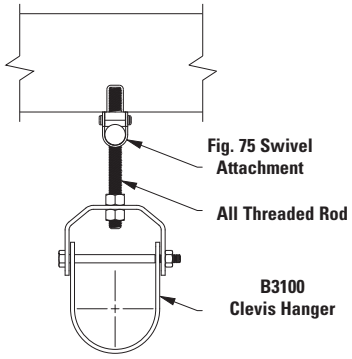
Patent: #7,887,248



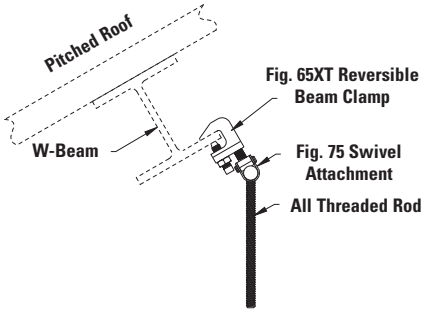




May be used as a structural attachment component of a branch line restraint



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



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

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

Fig. 76 - TOLCO™ Structural Attachment for Branch Line Restraint Assembly (UL Listed)

Size Range: ⅜" and ½" all threaded rod (ATR)

Material: Steel

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

Features: The Fig. 76 has multiple sized fastener holes to accommodate multiple types of fasteners for various types of structures (concrete, wood and steel) see table below. It can be bent in the field to accommodate multiple angles, but is supplied fixed at 45° to accommodate the most common installation configuration. Its open design allows easy inspection to verify thread engagement. It will fit both ⅜" and ½" all thread rod to accommodate changing field conditions when longer brace material is required. It is UL listed both as a restraint and as a hanger attachment for up to 4" (IPS) pipe size.

Installation Instructions: Follow fastener manufacturer and NFPA 13 guidelines to install appropriate fastener for the structural type (i.e. concrete, wood, steel). Install all thread rod (brace member) to TOLCO™ Fig. 76 structural attachment. Bottom out ATR to ensure full thread engagement. This can be visually confirmed due to the open thread design. For more information visit our website for the most up to date instructions sheets.

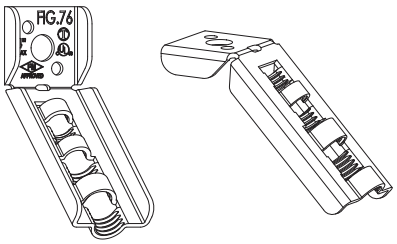
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. For FM Approval information refer to FM Approved page 43.

Finish: Pre-Galvanized.

Order By: Figure number.



Structural Attachment for Branch Line Restraint





Maximum Allowable Loads (UL Listed)

Part No.	⅜" Rod	½" Rod
Fig. 76	300 lbs.	300 lbs.

Loads shown are axial ASD loads.

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

Structure Type	Fastener Type	Fastener Diameter	Fastener Embedment	NFPA 13 (2013 & 2016) Reference
Concrete	Through Bolt	⅜"	N/A	9.1.3.10.1
Concrete	Post Installed Anchors	Various	Various	9.1.3 - 9.1.3.8
Steel	Through Bolt	⅜"	N/A	9.1.4.5.1
Steel	Beam Clamp	⅜"	N/A	UL Listed Beam Clamp with Retaining Strap
Wood	(1) ⅜" lag screw	⅜"	2 ½"	9.1.5.3.1
Wood	(2) #10 wood screws	#10	1″	

All Thread Rod Maximum Restraint Lengths

Rod Size (in)	Root Dia. (in)	Least Radius of Gyration r (in)	Maximum Unbraced Length L - (in.) l/r=100	l/r=200	l/r=300	l/r=400†	Max. Horizontal Load @ 45° (lbs.)** l/r=100	l/r=200	l/r=300	l/r=400†
⅜	0.300	0.075	7	14	22	30	300	186	82	44
½	0.404	0.101	10	20	30	40	300‡	300‡	152	85

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

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

‡Max load governed by Fig. 76/77 Max horizontal load.

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

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

Fig. 76 - TOLCO™ Structural Attachment for Sway Brace Assembly (FM Approved)

Size Range: ⅜" and ½" all threaded rod (ATR)

Material: Steel

Function: Structural attachment for restraint (sway brace) assembly

Features: The Fig. 76 has multiple sized fastener holes to accommodate multiple types of fasteners for various types of structures (steel, wood or concrete). It can be bent in the field to accommodate multiple angles, but is supplied fixed at 45° to accommodate the most common installation configuration. Its open design allows easy inspection to verify thread engagement. It will fit both ⅜" and ½" all thread rod to accommodate changing field conditions when longer brace material is required.

Installation Instructions: Follow fastener manufacturer and NFPA 13 guidelines to install appropriate fastener for the structural type (i.e. concrete, wood, steel). Install all thread rod (brace member) to TOLCO™ Fig. 76 structural attachment. Bottom out ATR to ensure full thread engagement. This can be visually confirmed due to the open thread design. For more information visit our website for the most up to date instructions sheets.

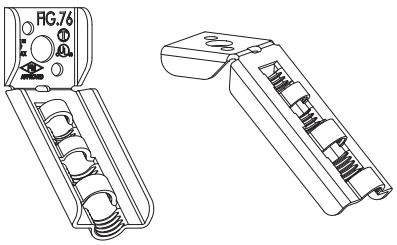
Approvals: Approved by Factory Mutual Engineering **(FM)**.
For UL Listed information refer to UL Listed page 42.

Finish: Pre-Galvanized.

Order By: Figure number.



Structural Attachment for Restraint (Sway Brace)





Maximum Allowable Loads (FM Approved)

Part No.	30°-44°		45°-59°		60°-74°		75°-90°	
	⅜" Rod lbs.	½" Rod lbs.	⅜" Rod lbs.	½" Rod lbs.	⅜" Rod lbs.	½" Rod lbs.	⅜" Rod lbs.	½" Rod lbs.
Fig. 76	380	420	530	580	800	1,020	750	1,110

Loads shown are axial ASD loads.

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

Structure Type	Fastener Type	Fastener Diameter	Fastener Embedment	NFPA 13 (2013 & 2016) Reference
Concrete	Through Bolt	⅜"	N/A	9.1.3.10.1
Concrete	Post Installed Anchors	Various	Various	9.1.3 - 9.1.3.8
Steel	Through Bolt	⅜"	N/A	9.1.4.5.1
Steel	Beam Clamp	⅜"	N/A	FM Approved Beam Clamp with Retaining Strap
Wood	(1) ⅜" lag screw	⅜"	2 ½"	9.1.5.3.1
Wood	(2) #10 wood screws	#10	1"	

All Thread Rod Maximum Restraint Lengths

Rod Size (in)	Root Dia. (in)	Least Radius of Gyration r (in)	Maximum Unbraced Length L - (in.)				Max. Horizontal Load @ 45° (lbs.)**			
			l/r=100	l/r=200	l/r=300	l/r=400†	l/r=100	l/r=200	l/r=300	l/r=400†
⅜	0.300	0.075	7	14	22	30	300	186	82	44
½	0.404	0.101	10	20	30	40	300‡	300‡	152	85

† l/r = 400 NFPA 13 2010, Sec 9.3.6.1 (5) † l/r = 400 NFPA 13 2013 & 2016,Sec 9.3.6.1 (5) & NFPA (2016) TABLE 9.3.11.8(a)(b)(c)(d)(e)(f)
**Per NFPA 13 (2013) Table 9.3.5.11.8 (a)(b)(c), consult for maximum allowable load information on ATR.
‡Max load governed by Fig. 76/77 Max horizontal load.

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

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

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

Size Range: ⅜" and ½" all threaded rod (ATR)

Material: Steel

Function: System attachment for restraint (sway brace) assembly

Features: The Fig. 77 is UL Listed to be used with both (IPS) steel and CPVC fire sprinkler pipe, in 1" through 2" diameters. It fits multiple rod diameters allowing for field adjustment if longer brace material is needed. Its sturdy break-off bolt will not strip and verifies proper installation. Its snap on design has many advantages. It can be installed with one-hand, can easily position the brace all thread rod over the top of the pipe being braced or underneath the pipe being braced to accommodate the desired brace angle. It can be fixed in place or moved to a new location by sliding along the pipe or snapping on or off and relocating. An entire prefabricated assembly (Fig. 76 & 77 joined with ATR) can be pre-assembled to save time and labor and later be field installed and adjusted to fit.

Installation Instructions: Install TOLCO™ Fig. 77 system attachment to sprinkler pipe branch line to be restrained. You can position with the rod engagement either above or below the sprinkler pipe. Rod must extend a min. of 1" (25.4) past the edge of the Fig. 77. The attachment can be slid along the pipe to position close to where the Fig. 76 structural attachment will be fastened to the structure. The snap on design allows maximum adjustability during this stage of the installation process. Engage ATR (previously attached to the Fig. 76 structural attachment to the rod engagement portion of the Fig. 77 system attachment. Tighten set bolt on Fig. 77 system attachment until head breaks off verifying proper installation torque. For more information visit our website for the most up to date instructions sheets.

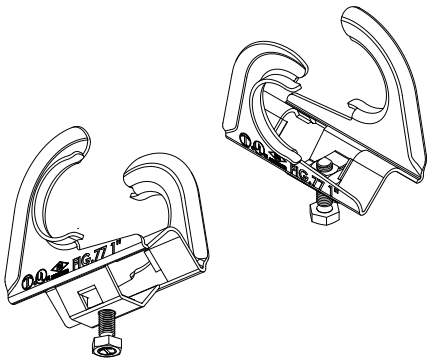
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. For FM Approved information refer to FM Approved page 45.

Finish: Pre-Galvanized.

Order By: Figure number and pipe size.



Pipe Attachment for Branch Line Restraint
Patent Pending





Part No.	Pipe Size in.	(mm)	Max.Design Loads (UL Listed) ⅜" Rod lbs.	(kN)	½" Rod lbs.	(kN)
77-1	1	(25)	300	(1.33)	300	(1.33)
77-1 1/4	1 1/4	(32)				
77-1 1/2	1 1/2	(40)				
77-2	2	(50)				

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

§ All other trademarks are property of their respective owners.

All Thread Rod Maximum Restraint Lengths

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

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

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

‡Max load governed by Fig. 76/77 Max horizontal load.

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

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

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

Size Range: ⅜" and ½" all threaded rod (ATR)

Material: Steel

Function: System attachment for restraint

Features: The Fig. 77 is to be used with both (IPS) steel and CPVC fire sprinkler pipe, in 1" through 2" diameters. It fits multiple rod diameters allowing for field adjustment if longer brace material is needed. Its sturdy break-off bolt will not strip and verifies proper installation. Its snap on design has many advantages. It can be installed with one-hand, can easily position the brace all thread rod over the top of the pipe being braced or underneath the pipe being braced to accommodate the desired brace angle. It can be fixed in place or moved to a new location by sliding along the pipe or snapping on or off and relocating. An entire prefabricated assembly (Fig. 76 & 77 joined with ATR) can be pre-assembled to save time and labor and later be field installed and adjusted to fit.



Pipe Attachment for Restraint (Sway Brace)
Patent Pending

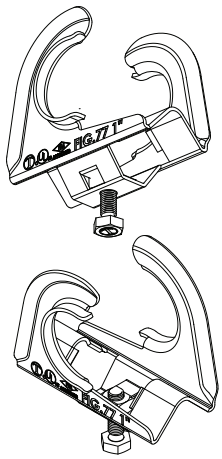
Installation Instructions: Install TOLCO™ Fig. 77 system attachment to sprinkler pipe branch line to be restrained. It can be positioned with the rod engagement either above or below the sprinkler pipe. Rod must extend a min. of 1" past the edge of the Fig. 77. The attachment can be slid along the pipe to position close to where the Fig. 76 structural attachment will be fastened to the structure. The snap on design allows maximum adjustability during this stage of the installation process. Engage ATR (previously attached to the Fig. 76 structural attachment to the rod engagement portion of the Fig. 77 system attachment. Tighten set bolt on Fig. 77 system attachment until head breaks off verifying proper installation torque. For more information visit our website for the most up to date instructions sheets.



Approvals: Approved by Factory Mutual Engineering **(FM)**.
For UL Listed information refer to UL Listed pag e 44.

Finish: Pre-Galvanized.

Order By: Figure number and pipe size.



Part No.	Pipe Size		Maximum Allowable Loads (FM Approved)*							
			30°-44°		45°-59°		60°-74°		75°-90°	
			⅜" Rod	½" Rod	⅜" Rod	½" Rod	⅜" Rod	½" Rod	⅜" Rod	½" Rod
	in.	(mm)	lbs. (kN)	lbs. (kN)	lbs. (kN)	lbs. (kN)	lbs. (kN)	lbs. (kN)	lbs. (kN)	lbs. (kN)
77-1	1	(25)	140 (0.62)	160 (0.71)	200 (0.89)	230 (1.02)	250 (1.11)	280 (1.24)	280 (1.24)	320 (1.42)
77-1¼	1¼	(32)	140 (0.62)	170 (0.75)	200 (0.89)	250 (1.11)	250 (1.11)	300 (1.33)	280 (1.24)	340 (1.51)
77-1½	1½	(40)	130 (0.58)	160 (0.62)	190 (0.84)	230 (1.02)	230 (1.02)	280 (1.24)	260 (1.15)	320 (1.42)
77-2	2	(50)	120 (0.53)	150 (0.67)	170 (0.75)	210 (0.93)	210 (0.93)	260 (1.15)	240 (1.07)	290 (1.29)

* Loads shown are axial ASD loads.

All Thread Rod Maximum Restraint Lengths

Rod Size	Root Dia.		Least Radius of Gyration r		Maximum Unbraced Length L - (in.)				Max. Horizontal Load @ 45° (lbs.)**			
					l/r=100	l/r=200	l/r=300Δ	l/r=400†Δ	l/r=100	l/r=200	l/r=300Δ	l/r=400†Δ
in.	in.	(mm)	in.	(mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	lbs. (kN)	lbs. (kN)	lbs. (kN)	lbs. (kN)
⅜-16	0.300	(7.6)	0.075	(1.9)	7 (177.8)	14 (355.6)	22 (558.8)	30 (763.0)	300 (1.33)	186 (0.82)	82 (0.36)	44 (0.19)
½-13	0.404	(10.2)	0.101	(2.5)	10 (254.0)	20 (508.0)	30 (762.0)	40 (1016.0)	300‡ (1.33)‡	300‡ (1.33)‡	152 (0.67)	85 (0.38)

† l/r = 400 NFPA 13 2010, Sec 9.3.6.1 (5) † l/r = 400 NFPA 13 2013 & 2016,Sec 9.3.6.1 (5) & NFPA (2016) TABLE 9.3.11.8(a)(b)(c)(d)(e)(f) Δ l/r = 300 for bracing

**Per NFPA 13 (2013) Table 9.3.5.11.8 (a)(b)(c), consult for maximum allowable load information on ATR. Δ l/r = 400 for restraint

‡Max load governed by Fig. 76/77 Max horizontal load.

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

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

TOLCO™ Fig. 3000 - CPVC Sway Brace Attachment

Size Range: Pipe size to be braced: in 1" (25mm) thru 3" (75mm) pipe sizes
Pipe size used for bracing 1" (25mm) Schedule 40 IPS

Material: Steel

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

Features: The Fig. 3000 is UL Listed as a sway brace to be used with both CPVC and (IPS) steel sprinkler pipe, in 1" (25mm) through 3" (75mm) diameters. The unique design does not compress the CPVC pipe, and the brace pipe to system pipe offset keeps the brace pipe from leaving harmful residue and oils on the CPVC pipe. Field adjustable, making critical pre-engineering of bracing pipe length unnecessary and requires no threading of bracing pipe. Comes assembled and ready for installation. Has a built-in visual verification of correct installation.
See the following installation note.

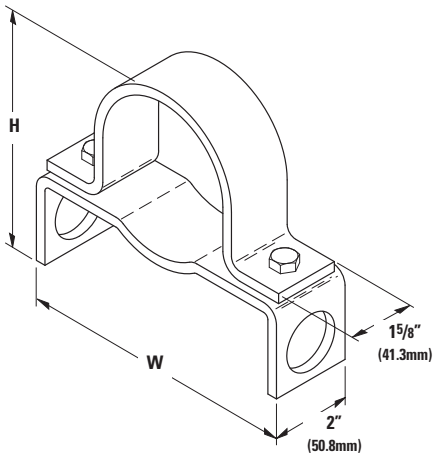
Installation Instructions: Slide the Fig. 3000 bracket over the brace member. Place the Fig. 3000 clamp over the pipe being braced, align the holes, and tighten the supplied bolts untill the underside of the bolt bottoms out against the Fig. 3000 clamp. The sway brace fitting is intended to be used with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

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

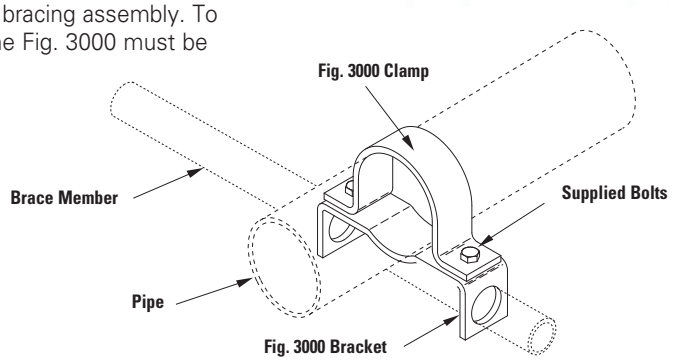
Finish: Electro-Galvanized

Order By: Figure number and pipe size.

Important Note: Fig. 3000 is precision manufactured to perform its function as a critical component of a complete bracing assembly. To ensure performance, the UL Listing requires the Fig. 3000 must be used with other TOLCO bracing products.





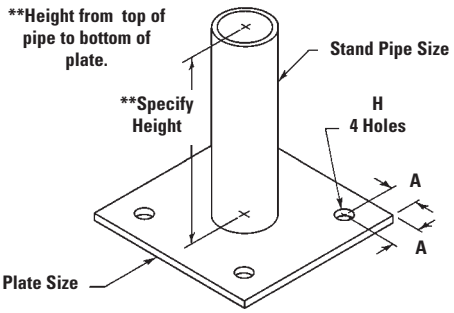


Part No.	CPVC or Pipe Size in.	(mm)	H Height in.	(mm)	W Width in.	(mm)	Max. Design Load UL Listed Lbs.	(kN)	Approx. Wt./100 Lbs.	(kg)
3000-1	1"	(25)	3 25/32"	(96.0)	4 1/4"	(107.9)	1000	(4.45)	126	(57.1)
3000-1 1/4	1 1/4"	(32)	4 1/8"	(104.8)	4 1/2"	(114.3)	1000	(4.45)	134	(60.8)
3000-1 1/2	1 1/2"	(40)	4 3/8"	(111.1)	4 3/4"	(120.6)	1000	(4.45)	141	(63.9)
3000-2	2"	(50)	4 3/4"	(120.6)	6"	(152.4)	1000	(4.45)	214	(97.1)
3000-2 1/2	2 1/2"	(65)	5 1/4"	(133.3)	6 1/2"	(165.1)	1000	(4.45)	241	(109.3)
3000-3	3"	(80)	5 7/8"	(146.9)	7"	(177.8)	1000	(4.45)	263	(119.3)

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

B3088 - Base Stand





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

Material: Steel

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

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

Order By: Figure number, height and finish.

Note: See Pipe Hangers & Supports catalog for attachments

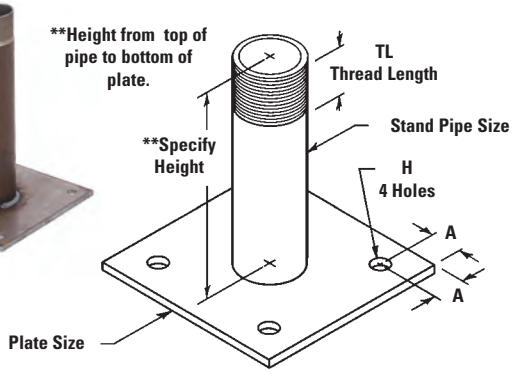
Part No.	Plate Size in.	Plate Size (mm)	Stand Pipe Size in.	Stand Pipe Size (mm)	A in.	A (mm)	Dia. H in.	Dia. H (mm)	Approx. Wt./100* Lbs.	Approx. Wt./100* (kg)
B3088-3/4	1/4" x 6" x 6"	(6.3 x 152.4 x 152.4)	3/4"	(20)	7/8"	(22.2)	3/4"	(14.3)	420	(190.5)
B3088-1	1/4" x 6" x 6"	(6.3 x 152.4 x 152.4)	1"	(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

OPM





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

Material: Steel

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

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

Order By: Figure number, height and finish.

Approvals: Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
Refer to pages 15.1 - 15.3B in Seismic Engineering Guidelines OPM-0052-13.

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

Part No.	Plate Size in.	Plate Size (mm)	Stand Pipe Size in.	Stand Pipe Size (mm)	A in.	A (mm)	Dia. H in.	Dia. H (mm)	TL in.	TL (mm)	Approx. Wt./100* Lbs.	Approx. Wt./100* (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).

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in

B3088S - Seismic Base Stand

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

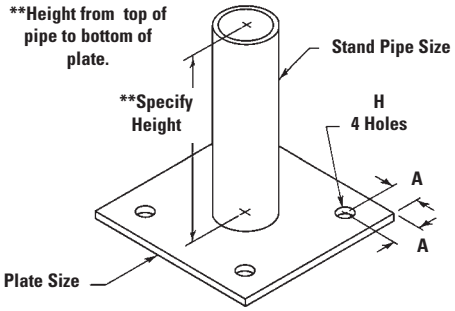
Material: Steel

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

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

Order By: Figure number, height and finish.





Note: See Pipe Hangers & Supports catalog for attachments

Part No.	Plate Size in.	Plate Size (mm)	Stand Pipe Size in.	Stand Pipe Size (mm)	A in.	A (mm)	Dia. H in.	Dia. H (mm)	Approx. Wt./100* Lbs.	Approx. Wt./100* (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"	(20)	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"	(32)	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

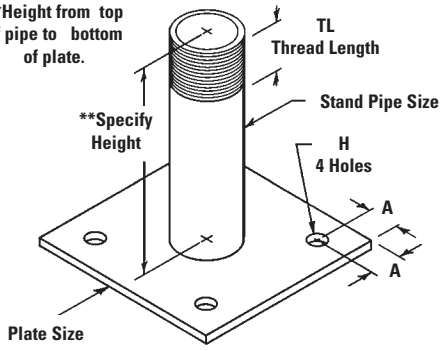
Material: Steel

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 customer service for alternative finishes and materials.

Order By: Figure number, height and finish.





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

Part No.	Plate Size in.	Plate Size (mm)	Stand Pipe Size in.	Stand Pipe Size (mm)	A in.	A (mm)	Dia. H in.	Dia. H (mm)	TL in.	TL (mm)	Approx. Wt./100* Lbs.	Approx. Wt./100* (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.

B3092 - Adjustable Pipe Saddle Support with Yoke

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

Material: Steel with cast iron reducer

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

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

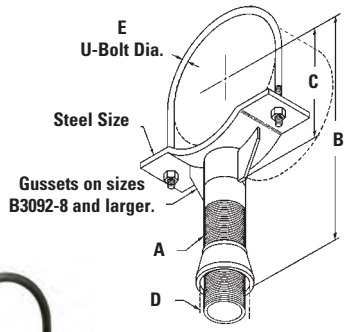
Finish: Plain. Contact customer service for alternative finishes and materials.

Order By: Figure number and finish

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

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 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)

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

B3093 - Adjustable Pipe Saddle Support

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

Material: Steel with cast iron reducer

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

Approvals: Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 38 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 37.

