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Visit the GearBoss Shelving System web page at gearboss.com for more information.

Note: Please read and understand these instructions before starting the assembly or installation.

Note: If you need additional information, contact Wenger Corporation using the information below.

Important User Information

General

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In no event will Wenger Corporation be liable for technical or editorial omissions made herein, nor for direct, indirect, special, incidental, or consequential damages resulting from the use or defect of this manual.

The information in this document is not intended to cover all possible conditions and situations that might occur. The end user must exercise caution and common sense when assembling or installing Wenger Corporation products. If any questions or problems arise, call Wenger Corporation at 1-800-887-7145.

Manufacturer

The GearBoss® Shelving System is manufactured by:

Wenger Corporation
555 Park Drive
Owatonna, MN 55060
(800) 4WENGER (493-6437) • +1 (507) 455-4100
www.wengercorp.com

Intended Use

- This product is intended for indoor use in normal ambient temperature and humidity conditions — it must not be exposed to outside weather conditions.
- This product is intended to be assembled only as described in these instructions.

Warranty

This product is guaranteed free of defects in materials and workmanship for ten full years from date of shipment. A full warranty statement is available upon request.

Safety Precautions

Throughout this document you may find cautions and warnings which are defined as follows:

- **WARNING:** Failure to follow the instruction could result in serious injury or damage to property.
- **CAUTION:** Failure to follow the instruction could result in minor injury or damage to property.

Read all of these safety instructions before assembling and installing any equipment.

⚠ CAUTION

Make sure anyone assembling or installing the shelving system has read and understands these instructions.

⚠ CAUTION

Failure to comply with Warnings and Cautions in this document can result in damage to property or serious injury.

⚠ CAUTION

To avoid damage and injury, more than one person is needed for installation.

Before Installation

Overview

- The shelving system should be installed only by skilled technical persons, and only after carefully studying these instructions.
- It is suggested that the shelving system is setup in a space that is large enough to safely handle the cartons, parts and accessories.
- The shelving system must comply with local building regulations and codes.

Before You Begin

- Read the complete assembly procedure before beginning the assembly.
- Hardware packs may contain extra fasteners that may not be required with every installation.
- At least two people are required to install the shelving system.

General Usage

- Never place more than 250 lb (113 kg) on a single shelf.
- Never place more than 1000 lb (454 kg) on all shelves in a single 48" (1219 mm) section.
- Never hang from or climb on the shelving system.
- Always load items carefully, never throwing or dropping heavy items in place.
- Overloading or shock-loading shelves could cause a collapse, resulting in property damage or serious injury.

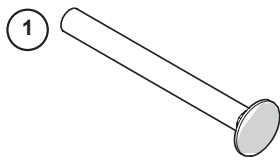
Maintenance

- Clean the shelving system with a mild detergent. Avoid using harsh or abrasive cleaning products.
- Check fasteners periodically to ensure they have not loosened or dislodged.

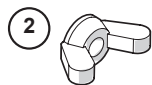
Required Tools

- Cordless drill
- Phillips drive bit
- 3/8" Hex nut drive bit
- 9/16" Combination wrench
- Carpenter's level
- Tape measure
- 50' chalk line
- Mallet
- C-clamps
- Impact driver (as required for anchors)
- Hammer drill (as required for anchors)
- Cement bits (as required for anchors)

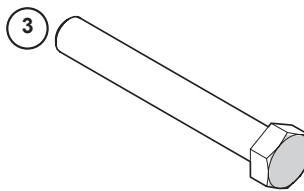
Supplied Fasteners



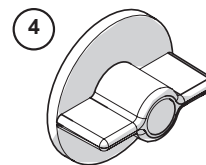
1/4-20 x 2-1/2"
Carriage Bolt



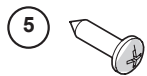
1/4-20
Wing Nut



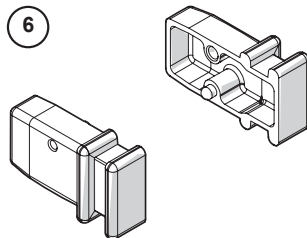
3/8-16 x 2-3/4"
Capscrew



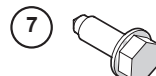
3/8-16
Wing Nut



#10-16 x 3/4"
Phillips Head Screw



Shelf Plug Halves



1/4-14 x 3/4"
Self-Tapping
Screw

Structural Fasteners - Not Supplied

Because materials and construction of floors and walls can vary, fasteners for attaching the shelving system to the structure are not provided.

The installer must choose the appropriate fastener and follow the manufacturer's instructions.

Note: Never use a hammer function when drilling into hollow concrete masonry units (CMU).

⚠ WARNING

Inferior or improperly installed fasteners could cause the shelving system to collapse.

Non-Seismic Floor Fastener Guidelines

Other fasteners may be used if the connection strength requirement is met.

- If the floor is wood construction, attachment by sheet metal or lag screws (#12 minimum with full penetration of solid sub floor) is acceptable.
- If the floor is concrete, attachment by 3/16" minimum concrete screw (Tapcon® type) with 1" minimum embedment is acceptable.

Structural Fasteners - Not Supplied (continued)

Non-Seismic Wall Fastener Guidelines

Note: Each bay of shelving requires no less than two wall anchors into solid material. Cumulative pull out values of bay wall fasteners shall exceed 750 lb per shelving bay.

Note: Lag screws require pilot holes.

- If the wall is wood stud-and-drywall construction, 1/4" minimum lag screws into every stud is acceptable. Thread penetration into each spruce-pine-fir (SPF) stud must be 2.17" minimum not including tapered lead in of the screw.

Example: stud framing with 5/8" drywall would require a lag screw of 3.5" min.

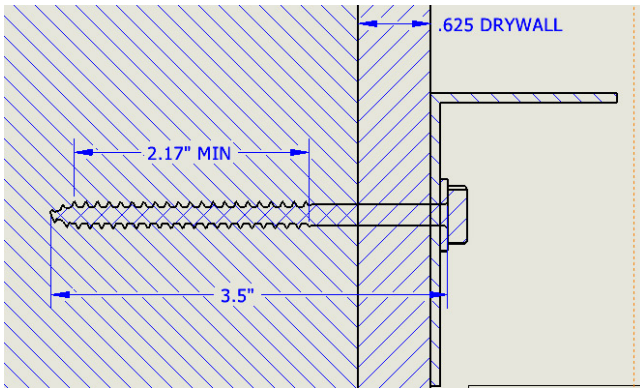


Table 11.2A Lag Screw Reference Withdrawal Design Values, W¹

Tabulated withdrawal design values (W) are in pounds per inch of thread penetration into side grain of wood member. Length of thread penetration in main member shall not include the length of the tapered tip (see 11.2.1.1).

Specific Gravity, G ²	Lag Screw Diameter, D										
	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"	1"	1-1/8"	1-1/4"
0.73	397	469	538	604	668	789	905	1016	1123	1226	1327
0.71	381	450	516	579	640	757	868	974	1077	1176	1273
0.68	357	422	484	543	600	709	813	913	1009	1103	1193
0.67	349	413	473	531	587	694	796	893	987	1078	1167
0.58	281	332	381	428	473	559	641	719	795	869	940
0.55	260	307	352	395	437	516	592	664	734	802	868
0.51	232	274	314	353	390	461	528	593	656	716	775
0.50	225	266	305	342	378	447	513	576	636	695	752
0.49	218	258	296	332	367	434	498	559	617	674	730
0.47	205	242	278	312	345	408	467	525	580	634	686
0.46	199	235	269	302	334	395	453	508	562	613	664
0.44	186	220	252	283	312	369	423	475	525	574	621
0.43	179	212	243	273	302	357	409	459	508	554	600
0.42	173	205	235	264	291	344	395	443	490	535	579
0.41	167	198	226	254	281	332	381	428	473	516	559
0.40	161	190	218	245	271	320	367	412	455	497	538
0.39	155	183	210	236	261	308	353	397	438	479	518
0.38	149	176	202	227	251	296	340	381	422	461	498
0.37	143	169	194	218	241	285	326	367	405	443	479
0.36	137	163	186	209	231	273	313	352	389	425	460
0.35	132	156	179	200	222	262	300	337	373	407	441
0.31	110	130	149	167	185	218	250	281	311	339	367

Note: specific gravity of SPF stud is .42

<https://awc.org/>

Structural Fasteners - Not Supplied (continued)

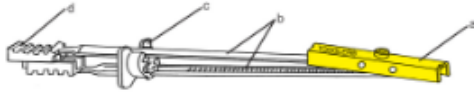
Non-Seismic Wall Fastener Guidelines (continued)

- If the wall is metal stud-and-drywall construction, 1/4" minimum SnapToggle® BB type anchors and bolts into every stud is acceptable.



