VERTICAL EXPRESS

M721 Entrance Manual

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Contents

Contents *(cont.)*

Center Opening Installation

APPENDIX

Door Mounted Interlock Rollers

Hanger Mounted Interlock Rollers

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

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

WARNING

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

General Safety

CAUTION

Before applying power to the controller, check all relays, contactors, fuse blocks, resistors, terminals on cards, and DIN rail terminals to ensure that the wiring connections installed by manufacturing are tight, because 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 Employee Safety and Accident Prevention Program Manual* and 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.

Electrical Safety
(continued)

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.

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 *Elevator Employee 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.

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 Employee Safety and Accident Prevention Program Manual* and the *Elevator Industry Field Employees' Safety Handbook* for mechanical equipment safety information on installation and service.

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.

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, manufacturing bases warranty decisions on the guidelines below.

Handling

- Cards shipped from manufacturing 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 manufacturing must be packaged in a static bag designed for the card.
- Any card returned to manufacturing must be packaged in a shipping carton designed for the card.
- “Peanuts” and styrofoam are unacceptable packing materials.

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

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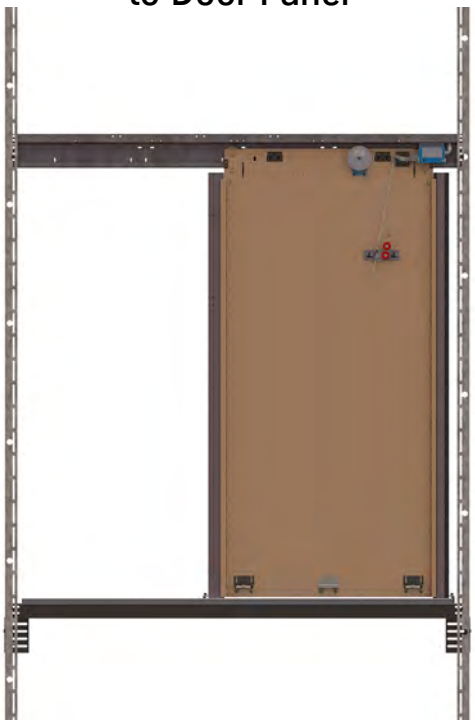
Interlock Rollers Mounted to Door Panel



Interlock Rollers Mounted to Door Hanger

SINGLE SPEED INSTALLATION

Single Speed Installation

Install the Wall Angles

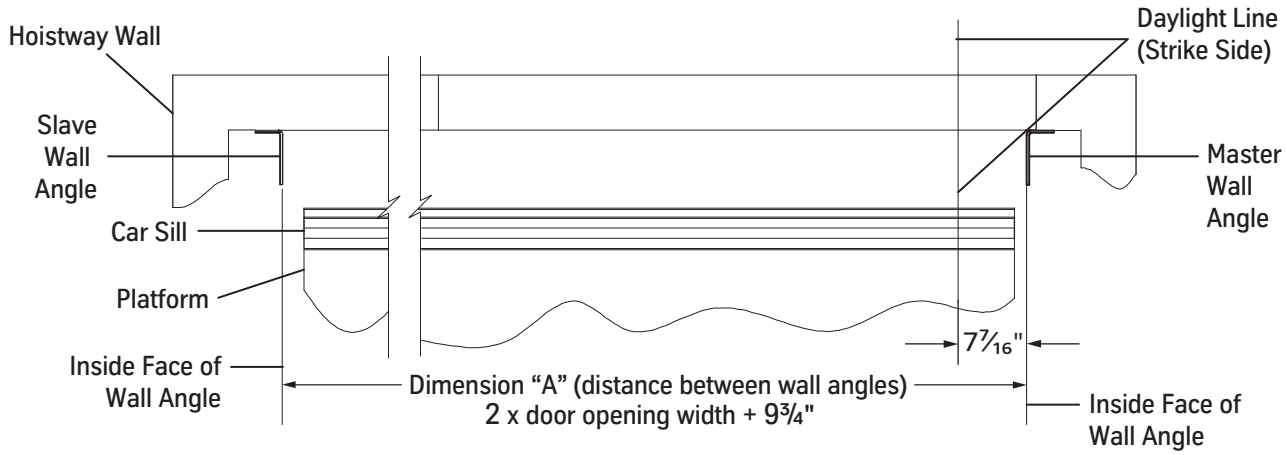
NOTE See the job layouts and Figure 1 on page 8 for all steps in this procedure.

1. Verify that a running platform with the car sill is installed.
2. Obtain the finished floor height dimension from the contractor.
3. Determine the daylight line location for the strike side.
4. Apply tape to the car sill, and mark the line on the tape.
5. Mark the horizontal position of the inside face of the master (first) wall angle relative to the daylight line nearest the strike column. Extra wall angles are provided if the pit is more than 6 feet deep.
6. Install the wall angle.

NOTE
- Where hoistway space allows, turn the wall angles away from the door opening.
- Wall anchors must be located below the sill support assembly.

7. Drop a plumb line in the front of the hoistway to locate the positions of the remaining master wall angles.
8. Install the remaining master wall angles.
9. Make sure that the master wall angles are square with the platform and plumb with each other. Check the tightness of the wall anchors.
10. Create a gauge stick for the slave wall angle. Cut a piece of light, but stiff material (e.g., $^{3}/_{4}$" EMT) for Dimension “A”.
11. Place the gauge stick against the master wall angle and locate, mark, and install the slave wall angles at all floors.

Install the Wall Angles
(continued)



Door Opening Width (inches)	Dimension "A" (inches)
32	73¾
36	81¾
42	93¾
48	105¾

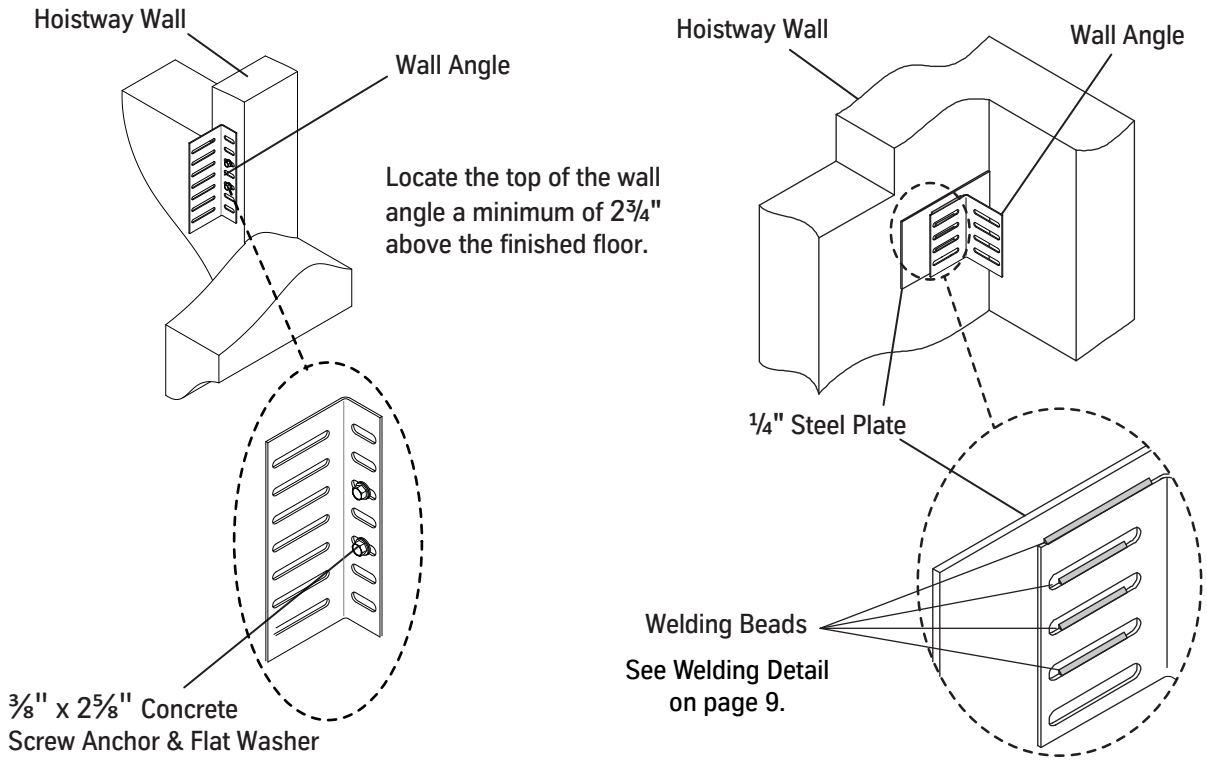
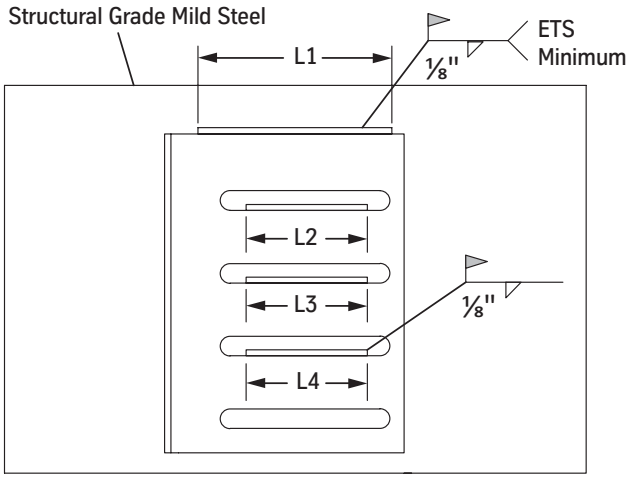


Figure 1 - Wall Angle Placement

Install the Wall Angles
(continued)

Welding Detail



1. Before welding, make sure the steel is clean. Remove burrs, paint, or coating in weld area.
2. Welding of elevator parts that are specified in *ASME A17.1 Safety Code For Elevators And Escalators*, shall conform to *A17.1, Section 8.8, Welding*.
3. Perform all welding in a well ventilated area, *ANSI Z49.1 Safety In Welding, Cutting And Allied Processes*.
4. Weld entrance wall angles to structural mild steel in two or more locations.

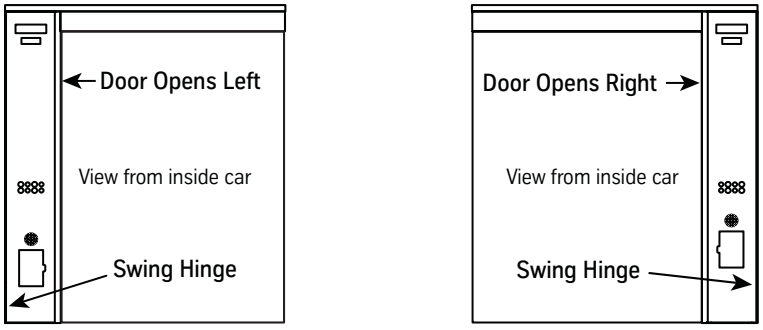
   Use horizontal fillet welds on square edges of the wall angle (recommended, but not required). The total effective length of fillet welds should equal or exceed 4 inches.

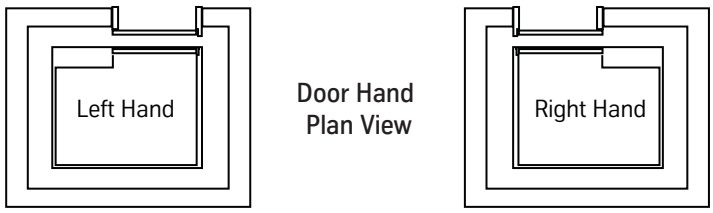
   Example: (L1 + L2 + L3 + L4 +..... + Ln = 4 inches minimum. The length of each fillet should be a minimum of 3/4 inches.
5. The type of filler metal used will depend on the welding process, but in no case shall the nominal tensile strength of the filler metal be less than 60,000 PSI.
6. For suitable structural mild steel or preheat specifications, refer to *AWS D1.1* or *AWS D1.3* whichever is applicable.

Architectural Hand Identification

Left Hand - Front/Rear Openings
Door opens LEFT when standing inside the car, facing the door.

Right Hand - Front/Rear Openings
Door opens RIGHT when standing inside the car, facing the door.





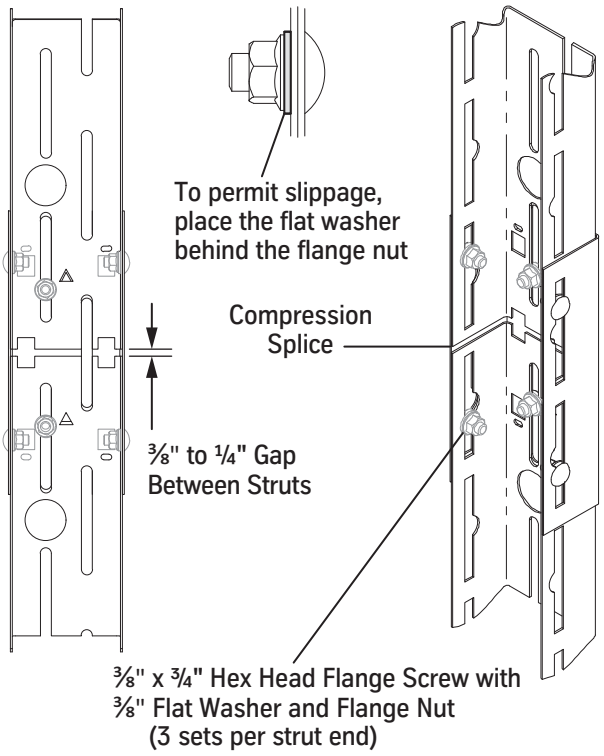
Stack the Struts

See Figure 2 on page 11 for all steps in this procedure.

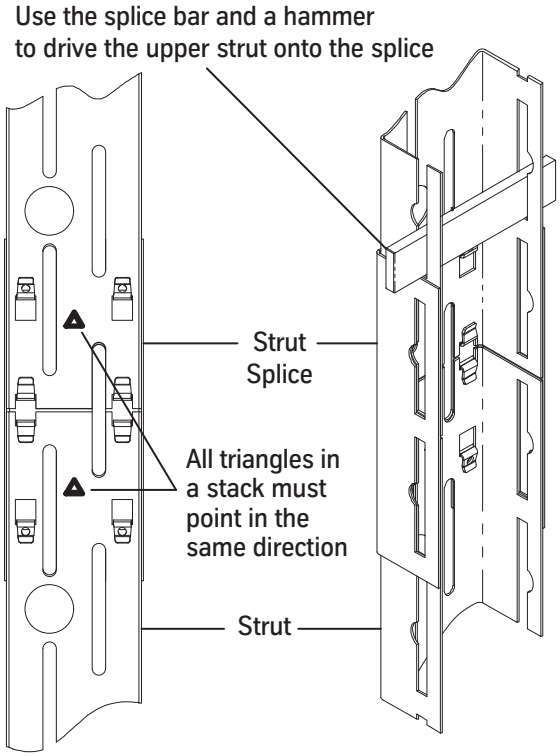
1. Set two struts on the pit floor, and fasten them to the wall angles. A compression splice is required every 32 feet.
2. Adjust the struts so that they are $1^1/_4$" from the car sill. The strut to car sill adjustment will set the final sill clearance.
3. Clip a strut splice to the top of the two struts. Triangles in splices must match the direction (up or down) of triangles in the struts.
4. Install the second set of struts.
   a. Clip the second set of struts to the splices.
   b. Use a splice bar and a hammer to drive the upper strut onto the splice.
   c. Fasten the struts to the next set of wall angles.
   d. At each landing, verify that the struts are $1^1/_4$" from the car sill.
5. Repeat this procedure until all of the struts are stacked, spliced, and fastened to wall angles.
6. Check all struts for plumb on two sides, and then securely fasten them.

Stack the Struts

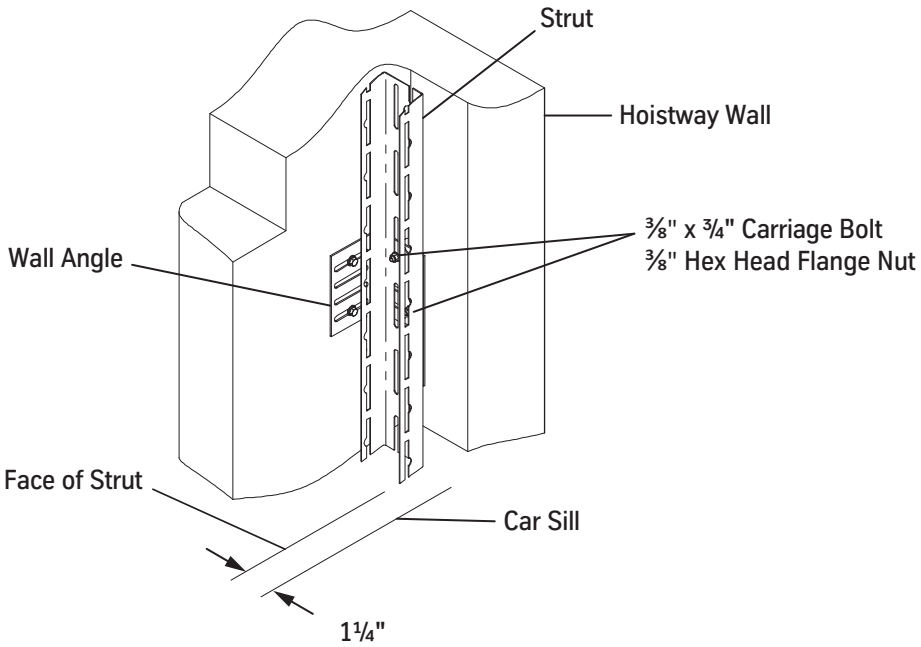
(continued)



Assemble a Compression Splice



Assemble the Strut Splice



Assemble the Strut to the Wall Angle

Figure 2 - Stack and Assemble the Struts

SINGLE SPEED

Install the Hoistway Sill

1. Determine the strike side of the hoistway sill.
2. Locate the two slots in the sill support.
3. Remove the hex head cap screws from the column mounting brackets, and slip them into the slot on the back side of the sill. See Figure 3.
4. Loosely attach each mounting bracket, and then adjust the bracket's tab to fit into the slot.
5. Tighten the brackets to the sill.

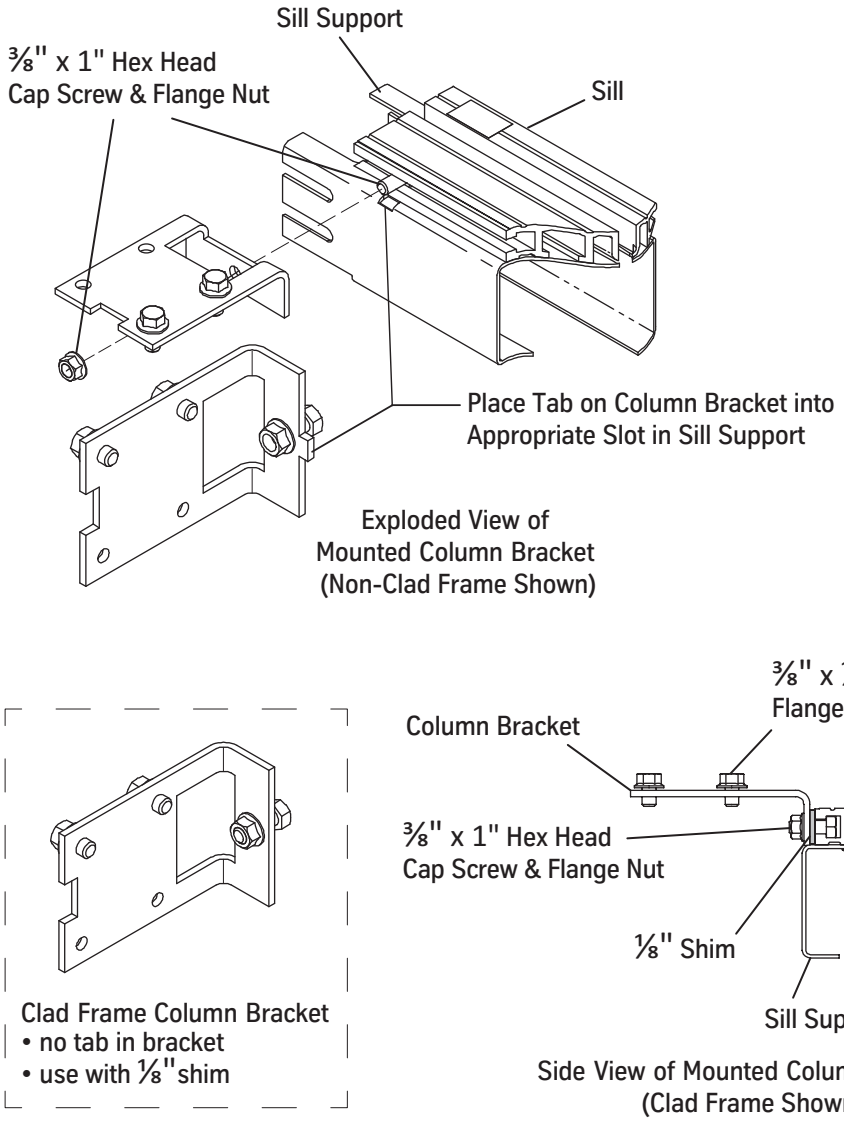


Figure 3 - Column Bracket Installation for Standard Sill

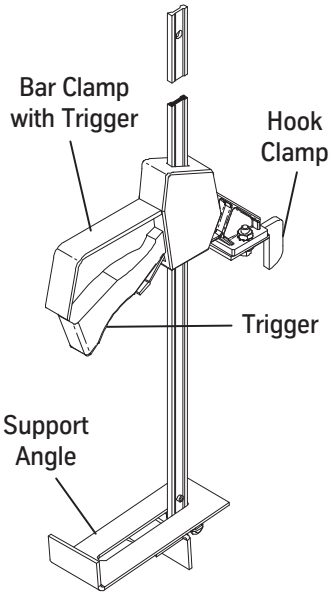
Install the Sill Support to the Struts

For all steps in this procedure, see Figure 4 on page 14.

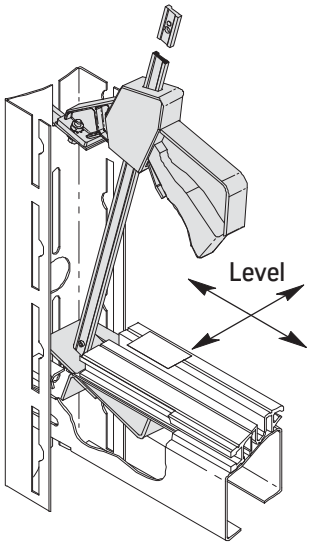
1. Hang the sill leveling tool in the slots or oval cutout on the back of each entrance strut.
2. Use the adjustment trigger to set the tool so that the support angle is roughly 2” inches below the finished floor.
3. Lay the sill and/or sill support on the support angles.
4. At each end of the sill and on each side of the strut, install a carriage bolt outside the assembly and a flange nut inside the assembly into matching slots of the sill support and strut.
5. Hand-tighten the bolt and nut.
6. Raise the sill to the finished floor level.
7. Level the sill side-to-side and front-to-back.
8. Move the sill up so that the daylight lines and the centerline (stamped into the header) are even with the car sill. Ensure that the adjustment is correct because this determines the accuracy of the entrance frame installation.
9. Verify that the vertical surface of the sill support is even with the angled fascia hanger on the sill.
10. Tighten the fasteners on the hall side.
11. Tighten the fasteners on the car side.
12. Repeat this procedure for all landings.

Install the Sill Support to the Struts

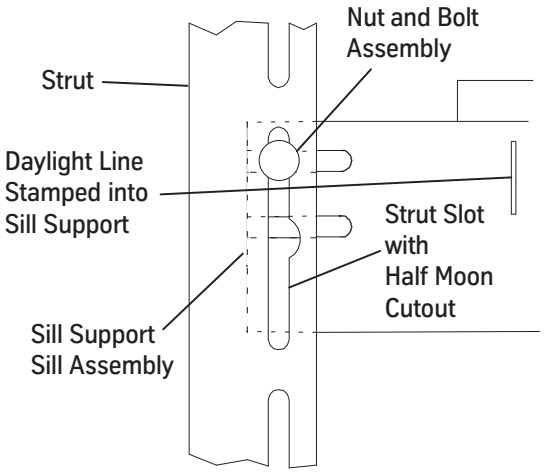
(continued)

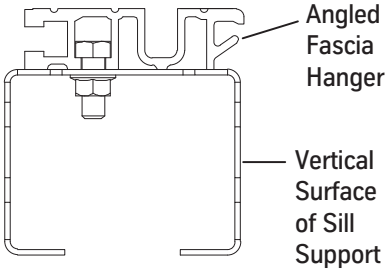


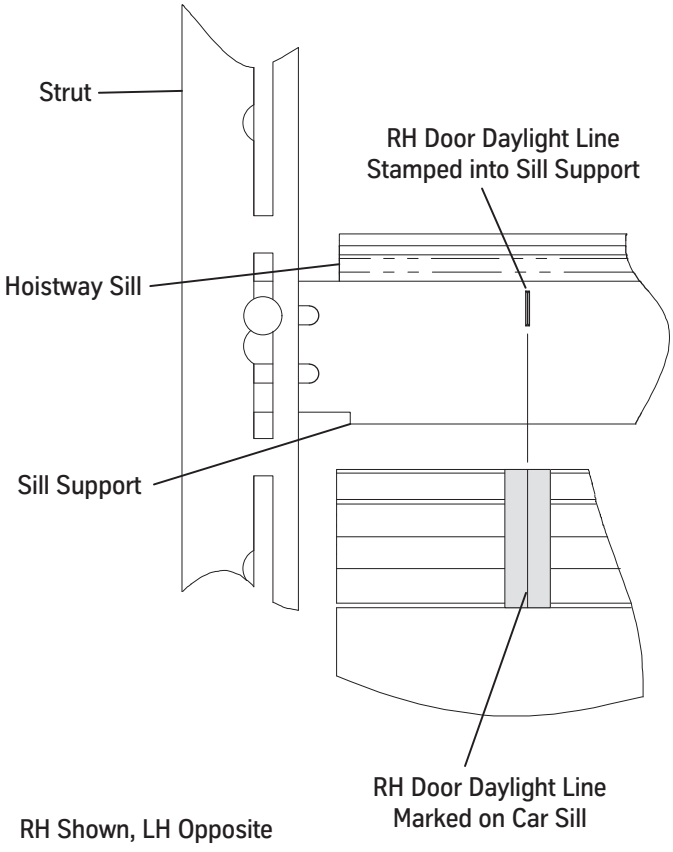
Sill Leveling Tool



Sill Support/Sill Assembly, Leveled on the Support Angles







RH Shown, LH Opposite

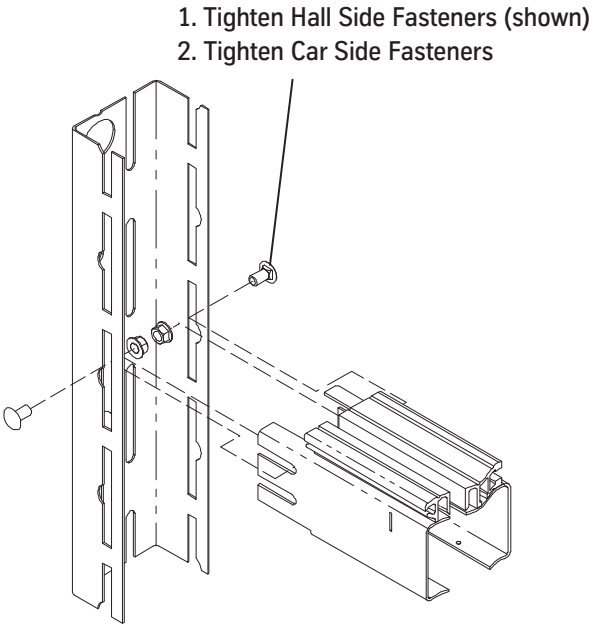


Figure 4 - Install the Sill Support to the Struts

Install the Hoistway Header

Gauge sticks are needed for this procedure.

- For standard door height (84") - two gauge sticks are provided for each job.
- For non-standard door height - use the following formula to determine the length, and cut the gauge sticks to this measurement.

  Gauge Stick Length: Sill-to-Header Dimension = Opening Height + $7^{15}/_{16}$".

1. Move the platform up where the header can be reached.
2. Place the gauge sticks on the sill of the landing below, one at each end of the sill. See Figure 5 on page 16 for all steps on this page.
3. Place the header on the gauge sticks.
   a. At each end of the header, install carriage bolts and flange nuts.
   b. Hand-tighten the hardware into the matching slots of the header and strut.
4. Move the platform up so that the daylight lines and the centerline stamped into the header are even with the car sill.
5. To prevent the door operator equipment from being out-of-plumb:
   a. First tighten the fasteners on the back of the header at both ends.
   b. Then tighten the fasteners on the front of the header at both ends.
6. Repeat this procedure for all landings.

Adjust the Hoistway Sill and Header

1. Level the platform with a landing.
2. Verify that the clearance between the hoistway sill and the car sill is $1^{1}/_{4}$".

SINGLE SPEED

Adjust the Hoistway Sill and Header

(continued)

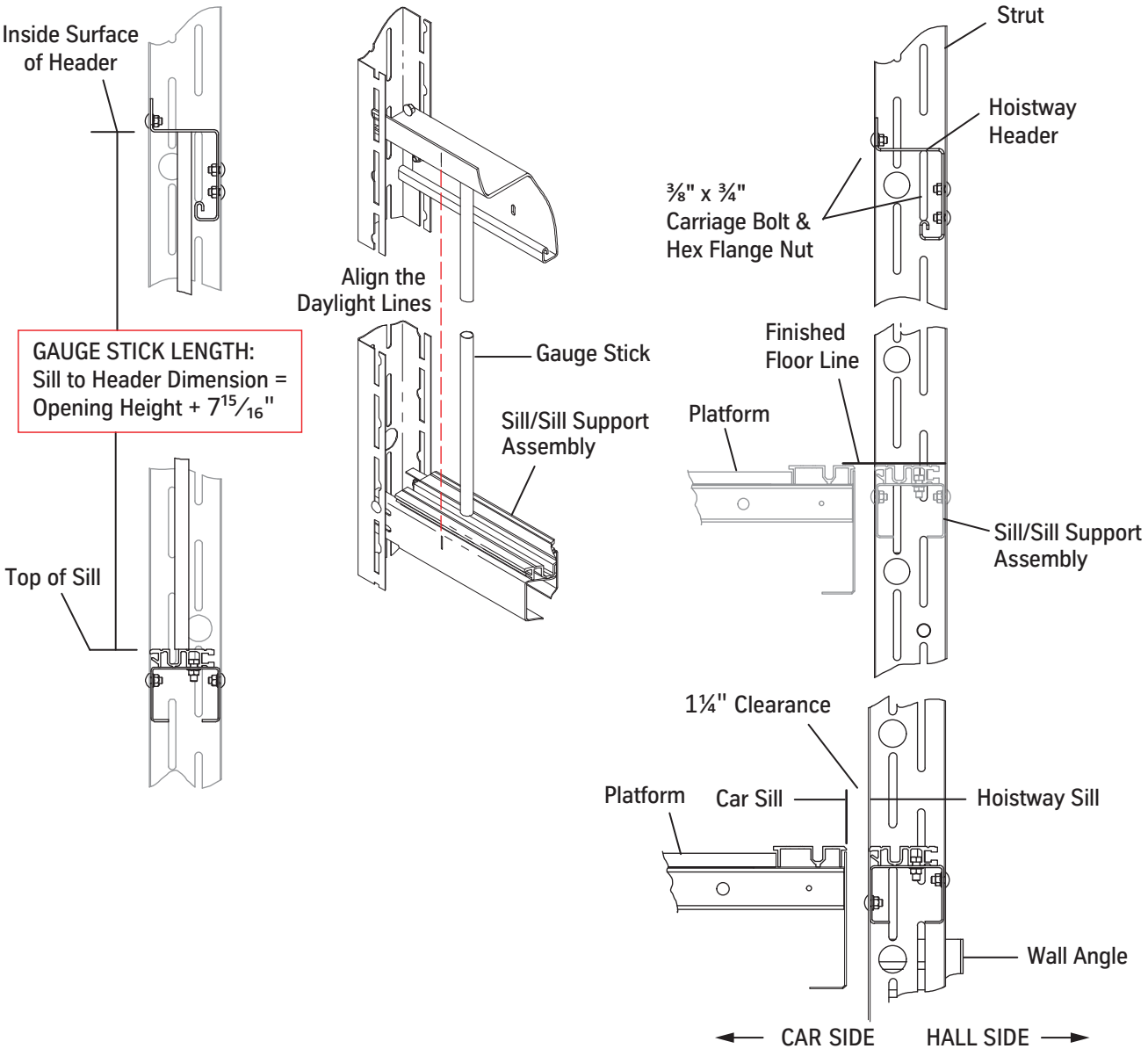


Figure 5 - Install and Adjust the Hoistway Header

Assemble the Frame

1. Place the entrance columns and transom face down, and position each column at a slight angle to the transom. See Figure 6.
2. On each end of the transom, remove the flange screw and nut and set them aside.
3. On each end of the transom, roughly align the clips with the rectangular cutouts in the columns.
4. While pushing down on the column, swing the column toward the transom.
5. Ensure that the back side (toward the car) of the transom is flush with the back side of the column.
6. Install the flange screw and nut in the matching holes of transom and column.
7. Repeat steps 3 through 6 for the other column.
8. Verify that the columns are square with the transom.
9. Ensure all fasteners are tight, and repeat this procedure for all landings.

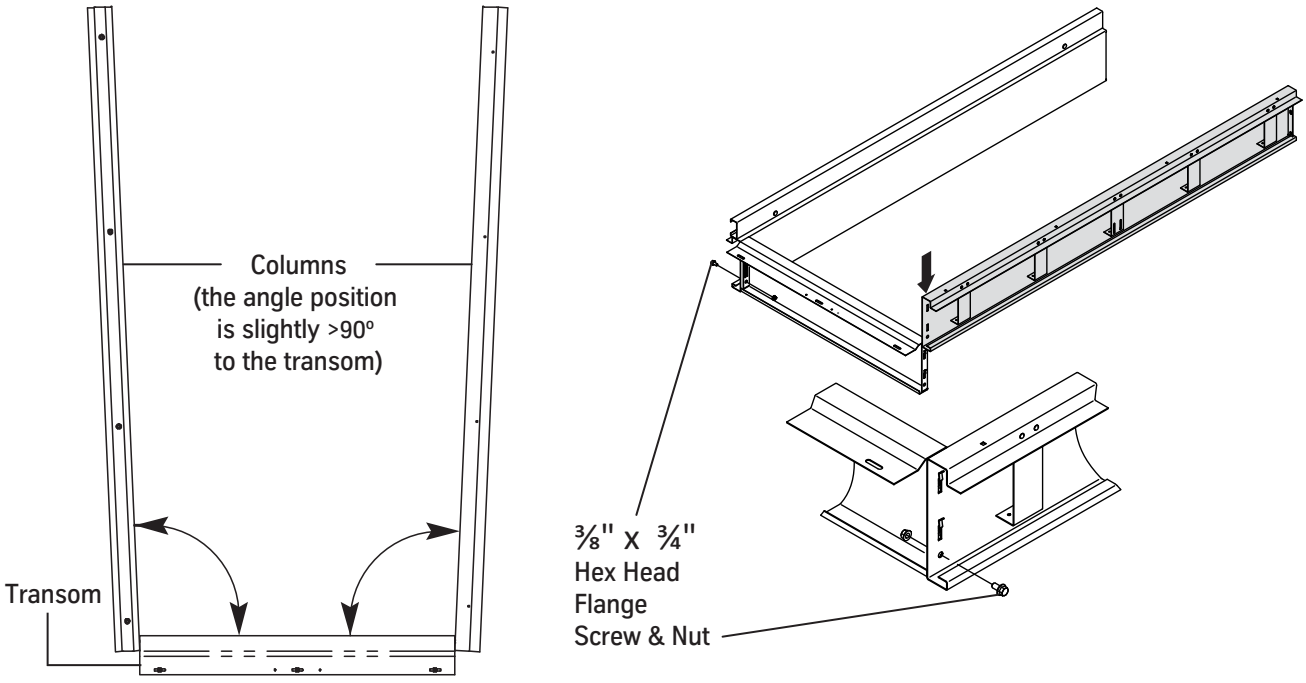


Figure 6 - Assemble the Frame

Attach the Frame to the Sill

1. Attach the frame to the column brackets.
   a. Stand the frame on the column mounting brackets.
   b. Install the hex head flange screws in the bottom of each column.
2. Align the frame columns so that they overlap the hoistway sill $^{1}/_{8}$" (the depth of the cutout on the top back edge of the hoistway sill). See Figure 7.
3. Tighten the four screws between the columns and the column brackets.
4. Move the platform up high enough to reach the header and transom.

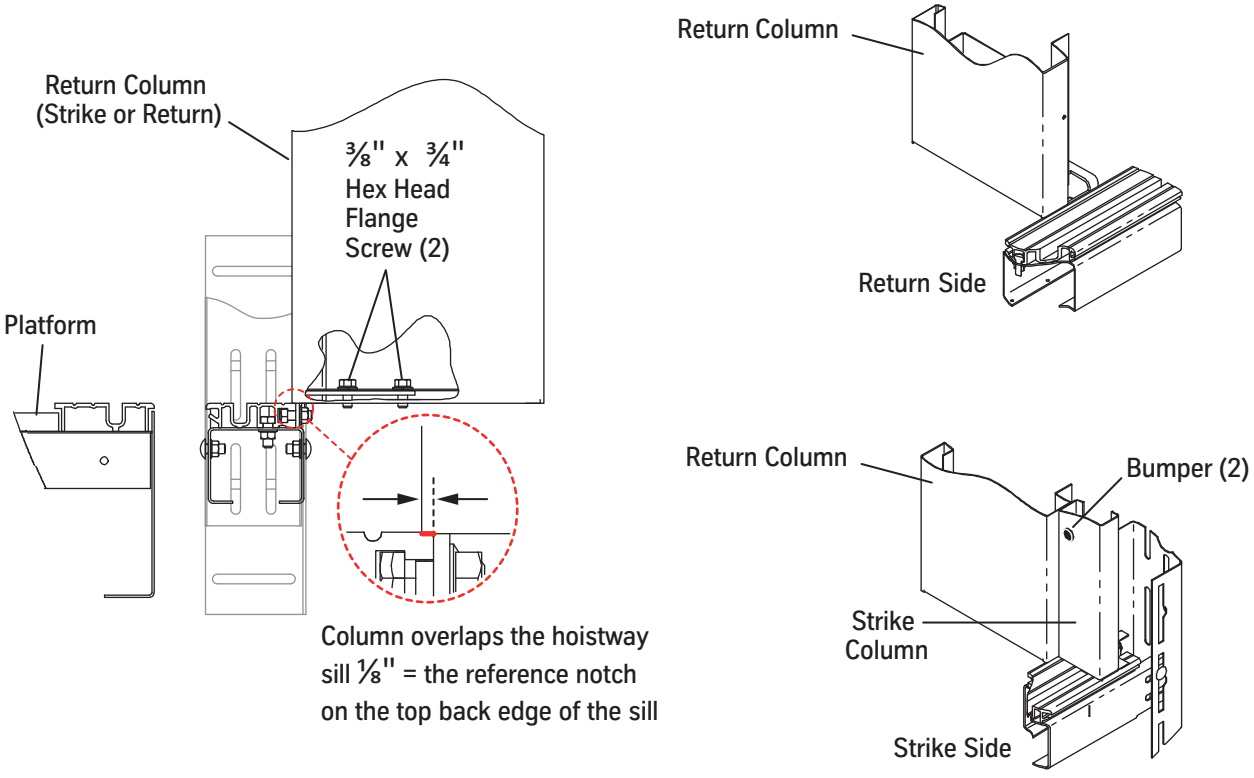


Figure 7 - Attach the Frame (standard sill shown)

Attach the Transom to the Header

1. Attach the transom to the header. See Figure 8.

- For non-clad frames:
  a. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
  b. Tighten the screws.

- For clad frames:
  a. Before the screws are added, install a $^{1}/_{8}$" shim between the transom and the header.
  b. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
  c. Tighten the screws.

2. Install one washer head self-tapping screw into the header.

3. Repeat this procedure for all landings.

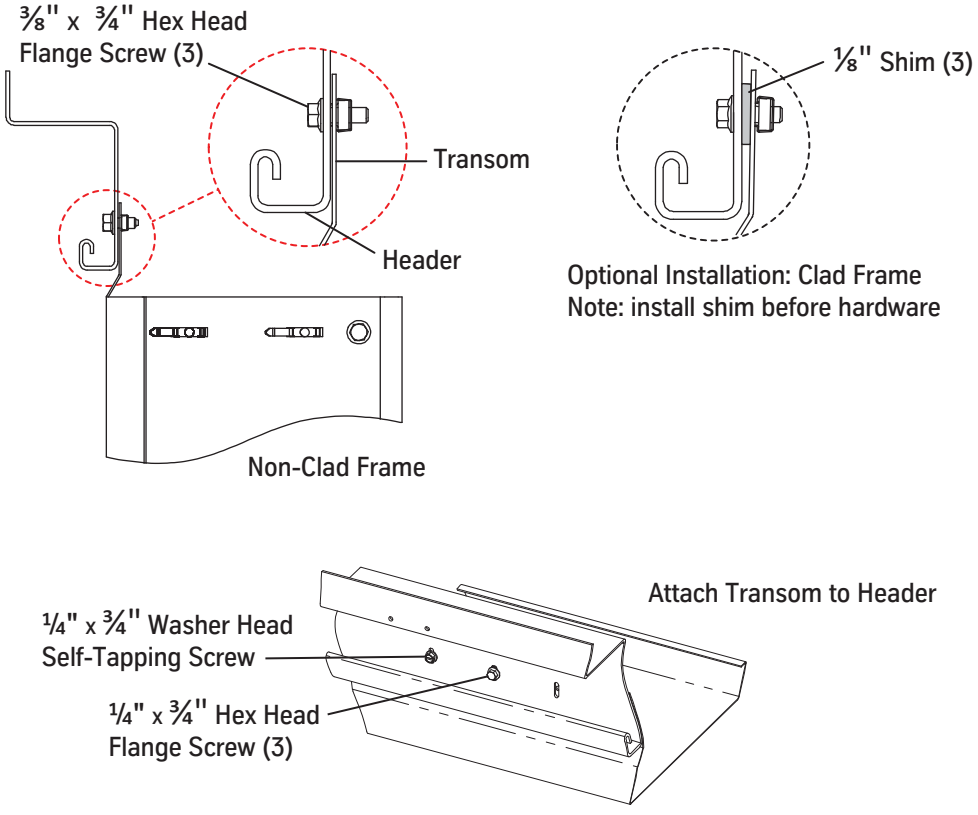


Figure 8 - Attach the Transom to the Header

Install the Grout Angles

NOTE Grout angles have a $2^1/_2$" leg and a $3^1/_2$" leg. Based on the gap, either leg can be placed against the hoistway wall.

1. Use self-tapping screws to install the grout angle on the bottom of the sill support and also tight against the hoistway wall. See Figure 9.
2. Anchor the grout angle to the wall.
3. Repeat this procedure for each landing.

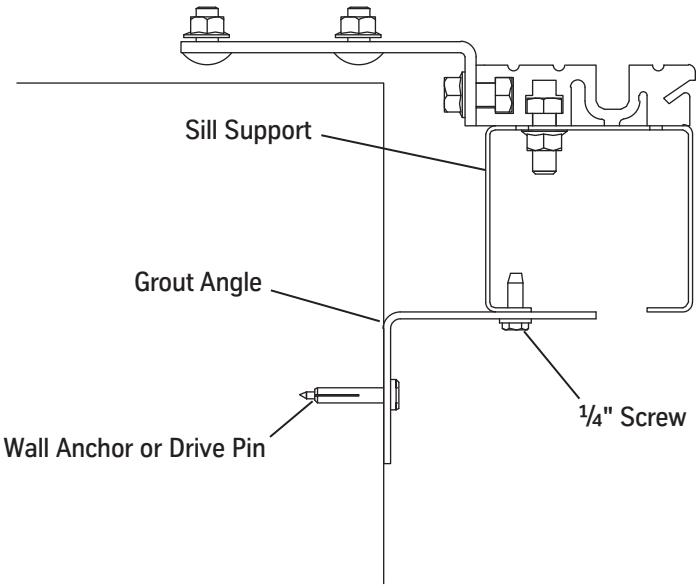


Figure 9 - Grout Angle Installation

Install the Fixture Boxes

Use brackets to install the fixture boxes at each landing.

Install the Hoistway Doors

1. Load the hoistway doors onto the platform.
2. At a landing, place the hoistway doors on the hoistway sill and lean the doors against the hoistway header.
3. Install the door isolation bumpers. See Figure 10.

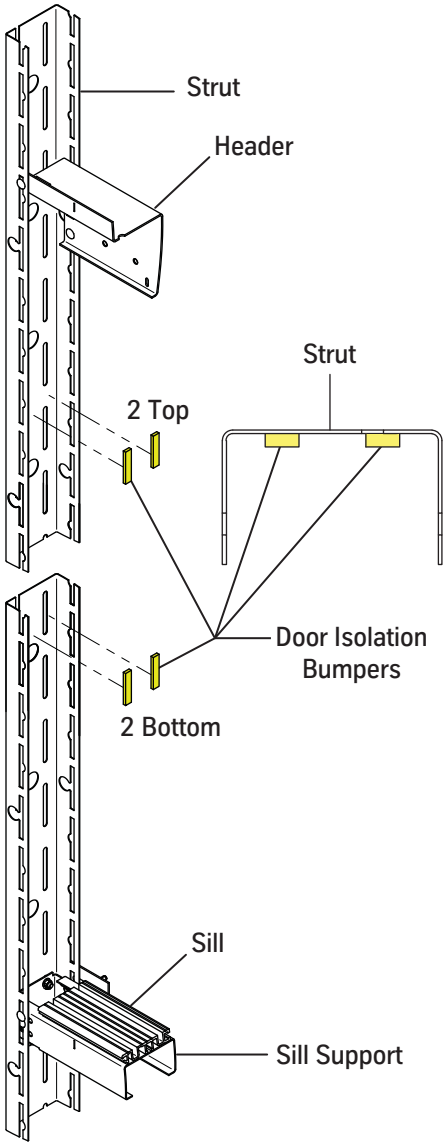
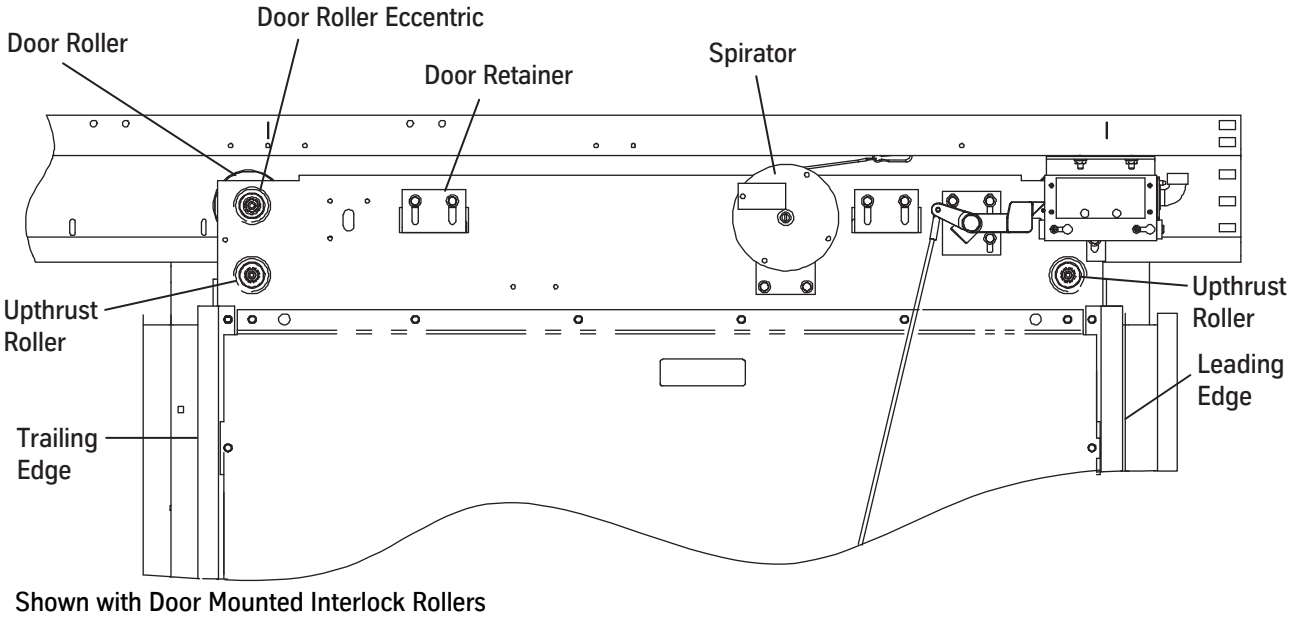


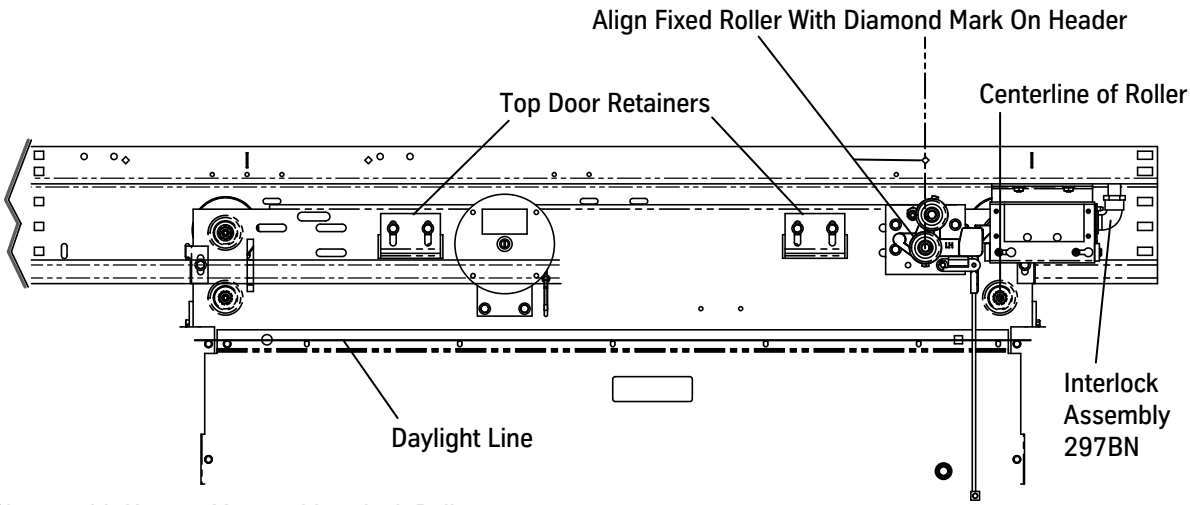
Figure 10 - Door Isolation Bumpers

Install the Hoistway Doors
(continued)

4. Loosen all upthrust rollers. See Figure 11.
5. Place the door rollers, one roller at a time, onto the door track.
6. Adjust the height of the door to $^{3}/_{8}$" by turning the eccentric on the door rollers, and then locking the eccentric with the nut.



Shown with Door Mounted Interlock Rollers



Shown with Hanger Mounted Interlock Rollers

Figure 11 - Door Rollers

Install the Hoistway Doors
(continued)

7. Install the door gibs and the door safety retainers. See Figure 12.

Two Gibs and One Safety Retainer per Door

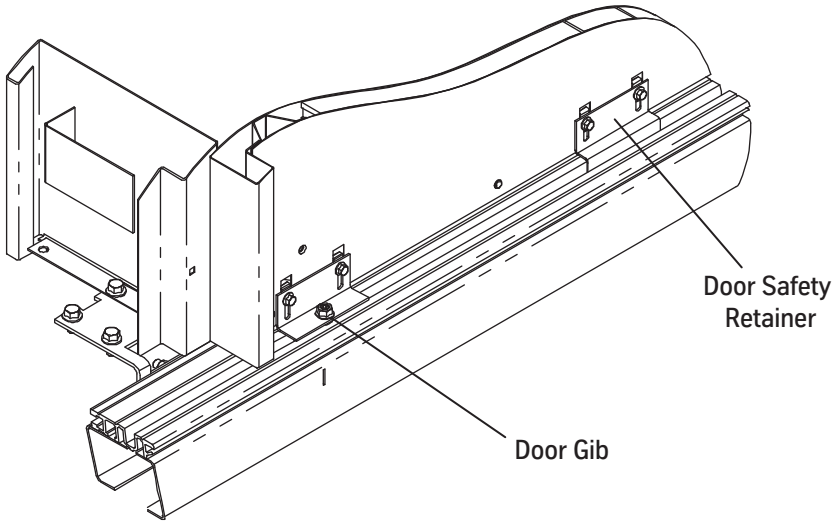


Figure 12 - Door Gibs and Safety Retainers

Adjust the Hoistway Door Running Clearance

1. Place a $^{5}/_{16}$" shim (running clearance) underneath the leading edge of the door. See Figure 13.
2. Loosen the upthrust roller, turn it to its lowest adjustment, and then snug it in place.
3. Adjust the eccentric on the door roller so that the door is flush with the shim and the door roller is flush with the track.
4. After the adjustment is made, tighten the door roller eccentric.
5. Remove the shim, and place it under the trailing edge of the door. Repeat steps 2 through 4.
6. Remove the shim, and verify that the doors are flush with the frame columns.

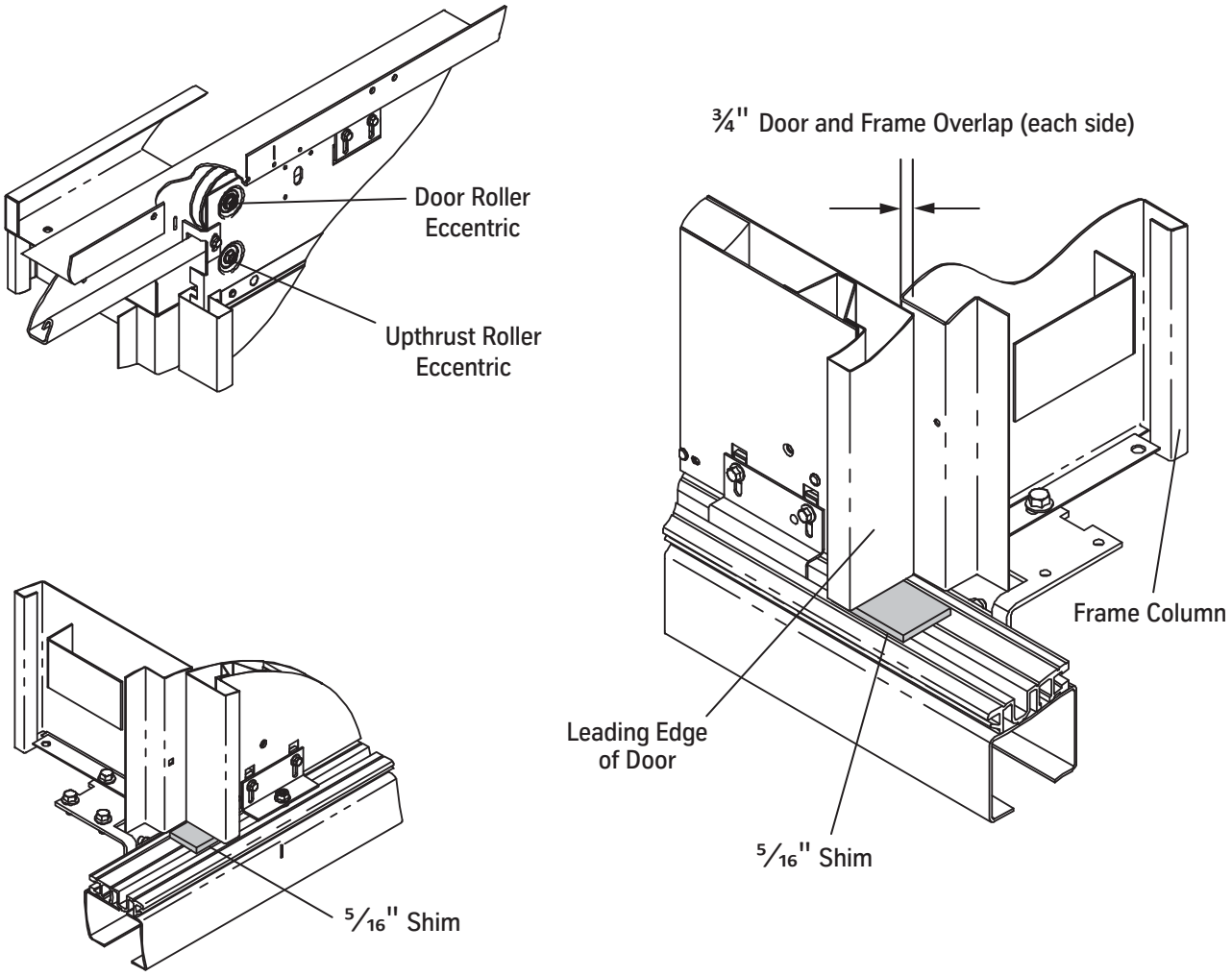


Figure 13 - Adjust Door-to-Sill Running Clearance

Adjust the Upthrust Rollers

1. Turn the eccentric of the upthrust roller clockwise until the roller just touches the bottom of the door track.

2. Adjust the eccentric so that a gap of 0.015″ is between the upthrust roller and the door track. See Figure 14.

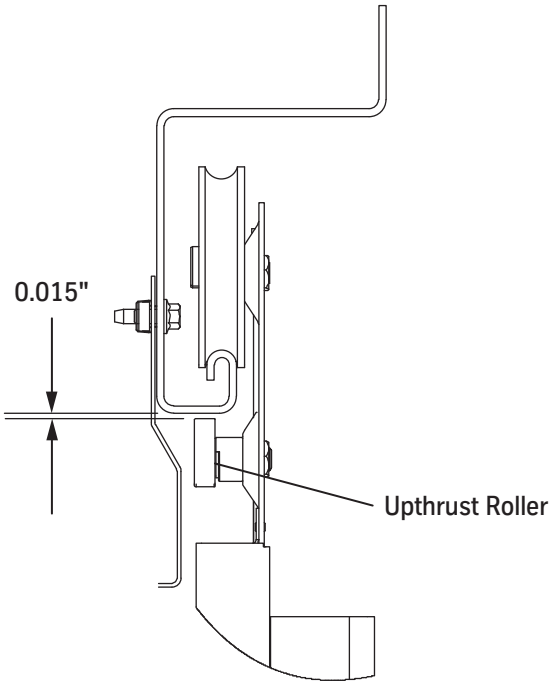


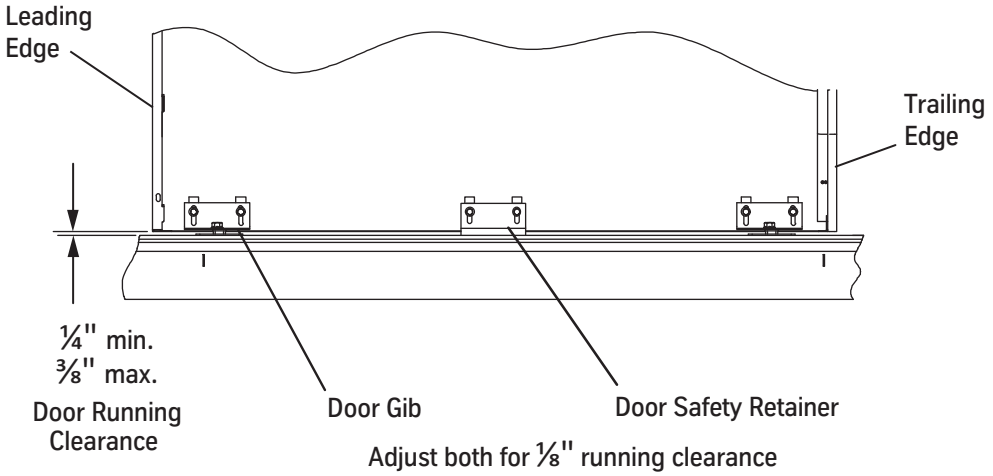
Figure 14 - Adjust Upthrust Roller Clearance

SINGLE SPEED

Adjust the Door Gibs

1. Adjust the door gib brackets and the door retainer brackets for a $^{1}/_{8}$" running clearance between the brackets and the hoistway sill. Tighten the bolts after adjustment. See Figure 15.
2. Place a $^{1}/_{4}$" shim between the bottom of the entrance frame column and the bottom of the leading edge of the door panel.
3. Use a $^{3}/_{16}$" hex wrench and turn the eccentric of the door gib to cause the door panel to just touch the $^{1}/_{4}$" shim, and then tighten the locknut.
4. Repeat Steps 2 and 3 for the trailing edge.
5. Verify that the door rolls freely and also tracks parallel to the hoistway sill groove. Adjust as necessary.

Standard Sill Running Clearance



Door-to-Frame Running Clearance

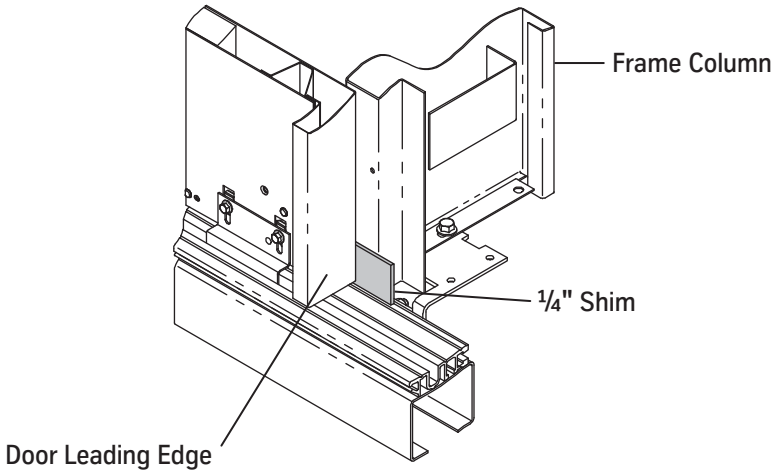


Figure 15 - Running Clearance

Install and Adjust the Spirator

1. Wrap the spirator cable three or four times around the spirator to connect the cable.
2. Use the spirator cable clip to attach the cable to the header. See Figure 16.
3. Adjust the spirator so that the doors close when they are released $^{1}/_{2}$" from the fully closed position.
4. Verify that the doors close fully with no “double bump” when the doors touch each other.

NOTE

- The spirator must close the doors from any open position.
- To obtain proper door operation from floor to floor, the spirator tension should be the same at each floor.

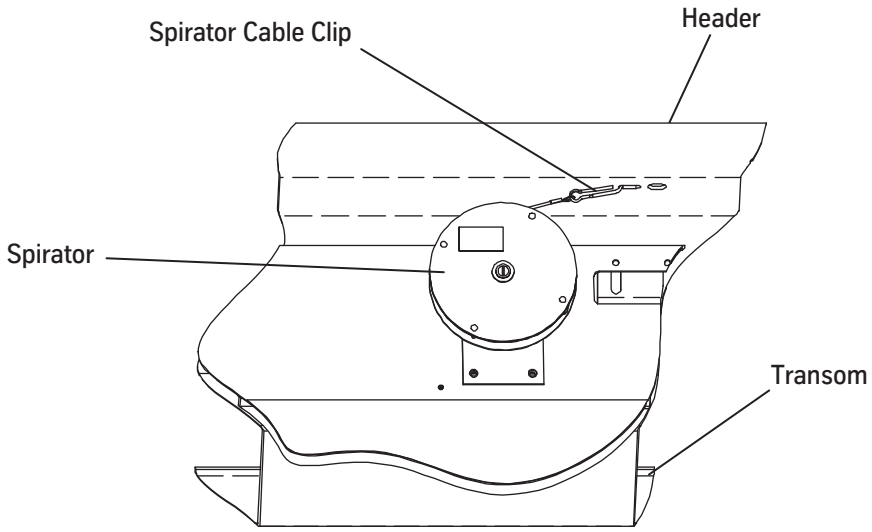


Figure 16 - Spirator

Install and Adjust the Top Door Retainers

1. On each side of the door panel, use the provided hardware to install a top door retainer on the hanger. See Figure 17.
2. Verify that there is sufficient running clearance between the retainer and the track, and adjust if needed.
3. On each side of the door panel, use the provided hardware to install a track retainer clip on the hanger.

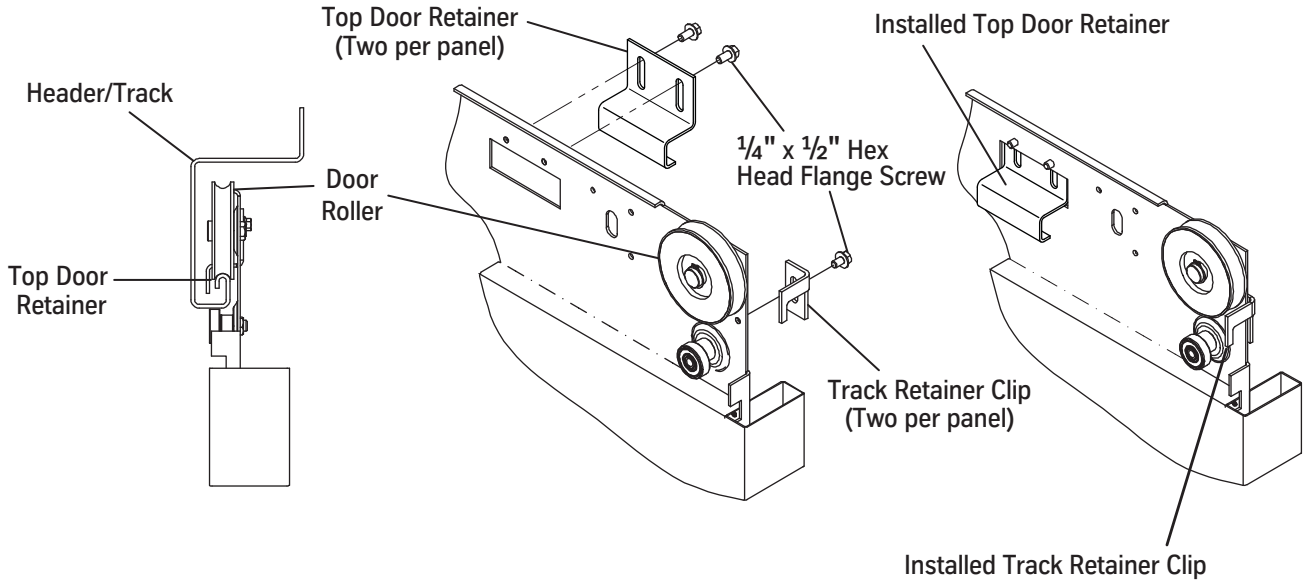


Figure 17 - Top Door Retainer

Install and Adjust the Interlocks for Door Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 18.
2. Remove the cover from the interlock box.

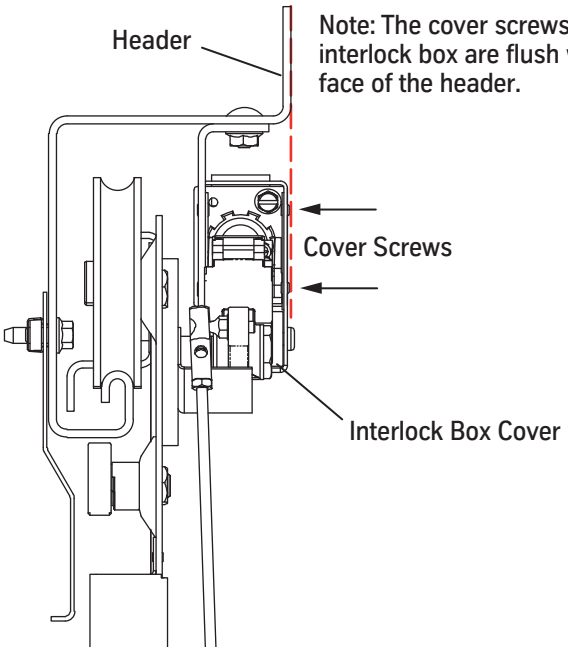


Figure 18 - Install the Door Interlock

3. Close the doors, and verify the following. See Figure 19 on page 30.
   a. The interlock hook is centered front-to-back on the contacts.

