

EZ-Fold® Double-Drop Backstops by DRAPER

① Superstructure (Truss) Attachment

- ① Mark off all measurements on floor using blue chalk line. (Measurements are included on project drawings.)
- ② Project chalk lines from the floor to the roof members using plumb bob or laser plumb pointer.

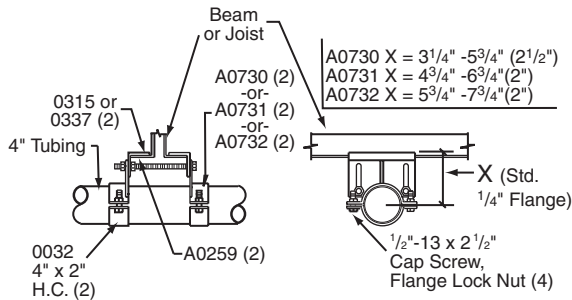
CAUTION: All measurements indicate center of clamp. Don't forget to add or subtract distance to clamp edges when placing clamps.

- ③ Attach clamp assemblies to roof structure (use numbers on project drawings to cross reference figures below).

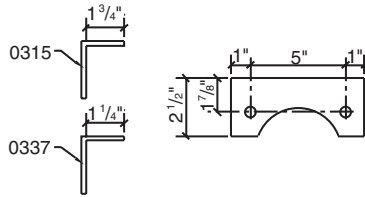
NOTE: Make sure all bolt and screw heads are toward the floor (threads pointing up).

- ④ Place superstructure tubing into clamp assemblies, insert Cap Screws, and start nuts.

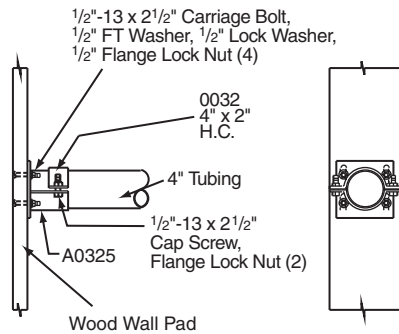
- ⑤ Tighten with impact tool.



**A0730, A0731, A0732
Adjustable Split-A Clamp**

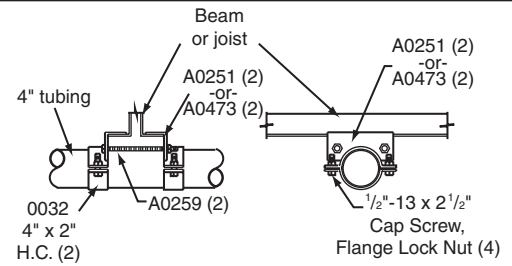


**0315 or 0337
Split-A Clamp Angle**

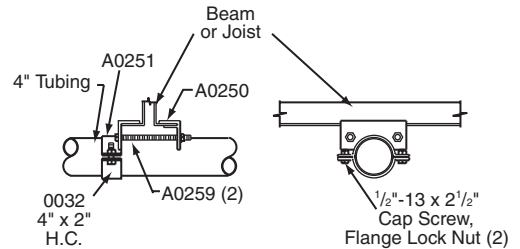


**A0325
Wall Mounted Tube Hanger**

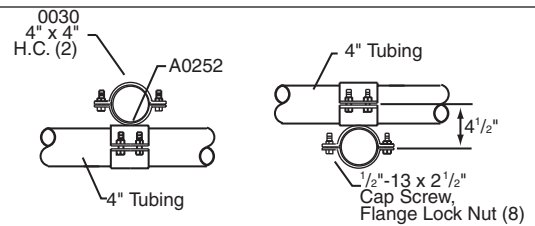
NOTE: Please use in conjunction with your customized project drawing, which will contain exact measurements and part numbers for each unit.



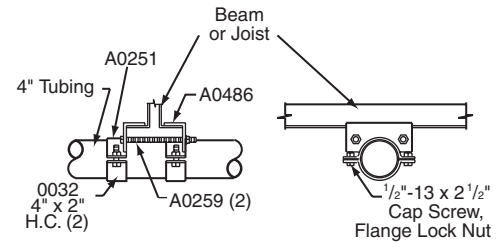
**A0251 or A0473
Split-A Clamp Assembly**



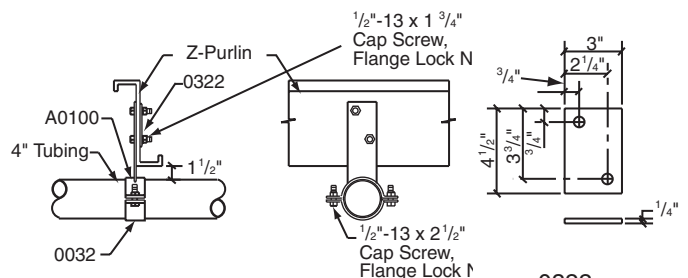
**A0250
Beam Clamp Angle**



**A0252
4" Back-to-Back Half Clamp**



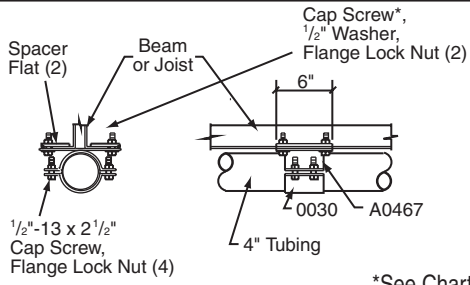
**A0486
Reversed Split-A Clamp**



**A0100 or A0150
Z-Purlin Hanger**

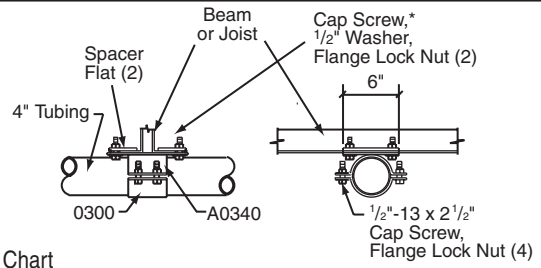
**0322
Backing Plate**

NOTE: Before attachment, hold hanger in place and mark hole locations on Z-Purlin. Drill 9/16" holes.



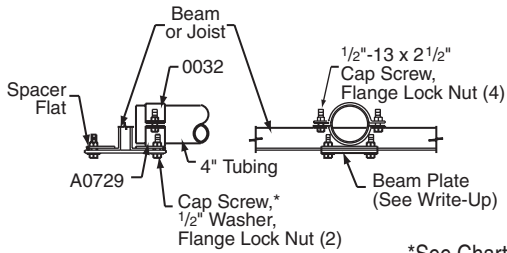
A0467
Parallel Beam Mounted Tube Hanger

*See Chart



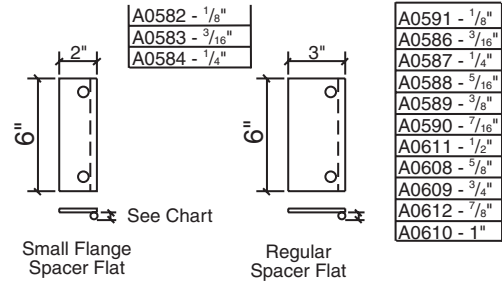
A0340
Perpendicular Beam Mounted Tube Hanger

*See Chart



A0729
Spacer Flat Tube Mount

*See Chart



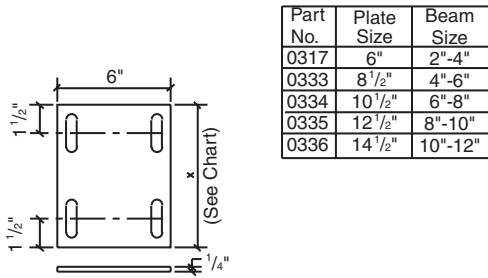
Spacer Flat Assembly

***Cap Screws used with Spacer Flats:**

Up through 3/8" = 1 3/4" C.S.

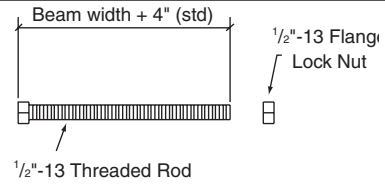
3/8"-3/4" = 2" C.S.