SNAPTOGGLE® Heavy-Duty Toggle Bolts

Installation Data



a = anchoring channel / zinc-plated cold rolled steel or 304 series stainless steel
 b = straps / high-impact polystyrene / locking ratchet
 c = cap / translucent polypropylene copolymer
 d = ergonomic handle / same as straps

UNC - Imperial

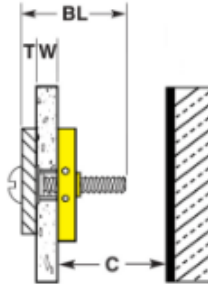
Steel Style	Stainless Style	Drill Bit Dia.	Thread Size (UNC)	Threads Per Anchor	Grip Range	Minimum Clearance
BA	BAS	1/2"	3/16 - 24	2.8	3/8" - 3-5/8"	1-7/8"
BB	BBS	1/2"	1/4 - 20	2.5	3/8" - 3-5/8"	1-7/8"
BE		3/4"	5/16 - 18	2.8	3/8" - 2-1/2"	1-7/8"
BC	BCS	3/4"	3/8 - 16	2.4	3/8" - 2-1/2"	1-7/8"
BD	BDS	3/4"	1/2 - 13	2.25	3/8" - 2-1/2"	1-7/8"
BAL*	BALS*	1/2"	3/16 - 24	2.8	2" - 9-1/2"	1-7/8"
BBL*	BBLS*	1/2"	1/4 - 20	2.5	2" - 9-1/2"	1-7/8"

*Long straps (L) for roofing and very thick walls or ceilings

Metric

Steel Style	Stainless Style	Drill Bit Dia.	Thread Size (ISO)	Threads Per Anchor	Grip Range	Minimum Clearance
BM5	BM5S	13mm	M5 x 0.8	3.8	10-92mm	48mm
BM6	BM6S	13mm	M6 x 1.0	3.1	10-92mm	48mm
BM8	BM8S	19mm	M8 x 1.25	3.1	10-64mm	48mm
BM10	BM10S	19mm	M10 x 1.5	2.75	10-64mm	48mm
BM5L*	BM5LS*	13mm	M5 x 0.8	3.8	51-240mm	48mm
BM6L*	BM6LS*	13mm	M6 x 1.0	3.1	51-240mm	48mm

*Long straps (L) for roofing and very thick walls or ceilings



C = 1-7/8" (48mm)
 BL = T + W + 1/2" (13mm)
 [For min. W & max. W, see "Grip Range" at left]

Performance Data

Ultimate Tensile Pull-Out Values (lbs.)

Anchor Type	Thread Size (UNC)	Drill Bit Dia.	1/2" Drywall	5/8" Drywall	*1/2" With 25 Gauge Stud	*5/8" With 25 Gauge Stud	Concrete Block	1/2" Steel Plate	Stainless in 1/2" Steel ³
BA	3/16 - 24	1/2"	238	356	412	462	802	918 ¹	1,193 ¹
BB	1/4 - 20	1/2"	265	356	425	464	1,080	1,288 ²	1,735 ¹
BE	5/16 - 18	3/4"	270	480	439	480	1,400	1,680	2,118
BC	3/8 - 16	3/4"	275	576	466	576	1,745	1,692	2,523 ¹
BD	1/2 - 13	3/4"	275	576	468	576	**2,038 ¹	2,605	3,150

¹ Failure measured as breakage of drywall portion

** Failure of block

¹ Stainless steel bolts used

² Hardened bolts used

³ Stainless steel channel tested with stainless bolts in 1/2" steel plate

Ultimate Shear (lbs.)

Anchor Type	Thread Size (UNC)	Drill Bit Dia.	1/2" Drywall	5/8" Drywall
BA	3/16 - 24	1/2"	247	298
BB	1/4 - 20	1/2"	241	324
BC	3/8 - 16	3/4"	292	406

Notes:

- Industry standards recommend 1/4 of ultimate test load.
- Holding strength for a SnapToggle heavy-duty hollow-wall anchor varies directly with the strength and condition of the substrate and the bolt size—and inversely with variations in hole diameter and the distance of the load from the wall.
- All figures in pounds. Pull-out values based on independent laboratory tests done according to U.S. Government standards. They should be used as guides only and cannot be guaranteed. The age, condition, and capacity of the substrate must be considered.

Structural Fasteners - Not Supplied (continued)

Non-Seismic Wall Fastener Guidelines (continued)

- If the wall is concrete block (CMU) construction (hollow), 1/4" minimum Tapcon® hex HD concrete screws, spaced no more than 16" apart (three per bay minimum) is acceptable.

Note: Never use a hammer function when drilling into hollow CMU.



ULTIMATE TENSION AND SHEAR VALUES (LBS/KN) IN CONCRETE

ANCHOR DIA In.(mm)	MIN. DEPTH OF EMBEDMENT In.(mm)	f' c = 2000 PSI (13.8 MPa)		f' c = 3000 PSI (20.7 MPa)		f' c = 4000 PSI (27.6 MPa)		f' c = 5000 PSI (34.5 MPa)	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/16 (4.8)	1 (25.4)	600 (2.7)	720 (3.2)	625 (2.8)	720 (3.2)	650 (2.9)	720 (3.2)	800 (3.6)	860 (3.8)
	1-1/4 (31.8)	845 (3.7)	720 (3.2)	858 (3.8)	720 (3.2)	870 (3.9)	720 (3.2)	1,010 (4.5)	860 (3.8)
	1-1/2 (38.1)	1,090 (4.8)	860 (3.8)	1,090 (4.8)	860 (3.8)	1,090 (4.8)	860 (3.8)	1,220 (4.8)	860 (3.8)
	1-3/4 (44.5)	1,450 (6.5)	870 (3.9)	1,455 (6.5)	870 (3.9)	1,460 (6.5)	990 (4.4)	1,730 (7.7)	990 (4.4)
1/4 (6.4)	1 (25.4)	750 (3.3)	900 (4.0)	775 (3.4)	900 (4.0)	800 (3.6)	1,360 (6.1)	950 (4.2)	1,440 (6.4)
	1-1/4 (31.8)	1,050 (4.7)	900 (4.0)	1,160 (5.2)	900 (4.0)	1,270 (5.6)	1,360 (6.1)	1,515 (6.7)	1,440 (6.4)
	1-1/2 (38.1)	1,380 (6.1)	1,200 (5.3)	1,600 (7.2)	1,200 (5.3)	1,820 (8.1)	1,380 (6.1)	2,170 (9.7)	1,670 (7.4)
	1-3/4 (44.5)	2,020 (9.0)	1,670 (7.4)	2,200 (9.8)	1,670 (7.4)	2,380 (10.6)	1,670 (7.4)	2,770 (12.3)	1,670 (7.4)

Safe working loads for single installation under static loading should not exceed 25% of the ultimate load capacity.

ULTIMATE TENSION AND SHEAR VALUES (LBS/KN) IN HOLLOW BLOCK

ANCHOR DIA In.(mm)	ANCHOR EMBEDMENT In.(mm)	LIGHTWEIGHT BLOCK		MEDIUM WEIGHT BLOCK	
		TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/16 (4.8)	1 (25.4)	220 (1.0)	400 (1.8)	340 (1.5)	730 (3.2)
1/4 (6.4)	1 (25.4)	250 (1.1)	620 (1.8)	500 (2.2)	1,000 (4.4)

Safe working loads for single installation under static loading should not exceed 20% of the ultimate load capacity.
NOTE: 3/16" Tapcon requires 5/32" bit, 1/4" Tapcon requires 3/16" bit.