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

Order By: Figure number and finish

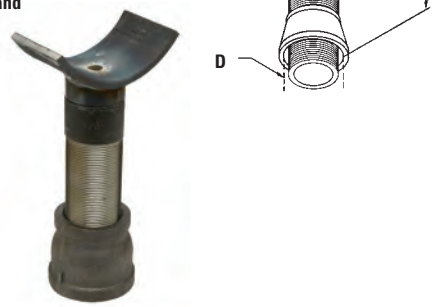
Note: Order with B3088T for complete stanchion support.

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 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)	1 29/32"	(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 B3093-3 1/2

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

Notes

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

TOLCO™ Fig. 828 - Universal Sway Brace Attachment to Steel (UL Listed)

OPM

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 and Fig. 825A.

Material: Steel

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

Features: Permits secure non-friction connection without drilling or welding. Unique design allows offset placement on wide flange beam, 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)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
For FM Approval information refer to FM Approved page 53.

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

To Install: 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)

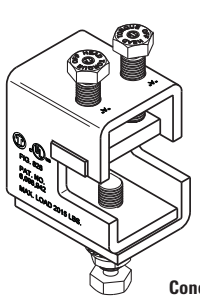
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Patent #6,098,942, #8,534,625

Canada Patent #2,286,659

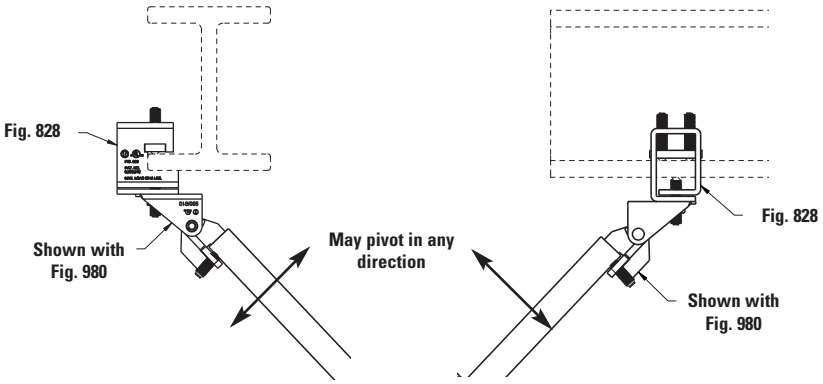
Patent Pending

* Retaining strap not required.



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





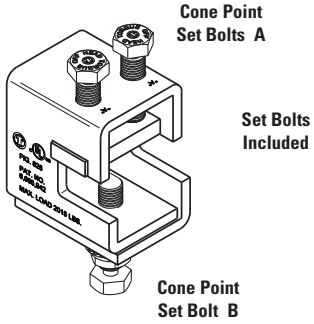
Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard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

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

TOLCO™ Fig. 828 - Universal Sway Brace Attachment to Steel (FM Approved)

OPM

FM APPROVED



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 and/or hangers to various types of steel structural members.

Features: Permits secure non-friction connection without drilling or welding. Unique design allows offset placement on wide flange beam, 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)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For UL Listed information refer to UL Listed page 52.

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

To Install: 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

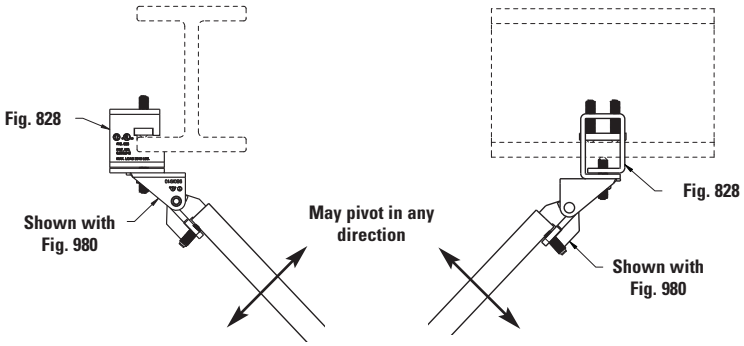
Designed to meet or exceed requirements of FM DS 2-8.

* Retaining strap not required.

FM Approved Allowable Horizontal Load* With Brace Perpendicular To Beam			
Brace Angle (degrees from vertical)			
30°-44°	45°-59°	60°-74°	75°-90°
1570 (6.98kN)	2220 (9.87kN)	1210 (5.38kN)	700 (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 (3.07kN)	970 (4.31kN)	1210 (5.38kN)	1330 (5.91kN)

FM Approved design loads are based on ASD design method.



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

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

TOLCO™ Fig. 825 - Bar Joist Sway Brace Attachment To Steel (UL Listed)

OPM

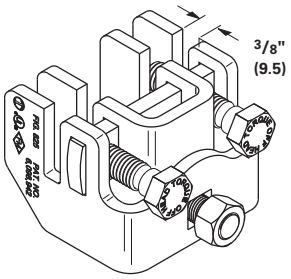
Size Range: One size accommodates all Fig. 900 Series sway brace attachments. Maximum Horizontal Design Load 2015 lbs (8.96kN).

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.).



Set Bolts & Hardware Included

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
For FM Approval information refer to FM Approved page 55.

Maximum Design Load 2015 lbs. (8.96kN)

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

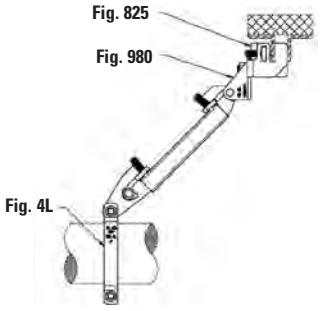
Installation Instructions: Fig. 825 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment, to form a complete bracing assembly. NFPA 13 guidelines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

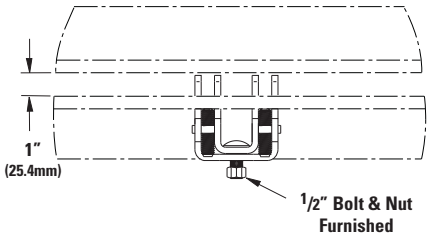
To Install: Place the Fig. 825 on the steel beam, tighten the cone point set bolts until heads break off. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional fitting. Transitional fitting attachment can pivot for adjustment to proper brace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

Finish: Plain, Electro-Galvanized and HDG

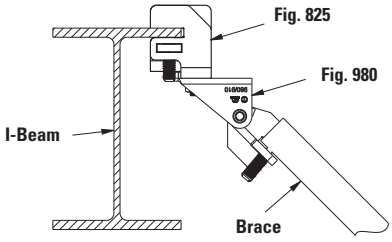
Approx. Wt./100: 247.5 Lbs. (112.2kg)

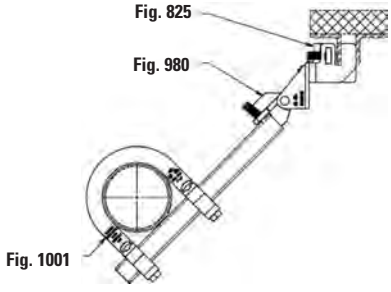
Order By: Figure number and finish
US Patent #6,098,942,
Canada Patent #2,286,659
* Retaining strap not required.

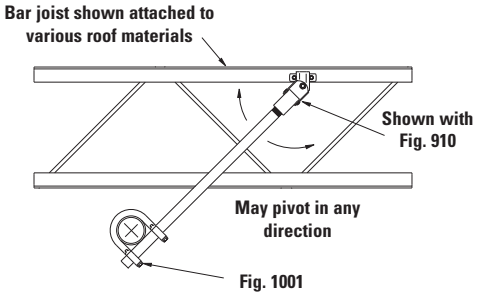




Top View







Front View

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

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

TOLCO™ Fig. 825 - Bar Joist Sway Brace Attachment To Steel (FM Approved)

OPM

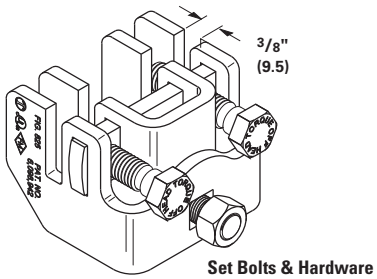
FM APPROVED

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

Material: Steel

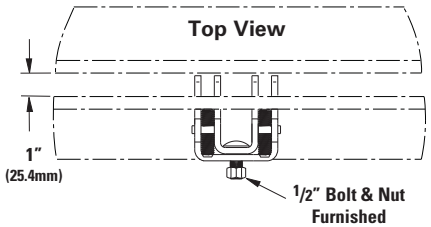
Function: To attach sway bracing and hanger assemblies to steel members.





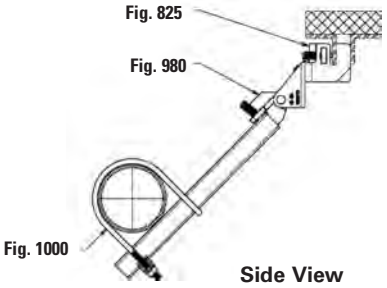
Features: This product's design incorporates a concentric attachment point which is critical to the performance of structural seismic connections. NFPA 13 indicates the importance of concentric loading of connections and fasteners. Permits secure non-friction connection without drilling or welding. Unique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

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



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

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

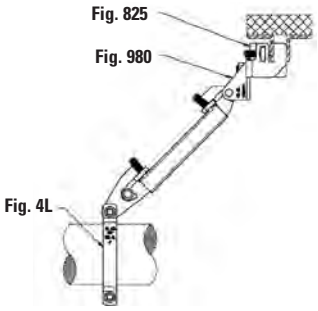


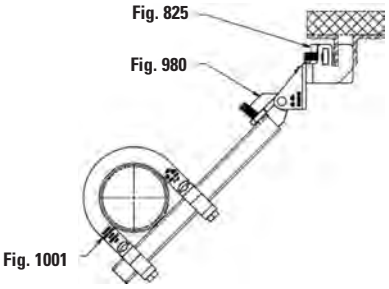
Finish: Plain, Electro-Galvanized and HDG

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

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

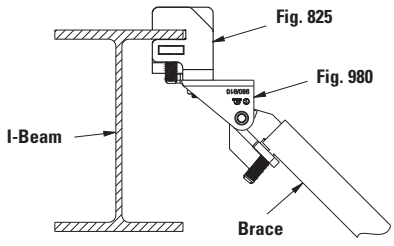
Designed to meet or exceed requirements of FM DS 2-8.
* Retaining strap not required.





FM Approved design loads are based on ASD design method.

		FM Approved Design Loads			
		30°-44° lbs. / (kN)	45°-59° lbs. / (kN)	60°-74° lbs. / (kN)	75°-90° 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 series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

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

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

OPM

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

Material: Steel

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

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

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

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

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

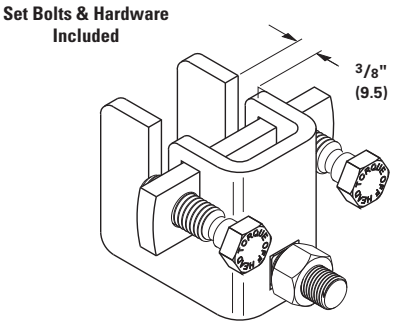
Finish: Plain or Electro-Galvanized

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

Order By: Figure number and finish

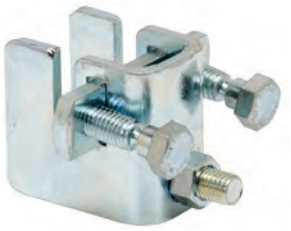
Patent #6,098,942

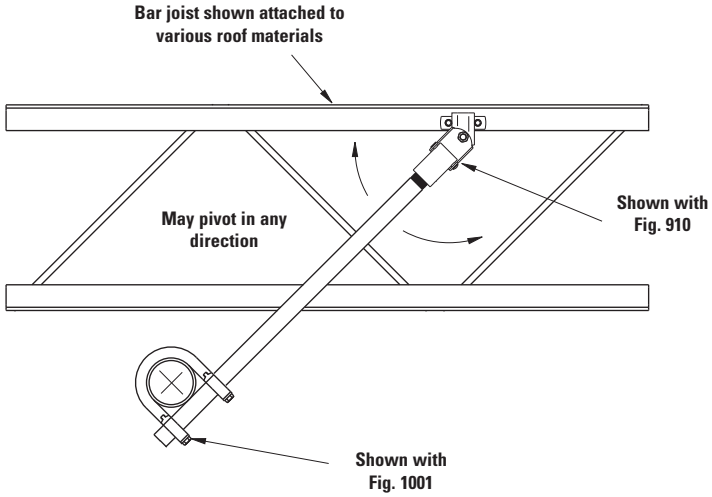
* Retaining strap not required.



Maximum Design Load
1600 lbs. (7.11kN)

UL Listed as a hanger up to 8" (7.11kN).





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

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

TOLCO™ Fig. 906 - Sway Brace Multi-Fastener Adapter

OPM

Material: Steel

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

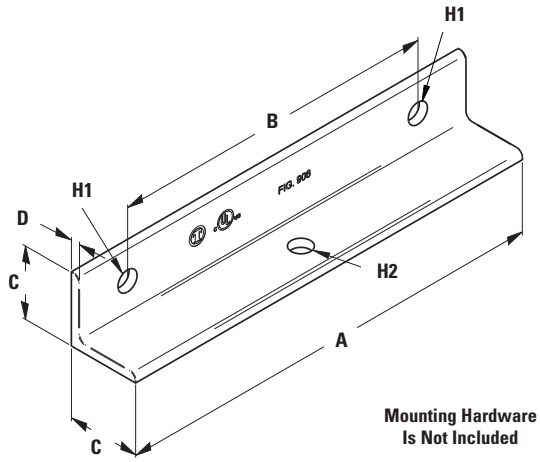
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** only when used with TOLCO Fig. 900 Series Earthquake Brace Attachments. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**.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

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

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

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

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





Part Number	A 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)

Load Note: Actual design load determined by anchor and concrete strength, not to exceed the UL Listed maximum horizontal load of 2015 lbs. (8.96kN).
Load is for Fig. 906. If combined load of anchors is less, must reduce to anchor maximum capacity.

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

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

TOLCO™ Fig. 800 - Adjustable Sway Brace Attachment to Steel (UL Listed)

OPM

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.

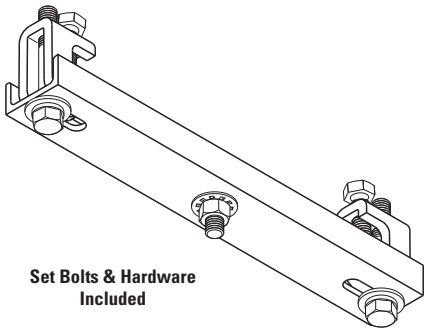
Installation Instructions: Fig. 800 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly.
NFPA 13 guidelines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

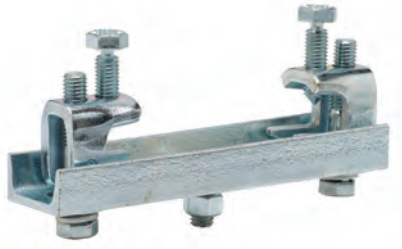
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
For FM Approval information refer to FM Approved page 59.

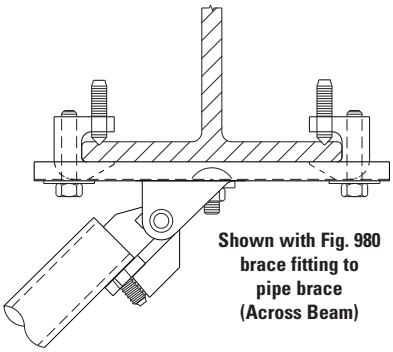
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

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

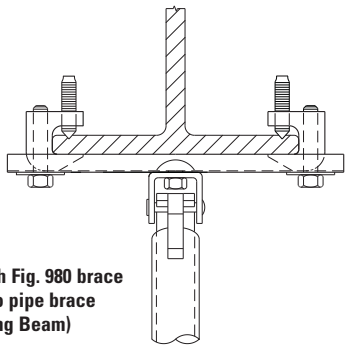


Set Bolts & Hardware Included





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



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

Type	Fits Beam Flange Thickness in.	(mm)	Max.Design Loads (cULus) Along Beam lbs.	(kN)	Across Beam lbs.	(kN)
800 TYPE1	Up to 3/4"	(Up to 19.0)	1265	(5.62)	2015	(8.96)
800 TYPE2	3/4" to 1 1/4"	(19.0 to 31.7)	1265	(5.62)	2015	(8.96)

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

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

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

TOLCO™ Fig. 800 - Adjustable Sway Brace Attachment to Steel (FM Approved)

OPM

FM APPROVED

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

Material: Steel

Function: Seismic brace attachment to steel.

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

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

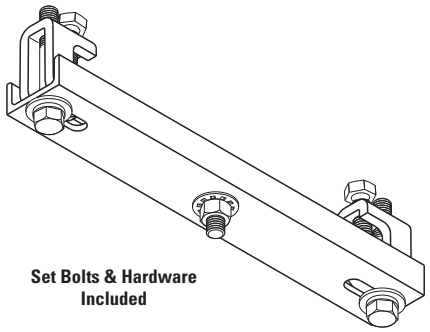
To Install: Place the Fig. 800 on the steel beam, tighten the cone point set bolts on flange until the heads break off. Tighten hex head bolts into clamp body until lock washers are fully flat. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional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

Approvals: Approved by Factory Mutual Engineering **(FM)**.
Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
For UL Listed information refer to UL Listed page 58.

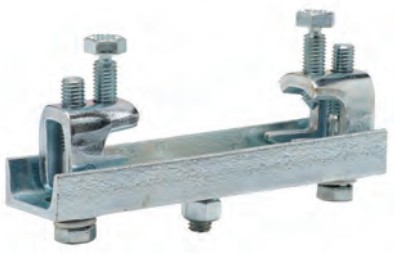
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

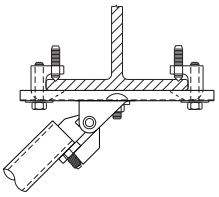
Order By: Figure number, type number and size number.
Example: FIG. 800 TYPE2X14-16

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

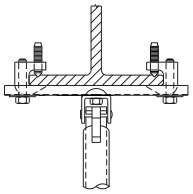


Set Bolts & Hardware Included





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



Shown with Fig. 980 brace fitting to pipe brace (Across 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)
800 TYPE1	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)
800 TYPE2	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)

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

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

FM Approved design loads are based on ASD design method.

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

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

TOLCO™ Fig. 980 - Universal Swivel Sway Brace Attachment - 3/8" to 3/4" (UL Listed)

OPM

Size Range: One size fits bracing pipe 1" (25mm) thru 2" (50mm), B-Line series 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 (2016) 9.3.5.8.4 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, 3000, 4L, 4LA, 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.

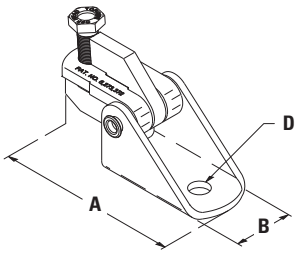
Approvals: —Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
For FM Approval information refer to FM Approved page 61.

Note: Fig. 980 Swivel Attachment and Fig. 1001, 1000, 2002, 4A, 4L, 4LA, 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 customer service for alternative finishes.

Order By: Figure number and finish.

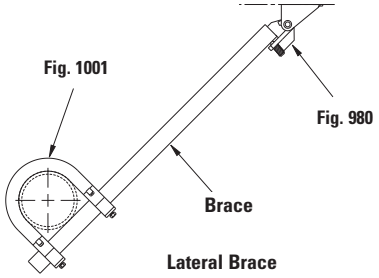
Pat. #6,273,372, Pat. #6,517,030, Pat. #6,953,174, Pat. #6,708,930, Pat. #7,191,987, Pat. #7,441,730, Pat. #7,669,806



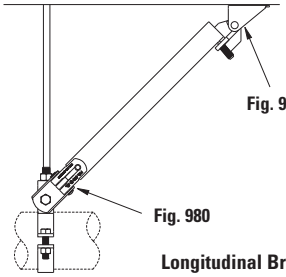
Set Bolt Included

Mounting Hardware Is Not Included





Lateral Brace



Longitudinal Brace

Fig. 4B shown

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)	1 7/8" (47.6)	13/32" (10.3)	2015 (8.96)	149 (67.6)
980-1/2 *	1/2" (12.7)	5 1/4" (133.3)	1 7/8" (47.6)	17/32" (13.5)	2015 (8.96)	148 (67.1)
980-5/8	5/8" (15.9)	5 1/4" (133.3)	1 7/8" (47.6)	11/16" (17.5)	2015 (8.96)	147 (66.7)
980-3/4	3/4" (19.0)	5 1/4" (133.3)	1 7/8" (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 AL-1 thru AL-21.

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

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

TOLCO™ Fig. 980 - Universal Swivel Sway Brace Attachment - 3/8" to 3/4" (FM Approved)

OPM

FM APPROVED

Size Range: One size fits bracing pipe 1" (25mm) thru 2" (50mm), B-Line series 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 (2016) 9.3.5.8.4 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, 3000, 4L, 4LA, or other TOLCO approved attachment to pipe to form a complete bracing assembly. NFPA 13 guidelines should be followed.

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

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

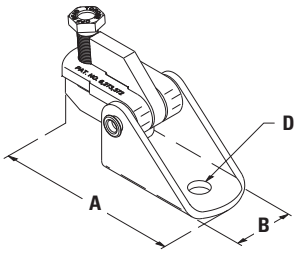
Note: Fig. 980 Swivel Attachment and Fig. 1000, 1001, 4L, 4LA or other TOLCO approved attachment to pipe that make up a sway brace system of bracing materials which satisfies the requirements of Factory Mutual Engineering and the National Fire Protection Association **(NFPA)**

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

Order By: Figure number and finish.

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

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

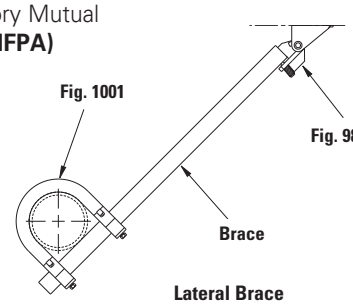


Set Bolt Included

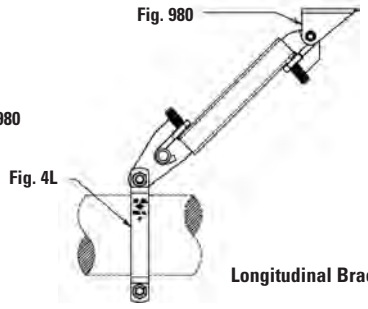
Mounting Hardware Is Not Included



Fig. 980



Lateral Brace



Longitudinal Brace

Part Number	Mtg. Hdw. Size in. (mm)	A in. (mm)	B in. (mm)	Mounting Hole D in. (mm)	Max. Design Load** (FM) 30° - 44° lbs./(kN)	45° - 59° lbs./(kN)	60° - 74° lbs./(kN)	75° - 90° lbs./(kN)	Approx. Wt./100 lbs. (kg)
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 (5.87)	1970 (8.76)	2310 (10.27)	2550 (11.34)	148 (67.1)
980-5/8	5/8" (15.9)	5 1/4" (133.3)	1 7/8" (47.6)	11/16" (17.5)					147 (66.7)
980-3/4	3/4" (19.0)	5 1/4" (133.3)	1 7/8" (47.6)	13/16" (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 AL-1 thru AL-21.

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

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

TOLCO™ Fig. 909 - No-Thread Swivel Sway Brace Attachment (UL Listed)

OPM

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

Material: Steel, 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.

