Eaton B-Line TOLCO
509 West Monroe Street
Highland, IL 62249

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RESEARCH REPORT: RR 25949
(CSI # 15060)

Expires: July 1, 2022
Issued Date: September 1, 2020
Code: 2020 LABC

GENERAL APPROVAL – Renewal and Clerical Modification - 4”, 6”, and 8” Clevis Hanger Assembly, Seismic Bracing Attachment Brackets of Support on Non-Structural Components, Seismic Hold- down Clamps for Cable Tray, Seismic Beam Clamps, and Seismic Sway Bracing

DETAILS

1. 4”, 6”, and 8” Clevis Hanger Assembly:

Each size assembly consists of the following components:

a) Fig. 1 CBS cross bolt spacer and Fig. B3100 Standard Clevis Hanger.
b) 5/8” threaded rod for the 4” standard clevis hanger, ¾” threaded rod for the 6” and 8” standard clevis hanger.
c) Fig. 980 sway brace attachment. The TOLCO Fig. 980 was designed to be used with B-Line B22 solid channel.

The maximum allowable transverse load applied at the center of the pipe for each assembly is shown in attached Overall Load Table.

2. Fig. 985 Mechanical Fast Clamp:

The Fig. 985 mechanical fast clamp is a low carbon steel used for attachment of seismic bracing to pipe hanger or trapeze. This clamp fits a rod size of 1/2” through 5/8” in diameter.

The maximum allowable load applied to a bracing member attached to the clamp at 30 or 45 degrees from a vertical plane are shown in attached Overall Load Table.

3. Fig. 986 Mechanical Fast Clamp:
The Fig. 986 mechanical fast clamp is a low carbon steel used for attachment of seismic bracing to pipe hanger or trapeze. This clamp fits a rod size of ½” in diameter, or ½” bolt to attach to the structure.

The maximum allowable load applied to a bracing member attached to the clamp at 30 or 45 degrees from a vertical plane are shown in attached Overall Load Table.

4. Fig. 981 Sway Brace Attachment:
The Fig. 981 sway brace attachment is a low carbon steel multi-functional attachment to hanger rod, strut or structural steel in a lateral or longitudinal brace assembly. The TOLCO Fig. 981 was designed to be used with B-Line B22 solid channel or steel pipe.

The maximum allowable load applied to a bracing member attached to the Fig. 981 sway brace at 30 or 45 degrees from a vertical plane are shown in attached Overall Load Table.

5. Fig. 990 Cable Sway Brace Attachment:
The cable sway brace attachment is a carbon steel material with pre galvanized finish and is used to attach min 3/16” diameter pre-stretched galvanized aircraft cable to structure or hanger with a rod size of 1/2” in diameter, or ½” bolt to attach to the structure.

The maximum allowable load applied to the aircraft cable attached to the clamp at 30 or 45 degrees from a vertical plane are shown in attached Overall Load Table.

6. Fig. 991 Cable Sway Brace Attachment:
The cable sway brace attachment is a carbon steel material with pre galvanized finish and is used to attach min 3/16” diameter pre-stretched galvanized aircraft cable to structure or hanger with a rod size of 3/8” through 5/8” in diameter.

The maximum allowable load applied to the aircraft cable attached to the clamp at 30 or 45 degrees from a vertical plane are shown in attached Overall Load Table.

7. Fig. 9ZN-1205, 9ZN-1208, 9ZN-1241 & B335 Hold Down Clamps:
The hold down clamps hold B-Line branded cable tray to trapezes’ utilizing B-Line branded strut.

The maximum allowable loads applied to the hold down clamps are shown in attached Overall Load Table.

8. Fig. 98B Rod Stiffener:
The rod stiffener is a low carbon steel that secures the B-Line channel to hanger rod for increased stiffness.

9. Fig. 828 Universal Sway Brace Attachment:
The universal sway brace attachment is a low carbon steel designed to attach sway bracing and hanger assemblies to structural members using a secure, non-friction connection without drilling or welding. The attachment can be used to secure brace to structure along or across the structural member.

The maximum allowable loads for Fig. 828 are shown in on pages 19 and 20 of attached assembly details.

10. Fig. 4LA In-Line Sway Brace:
The in-line sway brace is a low carbon steel attachment designed as a connection of the pipe system to B-Line channel or steel pipe bracing member.

The allowable loads for Fig. 4LA are shown on pages 23 to 28 of attached assembly details.

11. Fig. 1001 Sway Brace Attachment:
The sway brace attachment is a low carbon steel used in conjunction with a Fig 900 series fitting and joined together with bracing per NFPA 13, forming a complete lateral sway brace assembly.

The allowable loads for Fig. 1001 are shown on pages 29 to 31 of attached assembly details.

12. Fig. 68S, 68W and 65XT Beam Clamp:
The Fig. 68S/68W beam clamp are cast malleable steel with a SAE 1035 case hardened steel head cut point screw and hex jam nut. The 68S clamp has a narrower mouth opening than the 68, otherwise the designs are similar.

The Fig. 65XT beam clamp is made from ASTM A-569 carbon steel strip bent into a U shape. The clamp features a drawn section around the threaded holes in the bottom of the U. Notches formed in the arms of the U engage the beam. The set screw is a SAE 1035 case hardened cup point screw.

The allowable loads for Fig 68S, 68W and 65XT are shown on page 32 of attached assembly details.

13. Fig. 980 Universal Swivel Brace Attachment:

The universal swivel sway brace attachment is a low carbon steel structural attachment designed to attach sway bracing to structural members. The TOLCO Fig. 980 was designed to be used with B-Line B22 solid channel or steel pipe.

The maximum allowable loads for the Fig. 980 are shown on page 21 of the attached assembly details.

The approval is subject to the following conditions:

1. Allowable capacities of brace attachments, beam clamps and clevis hanger assemblies are listed in attached Overall Load Table.

2. Existing ceiling, walls, or other structures that support hanger rods and brace attachments shall be evaluated by an architect, civil or structural engineer licensed in the State of California. The plans and calculations shall be submitted to structural plan check for review and approval.

3. Approval of the supported systems is outside the scope of the research report.

4. Calculations for the design of hanger rods and brace elements in accordance with the 2020 Los Angeles Building Code shall be submitted to structural plan check for review and approval.

5. Installation of the brace system shall be in accordance with the manufacturer’s instructions.

6. The design of the connection used to attach the clamps and sway braces to the supporting structure shall be evaluated by an architect, civil or structural engineer licensed in the State of California. The plans and calculations shall be submitted to structural plan check for review and approval.

7. The mechanical fast clamps, hold down clamps, and the sway braces shall not be used to resist forces produced by the effects of gravity.

8. The use of the clamps and sway braces is limited to the support of non-structural components.

9. The design of the clamps and sway braces shall be in accordance with Chapter 13 of ASCE 7-16.

10. Cable Sway braces must be used in opposing pairs.

11. The brace attachments listed in the attached Overall Load Table are only approved as specified under the Details section of this Research Report.

12. The allowable loads shall not be increased for duration of load.

Cooper B-Line I TOLCO
RE: 4”, 6”, and 8” Clevis Hanger Assembly, Seismic Bracing Attachment Brackets of Support on Non Structural Components, Seismic Hold- down Clamps for Cable Tray, Seismic Sway Bracing and Beam Clamps

DISCUSSION

The clerical modification is to capture compliance with the 2020 Los Angeles Building Code.

The report is in compliance with the 2020 Los Angeles Building Code.

The approval is based on load tests.

For this General Approval to be valid on any individual construction project in the City of Los Angeles, an engineer or inspector of the Department of Building and Safety must make a determination that all conditions of the General Approval required to provide equivalency have been met in the case of each construction project under consideration.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

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EB
RR2594
TLB2000152
R09/08/2020
104.2.6

Attachments: Overall Load Table (2 Pages)
Detail drawings (30 Pages)

OVERALL LOAD TABLE (1 of 2)

TABLE
1LOAD

	Maximum Brace Loads		Allowable Values			
	Configuration		45 deg Brace from Horiz Tension (lb)	Comp. (lb)	60 deg Brace from Horiz Tension (lb)	Comp. (lb)
*	General Bracket Connections	Fig 981 w/ 3/8” to 7/8” Rod	1263	~~1843~~	~~1320~~	1227
*		Fig 985 w/ 3/8” to 5/8” Rod	813	~~1030~~	693	~~1123~~
*		Fig 986	787	~~847~~	797	~~927~~
		Fig 990 w/ 3/16" Dia Cable	1387	0	1507	0
		Fig 991 w/ 3/16" Dia Cable	1023	0	1073	0
*	Fig 1 Bracket Connections	4" Clevis Hanger/ Fig 980 w/ 5/8” Rod	~~1105~~	303	~~864~~	310
*		6" Clevis Hanger/ Fig 980 w/ 3/4” Rod	~~1175~~	665	~~1181~~	503
*		8" Clevis Hanger/ Fig 980 w/ 3/4” Rod	~~1540~~	450	~~1073~~	390

LARR APPROVAL

1. A factor of Safety of 3.0 is applied to the lowest of ultimate loads.

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DATE: MAY 31, 2019

* Deleted by the City of Los Angeles

OVERALL LOAD TABLE (2 of 2)

TABLE
2LOAD

Maximum Loads		Allowable Values					
	PART NUMBER	CLAMP			GUIDE		
		Design Load	Pt	Pl	Design Load	Pt	Pl
Hold Down Clamp	9ZN-1205	570	482	155	570	482	--
	9ZN-1208	570	482	155	570	482	--
	9ZN-1241	1031	1240	702	--	--	--
	B355	1196	503	180	--	--	--

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TRANSVERSE RIGID BRACING FOR SINGLE HUNG PIPE OR CONDUIT WITH CLEVIS HANGER

DETAIL
1LAT 45

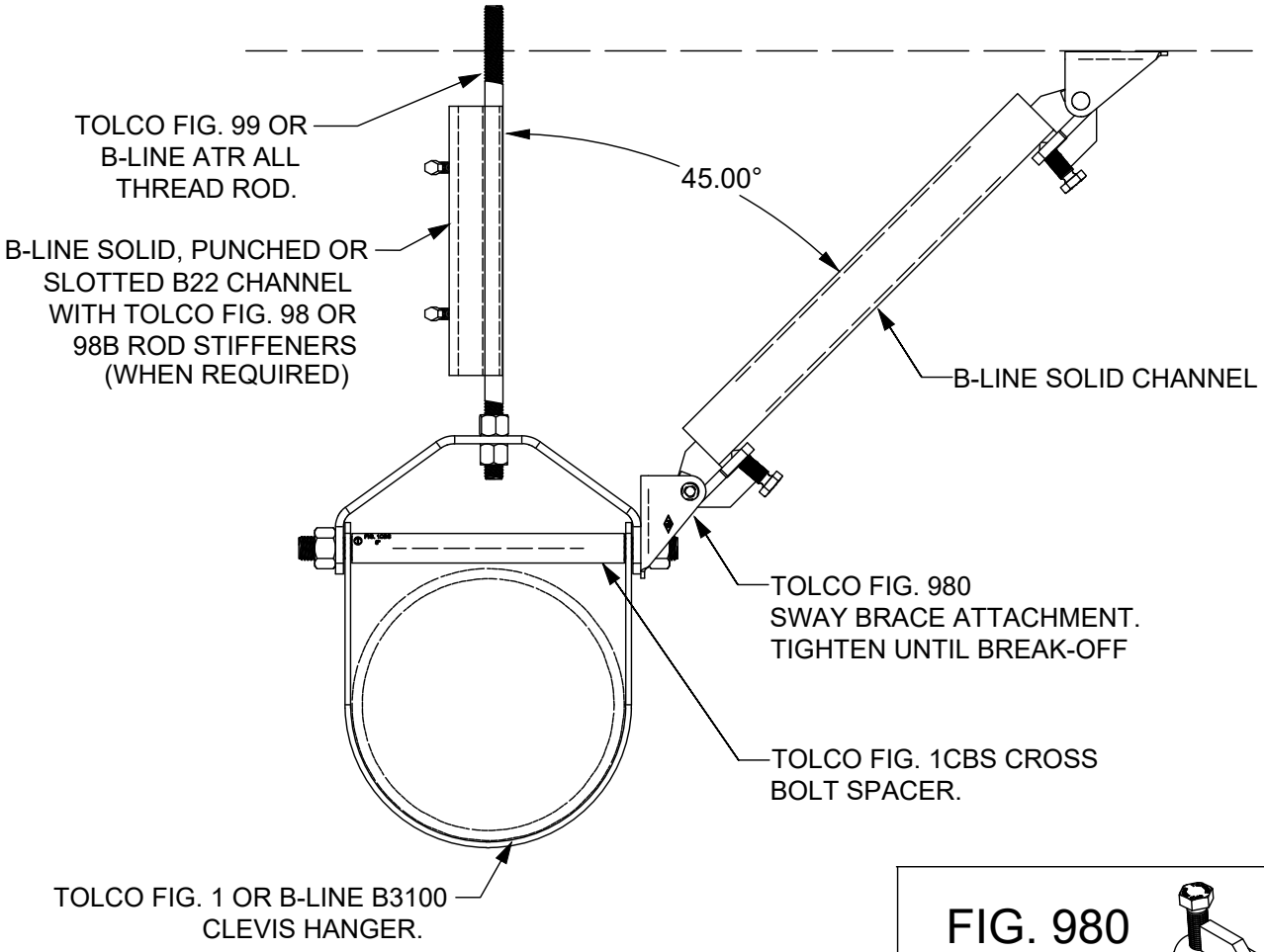
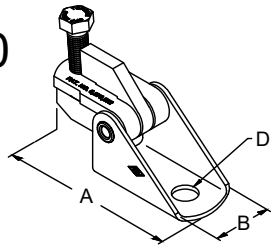


FIG. 980



Part Number	A		B		D	
	in.	(mm)	in.	(mm)	in.	(mm)
980-1/2	51/4”	(133.3)	17/8”	(47.6)	17/32”	(13.5)
980-5/8	51/4”	(133.3)	17/8”	(47.6)	11/16”	(17.5)
980-3/4	51/4”	(133.3)	17/8”	(47.6)	13/16”	(20.5)

To Install: Place the Fig. 980 onto the “bracing member”. Tighten the set screw until the head breaks off. Attachment can pivot for adjustment to proper brace angle.

PIPE SIZE	4"	6"	8"
MAX LOAD PER BRACE (lbs) SAFETY FACTOR: 3	303	665	450

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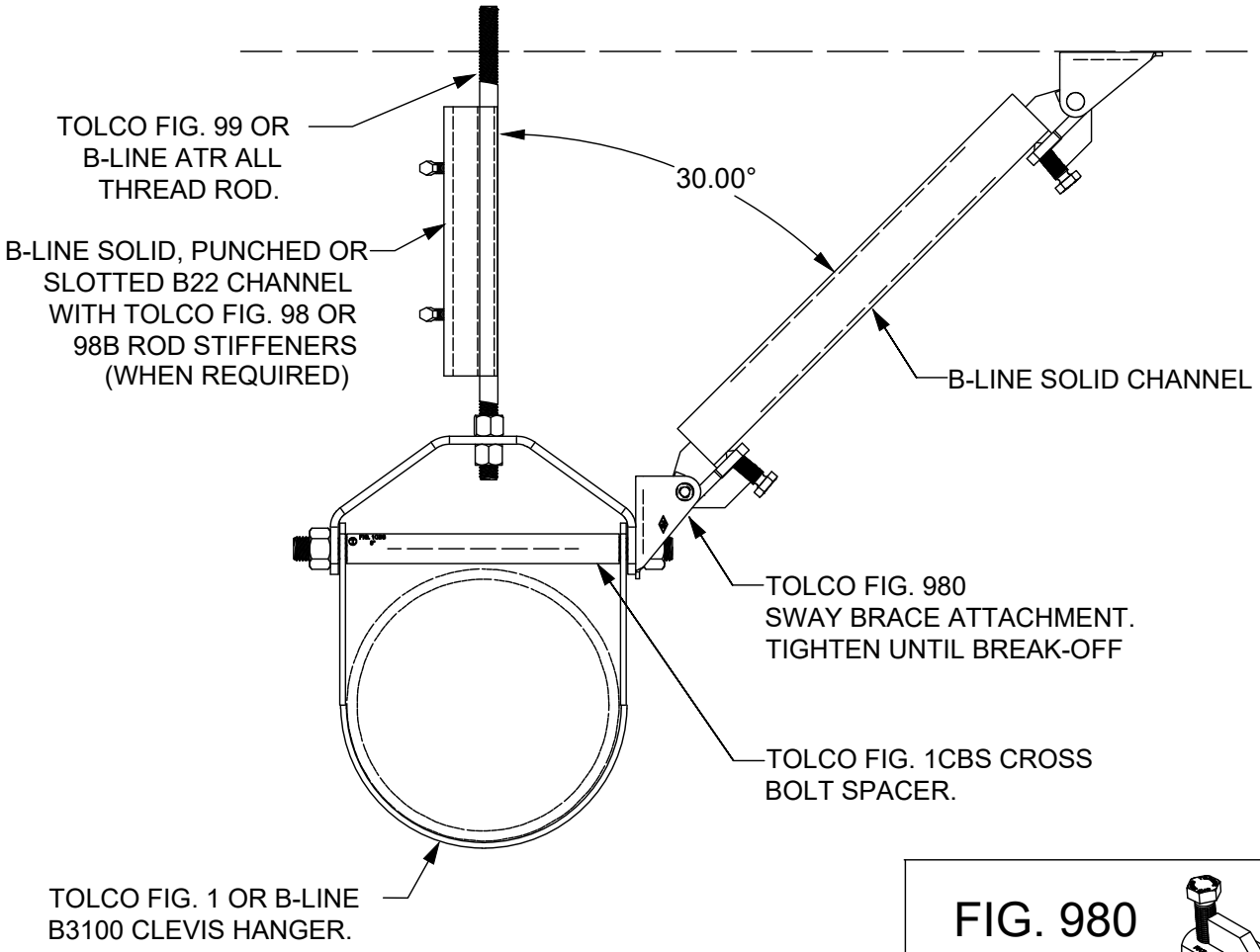
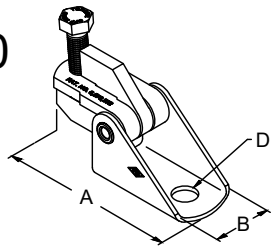
TRANSVERSE RIGID BRACING FOR SINGLE HUNG PIPE OR CONDUIT WITH CLEVIS HANGER

DETAIL
1LAT 30



PIPE SIZE	4"	6"	8"
MAX LOAD PER BRACE (lbs) SAFETY FACTOR: 3	310	503	390

FIG. 980



Part Number	A		B		D	
	in.	(mm)	in.	(mm)	in.	(mm)
980-1/2	51/4"	(133.3)	17/8"	(47.6)	17/32"	(13.5)
980-5/8	51/4"	(133.3)	17/8"	(47.6)	11/16"	(17.5)
980-3/4	51/4"	(133.3)	17/8"	(47.6)	13/16"	(20.5)

To Install: Place the Fig. 980 onto the “bracing member”. Tighten the set screw until the head breaks off. Attachment can pivot for adjustment to proper brace angle.

