VERTICAL EXPRESS

Traditional Entrance Installation Manual

SINGLE SPEED

TWO SPEED

CENTER OPENING

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

Vertical Express • P.O. Box 2019 • Memphis, Tennessee 38101

Published October, 2021
Second Edition
Printed in the United States of America

Manual Number: 89104 v.1.0

Contents

Contents
(continued)

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 that all manufacturing wire connections are tight on relays, contactors, fuse blocks, resistors, and terminals on cards and DIN rail terminals. Connections loosened during shipment may cause damage or intermittent operation.**

Other specific warnings and cautions are found where applicable and do not appear in this summary. See the *Elevator 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, Lockout, and Tagout 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 Employees' Safety and Accident Prevention Program Manual* for the required procedure.

When Power Is On

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

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.

Mechanical Safety

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

Power Unit Fluid System

If working on the power unit fluid system, the static car weight is applying pressure to the jack and valve system and this stored pressure is present at the power unit.

Before working on any component of the power unit, do one of the following:

- Manually lower the car onto the buffers to relieve the stored pressure.
- Close the machine room oil line shutoff valve, and then release the power unit pressure by momentarily opening the manual lowering adjuster valve.

Asbestos Compliance

Vertical Express elevator personnel will no longer drill or modify any doors with asbestos containing materials (ACM) or possible asbestos containing materials (PACM). All elevator doors manufactured or installed 1980 and earlier will be treated as having ACM/PACM.

Doors with ACM/PACM should be replaced rather than modified. If replacement is not feasible, abatement modifications shall be done by a licensed asbestos abatement company. Vertical Express mechanics will safely stage equipment for the abatement team, or remove the doors and seal them with plastic for delivery or pick up by the asbestos abatement company.

Doors manufactured or installed 1980 and earlier may be modified by Vertical Express employees if a test is conducted by a licensed asbestos company prior to work showing zero evidence of ACM/PACM.

All employees that risk exposure to asbestos will complete the safety department approved asbestos awareness training.

All employees will stop any work that could expose them to ACM/PACM, and immediately contact their supervisor and their safety manager. All exceptions must be approved by the Director of Health and Safety.

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

- Store boards in separate, sealed, anti-static bags until time for installation.
- When handling boards, wear an anti-static wrist strap with ground wire. Acceptable straps are available through local electronics parts suppliers. Typical anti-static wrist straps are intended for applications below 240 VAC.
- Do not place boards on any surface without adequate static protection.
- Handle boards only by their edges using proper anti-static techniques. Avoid touching components, traces, and connectors.
- Take extra care when handling individual components, such as integrated chips, metal oxide semiconductors, and field-effect transistors. These components can be destroyed with as little as 30 volts of electrostatic discharge.

Shipping

- Complete the included board discrepancy sheet.
- Any board returned to manufacturing must be packaged in a closed, sealed anti-static bag designed for the board, and packaged in a sturdy protective shipping carton.
- Clear bubble wrap and Styrofoam are unacceptable packing materials.

Failure to adhere to the above guidelines will void the board warranty.

Access and Egress Procedures

The access and egress procedures that are used entering the hoistway determine whether or not power is needed to perform the required task(s). If not, Turn OFF, Lockout, and Tagout the mainline disconnect.

WARNING **DO NOT stand on the car top emergency access cover.**

Car Top Safety

Safety Precautions When Accessing/Egressing Car Tops

- Before opening the hoistway door, ensure that the correct hoistway has been selected and that the car is at the proper floor (to avoid a fall hazard).
- Access car tops from the top terminal landing whenever possible.
- Never access a hoistway, unless a reliable method of controlling the car has been determined.
- Locate the emergency stop switch.
- Before accessing the car top, place the stop switch in the STOP position, and confirm the proper operation.
- Locate a safe refuge area.
- Always maintain control of the hoistways doors during access/egress.
- Fall protection is to be used when a fall hazard exists. The only exception to this is when routine maintenance is being performed on top of complete, operational elevator cars, Do Not use fall protection where there is a greater risk of entanglement.
- When opening hoistway doors from the car top, do so slowly, so that no one steps in from the landing thinking a car has arrived.
- Observe overhead clearances.
- Use extra care when working on car tops that are curved, domed, or located in unenclosed hoistways.

WARNING **DO NOT turn the following switches to Automatic Operation until the hoistway door interlock is open–and remains open–and the hoistway is empty.**

- When egressing the hoistway/car top, ensure that the stop switch is in the STOP position, and that the inspection switch is on Inspection Operation.

Safety Precautions When Working on Car Tops

- Before beginning work, check the car top for oil or grease, and clean as required.
- Locate the position and counterweights of the car being accessed, as well as any other cars/counterweights in the vicinity. Take appropriate measures to avoid hazards.
- Verify proper operation of the top-of-car inspection operating buttons. Where outlets are provided, use a grounded, portable light with a suitable, non-conductive; or use a grounded lamp guard and reflector.

Access and Egress Procedures
(continued)

CAUTION **DO NOT attach electrical cords on the car or counterweight ropes.**

Pit Safety

Before entering a pit, ensure that every employee is aware of the hazards. Some common hazards are:

- Recognized refuge space
- Inadequate lighting
- Improper access
- Tripping hazards
- Improper use of pit ladders
- Moisture/water/fluid
- Moving equipment

Before entering a pit, take appropriate steps to minimize the following hazards and any others that are identified:

- Locate the position of the car being accessed, as well as any other cars in the vicinity.
- Before accessing the pit, the car MUST be located high enough to allow the placement of the pit prop pipe stands to be inserted into the buffers.
- Once the pit is initially accessed, the pit props must be installed and the oil line shutoff valve closed to prevent car movement.
- Obtain control of the car.
- Identify a refuge space.
- If movement of the elevator is not needed to complete the work being performed, Turn OFF, Lockout, and Tagout procedures are required.
- If notified by the building owner or representative that the pit and/or hoistway has been classified as a Permit Required Confined Space (this notification could be verbal or the pit/hoistway may be labeled), contact the appropriate person for authorization. In either case, DO NOT enter the pit/hoistway until you receive authorization.

Safety Precautions When Working In Pits

- Before entering pit, test and verify door lock circuit and stop switch circuit.
- Ensure that all portable lights and tools are connected through a ground fault (GFCI).
- Take care to protect all lighting from damage.
- DO NOT work in a pit with standing water.
- Before climbing, always examine shoes for fluid/grease.
- Use both hands when working with ladders and when access/egress the pit.
- Be aware of moving equipment (e.g., pump, motors, belts, and sheaves), and ensure that clothing and hands cannot get caught in them.
- Avoid smoking, or the use of open flames in the pit.

SINGLE SPEED

Single Speed Installation

Two Speed Installation starts on page 30.

Center Opening Installation starts on page 52.

Sill Installation

1. Verify that a running platform with the car sill is installed.
2. Obtain the finished floor height dimension from the contractor.
3. Use the job layouts to determine the location of daylight lines and car centerline.
4. Apply tape to car sill, and mark lines on tape. See Figure 1.
5. Draw a plumb line on the landing wall that corresponds to the car's centerline.
6. Subtract the finished floor height from $4^{1}/_{2}$". Mark this distance on the landing wall lower than the plumb line drawn in the previous step, drill a hole for a $^{1}/_{2}$" anchor, and install an anchor. See Figure 1.
7. With the jack bolts, adjust the space between the sill support angle and the reinforcing angle to a uniform $^{5}/_{8}$" along the length of the sill. See Figure 2 on page 11.
8. Install the column and the strut angle mounting brackets on the sill.
9. Check for, and remove, any debris on the landing wall.

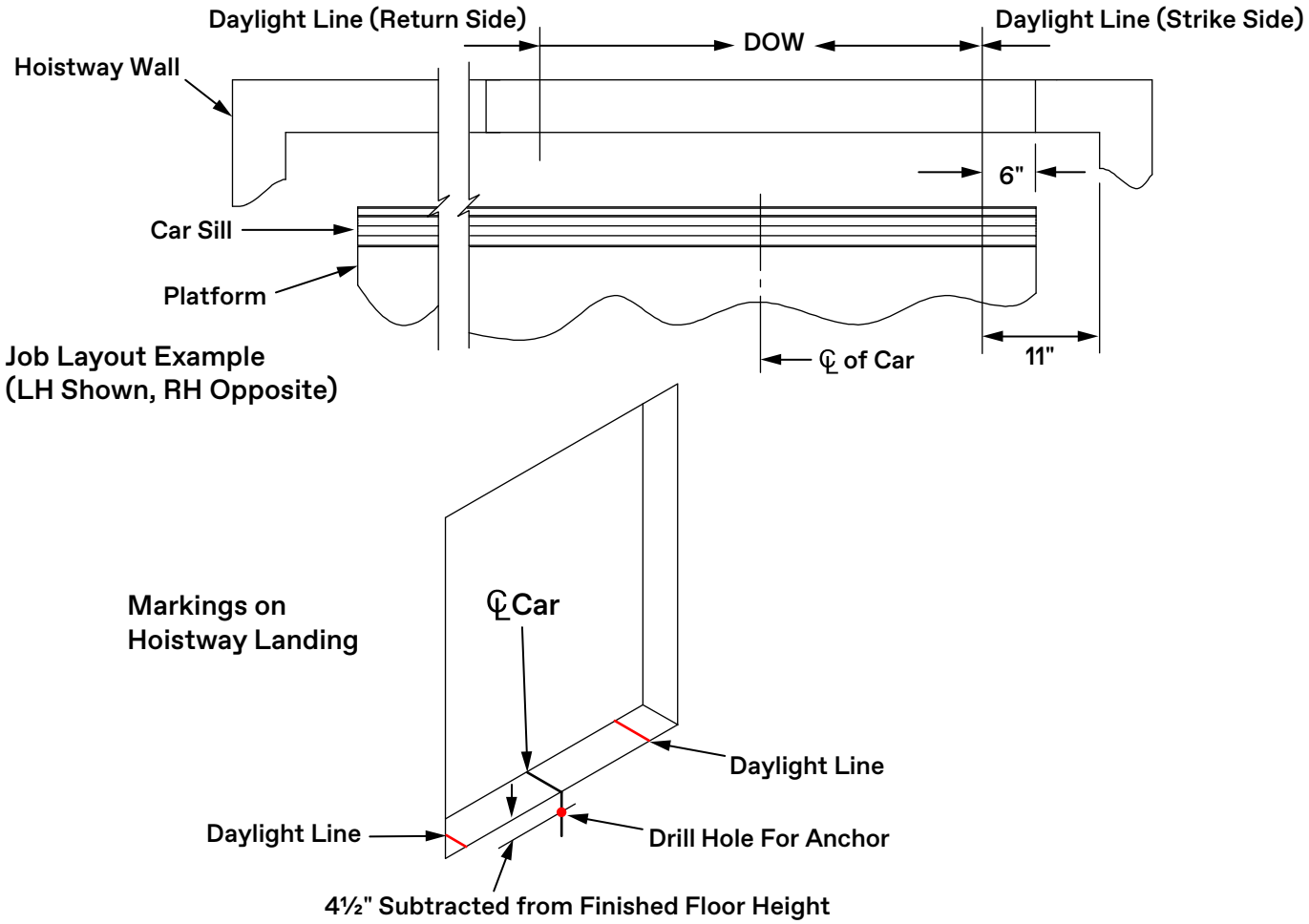
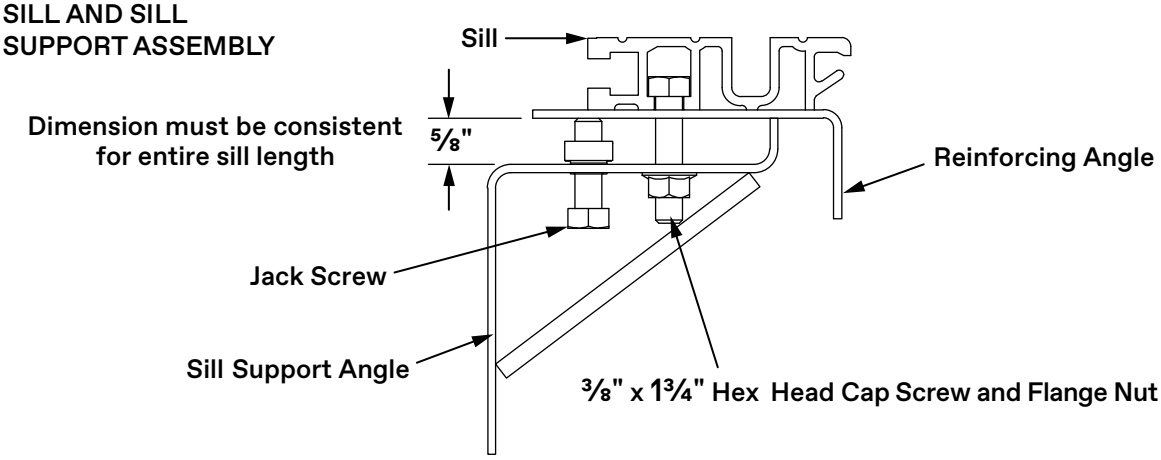


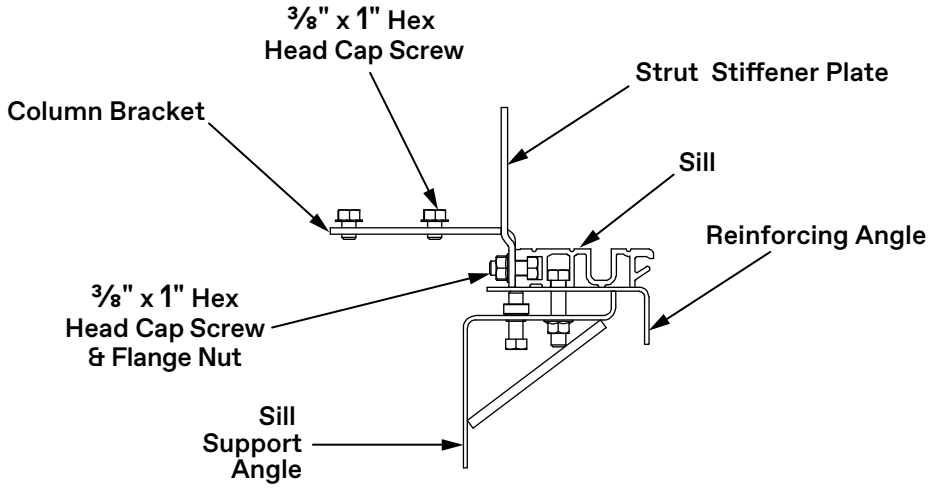
Figure 1 - Sill Installation (1 of 2)

Sill Installation
(continued)

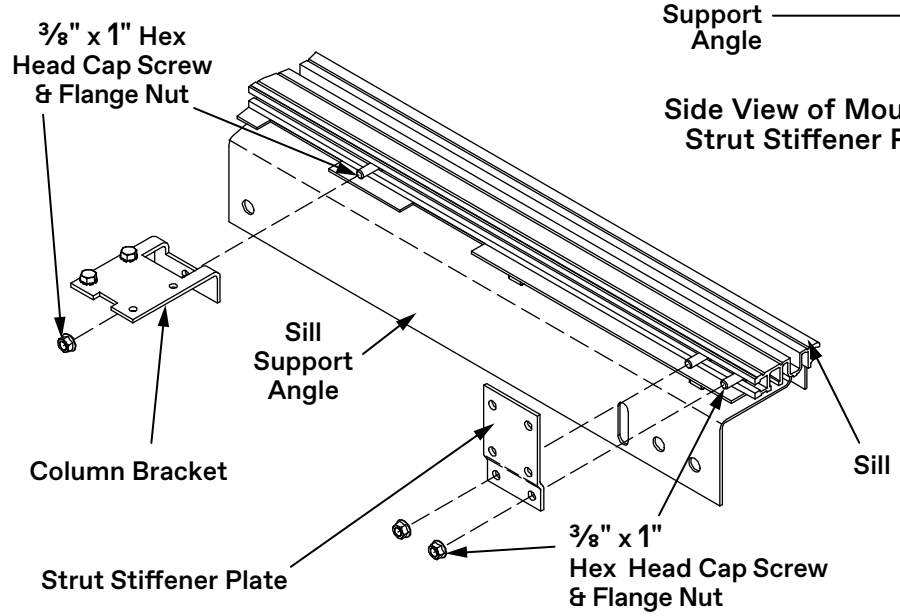
SILL AND SILL SUPPORT ASSEMBLY



COLUMN BRACKET INSTALLATION



Side View of Mounted Column Bracket and Strut Stiffener Plate (Non-Clad Frames)



Exploded View of Mounted Column Bracket and Strut Stiffener Plate (Non-Clad Frames)

Figure 2 - Sill Installation (2 of 2)

Sill Installation
(continued)

Mount the Sill and Sill Support Assembly

1. Slide the middle slot of the sill assembly onto the anchor in the wall. Screw the nut onto the anchor, and hand tighten. See Figure 3.
2. Raise the sill even with the finished floor height, and tighten the anchor nut.
3. Check for, and shim, any gaps between the sill and the hoistway wall.
4. Level the sill post–wise.
5. Match drill a $^{1}/_{2}$" hole through each of the two end slots, and install a $^{1}/_{2}$" anchor in both slots.
6. Loosen the four $^{3}/_{8}$" nuts underneath the sill. Use a header/sill gauge to adjust the sill for a uniform gap of $1^{1}/_{4}$" between it and the car sill.
7. Line up the centerline of the sill with the car's centerline marked on the landing.

CAUTION **Do not overtighten nuts in the next step or the reinforcing angle could bend.**

8. Tighten the four $^{3}/_{8}$" nuts.

CAUTION **If jack bolts are needed for the next step, anchors in the sill support angle may need loosening.**

9. Level the sill front–to–back.
10. Install a $^{1}/_{2}$" anchor in the two remaining slots in the center of the sill support angle.
11. Install a $^{9}/_{16}$" anchor in one of the round holes on each end of the sill support angle.

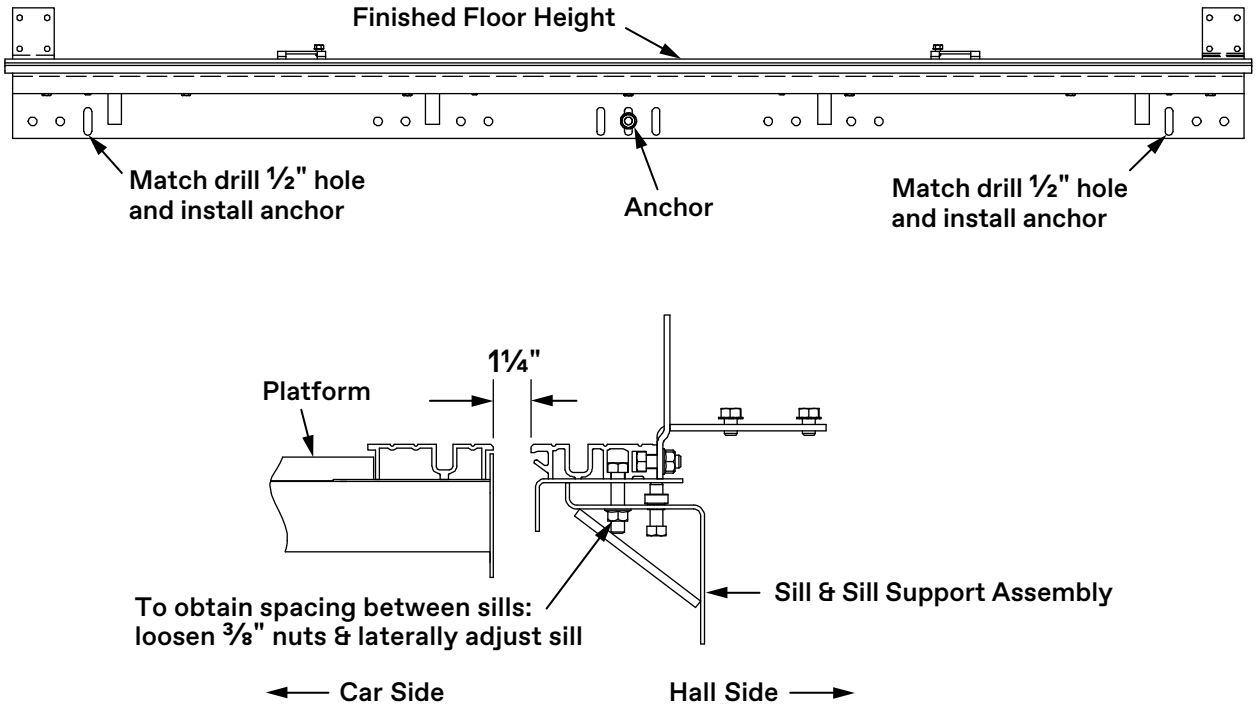


Figure 3 - Sill and Sill Support Mounting

Install Struts

1. Install a strut on the strut stiffener plate at each end of the sill; do not tighten the hardware. See Figure 4. The end with the vertical slots attaches to the strut stiffener plate.
2. Loosely install an end clip to the top of each strut extension.
3. Ensure that the strut extension reaches above the rough opening, and use a $^{1}/_{4}$" cap screw and flange nut to snugly fasten the strut extension and the strut together.
4. Hold the strut/strut extension plumb, place the end clip against the hoistway wall, and match drill a $^{3}/_{8}$" x $3^{1}/_{8}$" hole.
5. Install a $^{3}/_{8}$" anchor, and fasten the end clip to the anchor.
6. Tighten the hardware that is holding the strut angles to the strut stiffener plate.
7. Repeat this procedure on the other side.

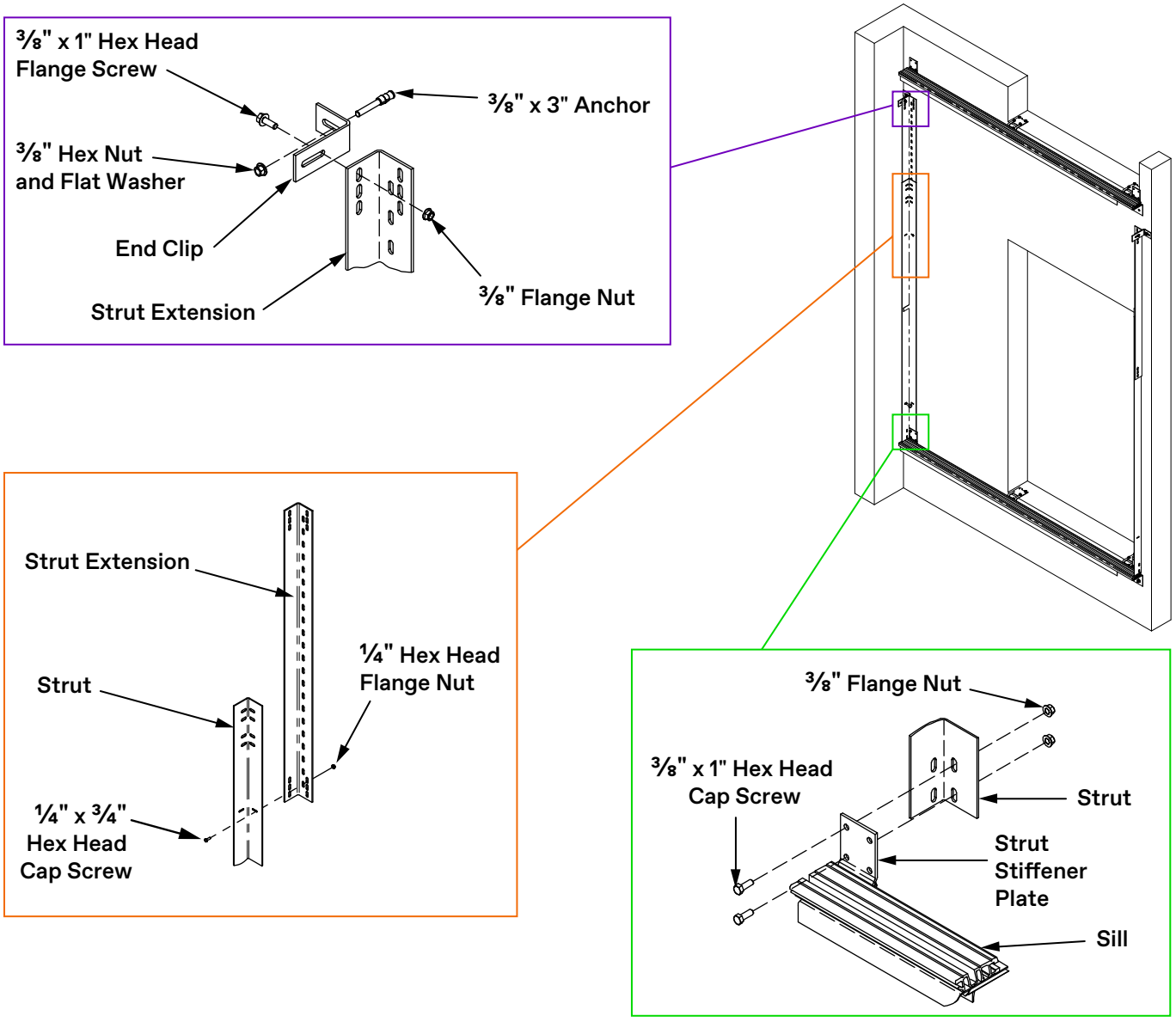


Figure 4 - Install Struts and Strut Extensions

Install Header

1. From the sill, measure the header height given in Figure 5, and mark the strut. Repeat for the other side.
2. Align the bottom of the header with the marks made in step 1.
3. Match the slots in the end of the header to the slots in the strut.
4. Install a $^{3}/_{8}$" x 1" cap screw and flange nut in each slot.
5. Level the header, and tighten the hardware.

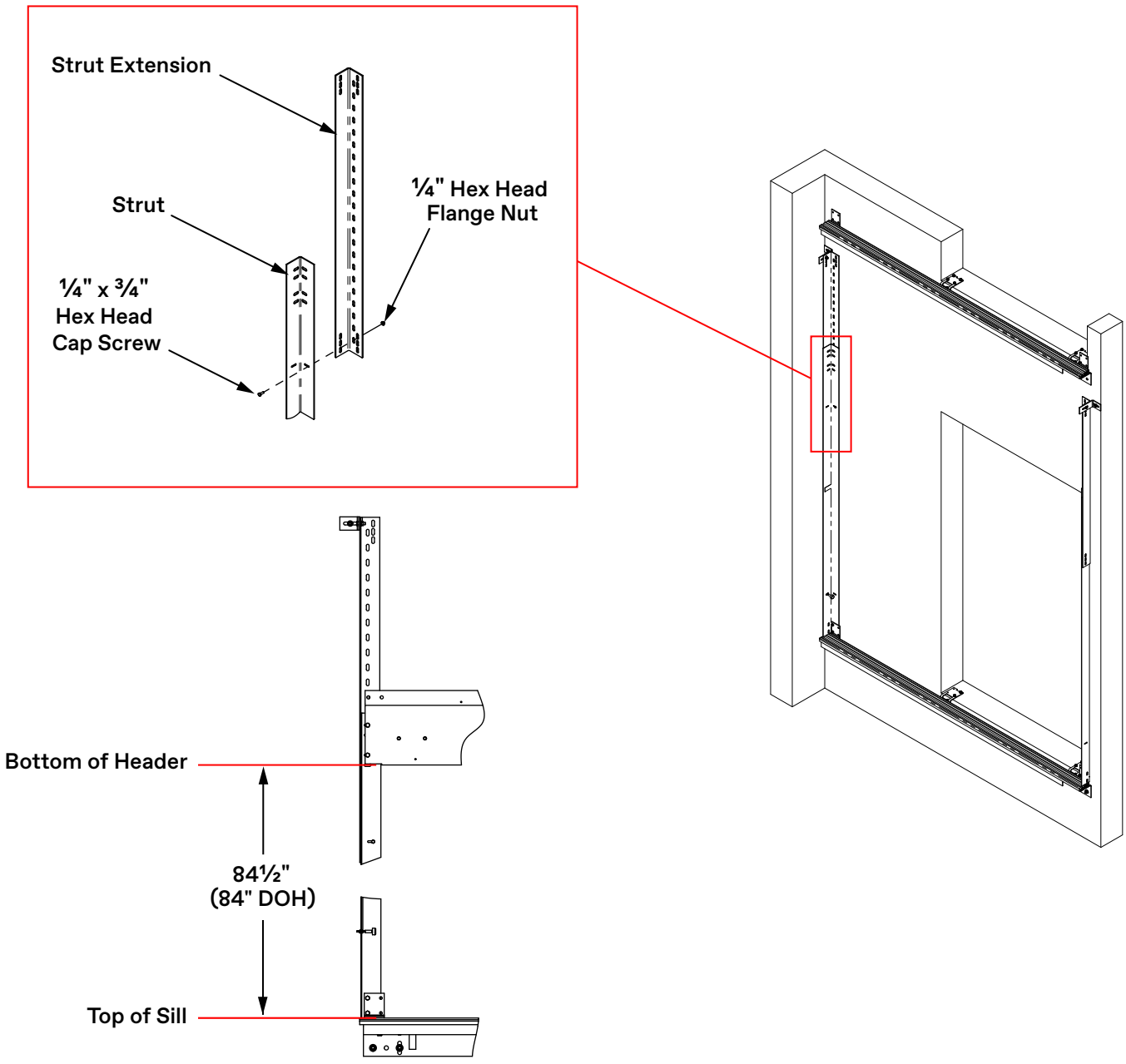


Figure 5 - Mount Header on the Struts

Assemble Entrance Frames

1. Distribute the frame materials (columns, transom, and fasteners) to each landing.
2. At a landing, assemble the entrance frame face down on cardboard or carpet in front of the opening. See Figure 6.
3. Install the strike column door bumpers.
4. Tighten all fasteners.
5. Verify that the columns are square with the transom.
6. Repeat this procedure for all other landings.

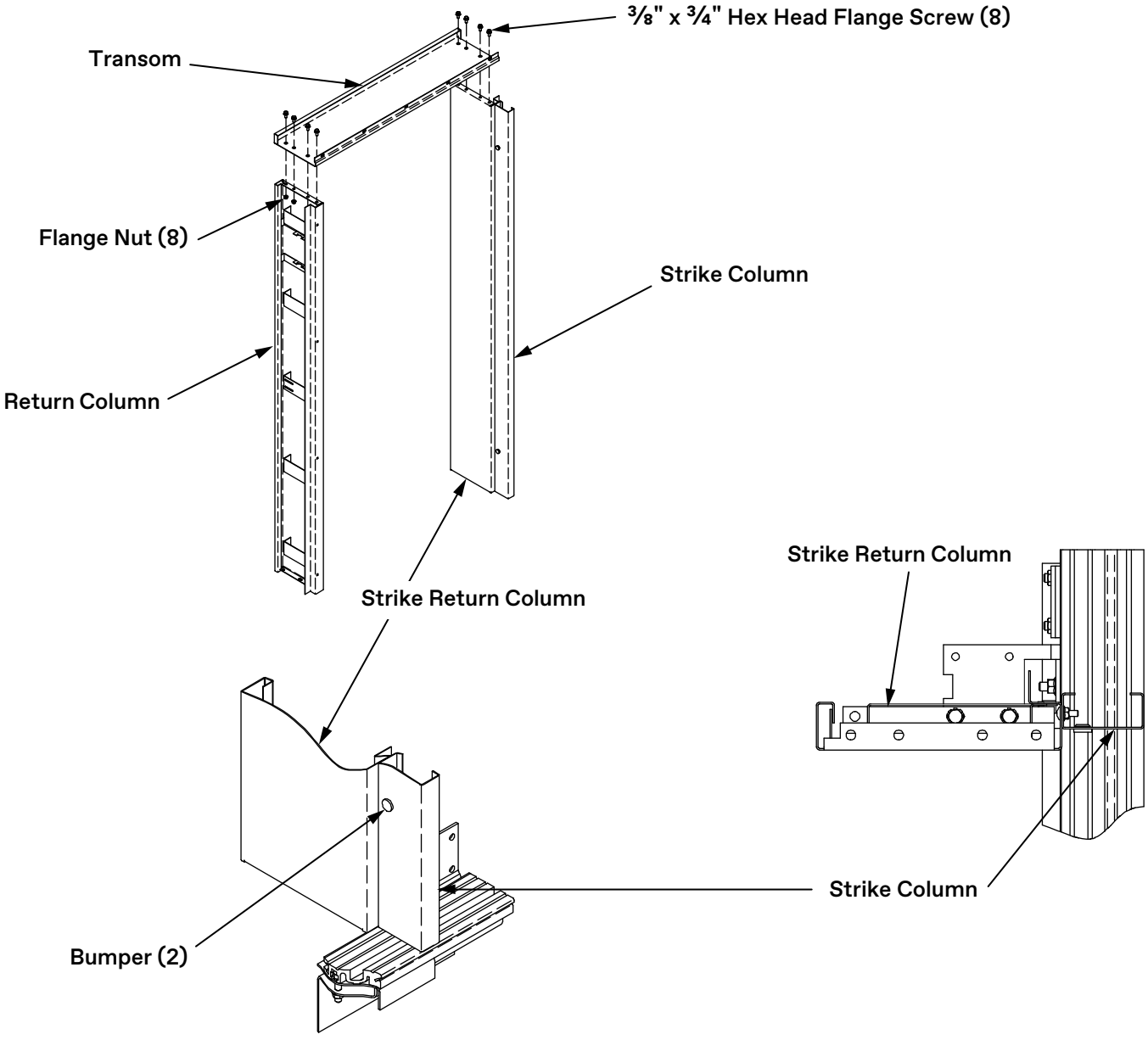


Figure 6 - Assemble Entrance Frames

Install Entrance Frames

See Figure 7 on page 17 for all steps in this procedure.

