Seismic Bracing

The TOLCO™ seismic bracing solutions, coupled with Eaton B-Line series pipe hangers and strut systems product offering, is the most complete line of bracing components in the industry. The TOLCO brand has a history of over 40 years in seismic bracing of non-structural systems including fire sprinklers, plumbing, mechanical, HVAC and electrical. Our offering includes both rigid and cable bracing systems vibration isolation, and engineering services.

Some of the key features of our seismic products include:

- Visual verification of proper installation
- Universal application
- Multi size adaptable
- OSHPD OPM Approval (OPM-0052-13)
- Underwriters Laboratories Listed
- FM Approved

TOLCO™

In addition to the products shown in this catalog we also offer engineered solutions for any seismic bracing application. Our team of experts can help you design your seismic bracing layout to ensure it meets applicable building codes and standards. Contact SeismicQuotes@Eaton.com for assistance with your next project.

Engineering services include:

- BOM assistance
- Submittal packages
- Engineered design layout
- PE stamp in all 50 states and aCanada
- TOLBrace™ Software for Fire Sprinkler seismic bracing design

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: 2½" (65mm) thru 8" (200mm) pipe. For sizes smaller than 2½" (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)** 2½" (65mm) thru 8" (200mm).

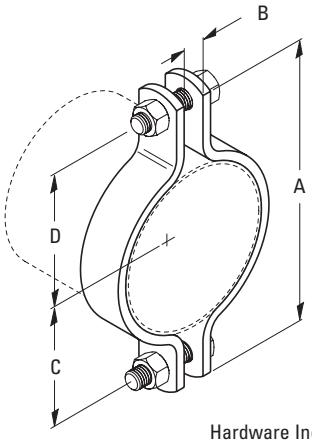
Installation Instructions: Fig. 4A is the "braced pipe" attachment component of a longitudinal, lateral or riser brace assembly. It is intended to be combine with the "bracing pipe" and TOLCO transitional and structural attachment component(s) to form a complete bracing assembly. NFPA 13 guidelines should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

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

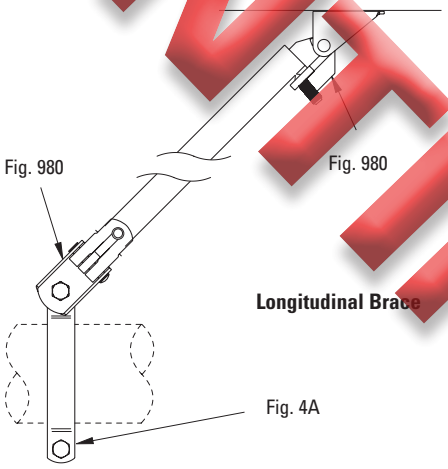
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Order By: Figure number, pipe size and finish

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



Hardware Included



For Lateral Brace Refer to 4LA

Longitudinal Brace

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-2½	2½" (100)	7" (177.8)	2 11/16" (68.3)	3" (76.2)	½"-13	1000 (4.45)	134 (60.8)
4A-3	3" (80)	7½" (190.5)	3" (76.2)	3 5/16" (84.1)	½"-13	1000 (4.45)	150 (69.0)
4A-4	4" (100)	8½" (215.9)	3⅜" (85.7)	3 11/16" (93.7)	½"-13	1600 (7.11)	221 (100.2)
4A-5	5" (125)	9¾" (247.6)	3⅞" (98.4)	4⅜" (111.1)	½"-13	1600 (7.11)	253 (114.7)
4A-6	6" (150)	11½" (292.1)	5" (127.0)	5⅛" (130.2)	½"-13	2015 (8.96)	513 (232.7)
4A-8	8" (200)	13¼" (336.5)	6 11/16" (169.9)	6⅛" (155.6)	½"-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.

Updated 3-30-21

TOLCO Fig. 4L - sway brace attachment (UL listed)

Size Range: 1" (25mm) through 8" (200mm) IPS. 10" (250mm) and 12" (300mm) not UL listed

Material: Steel and stainless steel.

Function: For bracing pipe against sway and seismic disturbance.

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** 1" (25mm) through 8" (200mm) pipe. UL Listed for the following sprinkler type pipes: Sch. 40, Sch. 10, Bull Moose Eddy Flow, Wheatland Mega Flow, DIN 2448, KSD 3562, KSD 3507. Ask the factory for additional information as it may vary by product size. For FM Approval information refer to FM Approved page 175. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

Installation Instructions: Fig. 4L is the "braced pipe" attachment component of a longitudinal and lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component to form a complete bracing assembly. NFPA 13 guidelines should be followed. (For complete detailed instructions see instruction sheet IL309015EN).

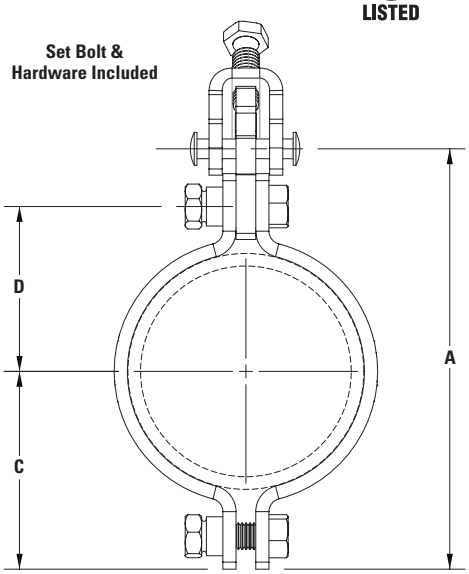
To Install: Place the Fig. 4L over the pipe to be braced and tighten bolts. Then engage "bracing pipe" into jaw opening and tighten set bolt until head snaps off. Jaw attachment can pivot for adjustment to proper brace angle.

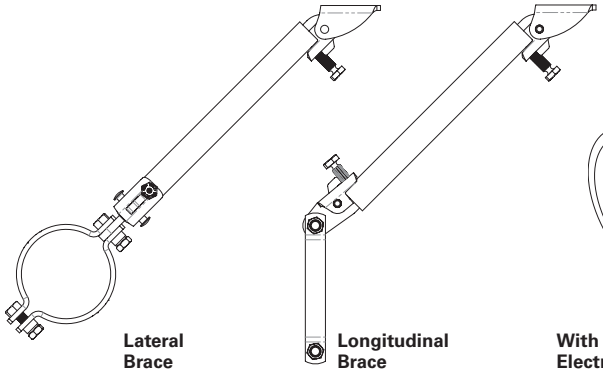
Finish: Plain, Electrogalvanized, Hot Dib Galvanized or Stainless Steel (only for 4" & 6" sizes).

Order By: Figure number, pipe size and finish.

OPM

c UL us LISTED





Lateral Brace

Longitudinal Brace

With Plain & Electrogalvanized Finish

With Hot Dip Galvanized & Stainless Steel Finish

Part No.	Nom Pipe Size in.	Nom Pipe Size (mm)	A (Max) in.	C in.	D in.	Bolt Size in.	UL Max. Rec. Load Logitudinal lbs.	UL Max. Rec. Load Lateral lbs.	PLN & EG. Approx. Wt./100 lbs.
4L-1	1	(25)	5	2	1 3/8	1/2-13	1000	1000	176
4L-1 1/4	1 1/4	(32)	5 2/7	2 1/16	1 5/9	1/2-13	1000	1000	182
4L-1 1/2	1 1/2	(40)	5 1/2	2 1/3	1 2/3	1/2-13	1000	1000	187
4L-2	2	(50)	6 2/7	2 2/3	2	1/2-13	1600	1000	204
4L-2 1/2	2 1/2	—	6 7/9	3	2 1/3	1/2-13	2000	1000	217
4L-65mm	—	(65)	6 7/9	3	2 1/3	1/2-13	700	1000	214
4L-3	3	(80)	7 3/7	3 1/4	2 5/8	1/2-13	2000	1000	323
4L-3 1/2	3 1/2	(90)	8	3 1/2	2 7/8	1/2-13	2000	1000	343
4L-4* **	4	(100)	8 3/7	3 3/4	3 1/8	1/2-13	2000**	1000	253
4L-5	5	—	9 5/9	4 3/8	3 5/8	1/2-13	2000**	1600*	314
4L-125mm	—	(125)	9 5/9	4 3/8	3 5/8	1/2-13	1200	1600*	314
4L-6* **	6	—	11 3/7	5 1/3	4 4/7	1/2-13	2000	1600*	540
4L-150mm	—	(150)	11 3/7	5 1/3	4 4/7	1/2-13	1200	1600*	538
4L-8	8	—	13 3/5	6 2/5	5 2/3	1/2-13	2000	2100*	645
4L-200mm	—	(200)	13 3/5	6 2/5	5 2/3	1/2-13	1400	2100*	643
4L-10** **	10	(254)	17 3/5	8 1/4	7 1/4	1/2-13	NA	NA	1349
4L-12** **	12	(300)	19 3/5	9 1/4	8 1/4	1/2-13	NA	NA	1526

* Only UL listed as a lateral brace for use with a 1" (25mm) pipe as the brace member.
** Only UL listed as a longitudinal brace for use with a 1" (25mm) thru 1 1/2" (40mm) pipe as the brace member.
*** Fig 4L-4 and Fig 4L-6 are only sizes available in stainless steel 316.
**** FM approved not UL listed.

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Updated 4-7-21

TOLCO Fig. 4L - 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 174. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

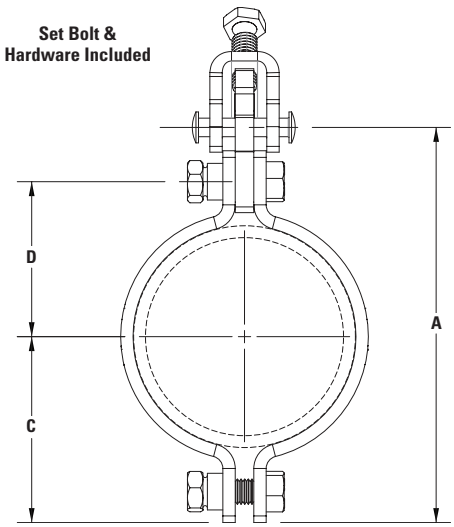
Installation Instructions: Fig. 4L is the "braced pipe" attachment component of a longitudinal and lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO™ structural attachment component to form a complete bracing assembly. NFPA 13 and/or FM guidelines should be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

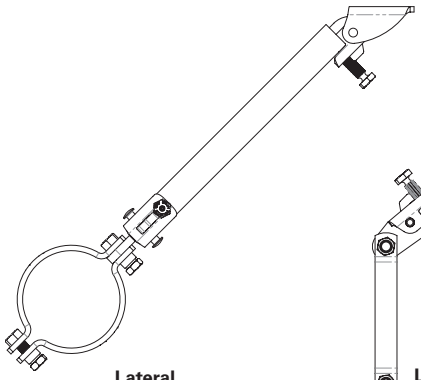
To Install: Place the Fig. 4L over the pipe to be braced and tighten bolts. Then engage "bracing pipe" into jaw opening and tighten set bolt until head snaps off. Jaw attachment can pivot for adjustment to proper brace angle. (For complete detailed instructions see instruction sheet IL309015EN).

Finish: Plain, Electrogalvanized.

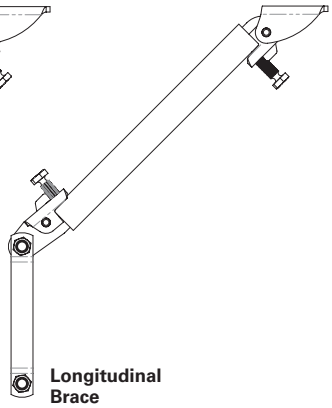
Order By: Figure number, pipe size and finish.