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TRANSVERSE RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
2 LAT 45

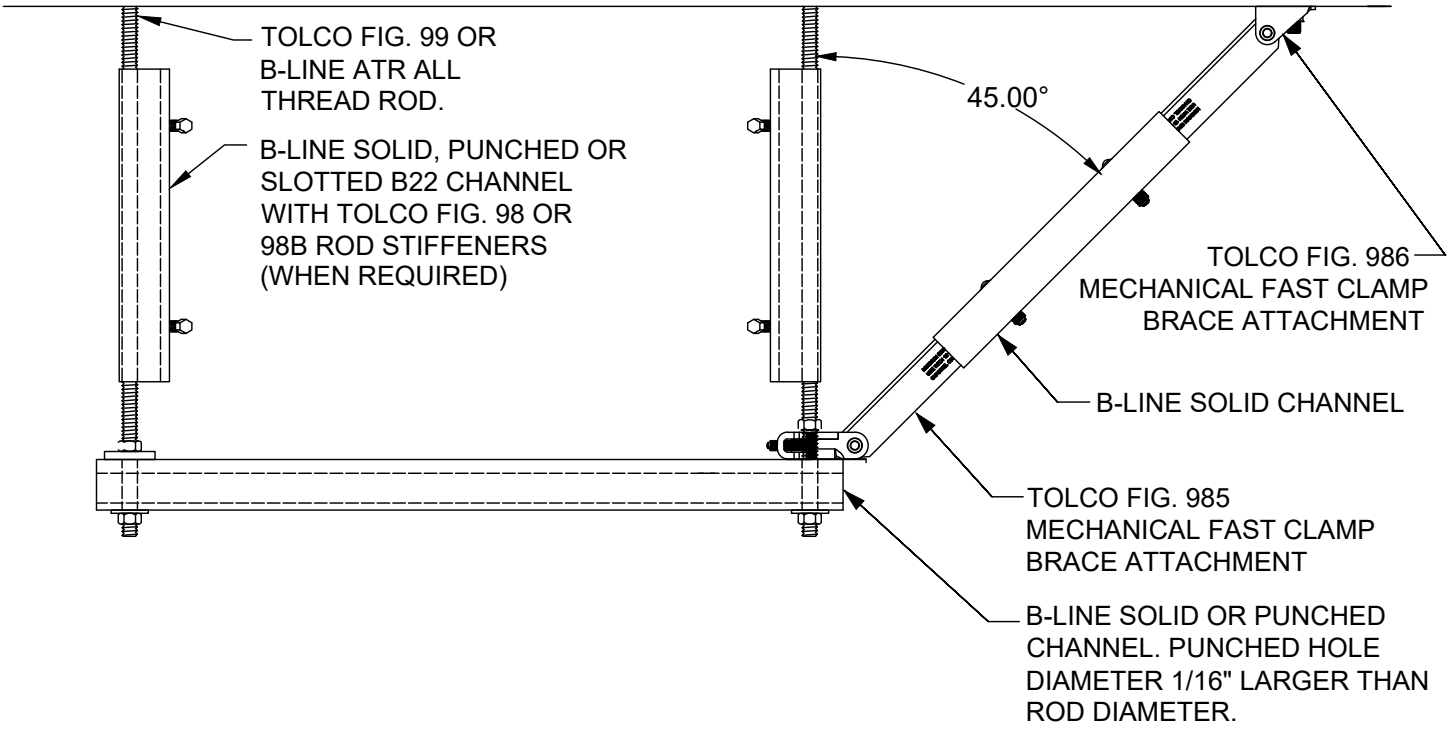
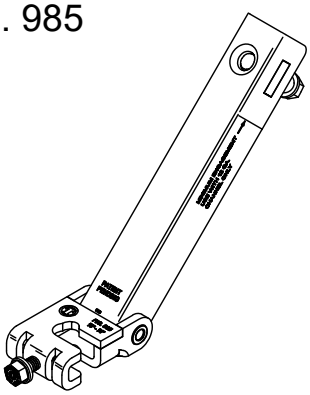
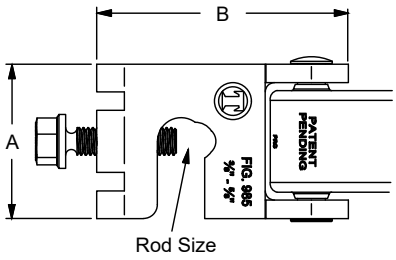


FIG. 985

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
813



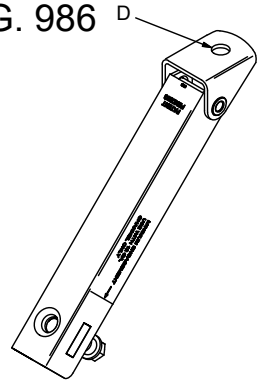


Part Number	Rod Size	A in.	A (mm)	B in. (mm)
985-S	3/8" thru 5/8"	2"	(50.8)	11/2" (38.1)

To Install: Slip the open side of the 985 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 arm and adjust to desired length ensuring the channel passes minimum engagement indicator. Tighten set screw until head breaks off.

FIG. 986

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
787



Part Number	Rod Size	Hole Dia. D in.	(mm)
986-1/2	1/2"	9/16"	(14.3)
986-5/8	5/8"	11/16"	(17.5)
986-3/4	3/4"	13/16"	(20.6)

Insert channel brace into the 981 arm and adjust to desired length ensuring the channel passes minimum engagement indicator. Tighten set screw until head breaks off.

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TRANSVERSE RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
2 LAT 30

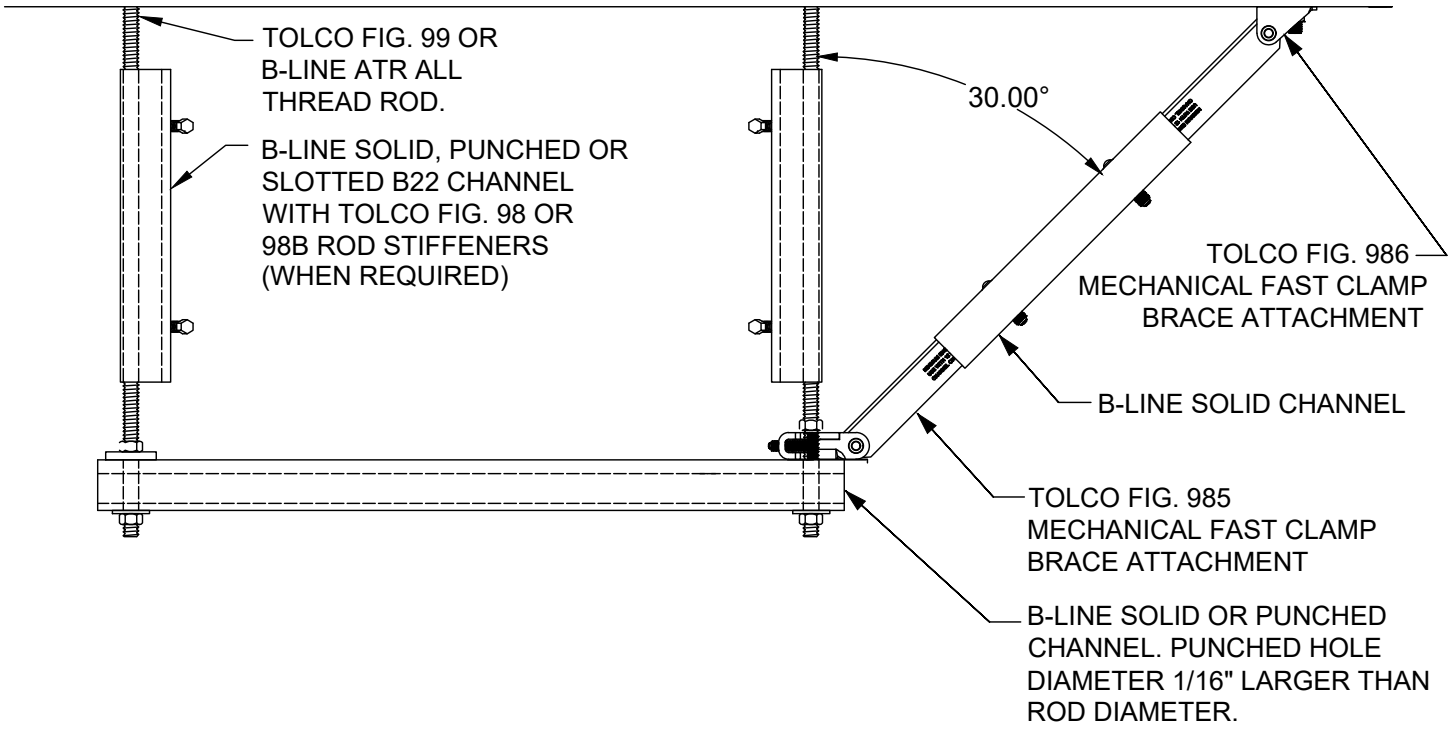
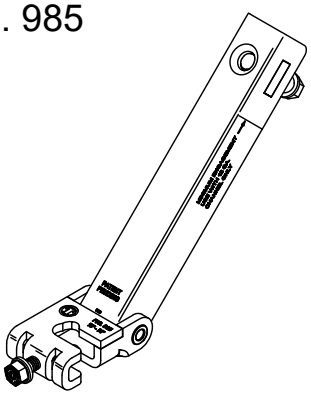
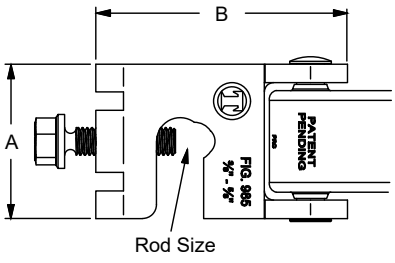


FIG. 985

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
693



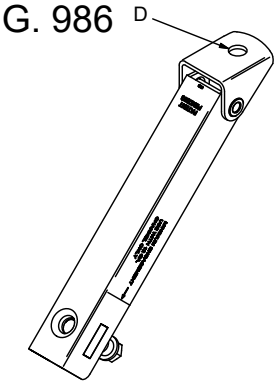


Part Number	Rod Size	A in.	A (mm)	B in.	B (mm)
985-S	3/8" thru 5/8"	2"	(50.8)	11/2"	(38.1)

To Install: Slip the open side of the 985 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 arm and adjust to desired length ensuring the channel passes minimum engagement indicator. Tighten set screw until head breaks off.

FIG. 986

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
797



Part Number	Rod Size	Hole Dia. D in.	Hole Dia. D (mm)
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986-5/8	5/8"	11/16"	(17.5)
986-3/4	3/4"	13/16"	(20.6)

Insert channel brace into the 981 arm and adjust to desired length ensuring the channel passes minimum engagement indicator. Tighten set screw until head breaks off.

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LONGITUDINAL RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
2 LONG 45

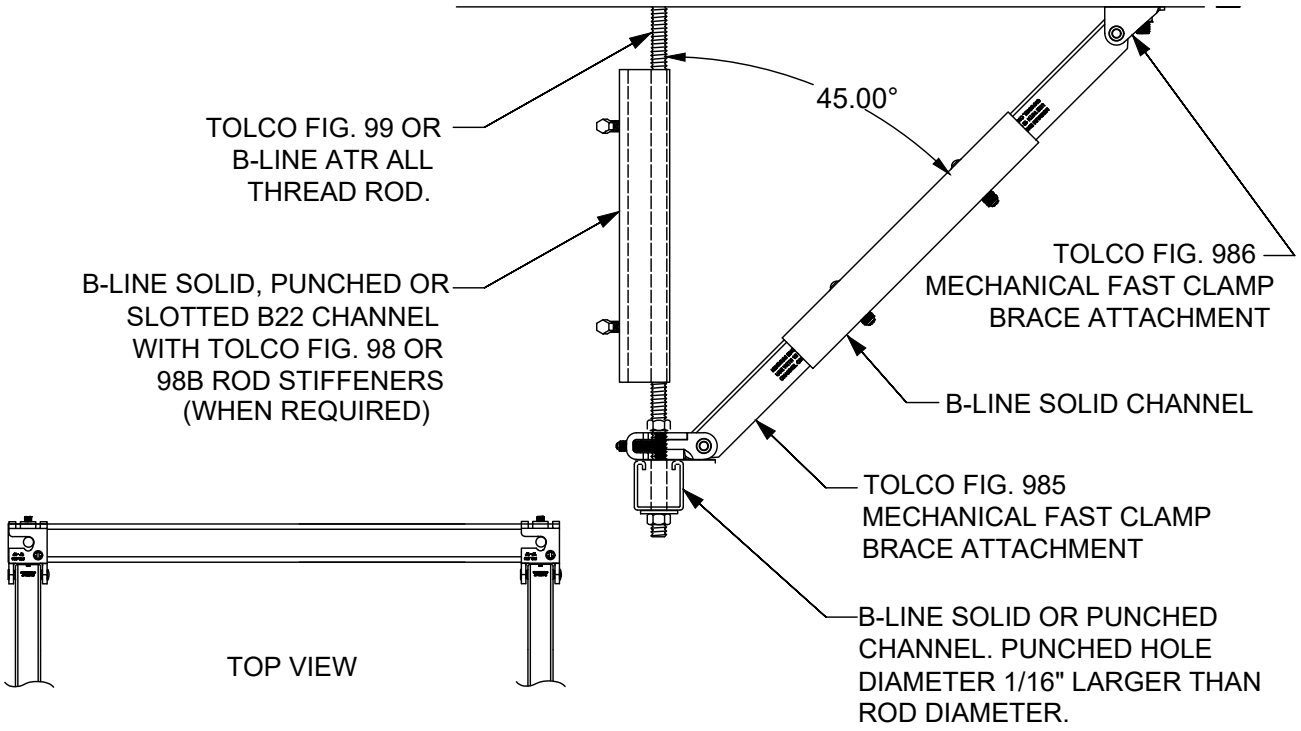

FIG. 985

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
813

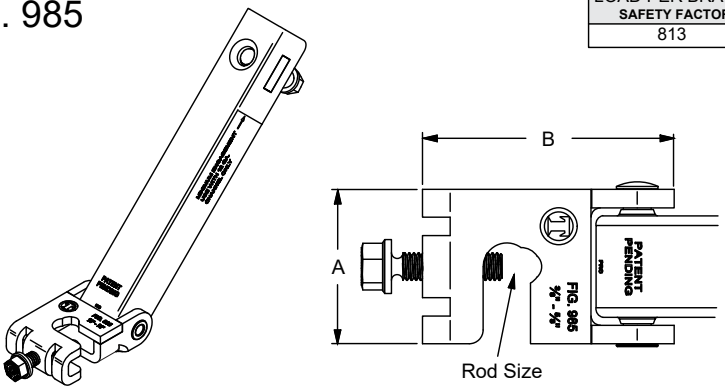

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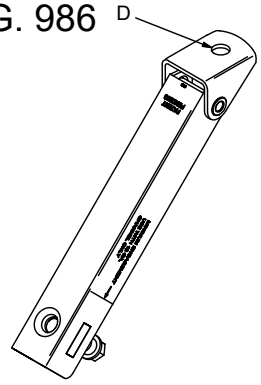
FIG. 986