1. Remove and retain the four $^{3}/_{8}$" cap screws and external tooth lock washers from the column mounting brackets.
2. Stand the frame on the column mounting brackets, and loosely install the four $^{3}/_{8}$" cap screws and external tooth lock washers.
3. Align the columns so that they overlap the hoistway sill $^{1}/_{8}$".

NOTE

The $^{1}/_{8}$" dimension corresponds to the depth of the cutout on the top back edge of the hoistway sill.

4. Square each column with the hoistway sill, and tighten the columns to their mounting brackets.

- For columns equal to or greater than 12"
  a. Attach the frame stiffener to the base of the column.
  b. Match drill a $^{5}/_{16}$" x $2^{3}/_{4}$" hole on the other end of the frame stiffener.
  c. Install the $^{3}/_{8}$" anchor.

5. Run the platform up to a point where the transom can be easily reached.
6. Use $^{1}/_{4}$" machine screws to attach the header to the transom.
7. Repeat this procedure for all other landings.

Install Entrance Frames
(continued)

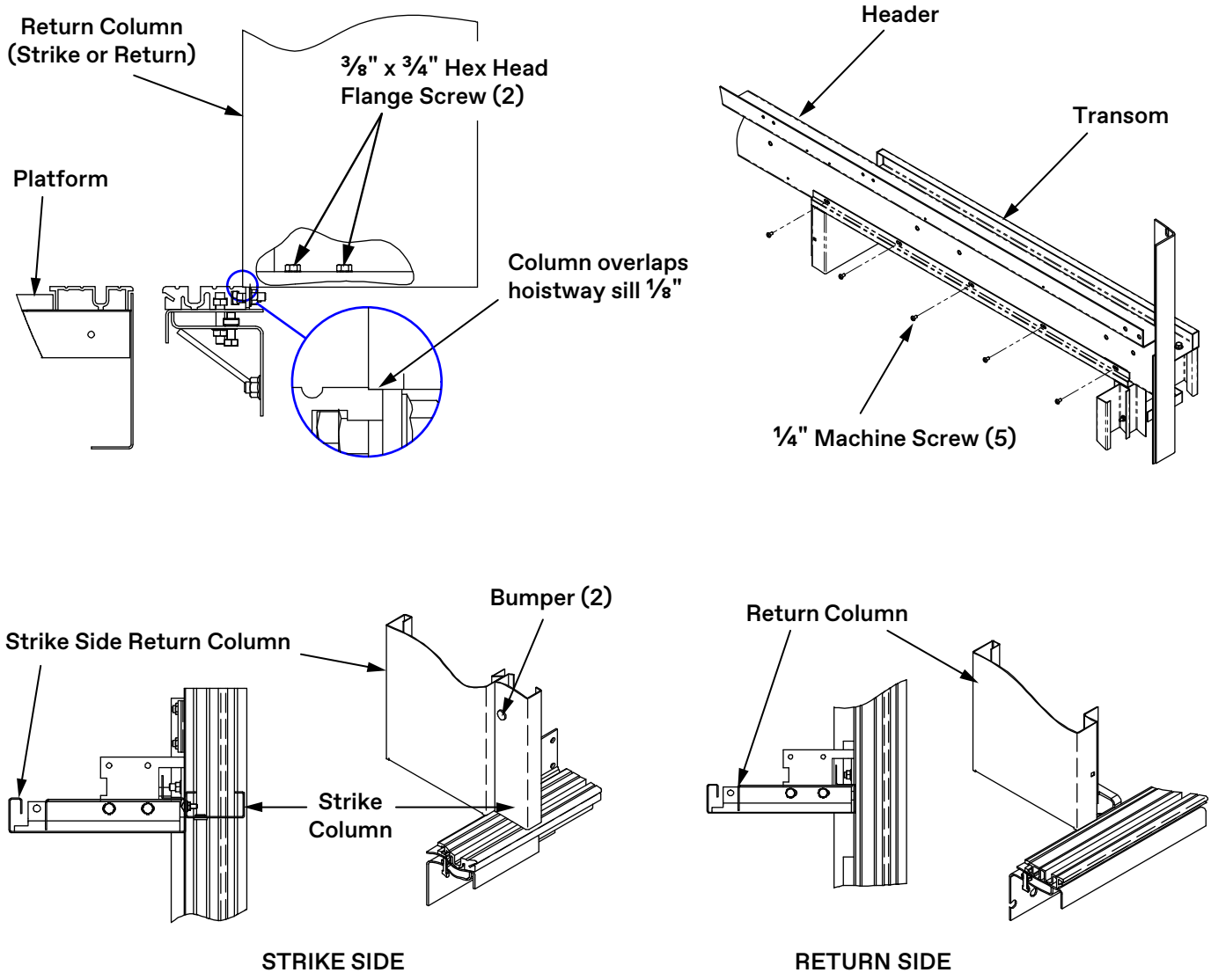


Figure 7 - Install Entrance Frame

Adjust Strut/Header/Frame Assembly

1. At the end clips, adjust the strut/header/frame assembly toward the hoistway wall so that the assembly is $^{1}/_{8}$" off–plumb at the header. This action allows the clutch to clear the fascia. See Figure 8.
2. Tighten the end clip hardware.
3. Check the post–wise plumb, and adjust (if necessary).
4. Mount a stand-off bumper on the strut opposite the strike column.
5. Repeat this procedure for all other landings.

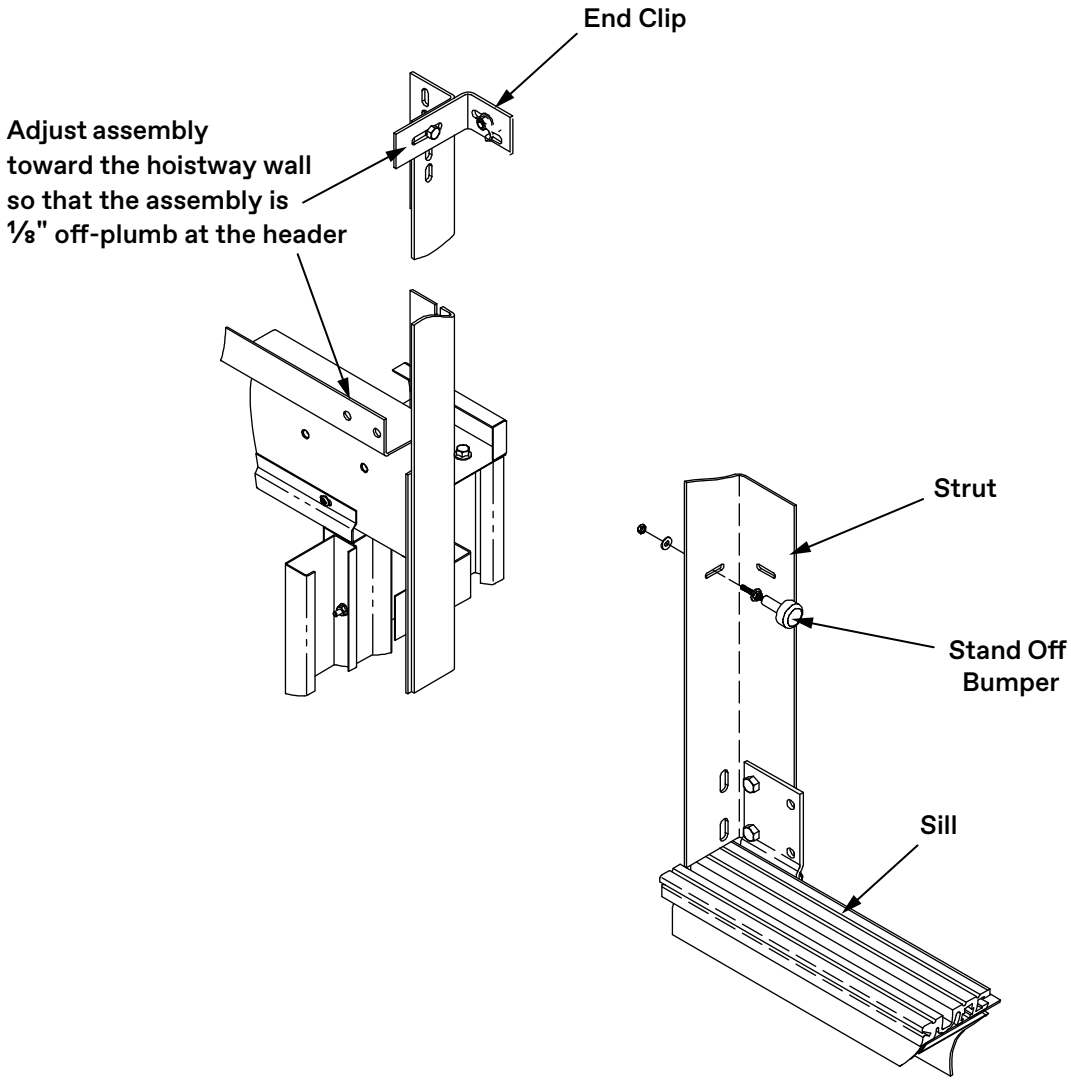


Figure 8 - Adjust Frame Assembly

Install Hoistway Hangers

1. Place a hoistway hanger assembly at each landing.
2. At a landing, place the hanger assembly on the platform, and run the platform up until the header can be reached easily.
3. Remove the shipping nuts from the $^{3}/_{8}$" mounting screws. See Figure 9.
4. Lift the hanger into place and install and tighten each of the mounting screws.
5. Repeat this procedure for all other landings.

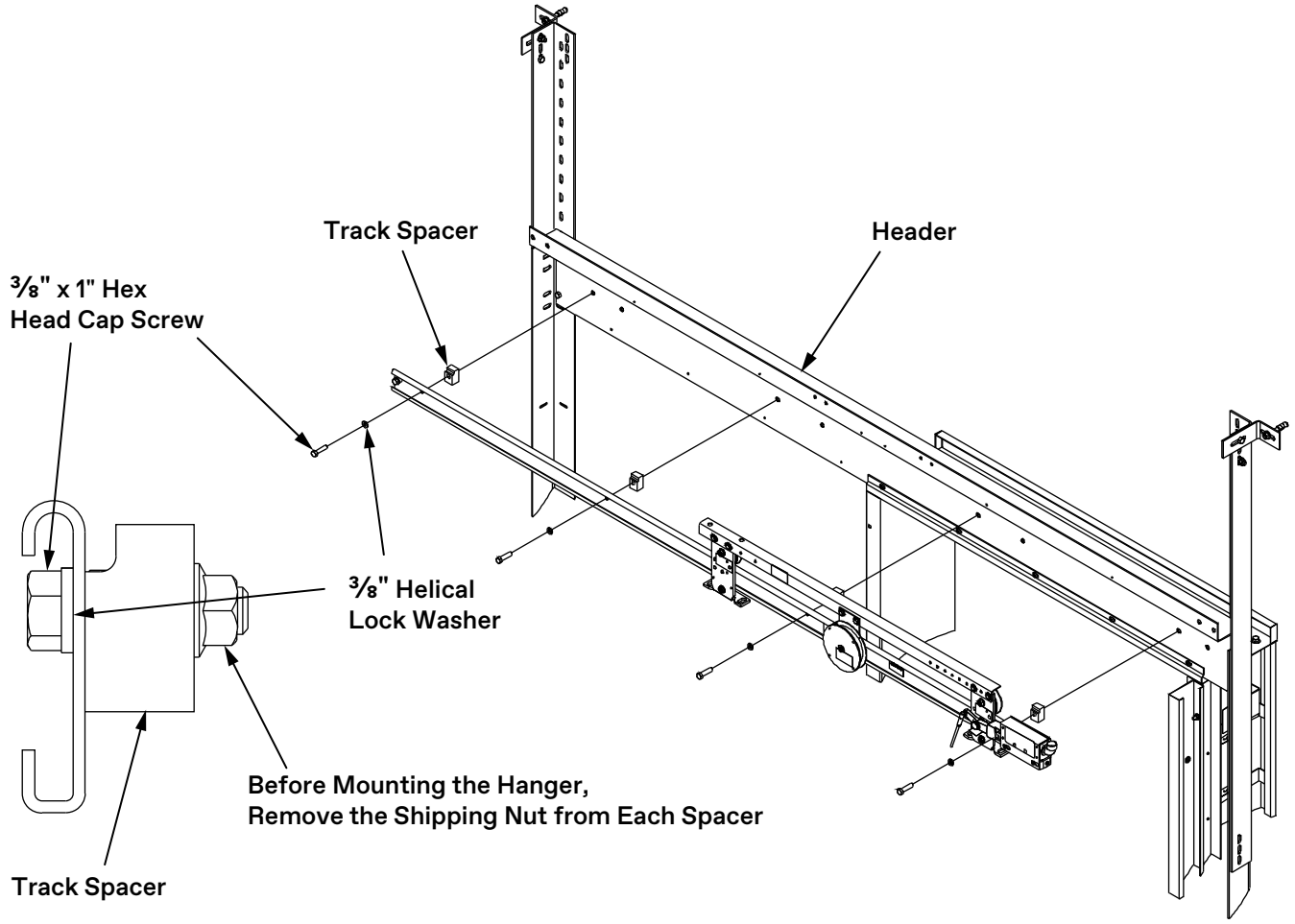


Figure 9 - Install Hoistway Hangers

Mount Hoistway Doors

1. Distribute the hoistway doors to each landing.
2. At a landing, place doors on the hoistway sill, and lean against the hoistway header.
3. Install pendant bolts in the top of the doors and tighten. See Figure 10.
4. Install a jam nut, followed by a flat washer, on each pendant bolt.
5. Guide the pendant bolts through the slots of the door hangers. Install a flat washer and a jam nut on each pendant bolt.
6. Mount the door gibs, the door retainers, and the door safety guides. Adjustments will be done later.

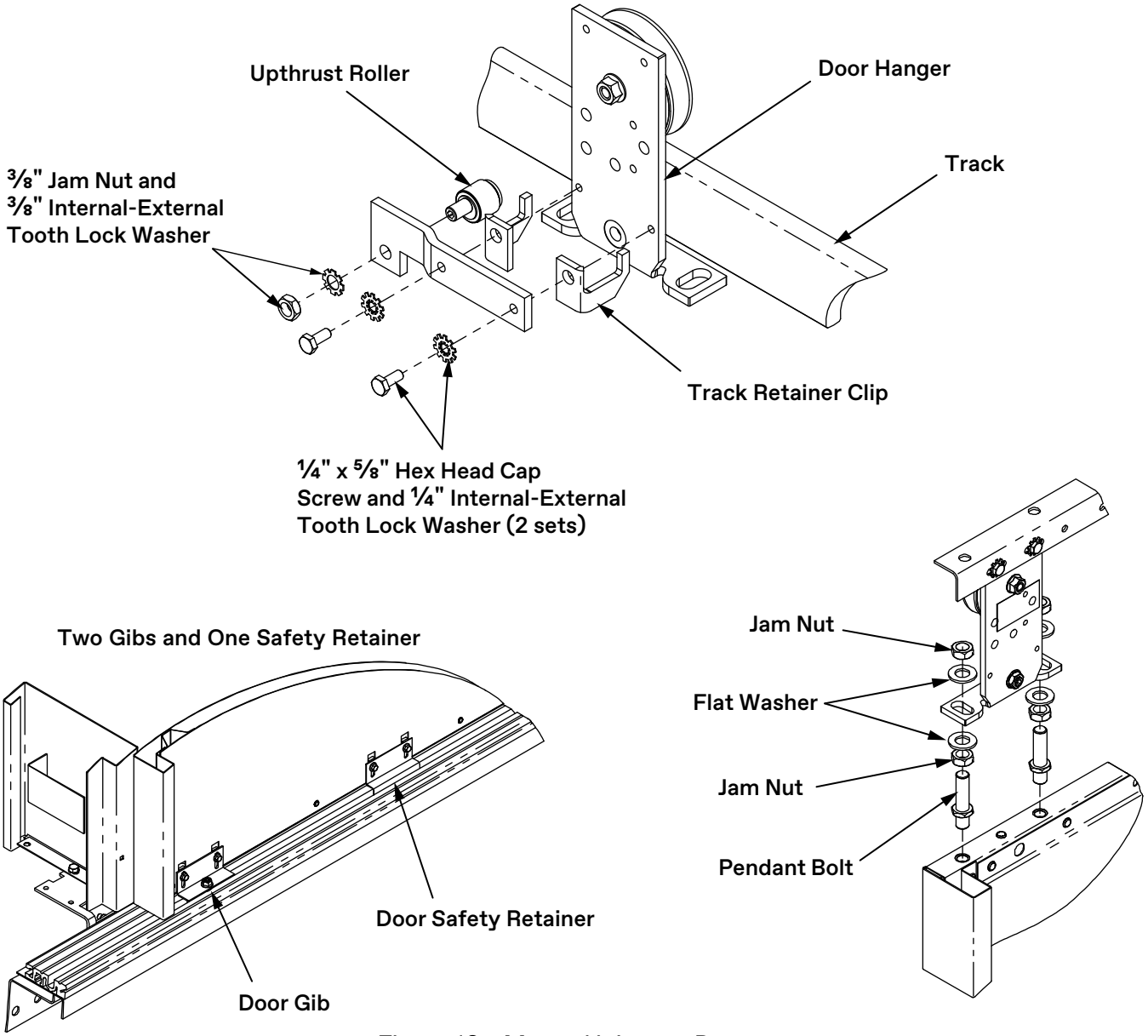


Figure 10 - Mount Hoistway Doors

Adjust Running Clearance

1. Place a $^{1}/_{4}$" shim (running clearance) underneath each edge of door. See Figure 11.
2. Loosen the jam nuts underneath the door hangers.
3. Turn the top jam nut to adjust the doors up or down until each edge of the door just touches the $^{1}/_{4}$" shim.
4. Tighten the jam nuts.
5. Check the leading edge of the door by rolling it to the closed position.
6. Observe whether the edge meets the two bumpers in the strike column at the same time. The leading edge of the door *must never* meet the bottom bumper first.
7. Turn the eccentric of the upthrust roller clockwise until the roller just touches the bottom of the door track.
8. Adjust the eccentric for a 0.015" gap between the upthrust roller and the door track.

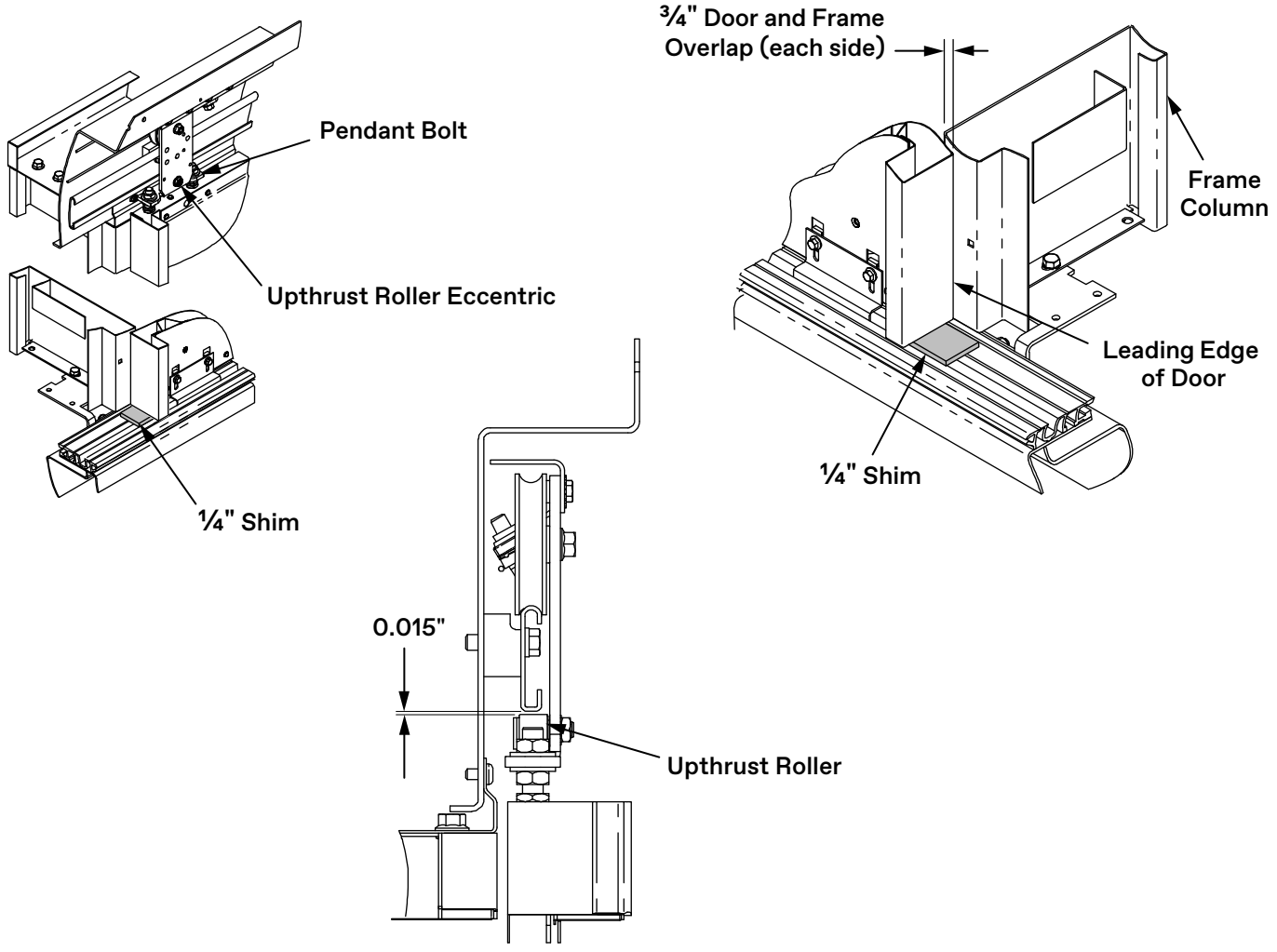


Figure 11 - Adjust Running Clearance

Adjust 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 12.
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. With a $^{3}/_{16}$" hex wrench, turn the eccentric of the door gib until the door panel just touches the $^{1}/_{4}$" shim, 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.

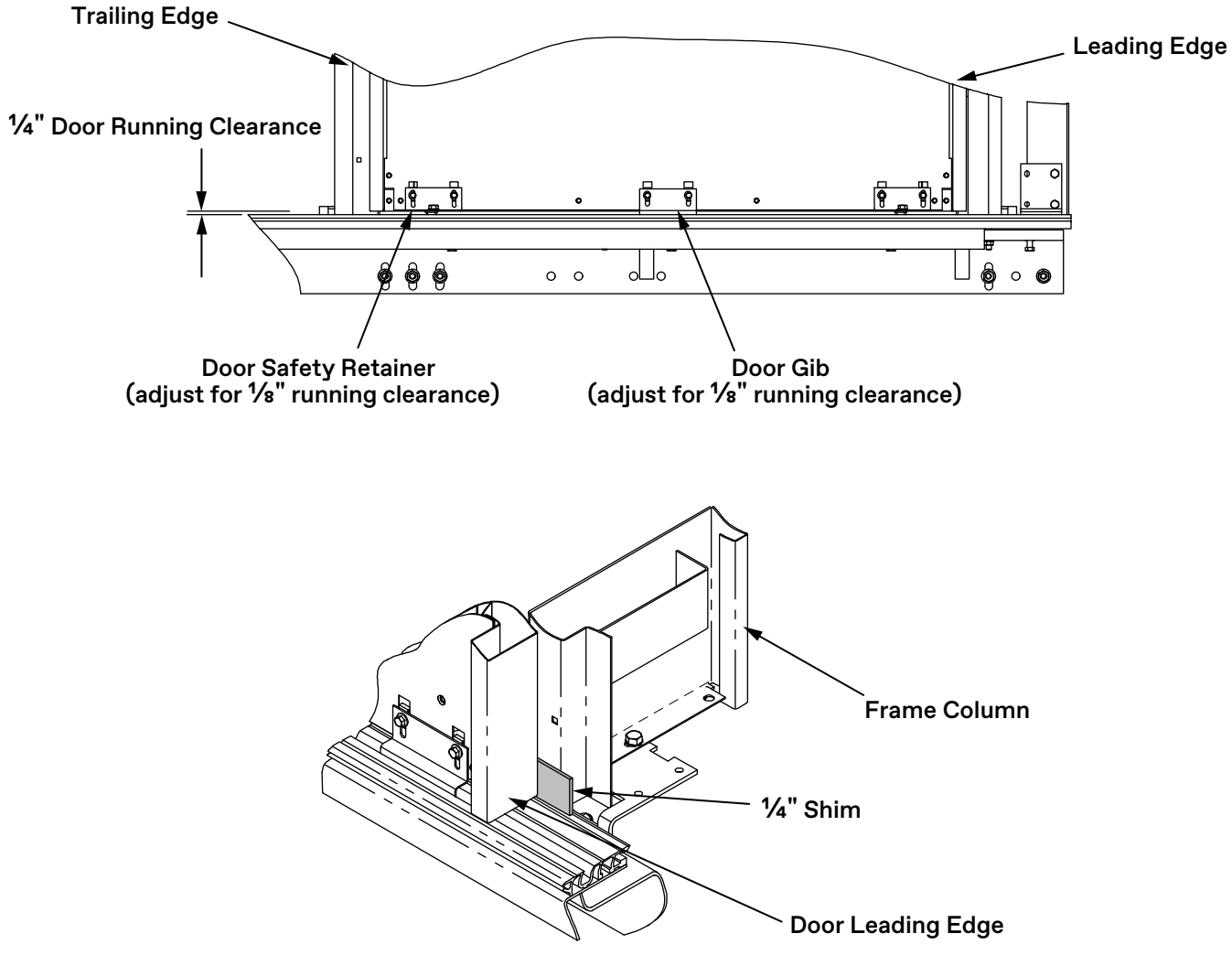


Figure 12 - Adjust Door Gibs

Adjust Closer Reel and Track Retainers

1. Put 3 or 4 wraps on the closer reel, and then use a $^{1}/_{4}$" x $^{3}/_{4}$" hex head cap screw and a $^{1}/_{4}$" flange nut to attach the cable to the header. See Figure 13.
2. Adjust the closer reel so that the doors close when released $^{1}/_{2}$" from the fully closed position.
3. Verify the doors fully close with no “double bump” when doors touch each other.

NOTE

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

4. On each side of the door panel, use $^{1}/_{4}$" x $^{1}/_{2}$" hex head flange screws to install 2 track retainers on each door hanger.
5. Adjust the track retainers to allow sufficient running clearance between the retainer and the track.

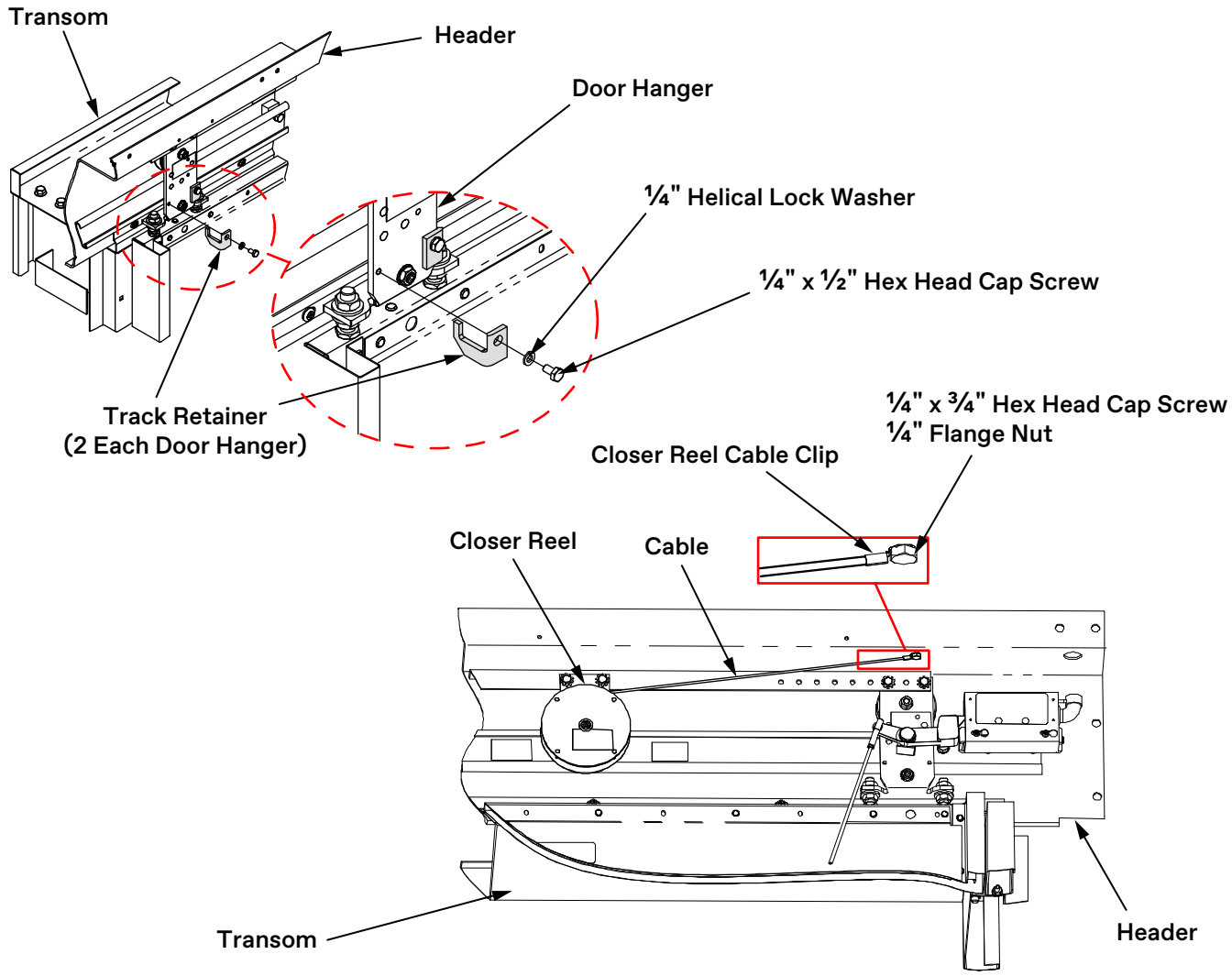


Figure 13 - Adjust Closer Reel and Install Track Retainers

Install Fixture Boxes

- Fixture boxes must be installed *after* the entrance frames are installed, and *before* the hoistway wall is completed.
- Use brackets to install the fixture boxes at each landing.
- The brackets may be used to mount the fixture boxes on the strut angle, the entrance frame, or the hoistway wall.
- Attach a length of EMT between the hoistway duct and the fixture boxes.

Install and Adjust Interlocks

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 14 on page 25.
2. Remove the cover from the interlock box.
3. Close the doors, and verify the following:
   a. The interlock hook is centered front-to-back on the contacts.
   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.

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

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.
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.

Install and Adjust the Interlocks
(continued)

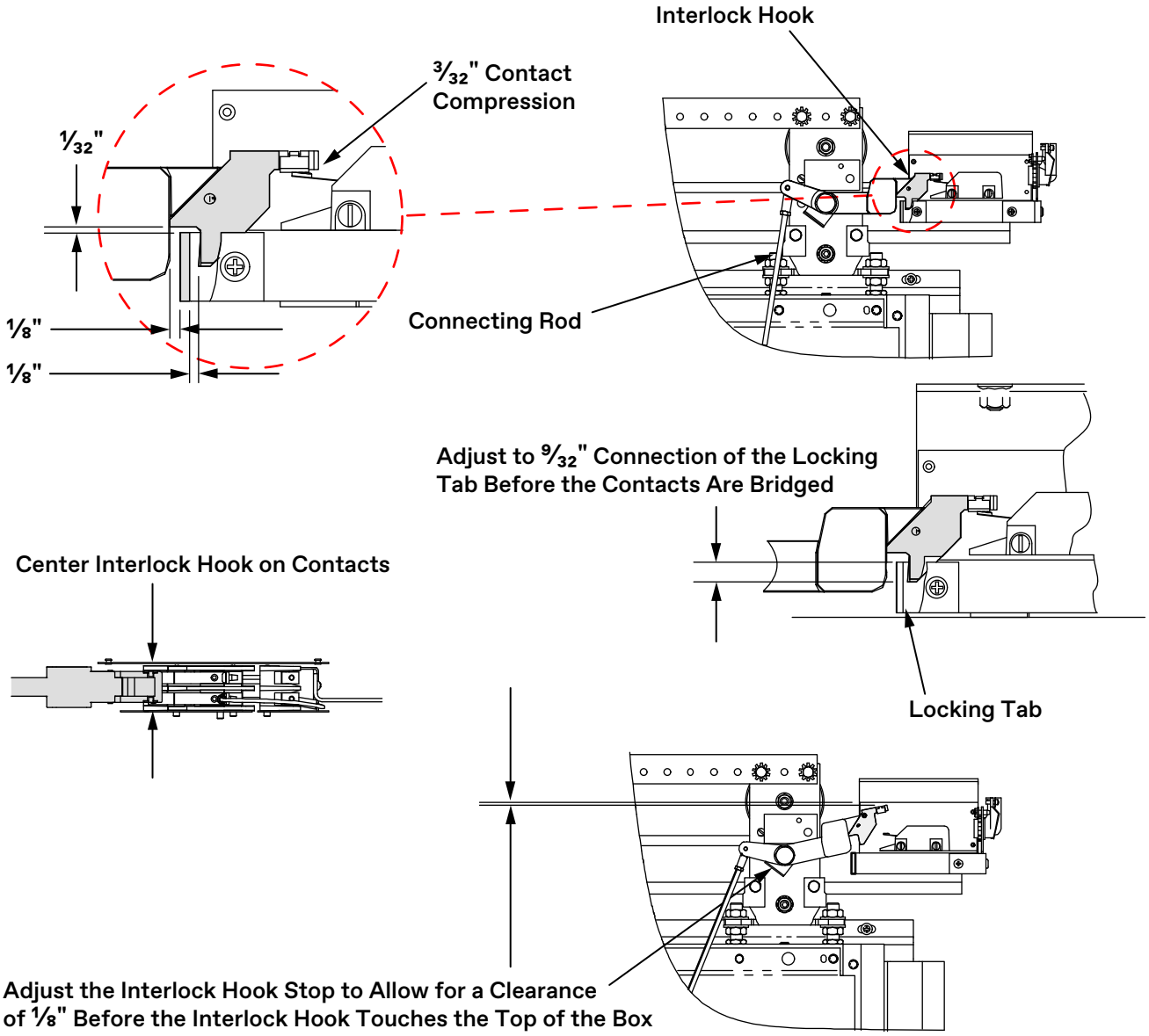


Figure 14 - Interlock Adjustment

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 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 15 on page 27.
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 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.
11. 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 toe guard in the pit must extend far enough below sill so that when the car is on compressed buffers the platform toe guard will not be below the hoistway toe guard.
12. Install the toe guard by hooking it onto the top fascia plate.
13. Fasten the toe guard to the wall with the provided drive pin anchors.
14. If required, install all dust covers.