3/4"-1 1/4" = 2 1/2" C.S.



Beam Plate

Part No.	Plate Size	Beam Size
0317	6"	2"-4"
0333	8 1/2"	4"-6"
0334	10 1/2"	6"-8"
0335	12 1/2"	8"-10"
0336	14 1/2"	10"-12"



A0259
1/2" Acme Thread Assembly

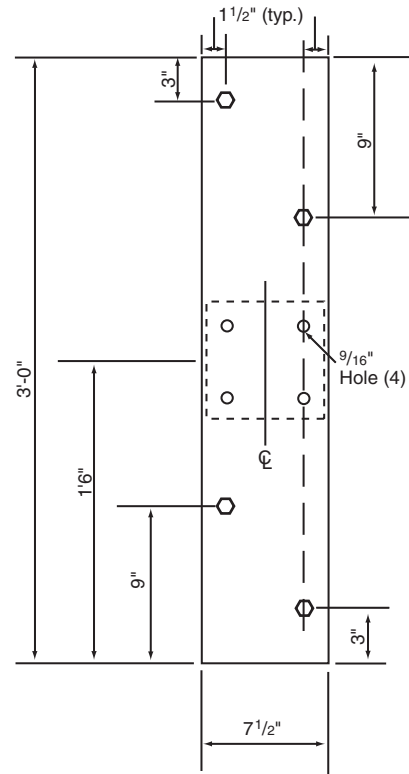
② Wood Wall Pad Installation

Caution: Draper, Inc. is not responsible for wall strength. Do not install wall pads if wall is not strong enough to bear stress loads required for backstop. Attachment method to be determined by project architect/engineer. Attachment hardware provided by others.

Note: Drawings will show locations of wall pads. Before drilling, make sure there are no obstructions or electrical wiring where you will be drilling. Spread plastic throws on inside floor before drilling.

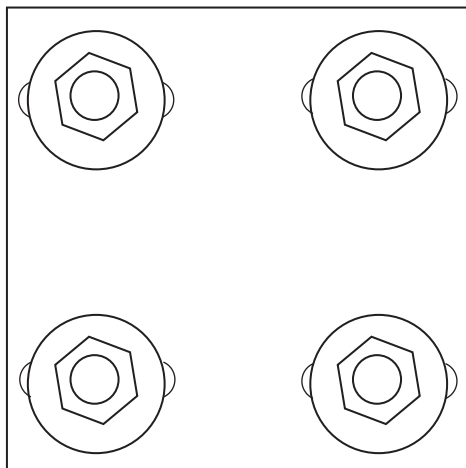
- ① Mark wall attachment locations on 0037 Wood Wall Pads (see figure at right). These may be adjusted to meet field conditions. (If thru-bolts are present, lay out holes to match bolt locations.) Drill four $\frac{9}{16}$ " diameter holes.
- ② Position part to be attached to wood pad on center line. Mark hole locations, and drill required number of $\frac{7}{16}$ " holes.
- ③ Turn wood pad to unfinished side, countersink $\frac{7}{16}$ " holes so carriage bolt heads will be flush with wood pad ($1\frac{3}{8}$ " diameter x $\frac{3}{8}$ " deep).
- ④ Place wood pad against wall and mark wall where $\frac{9}{16}$ " holes are drilled in wood pad.
- ⑤ Drill holes in wall as required.
- ⑥ Install $\frac{3}{8}$ "-16 x $2\frac{1}{2}$ " carriage bolts with $\frac{1}{2}$ " flat washers in $\frac{7}{16}$ " holes from back side of pad.
- ⑦ Place wood pad on wall and attach with type of wall bolt appropriate for field conditions.
- ⑧ Tighten wall bolts with hand wrench.

NOTE: Although not necessary, flat washers may be used in countersunk holes to ensure all mounting bolts coming through the wall pad extend the same distance from the surface of the wood wall pad.

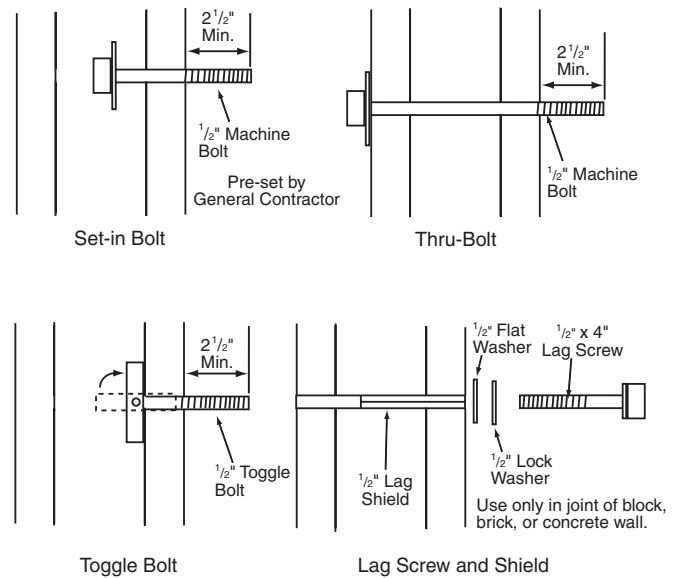


0037
2" x 8" x 36" Wood Wall Pad

NOTE: See Wall-Mounted Backstop instructions for information on installing larger wall pads.



DD-TS-22 Leg/Wall Attachment



Wood Wall Pad Mounting Options (Typ.)

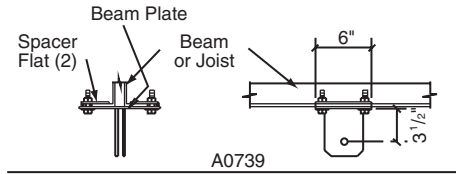
NOTE: Attachment method to be determined by project architect/engineer. Attachment hardware provided by others.

③ Standoff Attachment

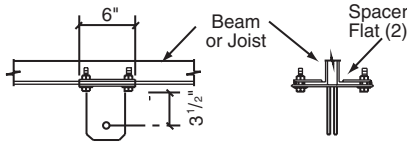
① Attach hangers to superstructure.

② Install standoff. (Standoff hangers and pieces vary according to installation. Cross reference diagrams with project drawings using part numbers.)

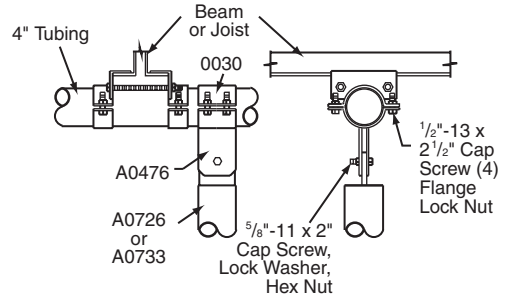
NOTE: Make sure all bolt and screw heads are toward the floor (threads pointing up).



A0739



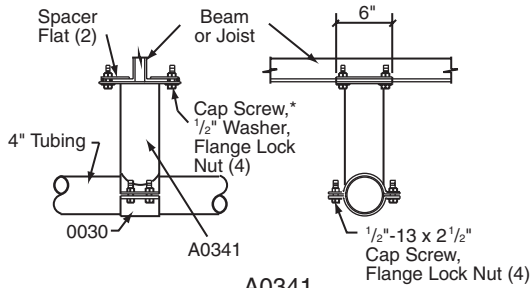
A0740



A0476

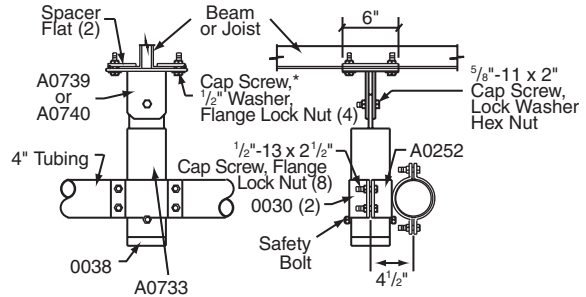
Tube Mounted Standoff Hanger

NOTE: See A0726 & A0733 for typ. use.