ALLOWABLE EDGE AND SPACING DISTANCES

PARAMETER	ANCHOR DIA. In.(mm)	NORMAL WEIGHT CONCRETE			CONCRETE MASONRY UNITS (CMU)		
		FULL CAPACITY (Critical Distance Inches)	REDUCED CAPACITY (Minimal Distance Inches)	LOAD REDUCTION FACTOR	FULL CAPACITY (Critical Distance Inches)	REDUCED CAPACITY (Minimal Distance Inches)	LOAD REDUCTION FACTOR
Spacing Between Anchors - Tension	3/16	3	1-1/2	0.73	3	1-1/2	1.00
	1/4	4	2	0.66	4	2	0.84
Spacing Between Anchors - Shear	3/16	3	1-1/2	0.83	3	1-1/2	1.00
	1/4	4	2	0.82	4	2	0.81
Edge Distance - Tension	3/16	1-7/8	1	0.83	3	2	0.91
	1/4	2-1/2	1-1/4	0.82	4	2	0.81
Edge Distance - Shear	3/16	2-1/4	1-1/8	0.70	3	2	0.93
	1/4	3	1-1/2	0.59	4	2	0.80

<https://www.tapcon.com/>

Structural Fasteners - Not Supplied (continued)

Non-Seismic Wall Fastener Guidelines (continued)

- If the wall is concrete block (CMU) construction (core filled), 1/4" (6 mm) minimum Tapcon® hex HD concrete screws, spaced no more than 16" apart is acceptable.
- If the wall is poured concrete construction, 1/4" min wedge/expansion-type concrete anchors, spaced no more than 24" apart is acceptable.



INSTALLATION PARAMETERS

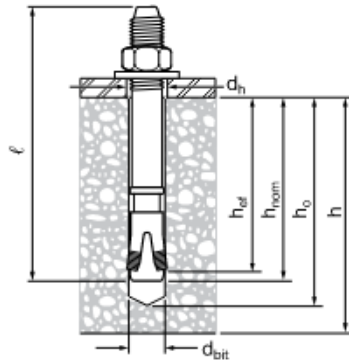


Figure 1 - KWIK Bolt 3 installation

Table 2 - Hilti KWIK Bolt 3 specifications

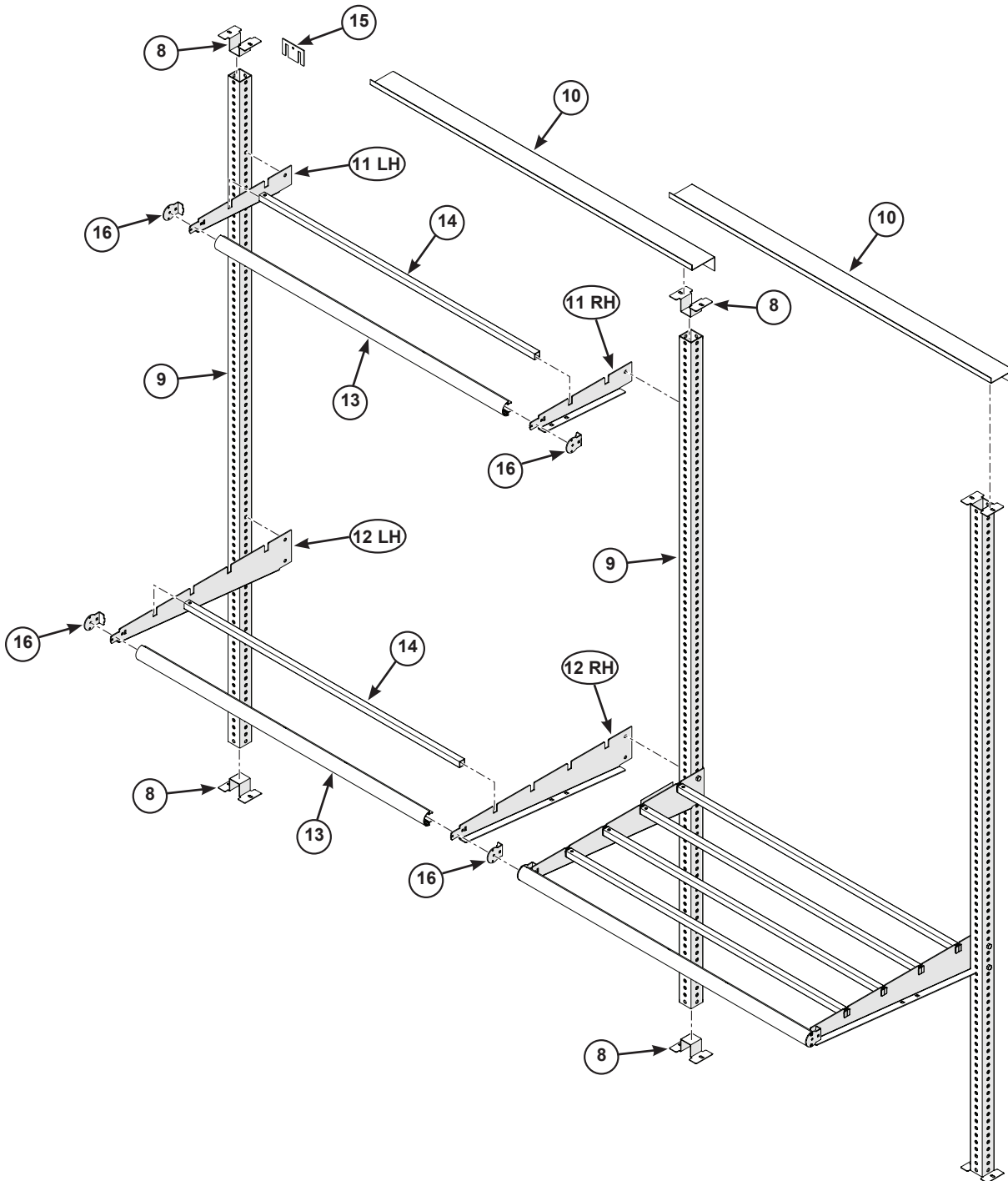
Setting information	Symbol	Units	Nominal anchor diameter									
			1/4	3/8	1/2		5/8		3/4		1	
Drill bit dia.	d_{bit}	in.	1/4	3/8	1/2		5/8		3/4		1	
Minimum nominal embedment	h_{nom}	in. (mm)	1-3/4 (44)	2-3/8 (60)	2-1/4 (57)	3-5/8 (92)	3-1/2 (89)	4-3/8 (111)	4-1/4 (108)	5-5/8 (143)	4-5/8 117	6-3/8 162
Minimum effective embedment	h_{ref}	in. (mm)	1-1/2 (38)	2 (51)	2 (51)	3-1/4 (83)	3-1/8 (79)	4 (102)	3-3/4 (95)	5 (127)	4 (102)	5-3/4 (146)
Minimum hole depth	h_o	in. (mm)	2 (51)	2-5/8 (67)	2-5/8 (67)	4 (102)	3-7/8 (98)	4-3/4 (121)	4-1/2 (114)	5-3/4 (146)	5 (127)	6-3/4 (171)
Fixture hole dia.	d_h	in.	5/16	7/16	9/16		11/16		13/16		1-1/8	
Anchor length	l		See ordering information									
Installation torque concrete	T_{ref}	ft-lb (Nm)	4 (5)	20 (27)	40 (54)		60 (81)		110 (149)		150 (203)	
Installation torque masonry	T_{ref}	ft-lb (Nm)	4 (5)	15 (20)	25 (34)		65 (88)		120 (163)		not recommended	
Wrench size		in.	7/16	9/16	3/4		15/16		1-1/8		1-1/2	