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
787



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LONGITUDINAL RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
2 LONG 30

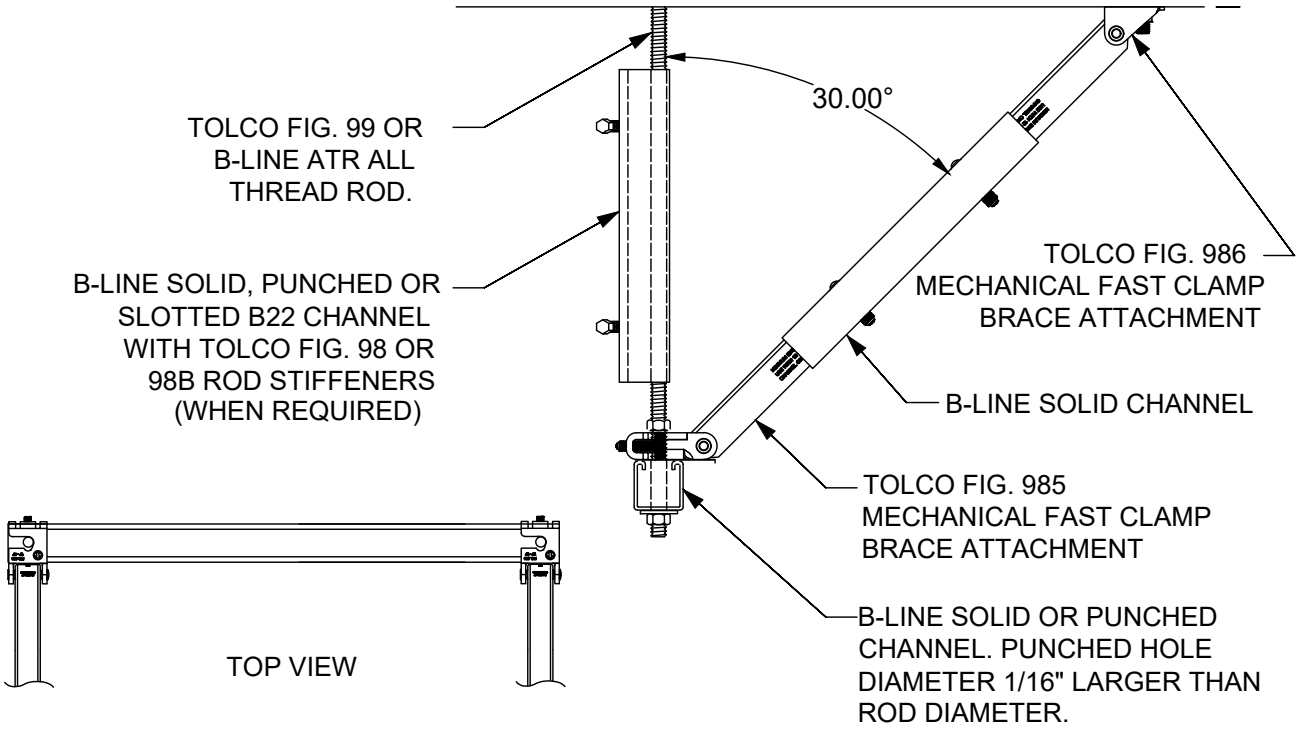
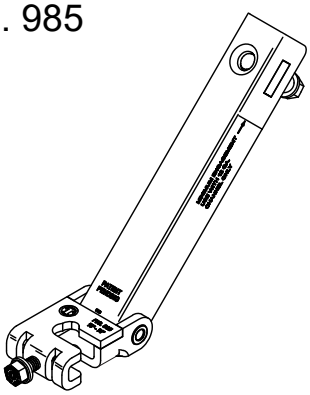
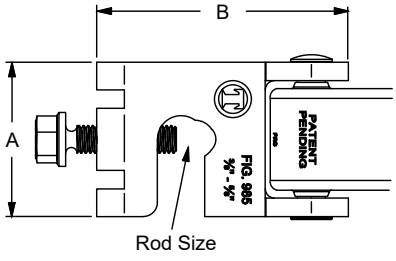


FIG. 985

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
693





Part Number	Rod Size	A in.	A (mm)	B in.	B (mm)
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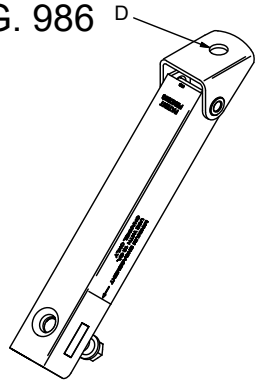
To Install: Slip the open side of the 985 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 arm and adjust to desired length ensuring the channel passes minimum engagement indicator. Tighten set screw until head breaks off.

FIG. 986

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
797



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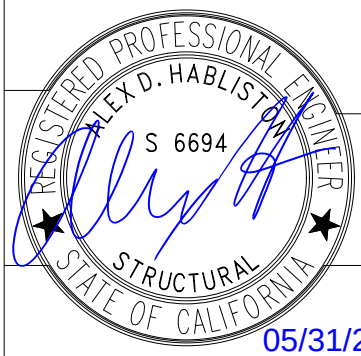
Insert channel brace into the 981 arm and adjust to desired length ensuring the channel passes minimum engagement indicator. Tighten set screw until head breaks off.

LARR APPROVAL



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TRANSVERSE RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
3 LAT 45

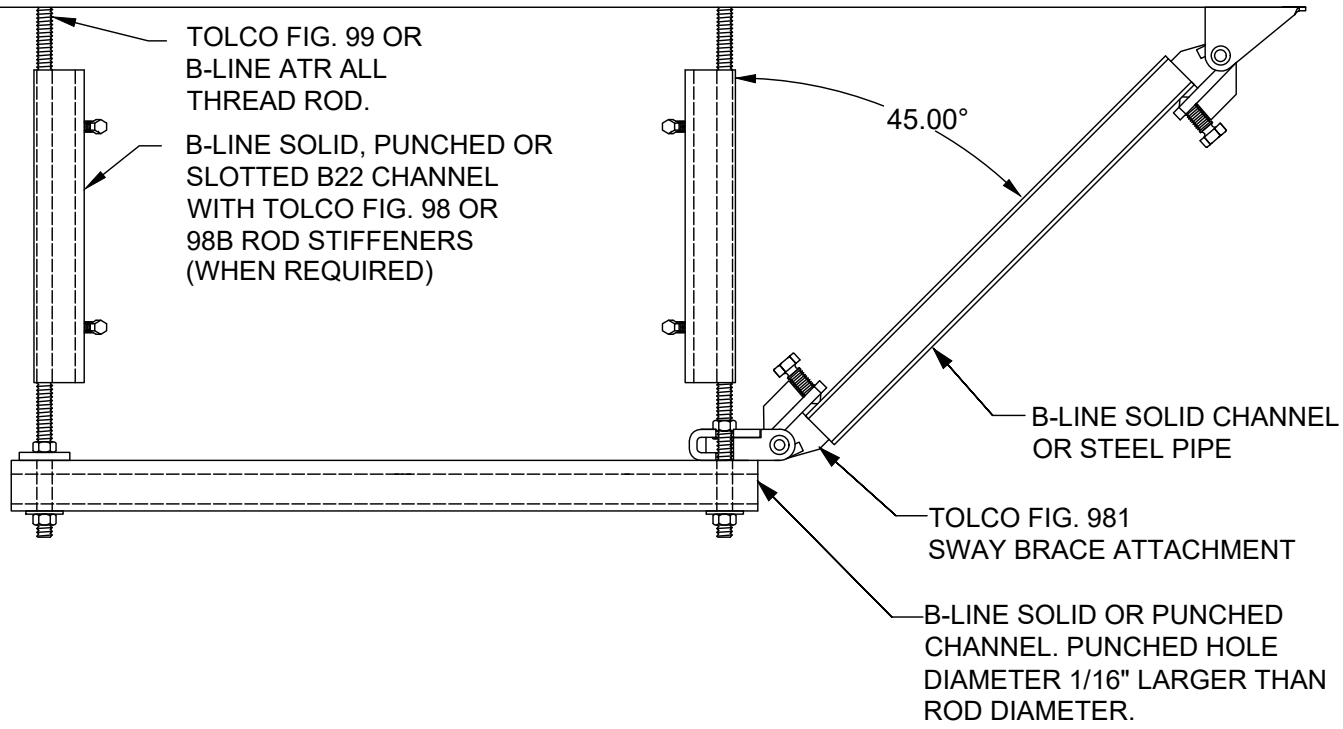
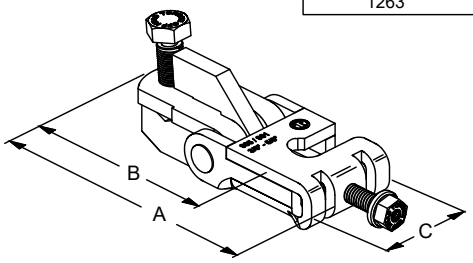


FIG. 981

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
1263



Part Number	Rod Size Range	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)
981-S	3/8" thru 5/8"	51/8"	(130.2)	41/8"	(104.8)	11/4"	(31.7)
981-L	3/4" & 7/8"	51/8"	(130.2)	41/8"	(104.8)	11/4"	(31.7)

To Install: Slip the open side of the 981 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 jaw and tighten set screw until head breaks off.

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TRANSVERSE RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
3 LAT 30

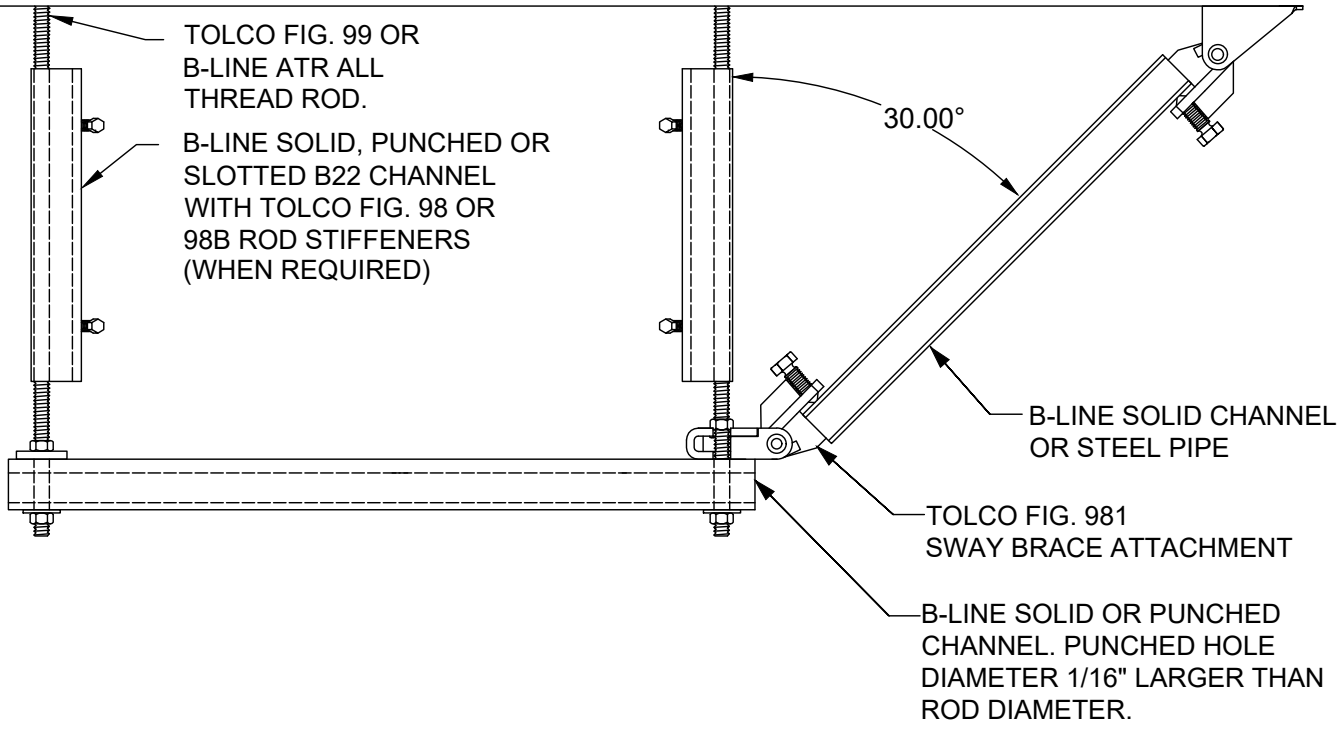
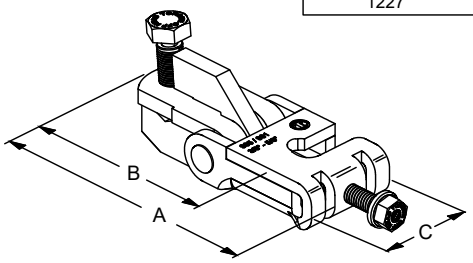


FIG. 981

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
1227



Part Number	Ro d Size Range	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)
981-S	3/8" thru 5/8"	51/8"	(130.2)	41/8"	(104.8)	11/4"	(31.7)
981-L	3/4" & 7/8"	51/8"	(130.2)	41/8"	(104.8)	11/4"	(31.7)

To Install: Slip the open side of the 981 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 jaw and tighten set screw until head breaks off.

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LONGITUDINAL RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
3 LONG 45

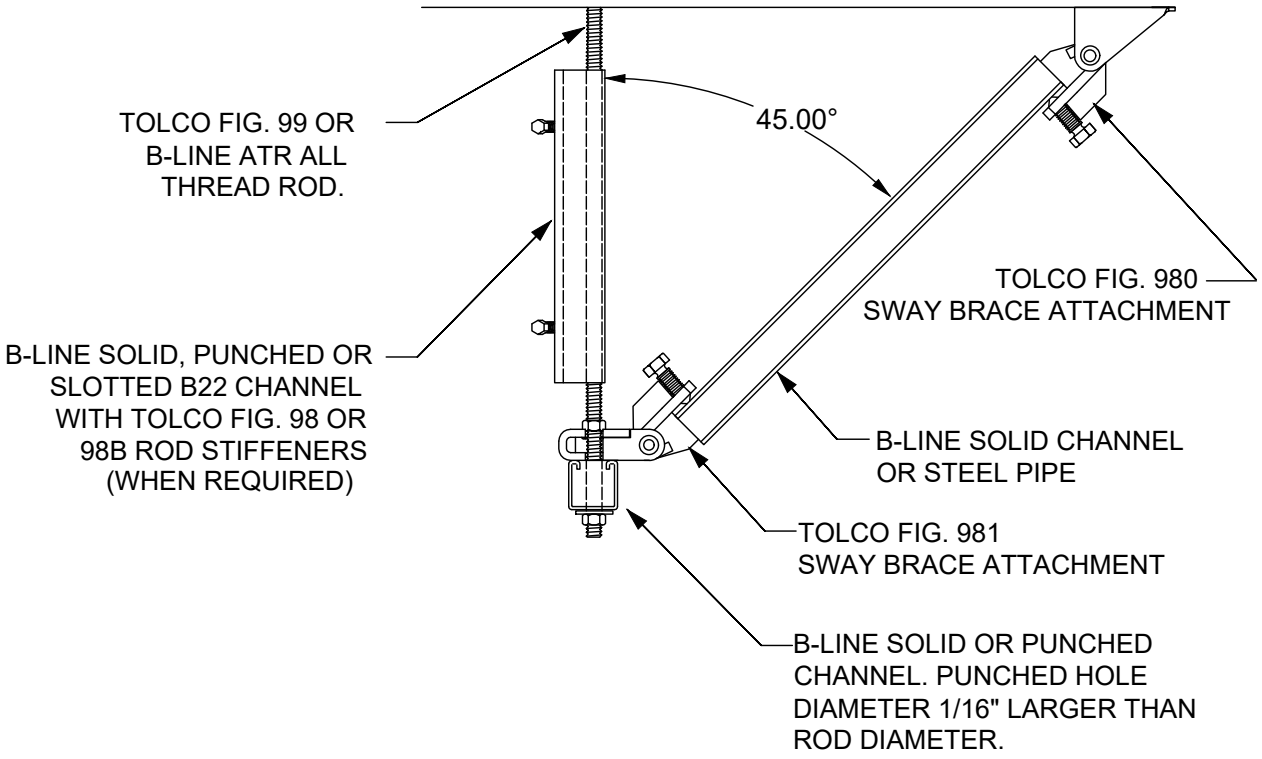
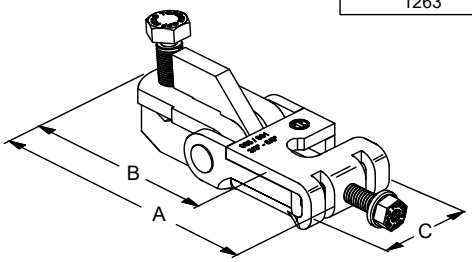


FIG. 981

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
1263



Part Number	Ro d Size Range	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)
981-S	3/8" thru 5/8"	51/8"	(130.2)	41/8"	(104.8)	11/4"	(31.7)
981-L	3/4" & 7/8"	51/8"	(130.2)	41/8"	(104.8)	11/4"	(31.7)

To Install: Slip the open side of the 981 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 jaw and tighten set screw until head breaks off.