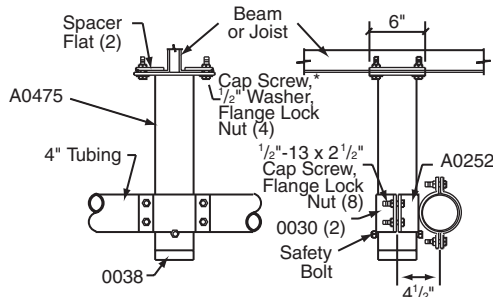
A0341

Beam Mounted Standoff W/Perpendicular Clamp



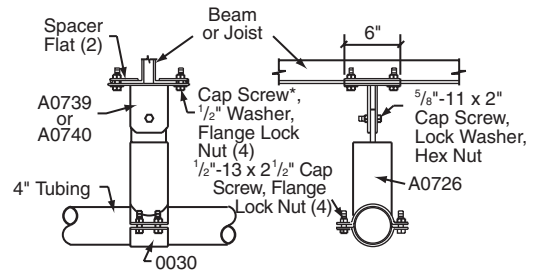
A0733

Beam Mounted Standoff W/Lug



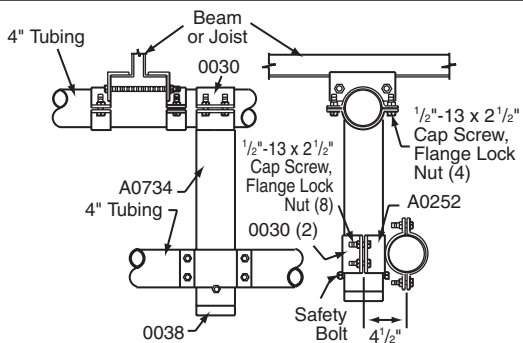
A0475

Beam Mounted Standoff



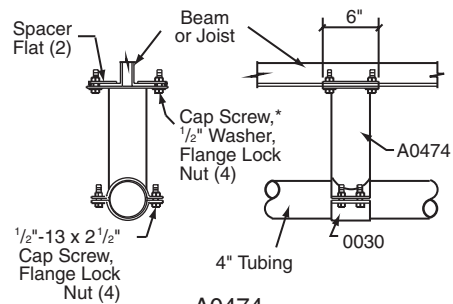
A0726

Beam Mounted Standoff W/Clamp & Lug



A0734

Tube Mounted Standoff W/Clamp



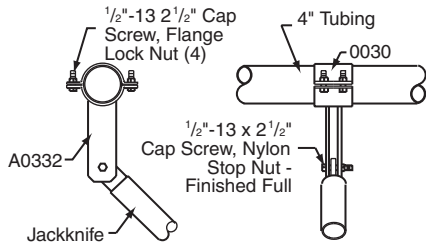
A0474

Beam Mounted Standoff W/Parallel Clamp

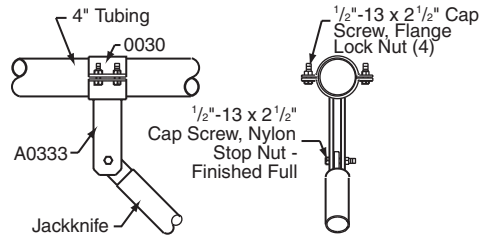
④ Upper Back Brace and Jackknife Hangers/ Attachments.

Perpendicular and parallel are used to describe the Hangers' positions in relation to the backboard.

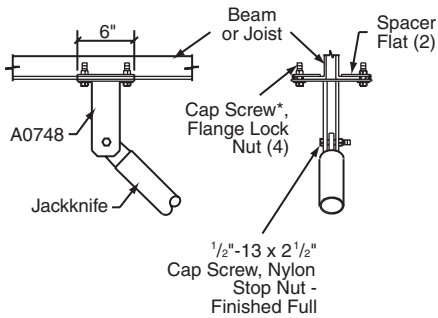
*See note on Page 2 of EZ-Fold Instructions Intro for Cap Screw sizes.



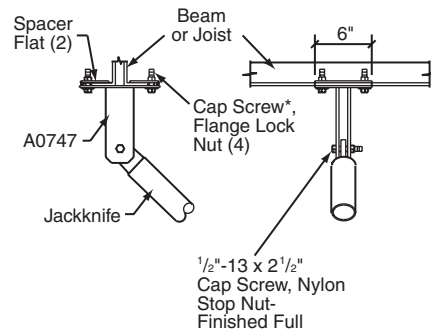
A0332
8" Parallel Upper Jackknife Hanger



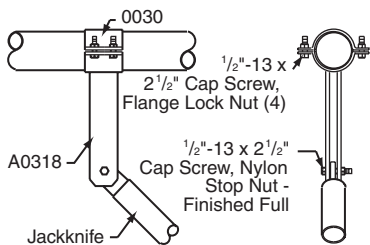
A0333
8" Perpendicular Upper Jackknife Hanger



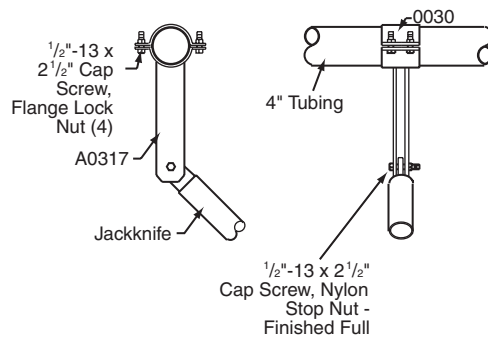
A0748
8" Beam Mounted Perpendicular Upper Jackknife Hanger



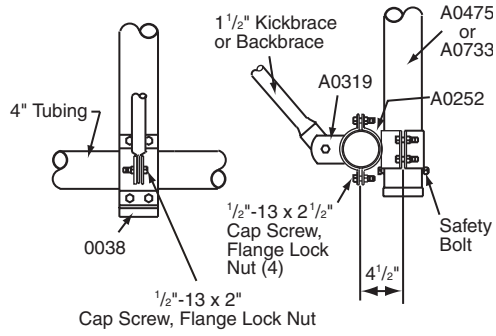
A0747
8" Beam Mounted Parallel Upper Jackknife Hanger



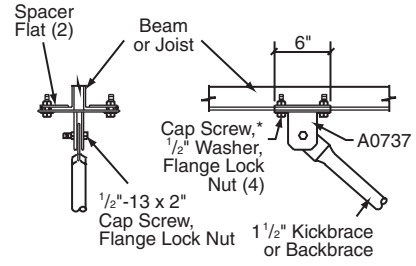
A0318
12" Perpendicular Upper Jackknife Hanger



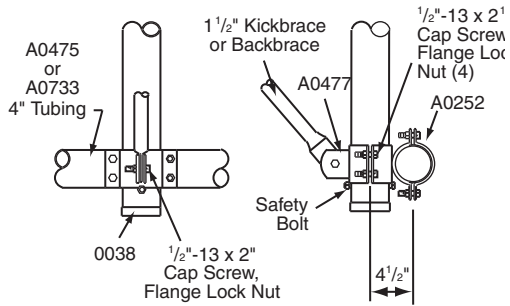
A0317
12" Parallel Upper Jackknife Hanger



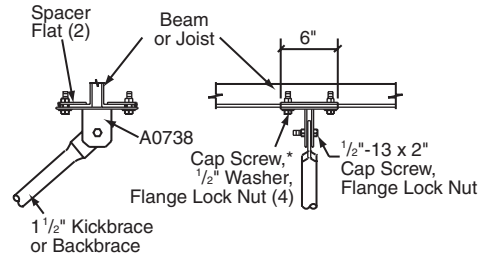
A0319
Perpendicular Kickbrace Hanger



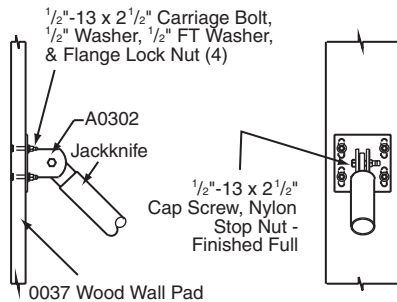
A0737
Beam Mounted Kickbrace Hanger - Perpendicular