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

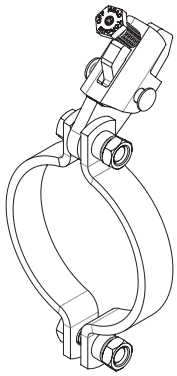




Lateral Brace



Longitudinal Brace



With Plain & Electrogalvanized Finish

Part No.	Nom Pipe Size in.	Nom Pipe Size (mm)	A (Max) in.	C in.	D in.	Bolt Size in.	FM Max. Rec. Load Logitudinal 30°-44° lbs. (kN)	45°-59° lbs. (kN)	60°-74° lbs. (kN)	75°-90° lbs. (kN)	FM Max. Rec. Load Lateral 30°-44° lbs. (kN)	45°-59° lbs. (kN)	60°-74° lbs. (kN)	75°-90° lbs. (kN)	Approx. Wt./100 lbs.
4L-1	1	(25)	5	2	1 3/8	1/2-13	1060 (4.72)	1160 (5.16)	1400 (6.23)	1500 (6.68)	1370 (6.10)	1940 (8.63)	2380 (10.59)	2650 (11.79)	176
4L-1 1/4	1 1/4	(32)	5 2/7	2 1/16	1 5/9	1/2-13	1060 (4.72)	1160 (5.16)	1400 (6.23)	1500 (6.68)	1370 (6.10)	1940 (8.63)	2380 (10.59)	2650 (11.79)	182
4L-1 1/2	1 1/2	(40)	5 1/2	2 1/3	1 2/3	1/2-13	740 (3.30)	1020 (4.54)	1250 (5.57)	920 (4.10)	1370 (6.10)	1940 (8.63)	2380 (10.59)	2650 (11.79)	187
4L-2	2	(50)	6 2/7	2 2/3	2	1/2-13	740 (3.30)	1020 (4.54)	1250 (5.57)	920 (4.10)	1420 (6.32)	1990 (8.86)	2440 (10.86)	2720 (12.10)	204
4L-2 1/2	2 1/2	—	6 7/9	3	2 1/3	1/2-13	520 (2.32)	650 (2.90)	790 (3.52)	1040 (4.63)	1410 (6.28)	1990 (8.86)	2440 (10.86)	2720 (12.10)	220
4L-65mm	—	(65)	6 7/9	3	2 1/3	1/2-13	520 (2.32)	650 (2.90)	790 (3.52)	1040 (4.63)	1410 (6.28)	1990 (8.86)	2440 (10.86)	2720 (12.10)	218
4L-3	3	(80)	7 3/7	3 1/4	2 5/8	1/2-13	520 (2.32)	650 (2.90)	790 (3.52)	1040 (4.63)	1410 (6.28)	1990 (8.86)	2440 (10.86)	2720 (12.10)	323
4L-3 1/2	3 1/2	(90)	8	3 1/2	2 7/8	1/2-13	520 (2.32)	650 (2.90)	790 (3.52)	1040 (4.63)	1410 (6.28)	1990 (8.86)	2440 (10.86)	2720 (12.10)	343
4L-4	4	(100)	8 3/7	3 3/4	3 1/8	1/2-13	520 (2.32)	650 (2.90)	790 (3.52)	1040 (4.63)	1410 (6.28)	1990 (8.86)	2440 (10.86)	2720 (12.10)	253
4L-5	5	—	9 5/9	4 3/8	3 5/8	1/2-13	520 (2.32)	650 (2.90)	790 (3.52)	1040 (4.63)	1410 (6.28)	1990 (8.86)	2440 (10.86)	2720 (12.10)	313
4L-125mm	—	(125)	9 5/9	4 3/8	3 5/8	1/2-13	520 (2.32)	650 (2.90)	790 (3.52)	1040 (4.63)	1410 (6.28)	1990 (8.86)	2440 (10.86)	2720 (12.10)	312
4L-6	6	—	11 3/7	5 1/3	4 4/7	1/2-13	870 (3.87)	1200 (5.34)	1460 (6.50)	1630 (7.26)	1560 (6.94)	2210 (9.84)	2710 (12.06)	3020 (13.44)	540
4L-150mm	—	(150)	11 3/7	5 1/3	4 4/7	1/2-13	870 (3.87)	1200 (5.34)	1460 (6.50)	1630 (7.26)	1560 (6.94)	2210 (9.84)	2710 (12.06)	3020 (13.44)	538
4L-8	8	—	13 3/5	6 2/5	5 2/3	1/2-13	1190 (5.30)	1440 (6.41)	1580 (7.03)	1750 (7.79)	1560 (6.94)	2210 (9.84)	2710 (12.06)	3020 (13.44)	645
4L-200mm	—	(200)	13 3/5	6 2/5	5 2/3	1/2-13	1190 (5.30)	1440 (6.41)	1580 (7.03)	1750 (7.79)	1560 (6.94)	2210 (9.84)	2710 (12.06)	3020 (13.44)	643
4L-10	10	(254)	17 3/5	8 1/4	7 1/4	1/2-13	1620 (7.21)	1660 (7.38)	1570 (6.98)	1740 (7.74)	1620 (7.21)	2300 (10.23)	2820 (12.54)	3140 (13.97)	1349
4L-12	12	(300)	19 3/5	9 1/4	8 1/4	1/2-13	1620 (7.21)	1660 (7.38)	1570 (6.98)	1740 (7.74)	1620 (7.21)	2300 (10.23)	2820 (12.54)	3140 (13.97)	1526

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

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified. Updated 4-7-21

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 177. 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.

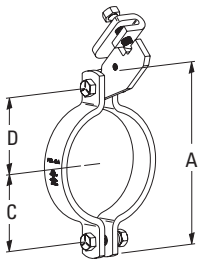
Installation Instructions: Fig. 4LA can be used as the system attachment component of a longitudinal or lateral brace assembly. It is intended to be combined with the "bracing member" and TOLCO transitional attachment and structural attachment to form a complete bracing assembly. For fire sprinkler applications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

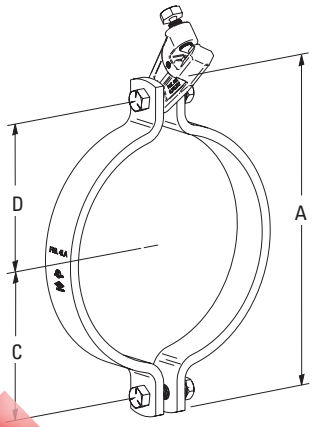
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

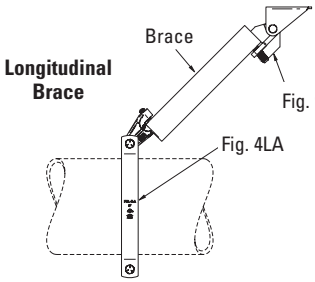
Order By: Figure number, pipe size and finish.

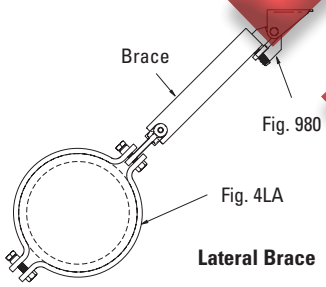
4LA-1 thru 4LA-4



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.

Updated 3-30-21

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

OPM

FM APPROVED

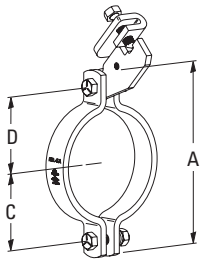
Size Range: 1" (25mm) through 12" (300mm) IPS.

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 176.
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.

4LA-1 thru 4LA-4



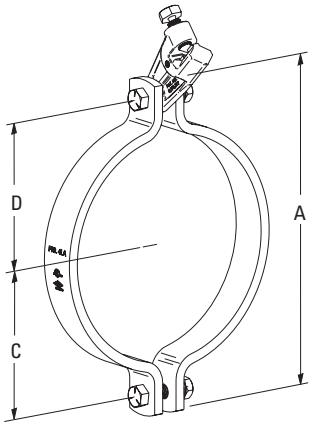
Installation Instructions: Fig. 4LA can be used as the system attachment component of a longitudinal or lateral brace assembly. It is intended to be combined with the "bracing member" and TOLCO transitional attachment and structural attachment to form a complete bracing assembly. For fire sprinkler applications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

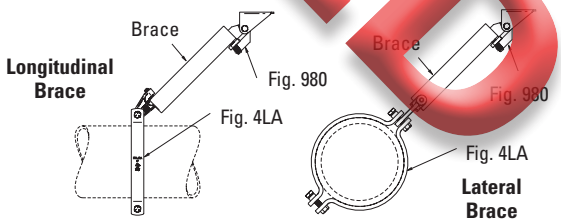
Order By: Figure number, pipe size and finish.

4LA-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)	$3\frac{19}{32}$" (91.2)	$1\frac{5}{16}$" (33.5)	$1\frac{5}{16}$" (33.5)	$\frac{3}{8}$"-16	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	119 (54.0)
4LA-1¼	1¼" (32)	$3\frac{29}{32}$" (99.3)	$1\frac{3}{8}$" (35.3)	$1\frac{3}{8}$" (35.3)	$\frac{3}{8}$"-16	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	123 (55.8)
4LA-1½	1½" (40)	$4\frac{5}{32}$" (105.7)	$1\frac{1}{2}$" (38.5)	$1\frac{1}{2}$" (38.5)	$\frac{3}{8}$"-16	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	127 (57.6)
4LA-2	2" (50)	$5\frac{11}{32}$" (135.6)	$2\frac{1}{32}$" (51.9)	$2\frac{1}{16}$" (51.9)	$\frac{3}{8}$"-16	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	142 (64.4)
4LA-2½	2½" (65)	$5\frac{27}{32}$" (148.7)	$2\frac{5}{16}$" (58.5)	$2\frac{5}{16}$" (58.5)	$\frac{3}{8}$"-16	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	173 (78.5)
4LA-3	3" (80)	6½" (164.9)	$2\frac{5}{8}$" (66.6)	$2\frac{5}{8}$" (66.6)	$\frac{3}{8}$"-16	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	187 (84.8)
4LA-3½	3½" (90)	7.407" (188.1)	$2\frac{7}{8}$" (73.1)	$2\frac{7}{8}$" (73.1)	$\frac{3}{8}$"-16	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	198 (89.8)
4LA-4	4" (100)	$7\frac{13}{32}$" (190.8)	$3\frac{1}{8}$" (79.5)	$3\frac{1}{8}$" (79.5)	$\frac{3}{8}$"-16	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	209 (94.8)
4LA-6	6" (150)	$10\frac{5}{8}$" (269.9)	$4\frac{9}{16}$" (115.9)	$4\frac{9}{16}$" (115.9)	$\frac{1}{2}$"-13	1620 (7.20)	*Note 1*	*Note 3*	*Note 5*	521 (236.3)
4LA-8	8" (200)	$12\frac{13}{16}$" (325.5)	$5\frac{9}{16}$" (143.7)	$5\frac{21}{32}$" (143.7)	$\frac{1}{2}$"-13	1620 (7.20)	*Note 2*	*Note 4*	*Note 6*	629 (285.3)
4LA-10	10" (250)	16½" (419.1)	$7\frac{1}{4}$" (184.2)	$7\frac{1}{4}$" (184.2)	½"-13	1620 (7.20)	*Note 2*	*Note 4*	*Note 6*	1320 (598.7)
4LA-12	12" (300)	18½" (469.9)	$8\frac{1}{4}$" (209.6)	$8\frac{1}{4}$" (209.6)	½"-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.

Updated 3-30-21

TOLCO™ Figure 4B Pipe Clamp for Sway Bracing

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.

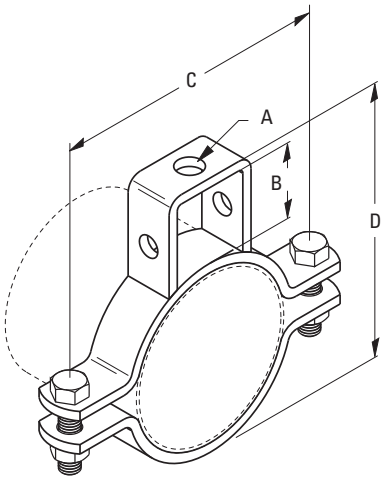
Standard Finish: Plain or Electro-Plated, Contact customer service for alternative finishes and materials.

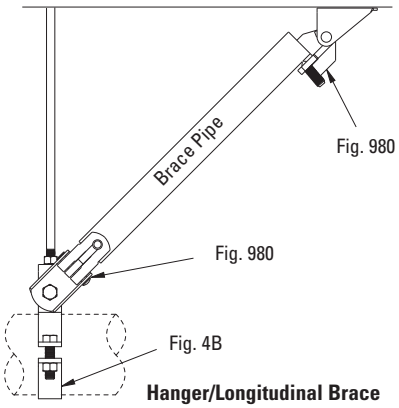
Ordering: Specify part number and finish.

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. NFPA 13 and/or OSHPD guidelines should be followed.

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

Component of State of California OSHPD Approved Seismic Restraints System





Hanger/Longitudinal Brace

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

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.

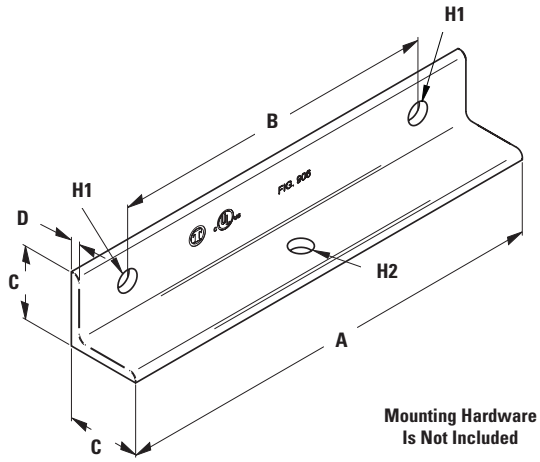
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** only when used with TOLCO™ Fig. 900 Series Earthquake Brace Attachments. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. 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)	2.5" (63.5)	1/4" (6.3)	Specify	Specify	394 (178.7)
906-12	15" (381.0)	12" (304.8)	2.5" (63.5)	1/4" (6.3)	Specify	Specify	494 (224.1)

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

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

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

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.

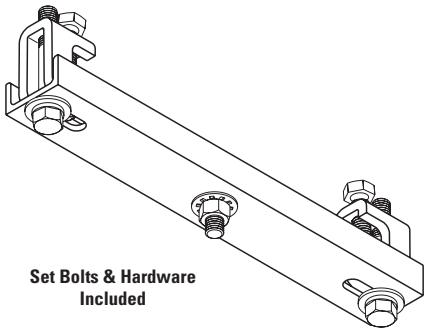
To Install: Place the Fig. 800 on the steel beam, tighten the cone point set bolts on flange until the heads break off. Tighten hex head bolts into clamp body until lock washers are fully flat. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional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

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

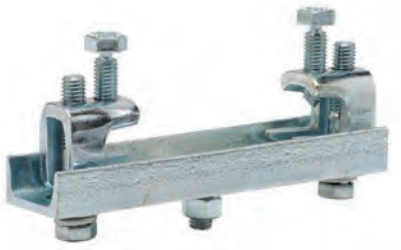
For FM Approval information refer to FM Approved page 59.

