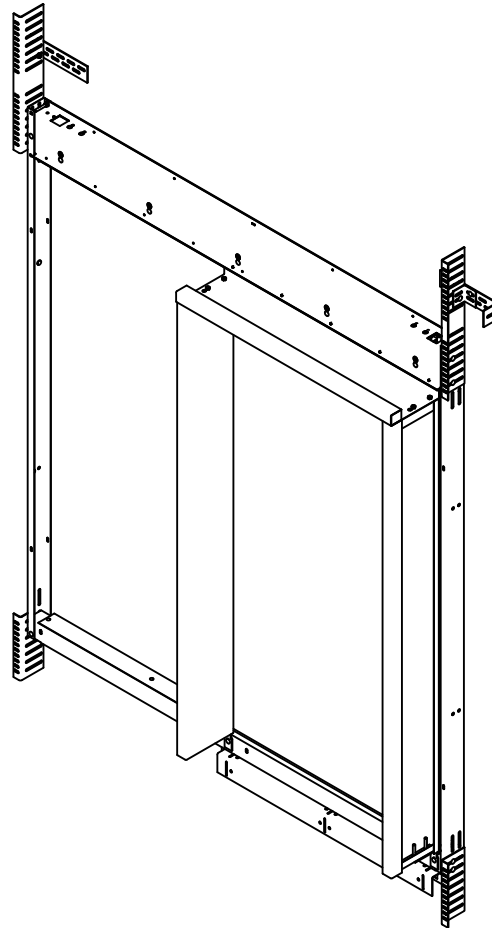




VERTICAL EXPRESS

T-Style Entrance



Every attempt has been made to ensure that this documentation is as accurate and up-to-date as possible. However, Vertical Express assumes no liability for consequences, directly or indirectly, resulting from any error or omission. The material contained herein is subject to revision. Please report any problems with this manual to Vertical Express, P.O. Box 2019, Memphis, Tennessee 38101.

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Published January, 2012
Twelfth Edition
Printed in the United States of America

Manual Number: 89141 v.1.1

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Safety Precautions

IMPORTANT!

Read this page before any work is performed on elevator equipment. The procedures contained in this manual are intended for the use of qualified elevator personnel. In the interest of your personal safety and the safety of others, do not attempt any procedure that you are not qualified to perform.

All procedures must be accomplished in accordance with the applicable rules in the latest edition of the National Electrical Code, the latest edition of ASME A17.1, and any governing local codes.

Terms in This Manual



CAUTION statements identify conditions that may result in damage to the equipment or other property if improper procedures are followed.



WARNING statements identify conditions that may result in personal injury if improper procedures are followed.

General Safety



Before applying power to the controller, check that all factory wire connections are tight on relays, contactors, fuse blocks, resistors, and terminals on cards and DIN rail terminals. Connections loosened during shipment may cause damage or intermittent operation.

Other specific warnings and cautions are found where applicable and do not appear in this summary. See the *Elevator Industry Field Employees' Safety Handbook* for electrical equipment safety information on installation and service.

Electrical Safety

All wiring must be in accordance with the National Electrical Code and be consistent with all state and local codes.

Use the Proper Fuse

To avoid fire hazards, use only a fuse of the correct type, voltage, and current rating. See the job specific drawings sheet (Power Supplies) for fusing information.

Electric shocks can cause personal injury or loss of life. Circuit breakers, switches, and fuses may not disconnect all power to the equipment. Always refer to the wiring diagrams. Whether the AC supply is grounded or not, high voltage will be present at many points.

Printed Circuit Cards

Printed circuit boards may be damaged if removed or installed in the circuit while applying power. Before installation and/or removing printed circuit boards, secure all power.

Always store and ship printed circuit cards in separate static bags.

Electrical Safety*(continued)***Mainline Disconnect**

Unless otherwise directed, always Turn OFF, Lock, and Tag out the mainline disconnect to remove power from elevator equipment. Before proceeding, confirm that the equipment is de-energized with a volt meter. Refer to the *Vertical Express Employees' Safety and Accident Prevention Program Manual* for the required procedure.

Test Equipment Safety

Always refer to manufacturers' instruction book for proper test equipment operation and adjustments.

Megger or buzzer-type continuity testers can damage electronic components. Connection of devices such as voltmeters on certain low level analog circuits may degrade electronic system performance. Always use a voltmeter with a minimum impedance of 1M Ohm/Volt. A digital voltmeter is recommended.

When Power Is On

To avoid personal injury, do not touch exposed electrical connections or components while power is ON.

Mechanical Safety

See the *Elevator Industry Field Employees' Safety Handbook* for mechanical equipment safety information on installation and service.

Static Protection Guidelines

IMPORTANT!

Read this page before working with electronic circuit boards.

Elevator control systems use a number of electronic cards to control various functions of the elevator. These cards have components that are extremely sensitive to static electricity and are susceptible to damage by static discharge.

Immediate and long-term operation of an electronic-based system depends upon the proper handling and shipping of its cards. For this reason, the factory bases warranty decisions on the guidelines below.

Handling

- Cards shipped from the factory in separate static bags must remain in the bags until time for installation.
- Anti-static protection devices, such as wrist straps with ground wire, are required when handling circuit boards.
- Cards must not be placed on any surface without adequate static protection.
- Only handle circuit cards by their edges, and only after discharging personal static electricity to a grounding source. DO NOT touch the components or traces on the circuit card.
- Extra care must be taken when handling individual, discrete components such as EPROMS (which do not have circuit card traces and components for suppression).

Shipping

- Complete the included board discrepancy sheet.
- Any card returned to the factory must be packaged in a static bag designed for the card.
- Any card returned to the factory must be packaged in a shipping carton designed for the card.
- “Peanuts” and styrofoam are unacceptable packing materials.

Note: Refer to the Vertical Express Replacement Parts Catalog to order extra static bags and shipping cartons for each card.

Failure to adhere to the above guidelines will VOID the card warranty!

Arrival of Equipment


Receiving

Upon arrival of the equipment, inspect it for damage. Promptly report all visible damage to the carrier. All shipping damage claims must be filed with the carrier.

Storing

During storage in a warehouse or on the elevator job site, precautions should be taken to protect the equipment from dust, dirt, moisture, and temperature extremes.

Revision Change Bars



Each revised page included in this manual will have a vertical line (change bar) to the left of the text that has been added or changed. The example at the left of this paragraph shows the size and position of the revision change bar.

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Overview

IMPORTANT!

- Equipment is loaded onto the platform of the main landing for transport to the upper landings.
- The doors and frames may be pre-assembled and stored for installation at a later time.
- The entrance frames are installed from the top landing to the bottom.
- Before the cab is constructed, install all entrance frames except the main landing.
- To facilitate cab assembly, do not install the main landing until the cab is assembled.

Recommended Tools

- Drill motor
- Cordless drill
- Shallow and deep well sockets in standard assorted SAE sizes
- Assorted sizes of magnetic nut drivers
- Hex key assortment
- Tape measure
- Spirit level
- Sill adjustment tool, (available from the Parts Warehouse)

Notes:

- A bench or work table may be used to assemble the frames.
- A cardboard shipping box can be placed on the work surface to protect the frame during assembly.

Installation Diagrams

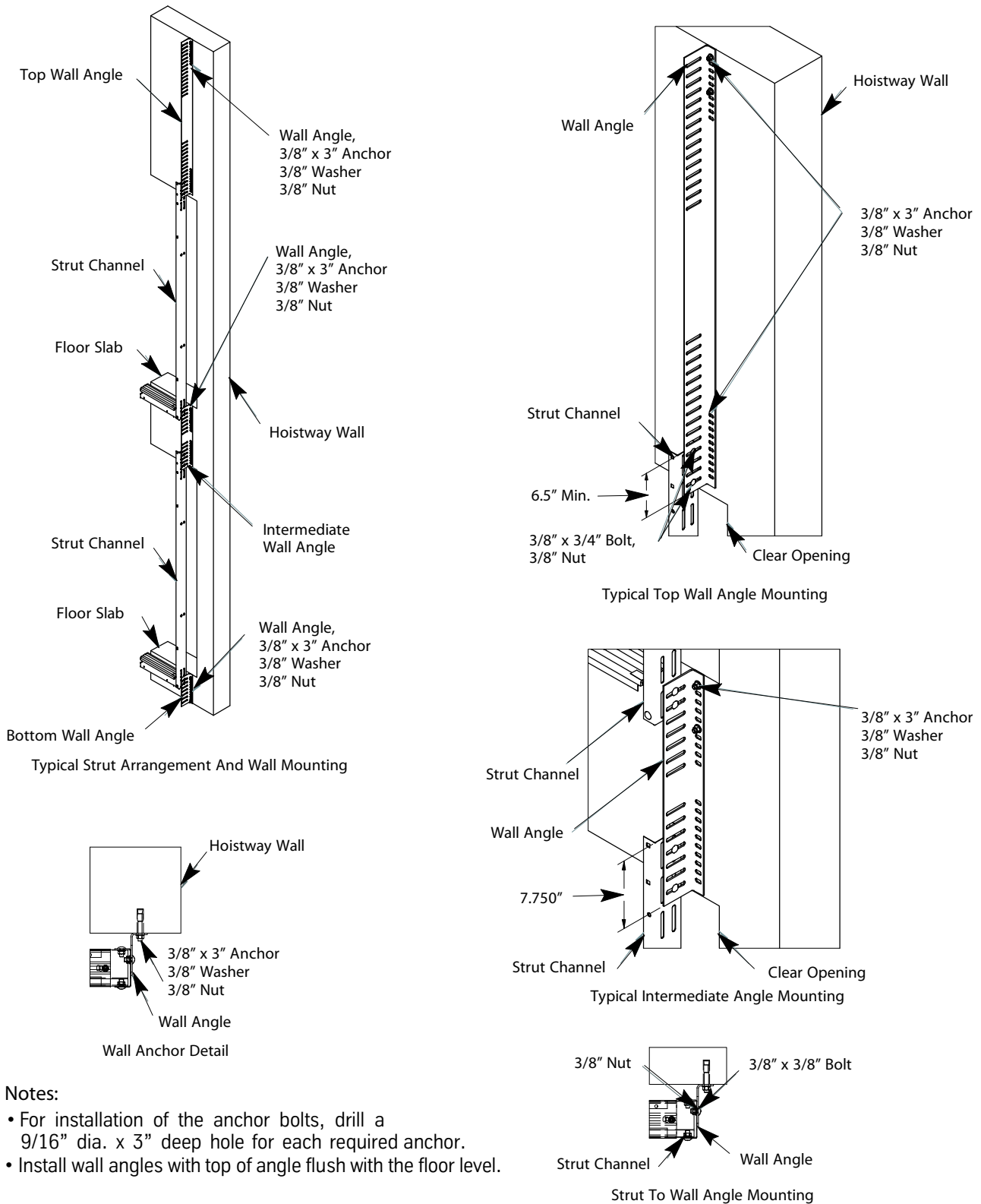
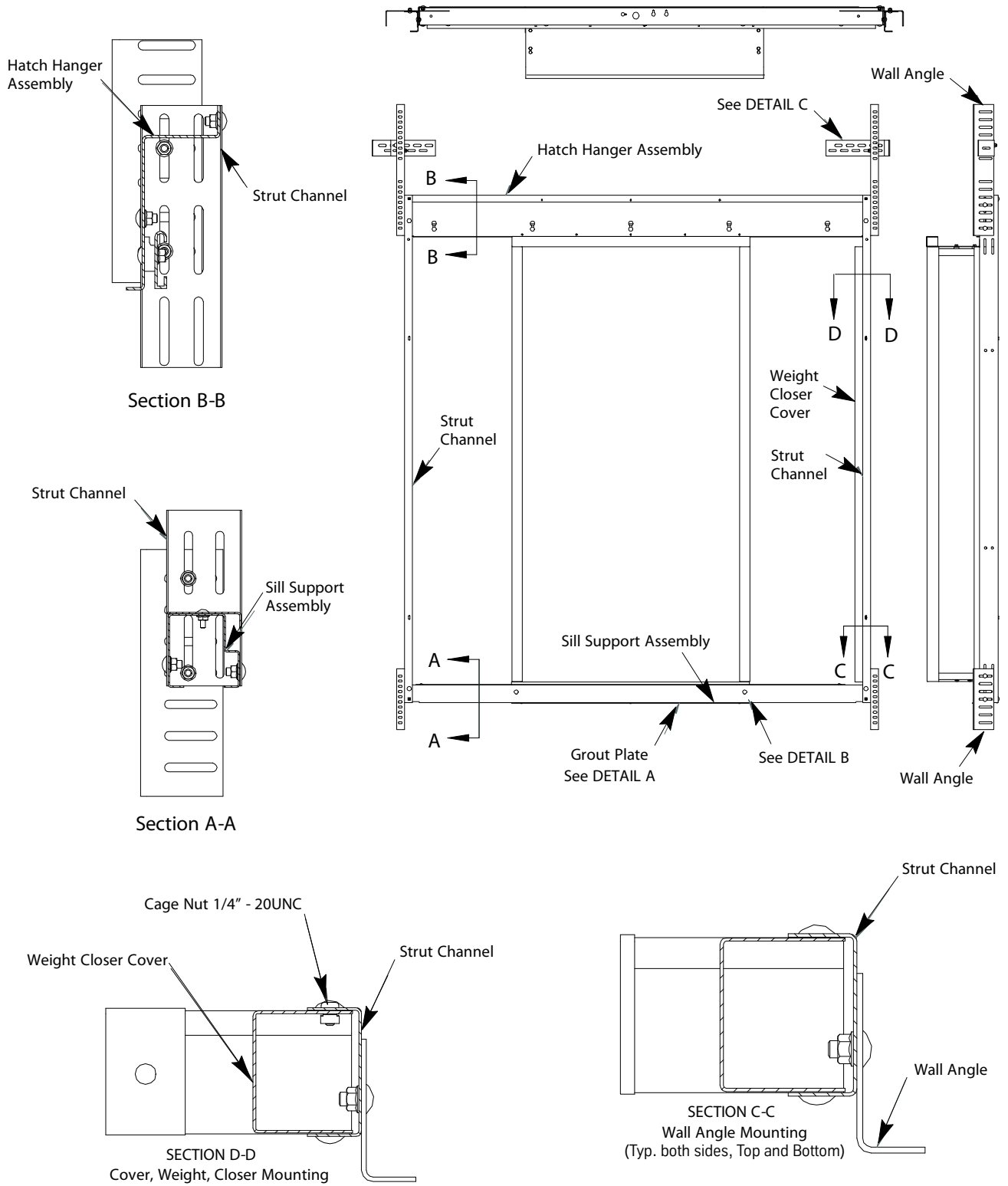


Figure 1 - Typical Frame Installation (1 of 3)

Installation Diagrams

(continued)

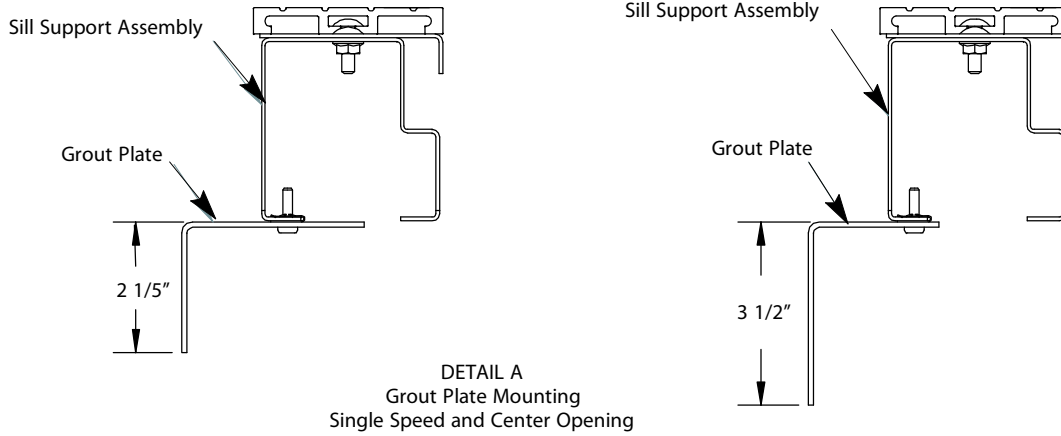


Center Opening Entrance Frame Shown
Single Speed and Two Speed Entrance Frames Typical

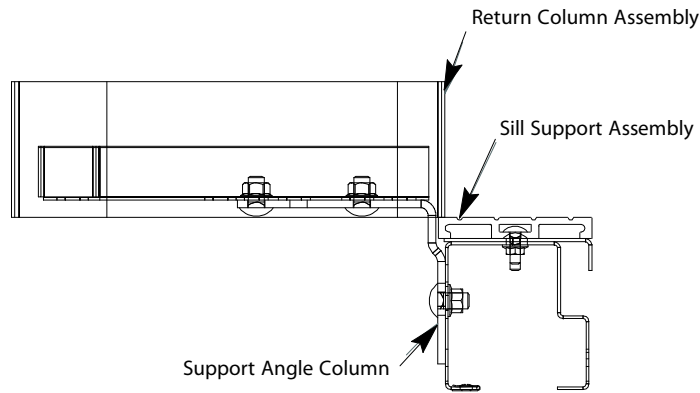
Figure 2 - Typical Frame Installation (2 of 3)

Installation Diagrams

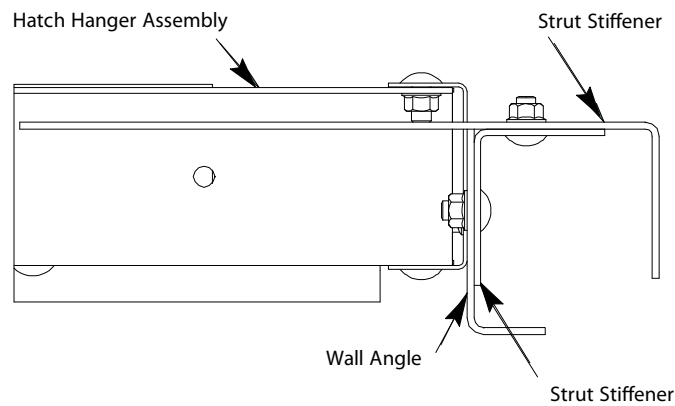
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NOTE: Grout angle may be installed in either position shown.



DETAIL B
Return Column Assembly Mounting

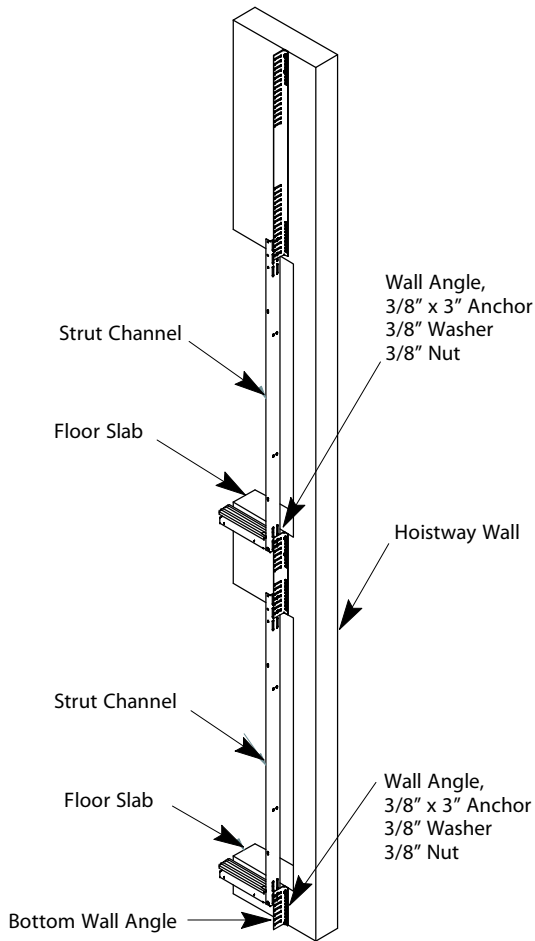


DETAIL C
Stiffener, Strut Mounting
(Typ., Both Sides)

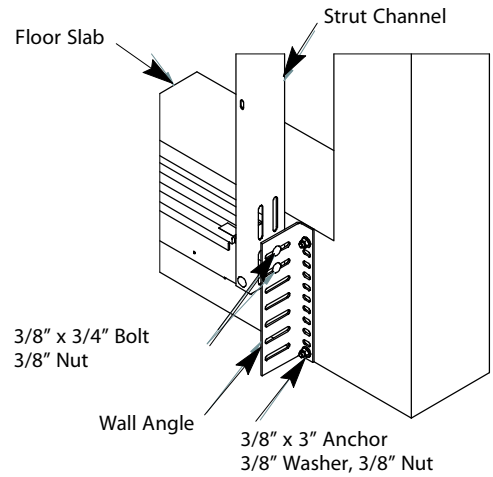
Figure 3 - Typical Frame Installation (3 of 3)

Installation Diagrams

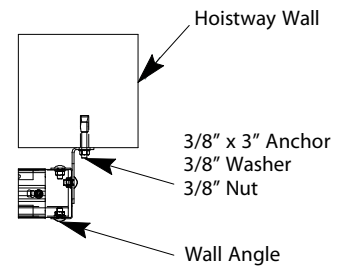
(continued)



Typical Strut Arrangement And Wall Mounting



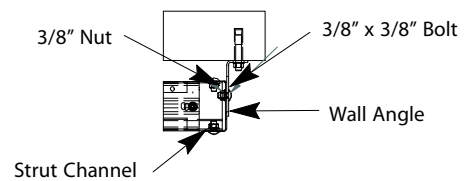
Typical Bottom Wall Angle Mounting
(used at all entrance locations on Cimarron)



Wall Anchor Detail

Notes:

- For installation of the anchor bolts, drill a 9/16" dia. x 3" deep hole for each required anchor.
- Install wall angles with top of angle flush with the floor level.