1 For more information, see ESR-1385 and section 3.3.8.3.3. Approval value are for carbon steel anchors only.

<https://www.hilti.com/>

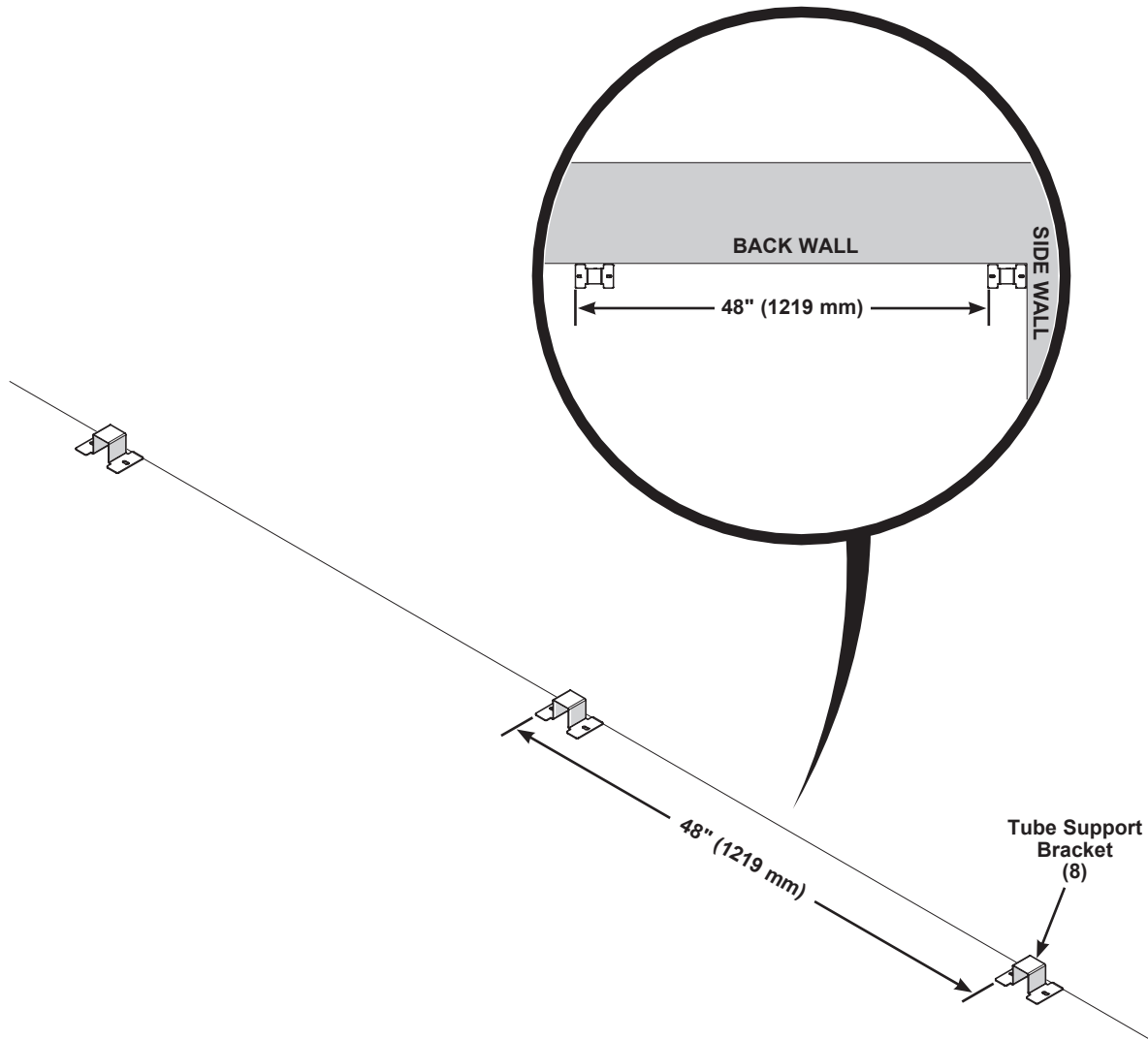
Shelving System Components

Item	Description	Item	Description
8	Unit Tube Support Bracket	13	Shelf Extrusion
9	Vertical Tube	14	Shelf Tube
10	Shelf Support Bracket	15	Shelf Marking Tool
11	17-1/2" (445 mm) Shelf Bracket (LH & RH)	16	Extrusion Cap Bracket
12	30-1/2" (775 mm) Shelf Bracket (LH & RH)		



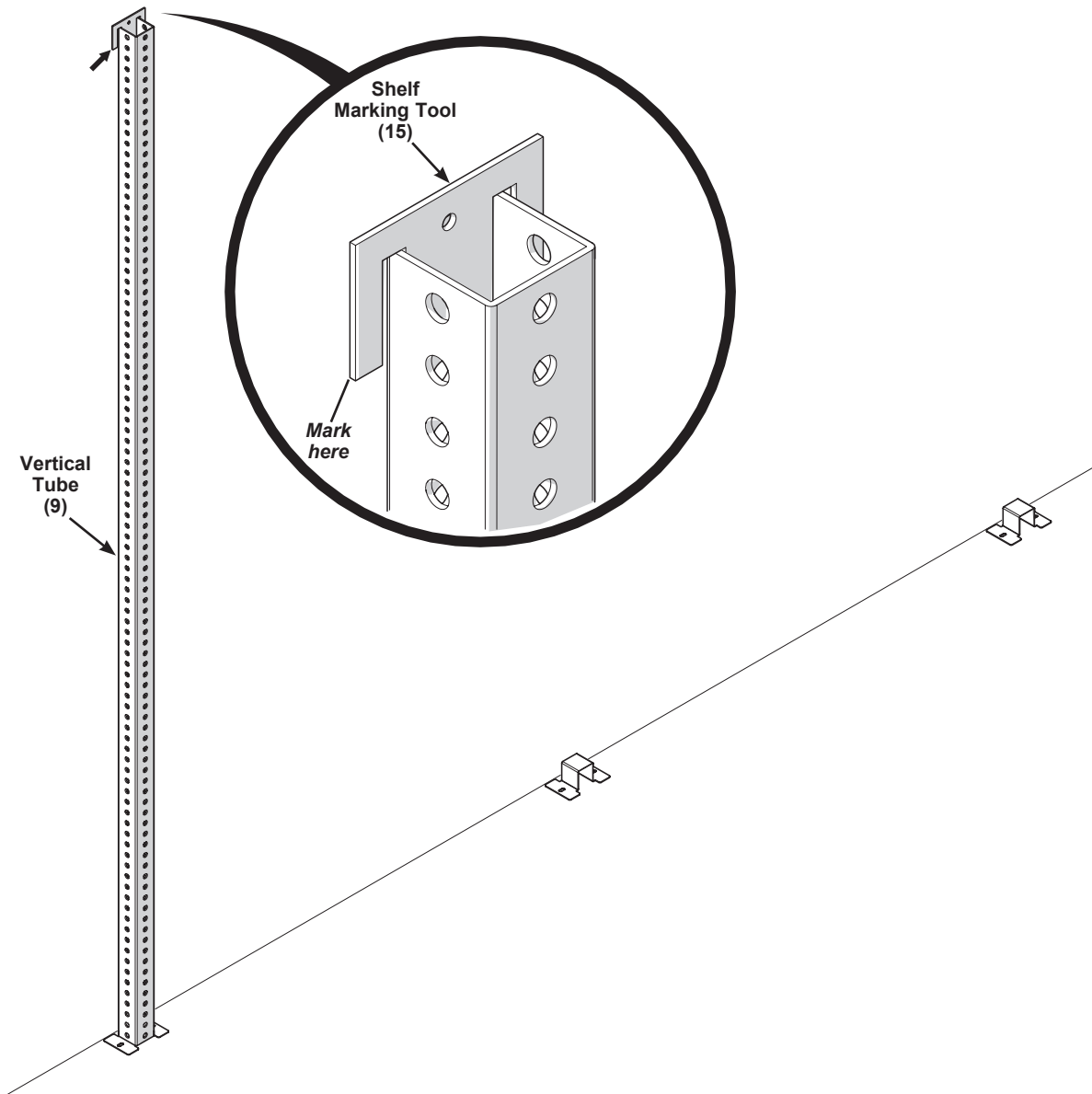
Installation

1. Attach tube support brackets (8) to the floor to support the vertical tubes (9). Brackets are typically spaced 48" (1219 mm) apart as shown. Custom widths are available.
 - a. See the installation drawings for bracket locations.
 - b. Measure and mark the location of each bracket. The brackets must be tight against the back wall (against the side wall if starting in a corner).
 - c. Attach the brackets to the floor using the appropriate fasteners and method described in the "Structural Fasteners - Not Supplied" section.



Installation (continued)

2. To determine the height for the shelf support brackets (10):
 - a. Place a vertical tube (9) onto the first floor mounted bracket and position it to be flush against the wall.
 - b. Position the shelf marking tool (15) onto the vertical tube and mark the wall at the bottom corner as shown.
 - c. Continue marking the locations at all the floor mounted brackets.