CAUTION **Never remove both washers on the interlock hook shaft.**

   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.
4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $^{1}/_{8}$" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - 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.

NOTE The pickup roller crank should be resting on its stop at this time.

   c. Interlock hook - contact compression of $^{3}/_{32}$".
      - The hook touches both contact leafs at the same time.
      - When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $^{1}/_{8}$". If necessary, adjust the interlock hook stop to limit the hook travel.

Install and Adjust the Interlocks for Door Mounted Interlock Rollers

(continued)

5. Move the rollers and the interlock hook, and verify that there is $^{9}/_{32}$" hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.

6. Repeat this procedure for all other landings.

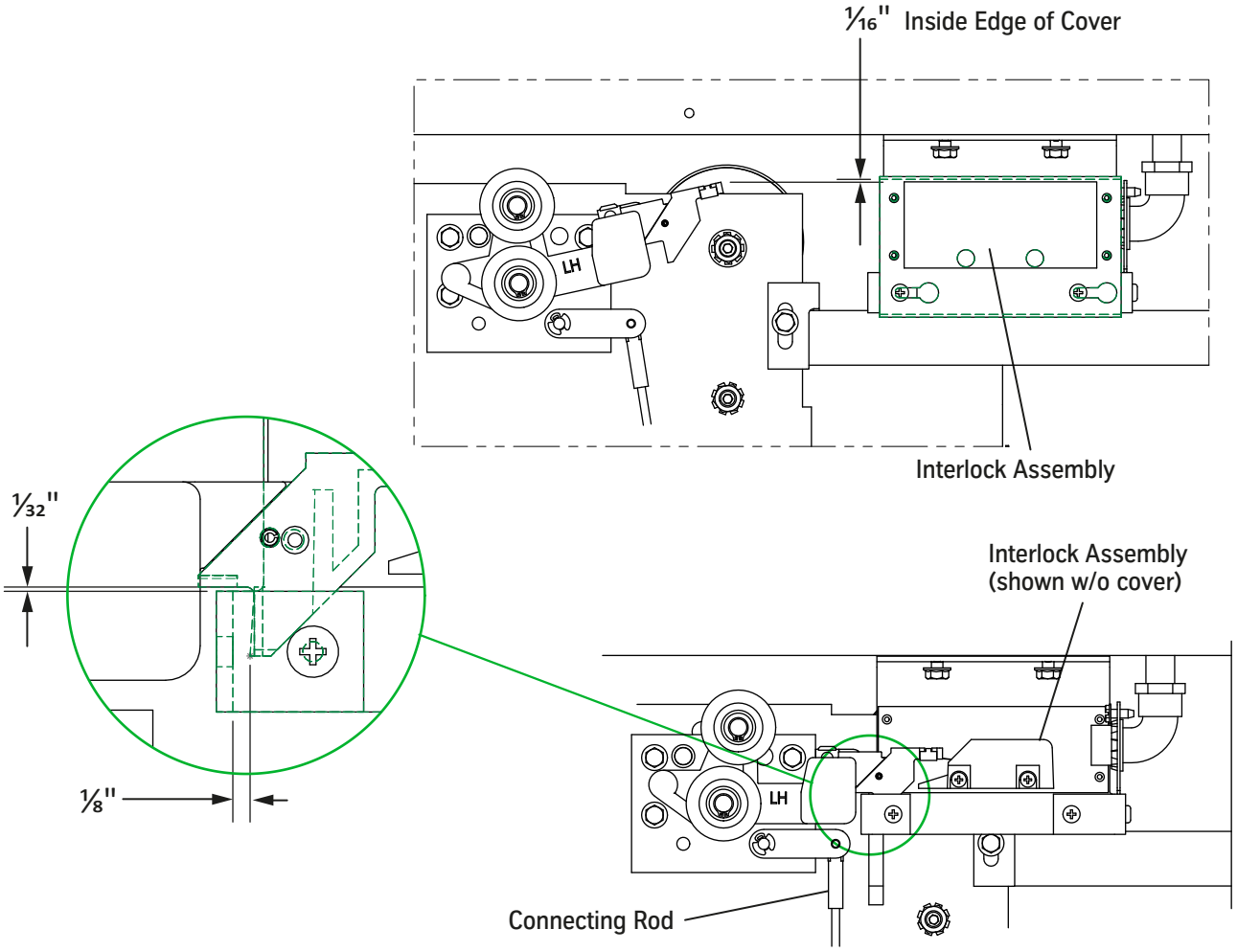


Figure 19 - Single Speed Interlock Adjustment

Interlock Wiring

1. Remove the interlock box cover.

2. Ensure that after the hook is in the locked position, the shorting bar has a good wipe on the contacts.

WARNING **All door interlock contacts must be wired in series. See the wiring diagrams for details.**

3. Repeat Steps 1 and 2 for all other landings.

Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 20.
2. Remove the cover from the interlock box.

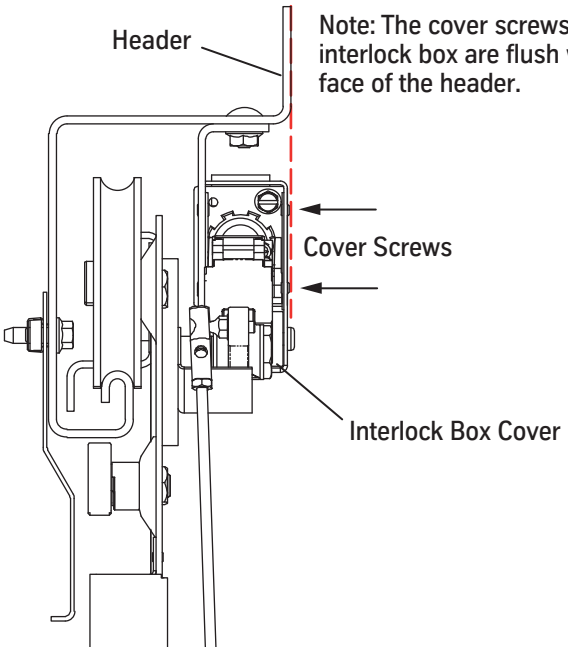


Figure 20 - Install the Door Interlock

3. Close the doors, and verify the following. See Figure 21 on page 32.
   a. The interlock hook is centered front-to-back on the contacts.

CAUTION **Never remove both washers on the interlock hook shaft.**

   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.
4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $^{1}/_{8}$" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - 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.

NOTE The pickup roller crank should be resting on its stop at this time.

   c. Interlock hook - contact compression of $^{3}/_{32}$".
      - The hook touches both contact leafs at the same time.
      - When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $^{1}/_{8}$". If necessary, adjust the interlock hook stop to limit the hook travel.

Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

(continued)

5. Move the rollers and the interlock hook, and verify that there is $^{9}/_{32}$" hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.

6. Repeat this procedure for all other landings.

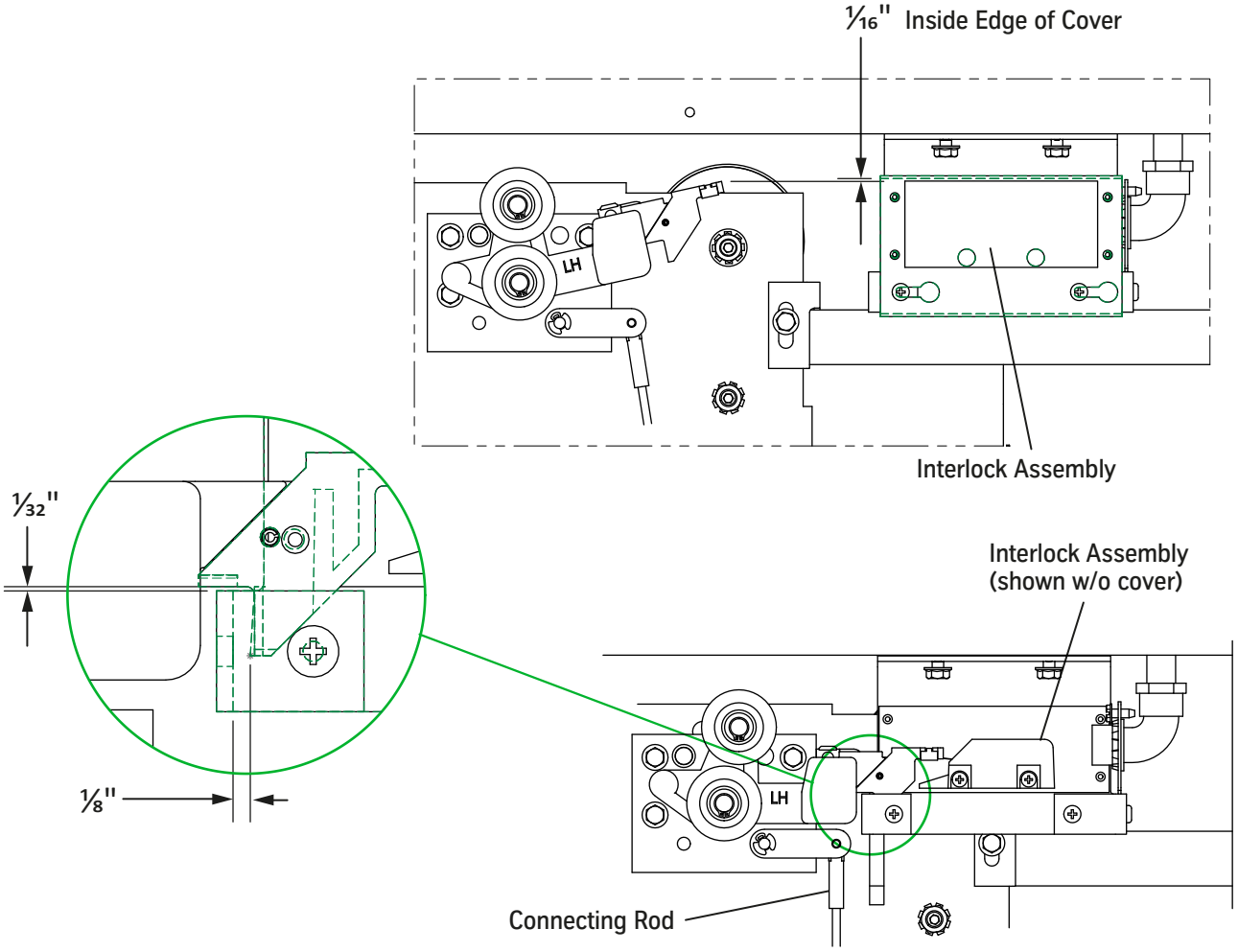


Figure 21 - Single Speed Interlock Adjustment

Interlock Wiring

1. Remove the interlock box cover.

2. Ensure that after the hook is in the locked position, the shorting bar has a good wipe on the contacts.

WARNING **All door interlock contacts must be wired in series. See the wiring diagrams for details.**

3. Repeat Steps 1 and 2 for all other landings.

Install the Fascia Plates and Dust Covers

1. Position the platform near the top landing.
2. Center a top fascia plate in the opening, and hook the fascia plate onto the hoistway sill of the top landing. See Figure 22 on page 34 through Figure 24 on page 36.
3. Use self-tapping screws to anchor the top fascia plate to the top landing hoistway sill support.
4. Install the first intermediate fascia plate by hooking it onto the top fascia plate.

NOTE If required, install the remaining intermediate fascia plates by hooking each one onto the last one installed.

5. Clip the bottom fascia plate to the top of the header. The bottom fascia plate vertically overlaps the last intermediate fascia plate.
6. Measure the distance between the sill support and the header, and subtract one inch.
7. Cut two fascia plate stiffeners (from the provided fascia stiffener angle) to the length measured in the previous step.
8. Clamp the angles in place behind and also flush with the edge of the fascia plates.
9. Run self-tapping screws through the pilot holes in the fascia plates to anchor the fascia plates to the stiffeners.
10. Repeat Steps 2 through 9 for all intermediate landings.

NOTE If required, center a top fascia plate in the opening and hook it onto the hoistway sill of the bottom landing.The fascia plate and the toe guard in the pit must extend far enough below the sill so that when the car is on compressed buffers, the platform toe guard will not be below the hoistway toe guard.

11. Use self-tapping screws to anchor the top fascia plate to the bottom landing hoistway sill support.
12. Install the toe guard by hooking it onto the top fascia plate.
13. Use the provided drive pin anchors to fasten the toe guard to the wall.
14. If required, install all dust covers.

Install the Fascia Plates and Dust Covers

(continued)

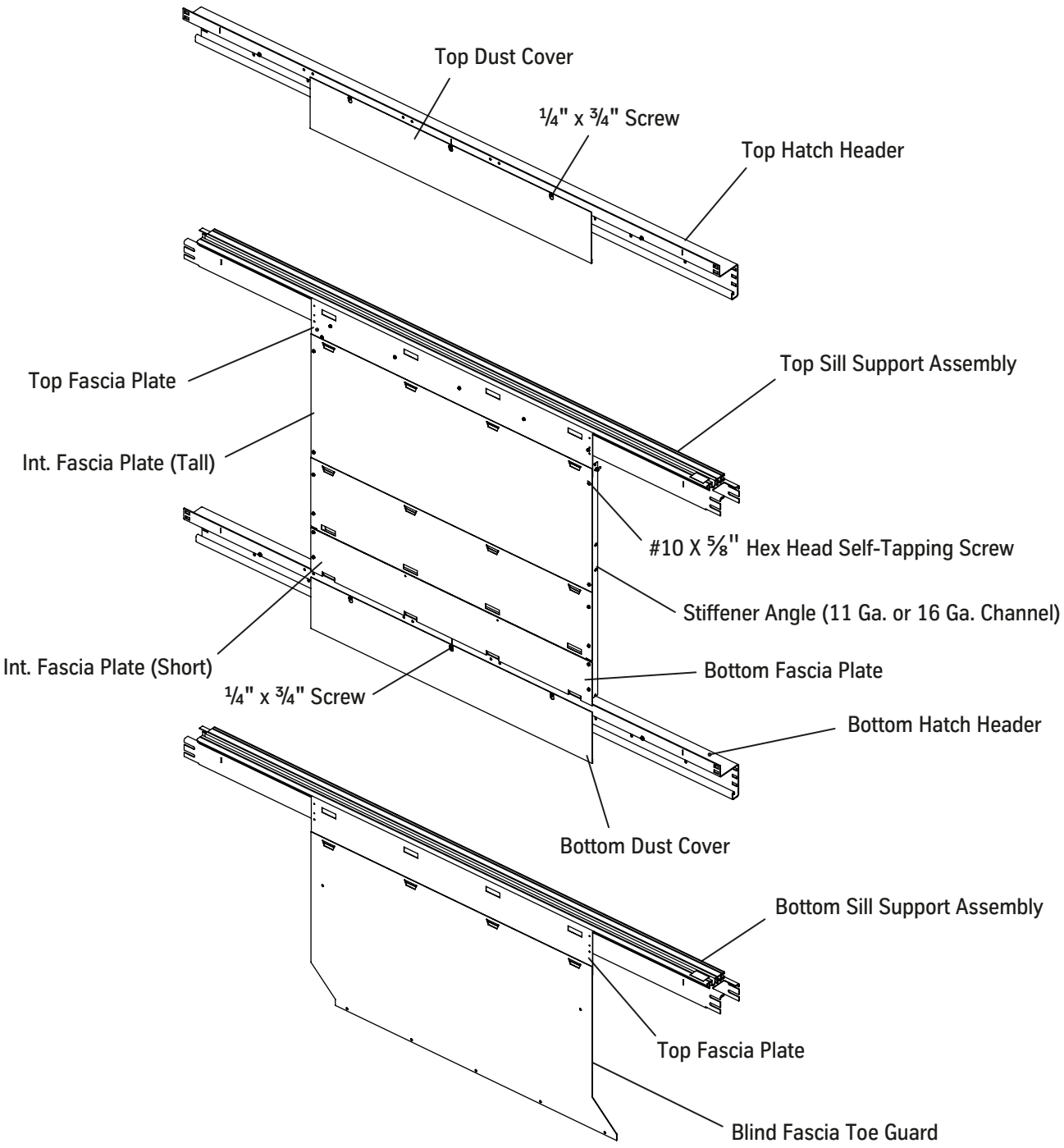


Figure 22 - Install Fascia Plates, Dust Covers, and Toe Guards (1 of 4)

Install the Fascia Plates and Dust Covers

(continued)

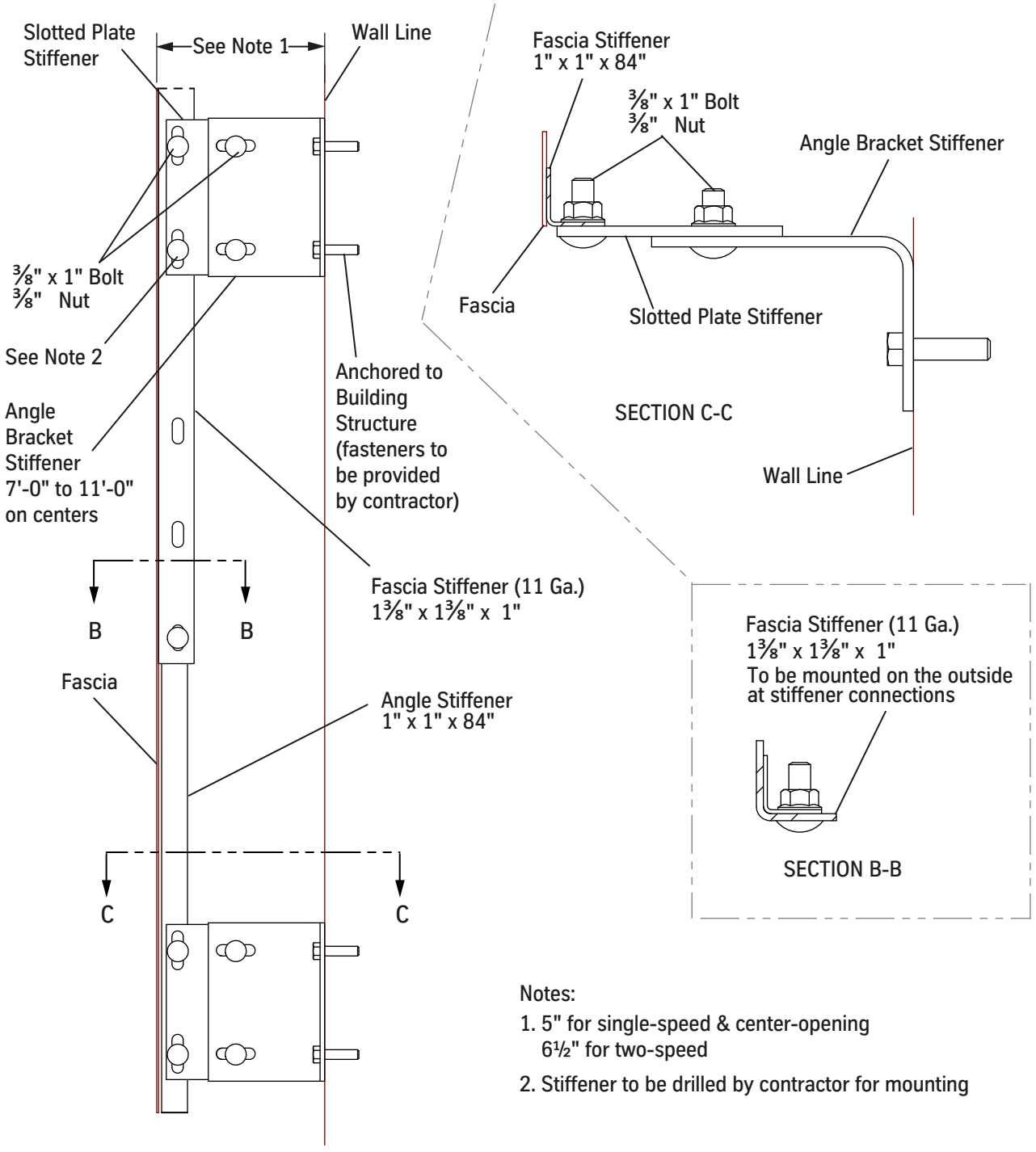
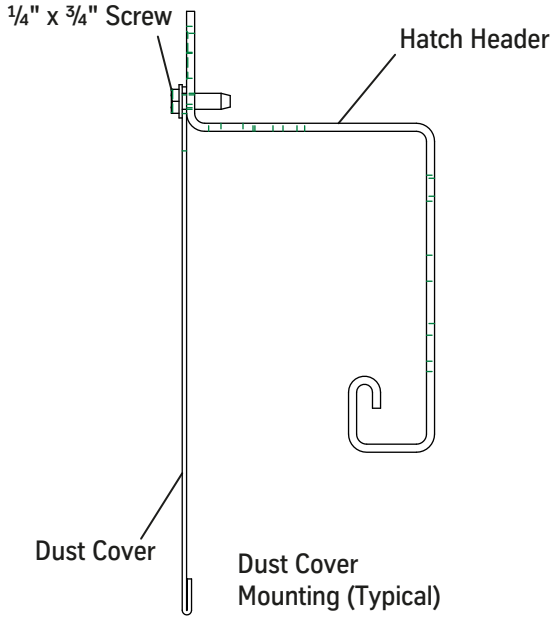
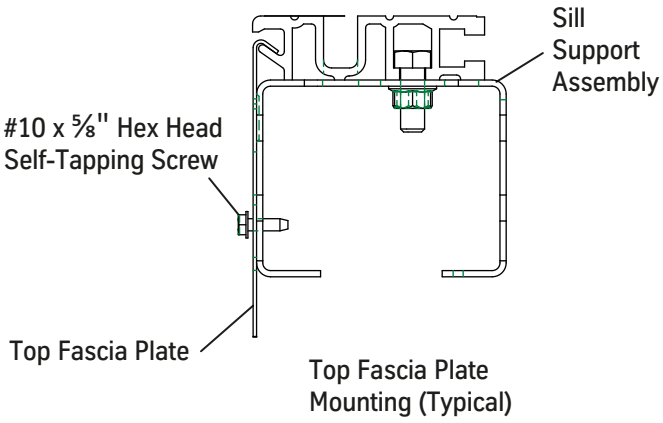
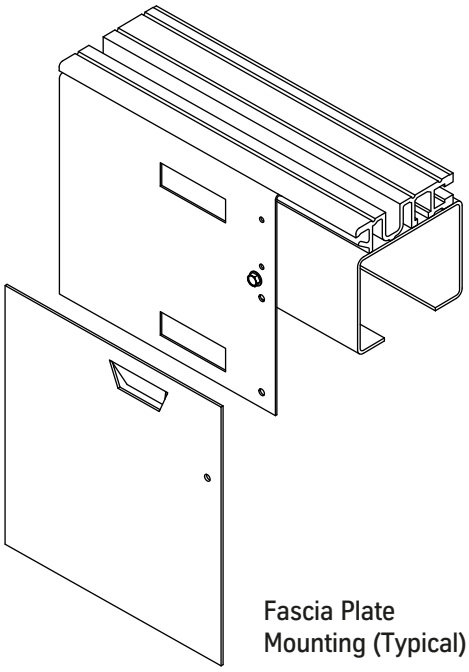


Figure 23 - Install Fascia Plates, Dust Covers, and Toe Guards (2 of 4)

Install the Fascia Plates and Dust Covers
(continued)







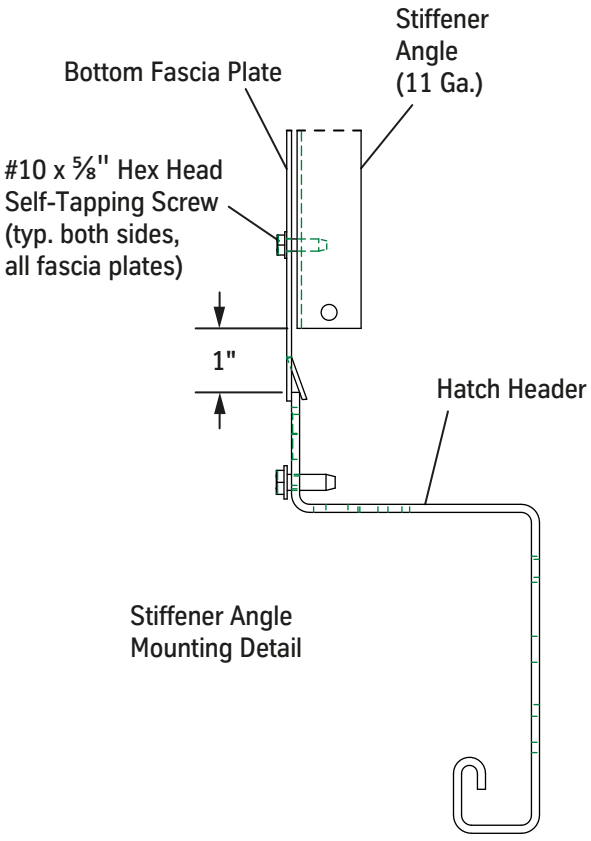


Figure 24 - Install Fascia Plates, Dust Covers, and Toe Guards (3 of 4)

Install the Fascia Plates and Dust Covers
(continued)

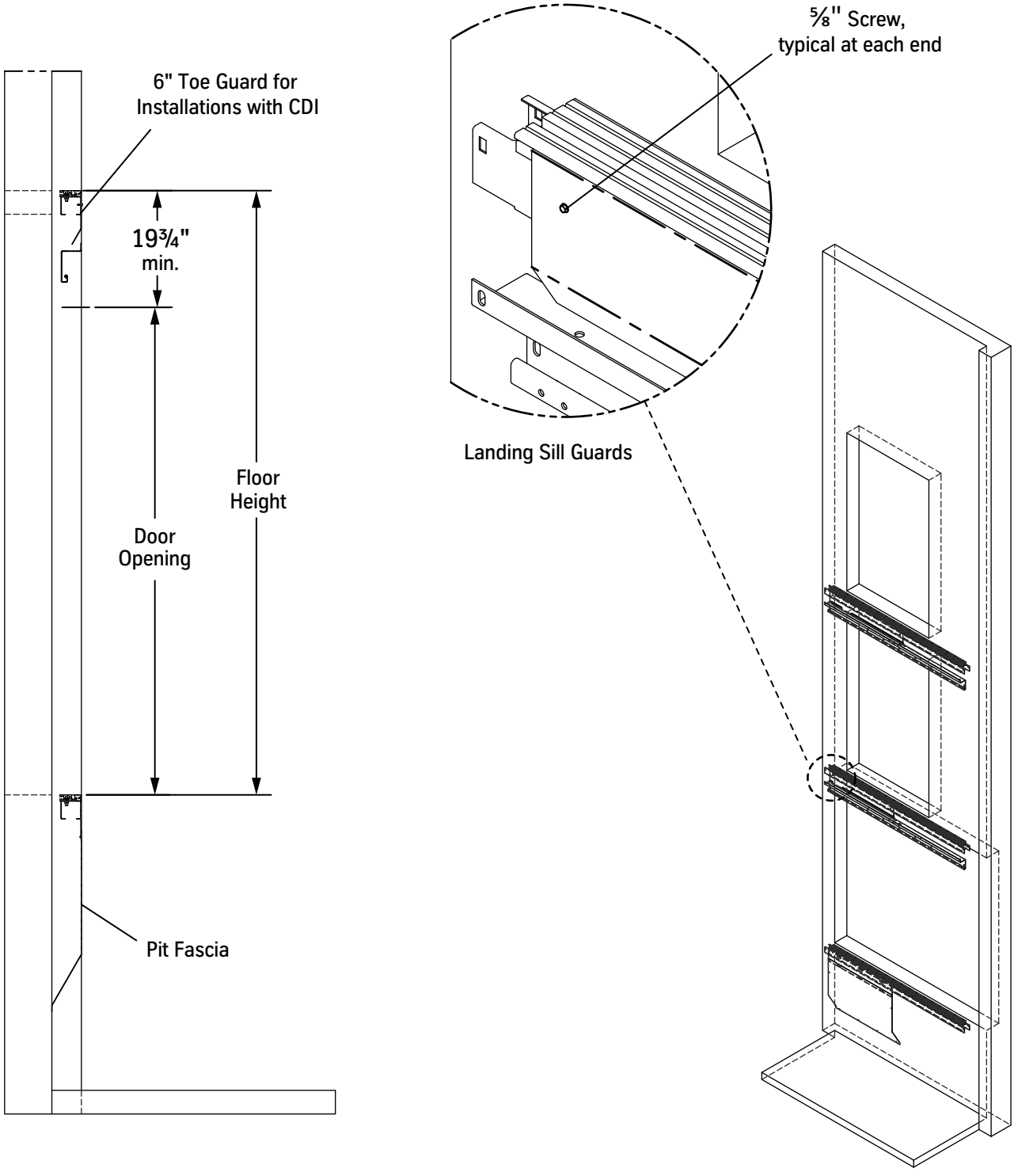


Figure 25 - Install Fascia Plates, Dust Covers, and Toe Guards (4 of 4)

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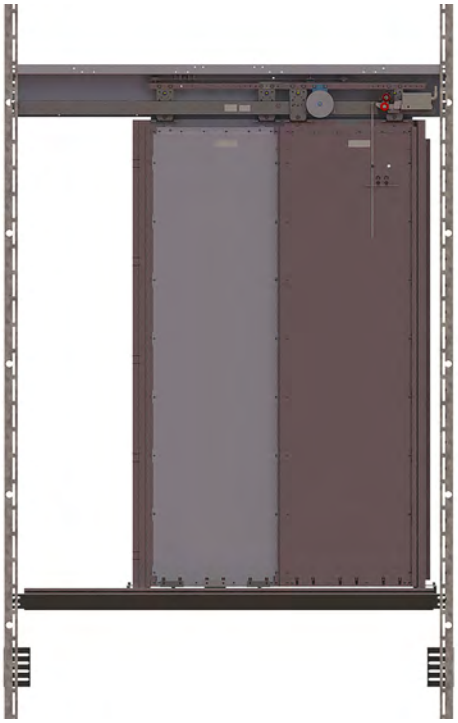
Interlock Rollers Mounted to Door Panel

Interlock Rollers Mounted to Door Hanger



TWO SPEED INSTALLATION

Two Speed Installation

Install the Wall Angles

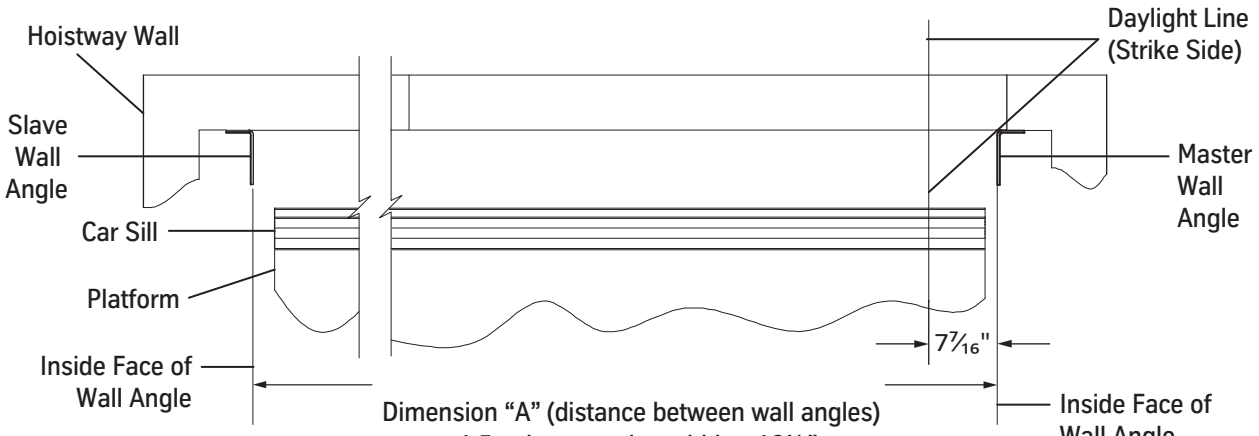
NOTE See the job layouts and Figure 26 on page 40 for all steps in this procedure.

1. Verify that a running platform with the car sill is installed.
2. Obtain the finished floor height dimension from the contractor.
3. Determine the daylight line location for the strike side.
4. Apply tape to the car sill, and mark the line on the tape.
5. Mark the horizontal position of the inside face of the master (first) wall angle relative to the daylight line nearest the strike column. Extra wall angles are provided if the pit is more than 6 feet deep.
6. Install the wall angle.

NOTE
- Where hoistway space allows, turn the wall angles away from the door opening.
- Wall anchors must be located below the sill support assembly.

7. Drop a plumb line in the front of the hoistway to locate the positions of the remaining master wall angles.
8. Install the remaining master wall angles.
9. Make sure that the master wall angles are square with the platform and plumb with each other. Check the tightness of the wall anchors.
10. Create a gauge stick for the slave wall angle. Cut a piece of light, but stiff material (e.g., $^{3}/_{4}$" EMT) for Dimension “A”.
11. Place the gauge stick against the master wall angle and locate, mark, and install the slave wall angles at all floors.

Install the Wall Angles
(continued)



Door Opening Width (inches)	Dimension "A" (inches)
48	82 ¼
54	91 ¼

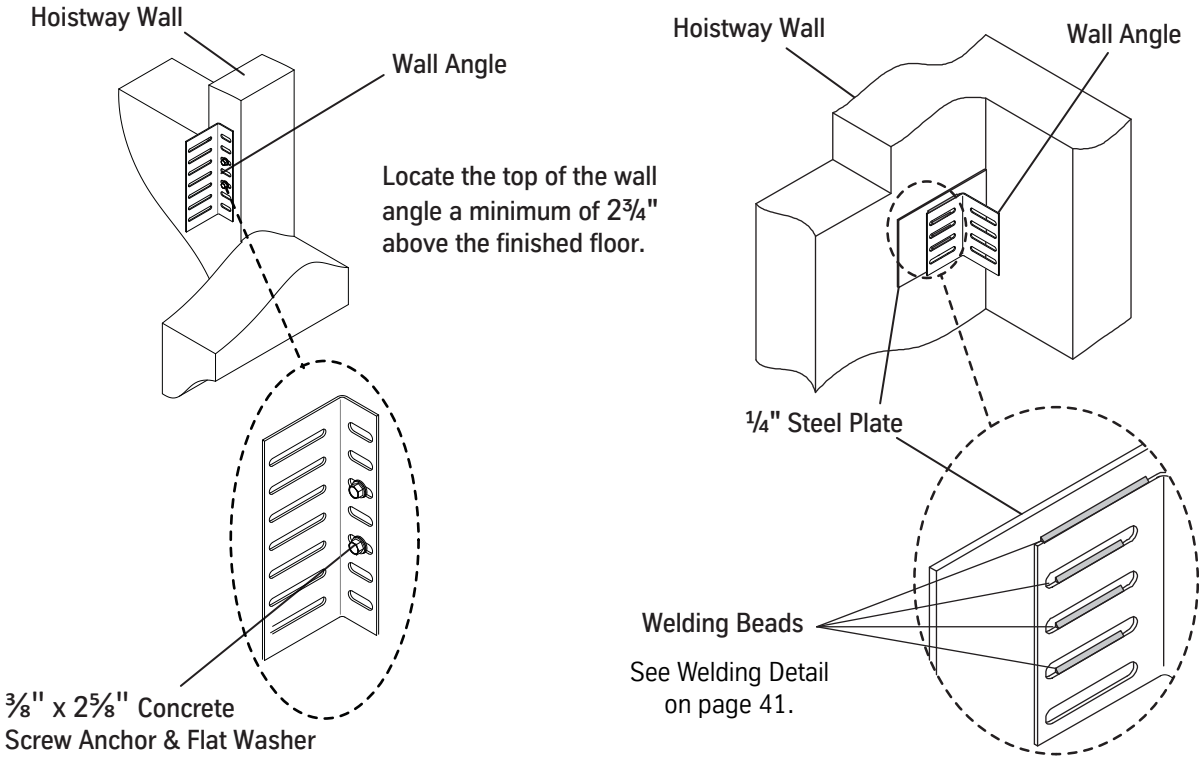
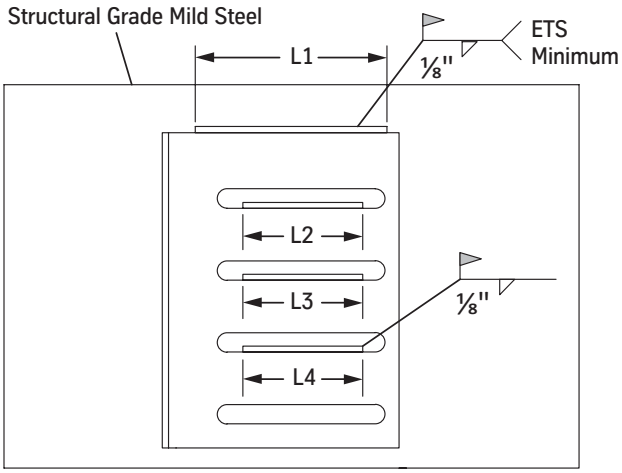


Figure 26 - Wall Angle Placement

Install the Wall Angles
(continued)

Welding Detail



1. Before welding, make sure the steel is clean. Remove burrs, paint, or coating in weld area.
2. Welding of elevator parts that are specified in *ASME A17.1 Safety Code For Elevators And Escalators*, shall conform to *A17.1, Section 8.8, Welding*.
3. Perform all welding in a well ventilated area, *ANSI Z49.1 Safety In Welding, Cutting And Allied Processes*.
4. Weld entrance wall angles to structural mild steel in two or more locations.

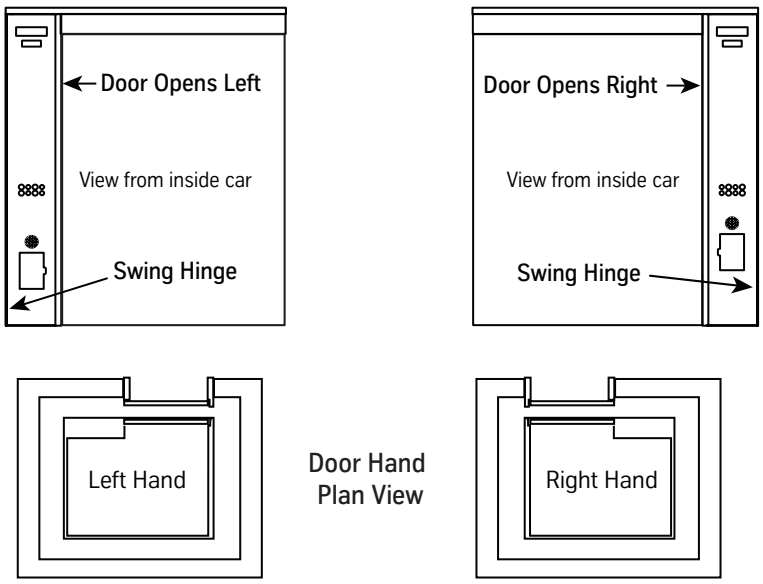
   Use horizontal fillet welds on square edges of the wall angle (recommended, but not required). The total effective length of fillet welds should equal or exceed 4 inches.

   Example: (L1 + L2 + L3 + L4 +..... + Ln = 4 inches minimum. The length of each fillet should be a minimum of 3/4 inches.
5. The type of filler metal used will depend on the welding process, but in no case shall the nominal tensile strength of the filler metal be less than 60,000 PSI.
6. For suitable structural mild steel or preheat specifications, refer to *AWS D1.1* or *AWS D1.3* whichever is applicable.

Architectural Hand Identification

Left Hand - Front/Rear Openings
Door opens LEFT when standing inside the car, facing the door.

Right Hand - Front/Rear Openings
Door opens RIGHT when standing inside the car, facing the door.



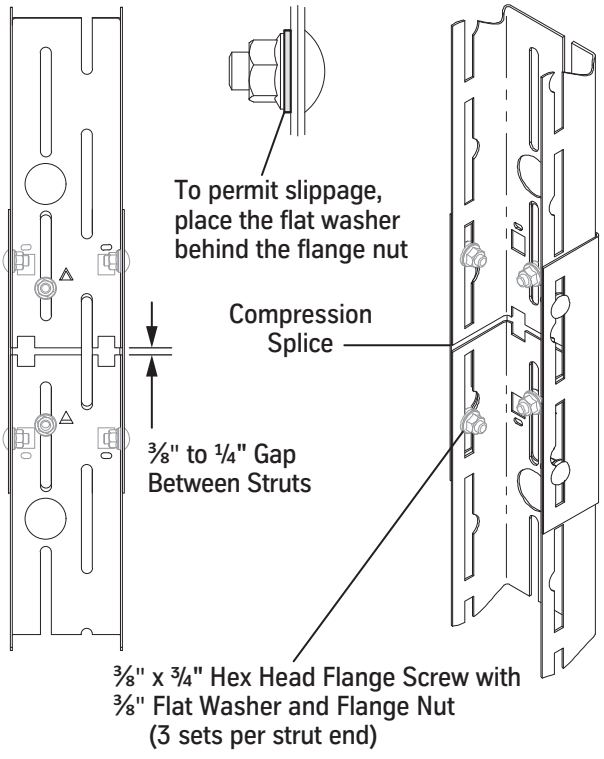
Stack the Struts

See Figure 27 on page 43 for all steps in this procedure.

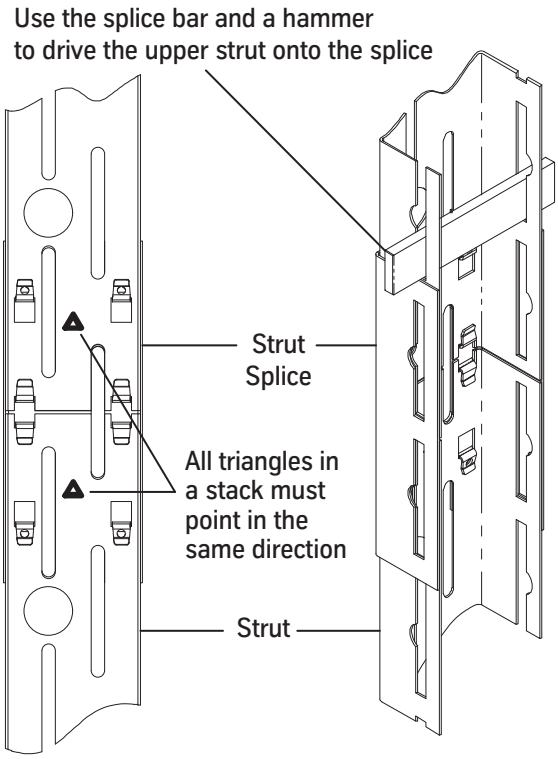
1. Set two struts on the pit floor, and fasten them to the wall angles. A compression splice is required every 32 feet.
2. Adjust the struts so that they are $1^1/_4$" from the car sill. The strut to car sill adjustment will set the final sill clearance.
3. Clip a strut splice to the top of the two struts. Triangles in splices must match the direction (up or down) of triangles in the struts.
4. Install the second set of struts.
   a. Clip the second set of struts to the splices.
   b. Use a splice bar and a hammer to drive the upper strut onto the splice.
   c. Fasten the struts to the next set of wall angles.
   d. At each landing, verify that the struts are $1^1/_4$" from the car sill.
5. Repeat this procedure until all of the struts are stacked, spliced, and fastened to wall angles.
6. Check all struts for plumb on two sides, and then securely fasten them.

Stack the Struts

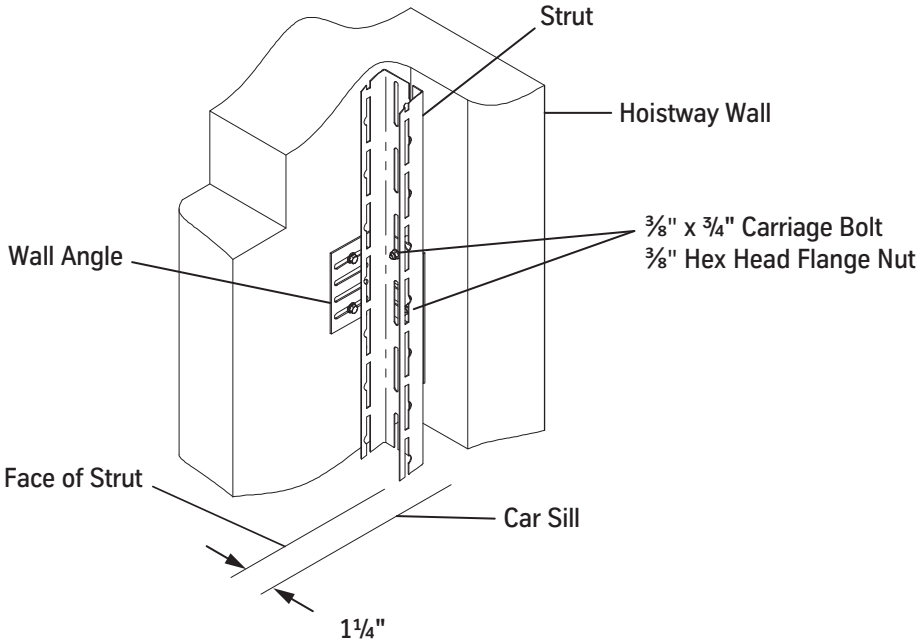
(continued)



Assemble a Compression Splice



Assemble the Strut Splice



Assemble the Strut to the Wall Angle

Figure 27 - Stack and Assemble the Struts

TWO SPEED

Install the Hoistway Sill

1. Determine the strike side of the hoistway sill.
2. Locate the two slots in the sill support.
3. Remove the hex head cap screws from the column mounting brackets, and slip them into the slot on the back side of the sill. See Figure 28.
4. Loosely attach each mounting bracket, and then adjust the bracket's tab to fit into the slot.
5. Tighten the brackets to the sill.

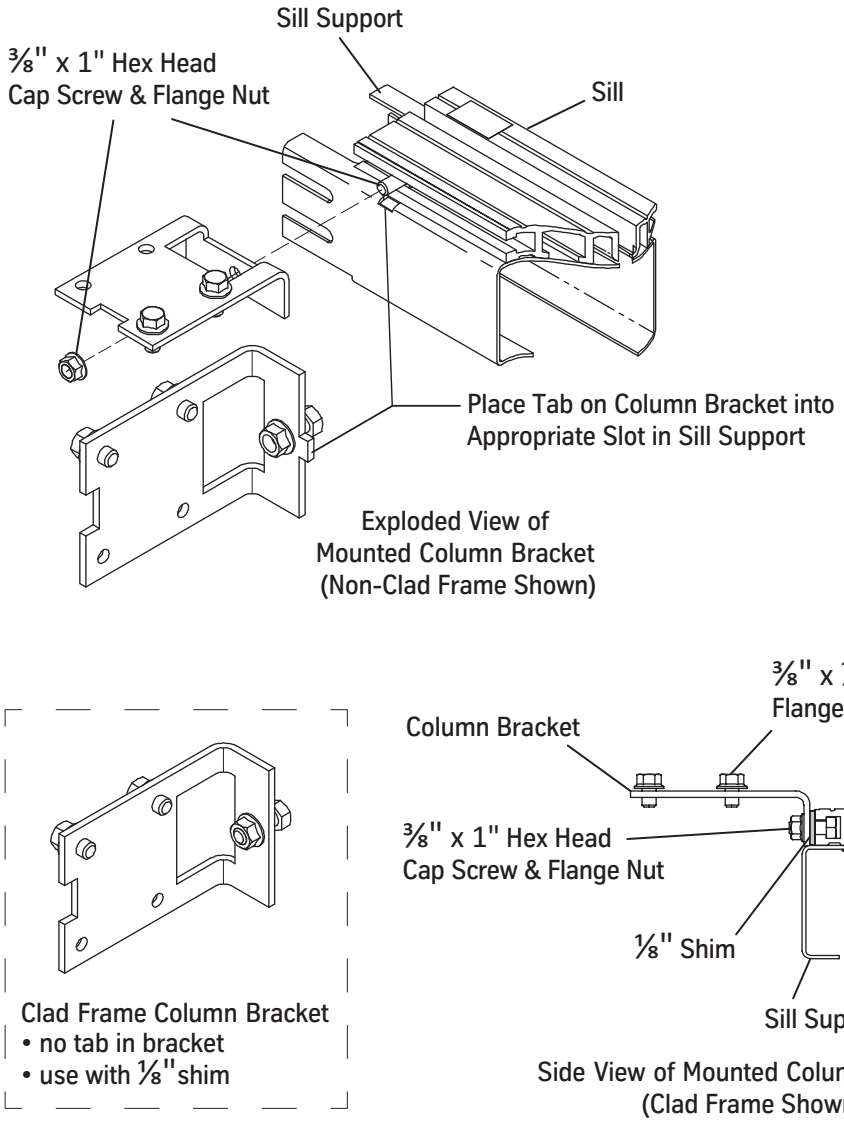


Figure 28 - Column Bracket Installation for Standard Sill

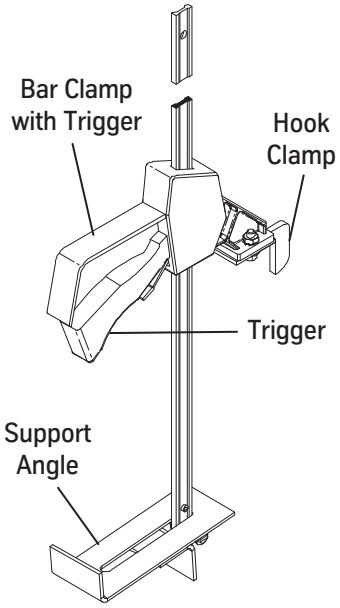
Install the Sill Support to the Struts

For all steps in this procedure, see Figure 29 on page 46.

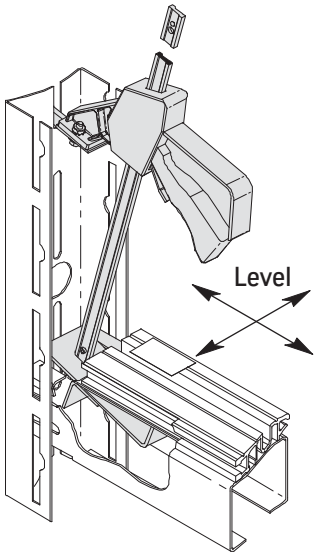
1. Hang the sill leveling tool in the slots or oval cutout on the back of each entrance strut.
2. Use the adjustment trigger to set the tool so that the support angle is roughly 2 inches below the finished floor.
3. Lay the sill and/or sill support on the support angles.
4. At each end of the sill and on each side of the strut, install a carriage bolt and a flange nut—the nut goes inside the assembly.
5. Hand-tighten the hardware into the matching slots of the sill support and strut.
6. Raise the sill to the finished floor level.
7. Level the sill side to side and front to back.
8. Move the sill up so that the daylight lines and the centerline stamped into the header are even with the car sill. Make sure that the adjustment is accurate because this determines the accuracy of the entrance frame installation.
9. Verify that the vertical surface of the sill support is even with the angled fascia hanger on the sill.
10. Tighten the fasteners on the hall side and the car side.
11. Repeat this procedure for all landings.

Install the Sill Support to the Struts

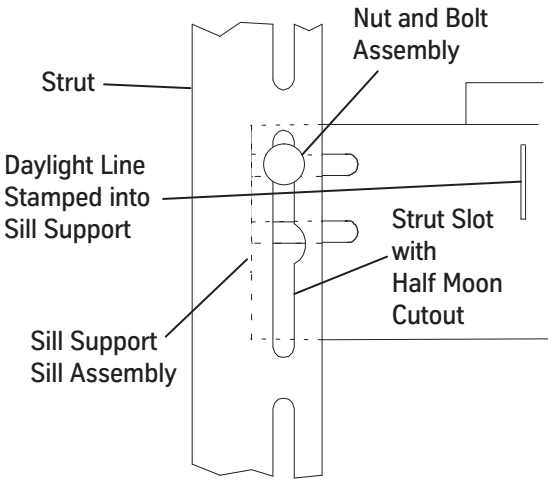
(continued)

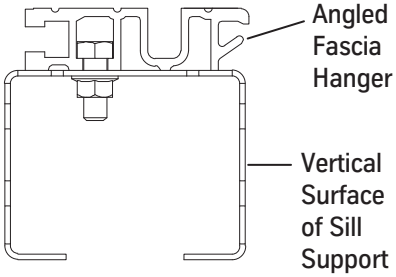


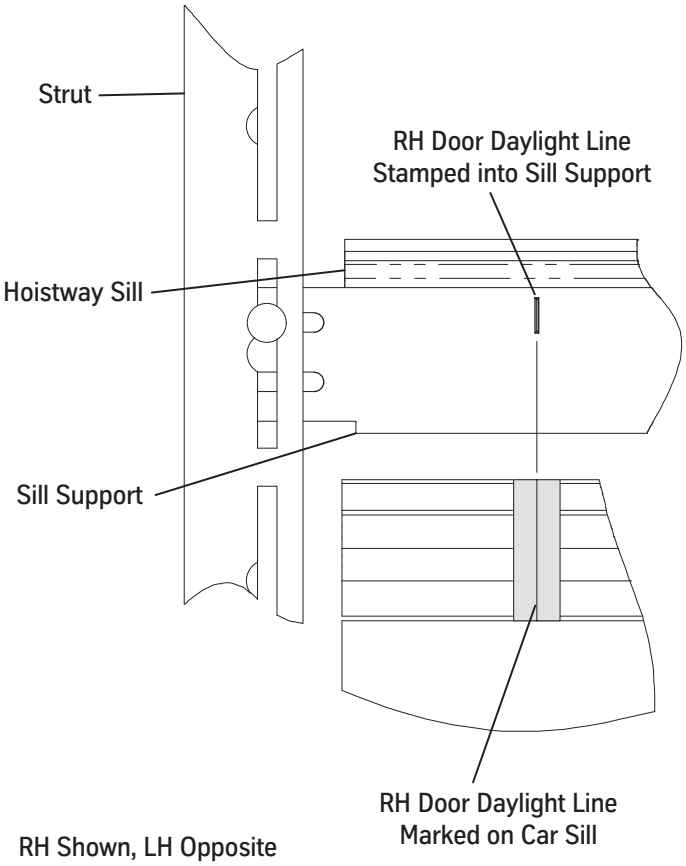
Sill Leveling Tool



Sill Support/Sill Assembly, Leveled on the Support Angles







RH Shown, LH Opposite

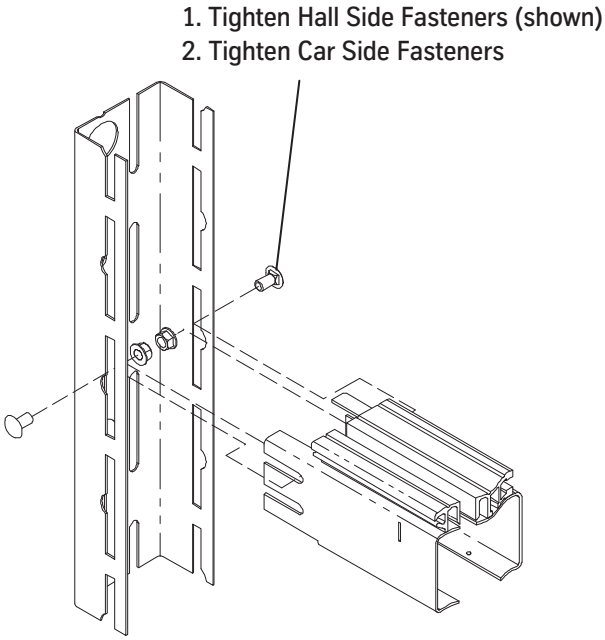


Figure 29 - Install the Sill Support to the Struts

Install the Hoistway Header

Gauge sticks are needed for this procedure.

- For standard door height (84") - two gauge sticks are provided for each job.
- For non-standard door height - use the following formula to determine the length, and cut the gauge sticks to this measurement.

  Gauge Stick Length: Sill-to-Header Dimension = Opening Height + $10^{5}/_{16}$".

1. Move the platform up where the header can be reached.
2. Place the gauge sticks on the sill of the landing below, one at each end of the sill. See Figure 30 on page 48 for all steps on this page.
3. Place the header on the gauge sticks.
   a. At each end of the header, install carriage bolts and flange nuts.
   b. Hand-tighten the hardware into the matching slots of the header and strut.
4. Move the platform up so that the daylight lines and the centerline stamped into the header are even with the car sill.
5. To prevent the door operator equipment from being out-of-plumb:
   a. First tighten the fasteners on the back of the header at both ends.
   b. Then tighten the fasteners on the front of the header at both ends.
6. Repeat this procedure for all landings.

Adjust the Hoistway Sill and Header

1. Level the platform with a landing.
2. Verify that the clearance between the hoistway sill and the car sill is $1^{1}/_{4}$".

TWO SPEED

Install the Hoistway Header
(continued)

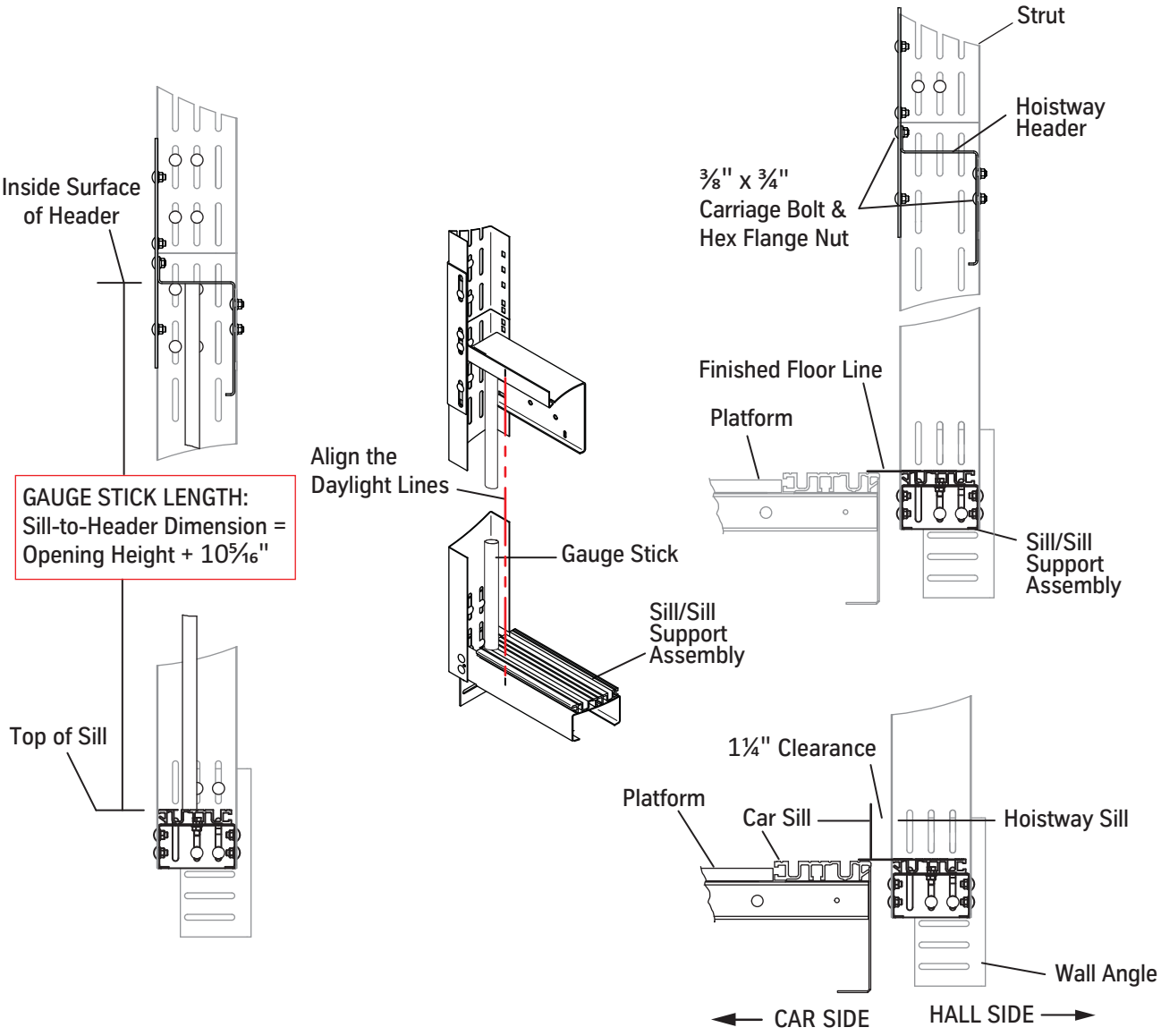


Figure 30 - Install and Adjust the Hoistway Header

Assemble the Frame

1. Place the entrance columns and transom face down, and position each column at a slight angle to the transom. See Figure 31.
2. On each end of the transom, remove the flange screw and nut and set them aside.
3. On each end of the transom, roughly align the clips with the rectangular cutouts in the columns.
4. While pushing down on the column, swing the column toward the transom.
5. Ensure that the back side (toward the car) of the transom is flush with the back side of the column.
6. Install the flange screw and nut in the matching holes of the transom and column.
7. Repeat steps 3 through 7 for the other column.
8. Verify that the columns are square with the transom.
9. Ensure all fasteners are tight, and repeat this procedure for all landings.

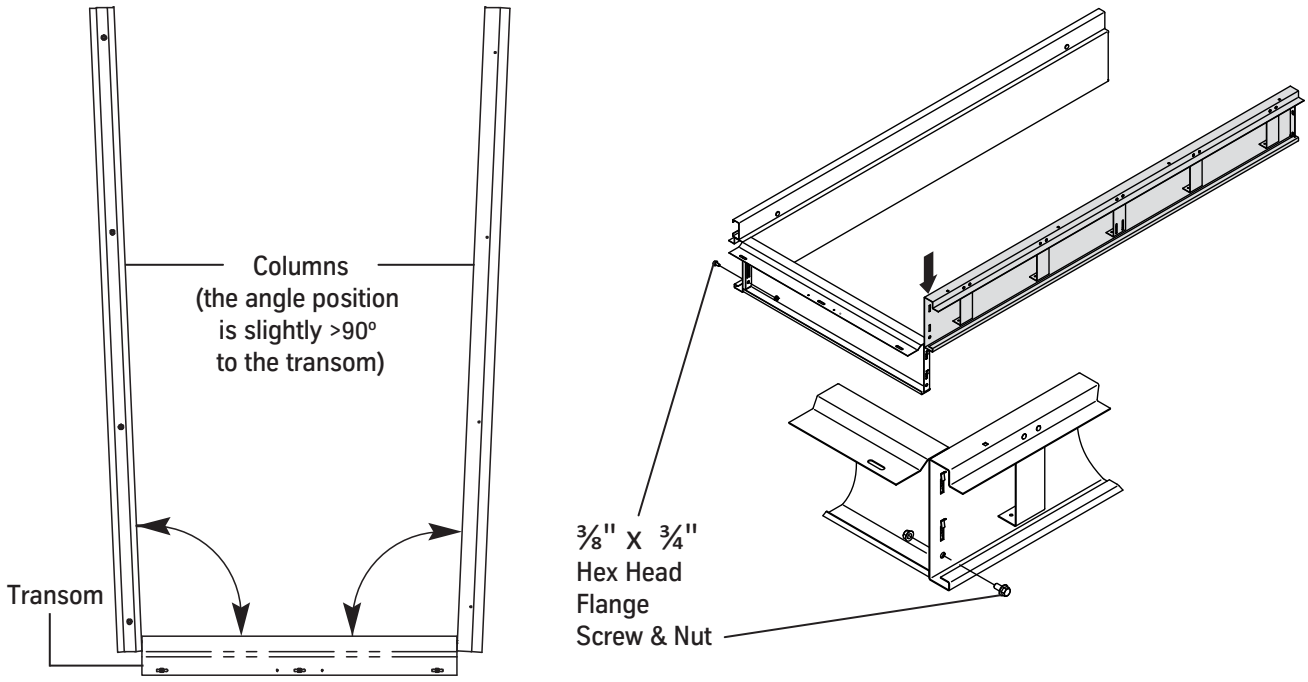


Figure 31 - Assemble the Frame

Attach the Frame to the Sill

1. Attach the frame to the column brackets.
   a. Stand the frame on the column mounting brackets.
   b. Install the hex head flange screws in the bottom of each column.
2. Align the frame columns so that they overlap the hoistway sill $^{1}/_{8}$" (the depth of the cutout on the top back edge of the hoistway sill). See Figure 32.
3. Tighten the four screws between the columns and the column brackets.
4. Move the platform up high enough to reach the header and transom.

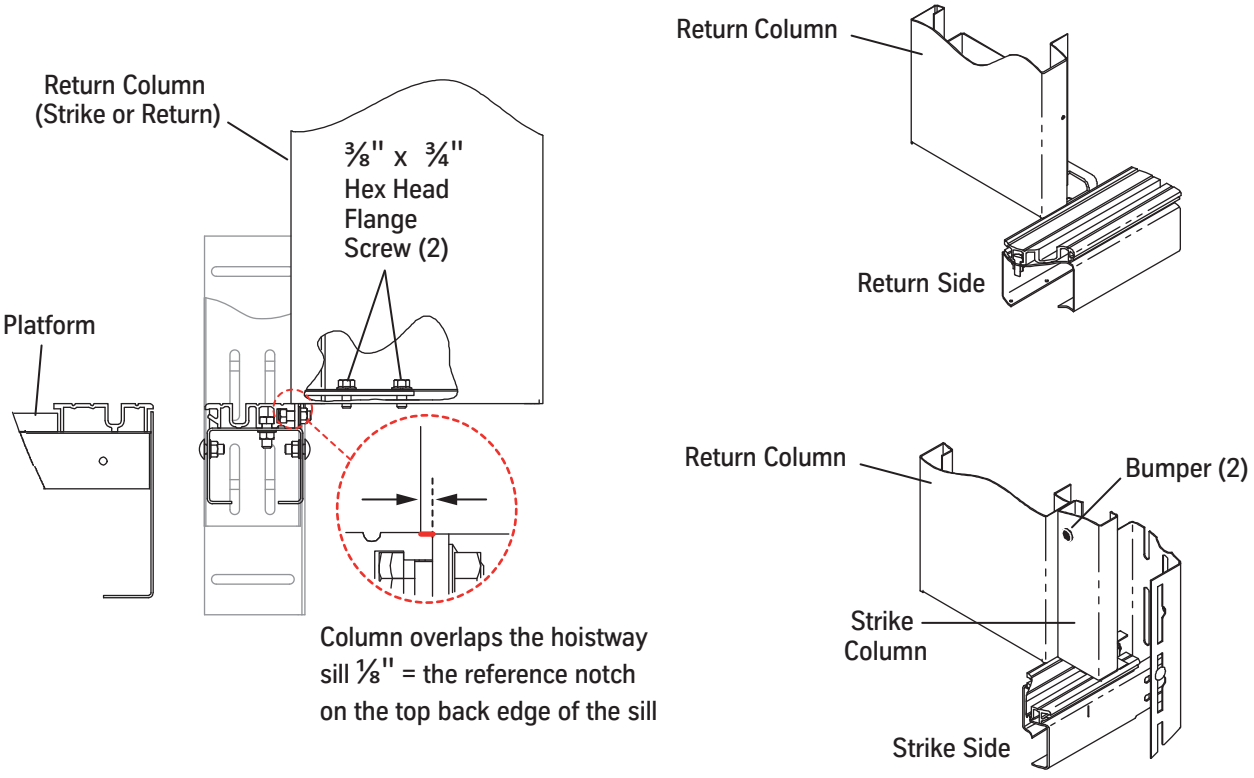


Figure 32 - Attach the Frame (standard sill shown)

Attach the Transom to the Header

1. Attach the transom to the header. See Figure 33.

- For non-clad frames:
  a. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
  b. Tighten the screws.
- For clad frames:
  a. Before screws are added, install a 1/8” shim between the transom and the header.
  b. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
  c. Tighten the screws.