Strut To Wall Angle Mounting

Figure 4 - Cimarron Frame Installation (1 of 3)

Installation Diagrams

(continued)

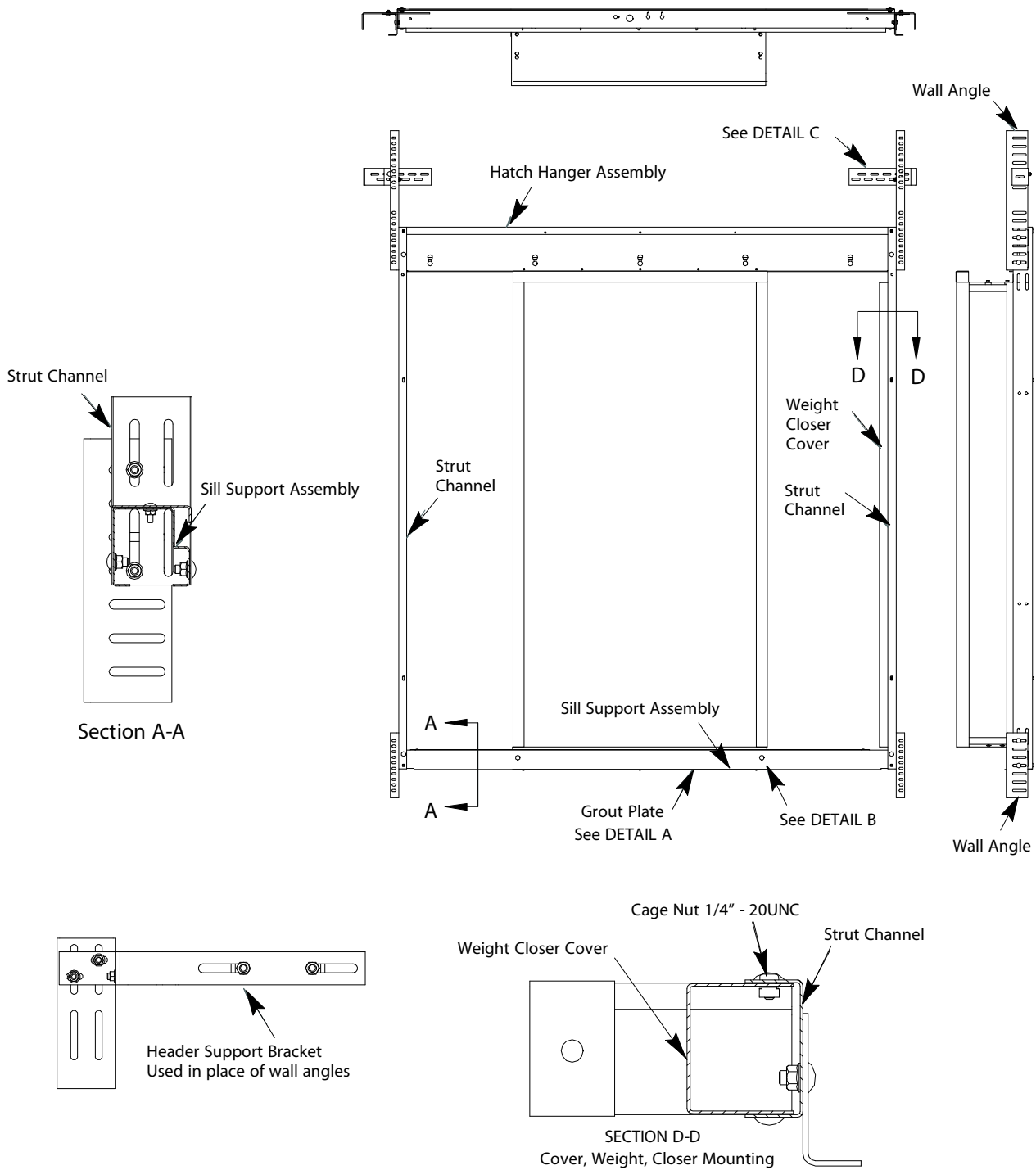


Figure 5 - Cimarron Frame Installation (1 of 3)

Installation Diagrams

(continued)

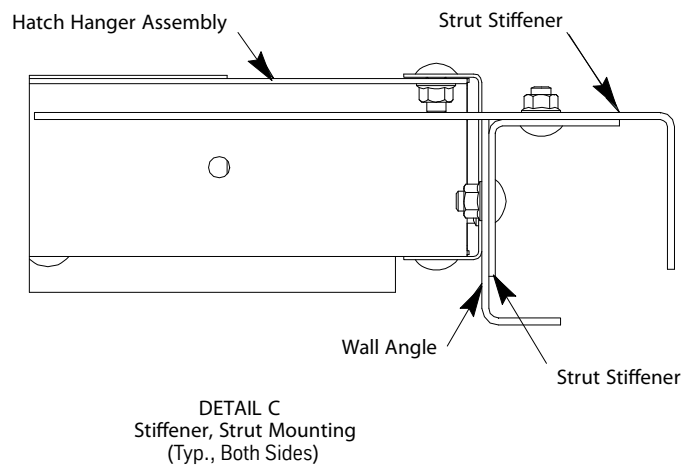
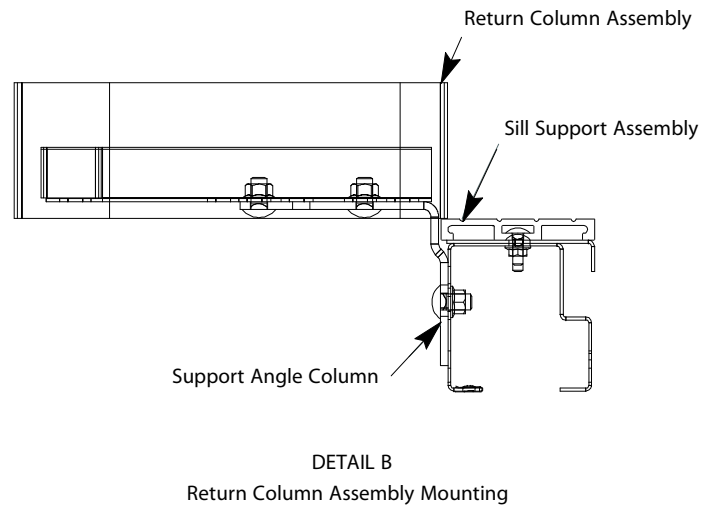
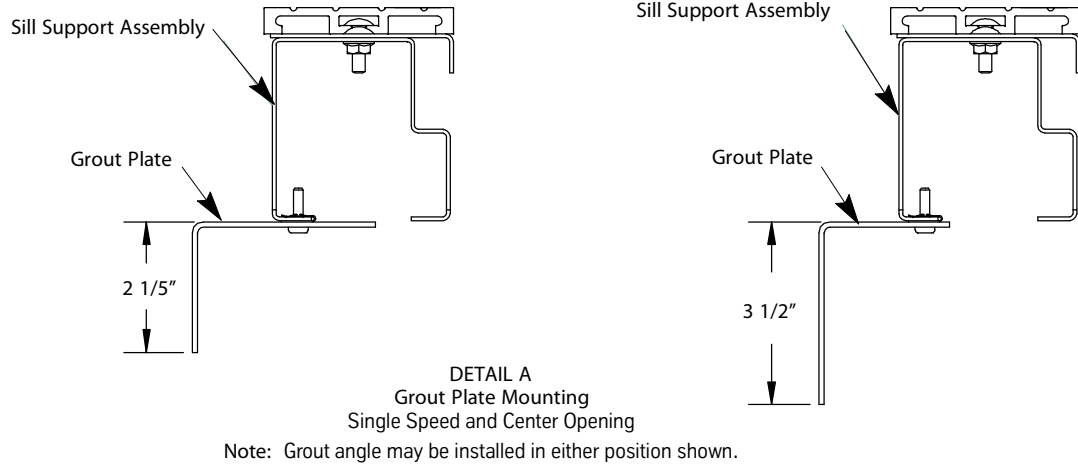


Figure 6 - Cimarron Frame Installation (1 of 3)

Frame Assembly

1. With the face side down, use the proper spacers and hardware to assemble the strike and return columns to the transom. Place the columns so that the end angle dry wall trap is toward the hall side. Single Speed see Figure 7; Two Speed, see Figure 8 on page 15.
2. Install the sill support angles to the bottom of the columns. The angles must be flush with the edge of the column because the sill support assembly will be bolted to these brackets.

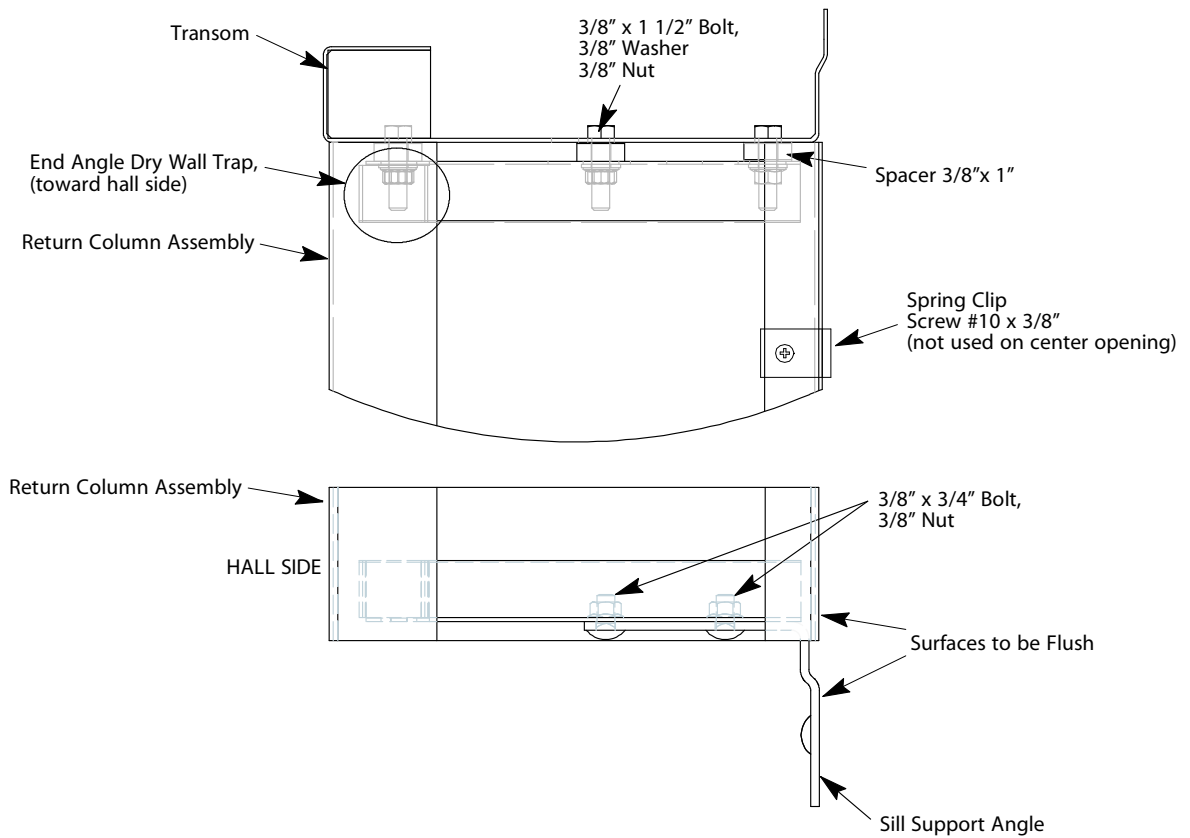


Figure 7 - Single Speed and Center Opening Frame Assembly

Frame Assembly

(continued)

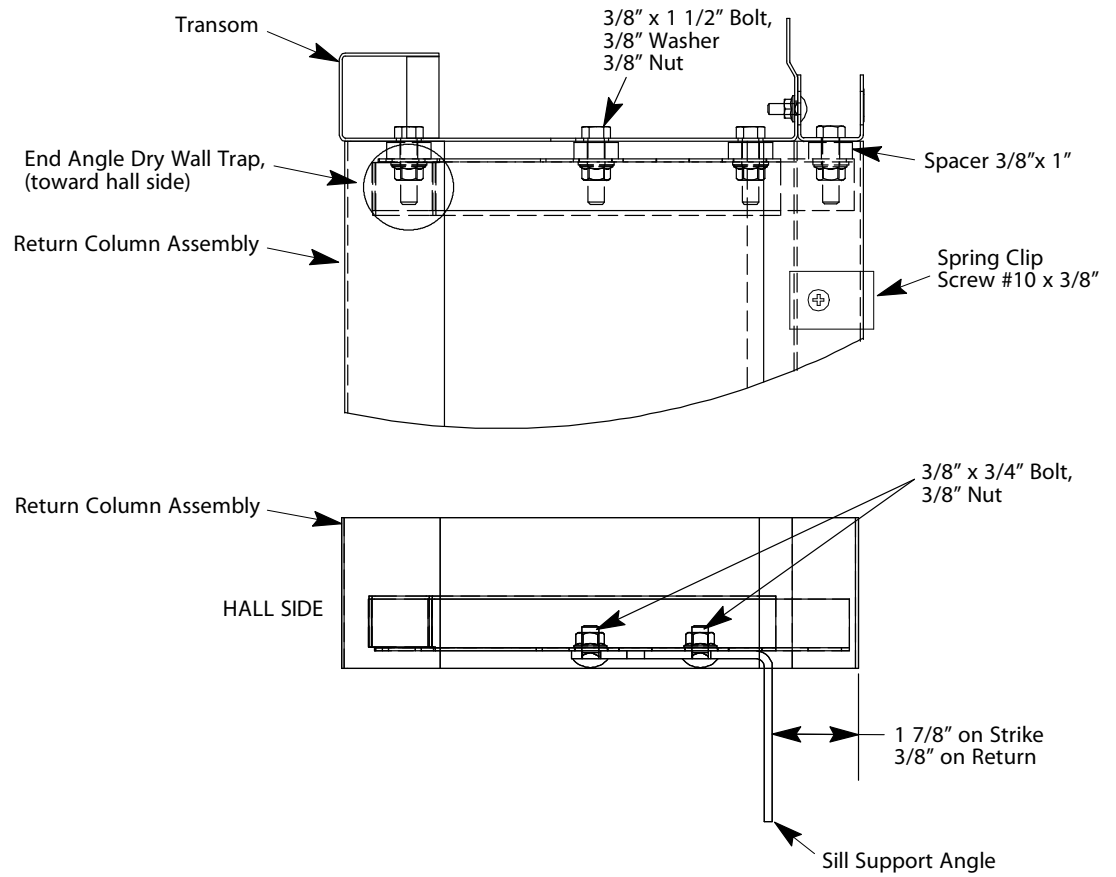


Figure 8 - Two Speed Opening Frame Assembly

Frame Assembly

(continued)

3. Attach the sill support assembly to the sill support angles. See Figure 9.

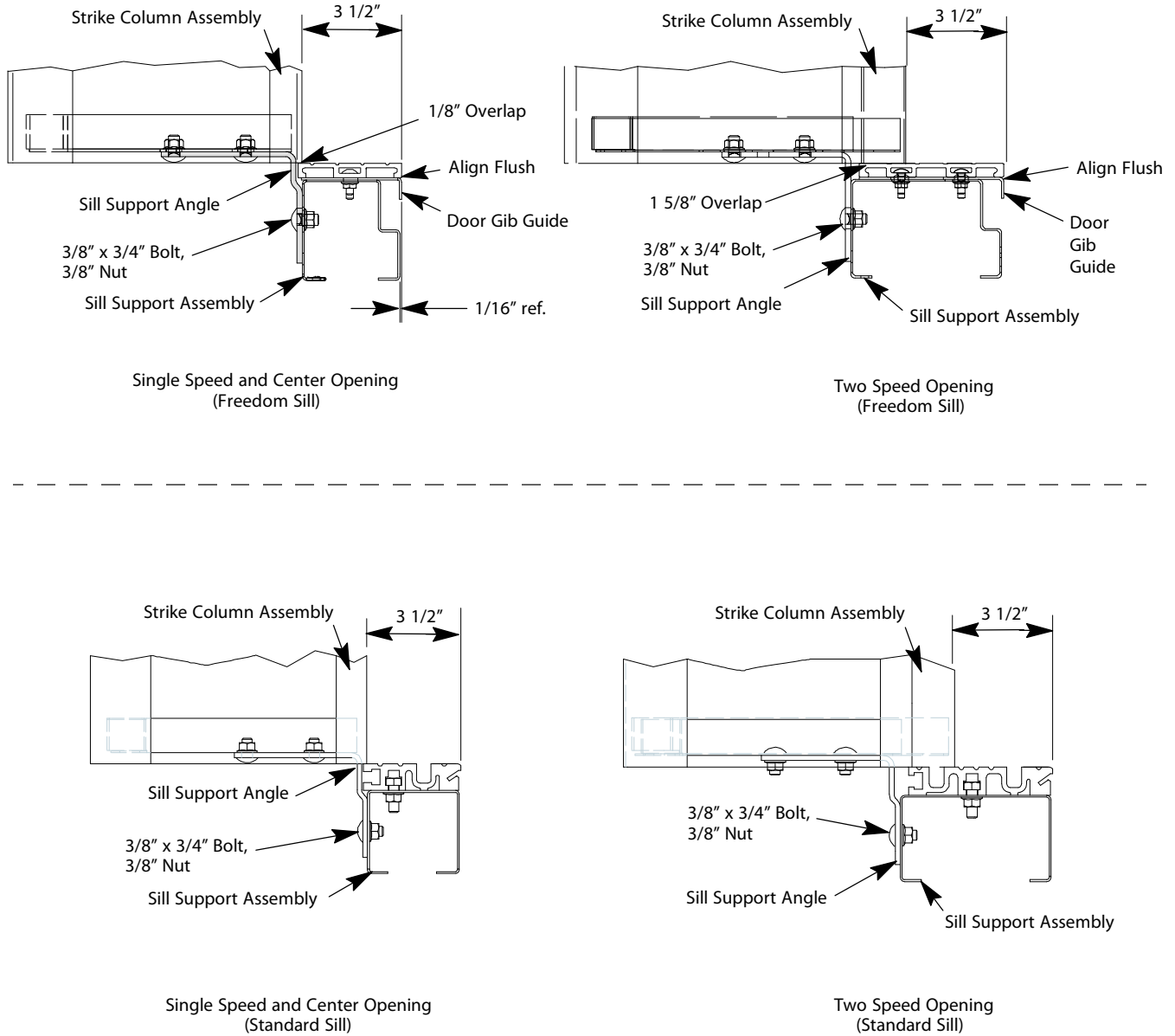


Figure 9 - Sill Support Assembly

Frame Assembly

(continued)

- Verify that the sill is flush with the door gib guide, and the strike column assembly overlaps the sill support assembly 1/8", with 3 1/2" of exposed sill. See Figure 10 for the correct sill-to-sill support connections.

Opening Width	Sill Length	Sill Support Length	"S"	"A"
SINGLE SPEED, TWO SPEED				
All	All	All	1 5/8	2
CENTER OPENING				
36	40	77 7/16	20	2
38	46	81 7/16	19	4
40		85 7/16	21	3
42		89 7/16	23	2
44	64	93 7/16	16	10
46		97 7/16	18	9
48		101 7/16	20	8
50		105 7/16	22	7
52		109 7/16	24	6
54		113 7/16	26	5
56		117 7/16	28	4
58	121 7/16	30	3	
60	125 7/16	32	2	

All dimensions above listed in inches.

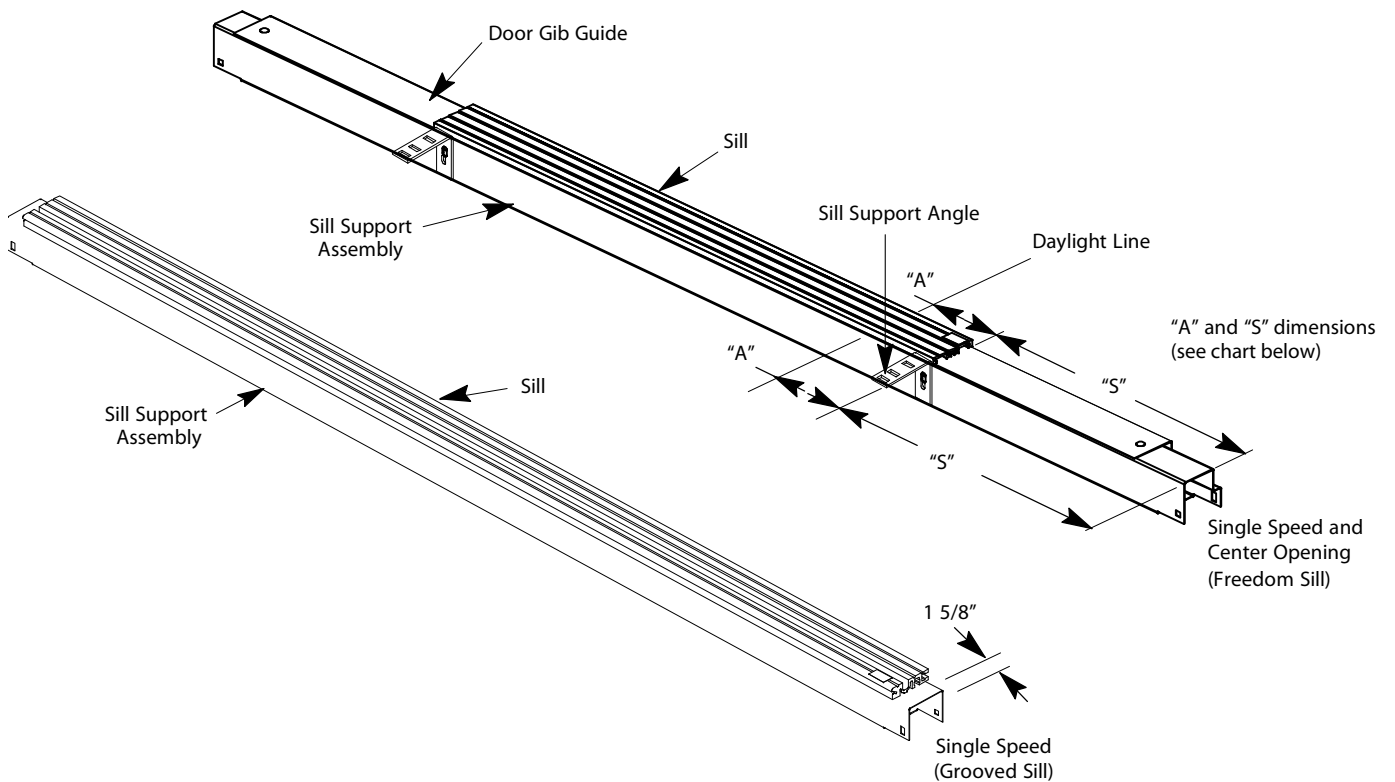


Figure 10 - Sill-to-Sill Support Connections

Frame Assembly

(continued)

5. Remove the door track and hangers.
6. Place a 1/4" x 1/2" large bolt in the center alignment hole of the header, and attach the header to the transom. Install additional bolts and tighten. See Figure 11.

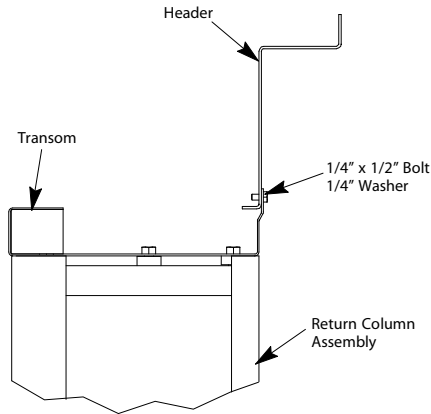


Figure 11 - Bolt on Track Header

7. Use 3/8" x 3/4" bolts to install the strut channels to the header. See Figure 12.
8. Verify the following:
 - a. The end of the strut channel with 2 rows of slots is at the sill.
 - b. The end of the strut channel with 3 rows of slots is toward the header.
9. Square the frame, and tighten all of the bolts.

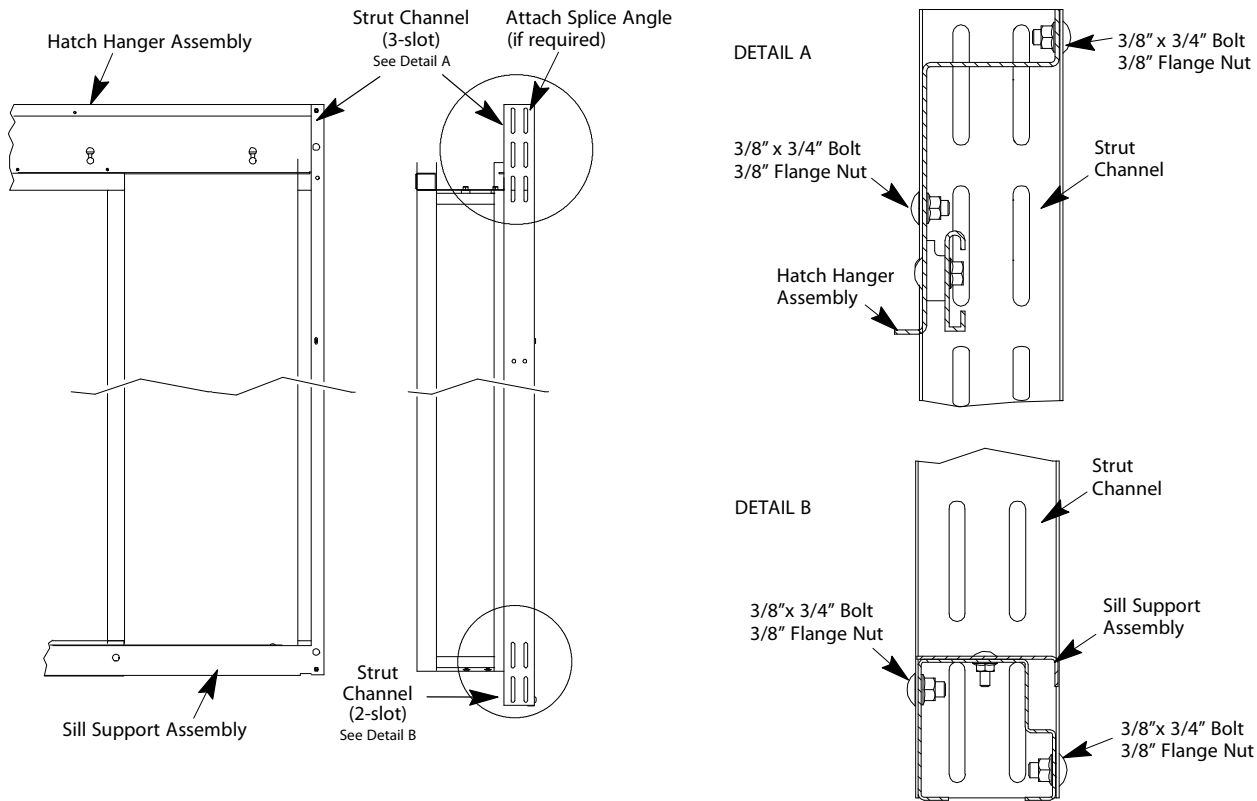


Figure 12 - Strut Channel Installation

Frame Assembly

(continued)

10. Use 3/8" x 3/4" bolts to attach the strut channels to the sill support assembly, but do NOT tighten the bolts.
11. Install the door bumpers. See Figure 13, or Figure 14 on page 20 for Cimarron.