Install Fascia Plates and Dust Covers
(continued)

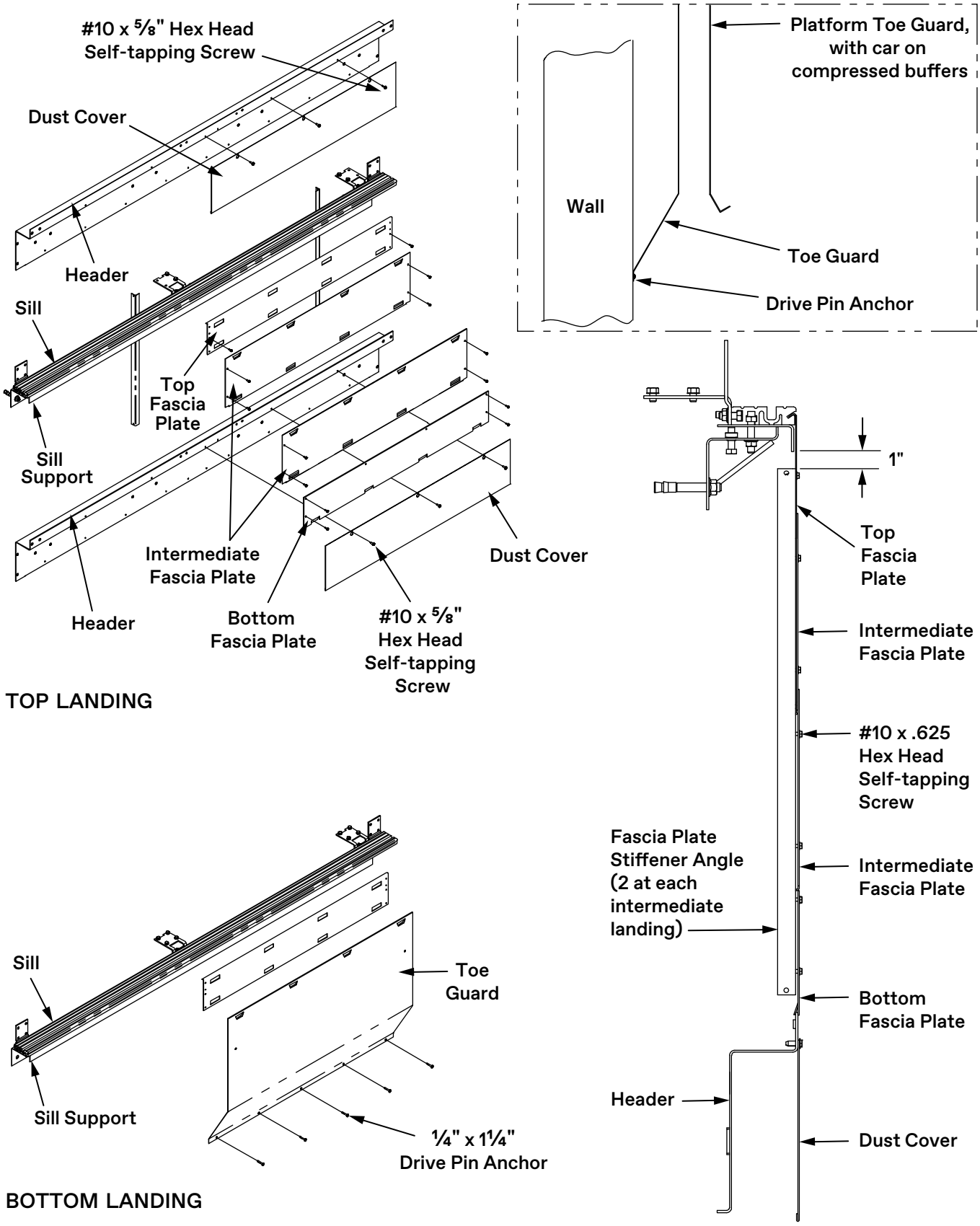


Figure 15 - Install Fascia Plates and Dust Covers

Install the Type 2 Door Restrictor

1. Mark the position of the hoistway restrictor angle. See Figure 16.
2. Use the supplied hardware to install the restrictor angle on the fascia. The restrictor angle must not be lower than 1″ below the top of the hoistway sill.
3. Repeat this procedure for all landings.

Opening Width	Angle Position
32"	35 3/8"
34"	37 3/8"
36"	39 3/8"
38"	41 3/8"
40"	43 3/8"
42"	45"
44"	47 3/8"
46"	49 3/8"
48"	51 3/8"

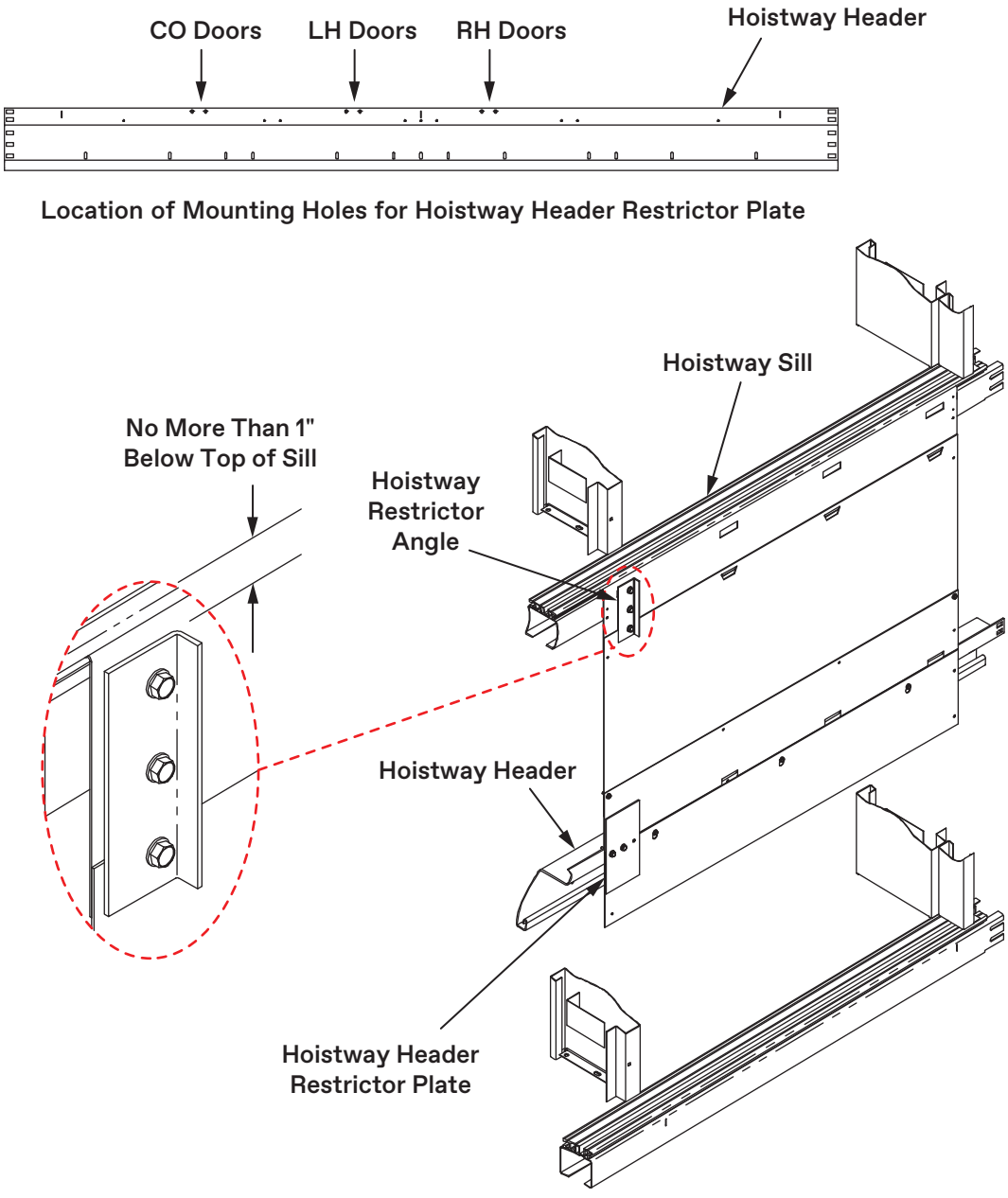


Figure 16 - Hoistway Restrictor Angle Positions

Install Car Door Restrictor

1. Install the car door restrictor into the two key slots on trailing edge of the car door.
2. Use washers to adjust the car door restrictor so that it is plumb and a $^{1}/_{4}$" minimum interference when the car door restrictor engages the hoistway restrictor angle. See Figure 17.

Restrictor Testing

Run the car, and verify the following throughout the hoistway:

- The car door will open when the car is within 3" of each landing.
- The car door will not open more than 4" when the car is 18" or more away from each landing (except where the car doors open only to fascia). This includes top and bottom overtravel.
- There is $^{1}/_{4}$" minimum interference when the car door restrictor engages the hoistway restrictor angle.

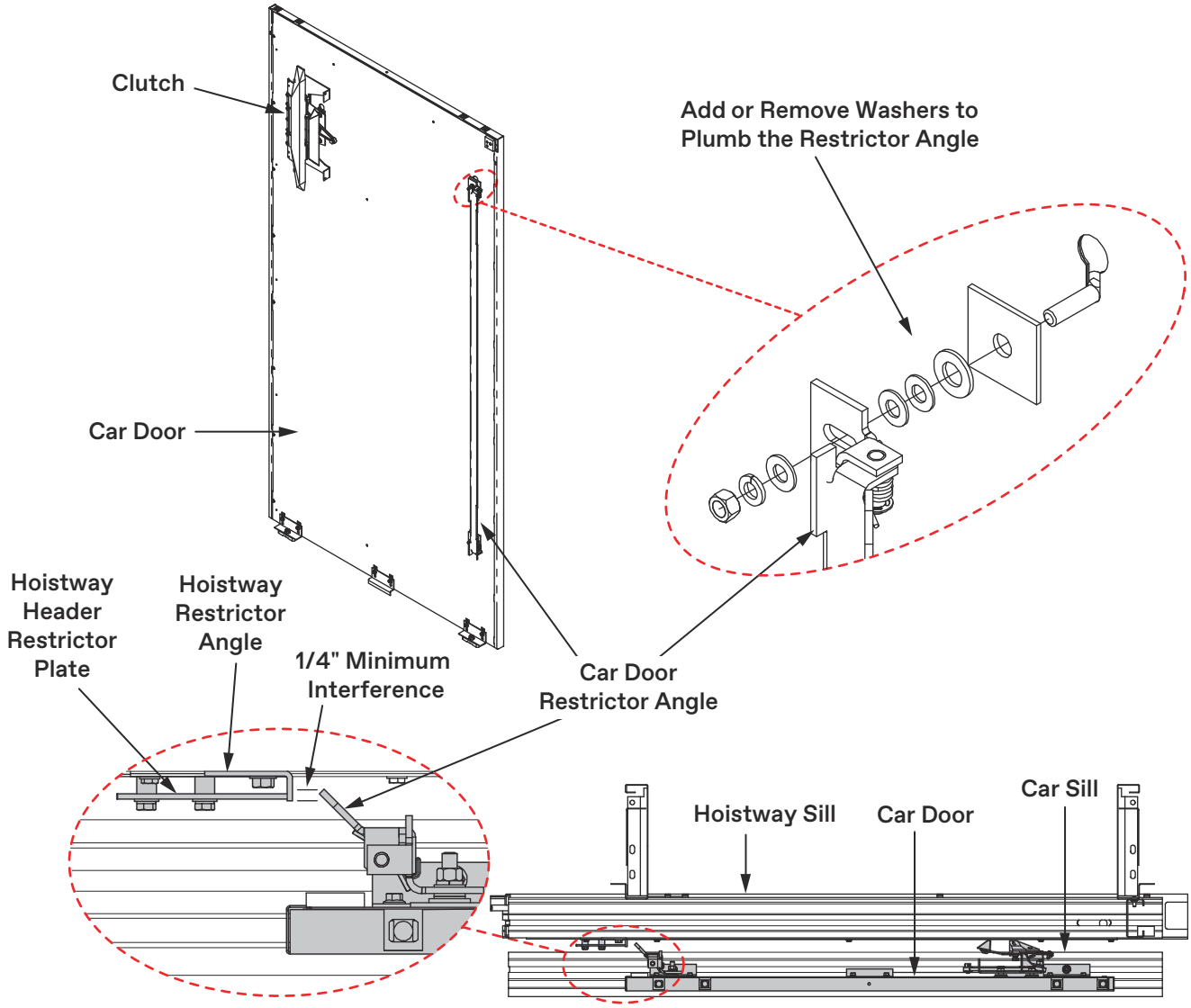


Figure 17 - Install the Car Door Restrictor Angle

TWO SPEED

Two Speed Installation

Center Opening Installation starts on page 52

Sill Installation

1. Verify that a running platform with the car sill is installed.
2. Obtain the finished floor height dimension from the contractor.
3. Use the job layouts to determine the location of daylight lines and the car center-line.
4. Apply tape to car sill, and mark lines on tape. See Figure 18.
5. Draw a plumb line on the landing wall that corresponds to the car's centerline.
6. Subtract the finished floor height from $4^{1}/_{2}$". Mark this distance on the landing wall lower than the plumb line drawn in the previous step, drill a hole for a $^{1}/_{2}$" anchor, and install an anchor. See Figure 18.
7. With the jack bolts, adjust space between the sill support angle and the reinforcing angle to a uniform $^{5}/_{8}$" along the length of the sill. See Figure 19 on page 32.
8. Install the column and the strut angle mounting brackets on the sill.
9. Check for, and remove, any debris on the landing wall.

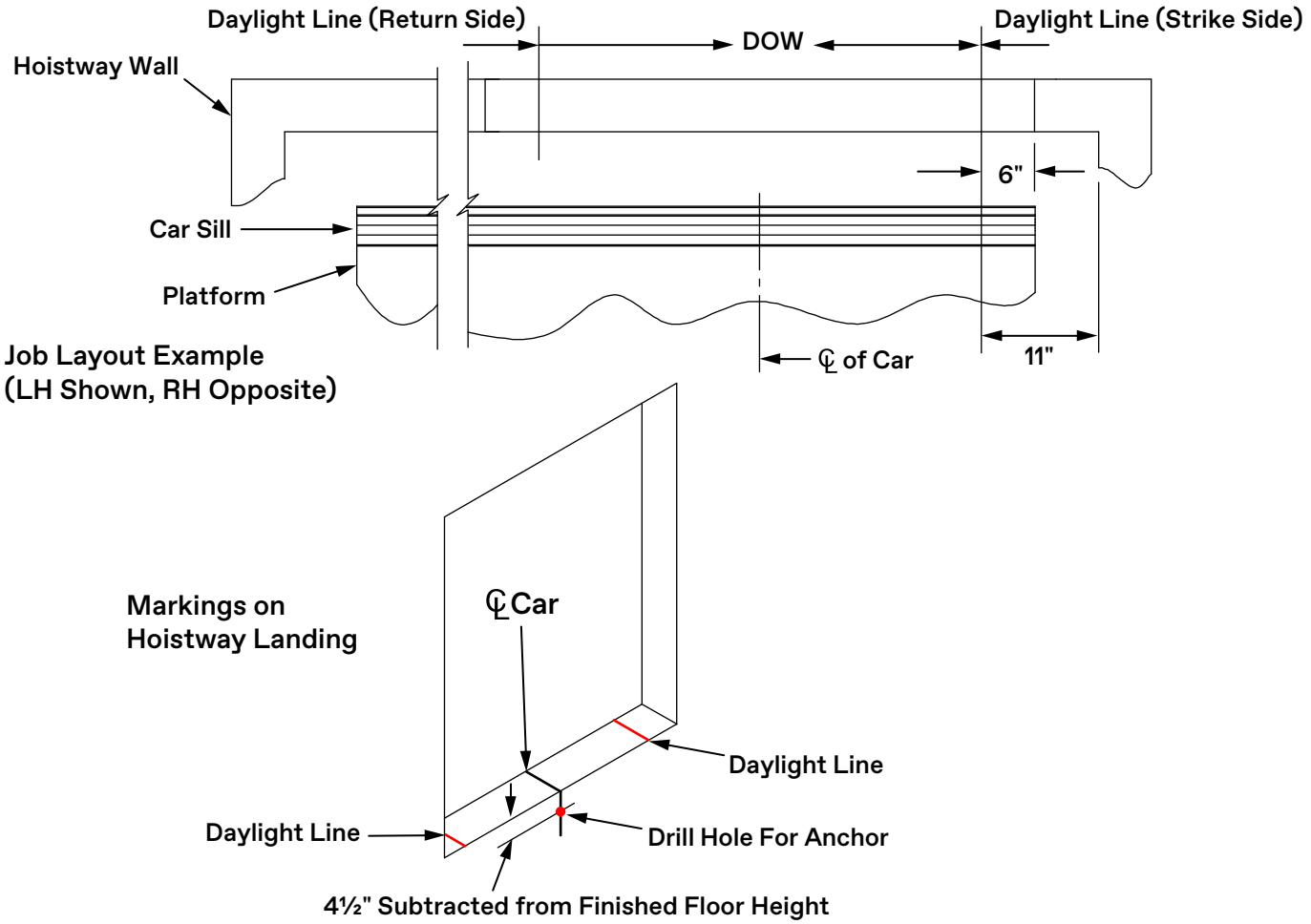
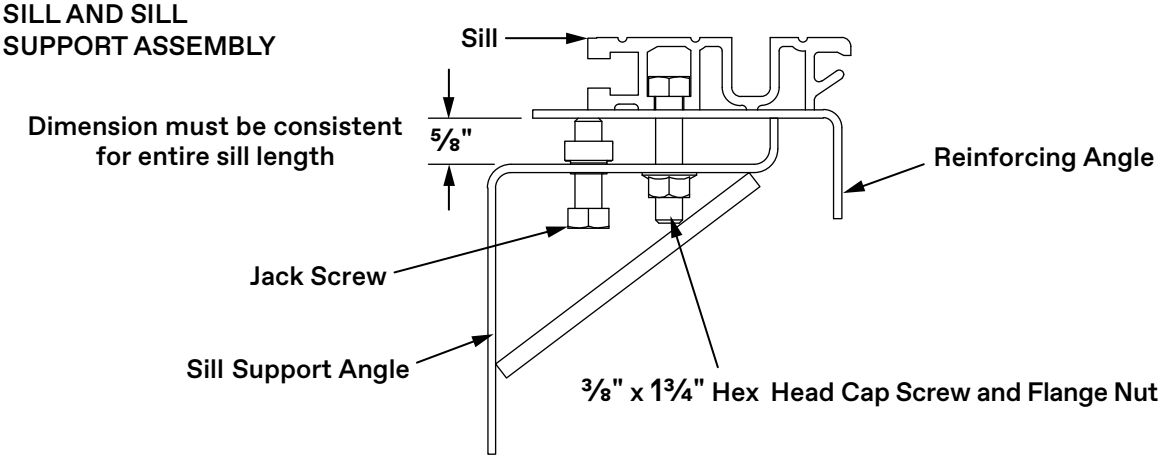


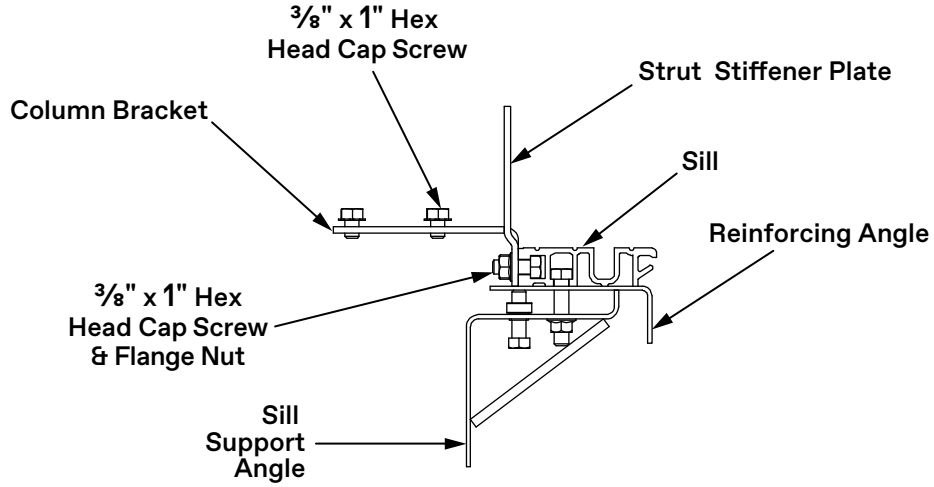
Figure 18 - Sill Installation (1 of 2)

Sill Installation
(continued)

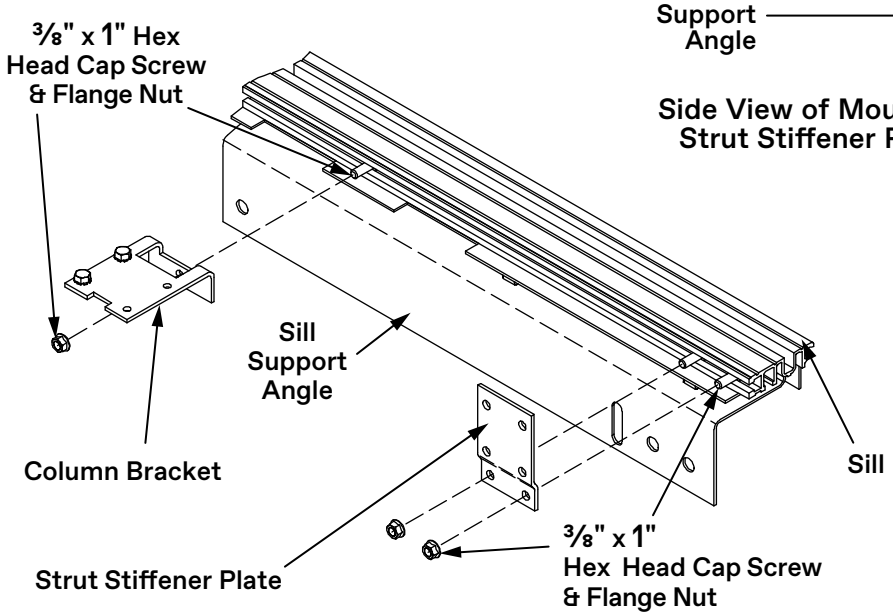
SILL AND SILL SUPPORT ASSEMBLY



COLUMN BRACKET INSTALLATION



Side View of Mounted Column Bracket and Strut Stiffener Plate (Non-Clad Frames)



Exploded View of Mounted Column Bracket and Strut Stiffener Plate (Non-Clad Frames)

Figure 19 - Sill Installation (2 of 2)

Sill Installation
(continued)

Mount the Sill and Sill Support Assembly

1. Slide the middle slot of the sill assembly onto the anchor in the wall. Screw the nut onto the anchor, and hand tighten. See Figure 20.
2. Raise the sill even with the finished floor height, and tighten the anchor nut.
3. Check for, and shim, any gaps between the sill and the hoistway wall.
4. Level the sill post–wise.
5. Match drill a $^{1}/_{2}$" hole through each of the two end slots, and install a $^{1}/_{2}$" anchor in both slots.
6. Loosen the four $^{3}/_{8}$" nuts underneath the sill. Use a header/sill gauge to adjust the sill for a uniform gap of $1^{1}/_{4}$" between it and the car sill.
7. Line up the centerline of the sill with the car's centerline marked on the landing.

CAUTION **Do not overtighten nuts in the next step or the reinforcing angle could bend.**

8. Tighten the four $^{3}/_{8}$" nuts.

CAUTION **If jack bolts are needed for the next step, anchors in the sill support angle may need loosening.**

9. Level the sill front–to–back.
10. Install a $^{1}/_{2}$" anchor in the two remaining slots in the center of the sill support angle.
11. Install a $^{9}/_{16}$" anchor in one of the round holes on each end of the sill support angle.

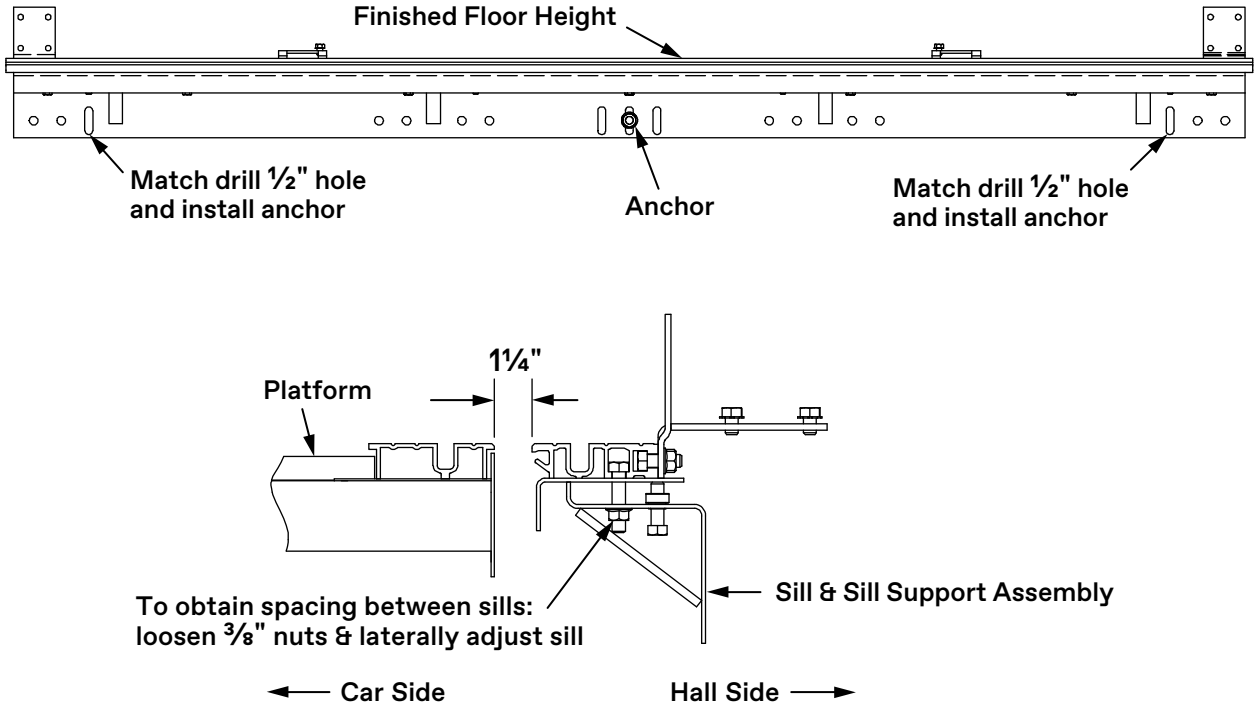


Figure 20 - Sill and Sill Support Mounting

Install Struts

1. Install a strut on strut stiffener plate at each end of sill; do not tighten the hardware. The end with the vertical slots attaches to the strut stiffener plate. See Figure 21.
2. Loosely install an end clip to the top of each strut extension.
3. Ensure that the strut extension reaches above the rough opening, and use a $^{1}/_{4}$" cap screw and flange nut to snugly fasten the strut extension and the strut together.
4. Hold the strut/strut extension plumb, place the end clip against the hoistway wall, and match drill a $^{3}/_{8}$" x $3^{1}/_{8}$" hole.
5. Install a $^{3}/_{8}$" anchor, and fasten the end clip to the anchor.
6. Tighten the hardware that is holding the strut angles to the strut stiffener plate.
7. Repeat this procedure on the other side.

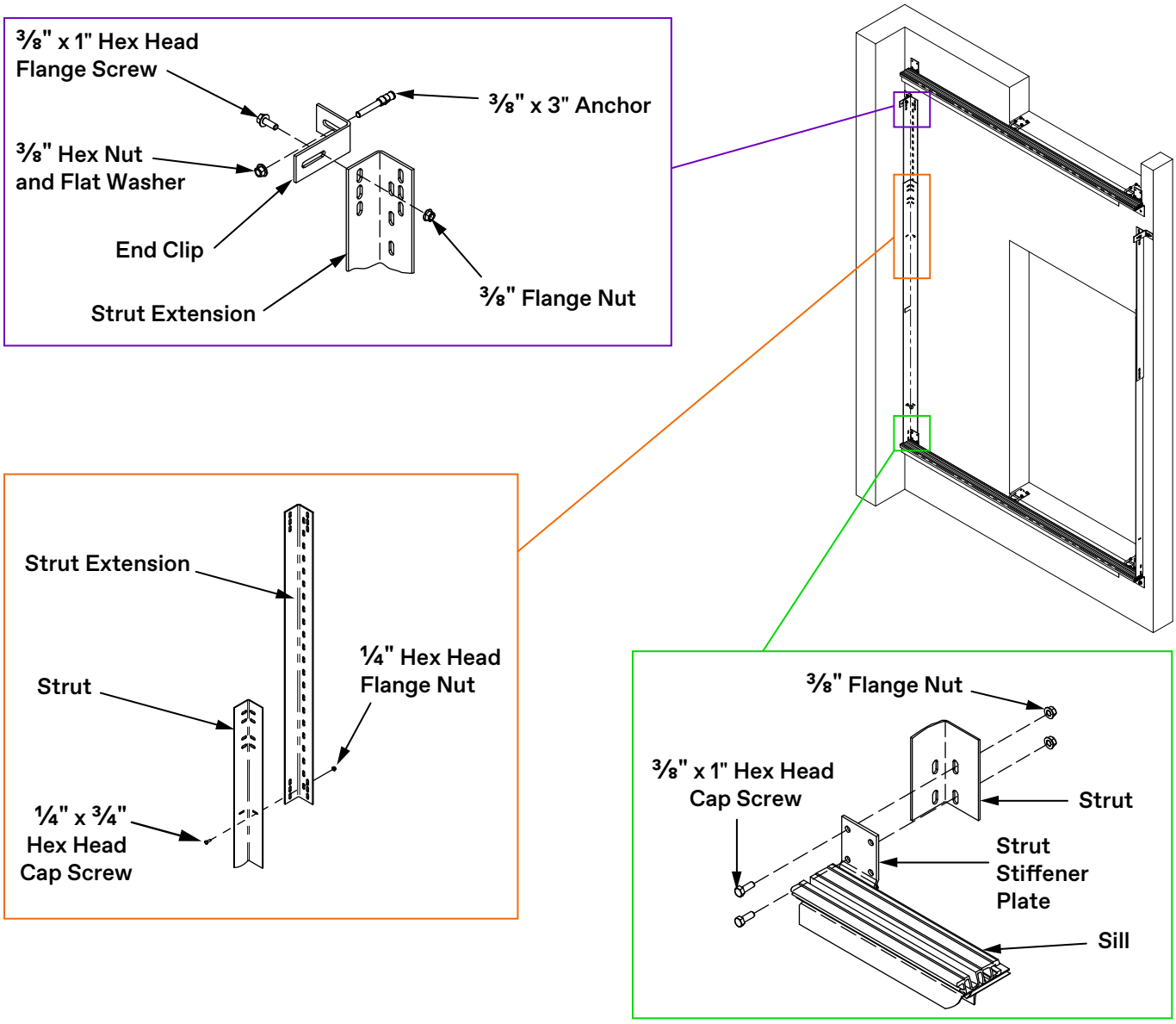


Figure 21 - Install Struts and Strut Extensions

Install Header

1. From the sill, measure the header height given in Figure 22, and mark the strut. Repeat for the other side.
2. Align the bottom of the header with the marks made in step 1.
3. Match the slots in the end of the header to the slots in the strut.
4. Install a $^{3}/_{8}$" x 1" cap screw and flange nut in each slot.
5. Level the header, and tighten the hardware.