2. Install one washer head self-tapping screw into the header.

3. Repeat this procedure for all landings.

Non-clad frame shown
Optional installation: clad frame
Note: install ⅛" shim before hardware

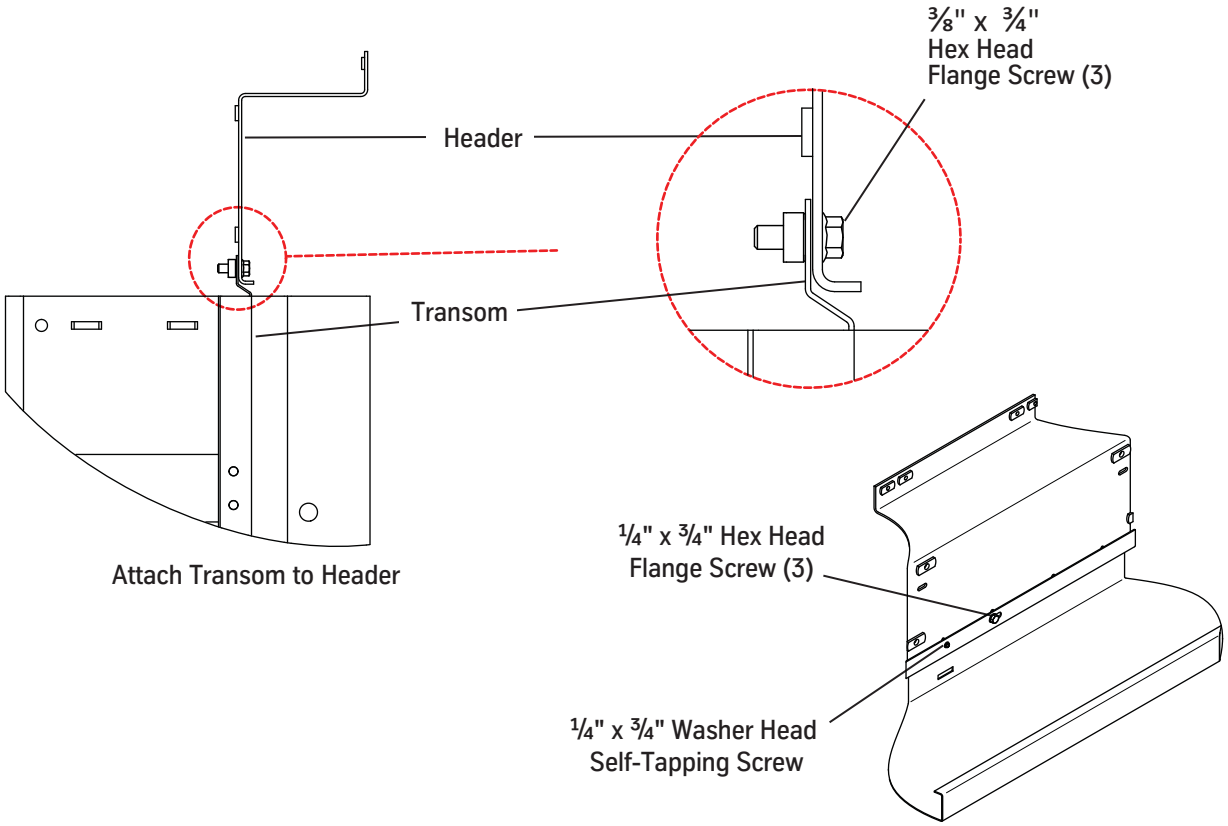


Figure 33 - Attach the Transom to the Header

Install the Grout Angles

NOTE Grout angles have a $2^1/_2$" leg and a $3^1/_2$" leg. Based on the gap, either leg can be placed against the hoistway wall.

1. Use self-tapping screws to install the grout angle on the bottom of the sill support and also tight against the hoistway wall. See Figure 34.
2. Anchor the grout angle to the wall.
3. Repeat this procedure for each landing.

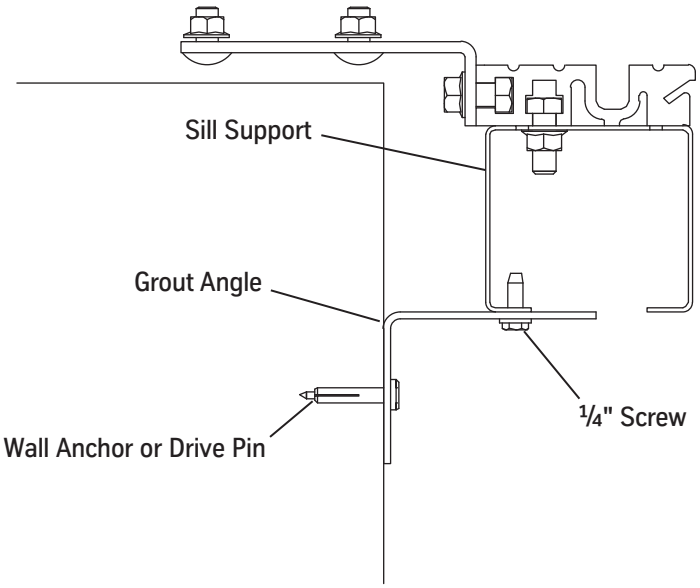


Figure 34 - Grout Angle Installation

Install the Fixture Boxes

Use brackets to install the fixture boxes at each landing.

Install Hoistway Doors

1. Load the hoistway doors onto the platform.
2. At a landing, place the hoistway doors on the hoistway sill and lean the doors against the hoistway header.
3. Install the door isolation bumpers. See Figure 35.

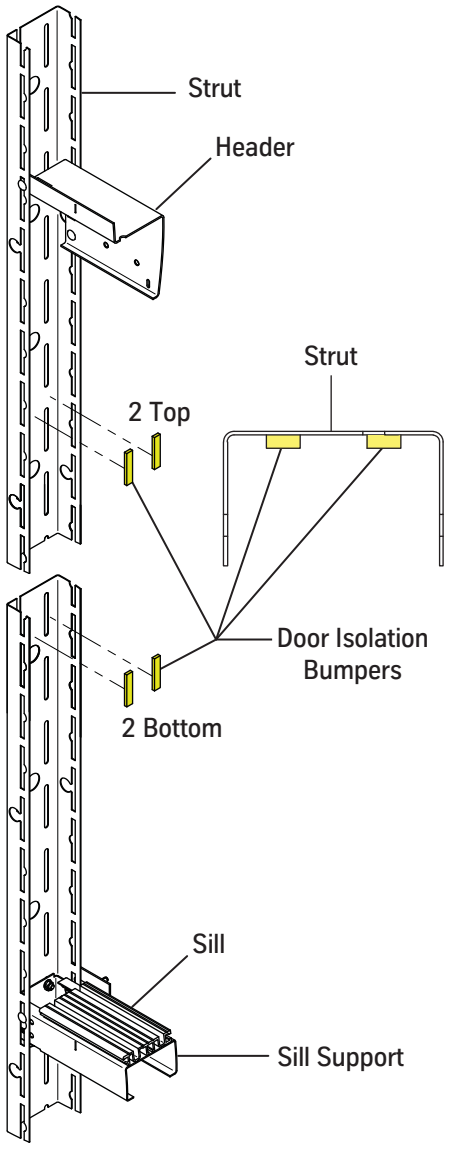


Figure 35 - Door Isolation Bumpers

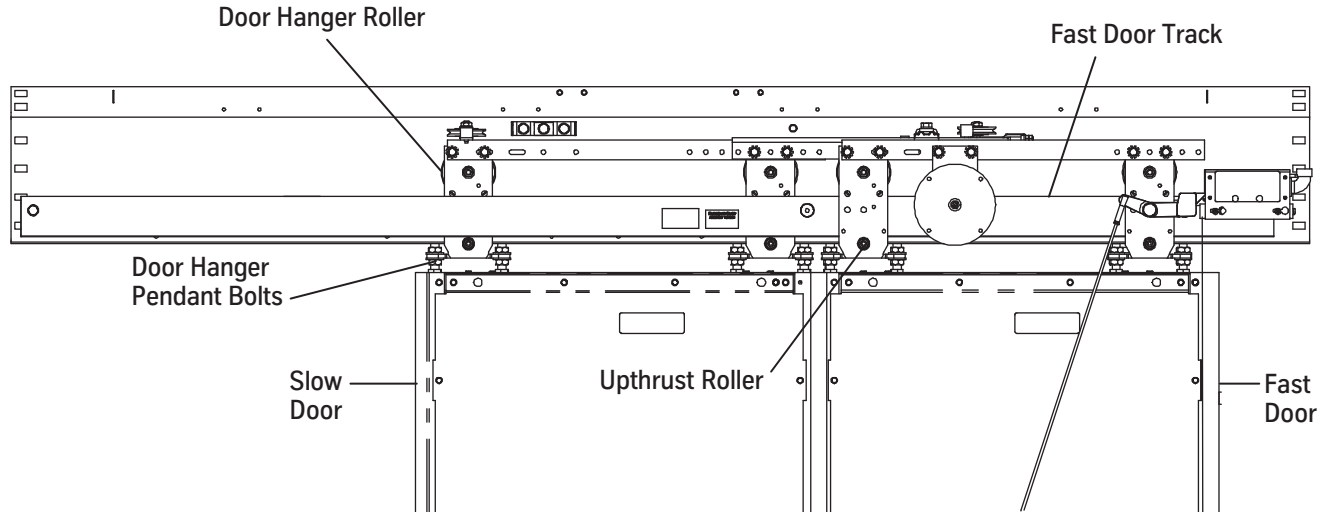
TWO SPEED

Install Hoistway Doors
(continued)

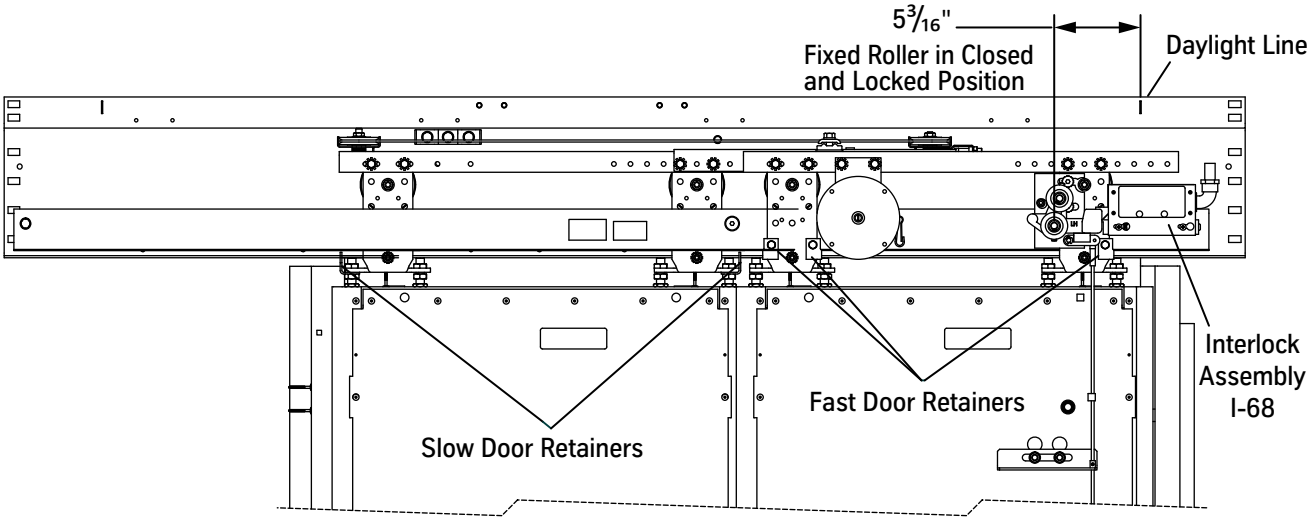
4. Loosen all upthrust rollers. See Figure 36.

5. Place the door rollers, one roller at a time, onto the door track.

6. Adjust the height of the door to $^{3}/_{8}$" by turning the eccentric on the door rollers, and then lock the eccentric with the nut.



Shown with Door Mounted Interlock Rollers



Shown with Hanger Mounted Interlock Rollers

Figure 36 - Door Rollers

Install Hoistway Doors
(continued)

7. Install the door gibs and the door safety retainers. See Figure 37.

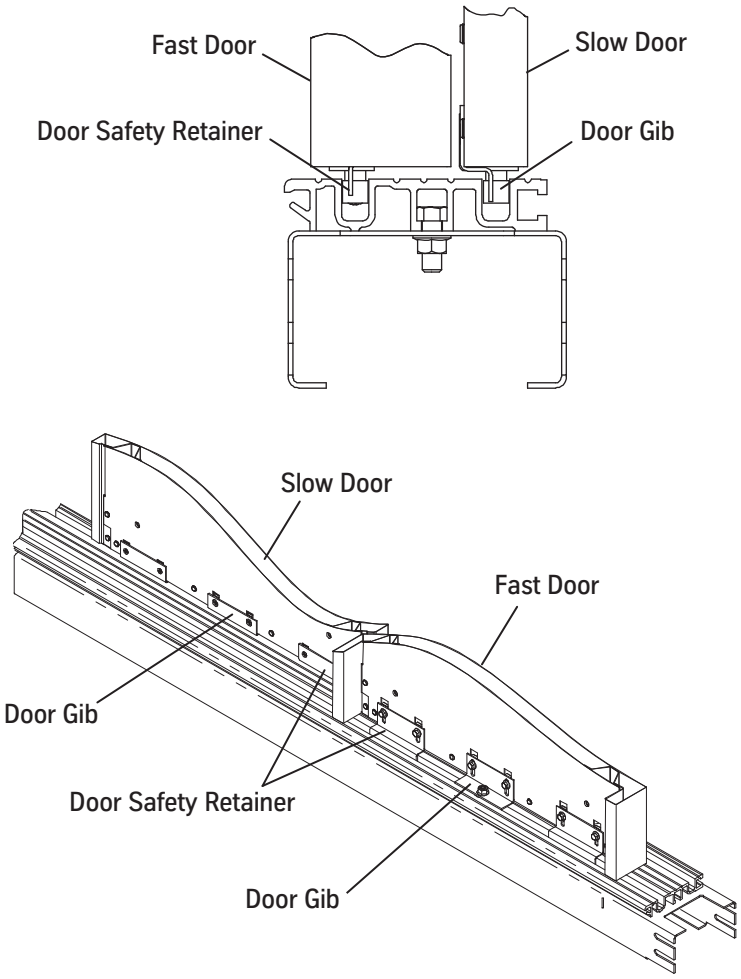
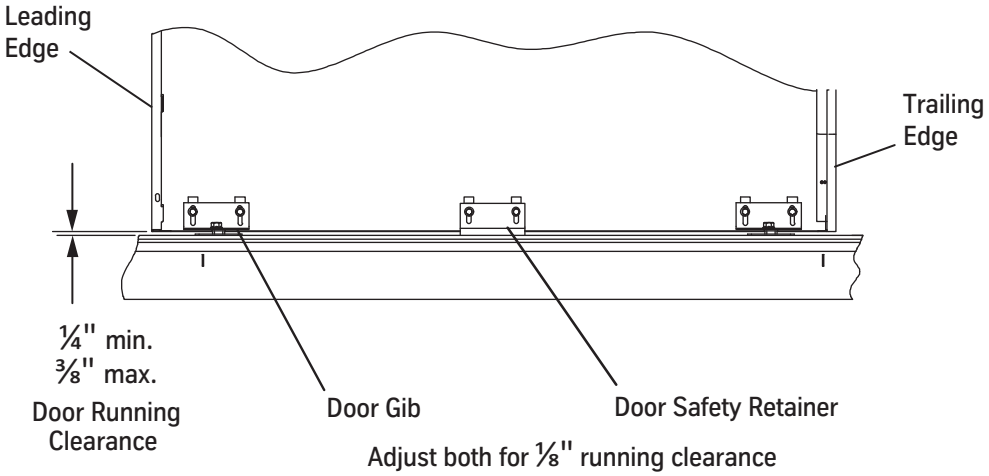


Figure 37 - Door Gibs and Safety Retainers

Adjust the Hoistway Door Running Clearance

1. Place a $^{5}/_{16}$" shim (running clearance) underneath the leading edge of the door. See Figure 38.
2. Loosen the upthrust roller, turn it to its lowest adjustment, and then snug it in place.
3. Adjust the eccentric on the door roller so that the door is flush with the shim and the door roller is flush with the track.
4. After the adjustment is made, tighten the door roller eccentric.
5. Remove the shim, and place it under the trailing edge of the door. Repeat steps 2 through 4.
6. Remove the shim, and verify that the doors are flush with the frame columns.



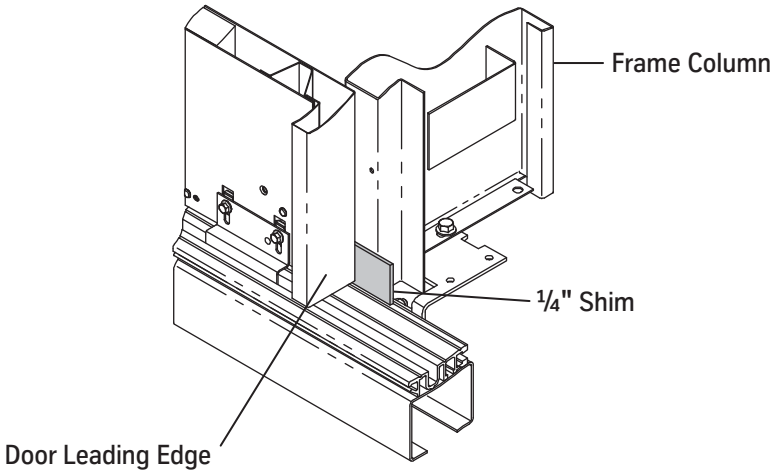


Figure 38 - Adjust Door to Sill Running Clearance

Adjust the Upthrust Rollers

1. Turn the eccentric of the upthrust roller clockwise until the roller just touches the bottom of the door track.
2. Adjust the eccentric so that a gap of 0.015″ is between the upthrust roller and the door track. See Figure 39.

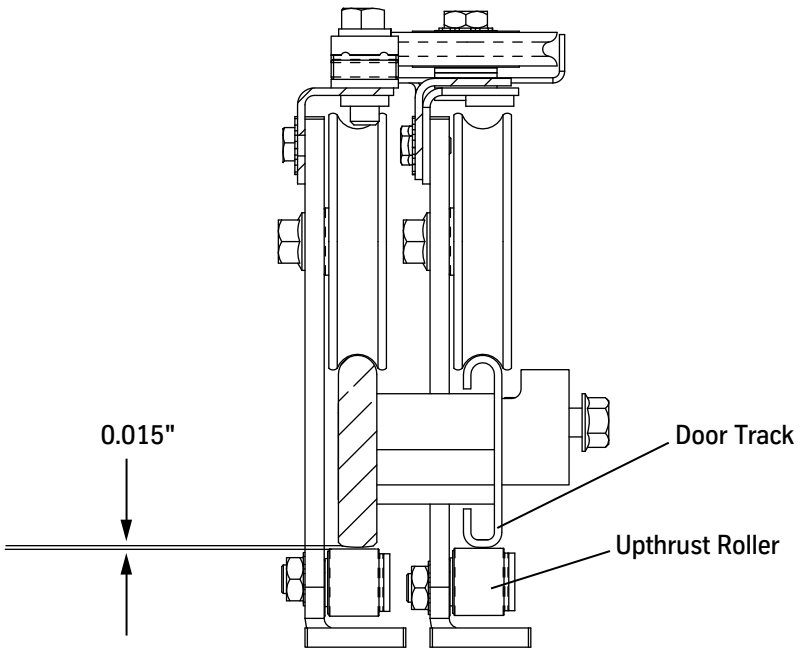


Figure 39 - Adjust Upthrust Roller Clearance

Adjust the Door Gibs

1. Adjust the door gib brackets and the door safety guide brackets to obtain a $^1/_8$" running clearance between the brackets and the hoistway sill. After adjustment, tighten the bolts.
2. Place a $^1/_4$" shim between the bottom of the entrance frame column and the bottom of the leading edge of the slow door panel.
   a. Loosen the door gib screws.
   b. Adjust the slow door leading edge to just touch the $^1/_4$" shim.
   c. Adjust the trailing door edge to just touch the $^1/_4$" shim.
   d. Tighten the door gib screws.
3. Place the $^1/_4$" shim between the two door panels.
   a. Adjust door gibs so that fast door trailing edge just touches the $^1/_4$" shim.
   b. Place $^1/_4$" shim between the fast door leading edge and the strike column.
   c. Adjust door gibs so that fast door leading edge just touches the $^1/_4$" shim.
4. Verify that the doors roll freely and track parallel to the hoistway sill grooves. Adjust as necessary.

Install and Adjust the Spirator

1. Wrap the spirator cable three or four times around the spirator to connect the cable.
2. Use the spirator cable clip to attach the cable to the header. See Figure 40.
3. Adjust the spirator so that the doors close when they are released $^{1}/_{2}$" from the fully closed position.
4. Verify that the doors close fully with no “double bump” when the doors touch each other.

NOTE

- The spirator must close the doors from any open position.
- To obtain proper door operation from floor to floor, the spirator tension should be the same at each floor.

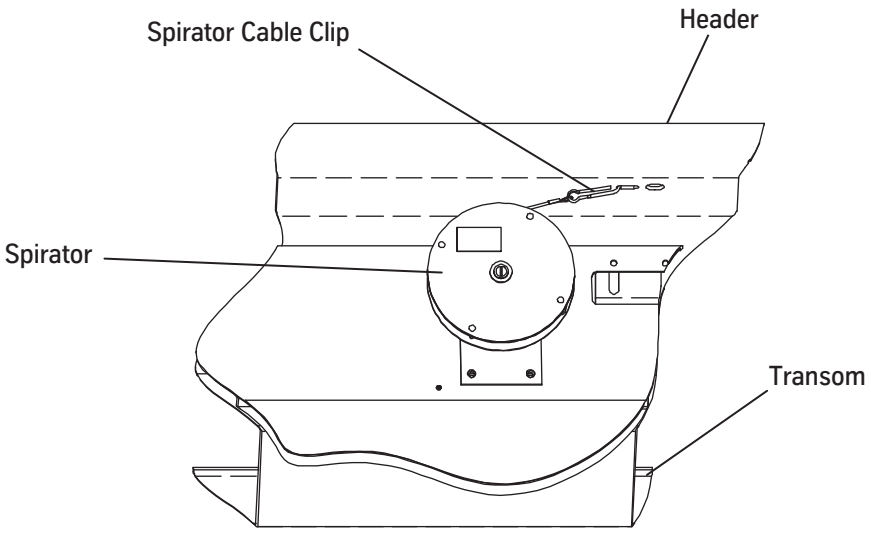


Figure 40 - Spirator

Install and Adjust the Top Door Retainers

1. On each side of the door panel, use the provided hardware to install a top door retainer on the hanger. See Figure 41.

2. Verify that there is sufficient running clearance between the retainer and the track, and adjust if needed.

3. On each side of the door panel, use the provided hardware to install a track retainer clip on the hanger.

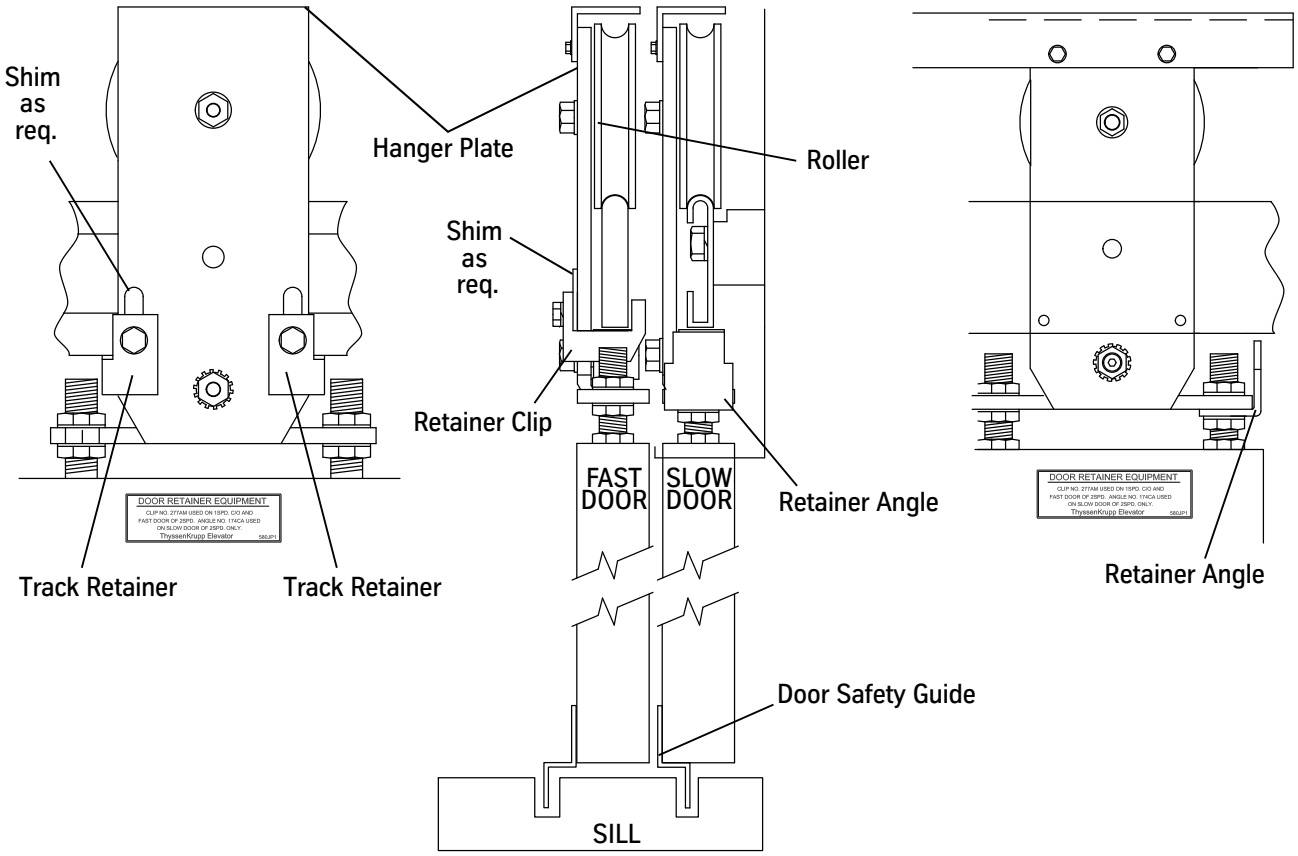


Figure 41 - Top Door Retainer

Install and Adjust the Interlocks for Door Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header.
2. Remove the cover from the interlock box.
3. Close the doors, and verify the following. See Figure 42 on page 61.
   a. The interlock hook is centered front-to-back on the contacts.

CAUTION **Never remove both washers on the interlock hook shaft.**

   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.

4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $^{1}/_{8}$" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - 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. The pickup roller crank should be resting on its stop at this time.
   c. Interlock hook - contact compression of $^{3}/_{32}$".
      - The hook touches both contact leafs at the same time.
      - When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $^{1}/_{8}$". If necessary, adjust the interlock hook stop to limit the hook travel.
5. Move the rollers and the interlock hook, and verify that there is $^{9}/_{32}$" hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.
6. Repeat this procedure for all other landings.

Interlock Wiring

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

WARNING **All door interlock contacts must be wired in series. See the wiring diagrams for details.**

3. Repeat Steps 1 and 2 for all other landings.

Install and Adjust the Interlocks
(continued)

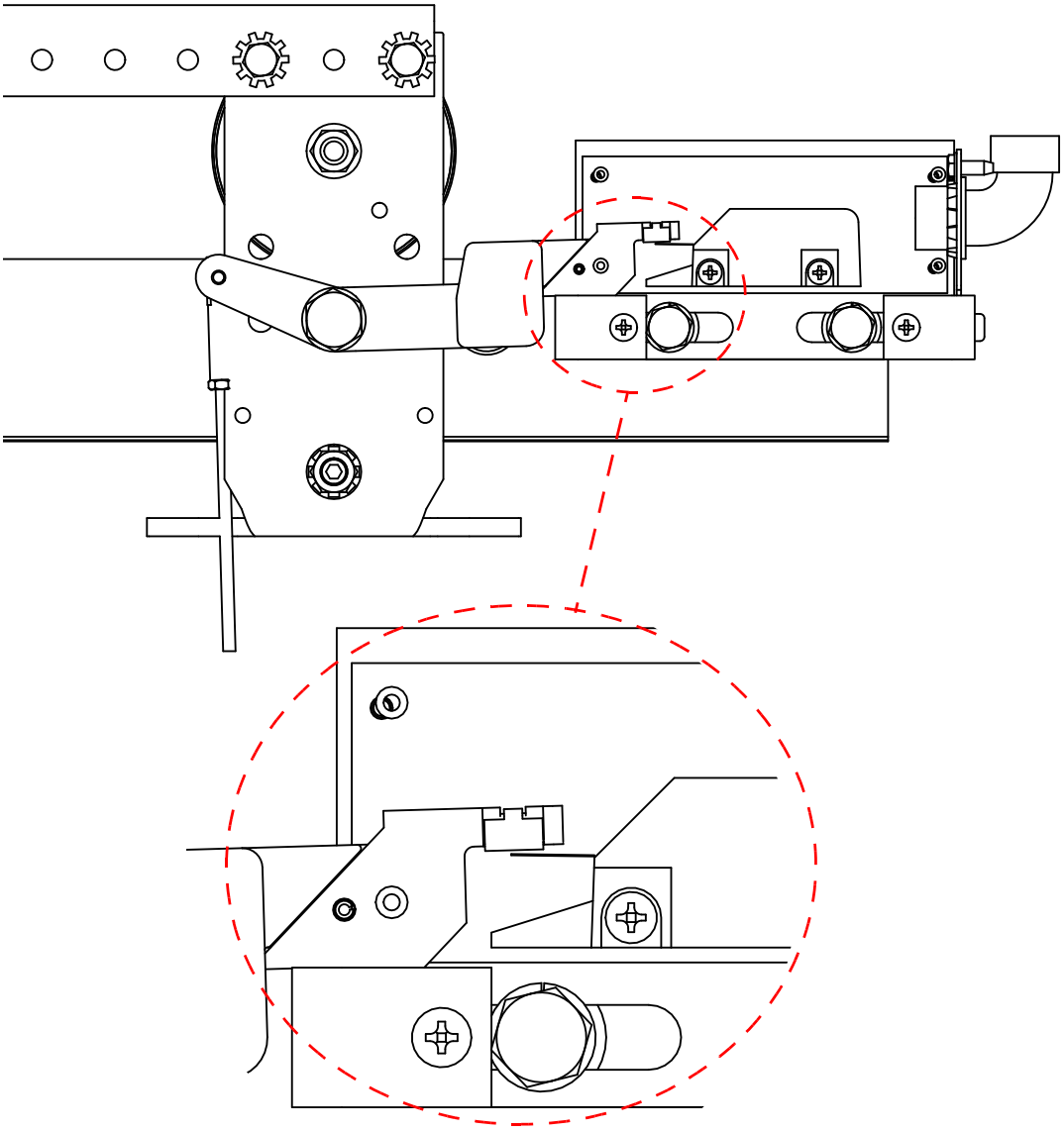


Figure 42 - Two Speed Interlock Adjustment

Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 43.
2. Remove the cover from the interlock box.

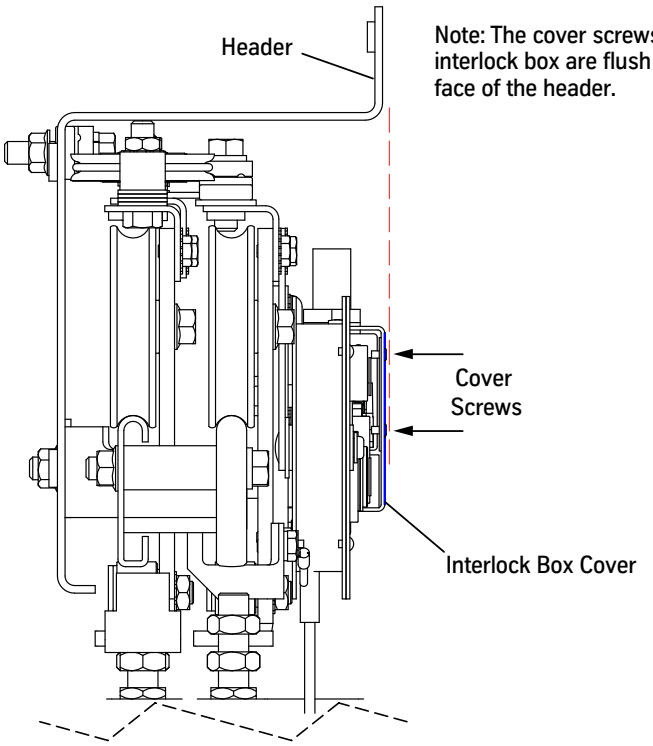


Figure 43 - Interlock Contact Box Installation

3. Close the doors, and verify the following. See Figure 44 on page 63.
   a. The interlock hook is centered front-to-back on the contacts.

CAUTION

Never remove both washers on the interlock hook shaft.

   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.
4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $^{1}/_{8}$" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - 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. The pickup roller crank should be resting on its stop at this time.
   c. Interlock hook - contact compression of $^{3}/_{32}$".
      - The hook touches both contact leafs at the same time.
      - When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $^{1}/_{8}$". If necessary, adjust the interlock hook stop to limit the hook travel.

Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

(continued)

5. Move the rollers and the interlock hook, and verify that there is $^{9}/_{32}$" hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.
6. Repeat this procedure for all other landings.

Interlock Wiring

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

WARNING **All door interlock contacts must be wired in series. See the wiring diagrams for details.**

3. Repeat Steps 1 and 2 for all other landings.

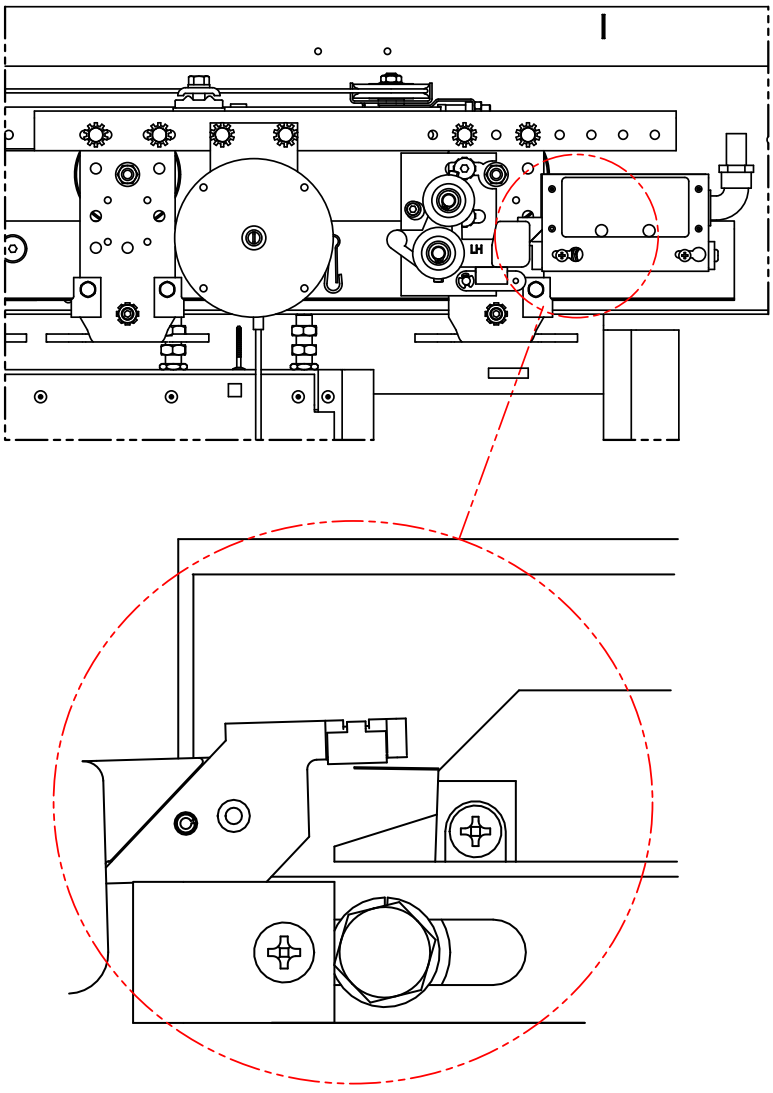


Figure 44 - Two Speed Interlock Adjustment

Install the Fascia Plates and Dust Covers

1. Position the platform near the top landing.
2. Center a top fascia plate in the opening, and hook the fascia plate onto the hoistway sill of the top landing. See Figure 45 on page 65 through Figure 47 on page 67.
3. Use self-tapping screws to anchor the top fascia plate to the top landing hoistway sill support.
4. Install the first intermediate fascia plate by hooking it onto the top fascia plate.

NOTE If required, install the remaining intermediate fascia plates by hooking each one onto the last one installed.

5. Clip the bottom fascia plate to the top of the header. The bottom fascia plate vertically overlaps the last intermediate fascia plate.
6. Measure the distance between the sill support and the header, and subtract one inch.
7. Cut two fascia plate stiffeners (from the provided fascia stiffener angle) to the length measured in the previous step.
8. Clamp the angles in place behind and also flush with the edge of the fascia plates.
9. Run self-tapping screws through the pilot holes in the fascia plates to anchor the fascia plates to the stiffeners.
10. Repeat Steps 2 through 9 for all intermediate landings.

NOTE If required, center a top fascia plate in the opening and hook it onto the hoistway sill of the bottom landing.The fascia plate and the toe guard in the pit must extend far enough below the sill so that when the car is on compressed buffers, the platform toe guard will not be below the hoistway toe guard.

11. Use self-tapping screws to anchor the top fascia plate to the bottom landing hoistway sill support.
12. Install the toe guard by hooking it onto the top fascia plate.
13. Use the provided drive pin anchors to fasten the toe guard to the wall.
14. If required, install all dust covers.

Install the Fascia Plates and Dust Covers
(continued)

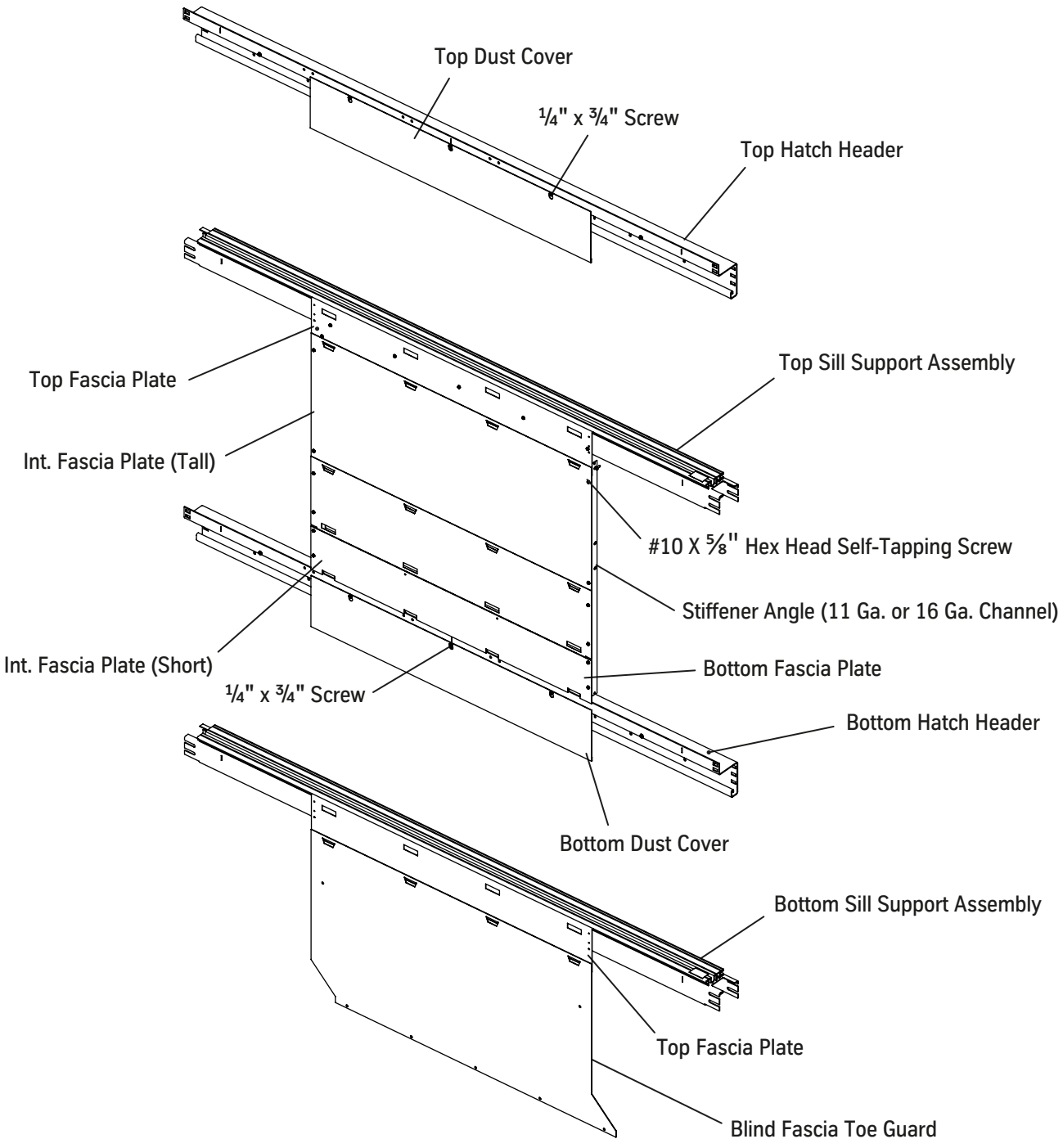


Figure 45 - Install Fascia Plates, Dust Covers, and Toe Guards (1 of 4)

TWO SPEED

Install the Fascia Plates and Dust Covers

(continued)

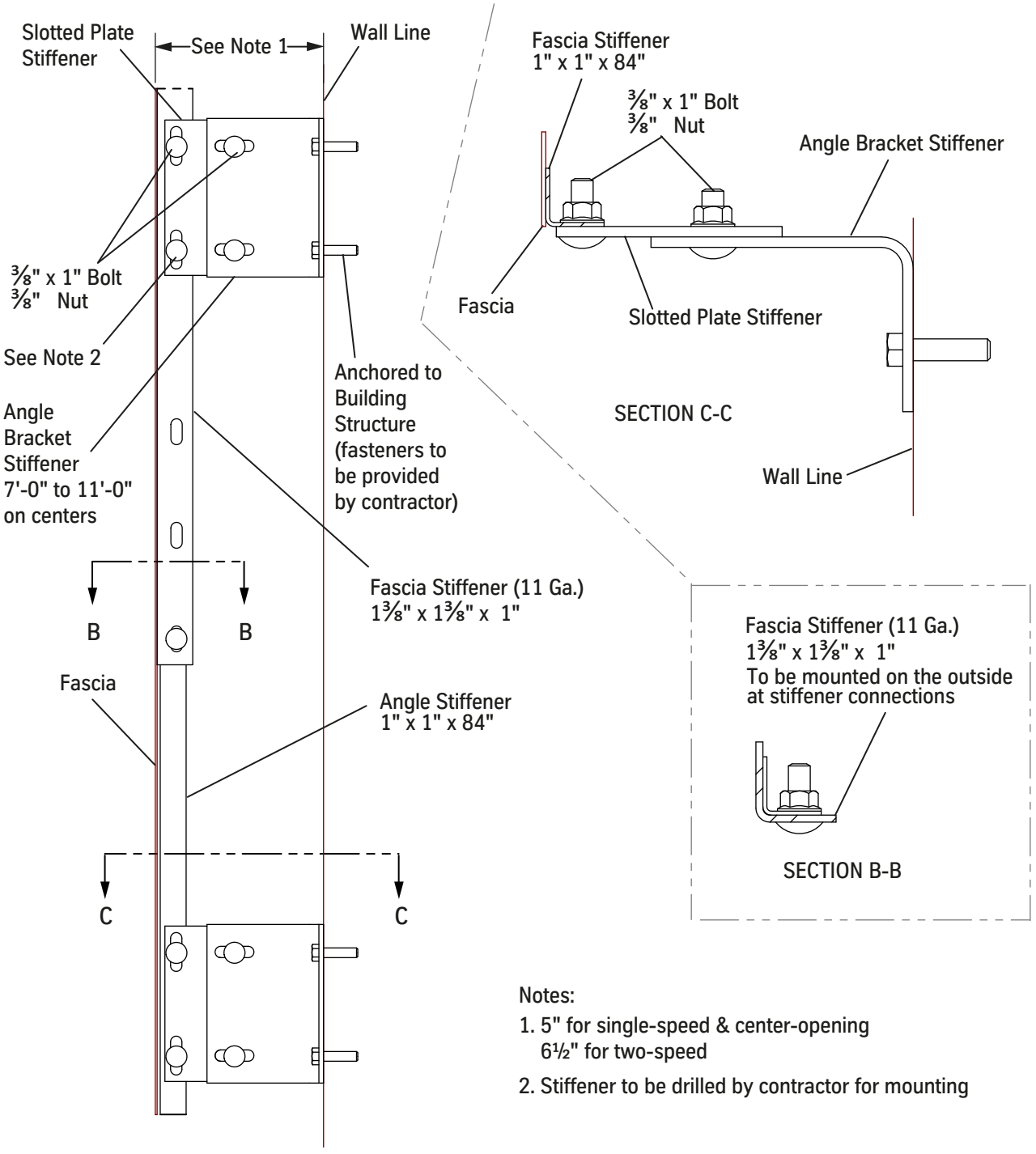
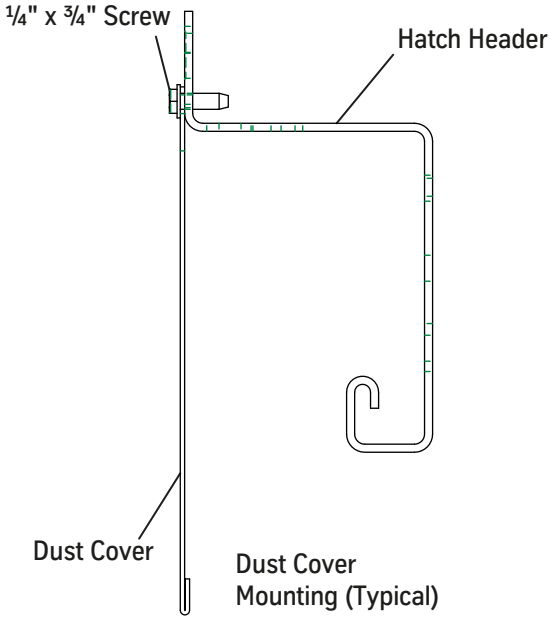


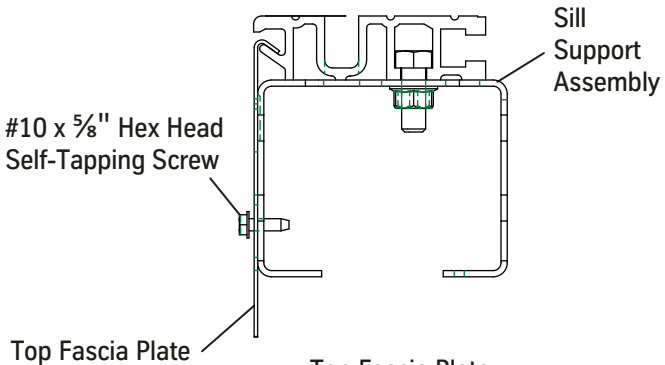
Figure 46 - Install Fascia Plates, Dust Covers, and Toe Guards (2 of 4)

Install the Fascia Plates and Dust Cover

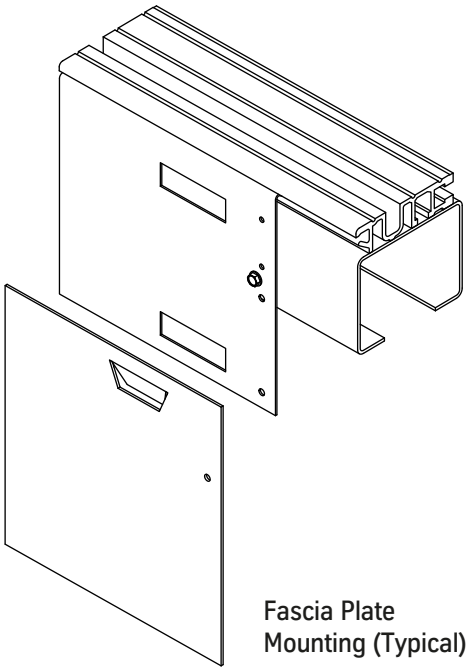
(continued)s



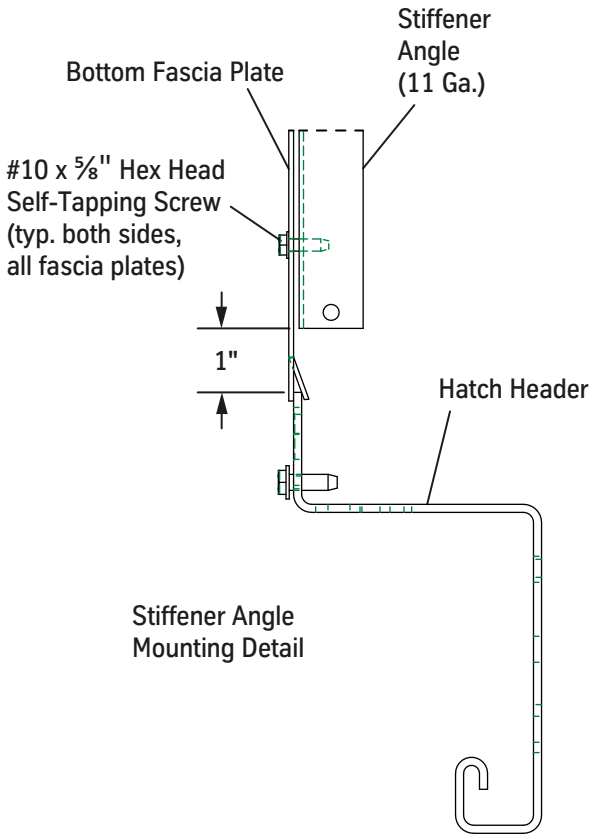
Dust Cover Mounting (Typical)



Top Fascia Plate Mounting (Typical)



Fascia Plate Mounting (Typical)



Stiffener Angle Mounting Detail

Figure 47 - Install Fascia Plates, Dust Covers, and Toe Guards (3 of 4)

TWO SPEED

Install the Fascia Plates and Dust Covers
(continued)

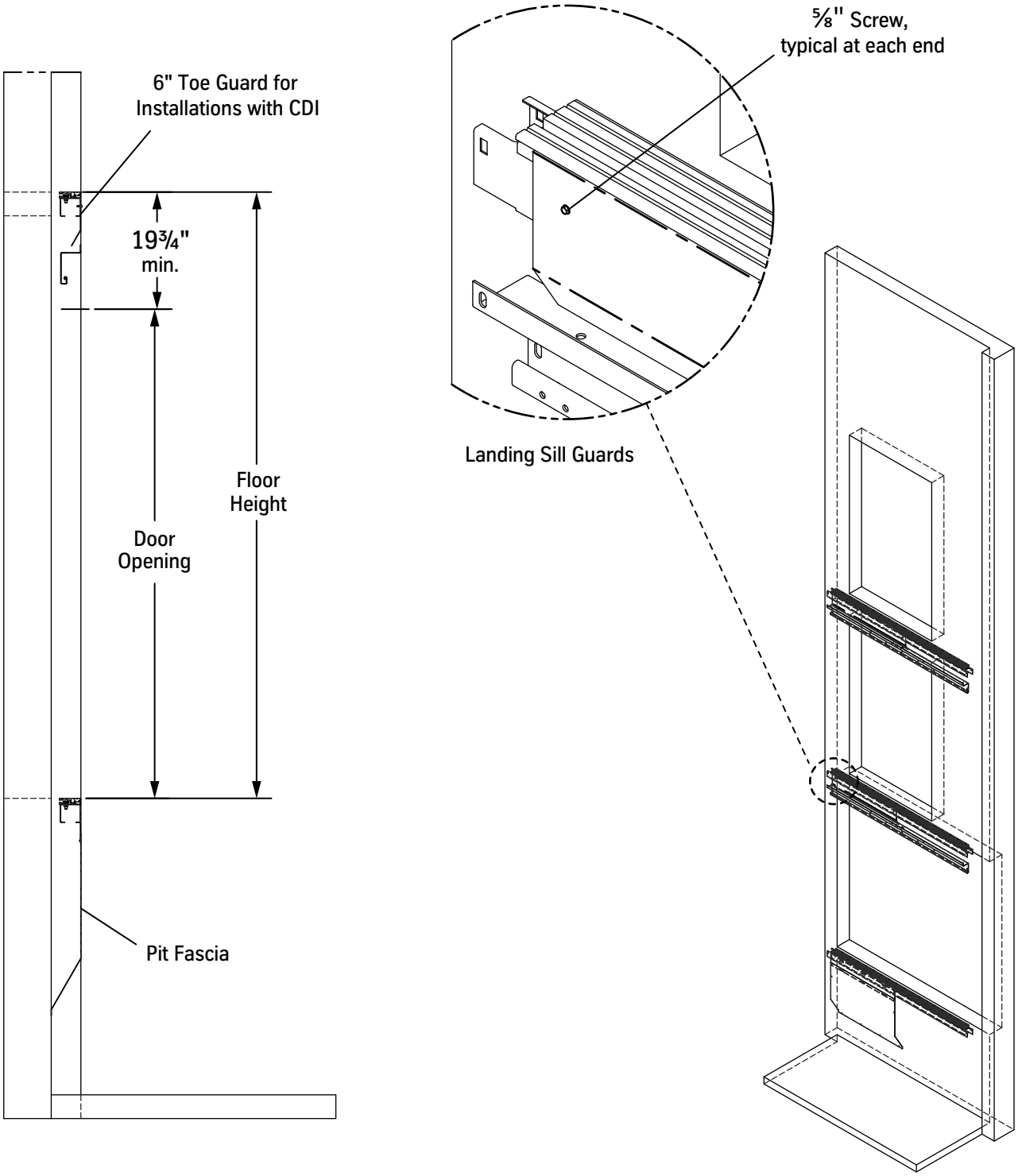
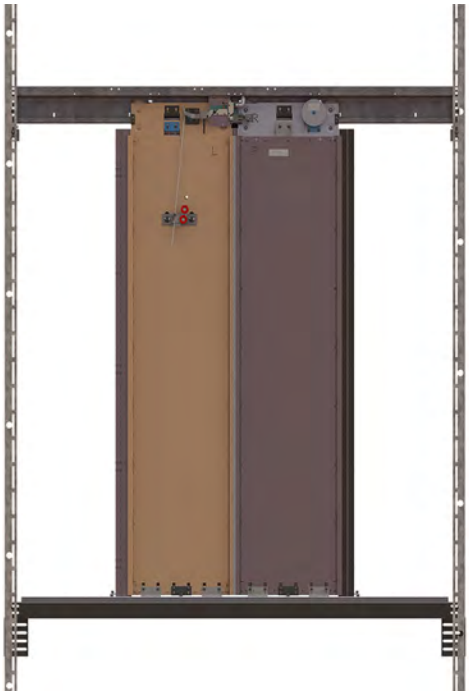
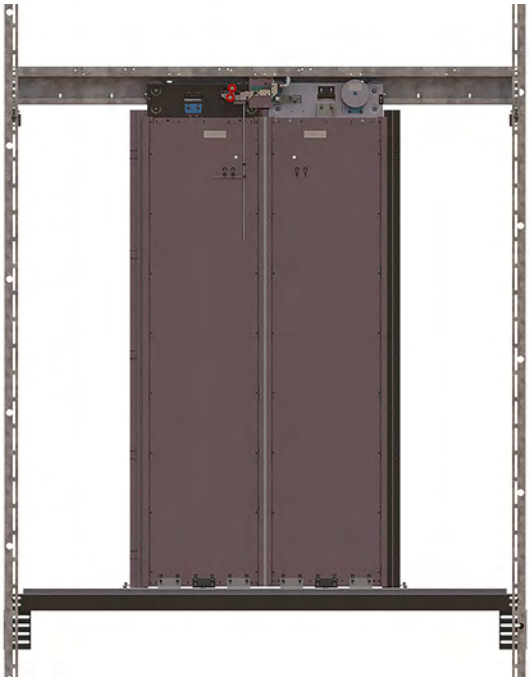


Figure 48 - Install Fascia Plates, Dust Covers, and Toe Guards (4 of 4)

Interlock Rollers Mounted to Door Panel



Interlock Rollers Mounted to Door Hanger



CENTER OPENING INSTALLATION

Center Opening Installation

Install the Wall Angles

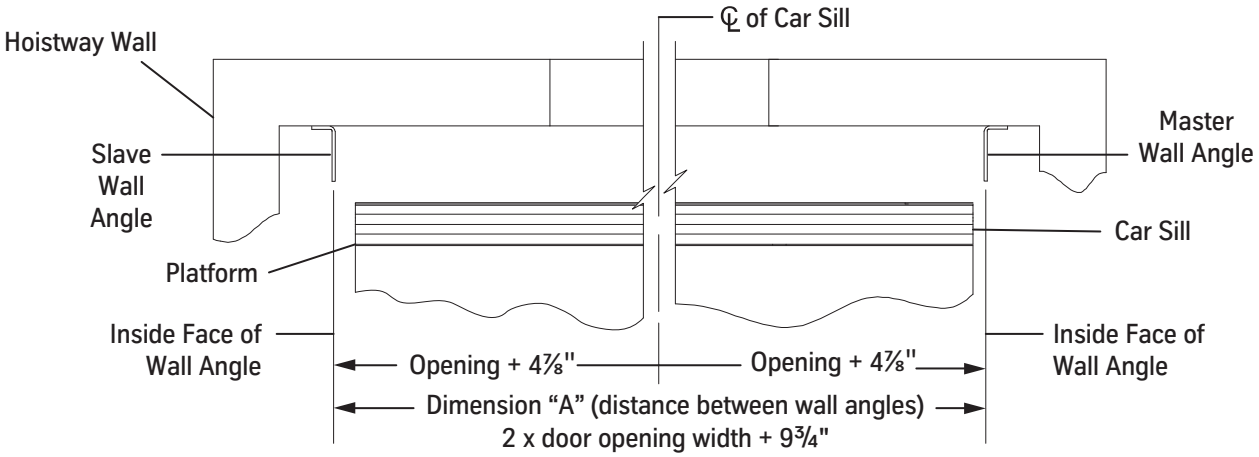
NOTE See the job layouts and Figure 49 on page 70 for all steps in this procedure.

1. Verify that a running platform with the car sill is installed.
2. Obtain the finished floor height dimension from the contractor.
3. Determine the daylight line location for the strike side.
4. Apply tape to the car sill, and mark the line on the tape.
5. Mark the horizontal position of the inside face of the master (first) wall angle relative to the daylight line nearest the strike column. Extra wall angles are provided if the pit is more than 6 feet deep.
6. Install the wall angle.

NOTE
- Where hoistway space allows, turn the wall angles away from the door opening.
- Wall anchors must be located below the sill support assembly.

7. Drop a plumb line in the front of the hoistway to locate the positions of the remaining master wall angles.
8. Install the remaining master wall angles.
9. Make sure that the master wall angles are square with the platform and plumb with each other. Check the tightness of the wall anchors.
10. Create a gauge stick for the slave wall angle. Cut a piece of light, but stiff material (e.g., $^{3}/_{4}$" EMT) for Dimension “A”.
11. Place the gauge stick against the master wall angle and locate, mark, and install the slave wall angles at all floors.

Install the Wall Angles
(continued)



Door Opening Width (inches)	Dimension "A" (inches)
36	81¾
42	93¾
48	105¾
60	129¾

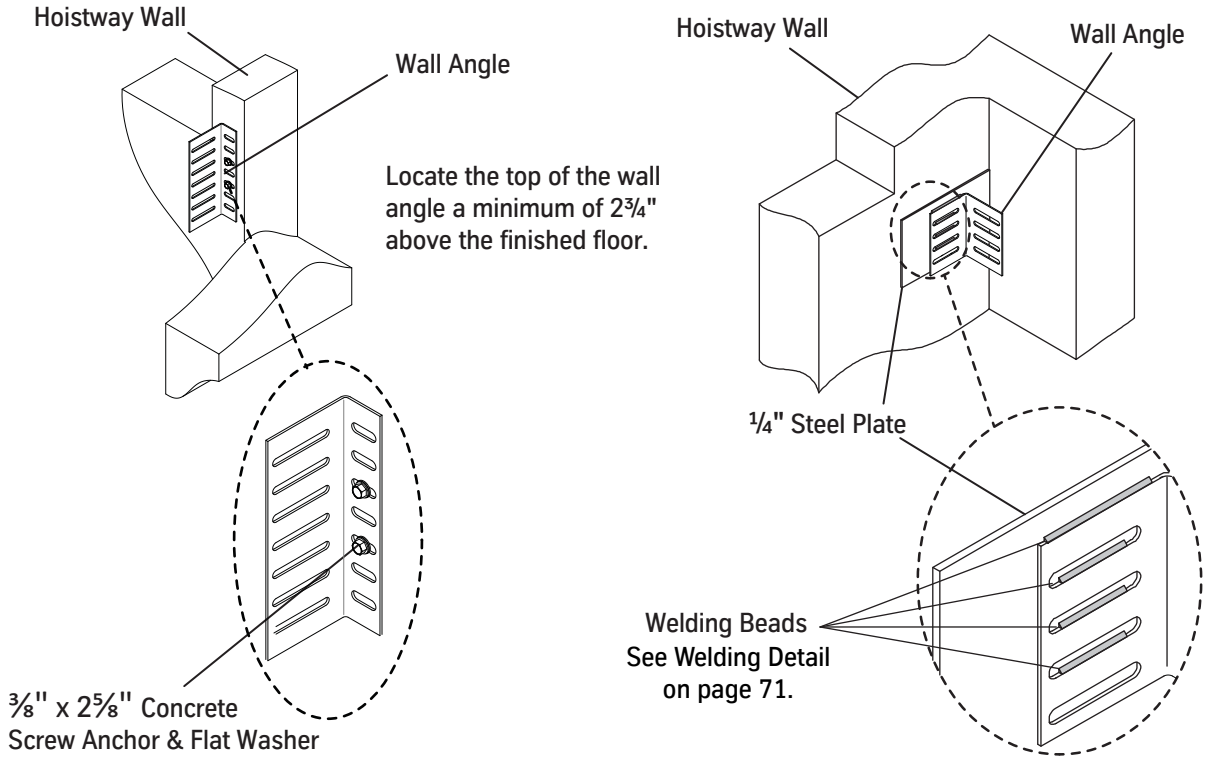
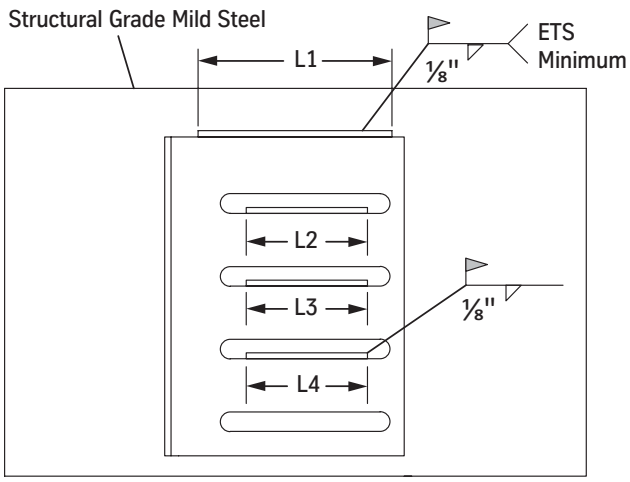


Figure 49 - Wall Angle Placement

Install the Wall Angles
(continued)

Welding Detail



1. Before welding, make sure the steel is clean. Remove burrs, paint, or coating in weld area.
2. Welding of elevator parts that are specified in *ASME A17.1 Safety Code For Elevators And Escalators*, shall conform to *A17.1, Section 8.8, Welding*.
3. Perform all welding in a well ventilated area, *ANSI Z49.1 Safety In Welding, Cutting And Allied Processes*.
4. Weld entrance wall angles to structural mild steel in two or more locations.

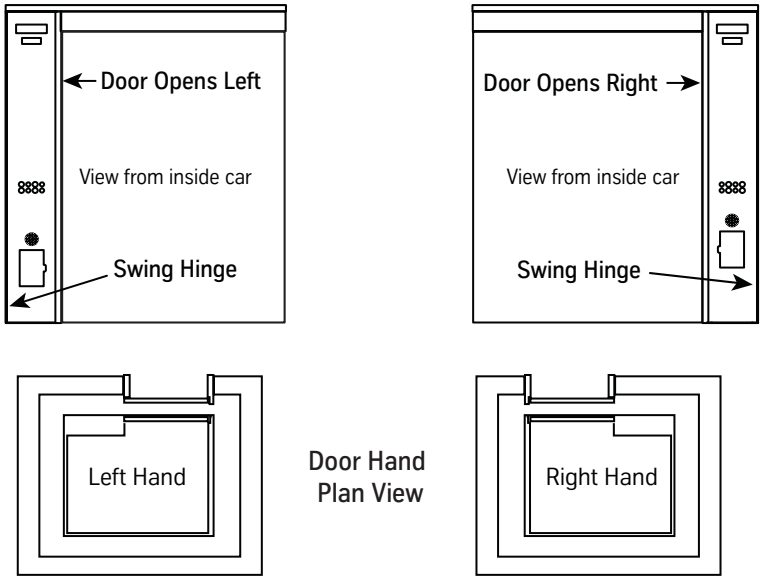
   Use horizontal fillet welds on square edges of the wall angle (recommended, but not required). The total effective length of fillet welds should equal or exceed 4 inches.

   Example: (L1 + L2 + L3 + L4 +..... + Ln = 4 inches minimum. The length of each fillet should be a minimum of 3/4 inches.
5. The type of filler metal used will depend on the welding process, but in no case shall the nominal tensile strength of the filler metal be less than 60,000 PSI.
6. For suitable structural mild steel or preheat specifications, refer to *AWS D1.1* or *AWS D1.3* whichever is applicable.

Architectural Hand Identification

Left Hand - Front/Rear Openings
Door opens LEFT when standing inside the car, facing the door.

Right Hand - Front/Rear Openings
Door opens RIGHT when standing inside the car, facing the door.



CENTER OPENING

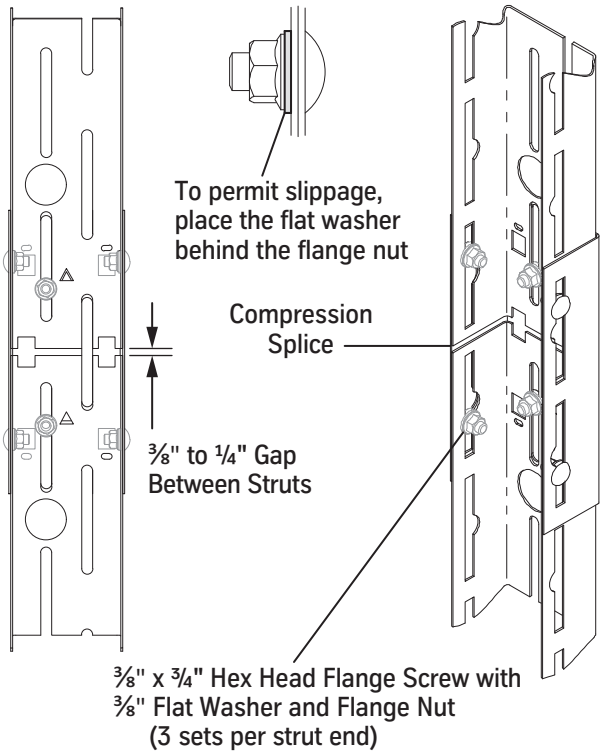
Stack the Struts

See Figure 50 on page 73 for all steps in this procedure.