A0477
Parallel Kickbrace Hanger



A0738
Beam Mounted Kickbrace Hanger - Parallel



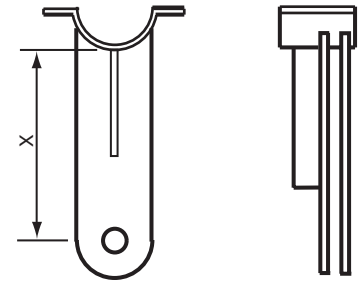
A0302
Perpendicular Rigid Guide

⑤ Backstop Attachment

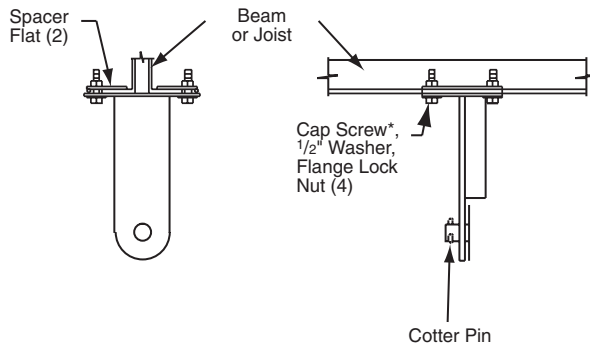
NOTE: When marking roof structure or truss for Backstop Hanger placement, remember to account for offset distances (center to edge of clamp).

- ① Attach Backstop Hangers to the backstop. (Hanger types vary according to installation. Cross reference diagrams with project drawings using part numbers.)
- NOTE: If backstop is to be hoisted into position, make sure to place the bottom of the backstop on a dolly, or casters, to keep from damaging the floor.
- ② If necessary, connect cable to cable clamp on top Cross Brace.
- ③ Carefully hoist backstop into position.
- CAUTION: Use extreme care when hoisting backstop. Hoisting too quickly can cause the frame to bounce or swing.
- ④ Attach Backstop to Superstructure. NOTE: Make sure all bolt and screw heads are toward the floor (threads pointing up).
- ⑤ Tighten screws and bolts with impact wrench.
- ⑥ Attach Front or Back Braces, Kick Braces, and/or Jackknives to backstop.
- ⑦ For folding backstops, attach cable and safety belt to proper connections. Raise and lower backstop to check operation.

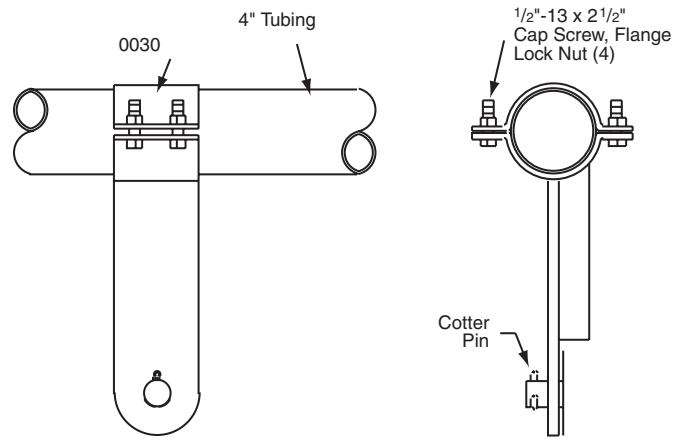
Assy. No.	Part No.	Lg.	X
A0806	0811	6"	4"
A0807	0812	8"	6"
A0808	0813	10"	8"
A0809	0814	12"	10"



Parallel Hanger



Beam-Mounted Parallel Hanger



Perpendicular Hanger



Beam-Mounted Perpendicular Hanger

⑥ Backstop Assembly

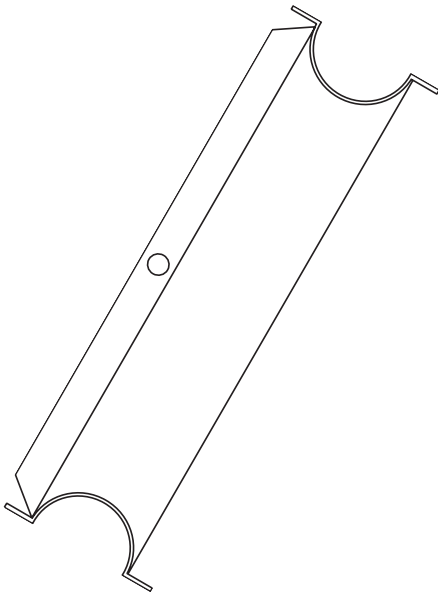
The following instructions are for all Draper EZ-Fold® Double-Drop Backstops. Diagrams of completed backstops, including guidelines on clamp placement, can be found immediately following this section. Skip steps that do not pertain to your backstop model.

Scale project drawings will indicate locations of hangers, clamps, and braces. Follow your project drawing from top to bottom, assembling as you go, using this manual for assembly details. Tips on specific models are included with diagrams of completed backstops at the end of this section.

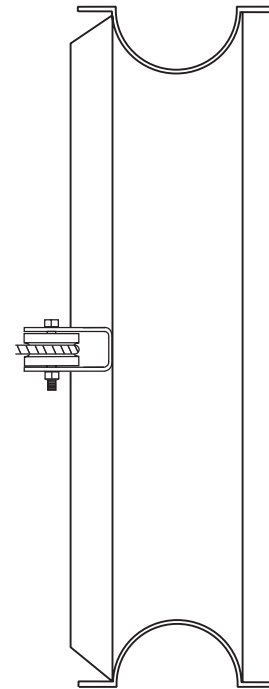
NOTE: All bolts used on the backstop frame require a 3/4" wrench or socket; height adjuster bolts require a 9/16" wrench or socket.

ASSEMBLY NOTE: When assembling Double-Drop H-Frame, rest the top-most Cross Brace on two overturned five gallon buckets; place the bottom Cross Brace on a four-wheeled cart or casters. This will allow for easier assembly and hoisting of the backstop.

① Bolt together H-Frame and attach Frame Hangers.

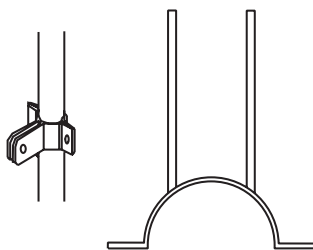


A0824 Cross Brace with Cable Thimble
(lowest cross brace)

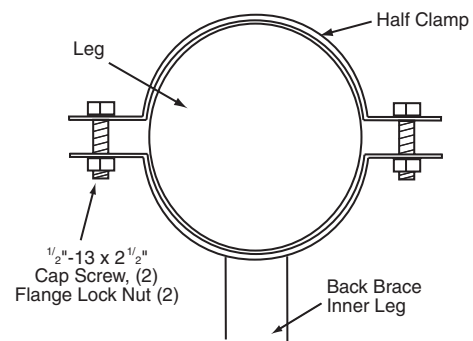


A0825 Cross Brace with Cable Sheave
("middle" cross brace—forms the center of the "H" and Brace)

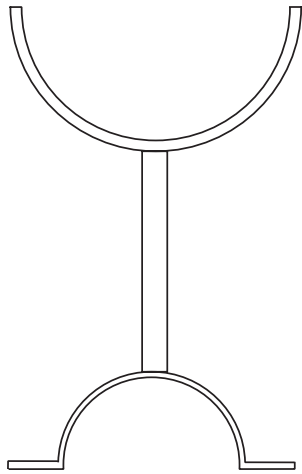
② Fasten Lower Jackknife Braces or Lower Front or Back Braces to H-Frame.



A0805 Lower Jackknife Hanger for DDTF-20/20J, DDTB-25
Back or Front Brace Hanger for DDTS-21.
(NOTE: One on each horizontal stem. Mount using half clamp.)



Lower Back Brace Hanger for DDTS-22
(NOTE: One on each horizontal stem)



A0822 Latch stop for Lower Jackknife on DDTF-20J.