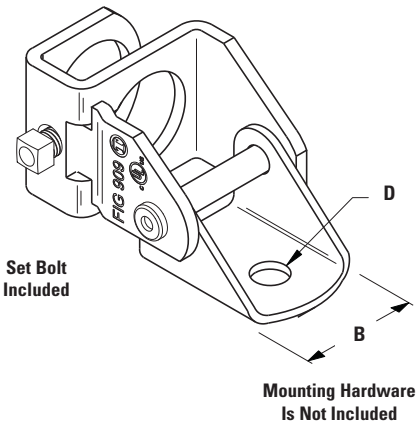
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to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

Installation Instructions: Fig. 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, 2002, 3000, 4A, 4LA 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 customer service 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)	B in. (mm)	Max. Design Load lbs. (kN)	Approx. Wt./100 lbs. (kg)
909-1/2 *	17/32" (13.5)	1" (25)	1 5/8" (41.3)	2015 (8.96)	91 (41.3)
909-5/8	11/16" (17.5)	1" (25)	1 5/8" (41.3)	2015 (8.96)	90 (40.8)
909-3/4	13/16" (20.6)	1" (25)	1 5/8" (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 AL-1 thru AL-21.

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

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

TOLCO™ Fig. 910 - Threaded Swivel Sway Brace Attachment (UL Listed)

OPM

Size Range: 1" (25mm) bracing pipe. For brace pipe sizes larger than 1" (25mm), use Fig. 980. Available with holes for ½", ⅝", or ¾" 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 and (2013-2016) 9.3.5.11.5 indicates that fastener table load values are based only on concentric loading. Universal swivel design allows Fig. 910 to be attached at any surface angle.

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

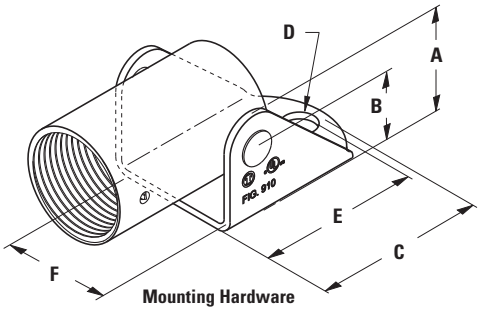
Installation Instructions: Fig. 910 is a structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe", and TOLCO "braced pipe" attachment, Fig. 1000, Fig. 1001, Fig. 4A, Fig. 4L or Fig. 4LA to form a complete bracing 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, 1000, 2002, 3000, 4A, 4L, or 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).

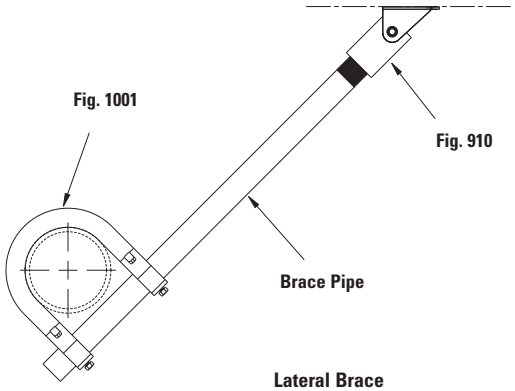
Finish: Electro-Galvanized. Contact customer service for alternative finishes and materials.

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



Mounting Hardware Is Not Included





Lateral Brace

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 1/2	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)	11/16"	(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)	13/16"	(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 AL-1 thru AL-21.

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

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

TOLCO™ Fig. 907 - Multi-Angle Attachment

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

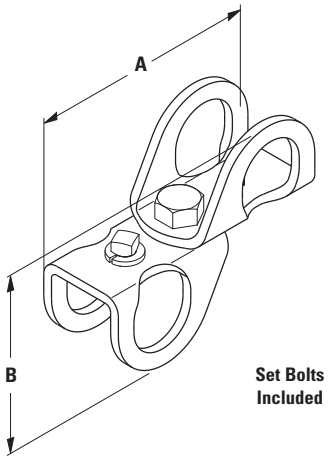
Material: Steel, hardened cone (or cup) point set bolt

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

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

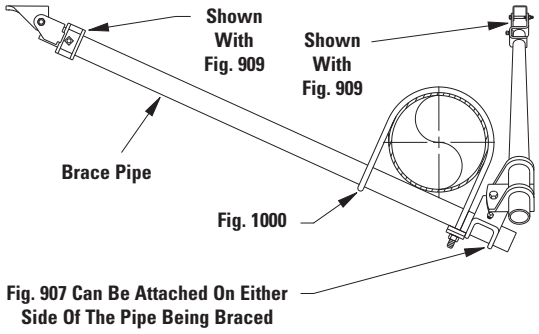
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

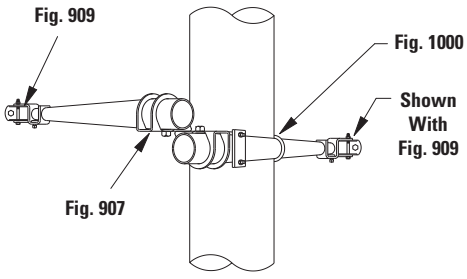
Order By: Figure number, bracing pipe sizes and finish.





Part Number	Brace Pipe Size in.	(mm)	A in.	(mm)	B in.	(mm)	Max. Design Load lbs.	(kN)	Approx. Wt./100 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)





4-Way Riser Brace

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

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

TOLCO™ Fig. 975 - Straight Sway Brace Fitting (UL Listed)

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

Material: Steel

Function: 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)**.

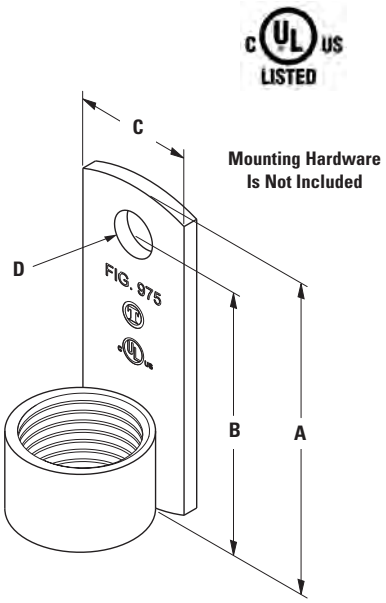
Installation: Fig. 975 is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO "braced pipe" attachment, Fig. 1000, 1001, 4A or any approved TOLCO seismic bracing attachment to pipe to form 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.

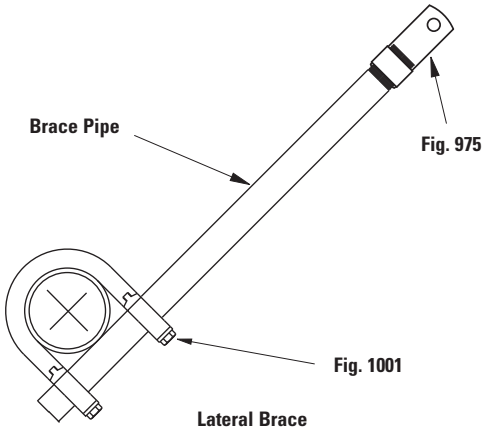
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Order By: Figure number and finish.

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







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

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

TOLCO™ Fig. 1001 - Sway Brace Attachment (UL Listed)

OPM

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

Material: Steel

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

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

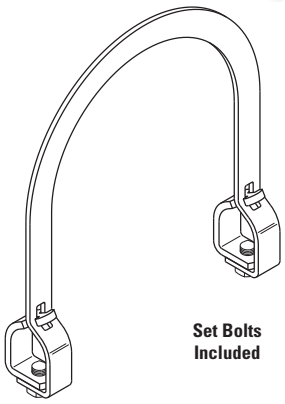
Installation Note: Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set bolts until heads bottom out. A minimum of 1" (25mm) pipe extension is recommended. Brace pipe can be installed on top or bottom of pipe to be braced.

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
For FM Approval information refer to FM Approved page 67.

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

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

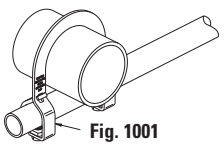
Important Note: Fig. 1001 is precision manufactured to perform its function as a critical component of a complete bracing assembly. To ensure performance, the UL Listing requires that Fig. 1001 must be used only with other TOLCO bracing products.

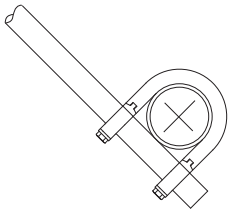


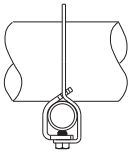


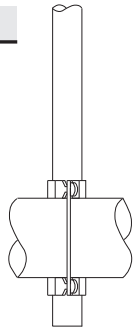
Pipe Size	Part Number & Approx. Wt./100				Design Load - Lbs. For Brace Pipe Size 1" / 1¼"		
	1" (24mm) Brace Pipe		1¼" (32mm) Brace Pipe		Sch. 7	Sch. 10	Sch. 40
in. (mm)		Lbs. (kg)		Lbs. (kg)	1" / 1¼"	1" / 1¼"	1" / 1¼"
1" (25)	**1001-1 X 1**	100.0 (45.3)	**1001-1 X 1¼**	118.0 (53.5)	-- / --	1000 / 1000	1000 / 1000
1¼" (32)	**1001-1¼ X 1**	100.0 (45.3)	**1001-1¼ X 1¼**	114.0 (51.7)	1000 / 1000	1000 / 1000	1000 / 1000
1½" (40)	**1001-1½ X 1**	100.0 (45.3)	**1001-1½ X 1¼**	115.0 (52.1)	1000 / 1000	1500 / 1500	1500 / 1500
2" (50)	**1001-2 X 1**	108.0 (49.0)	**1001-2 X 1¼**	121.0 (54.8)	1000 / 1000	2015 / 2015	2015 / 2015
2½" (65)	**1001-2½ X 1**	138.6 (62.8)	**1001-2½ X 1¼**	160.4 (72.7)	1600 / 1600	2015 / 2765	2015 / 2765
3" (80)	**1001-3 X 1**	147.2 (66.7)	**1001-3 X 1¼**	168.7 (76,5)	1600 / 1600	2015 / 2765	2015 / 2765
4" (100)	**1001-4 X 1**	160.9 (73.0)	**1001-4 X 1¼**	182.4 (82.7)	1600 / 1600	2015 / 2765	2015 / 2765
6" (150)	**1001-6 X 1**	190.0 (86.2)	**1001-6 X 1¼**	211.4 (95.9)	1600 / 1600	2015 / 2765	2015 / 2765
8" (200)	**1001-8 X 1**	217.4 (98.6)	**1001-8 X 1¼**	238.8 (108.3)	1600 / 1600	2015 / 2765	2015 / 2765

Note: Metric sizes are available, contact factory.







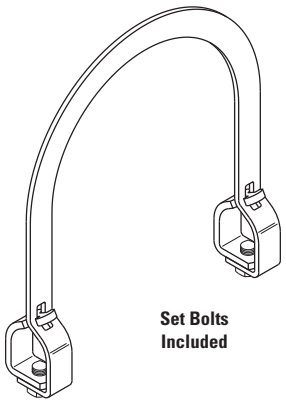


All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

TOLCO™ Fig. 1001 - Sway Brace Attachment (FM Approved)

OPM

FM APPROVED





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

Material: Steel

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

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

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

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

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

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

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.

Pipe Size in. (mm)	Part Number & Approx. Wt./100				Design Load - For Sch. 7, Sch. 10, & Sch. 40 Pipe Allowable Horizontal Capacity (lbf) Per Installation [1,2,3]							
	1" (24mm) Brace Pipe			1¼" (32mm) Brace Pipe			30°-44°		45°-59°		60°-74°		75°-90°	
		Lbs.	(kg)		Lbs.	(kg)	Lbs.	(kN)	Lbs.	(kN)	Lbs.	(kN)	Lbs.	(kN)
1" (25)	**1001-1 X 1**	100.0	(45.3)	**1001-1 X 1¼**	118.0	(53.5)	1800	(8.00)	2550	(11.34)	3120	(13.88)	3490	(25.52)
1¼" (32)	**1001-1¼ X 1**	100.0	(45.3)	**1001-1¼ X 1¼**	114.0	(51.7)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.58)
1½" (40)	**1001-1½ X 1**	100.0	(45.3)	**1001-1½ X 1¼**	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 1¼**	121.0	(54.9)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.58)
2½" (65)	**1001-2½ X 1**	138.6	(62.8)	**1001-2½ X 1¼**	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 1¼**	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 1¼**	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 1¼**	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 1¼**	238.8	(108.3)	510	(2.27)	730	(3.25)	890	(3.96)	990	(4.40)

[1] FM Approved when used with 1 or 1¼ 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.

Note: Metric sizes are available, contact factory.

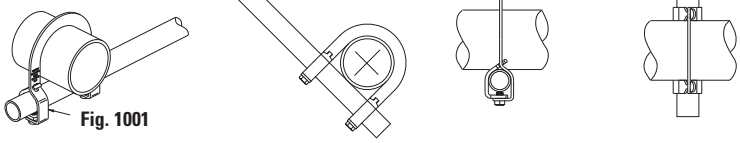


Fig. 1001

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

TOLCO™ Fig. 1000 - "Fast Clamp" Branch Line Restraint Attachment (UL Listed)

OPM

Size Range: Pipe size to be braced: 1" (25mm) thru 4" (100mm) 40 IPS. Pipe size used for bracing: 1" (25mm) and 1¼" (32mm) Schedule 40 IPS. For pipe sizes larger than 2" (500mm) please refer to TOLCO Fig. 1001.

Material: Steel

Function: A restraint device intended for lateral bracing.

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

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

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

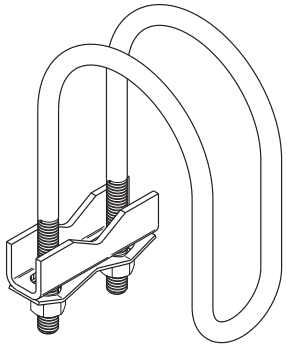
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Approved for use with engineered light wall sprinkler pipe up to 2" as a restraint device. Torque requirement is 6-8 ft./lbs. (8-10Nm). Included in our Seismic Engineering Guidelines approved by the State of California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

For FM Approval information refer to FM Approved page 69.

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

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

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

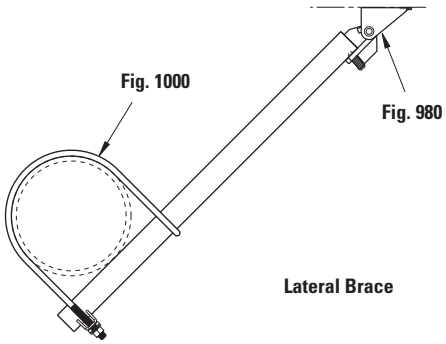


Hardware Included

*** UL Listed**
1" (25mm) thru 2" (50mm) pipe size



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



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

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

TOLCO™ Fig. 1000 - "Fast Clamp" Sway Brace Attachment (FM Approved)

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

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.

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

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

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

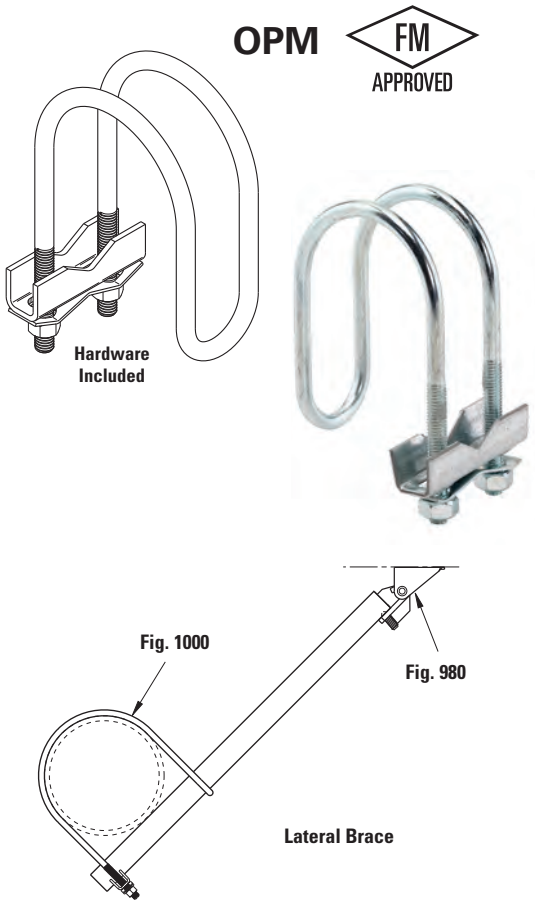
Approvals: Approved by Factory Mutual Engineering **(FM)**.
Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer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

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

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

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

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



Pipe Size	Part Number & Approx. Wt./100				Design Load - Allowable Horizontal Capacity (lbf) Per Installation [1,2,3]							
	1" (24mm) Brace Pipe		1¼" (32mm) Brace Pipe		30°-44°		45°-59°		60°-74°		75°-90°	
in. (mm)		Lbs. (kg)		Lbs. (kg)	Lbs.	(kN)	Lbs.	(kN)	Lbs.	(kN)	Lbs.	(kN)
1" (25)	**1000-1 X 1**	71.6 (32.5)	**1000-1 X 1¼**	75.8 (34.4)	200	(0.89)	280	(1.24)	340	(1.51)	380	(1.69)
1¼" (32)	**1000-1¼ X 1**	74.8 (33.9)	**1000-1¼ X 1¼**	79.1 (35.9)	200	(0.89)	280	(1.24)	340	(1.51)	380	(1.69)
1½" (40)	**1000-1½ X 1**	77.8 (35.3)	**1000-1½ X 1¼**	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 1¼**	88.4 (40.1)	200	(0.89)	280	(1.24)	340	(1.51)	380	(1.69)
2½" (65)	**1000-2½ X 1**	90.2 (40.9)	**1000-2½ X 1¼**	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 1¼**	101.7 (46.1)	230	(1.02)	320	(1.42)	400	(1.78)	450	(2.00)
3½" (90)	**1000-3½ X 1**	104.0 (47.2)	**1000-3½ X 1¼**	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 1¼**	114.6 (52.0)	230	(1.02)	320	(1.42)	400	(1.78)	450	(2.00)

[1] FM Approved when used with 1, 1¼, 1½, 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 series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

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

TOLCO™ Fig. 2002 - Sway Brace Attachment (UL Listed)

Size Range: Pipe size to be braced: 2½" (65mm) thru 8" (200mm) all steel schedules.
Consult factory when bracing other than steel. The Fig. 2002 accepts brace 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.

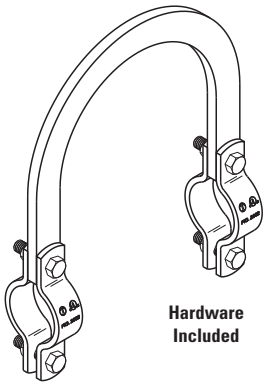
Installation: Place Fig. 2002 over pipe to be braced. Slide bracing pipe through attachment and tighten hex nuts until ears touch.

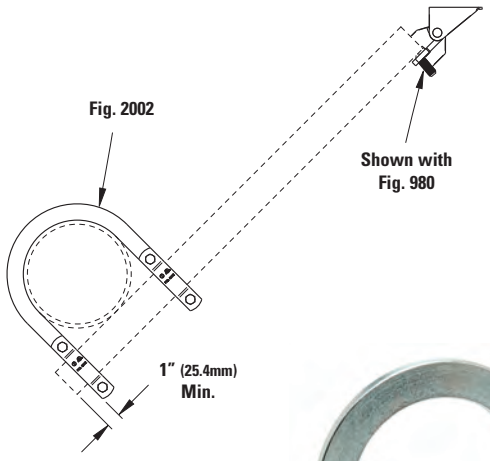
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**.

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

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

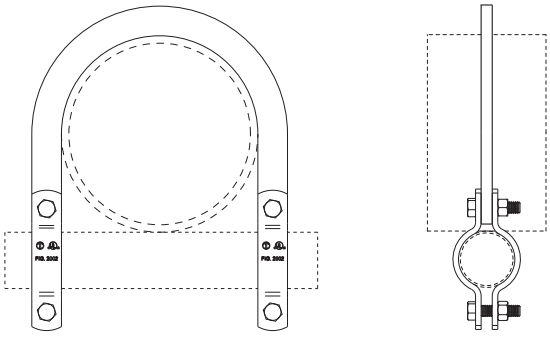
Important Note: Fig. 2002 is precision manufactured to perform its function as a critical component of a complete bracing assembly. To ensure performance, the UL Listing requires that the Fig. 2002 must be used only with other TOLCO bracing products.







Pipe Size in. (mm)	Part Number & Approx. Wt./100 1½" (32mm) Brace Pipe	Lbs. (kg)	2" (50mm) Brace Pipe	Lbs. (kg)	Design Load 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)



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

TOLCO™ Fig. 75 - Swivel Attachment

Function: Three recommended applications for this product:

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

Refer to page 41 for more information and sizing.

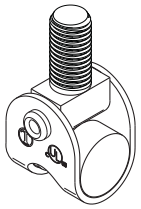




Fig. 76 - TOLCO™ Structural Attachment for Branch Line Restraint Assembly (UL Listed) Structural Attachment for Sway Brace Assembly (FM)

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

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

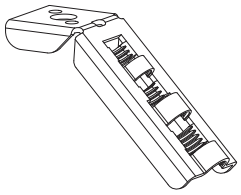
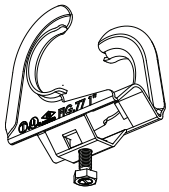




Fig. 77 - TOLCO™ Structural Attachment for Branch Line Restraint Assembly (UL Listed) Structural Attachment for Sway Brace Assembly (FM)

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

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

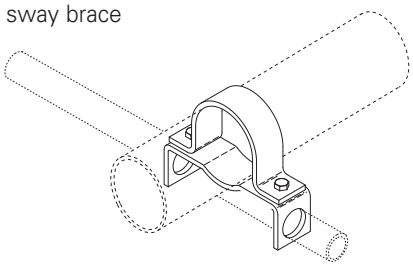




TOLCO™ Fig. 3000 - CPVC Sway Brace Attachment

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

Refer to page 46 for more information and sizing.





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

TOLCO™ Fig. 98 - Rod Stiffener
TOLCO™ 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.

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

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

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

Order By: Figure number

OPM



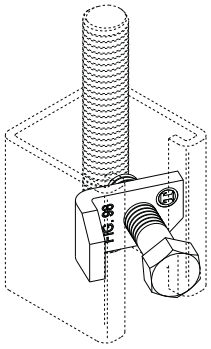


Fig. 98



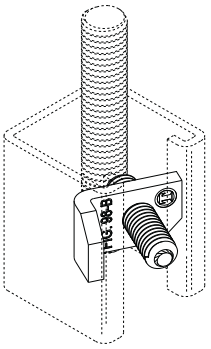


Fig. 98B

Fig. SC228 - Hanger Rod Stiffener

Size Range: Secures 3/8"-16 thru 5/8"-11 hanger rod

Material: Steel

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

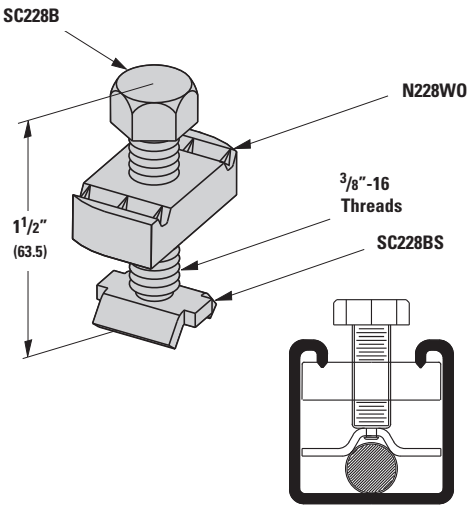
Finish: Electro Galvanized. Contact customer service for alternative finishes and materials.

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

Order By: Figure part number

Note: Order channel separately





Rod Stiffener Requirements

Rod Size	Maximum Rod Length Without Rod Stiffener	Maximum Spacing Between Rod Stiffeners
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)

* Use with SC228 only.

Notes:

1.) Rod stiffeners are required only on hanger and trapeze assemblies that have seismic bracing attached at or within 6" (152.4mm) of the rod. A minimum of two rod stiffeners (Figure 98, 98B, or SC228) must be installed.