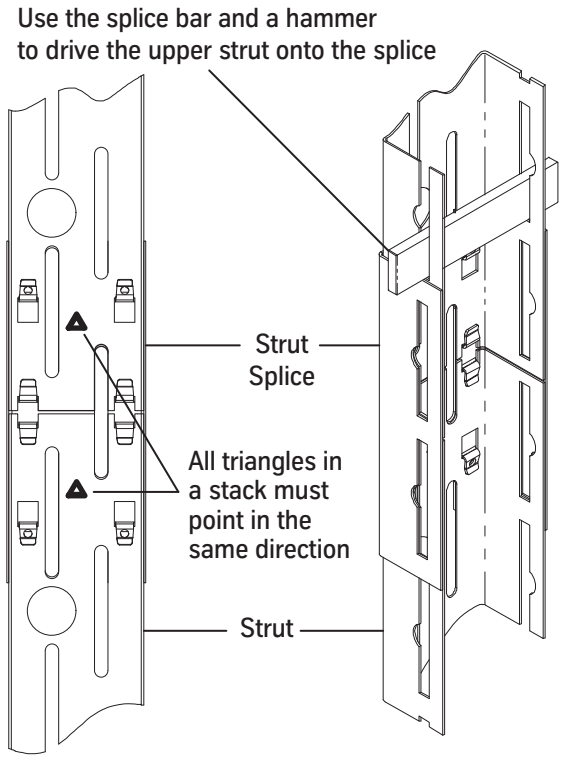
1. Set two struts on the pit floor, and fasten them to the wall angles. A compression splice is required every 32 feet.
2. Adjust the struts so that they are $1^1/_4$" from the car sill. The strut to car sill adjustment will set the final sill clearance.
3. Clip a strut splice to the top of the two struts. Triangles in splices must match the direction (up or down) of triangles in the struts.
4. Install the second set of struts.
   a. Clip the second set of struts to the splices.
   b. Use a splice bar and a hammer to drive the upper strut onto the splice.
   c. Fasten the struts to the next set of wall angles.
   d. At each landing, verify that the struts are $1^1/_4$" from the car sill.
5. Repeat this procedure until all of the struts are stacked, spliced, and fastened to wall angles.
6. Check all struts for plumb on two sides, and then securely fasten them.

Stack the Struts

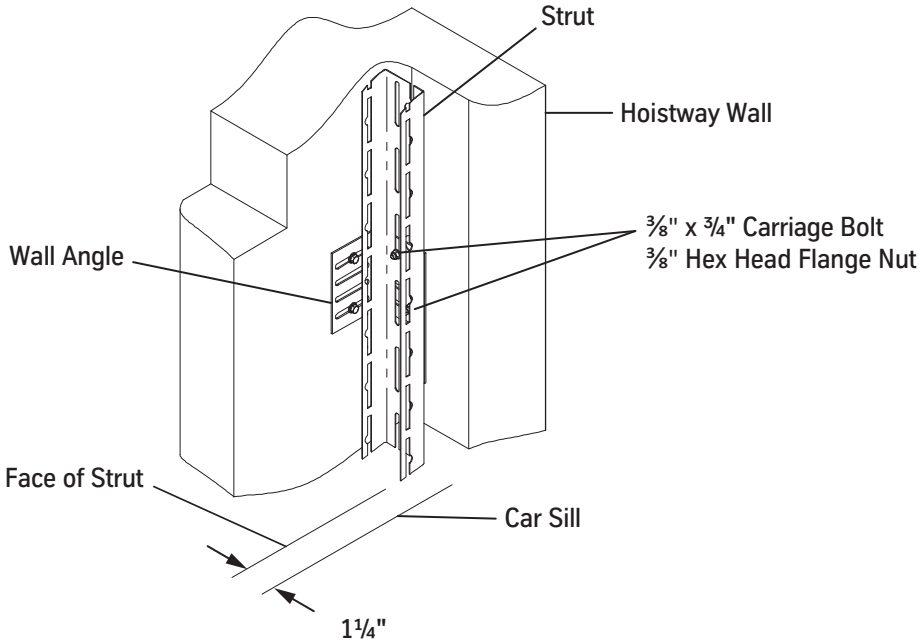
(continued)



Assemble a Compression Splice



Assemble the Strut Splice



Assemble the Strut to the Wall Angle

Figure 50 - Stack and Assemble the Struts

CENTER OPENING

Install the Hoistway Sill

1. Determine the strike side of the hoistway sill.
2. Locate the two slots in the sill support.
3. Remove the hex head cap screws from the column mounting brackets, and slip them into the slot on the back side of the sill. See Figure 51.
4. Loosely attach each mounting bracket, and then adjust the bracket's tab to fit into the slot.
5. Tighten the brackets to the sill.

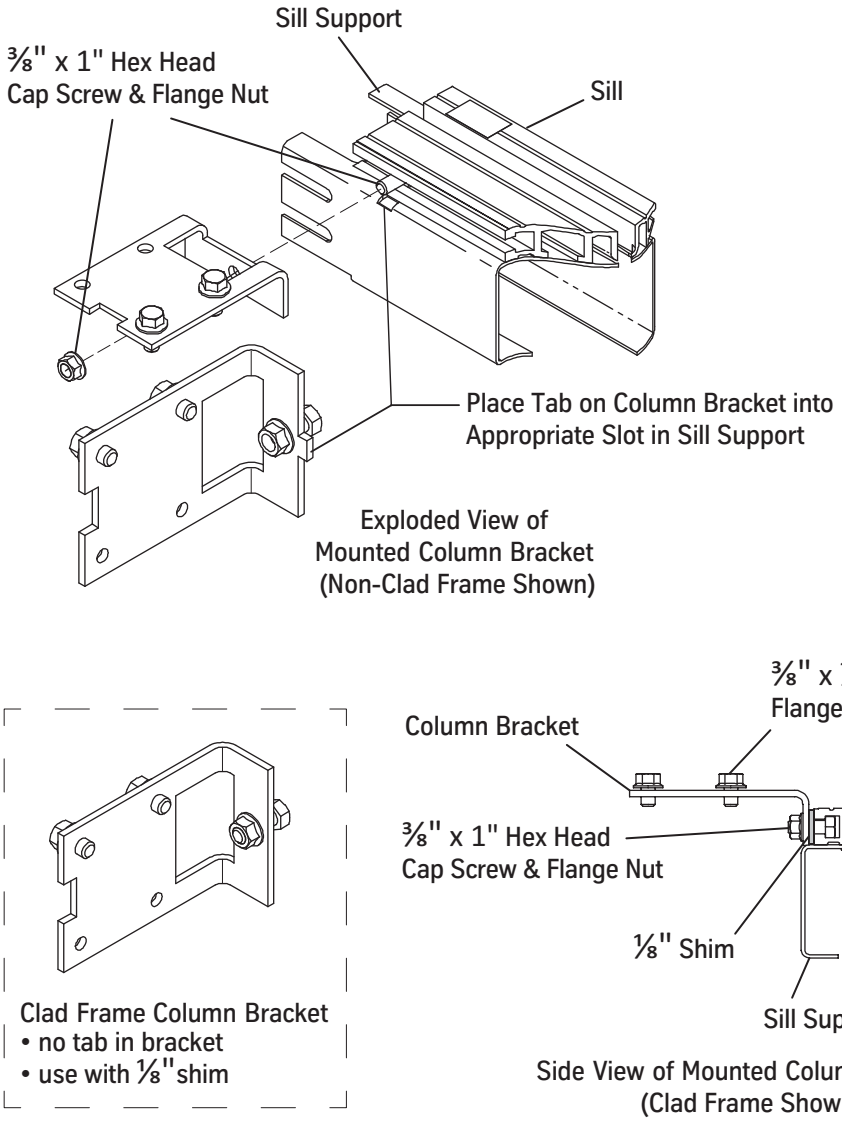


Figure 51 - Column Bracket Installation for Standard Sill

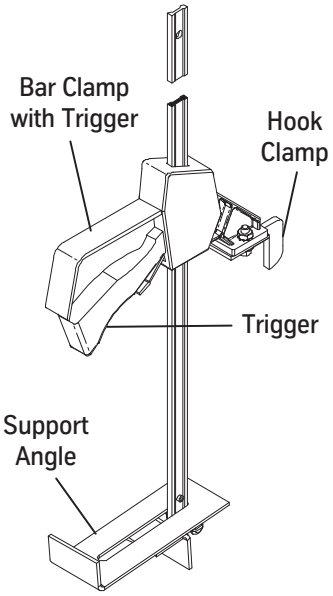
Install the Sill Support to the Struts

For all steps in this procedure, see Figure 52 on page 76.

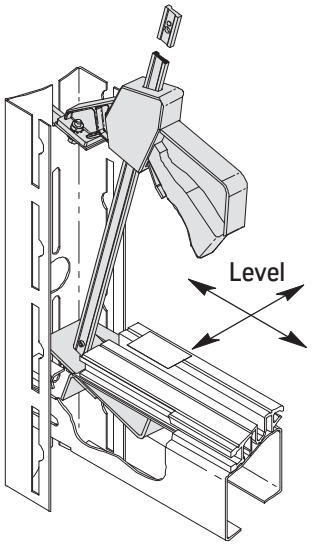
1. Hang the sill leveling tool in the slots or oval cutout on the back of each entrance strut.
2. Use the adjustment trigger to set the tool so that the support angle is roughly 2” inches below the finished floor.
3. Lay the sill and/or sill support on the support angles.
4. At each end of the sill and on each side of the strut, install a carriage bolt outside the assembly and a flange nut inside the assembly into matching slots of the sill support and strut.
5. Hand-tighten the bolt and nut.
6. Raise the sill to the finished floor level.
7. Level the sill side-to-side and front-to-back.
8. Move the sill up so that the daylight lines and the centerline (stamped into the header) are even with the car sill. Ensure that the adjustment is correct because this determines the accuracy of the entrance frame installation.
9. Verify that the vertical surface of the sill support is even with the angled fascia hanger on the sill.
10. Tighten the fasteners on the hall side.
11. Tighten the fasteners on the car side.
12. Repeat this procedure for all landings.

Install the Sill Support to the Struts

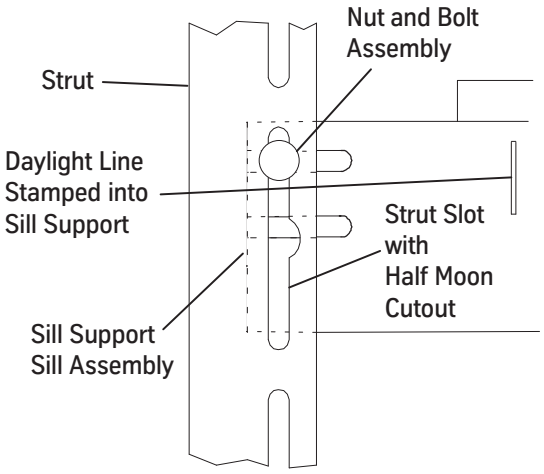
(continued)

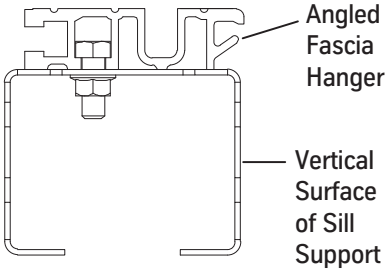


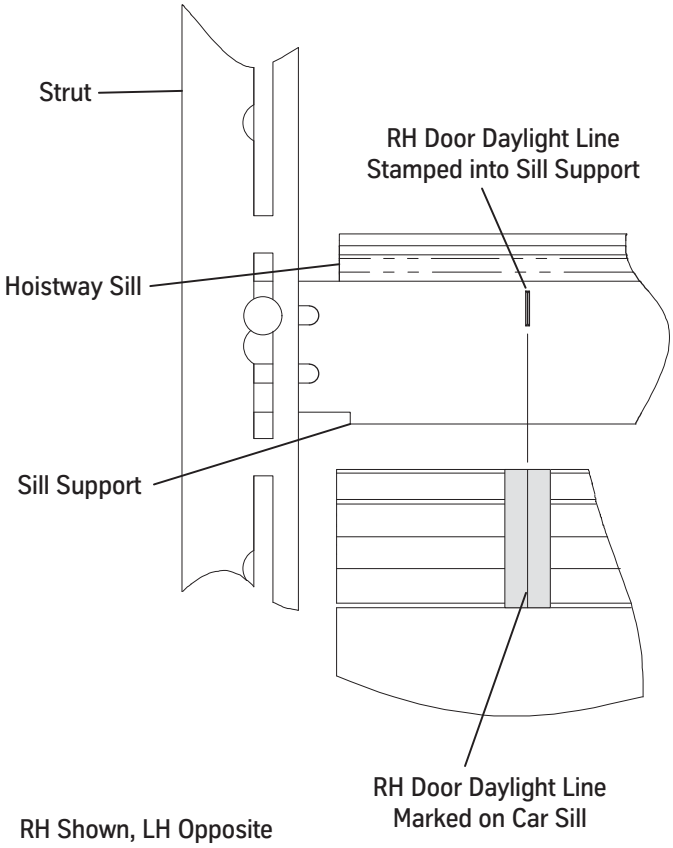
Sill Leveling Tool



Sill Support/Sill Assembly, Leveled on the Support Angles







RH Shown, LH Opposite

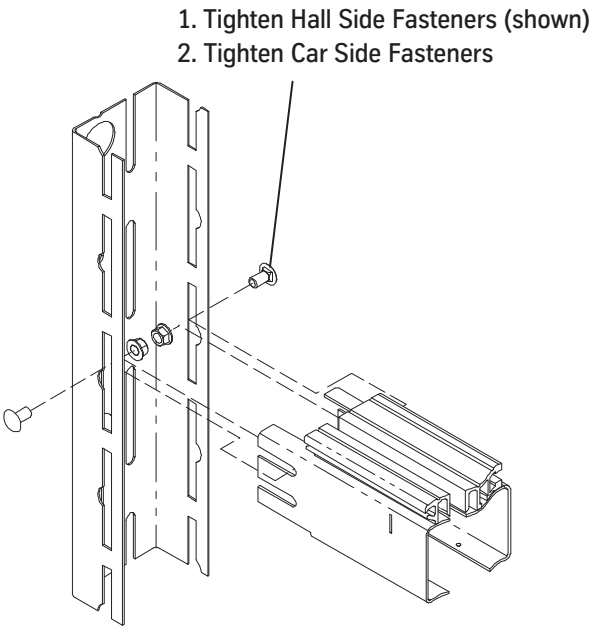


Figure 52 - Install the Sill Support to the Struts

CENTER OPENING

Install the Hoistway Header

Gauge sticks are needed for this procedure.

- For standard door height (84") - two gauge sticks are provided for each job.
- For non-standard door height - use the following formula to determine the length, and cut the gauge sticks to this measurement.

  Gauge Stick Length: Sill-to-Header Dimension = Opening Height + $7^{15}/_{16}$".

1. Move the platform up where the header can be reached.
2. Place the gauge sticks on the sill of the landing below, one at each end of the sill. See Figure 53 on page 78 for all steps on this page.
3. Place the header on the gauge sticks.
   a. At each end of the header, install carriage bolts and flange nuts.
   b. Hand-tighten the hardware into the matching slots of the header and strut.
4. Move the platform up so that the daylight lines and the centerline stamped into the header are even with the car sill.
5. To prevent the door operator equipment from being out-of-plumb:
   a. First tighten the fasteners on the back of the header at both ends.
   b. Then tighten the fasteners on the front of the header at both ends.
6. Repeat this procedure for all landings.

Adjust the Hoistway Sill and Header

1. Level the platform with a landing.
2. Verify that the clearance between the hoistway sill and the car sill is $1^{1}/_{4}$".

Adjust the Hoistway Sill and Header

(continued)

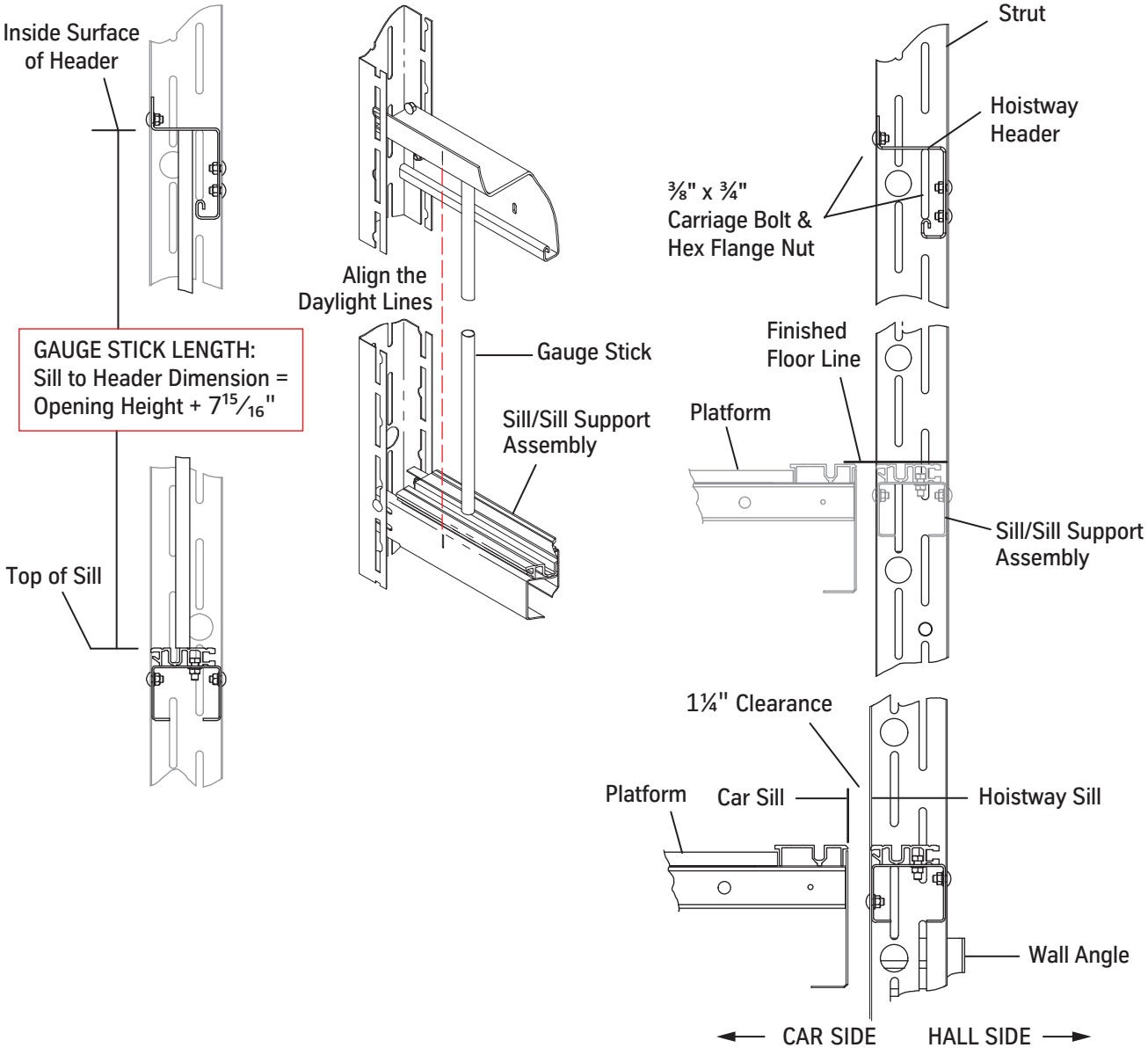


Figure 53 - Install and Adjust the Hoistway Header

Assemble the Frame

1. Place the entrance columns and transom face down, and position each column at a slight angle to the transom. See Figure 54.
2. On each end of the transom, remove the flange screw and nut and set them aside.
3. On each end of the transom, roughly align the clips with the rectangular cutouts in the columns.
4. While pushing down on the column, swing the column toward the transom.
5. Ensure that the back side (toward the car) of the transom is flush with the back side of the column.
6. Install the flange screw and nut in the matching holes of the transom and column.
7. Repeat steps 3 through 7 for the other column.
8. Verify that the columns are square with the transom.
9. Ensure all fasteners are tight, and repeat this procedure for all landings.

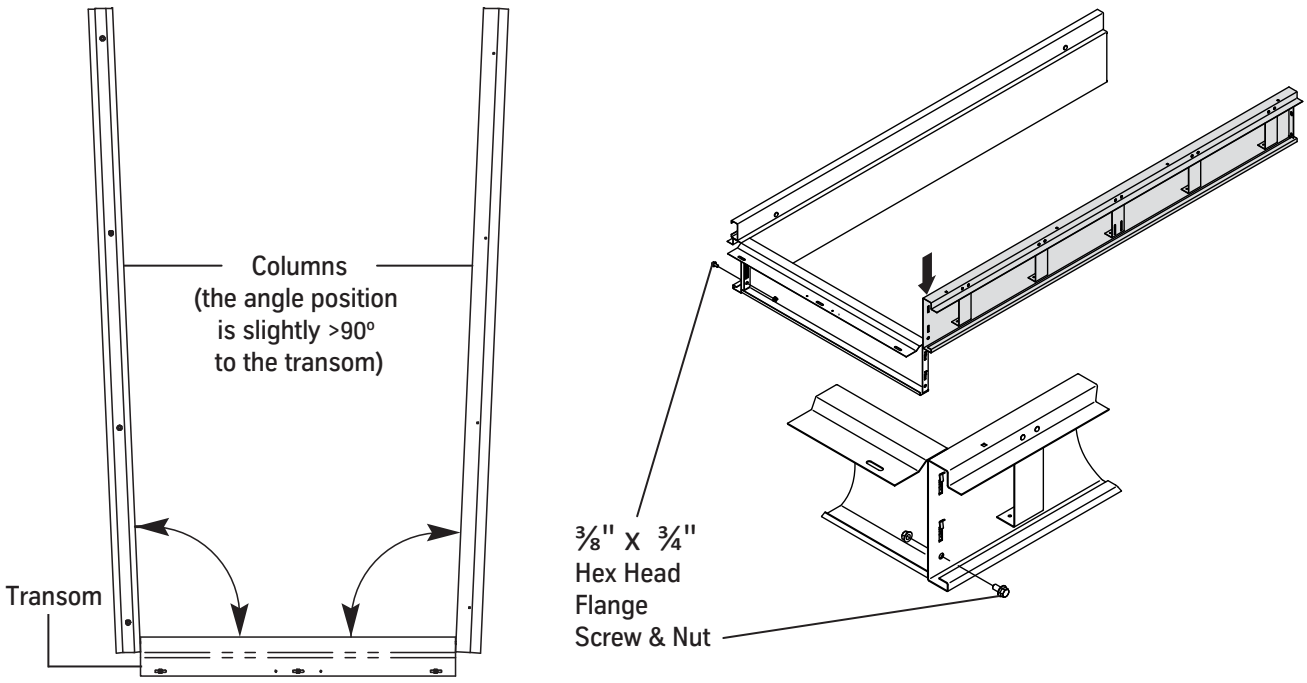


Figure 54 - Assemble the Frame

Attach the Frame to the Sill

1. Attach the frame to the column brackets.
   a. Stand the frame on the column mounting brackets.
   b. Install the hex head flange screws in the bottom of each column.
2. Align the frame columns so that they overlap the hoistway sill $^{1}/_{8}$" (the depth of the cutout on the top back edge of the hoistway sill). See Figure 55.
3. Tighten the four screws between the columns and the column brackets.
4. Move the platform up high enough to reach the header and transom.

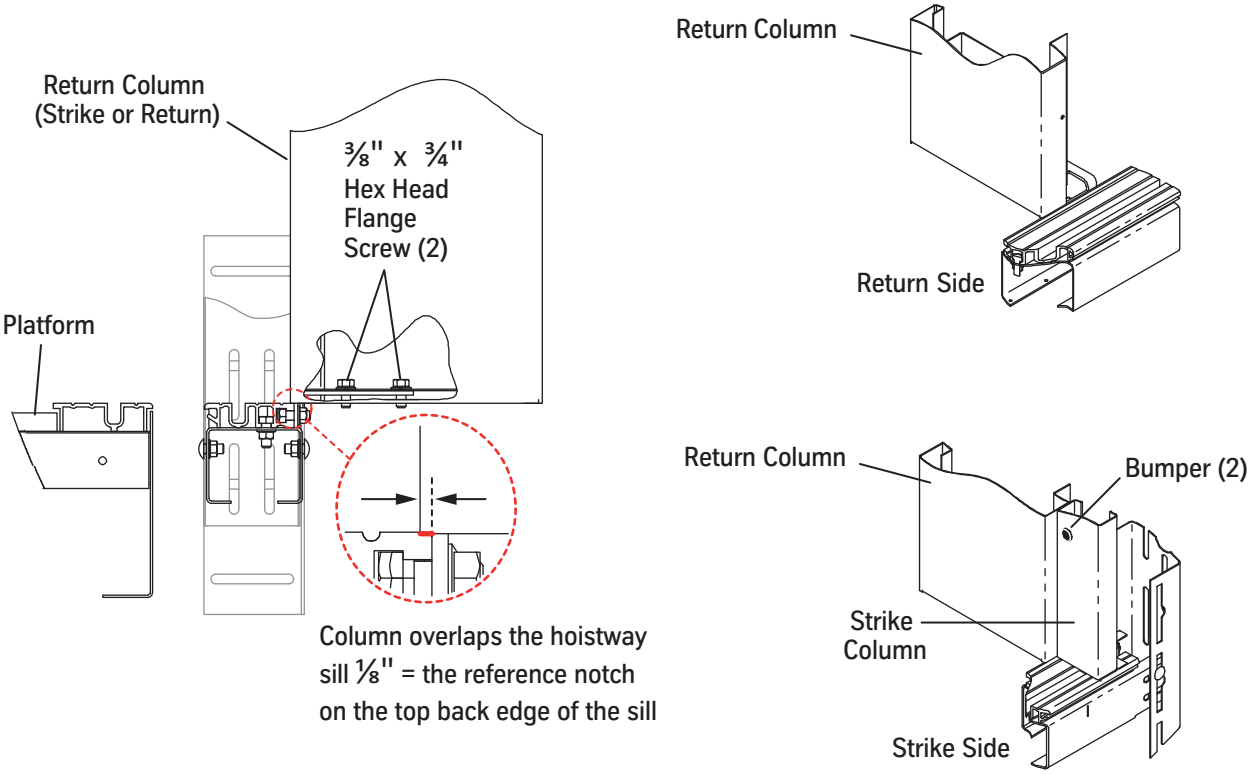


Figure 55 - Attach the Frame (standard sill shown)

Attach the Transom to the Header

1. Attach the transom to the header. See Figure 56.

- For non-clad frames:
  a. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
  b. Tighten the screws.
- For clad frames:
  a. Before the screws are added, install a $^{1}/_{8}$" shim between the transom and the header.
  b. Install the hex flange screws through the holes in the header that match the transom slots with the cage nuts.
  c. Tighten the screws.

2. Install one washer head self-tapping screw into the header.
3. Repeat this procedure for all landings.

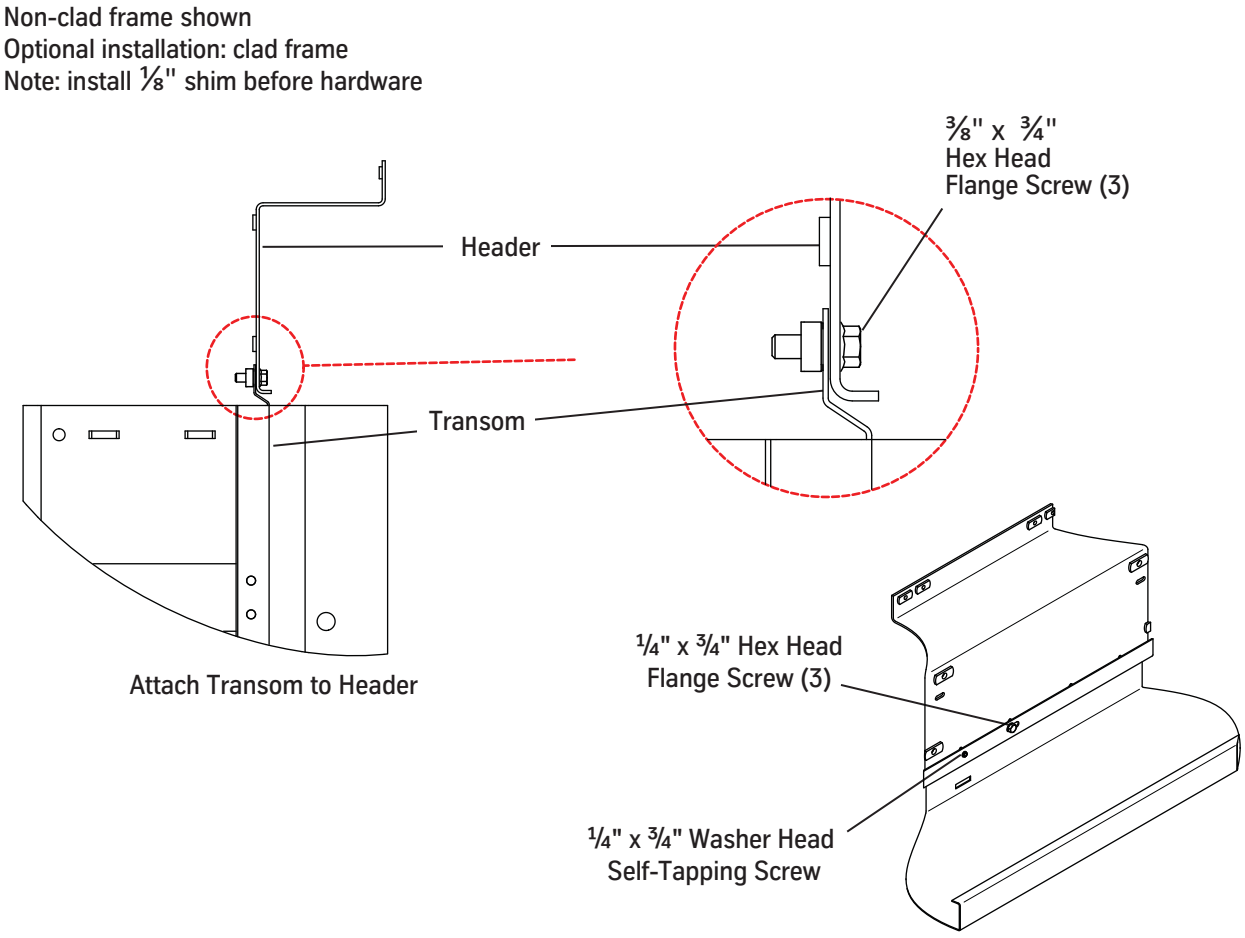


Figure 56 - Attach the Transom to the Header

Install the Grout Angles

NOTE Grout angles have a $2^1/_2$" leg and a $3^1/_2$" leg. Based on the gap, either leg can be placed against the hoistway wall.

1. Use self-tapping screws to install the grout angle on the bottom of the sill support and also tight against the hoistway wall. See Figure 57.
2. Anchor the grout angle to the wall.
3. Repeat this procedure for each landing.

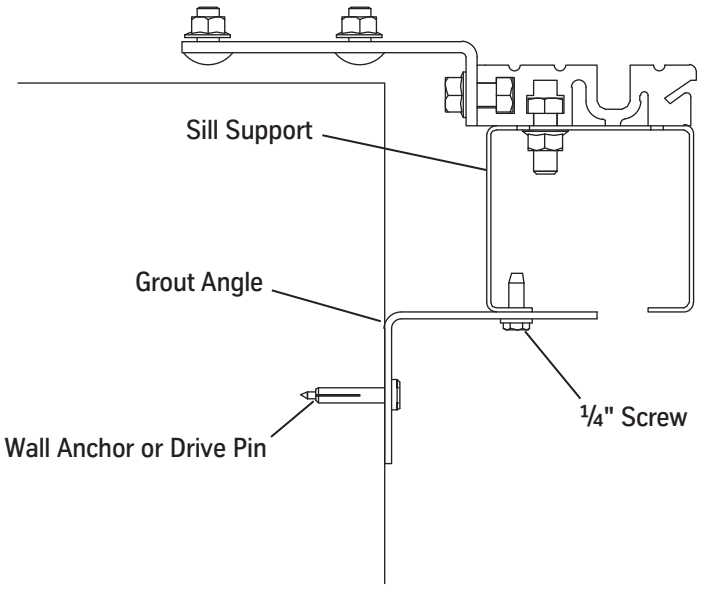


Figure 57 - Grout Angle Installation

Install the Fixture Boxes

Use brackets to install the fixture boxes at each landing.

Install the Hoistway Doors

1. Load the hoistway doors onto the platform.

2. At a landing, place the hoistway doors on the hoistway sill and lean the doors against the hoistway header.

3. Install the door isolation bumpers. See Figure 58.

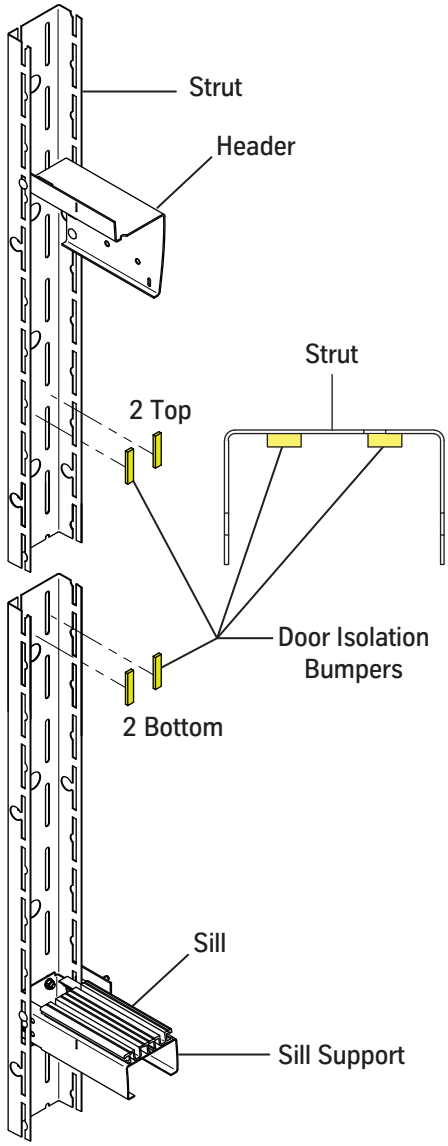


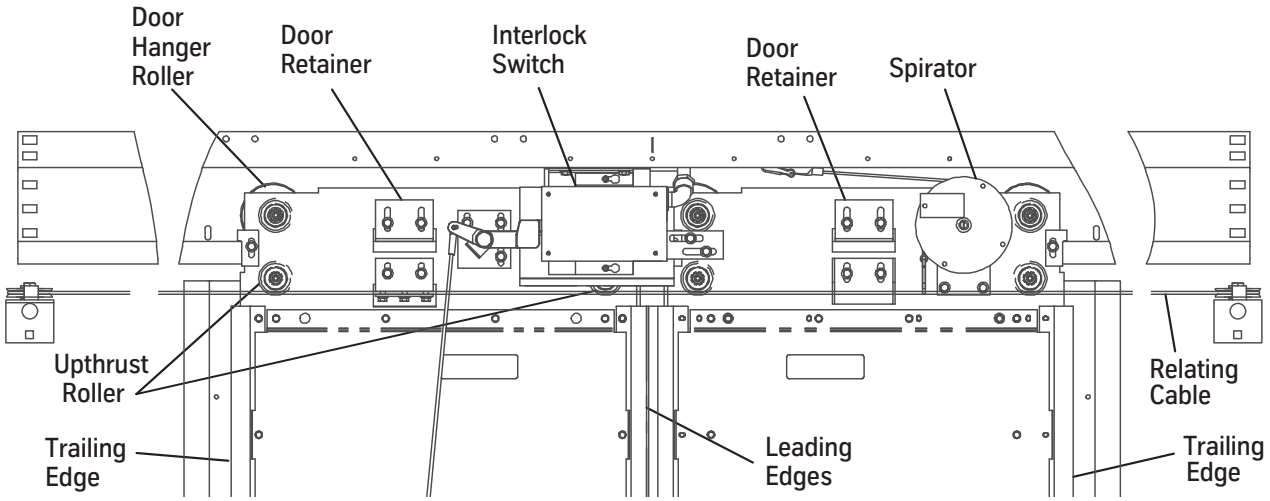
Figure 58 - Door Isolation Bumpers

Install the Hoistway Doors
(continued)

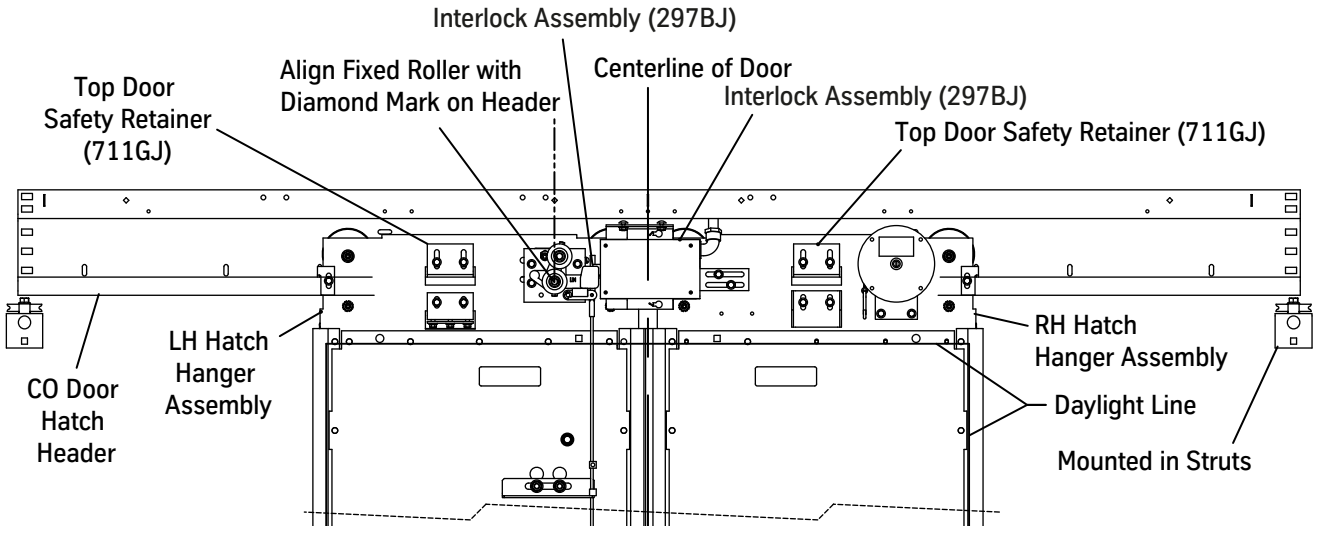
4. Loosen all upthrust rollers. See Figure 59.

5. Place the door rollers, one roller at a time, onto the door track.

6. Adjust the height of the door to $^{3}/_{8}$" by turning the eccentric on the door rollers, and then lock the eccentric with the nut.



Shown with Door Mounted Interlock Rollers



Shown with Hanger Mounted Interlock Rollers

Figure 59 - Door Rollers

Install Hoistway Doors
(continued)

7. Install the door gibs and the door safety retainers. See Figure 60.

One Gib and Two Safety Retainers per Door

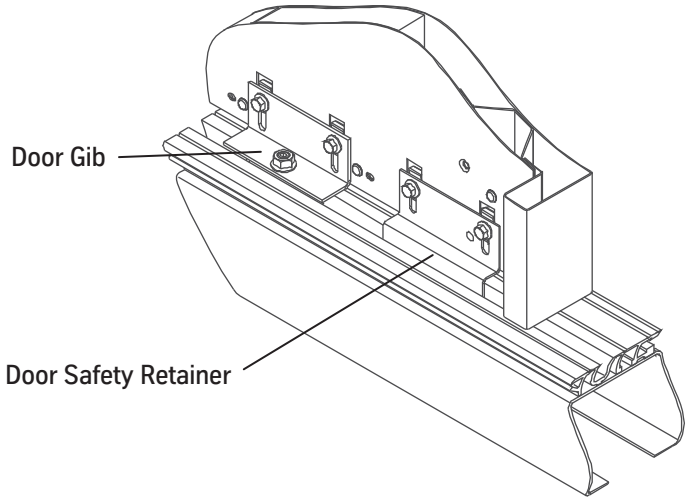


Figure 60 - Door Gibs and Safety Retainers

Adjust the Hoistway Door Running Clearance

1. Place a $^{5}/_{16}$" shim (running clearance) underneath the leading edge of the door. See Figure 61.
2. Loosen the upthrust roller, turn it to its lowest adjustment, and then snug it in place.
3. Adjust the eccentric on the door roller so that the door is flush with the shim and the door roller is flush with the track.
4. After the adjustment is made, tighten the door roller eccentric.
5. Remove the shim, and place it under the trailing edge of the door. Repeat steps 2 through 4.
6. Remove the shim, and verify that the doors are flush with the frame columns.

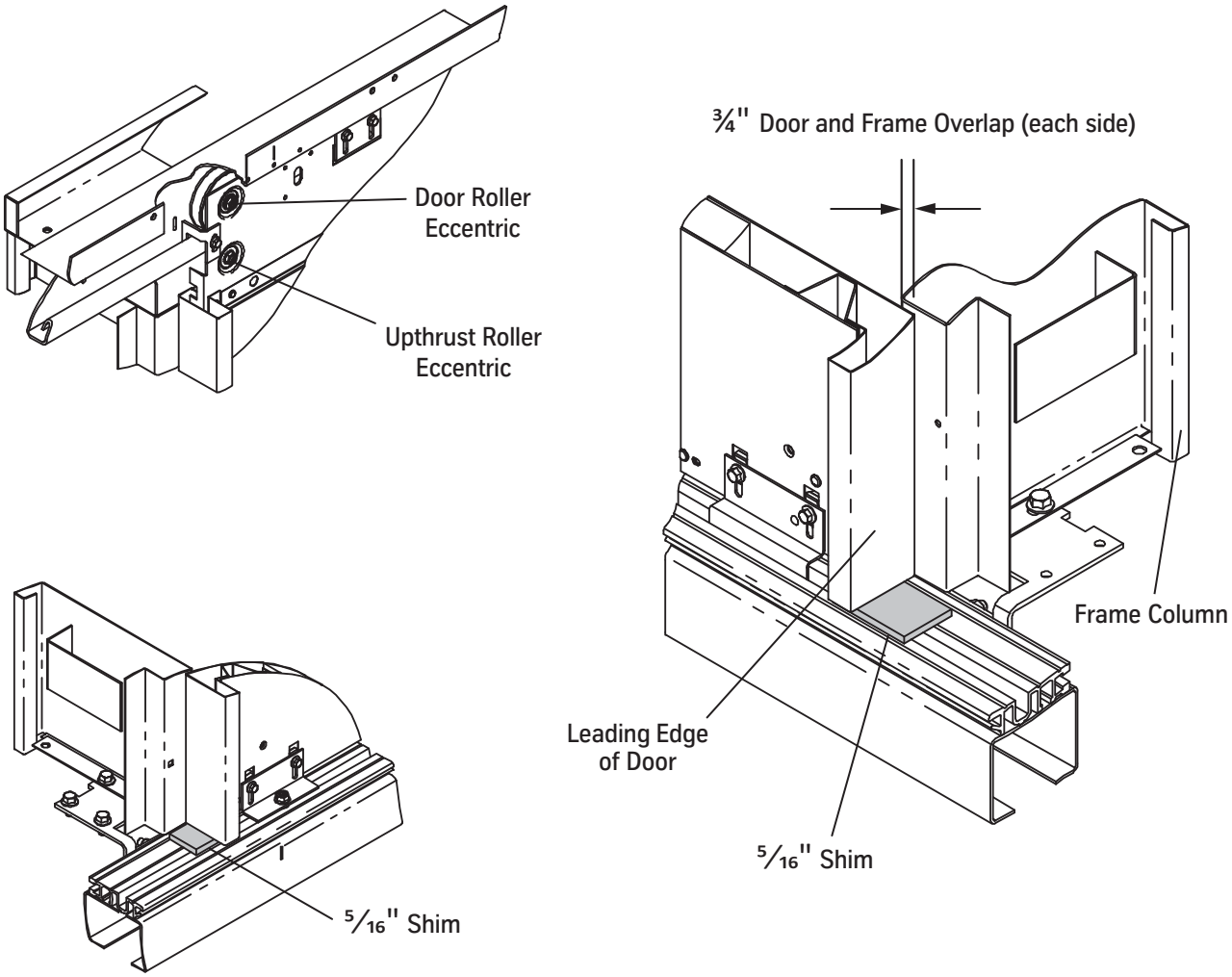


Figure 61 - Adjust Door to Sill Running Clearance

Adjust the Upthrust Rollers

1. Turn the eccentric of the upthrust roller clockwise until the roller just touches the bottom of the door track.

2. Adjust the eccentric so that a gap of 0.015″ is between the upthrust roller and the door track. See Figure 62.

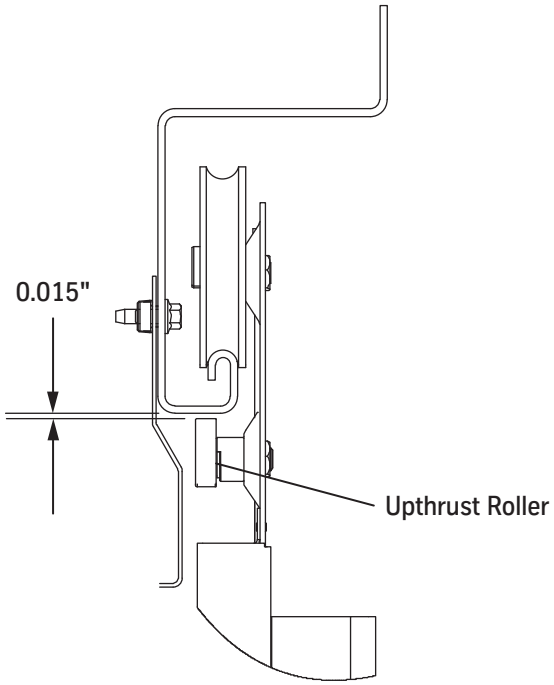


Figure 62- Adjust Upthrust Roller Clearance

Adjust the Door Gibs

1. Adjust the door gib brackets and the door retainer brackets for a $^{1}/_{8}$" running clearance between the brackets and the hoistway sill. Tighten the bolts after adjustment. See Figure 63.
2. Place a $^{1}/_{4}$" shim between the bottom of the entrance frame column and the bottom of the leading edge of the door panel.
3. Use a $^{3}/_{16}$" hex wrench and turn the eccentric of the door gib to cause the door panel to just touch the $^{1}/_{4}$" shim, and then tighten the locknut.
4. Repeat Steps 2 and 3 for the trailing edge.
5. Verify that the door rolls freely and also tracks parallel to the hoistway sill groove. Adjust as necessary.

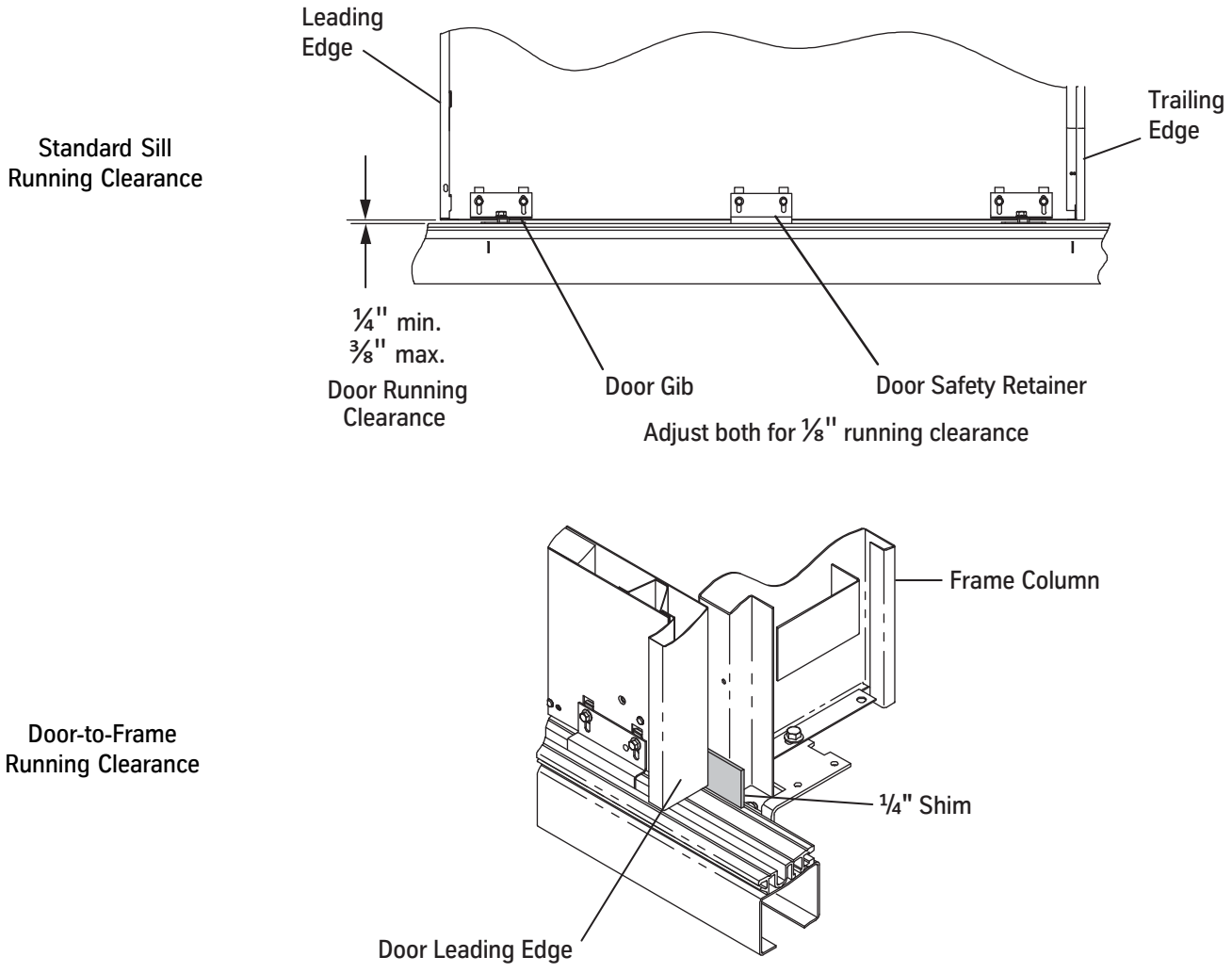


Figure 63 - Running Clearance

Install and Adjust the Spirator

1. Wrap the spirator cable three or four times around the spirator to connect the cable.
2. Use the spirator cable clip to attach the cable to the header. See Figure 64.
3. Adjust the spirator so that the doors close when they are released $^{1}/_{2}$" from the fully closed position.
4. Verify that the doors close fully with no “double bump” when the doors touch each other.

NOTE

- The spirator must close the doors from any open position.
- To obtain proper door operation from floor to floor, the spirator tension should be the same at each floor.

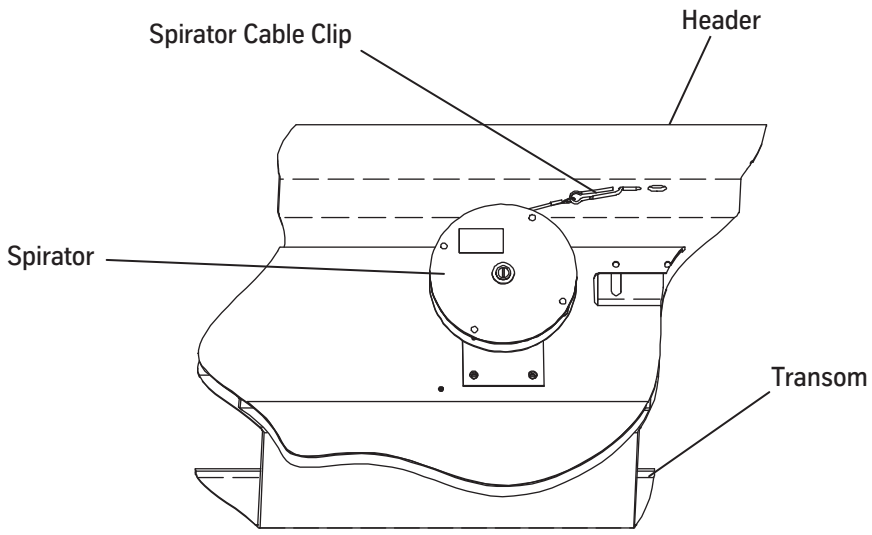


Figure 64 - Spirator

Install and Adjust the Top Door Retainers

1. On each side of the door panel, use the provided hardware to install a top door retainer on the hanger. See Figure 65.
2. Verify that there is sufficient running clearance between the retainer and the track, and adjust if needed.
3. On each side of the door panel, use the provided hardware to install a track retainer clip on the hanger.

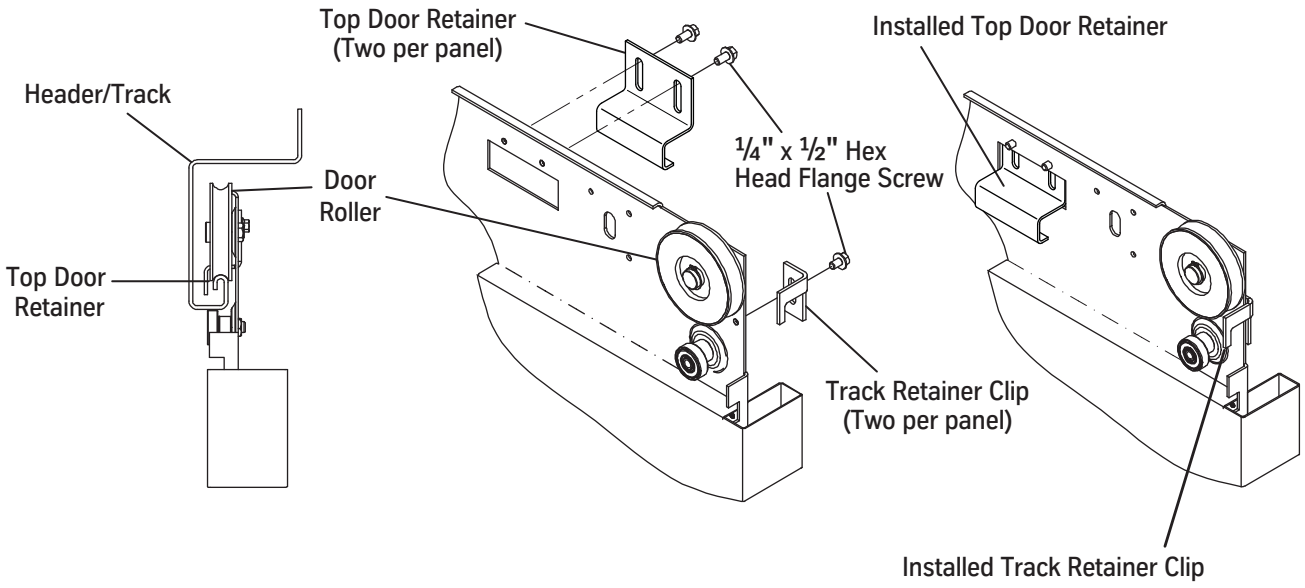


Figure 65 - Top Door Retainer

Install the Door Relating Cable

1. Install one relating cable pulley assembly in the strut on each end of the hoistway header. See Figure 66 on page 91.
2. Wrap the relating cable around the two pulleys, and install the ends into the relating cable clamp assembly.
3. Place the relating cable (located on back side of the hanger assembly) between the two plates of the relating cable anchor, and tighten the two plates together.
4. Tighten the relating cable tension using the four nuts on the relating cable clamp assembly. The relating cable should be tight, but not enough to cause the doors to bind.
5. Fully close the hoistway doors.

Install the Door Relating Cable

(continued)

6. Move the doors until their meeting point is aligned with the centerline of the sill and the header. Adjust the relating cable tension (if necessary).

7. Fully open the hoistway doors.

8. Verify that the edge of the door is flush with the return column.

9. Verify that the relating cable clears all pulleys and other obstructions. Adjust if necessary.

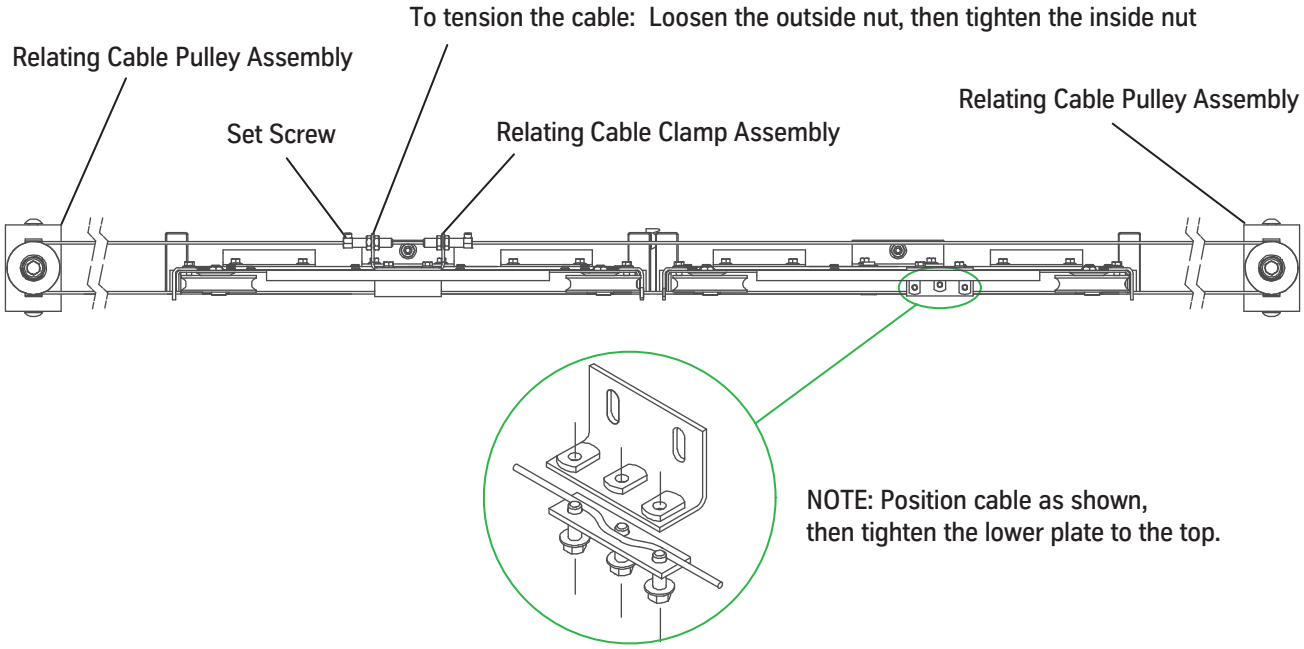


Figure 66 - Relating Cable Installation

Install and Adjust the Interlocks for Door Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 67 on page 92.

2. Remove the cover from the interlock box.

Install and Adjust the Interlocks for Door Mounted Interlock Rollers
(continued)

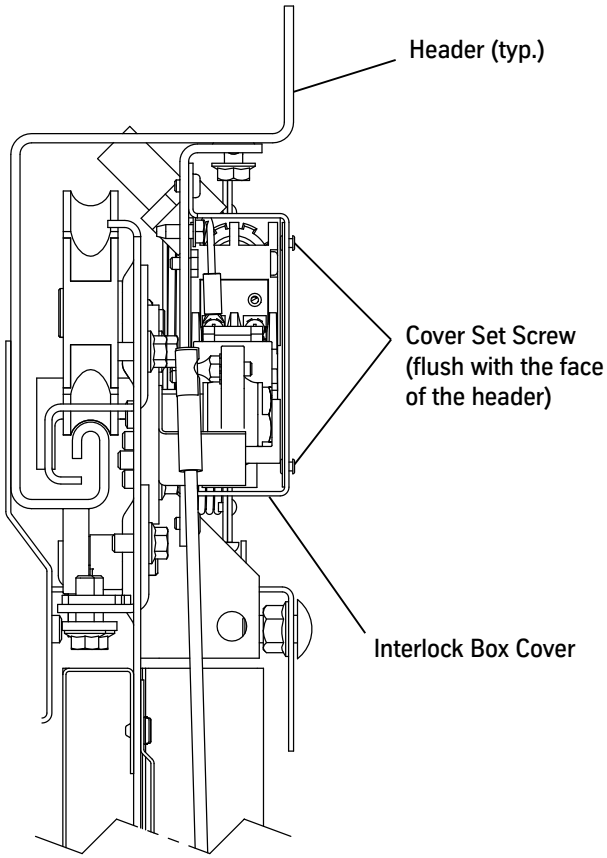


Figure 67 - Install the Door Interlock

3. Close the doors, and verify the following. See Figure 68 on page 93.
   a. The interlock hook is centered front-to-back on the contacts.

CAUTION **Never remove both washers on the interlock hook shaft.**

   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.

4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $^{1}/_{8}$" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - 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.

NOTE The pickup roller crank should be resting on its stop at this time.

   c. Interlock hook - contact compression of $^{3}/_{32}$".
      - The hook touches both contact leafs at the same time.
      - When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $^{1}/_{8}$". If necessary, adjust the interlock hook stop to limit the hook travel.

CENTER OPENING

Install and Adjust the Interlocks for Door Mounted Interlock Rollers

(continued)

5. Move the rollers and the interlock hook, and verify that there is $^{9}/_{32}$" hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.

6. Repeat this procedure for all other landings.

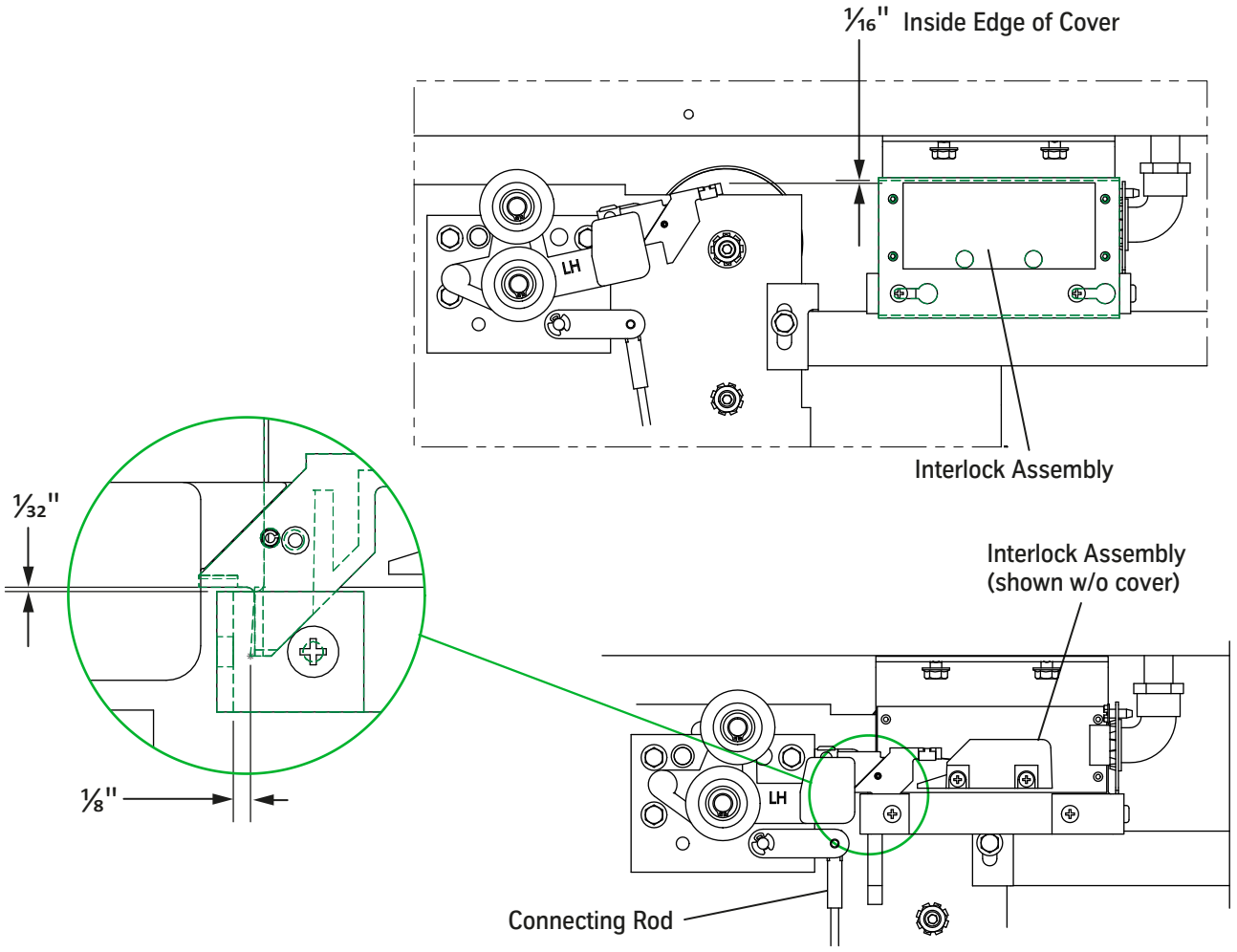


Figure 68 - Center Opening Interlock Adjustment

Interlock Wiring

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

WARNING **All door interlock contacts must be wired in series. See the wiring diagrams for details.**

3. Repeat Steps 1 and 2 for all other landings.

Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 69.
2. Remove the cover from the interlock box.

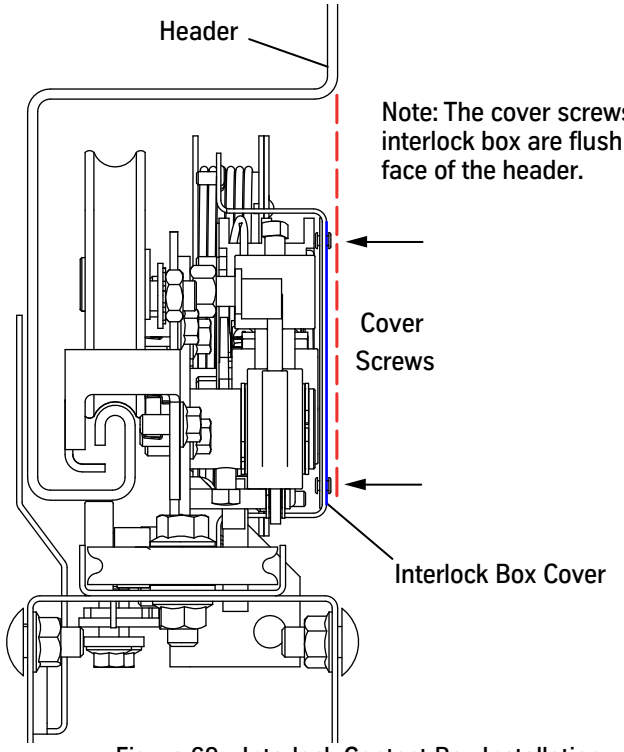


Figure 69 - Interlock Contact Box Installation

3. Close the doors, and verify the following. See Figure 70 on page 95.
   a. The interlock hook is centered front-to-back on the contacts.