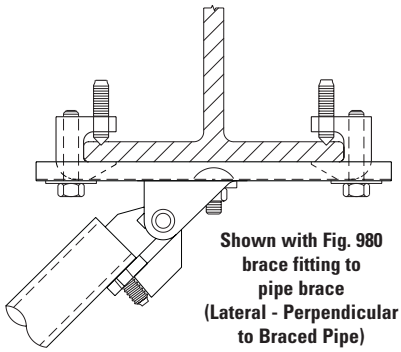
Finish: Plain, Electro-Galvanized and Hot Dip Galvanized. Contact customer service for alternative finishes and materials.

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

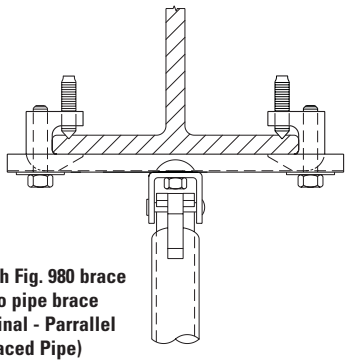


Set Bolts & Hardware Included





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



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

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

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

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

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

Updated 6-9-21

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.

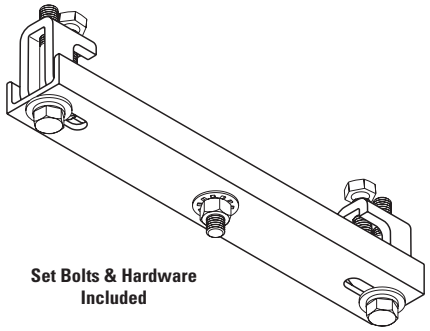
To Install: Place the Fig. 800 on the steel beam, tighten the cone point set bolts on flange until the heads break off. Tighten hex head bolts into clamp body until lock washers are fully flat. Attach other TOLCO transitional attachment fitting, Fig. 980, 910, 909, or any other TOLCO approved transitional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

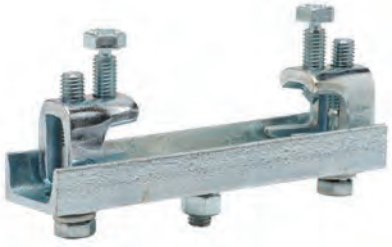
Finish: Plain, Hot Dip Galvanized or Electro-Galvanized. Contact customer service for alternative finishes and materials.

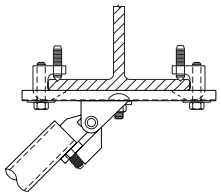
Order By: Figure number, type number and size number.
Example: FIG. 800 TYPE2X14-16

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

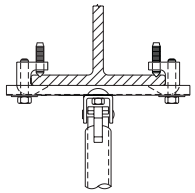


Set Bolts & Hardware Included





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



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

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

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

Approvals: Underwriters Laboratories Listed in the USA and Canada **(cULus)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
For FM Approval information refer to FM Approved page 183.

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

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

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

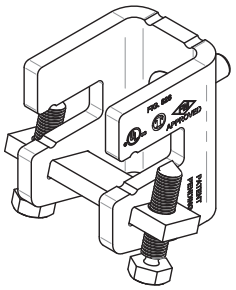
Finish: Plain or Electro-Galvanized

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

Order By: Figure number and finish

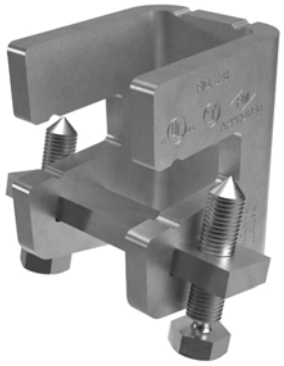
Patent Pending

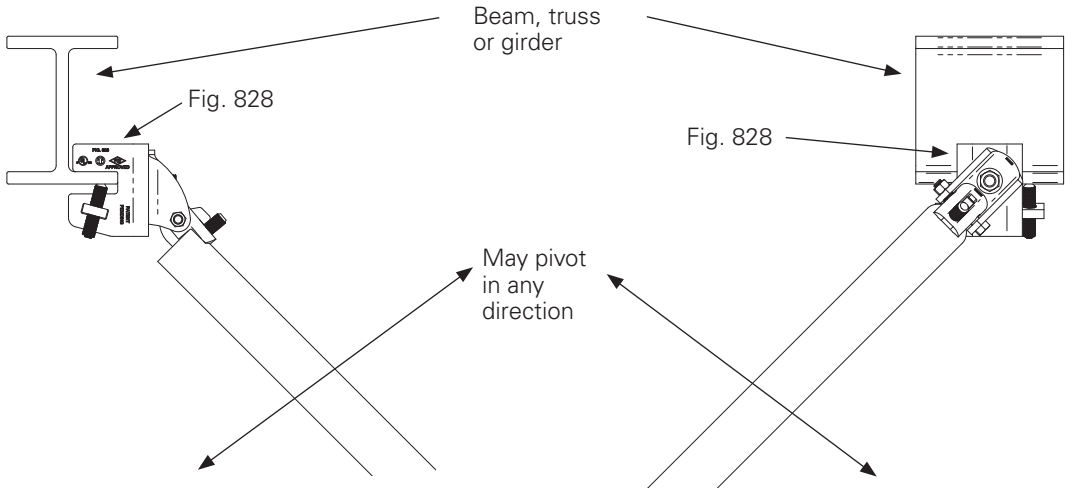
Note: Retaining strap not required.



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

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





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

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

Updated 4-6-21

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, 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 182.

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

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

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

Finish: Plain or Electro-Galvanized

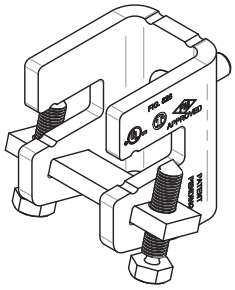
Approx. Weight/100: 341 Lbs. (154.7 kg)

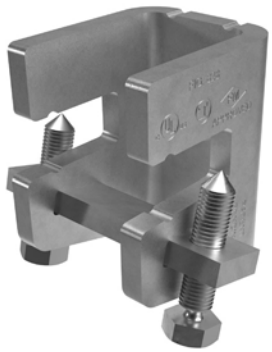
Order By: Figure number and finish

Patent Pending

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

Note: Retaining strap not required.

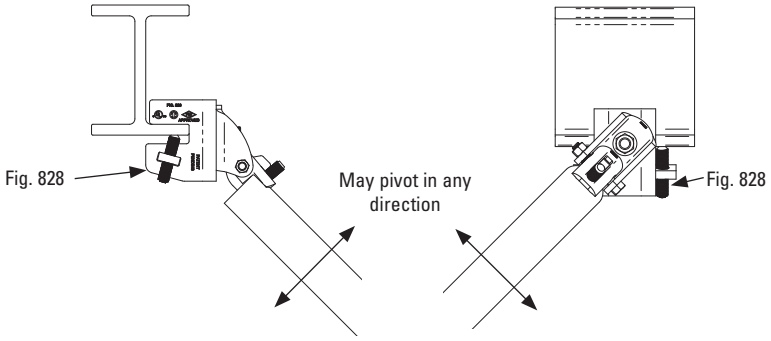




FM Approved Allowable Horizontal Load With Brace Perpendicular To Beam			
Brace Angle (degrees from vertical)			
30°-44°	45°-59°	60°-74°	75°-90°
980 (4.350kN)	2220 (9.780kN)	3340 (14.850kN)	4040 (17.970kN)

FM Approved Allowable Horizontal Load With Brace Parallel To Beam			
Brace Angle (degrees from vertical)			
30°-44°	45°-59°	60°-74°	75°-90°
820 (3.640kN)	1270 (5.640kN)	1490 (6.620kN)	1650 (7.330kN)

FM Approved design loads are based on ASD design method.



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

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)

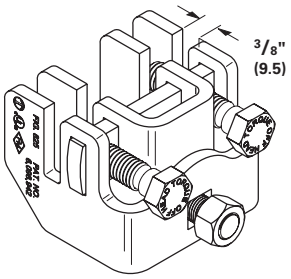
OPM

C UL US LISTED

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

Material: Steel

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



Set Bolts & Hardware Included

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

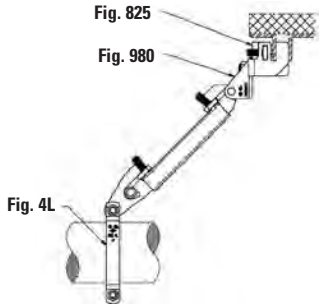
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. UL listed with Fig. 909, 910, and 980 series attachments and the following brace member type pipes: Sch. 40, KSD 3562. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(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.

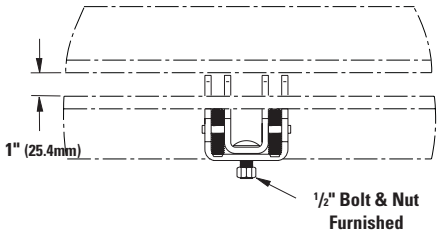
Maximum Design Load	
825W/909-1370 lbs	(5.78 KN)
825W/910-1500 lbs	(7.11 KN)
825W/980-1600 lbs	(8.45 KN)

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.

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

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.





Top View

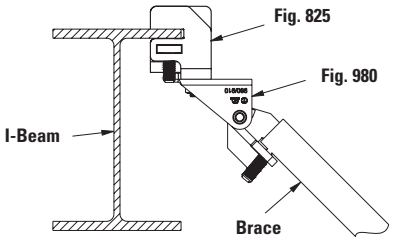
Finish: Plain, Electro-Galvanized and HDG

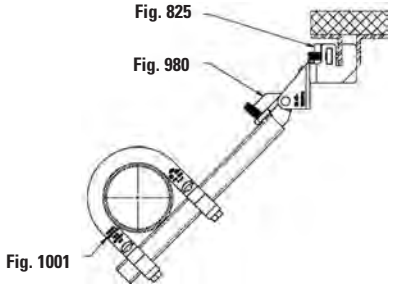
Approx. Wt./100: 247.5 Lbs. (112.2kg)

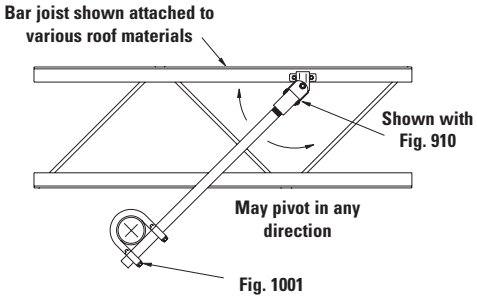
Order By: Figure number and finish

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

Retaining strap not required.







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.

Updated 5-24-21

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

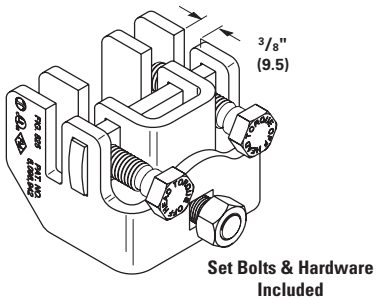
OPM

FM APPROVED

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

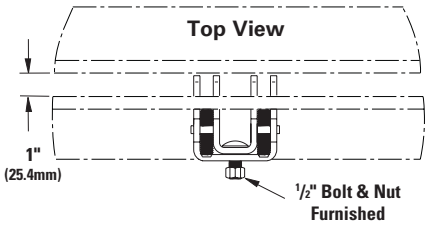
Material: Steel

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



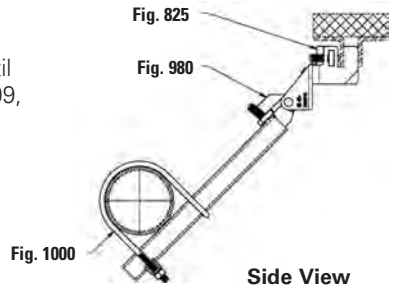
Features: This product's design incorporates a concentric attachment point which is critical to the performance of structural seismic connections. NFPA 13 indicates the importance of concentric loading of connections and fasteners. Permits secure non-friction connection without drilling or welding. Unique 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 componentof 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)

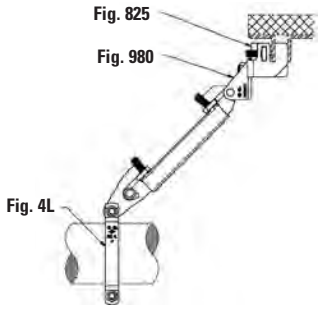
Order By: Figure number and finish

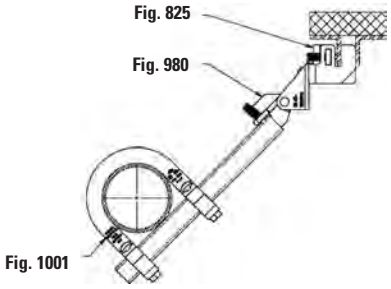
US Patent #6,098,942,
Canada Patent #2,286,659

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

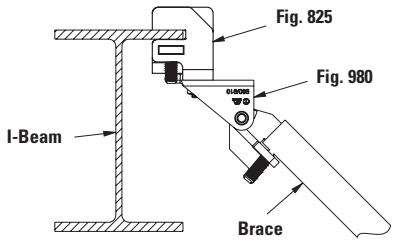
Retaining strap not required.