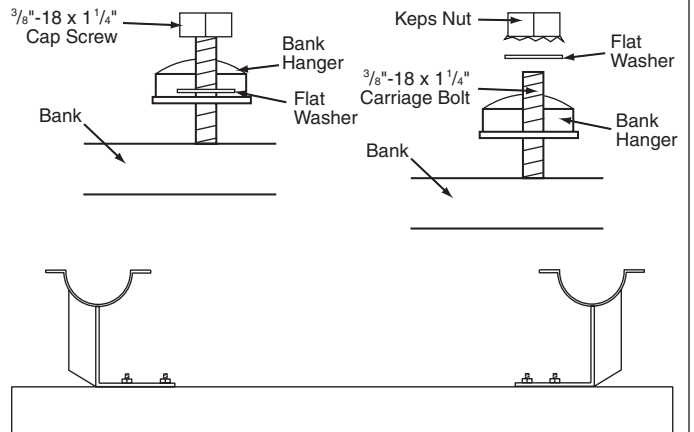
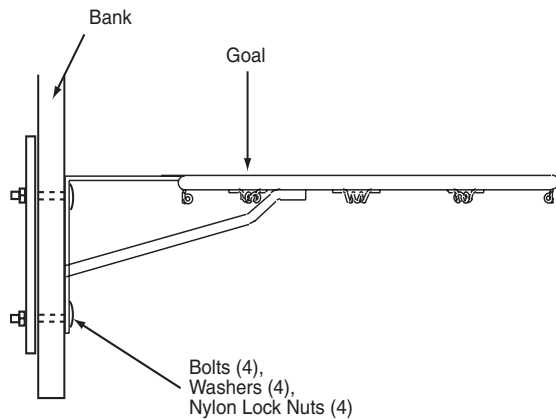
NOTE: Mount one on each leg of H-Frame using Half Clamp.
(For detail of how Stop will function, see DDTF-20J diagram, page 12)

⑦ Attach Bank and Goal

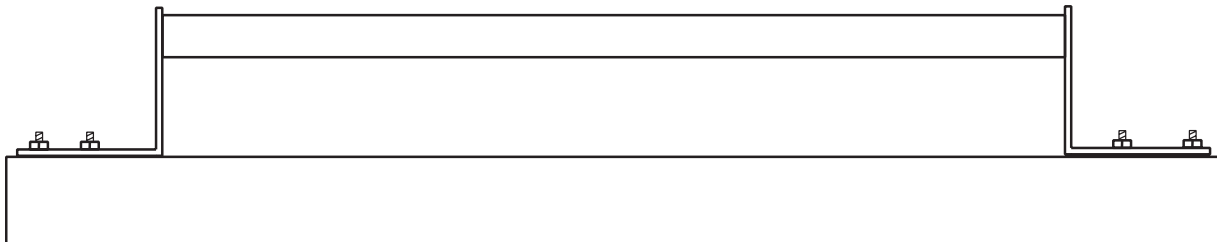
NOTE: Assemble bank/goal face down on sawhorses (use heavy blanket or other padding to protect from scratches).

- ① If mounting brackets are not already attached to bank, install 0022 Bank Brackets $\frac{1}{2}$ " from horizontal edges and $\frac{5}{8}$ " from vertical (top) edges, using $1\frac{1}{4}$ " Hex Head Self-tapping Screws.
- ② Place bolts into slots of top brackets (threads should be facing out).
- ③ Insert bolts into mounting holes on Bank Hangers and fasten using Flat Washers and Keps Nuts.
- ④ Place Goal in position (holes over holes).
- ⑤ Bolt Goal to Bank using $\frac{3}{8}$ " Carriage Bolts and Hex Nuts.

NOTE: Most glass banks come with studs protruding from the bottom two goal mounting holes. On these banks, secure using $\frac{3}{8}$ " lock nuts.



Bank Attachment using A0802 Bank Hangers
NOTE: Center Line of main frame to face of bank: Rect. Glass $7\frac{1}{2}$ ";
Rect. Wood $7\frac{5}{16}$ "



Bank Attachment using A4010056 Adapter

NOTE: When used with Rectangular Glass Bank, face of bank is $9\frac{9}{8}$ " from center of $2\frac{9}{8}$ " Drop Pipes.

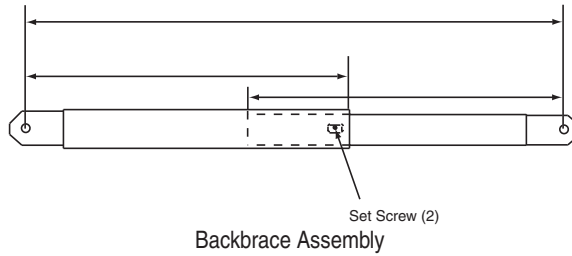
⑧ Hoist backstop into position and attach (see "Backstop Attachment" section).

NOTE: There are several ways to hoist the backstop into position, including use of an electric winch or block and tackle. When hoisting, one person should steady the backstop to prevent swaying.

⑨ Assemble/install Back/Front Brace or Jackknife.

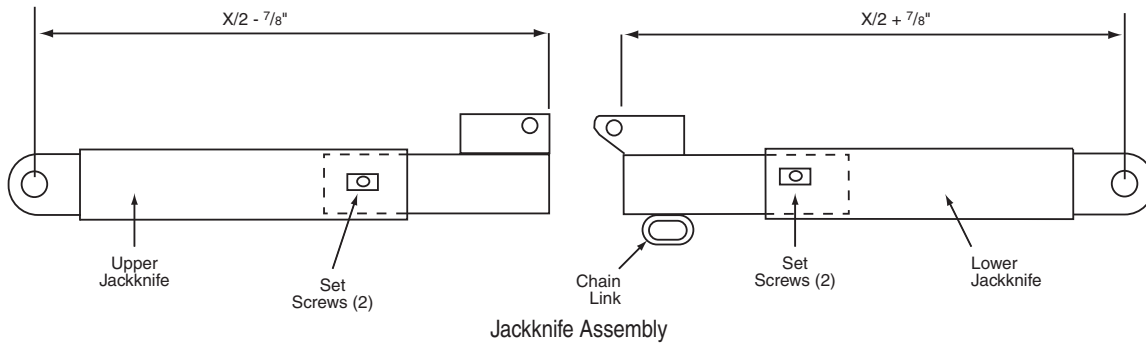
For Back Braces on DDTS-21 or DDTS-22:

Plumb backstop and measure "hole center to hole center" distances between Upper Back (or Front) Hangers or Wall Hangers and Lower Back (or Front) Brace Hangers on Drop Pipes. Assemble Braces to that length using set screws and stop nuts. Hoist and attach to Upper (or Wall) and Lower Hangers.



For Jackknives on DDTF-20J (also refer to diagram on page 12 for steps 2 and 3):

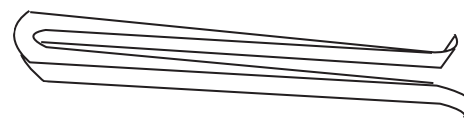
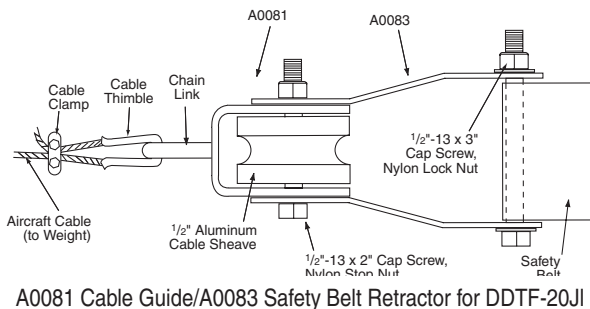
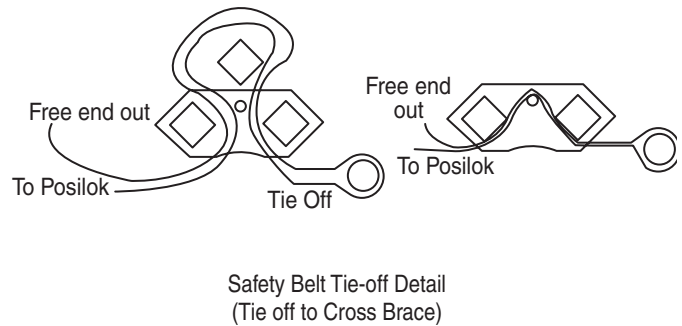
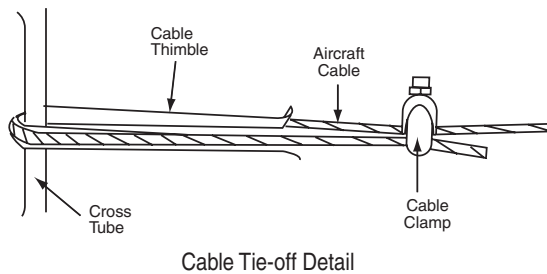
- ① Assemble two legs of each Jackknife using set screws, bolt together, then hoist and attach to upper hangers.
- ② Attach jackknives to Lower Hangers and extend until open end rests in Jackknife Stops. Tighten Set Screws.
- ③ Loosen Set Screws in long end of Jackknives, and adjust until Bank is plumb. Tighten Set Screws.