CAUTION **Never remove both washers on the interlock hook shaft.**

   b. The interlock hook does not contact the front or the back of the contact box. If necessary, either shim the interlock box or remove ONLY ONE of the two washers on the interlock hook hinge bolt.
4. Adjust the following to obtain the correct measurements:
   a. Interlock box - when the doors are closed, there is $^{1}/_{8}$" between the interlock hook and both sides of the locking tab on the box.
   b. Connecting rod length - 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.

NOTE The pickup roller crank should be resting on its stop at this time.

   c. Interlock hook - contact compression of $^{3}/_{32}$".
      - The hook touches both contact leafs at the same time.
      - When the hook is raised by the crank, the hook clears the box at the top and also the locking tab by a minimum of $^{1}/_{8}$". If necessary, adjust the interlock hook stop to limit the hook travel.

CENTER OPENING

Install and Adjust the Interlocks for Hanger Mounted Interlock Rollers

(continued)

5. Move the rollers and the interlock hook, and verify that there is $^{9}/_{32}$" hook engagement before the contacts are bridged. If necessary, adjust the plastic contact block in the interlock box to obtain the proper angle and position of the contacts.

6. Repeat this procedure for all other landings.

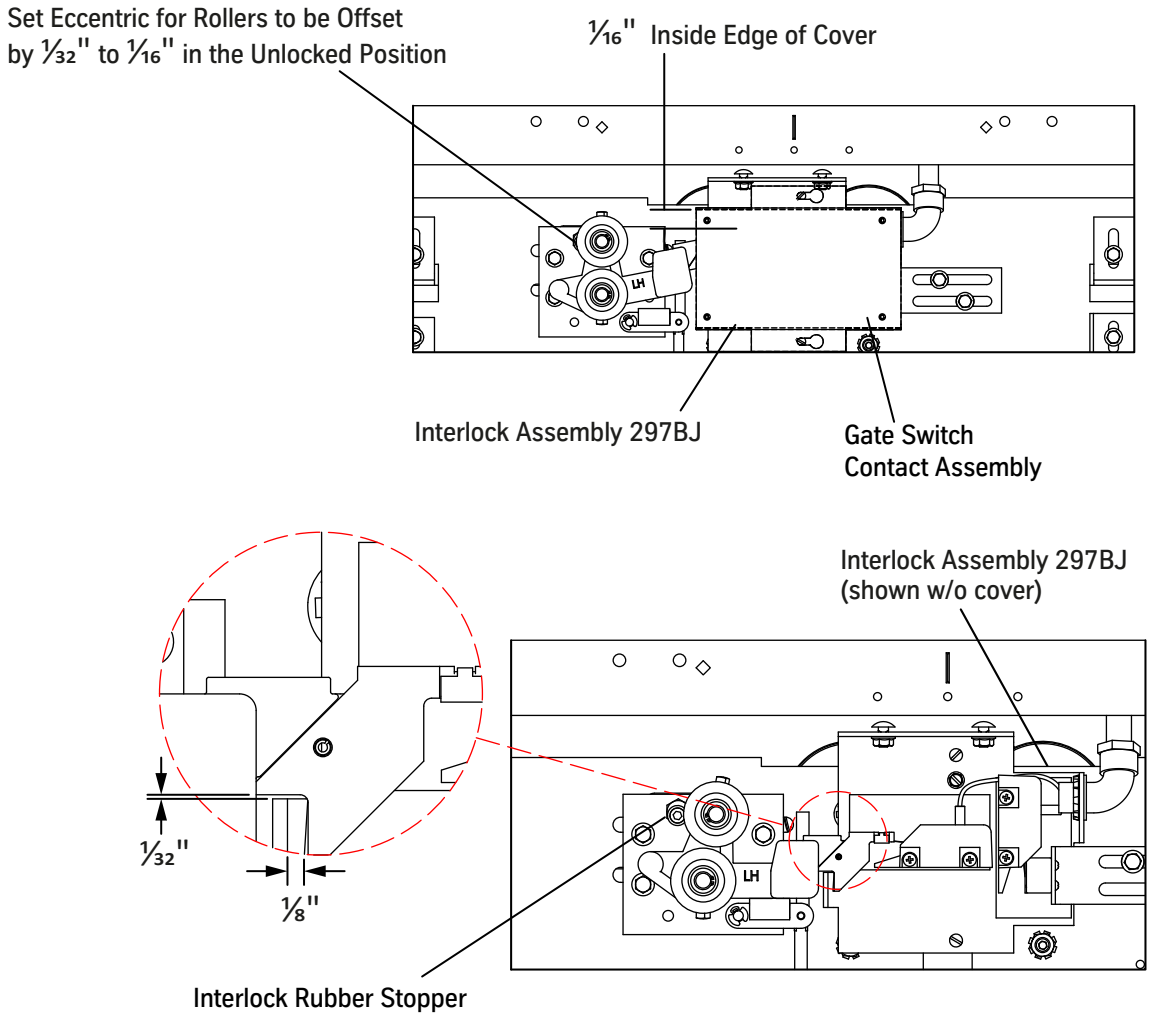


Figure 70 - Interlock Adjustment

Interlock Wiring

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

WARNING **All door interlock contacts must be wired in series. See the wiring diagrams for details.**

3. Repeat Steps 1 and 2 for all other landings.

CENTER OPENING

Install the Fascia Plates and Dust Covers

1. Position the platform near the top landing.
2. Center a top fascia plate in the opening, and hook the fascia plate onto the hoistway sill of the top landing. See Figure 71 on page 97 through Figure 73 on page 99.
3. Use self-tapping screws to anchor the top fascia plate to the top landing hoistway sill support.
4. Install the first intermediate fascia plate by hooking it onto the top fascia plate. If required, install the remaining intermediate fascia plates by hooking each one onto the last one installed.
5. Clip the bottom fascia plate to the top of the header. The bottom fascia plate vertically overlaps the last intermediate fascia plate.
6. Measure the distance between the sill support and the header, and subtract one inch.
7. Cut two fascia plate stiffeners (from the provided fascia stiffener angle) to the length measured in the previous step.
8. Clamp the angles in place behind and also flush with the edge of the fascia plates.
9. Run self-tapping screws through the pilot holes in the fascia plates to anchor the fascia plates to the stiffeners.
10. Repeat Steps 2 through 9 for all intermediate landings.

If required, center a top fascia plate in the opening and hook it onto the hoistway sill of the bottom landing.The fascia plate and the toe guard in the pit must extend far enough below the sill so that when the car is on compressed buffers, the platform toe guard will not be below the hoistway toe guard.

11. Use self-tapping screws to anchor the top fascia plate to the bottom landing hoistway sill support.
12. Install the toe guard by hooking it onto the top fascia plate.
13. Use the provided drive pin anchors to fasten the toe guard to the wall.
14. If required, install all dust covers.

Install the Fascia Plates and Dust Covers
(continued)

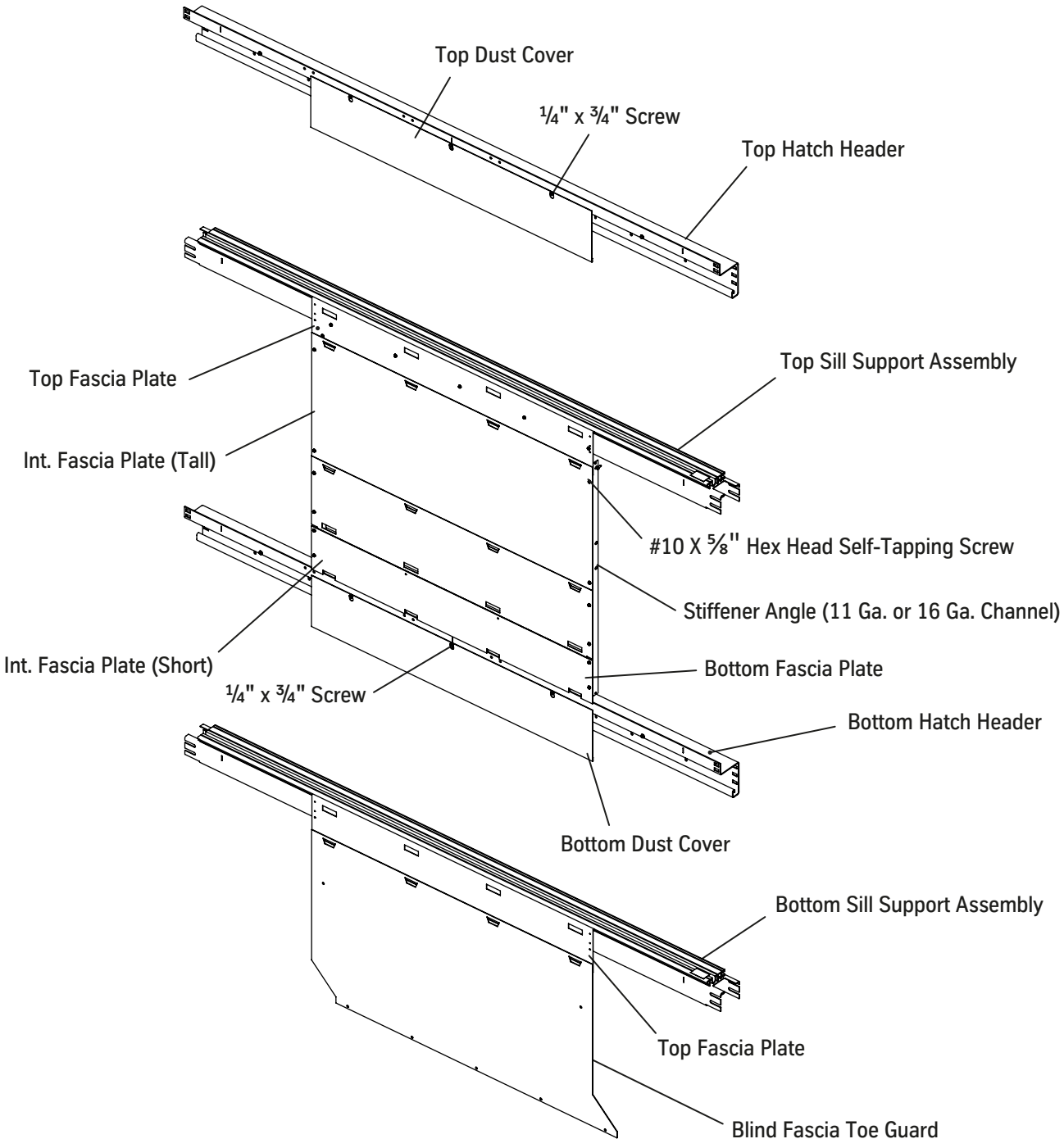


Figure 71 - Install Fascia Plates, Dust Covers, and Toe Guards (1 of 4)

Install the Fascia Plates and Dust Covers
(continued)

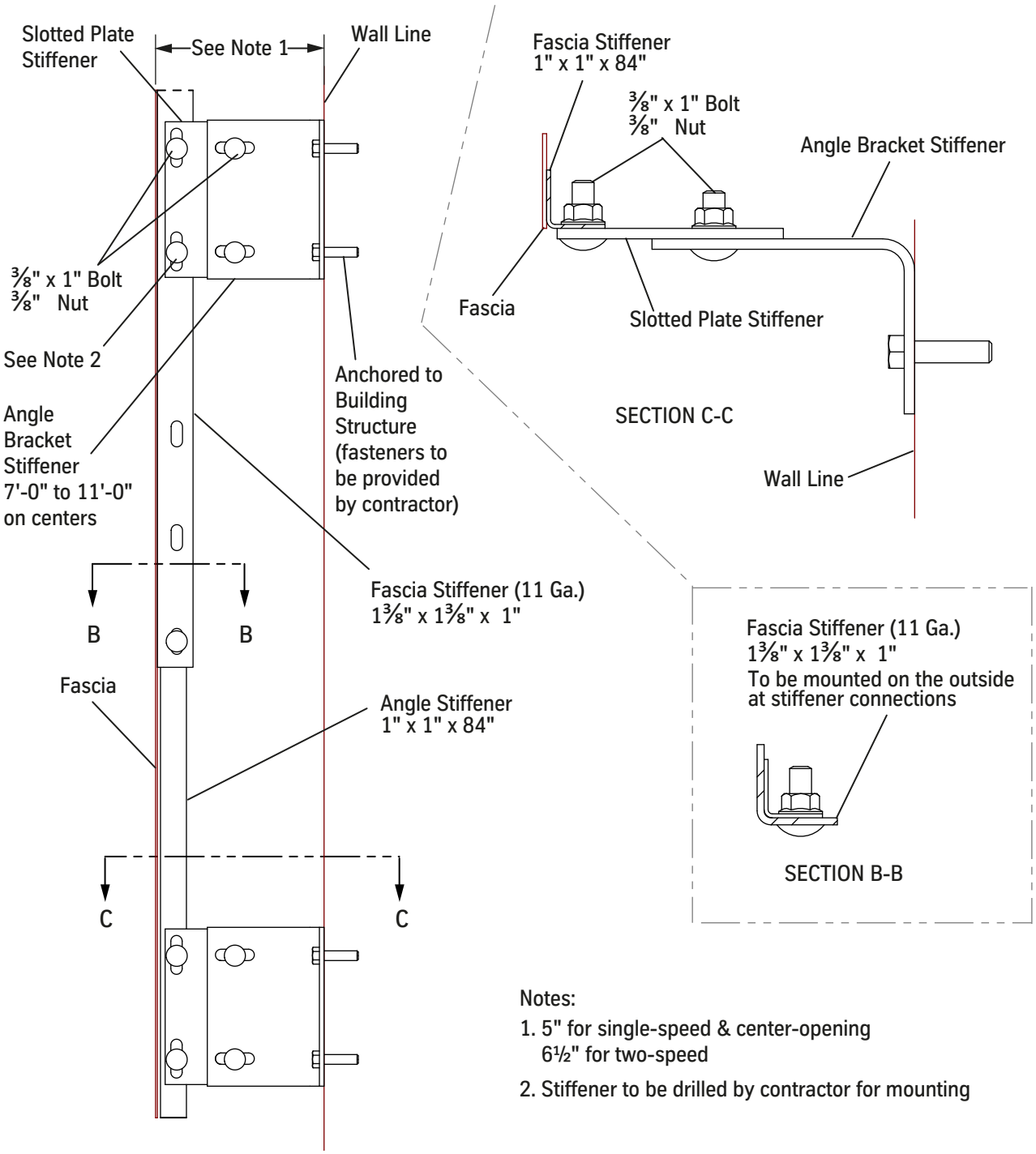
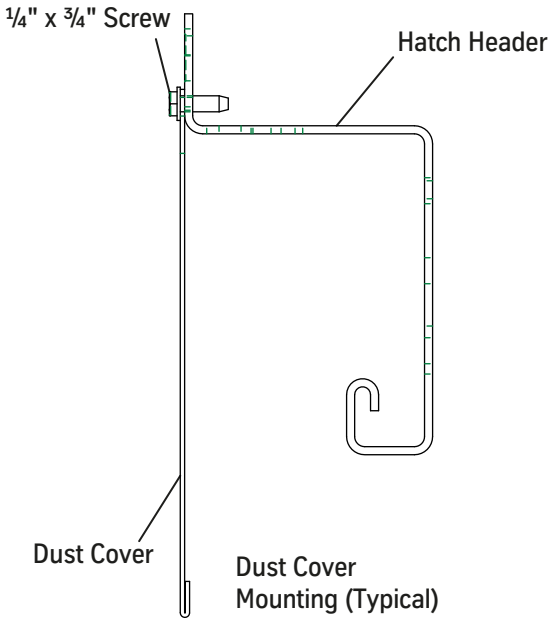


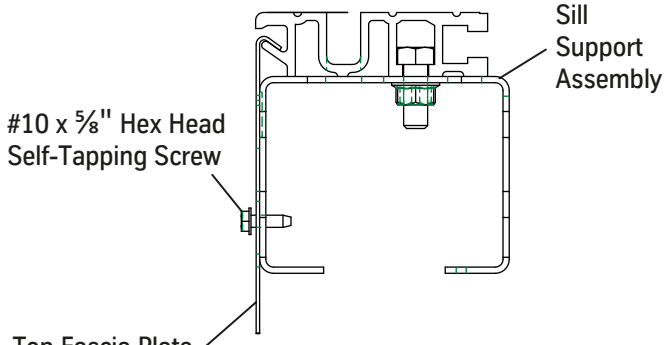
Figure 72 - Install Fascia Plates, Dust Covers, and Toe Guards (2 of 4)

CENTER OPENING

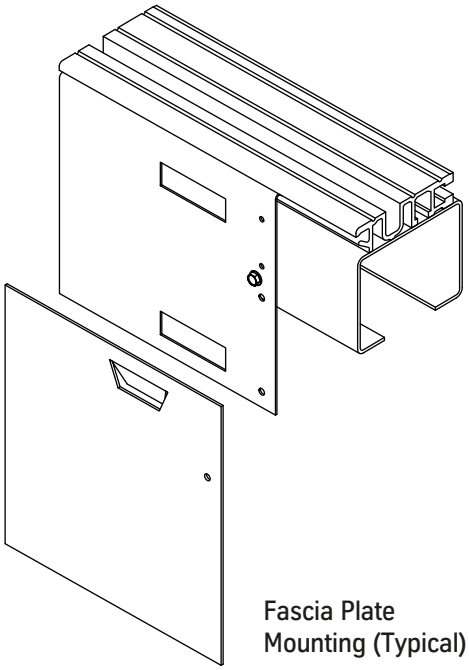
Install the Fascia Plates and Dust Covers
(continued)



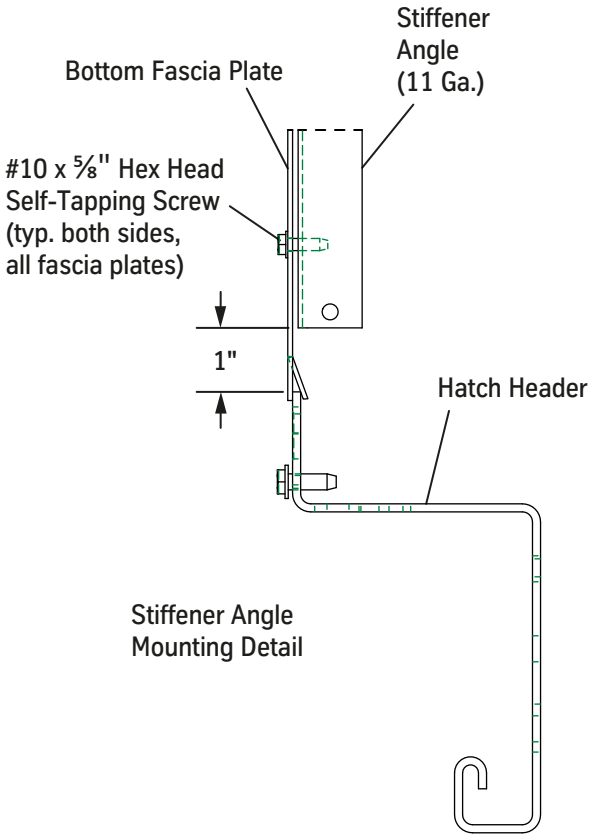
Dust Cover Mounting (Typical)



Top Fascia Plate Mounting (Typical)



Fascia Plate Mounting (Typical)



Stiffener Angle Mounting Detail

Figure 73 - Install Fascia Plates, Dust Covers, and Toe Guards (3 of 4)

CENTER OPENING

Install the Fascia Plates and Dust Covers
(continued)

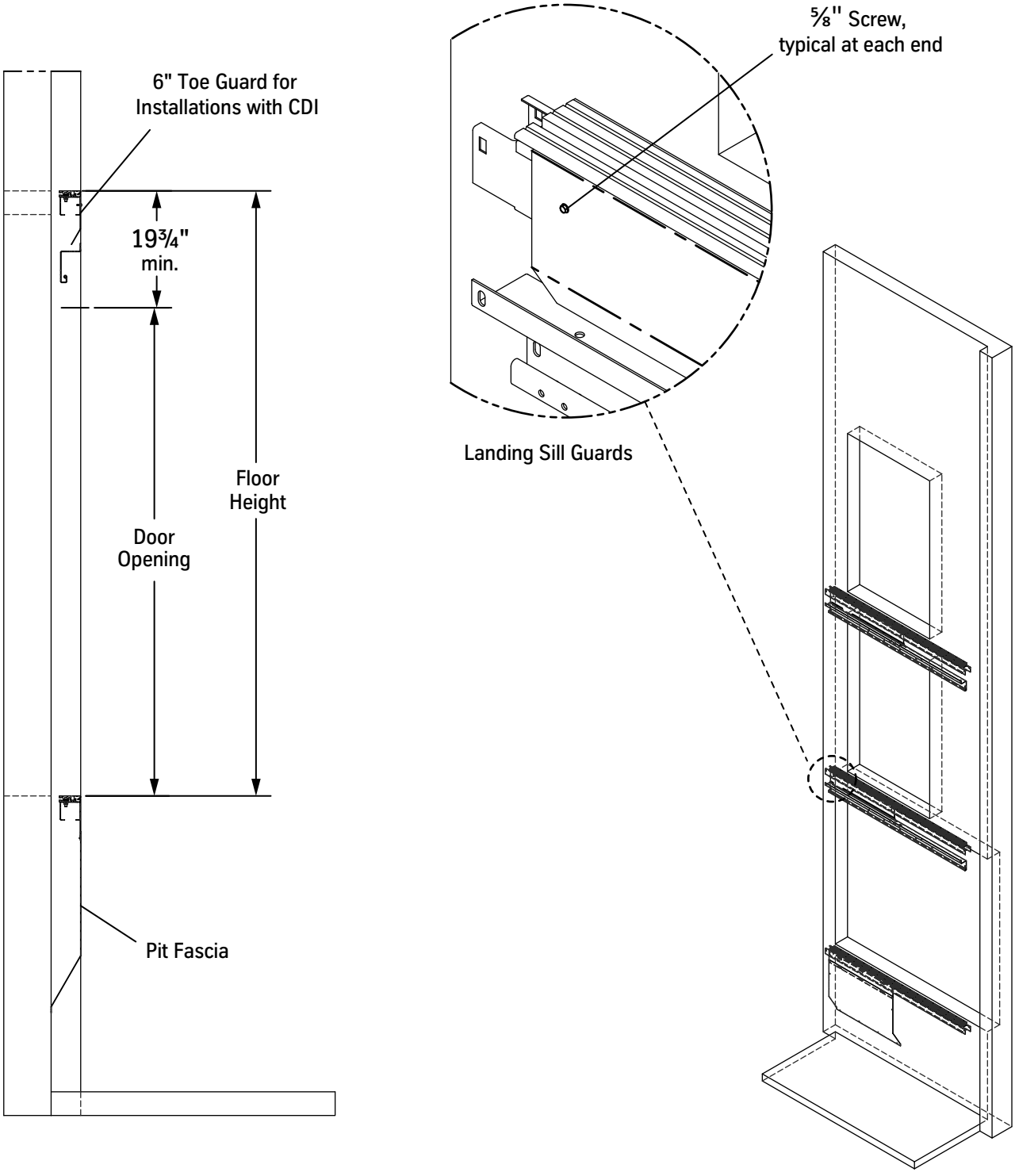


Figure 74 - Install Fascia Plates, Dust Covers, and Toe Guards (4 of 4)

Maintenance

Hoistway Doors and Tracks (each floor)

Monthly

1. Slightly move 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. Slightly move 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 $1^{1}/_{8}$" clearance between door panels.
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).

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. Move the car to allow access to the bottom of the doors.
2. Unlock the doors, and move them full travel to check that doors move freely on the sill.
3. Check the following:
   - Gibs for wear (adjust or replace as necessary).
   - Fire tab screws are tight.
   - Door to sill clearance of $1^1/_4$" (optimum) to $3^1/_8$" (maximum).
4. Remove and store the dust cover.
5. Unlock the doors, and partially open them.
6. 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, and check the eccentric setting. Set as close as possible throughout the door travel without causing drag (approximately $^1/_{32}$").
   d. Ensure that the eccentrics and hanger bolts are tight.
7. 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. Adjustment here will affect the interlock settings.
8. 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 $1^1/_2$" from fully closed, and release them to check the setting of the closer (doors should close from any position).

Maintenance
(continued)

9. 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. Check all clearances below:
        - The pickup of 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 over-travel 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.

10. 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 ($1^{1}/_{4}$" 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.

Cleaning Architectural Finishes

Any cleaning or refinishing, other than routine, should be handled by qualified professionals.

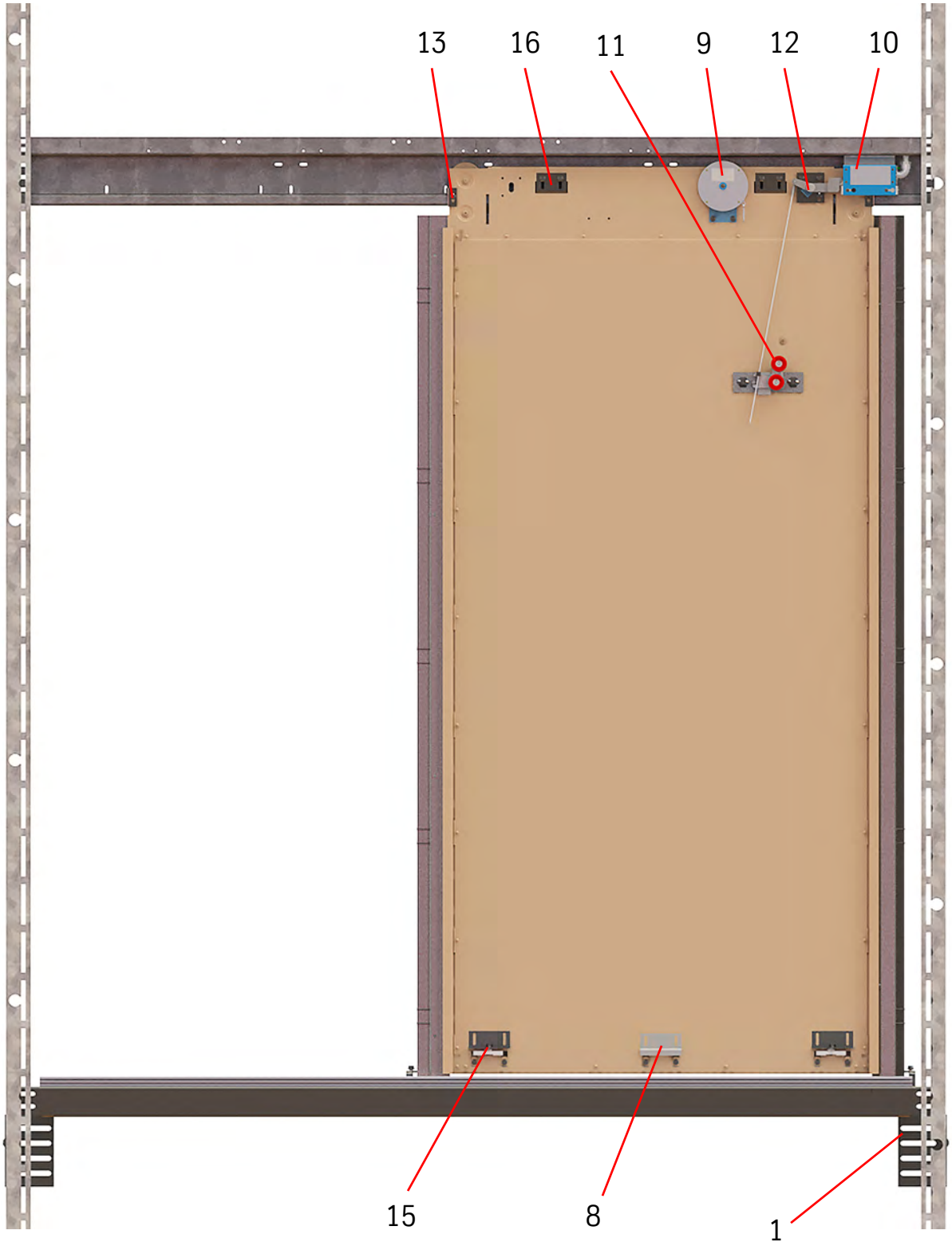
Architectural Powder Coating	Clean all surfaces with a soft cloth or soft natural bristle brush with a non-abrasive, PH neutral solution. Do not use strong solvents such as thinners, or solutions containing chlorinated hydrocarbon, ester, ketone, or any abrasive cleaners.
Plastic Laminate	Routine cleaning with a mild detergent will remove fingerprints, smears, and everyday spills.Do not use abrasives or harsh chemicals.
Stainless Steel	Routine cleaning with a mild detergent will remove fingerprints, smears, and everyday liquid spills.Consumer-type glass cleaners and stainless steel cleaners may also be used. Do not use abrasives or harsh chemicals.
Muntz (Bronze)	These surfaces are coated with a lacquer finish. To prevent scuffing, use a paste wax (for clear coats finishes) every week. Routine cleaning with a damp, soft cloth will remove spills, smears and fingerprints. Do not use abrasives or harsh chemicals.

Replacement Parts

Single Speed Opening, see page 105.
Two Speed Opening, see page 106.
Center Opening, see page 107.

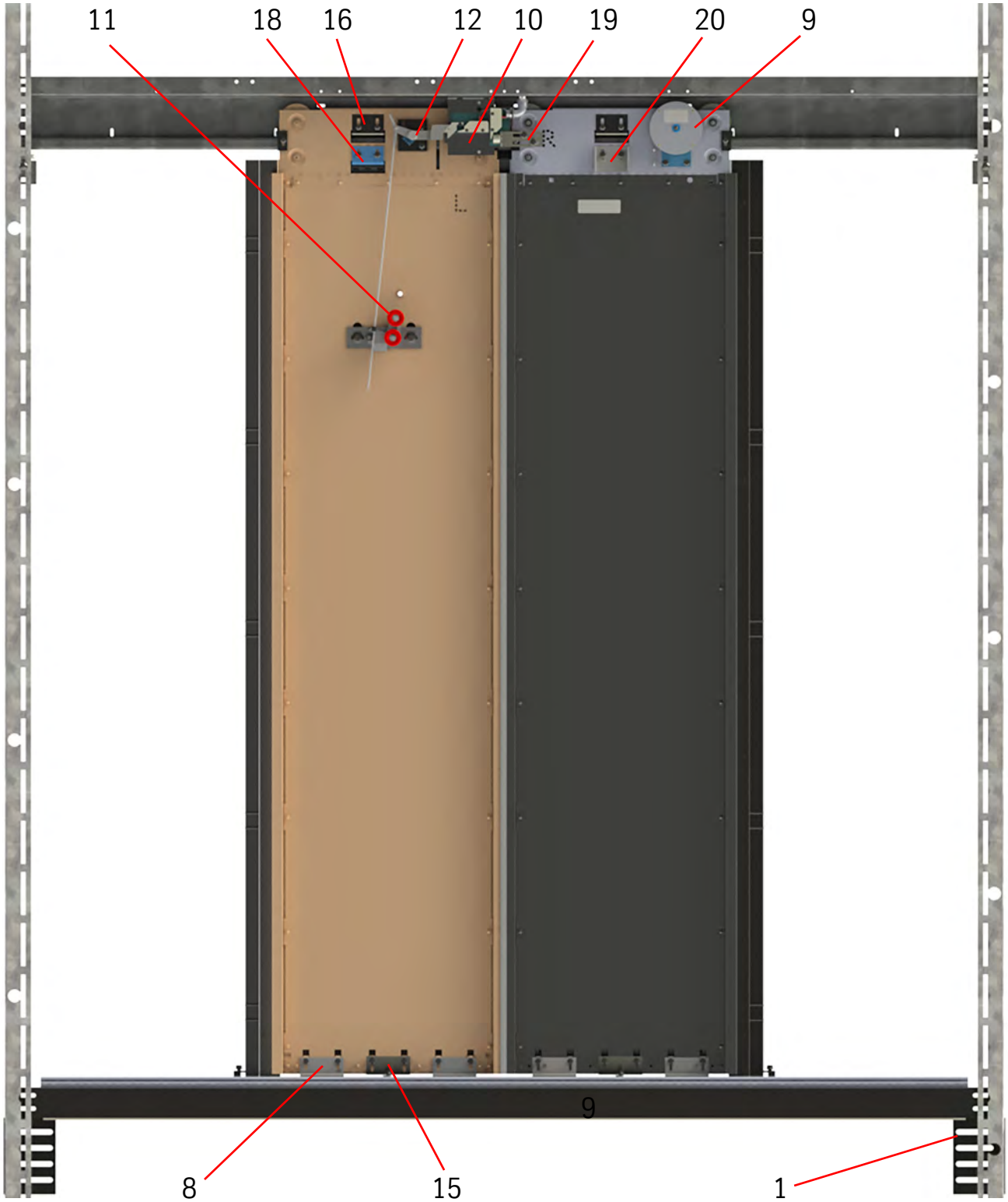
ITEM	PRINT NO.	DESCRIPTION
1	174JC4	Wall Angle
2	196JE1	Angle Bracket
3	124580	Hanger Roller
4	792AK2	Fascia Stiffener (11 GA.)
5	760CF2	Shim, Frame to Sill
6	286AJ37	EMT Steel Conduit, $91\frac{15}{16}$" length
7	286AJ36	EMT Steel Conduit, $94\frac{1}{4}$" length
8	711GJ001	Safety Door Retainer, Top, SS
	711ET1	Safety Door Retainer, Bottom, SS
	711GR001	Safety Door Retainer, CO
9	278AC001	Closer Reel Assembly, LH, SS
	278AC101	Closer Reel Assembly, RH & CO
10	297BN3	Contact Box Assembly, LH
	297BN4	Contact Box Assembly, RH
	297BJ2	Contact Box Assembly, CO, LH
	297BJ4	Contact Box Assembly, CO, RH
11	596EV0011	Roller Crank Assembly Mount, LH
	596EV101	Roller Crank Assembly Mount, RH
12	532AW001	Interlock Hook Assembly, LH, USA
	532AW101	Interlock Hook Assembly, RH, USA
13	277ED001	Track Retainer Clip, LH
	277ED101	Track Retainer Clip, RH
14	454DW1	Gib Door Guide Assembly, SS
15	454FB001	Door Guide Assembly
16	196BBJ001	Door Safety Guide Retainer Bracket
17	454FK001	Door Gib Guide, 2S
18	196AHM1	Cable Anchor Bracket Assembly, CO
19	297DA001	Gate Switch Contact Assembly, CO
20	196AHP1	Cable Clamp Bracket, CO
21	224AJ_	Relating Cable Assembly, CO (Not Shown)
22	196BBH001	Relating Cable Assembly Bracket, CO (Not Shown)
23	200BAP002	Bolt Kit, Wall Angle (All Bolts Kits Not Shown)
	200LA1	Bolt Kit, Strut Splice (Compression)
	200BDR001	Bolt Kit, Entrance
	200FF1	Bolt Kit, Fascia Plate
	200FX1	Bolt Kit, Fascia Stiffener
	200AEJ1	Bolt Kit, Toe Guard
	200PT1	Bolt Kit, Dust Cover
	200BLF001	Bolt Kit, Hardware SS
	200BLE001	Bolt Kit, Hardware CO

Single Speed Opening (494AVX)



Two Speed Opening (494AWA)

Center Opening (494AVY)



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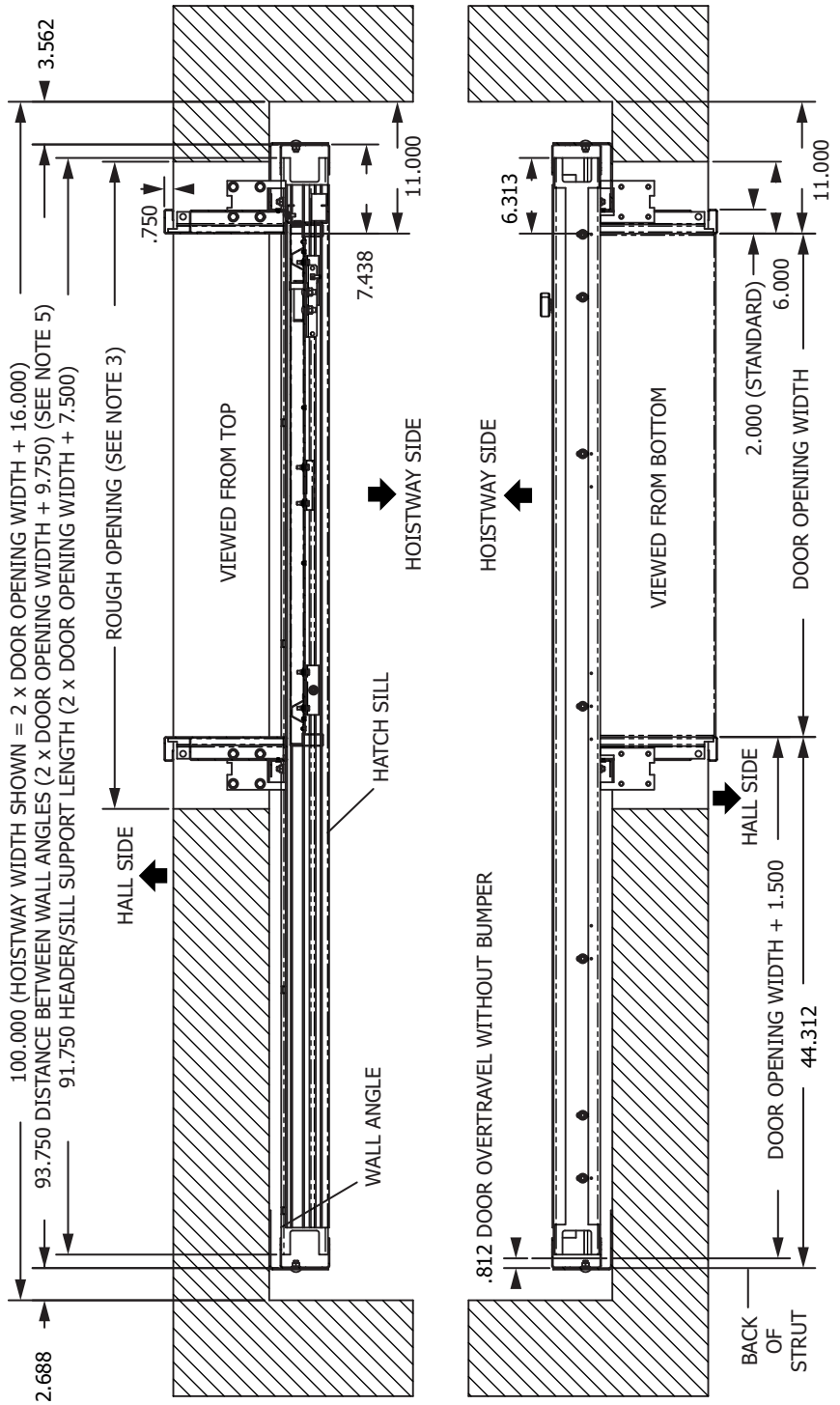
APPENDIX

APPENDIX

Door Mounted Interlock Rollers

Entrance System Installation

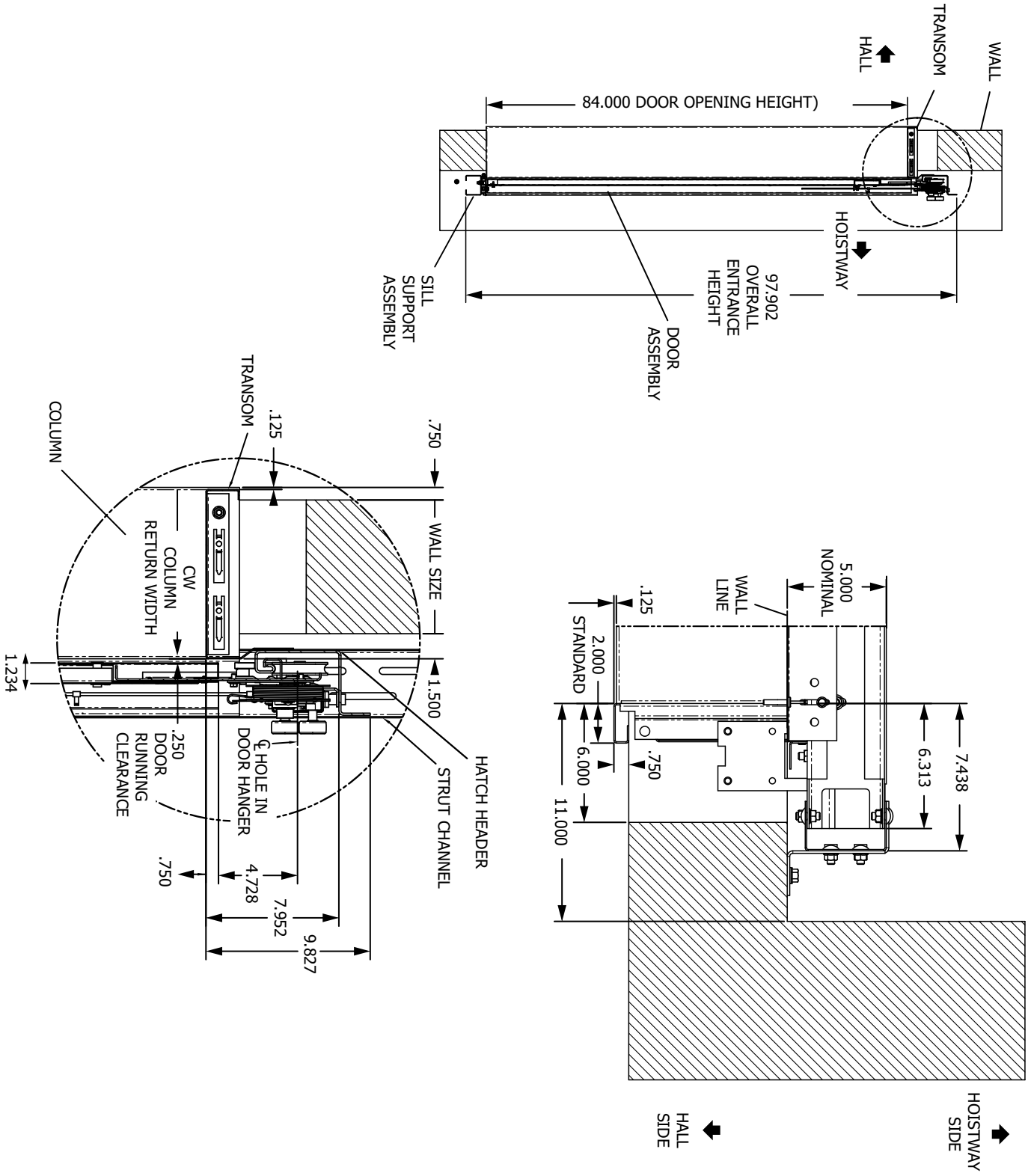
Single Speed (494AVX-C)



NOTES:
1. ENTRANCE FRAME SHOWN IS FOR A SINGLE SPEED (LEFT HAND), 42.000 DOOR OPENING WIDTH WITH 7 FT. (84.000) DOORS. ALL OTHER SINGLE SPEED ENTRANCE FRAMES TYPICAL.
2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.
3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.
4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JT. FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.
5. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.

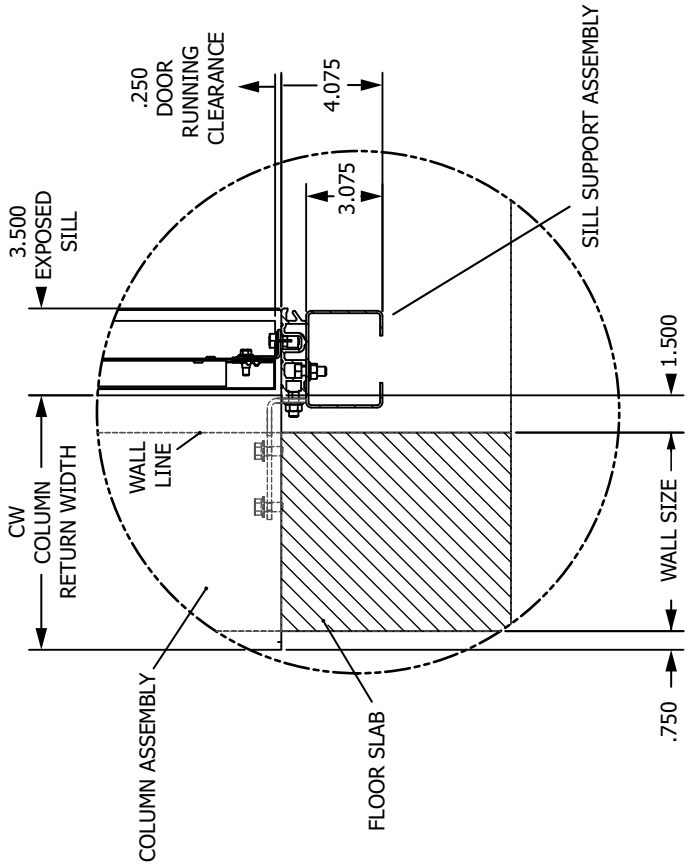
Entrance System Installation - Single Speed

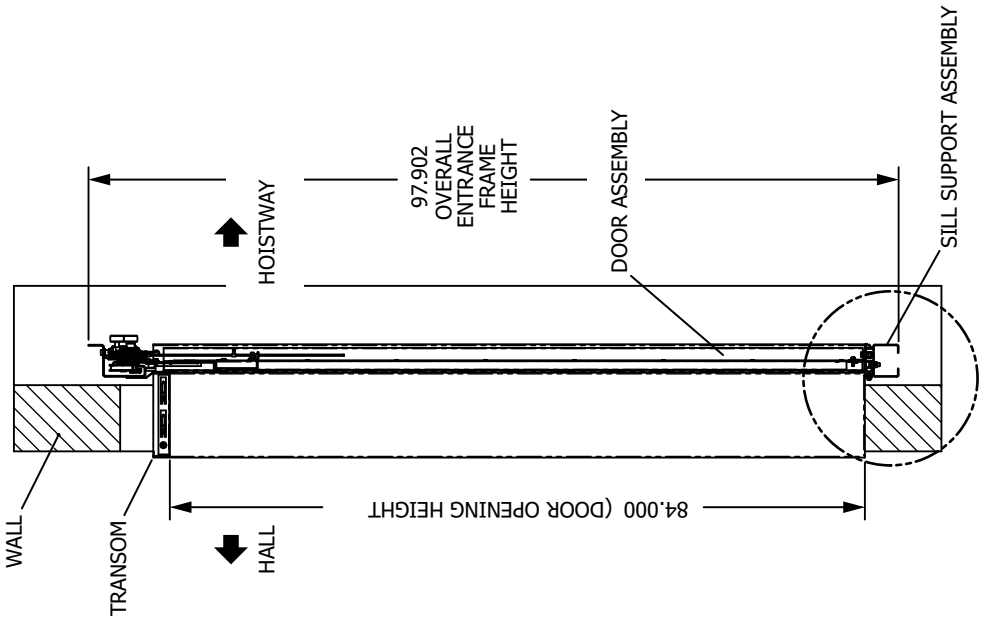
(continued)



Entrance System Installation - Single Speed

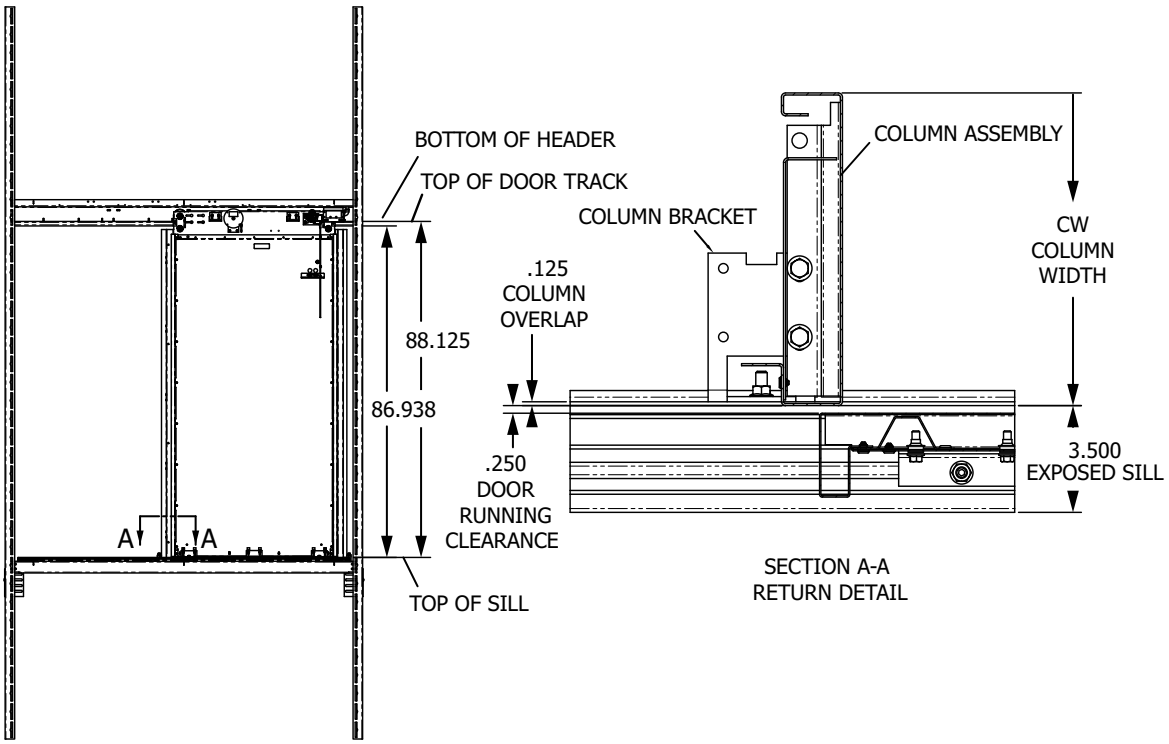
(continued)

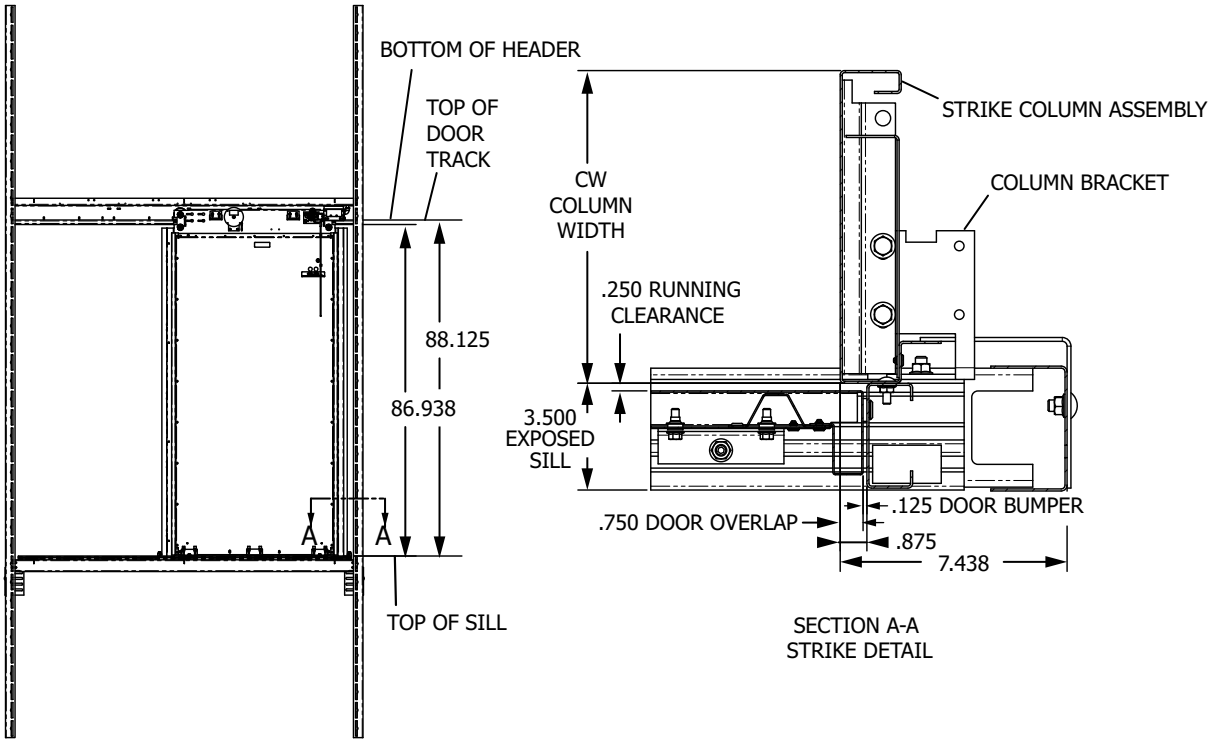




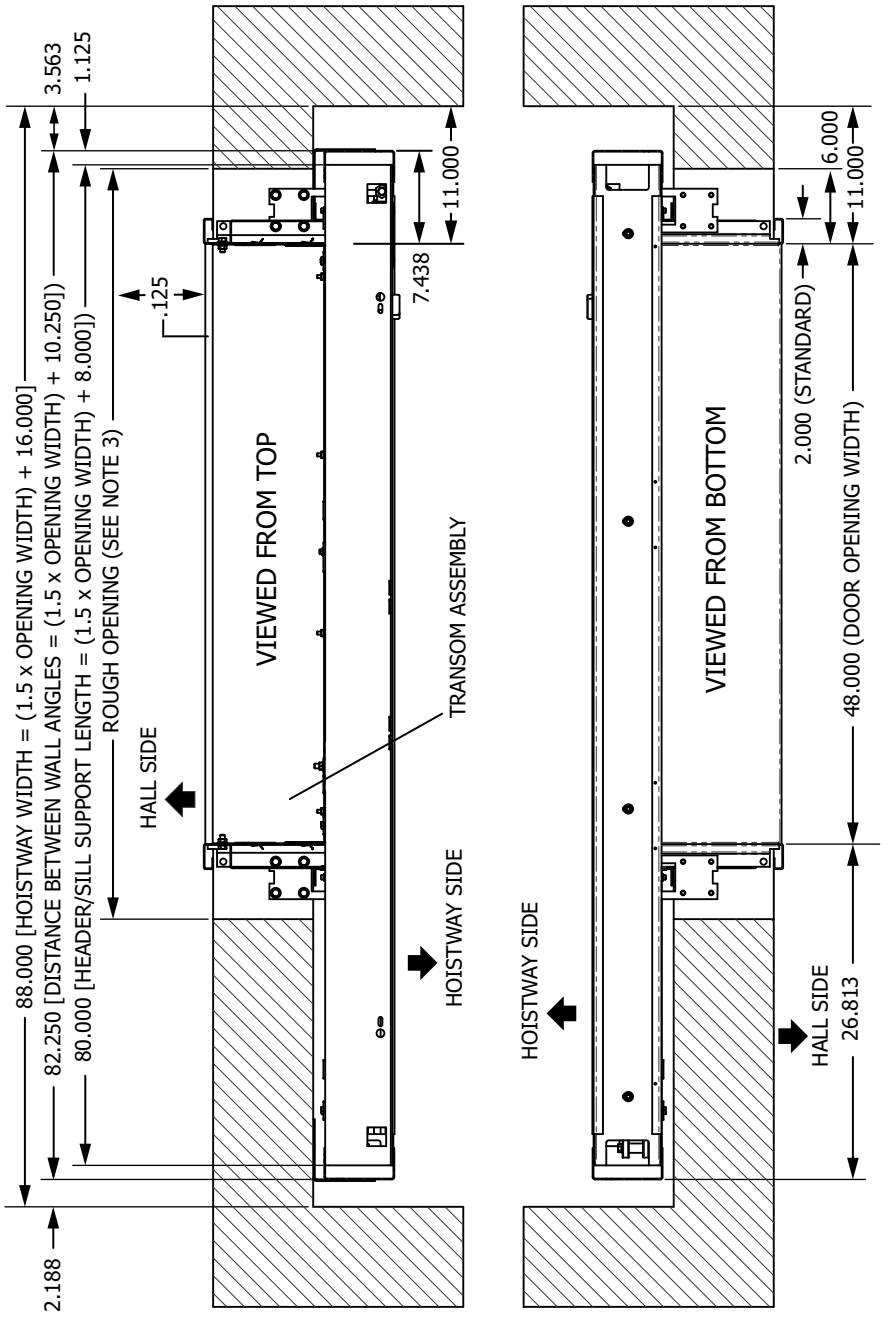
Entrance System Installation - Single Speed

(continued)





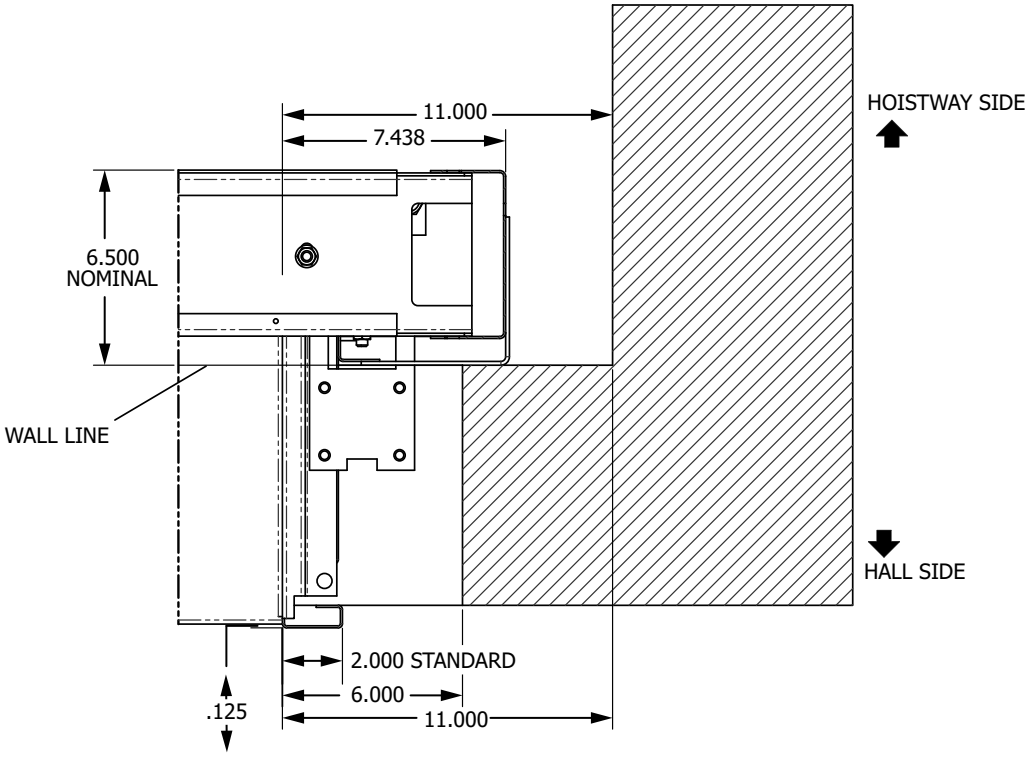
Two Speed (494AWA-C)

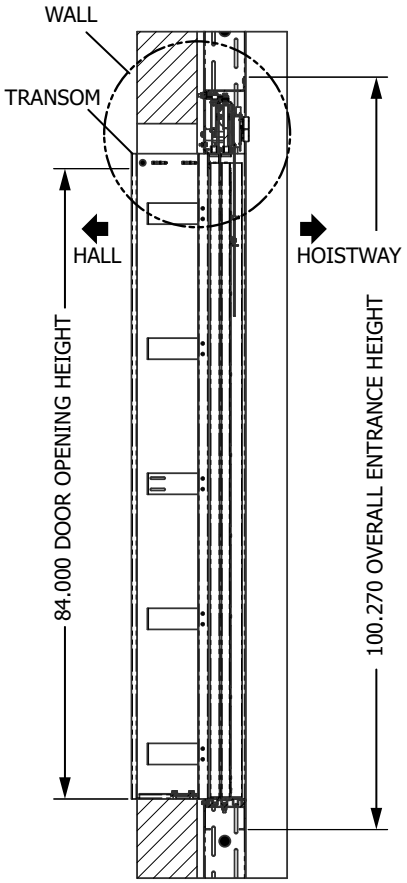


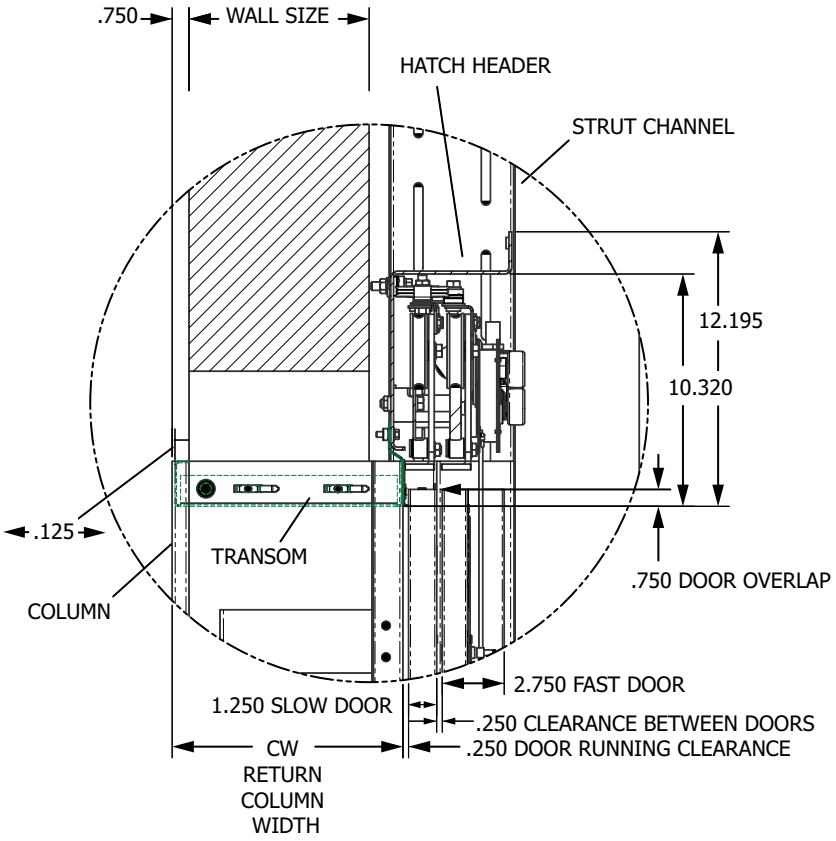
NOTES:
1. ENTRANCE FRAME SHOWN IS FOR A TWO SPEED (LEFT HAND) 48.000 OPENING WITH 7 FT. (84.000) DOORS. ALL OTHER TWO SPEED ENTRANCE FRAMES TYPICAL.
2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.
3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.
4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 4941T. FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 4941V.
5. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.