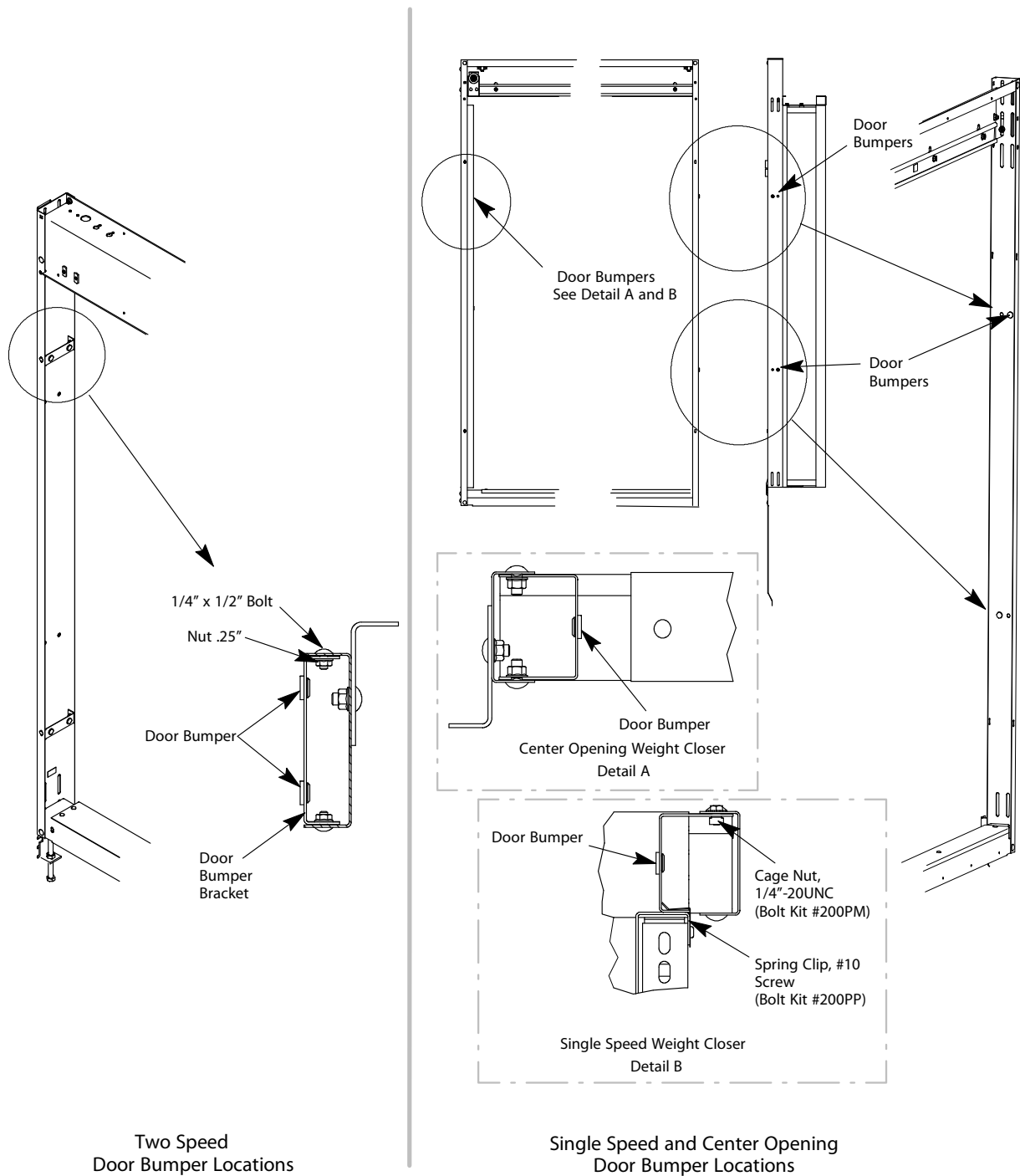
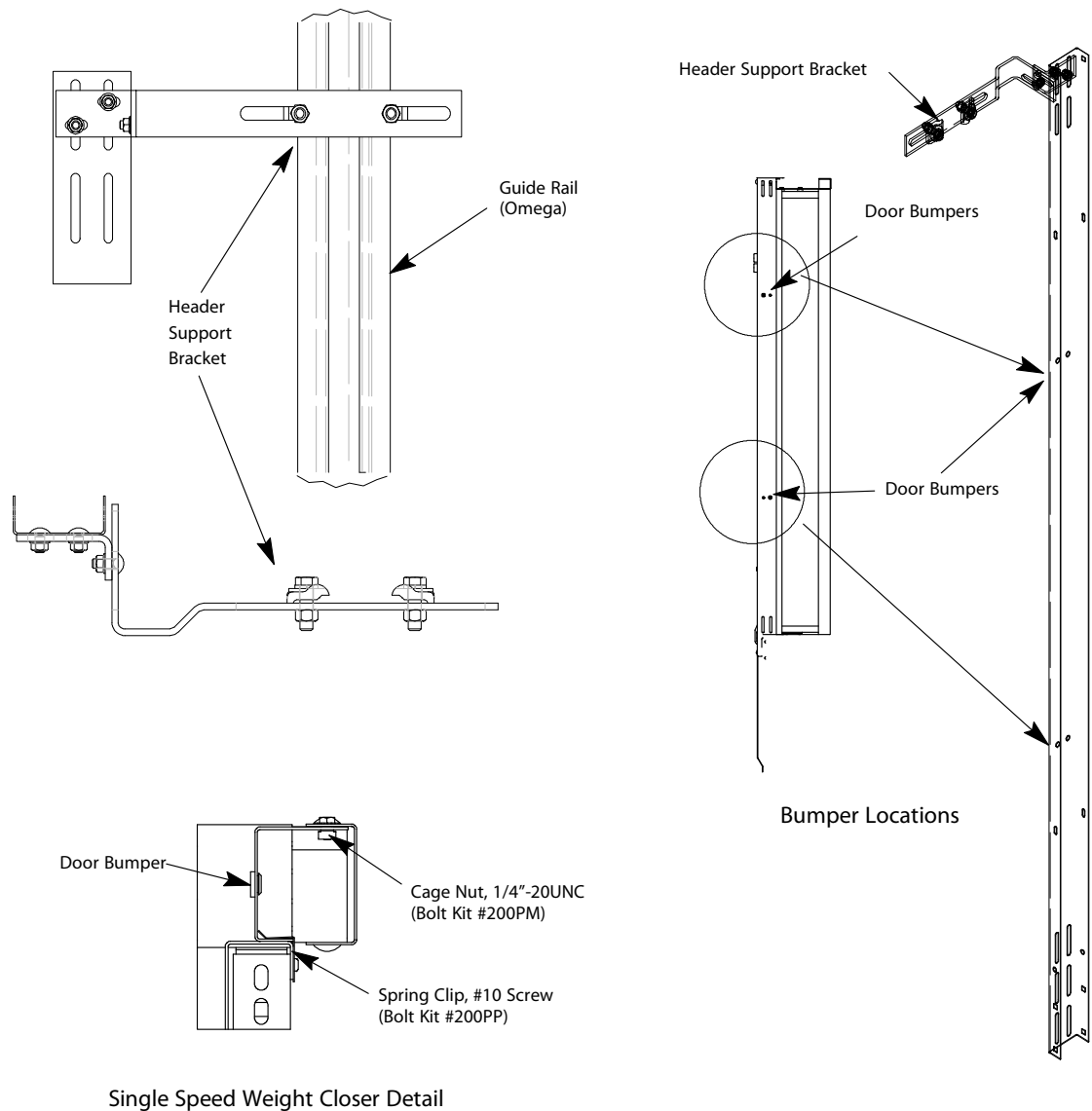


Figure 13 - Door Bumper Locations

Frame Assembly

(continued)



Single Speed Weight Closer Detail

Figure 14 - Cimarron Door Bumper Locations

12. Verify the dimensions of the frame. Measure the area diagonally from top to bottom. See Figure 15 on page 21.

Notes:

- The frame dimensions will be the same when the frame is square.
- For a standard 7-foot door, the dimensions from the top of the track to the lip on the door gib guide will be 88 3/4 inches. This dimension must be the same across the entire length of the track.
- For door openings greater than 7 feet, add to the 88 3/4inch dimension (as required).
- Center opening frames will be slightly offset because of the weight box.

Frame Assembly

(continued)

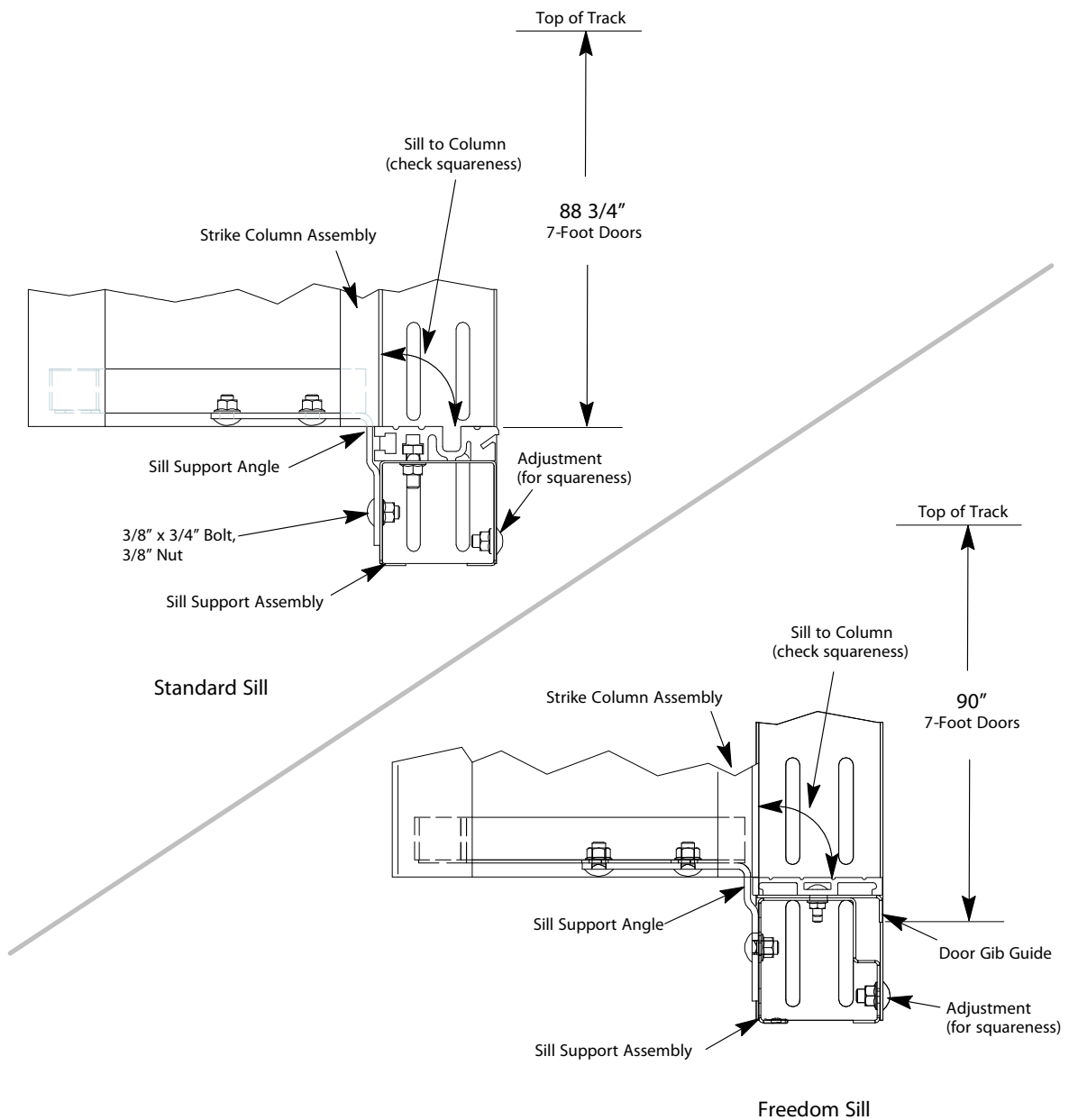


Figure 15 - Door Opening Dimensions

13. Tighten all of the bolts when the frame is square.
14. Verify that the sill is square and all of the bolts are tight.
15. Determine if any floor height exceeds 150 5/8".
 - If no: The frame is now ready to be installed. If the frame is being pre-assembled, it can be stored for installation at a later time.
 - If yes: These openings will require strut angle splices. Continue to the "Install Strut Angle Splices" procedure.

Frame Assembly

(continued)

Install Strut Angle Splices

1. Determine the part number and configuration for the splices. See Figure 16 (below) and Table 1 on page 23.
2. Mount the strut angle splices to the strut channels at the top of the frame.

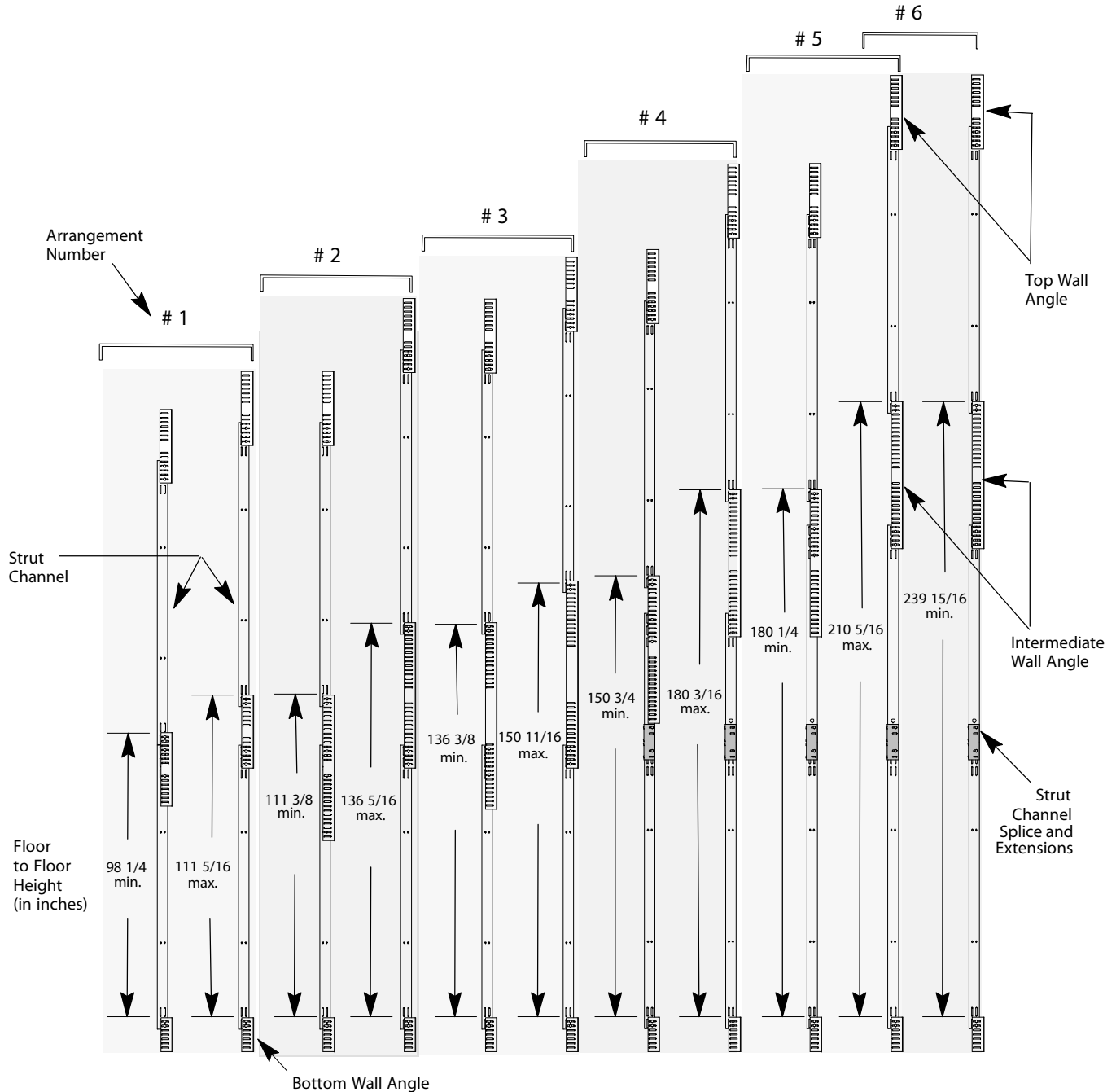


Figure 16 - Wall Angle Arrangements

Install Strut Angle Splices

(continued)

Arrangement	Floor-to-Floor Height (7 ft. opening only)		Strut Channel	*Top Wall Angle	Bottom Wall Angle	*Intermediate Wall Angle	*Strut Angle Splice	*Strut Channel Extension	*Strut Extension Bolt Kit
	Minimum	Maximum							
Single Speed and Center Opening									
1	98 1/4"	111 5/16"	268EJ1	50 1/4"	11 3/4"	174EW2 25 1/4"	—	—	—
2	111 3/8"	136 5/16"	268EJ1	50 1/4"	11 3/4"	174EW3 50 1/4"	—	—	—
3	136 3/8"	150 11/16"	268EJ1	50 1/4"	11 3/4"	174EW4 64 1/2"	—	—	—
4	150 3/4"	180 3/16"	268EJ1	50 1/4"	11 3/4"	174EW3 50 1/4"	174EX1	268EK1 44"	200PR1
5	180 1/4"	210 5/16"	268EJ1	50 1/4"	11 3/4"	174EW3 50 1/4"	174EX1	268EK2 74"	200PR1
6	210 3/8"	239 15/16"	268EJ1	50 1/4"	11 3/4"	174EW3 50 1/4"	174EX1	268EK3 Contract Length	200PR1
Two Speed Opening									
1	99 1/16"	112 1/8"	268EJ3	50 1/4"	11 3/4"	174EW2 25 1/4"	—	—	—
2	112 3/16"	137 1/8"	268EJ3	50 1/4"	11 3/4"	174EW3 50 1/4"	—	—	—
3	137 3/16"	151 1/2"	268EJ3	50 1/4"	11 3/4"	174EW4 64 1/2"	—	—	—
4	151 9/16"	181"	268EJ3	50 1/4"	11 3/4"	174EW3 50 1/4"	174EX2	268EK4 44"	200PR1
5	181 1/16"	211 1/8"	268EJ3	50 1/4"	11 3/4"	174EW3 50 1/4"	174EX2	268EK5 74"	200PR1
6	211 3/16"	239 15/16"	268EJ3	50 1/4"	11 3/4"	174EW3 50 1/4"	174EX2	268EK6 Contract Length	200PR1

Table 1 - Door Arrangement Specifications

Mounting King and Slave Wall Angles

Notes:

- Top wall angle = 50 1/4" long
- Bottom wall angle = 11 3/4" long
- Before installing any intermediate wall angles, see Figure 16 on page 22.
- How to determine handedness: Stand in the car, or stand on the platform while facing the front opening of the car.
- How to determine door handedness: Stand in the car facing the opening, and see which way the door moves to open.

Locate the Daylight Line

1. With a stable running platform, mark the daylight line on the platform.
 Custom cabs - Consult job documents, such as hoistway layouts.
 Standard cabs - Use the following formulas:
 - Single Speed and Two Speed Handed Opening Doors - Measure and mark 3" from the platform edge on the strike side. See Figure 17.
 - Single Speed Center Handed Opening Doors - Mark the center of the platform using this formula: Platform Width ÷ 2. See Figure 18 on page 25.
2. Transfer the daylight line on the platform to the face of the floor slab. This line *must* be vertical.
3. Measure and mark an additional vertical line on the hoistway according to the following:
 - Single Speed and Two Speed Handed Opening Doors
 - a. Locate a vertical line 3 7/8" from the daylight line created in Step 1.
 - b. Take this measurement in a direction toward the edge of the platform closest to the daylight line.
 - Single Speed Center Handed Opening Doors
 - a. Make a vertical line.
 - b. Determine the opening width (dimension "X").

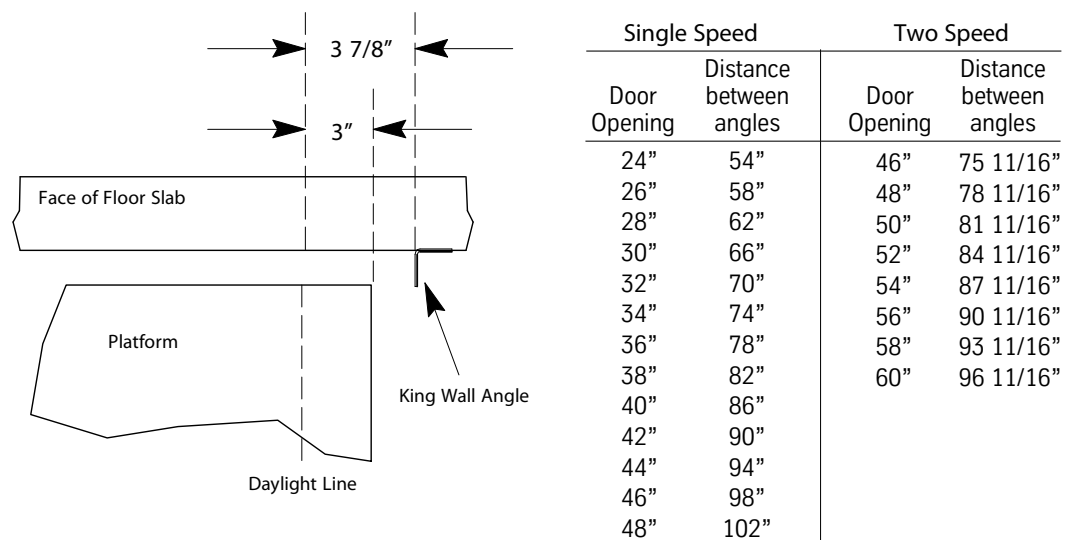


Figure 17 - Distance Between King and Slave Wall Angles (1 of 2)

Mounting King and Slave Wall Angles

(continued)

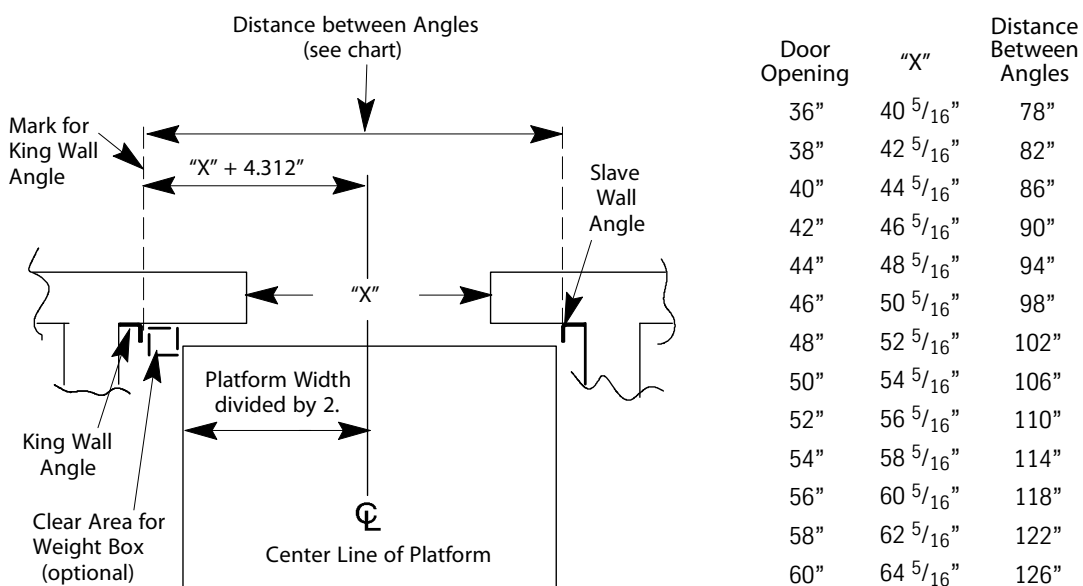


Figure 18 - Distance Between King and Slave Wall Angles (2 of 2)

Locate the King Wall Angles

1. Hold a king angle against the wall as a template. See Figure 19 on page 26.
2. Position the wall angle so that the bend of the angle is towards the center of the door opening.
3. Verify that the bend angle side of the bracket lines up with the vertical angle on the landing.
4. Locate the wall angle at an elevation so that the top of the angle is flush with the finished floor of the landing.
5. Mark locations for at least two anchors (if possible).
6. Install and tighten the mounting bolts, and secure the king angle to the landing so that the projecting leg of the wall angle aligns vertically.