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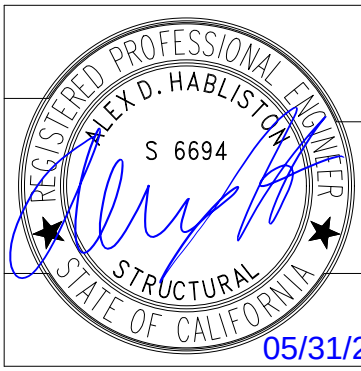

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DETAIL
3 LONG 30

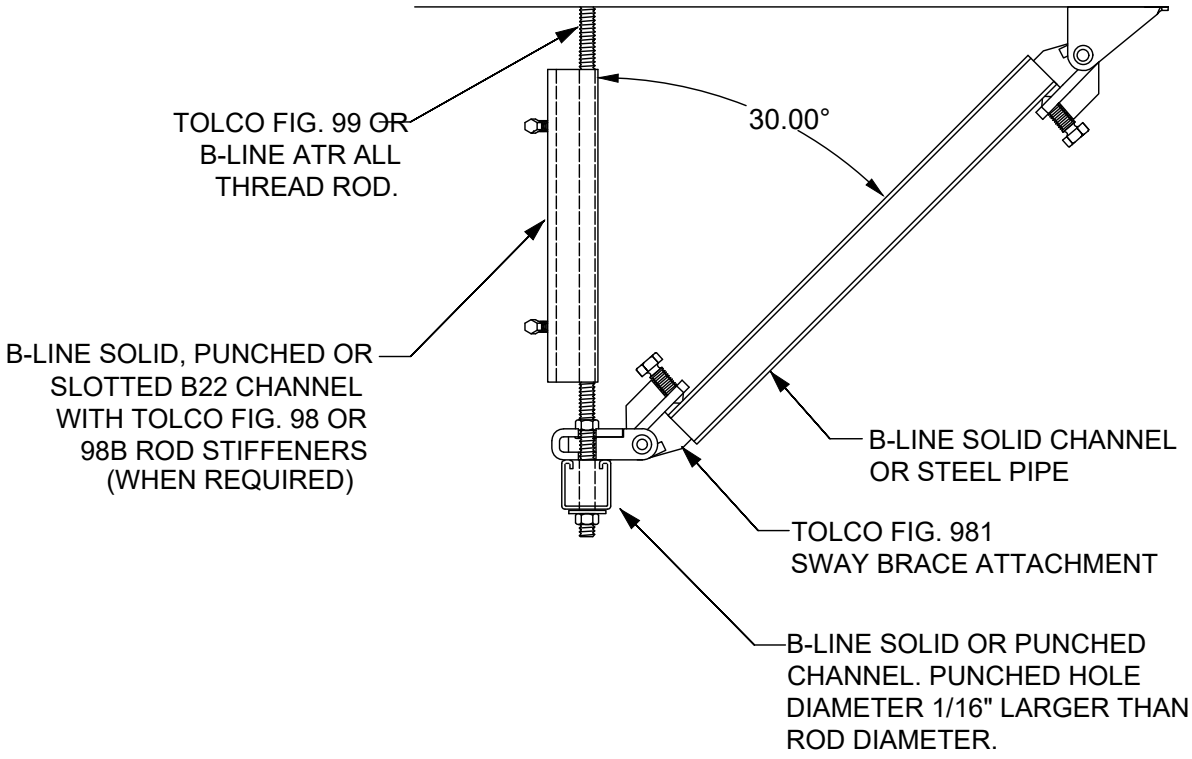
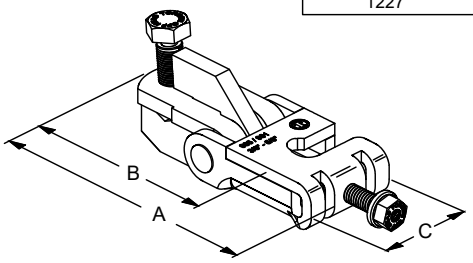


FIG. 981

LOAD PER BRACE (lbs) SAFETY FACTOR: 3
1227



Part Number	Ro d Size Range	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)
981-S	3/8" thru 5/8"	51/8"	(130.2)	41/8"	(104.8)	11/4"	(31.7)
981-L	3/4" & 7/8"	51/8"	(130.2)	41/8"	(104.8)	11/4"	(31.7)

To Install: Slip the open side of the 981 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 jaw and tighten set screw until head breaks off.

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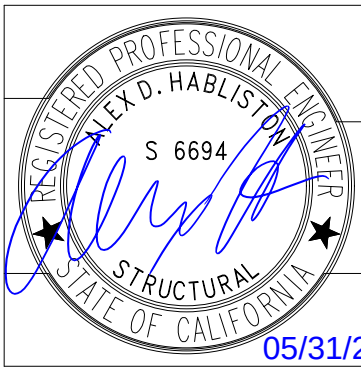

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TRANSVERSE CABLE BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
4 LAT 45

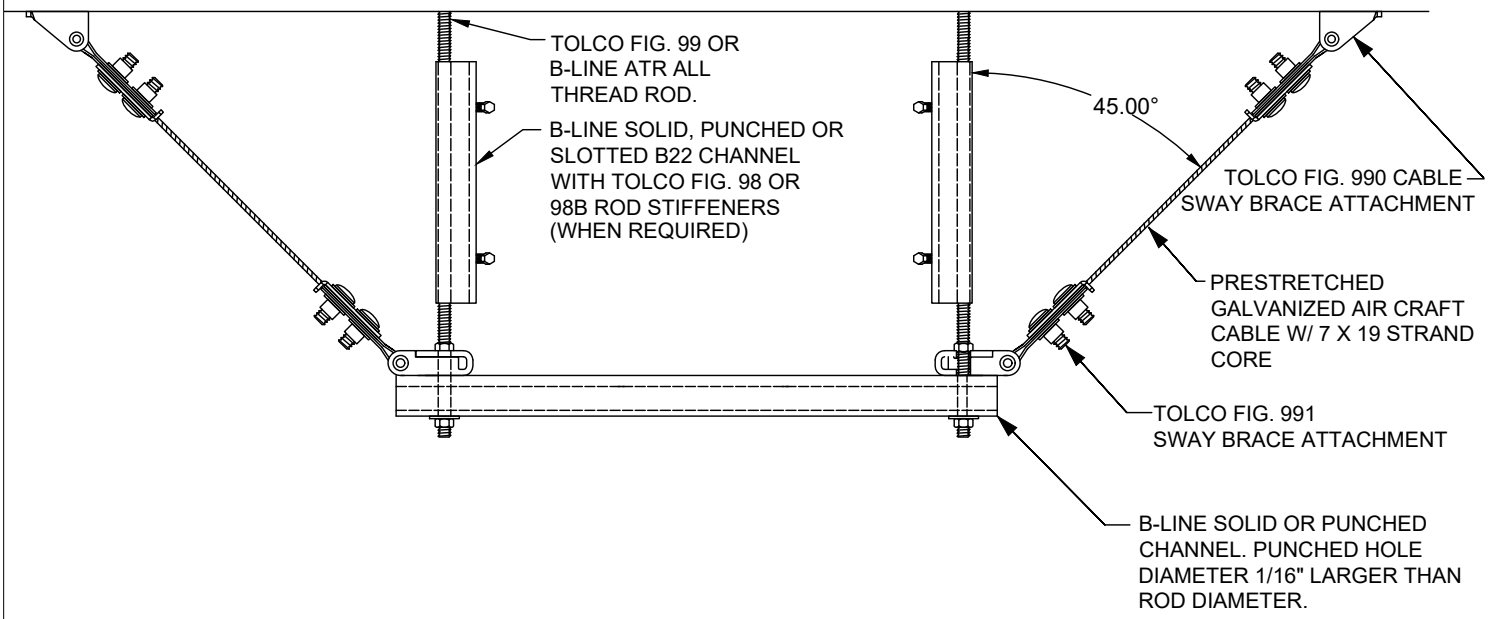
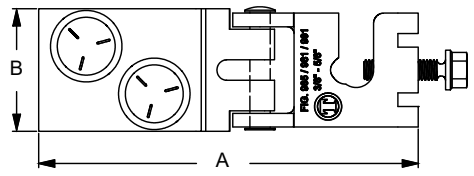


FIG. 991

MIN. 3/16" CABLE: LOAD PER BRACE (lbs) SAFETY FACTOR: 3
1023

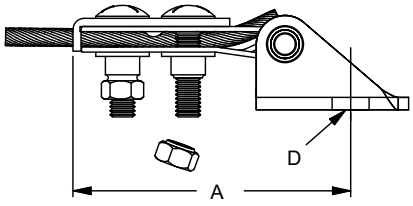


Part Number	Rod Size	Cable Diameter in.	(mm)	A in.	(mm)	B in.	(mm)
991	3/8" thru 5/8"	3/16"	(4.8)	5"	(127)	21/4"	(57.1)
		1/4"	(6.3)	5"	(127)	25/8"	(66.7)

To Install: Slip the open side of the Fig 991 yoke onto the all thread rod above the top of the trapeze. Insert the cable through opening and out the back, pull tight. Tighten break-off nuts until nut shears. Secure in place with hex nut.

FIG. 990

MIN. 3/16" CABLE: LOAD PER BRACE (lbs) SAFETY FACTOR: 3
1387



Part Number	A in.	(mm)	D in.	(mm)
990-1/2	5"	(127)	17/32"	(13.5)
990-5/8	5"	(127)	11/16"	(17.5)
990-3/4	5"	(127)	13/16"	(20.5)

To Install: Bolt Fig 990 to structural attachment. Slide cable through Fig 990 and tighten break off nuts until shearing off. Attachment can pivot for adjustment to proper brace angle.

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TRANSVERSE CABLE BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
4 LAT 30

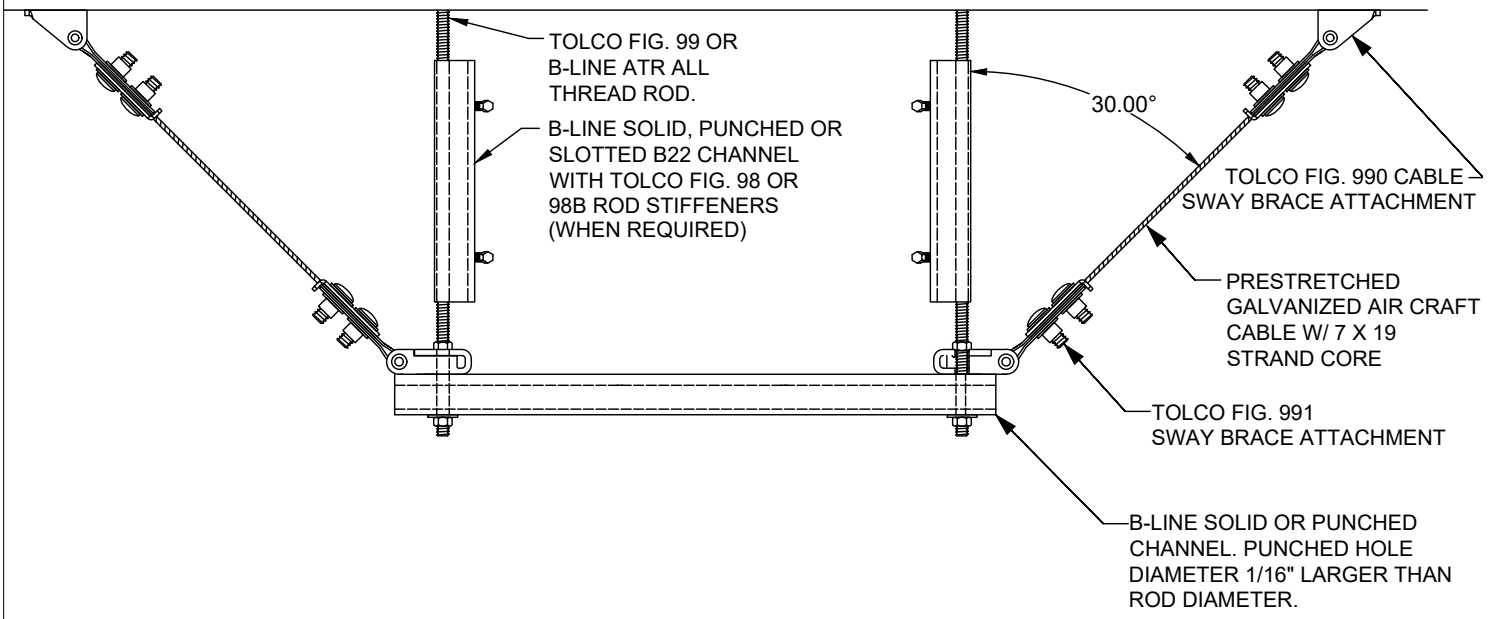
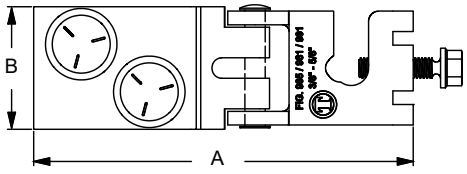


FIG. 991

MIN. 3/16" CABLE: LOAD PER BRACE (lbs) SAFETY FACTOR: 3
1073

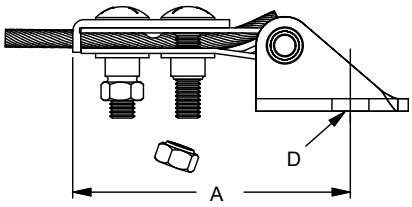


Part Number	Rod Size	Cable Diameter in.	(mm)	A in.	(mm)	B in.	(mm)
991	3/8" thru 5/8"	3/16"	(4.8)	5"	(127)	21/4"	(57.1)
		1/4"	(6.3)	5"	(127)	25/8"	(66.7)

To Install: Slip the open side of the Fig 991 yoke onto the all thread rod above the top of the trapeze. Insert the cable through opening and out the back, pull tight. Tighten break-off nuts until nut shears. Secure in place with hex nut.

FIG. 990

MIN. 3/16" CABLE: LOAD PER BRACE (lbs) SAFETY FACTOR: 3
1507



Part Number	A in.	(mm)	D in.	(mm)
990-1/2	5"	(127)	17/32"	(13.5)
990-5/8	5"	(127)	11/16"	(17.5)
990-3/4	5"	(127)	13/16"	(20.5)

To Install: Bolt Fig 990 to structural attachment. Slide cable through Fig 990 and tighten break off nuts until shearing off. Attachment can pivot for adjustment to proper brace angle.