For Jackknives on all other folding models:

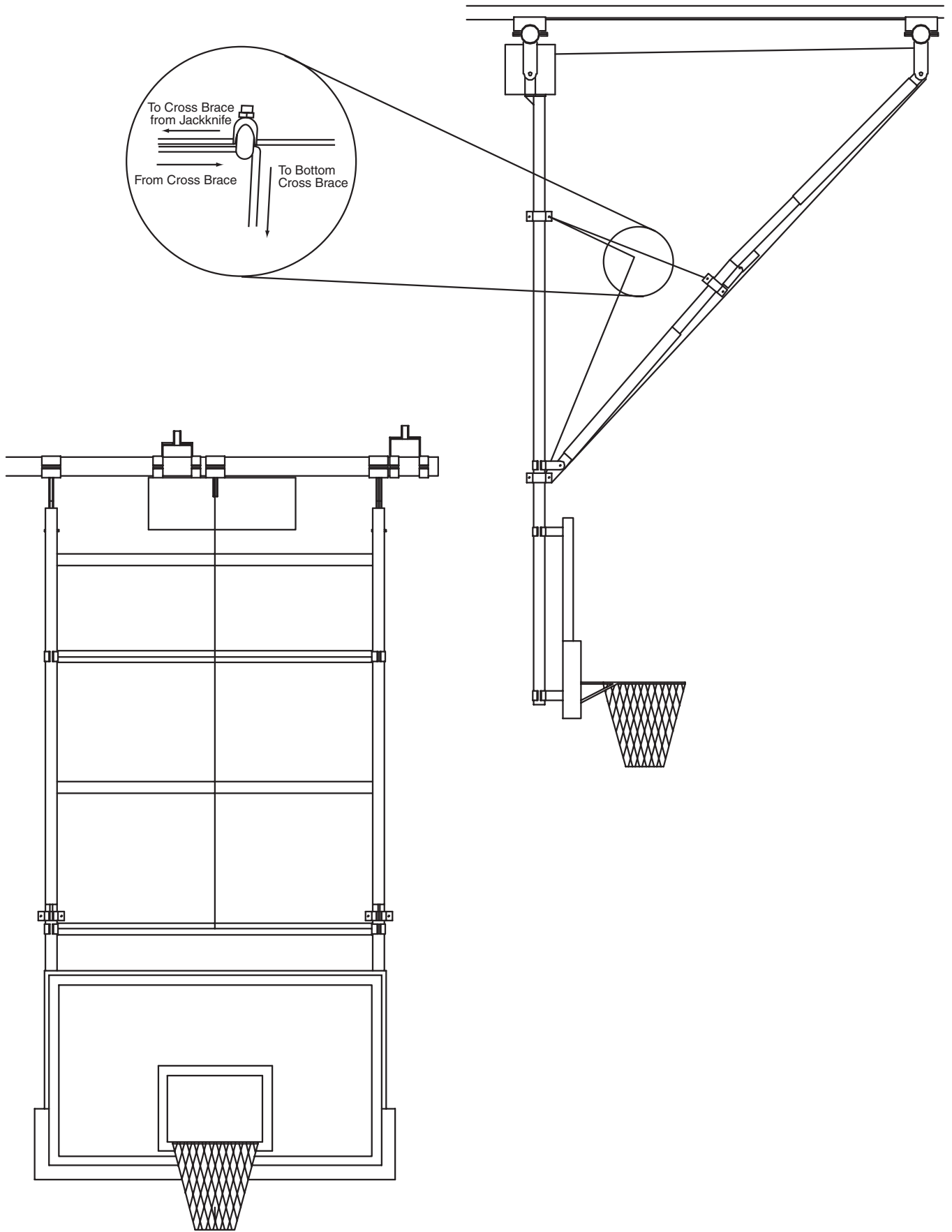
- ① Plumb backstop and measure "hole center to hole center" distances between Upper Back (or Front) Hanger or Wall Hangers and the middle-of-drop pipe (NOTE: This measurement should equal the hole center-to-hole center distance between the H-Frame Hangers and the Lower Jackknife Hangers). Divide this measurement (X) in half. Subtract 7/8" from one half of "X". This is the Upper Jackknife length. Add 7/8" to the other half of "X" to obtain the Lower Half length.
- ② Adjust Jackknife halves to proper length by loosening set screws, sliding inner tube in or out, and re-tightening set screws. Connect Jackknife halves.

⑩ For folding models, complete cable run and attach EZ-Lock Safety Belt.

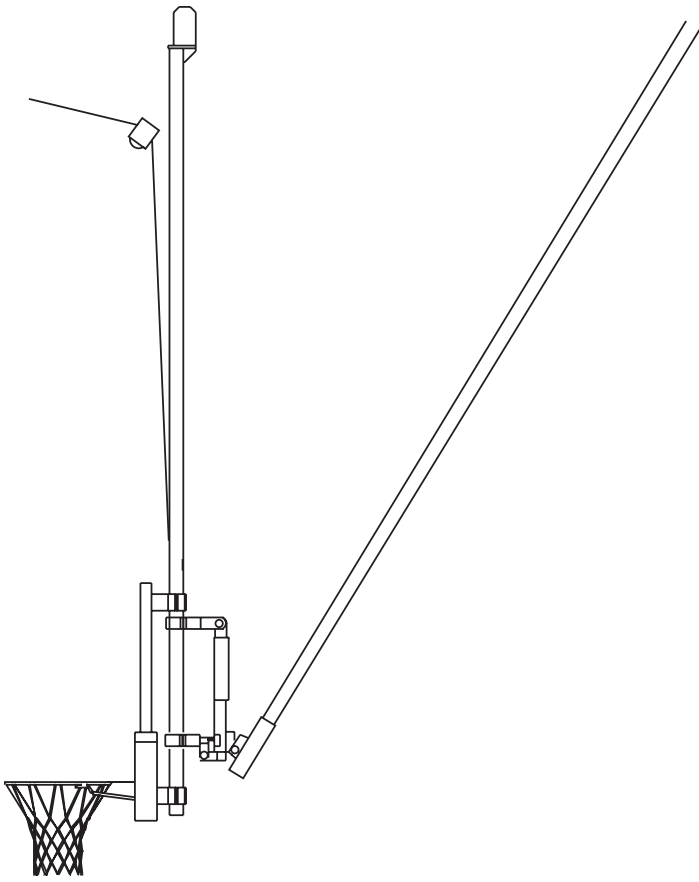


Cable Thimble
(Use anywhere aircraft cable will be passing through or tied off to an opening or chain link to prevent excessive wear. Install by using a wrench to gently tap open end through opening. Thread cable through groove.)