Note: Shimming may be necessary to plumb the wall angle on the wall surface.

Locate the Slave Wall Angles

1. Push the slave wall angle to the outside so that the two wall angles are as far away from each other as possible. For angle distance, see Figure 17 on page 24, and Figure 18 (above).
2. After all the wall angles have been installed, check the king angle side to make sure the angles are plumb with each other and are square with the platform. Adjust as necessary, and check tightness.

Mounting King and Slave Wall Angles

(continued)

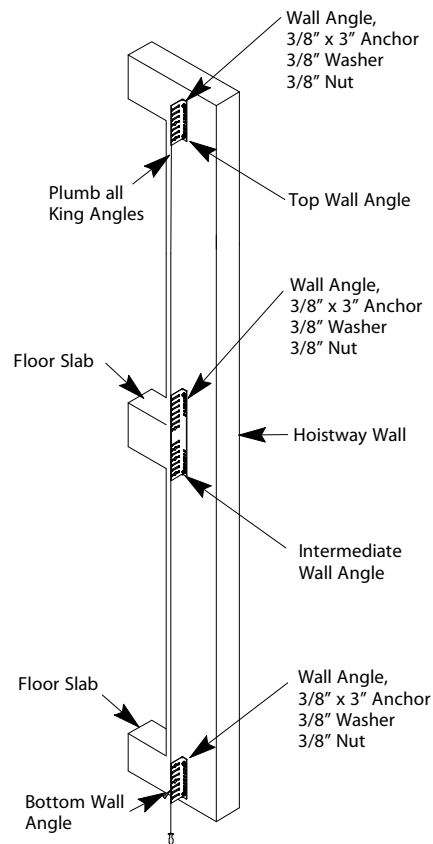


Figure 19 - Plumb and Square all King Angles

Install the Frames

Notes:

- See Figure 1 on page 8 through Figure 6 on page 13 for Frame Installation Overview Diagrams.
- Install the entrance frames starting with the top most landing and working downward.

1. Load the entrance frames onto the platform.



Ensure that as the entrance frames are moved on the platform, they do not strike anything in the hoistway.

2. Select any required strut extension channels using Figure 16 on page 22 and Table 1 on page 23.
3. Carry these channels onto the platform with the appropriate entrance frame, and lift them to the appropriate landings for installation.
4. Level the car at the landing where the frame is to be installed.
5. Slide the frame into place, and install any required strut extensions to the strut channel splice.
6. Use bolts to loosely attach the top and bottom of the frame to the king wall angles.
7. Slide the slave wall angles into place and loosely bolt them.

Install the Frames*(continued)*

8. Install the door track and hangers.
9. Repeat Steps 3 through 9 for each landing.

Install the Car Sill

1. Determine the correct finish floor height for the landing.
2. Set the entrance.

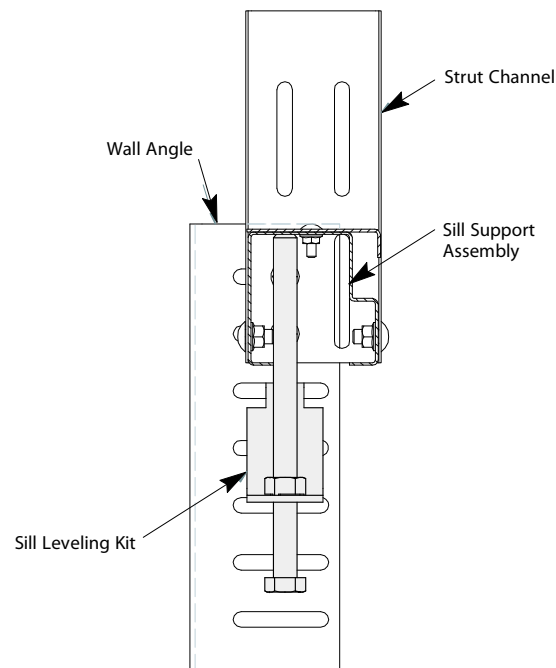
Note: Ensure that the columns are plumb and that the frame is square.

3. Use a pair of sill leveling tools and a 4 foot level, and level the sill to the finish floor height. See Figure 20.
4. Verify the following:
 - The columns are aligned with the daylight line.
 - The header and the sill support have the correct running clearance of 1-1/4 inches from sill to sill.

5. Tighten all attachment bolts to the king and slave wall angles.

Note: Before proceeding to the next frame, make a final check of the measurements and verify that the frame is plumb.

6. Repeat Steps 1 through 5 for each frame; work from the top to the second landing.
7. Install the cab.
8. Install the bottom entrance frame.



Note: When installed, there should be at least 1" of side-to-side adjustment.

Figure 20 - Level the Sill

Install the Hoistway Doors

Hoistway Entrance Components

See Figure 21 on page 29.

- Astragal - The moulding on the leading edge of a center opening door (full height) that provides a quiet closing of the doors, and a cushion if something gets caught between the doors.
- Closer Reel (Spirator) - The mechanical spring device that provides self-closing of the hoistway doors. Wraps of cable can be added or taken away to ensure that the doors will smoothly close if stopped 1/2" from fully closed.
- Connecting Rod - The connection point between the pick-up roller and the interlock hook.
- Pickup Roller Assembly - The device that the car door clutch engages to unlock and open the hoistway door.
- Door Gibs - The sliding guides that attach to the bottom of the door panel (which fits into the groove of the sill), to hold the door in alignment.
- Door Panel - The large panels that open and close to provide access to the landing.
- Door Sill - The footing for the entrance frame that extends the full length of door travel.
- Hanger - Attaches to the top of the door, and has mounted rollers that allow the doors to roll.
- Hanger Track - The track for the hanger roller.
- Hanger Rollers - The roller that rides the hanger track.
- Interlock Box - The device attached to the header, that works with the interlock hook to provide the mechanical and electrical door locks.
- Interlock Hook - This hook provides the mechanical lock for the hoistway door, and the bridging contacts for the hoistway door electrical contacts.
- Link Angle - The angle that connects the 2 hanger rollers.
- Pendant Bolts - The bolts used to fasten the door hangers to the door panels. These can be adjusted to allow the doors to be level with the hanger track and sill, and also for the bottom of the doors to be the proper height from the sill (without dragging).
- Relating Cable - For doors with multiple panels, this cable maintains the relationship between the door panels.
- Sight Guard - This guard attaches to the leading edges of the doors to block out any view of the hoistway space when the doors are open.
- Upthrust Roller - The device on the hanger assembly that prevents the doors from rocking or coming off of the track when they open or close.

Hoistway Entrance Components

(continued)

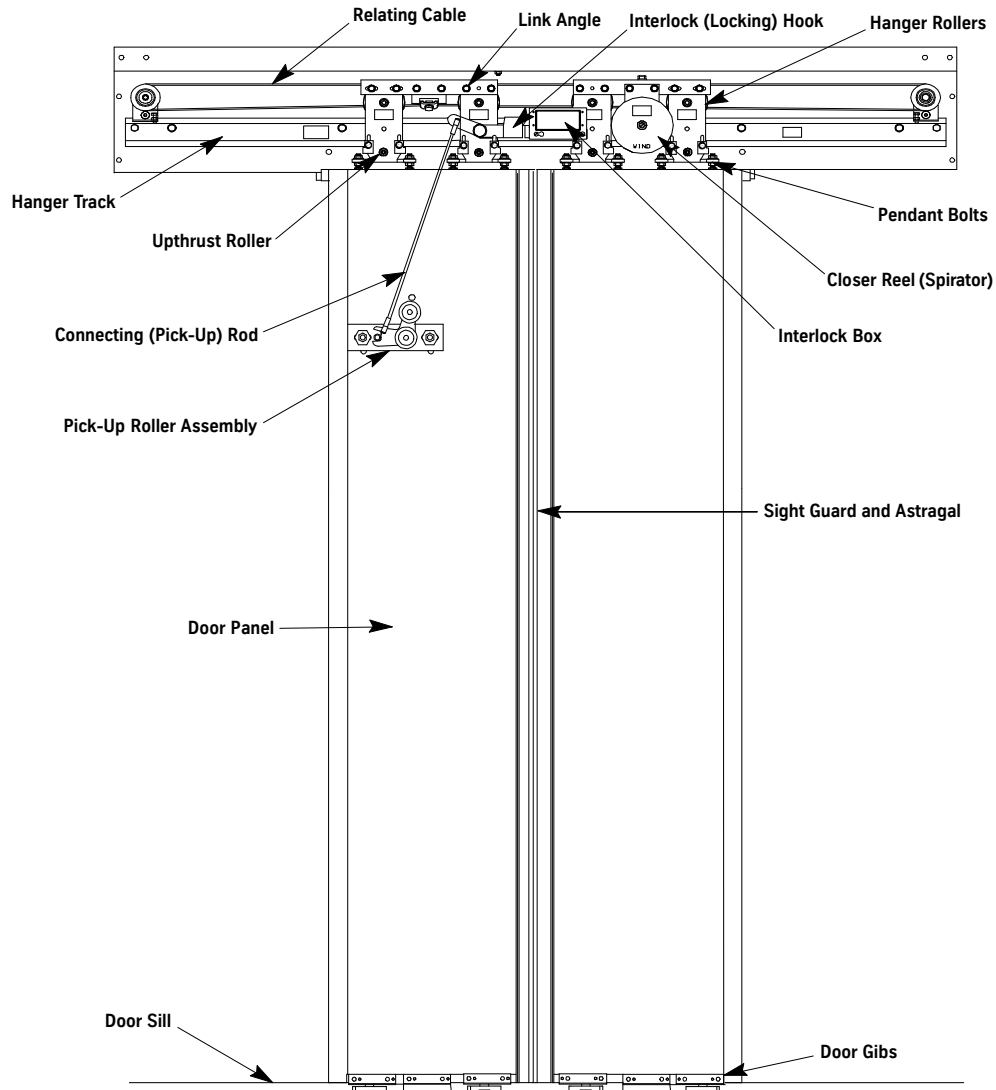


Figure 21 - Hoistway Door Overview

Hoistway Door Installation

1. Tighten all of the bolts, and install the hoistway track and hanger assembly. Select the proper hoistway drawing (typical layouts) from the following list:
 - Single Speed, RH/LH: Figure 22 on page 30
 - Center Opening: Figure 23 on page 31
 - Two Speed, RH/LH: Figure 24 on page 32
 - Two Speed, Center Opening: Figure 25 on page 33
 - Dual Interlock, Center Opening: Figure 26 on page 34

Note: The Installation Procedure continues on on page 35.

Hoistway Drawings

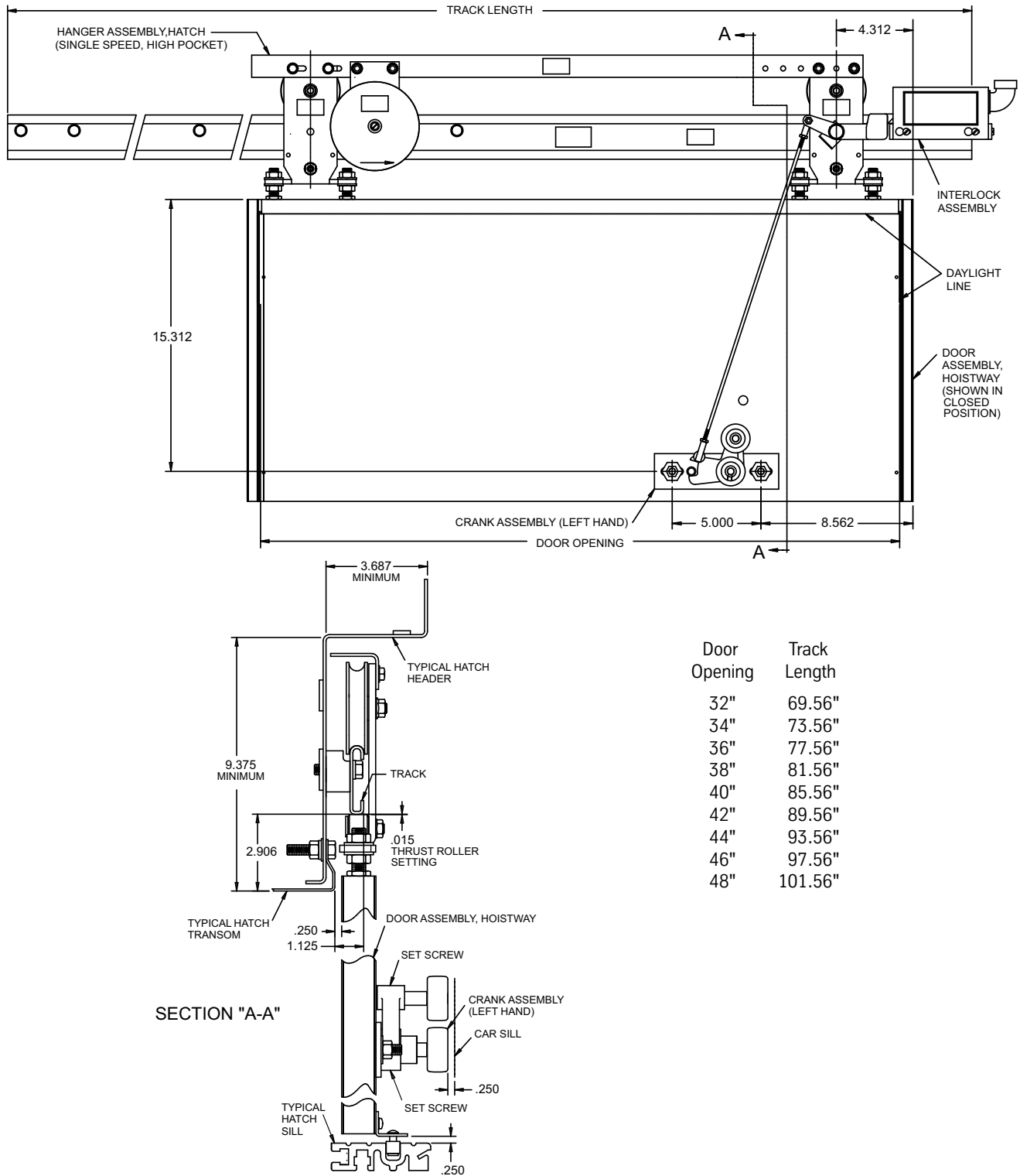
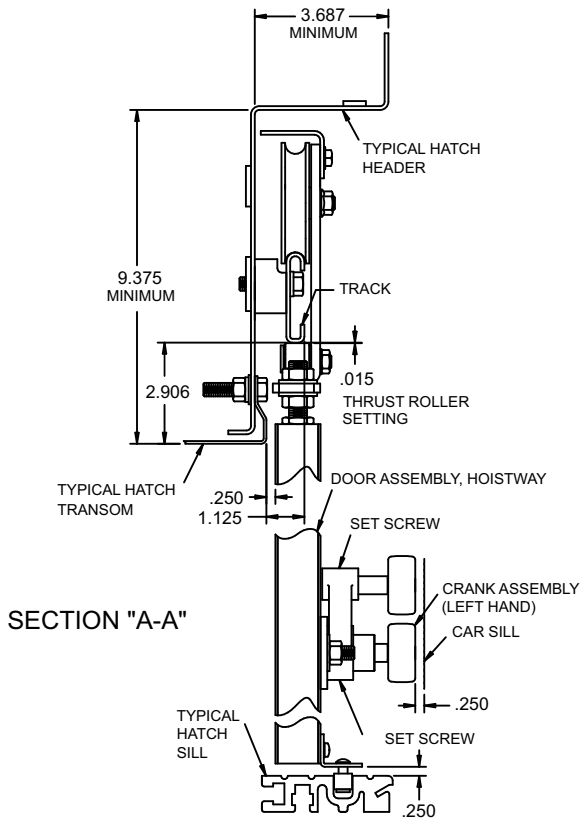
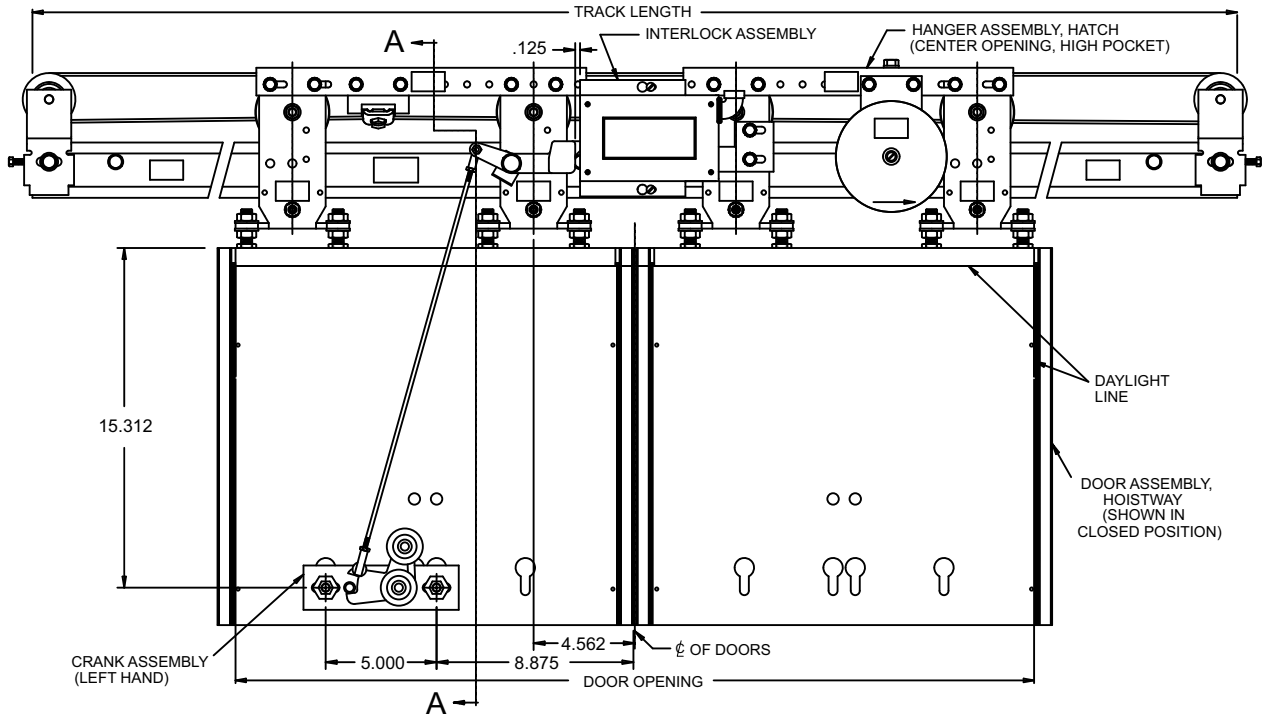


Figure 22 - Single Speed Hoistway Track and Hanger Assembly (LH shown, typical)

Hoistway Drawings

(continued)

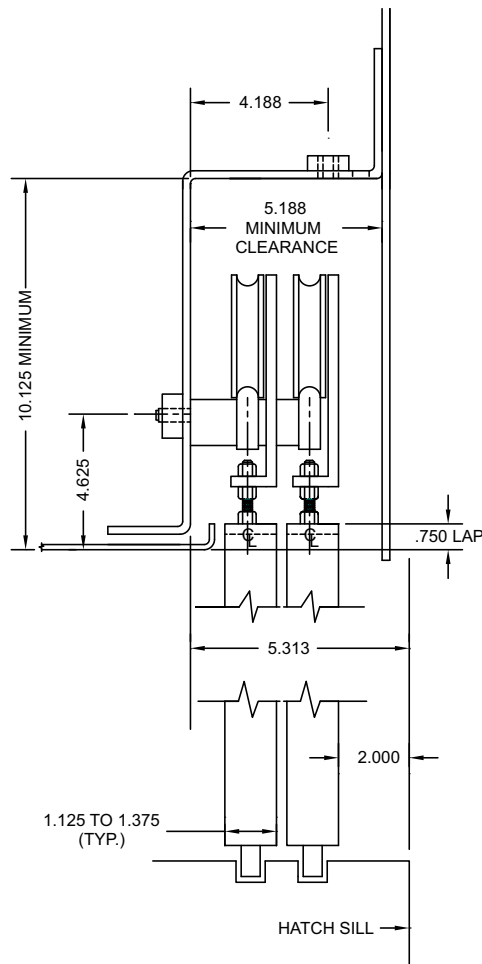
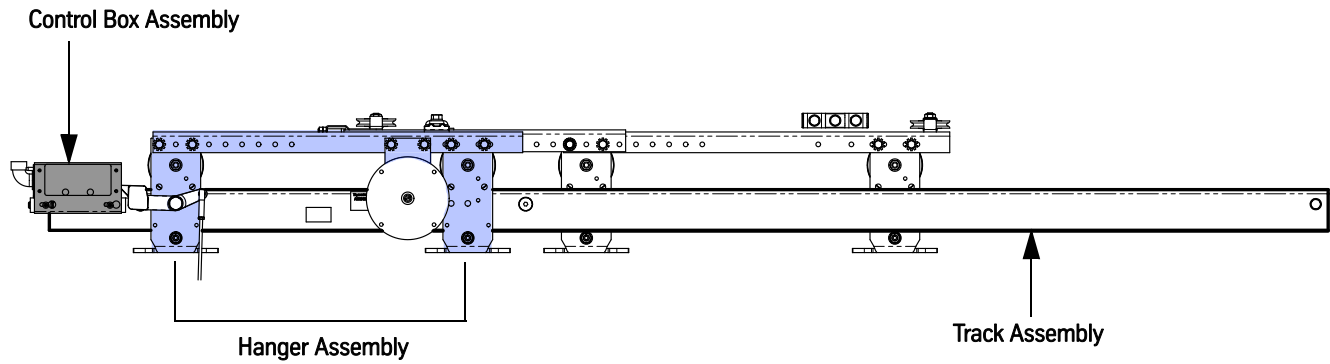


Door Opening	Track Length
36"	75"
38"	79"
40"	83"
42"	87"
44"	91"
46"	99"
48"	99"
Contract	Contract

Figure 23 - Center Opening Hoistway Track and Hanger Assembly (RH shown, typical)

Hoistway Drawings

(continued)



Door Opening	Track Length	Short Track Length
32"	53.18"	33.18"
34"	56.18"	35.18"
36"	59.18"	37.18"
38"	62.18"	39.18"
40"	65.18"	41.18"
42"	68.18"	43.18"
44"	71.18"	45.18"
46"	74.18"	47.18"
48"	77.18"	49.18"
50"	80.18"	51.18"
52"	83.18"	53.18"
54"	86.18"	55.18"
56"	89.18"	57.18"
58"	92.18"	59.18"
60"	95.18"	61.18"
62"	98.18"	63.18"
64"	101.18"	65.18"
66"	104.18"	67.18"
68"	117.18"	69.18"
70"	110.18"	71.18"
72"	113.18"	73.18"

Figure 24 - Two Speed Hoistway Track and Hanger Assembly (RH shown, typical)

Hoistway Drawings

(continued)