2.) Recommended torque on Figure 98 and SC228 is 8 ft-lbs. (10.8Nm) or finger tight and one full turn with a wrench.
Figure 98B has the break off bolt head.

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

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

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

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.

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

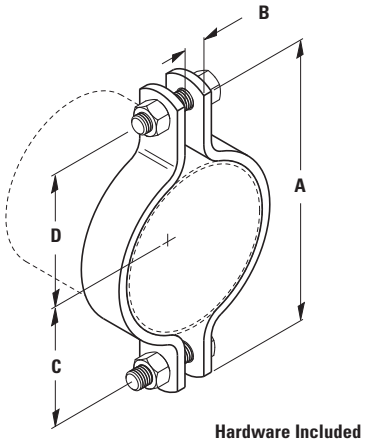
Installation Instructions: Fig. 4A is the "braced pipe" attachment component of a longitudinal, lateral or riser brace assembly. It is intended to be combine with the "bracing pipe" and TOLCO transitional and structural attachment component(s) to form a complete bracing assembly. NFPA 13 guidelines should be followed.

To Install: Place the Fig. 4A over the pipe to be braced. Attach TOLCO transitional fitting, either Fig. 980, 910 or 909, to the clamp ears. Tighten bolts and nuts; torque requirement is a minimum of 50 ft./lbs. (68Nm). Transitional fitting attachment can pivot for adjustment to proper brace angle.

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

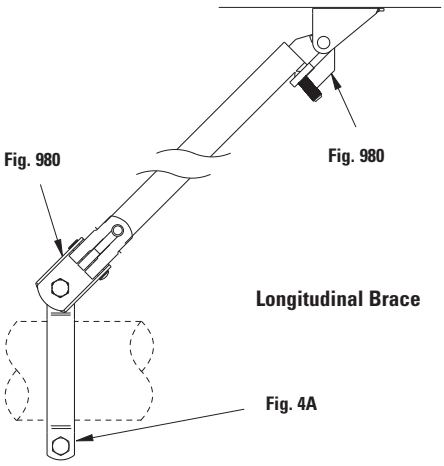
Order By: Figure number, pipe size and finish

Note: Please refer to Fig. 4LA for longitudinal brace applications for 1" (25mm) - 12" (300mm) pipe sizes.



Hardware Included





For Laterial Brace Refer to 4LA

Part No.	Pipe Size in.	(mm)	A in.	(mm)	C in.	(mm)	D in.	(mm)	Bolt Size	Max. Horizontal Design Load (UL) lbs.	(kN)	Approx. Wt./100 lbs.	(kg)
4A-2 1/2	2 1/2"	(100)	7"	(177.8)	2 11/16"	(68.3)	3"	(76.2)	1/2"-13	1000	(4.45)	134	(60.8)
4A-3	3"	(80)	7 1/2"	(190.5)	3"	(76.2)	3 5/16"	(84.1)	1/2"-13	1000	(4.45)	150	(69.0)
4A-4	4"	(100)	8 1/2"	(215.9)	3 3/8"	(85.7)	3 11/16"	(93.7)	1/2"-13	1600	(7.11)	221	(100.2)
4A-5	5"	(125)	9 3/4"	(247.6)	3 7/8"	(98.4)	4 3/8"	(111.1)	1/2"-13	1600	(7.11)	253	(114.7)
4A-6	6"	(150)	11 1/2"	(292.1)	5"	(127.0)	5 1/8"	(130.2)	1/2"-13	2015	(8.96)	513	(232.7)
4A-8	8"	(200)	13 1/4"	(336.5)	6 11/16"	(169.9)	6 1/8"	(155.6)	1/2"-13	2015	(8.96)	601	(272.6)

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

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

TOLCO™ Fig. 4L - Longitudinal In-Line Sway Brace Attachment (UL Listed)

OPM

Size Range: 2" (50mm) 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 FM Approved page 75.
Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

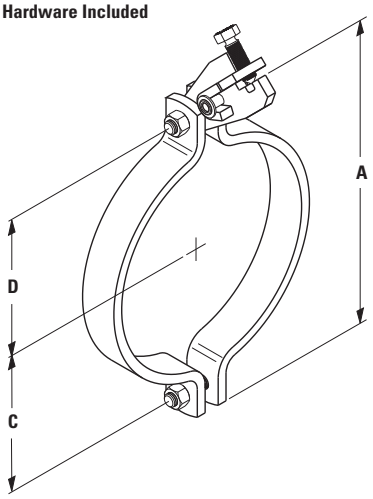
Installation Instructions: Fig. 4L is the "braced pipe" attachment component of a longitudinal sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component to form a complete bracing assembly. NFPA 13 guidelines should be followed.

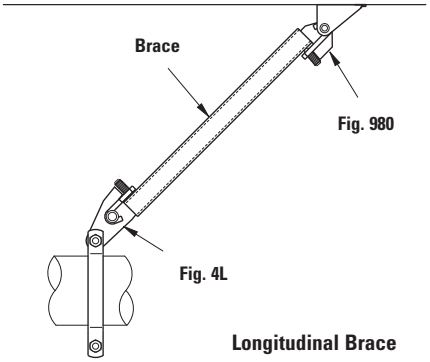
To Install: Place the Fig. 4L over the pipe to be braced and tighten bolts. Then engage "bracing pipe" into jaw opening and tighten set bolt until head snaps off. Jaw attachment can pivot for adjustment to proper brace angle.

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

Order By: Figure number, pipe size and finish.

Set Bolt & Hardware Included





Longitudinal Brace



Part No.	Pipe Size in.	(mm)	A in.	(mm)	C in.	(mm)	D in.	(mm)	Bolt Size	Max. Rec. Load (cULus) lbs.	(kN)	Approx. Wt./100 lbs.	(kg)
4L-2	2"	(50)	5 3/8"	(136.5)	2 1/16"	(52.4)	2 1/16"	(52.4)	1/2"-13	2015	(8.96)	243	(110.2)
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 series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

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

TOLCO™ Fig. 4L - Longitudinal In-Line Sway Brace Attachment (FM Approved)

OPM

FM APPROVED

Size Range: 2" (50mm) 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 UL Listed page 74.
Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**.
For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

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

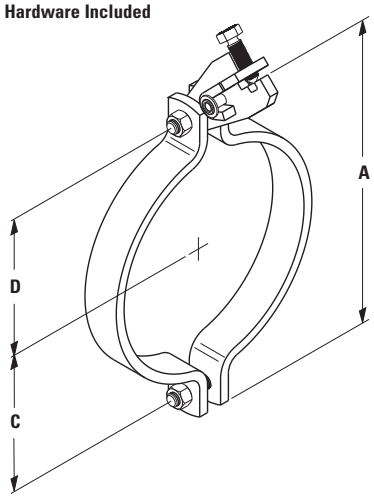
To Install: Place the Fig. 4L over the pipe to be braced and tighten bolts. Then engage "bracing pipe" into jaw opening and tighten set bolt until head snaps off. Jaw attachment can pivot for adjustment to proper brace angle.

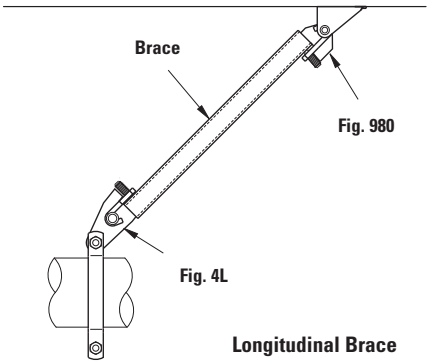
Finish: Plain. Contact customer service for alternative finishes and materials.

Order By: Figure number, pipe size and finish.

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

Set Bolt & Hardware Included





Longitudinal Brace



Part No.	Pipe Size in. (mm)	A in. (mm)	C in. (mm)	D in. (mm)	Bolt Size	Max. Rec. Load (FM) 30°-44° lbs. (kN)	45°-59° lbs. (kN)	60°-74° lbs. (kN)	75°-90° lbs. (kN)	Approx. Wt./100 lbs. (kg)
4L-2	2" (50)	5 3/8" (136.5)	2 1/16" (52.4)	2 1/16" (52.4)	1/2"-13	1030 (4.58)	1180 (5.24)	1420 (6.31)	1590 (7.07)	243 (110.2)
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.

* UL Listed not FM Approved.

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

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

TOLCO™ Fig. 4LA - In-Line Sway Brace Attachment (UL Listed)

OPM

Size Range: 1" (25mm) through 8" (200mm) IPS.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.

Approvals: For FM Approval information refer to FM Approved page 77. Underwriters Laboratories Listed in the USA and Canada **(cULus)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

Installation Instructions: Fig. 4LA can be used as the system attachment component of a longitudinal or lateral brace assembly. It is intended to be combined with the "bracing member" and TOLCO transitional attachment and structural attachment to form a complete bracing assembly. For fire sprinkler applications NFPA 13 guidelines should be followed.

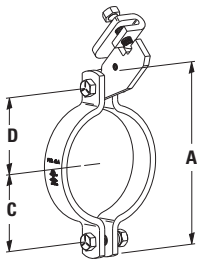
To Install: Place the Fig. 4LA pipe clamp component over the pipe to be braced and tighten down the break-off nuts until the hex head portion breaks off to verify correct installation torque. Next engage brace member (pipe or strut) with jaw component and tighten break-off head bolt until the hex head breaks off to verify correct installation torque. Pivot jaw for correct angle and attach to structure using TOLCO brand transitional attachment and structural attachment.

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

Order By: Figure number, pipe size and finish.

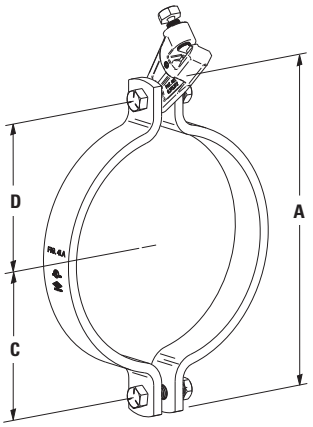


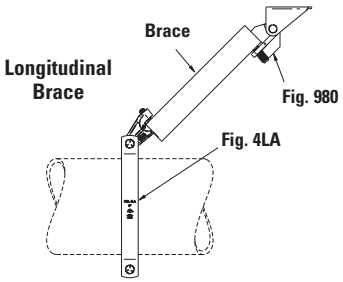
4LA-1 thru 4LA-4

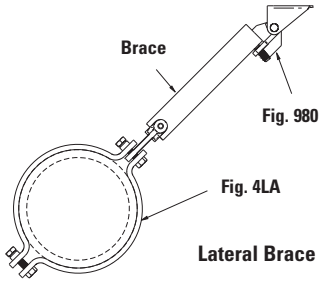




4LA-6 thru 4LA-12







Part No.	Pipe Size in.	(mm)	A in.	(mm)	C in.	(mm)	D in.	(mm)	Bolt Size	UL Max. Rec. Load Longitudinal lbs.	(kN)	Lateral lbs.	(kN)	Approx. 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	1000	(4.45)	NA	(NA)	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	1000	(4.45)	NA	(NA)	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	1000	(4.45)	NA	(NA)	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	1000	(4.45)	NA	(NA)	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	1000	(4.45)	NA	(NA)	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	1000	(4.45)	1000	(4.45)	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	1000	(4.45)	1000	(4.45)	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	1000	(4.45)	1000	(4.45)	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	1600	(7.12)	1600	(7.12)	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	2015	(7.12)	2015	(7.12)	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	NA	(NA)	NA	(NA)	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	NA	(NA)	NA	(NA)	1496	(678.6)

* FM Approved but not UL Listed.

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

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

TOLCO™ Fig. 4LA - In-Line Sway Brace Attachment (FM Approved)

OPM

FM APPROVED

Size Range: 1" (25mm) through 12" (300mm) IPS.
Material: Steel
Function: For bracing pipe against sway and seismic disturbance.
Approvals: Approved by Factory Mutual Engineering **(FM)**, 1" (25mm) through 12" (300mm) pipe.
For UL Listed information refer to UL Listed page 76.
Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

Installation Instructions: Fig. 4LA can be used as the system attachment component of a longitudinal or lateral brace assembly. It is intended to be combined with the "bracing member" and TOLCO transitional attachment and structural attachment to form a complete bracing assembly. For fire sprinkler applications NFPA 13 guidelines should be followed.

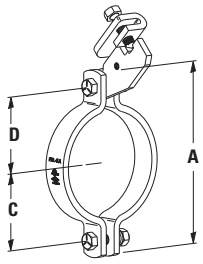
To Install: Place the Fig. 4LA pipe clamp component over the pipe to be braced and tighten down the break-off nuts until the hex head portion breaks off to verify correct installation torque. Next engage brace member (pipe or strut) with jaw component and tighten break-off head bolt until the hex head breaks off to verify correct installation torque. Pivot jaw for correct angle and attach to structure using TOLCO brand transitional attachment and structural attachment.

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

Order By: Figure number, pipe size and finish.

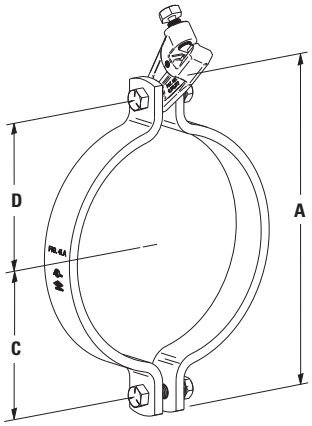


4LA-1 thru 4LA-4



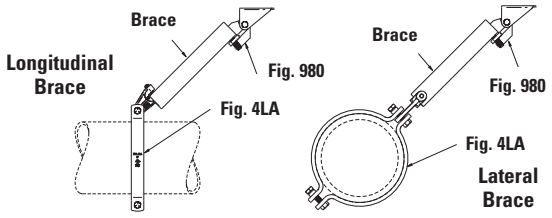


4LA-6 thru 4LA-12



Part No.	Pipe Size in.	(mm)	A in.	(mm)	C in.	(mm)	D in.	(mm)	Bolt Size	FM Max. Rec. Load Longitudinal & Lateral** 30°-44° lbs.	(kN)	45°-59° lbs.	(kN)	60°-74° lbs.	(kN)	75°-90° lbs.	(kN)	Approx. 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 series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

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

TOLCO™ Figure 4B Pipe Clamp

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

Material: Steel

Function: For bracing pipe against sway and seismic disturbance

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

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

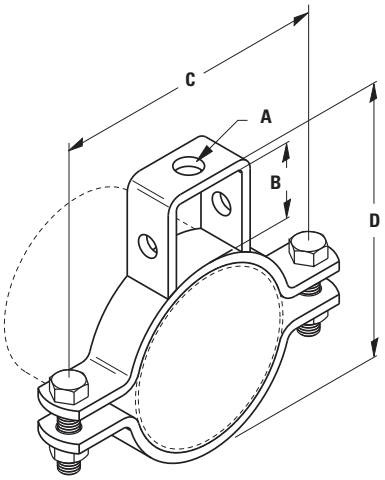
Ordering: Specify part number and finish.

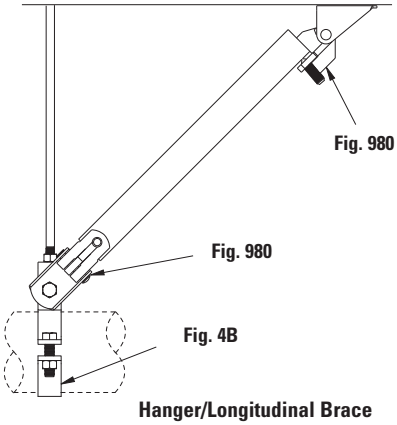
Installation Instructions: Fig. 4B is the "braced pipe" attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and transitional and structural attachment component(s) to form a complete bracing assembly. OSHPD guidelines should be followed.

To Install: Place the Fig. 4B over the pipe to be braced. Attach other transitional fitting, Fig. 909, 910, 980, or 990. Tighten bolts and nuts. Transitional fitting attachment can pivot for adjustment to proper brace angle.



OPM





Hanger/Longitudinal Brace

Part No.	Pipe Size in.	(mm)	Rod Size A	B in.	(mm)	C in.	(mm)	D in.	(mm)	Bolt Size	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	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	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	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	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	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	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	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	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	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	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	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	691	(313.4)

Refer to OPM-0052-13 for approved loads.

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

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

TOLCO™ Fig. 109DD - DDI+™ † Concrete Deck Insert with ICC-ES Approval

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

Material: Steel

Function: For use in concrete filled metal deck assemblies (i.e. pan deck, Q-deck) applications/ After installation, the threaded male hanger of the insert protrudes below the surface of the deck. The threaded bolt offers adjustability for precise height requirements and guarantees the minimum embedment depth. The longer plate enables a variety of installation locations across the deck. Pre-mounted drill screws included for installation.

Approvals: International Code Council, Evaluation Service **(ICC-ES)**, ESR-3958 for concrete, for 3/8"-16 thru 5/8"-11″ anchor sizes. Approved for seismic and wind loading.
UL (Underwriters Laboratories) Listed
FM (Factory Mutual) Approved

Finish: Plate: Plain Steel. Rod: Electro-Galvanized.

Order By: Figure number, rod size and finish.

Applications Per NFPA 13 (2010): UL Listed as a component of a hanger assembly per Section 9.1.1.4.1
See dimensions and installation Detail below.

Note: Fig. 109DD replaces Fig. 109A which has been discontinued.

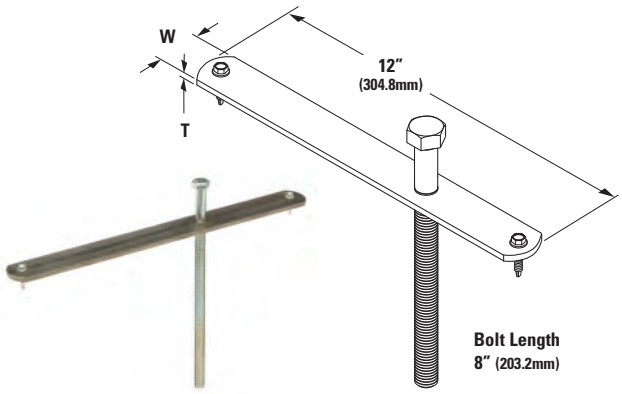


Figure A
DDI+ Concrete Inserts Installed Through the Soffit of Concrete-Filled Steel Deck Floor and Roof Assemblies (Over Upper Flute)
Sand-Lightweight Concrete or Normal Weight Concrete Over Steel Deck (Min. 3,000 PSI)

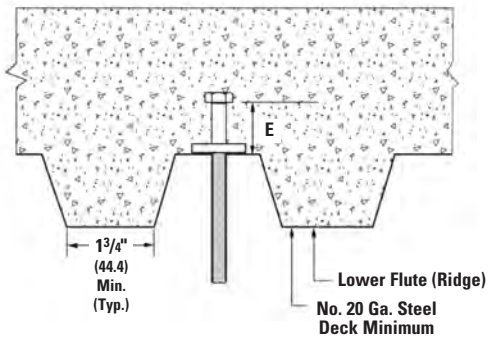


Figure B
DDI+ Concrete Inserts Installed Through the Soffit of Concrete-Filled Steel Deck Floor and Roof Assemblies (Over Flute Incline)
Sand-Lightweight Concrete or Normal Weight Concrete Over Steel Deck (Min. 3,000 PSI)

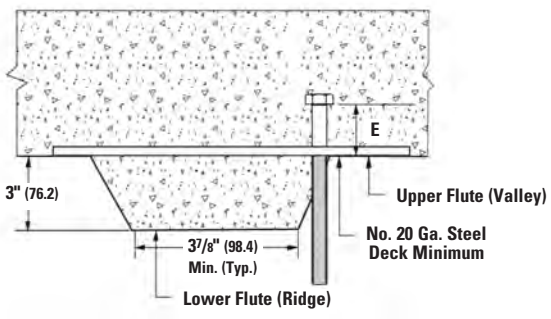
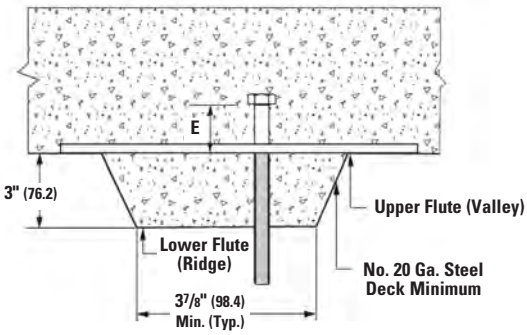


Figure C
DDI+ Concrete Inserts Installed Through the Soffit of Concrete-Filled Steel Deck Floor and Roof Assemblies (Over Lower Flute)
Sand-Lightweight Concrete or Normal Weight Concrete Over Steel Deck (Min. 3,000 PSI)



Part No.	Rod Size	Thickness T in.	(m)	Width W in.	(m)	Effective Embedment Depth E in.	(m)	Nominal Embedment Depth in.	(m)	Approx. Wt./100 lbs.	(kg)
109DD-3/8	3/8"-16	3/16"	(4.7)	1 1/4"	(31.7)	1 1/2"	(38.1)	1 3/4"	(44.4)	98.1	(44.5)
109DD-1/2	1/2"-13	3/16"	(4.7)	1 1/4"	(31.7)	1 3/4"	(44.4)	2"	(50.8)	112.8	(51.1)
109DD-5/8	5/8"-11	3/16"	(4.7)	1 1/4"	(31.7)	2"	(50.8)	2 3/8"	(60.3)	139.3	(63.2)
109DD-3/4	3/4"-10	3/8"	(9.5)	2"	(50.8)	2 1/8"	(54.0)	2 5/8"	(66.7)	338.7	(153.6)
109DD-7/8	7/8"-9	3/8"	(9.5)	2"	(50.8)	2 1/16"	(52.4)	2 5/8"	(66.7)	381.2	(172.9)

† DDi+™ is a registered trademark used by DEWALT®

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

ACPW Series - Wood-Knocker™† II

OPM

Features:

- Wood-Knocker™ concrete inserts are installed onto wooden forms used to support newly poured concrete floor slabs, roof slabs or walls.
- When the forms are stripped, the color-coded flange is visibly embedded in the concrete surface.
- The unique, six sided impact plate offers resistance to rotation within the concrete as threaded rod is being installed.
- Suitable for overhead installations such as suspending cable tray, pipe hangers, strut and conduit.
- Color coded by size for all trades.
- UL and FM approved.
- Lowest installation cost.



ACPW-50 shown

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

ICC-ES Certified. See ICC-ESR-3657

UL (Underwriters Laboratories) Listed

FM (Factory Mutual) Approved

Refer to pages 11-26 through 11-27 in Seismic Engineering Guidelines OPM-0052-13 for approval OSHPD structural attachment data.



Catalog Number	Rod Diameter	Color
ACPW-25-2	1/4"	Brown
ACPW-37-2	3/8"	Green
ACPW-3750-2	3/8"-1/2"	Gray
ACPW-50-2	1/2"	Yellow
ACPW-62-2	5/8"	Red
ACPW-75-2	3/4"	Purple

Wood Knocker™ - Data	1/4"	3/8"	1/2"	5/8"	3/4"
Insert Thread Length (in.)	3/8	5/8	11/16	15/16	1 1/8
Plastic Flange Diameter (in.)	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8
Thread Size (UNC)	1/4"-20	3/8"-16	1/2"-13	5/8"-11	3/4"-10
Overall Length (in.)	1 7/8	1 7/8	1 7/8	1 7/8	1 7/8
Min. Insert Spacing (in.)	9	9	9	12	12
Min. End Distance (in.)	6	6	6	9	9
Load Capacity Tension (lbs) *	930	1200	1200	1160	1160
Load Capacity Shear (lbs) *	370	1330	1840	2800	2800

* Based on normal weight concrete with minimum compression strength of 3000 psi.
Allowable load capacities are calculated using applied safety factor of 4.0.
For additional loading information contact factory.