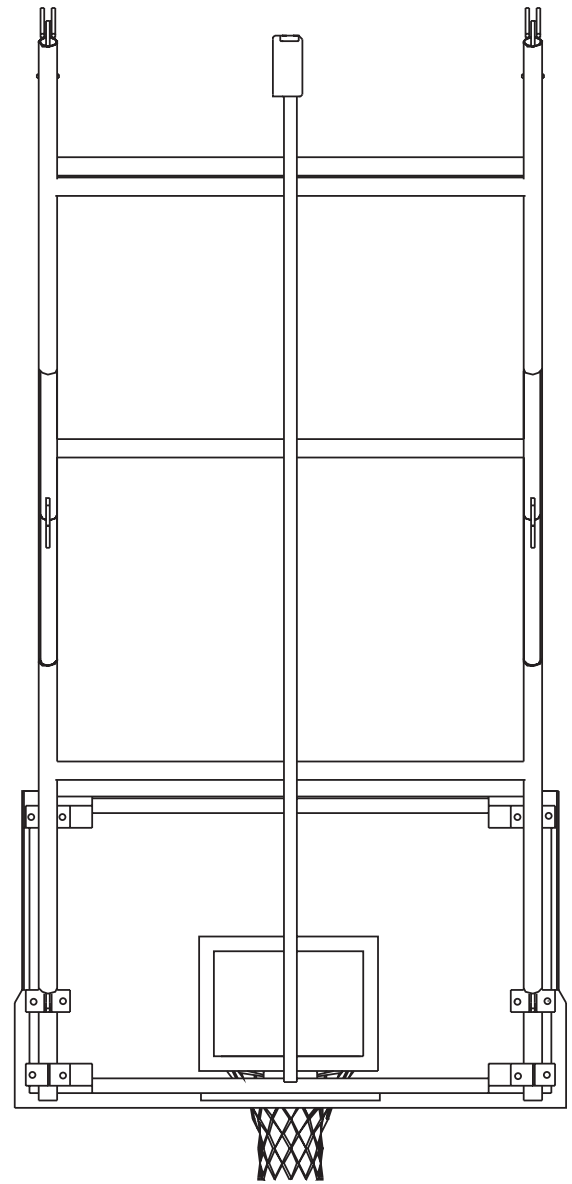
DDTF-20



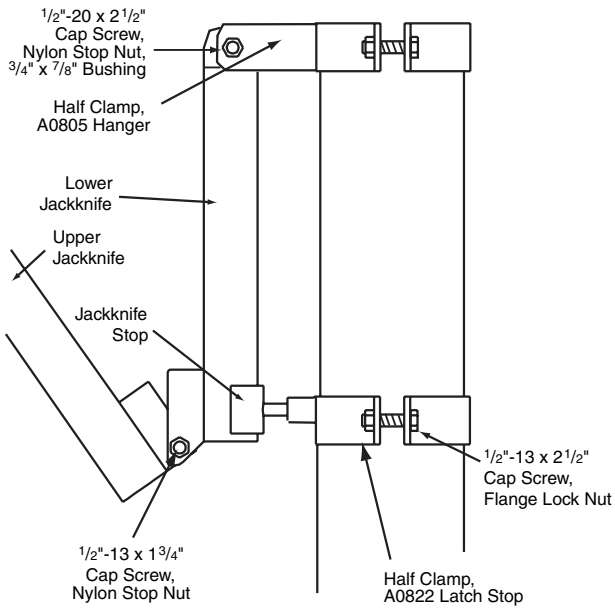
DDTF-20J



Side View

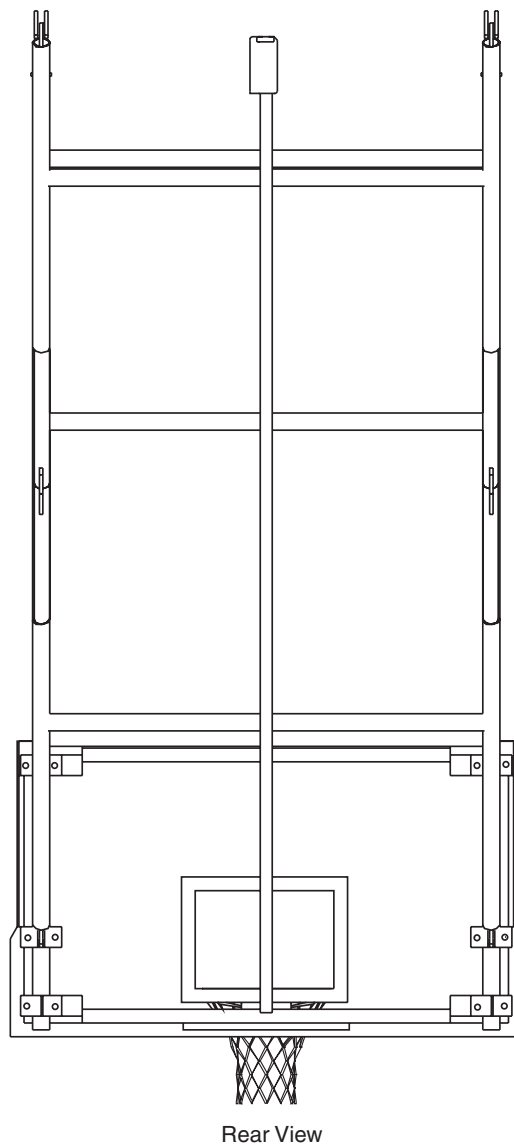
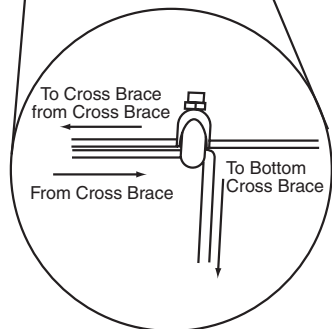
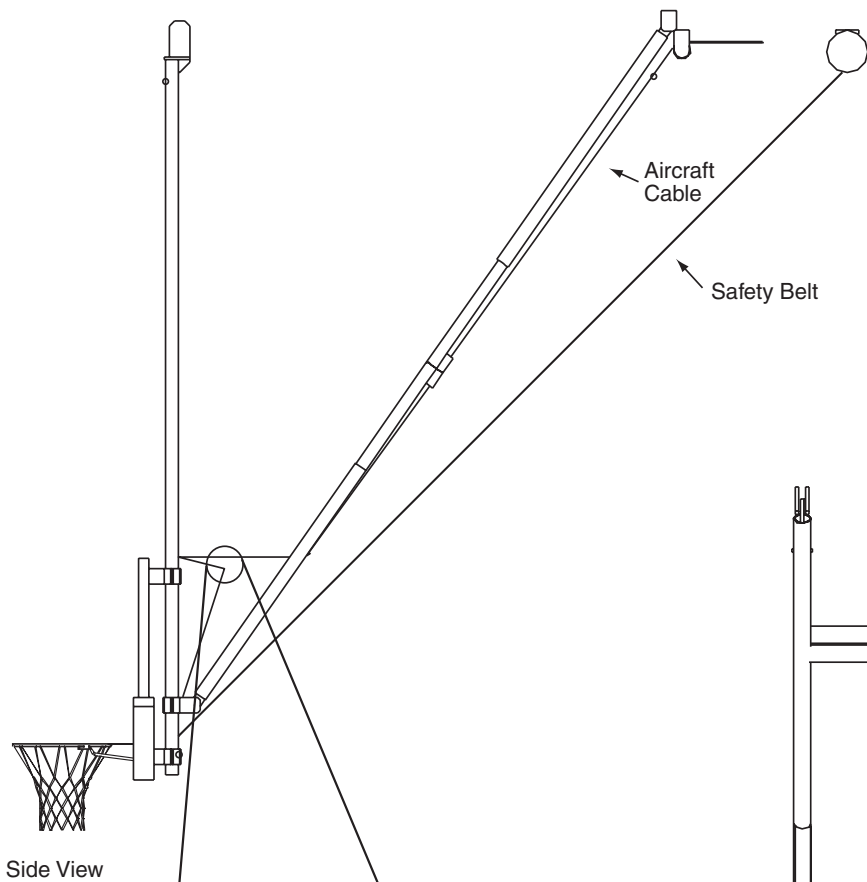