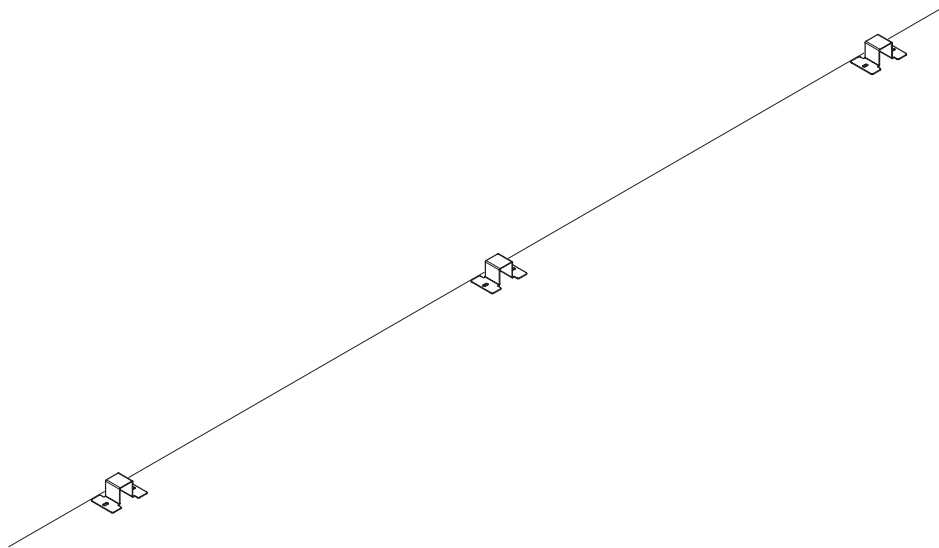
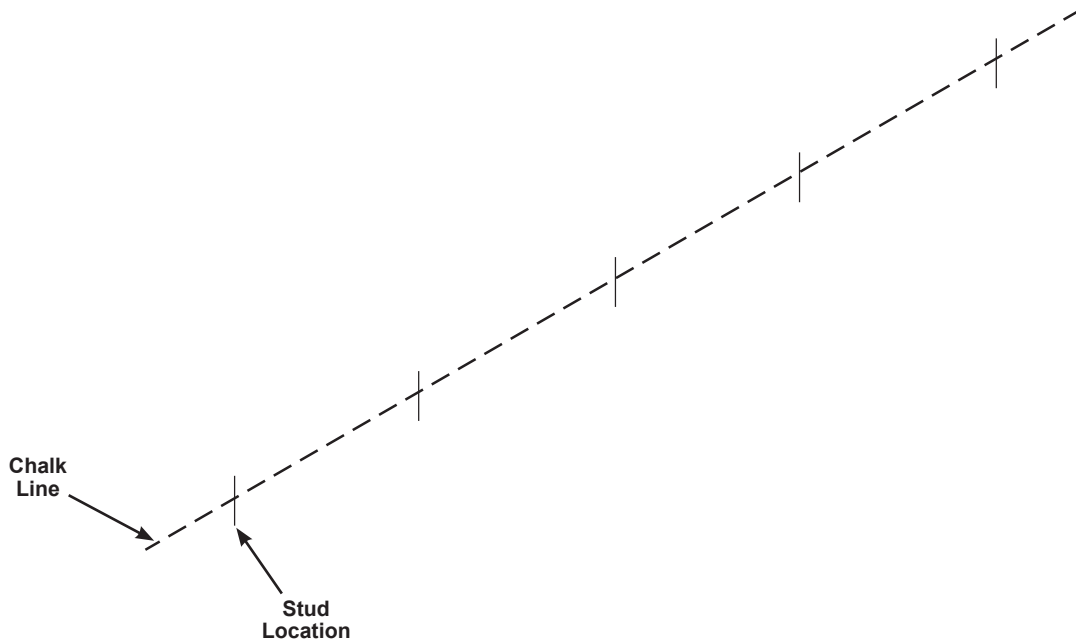


Installation (continued)

3. Snap a chalk line across the wall marks.

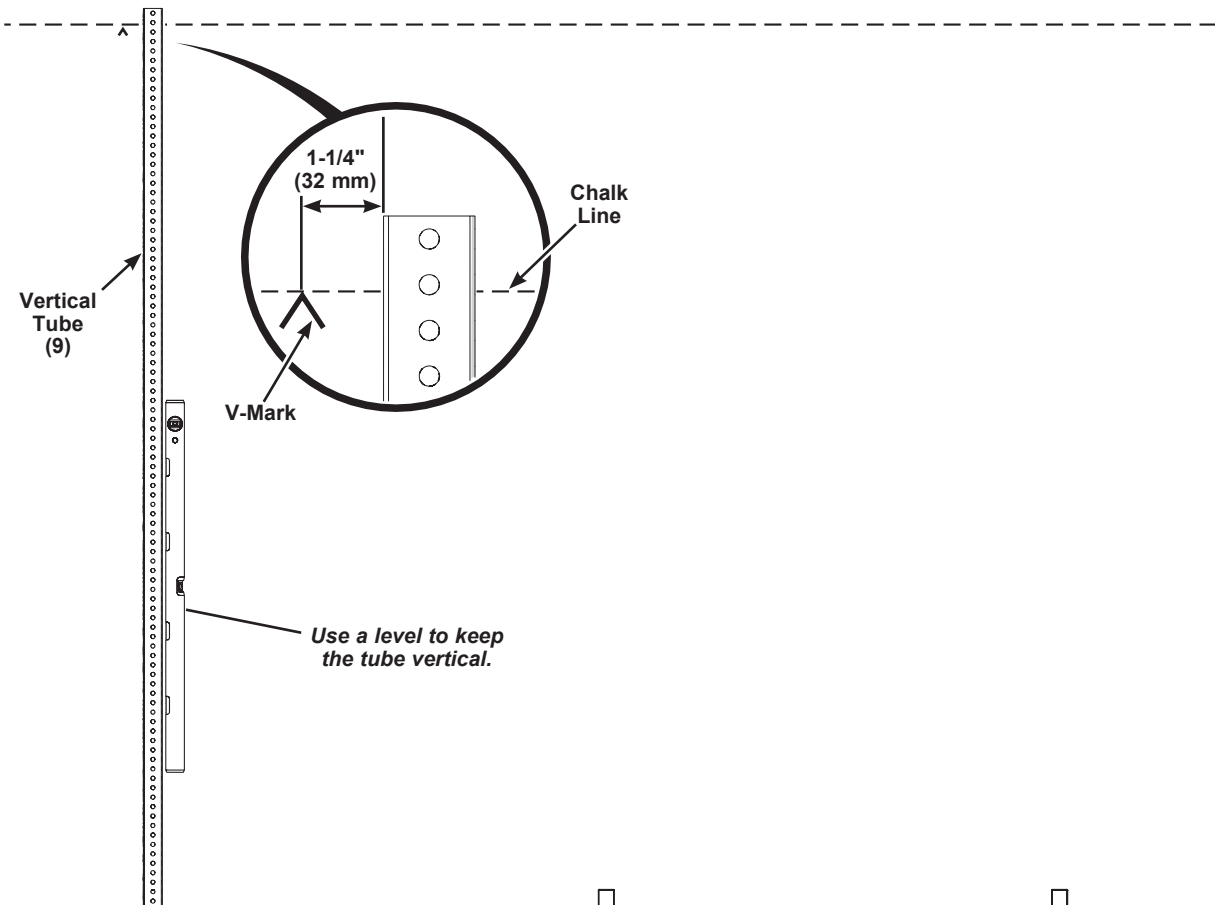
Note: If there is more than 1" (25 mm) discrepancy between the chalk line and the lowest mark, contact Wenger for further instructions.

Note: If the wall is stud construction, mark the location of each stud along the chalk line.



Installation (continued)

4. Mark the first shelf support bracket (10) location.
 - a. Place a vertical tube (9) onto the first floor mounted bracket and position it to be flush against the wall. Use a level to keep the tube vertical and make a v-mark on the chalk line 1-1/4" (32 mm) to the left of the tube.
 - b. Remove the vertical tube from the floor mounted bracket.



Installation (continued)

5. Mount the shelf support brackets (10) to the wall.

- a. Hold the first shelf support bracket with the bottom edge on the chalk line and the left edge even with the v-mark.

If the wall is masonry construction, locate the first bracket here.

If the wall is stud construction, move the bracket to the left until the punched holes align with the stud locations or new holes can be drilled to align with the studs.

A fastener must be installed in every stud.