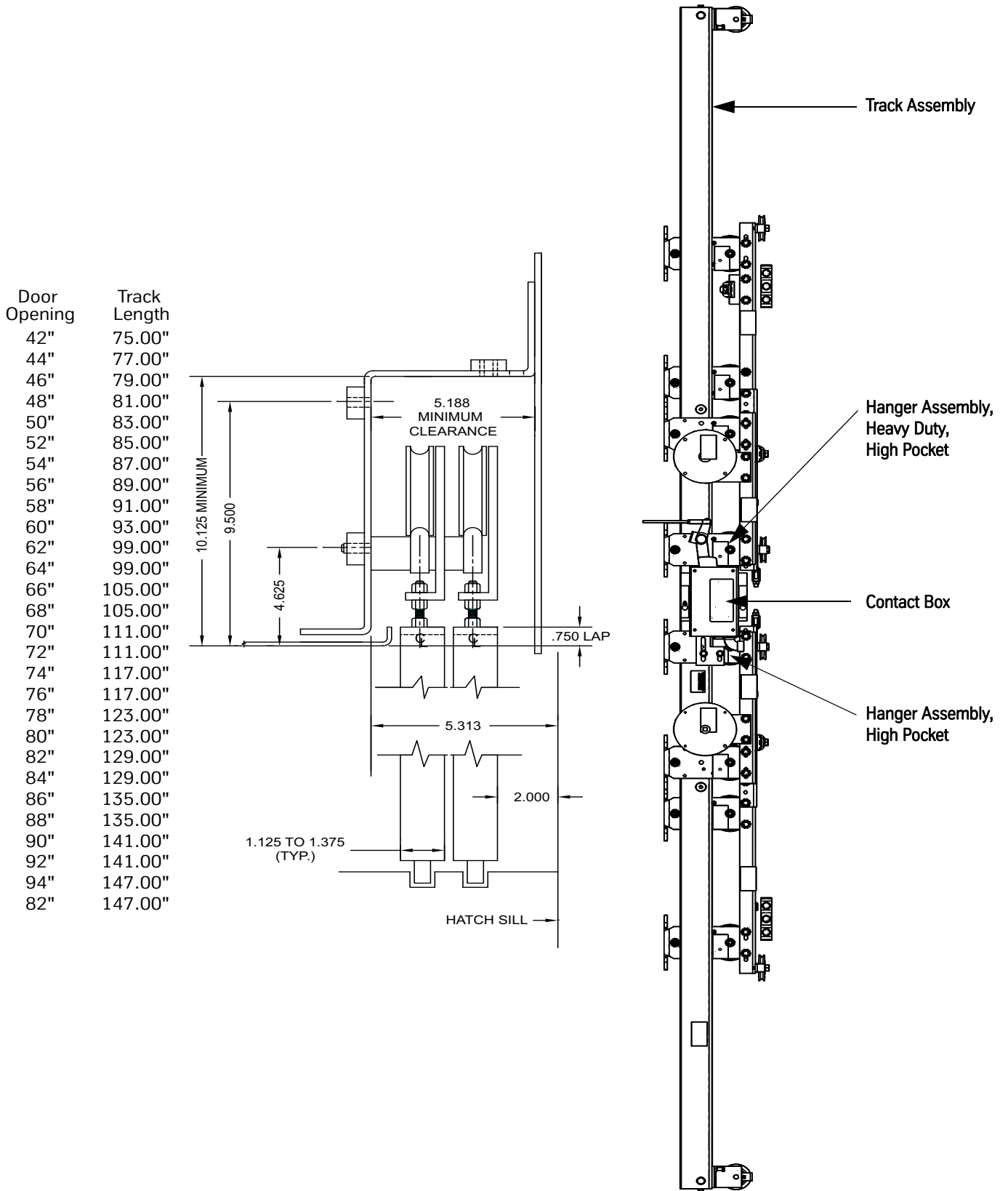
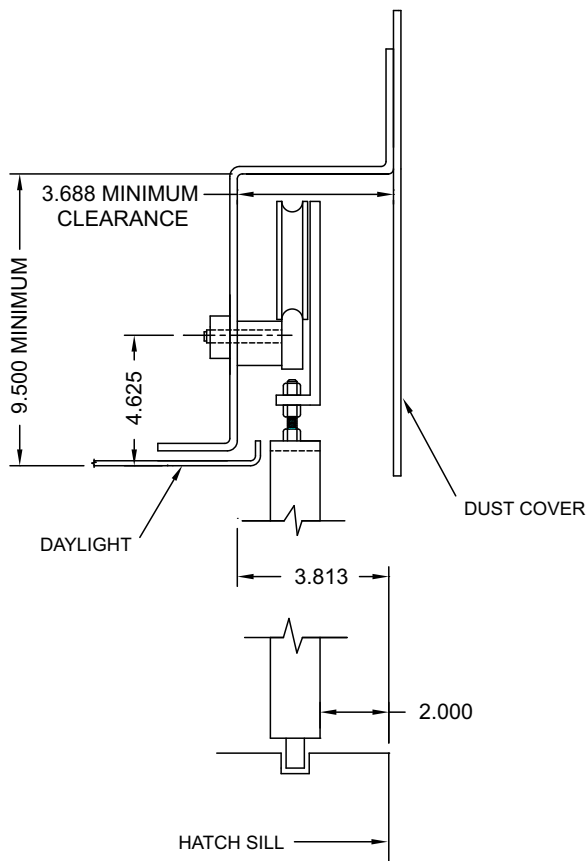
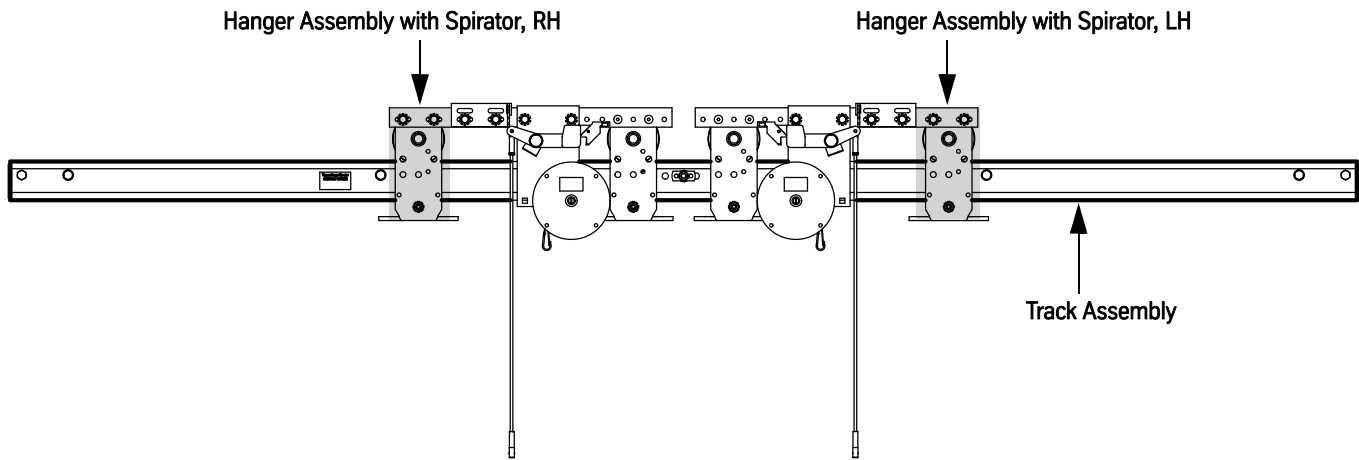


Figure 25 - Two Speed Center Opening Hoistway Track and Hanger Assembly (typical)

Hoistway Drawings

(continued)



Door Opening	Track Length
36"	75"
38"	79"
40"	83"
42"	87"
44"	91"
46"	99"
48"	99"
Contract	Contract

Figure 26 - Dual Interlock, Center Opening Hoistway Track and Hanger Assembly (typical)

Installation

(continued)

2. Install pendant bolts in the top of the doors, and verify that the bolts parallel the face of the door. Correct as necessary. See Figure 27.

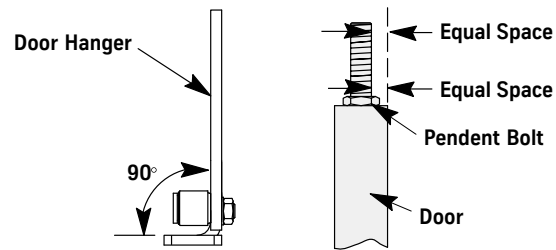


Figure 27 - Install Pendant Bolts

Astragal and Sight Guards Installation

1. Set the right-hand door (referenced from inside the car) face down on a table.
2. Place the astragal on the door, aligning the holes of each. See Figure 28 for the remaining steps in this procedure.
3. Place the sight guard over the flange of the astragal, and align the holes.
4. Start, but don't tighten, #8 self-tapping screws in each hole.
5. Start at one end and pull the astragal under the sight guard until it is tightly against the edge of the door.
6. Tighten the #8 self-tapping screws down the length of the door to secure the astragal and the sight guard.
7. Verify that the astragal is tight at all points.
8. Install the sight guard on the left-hand door, and ensure that there is a 1/8" gap from the edge of the door. This gap allows the astragal to overlap the closed doors.

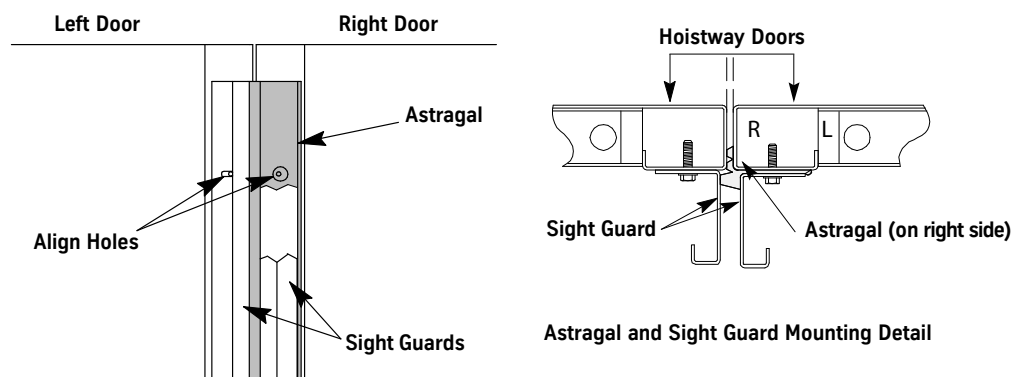


Figure 28 - Astragal and Sight Guard Mounting

Installation

(continued)

Header Hangers Installation

1. Loosen the four 1/4" hanger screws to allow the header hangers to move laterally on the link angle.
2. Loosen the cable door clamp to allow the header hangers to move independently of each other.
3. Install the jam nuts and the washers on the pendant bolts. Leave the nuts loose until the doors are plumb.
4. While guiding the pendant bolts into door hanger holes, lift the doors and rest them upon the sill.
5. Install washers and jam nuts onto the pendant bolts to secure the doors to the hangers.

Note: Ensure that the hangers are perpendicular to the link angle (reshape as needed). See Figure 29.

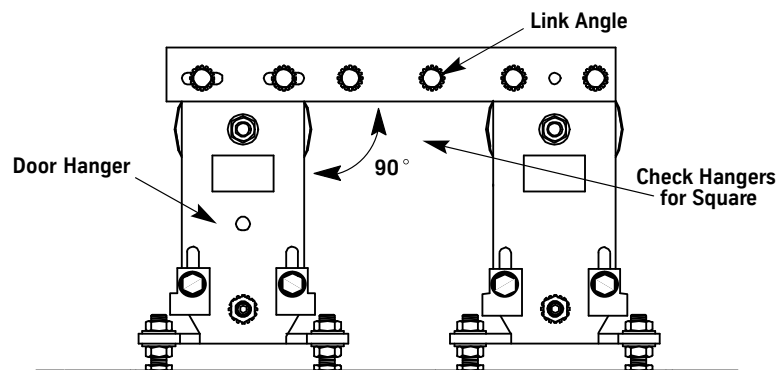


Figure 29 - Check Hanger to Link Angle

6. Tighten the 1/4" cap screws.
7. Tighten the outer top jamb nuts to lift the door evenly off of the sill about 5/16" See Figure 30.

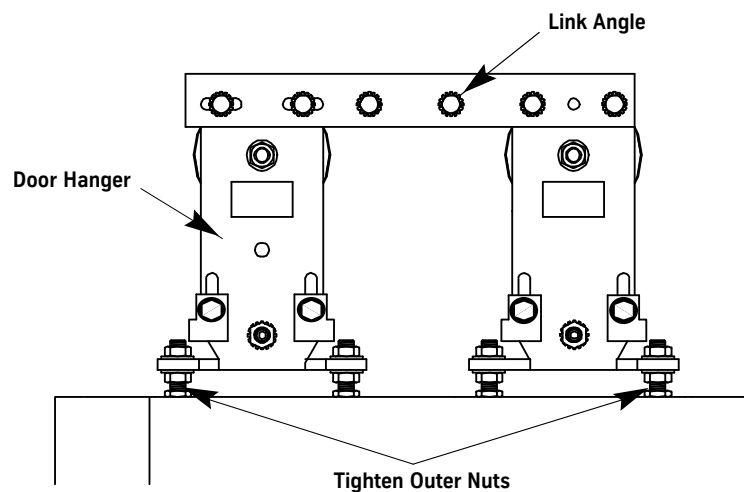


Figure 30 - Tighten Outer Jamb Nuts

Installation

(continued)

Door Alignment

1. Align the leading edge of the door to centerline of the head jamb and the sill. See Figure 31.
2. Adjust the jam nuts on the pendant bolts so that the leading edge of the door is plumb with the sill and the head jamb.

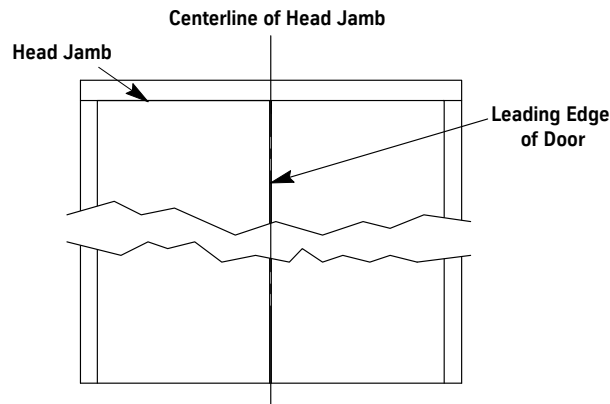


Figure 31 - Plumb the Doors

3. Adjust the hanger at the pendant bolt to allow a 1/4" gap between the head jamb and the face of the door.

Upthrust Roller Adjustment

1. Loosen the locknut on the allen head bolt located in the hanger. See Figure 32.
2. Turn the upthrust rollers clockwise until they touch the bottom of the door track.
3. Turn the upthrust rollers slightly counter-clockwise until a small gap appears between the upthrust rollers and the bottom of the door track.

Note: When manually opening and closing the doors, the upthrust must not come in contact with the bottom of the door track.

4. Tighten the lock nut.
5. Manually open and close doors to ensure there is no binding or interference with door travel.

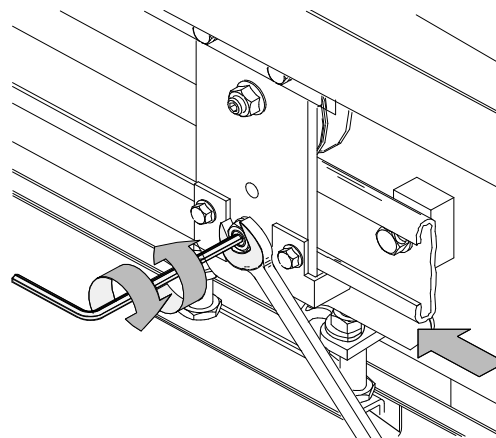


Figure 32 - Upthrust Roller Adjustment - Standard

Installation

(continued)

Door Relating Cable and Closer Adjustment

1. Ensure that the relating cables have proper tension, and adjust (as needed) with the cable tightening assembly.

Note: The relating cable should be tight, but not so tight as to cause the doors to bind.

2. Fully close the hoistway doors. See Figure 33 for all remaining steps in this procedure.
3. Move the doors until their meeting point is aligned with the centerline of the sill and the head jamb.
4. Tighten the relating clamp cable.
5. Fully open the doors.
6. Check that the edge of the door/astragal is flush with the return column.

Note: A slight readjusting of the relating cable may be necessary to obtain the proper opening; ensure that the relating cable clears all pulleys and other obstructions.

7. Connect one end of the closer cable to the header.
8. Adjust the tension on the closer reel: Add turns to the reel to close the doors when the doors are released 1/2" from the closed position.
9. Verify that the doors close fully with no "double bump" when the doors touch each other.

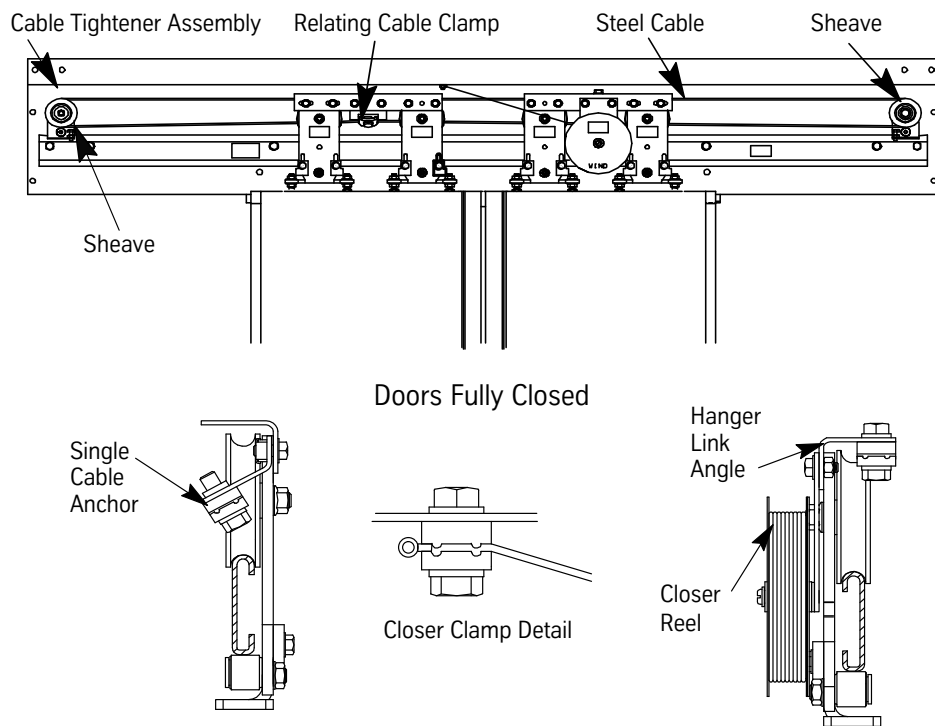


Figure 33 - Door Relating Cable Adjustment

Installation

(continued)

Install and Adjust the Door Gibs

10. Install the gib assemblies to the door panels and verify that they are free of binding through the entire travel. See Figure 34 on page 39, or Figure 35 on page 40.

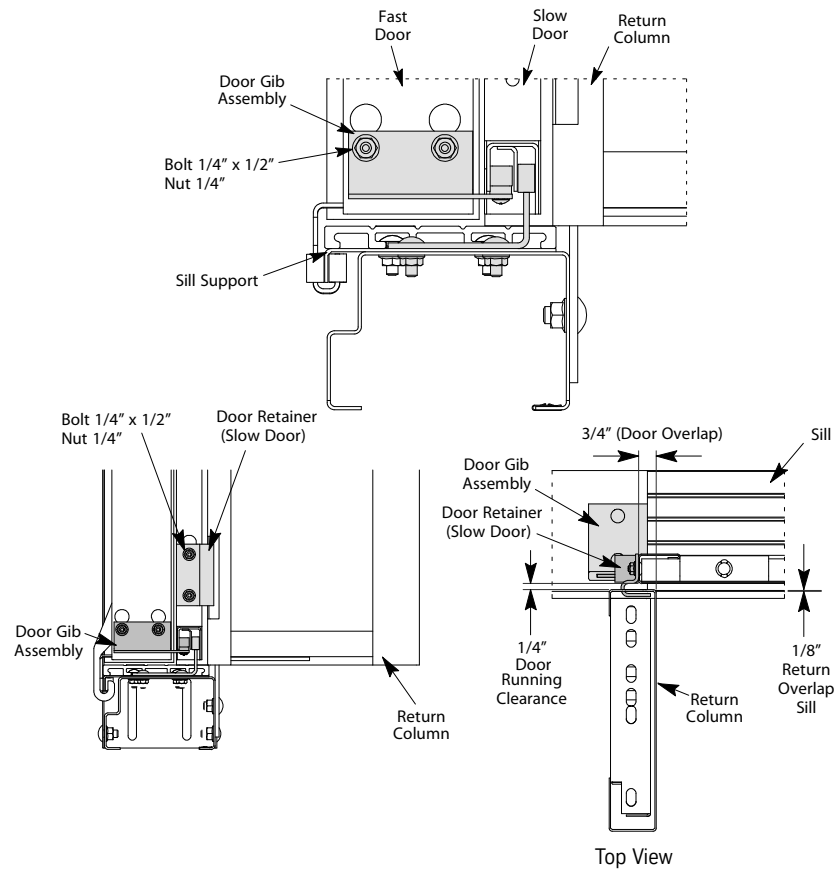
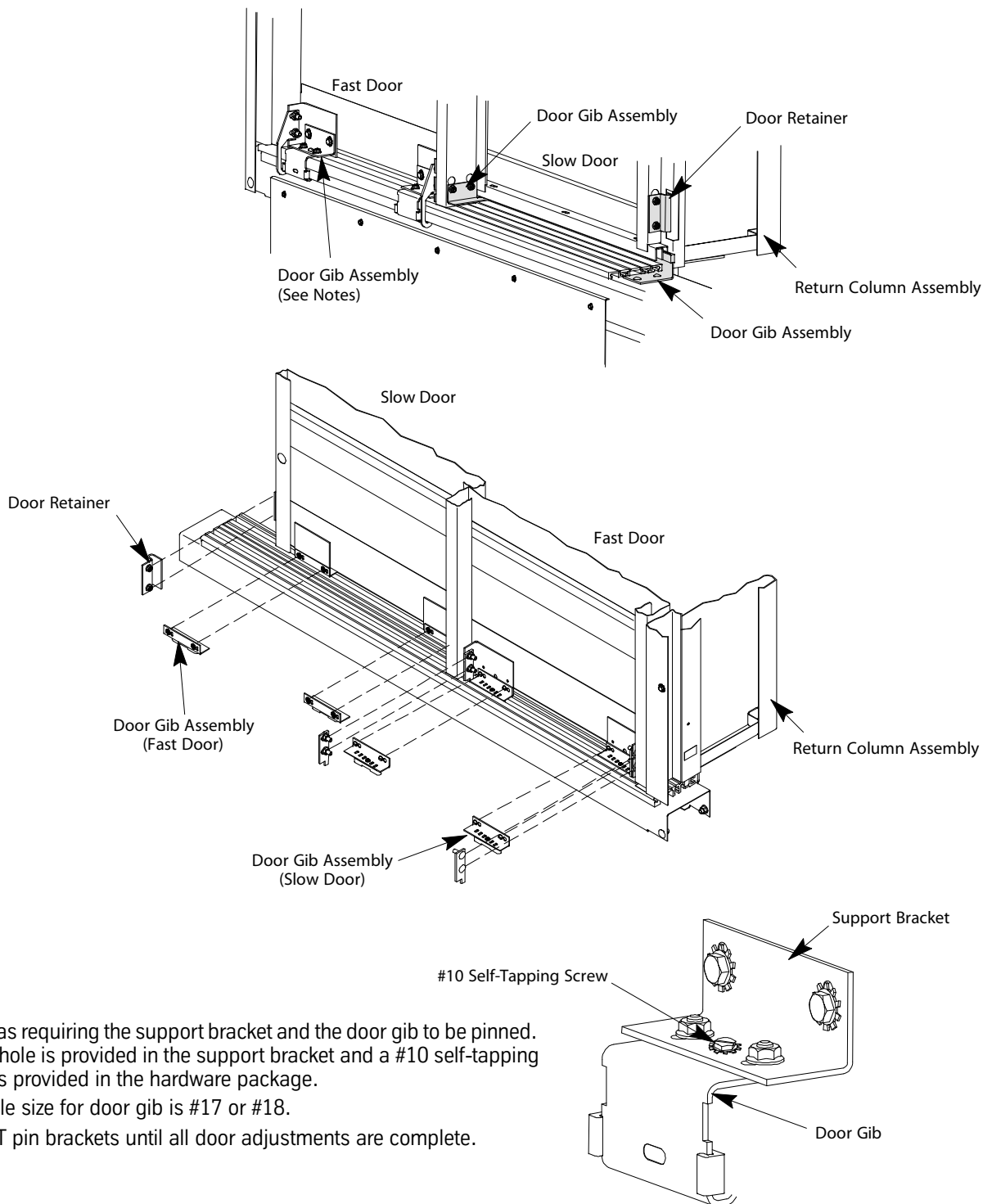


Figure 34 - Door Gib Assembly (Single Speed)

Install and Adjust the Door Gibs

(continued)



Notes:

- For areas requiring the support bracket and the door gib to be pinned. A pilot hole is provided in the support bracket and a #10 self-tapping screw is provided in the hardware package.
- Drill hole size for door gib is #17 or #18.
- Do NOT pin brackets until all door adjustments are complete.