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LONGITUDINAL CABLE BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
4 LONG 45

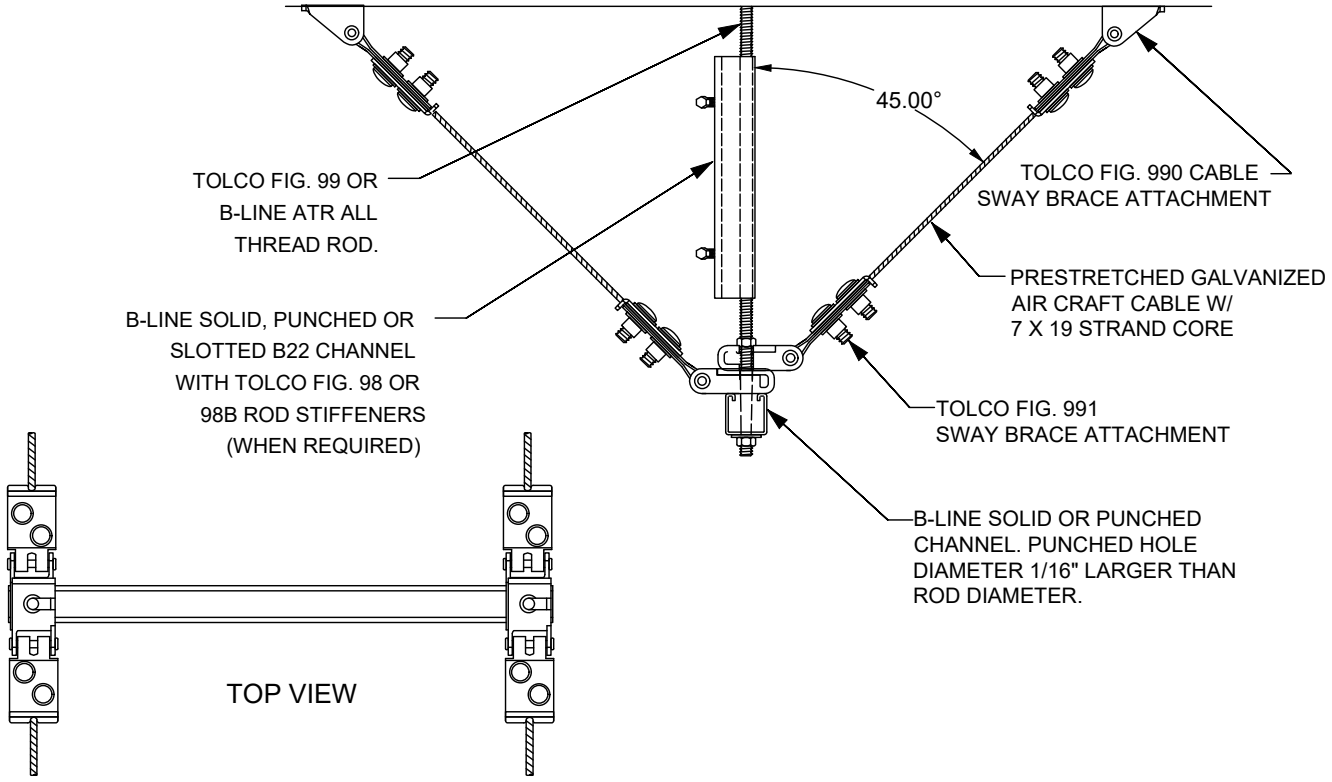
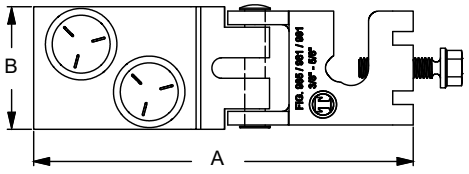


FIG. 991

MIN. 3/16" CABLE: LOAD PER BRACE (lbs) SAFETY FACTOR: 3
1023

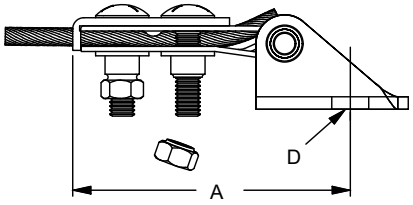


Part Number	Rod Size	Cable Diameter in.	(mm)	A in.	(mm)	B
991	3/8" thru 5/8"	3/16"	(4.8)	5"	(127)	21/4" (57.1)
		1/4"	(6.3)	5"	(127)	25/8" (66.7)

To Install: Slip the open side of the Fig 991 yoke onto the all thread rod above the top of the trapeze. Insert the cable through opening and out the back, pull tight. Tighten break-off nuts until nut shears. Secure in place with hex nut.

FIG. 990

MIN. 3/16" CABLE: LOAD PER BRACE (lbs) SAFETY FACTOR: 3
1387



Part Number	A in.	(mm)	D in.	(mm)
990-1/2	5"	(127)	17/32"	(13.5)
990-5/8	5"	(127)	11/16"	(17.5)
990-3/4	5"	(127)	13/16"	(20.5)

To Install: Bolt Fig 990 to structural attachment. Slide cable through Fig 990 and tighten break off nuts until shearing off. Attachment can pivot for adjustment to proper brace angle.

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LONGITUDINAL CABLE BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

DETAIL
4 LONG 30

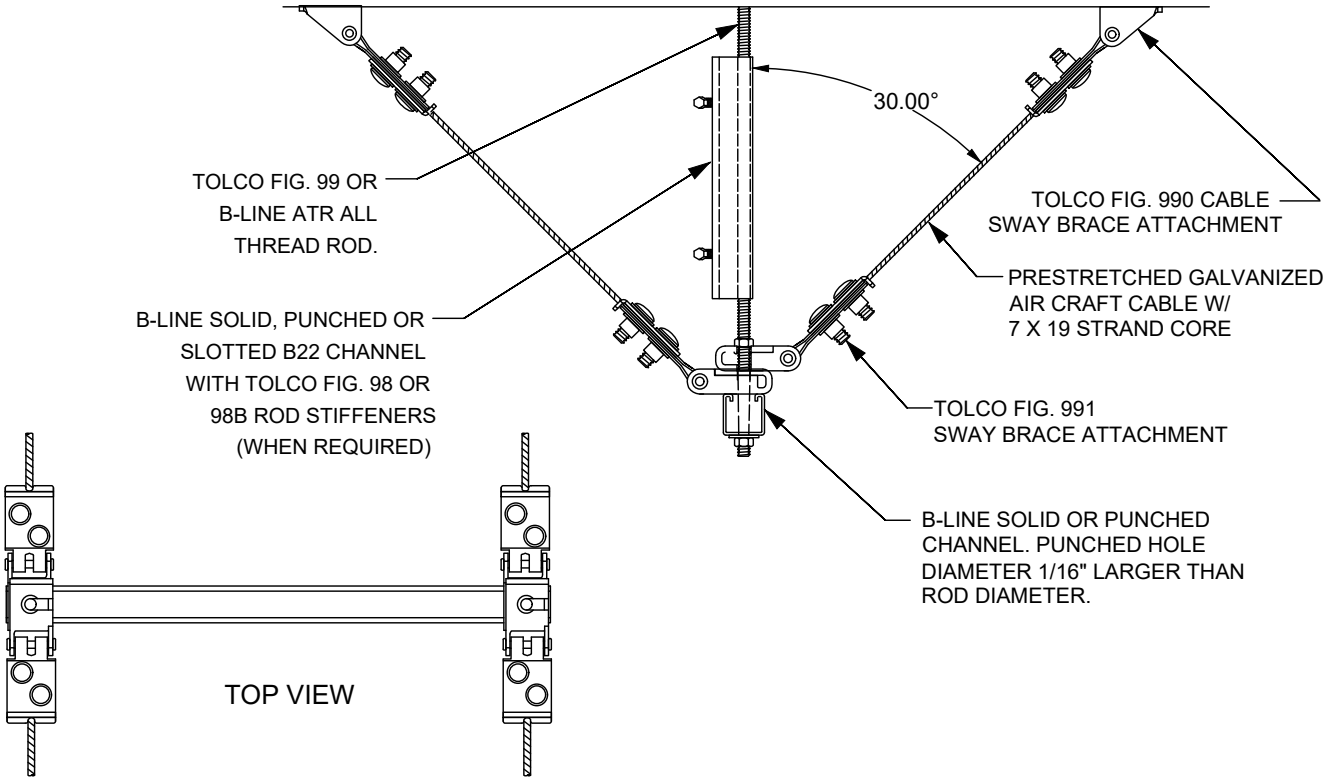
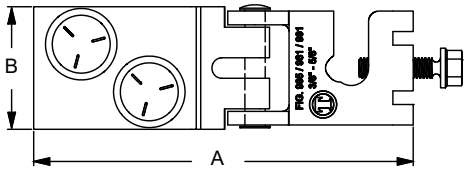


FIG. 991

MIN. 3/16" CABLE: LOAD PER BRACE (lbs)
SAFETY FACTOR: 3
1073

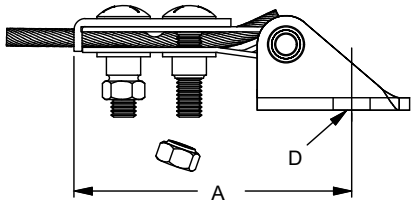


Part Number	Rod Size	Cable Diameter in.	(mm)	A in.	(mm)	B
991	3/8" thru 5/8"	3/16"	(4.8)	5"	(127)	21/4" (57.1)
		1/4"	(6.3)	5"	(127)	25/8" (66.7)

To Install: Slip the open side of the Fig 991 yoke onto the all thread rod above the top of the trapeze. Insert the cable through opening and out the back, pull tight. Tighten break-off nuts until nut shears. Secure in place with hex nut.

FIG. 990

MIN. 3/16" CABLE: LOAD PER BRACE (lbs)
SAFETY FACTOR: 3
1507



Part Number	A in.	(mm)	D in.	(mm)
990-1/2	5"	(127)	17/32"	(13.5)
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990-3/4	5"	(127)	13/16"	(20.5)

To Install: Bolt Fig 990 to structural attachment. Slide cable through Fig 990 and tighten break off nuts until shearing off. Attachment can pivot for adjustment to proper brace angle.

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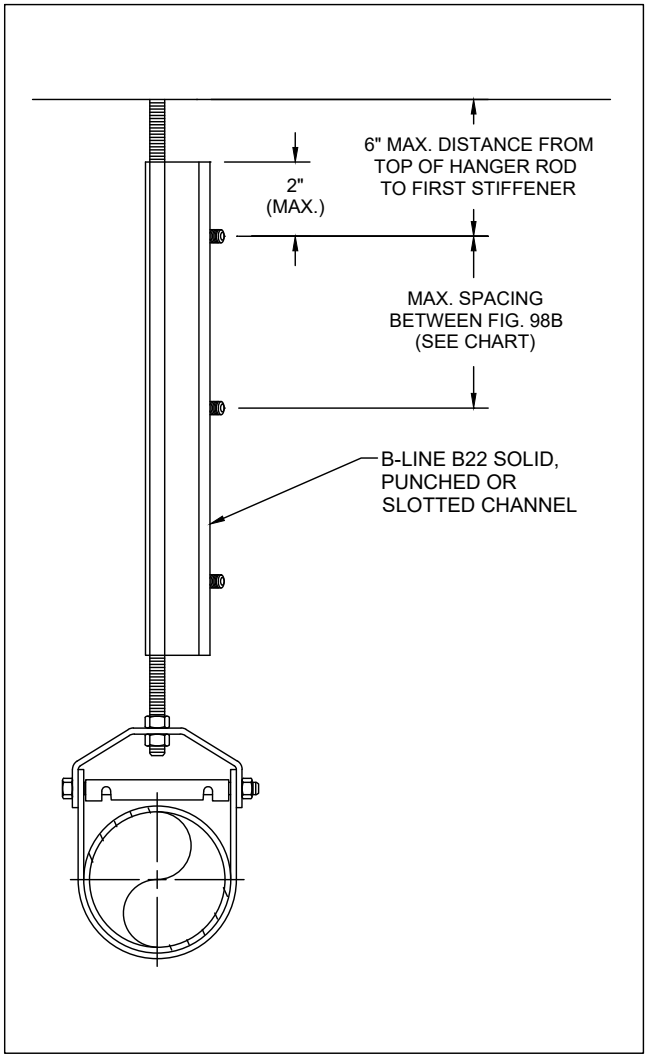
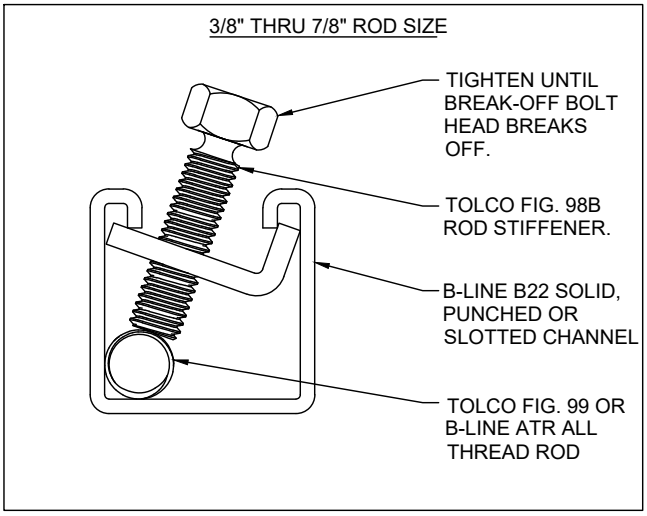
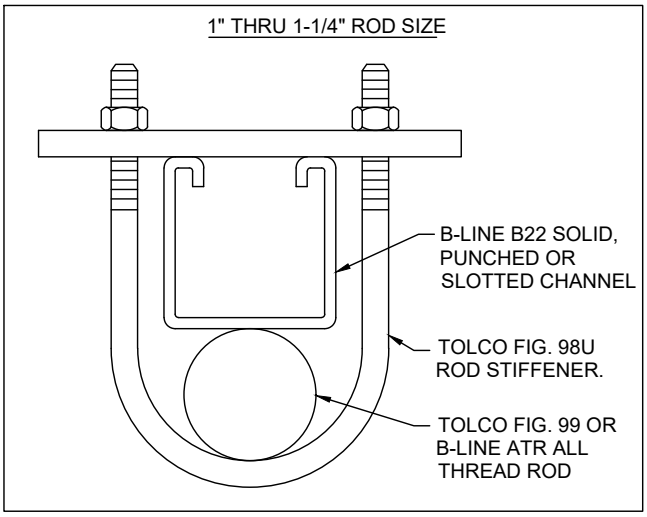
TOLCO FIG. 98B ROD STIFFENER

DETAIL
98B







ROD SIZE	MAX. ROD LENGTH WITHOUT ROD STIFFENER	MAX. SPACING BETWEEN TOLCO FIG. 98
3/8"	19"	13"
1/2"	25"	18"
5/8"	31"	23"
3/4"	37"	28"
7/8"	43"	33"
1"	50"	38"
1 1/4"	62"	43"

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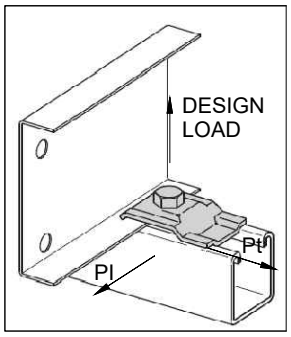
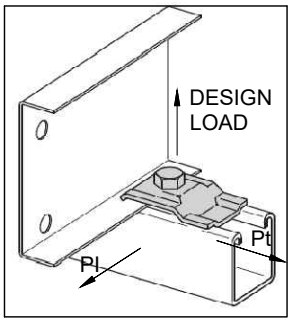
B-LINE 9ZN-1205, 9ZN-1208, 9ZN-1241 & B355 HOLD DOWN CLAMP

DETAIL
HC01

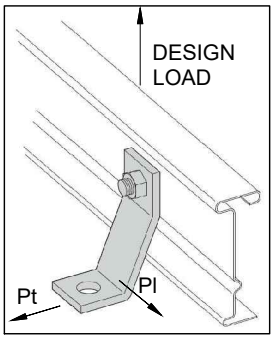
9ZN-1205



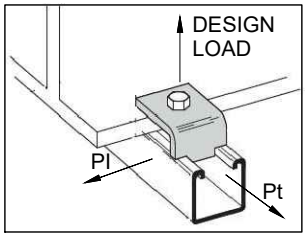
9ZN-1208



9ZN-1241



B355



PART NUMBER	CLAMP			GUIDE		
	DESIGN LOAD	Pt	Pl	DESIGN LOAD	Pt	Pl
9ZN-1205	570	482	155	570	482	-
9ZN-1208	570	482	155	570	482	-
9ZN-1241	1031	1240	702	-	-	-
B355	1196	503	180	-	-	-

NOTES:

1.) DESIGN LOADS ARE IN LBS., SAFETY FACTOR: 3

2.) LOADS ARE BASED ON CLAMPS BEING USED IN PAIRS

3.) LOADS APPLICABLE ONLY WITH B-LINE STRUT

4.) TIGHTEN BOLTS TO FOLLOW TORQUE VALUES AS FOLLOWS:
- a) FOR 9ZN-1205: TORQUE HARDWARE TO 50 FT-LBS FOR 1/2" DIA
- b) FOR 9ZN-1208: TORQUE HARDWARE TO 19 FT-LBS FOR 3/8" DIA
- c) FOR 9ZN-1241: TORQUE HARDWARE TO 19 FT-LBS FOR 3/8" DIA
- d) FOR B355: TORQUE HARDWARE TO 50 FT-LBS FOR 1/2" DIA