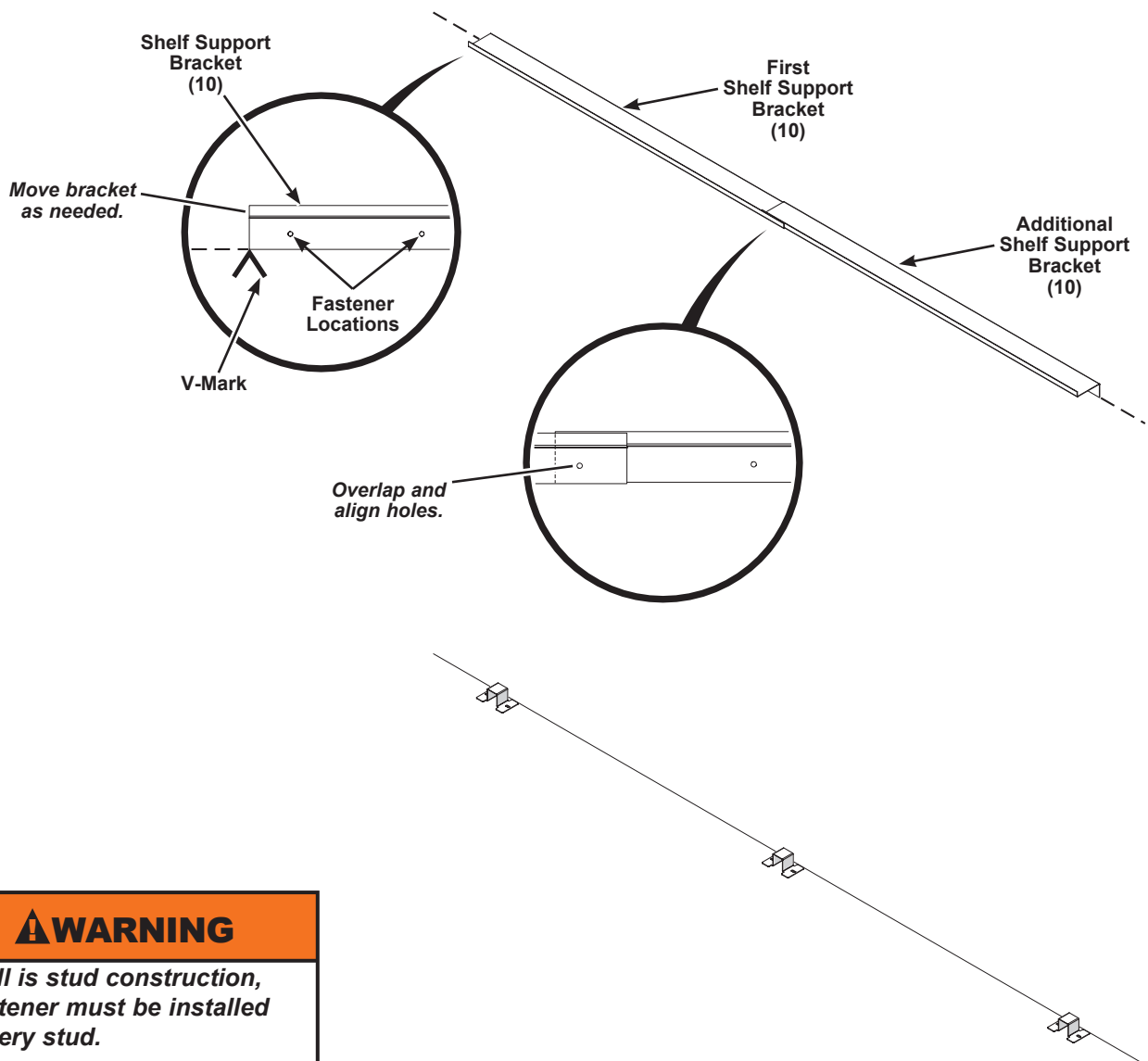
- b. Attach the first shelf support bracket to the wall using the appropriate fasteners and method described in the "Structural Fasteners - Not Supplied" section.

Leave the last hole open to attach additional support brackets.

- c. Attach additional shelf support brackets to span the entire run of the shelving system.

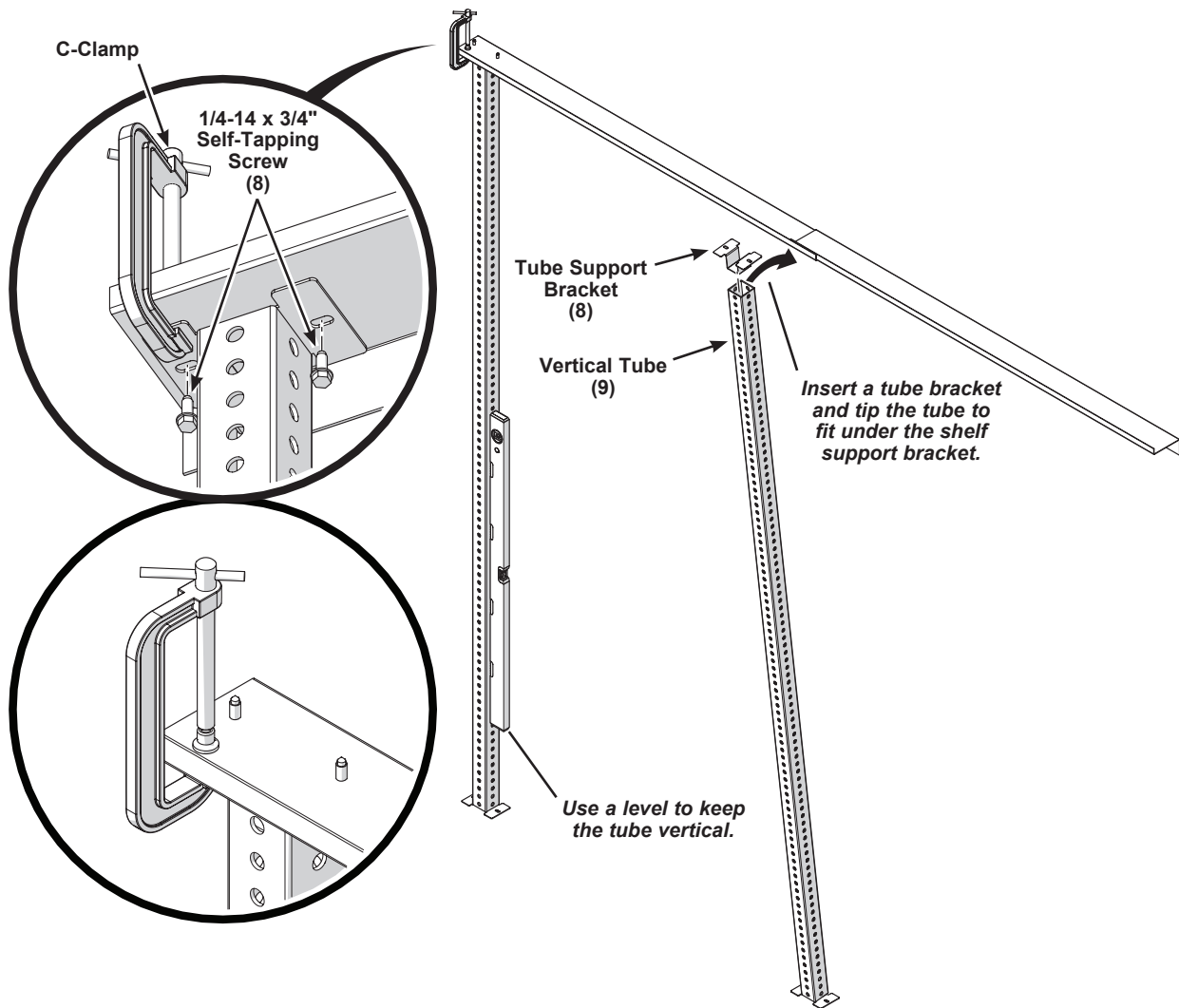
Each new bracket must overlap the previous one to align the holes.

If the last bracket is too long, it may be cut off 1" (25 mm) past the last vertical tube.



Installation (continued)

6. Attach the top tube support brackets (8).
 - a. Place a tube support bracket (8) at the top of a vertical tube (9).
 - b. Fit the vertical tube onto the floor mounted support bracket and tip the tube to fit under the shelf support bracket.
 - c. Use a level to sure that the tube is vertical in both directions.
 - d. Clamp the tube support bracket to the shelf support bracket.
 - e. Secure the tube support bracket to the shelf support bracket using two 1/4-14 x 3/4" self-tapping screws (7).
 - f. Repeat the above steps to install the remaining vertical tubes.