Minimum embedment depth is 2".

† Wood-Knocker™ is a registered trademark used by DeWalt.

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

ACPD Series - Bang-It™†+ Anchors

OPM

Features:

- Bang-It™ concrete inserts are designed for installation in and through metal composite deck used to support newly poured concrete floors or roof slabs.
- After installation, the protective sleeve of the insert protrudes below the surface of the deck, allowing overhead attachment of threaded rod.
- The unique, six sided impact plate offers resistance to rotation within the concrete as threaded rod is bing installed.
- Suitable for overhead installations such as suspending cable tray, pipe hangers, strut and conduit.
- Color coded by size for all trades.
- Lowest installation cost.



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

ICC-ES Certified. See ICC-ESR-3657

UL (Underwriters Laboratories) Listed

FM (Factory Mutual) Approved

Refer to pages 11-28 through 11-32 in Seismic Engineering Guidelines OPM-0052-13 for approval OSHPD structural attachment data.

Catalog Number	Rod Diameter	Color
ACPD-25	1/4"	Brown
ACPD-37	3/8"	Green
ACPD-3750-2	3/8"-1/2"	Gray
ACPD-50	1/2"	Yellow
ACPD-62	5/8"	Red
ACPD-75	3/4"	Purple

Catalog Number	Description
ACPD-HS813-2	13/16" Carbide Hole Saw for 1/4", 3/8", 1/2"
ACPD-HS1188-2	1 3/16" Carbide Hole Saw for 5/8", 3/4"

Bang-It™ - Data	1/4"	3/8"	1/2"	5/8"	3/4"
Metal Hole Saw Diameter (in.)	13/16	13/16	13/16	1 3/16	1 3/16
Drilling Speed (rpm)	700-900	700-900	700-900	500-700	500-700
Insert Thread Length (in.)	3/8	5/8	11/16	15/16	1 1/8
Length of Sleeve (in.)	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8
Thread Size (UNC)	1/4"-20	3/8"-16	1/2"-13	5/8"-11	3/4"-10
Embedment Depth (in.)	2	2	2	2	2
Upper Deck Tension Load (lbs) *	1115	1915	2370	2935	2935
Lower Deck Tension Load (lbs) *	830	830	830	930	990
Upper Deck Shear Load (lbs) *	835	1115	1115	1115	1115
Lower Deck Shear Load (lbs) *	625	840	840	840	840

* Based on sand lightweight and normal weight concrete with minimum compression strength of 3000 psi over steel deck.
Allowable load capacities are calculated using applied safety factor of 4.0.
For additional loading information contact factory.
Minimum insert spacing of 6", minimum end spacing 6".

† Bang-It™ is a registered trademark used by DeWalt

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

AWSD Series - Power Stud+®† SD2 Seismic Wedge Anchors

OPM

Features:

- Fully threaded, torque-controlled, wedge anchor which is designed for consistent performance in cracked and uncracked concrete.
- For use in concrete, structural sand lightweight concrete, and concrete over metal deck.
- Nominal drill bit size is the same as the anchor diameter.
- ICC-ES listed, ESR-2502, Category 1
- Zinc plated carbon steel body with stainless steel expansion clip from premium performance.
- Qualified for seismic and wind loading.



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

ICC-ES Certified. See ICC-ESR-2502

UL (Underwriters Laboratories) Listed

FM (Factory Mutual) Approved

Refer to pages 11-20 through 11-23 in Seismic Engineering Guidelines OPM-0052-13 for approval OSHPD structural attachment data.

Seismic Wedge Anchor - Data	3/8"-16	1/2"-13	5/8"-11	3/4"-10
ANSI Drill Bit Size (in. - mm)	3/8" - (9.5mm)	1/2" - (12.7mm)	5/8" - (15.9mm)	3/4" - (19.0mm)
Fixture Clearance Hole (in. - mm)	7/16" - (11.1mm)	9/16" - (14.3mm)	11/16" - (17.5mm)	13/16" - (20.6mm)
Minimum Hole Depth (in. - mm)	2 5/8" - (66.7mm)	2 3/4" - (69.8mm)	4 1/4" - (107.9mm)	5" - (127.0mm)
Minimum Concrete Thickness (in. - mm)	4" - (101.6mm)	4 1/2" - (114.3mm)	5 3/4" - (146.0mm)	7" - (177.8mm)
Max. Tightening Torque (lbs-ft - N•m)	20 lbs-ft - (27.1N•m)	40 lbs-ft - (54.2N•m)	60 lbs-ft - (81.3N•m)	110 lbs-ft - (149.1N•m)
Min. Embedment Depth (in. - mm)	2 3/8" - (60.3mm)	2 1/2" - (63.5mm)	3 7/8" - (98.4mm)	4 1/2" - (114.3mm)

For loading information, refer to the ICC-ES ESR-2502 evaluation report.

Wedge Anchor Part No.	Anchor Size Diameter in.	(mm)	Length in.	(mm)	Thread Length in.	(mm)	Wt./100 Lbs.	(kg)
AWSD-37-300	3/8"	(9.5)	3"	(76.2)	1 3/4"	(44.4)	11.4	(5.2)
AWSD-37-350	3/8"	(9.5)	3 1/2"	(88.9)	2 1/4"	(57.1)	12.2	(5.5)
AWSD-37-375	3/8"	(9.5)	3 3/4"	(95.2)	2 1/2"	(63.5)	13.2	(6.0)
AWSD-37-500	3/8"	(9.5)	5"	(127.0)	3 3/4"	(95.2)	16.0	(7.2)
AWSD-50-375	1/2"	(12.7)	3 3/4"	(95.2)	2 1/8"	(54.0)	23.0	(10.4)
AWSD-50-450	1/2"	(12.7)	4 1/2"	(114.3)	2 7/8"	(73.0)	26.6	(12.0)
AWSD-50-550	1/2"	(12.7)	5 1/2"	(139.7)	3 7/8"	(98.4)	34.0	(15.4)
AWSD-50-700	1/2"	(12.7)	7"	(177.8)	5 3/8"	(136.5)	38.0	(17.2)
AWSD-62-475	5/8"	(15.9)	4 3/4"	(120.6)	2 7/8"	(73.0)	50.3	(22.8)
AWSD-62-500	5/8"	(15.9)	5"	(127.0)	3 1/8"	(79.4)	52.0	(23.6)
AWSD-62-600	5/8"	(15.9)	6"	(152.4)	4 1/8"	(104.8)	58.8	(26.7)
AWSD-62-700	5/8"	(15.9)	7"	(177.8)	5 1/8"	(130.2)	65.2	(29.6)
AWSD-75-550	3/4"	(19.0)	5 1/2"	(139.7)	3 1/4"	(82.5)	81.5	(36.9)
AWSD-75-625	3/4"	(19.0)	6 1/4"	(158.7)	4"	(101.6)	94.0	(42.6)
AWSD-75-700	3/4"	(19.0)	7"	(177.8)	4 3/4"	(120.6)	106.5	(48.3)

† Power Stud+® SD2 is a registered trademark used by DeWalt.

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

ACB Series - Concrete Screw Bolts

Features:

- For use in racking, shelving, material handling, structural anchorage, masonry and food & beverage facilities.
- One piece heavy-duty anchor with a finished hex-head.
- Fits standard fixture hole dimensions in fabricated steel.
- Fast installation and immediate loading reduces downtime.
- For proper performance, screw anchors must be installed with the corresponding bits. The bits have a matched tolerance range designed to provide optimum performance.



Concrete Screw Bolts - Data	1/4"	3/8"
ACB Drill Bit Size (in. - mm)	1/4" - (6.3mm)	3/8" - (9.5mm)
Concrete Screw Tolerance Range (in. - mm)	0.255" - 0.259" - (6.5mm - 6.6mm)	0.385" - 0.389" - (9.8mm - 9.9mm)
Min. Embedment Depth (in. - mm)	1" - (25.4mm)	1 1/2" - (38.1mm)
Load Capacity Tension (lbs - kN) *	335 lbs. - (1.49kN)	630 lbs. - (2.80kN)
Load Capacity Shear (lbs - kN) *	520 lbs. - (2.31kN)	1170 lbs. - (5.20kN)

* Based on concrete compression strength of 4000 psi in uncracked concrete using applied safety factor of 4.0. For additional loading information contact factory.

For ultimate strength design data in cracked and uncracked concrete, refer to ICC-ES ESR-2526 evaluation report.

Concrete Bolt Part No.	Bolt Size Diameter in.	(mm)	Length in.	(mm)	Thread Length in.	(mm)	Wt./100 Lbs.	(kg)
ACB-25-175-2	1/4"	(6.3)	1 3/4"	(44.4)	1 5/8"	(41.3)	3.5	(1.6)
ACB-25-225-2	1/4"	(6.3)	2 1/4"	(57.1)	2"	(50.8)	4.2	(1.9)
ACB-25-300-2	1/4"	(6.3)	3"	(76.2)	2 3/4"	(69.8)	5.0	(2.3)
ACB-37-175-2	3/8"	(9.5)	1 3/4"	(44.4)	1 1/2"	(38.1)	7.8	(3.5)
ACB-37-250-2	3/8"	(9.5)	2 1/2"	(63.5)	2 1/4"	(57.1)	10.2	(4.6)
ACB-37-300-2	3/8"	(9.5)	3"	(76.2)	2 3/4"	(69.8)	11.6	(5.3)
ACB-37-400-2	3/8"	(9.5)	4"	(101.6)	3 3/4"	(95.2)	14.8	(6.7)

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

ATM Series - Self-Tapping Machine Screw Anchors

Features:

- For use in normal-weight concrete, structural sand lightweight concrete and concrete over metal deck.
- Anchor design allows for shallow embedment and mechanically interlocks with base material.
- Internally threaded anchor for easy adjustment and removability of threaded rod or bolt.
- Fast anchor installation with a powered impact wrench.
- Suitable for overhead applications such as suspending cable tray, strut, pipe hangers and conduit.
- Made of Zinc Plated carbon steel.
- Setting tool included.
- **Approvals: ICC-ES** certified. See ICC-ESR-2272.
  FM (Factory Mutual) Approved

FM APPROVED



Self-Tapping Machine Screw Anchor - Data	3/8"
ANSI Drill Bit Size (in. - mm)	1/2" - (12.7mm)
Minimum Concrete Thickness (in. - mm)	4" - (101.6mm)
Max. Tightening Torque (lbs-ft - N•m)	8 lbs-ft - (10.8N•m)
Min. Embedment Depth (in. - mm)	1 3/8" - (41.3mm)
Load Capacity Tension (lbs - kN)	540 lbs - (2.40kN)
Load Capacity Shear (lbs - kN)	825 lbs - (3.67kN)

* Based on concrete compression strength of 4000 psi in uncracked concrete using applied safety factor of 4.0. For additional loading information contact factory.
For ultimate strength design data in cracked and uncracked concrete, refer to ICC-ES ESR-2526 evaluation report.

Part No.	Anchor Thread Size	Thread Length in.	Thread Length (mm)	Wt./100 lbs.	Wt./100 (kg)
ATM-37	3/8"-16	11/16"	(17.6)	5.2	(2.3)

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

B3068 - Welded Bracket - Light Duty

Material: Steel

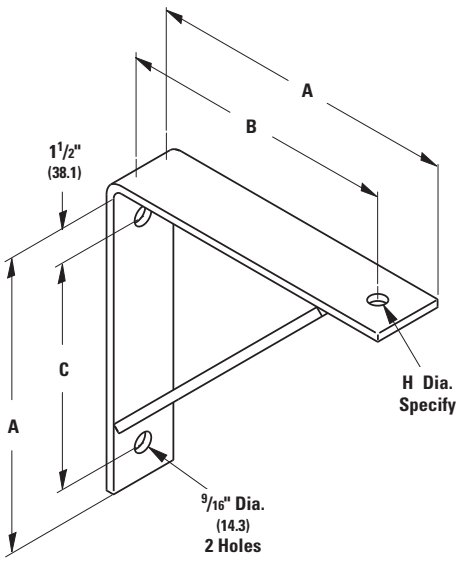
Function: Recommended for suspending pipe outward from mounting surface.

Approvals: Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 32 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 31.

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

Order By: Part number, hole size 'H', and finish





Part No.	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)	H Dia. in.	H Dia. (mm)	Design Load * Lbs.	Design Load * (kN)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
B3068-1	9"	(228.6)	8"	(203.2)	6 1/2"	(165.1)	Specify	(Specify)	275	(1.22)	360	(163.3)
B3068-2	13"	(330.2)	12"	(304.8)	10 1/2"	(266.7)	Specify	(Specify)	275	(1.22)	582	(264.0)
B3068-3	19"	(482.6)	18"	(457.2)	16 1/2"	(419.1)	Specify	(Specify)	275	(1.22)	860	(390.1)

* Design load based on a safety factor of 5 and reduced by 250 lbs per NFPA.

B3065 - Welded Bracket - Light Duty

Max. Recommended Load: 275 lbs. (1.22kN)

Material: Steel

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

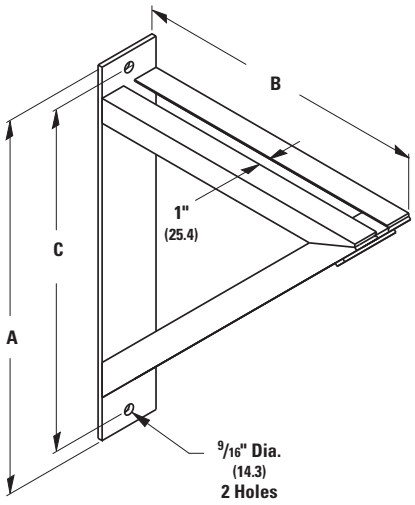
Approvals: Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 32 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 31.

Finish: Plain

Note: Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

Order By: Figure number and finish





Part No.	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)	Design Load * Lbs.	Design Load * (kN)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
B3065-1	13"	(330.2)	9"	(228.6)	11 1/2"	(292.1)	275	(1.22)	571	(259.0)
B3065-2	17"	(431.8)	13"	(330.2)	15 1/2"	(393.7)	275	(1.22)	769	(348.8)
B3065-3	23"	(584.2)	19"	(482.6)	21 1/2"	(546.1)	275	(1.22)	1057	(479.4)

* Design load based on a safety factor of 5 and reduced by 250 lbs per NFPA.

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

B3064 - Adjustable Strut Bracket

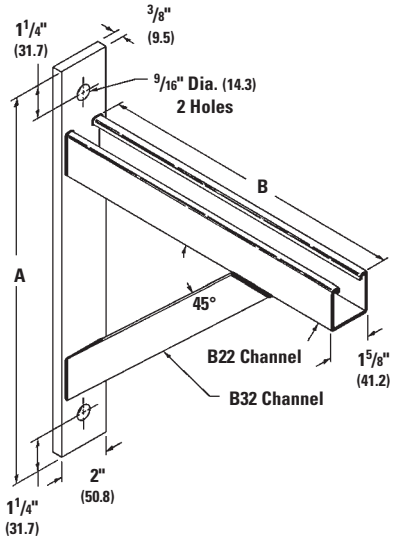
Material: Steel

Function: Designed for supporting pipe from walls or structures where lateral adjustment is required.

Standard Finish: Plain or Electro-Galvanized

Order By: Part number and finish.





Part No.	A in.	A (mm)	B in.	B (mm)	Design Load * Lbs.	Design Load * (kN)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
B3064-1	15"	(381.0)	12"	(304.8)	590	(2.62)	660	(299.4)
B3064-2	21"	(533.4)	18"	(457.2)	310	(1.38)	1004	(455.4)
B3064-3	27"	(685.8)	24"	(609.6)	170	(0.75)	1346	(610.5)

* Design load based on a safety factor of 5 and reduced by 250 lbs per NFPA.

B3066 - Welded Bracket - Medium Duty

Max. Recommended Load: 800 lbs. (3.56kN)

Material: Steel

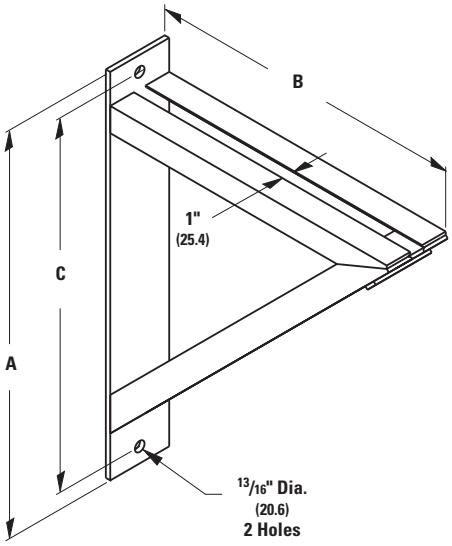
Function: Recommended for supporting pipe on top or hanging through support bracket outward from mounting surface.

Approvals: Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 33 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 32.

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

Order By: Figure number and finish





Part No.	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)	Design Load * Lbs.	Design Load * (kN)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
B3066-0	18"	(457.2)	12"	(304.8)	15 1/2"	(393.7)	800	(3.56)	1577	(715.3)
B3066-1	24"	(609.6)	18"	(457.2)	21 1/2"	(546.1)	800	(3.56)	2578	(1169.4)
B3066-2	30"	(762.0)	24"	(609.6)	27 1/2"	(698.5)	800	(3.56)	4446	(2016.7)

* Design load based on a safety factor of 5 and reduced by 250 lbs per NFPA.

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

B3067 - Welded Bracket - Heavy Duty

Max. Recommended Load: 3000 lbs. (13.34kN)

Material: Steel

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

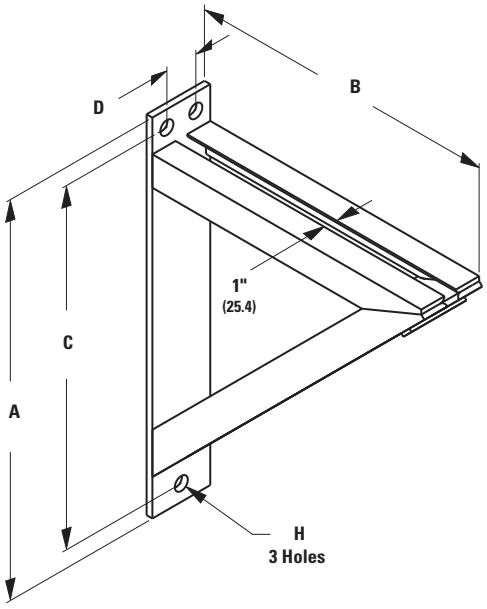
Approvals: Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 33 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 33.

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

Order By: Part number and finish



B3067-0 Shown



Only one hole in top for B3067-0

Part No.	Mtg. Hole H in.	(mm)	A in.	(mm)	B in.	(mm)	C in.	(mm)	D in.	(mm)
B3067-0	1 1/8"	(28.6)	18"	(457.2)	12"	(304.8)	15 1/4"	(387.3)	**	**
B3067-1	1 1/8"	(28.6)	24"	(609.6)	18"	(457.2)	21 1/4"	(539.7)	2 1/2"	(63.5)
B3067-2	1 1/8"	(28.6)	30"	(762.0)	24"	(609.6)	27 1/4"	(692.1)	2 1/2"	(63.5)
B3067-3	1 1/8"	(28.6)	36"	(914.4)	30"	(762.0)	33"	(838.2)	2 1/2"	(63.5)
B3067-4	1 1/8"	(28.6)	42"	(1066.8)	36"	(914.4)	39"	(990.6)	3 1/2"	(88.9)
B3067-5	1 1/8"	(28.6)	50"	(1270.0)	42"	(1066.8)	46"	(1168.4)	3 1/2"	(88.9)

** One Hole

Part No.	Design Load * Lbs.	(kN)	Approx. Wt./100 Lbs.	(kg)
B3067-0	1850	(8.23)	2195	(995.6)
B3067-1	1850	(8.23)	4398	(1994.9)
B3067-2	1850	(8.23)	6294	(2854.9)
B3067-3	1850	(8.23)	7196	(3264.1)
B3067-4	1850	(8.23)	13197	(5986.2)
B3067-5	1850	(8.23)	15795	(7164.6)

* Design load based on a safety factor of 5 and reduced by 250 lbs per NFPA.

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

B3069W - Welded Knee Bracket

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

Material: Steel

Function: Recommended for suspending pipe outward from mounting surface.

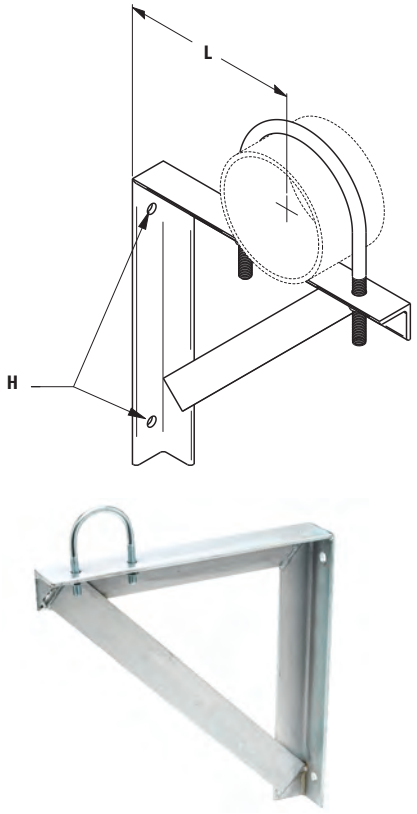
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Note: Maximum "L" dimension 16" (406.4mm).

Order By: Figure number, pipe size, (**) "L" dimension and finish

Part No.	Pipe Size in.	(mm)	Hole Size H in.	(mm)	Max. Rec. Load *** Lbs.	(kN)
B3069W-1/2-**	1/2"	(15)	9/16"	(14.3)	450	(2.00)
B3069W-3/4-**	3/4"	(20)	9/16"	(14.3)	450	(2.00)
B3069W-1-**	1"	(25)	9/16"	(14.3)	450	(2.00)
B3069W-1 1/4-**	1 1/4"	(32)	9/16"	(14.3)	450	(2.00)
B3069W-1 1/2-**	1 1/2"	(40)	9/16"	(14.3)	450	(2.00)
B3069W-2-**	2"	(50)	9/16"	(14.3)	450	(2.00)
B3069W-2 1/2-**	2 1/2"	(65)	9/16"	(14.3)	450	(2.00)
B3069W-3-**	3"	(80)	9/16"	(14.3)	450	(2.00)
B3069W-3 1/2-**	3 1/2"	(90)	9/16"	(14.3)	450	(2.00)
B3069W-4-**	4"	(100)	11/16"	(17.5)	450	(2.00)
B3069W-5-**	5"	(125)	11/16"	(17.5)	450	(2.00)
B3069W-6-**	6"	(150)	11/16"	(17.5)	450	(2.00)
B3069W-8-**	8"	(200)	11/16"	(17.5)	450	(2.00)

*** Load based on a safety factor of 5 and reduced by 250 lbs per NFPA.



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

B3069E - "O" Bracket

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

Material: Carbon Steel

Function: Recommended for suspending pipe outward from mounting surface.

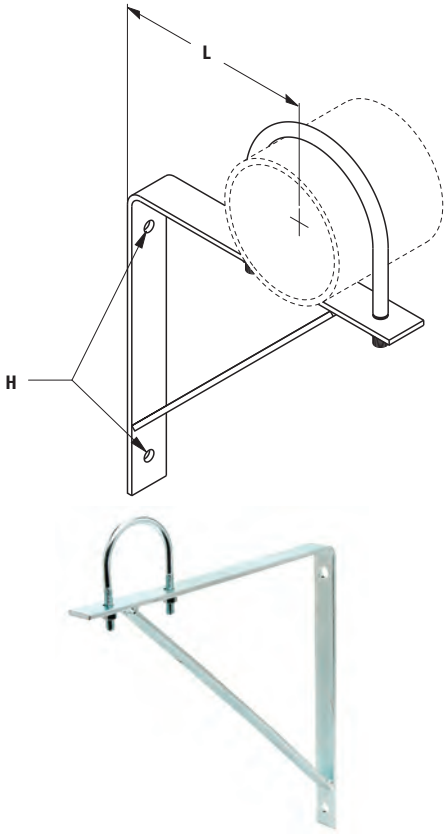
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Note: Maximum "L" dimension 16" (406.4mm).