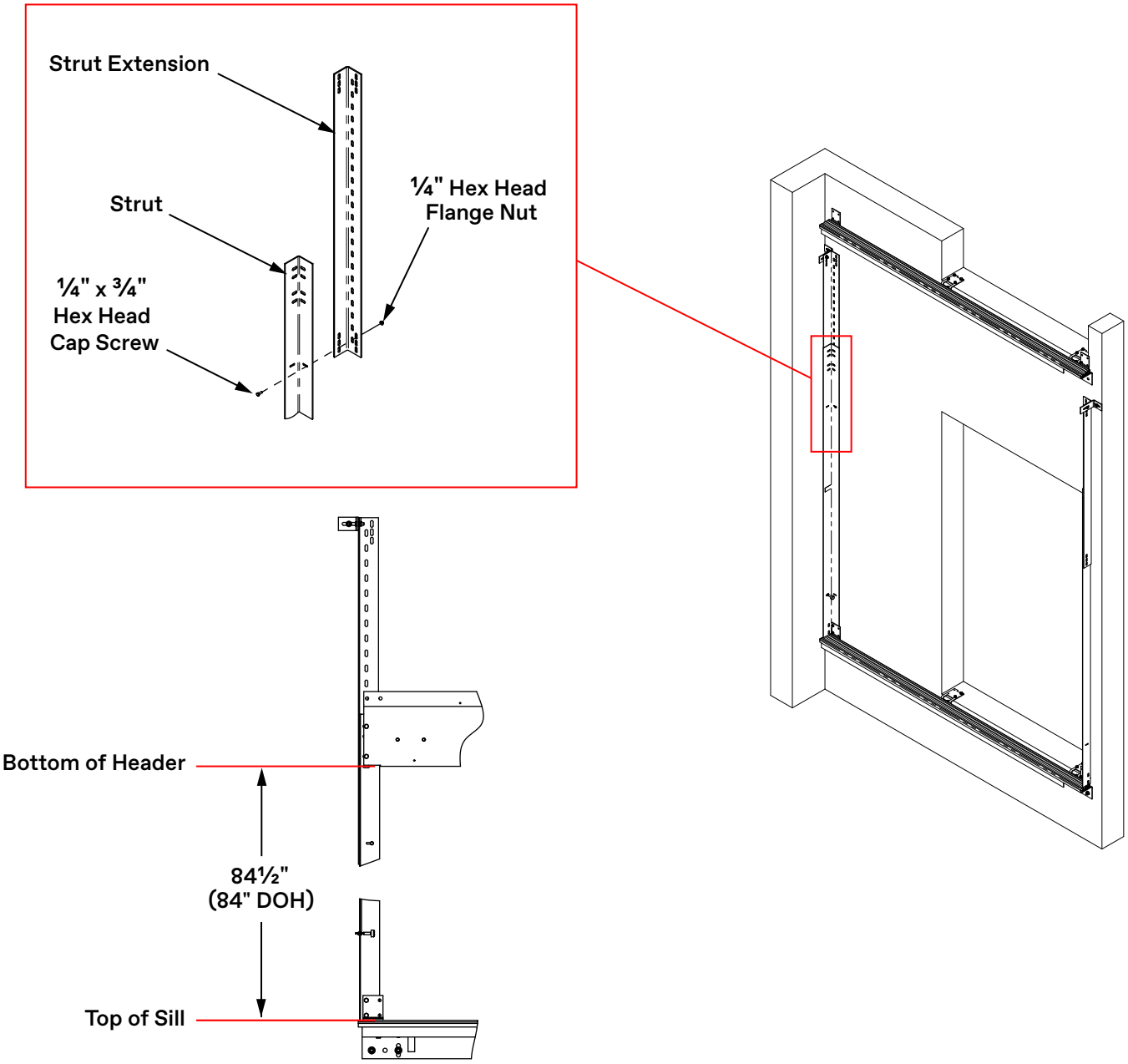


Figure 22 - Mount Header on the Struts

Assemble Entrance Frames

1. Distribute the frame materials (columns, transom, and fasteners) to each landing.
2. At a landing, assemble the entrance frame face down on cardboard or carpet in front of the opening. See Figure 23.
3. Install the strike column door bumpers.
4. Tighten all fasteners.
5. Verify that the columns are square with the transom.
6. Repeat this procedure for all other landings.

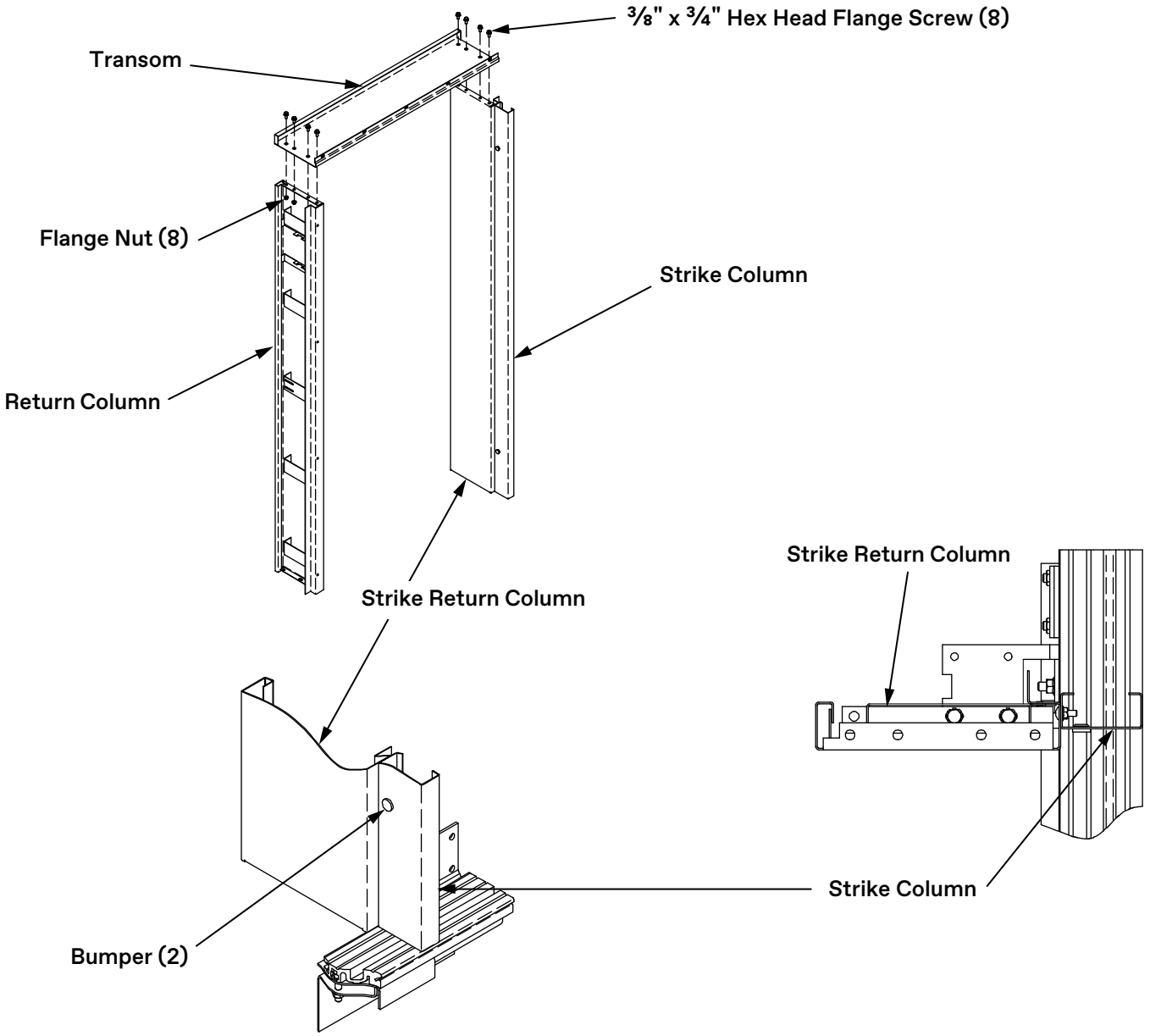


Figure 23 - Assemble Entrance Frames

Install Entrance Frames

See Figure 24 on page 38 for all steps in this procedure.

1. Remove and retain the four $^{3}/_{8}$" cap screws and external tooth lock washers from the column mounting brackets.
2. Stand the frame on the column mounting brackets, and loosely install the four $^{3}/_{8}$" cap screws and external tooth lock washers.
3. Align the columns so that they overlap the hoistway sill $^{1}/_{8}$". The $^{1}/_{8}$" dimension corresponds to the depth of the cutout on the top back edge of the hoistway sill.
4. Square each column with the hoistway sill, and tighten the columns to their mounting brackets.

- For columns equal to or greater than 12"
  a. Attach the frame stiffener to the base of the column.
  b. Match drill a $^{5}/_{16}$" x 2 $^{3}/_{4}$" hole on the other end of the frame stiffener.
  c. Install the $^{3}/_{8}$" anchor.

5. Run the platform up to a point where the transom can be easily reached.
6. Use $^{1}/_{4}$" machine screws to attach the header to the transom.
7. Repeat this procedure for all other landings.

Install Entrance Frames
(continued)

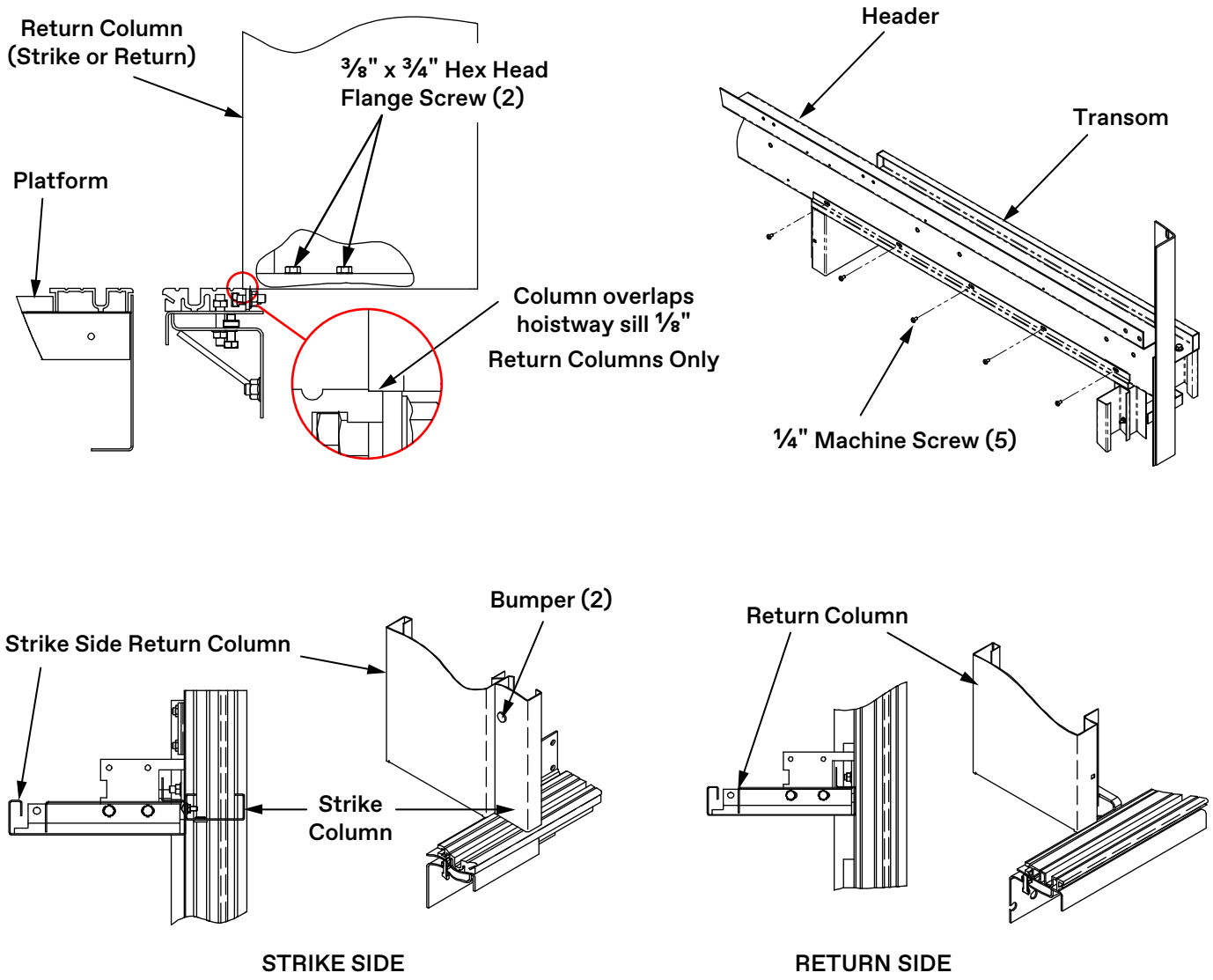


Figure 24 - Install Entrance Frame

Adjust Strut/Header/Frame Assembly

1. At the end clips, adjust the strut/header/frame assembly toward the hoistway wall so that the assembly is $^{1}/_{8}$" off–plumb at the header. This action allows the clutch to clear the fascia. See Figure 25.
2. Tighten the end clip hardware.
3. Check the post–wise plumb, and adjust (if necessary).
4. Mount a stand-off bumper on the strut opposite the strike column.
5. Repeat this procedure for all other landings.

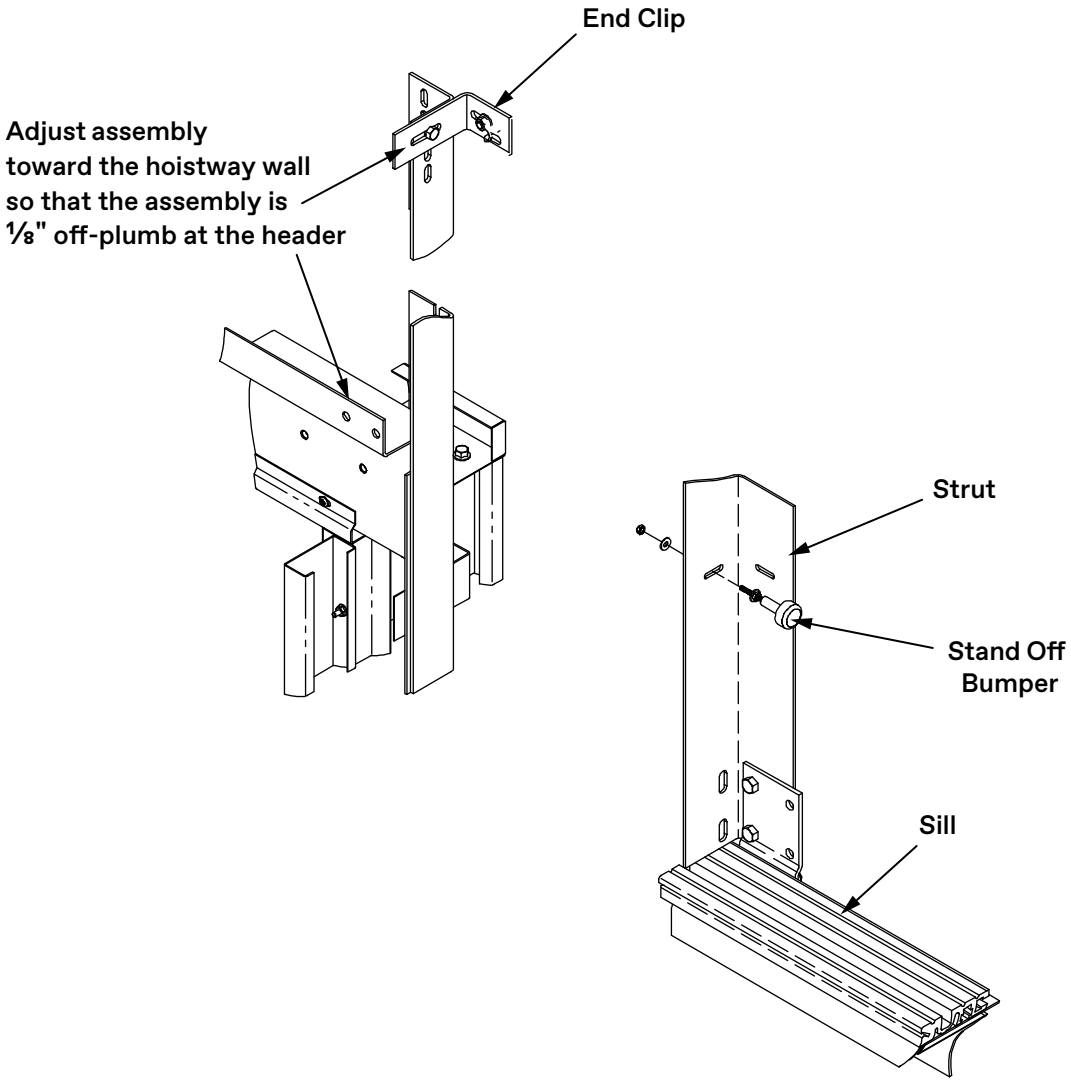


Figure 25 - Adjust Frame Assembly

Install Hoistway Hangers

1. Place a hoistway hanger assembly at each landing.
2. At a landing, place the hanger assembly on the platform, and run the platform up until the header can be reached easily.
3. Remove the shipping nuts from the $^{3}/_{8}$" mounting screws. See Figure 26.
4. Lift the hanger into place and install and tighten each of the mounting screws.
5. Repeat this procedure for all other landings.

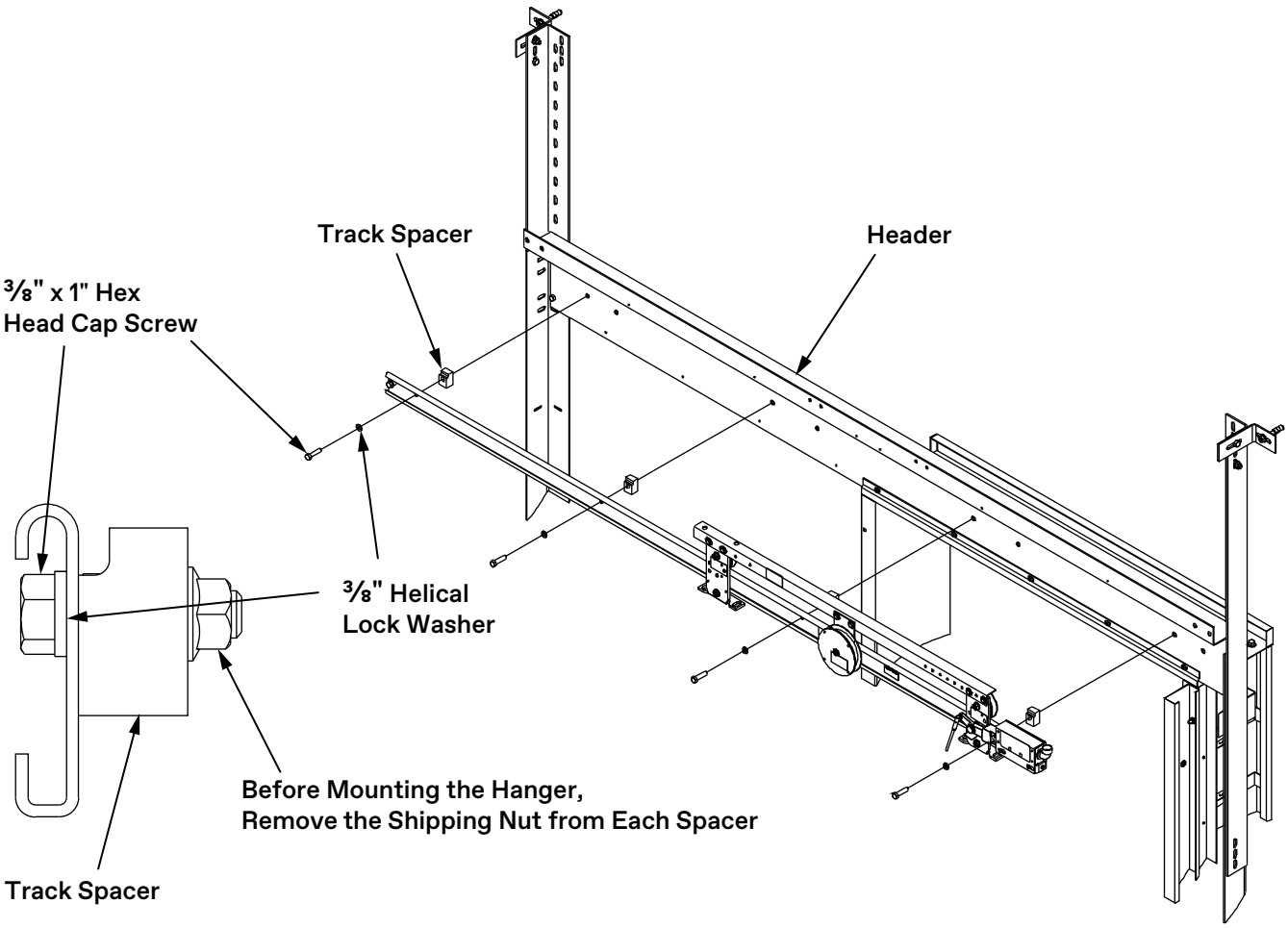


Figure 26 - Install Hoistway Hangers

Mount Hoistway Doors

1. Distribute the hoistway doors to each landing.
2. At a landing, place the doors on hoistway sill, and lean against the hoistway header.
3. Install pendant bolts in the top of the doors and tighten. See Figure 27.
4. Install a jam nut, followed by a flat washer, on each pendant bolt.
5. Guide the pendant bolts through the slots of the door hangers. Install a flat washer and a jam nut on each pendant bolt.
6. Mount the door gibs, the door retainers, and the door safety guides. Adjustments will be done later.

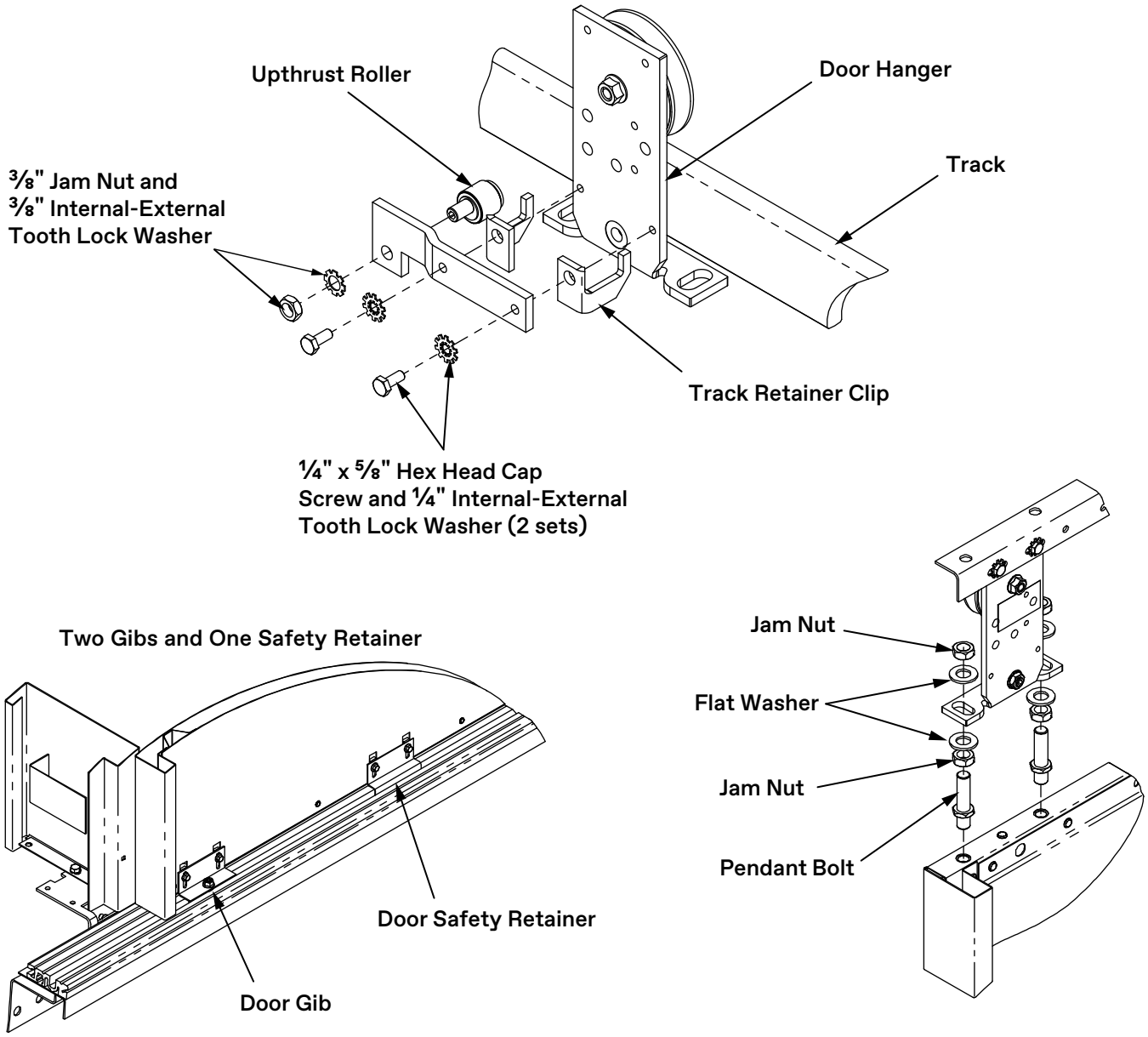


Figure 27 - Mount Hoistway Doors

Adjust Running Clearance

1. Place a $^{1}/_{4}$" shim (running clearance) under each edge of the door. See Figure 28.
2. Loosen the jam nuts underneath the door hangers.
3. Turn the top jam nut to adjust the doors up or down until each edge of the door just touches the $^{1}/_{4}$" shim.
4. Tighten the jam nuts.
5. Check the leading edge of the door by rolling it to the closed position.
6. Observe whether the edge meets the two bumpers in the strike column at the same time. The leading edge of the door *must never* meet the bottom bumper first.
7. Turn the eccentric of the upthrust roller clockwise until the roller just touches the bottom of the door track.
8. Adjust the eccentric for a 0.015" gap between the upthrust roller and the door track.

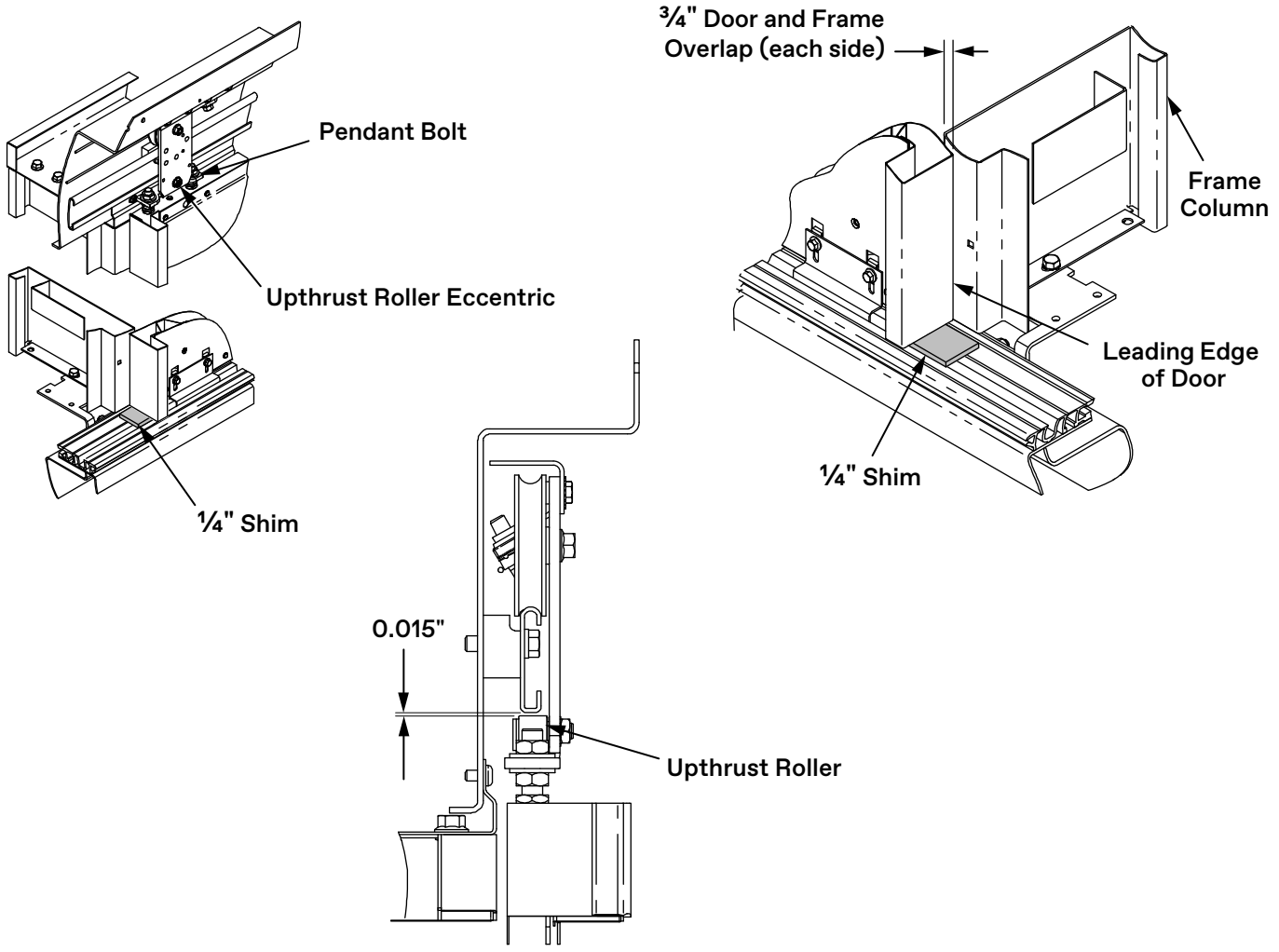


Figure 28 - Adjust Running Clearance

Adjust 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 29.
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. With a $^{3}/_{16}$" hex wrench, turn the eccentric of the door gib until the door panel just touches the $^{1}/_{4}$" shim, 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.

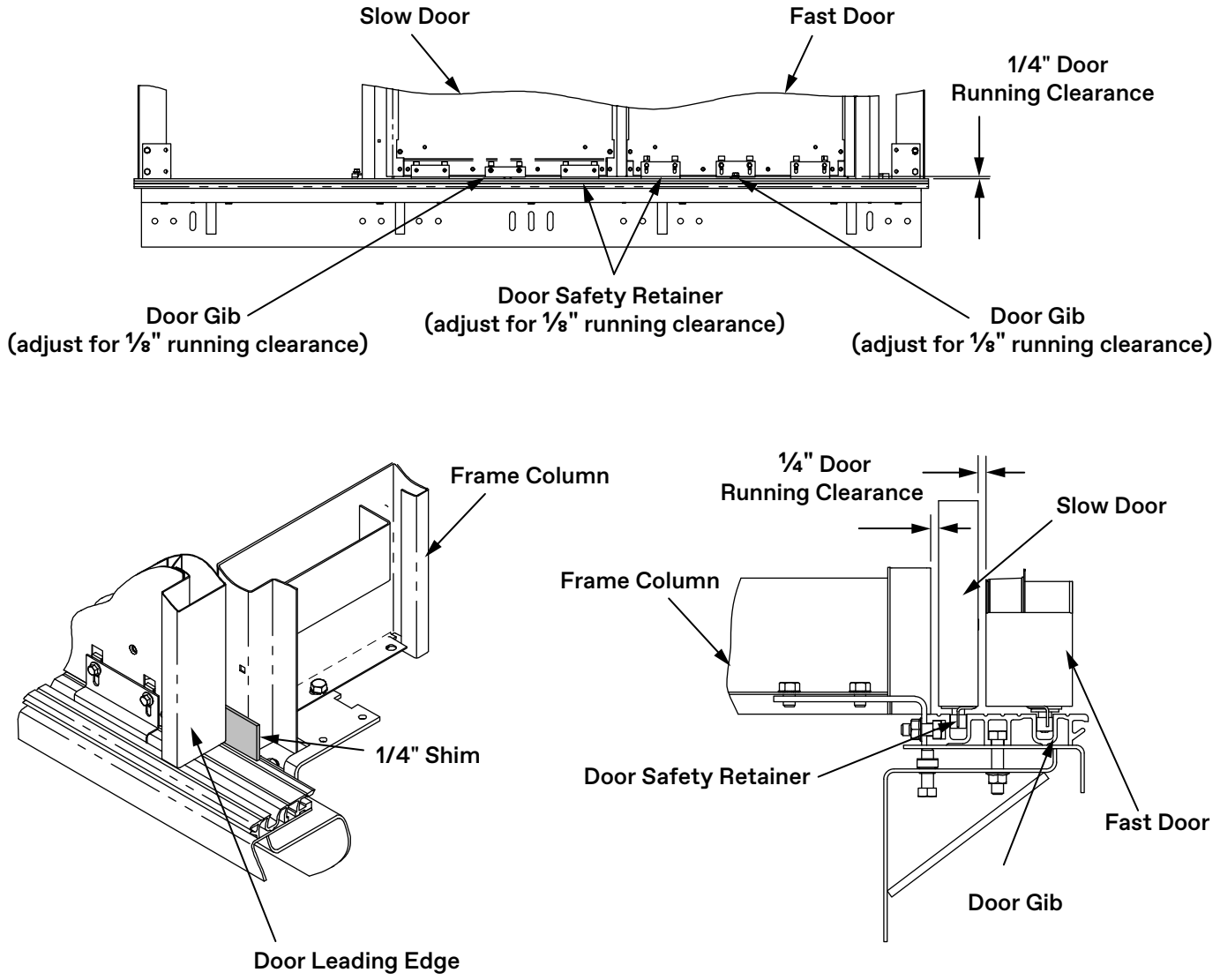


Figure 29 - Adjust Door Gibs

Adjust Closer Reel and Track Retainers

1. Put 3 or 4 wraps on the closer reel, and then use a $^{1}/_{4}$" x $^{3}/_{4}$" hex head cap screw and a $^{1}/_{4}$" flange nut to attach the cable to the header. See Figure 30.
2. Adjust the closer reel so that the doors close when released $^{1}/_{2}$" from the fully closed position.
3. Verify the doors fully close with no “double bump” when doors touch each other.