Rear View

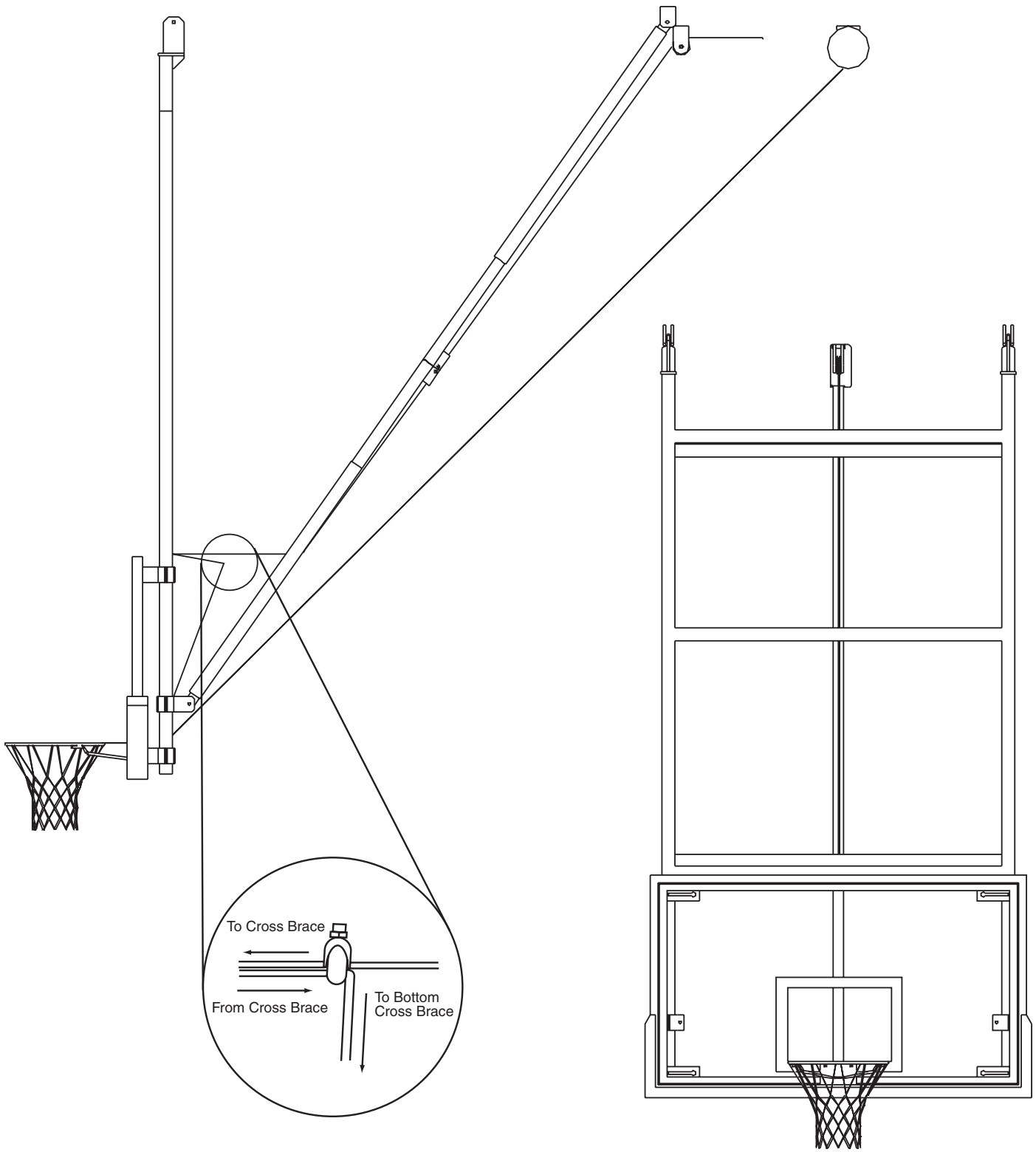


Jackknife Detail

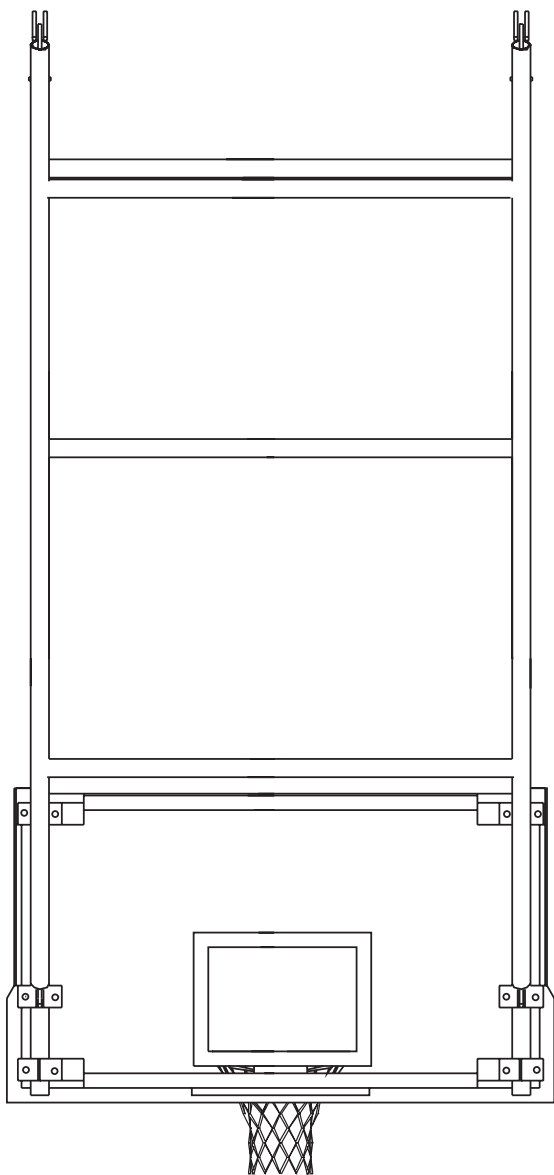
DDTB-25



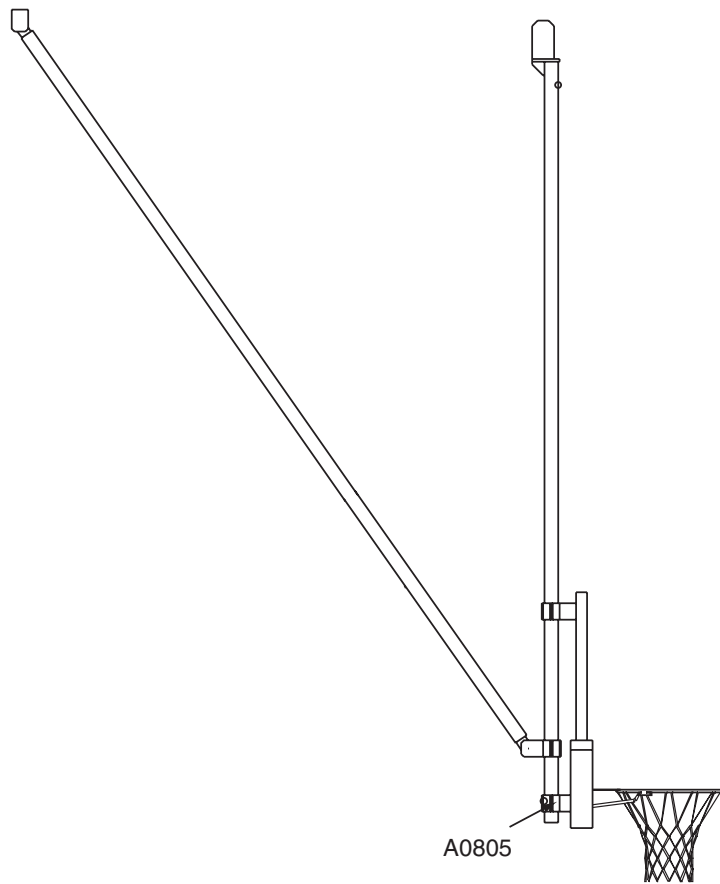
DDTB-25C



DDTS-21



Rear View



Side View

DDTS-22