Figure 35 - Door Gib Assembly (Two Speed)

Installation

(continued)

11. Install the bottom door retainer.
12. Install the door track retainer (fire tab). See Figure 36.

Note: When installing the door track retainers, use the center holes for integral headers and use the bottom holes for bolt-on track.

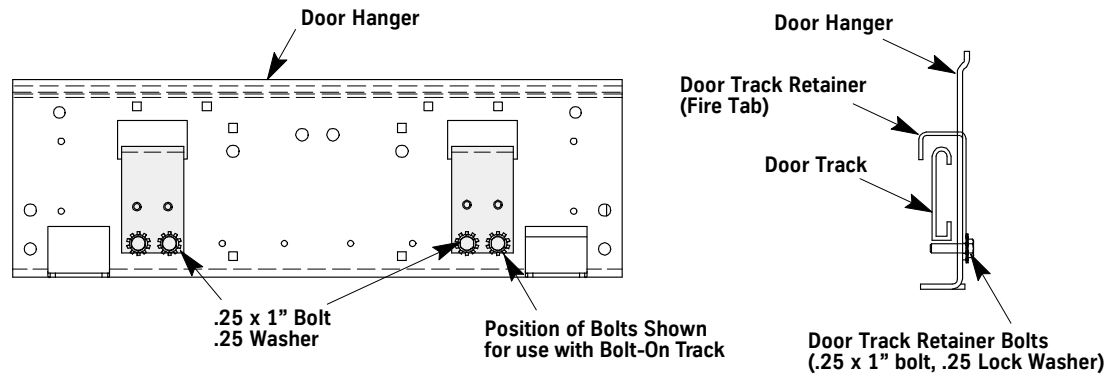


Figure 36 - Door Track Retainers

13. Adjust the relating cable tension and the door position on center opening and two speed jobs. See Figure 37.

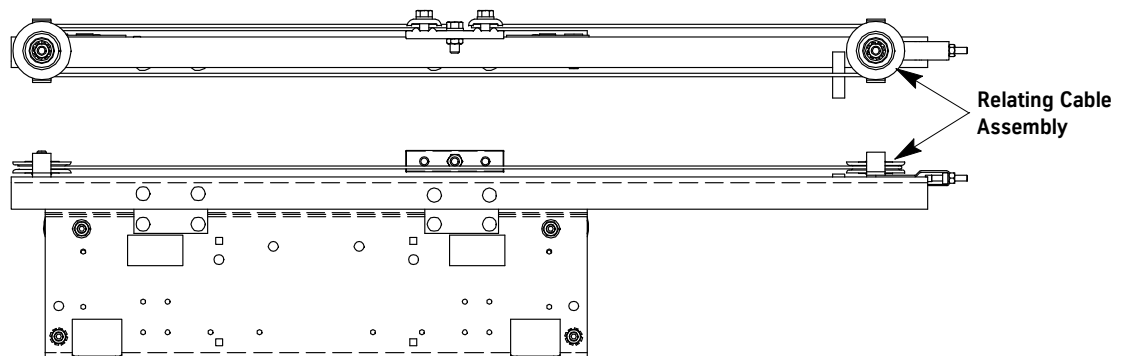


Figure 37 - Relating Cable

14. Connect the spirator cable to the spirator cable clip. See Figure 38; or, if required, connect the sash weight to the closer cable.

Note: Ensure that the cable is routed over the sash weight sheave at the top of the weight box, and is also connected to the hanger assembly.

15. Install the weight cover.

Installation

(continued)

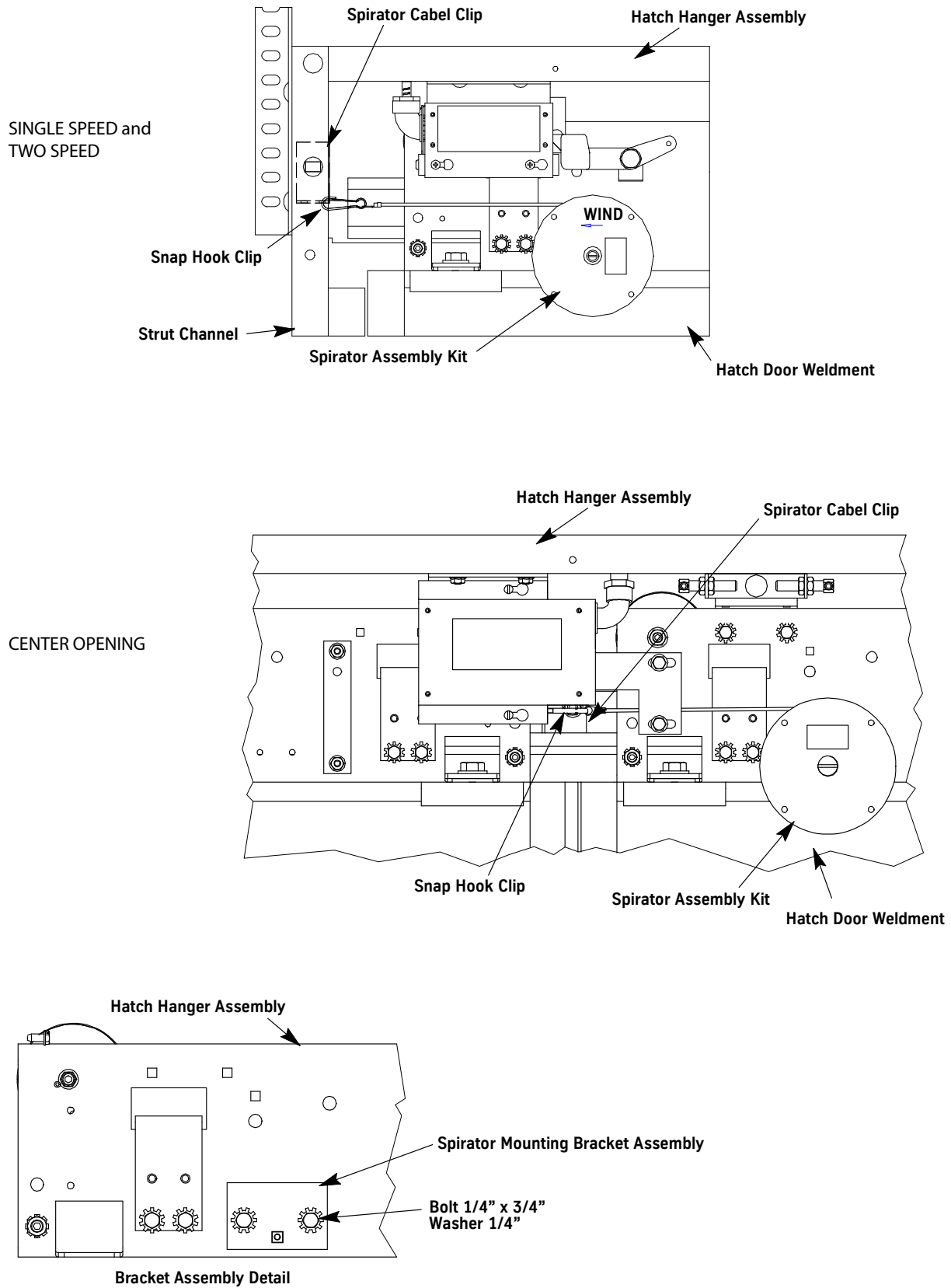


Figure 38 - Spirator Cable

Interlock Installation

1. Use a 3/8" x 1" carriage bolt and a shake proof lockwasher/nut to install the pickup roller crank assembly to the door panel. See Figure 39 and Figure 40 on page 44.
 - For single speed doors, mount in set of holes nearest leading edge of the door.
 - For two speed doors, mount in set of holes nearest leading edge of the fast door.
 - For center opening doors, mount in set of holes nearest leading edge of door.
2. Move the assembly to the center of the slots, and tighten the nuts.

Note: The centerline of the rollers must be plumb throughout the hoistway in order to engage the clutch properly.
3. Use the provided snap-on fittings to install the pickup link rod between the pickup roller assembly and the interlock hook.
 - a. Attach the ball joint bolt to a 3/16" hole on the pick-up roller assembly.
 - b. Install the connecting rod between the pick-up roller and the interlock arm.

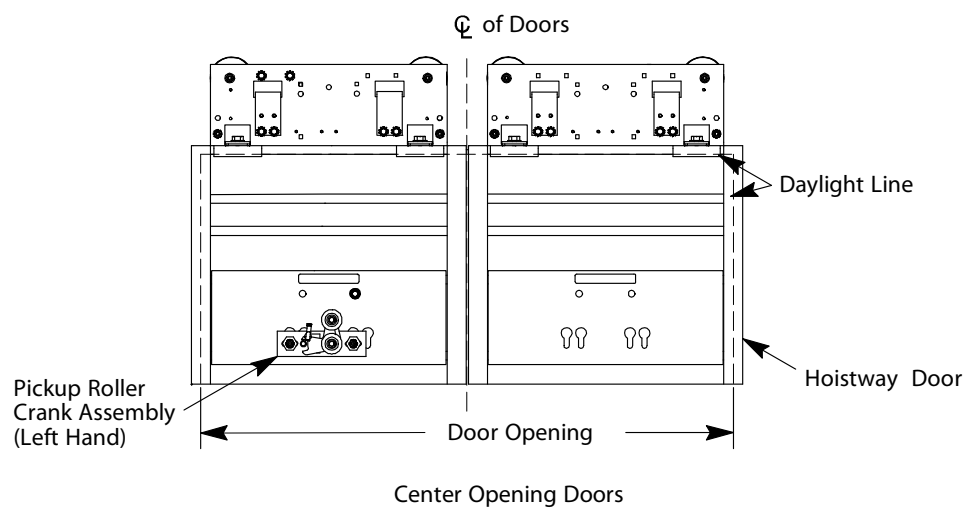
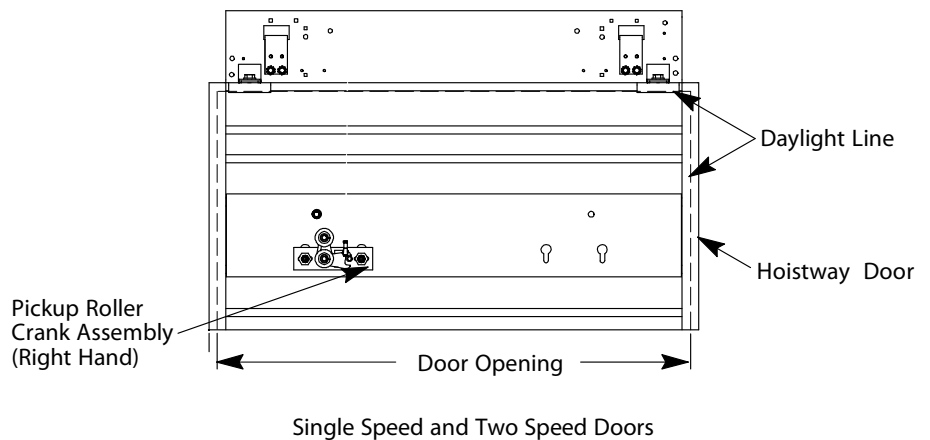


Figure 39 - Install the Pick-up Roller Crank Assembly

Interlock Installation

(continued)

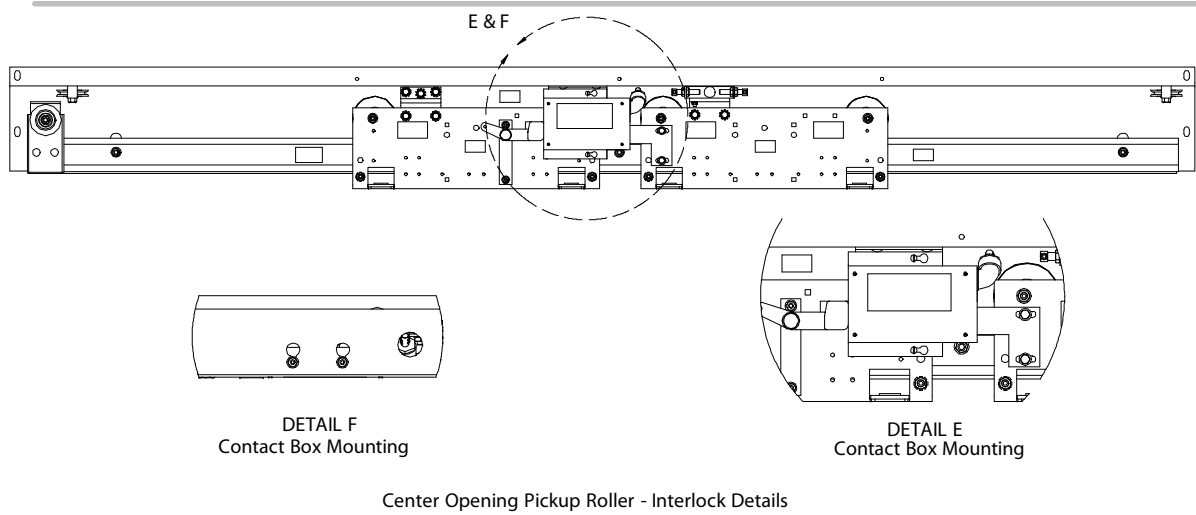
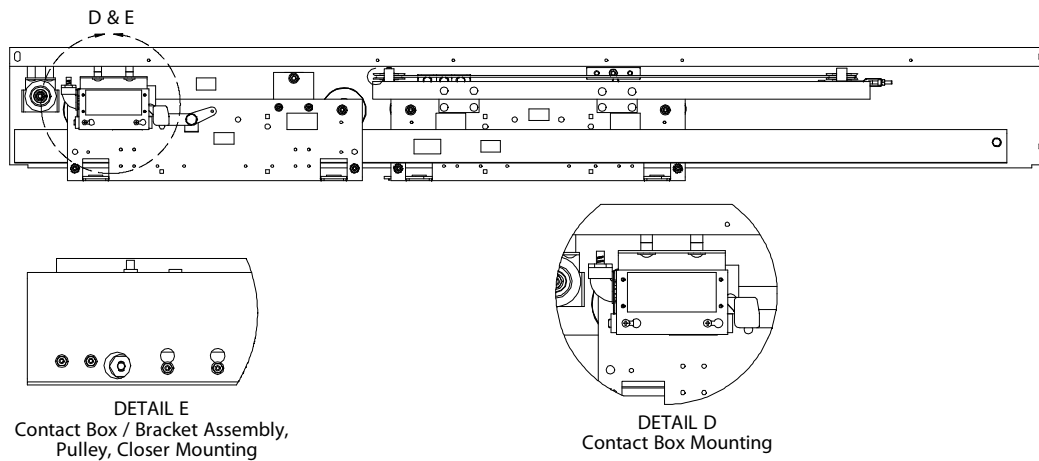
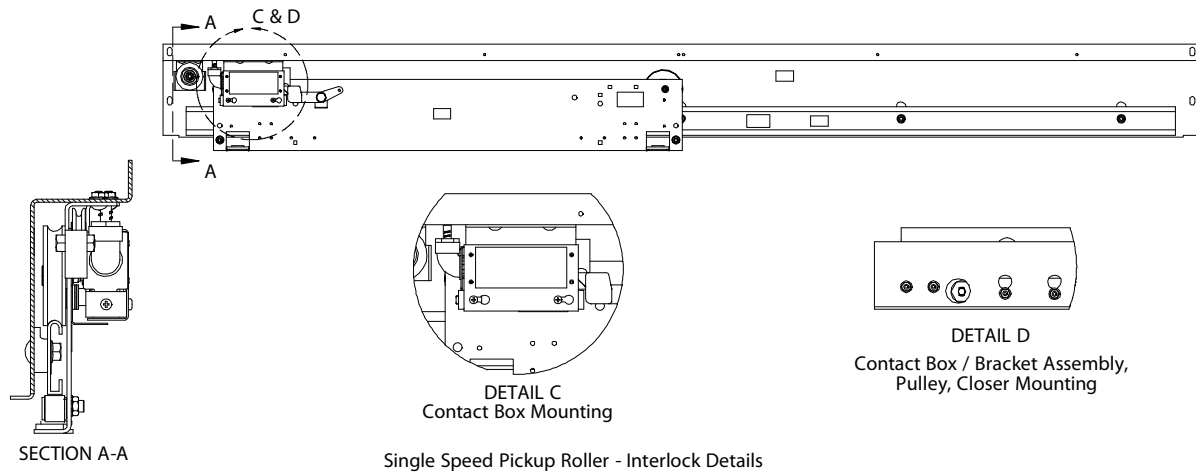


Figure 40 - Interlock Details

Single Interlock Adjustment

1. Remove the cover from the interlock box.
2. Close the doors and ensure that the interlock hook is centered on the contacts. See Figure 41.

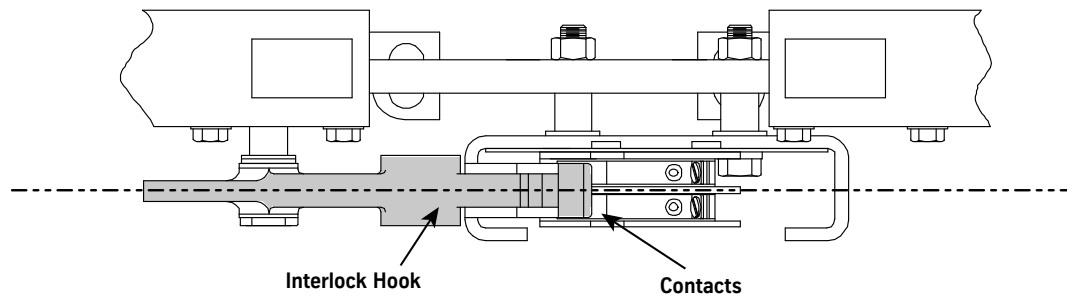


Figure 41 - Interlock Hook Centered on Contacts

3. Verify that the interlock hook does not contact the interlock box.
 - a. Put slight pressure on the front interlock hook to verify it does not contact the back of the box.
 - b. Put slight pressure on the back of the interlock hook to verify it does not contact the front of the box/frame.

Note: It may be necessary to either remove one of the two washers on the interlock hinge bolt, or shim the interlock box.



Never remove both washers on the interlock hook shaft.

4. Adjust the interlock box so there is an equal distance (about 1/8"), when the doors are closed, between the interlock hook and both sides of the locking tab on the box. See Figure 42.

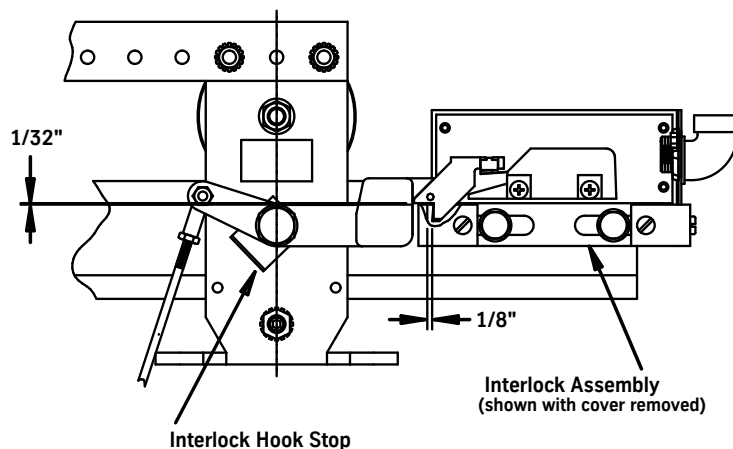


Figure 42 - Adjust the Interlock Box

5. Adjust the connecting rod length so that when the hook is resting on its contacts, the interlock hook has 1/32" clearance with the top of the locking tab on the box. At this time, the pickup roller crank should be resting on its stop.
6. Vertically adjust the box to obtain 3/32" contact compression. Ensure that the interlock hook touches both contact leaves at the same time.

Single Interlock Adjustment

(continued)

7. Ensure that when the interlock hook is raised (by actuation of the rollers), the hook clears the box at the top by a minimum of $1/16"$. See Figure 43.

Note: If necessary, adjust the interlock hook stop to limit the hook travel.

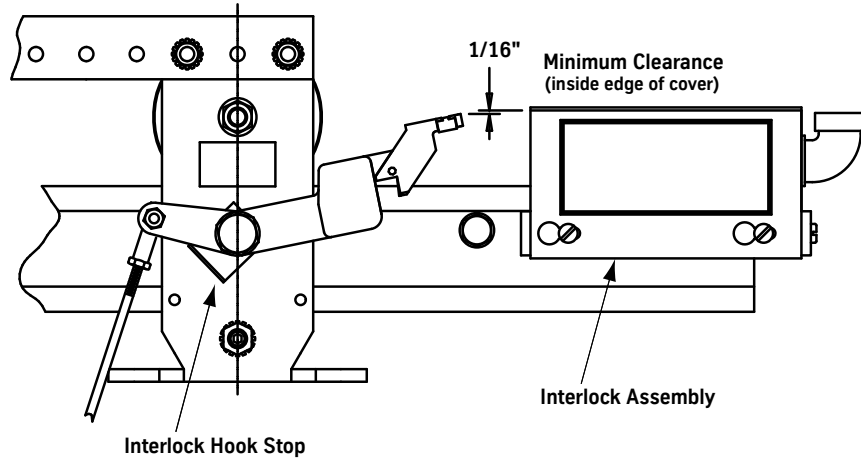


Figure 43 - Adjust the Interlock Hook Stop

8. While actuating the rollers and the interlock hook, verify that there is a $9/32"$ hook engagement before the contacts are bridged. See Figure 44.

Note: If necessary, adjust the plastic contact housing in the interlock box to obtain the proper angle and position of the contacts.

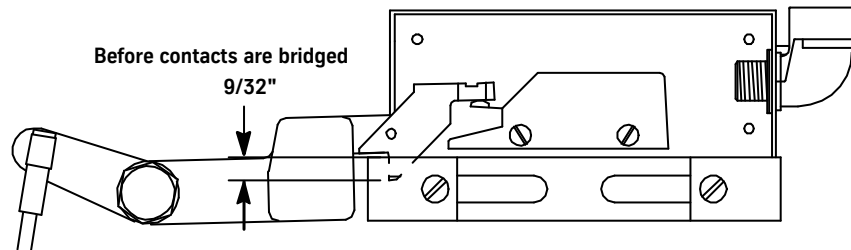


Figure 44 - Interlock Hook Engagement

Single Interlock Wiring

1. Remove the interlock box cover.
2. Ensure that the shorting bar has a good sweep on the contacts after the hook is in the locked position.



All door lock contacts must be wired in series. See specific wiring diagram for details.

Dual Contact Interlock Adjustment

1. Remove the cover from the interlock box.
2. Close the doors, and check the clearance between the sides of the interlock hook, contact plug, and box to ensure that they are centered on their respective contacts. See Figure 41 on page 45.
3. Put slight pressure on the front of the interlock hook to verify that it does not contact the back of the box.

Note: It may be necessary to either remove one of the two washers on the interlock hook hinge bolt, or shim the interlock box.



CAUTION

Never remove both washers on the interlock hinge bolt.

4. Adjust the interlock box so that there is an equal distance (about 1/8") when the doors are closed between the interlock hook and both sides of the locking tab on the box. See Figure 42 on page 45.
5. Adjust the connecting rod length so that when the hook is resting on its contacts, the interlock hook has 1/32" clearance with the top of the locking tab on the box. At this time, the pickup roller crank should be resting on the stop.
6. Vertically adjust the box to obtain 3/32" contact compression. Ensure that the hook touches both contact leaves at the same time.
7. Adjust the contact plug to obtain 5/32" compression of the contact leaves when the doors are closed. The contact plug should touch both contact leaves at the same time.
8. Manually push the doors in the open direction to take up all of the slack in the interlock hook, and verify that the contact remains closed.
9. While actuating the pickup rollers and the interlock hook, verify that there is a 9/32" hook engagement with the box before the contacts are bridged.