Order By: Figure number, pipe size, (**) "L" dimension and finish

Part No.	Pipe Size in.	(mm)	Hole Size H in.	(mm)	Max. Rec. Load *** Lbs.	(kN)
B3069E-1/2-**	1/2"	(15)	9/16"	(14.3)	65	(0.29)
B3069E-3/4-**	3/4"	(20)	9/16"	(14.3)	65	(0.29)
B3069E-1-**	1"	(25)	9/16"	(14.3)	65	(0.29)
B3069E-1 1/4-**	1 1/4"	(32)	9/16"	(14.3)	65	(0.29)
B3069E-1 1/2-**	1 1/2"	(40)	9/16"	(14.3)	65	(0.29)
B3069E-2-**	2"	(50)	9/16"	(14.3)	65	(0.29)
B3069E-2 1/2-**	2 1/2"	(65)	9/16"	(14.3)	65	(0.29)
B3069E-3-**	3"	(80)	9/16"	(14.3)	65	(0.29)
B3069E-3 1/2-**	3 1/2"	(90)	9/16"	(14.3)	65	(0.29)
B3069E-4-**	4"	(100)	11/16"	(17.5)	65	(0.29)
B3069E-5-**	5"	(125)	11/16"	(17.5)	65	(0.29)
B3069E-6-**	6"	(150)	11/16"	(17.5)	65	(0.29)
B3069E-8-**	8"	(200)	11/16"	(17.5)	65	(0.29)

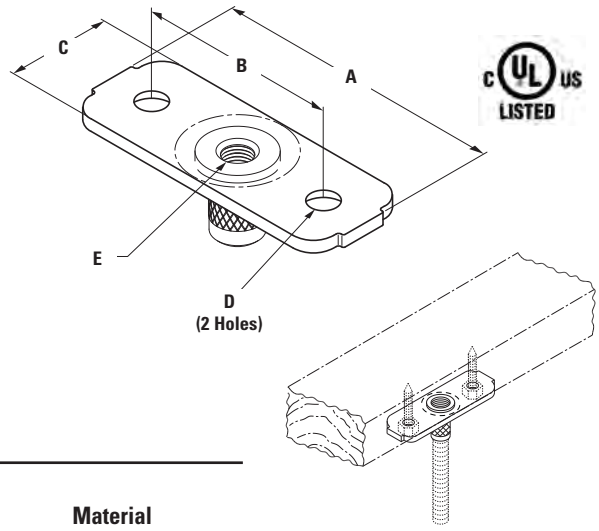
*** Load based on a safety factor of 5 and reduced by 250 lbs per NFPA.



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

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

TOLCO™ Fig. 78 - All Steel Ceiling Plate



Size Range: 3/8"-16 rod

Material: Pre-Galvanized Steel

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

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Additionally, UL has listed the Fig. 78 with fasteners as shown in the table below.

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

Order By: Figure number, rod size and finish

Patent #5,702,077

UL Listed Fastener Table

Pipe Size	Qty	Fastener Type	Material
1/2" - 2"	2	#14 x 1 1/4" A-point hex-washer-head sheet metal screw	Wood
2 1/2" - 4"	2	1/4" x 1 1/2" wood screws*	Wood
1/2" - 2"	2	1/4" x 1" tek screws	Metal (18 gauge)
1/2" - 2"	2	#14 x 1 1/4" A-point hex-washer-head sheet metal screw	Wood
1/2" - 2"	2	#14 x 2" A-point-hex-washer-head sheet metal screw	Wood thru 5/8" gyp board

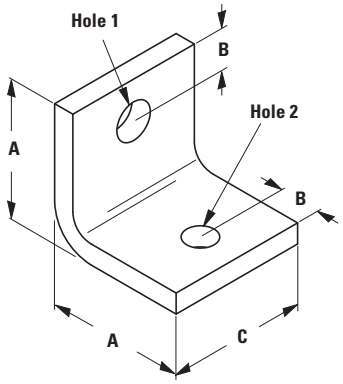
* No pre-drilling



Larger pipe sizes can be hung with reduced spacing.

Part No.	Pipe Size in.	Pipe Size (mm)	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)	Hole Dia. D in.	Hole Dia. D (mm)	Thread Size E	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
78-3/8	1/2" - 2"	(15 - 60)	3"	(76.2)	2 1/8"	(54.0)	1 1/8"	(28.6)	5/16"	(7.9)	3/8"-16	15	(6.8)

TOLCO™ Fig. 51 - Side Beam Bracket for NFPA Rod & Fastener Sizing



Size Range: 3/8"-16 thru 1/2"-13 rod, 1/2" (15mm) thru 8" pipe (200mm)

Material: Steel

Function: Recommended for attaching hanger rod to side of beams or walls. Designed to accommodate current rod schedule and fastener requirements per National Fire Protection Association (NFPA) Pamphlet 13.

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**, and Factory Mutual Engineering approved.

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

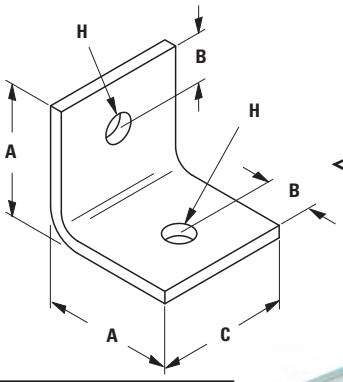
Order By: Figure number and finish



Part No.	Pipe Size in.	Pipe Size (mm)	Rod Size	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)	Hole 1 in.	Hole 1 (mm)	Hole 2 in.	Hole 2 (mm)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
51NFPA-3/8x3/8	1/2" - 2"	(15 - 60)	3/8"-16	2"	(50.8)	3/4"	(19.0)	2"	(50.8)	7/16"	(11.1)	7/16"	(11.1)	35	(15.9)
51NFPA-3/8x1/2	2 1/2" - 4"	(65 - 100)	3/8"-16	2"	(50.8)	3/4"	(19.0)	2"	(50.8)	9/16"	(14.3)	7/16"	(11.1)	34	(15.4)
51NFPA-1/2x1/2	5" - 6"	(125 - 150)	1/2"-13	2 1/2"	(63.5)	3/4"	(19.0)	2 1/2"	(63.5)	9/16"	(14.3)	9/16"	(14.3)	71	(32.2)
51NFPA-1/2x5/8	8"	(200)	1/2"-13	2 1/2"	(63.5)	3/4"	(19.0)	2 1/2"	(63.5)	11/16"	(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.

TOLCO™ 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 **(FM)** approved.

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

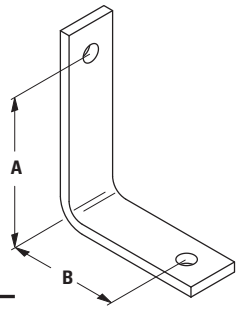
Order By: Figure number, rod size and finish



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





Material: Steel

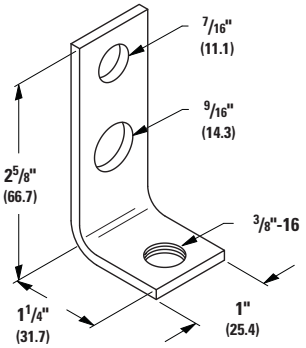
Function: — Recommended for supporting pipe at various distances from wall or column.

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

Order By: Figure number and finish

Part No.	Size	A		B		Hole Size		Max. Rec. Load		Approx. Wt./100	
	in.	(mm)	Size	in.	(mm)	in.	(mm)	Lbs.	(kN)	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)

TOLCO™ 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 **(FM)** approved for 1/2" (15mm) thru 4" (100mm) pipe.

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.

Part No.	Approx. Wt./100	
	Lbs.	(kg)
56	20	(9.1)

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

TOLCO™ Fig. 58 - Threaded Side Beam Bracket

Size Range: 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.

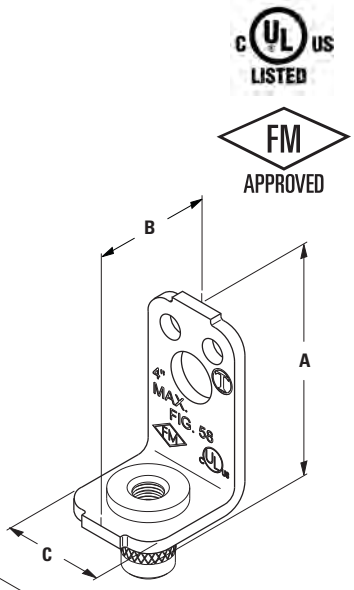
Features: Unique design allows rod to be easily threaded into bracket. Offset design permits unlimited rod adjustment. Center mounting hole will accept 3/8" and 1/2" fastener bolts. Per NFPA 13: 1/2" (15mm) thru 2" (50mm) pipe requires 3/8" fastener, 2 1/2" (65mm) thru 4" (100mm) pipe requires 1/2" fastener.*

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

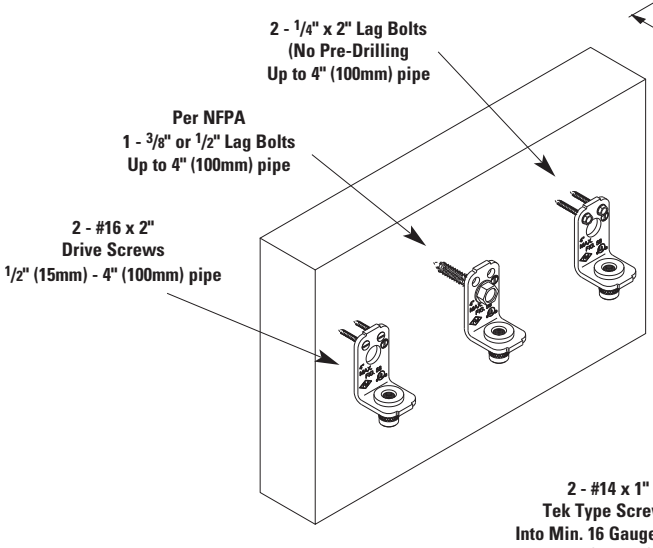
Finish: Pre-Galvanized

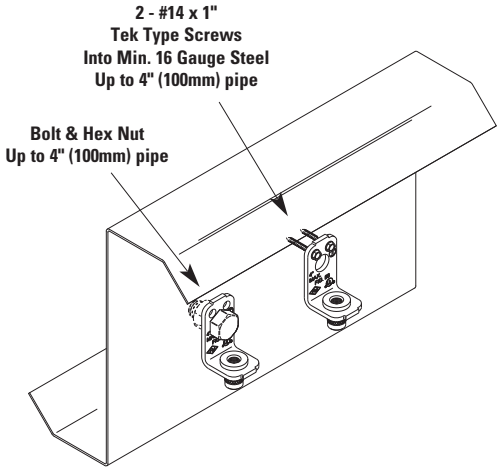
Order By: Figure number and finish

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









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

B3200 - Weldless Eye Nut

OPM

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.

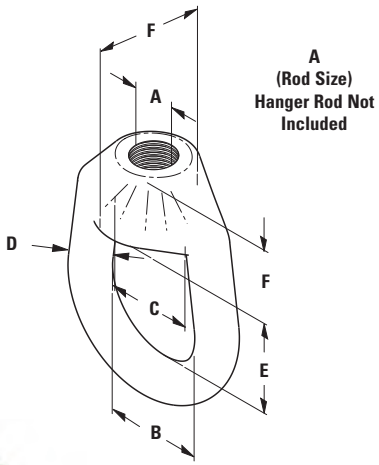
Threads: Tapped UNC Class 2B. Right hand threads are standard. Left hand threads supplied upon request (B3200L).

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

Approvals: Approvals: Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 17 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 17.

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

Order By: Figure number and finish.





Part No.	Rod Size A	B in.	B (mm)	C in.	C (mm)	D in.	D (mm)	E in.	E (mm)	F in.	F (mm)	G in.	G (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)	11/16"	(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)	11/16"	(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)	11/16"	(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)	11/16"	(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 650°F (343°C) Lbs.	(kN)	750°F (399°C) Lbs.	(kN)	Approx. Wt./100 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.

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

B501 - Light Weight U-Bolt with 2 Hex Nuts

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

Material: Carbon Steel

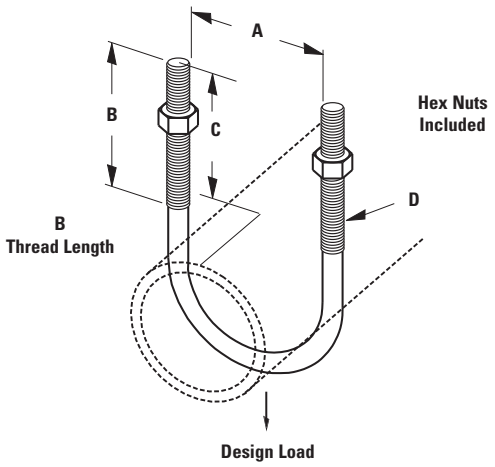
Function: Recommended for supporting or anchoring light pipe loads.

Maximum Temperature: 650°F (343°C)

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

Order By: Figure number and finish.

Note: When furnished in Hot-Dip Galvanized finish, oversize tapped hex nuts must be used.





Part No.	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)	D	Design Load Lbs.	Design Load (kN)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
B501-1/2	15/16"	(23.8)	1 3/4"	(44.4)	1 1/2"	(38.1)	5/16"-18	600	(2.67)	12	(5.4)
B501-3/4	1 1/8"	(28.6)	1 3/4"	(44.4)	1 5/8"	(41.3)	5/16"-18	600	(2.67)	13	(5.9)
B501-1	1 3/8"	(29.9)	1 7/8"	(47.6)	1 5/8"	(41.3)	5/16"-18	900	(4.00)	14	(6.3)
B501-1 1/4	1 23/32"	(43.6)	1 3/4"	(44.4)	1 15/32"	(37.3)	5/16"-18	900	(4.00)	15	(6.8)
B501-1 1/2	2"	(50.8)	1 3/4"	(44.4)	1 7/16"	(36.5)	5/16"-18	900	(4.00)	16	(7.2)
B501-2	2 7/16"	(61.9)	2 1/16"	(52.4)	1 7/8"	(47.6)	3/8"-16	1200	(5.34)	27	(12.2)
B501-2 1/2	2 15/16"	(74.6)	2 1/16"	(52.4)	1 13/16"	(46.0)	3/8"-16	1200	(5.34)	32	(14.5)
B501-3	3 9/16"	(90.5)	2"	(50.8)	1 3/4"	(44.4)	3/8"-16	1800	(8.00)	36	(16.3)
B501-3 1/2	4 3/32"	(94.6)	2"	(50.8)	1 23/32"	(43.6)	3/8"-16	1800	(8.00)	38	(17.2)
B501-4	4 19/32"	(116.7)	2 1/4"	(57.1)	1 21/32"	(50.0)	3/8"-16	1800	(8.00)	42	(19.0)
B501-5	5 21/32"	(143.6)	2 1/4"	(57.1)	2"	(50.8)	1/2"-13	2400	(10.70)	92	(41.7)
B501-6	6 3/4"	(171.4)	2 5/8"	(66.7)	2 3/8"	(60.3)	5/8"-11	2400	(10.70)	176	(79.8)
B501-8	8 3/4"	(222.2)	2 5/8"	(66.7)	2 3/8"	(60.3)	5/8"-11	2400	(10.70)	191	(86.6)

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

B3188 - Standard U-Bolt with 4 Hex Nuts
B3188C - Standard Plastic Coated U-Bolt

Size Range: Size 1/2" (15mm) thru 30" (900mm) pipe

Material: Steel

Function: Recommended for support, anchor or guide of pipe.

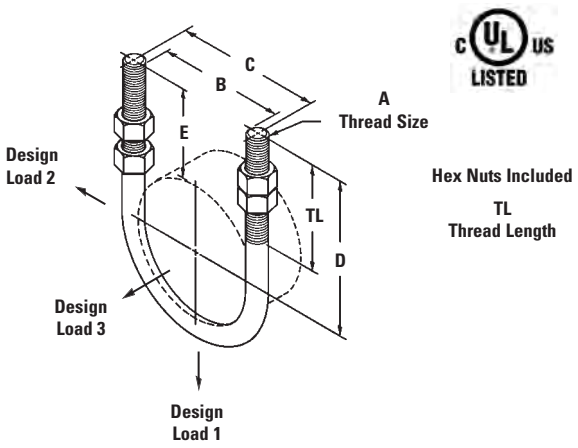
Approvals: Underwriters Laboratories Listed 3/4" (20mm) thru 12" (300mm). Conforms to Federal Specification WW-H-171E & A-A-1192A, Type 24 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 24.

Maximum Temperature: 750°F (399°C)

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

Order By: Figure number and finish. U-bolt can be furnished with longer tangents "D" or with longer threads "E". Consult factory.

Note: When furnished in Hot-Dip Galvanized finish, oversize tapped hex nuts must be used.
B3188NS - Non-standard (NS) U-bolts are available upon request. Specify dimensions other than standard. B3188DI - For ductile iron pipe.







B3188C
Plastic Coated

Part No.	Pipe Size in.	(mm)	Thread Size	Thread Length TL in.	(mm)	B in.	(mm)
B3188-1/2	1/2"	(15)	1/4"-20	2 1/8"	(54.0)	15/16"	(23.8)
B3188-3/4	3/4"	(20)	1/4"-20	2 1/8"	(54.0)	1 1/8"	(28.6)
B3188-1	1"	(25)	1/4"-20	2 1/8"	(54.0)	1 3/8"	(34.9)
B3188-1 1/4	1 1/4"	(32)	3/8"-16	2 1/8"	(54.0)	1 11/16"	(42.9)
B3188-1 1/2	1 1/2"	(40)	3/8"-16	2 1/2"	(63.5)	2"	(50.8)
B3188-2	2"	(50)	3/8"-16	2 1/2"	(63.5)	2 7/16"	(61.9)
B3188-2 1/2	2 1/2"	(65)	1/2"-13	3"	(76.2)	2 15/16"	(74.6)
B3188-3	3"	(80)	1/2"-13	3"	(76.2)	3 9/16"	(90.5)
B3188-3 1/2	3 1/2"	(90)	1/2"-13	3"	(76.2)	4 1/16"	(103.2)
B3188-4	4"	(100)	1/2"-13	3"	(76.2)	4 9/16"	(115.9)
B3188-5	5"	(125)	1/2"-13	3"	(76.2)	5 21/32"	(143.6)
B3188-6	6"	(150)	5/8"-11	3 3/4"	(95.2)	6 3/4"	(171.4)
B3188-8	8"	(200)	5/8"-11	3 3/4"	(95.2)	8 3/4 "	(222.2)
B3188-10	10"	(250)	3/4"-10	4"	(101.6)	10 7/8"	(276.2)
B3188-12	12"	(300)	7/8"-9	4 1/4"	(107.9)	12 7/8"	(327.0)
B3188-14	14"	(350)	7/8"-9	4 1/4"	(107.9)	14 1/8"	(358.8)

For larger sizes consult full line pipe hanger catalog.

B3188 - Standard U-Bolt with 4 Hex Nuts cont.

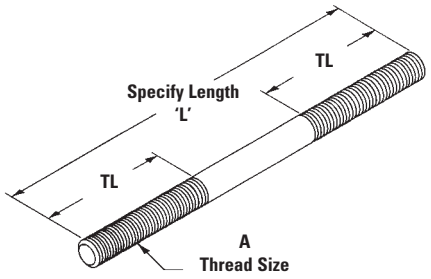
Part No.	C in.	C (mm)	Tangent D in.	Tangent D (mm)	E in.	E (mm)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
B3188-1/2	1 3/16"	(30.2)	2 3/4"	(69.8)	2 5/16"	(58.7)	10	(4.5)
B3188-3/4	1 3/8"	(34.9)	2 3/4"	(69.8)	2 7/32"	(56.3)	11	(5.0)
B3188-1	1 5/8"	(41.3)	2 3/4"	(69.8)	2 3/32"	(53.2)	11	(5.0)
B3188-1 1/4	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 1 650°F (343°C) Lbs.	Design Load 1 650°F (343°C) (kN)	Design Load 1 750°F (399°C) Lbs.	Design Load 1 750°F (399°C) (kN)	Design Load 2 650°F (343°C) Lbs.	Design Load 2 650°F (343°C) (kN)	Design Load 3 650°F (343°C) Lbs.	Design Load 3 650°F (343°C) (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.

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

B3205 - Threaded Rod (right-hand threads - both ends)
B3205L - Threaded Rod (right & left hand threads)



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

Material: Steel

Function: Recommended for use as a hanger support in hanger assemblies. Rod is threaded on both ends with right hand threads of the length shown. Also available with left and right hand threads - specify Fig. B3205L when ordering.

Maximum Temperature: 750°F (399°C)

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

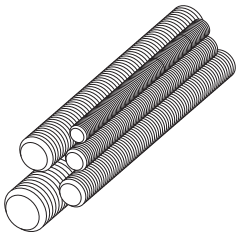
Order By: Figure number, rod size, length and finish



Part No.	Thread Size A	Standard Thread Length TL in.	(mm)	Design Load 650°F (343°C) Lbs.	(kN)	750°F (399°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. 99 - All Threaded Rod Cut To Length



OPM

Size Range: 1/4"-20 thru 7/8"-9 rod in 120" lengths or cut to length

Material: Steel

Maximum Temperature: 750°F (399°C)

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

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

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



Part No. - Size x Length ATR	Fig. 99	Threads Per Inch	Recommended Load Lbs.	(kN)	Approx. Wt./100 Ft. Lbs.	(kg)
ATR 1/4" x 120	99-1/4" x length	20	240	(1.07)	12	(5.44)
ATR 3/8" x 120	99-3/8" x length	16	730	(3.24)	29	(13.15)
ATR 1/2" x 120	99-1/2" x length	13	1350	(6.00)	53	(24.04)
ATR 5/8" x 120	99-5/8" x length	11	2160	(9.60)	89	(40.37)
ATR 3/4" x 120	99-3/4" x length	10	3230	(14.37)	123	(55.79)
ATR 7/8" x 120	99-7/8" x length	9	4480	(19.93)	170	(77.11)

For larger sizes consult full line pipe hanger catalog.

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

B3213 - Coach Screw Rod

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

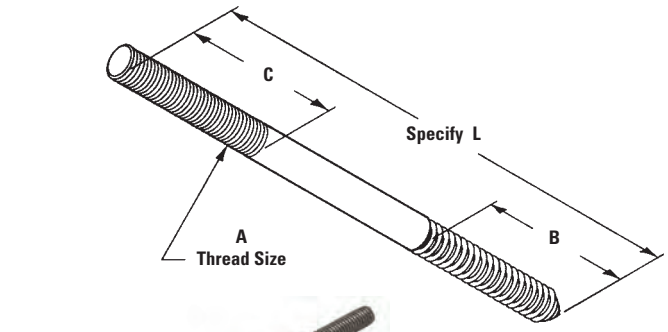
Material: Steel

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 customer service for alternative finishes and materials.

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





Part No.	Thread Size A	Standard Rod Lengths L in.	(mm)	Coach Screw Thread Length B in.	(mm)	Rod Thread Length C in.	(mm)	Design Load 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.