Installation (continued)

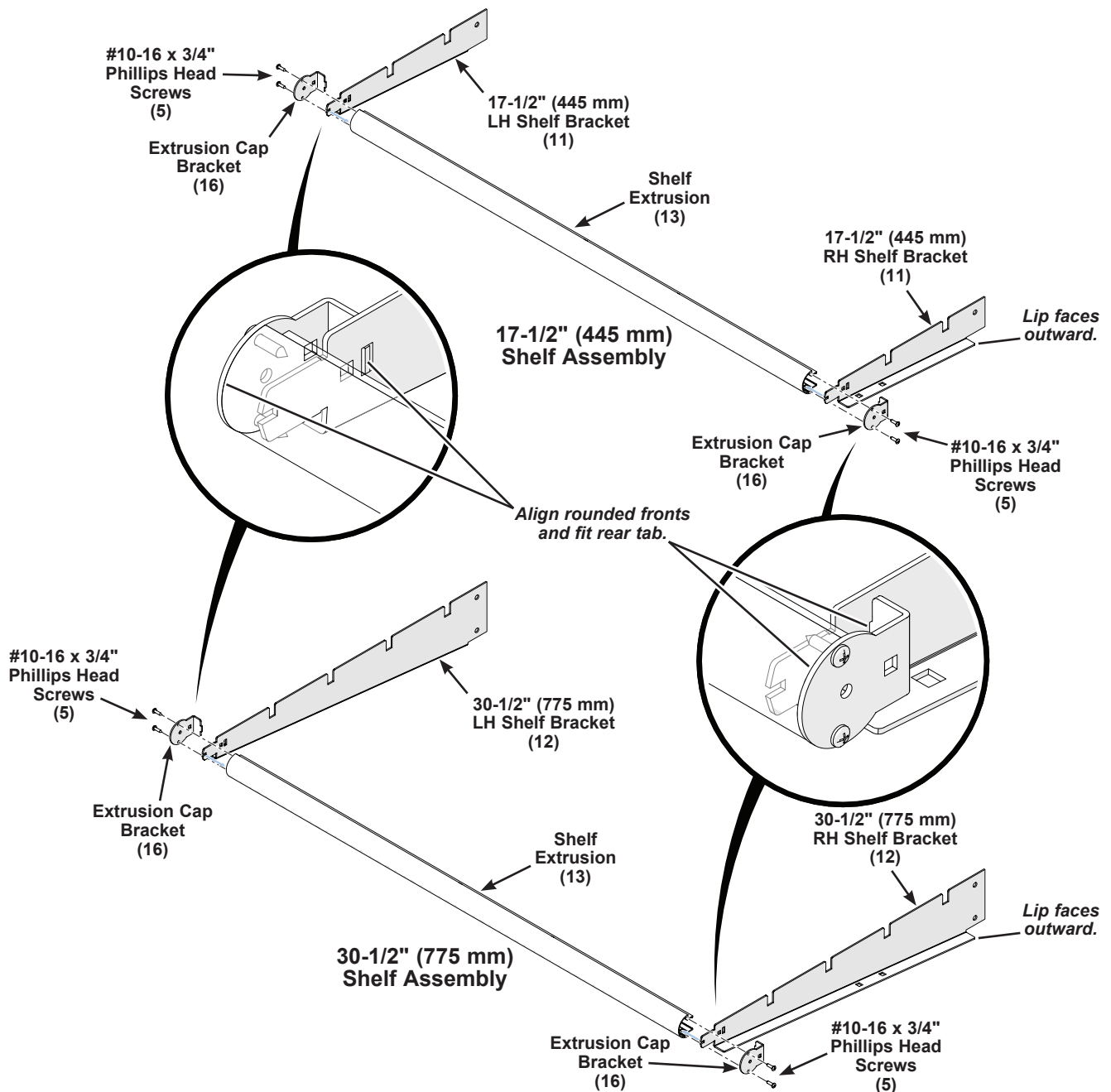
7. Assemble the shelves.

Shelves are available in two depths.

Narrower shelves use 17-1/2" (445 mm) shelf brackets (11).

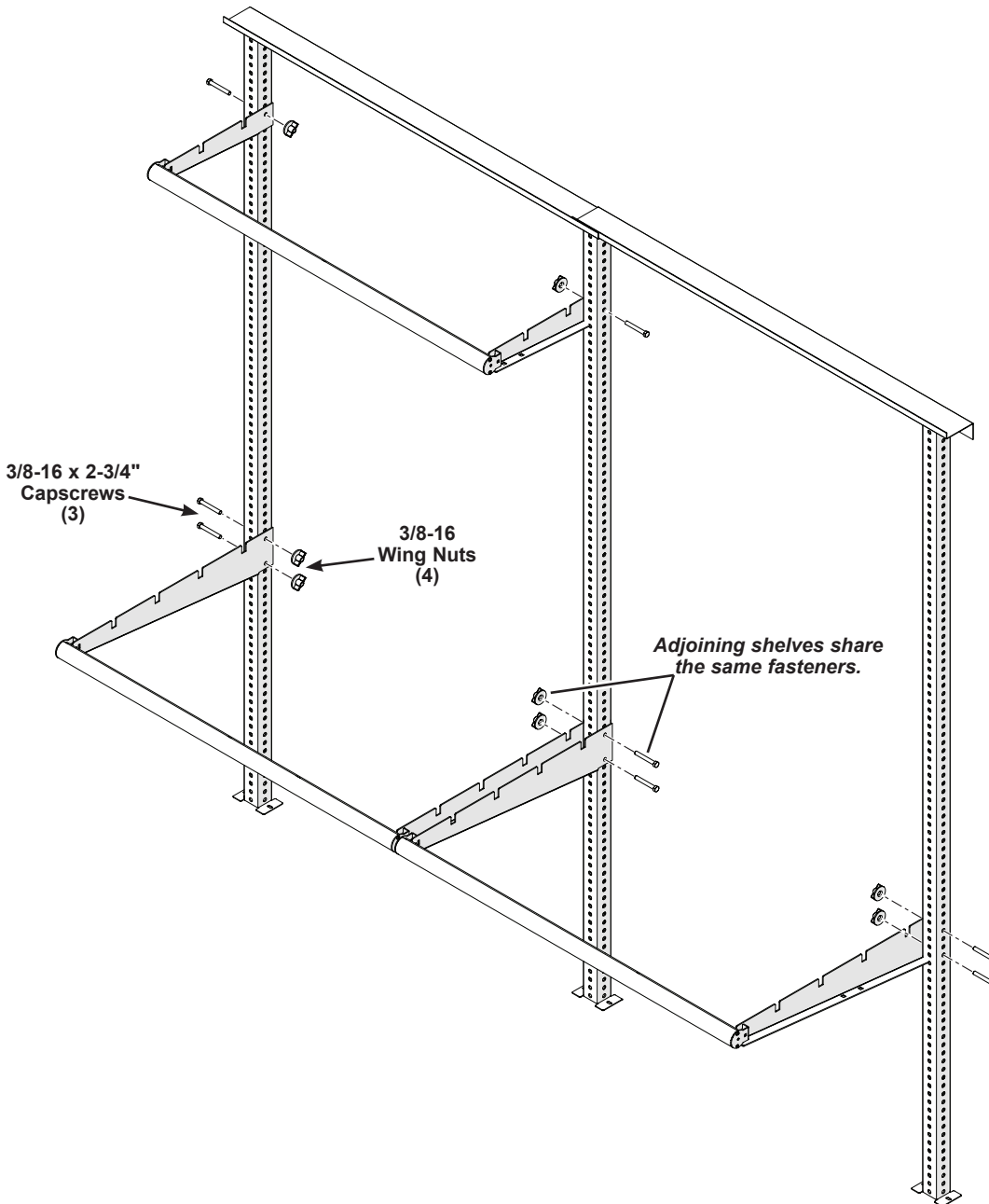
Deeper shelves use 30-1/2" (775 mm) shelf brackets (12).

- With the formed lip facing outward, slide both a left hand (LH) and right hand (RH) shelf bracket into the appropriate end of the shelf extrusion (13).
- Fit an extrusion cap bracket (16) onto both ends of the shelf extrusion. The rounded fronts must be flush with the tab at the back fitting into the cutout in the shelf bracket as shown.
- Secure the extrusion cap brackets to the shelf extrusion using two #10-16 x 3/4" phillips head screws (5) on each side.