Note: If necessary, adjust the plastic contact housing in the interlock box to obtain the proper angle and position of the contacts.

Dual Interlock Wiring

1. Remove the interlock box cover.
2. Verify there is a factory wire connecting one terminal on each of the two contact blocks.
3. Ensure that the shorting bar has a good sweep on the contacts after the hook is in the locked position.



CAUTION

All door lock contacts must be wired in series. See specific wiring diagram for details.

Fascia Plate Installation

**WARNING**

Leather gloves are required when handling fascia, dust covers, and toe guards because the edges are sharp.

Notes:

- The top fascia plate must be installed before the other fascia plates can be attached.
 - The top fascia plate clips over the sill support.
 - The top fascia plate has pilot holes for locating screws (these screws are used to fasten the plate to the sill support).
 - Depending upon the distance from floor to floor, two or more fascia plates will be required.
1. Install the top fascia plate. See Figure 45 on page 49.
 2. Center the top fascia plate with the entrance opening.
 3. Use #10 screws to fasten the fascia to the sill support.
 4. Attach additional fascia plates:
 - a. Insert tabs into the slots of the previous plate.
 - b. Fasten with #10 screws.
 5. Use #10 screws to attach fascia plates to the support angles on both sides. See Figure 46 on page 50.
 6. Install the toe guard at the bottom landing.

Fascia Plate Installation

(continued)

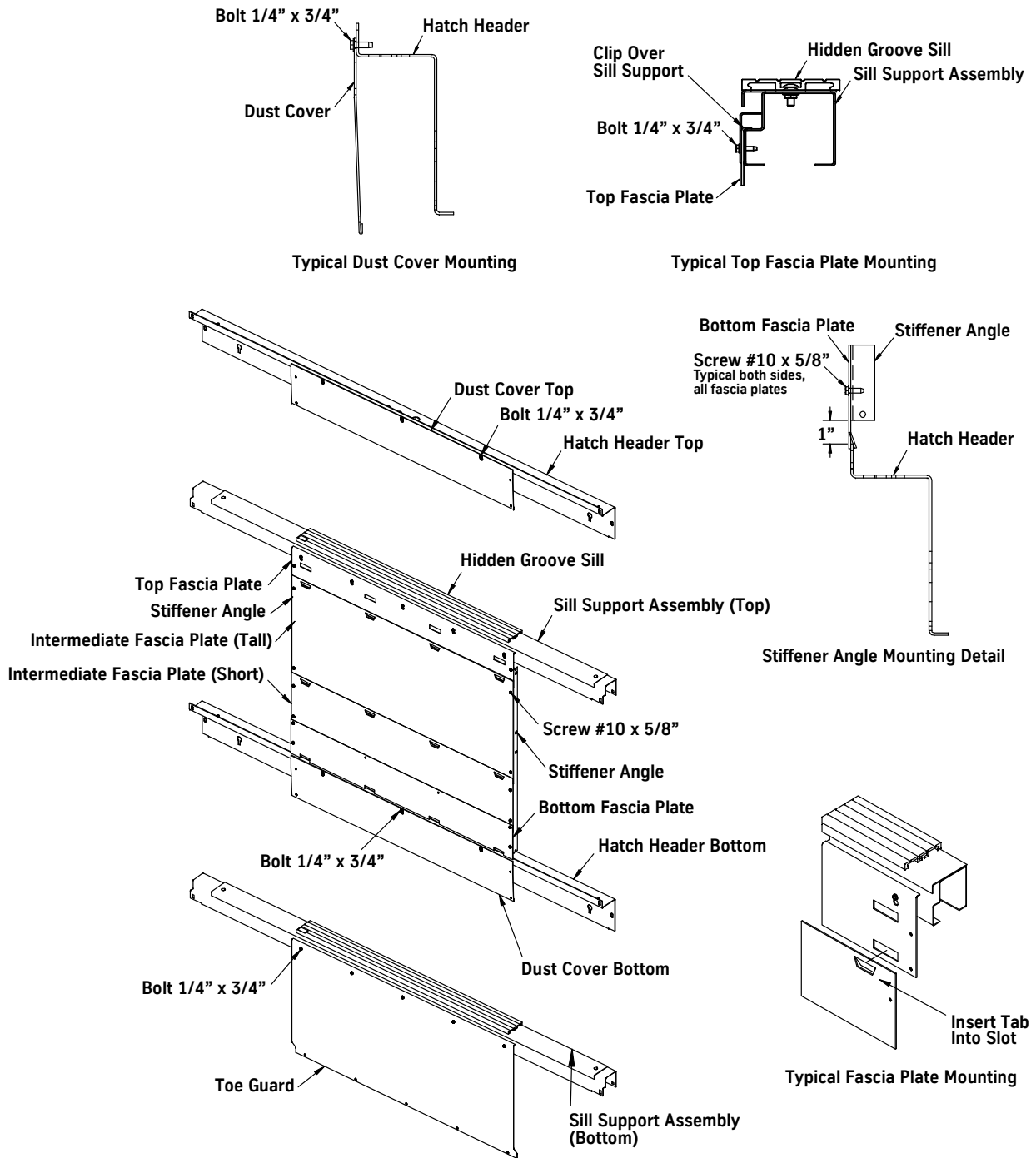


Figure 45 - Dust Cover and Fascia Installation

Fascia Plate Installation

(continued)

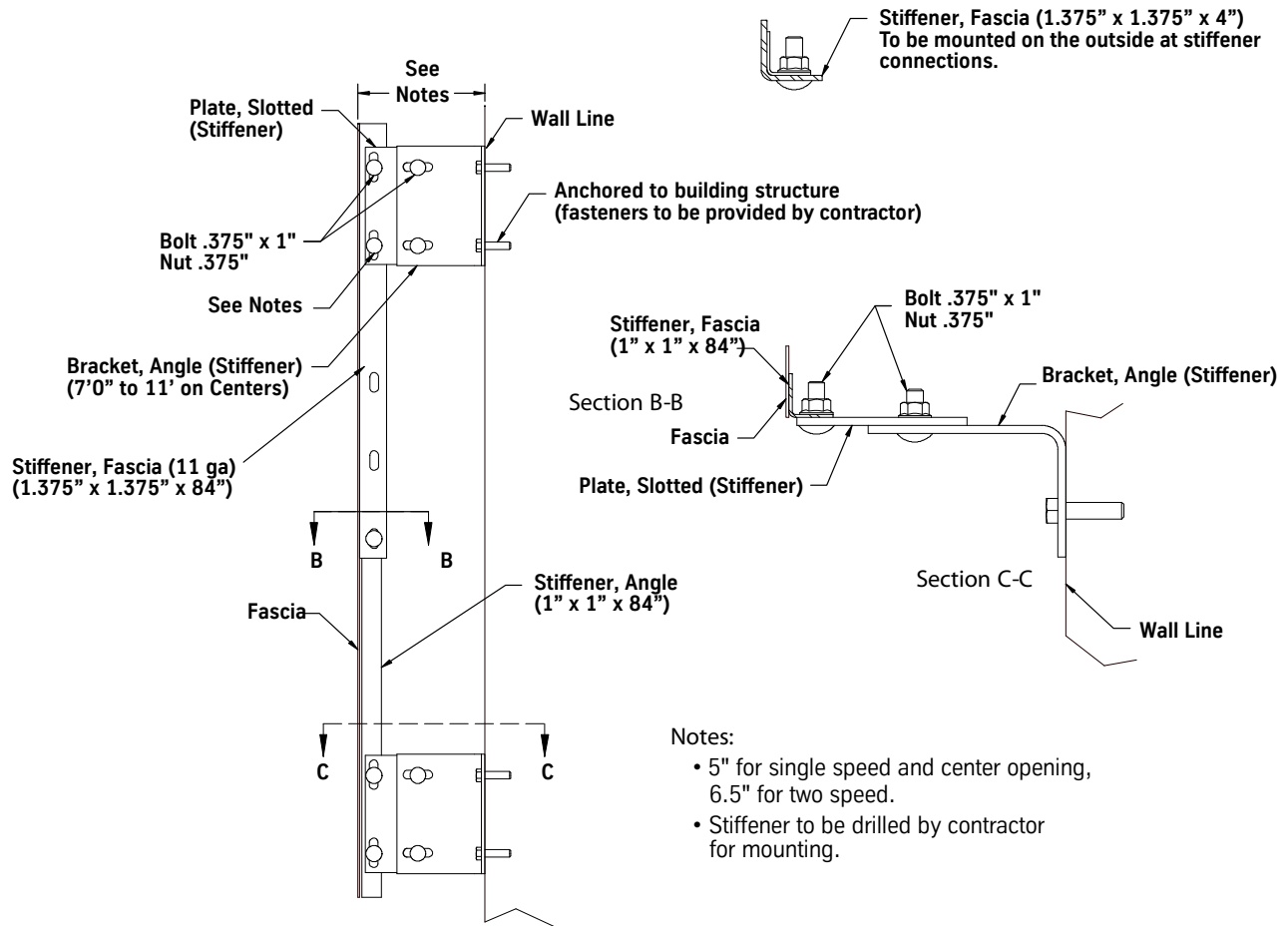


Figure 46 - Stiffener Angle Support Installation

Maintenance

Hoistway Doors and Tracks (each floor)

Monthly

1. Wiggle the top of the doors to check the door hangers for looseness.
2. Check that the door tracks are smooth and clean.
3. Unlock the doors, and move the hoistway door by hand to check the door rollers for cracking tires, loose bearings, or unusual noise.
4. Inspect the shorting bar contact of the hoistway door interlock.
5. Manually move the doors on track to check the door relating cables for excessive looseness, fraying, or loose connections; Ensure that the nylon idler pulleys rotate smoothly.
6. Manually move the doors on the track to check for cracked or broken eccentric rollers.
7. Manually check the door-closer mounting bracket for looseness, and move the doors the full travel on the track and listen for unusual noises.
8. Manually check the door interlock hook bolt for tightness, and check for clearance on the lock box cover.
9. Ensure the proper rotation on pickup rollers and check for cracking; Pull on the mounting to ensure it is tight.
10. Wiggle the bottom of the doors to check that the door guide mounting brackets are tight.
11. Ensure that the fire tabs are in place, and move the doors the full travel to check for scraping or rubbing noises.
12. Ensure a minimum of 118" clearance between door panels/bucks.
13. While running the car on Inspection Operation the length of the hoistway, randomly stop the car, trip a hoistway door lock, and attempt to run the car (to verify that the car will not run with the door unlocked).

Note: If car the runs with the doors unlocked, check the controller wiring for jumper of door relays for welded contacts.

Maintenance*(continued)***Annually**

The car door restrictor may be temporarily deactivated by depressing and blocking the restrictor to allow it to pass the header restrictor angle.

1. Inspect the door gibs:
 - a. Move the car to allow access to the bottom of the doors.
 - b. Unlock the doors, and move them full travel to check that the doors move freely on the sill.
 - c. Check gibs for wear (adjust or replace as necessary).
 - d. Check that the fire tab screws are tight.
 - e. Check for door-to-sill clearance of 114" (optimum) to 318" (maximum).
2. Remove and store the dust cover.
3. Unlock the doors, and partially open them.
4. Inspect the door hangers, eccentrics, and tracks:
 - a. Check that the tracks are smooth and clean, and tighten the mounting bolts.
 - b. Manually move doors to check the door rollers for cracks and for smooth bearing operation; check that the mounting bolt is tight.
 - c. Use a flashlight to observe the gap between the roller and the track, check the eccentric setting.

Note: Set as close as possible throughout door travel with-out causing drag (approx. .015").

- d. Ensure that the eccentrics and hanger bolts are tight.
5. Inspect the relating cable:
 - a. Manually move the doors and check the relating cable for frays or excessive looseness; adjust as necessary, and tighten all fastenings.
 - b. Check the condition of nylon pulleys for smooth operation, and tighten the mounting bracket.

Note: Adjustment here will affect the interlock settings.

6. Inspect the door closer (spirator):
 - a. Fully open the doors, and listen for unusual noises from the closer.
 - b. Check that the closer mounting bracket is tight.
 - c. Check the cable for fraying, and check the cable fastening.
 - d. Stop doors within 112" from fully closed, and release them to check the setting of the closer (doors should close from any position).

Maintenance*(continued)*

7. Inspect the door interlocks:
 - a. Remove the screws from the interlock cover, and remove the cover.
 - b. Verify that the lock is centered in the catch (shim as required).
 - c. Unlock the doors, and then allow them to close to check the clearances of the following:
 - The pickup of the interlock hook = 1/8" from the top of box with the hook up
 - The drop
 - The engagement of the hook before the contacts bridge = 9/32"
 - The overtravel on the contacts = 3/32"
 - Equal height of the contacts and the hook-to-locking bar clearance = 1/8" after locked (lateral movement indicates a bushing problem).
 - d. Clean the bridging bar, and tighten the mounting bolts.
 - e. Turn OFF the mainline disconnect.
 - f. Clean the lock contacts, and tighten the screws in the contact assembly base.
 - g. Replace the interlock box cover.
8. Inspect the clutch vane and the pick-up rollers:
 - a. Position the clutch vane in front of the pick-up rollers by moving the car and checking for proper clearance (1/4" maximum) between the face of the vane and the pick-up roller.
 - b. Check that the depth of the rollers into the clutch is 3/4 to FULL roller on the vane.
 - c. Check the pickup roller assembly mounting bolts

Troubleshooting

Problem	Cause	Solution
Doors won't close the last inch	Ramps on door tracks	Clean tracks
	Debris in sill	Clean sill
	No closure tension	Broken closure or improper adjustment
Doors drag when opening or closing	Gibs rubbing sill	Lift door
	Door out of alignment	Re-adjust door
Door lock won't make contact	Broken interlock hook	Replace interlock hook
	Bent connecting rod	Straighten rod
	Broken contact	Replace contact

Replacement Parts

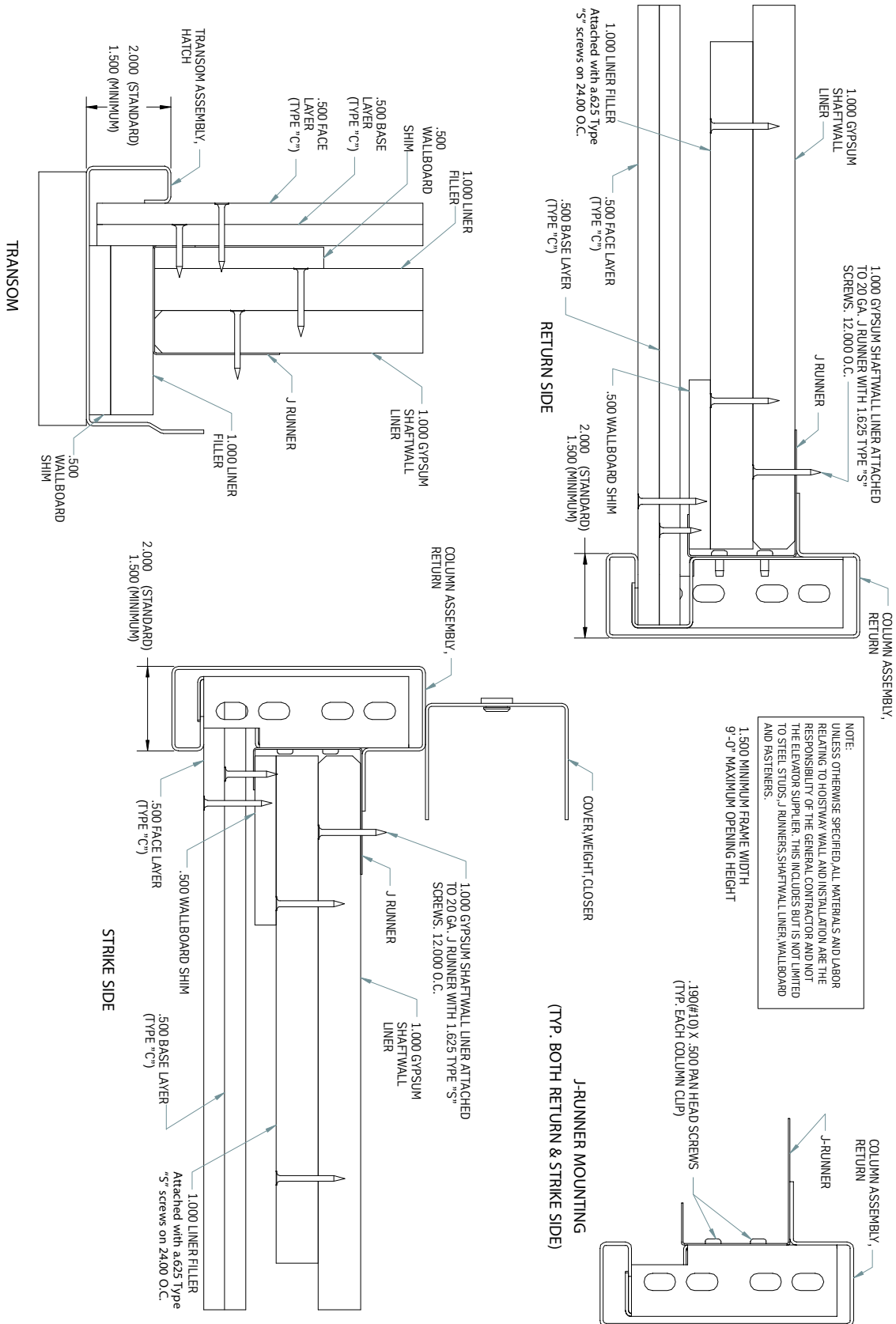
ITEM	PART NO.	PRINT NO.	DESCRIPTION
1	9864295	124580	Roller, Hanger
2		744FD1	Shaft, Roller
3	9752160	45216	Shaft, Upthrust
4	9875426	67542	Roller, Upthrust
5	9700687	700583	Nut, Upthrust
6	9846803	77572	Nut, Roller Shaft, NHJ, .375
7		45721	Interlock Hook Assembly
8		392CH1	Shaft, Interlock Hook, Shoulder Bolt
9	9701011	40101	Bushing, Interlock Shaft, Nylon
10	9801121	40114	Spacer, Interlock Hook 9/16" lg
11	9802400	47530	Rod, Link Assembly R.H.
	9802411	145793	Rod, Link Assembly L.H.
12		718CH1	Rod, Link, 18 5/8"
13	9951362	40130	Clip Cable
14	9951313	40113	Anchor, Cable, Single
15	9701229	700338	Bolt, Clip 3/8-16 x 1.25" lg, CSH
16	9701588	40158	Pulley Relating Cable, Closer Weight
17		224AE1	Cable, Weight Closer, 61"
		224AE2	Cable, Weight Closer, 71"
		224AE3	Cable, Weight Closer, 80"
		224AE4	Cable, Weight Closer, 107"
18		278AA2	Weight Assembly, Closer, 6#
		278AA1	Weight Assembly, Closer, 7.5#
19		108989	Cage Nut, 1/4" - 20 UNC (Closer Weight Cover)

Replacement Parts

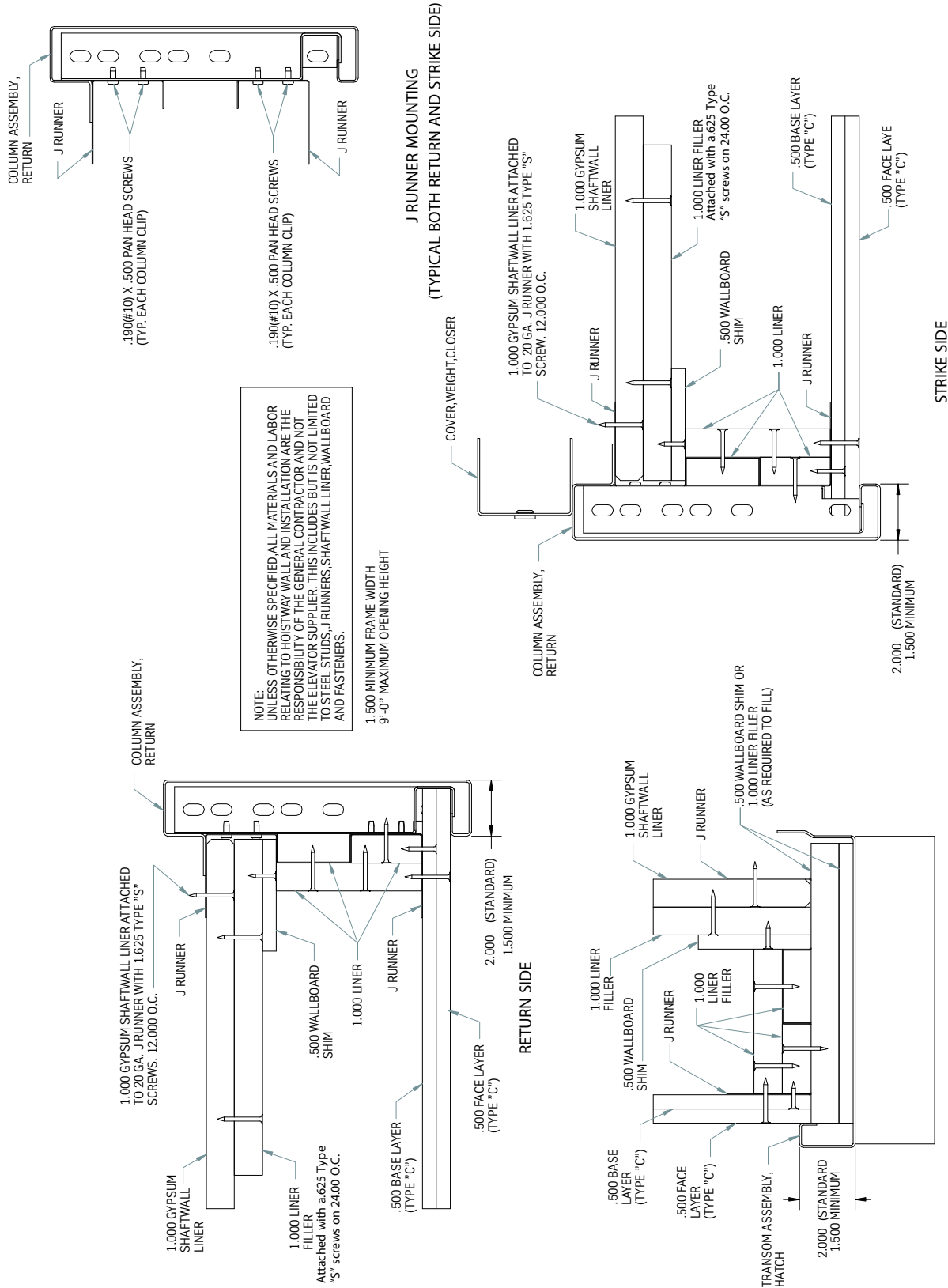
(continued)

ITEM	PART NO.	PRINT NO.	DESCRIPTION
20		277CV	Clip, Spring
21		113CH3	Weight Segment, Closer, .5#
22		232BY1	Cap, End, Closer Weight
23	9838338	63833	Adjuster, Speed Link Cable
24	9759876	75987	Closer Reel, 4" dia. SS/2S Standard Duty
	9730011	73001	Closer Reel, 5" dia., 2S Heavy Duty
		278AB1	Closer Reel, 4" dia., Center Opening
25		700643	Screw, Adjuster 1/4-20 a 1.5" lg, SSHS
26	9898943	29894	Stabilizer, Cable Adjuster
27	9735598	700562	Nut, 1/4-20, NH
28	9735598	77142	Cable Relating, 1/8" Dia.
29	9951398	40190	Anchor, Cable, Double
30		297BN1	Box, Interlock, L.H.
		297BN2	Box, Interlock, R.H.
31	9857072	105705	Contact Block, Interlock Box
32		454CP1	Guide, Shoe, Door Gib
	9712356	454CH1	Guide, Shoe, Door Gib
33		711DY1	Retainer, Door, Guide (Freedom Sill)
		711DW1	Retainer, Door, Guide (Standard Sill)
34		876AW1	Astragal, 84.5" lg
		876AW2	Astragal, 96.5" lg
		876AW3	Astragal, 108.5" lg
35		393DA1	Nut, Spring Clip, #10 Z, NS (Sill Support)
36	9951015	200TB1	Kit, Keyhole Insert (Painted and #4 Stainless Steel)
		200TB2	Kit, Keyhole Insert (#8 Stainless Steel)
		200TB3	Kit, Keyhole Insert (#4 Muntz)
		200TB4	Kit, Keyhole Insert (#8 Muntz)

