TOLCO™ Fig. 76 & Fig. 77

Branch Line Restraint Installation Instructions

Fig. 76 – Structural Attachment for Restraint (Sway Brace) Assembly

The required type, number and size of fasteners used for the structure attachment fitting shall be in accordance with NFPA 13.

- Accommodates ⅜" (9.5mm) or ½" (12.7mm) standard all thread rod (ATR) as the restraint (brace) member, refer to NFPA 13 (2013) Table 9.3.5.11.8 (a)(b) & (c) for allowable brace lengths.
- Multiple holes to allow various fasteners to attach to the structure.
  - Larger hole accommodates ⅜" (9.5mm) fastener
  - Two smaller holes accommodate #10 fastener
- Can be field bent to accommodate angles from 15° to 90° from the mounting surface.

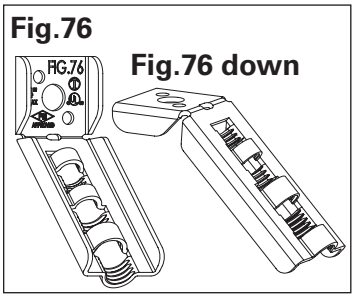
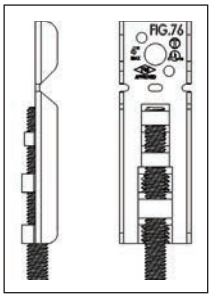


Fig. 76 Restraint application.



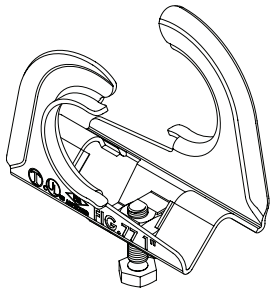
Hanger application.

UL Listed as a hanger in this application only. Must be completely bent open and only with ⅜" ATR to accomodate up to 4" (100mm) maximum pipe size.

Fig. 77 – System Piping Attachment for Restraint (Sway Brace) Assembly

- Accommodates ⅜" (9.5mm) or ½" (12.7mm) standard all thread rod (ATR) as the restraint (brace) member, refer to NFPA 13 for allowable brace length.
- UL Listed for Steel Sch. 10, 40 and light wall engineered pipe and plastic CPVC pipe.§
- FM Approved for Steel Sch. 10, 40 and light wall engineered pipe.

Fig.77 up



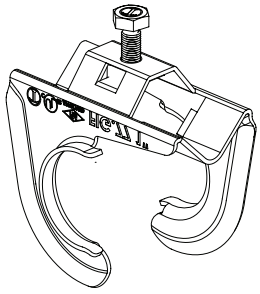


Fig.77 down

Fig. 76 & Fig.77 assembly

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Recommended Installation Method:

Step 1: Install all thread rod (brace member) to TOLCO™ Fig. 76 Structural Attachment. Bottom out ATR to ensure full thread engagement. This can be visually confirmed due to the open thread design.

Step 2: 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" (25.4mm) past the edge of the Fig. 77. The attachment can be slid along the pipe to position close to where the Fig. 76 structural attachment will be fastened to the structure. The snap on design allows maximum adjustability during this stage of the installation process. Can be field bent to accommodate angles from 15° to 90° from the mounting surface. The product shall not be bent more than three times to prevent material fatigue. (See Detail A & B at right).

Step 3: Engage ATR (previously attached to the Fig. 76 Structural Attachment to the rod engagement portion of the Fig. 77 System Attachment. DO NOT tighten the set bolt at this time.

Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions.

Step 4: Install Fig. 76 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).

Step 5: Tighten set bolt on Fig. 77 System Attachment until head breaks off verifying proper installation torque.

§When installing Fig. 77 to plastic (CPVC) pipe do NOT use power tools to tighten the break-off head set bolt as this may cause damage to the plastic pipe.