B3214 - Tie Bolt

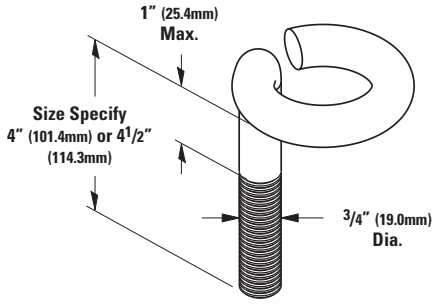
Material: Steel

Function: Recommended for securing the connection of steel pipe to ductile pipe first attach tie bolts to pipe flanges then connect tie rods. May be used in vertical or horizontal applications.

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

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

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





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

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

B3212 - J-Bolt

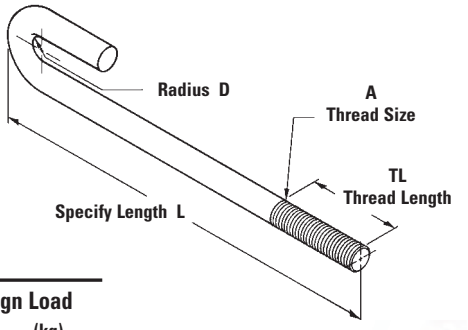
Size Range: 3/8"-16 thru 7/8"-19 rod

Material: Steel

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

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

Order By: Figure number, length and finish



Part No.	Thread Size A	Thread Length TL in.	(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

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

OPM

Material: Steel

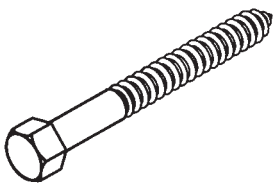
Function: Designed to fasten metal to wood. Lag screws are made with hex heads in lengths of 6" (152.5mm) or shorter and square heads in lengths longer than 6" (152.5mm). Both types have coarse lag threads and gimlet points and are available in diameters of 1/4"(6.3mm) to 5/8"(15.9mm) inclusive. Square-head lag screws are also available in 3/4"(19.0mm), 7/8"(22.2mm) and 1"(25.4mm) diameters.

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

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

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

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.

B655 - Steel Rod Coupling
B656 - Steel Reducing Rod Coupling

OPM

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

Material: Steel

Function: Used for coupling two threaded rods together of equal or reduced rod sizes, with or without inspection hole.

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

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

Order By: Figure number and finish

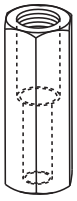
Part No.	For Rod Size	Length in.	Length (mm)	Design Load Lbs.	Design Load (kN)	Approx. Wt./100 Lbs.	Approx. Wt./100 (kg)
B655-1/4	1/4"-20	7/8"	(22.2)	300	(1.33)	1.9	(0.86)
B655-3/8	3/8"-16	1 1/8"	(28.6)	730	(3.25)	3.6	(1.63)
B655-1/2	1/2"-13	1 3/4"	(44.4)	1350	(6.00)	11.3	(5.12)
B655-5/8	5/8"-11	2 1/8"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

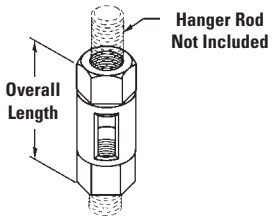
Size Range: 1/4"-20 thru 1"-8 rod

Material: Malleable Iron

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

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

Order By: Figure number and finish



Part No.	For Rod Size	Overall Length in.	Overall Length (mm)	Design Load Lbs.	Design Load (kN)	Approx. Wt./100 Lbs.	Approx. Wt./100 (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)



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

B3210 - Eye Rod (right-hand threads)
B3210L - Eye Rod (Left & right hand threads)

B3211 - Welded Eye Rod (right-hand threads)
B3211L - Welded Eye Rod (Left & right hand threads)

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

Material: Steel

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

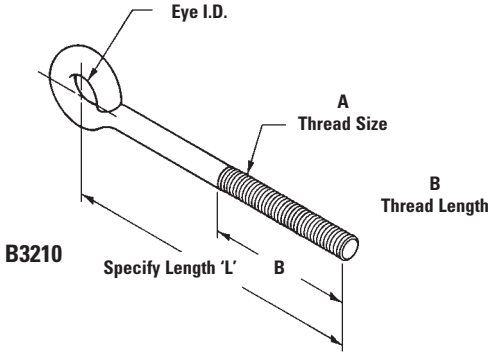
Approvals: Conforms to the requirements of NFPA13.

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

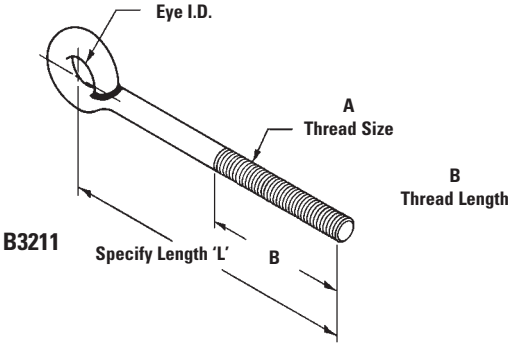
Order By: Figure number, rod size, length and finish

Important Note: The Eye I.D. dimension may be larger if needed. Contact B-line if larger Eye I.D. dimension is required.









Part No.		Thread Size A	Thread Length B		Eye I.D.		Design Load B3210 650°F (343°C)		Design Load B3211 650°F (343°C)		Design Load B3211 750°F (399°C)	
			in.	(mm)	in.	(mm)	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.

B3210X - Linked Eye Rods (Right-hand threads-both ends)
B3210XL - Linked Eye Rods (Left & right threads)

B3211X - Linked Welded Eye Rods (Right-hand threads-both ends)
B3211XL - Linked Welded Eye Rods (Left & right threads)

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

Material: Steel

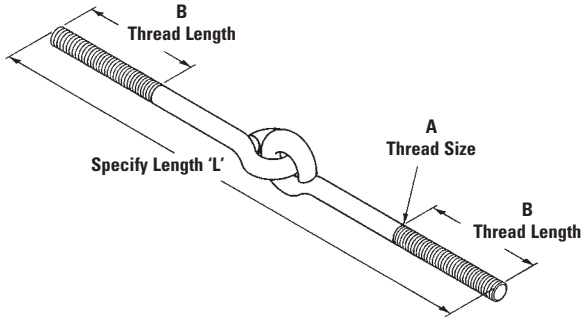
Function: Designed for use in a hanger assembly where universal movement is necessary. The welded eye rods allow for heavier loads.

Approvals: Conforms to the requirements of NFPA13.

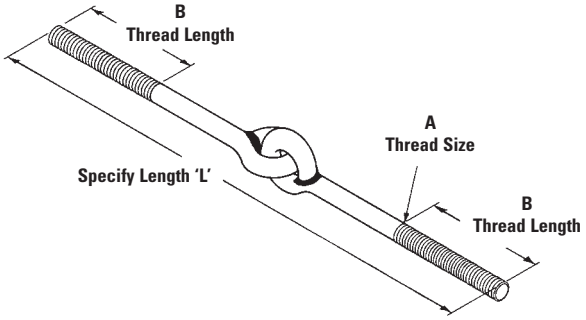
Finish: Plain. Contact customer service for alternative finishes and materials.

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







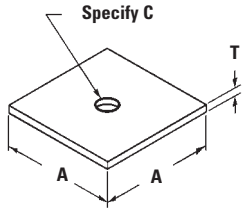


Part No.		Thread Size A	Thread Length B in.	(mm)	Eye I.D. in.	(mm)	Design Load B3210 650°F (343°C) Lbs.	(kN)	B3211 650°F (343°C) Lbs.	(kN)	B3211 750°F (399°C) Lbs.	(kN)
B3210X-3/8 x 'L'	B3211X-3/8 x 'L'	3/8"-16	2 1/2"	(63.5)	1/2"	(12.7)	240	(1.07)	730	(3.25)	572	(2.54)
B3210X-1/2 x 'L'	B3211X-1/2 x 'L'	1/2"-13	2 1/2"	(63.5)	5/8"	(15.9)	440	(1.96)	1350	(6.00)	1057	(4.70)
B3210X-5/8 x 'L'	B3211X-5/8 x 'L'	5/8"-11	2 1/2"	(63.5)	3/4"	(19.0)	705	(3.13)	2160	(9.61)	1692	(7.52)
B3210X-3/4 x 'L'	B3211X-3/4 x 'L'	3/4"-10	3"	(76.2)	7/8"	(22.2)	1050	(4.67)	3230	(14.37)	2530	(11.25)
B3210X-7/8 x 'L'	B3211X-7/8 x 'L'	7/8"-9	3 1/2"	(88.9)	1"	(25.4)	1470	(6.54)	4480	(19.93)	3508	(15.60)

For larger sizes consult full line pipe hanger catalog.

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

B3248 - Steel Washer Plate



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 customer service for alternative finishes and materials.

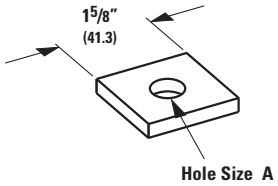
Order By: Figure number size and finish

Part No.	Rod Size C	A in.	A (mm)	T in.	T (mm)	Approx. Wt./100 Lbs.	Approx. Wt./100 (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

OPM



Material: Steel

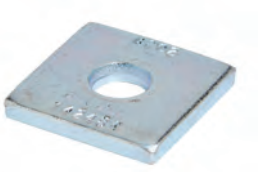
Standard Finish: Electro-Galvanized

Service: Designed as a washer to suspend hanger rods.

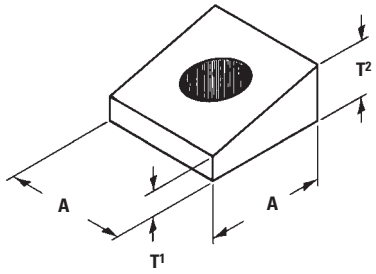
Approvals: Qualified for static, wind, and seismic loading in concrete. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects,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

Order by: Figure number and finish.

Part No.	Hole Size A in.	Hole Size A (mm)	Bolt Size	Thickness in.	Thickness (mm)	Approx. Wt./100 Lbs.	Approx. Wt./100 (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	11/16"	(17.4)	5/8"-11	1/4"	(6.3)	16	(7.2)
B202-2	13/16"	(20.6)	3/4"-10	1/4"	(6.3)	15	(6.8)



B3234 - Bevel Washer



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 customer service for alternative finishes and materials.

Order By: Figure number size and finish

Part No.	For Bolt Size	A in.	A (mm)	T^1 in.	T^1 (mm)	T^2 in.	T^2 (mm)	Approx. Wt./100 Lbs.	Approx. Wt./100 (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.

HN - Standard Hex Nut

OPM

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

Material: Steel

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

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

Order By: Figure number size and finish



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)	1 3/32"	(27.8)	35/64"	(13.9)	7.3	(3.3)
HN-3/4	3/4"-10	1 1/8"	(28.6)	1 5/16"	(33.3)	41/64"	(16.3)	12.0	(5.4)
HN-7/8	7/8"-9	1 5/16"	(33.3)	1 33/64"	(38.5)	3/4"	(19.0)	19.0	(8.6)

HHN - Heavy Hex Nut

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

Material: Steel

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

Order By: Figure number size and finish



Part Number	For Rod Size	Width Across Flats		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	11/16"	(17.5)	51/64"	(20.2)	23/64"	(9.1)	3.1	(1.4)
HHN-1/2	1/2"-13	7/8"	(22.2)	1 1/8"	(28.6)	31/64"	(12.3)	6.5	(2.9)
HHN-5/8	5/8"-11	1 1/16"	(27.0)	1 15/64"	(31.3)	39/64"	(15.5)	12.0	(5.4)
HHN-3/4	3/4"-10	1 1/4"	(31.7)	1 29/64"	(36.9)	47/64"	(18.6)	19.0	(8.6)
HHN-7/8	7/8"-9	1 7/16"	(36.5)	1 21/32"	(42.6)	55/64"	(21.8)	30.0	(13.6)

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

FW - Flat Washer

OPM

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

Material: Steel

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

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

Order By: Figure number size and finish

Part Number	For Rod Size	Outside Diameter in.	Outside Diameter (mm)	Approx. Wt./100 lbs.	Approx. Wt./100 (kg)
FW-1/4	1/4"-20	3/4"	(19.0)	0.7	(0.3)
FW-3/8	3/8"-16	1"	(25.4)	3.9	(1.7)
FW-1/2	1/2"-13	1 3/8"	(34.9)	6.7	(3.0)
FW-5/8	5/8"-11	1 3/4"	(44.4)	7.3	(3.3)
FW-3/4	3/4"-10	2"	(50.8)	11.0	(5.0)
FW-7/8	7/8"-9	2 1/4"	(57.1)	19.0	(8.6)
FW-1	1"-8	2 1/2"	(69.8)	22.0	(10.0)



LW - Lock Washer

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

Material: Steel

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

Order By: Figure number size and finish

Part Number	For Rod Size	Outside Diameter in.	Outside Diameter (mm)	Approx. Wt./100 lbs.	Approx. Wt./100 (kg)
LW-1/4	1/4"-20	.49"	(12.4)	0.3	(0.13)
LW-3/8	3/8"-16	.68"	(17.3)	0.6	(0.27)
LW-1/2	1/2"-13	.88"	(22.3)	1.3	(0.59)
LW-5/8	5/8"-11	1.08"	(27.4)	2.4	(1.09)
LW-3/4	3/4"-10	1.27"	(32.2)	3.8	(1.72)
LW-7/8	7/8"-9	1.46"	(37.1)	5.9	(2.67)
LW-1	1"-8	1.66"	(42.1)	8.8	(3.99)



FFW - Flat Fender Washer

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

Material: Steel

Function: To provide a greater bearing surface than standard washer.

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

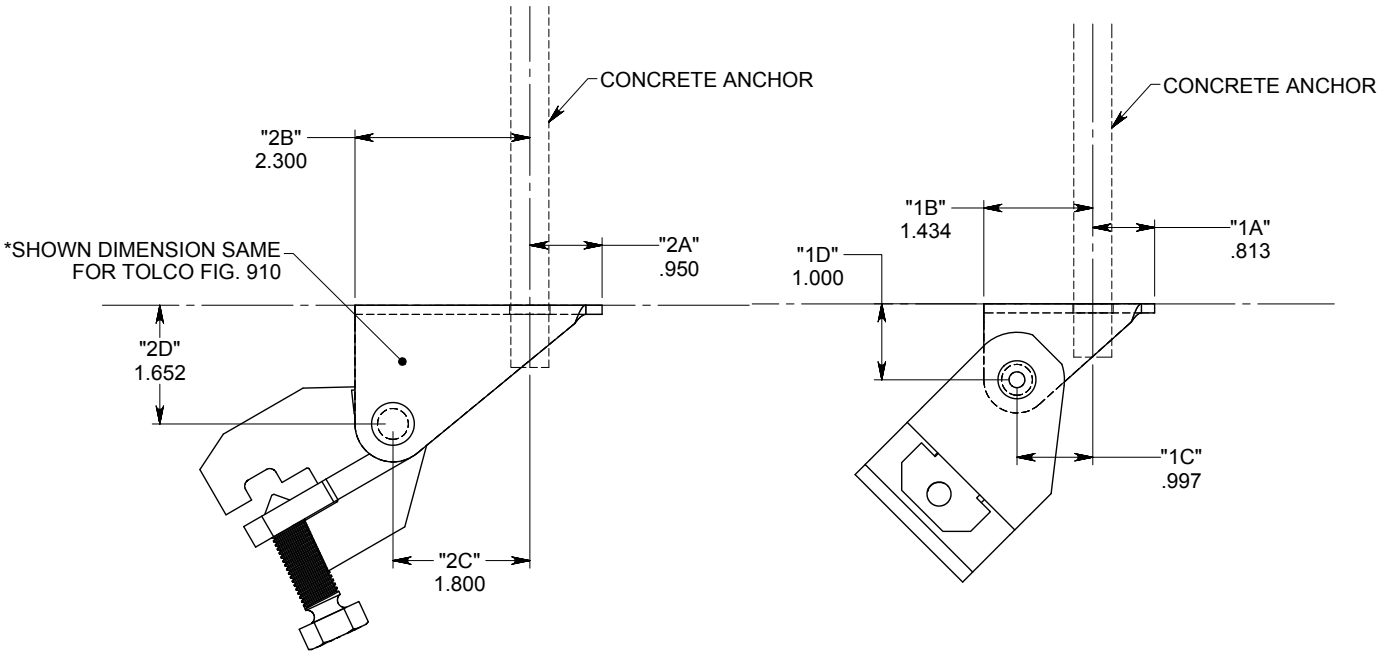
Order By: Figure number and size

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

Detail Per NFPA 13, 2013 Figures A.9.3.5.12.1 (a-c) and NFPA 13, 2016 Figures A.9.3.5.12.2 (a-c) & Annex Section E.7.2



TOLCO™ Fig. 980

TOLCO™ Fig. 909

Prying Factors Per NFPA 13, 2016 Section 9.3.5.12.8.2 (A) And Fig. 9.3.5.12.1 Designated Angle Category

Tolco Figure 980								
A	B	C	D	E	F	G	H	I
Pr	*Pr*	*Pr*	*Pr*	*Pr*	*Pr*	*Pr*	*Pr*	*Pr*
3.275	1.156	0.844	1.461	1.156	1.891	3.478	2.469	2.008

Tolco Figure 909								
A	B	C	D	E	F	G	H	I
Pr	*Pr*	*Pr*	*Pr*	*Pr*	*Pr*	*Pr*	*Pr*	*Pr*
2.626	1.002	0.873	1.513	1.002	1.516	2.460	1.740	1.420

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

AWSD (Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) [1,2]

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) [1,2]

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

AWSD (Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) [1,2]

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 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 DeWalt

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

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

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *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 >= Cac, slab thickness >= hmin, spacing >= 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *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 >= Cac, slab thickness >= hmin, spacing >= 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *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 >= Cac, slab thickness >= hmin, spacing >= 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 DeWalt

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

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

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 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 DeWalt

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

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

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 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 DeWalt

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

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

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
A thru I corresponds to fastener orientation (shown on page AL21) from Table Figure 9.3.5.9.1 NFPA 13 2016.

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

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 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 DeWalt

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										
		A	B	C	D	E	F	G	H	I
Dia. (in.)	Embedment (in.)	*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	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 >= 8", slab thickness >= hmin, spacing >= 3hef
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										
		A	B	C	D	E	F	G	H	I
Dia. (in.)	Embedment (in.)	*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	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 >= 8", slab thickness >= hmin, spacing >= 3hef
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										
		A	B	C	D	E	F	G	H	I
Dia. (in.)	Embedment (in.)	*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	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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 DeWalt

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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 DeWalt

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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 DeWalt

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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 DeWalt

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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
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 DeWalt

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

AWSD (Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) [1,2,3]

Tolco Figure 980

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 (Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) [1,2,3]

Tolco Figure 909

Dia. (in.)	Embedment (in.)	A *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 (Power -Stud+® SD2) Seismic Wedge Anchor in 3000 psi Sand Lightweight Concrete (lbs.) [1,2,3]

Tolco Figure 910

Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 DeWalt

ASCE 7-10
AWSD / Power-Stud+® SD2 Seismic Wedge Anchors
In 3000 psi Normal Weight Cracked Concrete

AWSD (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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 (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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 (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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 DeWalt

ASCE 7-10
AWSD / Power-Stud+® SD2 Seismic Wedge Anchors
In 4000 psi Normal Weight Cracked Concrete

AWSD (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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 (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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 (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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 DeWalt

ASCE 7-10
AWSD / Power-Stud+® SD2 Seismic Wedge Anchors
In 5000 psi Normal Weight Cracked Concrete

AWSD (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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 (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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 (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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 DeWalt

ASCE 7-10
AWSD / Power-Stud+® SD2 Seismic Wedge Anchors
In 6000 psi Normal Weight Cracked Concrete

AWSD (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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 (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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 (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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= Cac, slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 DeWalt

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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 DeWalt

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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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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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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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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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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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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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 *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.469	I *Pr* 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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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 *Pr* 2.626	B *Pr* 1.002	C *Pr* 0.873	D *Pr* 1.513	E *Pr* 1.002	F *Pr* 1.516	G *Pr* 2.460	H *Pr* 1.740	I *Pr* 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

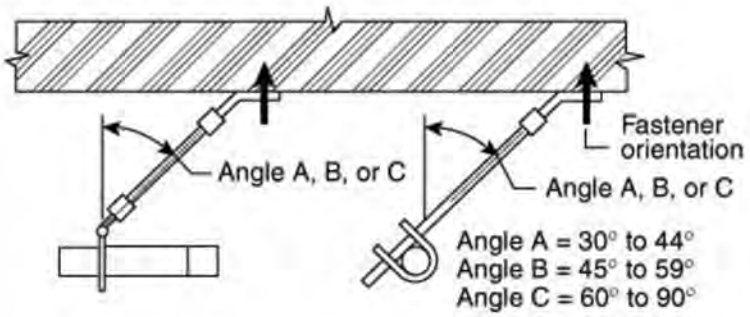
[1] Values calculated in accordance with ASCE 7-10 See ICC-ESR 3657 for complete product installation information
[2] Assumptions for table: seismic anchoring conditions, edge distance >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 1.2 per ASCE 7-10 Section 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.

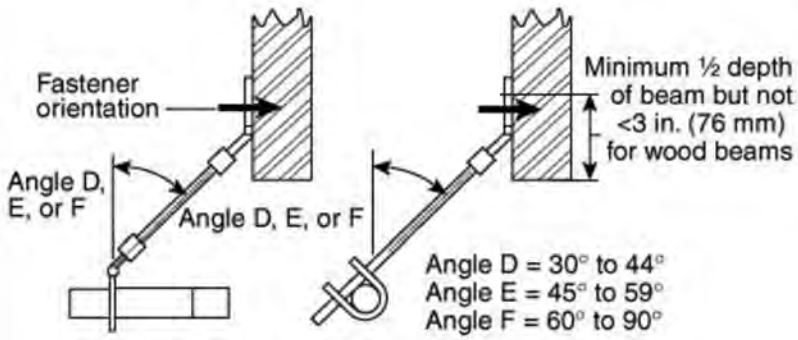
Wood-Knocker™ in 6000 psi Normal Weight Cracked Concrete (lbs.) [1,2,3]										
Tolco Figure 910										
Dia. (in.)	Embedment (in.)	A *Pr* 3.275	B *Pr* 1.156	C *Pr* 0.844	D *Pr* 1.461	E *Pr* 1.156	F *Pr* 1.891	G *Pr* 3.478	H *Pr* 2.459	I *Pr* 2.008
3/8	2	182	311	348	201	311	315	130	184	226
1/2	2	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 >= 8", slab thickness >= hmin, spacing >= 3hef
[3] Anchor capacities increased by a factor or 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.