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

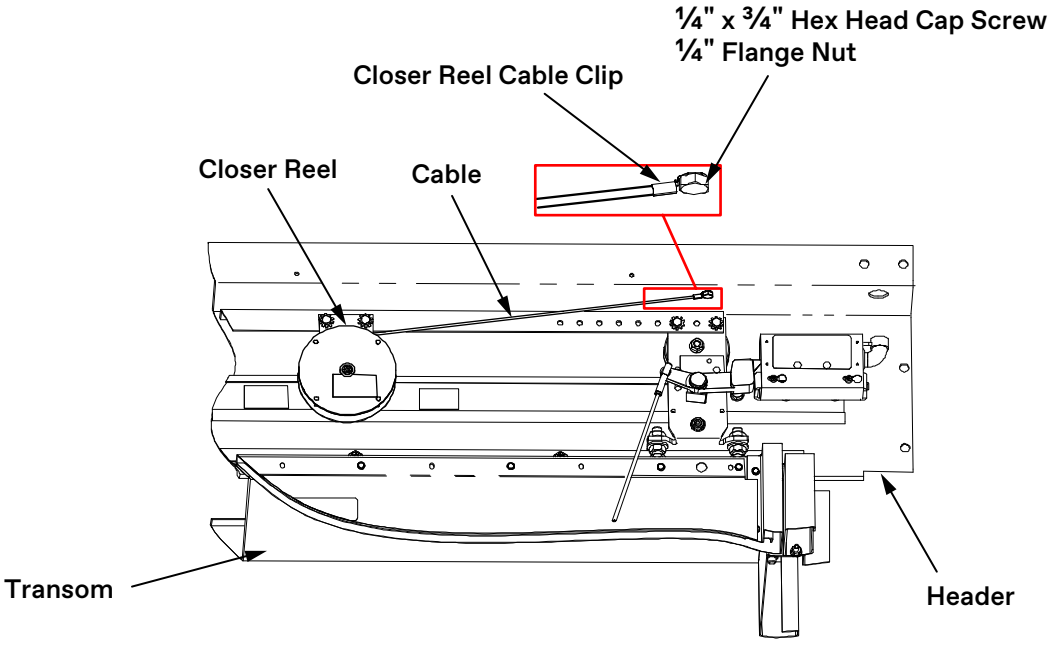


Figure 30 - Adjust Closer Reel

4. On each side of the door panel, use $^{1}/_{4}$" x $^{1}/_{2}$" hex head flange screws to install 2 track retainers on each door hanger. See Figure 31 on page 45.
5. Adjust the track retainers to allow sufficient running clearance between the retainer and the track.

Slow Door Only

1. Loosen the bottom jam nut on the outside pendant of each door hanger.
2. Install a hanger retainer angle between the hanger and the jam nut, and then tighten the jam nut. See Figure 31 on page 45.

Adjust Closer Reel and Track Retainers
(continued)

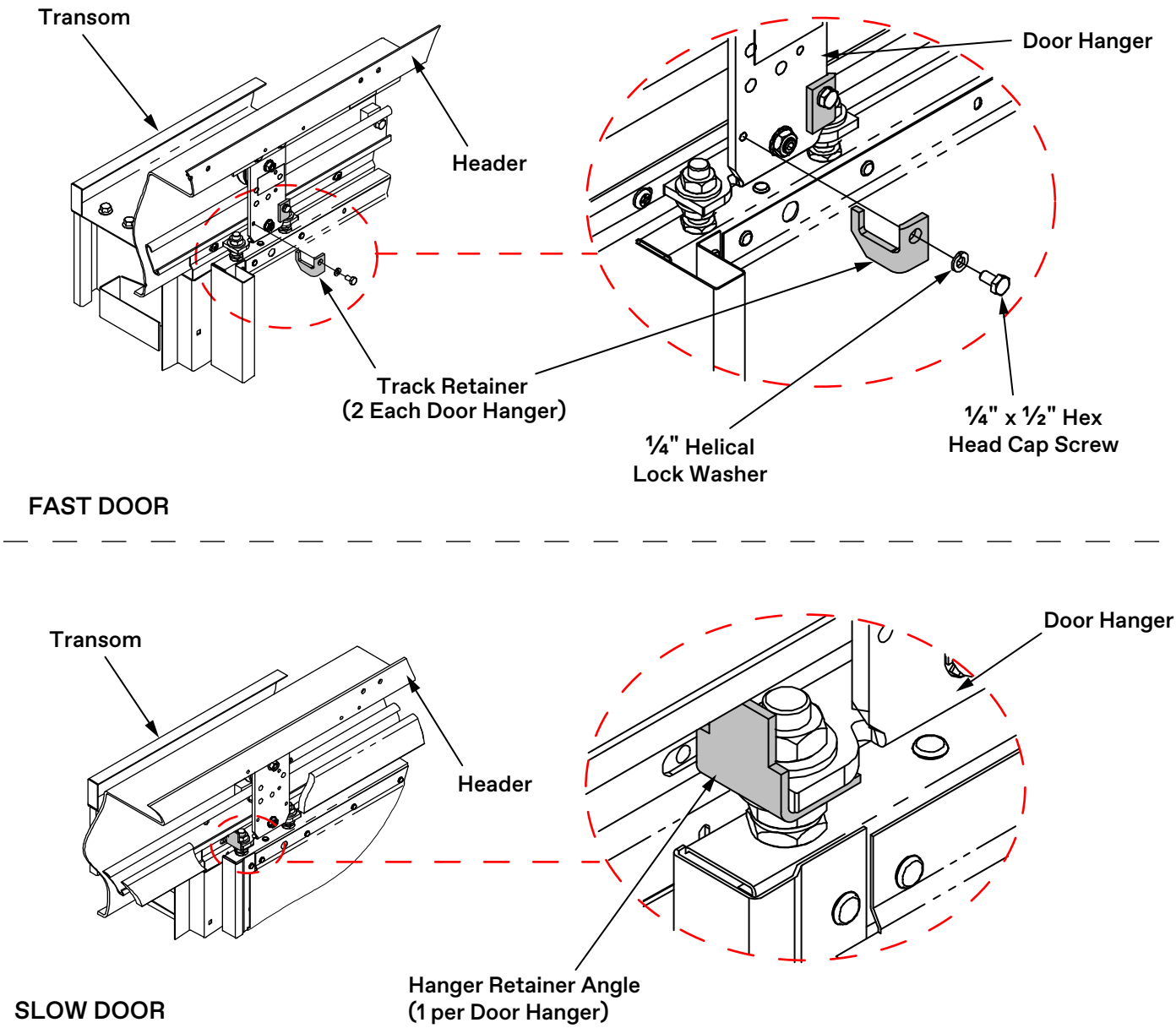


Figure 31 - Install Track Retainers

Install Fixture Boxes

- Fixture boxes must be installed *after* the entrance frames are installed, and *before* the hoistway wall is completed.
- Use brackets to install the fixture boxes at each landing.
- The brackets may be used to mount the fixture boxes on the strut angle, the entrance frame, or the hoistway wall.
- Attach a length of EMT between the hoistway duct and the fixture boxes.

Install and Adjust Interlocks

1. Install the interlock contact box. Evenly align the cover screws with the face of the header. See Figure 32 on page 47.
2. Remove the cover from the interlock box.
3. Close the doors, and verify the following.
   a. The interlock hook is centered front-to-back on the contacts.
   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.

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

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.

Install and Adjust the Interlocks
(continued)

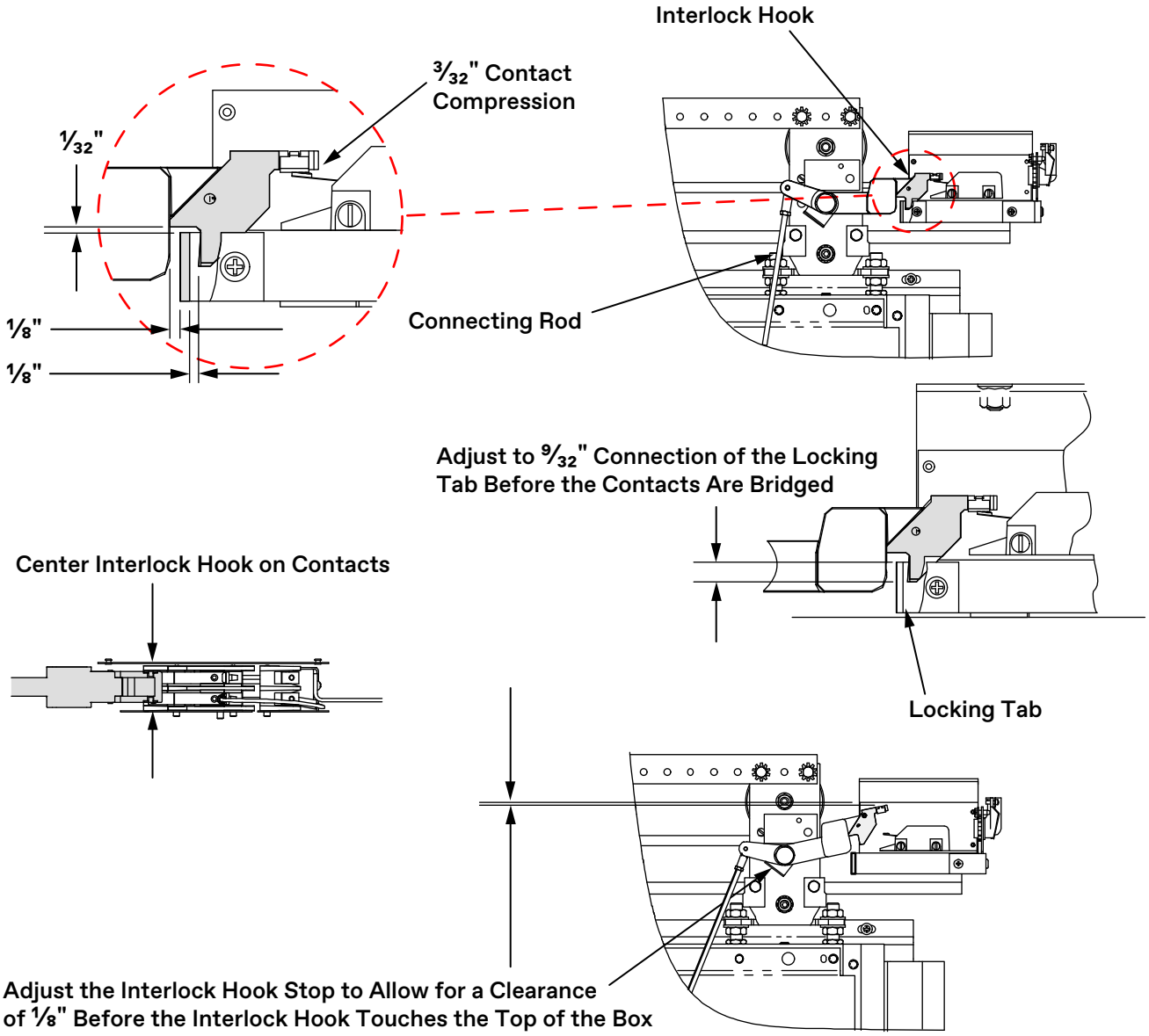


Figure 32 - Interlock Adjustment

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 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 33 on page 49.
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 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.
11. 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 toe guard in the pit must extend far enough below sill so that when car is on compressed buffers the platform toe guard will not be below hoistway toe guard.
12. Install the toe guard by hooking it onto the top fascia plate.
13. Fasten the toe guard to the wall with the provided drive pin anchors.
14. If required, install all dust covers.

Install Fascia Plates and Dust Covers
(continued)

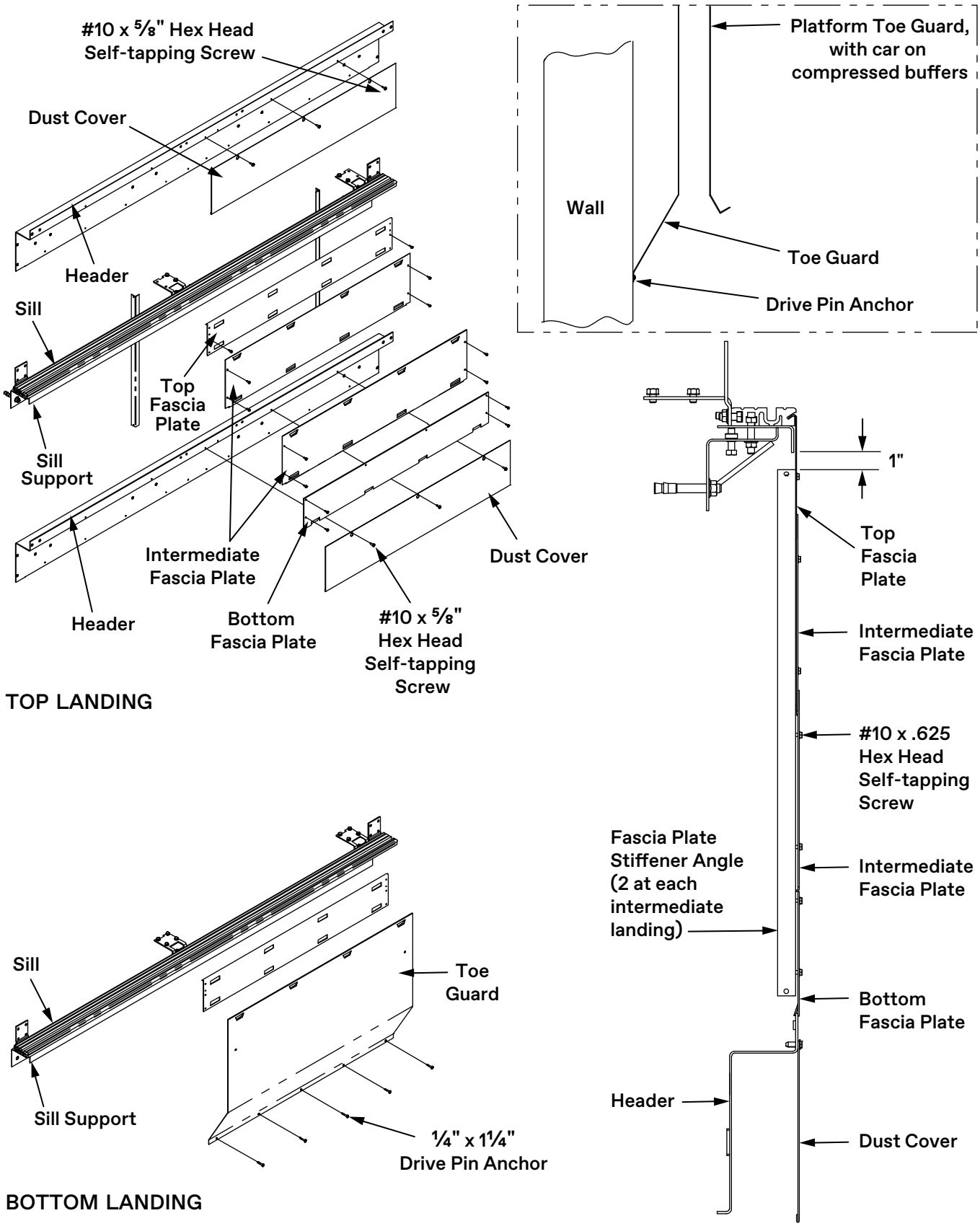


Figure 33 - Install Fascia Plates and Dust Covers

Install the Type 2 Door Restrictor

1. Mark the position of the hoistway restrictor angle. See Figure 34.
2. Use the supplied hardware to install the restrictor angle on the fascia. The restrictor angle must not be lower than 1″ below the top of the hoistway sill.
3. Repeat this procedure for all landings.

Opening Width	Angle Position
36"	20 3/4"
38"	21 3/4"
40"	22 3/4"
42"	23 3/4"
44"	24 3/4"
46"	25 3/4"
48"	26 3/4"
50"	27 3/4"
52"	28 3/4"
54"	29 3/4"

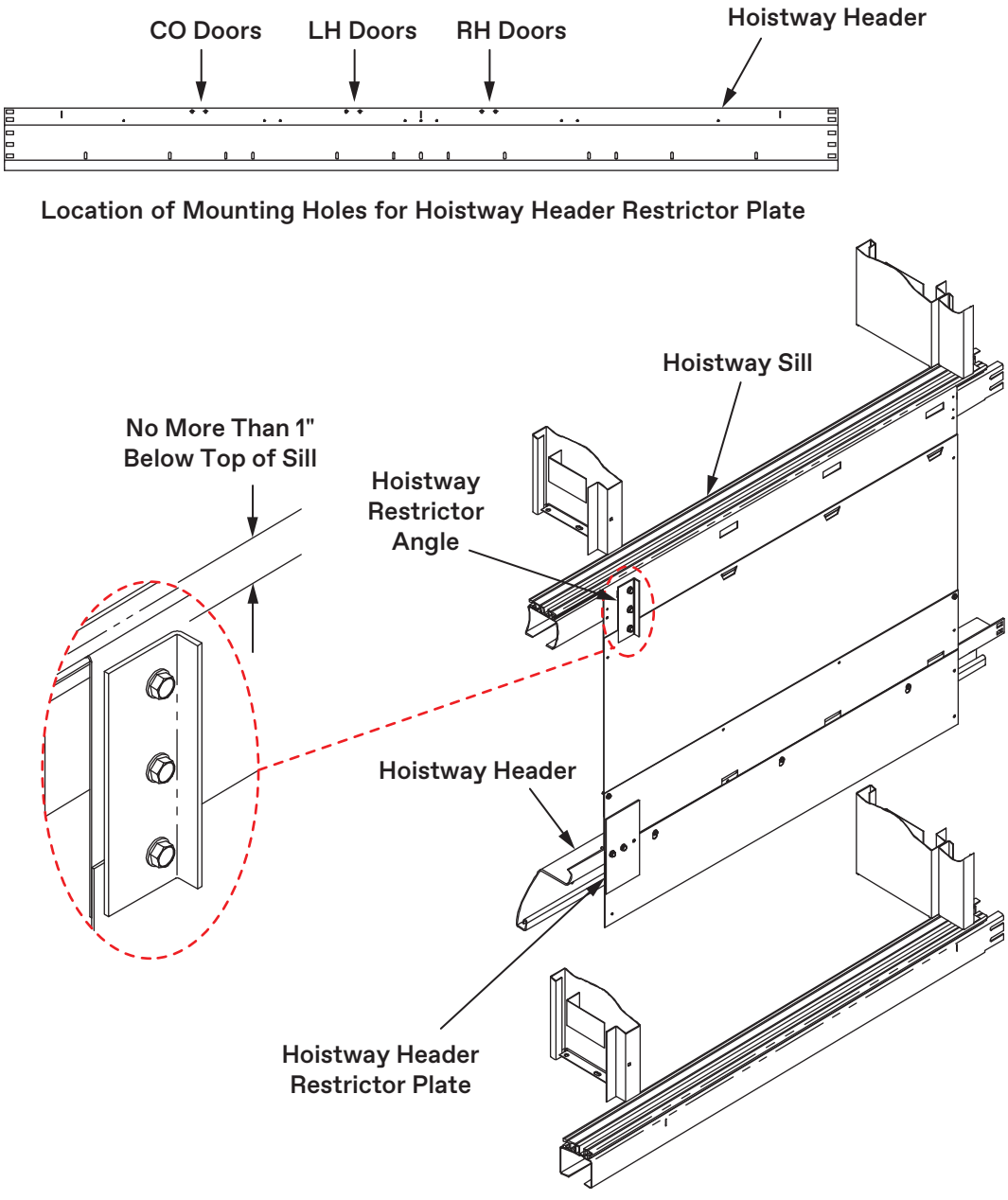


Figure 34 - Hoistway Restrictor Angle Positions

Install Car Door Restrictor

1. Install the car door restrictor into the two key slots on trailing edge of the car door.
2. Use washers to adjust the car door restrictor so that it is plumb and a $^{1}/_{4}$" minimum interference when the car door restrictor engages the hoistway restrictor angle. See Figure 35.

Restrictor Testing

Run the car, and verify the following throughout the hoistway:

- The car door will open when the car is within 3" of each landing.
- The car door will not open more than 4" when the car is 18" or more away from each landing (except where the car doors open only to fascia). This includes top and bottom overtravel.
- There is $^{1}/_{4}$" minimum interference when the car door restrictor engages the hoistway restrictor angle.

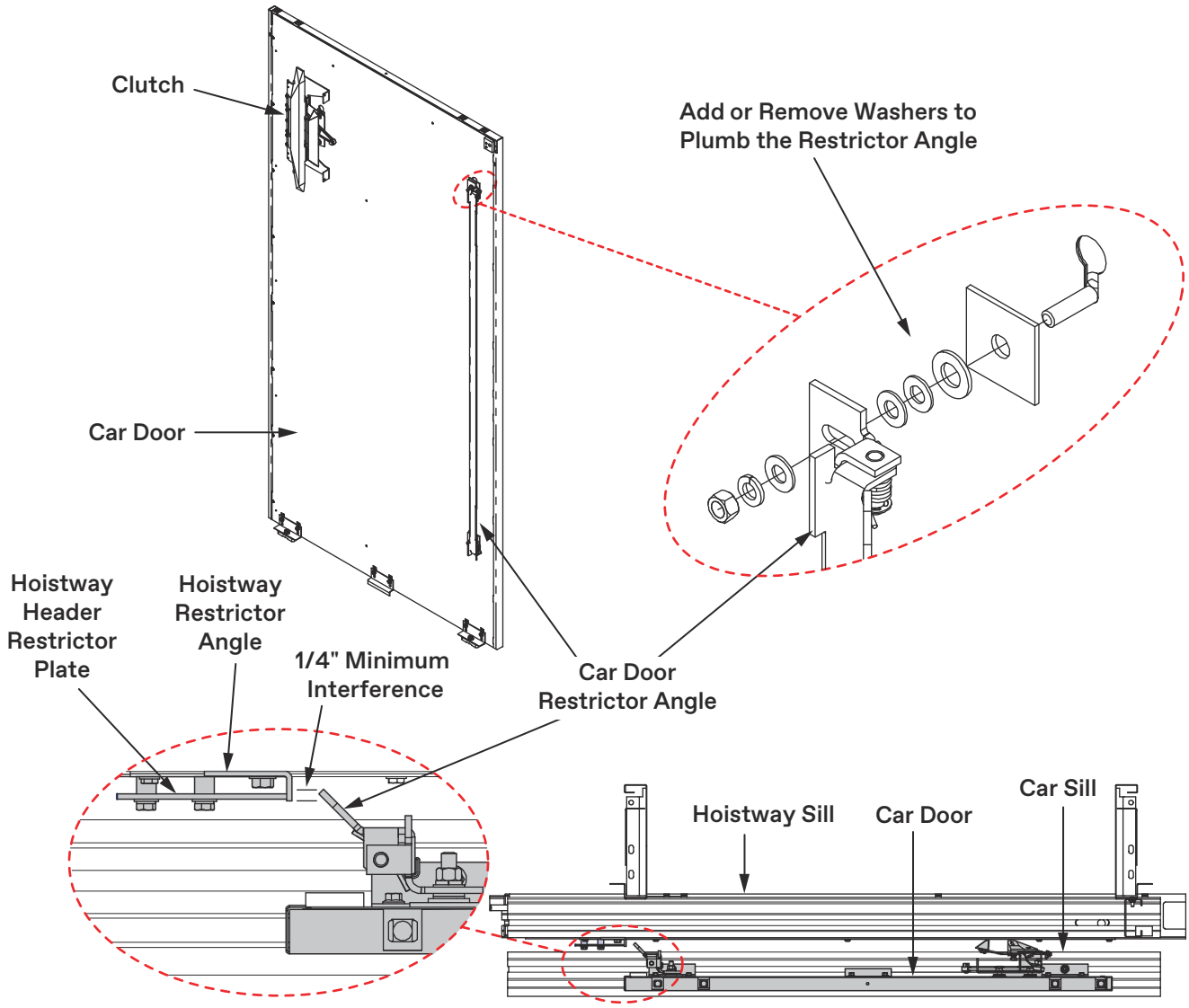


Figure 35 - Install the Car Door Restrictor Angle

CENTER OPENING

Center Opening Installation

Sill Installation

1. Verify that a running platform with the car sill is installed.
2. Obtain the finished floor height dimension from the contractor.
3. Use job layouts to determine the location of daylight lines and the car centerline.
4. Apply tape to car sill, and mark lines on tape. See Figure 36.
5. Draw a plumb line on the landing wall that corresponds to the car's centerline.
6. Subtract the finished floor height from $4^{1}/_{2}$". Mark this distance on the landing wall lower than the plumb line drawn in the previous step, drill a hole for a $^{1}/_{2}$" anchor, and install an anchor. See Figure 36.
7. With the jack bolts, adjust the space between the sill support angle and the reinforcing angle to a uniform $^{5}/_{8}$" along the length of the sill. See Figure 37 on page 54.
8. Install the column and the strut angle mounting brackets on the sill.
9. Check for, and remove, any debris on the landing wall.

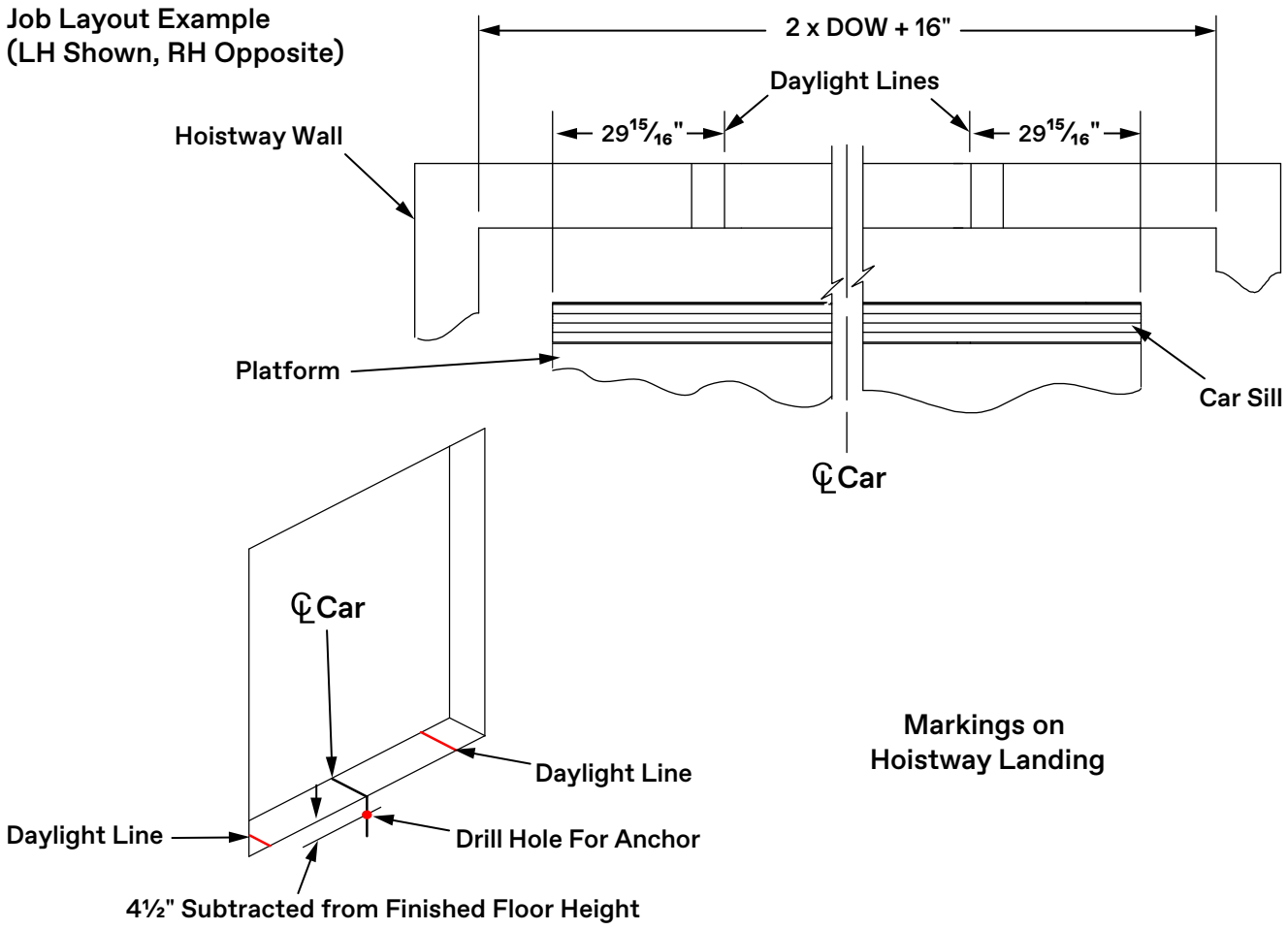


Figure 36 - Sill Installation (1 of 2)

Sill Installation
(continued)

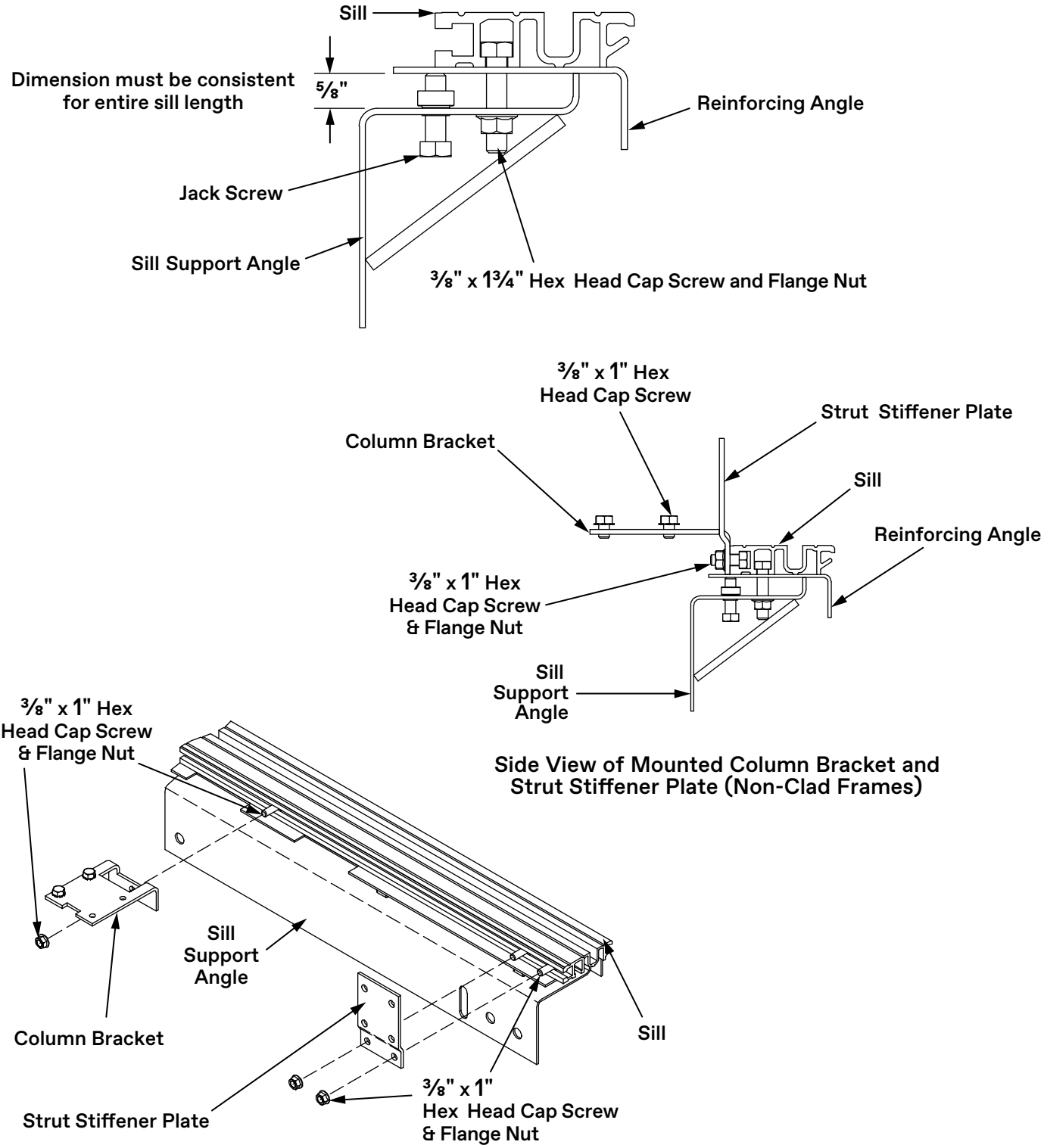


Figure 37 - Sill Installation (2 of 2)

Sill Installation
(continued)

Mount the Sill and Sill Support Assembly

1. Slide the middle slot of the sill assembly onto the anchor in the wall. Screw the nut onto the anchor, and hand tighten. See Figure 38.
2. Raise the sill even with the finished floor height, and tighten the anchor nut.
3. Check for, and shim, any gaps between the sill and the hoistway wall.
4. Level the sill post–wise.
5. Match drill a $^{1}/_{2}$" hole through each of the two end slots, and install a $^{1}/_{2}$" anchor in both slots.
6. Loosen the four $^{3}/_{8}$" nuts underneath the sill. Use a header/sill gauge to adjust the sill for a uniform gap of $1^{1}/_{4}$" between it and the car sill.
7. Line up the centerline of the sill with the car's centerline marked on the landing.