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

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

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

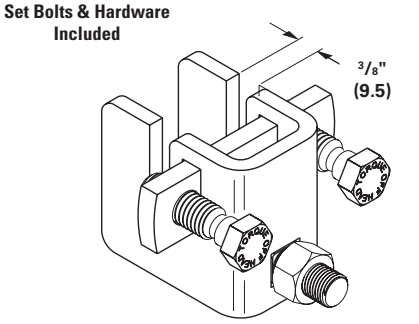
Finish: Plain or Electro-Galvanized

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

Order By: Figure number and finish

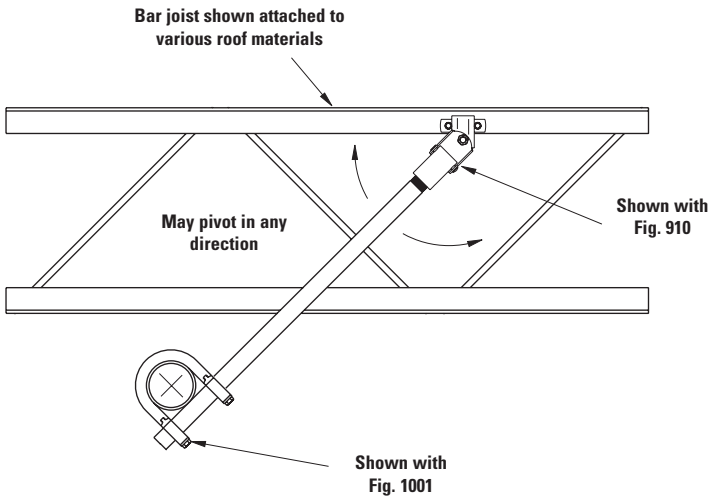
Patent #6,098,942

Retaining strap not required.



Maximum Design Load
825A 700 lbs. (3.11kN)

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



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

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

Updated 5-24-21

TOLCO Fig. 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 ⅜", ½" or ⅝" attachment.

Material: Steel, hardened cone point set bolt

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

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

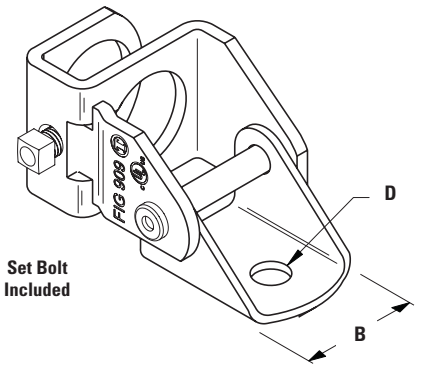
ApJ54plication Note: Fig. 909 is used in conjunction with the Fig. 1001 or Fig. 4L or other approved TOLCO attachment to pipe, and joined together with bracing pipe. Sway brace assemblies are intended to be installed in accordance with NFPA 13. The required type, number and size of fasteners used for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

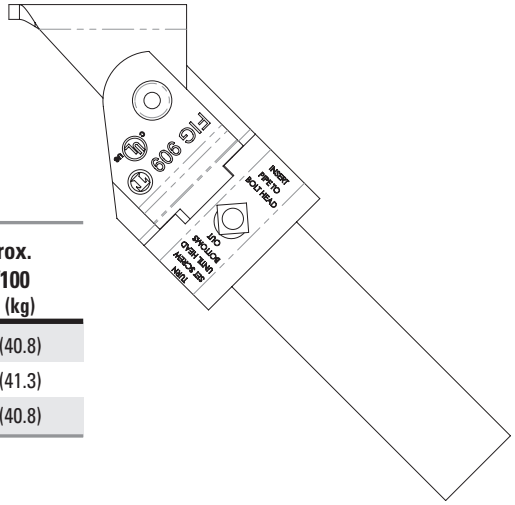
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. UL Listed for the following brace member type pipes: Sch. 40, KSD 3562. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**.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

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

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

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





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

* Standard size.

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

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

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

OPM

Size Range: 1" (25mm) bracing pipe. For brace pipe sizes larger than 1" (25mm), use Fig. 980. Available with holes for ½" fastener attachment.

Material: Steel

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

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

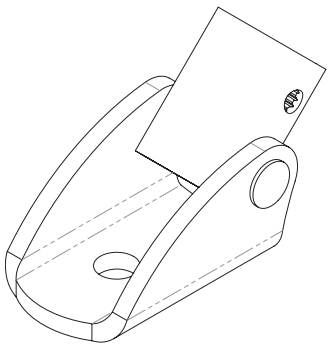
Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). **(cUL)**. UL Listed for the following brace member type pipes: Sch. 40. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For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

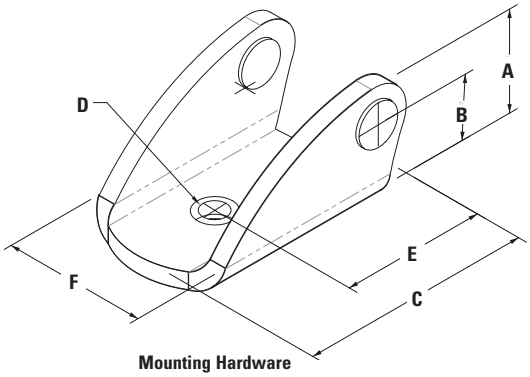
Installation Instructions: Thread the 1" brace pipe into the Fig. 910 until pipe threads are visible through inspection site hole. When using in combination with a Fig. 825A, Fig. 825, Fig. 828, or Fig. 906 refer to those instruction sheets, otherwise select an anchor that is sized appropriately for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

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

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

Order By: Figure number, pipe size and finish.





Mounting Hardware Is Not Included

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 1½	1" (25)	1 7/10" (43.2)	1 1/5" (30.5)	2 15/16"(74.7)	9/16" (14.3)	1 11/16" (42.9)	2 1/20" (52)	1600 (8.96)	105 (47.6)

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

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

Updated 3-30-21

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.

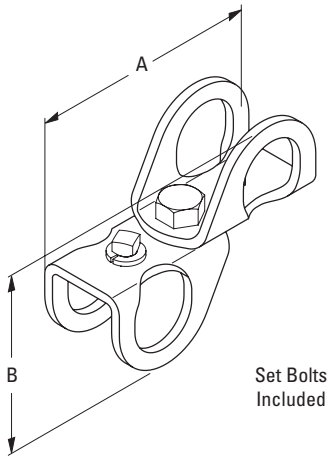
Material: Steel, hardened cone (or cup) point set bolt

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

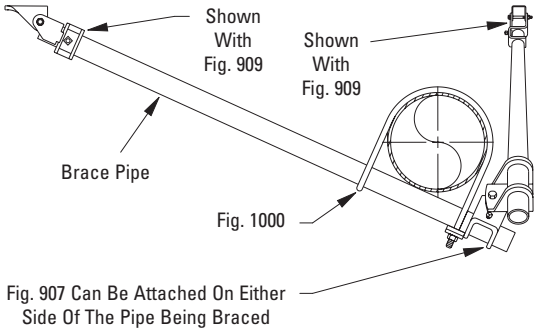
To Install: Attach the Fig. 907 over one piece of pipe and adjust to desired position. Tighten set bolt until head bottoms out on surface, then repeat the process for the second pipe.

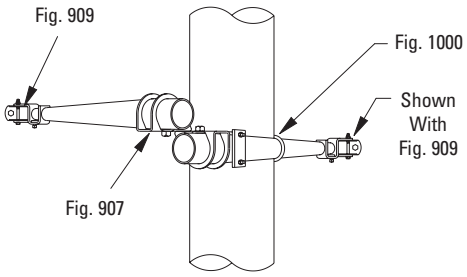
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

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 1¼	1" x 1¼"	(25 x 32)	5 3/16"	(128.6)	4 13/16"	(122.2)	655	(2.91)	107	(48.5)
907-1¼ X 1¼	1¼" x 1¼"	(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 ½", ⅝", or ¾" fastener attachment.

Material: Steel

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

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

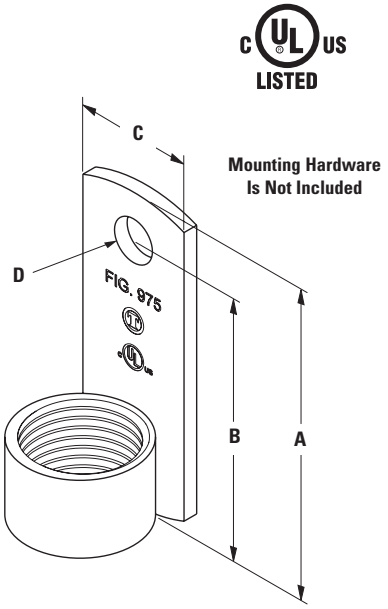
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. UL Listed for the following brace member type pipes: Sch. 40.

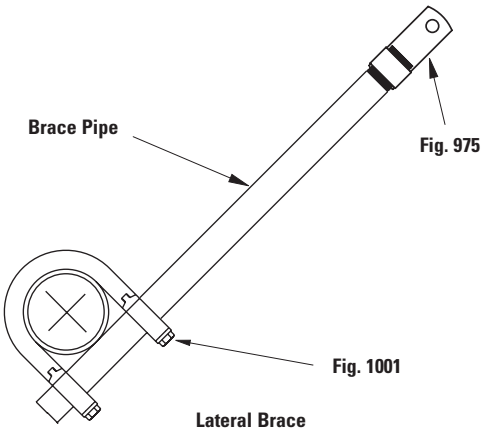
Installation: Thread the Fig. 975 onto the 1" threaded bracing pipe. When using in combination with the Fig. 906, refer to that instruction sheet, otherwise select an anchor that is sized appropriately for the intended use and follow anchor manufacturer's instructions regarding structural thickness and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

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

Order By: Figure number and finish.

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





Part Number	Brace Pipe Size 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)
975-½ *	1" (25)	4" (101.6)	3½" (88.9)	1½" (38.1)	9/16" (14.3)	2100 (9.34)	88 (39.9)
975-⅝	1" (25)	4" (101.6)	3½" (88.9)	1½" (38.1)	11/16" (17.5)	2100 (9.34)	87 (39.4)
975-¾	1" (25)	4" (101.6)	3½" (88.9)	1½" (38.1)	13/16" (20.6)	2100 (9.34)	86 (39.0)

* Standard size.

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

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

TOLCO Fig. 981 - fast attach – universal swivel sway brace attachment

Component of State of California OSHPD Approved Seismic Restraints System

Size Range: Fits bracing pipe 1" (25mm) thru 2" (50mm), 12 gauge (2.6mm) channel and all structural steel up to 1/4" (6.3mm) thick.
Fig. 981-S fits rod sizes 3/8" thru 5/8".
Fig. 981-L fits rod sizes 3/4" thru 7/8".

Material: Steel

Function: Multi-functional attachment to hanger rod, trapeze rod, structure or braced pipe fitting.

Features: Fits multiple sizes of bracing pipe, strut or structural steel. Swivel allows adjustment to various surface angles. Breakaway bolt heads assure verification of proper installation torque. Unique "fast attach" yoke design fits multiple rod sizes; 3/8" thru 5/8" and 3/4" thru 7/8". "Stackable" design allows installation of both lateral and longitudinal braces to be easily installed on a single hanger rod, with no disassembly.

Installation: Fig. 981 is the "braced pipe" attachment component of a lateral or longitudinal brace assembly. It is intended to be combined with the pipe hanger, all-thread rod, "bracing pipe" and TOLCO transitional and structural attachment component(s) to form a complete bracing assembly. NFPA 13 and or OSHPD guidelines should be followed.

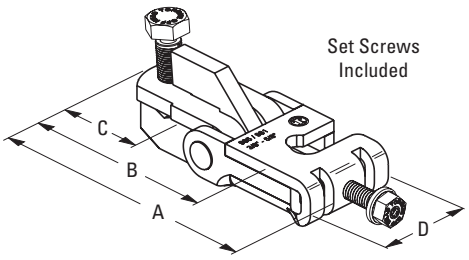
To Install: Spin nut on top of hanger counterclockwise to loosen the nut and raise it above the top of the hanger. Attach Fig. 981 by slipping the open side of the 981 yoke onto the all thread rod above the top of the hanger. Tighten 3/8" cone point set screw on yoke until head breaks-off to ensure proper installation torque. Spin the hex nut clockwise and tighten securely. Insert brace pipe into the jaw of the 981 and tighten the cone point set screw until the head breaks off ensuring proper installation torque. Pivot brace pipe to proper angle and attach to structure using a TOLCO swivel structural attachment.

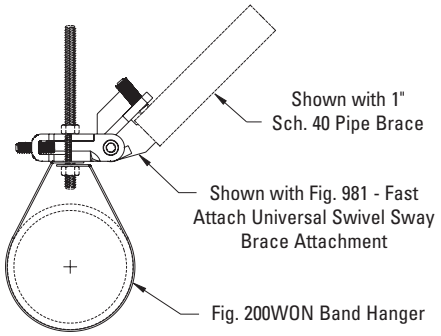
Approvals: Included in our Seismic Restraint Systems Guidelines, approved by the California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines.