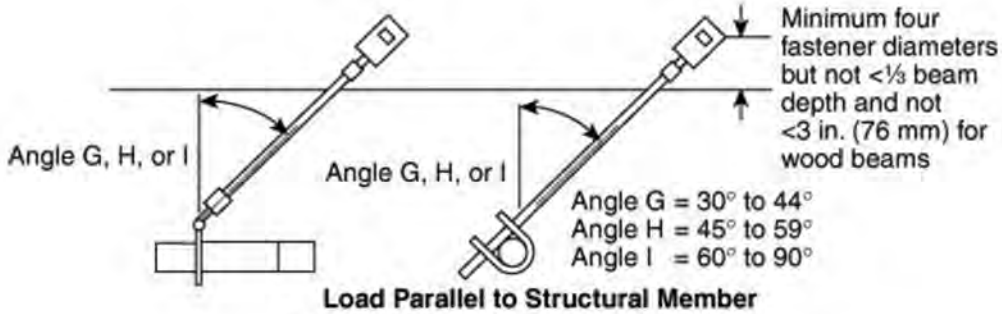
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Table Figure 9.3.5.12.1
NFPA 13 2016





Load Perpendicular to Structural Member



Load Parallel to Structural Member

To Convert From	To	Multiply By
Angle		
degree	radian (rad)	1.745329×10^{-2}
radian (rad)	degree	$5.729578 \times 10^{+1}$
Area		
foot^2	square meter (m^2)	9.290304×10^{-2}
inch^2	square meter (m^2)	6.451600×10^{-4}
circular mil	square meter (m^2)	5.067075×10^{-10}
sq. centimeter (cm^2)	square inch (in^2)	1.550003×10^{-1}
square meter (m^2)	foot^2	$1.076391 \times 10^{+1}$
square meter (m^2)	inch^2	$1.550003 \times 10^{+3}$
square meter (m^2)	circular mil	$1.973525 \times 10^{+9}$
Temperature		
degree Fahrenheit	degree Celsius	$t^{\circ}C = (t^{\circ}F - 32) / 1.8$
degree Celsius	degree Fahrenheit	$t^{\circ}F = 1.8\ t^{\circ}C + 32$
Force		
pounds-force (lbf)	newtons (N)	4.448222

To Convert From	To	Multiply By
Length		
foot (ft)	meter (m)	3.048000×10^{-1}
inch (in)	meter (m)	2.540000×10^{-2}
mil	meter (m)	2.540000×10^{-5}
inch (in)	millimeter (mm)	25.40000
inch (in)	micrometer (µm)	2.5400×10^{4}
millimeter (mm)	inch (in)	0.0393701
meter (m)	foot (ft)	3.280840
meter (m)	inch (in)	$3.937008 \times 10^{+1}$
meter (m)	mil	$3.937008 \times 10^{+4}$
micrometer (µm)	inch (in)	3.937008×10^{-5}
Volume		
foot^3	cubic meter (m^3)	2.831685×10^{-2}
inch^3	cubic meter (m^3)	1.638706×10^{-5}
cubic centimeter (cm^3)	cubic inch (in^3)	6.102374×10^{-2}
cubic meter (m^3)	foot^3	$3.531466 \times 10^{+1}$
cubic meter (m^3)	inch^3	$6.102376 \times 10^{+4}$
gallon (U.S. liquid)	cubic meter (m^3)	3.785412×10^{-3}

Section Properties		
section modulus S (in^3)	S (m^3)	1.638706×10^{-5}
moment of inertia I (in^4)	I (m^4)	4.162314×10^{-7}
modulus of elasticity E (psi)	E (Pa)	$6.894757 \times 10^{+3}$
section modulus S (m^3)	S (in^3)	$6.102374 \times 10^{+4}$
moment of inertia I (m^4)	I (in^4)	$2.402510 \times 10^{+6}$
modulus of elasticity E (Pa)	E (psi)	1.450377×10^{-4}

To Convert From	To	Multiply By
Bending Moment or Torque		
lbf•ft	newton meter (N•m)	1.355818
lbf•in	newton meter (N•m)	1.129848×10^{-1}
N•m	lbf•ft	7.375621×10^{-1}
N•m	lbf•in	8.850748
Mass		
ounce (avoirdupois)	kilogram (kg)	2.834952×10^{-2}
pound (avoirdupois)	kilogram (kg)	4.535924×10^{-1}
ton (short, 2000 lb)	kilogram (kg)	$9.071847 \times 10^{+2}$
ton (long, 2240 lb)	kilogram (kg)	$1.016047 \times 10^{+3}$
kilogram (kg)	ounce (avoirdupois)	$3.527396 \times 10^{+1}$
kilogram (kg)	pound (avoirdupois)	2.204622
kilogram (kg)	ton (short 2000 lb)	1.102311×10^{-3}
kilogram (kg)	ton (long 2240 lb)	9.842064×10^{-4}
Mass Per Unit Length		
lb/ft	kilogram per meter (kg/m)	1.488164
lb/in	kilogram per meter (kg/m)	$1.785797 \times 10^{+1}$
kg/m	lb/ft	6.719689×10^{-1}
kg/m	lb/in	5.599741×10^{-2}
Mass Per Unit Volume		
lb/ft^3	kilogram per cubic meter (kg/m^3)	$1.601846 \times 10^{+1}$
lb/in^3	kilogram per cubic meter (kg/m^3)	$2.767990 \times 10^{+4}$
kg/m^3	lb/ft^3	6.242797×10^{-2}
kg/m^3	lb/in^3	3.612730×10^{-5}
lbs/ft^3	lbs/in^3	$1.728000 \times 10^{+3}$
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)	2.048161×10^{-1}
Pressure or Stress		
lbf/in^2 (psi)	pascal (Pa)	$6.894757 \times 10^{+3}$
kip/in^2 (ksi)	pascal (Pa)	$6.894757 \times 10^{+6}$
lbf/in^2 (psi)	megapascals (MPa)	6.894757×10^{-3}
pascal (Pa)	pound force per sq. inch (psi)	1.450377×10^{-4}
pascal (Pa)	kip per sq. inch (ksi)	1.450377×10^{-7}
megapascals (MPa)	lbf/in^2 (psi)	$1.450377 \times 10^{+2}$

Abbreviations

AISC	= American Institute of Steel Construction
AISI	= American Iron & Steel Institute
ANSI	= American National Standards Institute
ASTM	= American Society for Testing & Materials
AWWA	= American Water Works Association
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

cm	= centimeter
kg	= kilogram
kN	= kilonewton
m	= meter
µm	= micrometer
mm	= millimeter
MPa	= megapascal
N	= newton
Nm	= newton-meter
Pa	= pascal

Decimals of a Foot

Inch	0"	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"
0	.0000	.0833	.1667	.2500	.3330	.4167	.5000	.5833	.6667	.7500	.8333	.9167
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		

Load Chart For Threaded Rod (ATR)

Rod Size	Root Area Thread		Maximum Safe Loads 650°F (349°C)		750°F (399°C)	
	In.²	cm²	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.

Rod Size As Determined By Steel Pipe Size For Fire Protection

Steel Pipe Size In.	Steel Pipe Size mm	Maximum Span Ft.	Maximum Span m	Rod Size
1"-1 1/4"	(25-30)	12	(3.66)	3/8"-16
1 1/2"-4"	(40-100)	15	(4.57)	3/8"-16
5"-8"	(125-200)	15	(4.57)	1/2"-13
10"-12"	(250-300)	15	(4.57)	5/8"-11

Based on NFPA 13.

Rod Size As Determined By Copper Tubing Size For Fire Protection

Copper Tubing Size In.	Copper Tubing Size mm	Maximum Span Ft.	Maximum Span m	Rod Size
3/4"-1"	(20-35)	8	(2.44)	3/8"-16
1 1/4"-1 1/2"	(32-40)	15	(3.05)	3/8"-16
2"-3"	(50-80)	15	(3.66)	3/8"-16
3 1/4"-4"	(90-100)	15	(4.57)	3/8"-16
5"-8"	(125-200)	15	(4.57)	1/2"-13

Based on NFPA 13.

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
In.	mm	In.	mm	In.	mm	Lbs./Ft.	kg/m	Lbs./Ft.	kg/m	Ft.	Meter	Sizes
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 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 In.	mm	Wall Thickness In.	mm	Weight of Pipe Lbs./Ft.	kg/m	Weight of Pipe Filled With Water 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 In.	mm	B3110	B3114	B3120	B3122	B3122A	B3124	B3126	B3117SL
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 In.	mm	B3118SL	B3119SL	B218	B219	B379	B479	B3114R	B3117R
3"	(80)	2 to 3 1/2	2 to 3 1/2	B218	B219-1	---	---	3 1/2	2 to 3 1/2
4"	(100)	4 to 6	4 to 6	B218	B219-2	---	---	4	4 to 6
6"	(150)	4 to 6	4 to 6	B218	B219-3	B379	---	6	4 to 6
8"	(200)	8 to 10	8 to 10	---	B219-4	B379	---	8	8 to 10
10"	(250)	8 to 10	8 to 10	---	B219-4	B379	---	10	8 to 10
12"	(300)	12 to 14	12 to 14	---	B219-5	B379	---	12	12 to 14
14"	(350)	12 to 14	12 to 14	---	---	B379	---	14	12 to 14
16"	(400)	16 to 20	16 to 20	---	---	B379	B479	16	16 to 20
18"	(450)	16 to 20	16 to 20	---	---	---	B479	18	16 to 20
20"	(500)	16 to 20	16 to 20	---	---	---	B479	20	16 to 20
24"	(600)	24	24	---	---	---	B479	24	24

Copper Tubing (Type L) Data

Nominal 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.

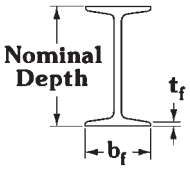
Schedule 40 PVC Plastic Pipe Data

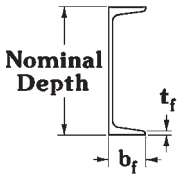
Nominal Pipe Size		Pipe O.D.		Wall Thickness		Weight of Pipe		Weight of Pipe Filled With Water	
In.	mm	In.	mm	In.	mm	Lbs./Ft.	kg/m	Lbs./Ft.	kg/m
1/8"	(3)	.405	(10.3)	.068	(1.7)	.04	(.06)	.06	(.09)
1/4"	(6)	.540	(13.7)	.088	(2.2)	.07	(.11)	.11	(.17)
3/8"	(10)	.675	(17.1)	.091	(2.3)	.10	(.14)	.18	(.26)
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.





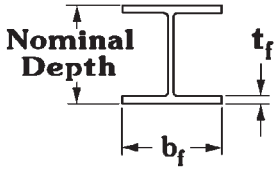
American Standard 'S' Shape I-Beams

Designation Nominal Depth & Weight		Flange Width b_f		Flange thickness t_f	
In. x Lbs./Ft.	(mm x kg/m)	in.	mm	in.	mm
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 Nominal Depth & Weight		Flange Width b_f		Flange thickness 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)



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)
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)

Dimensions taken from ASTM A6-86.

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.

MSS To B-Line series & Federal Specification Cross Reference

MSS SP-69 MSS SP-58	B-Line series 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 series 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 series & MSS Cross Reference

A-A-1192A WW-H-171E	B-Line series Part No.	MSS SP-69 MSS SP-58
–	B3106	Type 1
–	B3109	Type 1
–	B3690	Type 5
–	B3690C	Type 5
–	B3690F	Type 5
–	B22I, B32I, B52I	Type 18
–	B2503	Type 18
–	B2505-B2508	Type 18
–	67SS	Type 19
–	68SS	Type 19
–	B3080 S & L	Type 57
Type 1	1NFPA	Type 1
Type 1	B3100	Type 1
Type 1	B3100C	Type 1
Type 1	B3100F	Type 1
Type 1	B3102	Type 1
Type 1	B3104	Type 1
Type 1	B3108	Type 1
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 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 & 2F	Type 10
Type 10	B3170CT	Type 10
Type 10	B3170CTC	Type 10
Type 12	B3104	Type 1*
Type 12	B3104C	Type 1*
Type 12	B3104CT	Type 1
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	B3014	Type 18
Type 19	B303-B309	Type 19
Type 19	B321	Type 19
Type 19	B2500	Type 18
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	65 & 65XT	Type 19
Type 23	66	Type 19
Type 23	68S & 68W	Type 19
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	B3198H	Type 12
Type 25	B3198HCT	Type 12
Type 25	B3198R	Type 12
Type 25	B3198RCT	Type 12
Type 26	B2400	Type 26
Type 26	B3180	Type 26
Type 26	B3180FL	Type 26
Type 28	B3291, B3292 B3294, B3296 B3298	Type 28
Type 29	B3293, B3295 B3297	Type 29
Type 30	B3054	Type 30
Type 32	B3065	Type 31
Type 32	B3068	Type 31
Type 33	B3066	Type 32
Type 34	B3067	Type 33
Type 35	B3058	Type 34
Type 35	B3060	Type 34
Type 35	B3060L	Type 34
Type 35	B3062	Type 34
Type 35	B3070	Type 34
Type 35	B3891-B3897	Type 35
Type 35	B3991 & B3993	Type 35
Type 37	B3095	Type 36
Type 38	B3090	Type 37
Type 38	B3092	Type 37
Type 38	B3094	Type 37
Type 38	B3097	Type 37
Type 39	B3093	Type 38
Type 39	B3096	Type 38
Type 40A & 40B	B3160-3165	Type 39A & 39B
Type 41	B3151	Type 40
Type 42	B3114	Type 41
Type 42	B3122	Type 41
Type 42	B3122A	Type 41
Type 44	B3110	Type 43
Type 45	B3117SL	Type 44
Type 45	B3120	Type 44
Type 46	B3119SL	Type 45
Type 47	B3118SL	Type 46
Type 49	B3262	Type 48
Type 50	B3264	Type 49
Type 53	B3045	Type 25
Type 54	B3040	Type 27

* For all finishes excluding plain.

B-Line series 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	--
120RWA	--	--	Yes	--
130	--	--	Yes	Yes
200	Type 10	Type 10	Yes	Yes
200C	Type 10	Type 10	--	--
200F	Type 10	Type 10	--	--
200H	Type 10	Type 10	Yes	--
200M	Type 10	Type 10	Yes	Yes
800	--	--	Yes	Yes
825	--	--	Yes	Yes
825A	--	--	Yes	--
828	--	--	Yes	Yes
906	--	--	Yes	--
909	--	--	Yes	--
910	--	--	Yes	--

Part No.	ANSI/MSS SP-69 ANSI/MSS SP-58	A-A-1192A WW-H-171E	UL Listed	FM Approved
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	--
B2501	--	--	Yes	--
B2503	Type 18	--	--	--
B2505-B2508	Type 18	--	Yes	--
B3014	Type 18	Type 18	Yes	--
B3031	Type 19	Type 19	Yes	--
B3033	Type 19 & 23	Type 19 & 23	Yes	Yes
B3034	Type 19 & 23	Type 19 & 23	Yes	Yes
B3036L	Type 23	Type 23	Yes	--
B3037	Type 23	Type 23	Yes	--
B3040	Type 27	Type 27	--	--
B3042T	--	--	Yes	--
B3045	Type 25	Type 53	--	--
B3050	Type 21	Type 21	--	--
B3054	Type 30	Type 30	Yes	--
B3055	Type 21	Type 21	--	--
B3058	Type 34	Type 35	--	--
B3060	Type 34	Type 35	--	--
B3060L	Type 34	Type 35	--	--
B3062	Type 34	Type 35	--	--
B3065	Type 31	Type 32	--	--
B3066	Type 32	Type 33	--	--
B3067	Type 33	Type 34	--	--
B3068	Type 31	Type 32	--	--
B3070	Type 34	Type 35	--	--
B3080S & L	Type 57	--	--	--
B3083	Type 22	Type 22	--	--
B3090	Type 37	Type 38	--	--
B3092	Type 37	Type 38	--	--
B3093	Type 38	Type 39	--	--
B3094	Type 37	Type 38	--	--
B3095	Type 36	Type 37	--	--
B3096	Type 38	Type 39	--	--

Note: Refer to the catalog page for specific sizes that are UL Listed and/or FM Approved.

B-Line series Compliances & Approvals

Part No.	ANSI/MSS SP-69 ANSI/MSS SP-58	A-A-1192A WW-H-171E	UL Listed	FM Approved
B3097	Type 37	Type 38	--	--
B3100	Type 1	Type 1	Yes	Yes
B3100C	Type 1	Type 1	--	--
B3100F	Type 1	Type 1	--	--
B3102	Type 1	--	--	--
B3104	Type 1*	Type 12	Yes	--
B3104C	Type 1*	Type 12	--	--
B3104CT	Type 1	Type 12	--	--
B3104CTC	Type 1	Type 12	--	--
B3104F	Type 1*	Type 12	--	--
B3106	Type 1	--	--	--
B3108	Type 1	Type 1	--	--
B3109	Type 1	--	--	--
B3110	Type 43	Type 44	--	--
B3114	Type 41	Type 42	--	--
B3117SL	Type 44	Type 45	--	--
B3118SL	Type 46	Type 47	--	--
B3119SL	Type 45	Type 46	--	--
B3120	Type 44	Type 45	--	--
B3122	Type 41	Type 42	--	--
B3122A	Type 41	Type 42	--	--
B3140	Type 4	Type 4	Yes	Yes
B3141	Type 4	Type 4	--	--
B3142	Type 4	Type 4	--	--
B3144	Type 3	Type 3	--	--
B3146	Type 3	Type 3	--	--
B3151	Type 40	Type 41	--	--
B3160-B3165	Type 39A & 39B	Type 40A & 40B	--	--
B3170CT	Type 10	Type 10	--	--
B3170CTC	Type 10	Type 10	--	--
B3180	Type 26	Type 26	--	--
B3180FL	Type 26	Type 26	--	--
B3184	--	--	Yes	--
B3188	Type 24	Type 24	Yes	--
B3188C	Type 24	Type 24	--	--
B3198H	Type 12	Type 25	--	--
B3198HCT	Type 12	Type 25	--	--
B3198R	Type 12	Type 25	--	--
B3198RCT	Type 12	Type 25	--	--
B3200	Type 17	Type 17	--	--
B3201	Type 14	Type 14	--	--
B3202	Type 13	Type 13	--	--

Part No.	ANSI/MSS SP-69 ANSI/MSS SP-58	A-A-1192A WW-H-171E	UL Listed	FM Approved
B3203	--	--	Yes	--
B3222	Type 16	Type 16	Yes	--
B3223	--	--	Yes	--
B3224	Type 15	Type 15	--	--
B3224CT	Type 15	Type 15	--	--
B3262	Type 48	Type 49	--	--
B3264	Type 49	Type 50	--	--
B3291, B3292 B3294, B3296 B3298	Type 28	Type 28	--	--
B3293, B3295 B3297	Type 29	Type 29	--	--
B3373	Type 8	Type 8	Yes	Yes
B3373C	Type 8	Type 8	--	--
B3373CT	Type 8	Type 8	--	--
B3373CTC	Type 8	Type 8	--	--
B3373F	Type 8	Type 8	--	--
B3690	Type 5	Type 5	--	--
B3690C	Type 5	Type 5	--	--
B3690F	Type 5	Type 5	--	--
B3891-B3897	Type 35	Type 35	--	--
B3991	Type 35	Type 35	--	--
B3993	Type 35	Type 35	--	--
B3993A	Type 35	Type 35	--	--

Note: Refer to the catalog page for specific sizes that are UL Listed and/or FM Approved.

TOLCO	B-Line series
1 (Disc.)	B3100
1A (Disc.)	B3108
1CBS	B3100PS (Disc.)
1CI (Disc.)	B3102
1F (Disc.)	B3100F
1LD (Disc.)	B3104
1NFPA	1NFPA
1PVC (Disc.)	B3100C
1U (Disc.)	1U (Disc.)
1V (Disc.)	B3106
1VT (Disc.)	B3106V
2	B3170 (Disc.)
2F	B3170F (Disc.)
2FWON (Disc.)	N/A
2WON	N/A
3 (Disc.)	B3690
3F (Disc.)	B3690F
3PVC (Disc.)	B3690C
4 (Disc.)	B3140
4A	4A
4B	B386 (Disc.)
4CI (Disc.)	B3141
4F (Disc.)	B3140F
4H (Disc.)	B3142
4L	4L
4LA	4LA
4PVC (Disc.)	B3140C
5 (Disc.)	B3144
5H (Disc.)	B3146
6 (Disc.)	B3373
6F (Disc.)	B3373F
6PVC (Disc.)	B3373C
7 (Disc.)	B3148
8 (Disc.)	B3149
9 (Disc.)	B3132
9X (Disc.)	B3132W-1 &1 1/2
14 (Disc.)	B3134
14X (Disc.)	B3134W
20 (Disc.)	B3180
20S (Disc.)	B3180FL
21 (Disc.)	N/A
22	B3181 (Disc.)
22L2	22L2
23	B3182 (Disc.)
24	B3183 (Disc.)
25	25
27B	27B
28	28
28M	28M
29	29
30 (Disc.)	B3068
30H (Disc.)	B3067
30L (Disc.)	B3065
30M (Disc.)	B3066
31-M (Disc.)	B3069W
31-O (Disc.)	B3069E
32-1/2 thru 4 (Disc.)	B3147A-1/2 thru 4
32-5 thru 34 (Disc.)	B3147B 5 thru 24
33 (Disc.)	B3084
34 (Disc.)	B3086
35 (Disc.)	B3085
40 (Disc.)	B3190
41 (Disc.)	B3191
42 (Disc.)	B3061
50	50
51	51
52 (Disc.)	B3070
56	56
58	58
60 (Disc.)	N/A
61 (Disc.)	B3042
61T (Disc.)	B3042T
62 (Disc.)	B3050
64 (Disc.)	B351L
65	65
65XT	65XT
66	66
67SS	67SS
68S	B3034
68SS	68SS
68W	B3033
69	B3367 (Disc.)
69R	69R
70 (Disc.)	B655
70R (Disc.)	B656
70S (Disc.)	B655
71 (Disc.)	B3220
75	75
76	76
77	77
78	78 & B3199
81 (Disc.)	B3104CT
81PVC (Disc.)	B3104CTC
82 (Disc.)	B3373CT
82PVC (Disc.)	B3373CTC
83 (Disc.)	B3195CT
84 (Disc.)	B3195
98	98
98B	98B
99	ATR
100 (Disc.)	ATR
101 (Disc.)	B3211
101L (Disc.)	B3211X
102 (Disc.)	B3210
102L (Disc.)	B3210X
103 (Disc.)	B3205
104 (Disc.)	B3212
105 (Disc.)	B3213
106 (Disc.)	B3214
107F (Disc.)	B2499
109A (Disc.)	B3019 (Disc.)
109AF (Disc.)	B2501
110 (Disc.)	B3188
111 (Disc.)	B501
113 (Disc.)	HN
114 (Disc.)	HHN
115 (Disc.)	FW
116 (Disc.)	B3234
117 (Disc.)	LW
118 (Disc.)	B3248
119 (Disc.)	FFW
120	120
120MJ	120MJ
120RWA	120RWA
120W	120W
122 (Disc.)	N/A
123 (Disc.)	Toggle Bolts
124 (Disc.)	Toggle Bolt Head
125 (Disc.)	DS15x2
126 (Disc.)	N/A
130	B3052 (Disc.)
150 (Disc.)	N/A
200	B3170NF (Disc.)
200C	B3170NFC (Disc.)
200F	B3170NFF (Disc.)
200H	200H
200R (Disc.)	B3170NF (Disc.)
200WON (Disc.)	N/A
202 (Disc.)	B3170CT
203 (Disc.)	B3170NFC (Disc.)
207 (Disc.)	N/A
209 (Disc.)	AWA
219 (Disc.)	B3153
219 (Disc.)	B3155
220 (Disc.)	B3151
220 (Disc.)	B3154
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261 (Disc.)	B3161
262 (Disc.)	B3162
263 (Disc.)	B3163
264 (Disc.)	B3164
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302 (Disc.)	B3198H
304 (Disc.)	B3083WO
305 (Disc.)	B3083
306 (Disc.)	B3224
307 (Disc.)	B3222
309 (Disc.)	B3014
309N (Disc.)	B3014N
310 (Disc.)	B2500
310N (Disc.)	N2500
311 (Disc.)	B3097

TOLCO	B-Line series
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314 (Disc.)	B3094
315 (Disc.)	N/A
316 (Disc.)	B3088
316T (Disc.)	B3088T
317 (Disc.)	B3095
317A (Disc.)	B3093
318 (Disc.)	B3090
318A (Disc.)	B3092
319 (Disc.)	B3089
322 (Disc.)	B3114
323 (Disc.)	N/A
324 (Disc.)	B3110
325 (Disc.)	B3120
326 (Disc.)	B3122
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
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406 (Disc.)	B3257
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421 (Disc.)	B3281 - B3287
422 (Disc.)	B3281 - B3287
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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
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825	825
825A	825A

TOLCO	B-Line series
828	828
906	906
907	907
909	909
910	910
975	975
980	980
981	981
985	985
986	986
990	990
991	991
1000	1000
1001	1001
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3000	3000
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(Disc.) = Discontinued Item

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