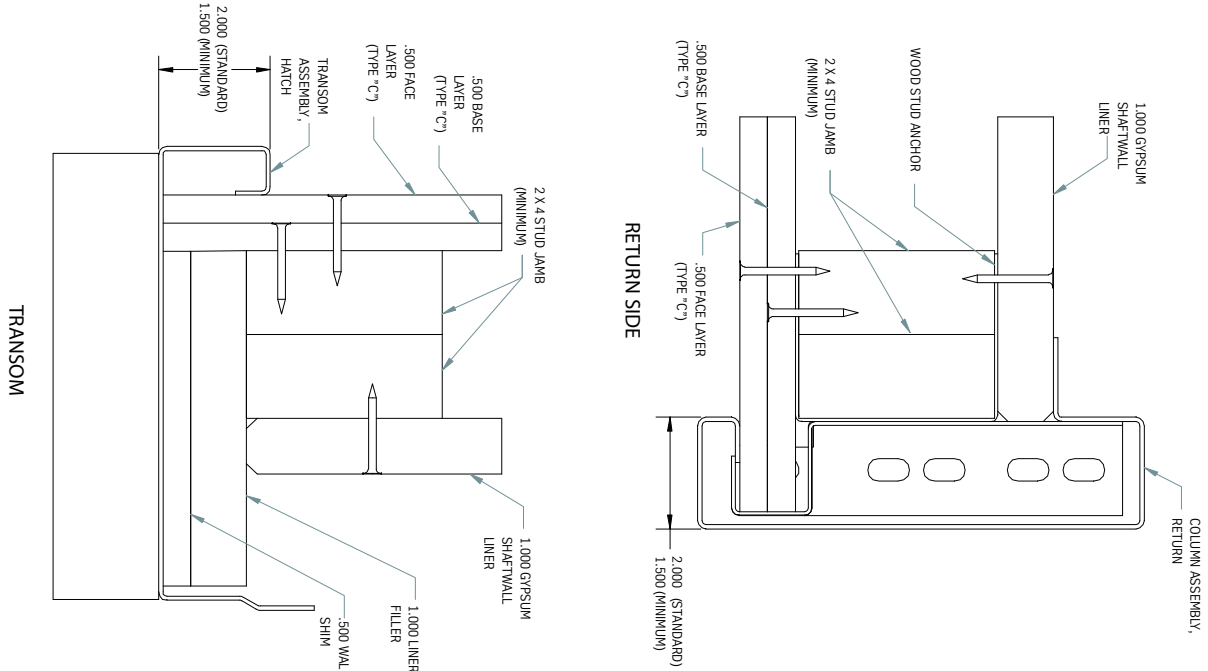
Supplemental Information



3.500 THRU 8.375 CHANNEL STUD SHAFTWALL
(1 1/2 HOUR AND 2 HOUR FIRE RATING)

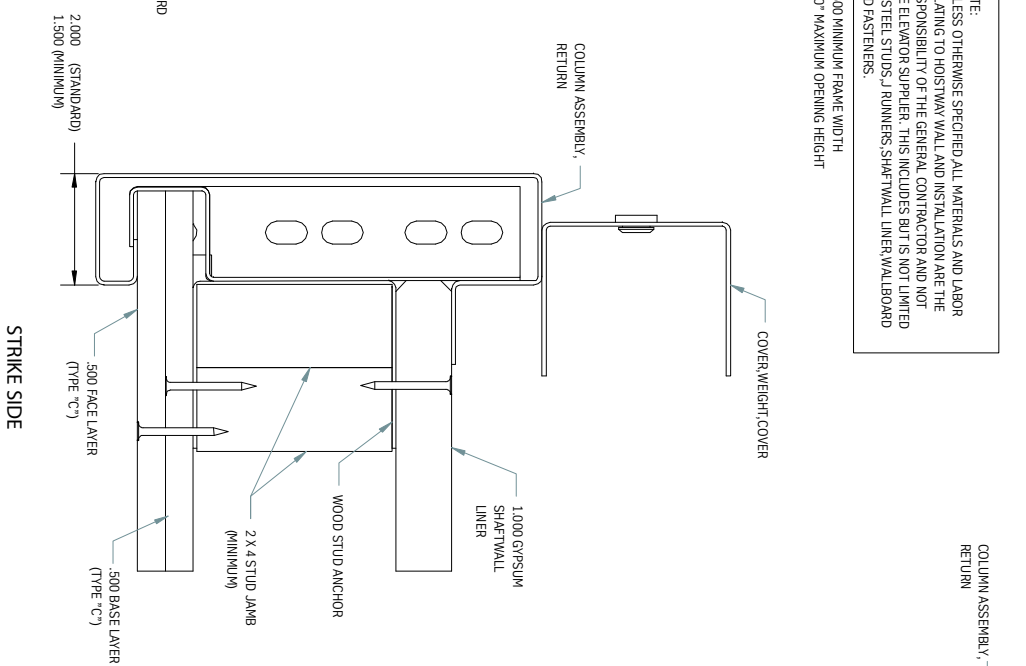


8.500 THRU 20.000 CHANNEL STUD SHAFTWALL
1 1/2 HOUR AND 2 HOUR FIRE RATING

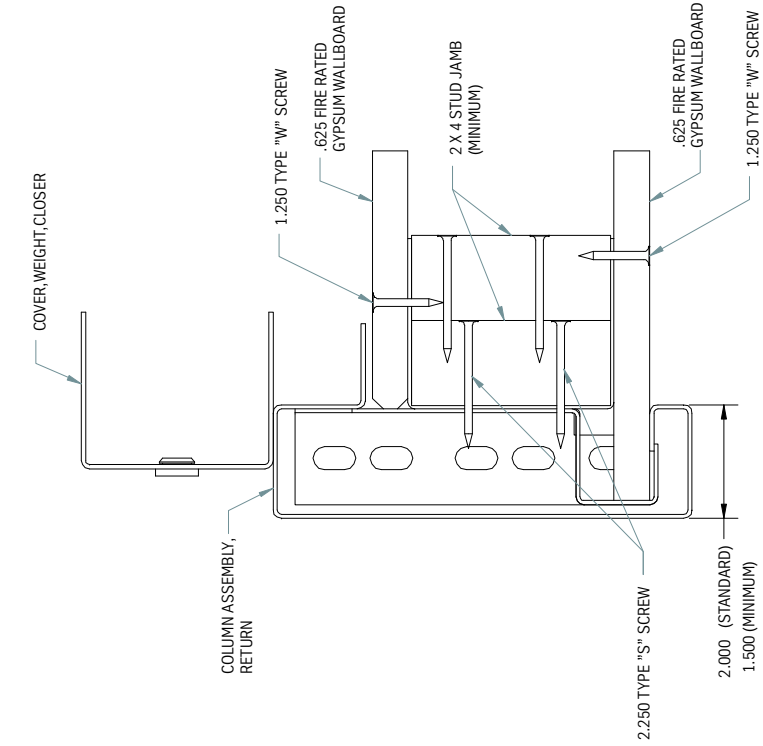


NOTE: UNLESS OTHERWISE SPECIFIED ALL MATERIALS AND LABOR RELATING TO HOISTWAY WALL AND INSTALLATION ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND NOT THE ELEVATOR SUPPLIER. THIS INCLUDES BUT IS NOT LIMITED TO STEEL STUDS, J-RUNNERS, SHAFTWALL LINER, WALLBOARD AND FASTENERS.

1,500 MINIMUM FRAME WIDTH
9'-0" MAXIMUM OPENING HEIGHT



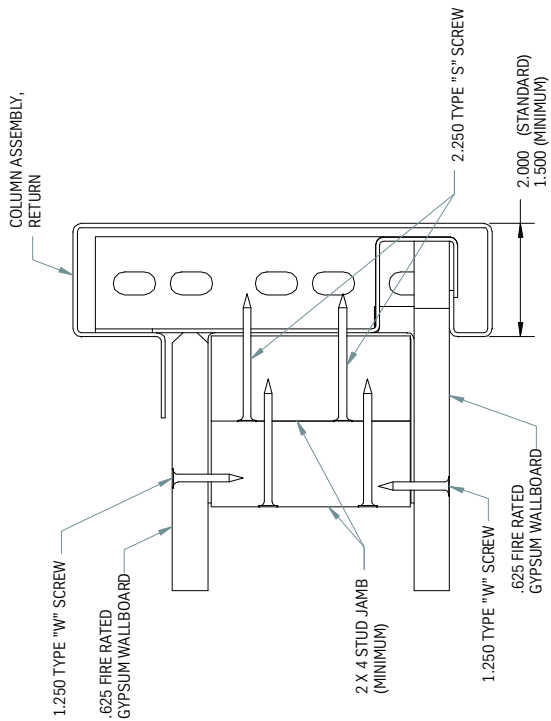
WOOD STUD SHAFTWALL (1 HOUR FIRE RATING)



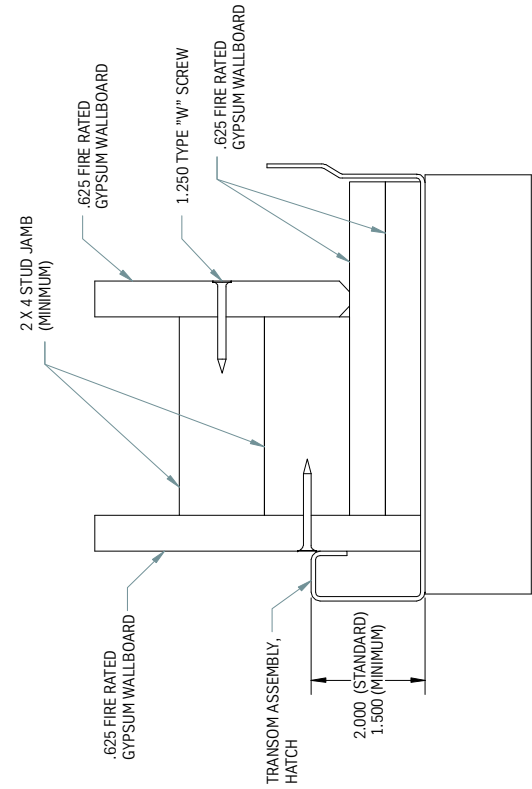
STRIKE SIDE

NOTE:
UNLESS OTHERWISE SPECIFIED ALL MATERIALS AND LABOR RELATING TO HOISTWAY WALL AND INSTALLATION ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND NOT THE ELEVATOR SUPPLIER. THIS INCLUDES BUT IS NOT LIMITED TO STEEL STUDS, J RUNNERS, SHAFTWALL LINER, WALLBOARD AND FASTENERS.

1.500 MINIMUM FRAME WIDTH
9'-0" MAXIMUM OPENING HEIGHT

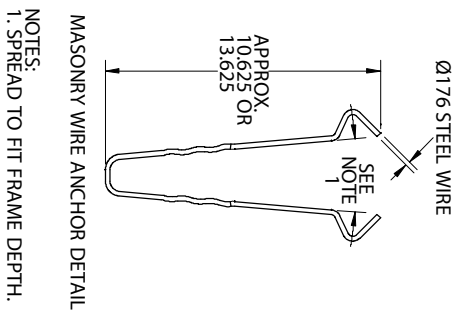
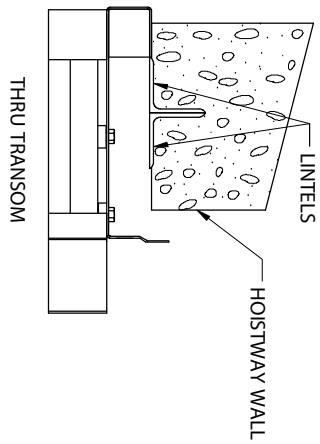
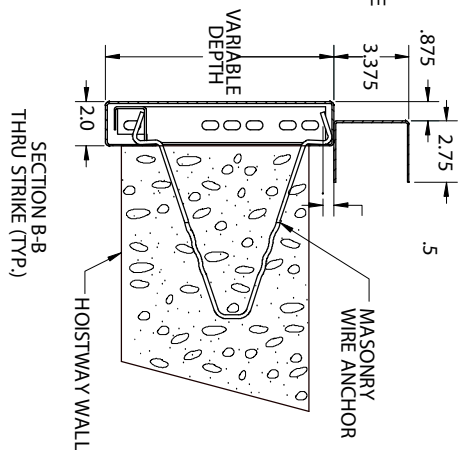
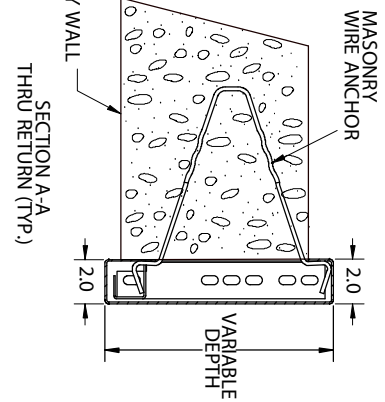
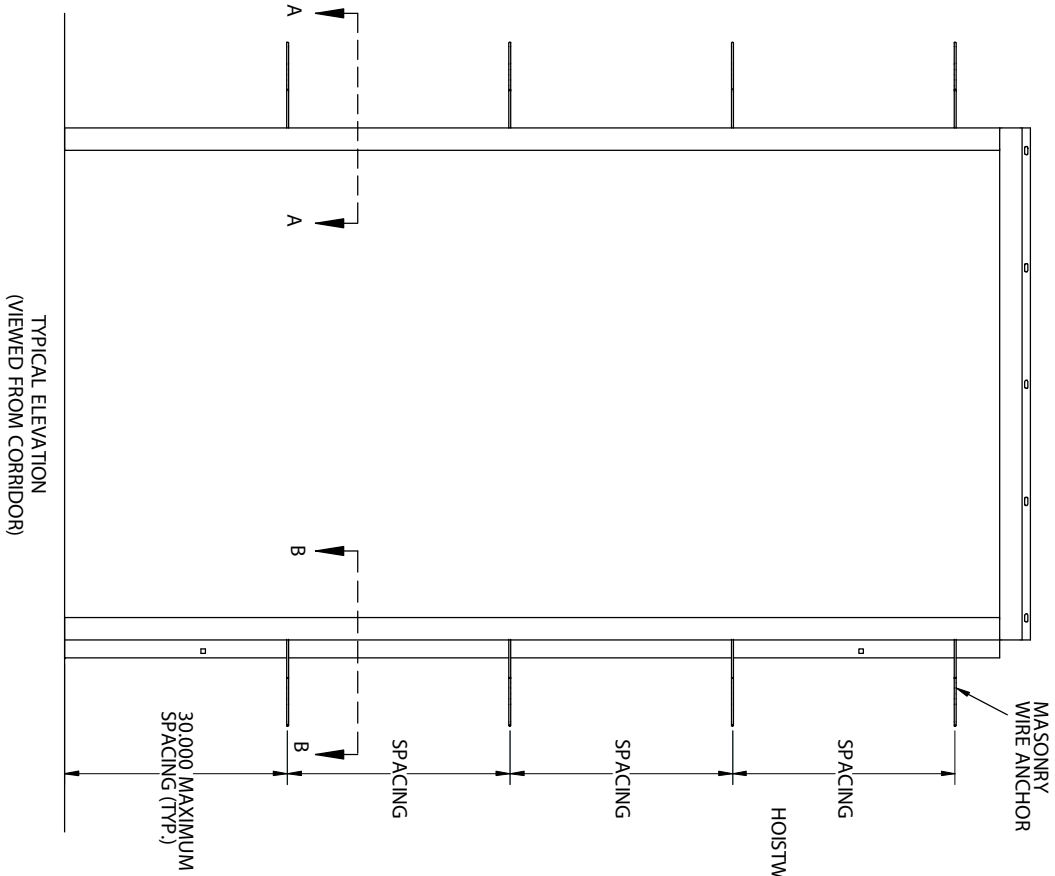


RETURN SIDE



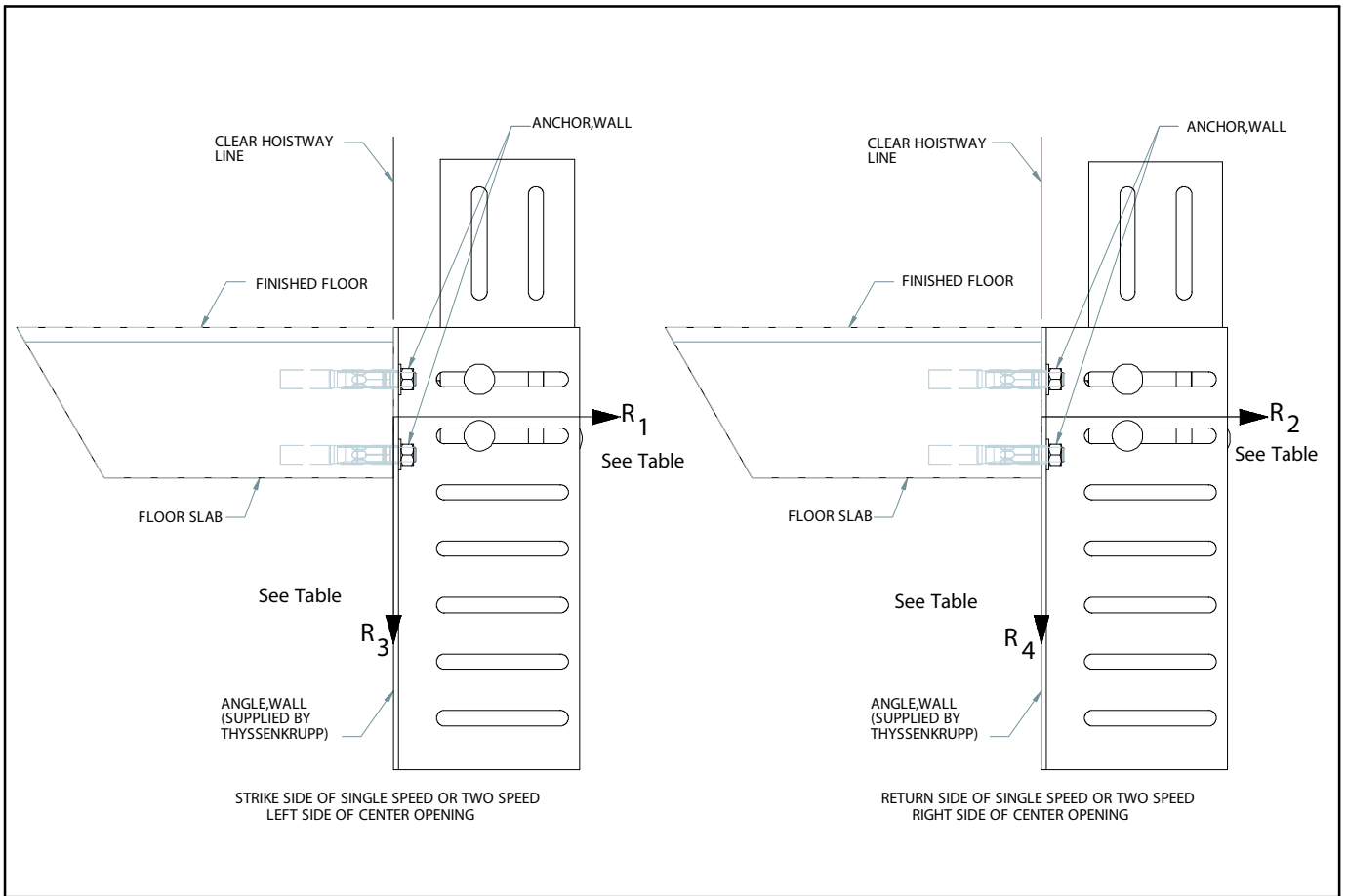
TRANSOM

WOOD STUD SHAFTWALL (1 HOUR FIRE RATING)



Hoistway Frame in Masonry Shaftwall for 1 1/2 or 2 Hours

Wall Anchor Loads

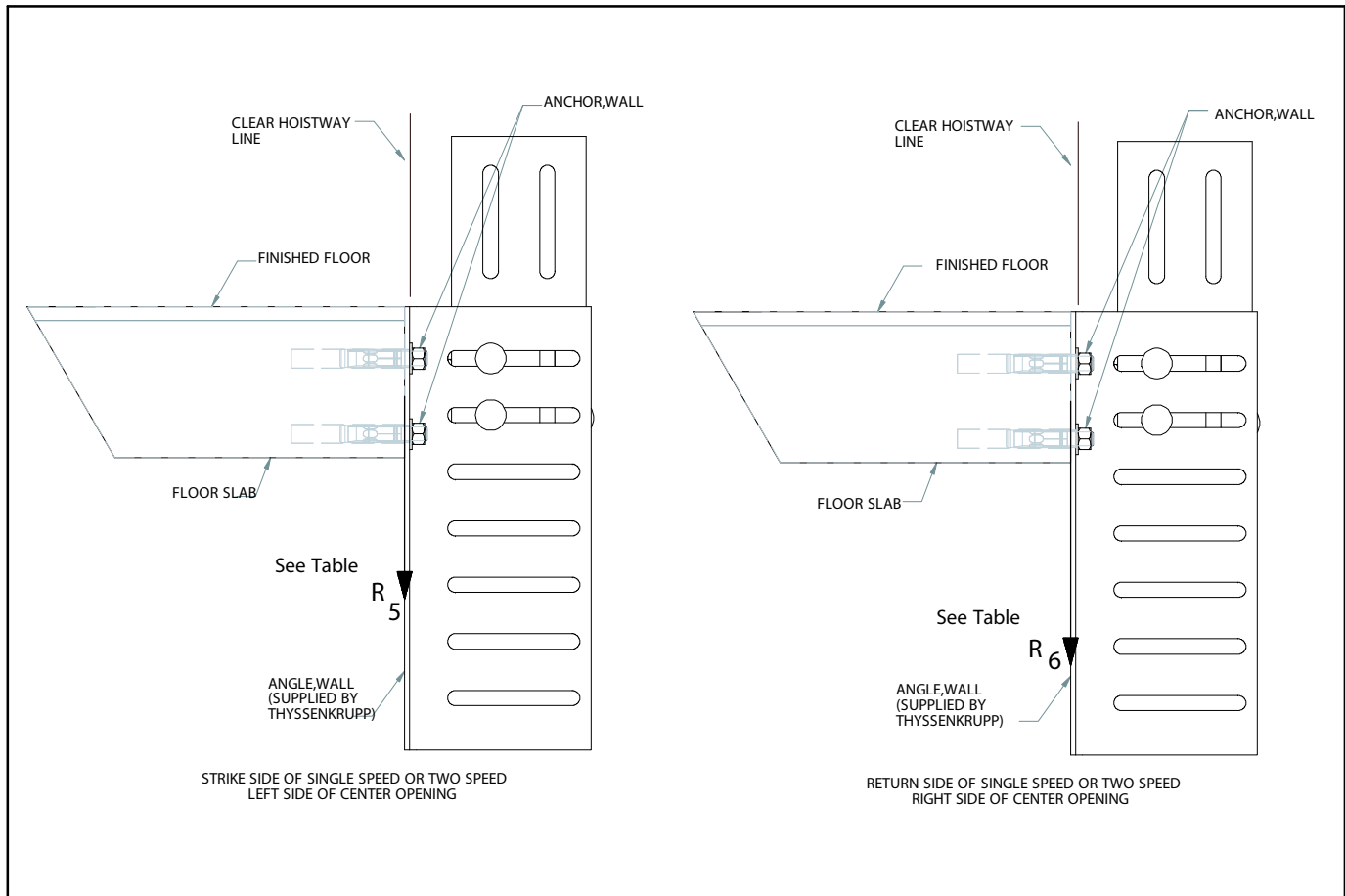


Reactions Including Door Panel Impact

	R1	R2	R3	R4
Single Speed	543	207	303	148
Center Opening	471	279	263	263
Two Speed	601	149	360	176

Door Panel Impact

Wall Anchor Loads



Reactions Including Live Sill Loads

	R5	R6
Single Speed	668	408
Center Opening	569	581
Two Speed	655	506

Live Sill Loads

Vertical Express

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