CAUTION **Do not overtighten nuts in the next step or the reinforcing angle could bend.**

8. Tighten the four $^{3}/_{8}$" nuts.

CAUTION **If jack bolts are needed for the next step, anchors in the sill support angle may need loosening.**

9. Level the sill front–to–back.
10. Install a $^{1}/_{2}$" anchor in the two remaining slots in the center of the sill support angle.
11. Install a $^{9}/_{16}$" anchor in one of the round holes on each end of the sill support angle.

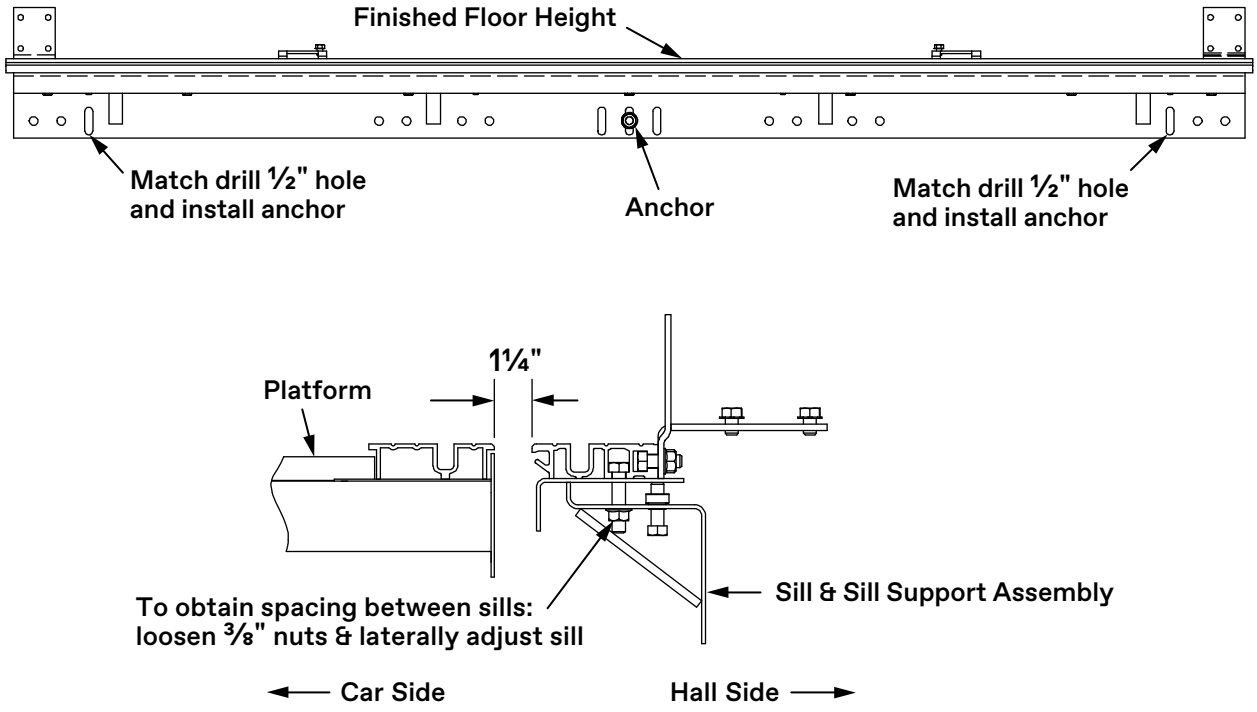


Figure 38 - Sill and Sill Support Mounting

Install Struts

1. Install a strut on the strut stiffener plate at each end of sill; do not tighten hardware. The end with the vertical slots attaches to the strut stiffener plate. See Figure 39.
2. Loosely install an end clip to the top of each strut extension.
3. Ensure that the strut extension reaches above the rough opening, and use a $^{1}/_{4}$" cap screw and flange nut to snugly fasten the strut extension and the strut together.
4. Hold the strut/strut extension plumb, place the end clip against the hoistway wall, and match drill a $^{3}/_{8}$" x $3^{1}/_{8}$" hole.
5. Install a $^{3}/_{8}$" anchor, and fasten the end clip to the anchor.
6. Tighten the hardware that is holding the strut angles to the strut stiffener plate.
7. Repeat this procedure on the other side.

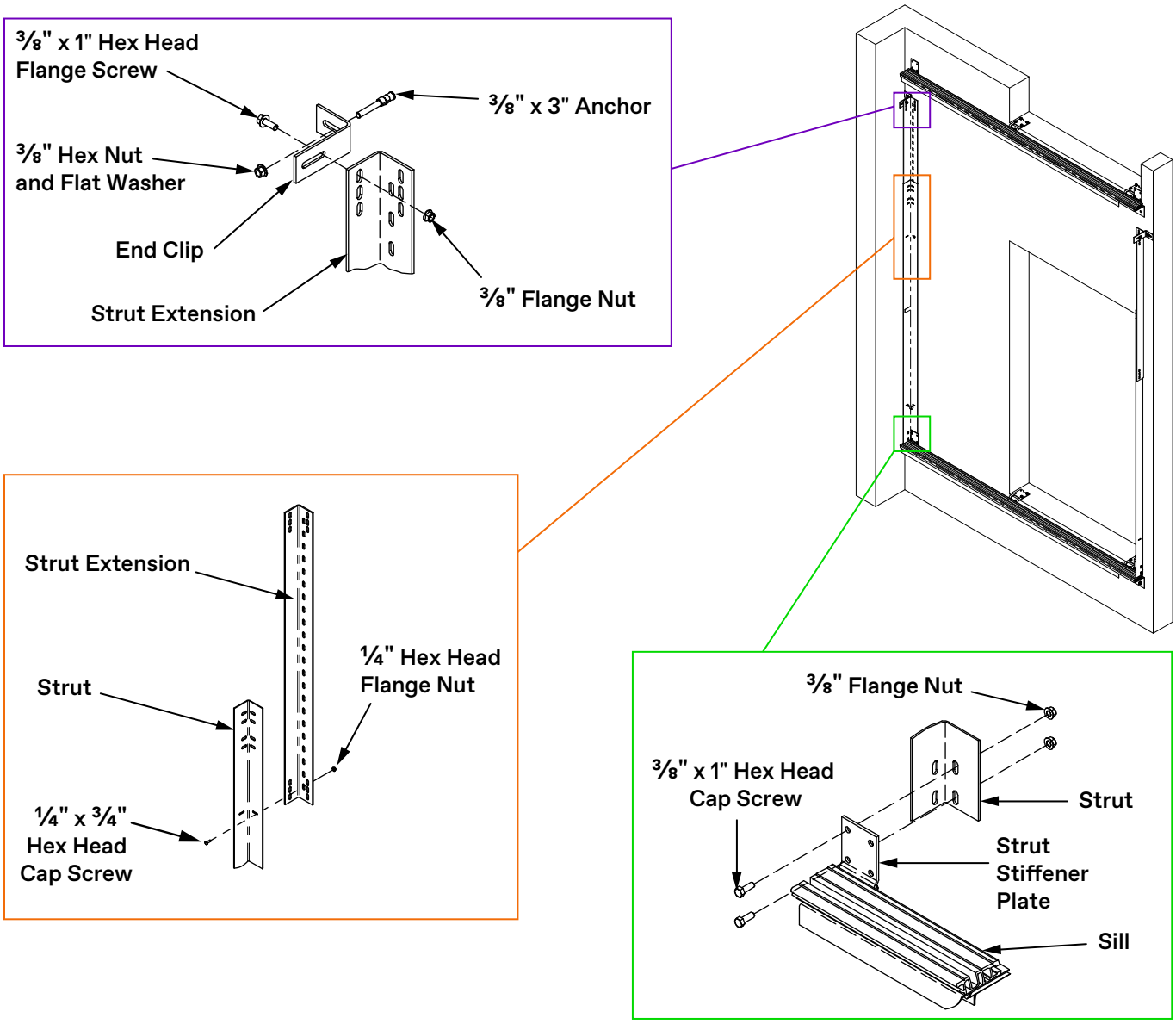


Figure 39 - Install Struts and Strut Extensions

Install Header

1. From the sill, measure the header height given in Figure 40, and mark the strut. Repeat for the other side.
2. Align the bottom of the header with the marks made in step 1.
3. Match the slots in the end of the header to the slots in the strut.
4. Install a $^{3}/_{8}$" x 1" cap screw and flange nut in each slot.
5. Level the header, and tighten the hardware.

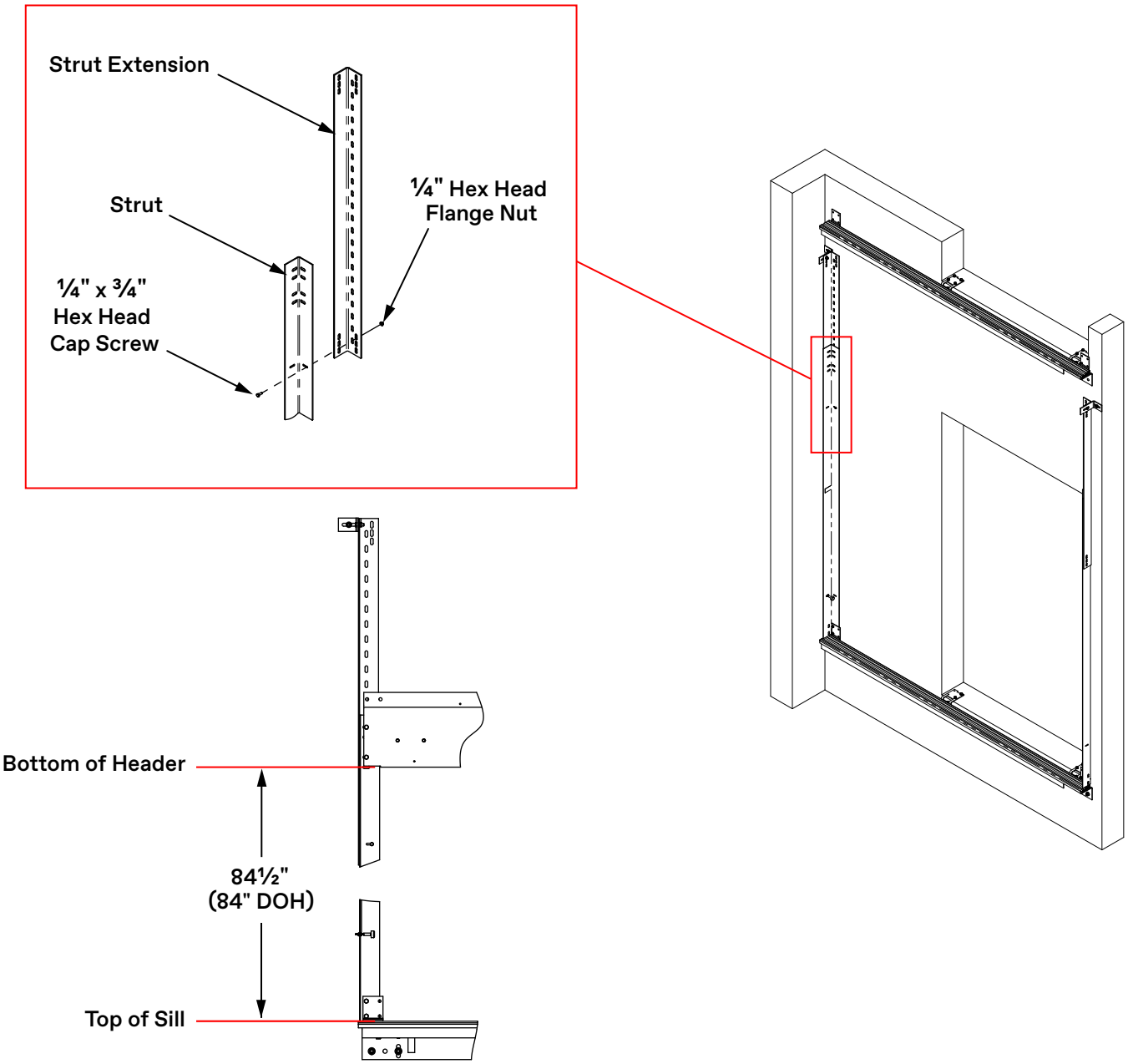


Figure 40 - Mount Header on the Struts

Assemble Entrance Frames

1. Distribute the frame materials (columns, transom, and fasteners) to each landing.
2. At a landing, assemble the entrance frame face down on cardboard or carpet in front of the opening. See Figure 41.
3. Tighten all fasteners.
4. Verify that the columns are square with the transom.
5. Repeat this procedure for all other landings.

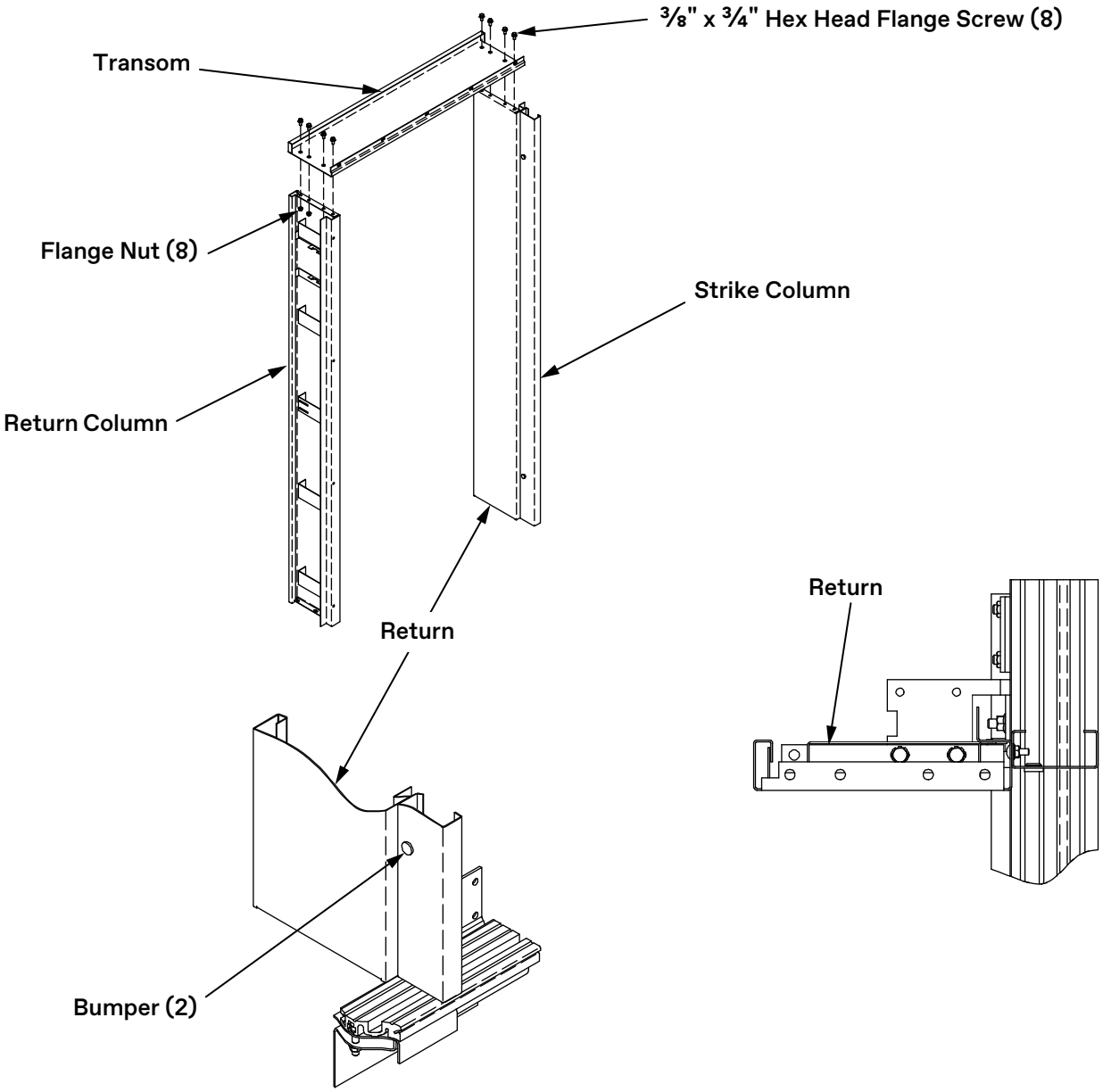


Figure 41 - Assemble Entrance Frames

Install Entrance Frames

See Figure 42 on page 60 for all steps in this procedure.

1. Remove and retain the four $^{3}/_{8}$" cap screws and external tooth lock washers from the column mounting brackets.
2. Stand the frame on the column mounting brackets, and loosely install the four $^{3}/_{8}$" cap screws and external tooth lock washers.
3. Align the columns so that they overlap the hoistway sill $^{1}/_{8}$". The $^{1}/_{8}$" dimension corresponds to the depth of the cutout on the top back edge of the hoistway sill.
4. Square each column with the hoistway sill, and tighten the columns to their mounting brackets.

- For columns equal to or greater than 12"
  a. Attach the frame stiffener to the base of the column.
  b. Match drill a $^{5}/_{16}$" x 2 $^{3}/_{4}$" hole on the other end of the frame stiffener.
  c. Install the $^{3}/_{8}$" anchor.

5. Run the platform up to a point where the transom can be easily reached.
6. Use $^{1}/_{4}$" machine screws to attach the header to the transom.
7. Repeat this procedure for all other landings.

Install Entrance Frames
(continued)

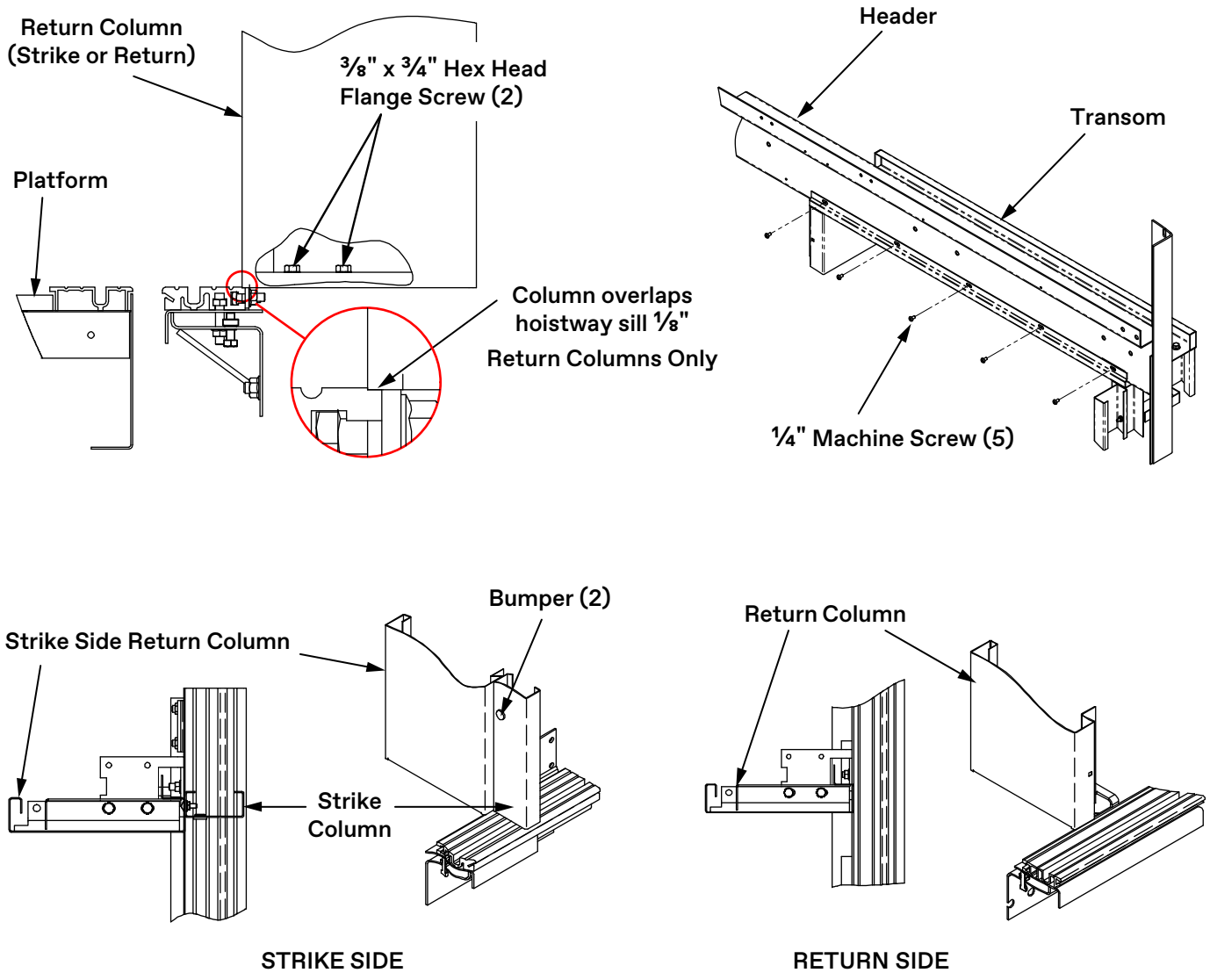


Figure 42 - Install Entrance Frame

Adjust Strut/Header/Frame Assembly

1. At the end clips, adjust the strut/header/frame assembly toward the hoistway wall so that the assembly is $^{1}/_{8}$" off–plumb at the header. This action allows the clutch to clear the fascia. See Figure 43.
2. Tighten the end clip hardware.
3. Check the post–wise plumb, and adjust (if necessary).
4. Mount a stand-off bumper on each strut.
5. Repeat this procedure for all other landings.

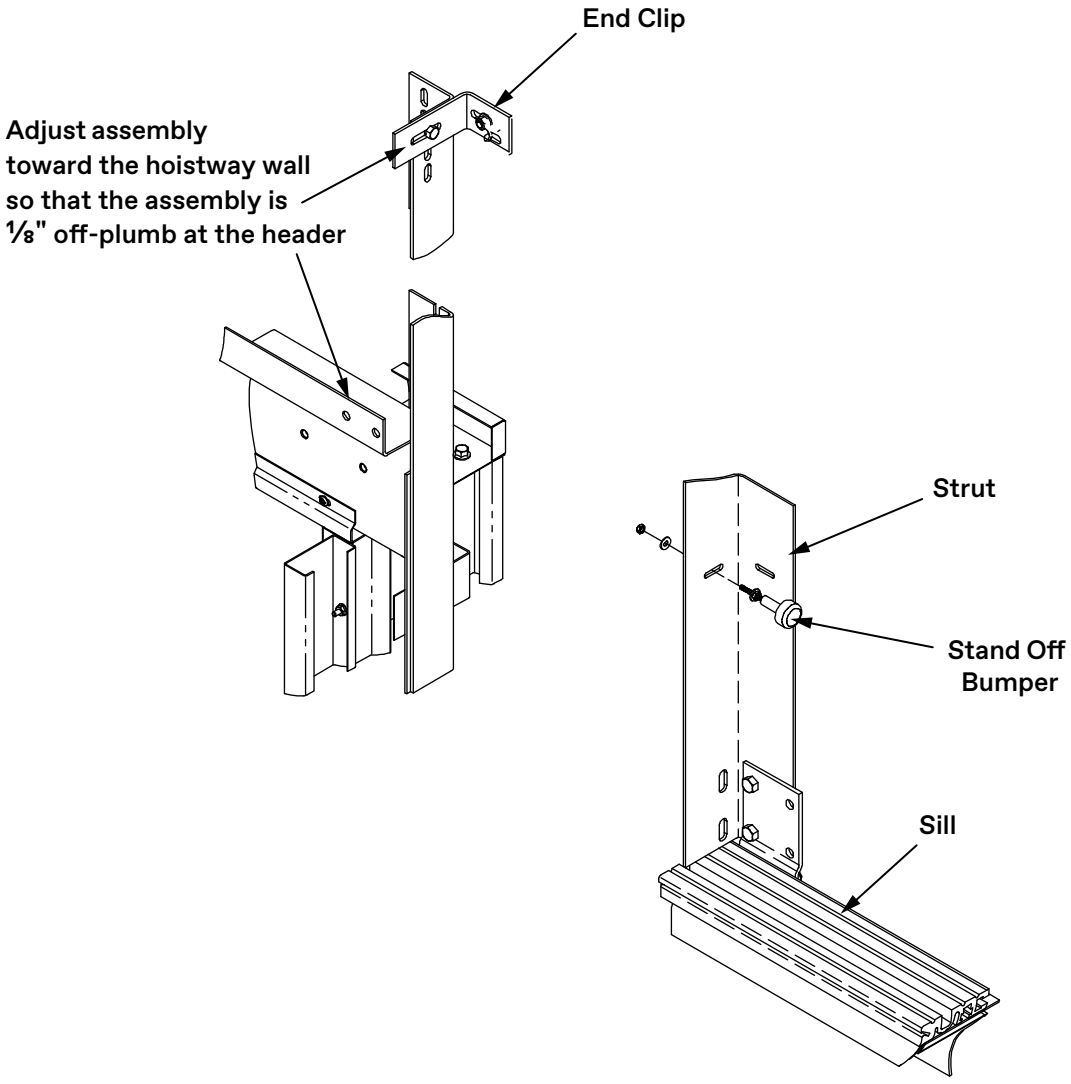


Figure 43 - Adjust Frame Assembly

Install Hoistway Hangers

1. Place a hoistway hanger assembly at each landing.
2. At a landing, place the hanger assembly on the platform, and run the platform up until the header can be reached easily.
3. Remove the shipping nuts from the $^{3}/_{8}$" mounting screws. See Figure 44.
4. Lift the hanger into place and install and tighten each of the mounting screws.
5. Repeat this procedure for all other landings.

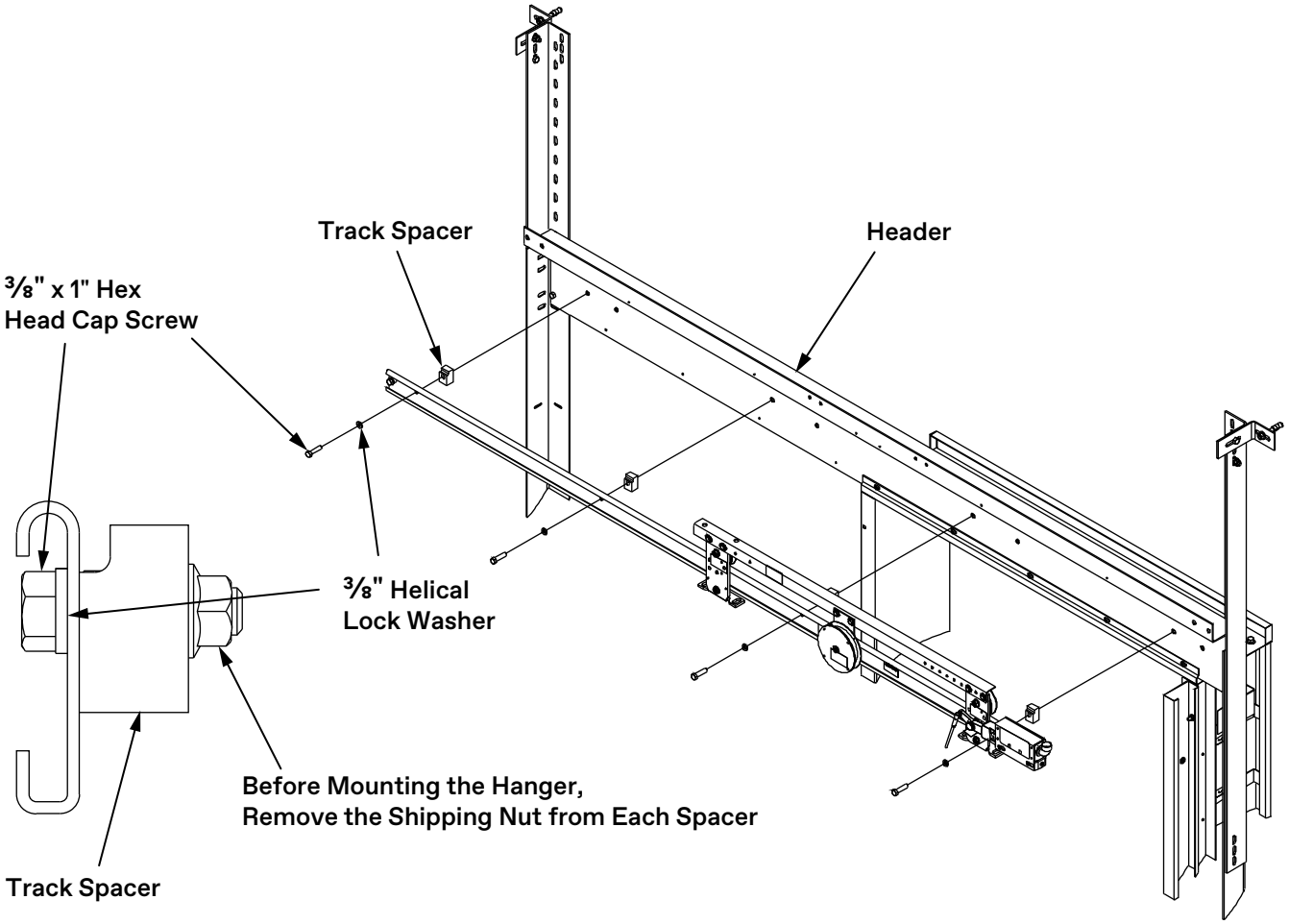


Figure 44 - Install Hoistway Hangers

Mount Hoistway Doors

1. Distribute the hoistway doors to each landing.
2. At a landing, place the doors on the hoistway sill, and lean against the hoistway header.
3. Install pendant bolts in the top of the doors and tighten. See Figure 45.
4. Install a jam nut, followed by a flat washer, on each pendant bolt.
5. Guide the pendant bolts through the slots of the door hangers. Install a flat washer and a jam nut on each pendant bolt.
6. Mount the door gibs, the door retainers, and the door safety guides. Adjustments will be done later.