Entrance System Installation - Two Speed

(continued)

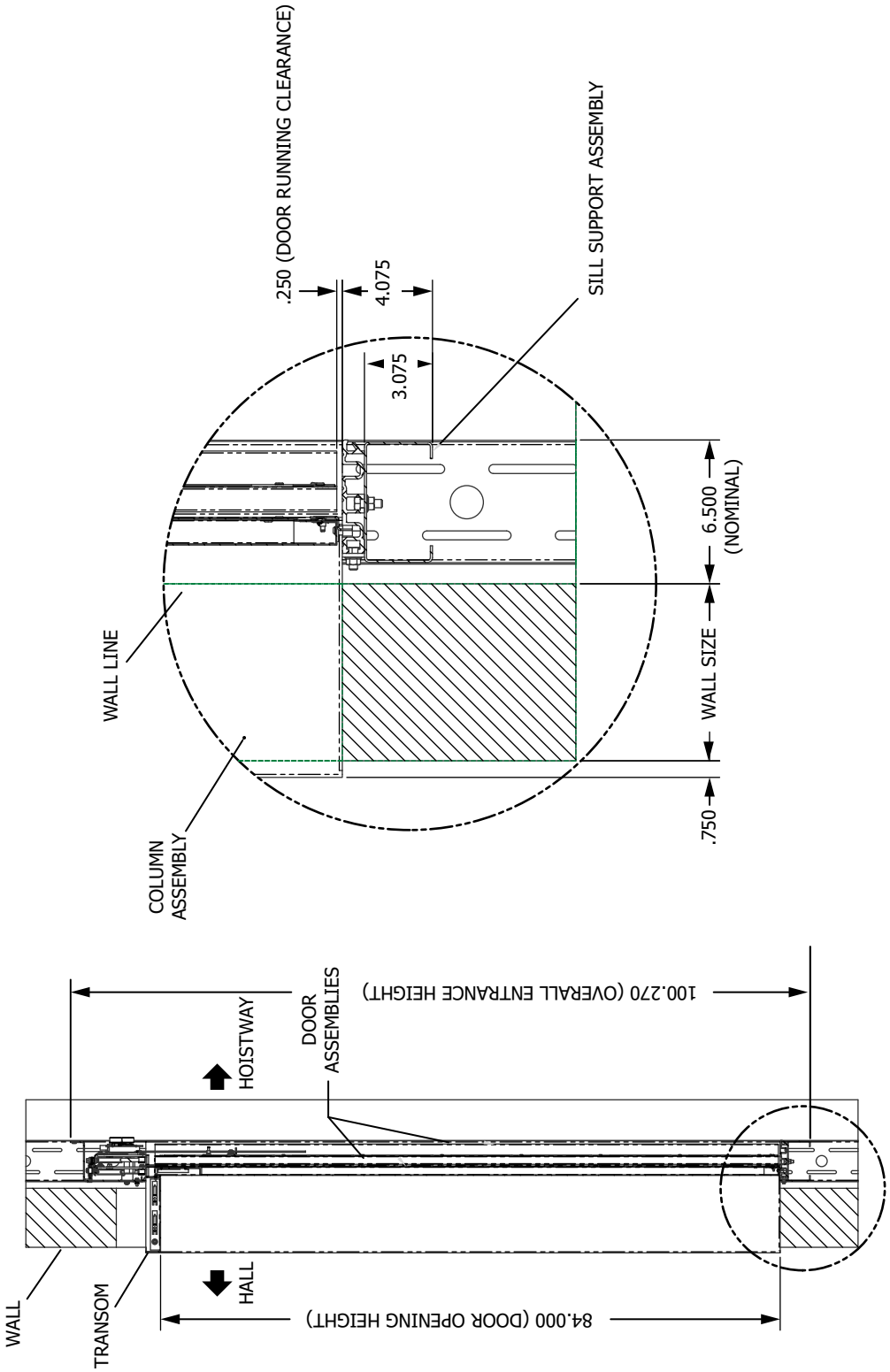






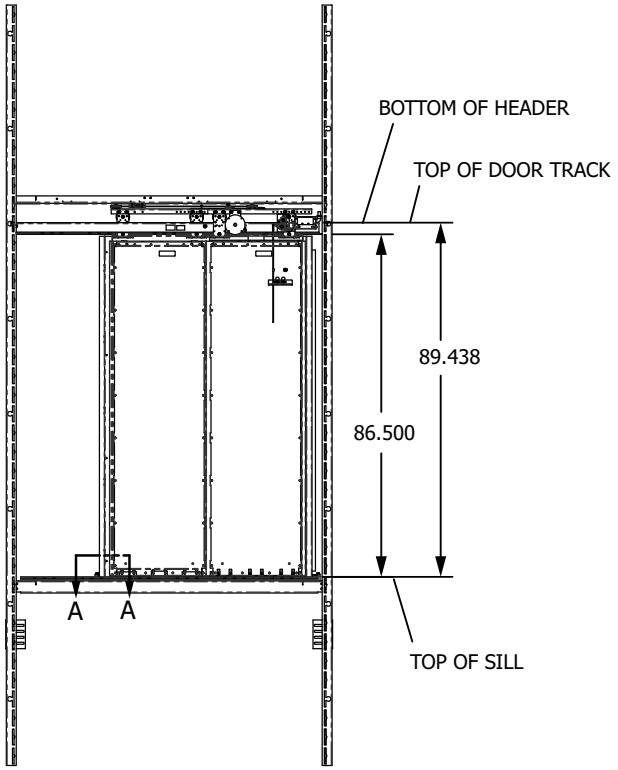
Entrance System Installation - Two Speed

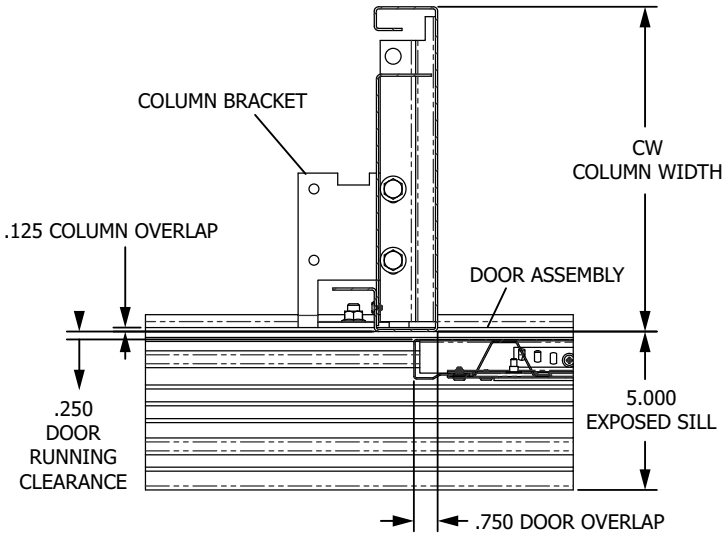
(continued)



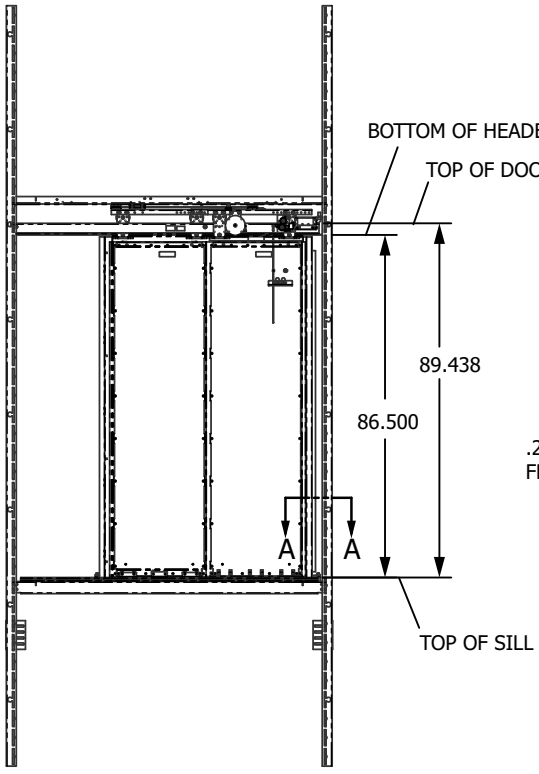
Entrance System Installation - Two Speed

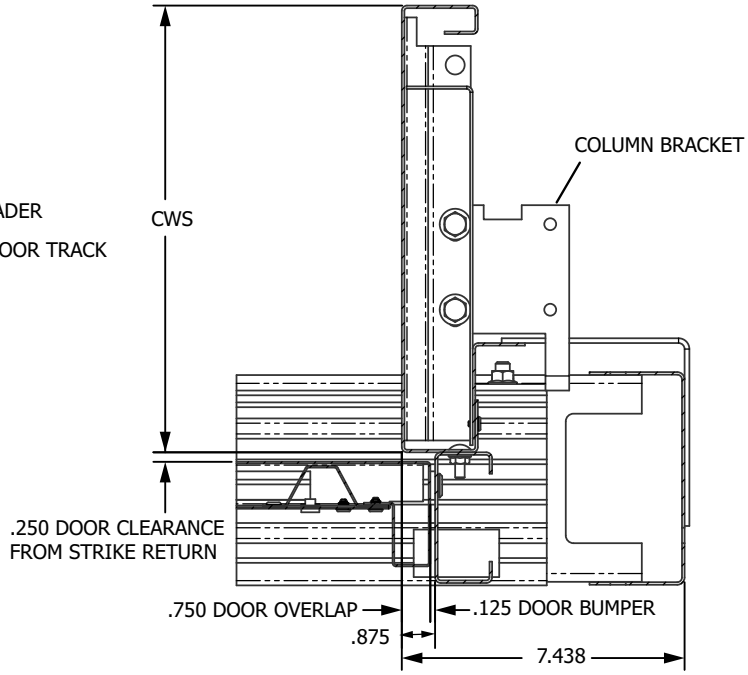
(continued)





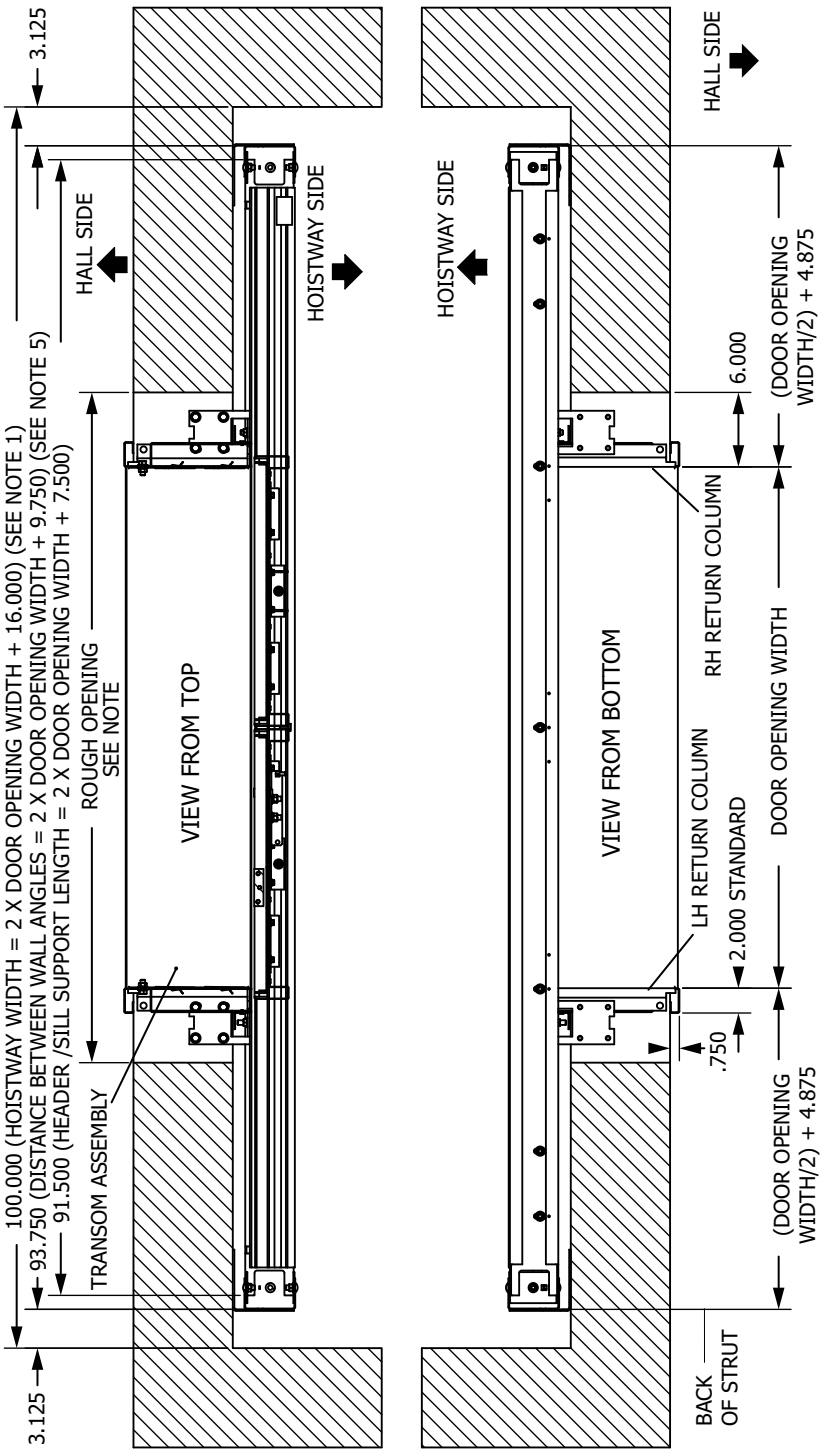
SECTION A-A
RETURN DETAIL





SECTION A-A
STRIKE RETURN DETAIL

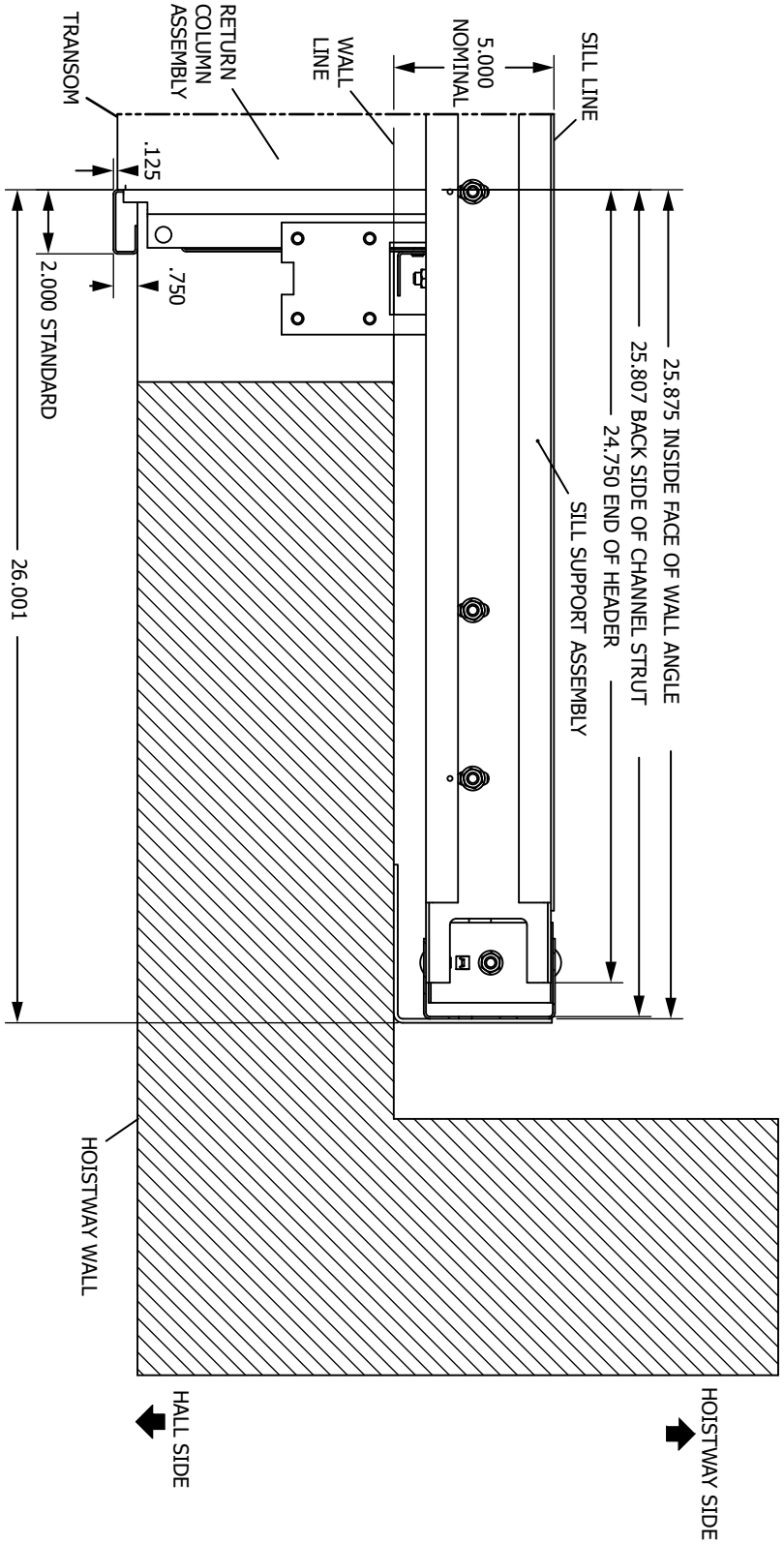
Center Opening (494AVY-C)



NOTES:
1. ENTRANCE FRAME SHOWN IS FOR A CENTER OPENING, 42.000 DOOR OPENING WIDTH WITH 7 FT. (84.000) DOORS. ALL OTHER CENTER OPENING ENTRANCE FRAMES TYPICAL.
2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.
3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.
4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JT. FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.
5. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.

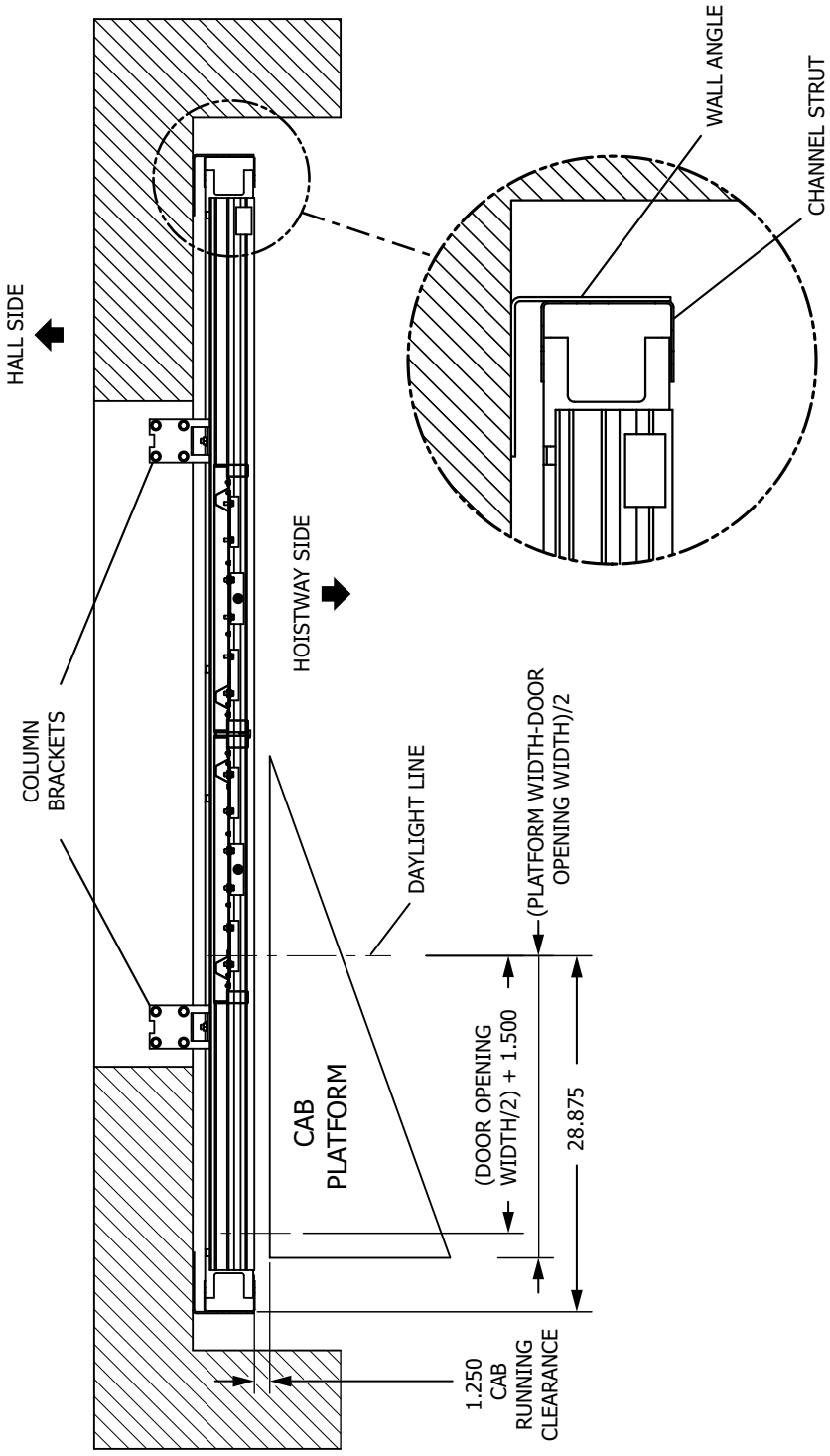
Entrance System Installation - Center Opening

(continued)



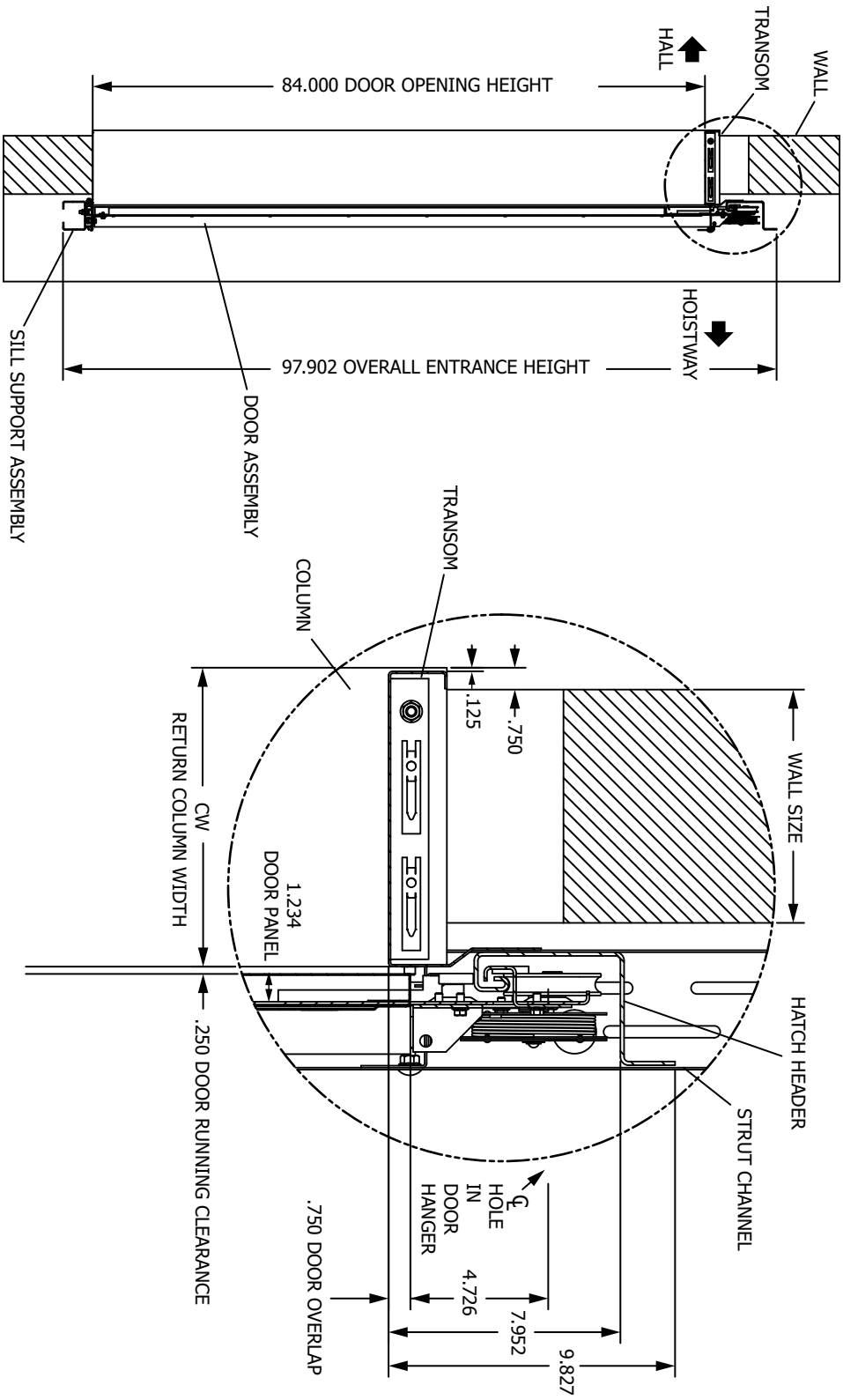
Entrance System Installation - Center Opening

(continued)



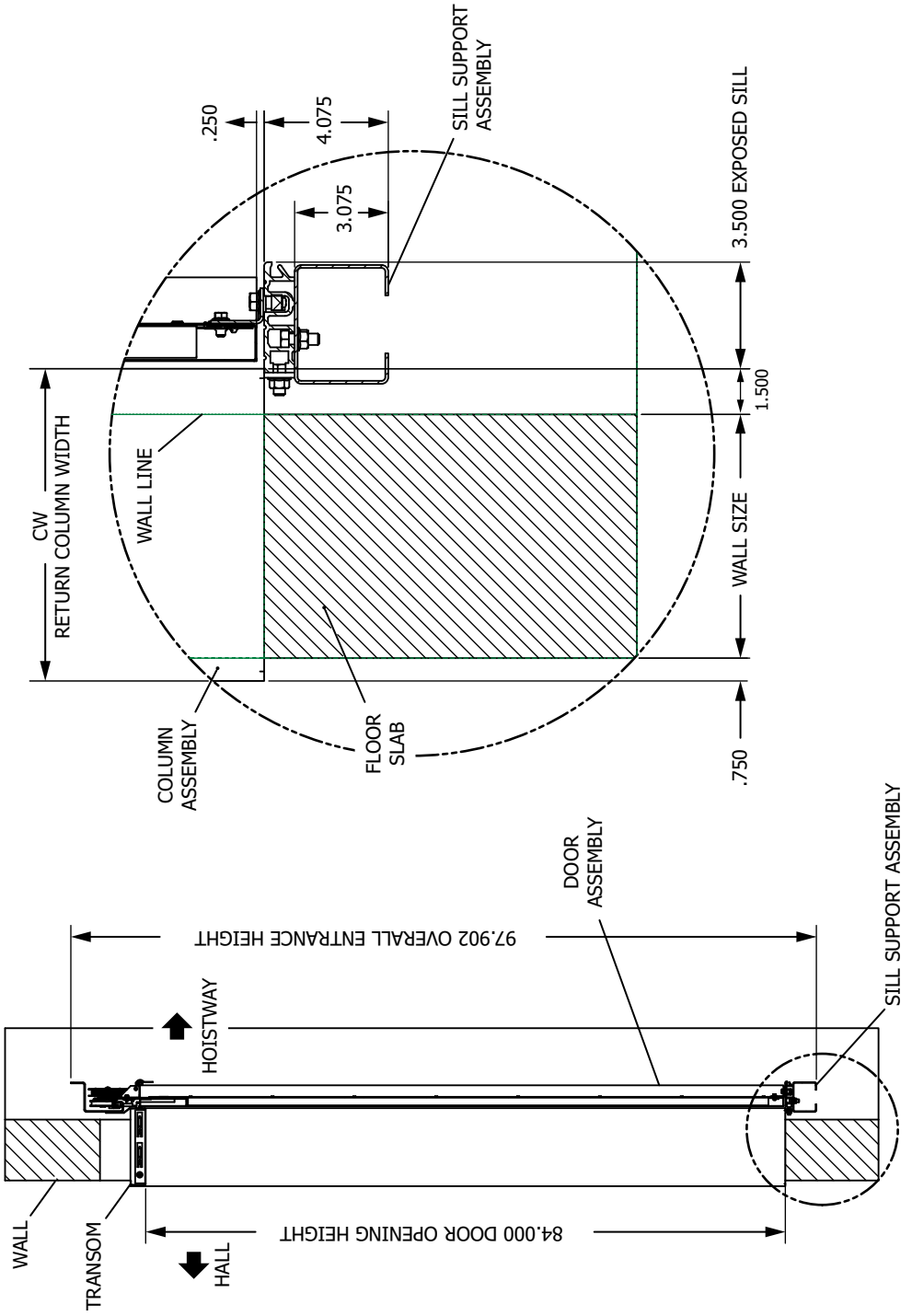
Entrance System Installation - Center Opening

(continued)



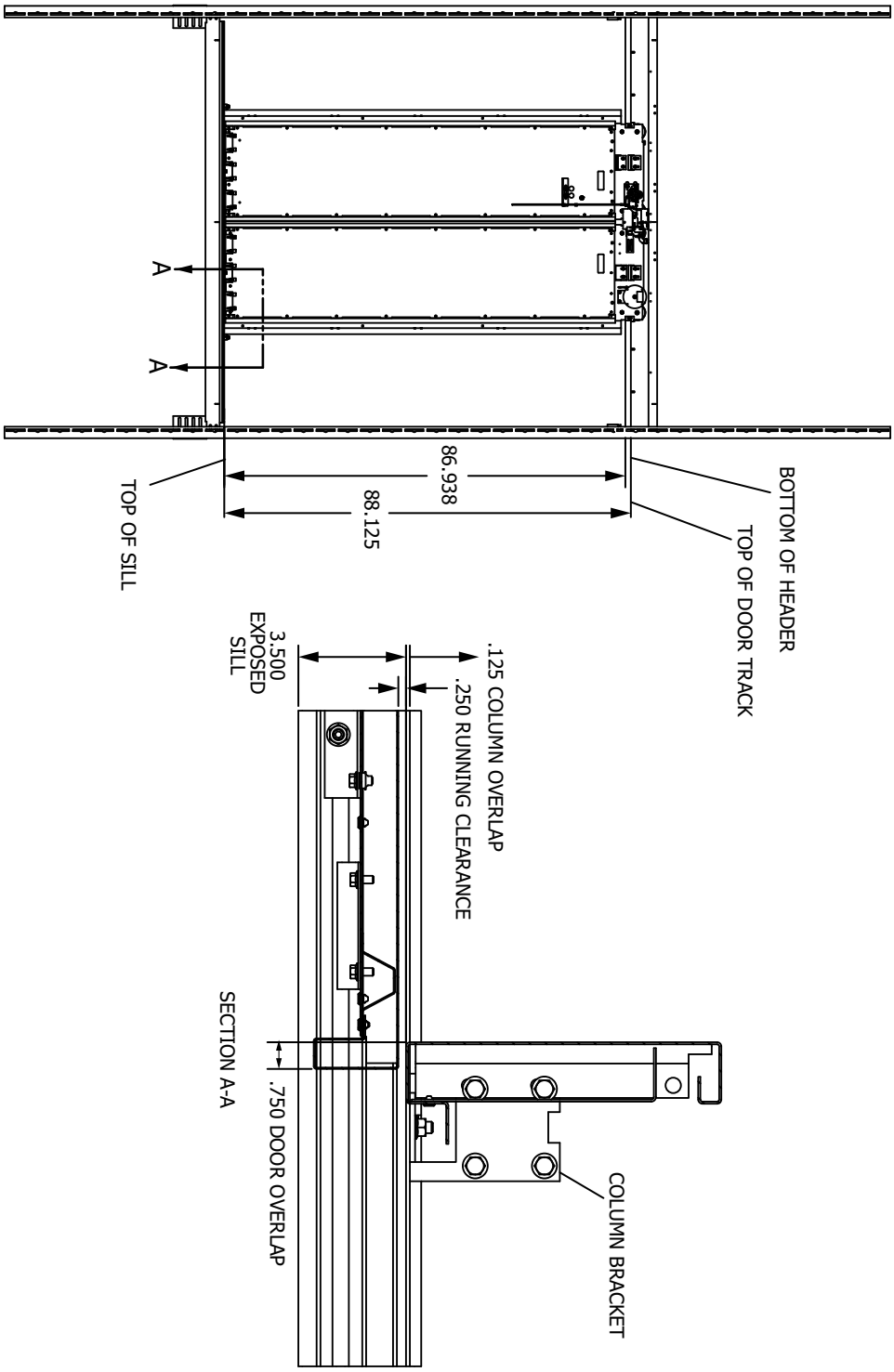
Entrance System Installation - Center Opening

(continued)



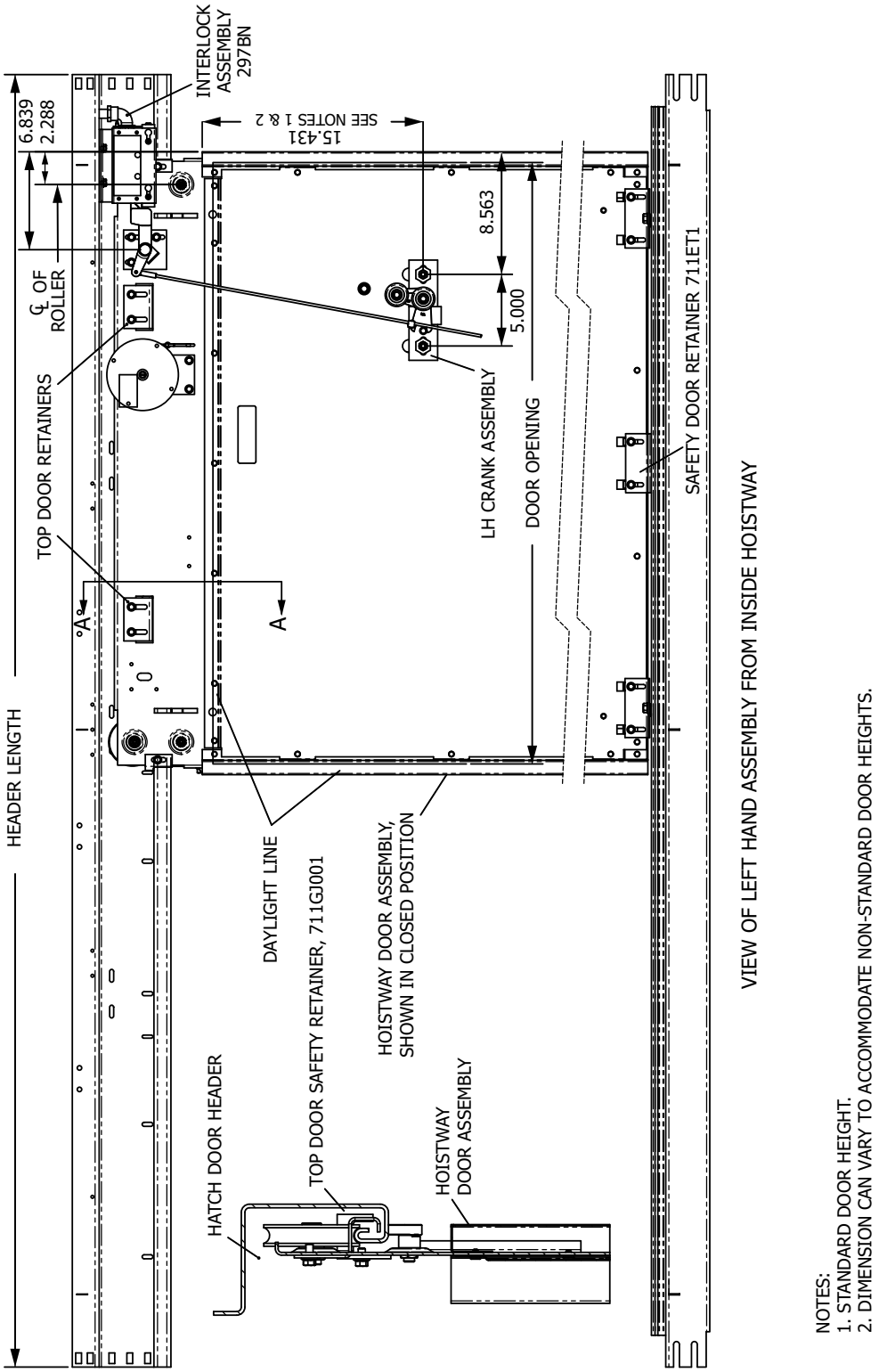
Entrance System Installation - Center Opening

(continued)



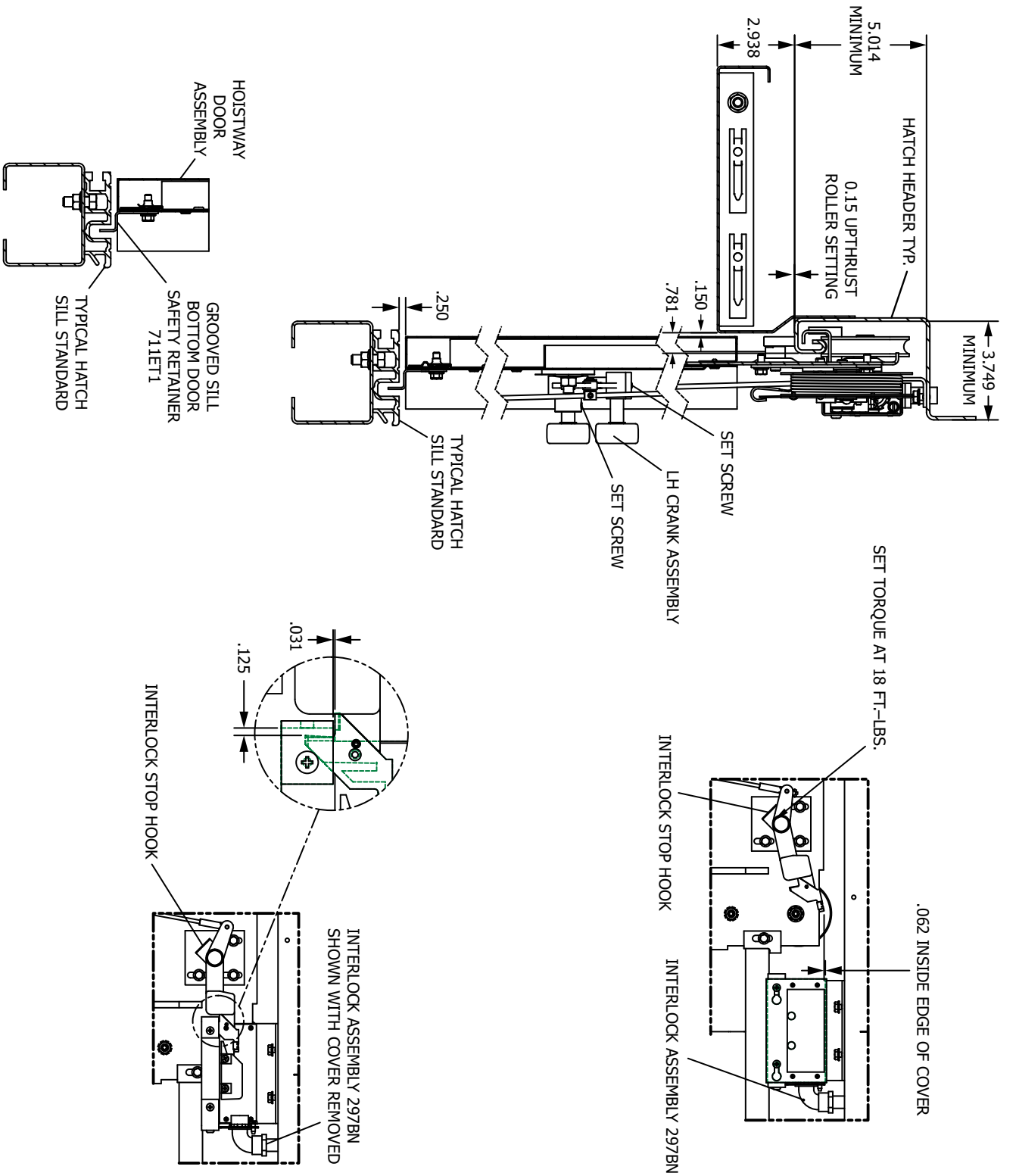
Hatch Hanger Assembly Installation

Single Speed (494ACY-E)

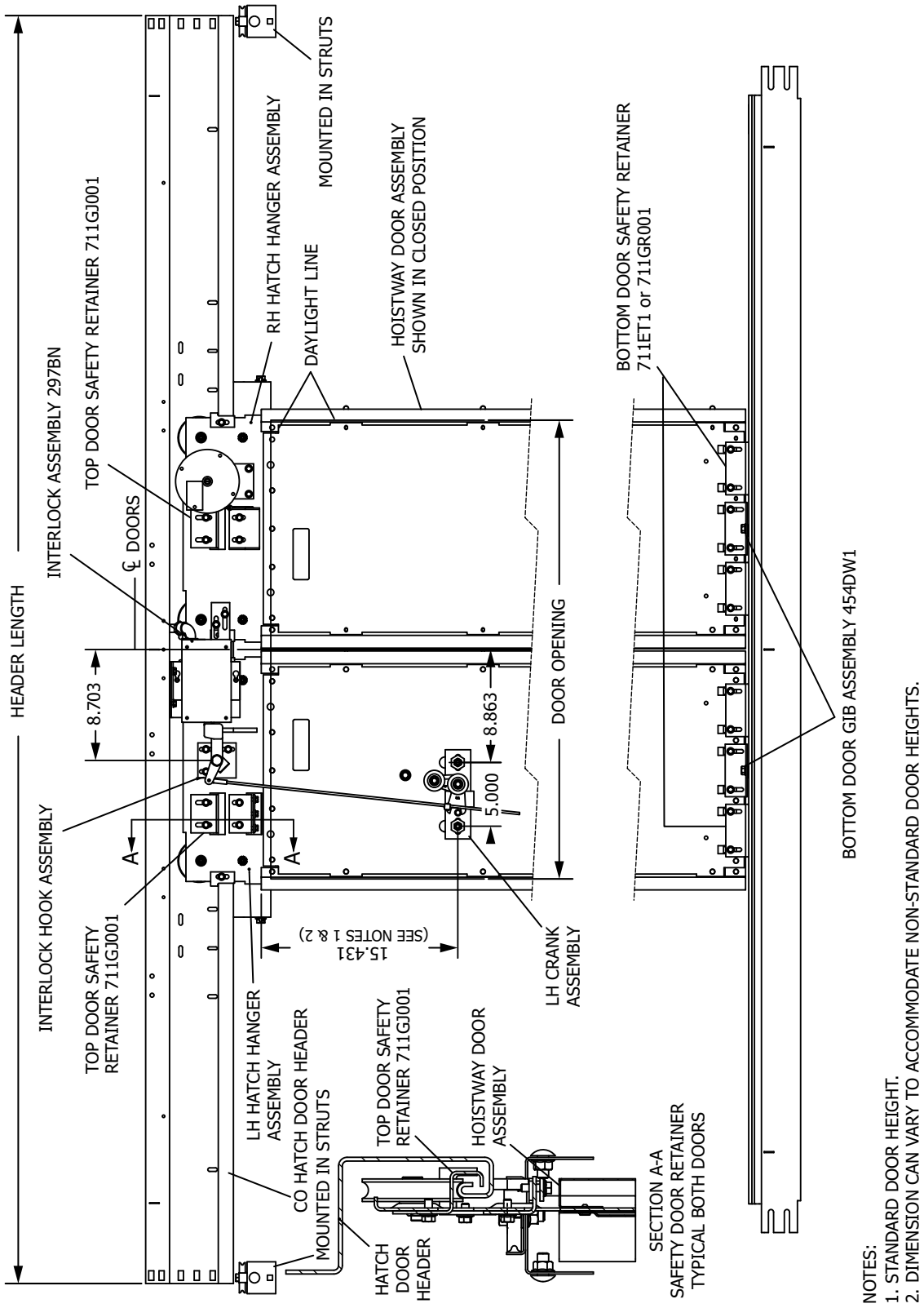


Hatch Hanger Assembly Installation - Single Speed

(continued)

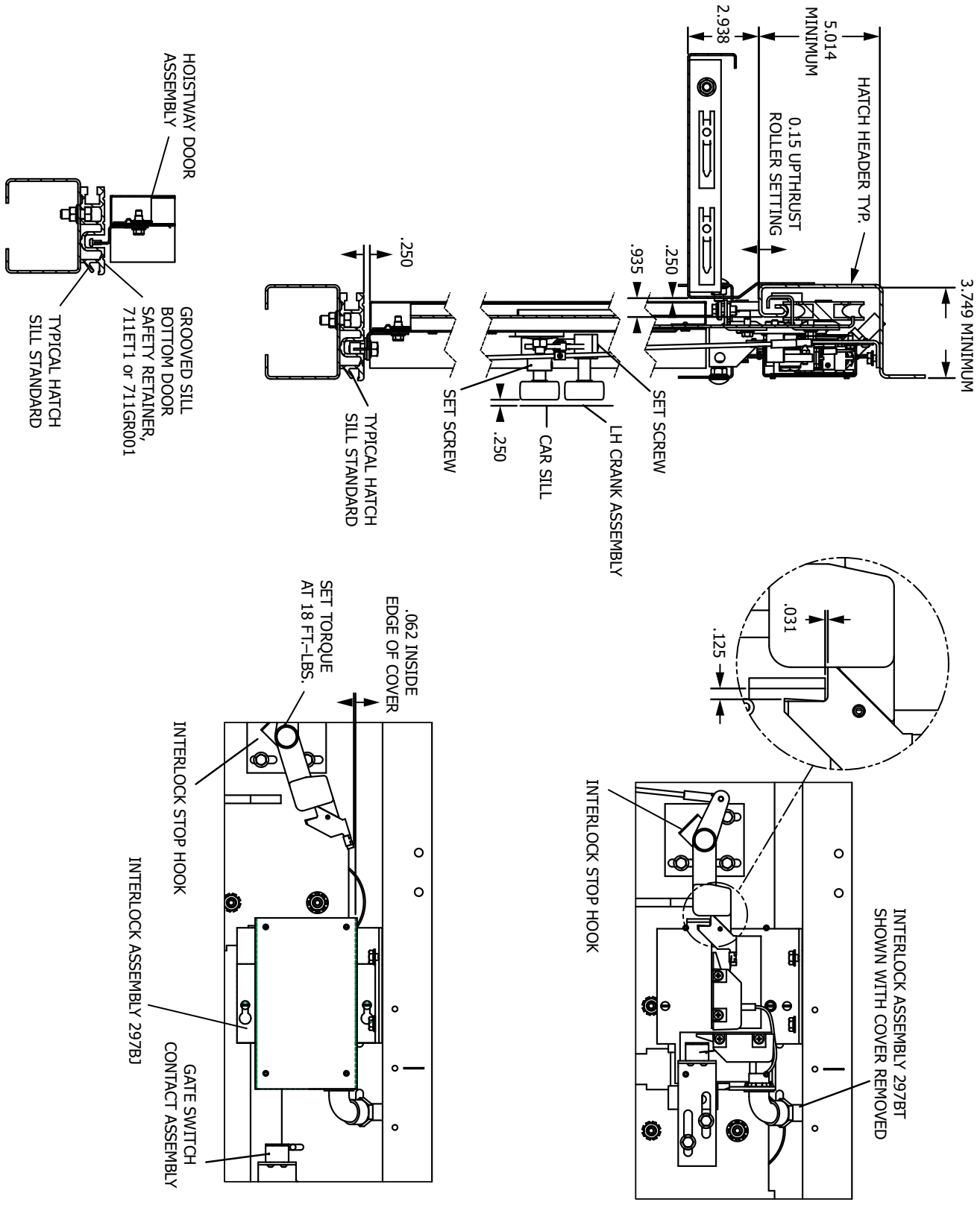


Center Opening (494ADA-E)



Hatch Hanger Assembly Installation - Center Opening

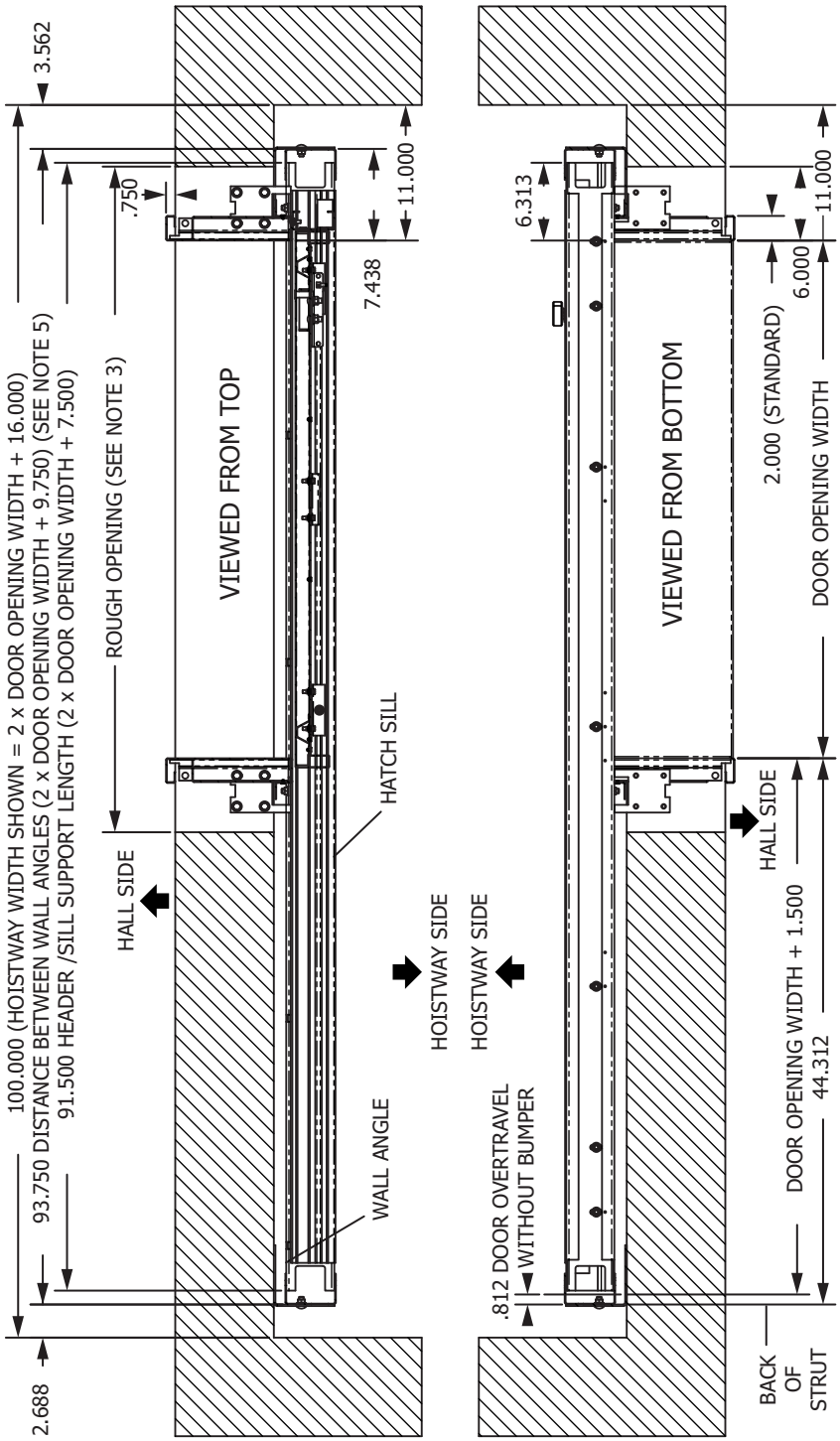
(continued)



Hanger Mounted Interlock Rollers

Entrance System Installation

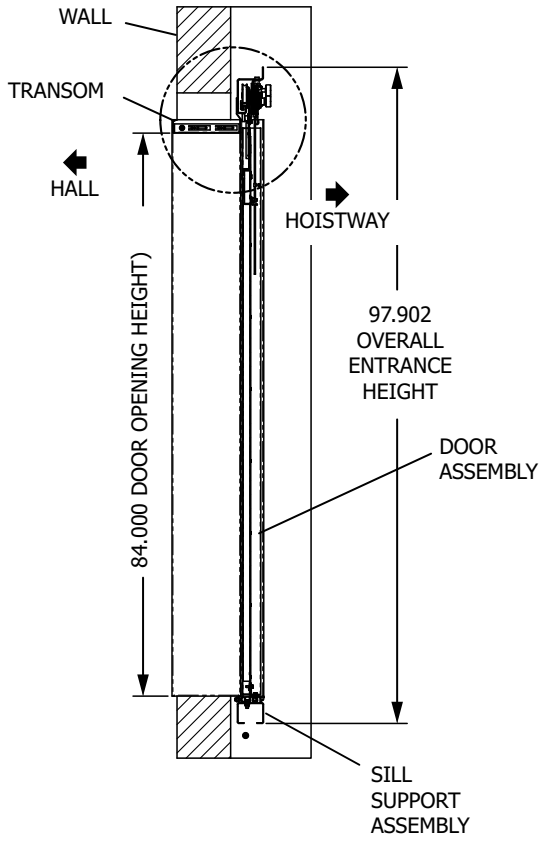
Single Speed (494BFE-A)

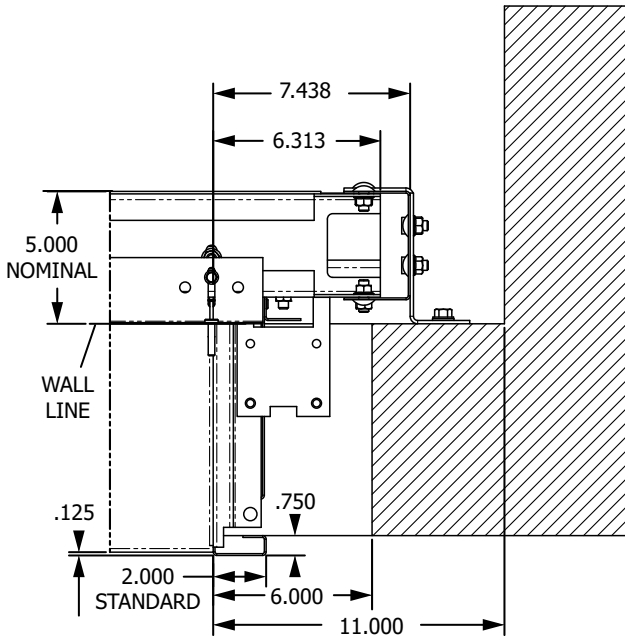


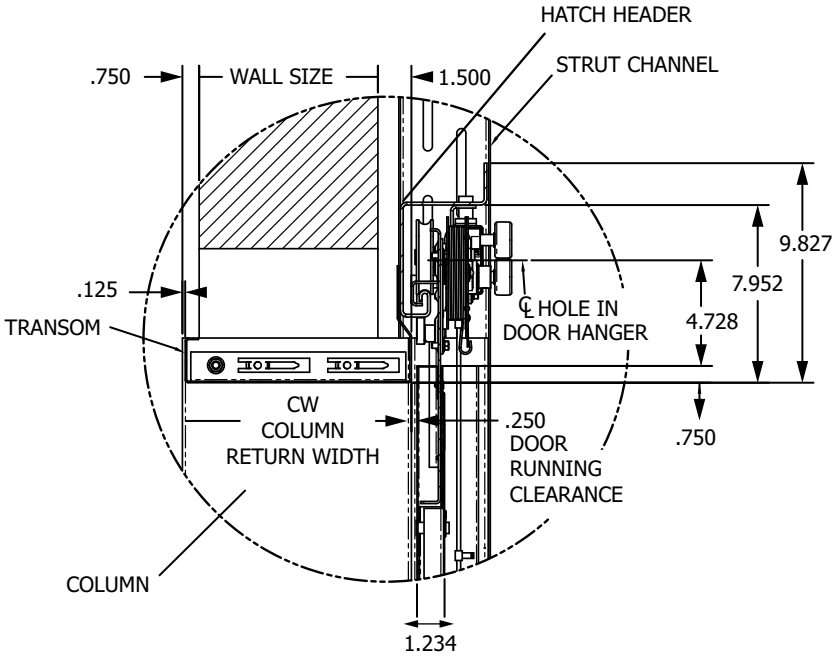
NOTES:
1. ENTRANCE FRAME SHOWN IS FOR A SINGLE SPEED (LEFT HAND), 42.000 DOOR OPENING WIDTH WITH 7 FT. (84.000) DOORS. ALL OTHER SINGLE SPEED ENTRANCE FRAMES TYPICAL.
2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.
3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.
4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JT. FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.
5. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.

Entrance System Installation - Single Speed (494BFE-A)

(continued)

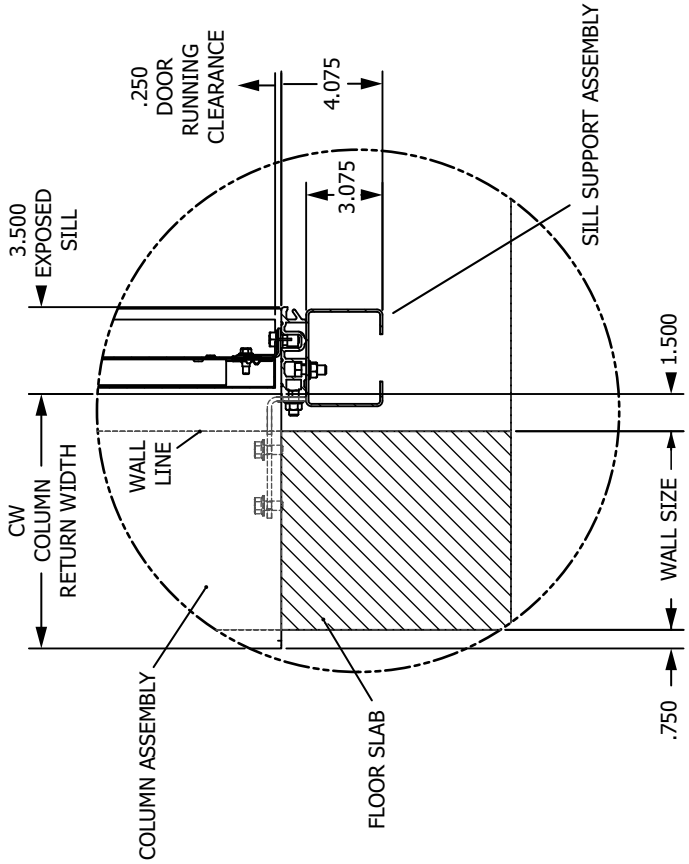


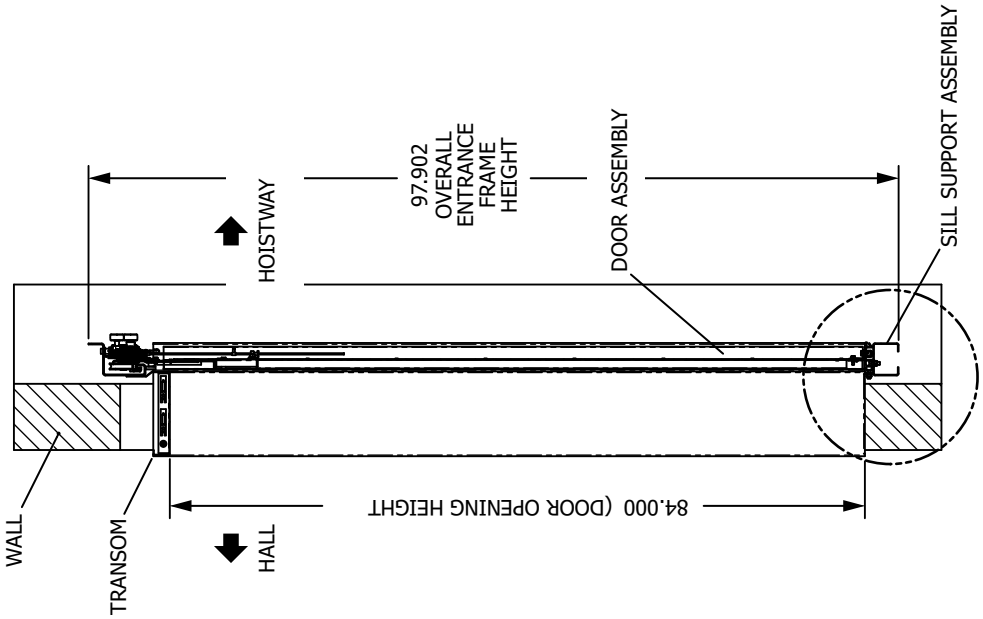




Entrance System Installation - Single Speed (494BFE-A)

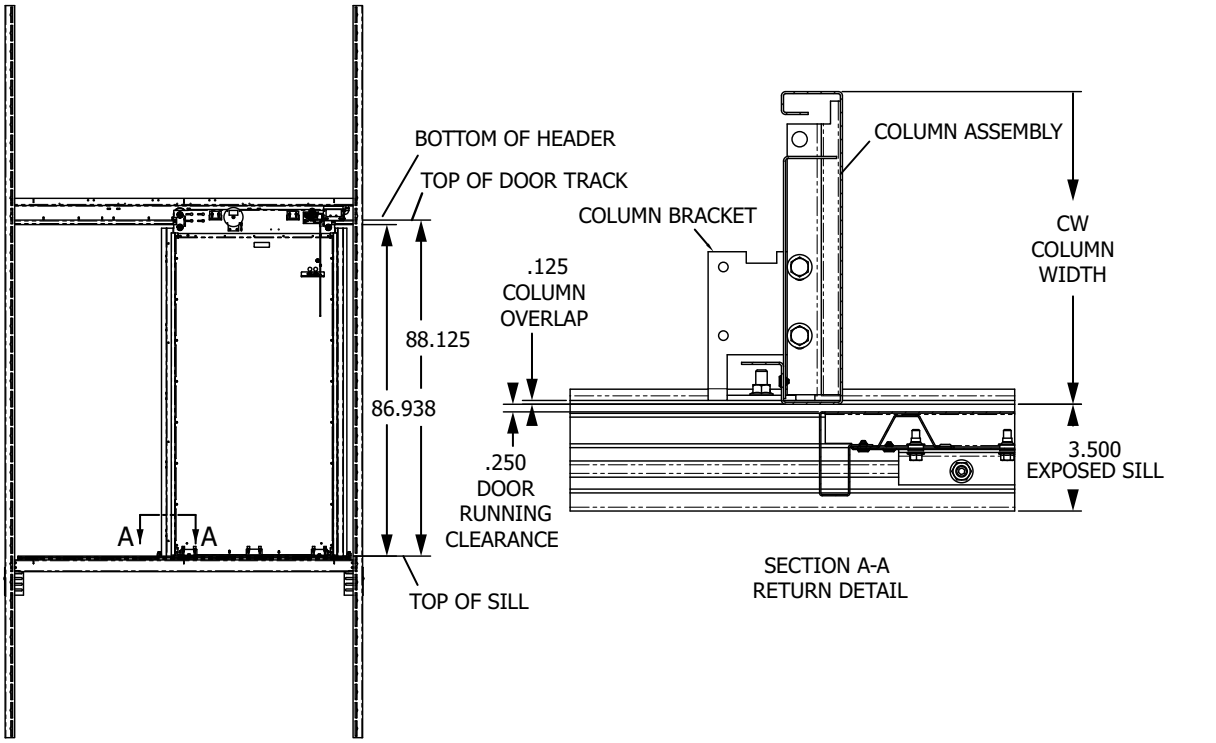
(continued)

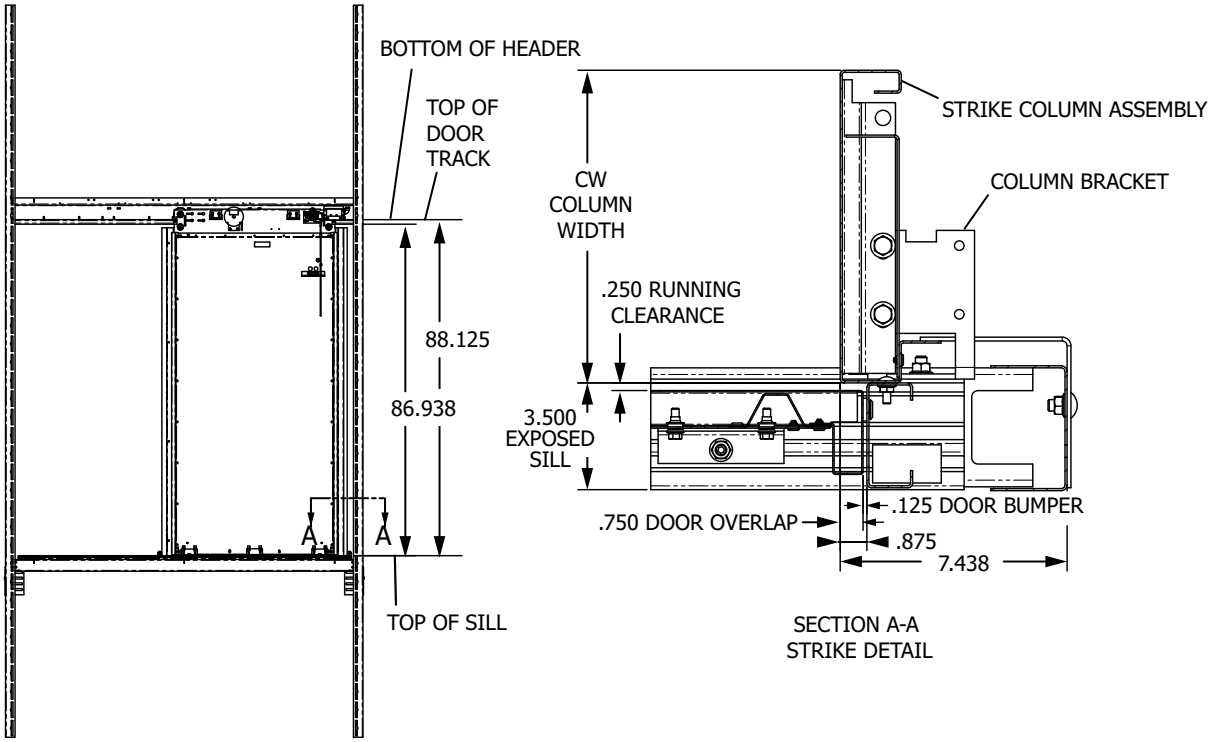




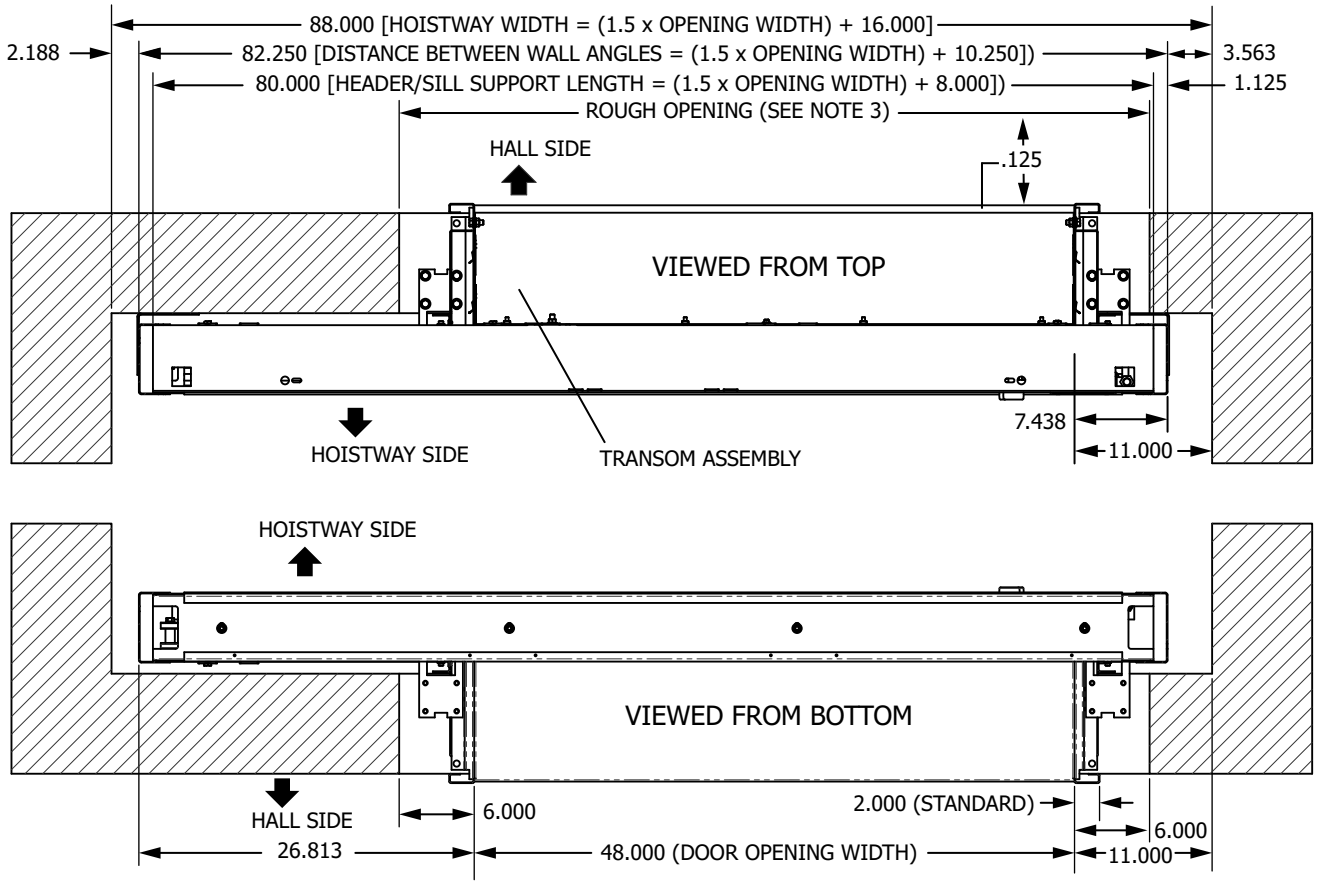
Entrance System Installation - Single Speed (494BFE-A)

(continued)





Two Speed (494BFH-B)

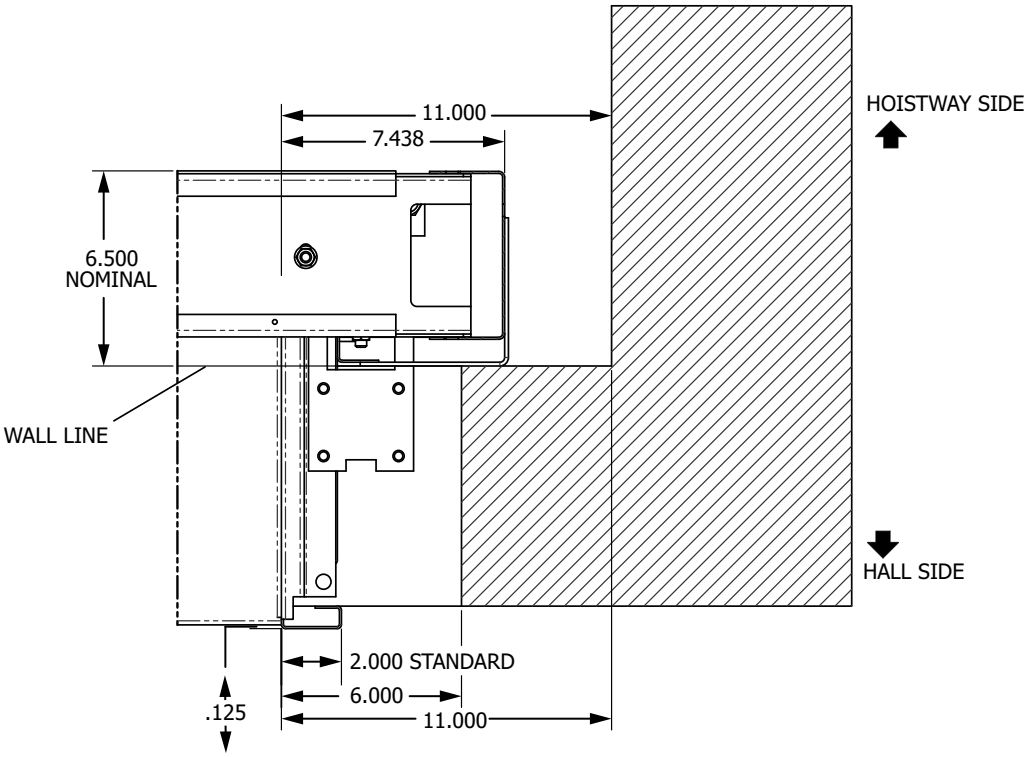


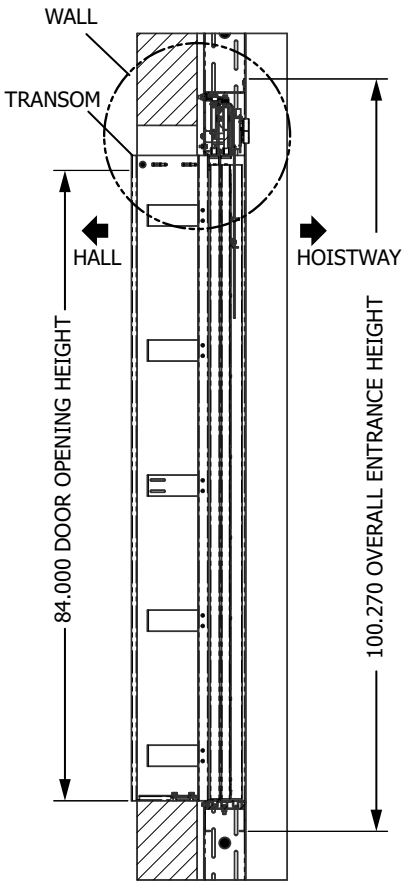
NOTES:

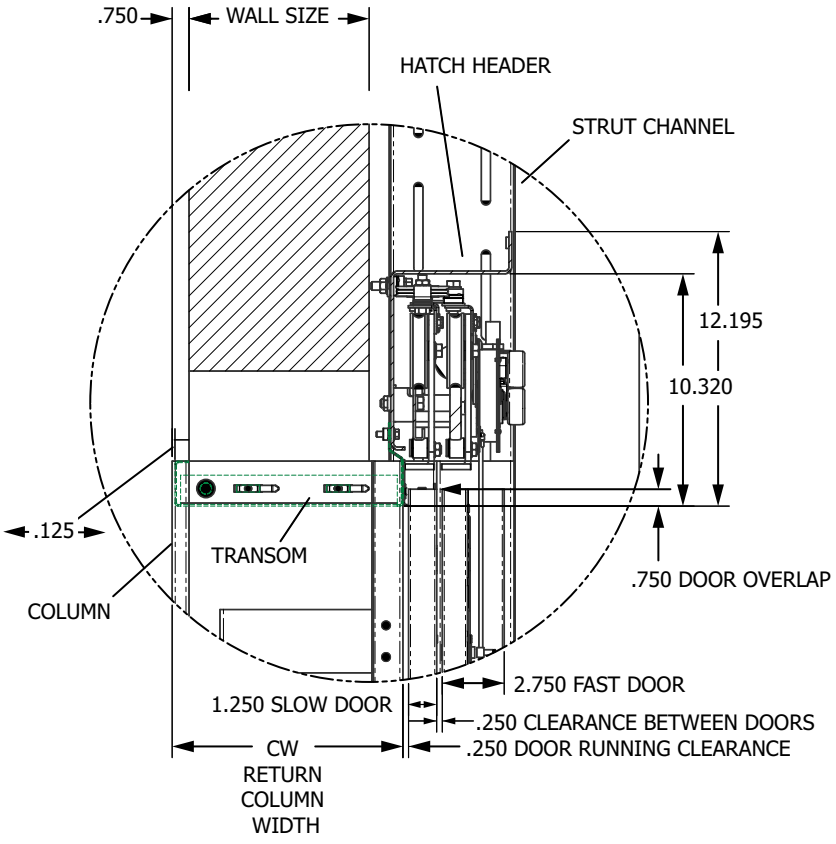
1. ENTRANCE FRAME SHOWN IS FOR A SINGLE SPEED (LEFT HAND), 42.000 DOOR OPENING WIDTH WITH 7 FT. (84.000) DOORS. ALL OTHER SINGLE SPEED ENTRANCE FRAMES TYPICAL.
2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.
3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.
4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JT. FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.
5. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.