Finish: Electro-Galvanized

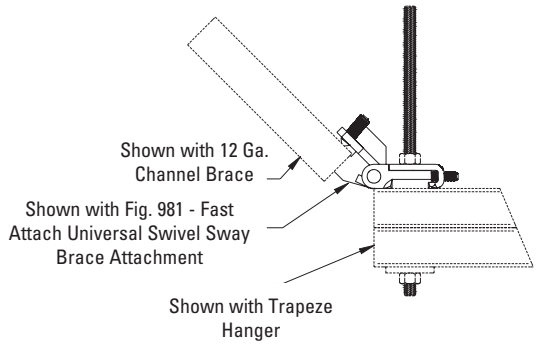
Order By: Figure number, rod size

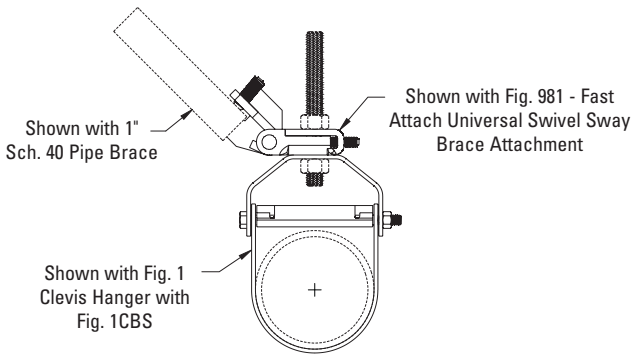
US Patent Numbers
Pat. #6,273,372, Pat. #7,097,141, Pat. #7,654,043, Pat. #7,654,043 B2





Part Number	Rod Size Range	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	Max. Horizontal Design Load lbs. (kN)	Approx. Wt./100 lbs. (kg)
981-S	3/8" thru 5/8"	5 1/8" (130.2)	4 1/8" (104.8)	1 1/4" (31.7)	2 1/4" (57.1)	2015 (8.96)	88 (39.9)
981-L	3/4" & 7/8"	5 1/8" (130.2)	4 1/8" (104.8)	1 1/4" (31.7)	2 1/4" (57.1)	2015 (8.96)	82 (37.2)





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

Fig. 980 - TOLCO Universal swivel sway brace attachment -3/8"-16 to 3/4"-10 rods
Fig. 980H - TOLCO Universal swivel sway brace attachment -7/8"-9 to 1 1/4"-7

OPM

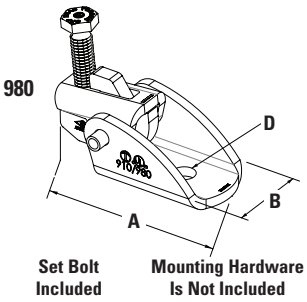
c UL us LISTED

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

Material: Carbon steel

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

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



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

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

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

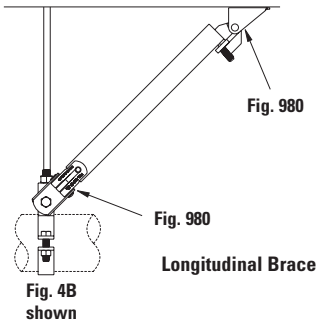
Note: Fig. 980 Swivel Attachment and Fig. 1001, 2002, 3000, 4L, or approved attachment to pipe make up a sway brace system of UL Listed attachments and bracing materials which satisfies the requirements of Underwriters Laboratories and the National Fire Protection Association **(NFPA)**

Finish: Plain, Electro-Galvanized or Stainless Steel.

Contact customer service for alternative finishes.

Order By: Figure number and finish.

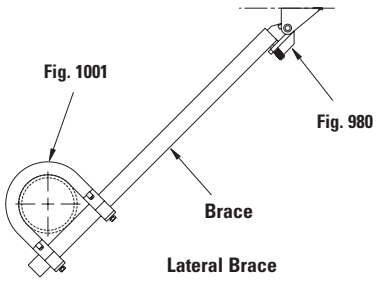
Pat. #6,273,372, Pat. #6,517,030, Pat. #6,953,174, Pat. #6,708,930, Pat. #7,191,987, Pat. #7,441,730, Pat. #7,669,806



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

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

** Mounting attachment hole size.



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

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

Updated 3-30-21

Fig. 980 - TOLCO Universal swivel sway brace attachment -3/8"-16 to 3/4"-10 rods
Fig. 980H - TOLCO Universal swivel sway brace attachment -7/8"-9 to 1 1/4"-7

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

Material: Carbon steel

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

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

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

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

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

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

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

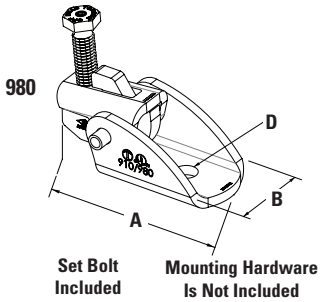
Order By: Figure number and finish.

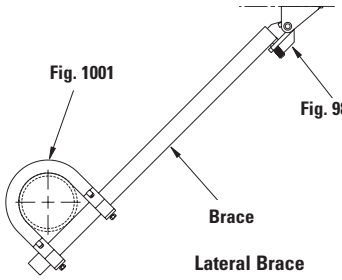
Pat. #6,273,372, Pat. #6,517,030, Pat. #6,953,174, Pat. #6,708,930, Pat. #7,191,987, Pat. #7,441,730, Pat. #7,669,806

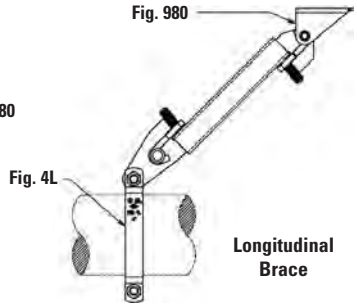
Designed to meet or exceed requirements of FM DS 2-8.

OPM

FM APPROVED







Catalog #	A in.	A (mm)	B in.	B (mm)	D** in.	D** (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	4 9/16	(114.9)	2 1/16	(52.4)	7/16	(11.1)	2370 (10.54)	2790 (12.41)	3360 (14.94)	3750 (16.68)	149	(67.6)
980-1/2					9/16	(14.3)					148	(67.1)
980-5/8					11/16	(17.5)					147	(66.7)
980-3/4					13/16	(20.6)					146	(66.2)
980H-7/8	6 3/4	(171.4)	3 1/2	(88.9)	15/16	(23.8)	Fig. 980H is not UL Listed or FM Approved				402	(182.3)
980H-1					1 1/16	(27.0)					400	(181.4)
980H-1 1/8					1 3/16	(30.2)					397	(180.1)
980H-1 1/4					1 5/16	(33.3)					390	(176.9)

** Mounting attachment hole size.
*** Installed with 1" or 1 1/4 "schedule 40 brace pipe.

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

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

Updated 3-30-21

TOLCO Fig. 985 - mechanical fast clamp

Size Range: Fig. 985-S fits rod sizes 3/8" thru 5/8"
Fig. 985-L fits rod sizes 3/4" thru 7/8" rod sizes

Material: Steel

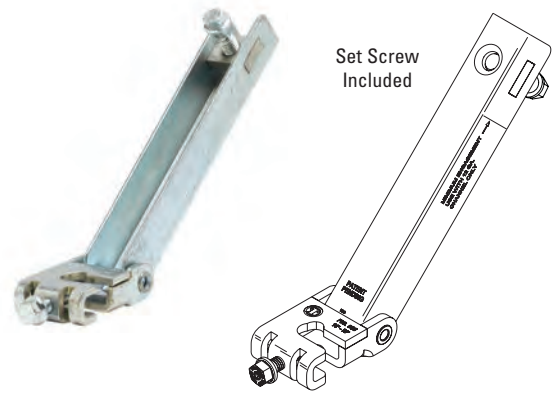
Function: Used for attachment of seismic bracing to pipe hanger or trapeze

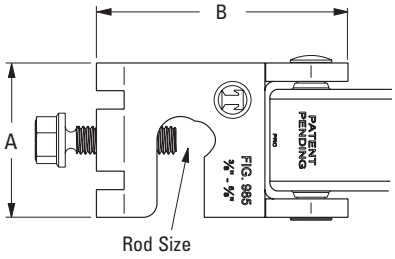
Features: Allows up to 12" (304.8mm) of adjustability in brace length, when used with Fig. 986. Break-off set screw heads visually verify required installation torque. Unique "Fast Attach" yoke design allows Fig. 985 to be installed to hanger rods 3/8" thru 5/8" or 3/4" thru 7/8"

Finish: Electro-galvanized

Order By: Figure number, rod size & finish

Patent Pending





Part Number	Rod Size	A in. (mm)	B in. (mm)	Max. Horizontal Design Load lbs. (kN)	Approx. Wt./100 lbs. (kg)
985-S	3/8" thru 5/8"	2" (50.8)	1 1/2" (38.1)	2015 (8.96)	204 (92.5)
985-L	3/4" & 7/8"	2" (50.8)	1 5/8" (41.3)	2015 (8.96)	198 (89.8)

TOLCO Fig. 986 - mechanical fast clamp

Size Range: Available with holes for 1/2"-13 thru 3/4"-10 fastener attachment.

Material: Steel

Function: Used for attachment of seismic bracing to structure or hanger.

Features: Allows up to 12" (304.8mm) of adjustability in brace length, when used with Fig. 985. Break-off set screw heads visually verify required installation torque. Swivel allows adjustment to various surface angles.

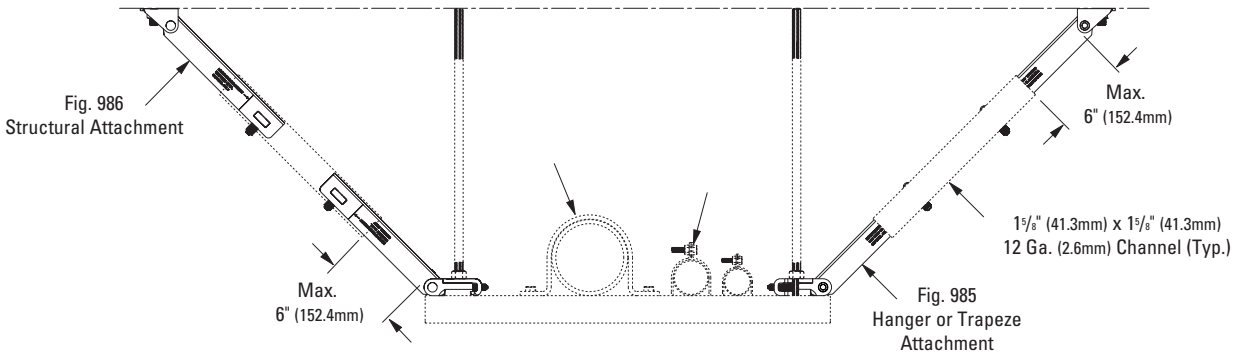
Finish: Electro-galvanized

Order By: Figure number, rod size & finish

Patent Pending

Part Number	Rod Size	Hole Dia. D in. (mm)	Max. Horizontal Design Load* lbs. (kN)	Approx. Wt./100 lbs. (kg)
986-1/2	1/2"	9/16" (14.3)	2015 (8.96)	204 (92.5)
986-5/8	5/8"	11/16" (17.5)	2015 (8.96)	203 (92.1)
986-3/4	3/4"	13/16" (20.6)	2015 (8.96)	202 (91.6)

* When used with 1 5/8" (41.3mm) x 1 5/8" (41.3mm) 12 Ga. (2.6mm) channel

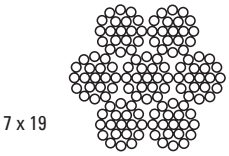


All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

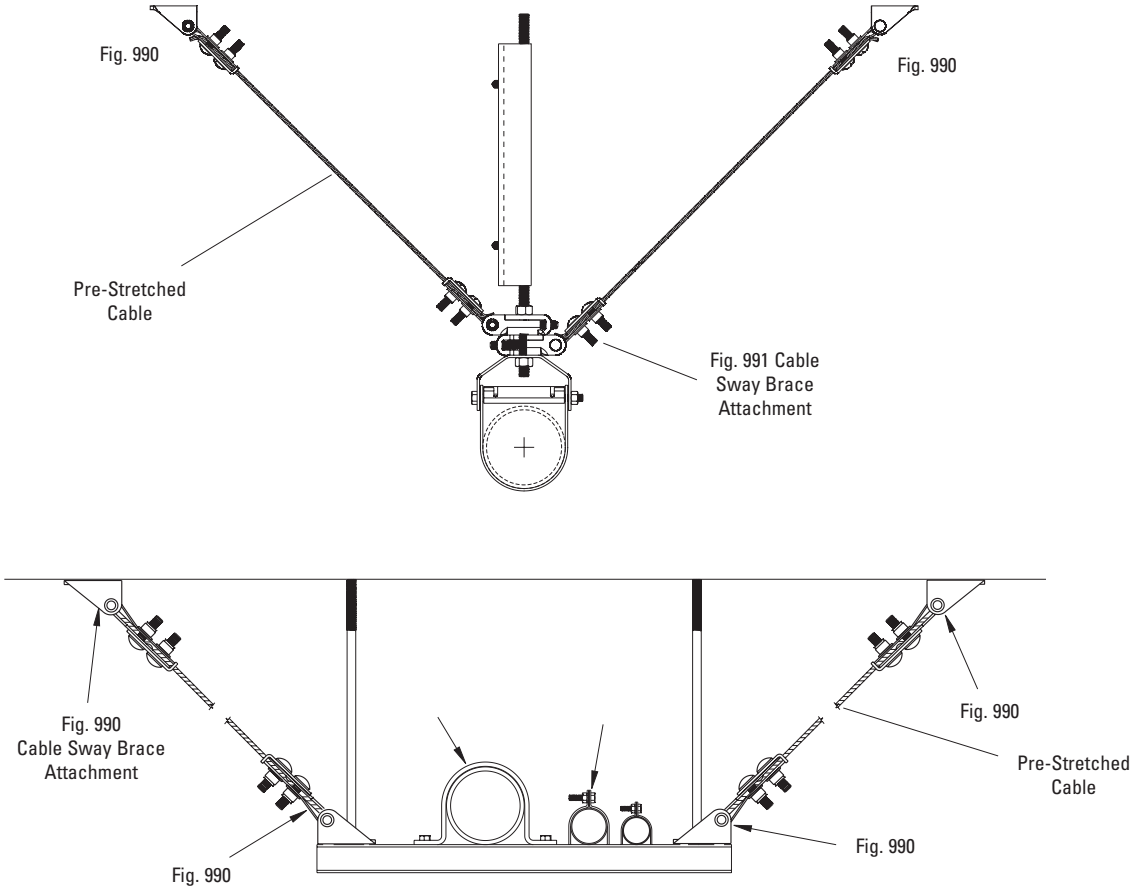
TOLCO Fig. BRC cable - pre-stretched 7 x 19 galvanized aircraft cable

Size Range: Available in cable diameters of 1/8", 3/16", and 1/4"
Material: Steel
Function: Used for attachment of seismic bracing to structure or hanger.
Features: Meets requirements of IBC 2009 and ASCE 7-05 for seismic bracing.
Finish: Galvanized
Order By: Figure number and size
Note: Only pre-stretched aircraft cable should be used in seismic bracing installations where cable is used as the bracing component. Use of other types of cable will, over time, begin to sag and deform, thus rendering the bracing system to not perform properly.