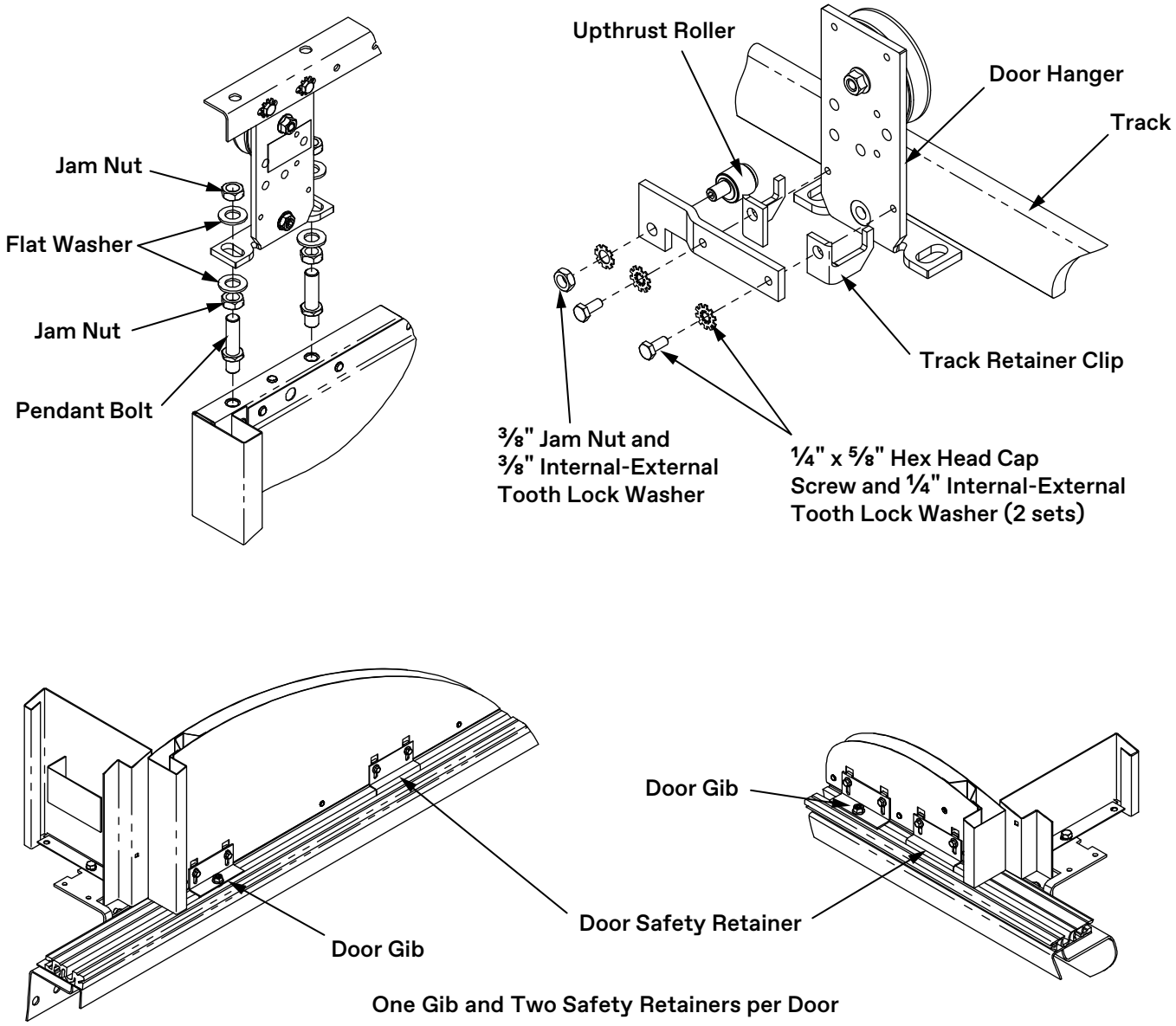


Figure 45 - Mount Hoistway Doors

Adjust Running Clearance

1. Place a $^{1}/_{4}$" shim (running clearance) underneath each edge of door. See Figure 46.
2. Loosen the jam nuts underneath the door hangers.
3. Turn the top jam nut to adjust the doors up or down until each edge of the door just touches the $^{1}/_{4}$" shim.
4. Tighten the jam nuts.
5. Check the leading edge of the door by rolling it to the closed position.
6. Observe whether the edge meets the two bumpers in the strike column at the same time. The leading edge of the door *must never* meet the bottom bumper first.
7. Turn the eccentric of the upthrust roller clockwise until the roller just touches the bottom of the door track.
8. Adjust the eccentric for a 0.015" gap between the upthrust roller and the door track.

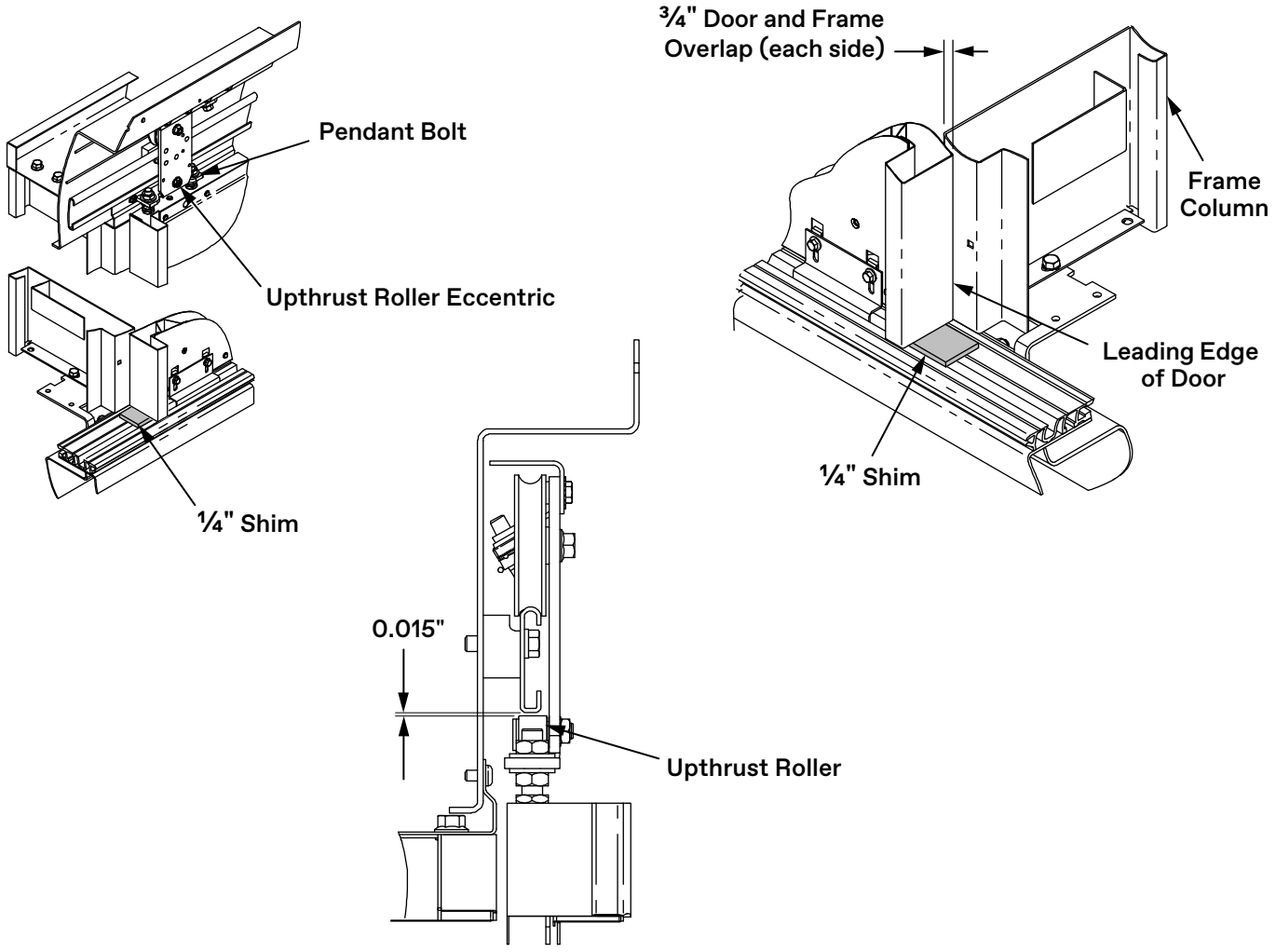


Figure 46 - Adjust Running Clearance

Adjust Door Gibs

1. Adjust door gib brackets and door retainer brackets for a $^{1}/_{8}$" running clearance between brackets and hoistway sill. Tighten bolts after adjustment. See Figure 47.
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. With a $^{3}/_{16}$" hex wrench, turn the eccentric of the door gib until the door panel just touches the $^{1}/_{4}$" shim, then tighten the locknut.
4. Repeat steps 2 and 3 for the trailing edge, and repeat steps 2 through 4 for the other door panel.
5. Verify that the door rolls freely and also tracks parallel to the hoistway sill groove; adjust as necessary.
6. Fully close the doors and check the gap between the leading edges of the two doors. The gap must be equal from top to bottom.

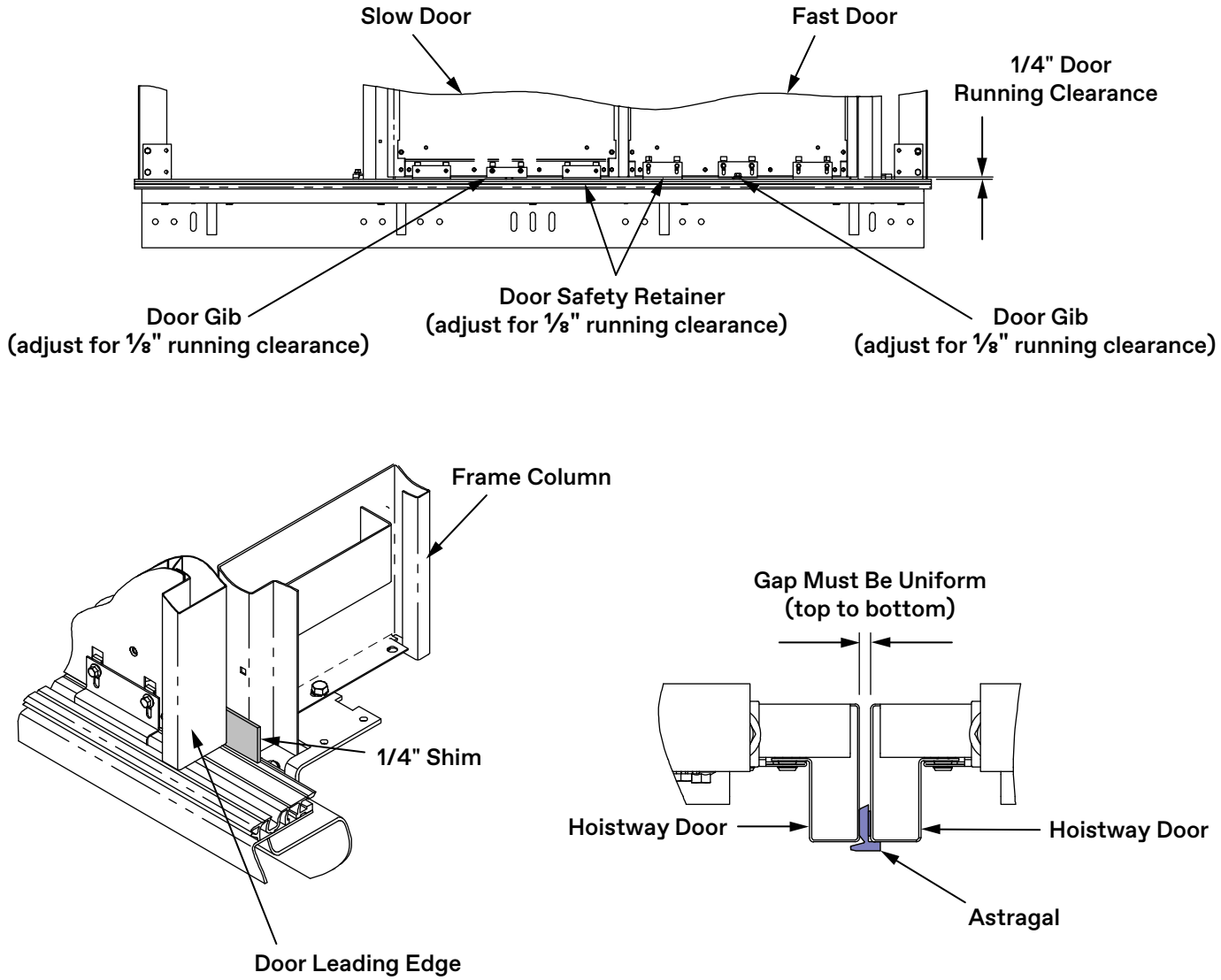


Figure 47 - Adjust Door Gibs

Adjust Closer Reel and Track Retainers

1. Put 3 or 4 wraps on the closer reel, and then use a $^{1}/_{4}$" x $^{3}/_{4}$" hex head cap screw and a $^{1}/_{4}$" flange nut to attach the cable to the header. See Figure 48.
2. Adjust the closer reel so that the doors close when released $^{1}/_{2}$" from the fully closed position.
3. Verify the doors fully close with no “double bump” when doors touch each other.

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

4. On each side of the door panel, use $^{1}/_{4}$" x $^{1}/_{2}$" hex head flange screws to install 2 track retainers on each door hanger.
5. Adjust the track retainers to allow sufficient running clearance between the retainer and the track.

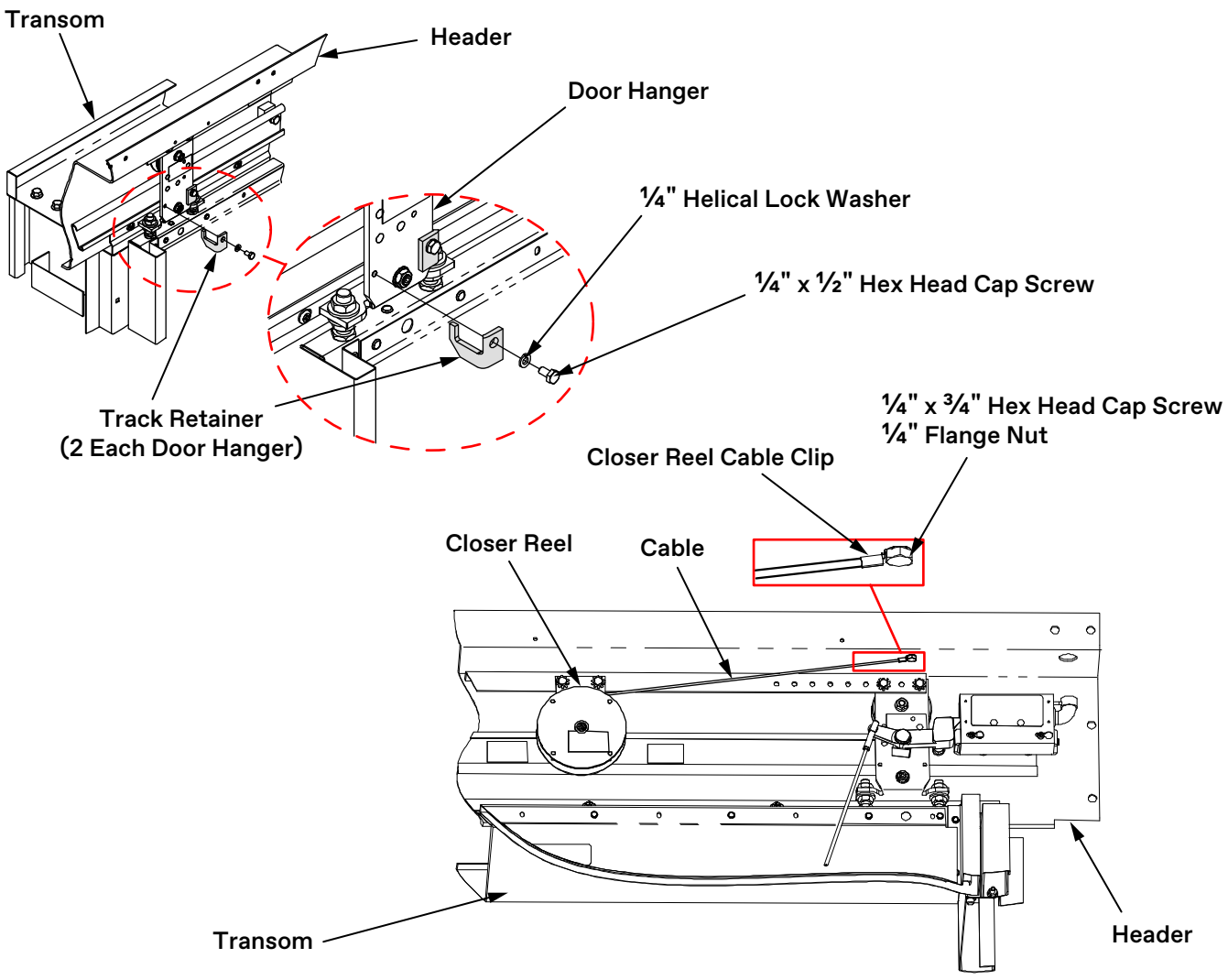


Figure 48 - Adjust Closer Reel and Install Track Retainers

Install the Door Relating Cable

1. Install one relating cable pulley assembly in the strut on each end of the hoistway header. See Figure 49.
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 with the four nuts on the relating cable clamp assembly. The relating cable should be tight, but not enough to cause doors to bind.
5. Fully close the hoistway doors.
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 the relating cable clears all pulleys and other obstructions, adjust if needed.

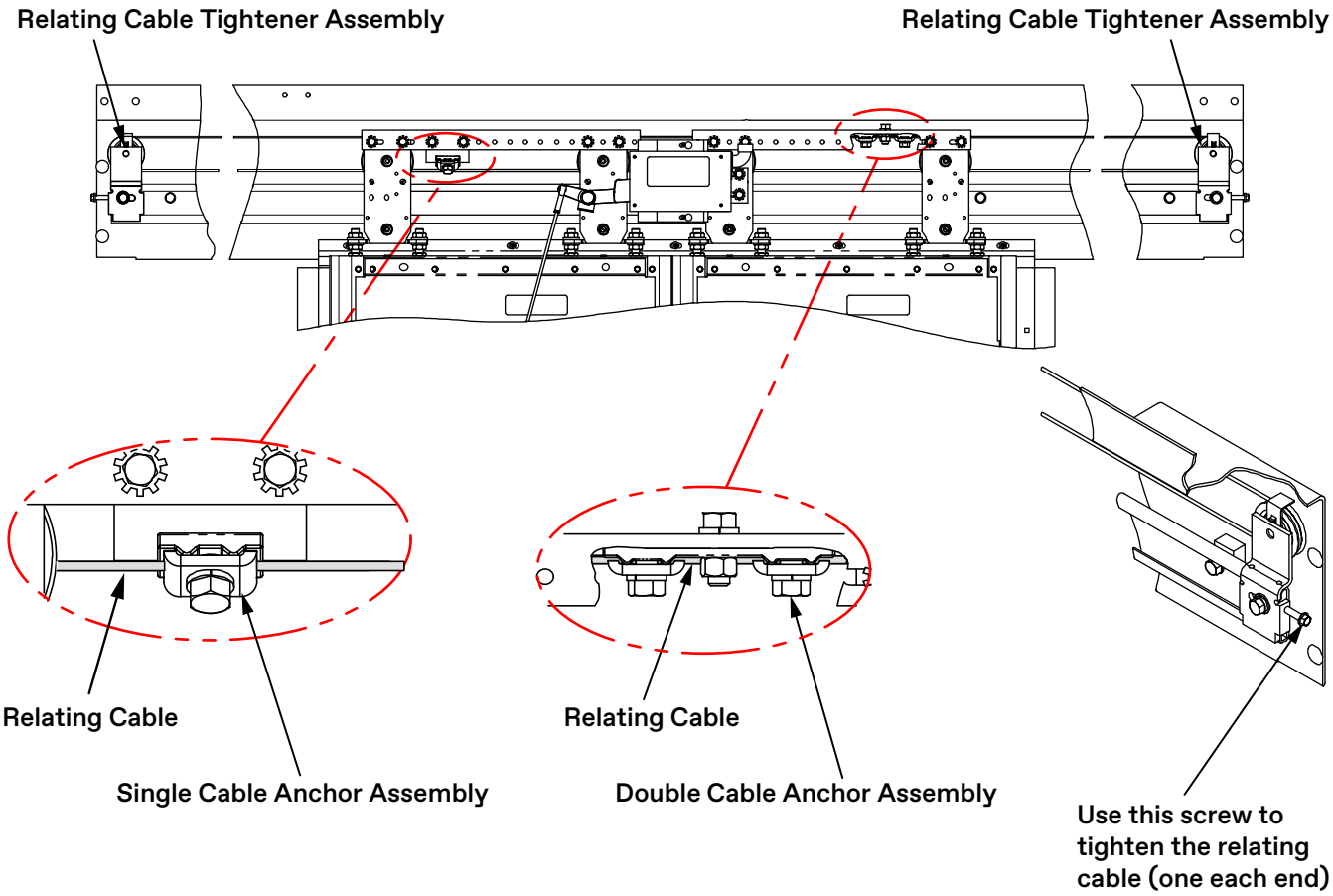


Figure 49 - Install the Relating Cable

Install Fixture Boxes

- Fixture boxes must be installed *after* the entrance frames are installed, and *before* the hoistway wall is completed.
- Use brackets to install the fixture boxes at each landing.
- The brackets may be used to mount the fixture boxes on the strut angle, the entrance frame, or the hoistway wall.
- Attach a length of EMT between the hoistway duct and the fixture boxes.

Install and Adjust the Dual Interlock

1. Remove the cover from the interlock box. See Figure 50 on page 69 for all steps in this procedure.
2. Close the doors, and verify the following:
   a. The interlock hook is centered front-to-back on the contacts.
   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.

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

3. 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.
4. Adjust the contact plunger to obtain $^{5}/_{32}$" compression of the contact leafs when the doors are closed. The contact plunger should touch both contact leafs at the same time.
5. Manually push the doors open to take up all of the slack in the interlock hook, and verify that the contact remains closed.
6. 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.
7. Repeat this procedure for all other landings.

Install and Adjust the Dual Interlock
(continued)

Interlock Wiring

1. Remove the interlock box cover.
2. Verify that a manufacturing wire connects one terminal on each of the two contact blocks.
3. 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.**

4. Repeat this procedure for all other landings.

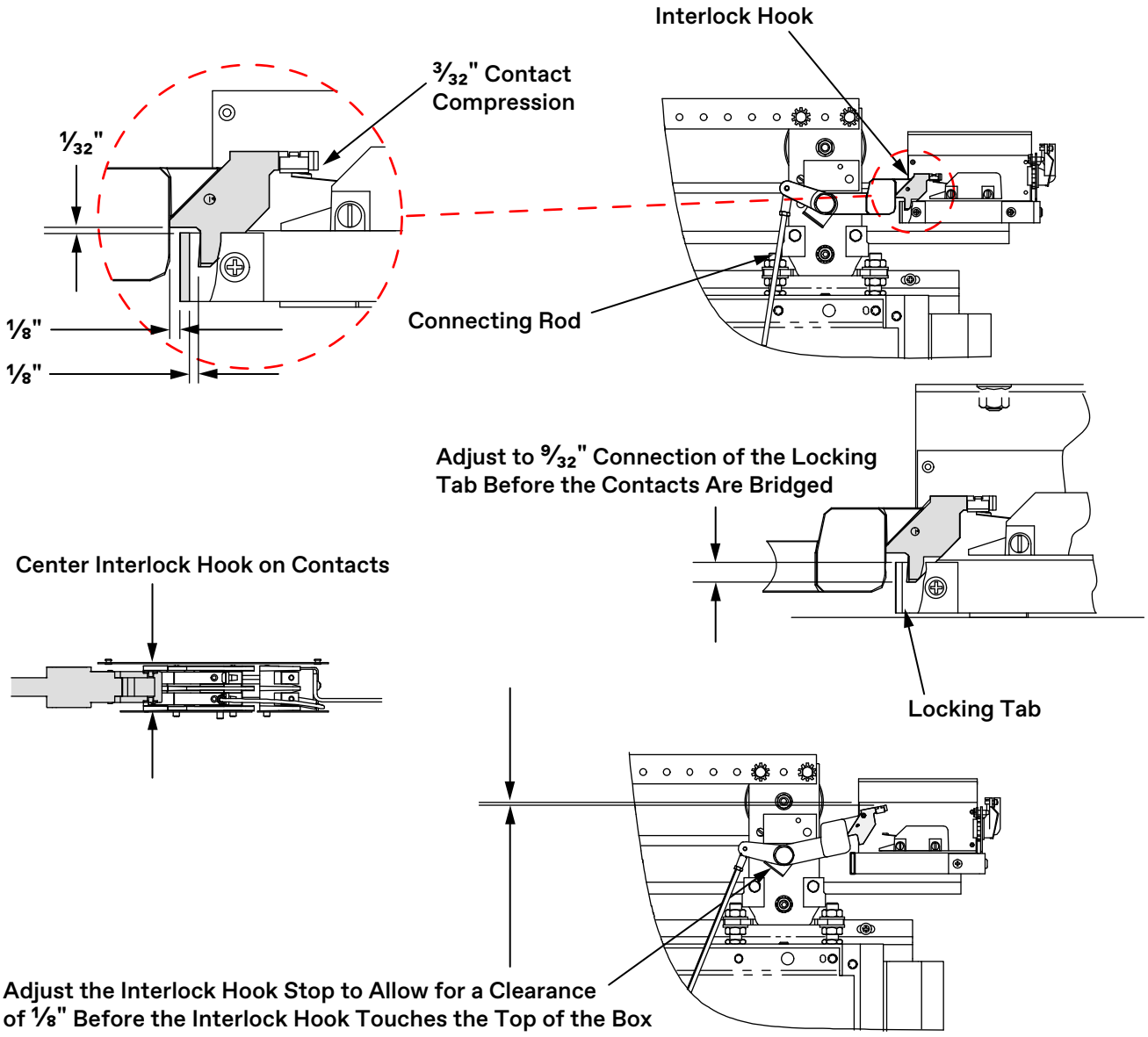


Figure 50 - Interlock Adjustment

Install 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 51 on page 71.
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 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.
11. 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 toe guard in the pit must extend far enough below sill so that when car is on compressed buffers the platform toe guard will not be below hoistway toe guard.
12. Install the toe guard by hooking it onto the top fascia plate.
13. Fasten the toe guard to the wall with the provided drive pin anchors.
14. If required, install all dust covers.

Install Fascia Plates and Dust Covers
(continued)

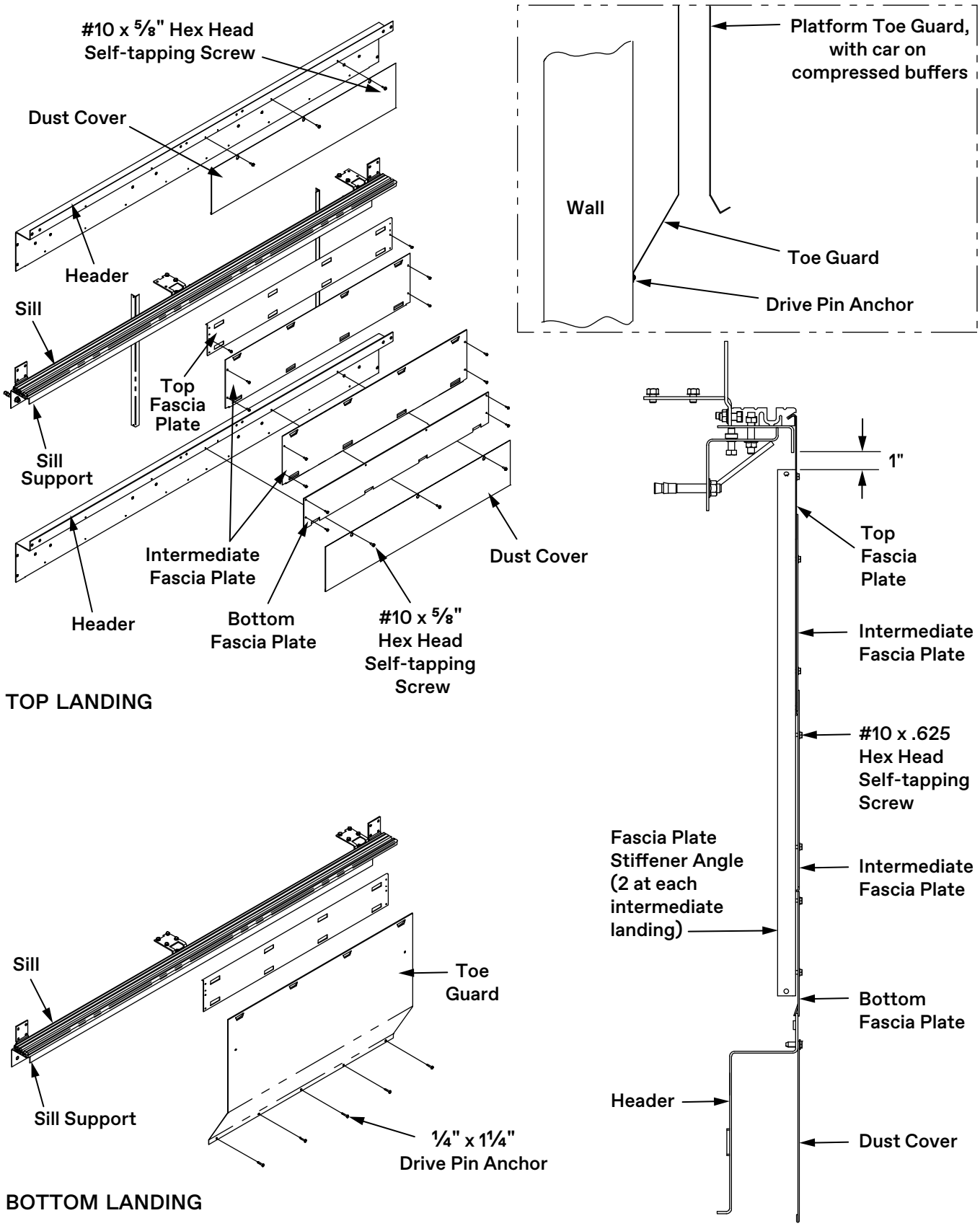


Figure 51 - Install Fascia Plates and Dust Covers

Install the Type 2 Door Restrictor

1. Mark the position of the hoistway restrictor angle. See Figure 52.
2. Use the supplied hardware to install the restrictor angle on the fascia. The restrictor angle must not be lower than 1″ below the top of the hoistway sill.
3. Repeat this procedure for all landings.

Opening Width	Angle Position
36"	19 7/8"
38"	20 7/8"
40"	21 7/8"
42"	22 7/8"
44"	23 7/8"
46"	24 7/8"
48"	25 7/8"
50"	26 7/8"
52"	27 7/8"
54"	28 7/8"
56"	29 7/8"
58"	30 7/8"
60"	31 7/8"

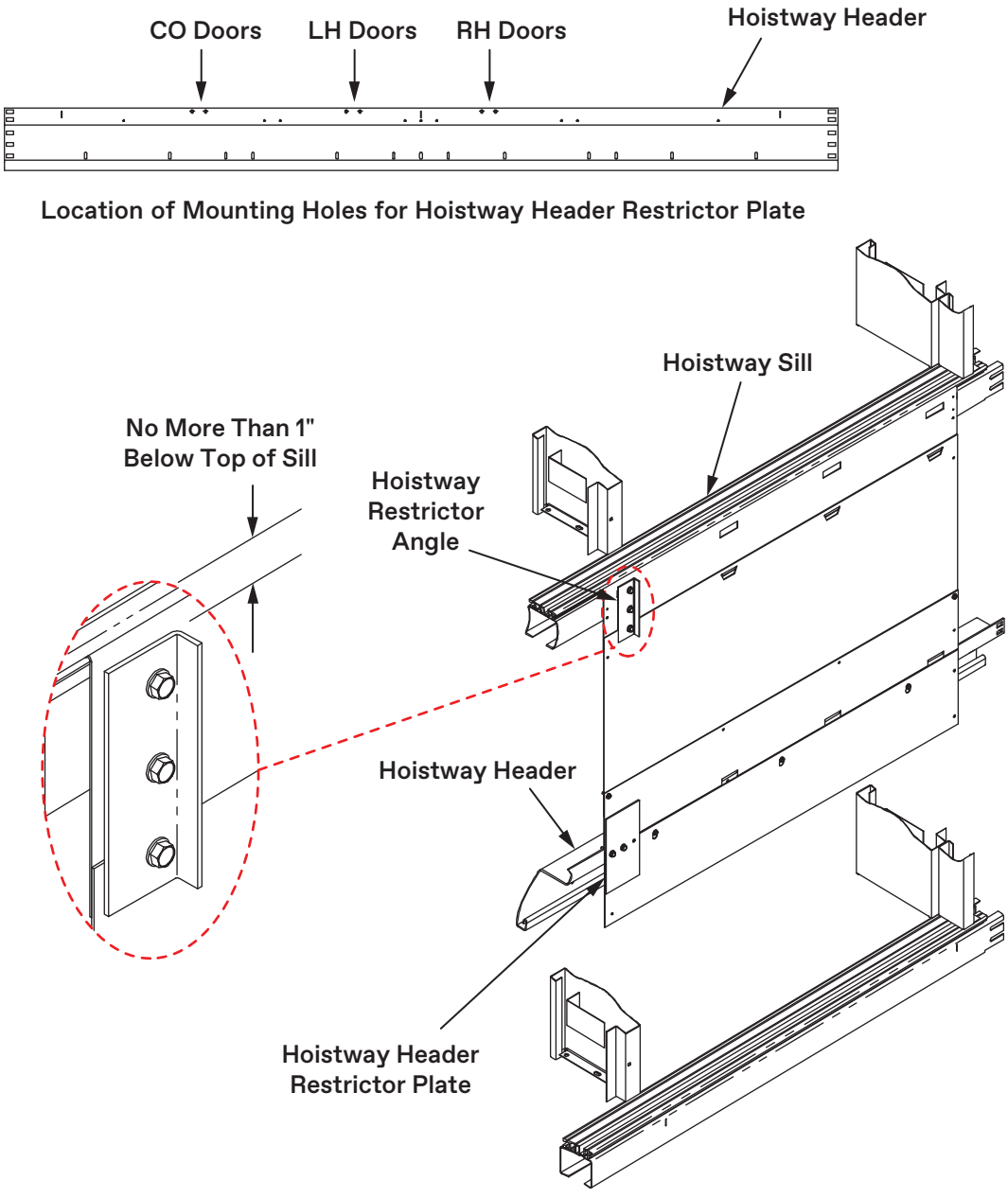


Figure 52 - Hoistway Restrictor Angle Positions

Install Car Door Restrictor

1. Install the car door restrictor into the two key slots on trailing edge of the car door.
2. Use washers to adjust the car door restrictor so that it is plumb and a $^{1}/_{4}$" minimum interference when the car door restrictor engages the hoistway restrictor angle. See Figure 53.