Installation (continued)

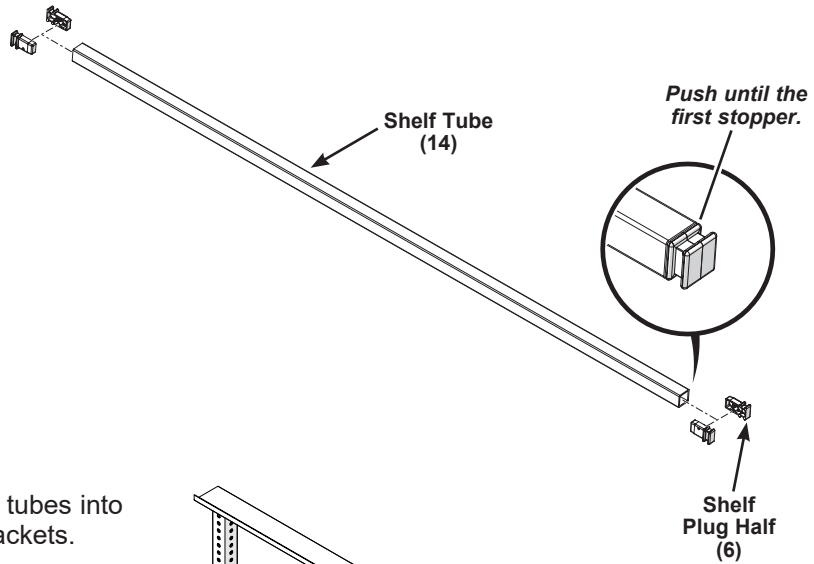
8. Attach the shelves.
 - a. Attach shelves to the vertical tubes using two 3/8-16 x 2-3/4" capscrews (3) and 3/8-16 wing nuts (4) on each side.
 - b. Adjoining shelves share the same fasteners as shown.



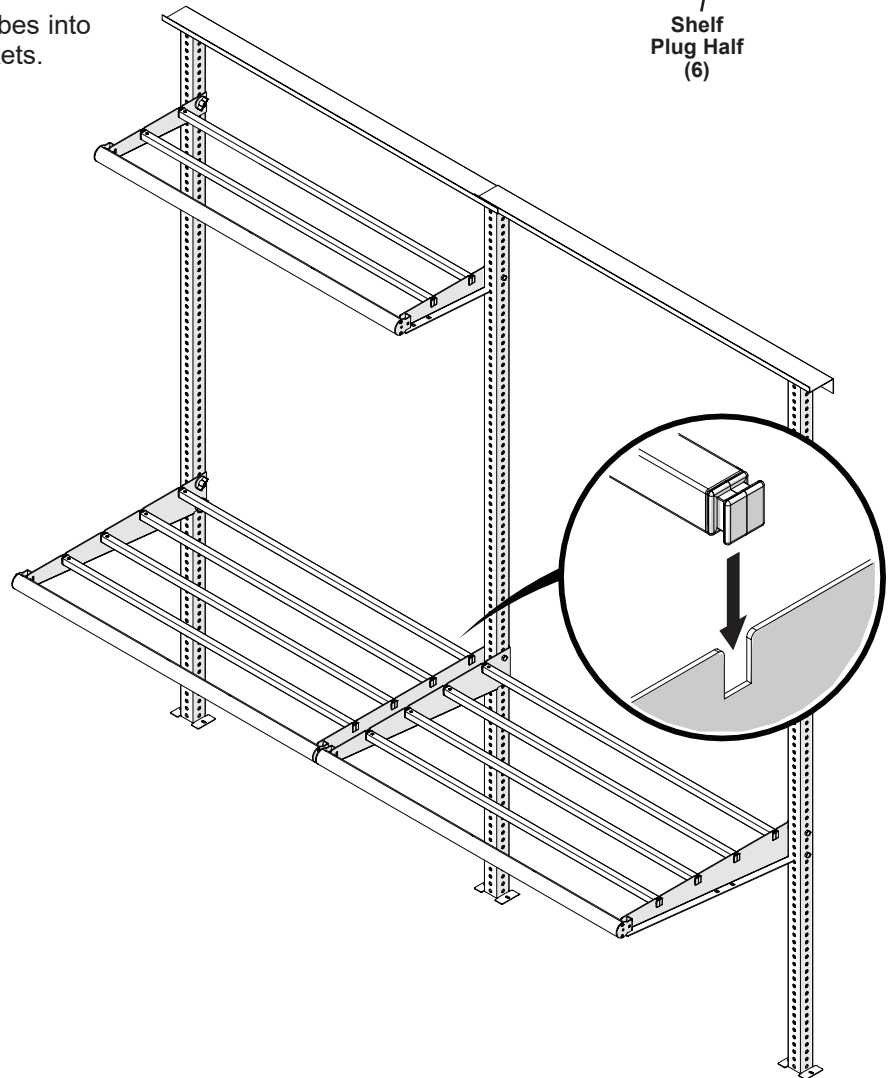
Installation (continued)

9. Assemble and install shelf tubes.

- a. Put two shelf plug halves (6) together and press them into both ends of every shelf tube (14). Push the plugs in until the first stopper is reached, a mallet may be used if necessary.

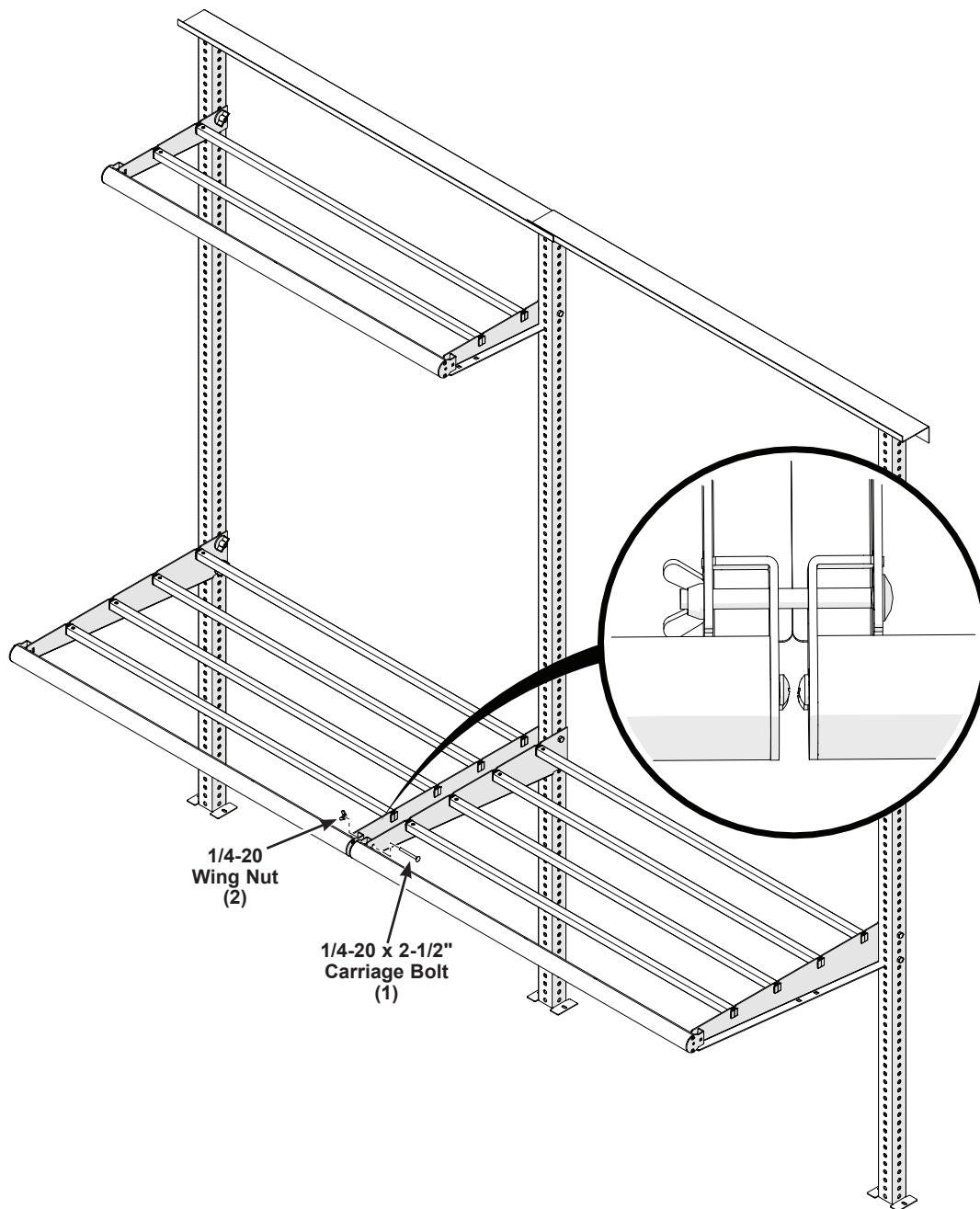


- b. With a mallet, tap the shelf tubes into the notches of the shelf brackets.



Installation (continued)

10. Connect the fronts of adjoining shelves using one 1/4-20 x 2-1/2" carriage bolt (1) and 1/4-20 wing nut (2).



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