Part Number	Cable Diameter in. (mm)	Max. Rec. Load* lbs. (kN)	Approx. Wt./100 Ft. lbs. (kg)
BRC CABLE-1/8	1/8" (3.2)	975 (4.33)	2.9 (1.31)
BRC CABLE-3/16	3/16" (4.8)	2050 (9.12)	6.5 (2.95)
BRC CABLE-1/4	1/4" (6.3)	3150 (14.01)	11.0 (4.99)



* Cable breaking strength



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

TOLCO Fig. 990 - cable sway brace attachment - 3/8"-16 to 3/4"-10 rods
TOLCO Fig. 990H - cable sway brace attachment - 7/8"-9 to 1 1/4"-7 rods

Component of State of California OSHPD Approved Seismic Restraints System

Size Range: 1/8", 3/16" and 1/4" pre-stretched cable.
Fig. 990 for 3/8", 1/2", 5/8", or 3/4" hanger rod, bolt, or fastener.
Fig. 990H for 7/8", 1", 1 1/8", or 1 1/4" hanger rod, bolt, or fastener.

Material: Steel

Function: Cable attachment for sway bracing. Attaches sway brace to structure or to hanger. To be used with 7 x 19 strand core pre-stretched galvanized aircraft cable.

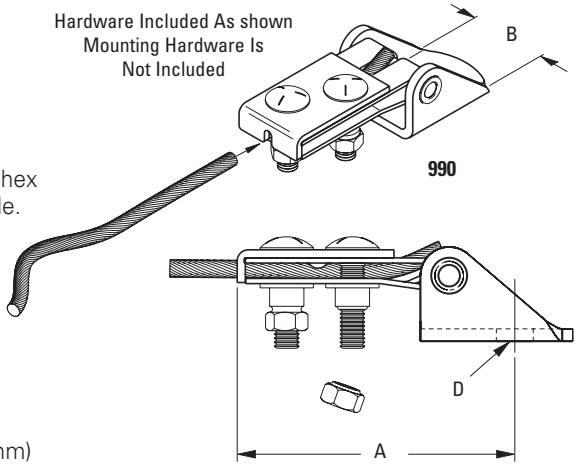
Features: Cable easily slides into oversized front arch opening. Breakaway hex nuts assure verification of proper installation. Will mount to any surface angle.

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

Finish: Electro-Galvanized

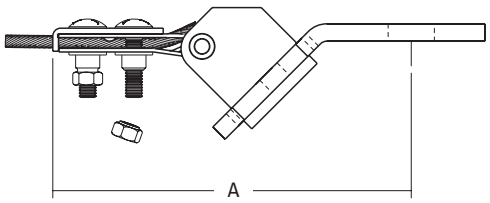
Order By: Figure number, cable size and mounting hole size.

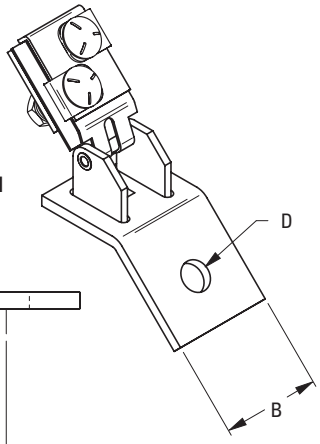
Note: Order 990H for hanger rod, bolt or fastener holes sized for 7/8" (22.2mm) thru 1 1/4" (31.7mm) rods.



Cable ** Diameter in. (mm)	990 Dimensions A in. (mm)	990 Dimensions B in. (mm)	990H Dimensions A in. (mm)	990H Dimensions B in. (mm)	Max. Horizontal Design Load * lbs. (kN)
1/8" (3.2)	4 5/16" (14.3)	2" (50.8)	7 3/4" (196.8)	3 1/2" 88.9)	975 (4.33)
3/16" (4.8)	5" (127.0)	2 1/4" (57.1)	8 1/2" (215.9)	3 1/2" 88.9)	2050 (9.12)
1/4" (6.3)	5" (127.0)	2 5/8" (66.7)	8 1/2" (215.9)	3 1/2" 88.9)	3150 (14.01)

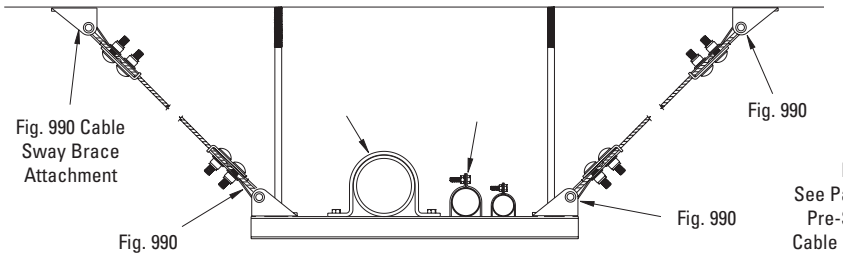
* Maximum load rating controlled by cable breaking strength.

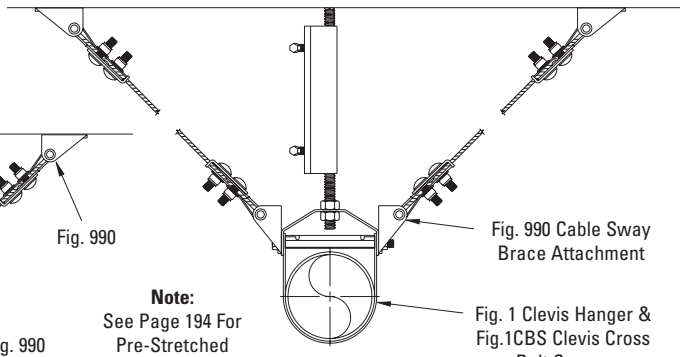




Part Number	Rod Sizes	D Dia. in. (mm)	Approx. Wt./100
990-3/8 X **	3/8"	13/32" (10.3)	Varies
990-1/2 X **	1/2"	17/32" (13.5)	Varies
990-5/8 X **	5/8"	11/16" (17.4)	Varies
990-3/4 X **	3/4"	13/16" (20.6)	Varies
990H-7/8 X **	7/8"	15/16" (23.8)	Varies
990H-1 X **	1"	1 1/8" (28.6)	Varies
990H-11/8 X **	1 1/8"	1 1/4" (31.7)	Varies
990H-11/4 X **	1 1/4"	1 3/8" (34.9)	Varies

** Insert cable diameter in part number.

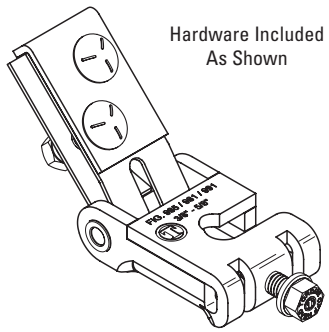




All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

TOLCO Fig. 991 - fast attach – cable sway brace attachment

Component of State of California OSHPD Approved Seismic Restraints System



Size Range: 1/8", 3/16" and 1/4" pre-stretched cable.
Fig. 991S fits rod sizes 3/8" thru 5/8".
Fig. 991L fits rod sizes 3/4" thru 7/8".

Material: Steel

Function: Cable attachment for sway bracing. Attaches sway brace to hanger rod. To be used with 7 x 19 strand core pre-stretched galvanized aircraft cable.

Features: Cable easily slides into oversized front arch opening. Swivel allows adjustment to various surface angles. Break-away hex nuts assure verification of proper installation torque. Unique "Fast-Attach" yoke design fits multiple rod sizes; 3/8" thru 5/8" or 3/4" thru 7/8". To verify proper installation to hanger rod, simply install yoke to hanger rod and tighten 3/8" cone point set screw until head breaks off. "Stackable" design allows installation of both lateral and longitudinal braces, as well as opposing braces, to be easily installed on a single hanger rod, with no disassembly. The retrofit yoke has a visual verification of proper installation torque. Tighten existing hex nut down until the slight gap in the yoke assembly closes completely.

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

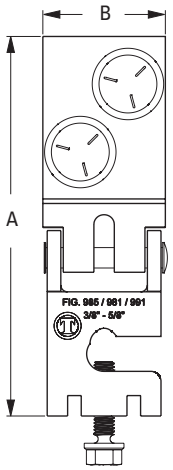
Finish: Electro-Galvanized

Order By: — Figure number, rod size range 3/8" thru 5/8" or 3/4" thru 7/8"

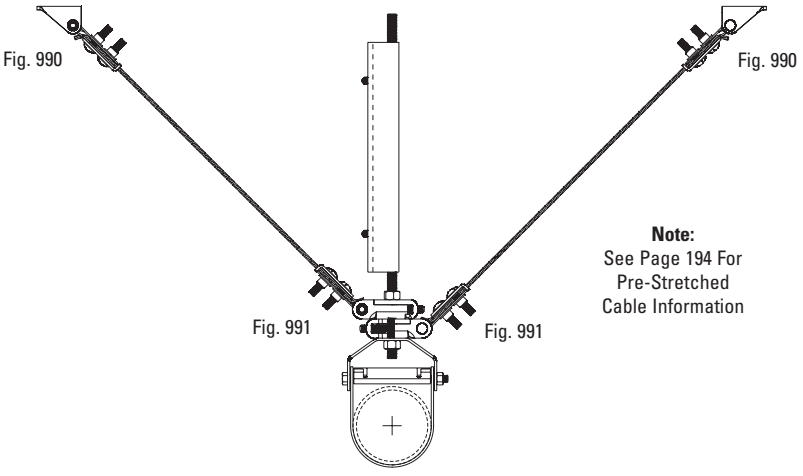
US Patent Numbers: Pat. #7,097,141, Pat. #7,654,043, Pat. #7,654,043 B2

Part Number	Rod Sizes	Cable Diameter in. (mm)	A in. (mm)	B in. (mm)	Max. Horizontal Design Load* lbs. (kN)	Approx. Wt./100 lbs. (kg)
991-S-1/8	3/8"	1/8" (3.2)	4 5/16" (14.3)	2" (50.8)	975 (4.33)	128.3 (58.2)
991-S-3/16	thru	3/16" (4.8)	5" (127.0)	2 1/4" (57.1)	2050 (9.12)	182.1 (82.6)
991-S-1/4	5/8"	1/4" (6.3)	5" (127.0)	2 5/8" (66.7)	3150 (14.01)	221.1 (100.3)

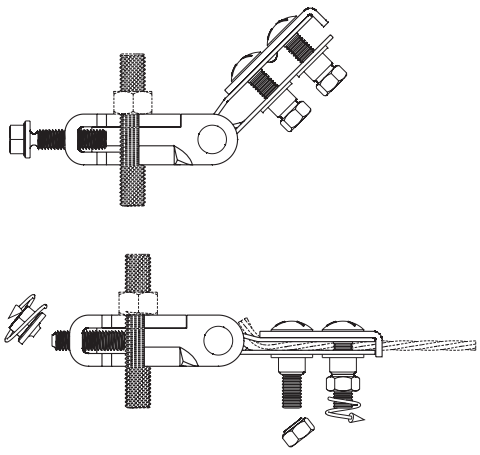
Part Number	Rod Sizes	Cable Diameter in. (mm)	A in. (mm)	B in. (mm)	Max. Horizontal Design Load* lbs. (kN)	Approx. Wt./100 lbs. (kg)
991-L-1/8	3/4"	1/8" (3.2)	4 5/16" (14.3)	2" (50.8)	975 (4.33)	122.3 (55.5)
991-L-3/16	&	3/16" (4.8)	5" (127.0)	2 1/4" (57.1)	2050 (9.12)	176.1 (79.9)
991-L-1/4	7/8"	1/4" (6.3)	5" (127.0)	2 5/8" (66.7)	3150 (14.01)	215.1 (97.5)



* Maximum load rating controlled by cable breaking strength.