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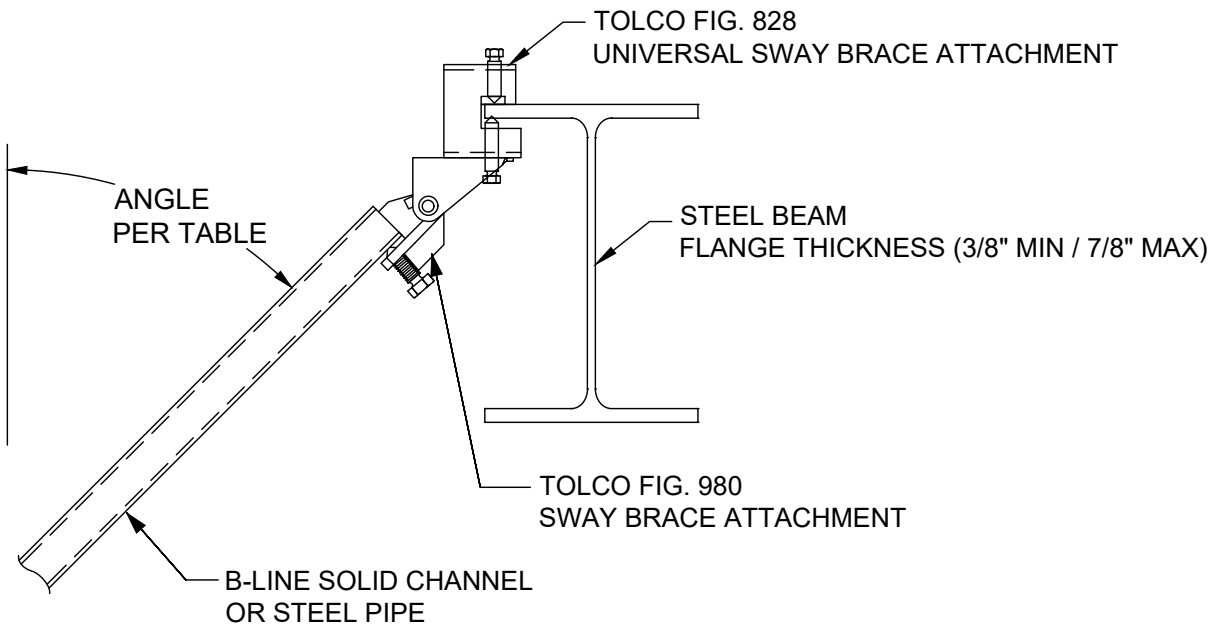
FIG 828 LOAD PERPENDICULAR TO BEAM (30, 45, AND 60 DEG FROM VERTICAL)

DETAIL
828T



BRACE ANGLE	60°	45°	30°
MAX AXIAL LOAD PER BRACE (lbs) PER FM TESTING	1210	1970	1320

NOTE: ALLOWABLE LOADS ARE MINIMUM BETWEEN FIG 980 AND FIG 828

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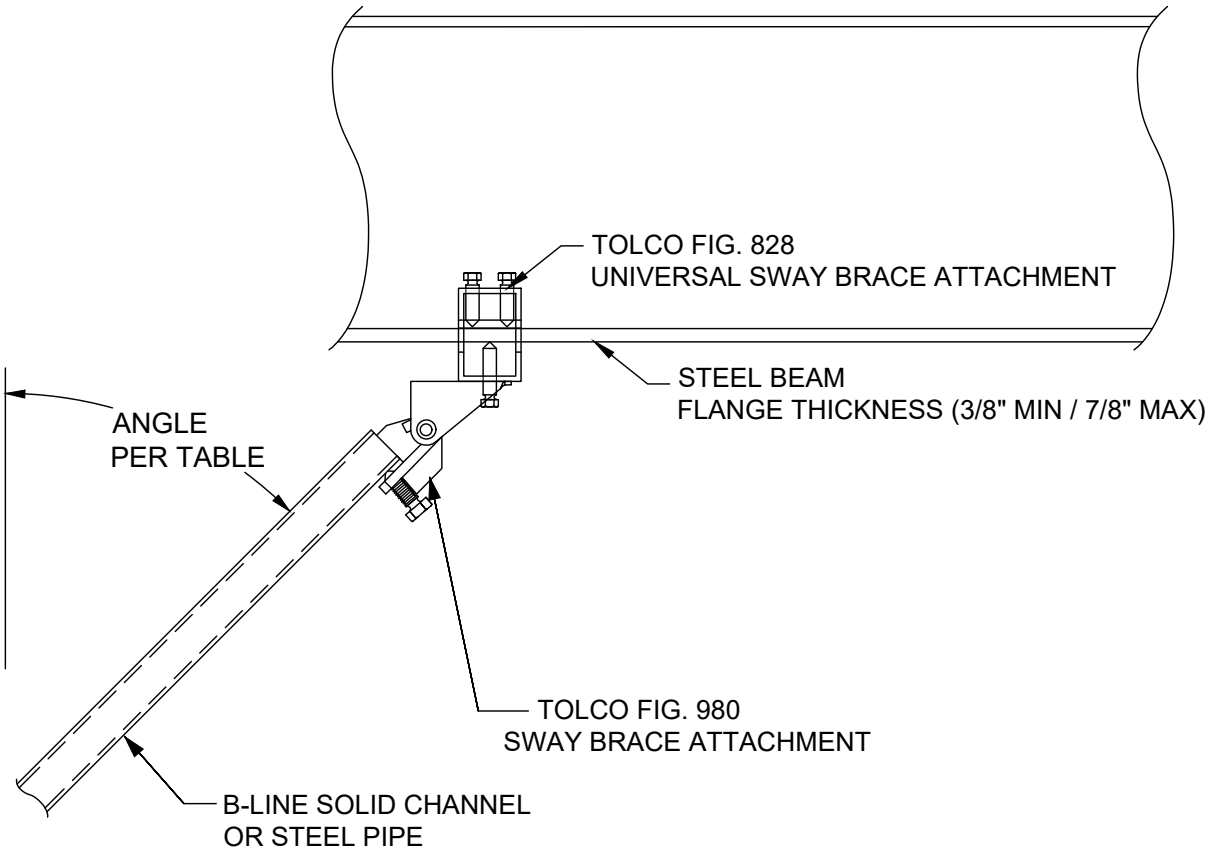
FIG 828 LOAD ALONG BEAM (30, 45, AND 60 DEGREES FROM VERTICAL)

DETAIL
828L



BRACE ANGLE	60°	45°	30°
MAX AXIAL LOAD PER BRACE (lbs) PER FM TESTING	1210	970	690

NOTE: ALLOWABLE LOADS ARE MINIMUM BETWEEN FIG 980 AND FIG 828

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FIG 980 BRACE LOAD (30, 45, AND 60 DEGREES FROM VERTICAL)

DETAIL
980

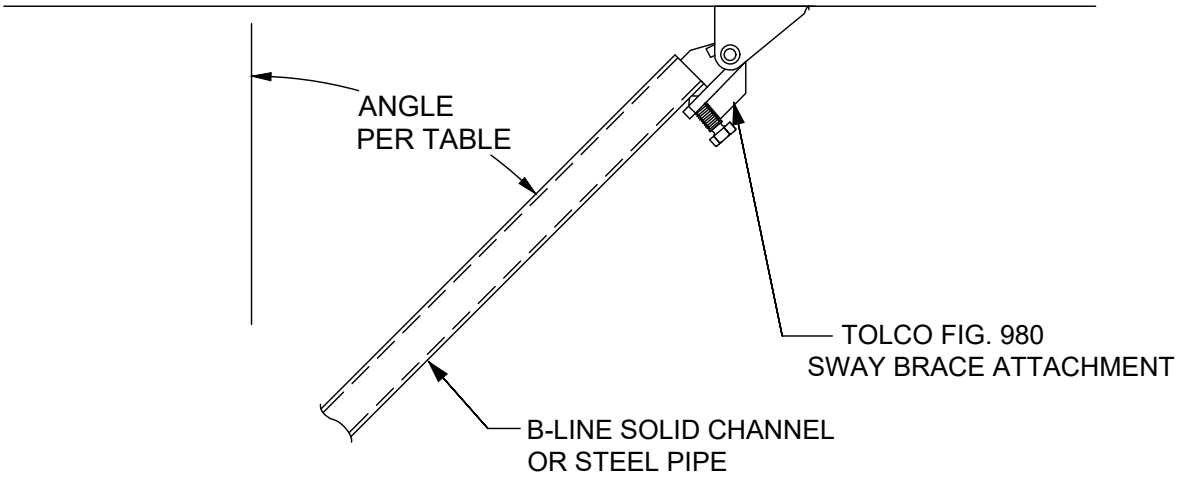
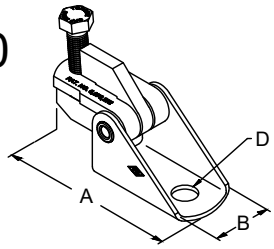


FIG. 980



Part Number	A		B		D	
	in.	(mm)	in.	(mm)	in.	(mm)
980-1/2	51/4”	(133.3)	17/8”	(47.6)	17/32”	(13.5)
980-5/8	51/4”	(133.3)	17/8”	(47.6)	11/16”	(17.5)
980-3/4	51/4”	(133.3)	17/8”	(47.6)	13/16”	(20.5)

To Install: Place the Fig. 980 onto the “bracing member”. Tighten the set screw until the head breaks off. Attachment can pivot for adjustment to proper brace angle.

BRACE ANGLE	60°	45°	30°
MAX AXIAL LOAD PER BRACE (lbs) PER FM TESTING	2310	1970	1320

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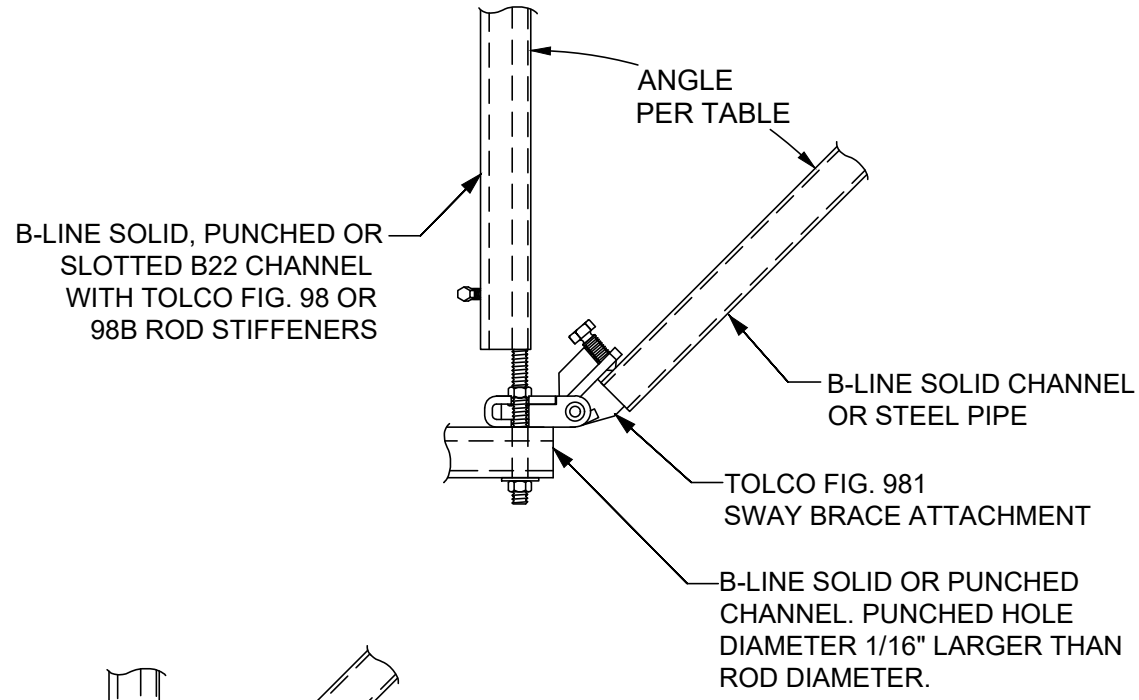
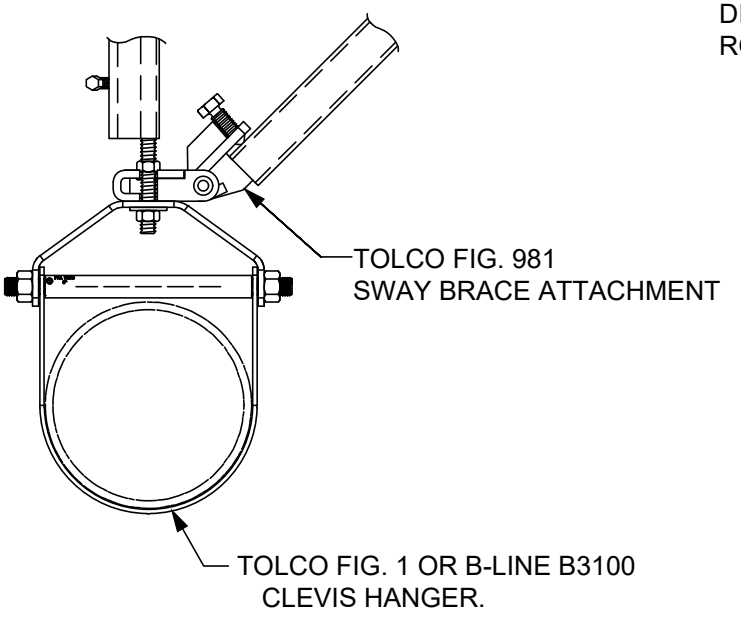
FIG 981 BRACE LOAD (30, 45, AND 60 DEGREES FROM VERTICAL)

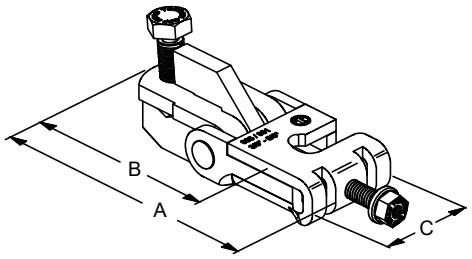
DETAIL
981





BRACE ANGLE	60°	45°	30°
MAX AXIAL LOAD PER BRACE (lbs) SAFETY FACTOR: 3	N/A	1263	1227

FIG. 981



Part Number	Ro d Size Range	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)
981-S	3/8" thru 5/8"	51/8"	(130.2)	41/8"	(104.8)	11/4"	(31.7)
981-L	3/4" & 7/8"	51/8"	(130.2)	41/8"	(104.8)	11/4"	(31.7)

To Install: Slip the open side of the 981 yoke onto the all thread rod above the top of the support. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 jaw and tighten set screw until head breaks off.