Entrance System Installation - Two Speed

(continued)

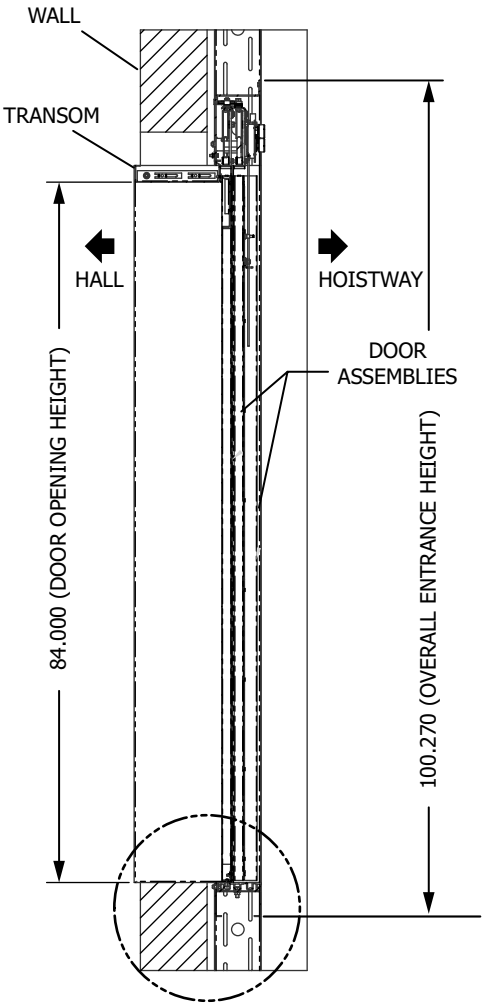


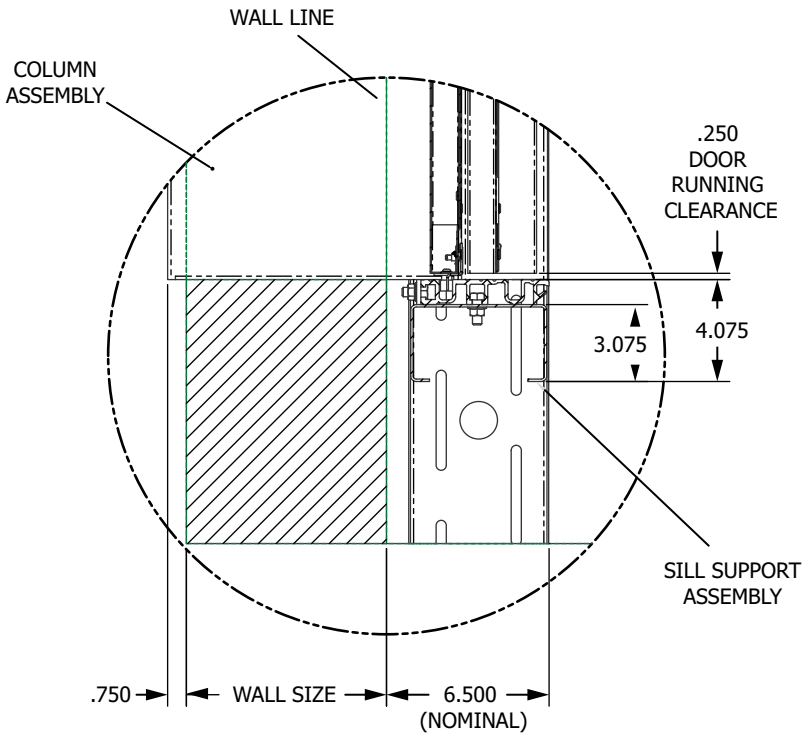




Entrance System Installation - Two Speed

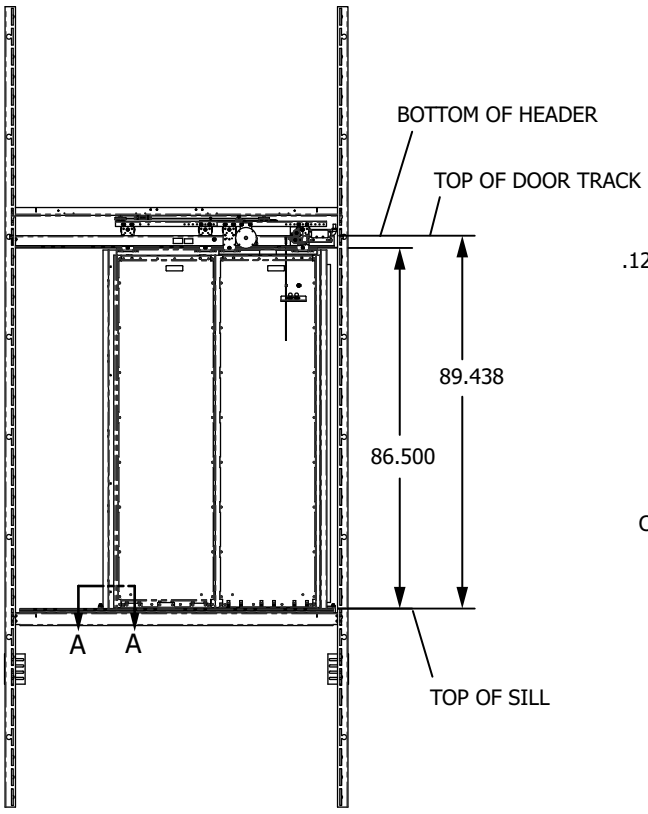
(continued)

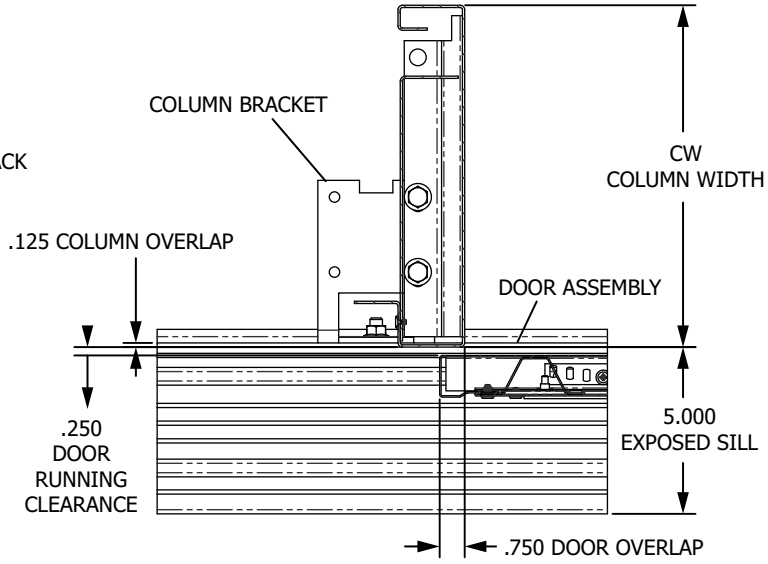




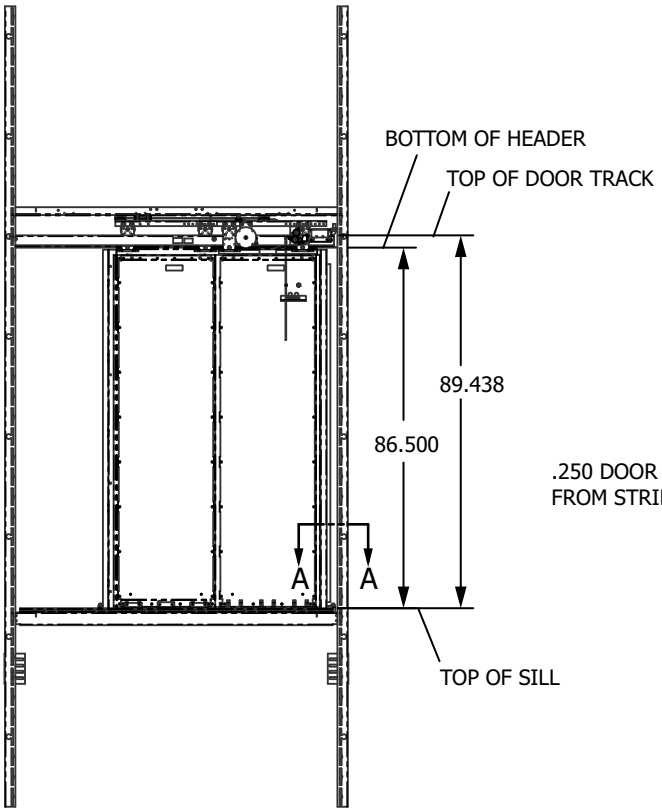
Entrance System Installation - Two Speed

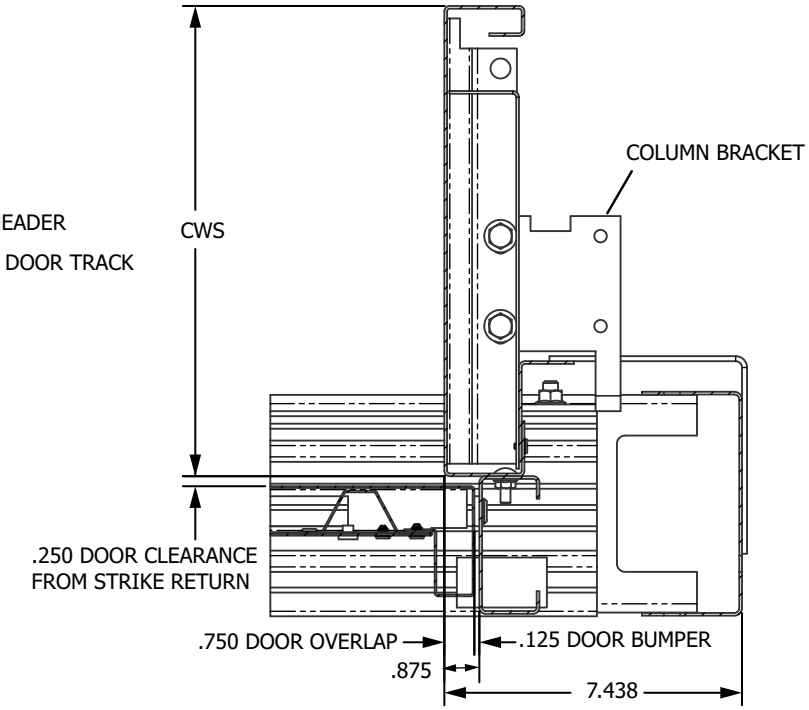
(continued)





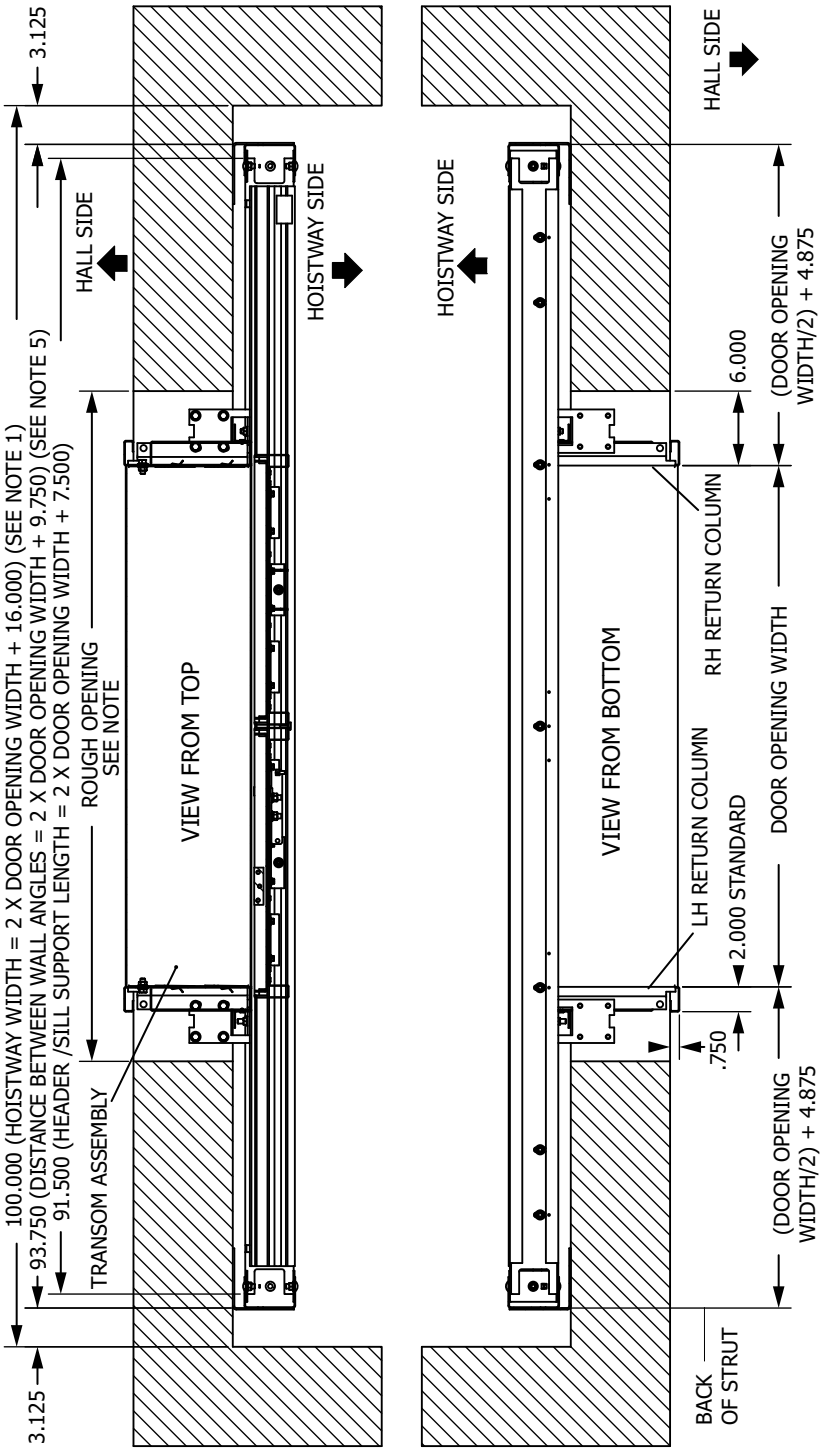
SECTION A-A
RETURN DETAIL





SECTION A-A
STRIKE RETURN DETAIL

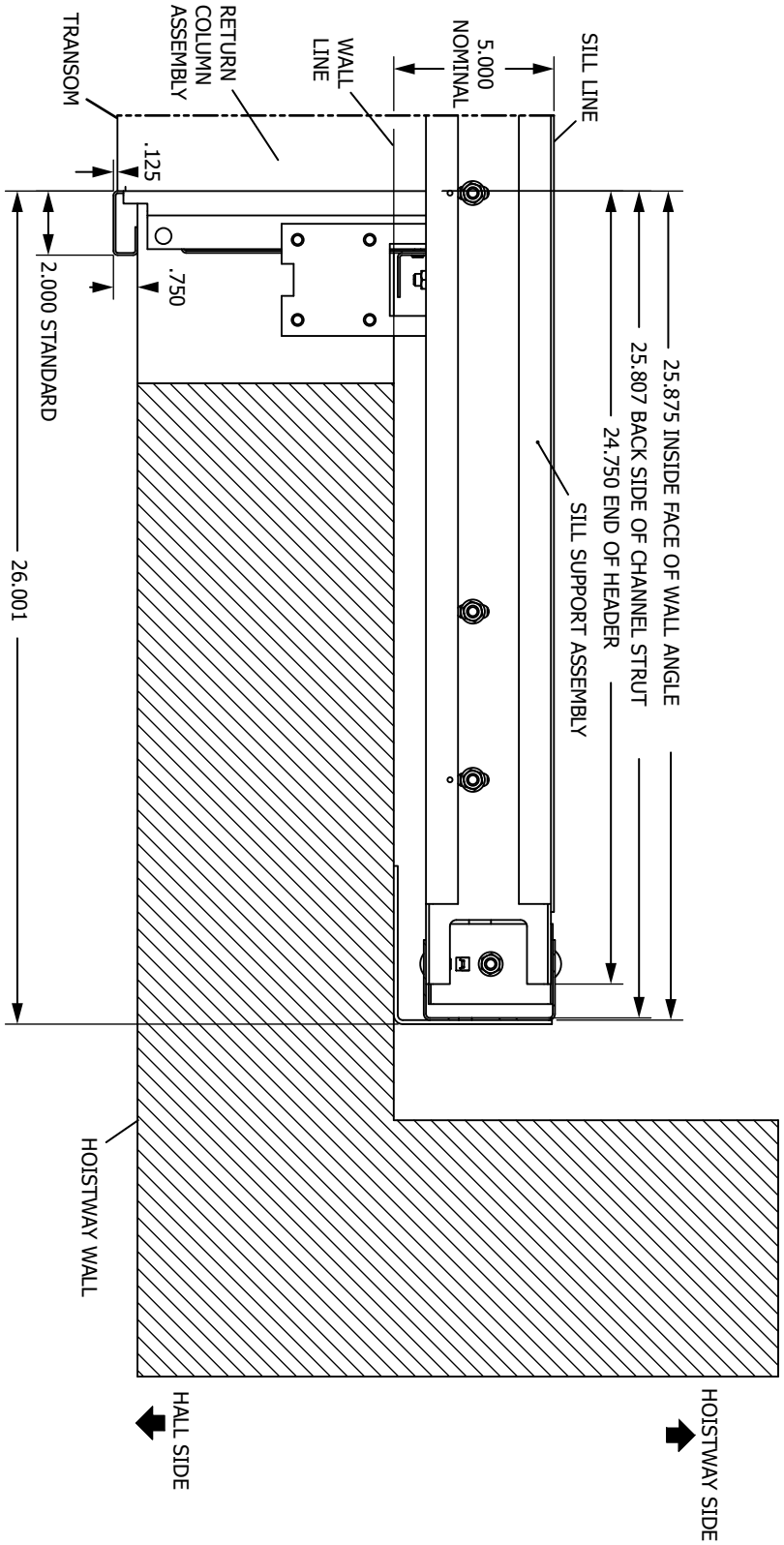
Center Opening (494BFG-A)



NOTES:
1. ENTRANCE FRAME SHOWN IS FOR A CENTER OPENING, 42.000 DOOR OPENING WIDTH WITH 7 FT. (84.000) DOORS. ALL OTHER CENTER OPENING ENTRANCE FRAMES TYPICAL.
2. FOR ENTRANCE FRAME ASSEMBLY DETAILS, SEE KIT, BOLT, ENTRANCE, DRAWING NUMBER 200BDR.
3. MINIMUM ROUGH OPENING: 12.000 WIDER AND 6.000 HIGHER THAN FRAME OPENING.
4. FOR MASONRY HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JT. FOR DRYWALL HOISTWAY WALL INTERFACE DETAILS, SEE DRAWING NUMBER 494JV.
5. THIS DIMENSION IS BETWEEN THE INSIDE FACES OF THE WALL ANGLES.

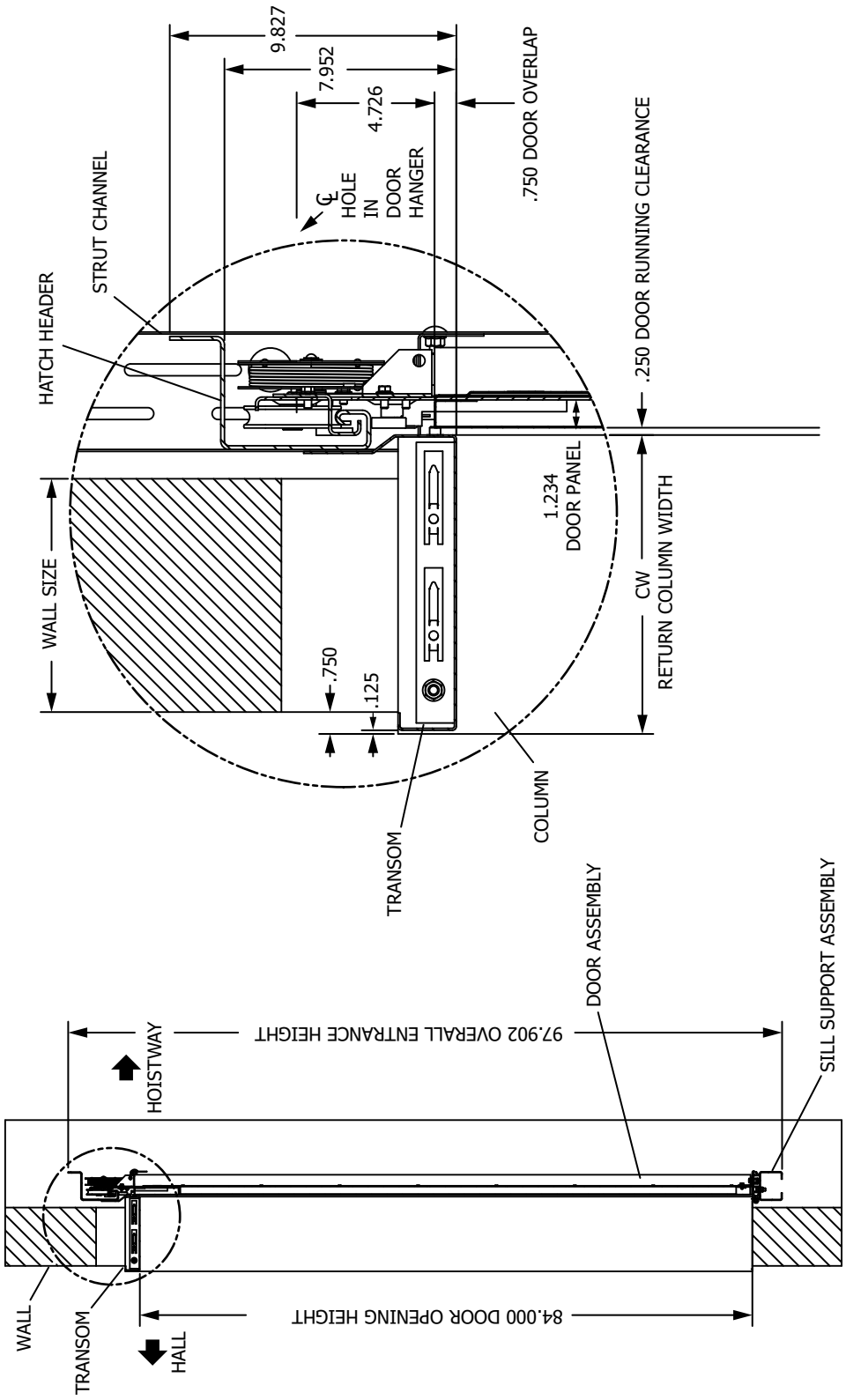
Entrance System Installation - Center Opening

(continued)



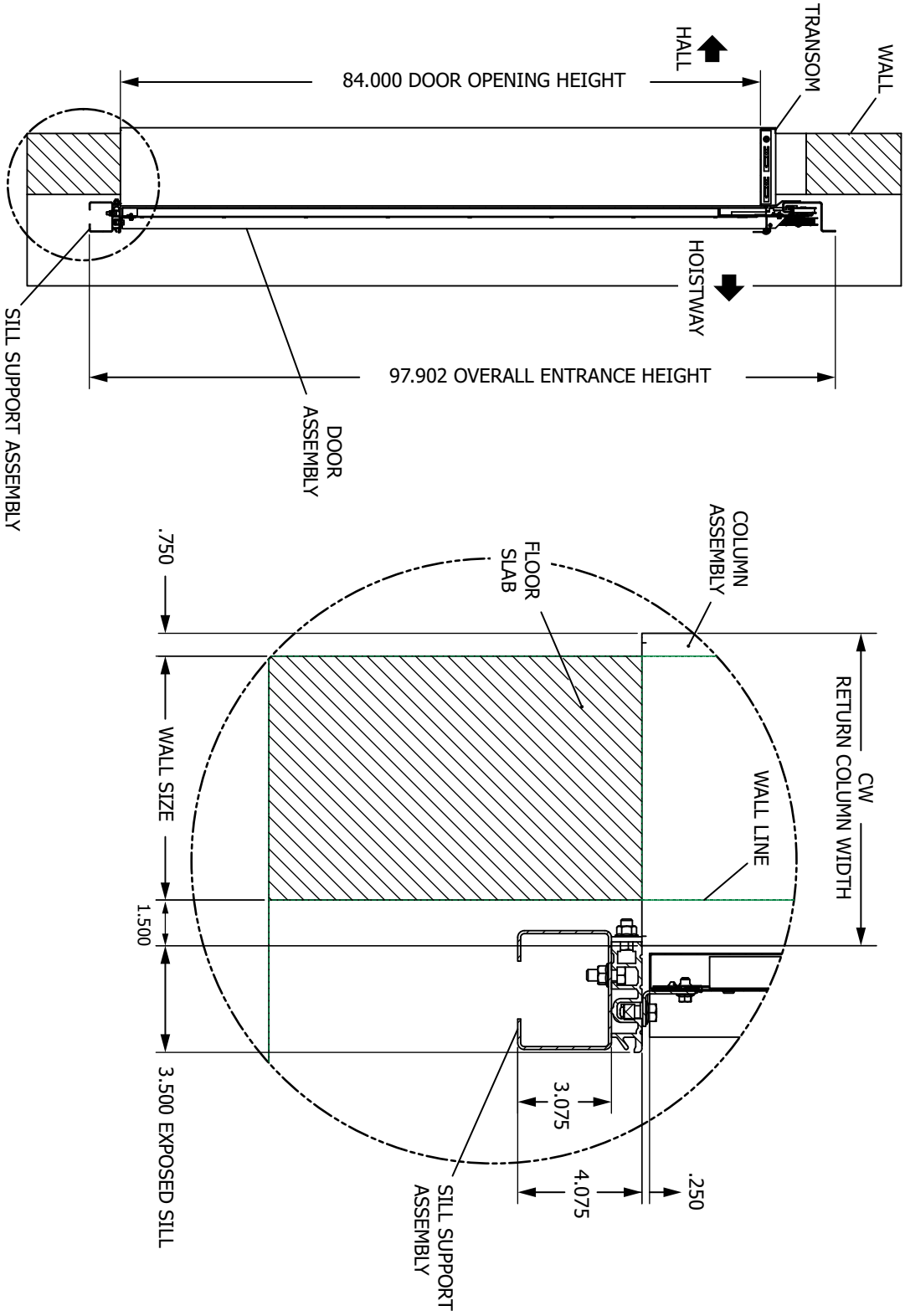
Entrance System Installation - Center Opening

(continued)



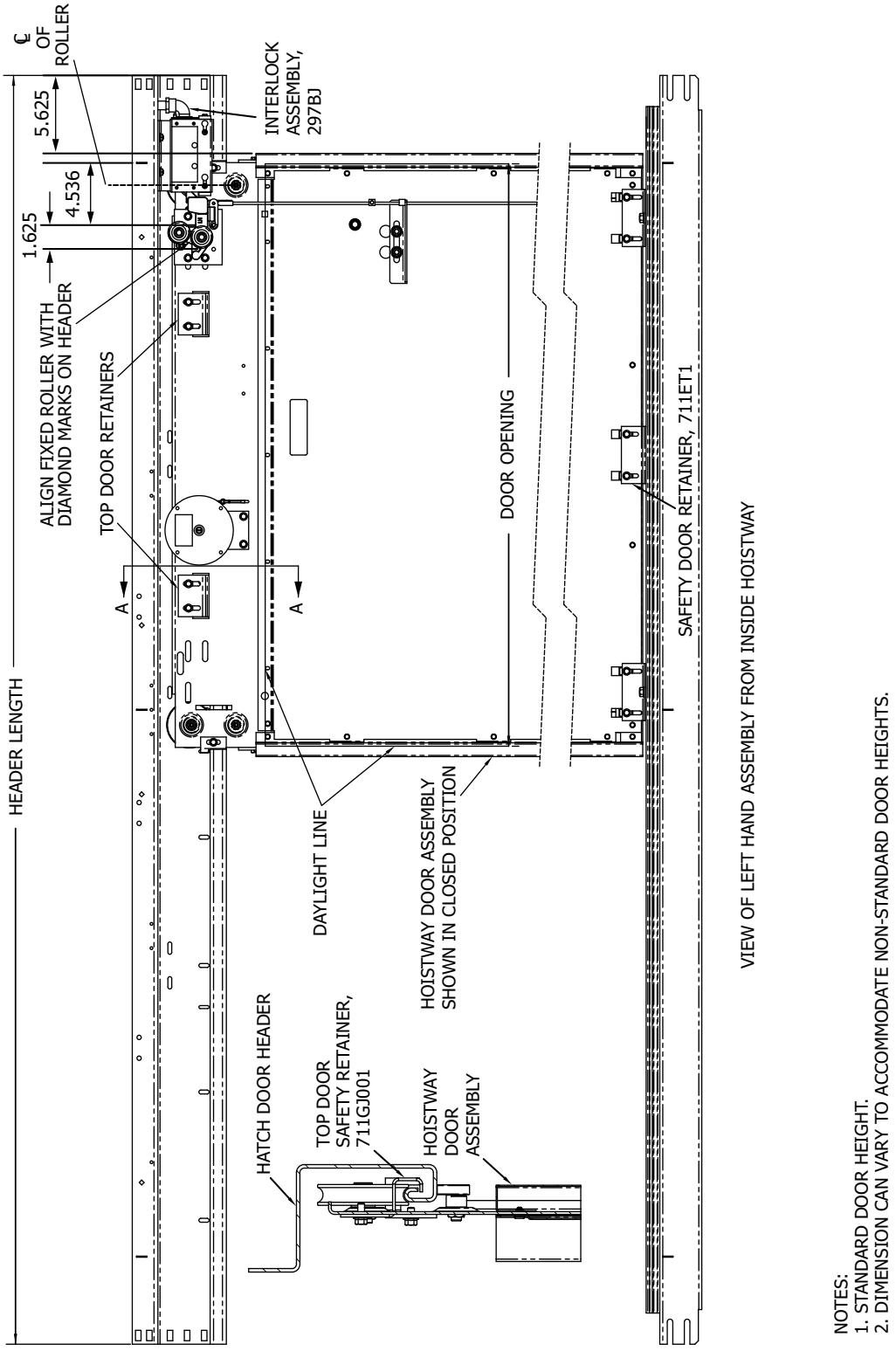
Entrance System Installation - Center Opening

(continued)



Hatch Hanger Assembly Installation

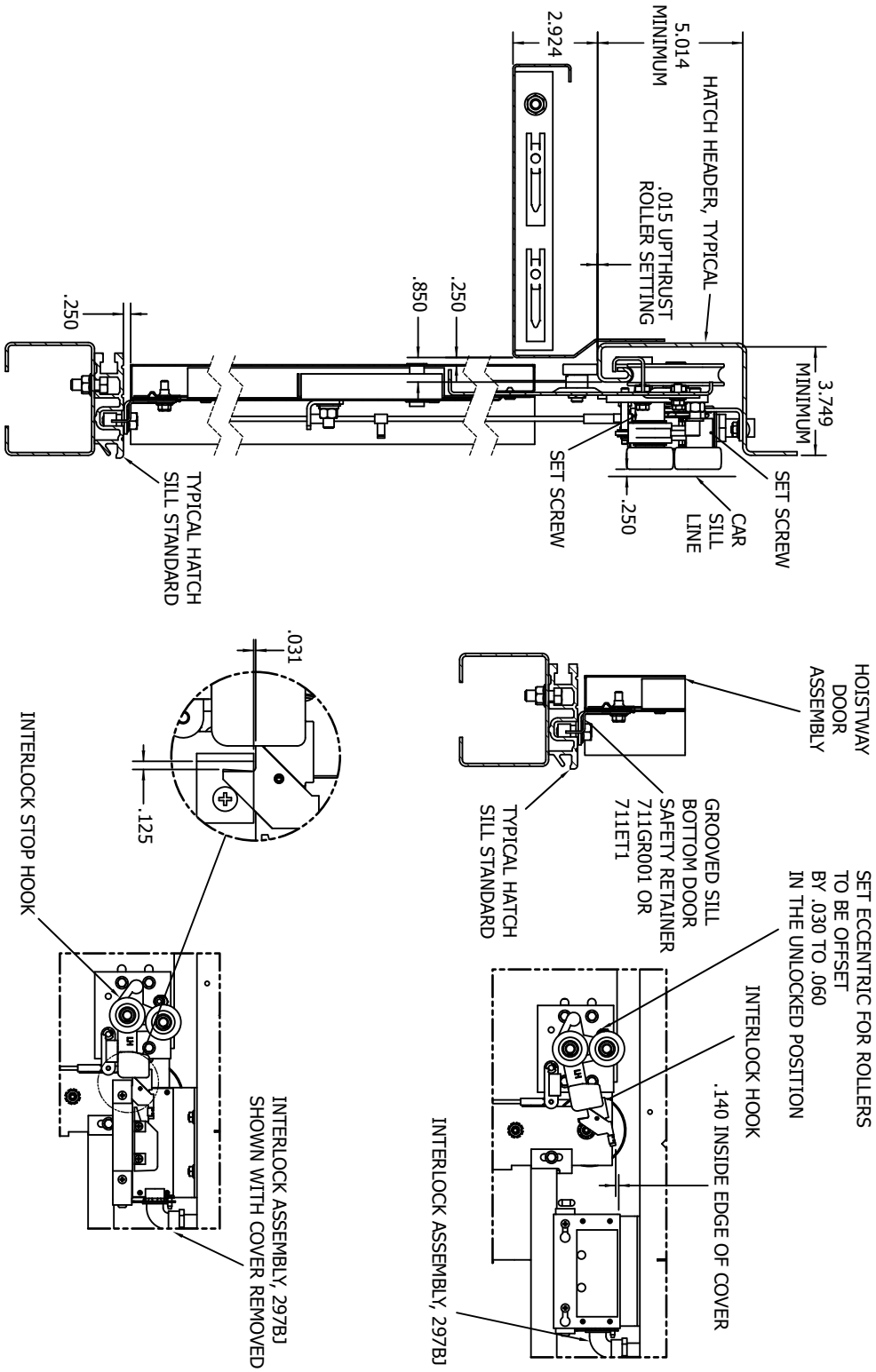
Single Speed (494BFD-D)



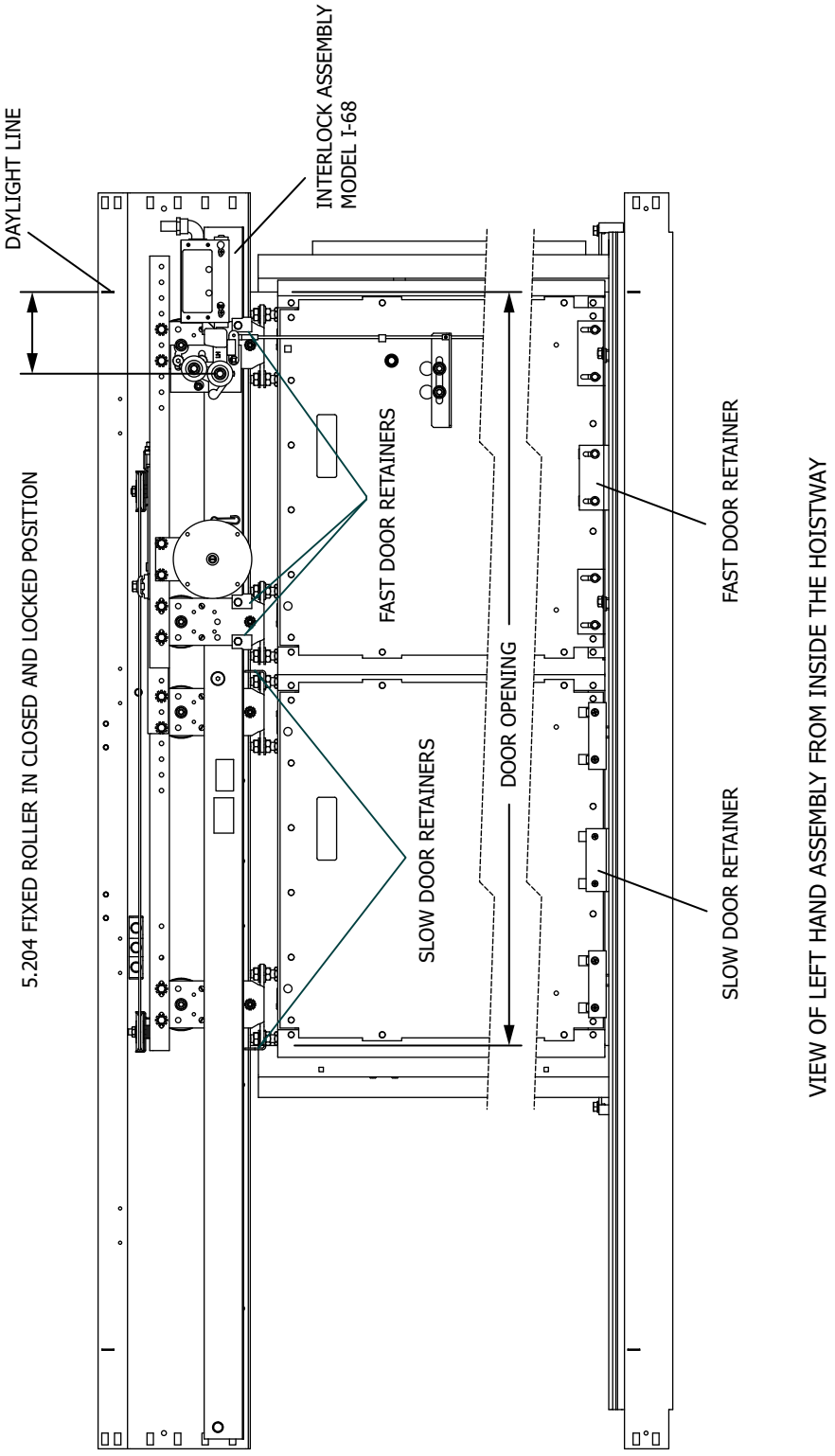
NOTES:
1. STANDARD DOOR HEIGHT.
2. DIMENSION CAN VARY TO ACCOMMODATE NON-STANDARD DOOR HEIGHTS.

Hatch Hanger Assembly Installation - Single Speed

(continued)

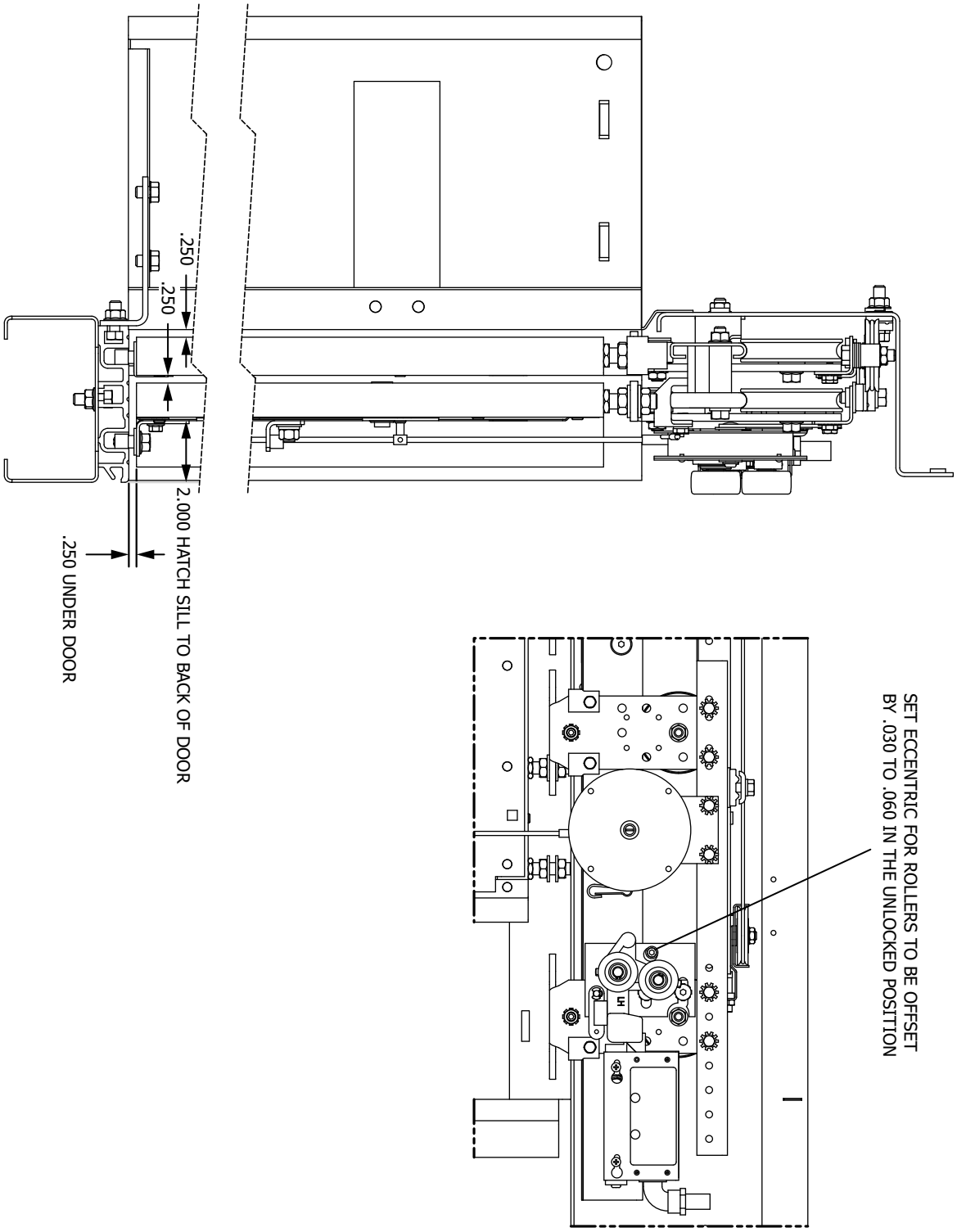


Two Speed (494BKD-A)

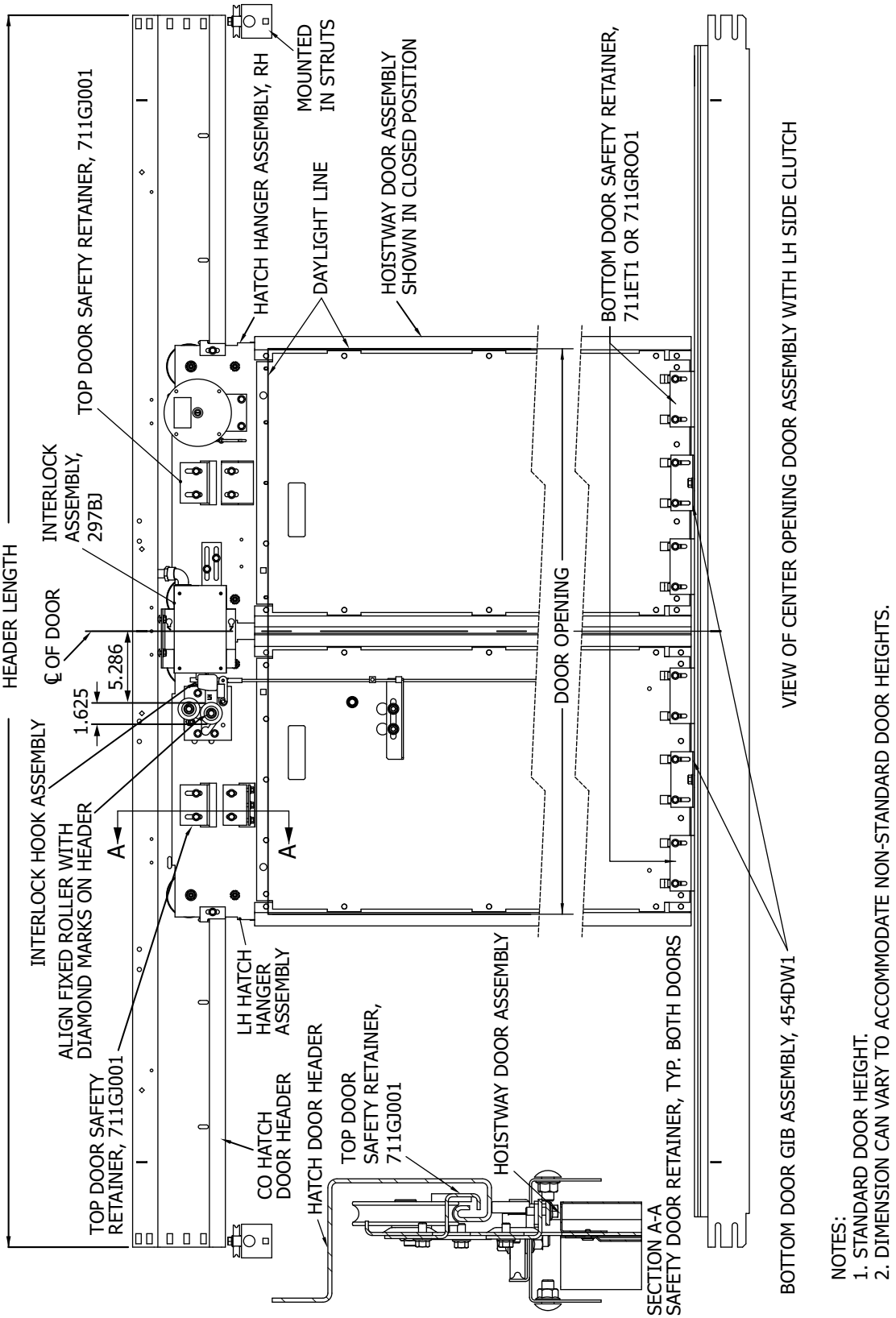


Hatch Hanger Assembly Installation - Two Speed

(continued)

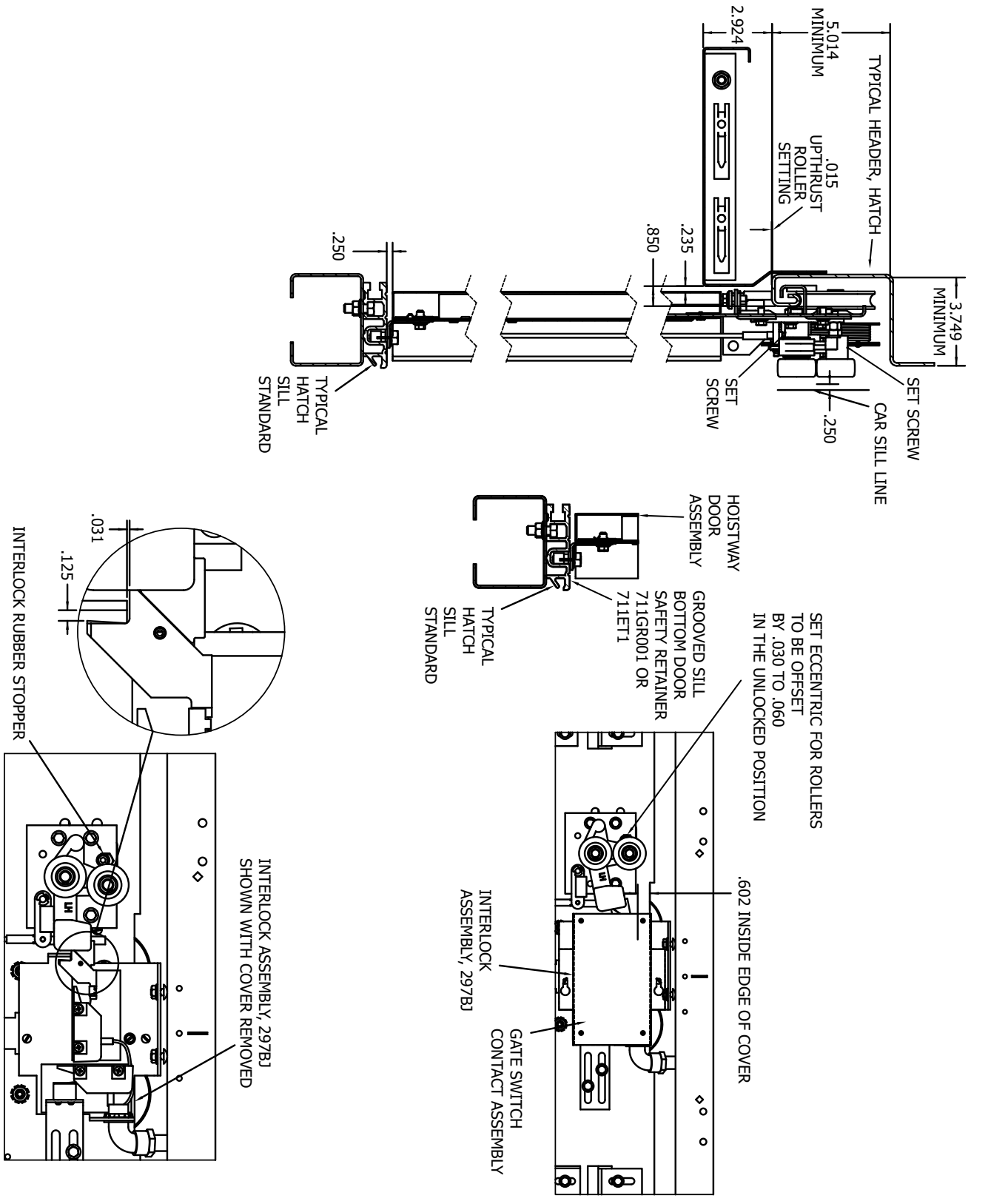


Center Opening (494BFF-D)

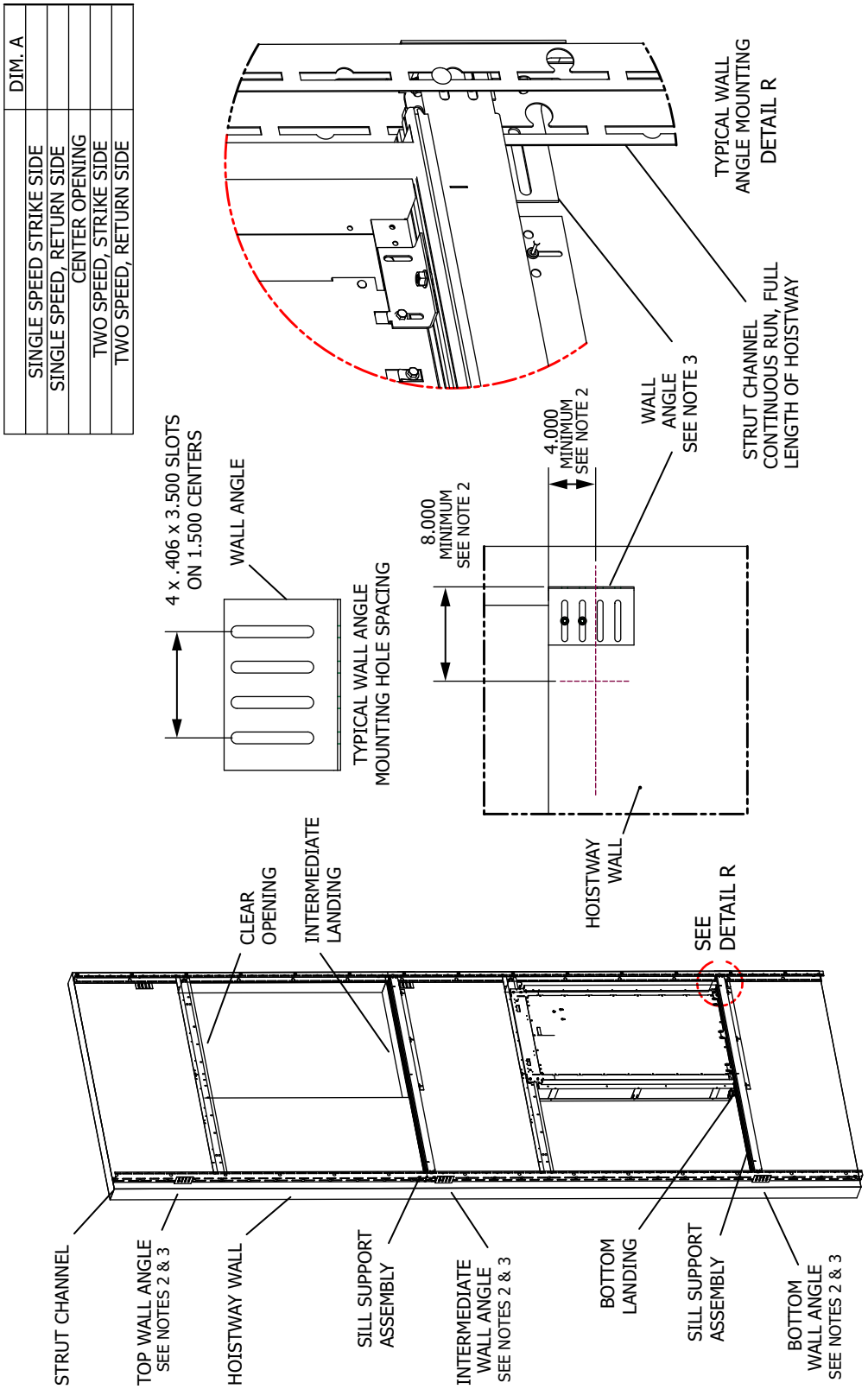


Hatch Hanger Assembly Installation - Center Opening

(continued)



Sill Support Assembly Installation (494ACX-D)

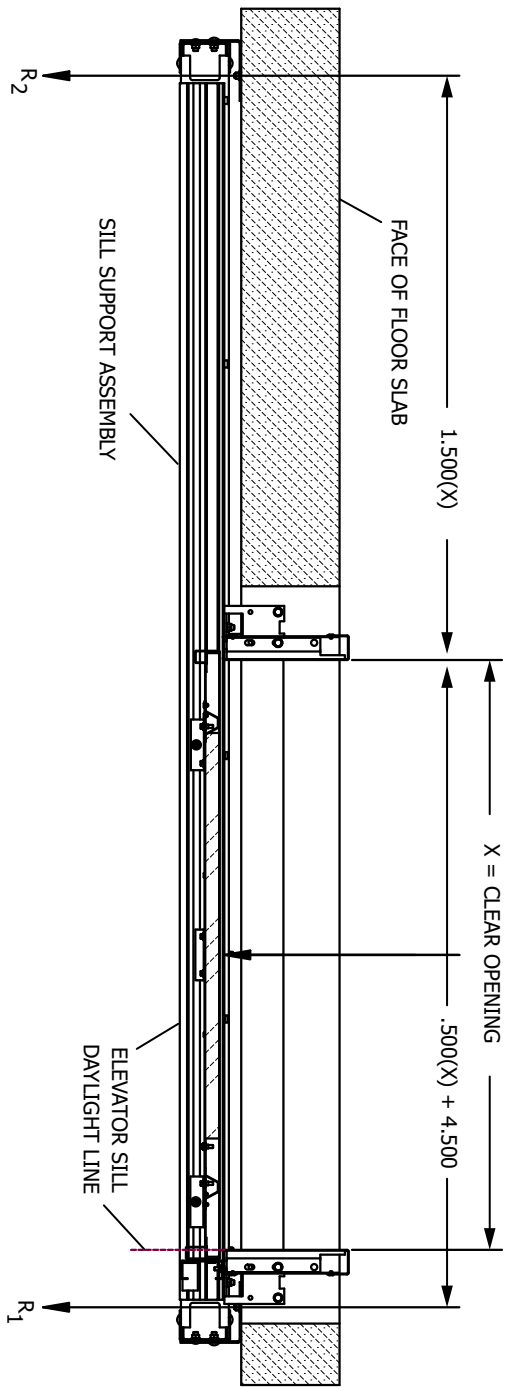


NOTES:

1. SILL LOAD RATING - MAXIMUM OF 5000 POUNDS. ANSI /ASME A17.1, CLASS A (1250 LBF AXLE LOAD). REINFORCED SILL LOAD RATING - MAXIMUM OF 20,000 POUNDS. ANSI/ASME A17.1, CLASS A (5000 LBF AXLE LOAD).
2. 4.000 X 8.000 MINIMUM AREA AT THE WALL LINE (AT EACH FLOOR) FOR ANCHORING WALL ANGLES. MOUNTING SURFACE CAN BE CONCRETE, FILLED BLOCK, SUITABLE WOOD BEAMS, STEEL BEAMS OR STEEL DECKING.
3. ATTACH TO WALL USING .375 DIAMETER BOLT CONCRETE ANCHORS, .375 LAG SCREWS OR WELDING. SEE 494ATJ FOR WELDING DETAIL. CONSULT ANCHOR MANUFACTURER FOR QUANTITY, SPACING AND EDGE DISTANCE RECOMMENDED FOR TYPE OF ANCHOR USED AND TYPE OF WALL CONSTRUCTION.
4. SEE DATA SHEET 1104AF FOR CALCULATIONS.

Sill Support Assembly
(continued)

SINGLE SPEED
REACTIONS (LBS.) DUE TO
LOADS ON DOOR PANELS



APPROXIMATE HORIZONTAL LOADS AND LOCATIONS APPLIED TO BUILDING SHOWN PER ASME A17.1, PART II, RULE 2.28.1(I). THE SPECIFIED LOADS HAVE CONSIDERED IMPACT.

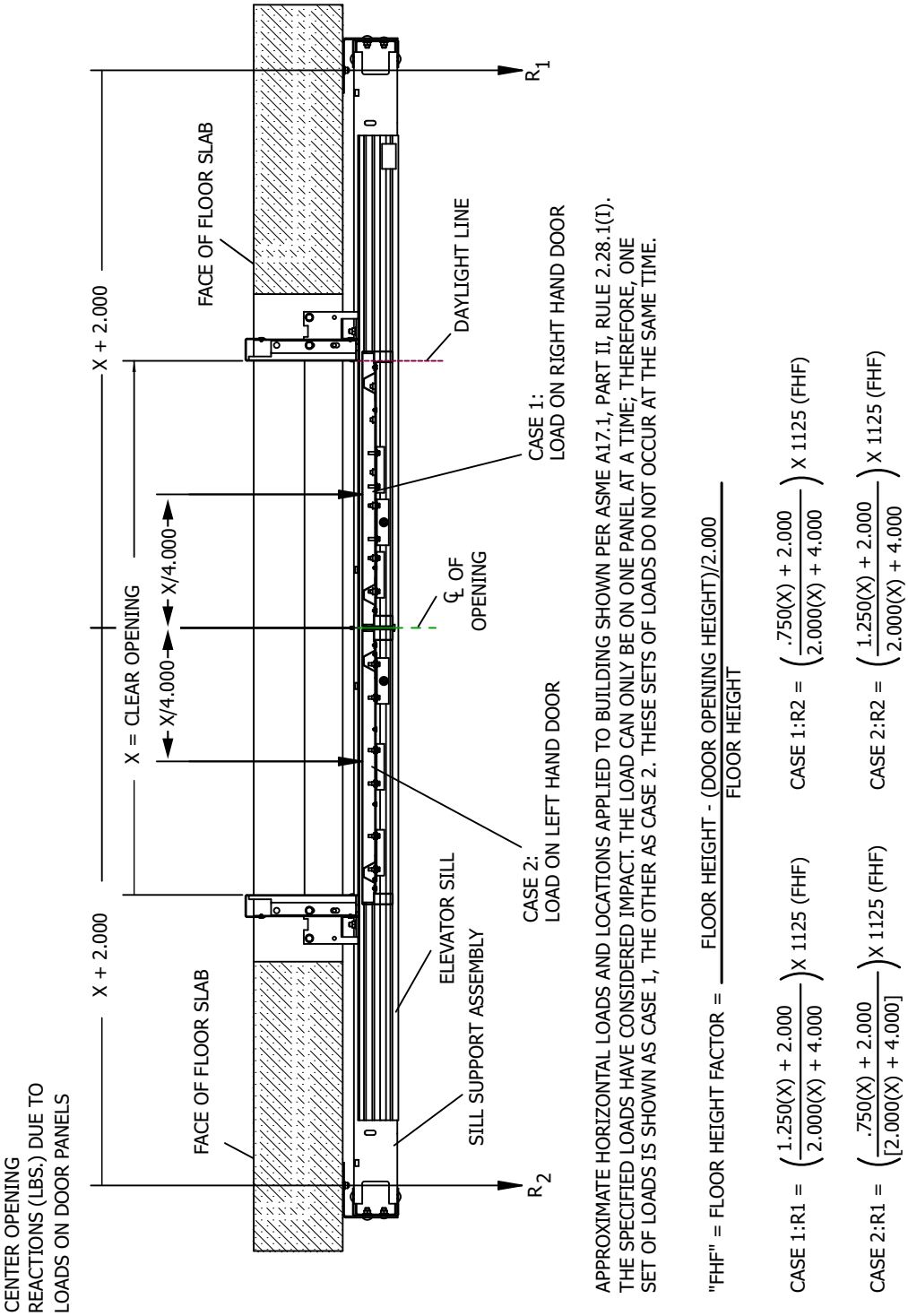
"FHF" = FLOOR HEIGHT FACTOR = $\frac{\text{FLOOR HEIGHT - (DOOR OPENING HEIGHT)/2.000}}{\text{FLOOR HEIGHT}}$

$R1 = \left(\frac{1.500(X)}{[2.000(X) + 4.500]}\right) X\ 1125\ (FHF)$

$R2 = \left(\frac{500(X) + 4.500}{[2.000(X) + 4.500]}\right) X\ 1125\ (FHF)$

Sill Support Assembly

(continued)



Sill Support Assembly

(continued)

DIM. "S"	STANDARD ADJUSTMENT
5.000	+2.000
	NOTE 1

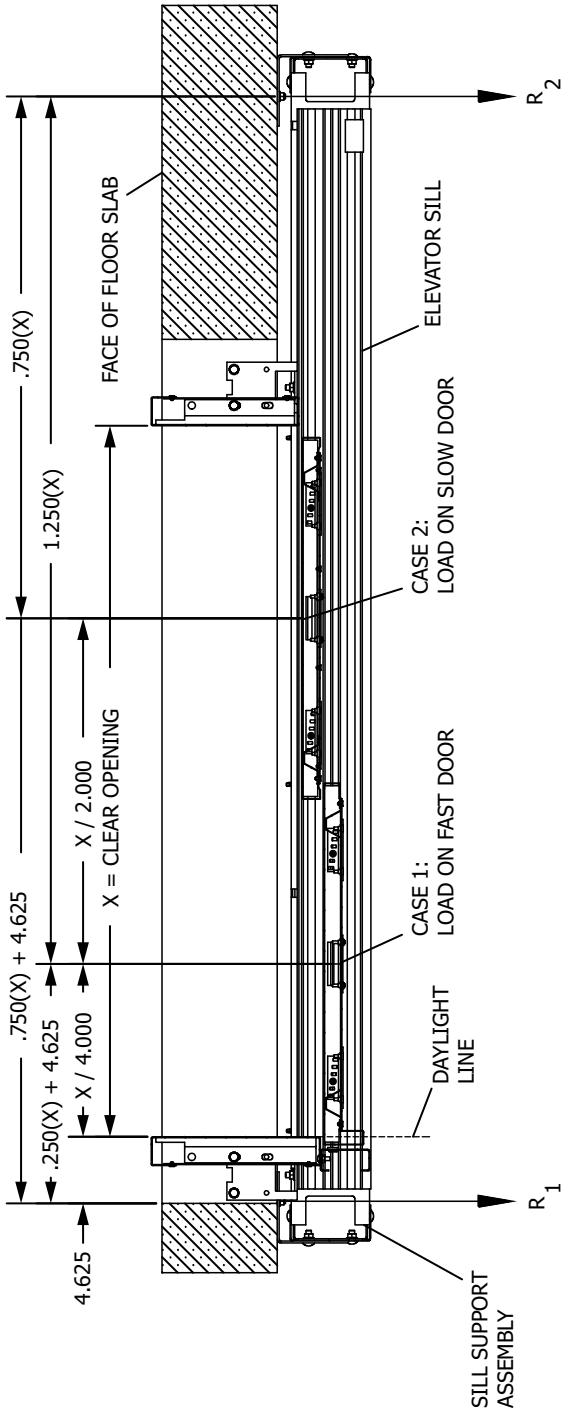
-0.625	
NOTE 2	

NOTES:

1. USING BOTH WALL ANGLE AND STRUT ANGLE, BLOCKING MAY BE REQUIRED FOR GROUT ANGLE WITH "S" GREATER THAN 8.000.
2. WALL ANCHORS MUST BE LOCATED BELOW SILL SUPPORT ASSEMBLY OR WALL ANGLES TURNED OUT AWAY FROM DOOR OPENING.
3. REINFORCEMENT AND BRACE ARE ONLY SUPPLIED WHEN CAPACITY IS >5000 LBS.

