

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

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

Material: Steel

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

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

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

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

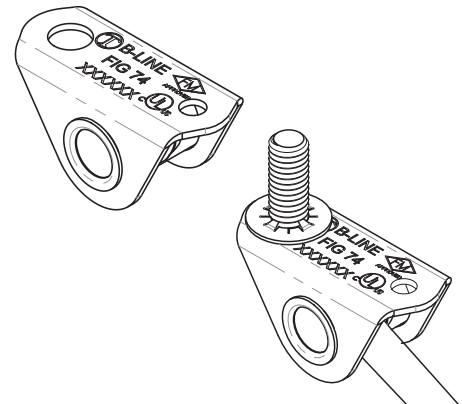
For FM Approval information refer to FM Approved page 43.

Finish: Zinc plated.

Order By: Figure number.



Structural Attachment for Branch Line Restraint



UL listed maximum allowable loads (horizontal)

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

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

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

All Thread Rod Maximum Restraint Lengths

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

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

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

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

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

Updated 5-24-21

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

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

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Approvals: Approved by FM.

For UL Listed information refer to UL Listed page 42.

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

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

Loads shown are axial ASD loads.

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

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

All Thread Rod Maximum Restraint Lengths

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

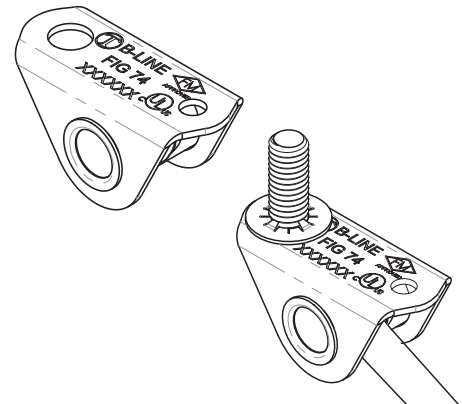
† I/r = 400 NFPA 13 2010, Sec 9.3.6.1 (5) † I/r = 400 NFPA 13 2013 & 2016, Sec 9.3.6.1 (5) & NFPA (2016) TABLE 9.3.11.8(a)(b)(c)(d)(e)(f)

**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.

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

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

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

Material: Steel

Function: System attachment for restraint (sway brace) assembly

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

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

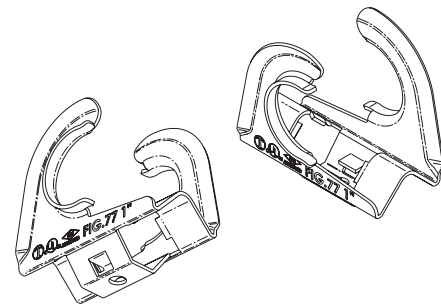
Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). For FM Approved information refer to FM Approved page 45.

Finish: Pre-Galvanized.

Order By: Figure number and pipe size.



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



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

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

§ All other trademarks are property of their respective owners.



All Thread Rod Maximum Restraint Lengths

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

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

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

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

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Updated 5-24-21

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

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

Material: Steel

Function: System attachment for restraint

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

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

Approvals: Approved by FM.

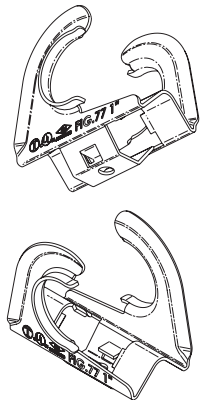
For UL Listed information refer to UL Listed page 44.

Finish: Pre-Galvanized.

Order By: Figure number and pipe size.



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



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

* Loads shown are axial ASD loads.

All Thread Rod Maximum Restraint Lengths

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

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

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

\pm Max load governed by Fig. 74/77 Max horizontal load.

Δ I/r = 300 for bracing

Δ I/r = 400 for restraint

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