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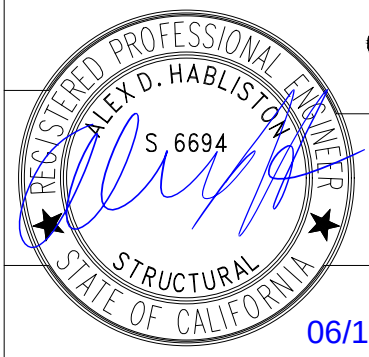

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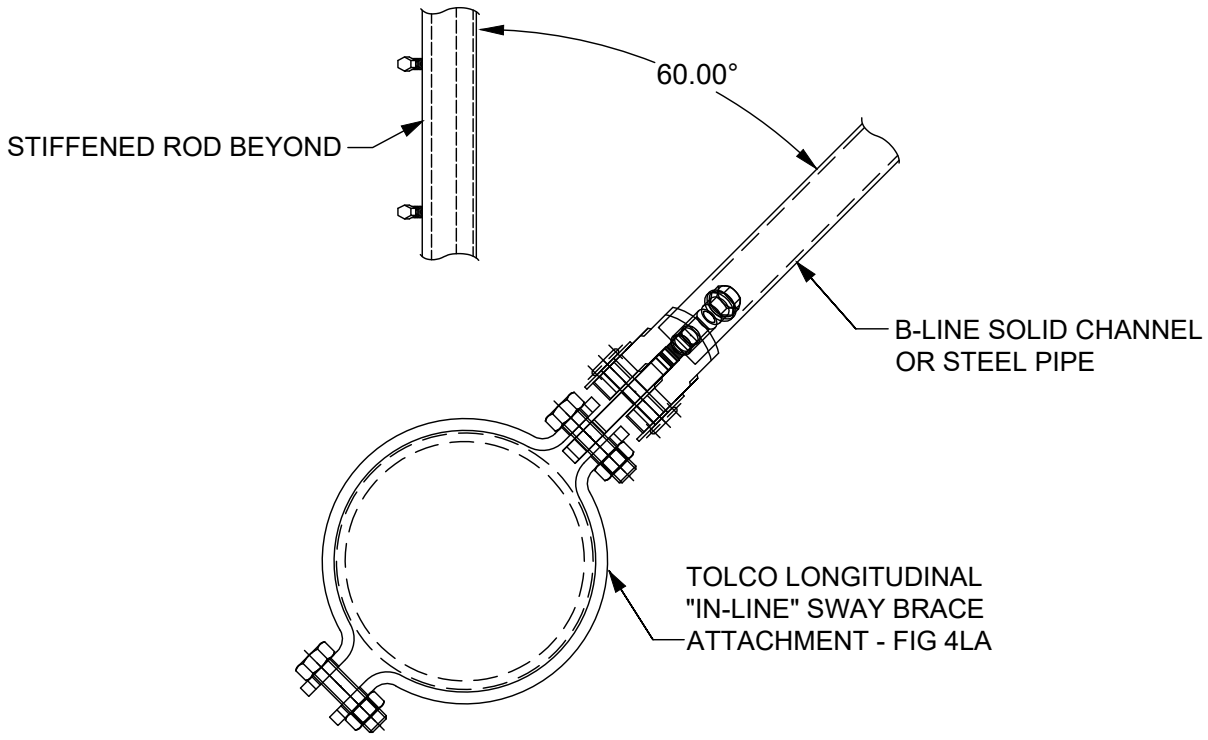
FIG 4LA TRANSVERSE LOAD

DETAIL
5LAT60



PIPE SIZE	1" -> 1 1/2"	2"	2 1/2" -> 5"	6"	8" -> 12"
MAX LOAD PER BRACE (lbs) PER FM TESTING	1190	1190	1190	2820	2820

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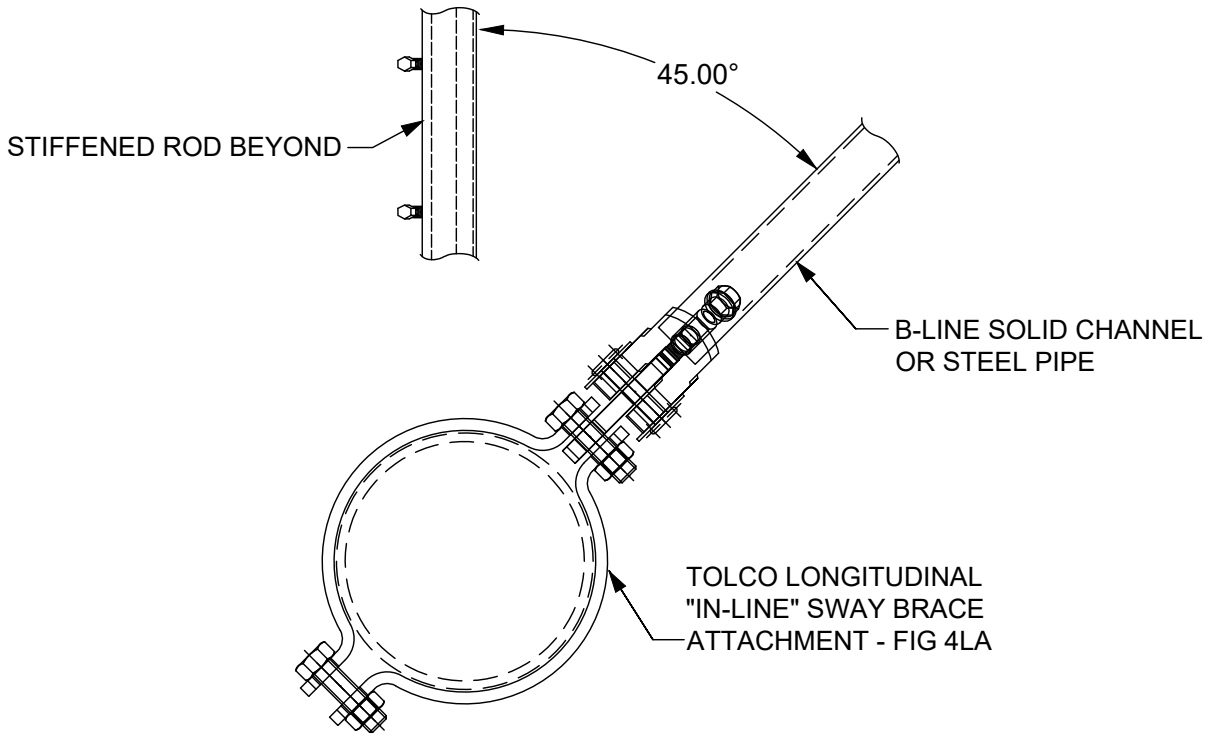
FIG 4LA TRANSVERSE LOAD

DETAIL
5LAT45



PIPE SIZE	1" -> 1 1/2"	2"	2 1/2" -> 5"	6"	8" -> 12"
MAX LOAD PER BRACE (lbs) PER FM TESTING	970	970	970	2300	2300

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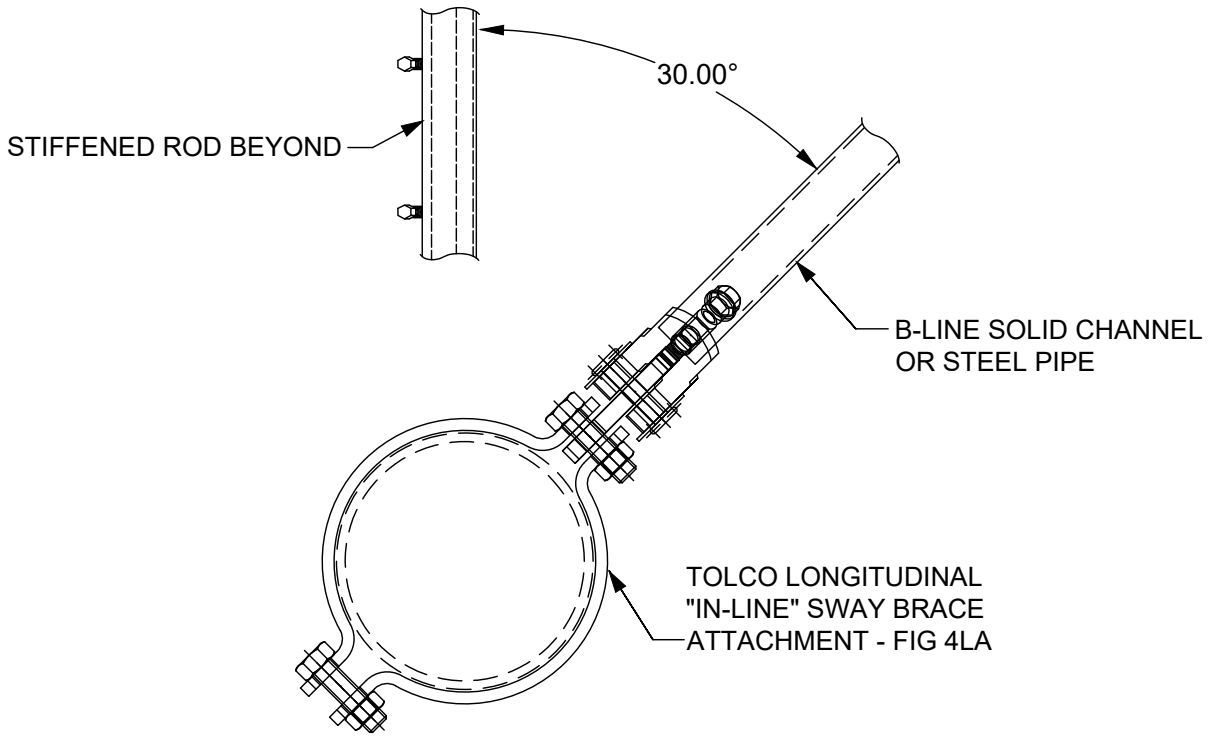
FIG 4LA TRANSVERSE LOAD

DETAIL
5LAT30



PIPE SIZE	1" -> 1 1/2"	2"	2 1/2" -> 5"	6"	8" -> 12"
MAX LOAD PER BRACE (lbs) PER FM TESTING	680	680	680	1620	1620

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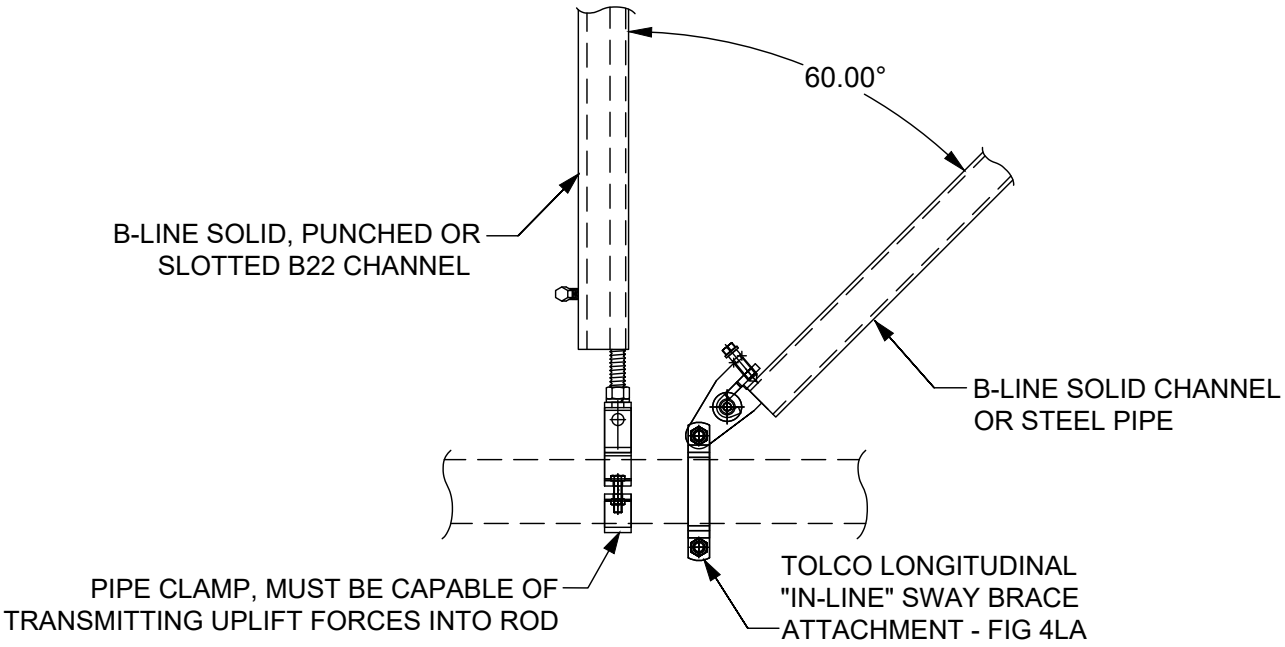
FIG 4LA LONGITUDINAL LOAD

DETAIL
5LONG60



PIPE SIZE	1" -> 1 1/2"	2"	2 1/2" -> 5"	6"	8" -> 12"
MAX LOAD PER BRACE (lbs) PER FM TESTING	1190	1030	1190	2010	1570

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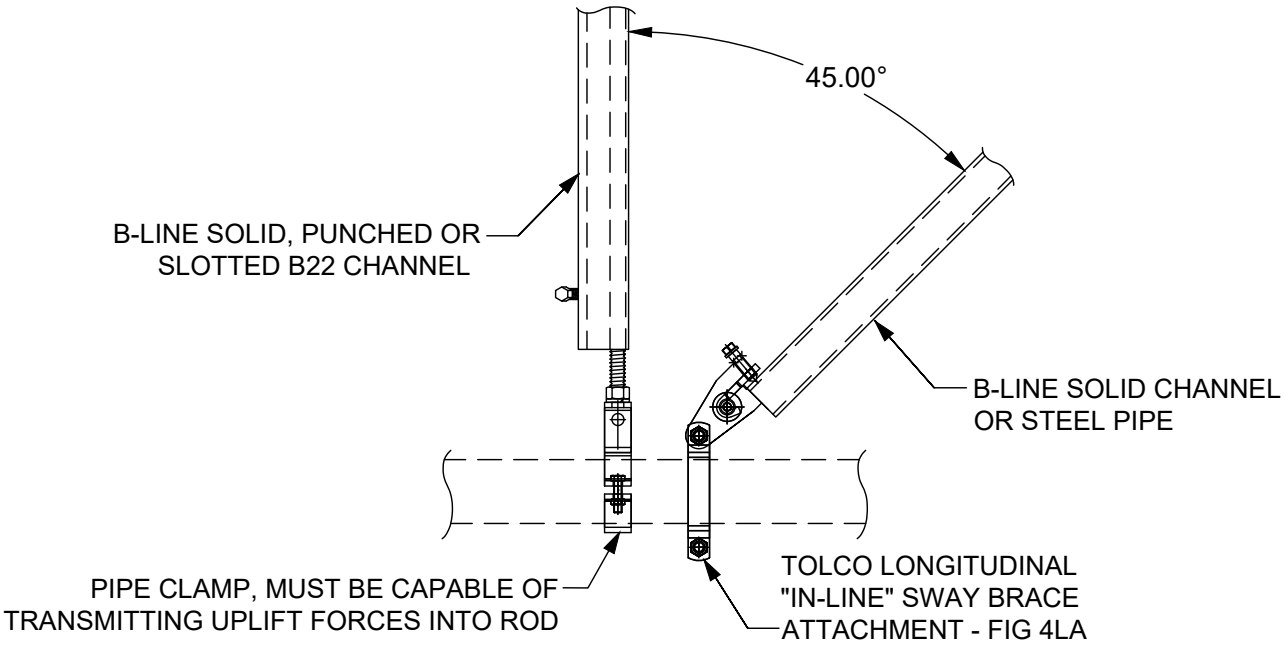
FIG 4LA LONGITUDINAL LOAD

DETAIL
5LONG45



PIPE SIZE	1" -> 1 1/2"	2"	2 1/2" -> 5"	6"	8" -> 12"
MAX LOAD PER BRACE (lbs) PER FM TESTING	970	860	970	2260	1660

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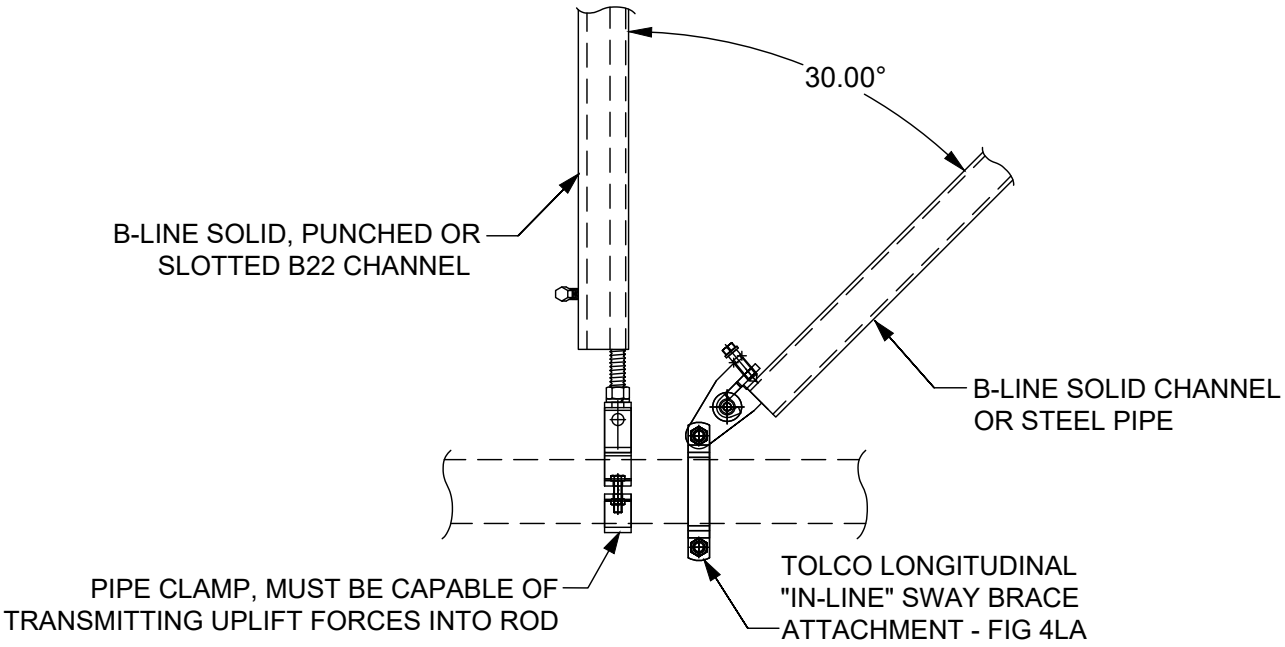
FIG 4LA LONGITUDINAL LOAD