Note:
See Page 194 For Pre-Stretched Cable Information



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

TOLCO Fig. 3000 - CPVC and steel sway brace attachment

Size Range: Pipe size to be braced: in 1" (25mm) thru 3" (80mm) except 65mm pipe sizes
Pipe size used for bracing 1" (25mm) Schedule 40 IPS

Material: Steel

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

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

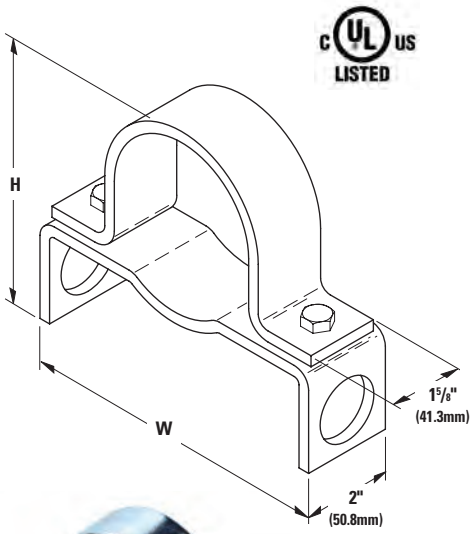
Installation Instructions: Slide the Fig. 3000 bracket over the brace member. Place the Fig. 3000 clamp over the pipe being braced, align the holes, and tighten the supplied bolts until the underside of the bolt bottoms out against the Fig. 3000 clamp. The sway brace fitting is intended to be used with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

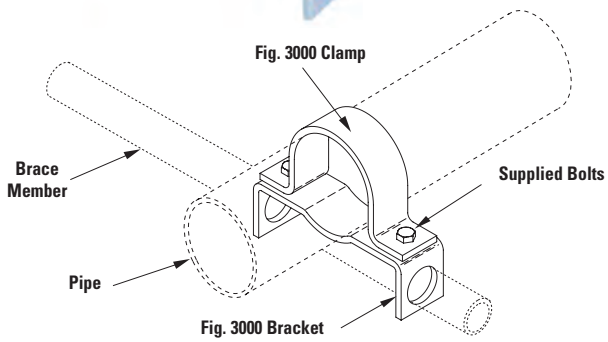
Note: Brace member may be over or under the braced pipe.

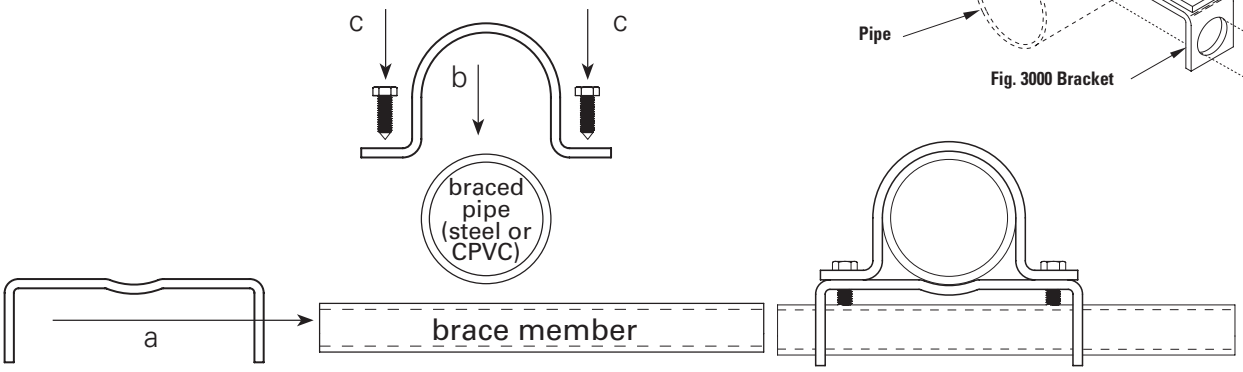
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. UL Listed for the following sprinkler type pipes: Sch. 40 (and as brace member), Sch. 10, CPVC, DIN 2448, KSD 3562 (and as brace member), KSD 3507.

Finish: Electro-Galvanized

Order By: Figure number and pipe size.







Part No.	CPVC or Steel 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 7/10"	(94.0)	4 3/4"	(120.7)	700	(3.11)	120	(54.4)
3000-1 1/4	1 1/4"	(32)	4"	(101.6)	5"	(127.0)	700	(3.11)	129	(58.5)
3000-1 1/2	1 1/2"	(40)	4 3/10"	(109.2)	5 1/4"	(133.4)	700	(3.11)	136	(61.6)
3000-2	2"	(50)	4 7/10"	(119.4)	6 1/2"	(165.1)	700	(3.11)	204	(92.5)
3000-2 1/2	2 1/2"	(65)	5 4/25"	(131.1)	7"	(177.8)	700	(3.11)	226	(102.5)
3000-3	3"	(80)	5 4/5"	(147.3)	7 1/2"	(190.5)	700	(3.11)	252	(114.3)

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

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

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

Material: Steel

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

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

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

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

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

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

OPM

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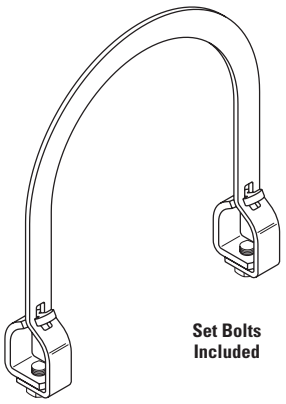


Pipe Size	Part Number & Approx. Wt./100 1" (25mm) Brace Pipe		1¼" (32mm) Brace Pipe		Design Load - Lbs. For Brace Pipe Size 1" / 1¼"		
in. (mm)		Lbs. (kg)		Lbs. (kg)	Sch. 7 1" / 1¼"	Sch. 10 1" / 1¼"	Sch. 40 1" / 1¼"
1" (25)	**1001-1 X 1**	104.6 (47.4)	**1001-1 X 1¼**	122.2 (55.4)	— / —	— / —	1000 / 1000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

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

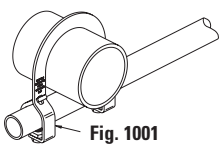
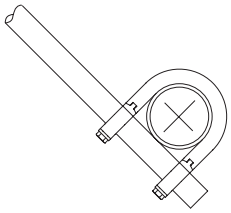
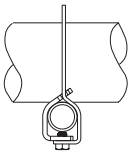
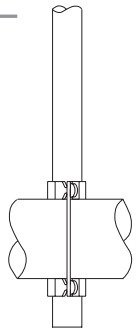


Fig. 1001







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

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

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.

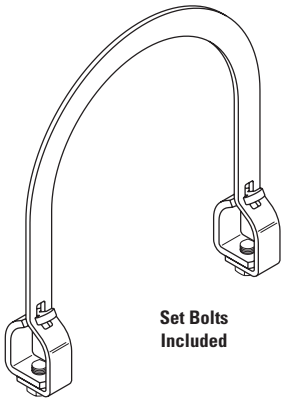
Approvals: Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer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

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

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

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

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



Pipe Size in. (mm)	Part Number & Approx. Wt./100 1" (25mm) Brace Pipe	Lbs.	(kg)	1¼" (32mm) Brace Pipe	Lbs.	(kg)	Design Load - For Sch. 7, Sch. 10, & Sch. 40 Pipe Allowable Horizontal Capacity (lbf) Per Installation[1,2,3] 30°-44° Lbs.	(kN)	45°-59° Lbs.	(kN)	60°-74° Lbs.	(kN)	75°-90° Lbs.	(kN)
1" (25)	**1001-1 X 1**	104.6	(47.4)	**1001-1 X 1¼**	122.2	(55.4)	1800	(8.01)	2550	(11.34)	3120	(13.88)	3490	(15.52)
1¼" (32)	**1001-1¼ X 1**	105.2	(47.7)	**1001-1¼ X 1¼**	122.6	(55.6)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.59)
1½" (40)	**1001-1½ X 1**	107.0	(48.5)	**1001-1½ X 1¼**	124.7	(56.6)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.59)
2" (50)	**1001-2 X 1**	112.6	(51.1)	**1001-2 X 1¼**	129.2	(58.6)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.59)
*2½"(65)	**1001-2½ X 1***	136.3	(61.8)	**1001-2½ X 1¼***	154.4	(70.0)	800	(3.56)	1130	(5.03)	1380	(6.14)	1540	(6.85)
3" (80)	**1001-3 X 1**	145.0	(65.8)	**1001-3 X 1¼**	163.1	(74.0)	850	(3.78)	1200	(5.34)	1470	(6.54)	1640	(7.30)
4" (100)	**1001-4 X 1**	158.6	(71.9)	**1001-4 X 1¼**	176.7	(80.1)	850	(3.78)	1200	(5.34)	1470	(6.54)	1640	(7.30)
5" (100)	**1001-5 X 1**	173.2	(78.6)	**1001-5 X 1¼**	191.4	(86.8)	510	(2.27)	730	(3.25)	890	(3.96)	990	(4.40)
*6" (150)	**1001-6 X 1***	190.0	(85.2)	**1001-6 X 1¼***	206.0	(93.4)	510	(2.27)	730	(3.25)	890	(3.96)	990	(4.40)
*8" (200)	**1001-8 X 1***	217.4	(111.5)	**1001-8 X 1 ¼***	265.3	(120.3)	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 available for 65mm, 150mm, 200mm pipe size with 25mm and 32mm brace pipe size. Contact the factory.

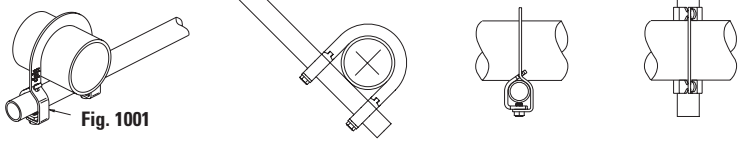


Fig. 1001

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

TOLCO Fig. 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.

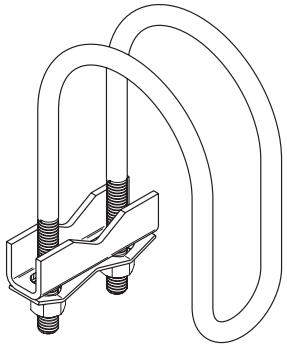
To Install: Place the Fig. 1000 over the pipe to be braced, insert bracing pipe through opening leaving a minimum of 1" extension. Brace pipe can be installed on top or bottom of pipe to be braced. Tighten hex nuts until leaf spring is flat. It is recommended that the brace angle be adjusted before hex 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 201.

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.

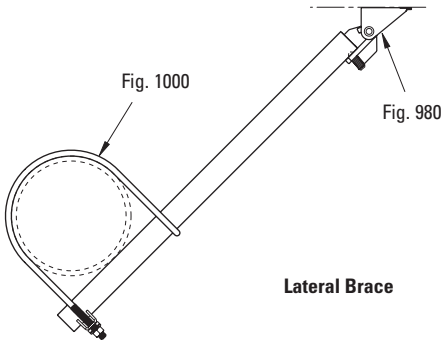
Order By: Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1¼" (32mm)) , and finish.



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.

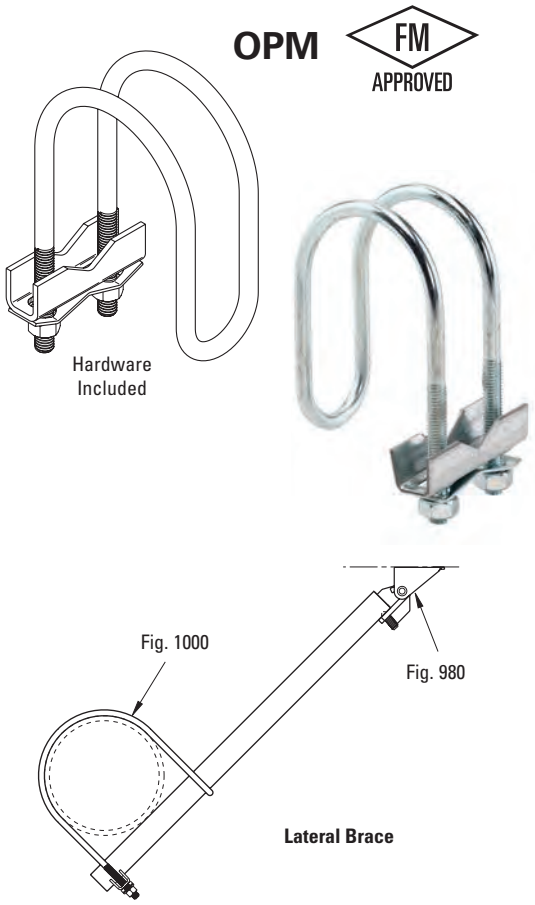
Approvals: Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For UL Listed information refer to UL Listed page 200.