Sill Support Assembly

(continued)



TWO SPEED
REACTIONS (LBS.) DUE TO
LOADS ON DOOR PANELS

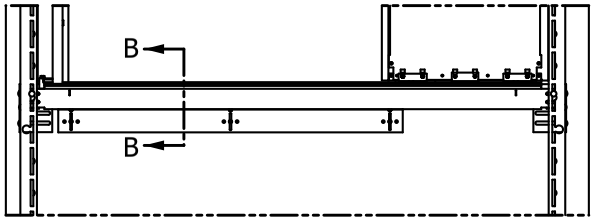
APPROXIMATE HORIZONTAL LOADS AND LOCATIONS APPLIED TO BUILDING SHOWN PER ASME A17.1, PART II, RULE 2.28.1(I). THE SPECIFIED LOADS HAVE CONSIDERED IMPACT. THE LOAD CAN ONLY BE ON ONE PANEL AT A TIME; THEREFORE, ONE SET OF LOADS IS SHOWN AS CASE 1, THE OTHER AS CASE 2. THESE SETS OF LOADS DO NOT OCCUR AT THE SAME TIME.

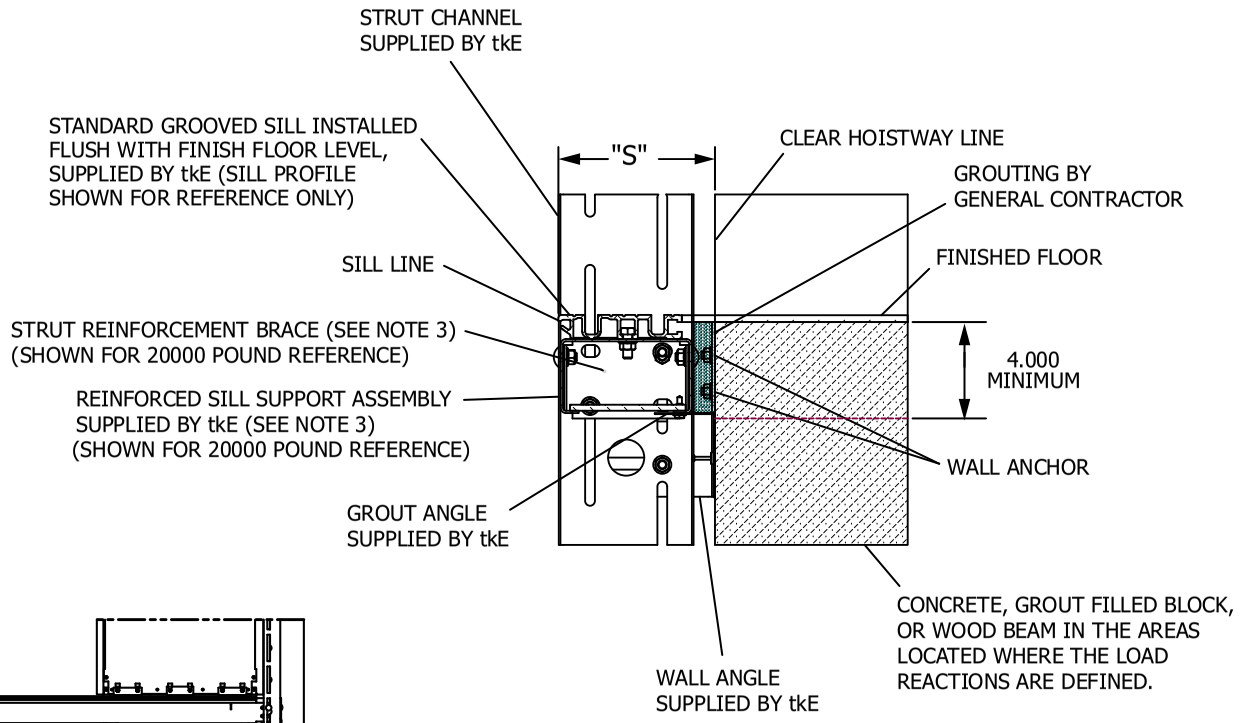
$$\text{"FHF" = FLOOR HEIGHT FACTOR} = \frac{\text{FLOOR HEIGHT - (DOOR OPENING HEIGHT) / 2.000}}{\text{FLOOR HEIGHT}}$$

$$\text{CASE 1:R1} = \left(\frac{1.250(X)}{1.500(X) + 4.625}\right) \text{X 1125 (FHF)} \qquad \text{CASE 1:R2} = \left(\frac{.750(X) + 4.625}{1.500(X) + 4.625}\right) \text{X 1125 (FHF)}$$

$$\text{CASE 2:R1} = \left(\frac{1.500(X) + 4.625}{}\right) \text{X 1125 (FHF)} \qquad \text{CASE 2:R2} = \left(\frac{.750(X) + 4.625}{1.500(X) + 4.625}\right) \text{X 1125 (FHF)}$$

TWO SPEED
ANSI/ASME A17.1 CLASS A LOADING
SUPPORT ASSEMBLY, SILL MOUNTING DETAILS
MAXIMUM 20000 POUND
REINFORCED SUPPORT ASSEMBLY,
SILL FOR 20000 POUND





SECTION B-B

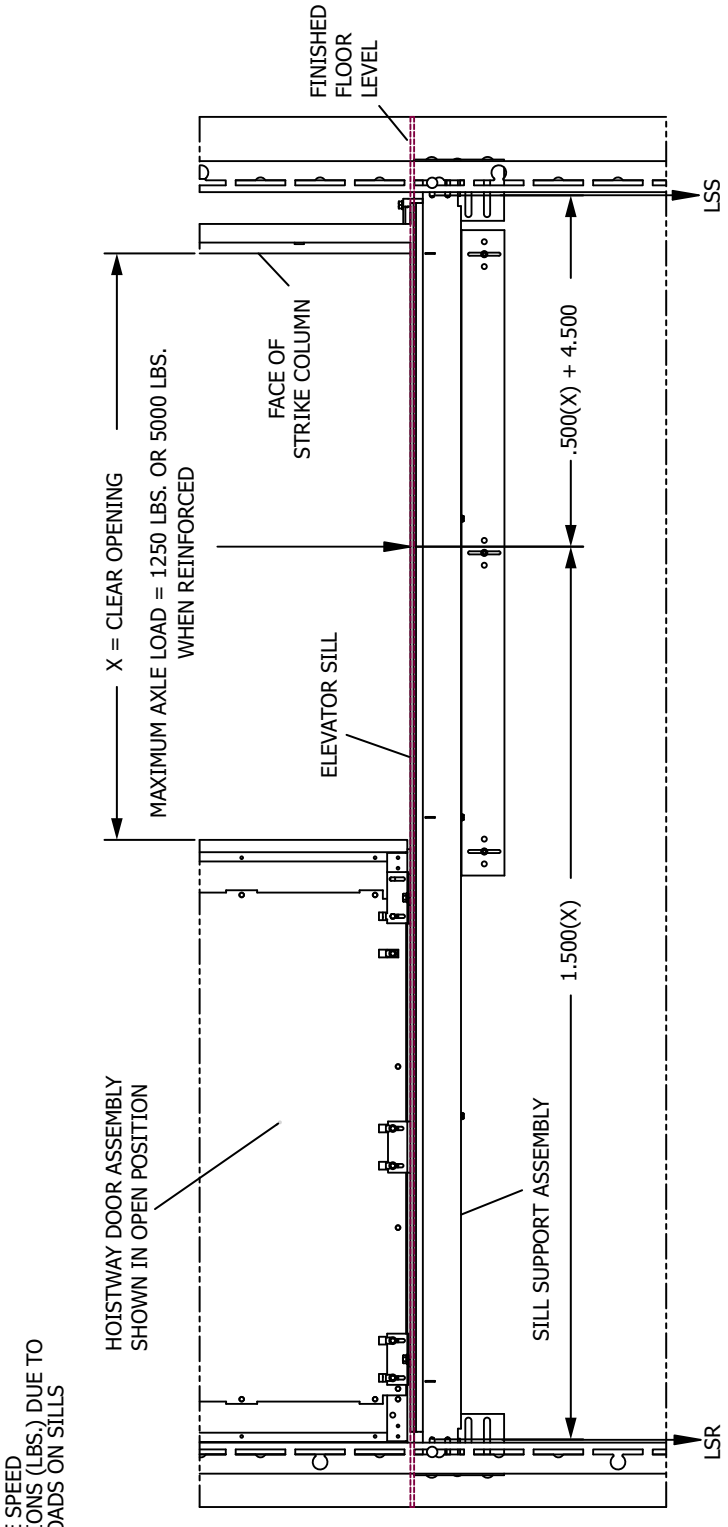
DIM. "S"	STANDARD ADJUSTMENT	
6.500	+2.000	-0.625
	NOTE 1	NOTE 2

NOTES:
1. USING BOTH WALL ANGLE AND STRUT ANGLE, BLOCKING MAY BE REQUIRED FOR GROUT ANGLE WITH "S" GREATER THAN 8.000.
2. WALL ANCHORS MUST BE LOCATED BELOW SILL SUPPORT ASSEMBLY OR WALL ANGLES TURNED OUT AWAY FROM DOOR OPENING.
3. REINFORCEMENT AND BRACE ARE ONLY SUPPLIED WHEN CAPACITY IS >5000 LBS.

Sill Support Assembly
(continued)

Sill Support Assembly

(continued)



SINGLE SPEED
REACTIONS (LBS.) DUE TO
LIVE LOADS ON SILLS

MAXIMUM ALLOWABLE AXLE LOAD IS 1250 LBS. OR 5000 LBS. IF REINFORCED AS DEFINED BY ASME A17.1.
HALF OF LIVE LOAD IS SUPPORTED BY ANCHORS AT THE FLOOR ABOVE OR BELOW.
LIVE LOADS CAN OCCUR ONLY AT ONE FLOOR AT A TIME.

MAX CAPACITY = 5000 LBS.

$$LSS = \left(\frac{1.500(X)}{2.000(X) + 4.500}\right) X\ 1250 / 2.000$$

$$LSR = \left(\frac{.500(X) + 4.500}{2.000(X) + 4.500}\right) X\ 1250 / 2.000$$

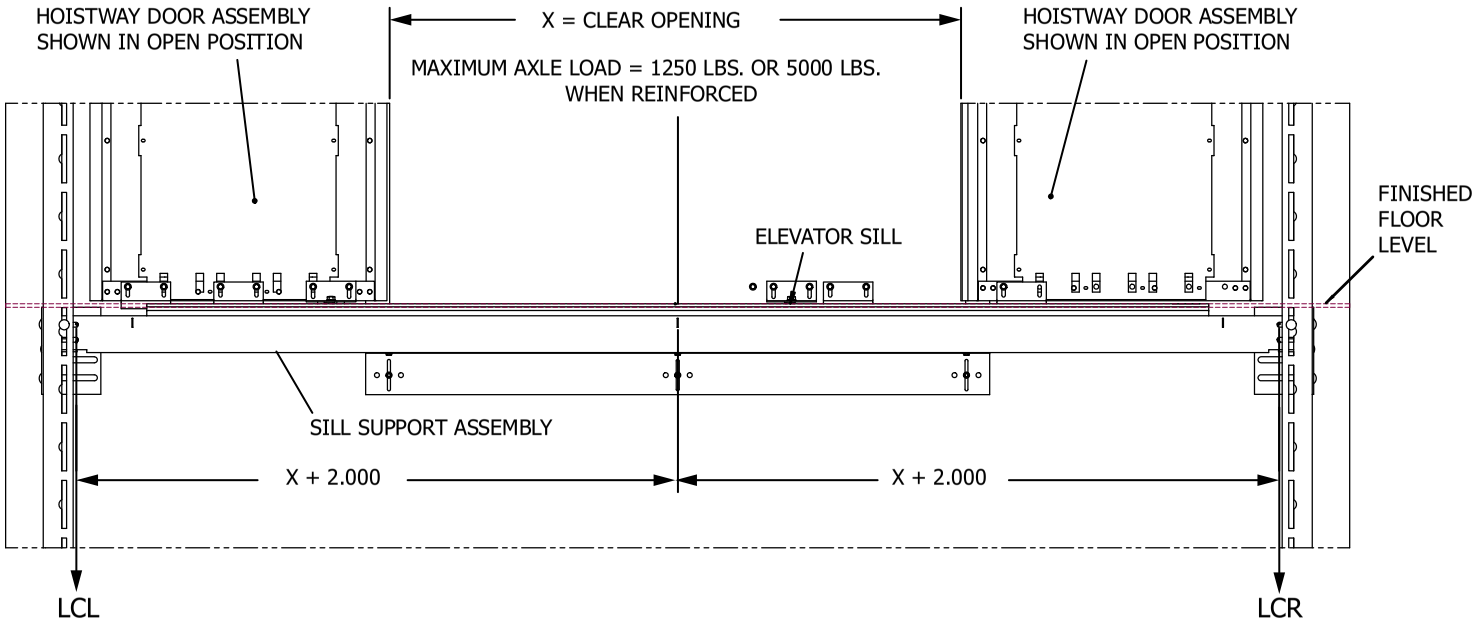
MAX CAPACITY = 20000 LBS.

$$LSS = \left(\frac{1.500(X)}{2.000(X) + 4.500}\right) X\ 5000 / 2.000$$

$$LSR = \left(\frac{.500(X) + 4.500}{2.000(X) + 4.500}\right) X\ 5000 / 2.000$$

Sill Support Assembly
(continued)

CENTER OPENING
REACTIONS (LBS.) DUE TO
LIVE LOADS ON SILLS



MAXIMUM ALLOWABLE AXLE LOAD IS 1250 LBS. OR 5000 LBS. IF REINFORCED AS DEFINED BY ASME A17.1.
HALF OF LIVE LOAD IS SUPPORTED BY ANCHORS AT THE FLOOR ABOVE OR BELOW.
LIVE LOADS CAN OCCUR ONLY AT ONE FLOOR AT A TIME.

MAX CAPACITY = 5000 LBS.

$$LCL = \left(\frac{X + 2.000}{2.000(X) + 4.000}\right) X\ 1250 / 2.000$$

$$LCR = \left(\frac{X + 2.000}{2.000(X) + 4.000}\right) X\ 1250 / 2.000$$

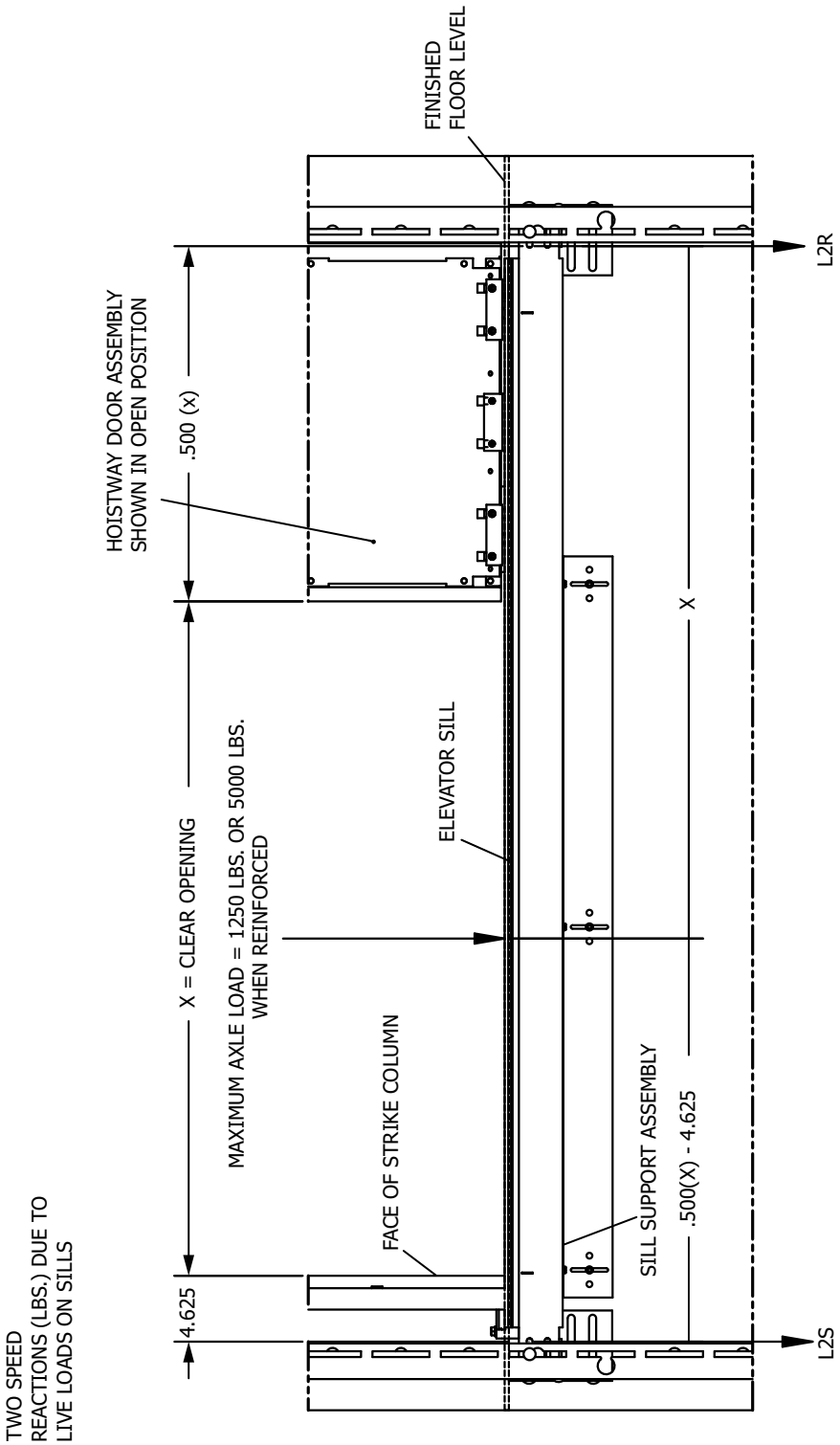
MAX CAPACITY = 20000 LBS.

$$LCL = \left(\frac{X + 2.000}{2.000(X) + 4.000}\right) X\ 5000 / 2.000$$

$$LCR = \left(\frac{X + 2.000}{2.000(X) + 4.000}\right) X\ 5000 / 2.000$$

Sill Support Assembly

(continued)



MAXIMUM ALLOWABLE AXLE LOAD IS 1250 LBS. OR 5000 LBS. IF REINFORCED AS DEFINED BY ASME A17.1.
HALF OF LIVE LOAD IS SUPPORTED BY ANCHORS AT THE FLOOR ABOVE OR BELOW.
LIVE LOADS CAN OCCUR ONLY AT ONE FLOOR AT A TIME.

MAX CAPACITY = 5000 LBS.

$$LCL = \left(\frac{X}{1.500(X) + 4.625}\right) X\ 1250 / 2.000$$

$$L2R = \left(\frac{.500(X) + 4.625}{1.500(X) + 4.625}\right) X\ 1250 / 2.000$$

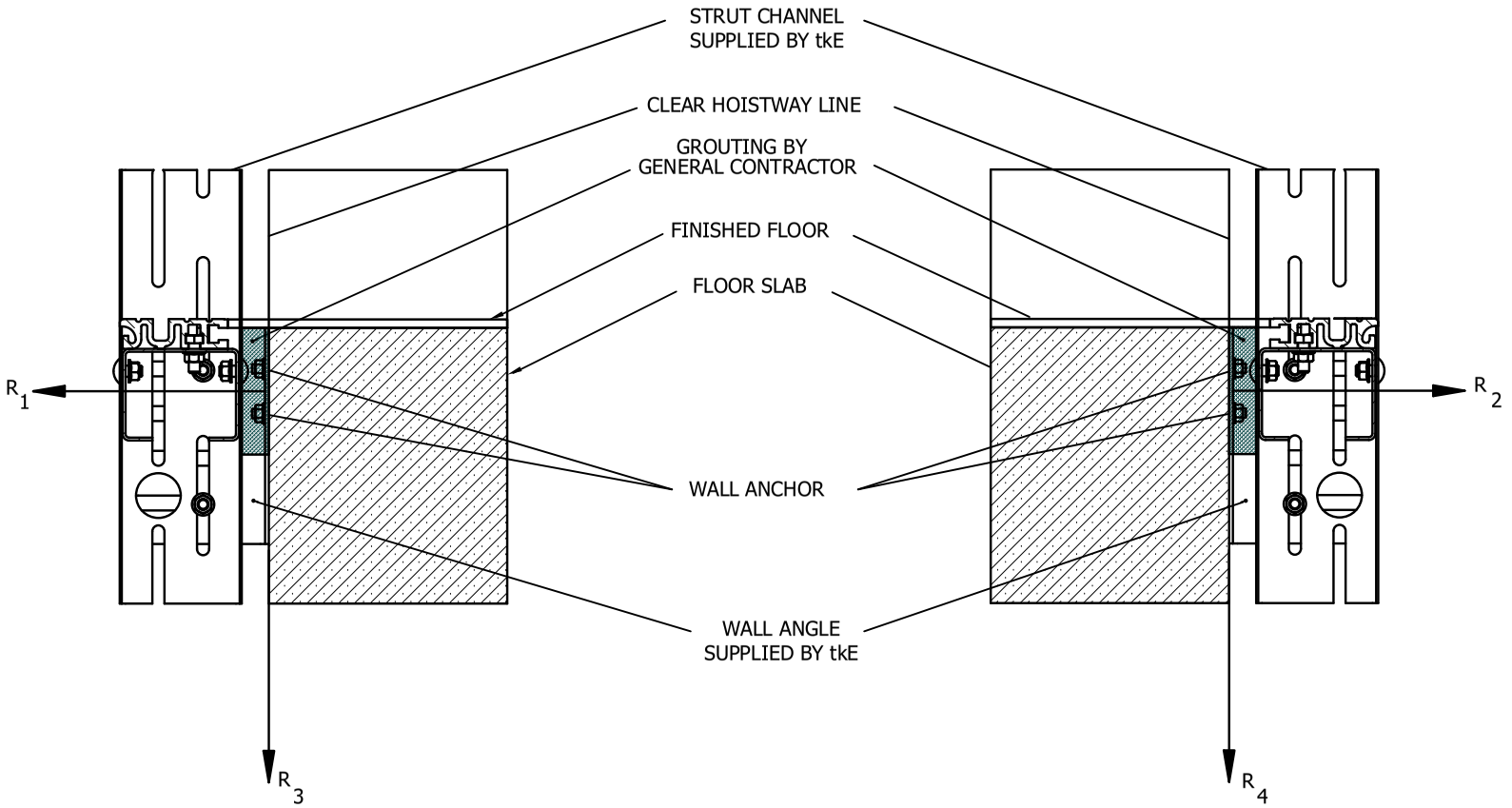
MAX CAPACITY = 20000 LBS.

$$L2S = \left(\frac{X}{1.500(X) + 4.625}\right) X\ 5000 / 2.000$$

$$L2R = \left(\frac{.500(X) + 4.625}{1.500(X) + 4.625}\right) X\ 5000 / 2.000$$

Sill Support Assembly
(continued)

REACTIONS INCLUDING DOOR PANEL IMPACT



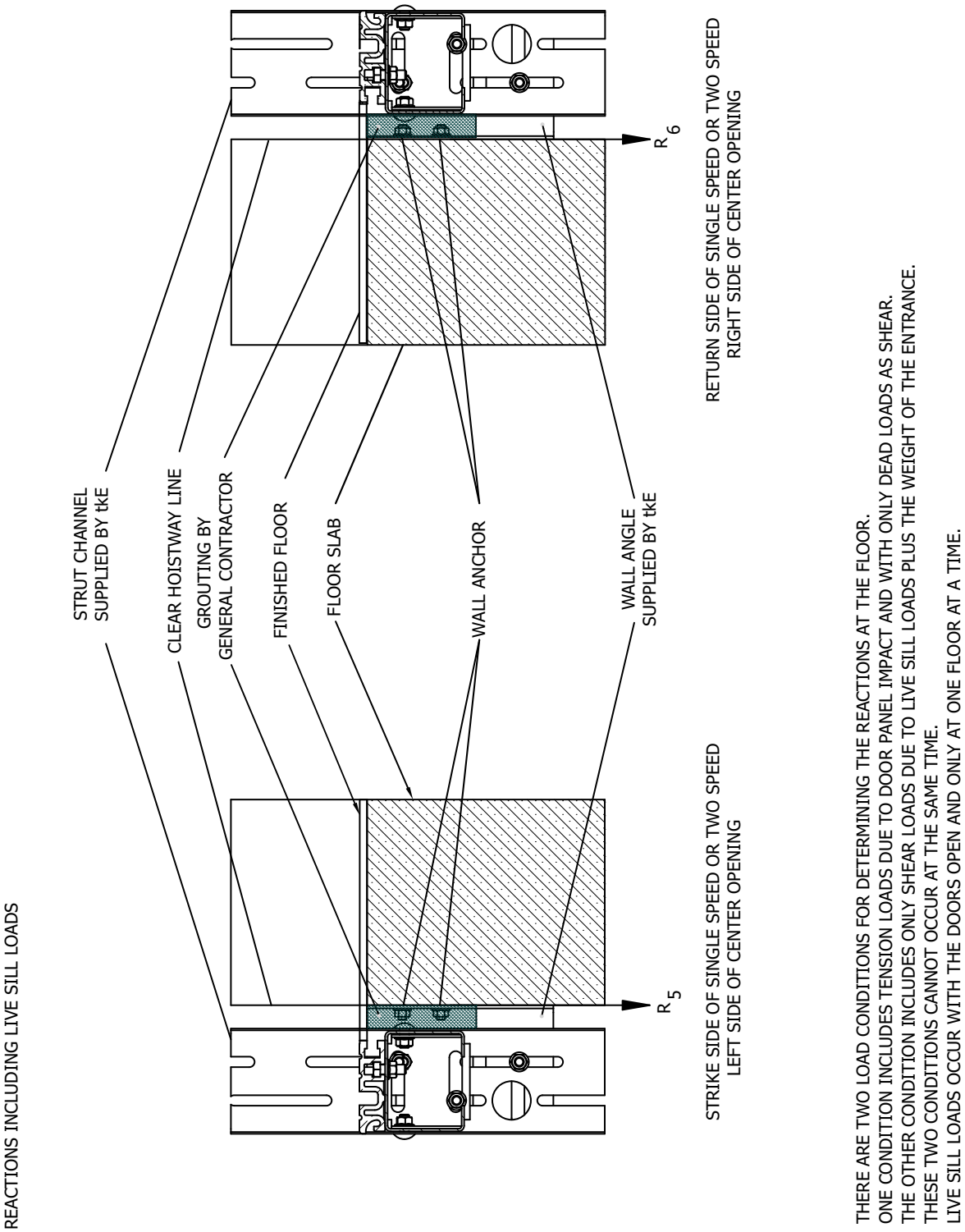
STRIKE SIDE OF SINGLE SPEED OR TWO SPEED
LEFT SIDE OF CENTER OPENING

RETURN SIDE OF SINGLE SPEED OR TWO SPEED
RIGHT SIDE OF CENTER OPENING

THERE ARE TWO LOAD CONDITIONS FOR THE REACTIONS AT FLOOR CONNECTIONS.
ONE CONDITION INCLUDES TENSION LOADS DUE TO DOOR PANEL IMPACT AND WITH ONLY DEAD LOADS AS SHEAR.
THE OTHER CONDITION INCLUDES LIVE SILL LOADS IN ADDITION TO THE DEAD LOADS.
THESE TWO CONDITIONS CANNOT OCCUR AT THE SAME TIME.
DOOR PANEL IMPACT LOADS OCCUR WITH THE DOORS CLOSED AND ONLY AT ONE FLOOR AT A TIME.

Sill Support Assembly

(continued)



Sill Support Assembly
(continued)

M721 ENTRANCE WALL ANCHOR LOADS
VALUES SHOWN ARE FOR 84.000 OPENING HEIGHT

TENSION LOADS FOR A17.1
DOOR PANEL IMPACT

SINGLE SPEED		
DOOR WIDTH (INCHES)	R1	R2
	STRIKE SIDE	RETURN SIDE
32.000	526	224
34.000	528	222
36.000	529	221
38.000	531	219
40.000	533	217
42.000	534	216
44.000	535	215
46.000	536	214
48.000	537	213

CENTER OPENING				
	CASE 1		CASE 2	
DOOR WIDTH (INCHES)	R1	R2	R1	R2
	STRIKE SIDE	RETURN SIDE	STRIKE SIDE	RETURN SIDE
36.000	464	286	286	464
38.000	464	286	286	464
40.000	464	286	286	464
42.000	464	286	286	464
44.000	465	285	285	465
46.000	465	285	285	465
48.000	465	285	285	465
50.000	465	285	285	465
52.000	465	285	285	465
54.000	465	285	285	465
56.000	465	285	285	465
58.000	465	285	285	465
60.000	465	285	285	465

TWO SPEED				
	CASE 1		CASE 2	
DOOR WIDTH (INCHES)	R1	R2	R1	R2
	STRIKE SIDE	RETURN SIDE	STRIKE SIDE	RETURN SIDE
36.000	576	174	345	405
38.000	578	172	347	403
40.000	580	170	348	402
42.000	582	168	349	401
44.000	584	166	350	400
46.000	586	164	351	399
48.000	587	163	352	398
50.000	589	161	353	397
52.000	590	160	354	396
54.000	591	159	355	395

SHEAR LOADS FOR MAXIMUM AXLE LOADS OF 1250 LBS.

SINGLE SPEED		
DOOR WIDTH (INCHES)	LSS	LSR
	STRIKE SIDE	RETURN SIDE
32.000	465	187
34.000	466	185
36.000	466	184
38.000	466	182
40.000	466	181
42.000	466	180
44.000	466	179
46.000	466	178
48.000	466	177

CENTER OPENING		
DOOR WIDTH (INCHES)	LCL	LCR
	LEFT HAND	RIGHT HAND
36.000	313	313
38.000	313	313
40.000	313	313
42.000	313	313
44.000	313	313
46.000	313	313
48.000	313	313
50.000	313	313
52.000	313	313
54.000	313	313
56.000	313	313
58.000	313	313
60.000	313	313

TWO SPEED		
	L2S	L2R
DOOR WIDTH (INCHES)	STRIKE SIDE	RETURN SIDE
36.000	384	241
38.000	385	240
40.000	387	238
42.000	388	237
44.000	389	236
46.000	390	235
48.000	392	233
50.000	392	233
52.000	393	232
54.000	394	231

SHEAR LOADS FOR MAXIMUM AXLE LOADS OF 5000 LBS.

SINGLE SPEED		
DOOR WIDTH (INCHES)	LSS	LSR
36.000	1765	736
42.000	1780	721
48.000	1792	709

CENTER OPENING		
DOOR WIDTH (INCHES)	LCL	LCR
42.000	1250	1250
48.000	1250	1250

TWO SPEED		
DOOR WIDTH (INCHES)	L2S	L2R
48.000	1567	934
54.000	1577	924

Sill Support Assembly

(continued)

M721 ENTRANCE WALL ANCHOR LOADS
WEIGHTS SHOWN FOR MASONRY FRAMES FOR B = 11.250,
PAINTED, 2.000 FACE, 84.000 DOORS

SHEAR LOADS FROM DEAD WEIGHT

DOOR WIDTH (INCHES)	SINGLE SPEED			
	R3	R4	R3	R4
	DEAD LOAD DOORS CLOSED STRIKE SIDE	DEAD LOAD DOORS CLOSED RETURN SIDE	DEAD LOAD DOORS OPEN STRIKE SIDE	DEAD LOAD DOORS OPEN RETURN SIDE
32.000	270	132	196	205
34.000	279	137	202	214
36.000	289	141	207	223
38.000	299	146	212	233
40.000	308	151	217	242
42.000	318	156	223	251
44.000	327	161	228	261
46.000	337	166	233	270
48.000	347	171	238	279

DOOR WIDTH (INCHES)	CENTER OPENING WITH DOORS OPEN			
	R3	R4	R3	R4
	TOTAL DEAD LOAD LEFT HAND SIDE	TOTAL DEAD LOAD RIGHT HAND SIDE	TOTAL DEAD LOAD LEFT HAND SIDE	TOTAL DEAD LOAD RIGHT HAND SIDE
36.000	215	215	215	215
38.000	222	222	222	222
40.000	230	230	230	230
42.000	237	237	237	237
44.000	244	244	244	244
46.000	252	252	252	252
48.000	258	258	258	258
50.000	266	266	266	266
52.000	273	273	273	273
54.000	281	281	281	281
56.000	288	288	288	288
58.000	295	295	295	295
60.000	303	303	303	303

DOOR WIDTH (INCHES)	TWO SPEED WITH DOORS OPEN			
	R3	R4	R3	R4
	TOTAL DEAD LOAD PER STRIKE SIDE	TOTAL DEAD LOAD PER RETURN SIDE	TOTAL DEAD LOAD PER STRIKE SIDE	TOTAL DEAD LOAD PER RETURN SIDE
36.000	314	162	232	244
38.000	325	168	239	255
40.000	335	174	244	265
42.000	345	179	250	275
44.000	355	185	256	285
46.000	366	191	262	295
48.000	376	196	268	305
50.000	387	202	274	315
52.000	397	208	280	325
54.000	407	214	286	335

1250 LBS. MAX AXLE WEIGHT

TOTAL SHEAR LOADS (LIVE LOAD + DEAD WEIGHT

DOOR WIDTH (INCHES)	SINGLE SPEED WITH DOORS OPEN		
	R5	R6	
	STRIKE SIDE (R3 + LSS)	RETURN SIDE (R4 + LSR)	
32.000	662	392	
34.000	667	400	
36.000	673	407	
38.000	678	415	
40.000	683	423	
42.000	689	431	
44.000	694	440	
46.000	700	448	
48.000	705	456	

DOOR WIDTH (INCHES)	CENTER OPENING WITH DOORS OPEN	
	R5	R6
	STRIKE SIDE (R3 + LCL)	RETURN SIDE (R4 + LCR)
36.000	528	528
38.000	535	535
40.000	542	542
42.000	550	550
44.000	557	557
46.000	564	564
48.000	570	570
50.000	579	579
52.000	586	586
54.000	593	593
56.000	600	600
58.000	608	608
60.000	615	615

DOOR WIDTH (INCHES)	TWO SPEED WITH DOORS OPEN	
	R5	R6
	STRIKE SIDE (R3 + L2S)	RETURN SIDE (R4 + L2R)
36.000	616	486
38.000	624	494
40.000	631	503
42.000	638	511
44.000	645	520
46.000	652	529
48.000	659	538
50.000	666	547
52.000	673	557
54.000	680	566

5000 LBS. MAX AXLE WEIGHT

DOOR WIDTH (INCHES)	SINGLE SPEED WITH DOORS OPEN	
	R5	R6
	32.000	2054	959
34.000	2098	972
36.000	2139	988

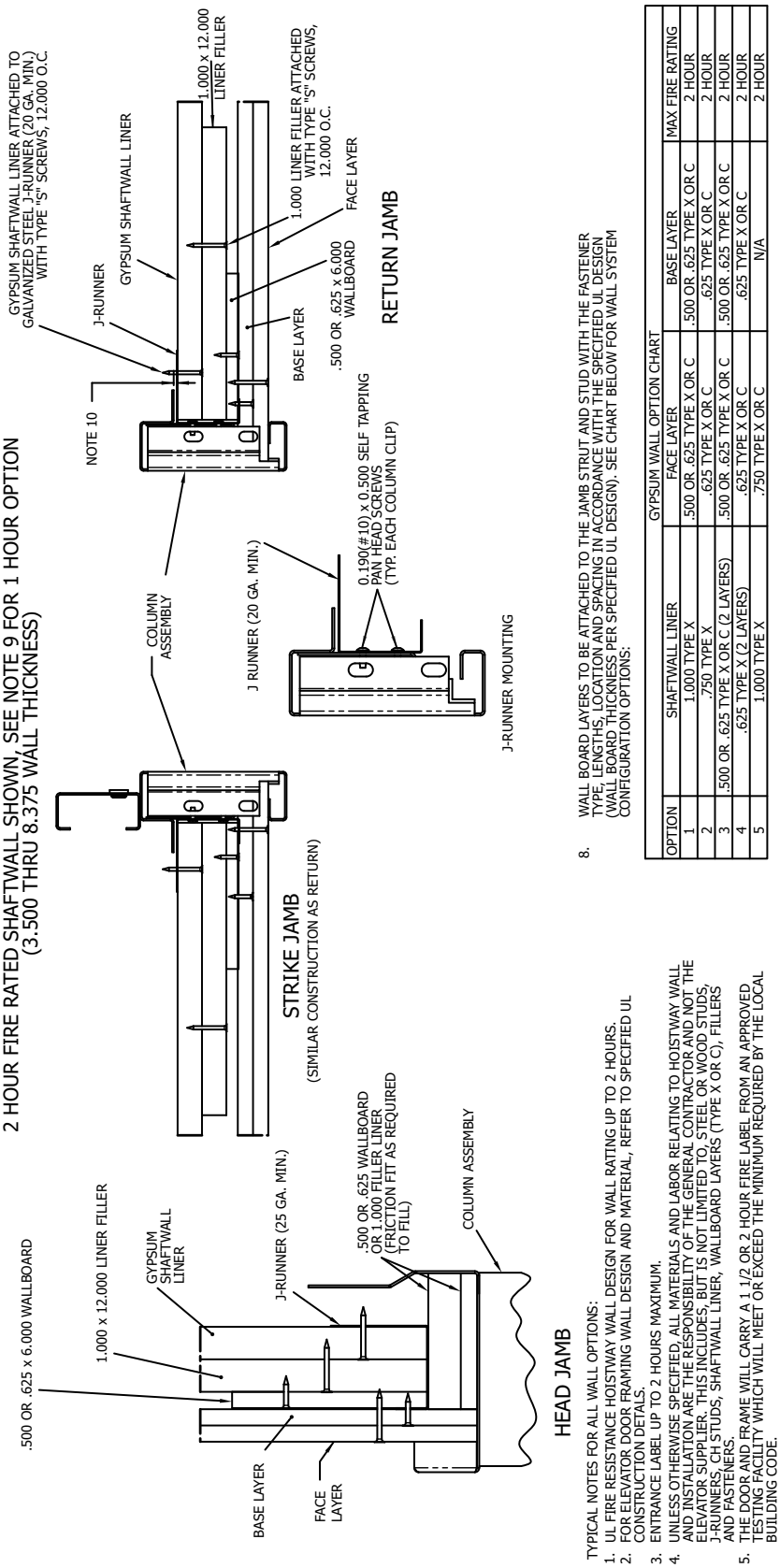
DOOR WIDTH (INCHES)	CENTER OPENING WITH DOORS OPEN	
	R5	R6
42.000	1487	1487
48.000	1508	1508

DOOR WIDTH (INCHES)	TWO SPEED WITH DOORS OPEN	
	R5	R6
48.000	1943	1239
54.000	1984	1259

Masonry Installation (494JT-C)

NOTES:
1. UL FIRE RESISTANCE HOISTWAY WALL DESIGN.
   FOR HOISTWAY WALL DESIGN AND MATERIALS SUCH AS CMU, CONCRETE, GROUT OR OTHER, REFER TO SPECIFIED UL CONSTRUCTION DETAILS.
2. ENTRANCE FRAMES DO NOT REQUIRE BACK FILLING WITH GROUT, BUT IT IS PERMISSIBLE. IF FRAMES ARE BACK FILLED, THEN WIRE ANCHORS ARE NOT MANDATORY.

Drywall Installation (494JV-J)



TYPICAL NOTES FOR ALL WALL OPTIONS:

1. UL FIRE RESISTANCE HOISTWAY WALL DESIGN FOR WALL RATING UP TO 2 HOURS.
2. FOR ELEVATOR DOOR FRAMING WALL DESIGN AND MATERIAL, REFER TO SPECIFIED UL CONSTRUCTION DETAILS.
3. ENTRANCE LABEL UP TO 2 HOURS MAXIMUM.
4. 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 OR WOOD STUDS, J-RUNNERS, CH STUDS, SHAFTWALL LINER, WALLBOARD LAYERS (TYPE X OR C), FILLERS AND FASTENERS.
5. THE DOOR AND FRAME WILL CARRY A 1 1/2 OR 2 HOUR FIRE LABEL FROM AN APPROVED TESTING FACILITY WHICH WILL MEET OR EXCEED THE MINIMUM REQUIRED BY THE LOCAL BUILDING CODE.
6. FOR CLEAR DOOR OPENING HEIGHTS 7 FEET OR LESS: FILLERS AND STRIPS / SHIMS ARE NOT REQUIRED PER SPECIFIED UL CONSTRUCTION.
7. FOR CLEAR DOOR OPENING HEIGHTS OVER 7 FEET (SHAFTWALL CONSTRUCTION ONLY):
   LINER FILLER - ATTACH 1.000 X 12.000 WIDE WALLBOARD TO SHAFTWALL LINER WITH 1.625 TYPE S STEEL SCREWS STAGGERED 12.000 O.C.
   FILLER STRIPS - ATTACH .500 OR .625 X 6.000 WIDE WALLBOARD LINER FILLER TO SHAFTWALL LINER WITH TYPE W STEEL SCREWS STAGGERED 12.000 O.C.
   FILL JAMB STRUT WITH HEADER COMPLETELY (WITHIN .188) WITH LAYERS AND THICKNESSES AS REQUIRED TO MEET UL DESIGN.
8. WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND STUD WITH THE FASTENER TYPE, LENGTHS, LOCATION AND SPACING IN ACCORDANCE WITH THE SPECIFIED UL DESIGN (WALL BOARD THICKNESS PER SPECIFIED UL DESIGN). SEE CHART BELOW FOR WALL SYSTEM CONFIGURATION OPTIONS:

OPTION	GYPSUM WALL OPTION CHART			
	SHAFTWALL LINER	FACE LAYER	BASE LAYER	MAX FIRE RATING
1	1.000 TYPE X	.500 OR .625 TYPE X OR C	.500 OR .625 TYPE X OR C	2 HOUR
2	.750 TYPE X	.625 TYPE X OR C	.625 TYPE X OR C	2 HOUR
3	.500 OR .625 TYPE X OR C (2 LAYERS)	.500 OR .625 TYPE X OR C	.500 OR .625 TYPE X OR C	2 HOUR
4	.625 TYPE X (2 LAYERS)	.625 TYPE X OR C	.625 TYPE X OR C	2 HOUR
5	1.000 TYPE X	.750 TYPE X OR C	N/A	2 HOUR

9. FOR WALLS WITH LESS THAN 2 HOURS RATING, ELIMINATE THE BASE LAYER OPTION.
10. THE SHAFT WALL LINER TO JAMB THROAT GAP TO BE .188 OR LESS. IF LARGER GAP EXISTS, FILL GAP WITH ADDITIONAL WALLBOARD X 6.000 WIDE. ATTACH ADDITIONAL LAYERS TO J-RUNNER OR STUD USING UL SPECIFIED STEEL SCREWS 12.000 O.C.

Drywall Installation

(continued)

TYPICAL NOTES FOR ALL WALL OPTIONS:

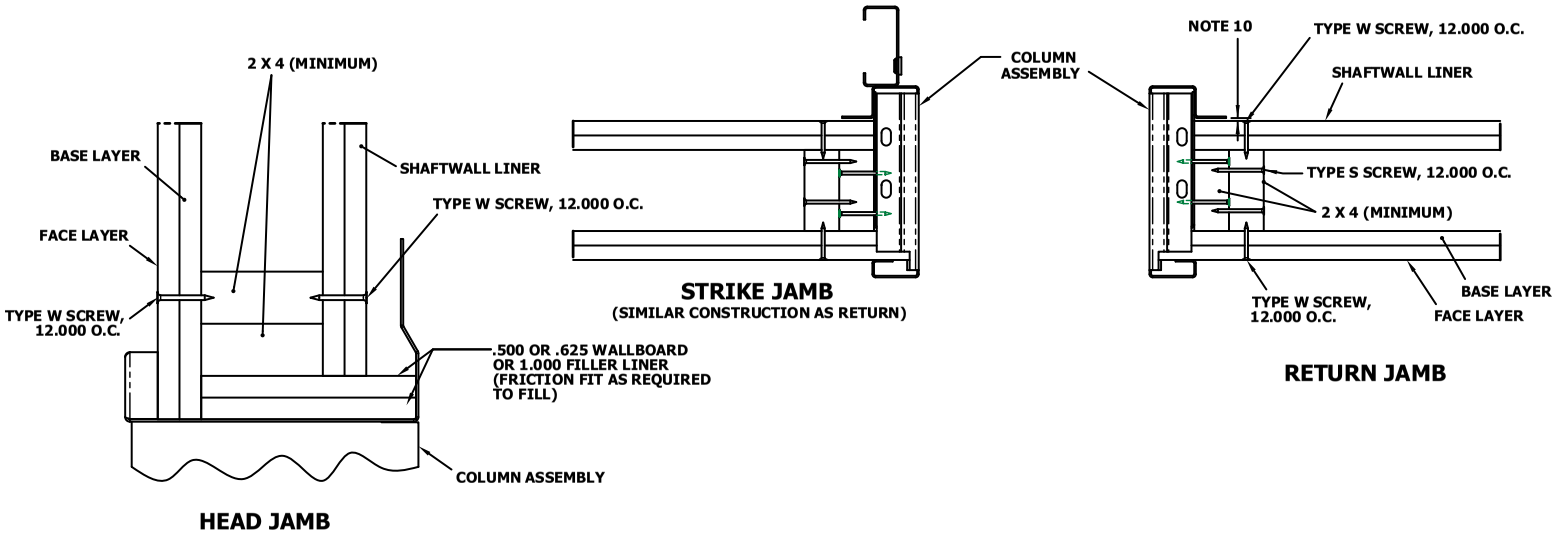
1. UL FIRE RESISTANCE HOISTWAY WALL DESIGN FOR WALL RATING UP TO 2 HOURS.
2. FOR ELEVATOR DOOR FRAMING WALL DESIGN AND MATERIAL, REFER TO SPECIFIED UL CONSTRUCTION DETAILS.
3. ENTRANCE LABEL UP TO 2 HOURS MAXIMUM.
4. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS, AND LABOR RELATING TO HOISTWAY WALL AND INSTALLATION ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND NOT THE ELEVATOR SUPPLIER. THIS INCLUDES, BUT IS NOT LIMITED TO, STEEL OR WOOD STUDS, J-RUNNERS, CH STUDS, SHAFTWALL LINER, WALLBOARD LAYERS (TYPE X OR C), FILLERS, AND FASTENERS.
5. THE DOOR AND FRAME WILL CARRY A 1 1/2 OR 2 HOUR FIRE LABEL FROM AN APPROVED TESTING FACILITY WHICH WILL MEET OR EXCEED THE MINIMUM REQUIRED BY THE LOCAL BUILDING CODE.
6. FOR CLEAR DOOR OPENING HEIGHTS 7 FEET OR LESS: FILLERS AND STRIPS / SHIMS ARE NOT REQUIRED PER SPECIFIED UL CONSTRUCTION.
7. FOR CLEAR DOOR OPENING HEIGHTS OVER 7 FEET (SHAFTWALL CONSTRUCTION ONLY): LINER FILLER - ATTACH 1.000 X 12.000 WIDE WALLBOARD TO SHAFTWALL LINER WITH 1.625 TYPE S STEEL SCREWS STAGGERED 12.000 O.C.
   FILLER STRIPS - ATTACH .500 OR .625 X 6.000 WIDE WALLBOARD LINER FILLER TO SHAFTWALL LINER WITH TYPE W STEEL SCREWS STAGGERED 12.000 O.C.
   FILL JAMB STRUT WITH HEADER, COMPLETELY (WITHIN .188) WITH LAYERS AND THICKNESSES AS REQUIRED TO MEET UL DESIGN.
8. WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND STUD WITH THE FASTENER TYPE, LENGTHS, LOCATION AND SPACING IN ACCORDANCE WITH THE SPECIFIED UL DESIGN (WALL BOARD THICKNESS PER SPECIFIED UL DESIGN). SEE CHART BELOW FOR WALL SYSTEM CONFIGURATION OPTIONS:

	GYPSUM WALL OPTION CHART			
OPTION	SHAFTWALL LINER	FACE LAYER	BASE LAYER	MAX. FIRE RATING
1	1.000 TYPE X	.500 OR .625 TYPE X OR C	.500 OR .625 TYPE X OR C	2 HOUR
2	.750 TYPE X	.625 TYPE X OR C	.625 TYPE X OR C	2 HOUR
3	.500 OR .625 TYPE X OR C (2 LAYERS)	.500 OR .625 TYPE X OR C	.500 OR .625 TYPE X OR C	2 HOUR
4	.625 TYPE X (2 LAYERS)	.625 TYPE X OR C	.625 TYPE X OR C	2 HOUR
5	1.000 TYPE X	.750 TYPE X OR C	N/A	2 HOUR

9. FOR WALLS WITH LESS THAN 2 HOURS RATING, ELIMINATE THE BASE LAYER OPTION.
10. THE SHAFT WALL LINER TO JAMB THROAT GAP TO BE .188 OR LESS. IF LARGER GAP EXISTS, FILL GAP WITH ADDITIONAL WALLBOARD X 6.000 WIDE. ATTACH ADDITIONAL LAYERS TO J-RUNNER OR STUD USING UL SPECIFIED STEEL SCREWS 12.000 O.C.

Drywall Installation
(continued)

2 HOUR FIRE RATED SHAFTWALL SHOWN, SEE NOTE 9 FOR 1 HOUR OPTION
(FOR WOOD STUD CONSTRUCTION)



TYPICAL NOTES FOR ALL WALL OPTIONS:

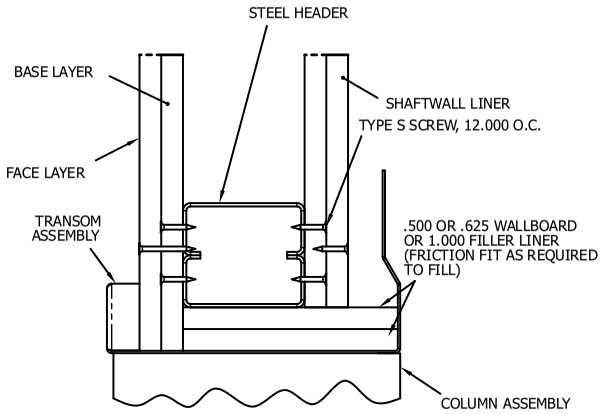
1. UL FIRE RESISTANCE HOISTWAY WALL DESIGN FOR WALL RATING UP TO 2 HOURS.
2. FOR ELEVATOR DOOR FRAMING WALL DESIGN AND MATERIAL, REFER TO SPECIFIED UL CONSTRUCTION DETALS.
3. ENTRANCE LABEL UP TO 2 HOURS MAXIMUM.
4. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND LABOR RELATING TO HOISTWAY WALL AND INSTALLATION ARE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND NOT THE ELEVATOR SUPPLIER. THIS INCLUDES, BUT IS NOT LIMITED TO, STEEL OR WOOD STUDS, J-RUNNERS, CH STUDS, SHAFTWALL LINER, WALLBOARD LAYERS (TYPE X OR C), FILLERS AND FASTENERS.
5. THE DOOR AND FRAME WILL CARRY A 1 1/2 OR 2 HOUR FIRE LABEL FROM AN APPROVED TESTING FACILITY WHICH WILL MEET OR EXCEED THE MINIMUM REQUIRED BY THE LOCAL BUILDING CODE.
6. FOR CLEAR DOOR OPENING HEIGHTS 7 FEET OR LESS: FILLERS AND STRIPS / SHIMS ARE NOT REQUIRED PER SPECIFIED UL CONSTRUCTION.
7. FOR CLEAR DOOR OPENING HEIGHTS OVER 7 FEET (SHAFTWALL CONSTRUCTION ONLY):
   LINER FILLER - ATTACH 1.000 X 12.000 WIDE WALLBOARD TO SHAFTWALL LINER WITH 1.625 TYPE S STEEL SCREWS STAGGERED 12.000 O.C.
   FILLER STRIPS - ATTACH .500 OR .625 X 6.000 WIDE WALLBOARD LINER FILLER TO SHAFTWALL LINER WITH TYPE W STEEL SCREWS STAGGERED 12.000 O.C.
   FILL JAMB STRUT WITH HEADER COMPLETELY (WITHIN .188) WITH LAYERS AND THICKNESSES AS REQUIRED TO MEET UL DESIGN.
8. WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND STUD WITH THE FASTENER TYPE, LENGTHS, LOCATION AND SPACING IN ACCORDANCE WITH THE SPECIFIED UL DESIGN (WALL BOARD THICKNESS PER SPECIFIED UL DESIGN). SEE CHART BELOW FOR WALL SYSTEM CONFIGURATION OPTIONS:

GYPSUM WALL OPTION CHART				
OPTION	SHAFTWALL LINER	FACE LAYER	BASE LAYER	MAX FIRE RATING
1	1.000 TYPE X	.500 OR .625 TYPE X OR C	.500 OR .625 TYPE X OR C	2 HOUR
2	.750 TYPE X	.625 TYPE X OR C	.625 TYPE X OR C	2 HOUR
3	.500 OR .625 TYPE X OR C (2 LAYERS)	.500 OR .625 TYPE X OR C	.500 OR .625 TYPE X OR C	2 HOUR
4	.625 TYPE X (2 LAYERS)	.625 TYPE X OR C	.625 TYPE X OR C	2 HOUR
5	1.000 TYPE X	.750 TYPE X OR C	N/A	2 HOUR

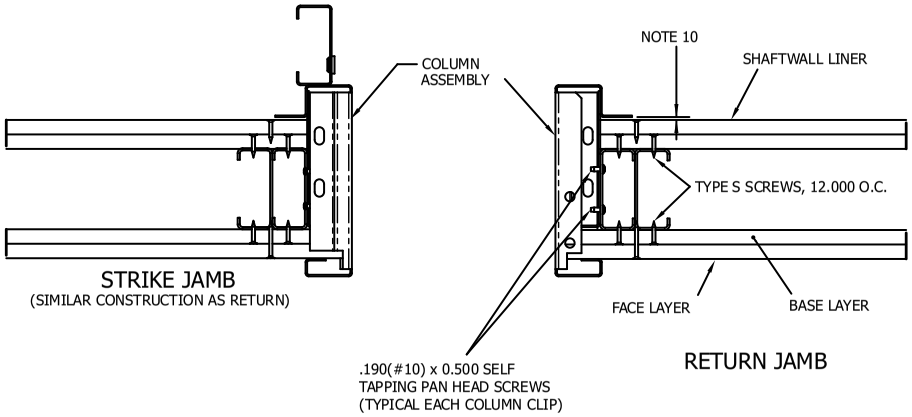
9. FOR WALLS WITH LESS THAN 2 HOURS RATING, ELIMINATE THE BASE LAYER OPTION.
10. THE SHAFT WALL LINER TO JAMB THROAT GAP TO BE .188 OR LESS. IF LARGER GAP EXISTS, FILL GAP WITH ADDITIONAL WALLBOARD X 6.000 WIDE. ATTACH ADDITIONAL LAYERS TO J-RUNNER OR STUD USING UL SPECIFIED STEEL SCREWS 12.000 O.C.

Drywall Installation
(continued)

2 HOUR FIRE RATED SHAFTWALL STEEL STUD, SEE NOTE 9 FOR 1 HOUR OPTION



HEAD JAMB



STRIKE JAMB
(SIMILAR CONSTRUCTION AS RETURN)

RETURN JAMB

TYPICAL NOTES FOR ALL WALL OPTIONS:

1. UL FIRE RESISTANCE HOISTWAY WALL DESIGN FOR WALL RATING UP TO 2 HOURS.
2. FOR ELEVATOR DOOR FRAMING WALL DESIGN AND MATERIAL, REFER TO SPECIFIED UL CONSTRUCTION DETALS.
3. ENTRANCE LABEL UP TO 2 HOURS MAXIMUM.
4. 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 OR WOOD STUDS, J-RUNNERS, CH STUDS, SHAFTWALL LINER, WALLBOARD LAYERS (TYPE X OR C), FILLERS AND FASTENERS.
5. THE DOOR AND FRAME WILL CARRY A 1 1/2 OR 2 HOUR FIRE LABEL FROM AN APPROVED TESTING FACILITY WHICH WILL MEET OR EXCEED THE MINIMUM REQUIRED BY THE LOCAL BUILDING CODE.
6. FOR CLEAR DOOR OPENING HEIGHTS 7 FEET OR LESS: FILLERS AND STRIPS / SHIMS ARE NOT REQUIRED PER SPECIFIED UL CONSTRUCTION.
7. FOR CLEAR DOOR OPENING HEIGHTS OVER 7 FEET (SHAFTWALL CONSTRUCTION ONLY):
   LINER FILLER - ATTACH 1.000 X 12.000 WIDE WALLBOARD TO SHAFTWALL LINER WITH 1.625 TYPE S STEEL SCREWS STAGGERED 12.000 O.C.
   FILLER STRIPS - ATTACH .500 OR .625 X 6.000 WIDE WALLBOARD LINER FILLER TO SHAFTWALL LINER WITH TYPE W STEEL SCREWS STAGGERED 12.000 O.C.
   FILL JAMB STRUT WITH HEADER COMPLETELY (WITHIN .188) WITH LAYERS AND THICKNESSES AS REQUIRED TO MEET UL DESIGN.
8. WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND STUD WITH THE FASTENER TYPE, LENGTHS, LOCATION AND SPACING IN ACCORDANCE WITH THE SPECIFIED UL DESIGN (WALL BOARD THICKNESS PER SPECIFIED UL DESIGN). SEE CHART BELOW FOR WALL SYSTEM CONFIGURATION OPTIONS:

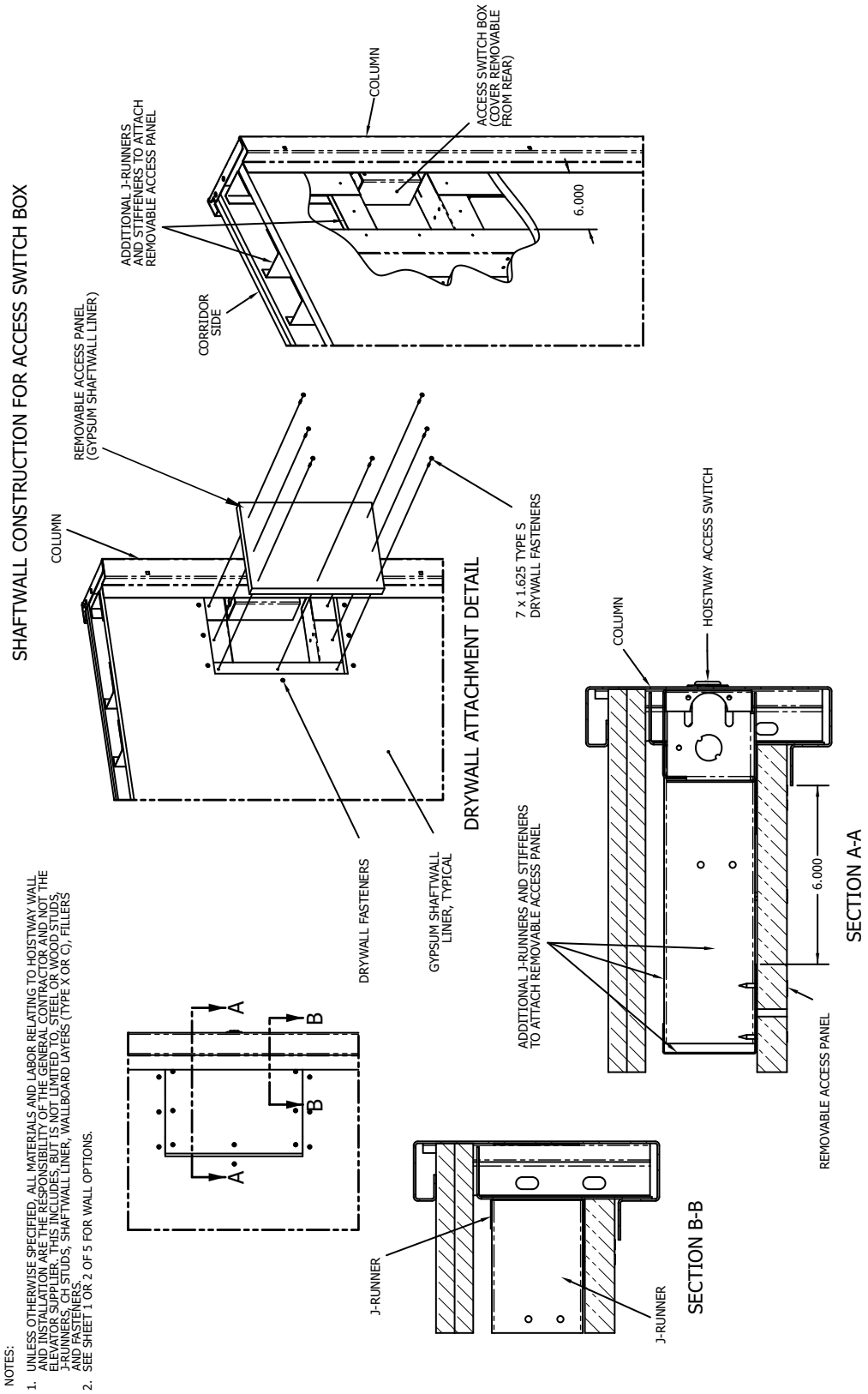
GYPSUM WALL OPTION CHART

OPTION	SHAFTWALL LINER	FACE LAYER	BASE LAYER	MAX FIRE RATING
1	1.000 TYPE X	.500 OR .625 TYPE X OR C	.500 OR .625 TYPE X OR C	2 HOUR
2	.750 TYPE X	.625 TYPE X OR C	.625 TYPE X OR C	2 HOUR
3	.500 OR .625 TYPE X OR C (2 LAYERS)	.500 OR .625 TYPE X OR C	.500 OR .625 TYPE X OR C	2 HOUR
4	.625 TYPE X (2 LAYERS)	.625 TYPE X OR C	.625 TYPE X OR C	2 HOUR
5	1.000 TYPE X	.750 TYPE X OR C	N/A	2 HOUR

9. FOR WALLS WITH LESS THAN 2 HOURS RATING, ELIMINATE THE BASE LAYER OPTION.
10. THE SHAFT WALL LINER TO JAMB THROAT GAP TO BE .188 OR LESS. IF LARGER GAP EXISTS, FILL GAP WITH ADDITIONAL WALLBOARD X 6.000 WIDE. ATTACH ADDITIONAL LAYERS TO J-RUNNER OR STUD USING UL SPECIFIED STEEL SCREWS 12.000 O.C.

Drywall Installation

(continued)



Drywall Installation

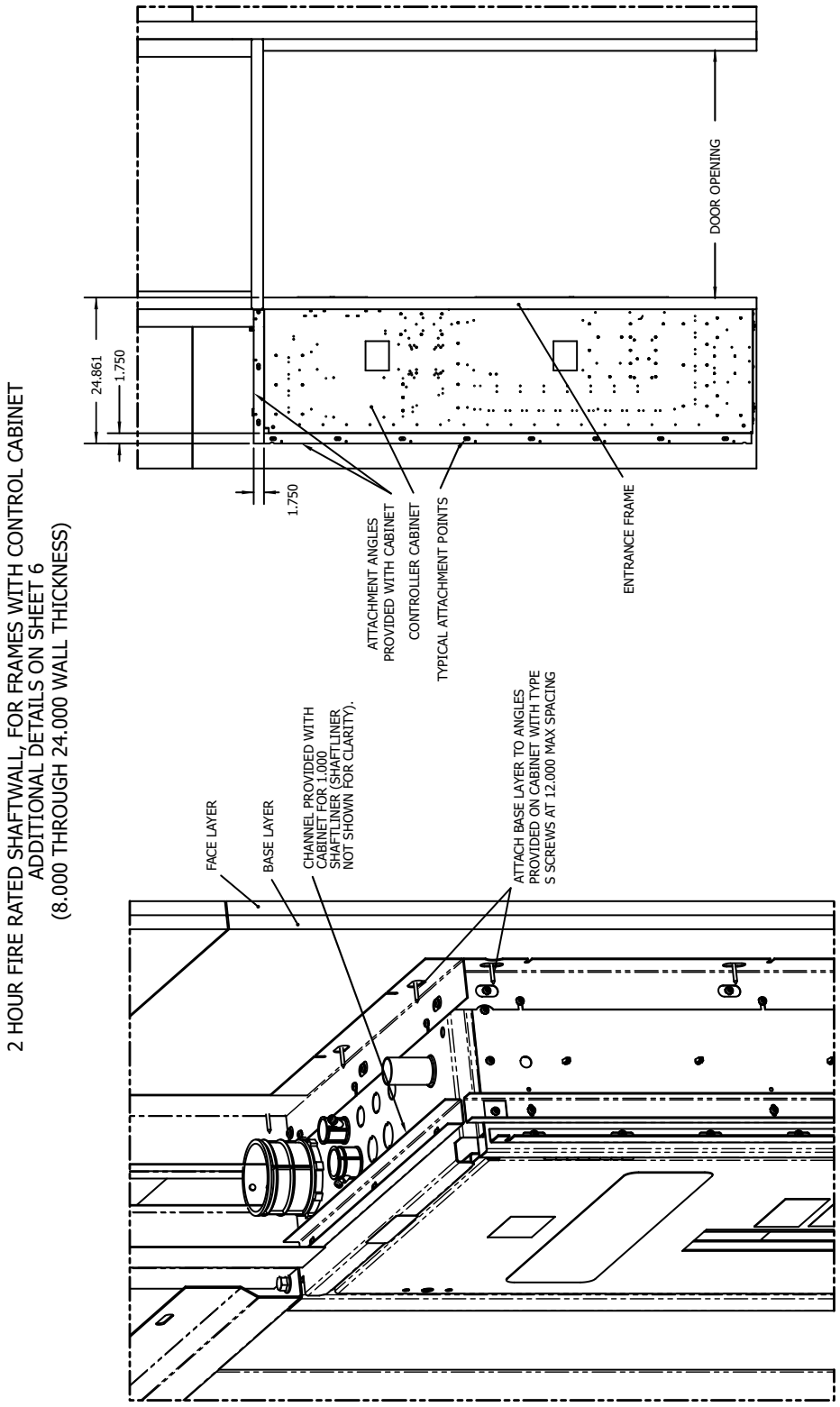
(continued)

TYPICAL NOTES FOR ALL WALL OPTIONS:

1. THE DOOR AND FRAME WILL CARRY A 1 1/2 HOUR FIRE LABEL FROM AN APPROVED TESTING FACILITY WHICH WILL MEET OR EXCEED THE MINIMUM REQUIRED BY THE LOCAL BUILDING CODE
2. 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 OR WOOD STUDS, J-RUNNERS, CH STUDS, SHAFTWALL LINER, WALLBOARD LAYERS (TYPE X OR C), FILLERS AND FASTENERS.
3. WALL BOARD LAYERS TO BE ATTACHED TO THE JAMB STRUT AND J-RUNNER WITH THE FASTENER TYPE, LENGTHS, LOCATION AND SPACING IN ACCORDANCE WITH THE SPECIFIED UL DESIGN (WALL BOARD THICKNESS PER SPECIFIED UL DESIGN).
4. FOR WALLS WITH LESS THAN 2 HOURS RATING, THE BASE LAYER MAY BE ELIMINATED.
5. THE SHAFT WALL LINER TO JAMB THROAT GAP TO BE .188 OR LESS. IF LARGER GAP EXISTS, FILL GAP WITH ADDITIONAL WALLBOARD X 6.000 WIDE. ATTACH ADDITIONAL LAYERS TO J-RUNNER OR STUD USING UL SPECIFIED STEEL SCREWS 12.000 O.C.

Drywall Installation

(continued)



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