DETAIL
5LONG30



PIPE SIZE	1" -> 1 1/2"	2"	2 1/2" -> 5"	6"	8" -> 12"
MAX LOAD PER BRACE (lbs) PER FM TESTING	680	680	680	1620	1620

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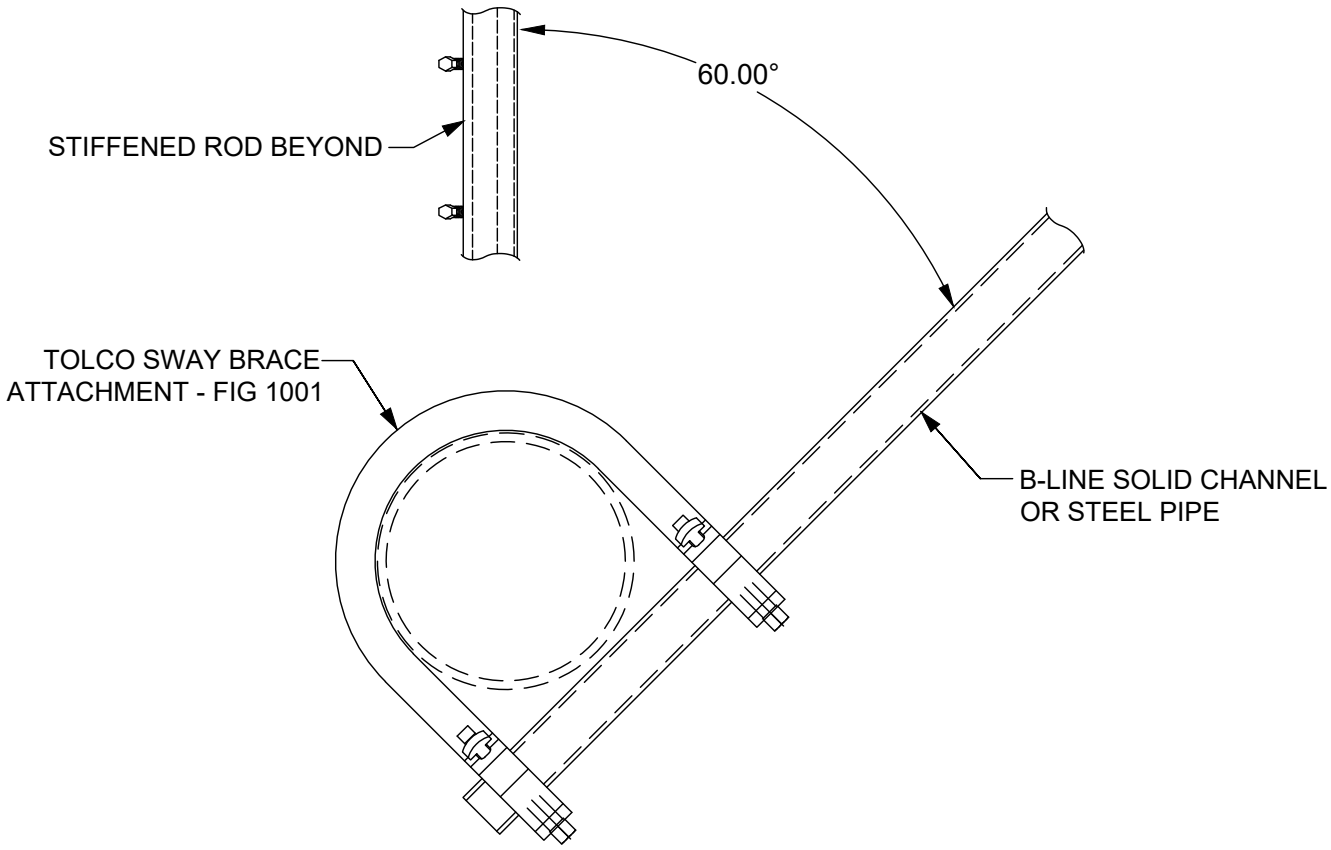
FIG 1001 TRANSVERSE LOAD

DETAIL
6LAT60



PIPE SIZE	1"	1 1/4" -> 2"	2 1/2"	3" -> 4"	5" -> 8"
MAX LOAD PER BRACE (lbs) PER FM TESTING	3120	2140	1380	1470	890

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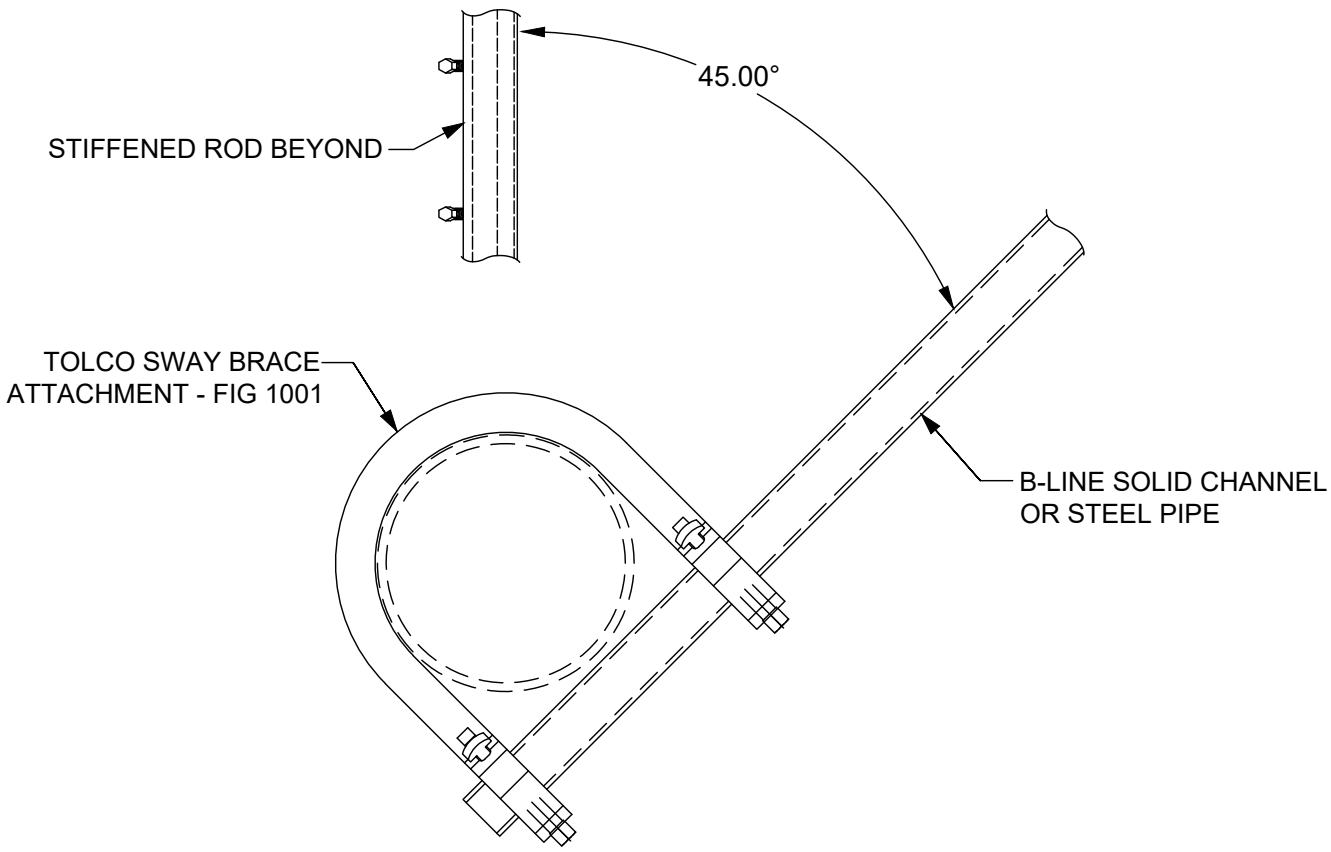
FIG 1001 TRANSVERSE LOAD

DETAIL
6LAT45



PIPE SIZE	1"	1 1/4" -> 2"	2 1/2"	3" -> 4"	5" -> 8"
MAX LOAD PER BRACE (lbs) PER FM TESTING	2550	1740	1130	1200	730

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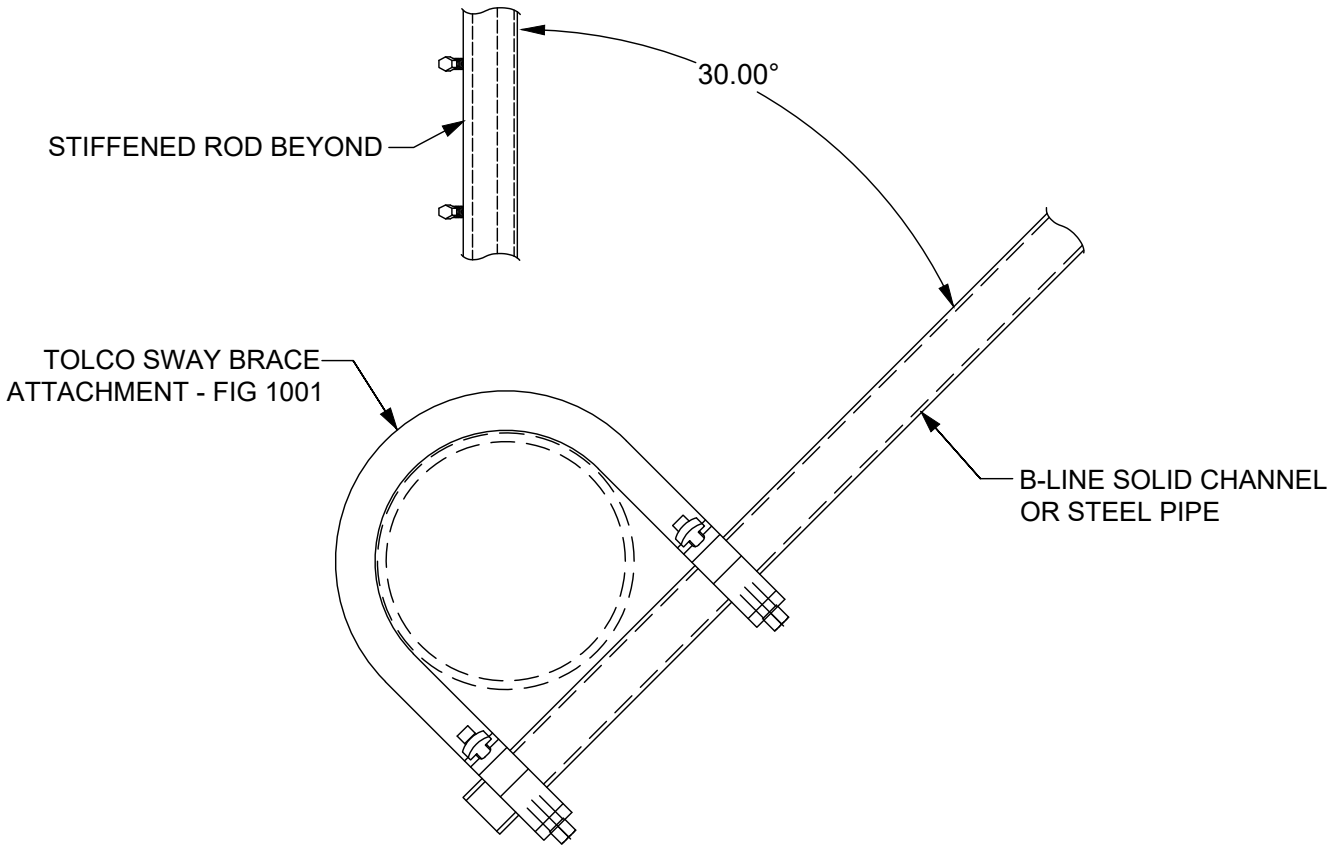
FIG 1001 TRANSVERSE LOAD

DETAIL
6LAT30



PIPE SIZE	1"	1 1/4" -> 2"	2 1/2"	3" -> 4"	5" -> 8"
MAX LOAD PER BRACE (lbs) PER FM TESTING	1800	1230	800	850	510

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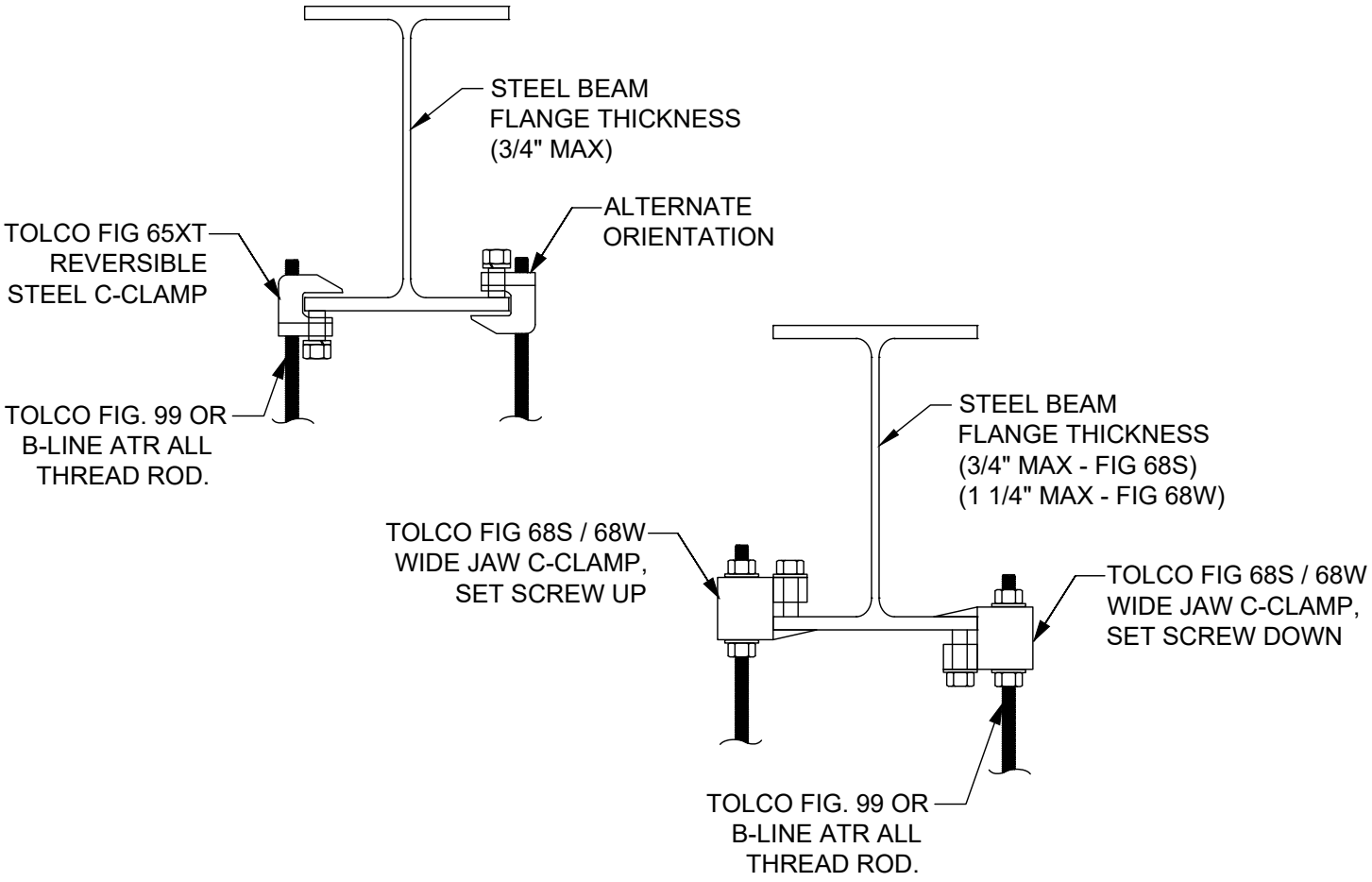
B-LINE 65XT, 68S, AND 68W BEAM CLAMPS

DETAIL
HC02



MAX LOAD PER CLAMP PER FM CRITERIA (5.0xDL + 250 LB)
LOADS SHOWN THUS '[XXX]' ARE ALLOWABLE DEAD LOAD ON CLAMP

PIPE SIZE	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"
FIGURE 65XT	340 [18]	410 [32]	430 [36]	520 [54]	635 [77]	940 [138]	1060 [162]	1255 [201]	1475 [245]	N/A N/A	N/A N/A	N/A N/A
FIGURE 68S (SET SCREW UP/DOWN)	340 [18]	410 [32]	430 [36]	520 [54]	635 [77]	940 [138]	1060 [162]	1255 [201]	1475 [245]	N/A N/A	N/A N/A	N/A N/A
FIGURE 68S (SET SCREW DOWN)	340 [18]	410 [32]	430 [36]	520 [54]	635 [77]	940 [138]	1060 [162]	1255 [201]	1475 [245]	2000 [350]	2615 [473]	3800 [710]
FIGURE 68W	340 [18]	410 [32]	430 [36]	520 [54]	635 [77]	940 [138]	1060 [162]	1255 [201]	1475 [245]	N/A N/A	N/A N/A	N/A N/A

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