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 in. (mm)	Part Number & Approx. Wt./100 1" (24mm) Brace Pipe	Lbs. (kg)	1¼" (32mm) Brace Pipe	Lbs. (kg)	Design Load - Allowable Horizontal Capacity (lbf) Per Installation [1,2,3] 30°-44° Lbs. (kN)	45°-59° Lbs. (kN)	60°-74° Lbs. (kN)	75°-90° Lbs. (kN)
1" (25)	**1000-1 X 1**	71.6 (32.5)	**1000-1 X 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 40.

Material: Steel

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

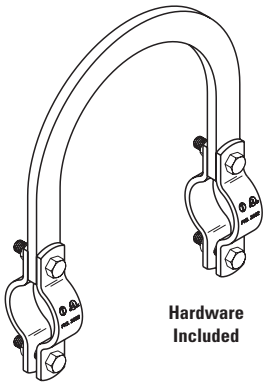
Features: Easy verification of proper installation by tightening bolts until ears touch.

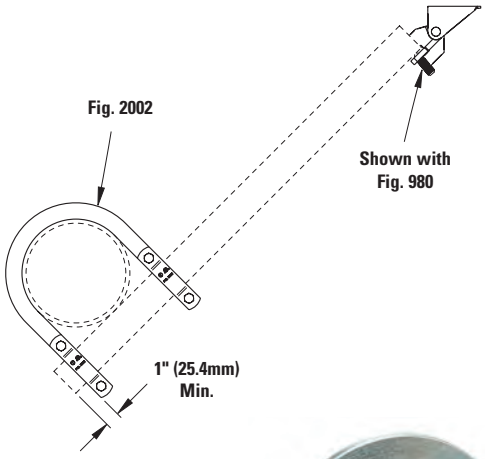
Installation: Place Fig. 2002 over pipe to be braced. Slide bracing pipe through attachment and tighten hex nuts until ears touch.

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

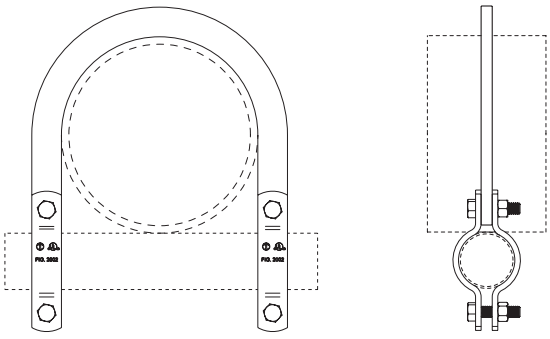
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

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





Pipe Size 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**	260	(117.9)	**2002-2½ X 2**	283.3	(128.6)	2000	(8.89)
3" (80)	**2002-3 X 1½**	276	(125.2)	**2002-3 X 2**	299.4	(135.8)	2000	(8.89)
4" (100)	**2002-4 X 1½**	303	(137.4)	**2002-4 X 2**	326.8	(148.2)	2000	(8.89)
6" (150)	**2002-6 X 1½**	361	(163.7)	**2002-6 X 2**	385.0	(174.6)	2000	(8.89)
8" (200)	**2002-8 X 1½**	416	(188.7)	**2002-8 X 2**	439.7	(199.4)	2000	(8.89)

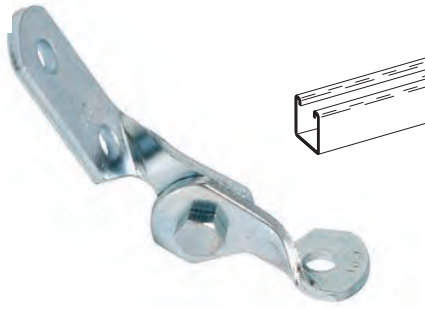


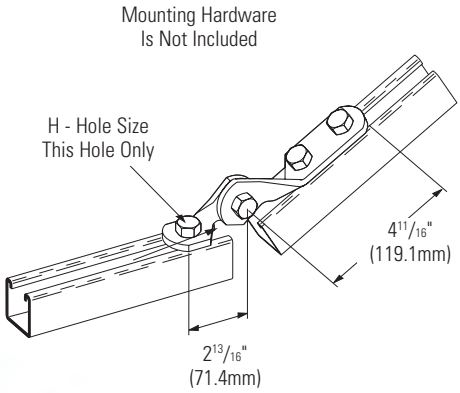
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

B335-2 Series - three hole adjustable hinge

Function: For bracing strut channel trapeze supports.

Finish: Zinc Plated or Dura-Green™ paint.





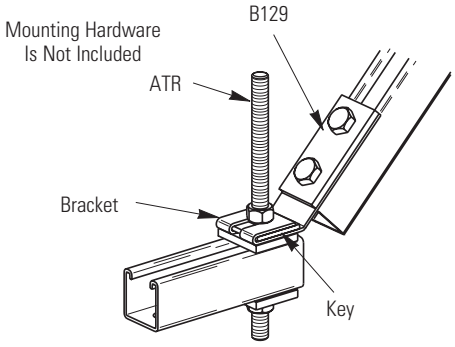
Part Number & Size	Hole Size H in.	(mm)	Approx. Wt./100 lbs.	(kg)
B335-2-3/8	1/2"	(11.1)	96	(43.2)
B335-2-1/2	9/16"	(14.3)	94	(42.3)
B335-2-5/8	11/16"	(17.4)	92	(41.4)
B335-2-3/4	13/16"	(20.6)	90	(40.6)

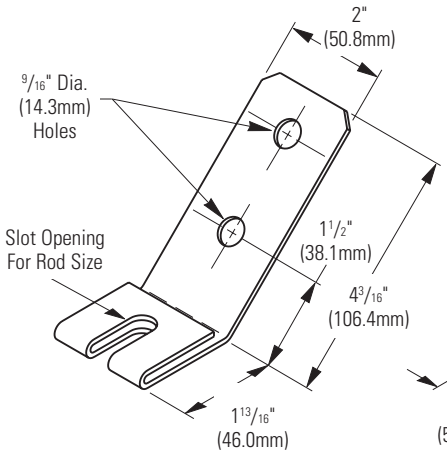
B650 Series - seismic retrofit bracket

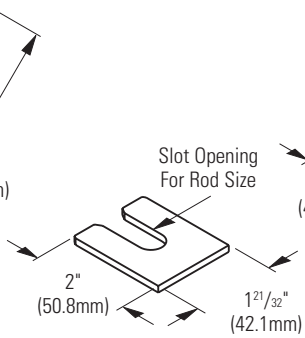
Function: Allows for bracing swivel in two planes.

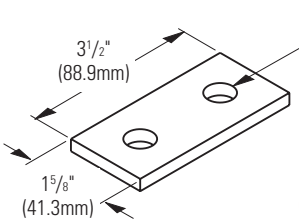
Application: Use ½" bolts & channel nuts on the two hole side of the fitting. (Torque to 50 ft.-lbs.)

Finish: Zinc Plated

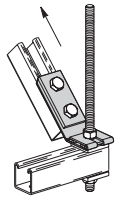




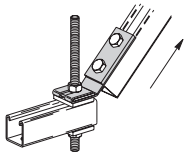




Part Number	Rod Size	TL in.	(kN)	LL in.	(kN)	Approx. Wt./100 lbs.	(kg)
B650-3/8	3/8"	1100	(4.89)	1100	(4.89)	92	(41.4)
B650-1/2	1/2"	1500	(6.67)	1500	(6.67)	97	(43.6)
B650-5/8	5/8"	1500	(6.67)	1500	(6.67)	95	(42.7)
B650-3/4	3/4"	1500	(6.67)	1500	(6.67)	107	(48.5)



Longitudal Load (LL)



Transverse Load (TL)

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

Fig. 74 - TOLCO structural attachment for branch line restraint assembly (UL listed)

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

Material: Steel

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

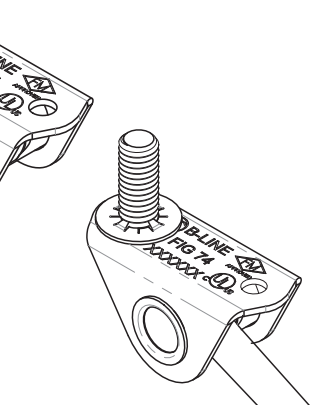
Features: The Fig. 74 has multiple sized fastener holes to accommodate multiple types of fasteners for various types of structures (concrete, wood and steel) see table below. It can be bent in the field to accommodate multiple angles, but is supplied fixed at 45° to accommodate the most common installation 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. 74 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 205.

Finish: Pre-Galvanized.

Order By: Figure number.



Structural Attachment for Branch Line Restraint

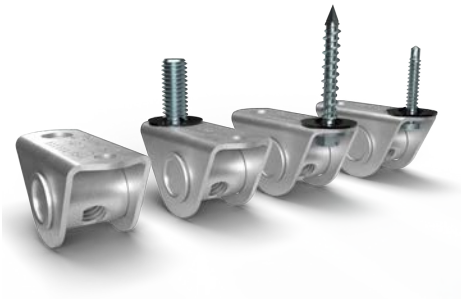
Maximum Allowable Loads (UL Listed)

Part No.	⅜" Rod	½" Rod
Fig. 74	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. 74/77 Max horizontal load.

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

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

Updated 7-13-21

Fig. 74 - 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. 74 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. 74 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)**.

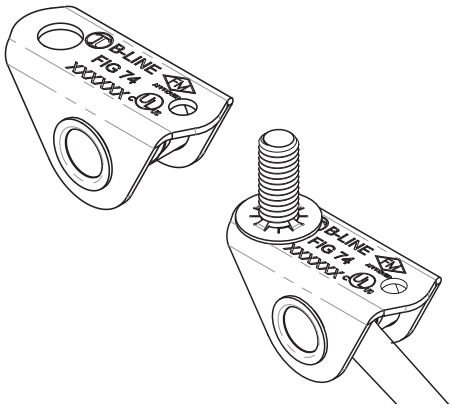
For UL Listed information refer to UL Listed page 204.

Finish: Pre-Galvanized.

Order By: Figure number.

FM APPROVED

Structural Attachment for Branch Line Restraint



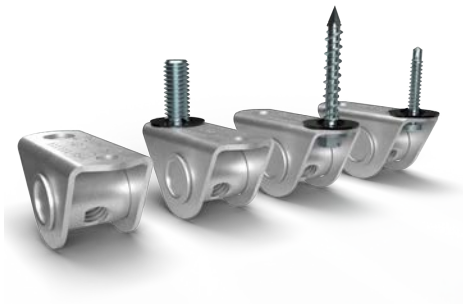
Maximum Allowable Loads (FM Approved)

Part No.	30°-44° ⅜" Rod lbs.	30°-44° ½" Rod lbs.	45°-59° ⅜" Rod lbs.	45°-59° ½" Rod lbs.	60°-74° ⅜" Rod lbs.	60°-74° ½" Rod lbs.	75°-90° ⅜" Rod lbs.	75°-90° ½" Rod lbs.
Fig. 74	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"	2½"	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. 74/77 Max horizontal load.

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

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

Updated 7-13-21

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. 74 & 77 joined with ATR) can be pre-assembled to save time and labor and later be field installed and adjusted to fit.

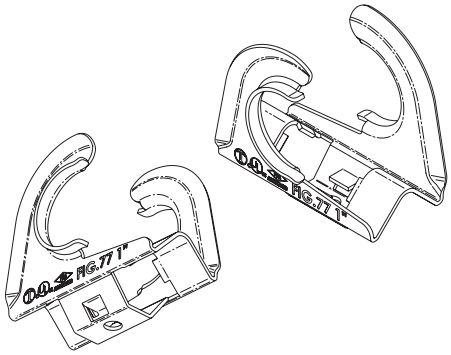
Installation Instructions: Install TOLCO™ Fig. 77 system attachment to sprinkler pipe branch line to be restrained. You can position with the rod engagement either above or below the sprinkler pipe. Rod must extend a min. of 1" (25.4) past the edge of the Fig. 77. The attachment can be slid along the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

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. For FM Approved information refer to FM Approved page 207.

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)
77-1¼	1¼	(32)				
77-1½	1½	(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)
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)

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

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

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

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

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. 74 & 77 joined with ATR) can be pre-assembled to save time and labor and later be field installed and adjusted to fit.

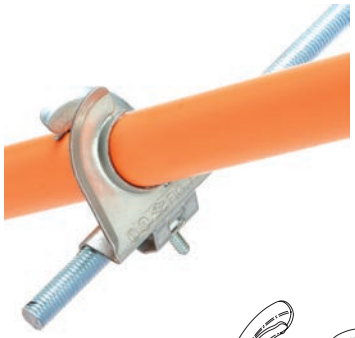
Installation Instructions: Install TOLCO™ Fig. 77 system attachment to sprinkler pipe branch line to be restrained. It can be positioned with the rod engagement either above or below the sprinkler pipe. Rod must extend a min. of 1" past the edge of the Fig. 77. The attachment can be slid along the pipe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

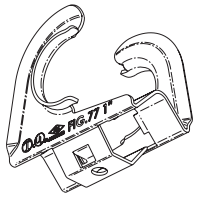
Approvals: Approved by Factory Mutual Engineering **(FM)**.
For UL Listed information refer to UL Listed page 206.

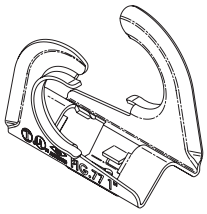
Finish: Pre-Galvanized.

Order By: Figure number and pipe size.

Pipe Attachment for Restraint (Sway Brace)
Patent Pending







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

Δ l/r = 400 for restraint

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

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

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