All Thread Rod Maximum Restraint Lengths

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

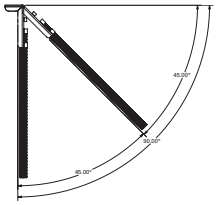
† l/r = 400 NFPA 13 2010, Sec 9.3.6.1 (5) † l/r = 400 NFPA 13 2013,Sec 9.3.6.1 (5)

** Per NFPA 13 (2013) Table 9.3.5.11.8 (a)(b)(c); for additional load information at various other angles see this table.

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

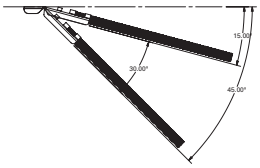
UL Listed Maximum Allowable Loads (Horizontal)

Product	Sch. 10, Sch. 40, Dynaflow & CPVC	
	⅜" Rod (9.5mm)	½" Rod (12.7mm)
Fig. 76	300 lbs. (1.344 kN)	300 lbs. (1.344 kN)
Fig. 77 – 1" (25.4)	300 lbs. (1.344 kN)	300 lbs. (1.344 kN)
Fig. 77 – 1¼" (31.75)	300 lbs. (1.344 kN)	300 lbs. (1.344 kN)
Fig. 77 – 1½" (38.1)	300 lbs. (1.344 kN)	300 lbs. (1.344 kN)
Fig. 77 – 2" (50.8)	300 lbs. (1.344 kN)	300 lbs. (1.344 kN)



Detail A

- Fig. 76 can be bent from the 45° angle it is supplied with, up to a maximum of 45° downward to allow an installation with the rod perpendicular to the mounting surface. (Detail A)
- Fig. 76 can be bent from the 45° angle it is supplied with, up to a maximum of 30° upward to allow an installation with the rod at a 15° angle from the mounting surface. (Detail B)
- The same bending angles apply to a side mount application.



Detail B

- A bend is defined as one direction within the limits shown in details A & B above. The Fig. 76 may be bent to accommodate the desired angle within the specified limits no more than three times. Excess bending may cause material fatigue and jeopardize the integrity of the part.
- These bending requirements apply to the installation of the Fig. 76 as both as a component of a branch line restraint or component of a hanger assembly.

FM Approved* Maximum Allowable Loads

Product	30° - 44°		45° - 59°		60° - 74°		75° - 90°	
	⅜" Rod (9.5mm)	½" Rod (12.7mm)	⅜" Rod (9.5mm)	½" Rod (12.7mm)	⅜" Rod (9.5mm)	½" Rod (12.7mm)	⅜" Rod (9.5mm)	½" Rod (12.7mm)
Fig. 76	380 (1.69 kN)	420 (1.87 kN)	530 (2.36 kN)	580 (2.58 kN)	800 (3.56 kN)	1,020 (4.54 kN)	750 (3.34 kN)	1,110 (4.94 kN)
Fig. 77 – 1" (25.4)	140 (.623 kN)	160 (.712 kN)	200 (.890 kN)	230 (1.02 kN)	250 (1.11 kN)	280 (1.25 kN)	280 (1.25 kN)	320 (1.42 kN)
Fig. 77 – 1¼" (31.75)	140 (.623 kN)	170 (.756 kN)	200 (.890 kN)	250 (1.11 kN)	250 (1.11 kN)	300 (1.33 kN)	280 (1.33 kN)	340 (1.51 kN)
Fig. 77 – 1½" (38.1)	130 (.578 kN)	160 (.712 kN)	190 (.845 kN)	230 (1.02 kN)	230 (1.02 kN)	280 (1.25 kN)	260 (1.29 kN)	320 (1.42 kN)
Fig. 77 – 2" (50.8)	120 (.534 kN)	150 (.667 kN)	170 (.756 kN)	210 (.934 kN)	210 (.934 kN)	260 (1.29 kN)	240 (1.07 kN)	290 (1.29 kN)

*Approved for Sch. 10, Sch. 40, Dynaflow, Eddy flow.

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