Restrictor Testing

Run the car, and verify the following throughout the hoistway:

- The car door will open when the car is within 3" of each landing.
- The car door will not open more than 4" when the car is 18" or more away from each landing (except where the car doors open only to fascia). This includes top and bottom overtravel.
- There is $^{1}/_{4}$" minimum interference when the car door restrictor engages the hoistway restrictor angle.

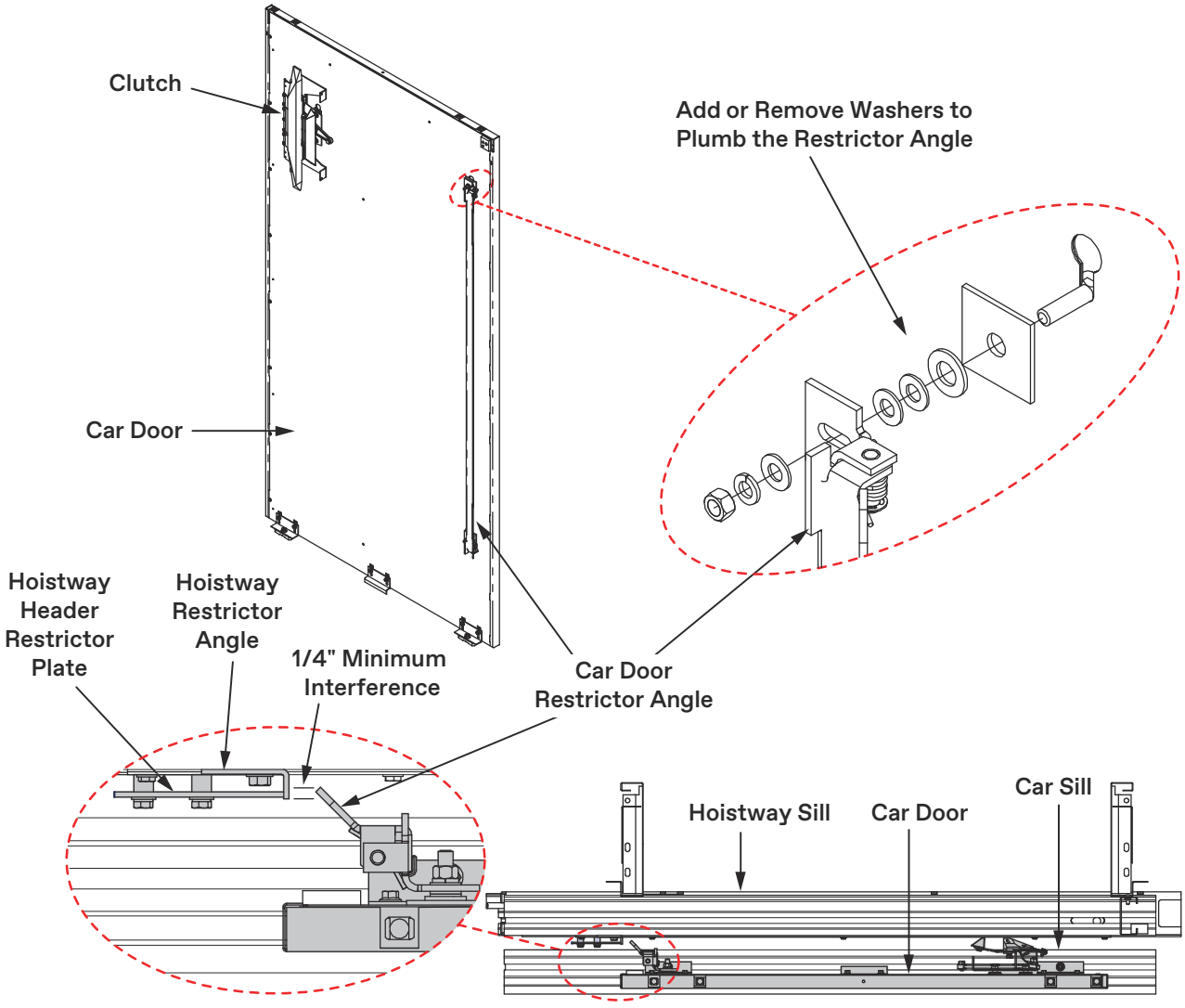


Figure 53 - Install the Car Door Restrictor Angle

Maintenance

Monthly

1. Wiggle the top of the doors to check the door hangers for looseness.
2. Check that the door tracks are smooth and clean.
3. Unlock the doors, and move the hoistway door by hand to check the door rollers for cracking tires, loose bearings, or unusual noise.
4. Inspect the shorting bar contact of the hoistway door interlock.
5. Manually move the doors on track to check the door relating cables for excessive looseness, fraying, or loose connections; Ensure that the nylon idler pulleys rotate smoothly.
6. Manually move doors on the track to check for cracked or broken eccentric rollers.
7. Manually check the door closer mounting bracket for looseness, and move the doors the full travel on the track and listen for unusual noises.
8. Manually check the door interlock hook bolt for tightness, and check for clearance on the lock box cover.
9. Ensure the proper rotation on pickup rollers and check for cracking; Pull on the mounting to ensure it is tight.
10. Wiggle the bottom of doors to check that 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.

Annually

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

1. Inspect the door gibs.
   a. Move the car to allow access to the bottom of the doors.
   b. Unlock the doors and move them full travel; verify that the doors move freely on the sill.
   c. Check the gibs for wear (adjust or replace as necessary).
   d. Check that the fire tab screws are tight.
   e. Check for door-to-sill clearance of $1^{1}/_{4}$" (optimum) to $3^{1}/_{8}$" (maximum).

Maintenance *(continued)*

2. Remove and store the dust cover.
3. Unlock the doors, and partially open them.
4. Inspect the door hangers, eccentrics, and tracks.
   a. Check that the tracks are smooth and clean, and tighten the mounting bolts.
   b. Manually move doors to check the door rollers for cracks and for smooth bearing operation; check that the mounting bolt is tight.
   c. Use a flashlight to observe the gap between the roller and the track, check the eccentric setting.

- Set the entire door travel as close as possible without causing drag (approximately 0.015").

   d. Ensure that the eccentrics and hanger bolts are tight.

5. Inspect the relating cable.
   a. Manually move the doors and check the relating cable for frays or excessive looseness; adjust as necessary, and tighten all fastenings.
   b. Check the condition of nylon pulleys for smooth operation, and tighten the mounting bracket. Adjustment here will affect the interlock settings.
6. Inspect the door closer (spirator).
   a. Fully open the doors, and listen for unusual noises from the closer.
   b. Check that the closer mounting bracket is tight.
   c. Check the cable for fraying, and check the cable fastening.
   d. Stop doors within $1^{1}/_{2}$" from fully closed, and release them to check the setting of the closer (doors should close from any position).
7. Inspect the door interlocks.
   a. Remove the screws from the interlock cover, and remove the cover.
   b. Verify that the lock is centered in the catch (shim as required).
   c. Unlock doors, and then allow them to close to check clearances of the following:
      - The pickup of the interlock hook = $^{1}/_{8}$" from the top of box with the hook up
      - The drop
      - The engagement of the hook before the contacts bridge = $^{9}/_{32}$"
      - The overtravel on the contacts = $^{3}/_{32}$"
      - Equal height of the contacts and the hook-to-locking bar clearance = $^{1}/_{8}$" after locked (lateral movement indicates a bushing problem)
   d. Clean the bridging bar, and tighten the mounting bolts.
   e. Turn OFF the mainline disconnect.
   f. Clean the lock contacts, and tighten the screws in the contact assembly base.
   g. Replace the interlock box cover.

Maintenance *(continued)*

8. Inspect the clutch vane and the pick-up rollers.
   a. Position the clutch vane in front of the pick-up rollers by moving the car and checking for proper clearance ($1^1/_4$" maximum) between the face of the vane and the pick-up roller.
   b. Check 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 hydrocarbons, esters, 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)

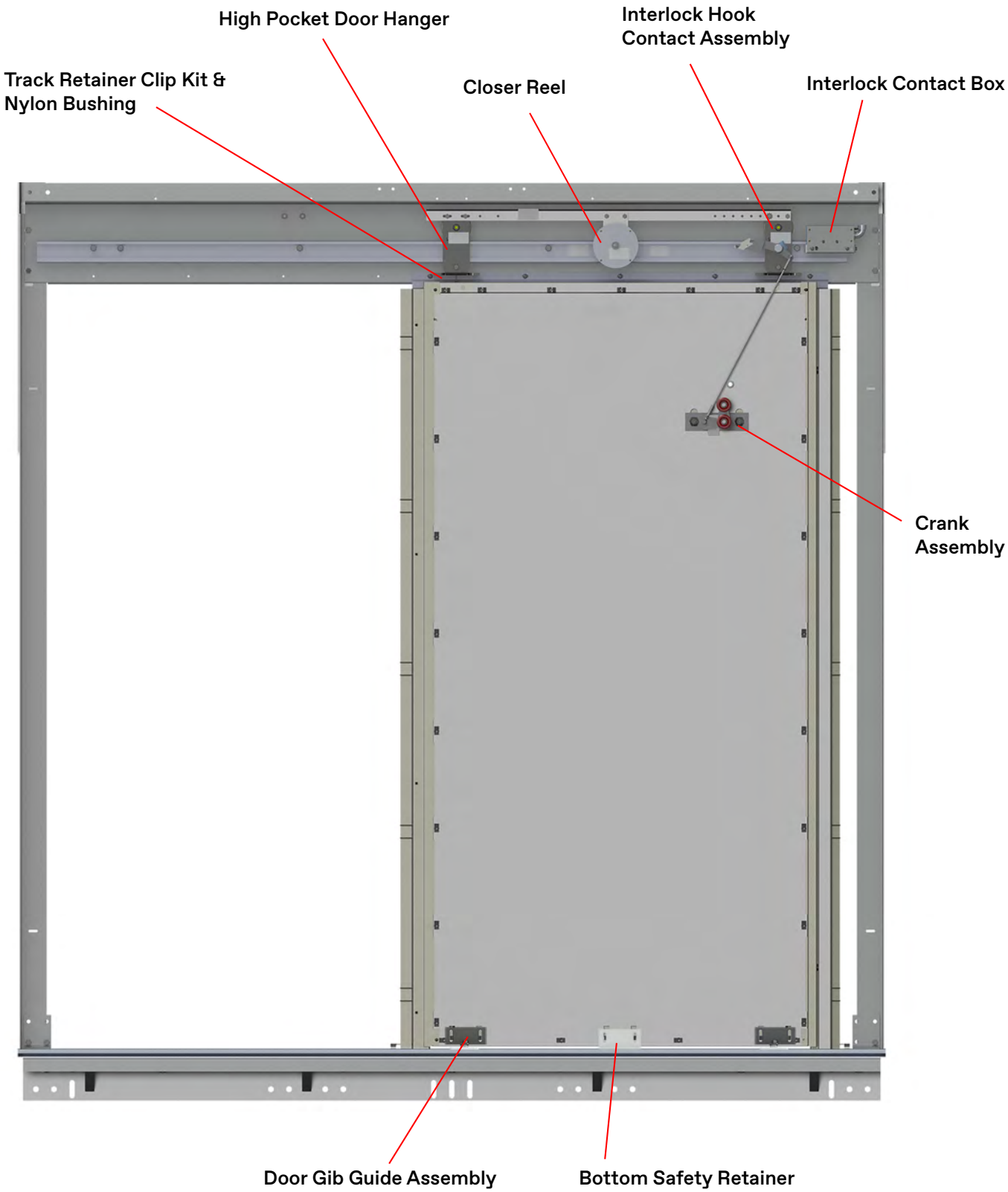
These surfaces are coated with a lacquer finish. To prevent scuffing, use a paste wax (for clear coats finishes) every week. Routine cleaning with a damp, soft cloth will remove spills, smears and fingerprints. Do not use abrasives or harsh chemicals.

Troubleshooting Guide

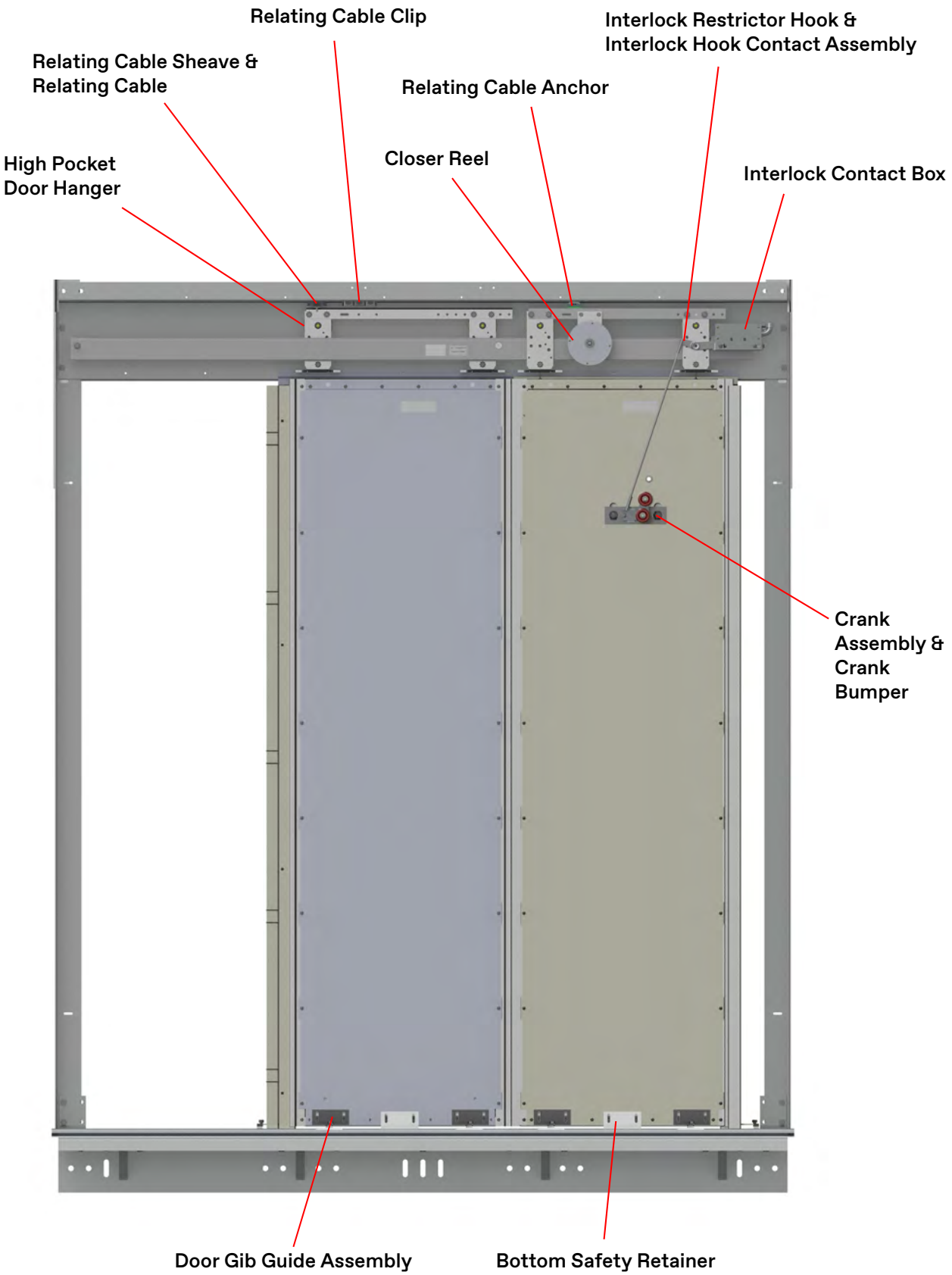
Problem	Cause	Solution
Doors won't close the final inch	Ramps on door tracks	Clean the tracks
	Debris in the sill	Clean the sill
	No closure tension	Verify closer reel operation and adjustment
Doors drag when opening or closing	Gibs are rubbing the sill	Lift the door
	Door is out of alignment	Re–adjust the door
Door lock won't make contact	Broken interlock hook	Replace the interlock hook
	Bent connecting rod	Straighten the rod
	Broken contact	Replace the contact

Replacement Parts

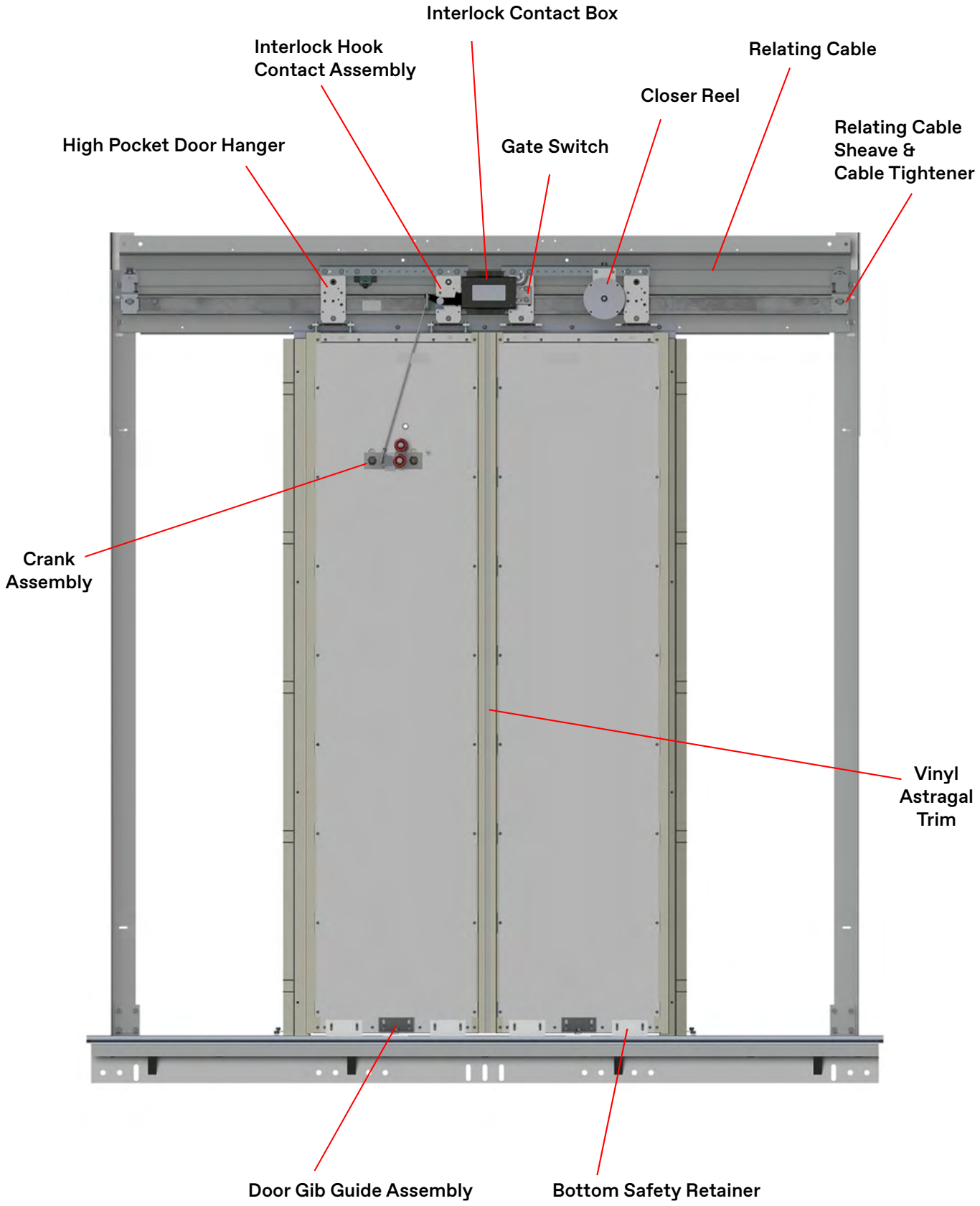
Single Speed (494AWD_)



Two Speed (494AXJ_)



Center Opening (494AWE_)



Parts List

Single Speed

Item	Print No.	Description
1	454DW1	Door Gib Guide Assembly (Standard Sill)
2	711ET1	Bottom Safety Retainer (Standard Sill)
3	63853	High Pocket Door Hanger
4	75987	4" Diameter Closer Reel
5	596CN5	Crank Assembly, Left Hand
	596CN6	Crank Assembly, Right Hand
6	66504	Interlock Contact Box, Left Hand
	66505	Interlock Contact Box, Right Hand
7	297BW3	Interlock Hook Contact Assembly, 18" Rod, Left Hand
	297BW1	Interlock Hook Contact Assembly, 18" Rod, Right Hand
8	40101	Nylon Bushing, $^{5}/_{8}$" dia. x $^{1}/_{4}$", SE-68
9	200FD1	Track Retainer Clip Kit
10	200HF1	Standoff Bumper Bolt Kit (not shown)

Two Speed

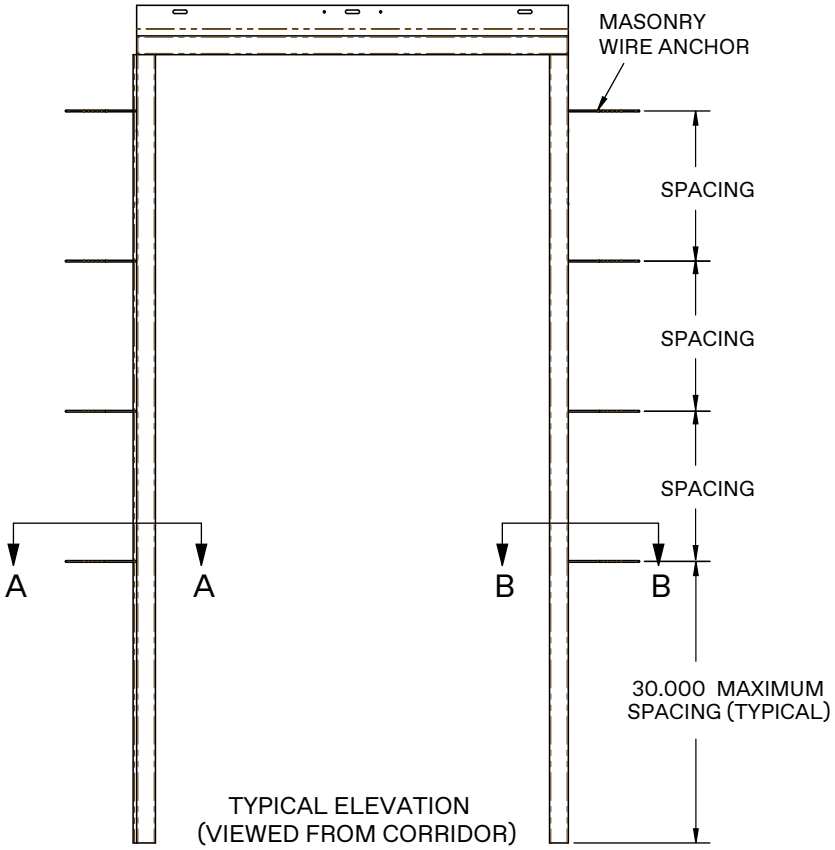
Item	Print No.	Description
1	454DW1	Door Gib Guide Assembly, Fast Door
	454FB001	Door Gib Guide Assembly, Slow Door
2	711ET1	Bottom Safety Retainer, Fast Door (Standard Sill)
	96BBJ001	Bottom Safety Retainer, Slow Door (Standard Sill)
3	63853	High Pocket Door Hanger
4	75987	Closer Reel, 4" Diameter, 48" Opening or Less
	73001	Closer Reel, 5" Diameter, Over 48" Opening
5	596CN5	Crank Assembly, Left Hand
	596CN6	Crank Assembly, Right Hand
6	142932	Crank Bumper
7	66504	Interlock Contact Box, Left Hand
	66505	Interlock Contact Box, Right Hand
8	297BW3	Interlock Hook Contact Assembly, 18" Rod, Left Hand
	297BW1	Interlock Hook Contact Assembly, 18" Rod, Right Hand
9	709AC1	Interlock Hook Restrictor
10	200FE1	Hanger Retainer Angle Kit - Slow Door Only
11	200FD1	Track Retainer Clip Installation Kit - Fast Door
12	40190	Relating Double Cable Anchor
	40113	Relating Single Cable Anchor
13	40130	Relating Cable Clip
14	40158	Relating Cable Sheave
15	77142	Relating Cable
16	200HF1	Standoff Bumper Bolt Kit (not shown)

Center Opening

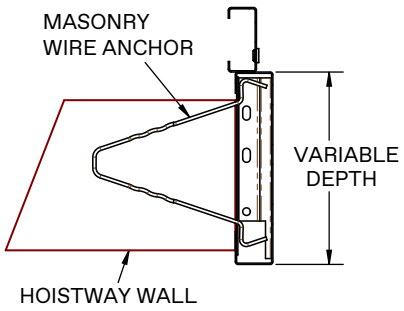
Item	Print No.	Description
1	454DW1	Door Gib Guide Assembly (Standard Sill)
2	711ET1	Bottom Safety Retainer (Standard Sill)
3	876AW004	Vinyl Astragal Trim, $84^{1}/_{2}$" (DOH ≤ 84")
	876AW005	Vinyl Astragal Trim, $96^{1}/_{2}$" (DOH > 84" but ≤ 96")
	876AW006	Vinyl Astragal Trim, $108^{1}/_{2}$" (DOH > 96")
4	75987	Closer Reel, 4" Diameter
5	297AR1	Contact Assembly, Gate Switch
6	63853	High Pocket Door Hanger, Standard Upthrust Rollers
	461BA1	High Pocket Door Hanger
7	297AT1	Interlock Contact Box Assembly
8	196NR1	Cable Tightener, Center Opening
9	40158	Relating Cable Sheave
10	77142	Relating Cable
11	596CN5	Crank Assembly, Left Hand
12	297BW3	Interlock Hook Contact Assembly, 18" Rod, Left Hand
13	200FD1	Track Retainer Clip Kit
14	200HF1	Standoff Bumper Bolt Kit (not shown)

Reference Information

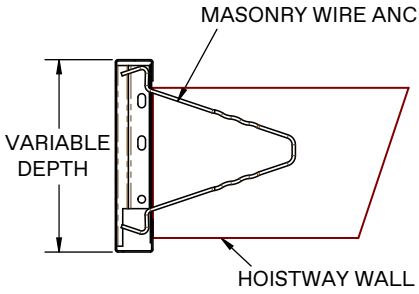
Masonry Entrance Interface Details (494JT-C)



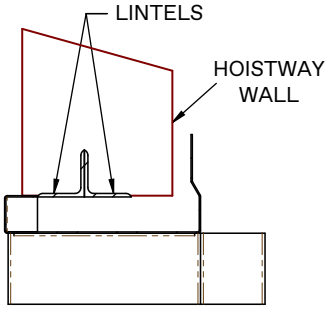
TYPICAL ELEVATION
(VIEWED FROM CORRIDOR)



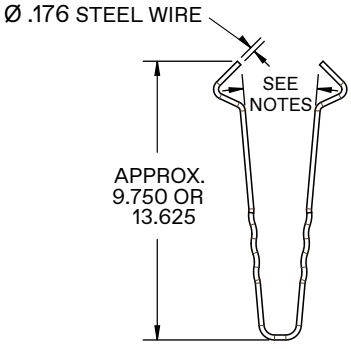
SECTION A-A
THRU STRIKE (TYPICAL)



SECTION B-B
THRU RETURN (TYPICAL)



THRU TRANSOM



NOTES:
- SPREAD TO FIT FRAME DEPTH
- ANCHOR CAN BE BENT TO ALIGN WITH WALL JOINTS

MASONRY WIRE ANCHOR DETAIL

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 Entrance Interface Details (494JV-K)

(applies to all applicable pages unless otherwise noted).

UL fire resistance hoistway wall design for wall rating up to 2 hours.

For walls with less than 2 hours rating: eliminate the base layer option.

For elevator door framing wall design and material, see specified UL construction details.

Entrance label up to 2 hours maximum.

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, shaft wall liners, wallboard layers (Type X or C), fillers, and fasteners.

The door and frame will carry a 1½ or 2 hour fire label from an approved testing facility which will meet or exceed the minimum required by the local building code.

Clear door opening heights:

- 7 feet or less = fillers and strips/shims are not required per specified UL construction
- Over 7 feet (shaft wall construction only)
  - » Liner Filler - Use $1^{5}/_{8}$" S-type steel screws staggered 12" o.c. to attach 1" x 12" wide wallboard to the shaft wall liner.
  - » Filler Strips - Use W-type steel screws staggered 12" o.c. to attach $^{1}/_{2}$" or $^{5}/_{8}$" x 6" wide wallboard liner filler to the shaft wall liner.
  - » Fill jamb strut with header completely (within $^{3}/_{16}$") with layers and thicknesses as required to meet UL design.

The shaft wall liner-to-jamb throat gap is to be $^{3}/_{16}$" or less. If a larger gap exists, fill the gap with additional 6" wide wallboard. Use specified steel screws staggered 12" o.c. to attach additional layers to the J-Runner or stud.

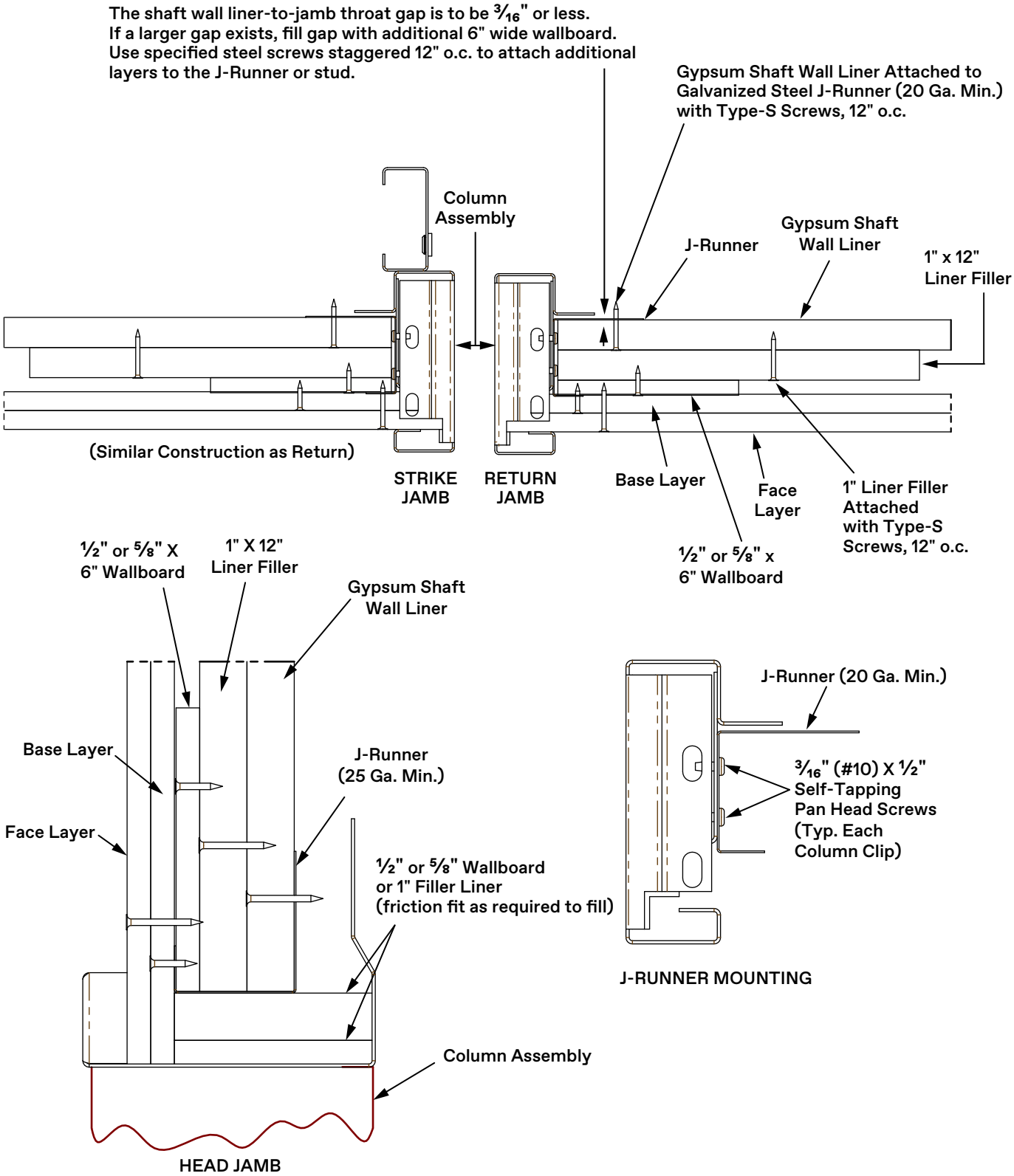
Attach the wall board layers to the jamb strut and stud with the fastener type, lengths, location, and spacing in accordance with the specified UL design (wall board thickness per specified UL design).

Gypsum Wall Options (2 hour maximum fire rating)

Option	Shaft Wall Liner	Face and Base Layer
1	1" Type X	$^{1}/_{2}$" or $^{5}/_{8}$" Type X or C
2	$^{3}/_{4}$" Type X	$^{5}/_{8}$" Type X or C
3	$^{1}/_{2}$" or $^{5}/_{8}$" Type X or C (2 layers)	$^{1}/_{2}$" or $^{5}/_{8}$" Type X or C
4	$^{5}/_{8}$" Type X (2 layers)	$^{5}/_{8}$" Type X or C
5	1" Type X	$^{3}/_{4}$" Type X or C — No base layer

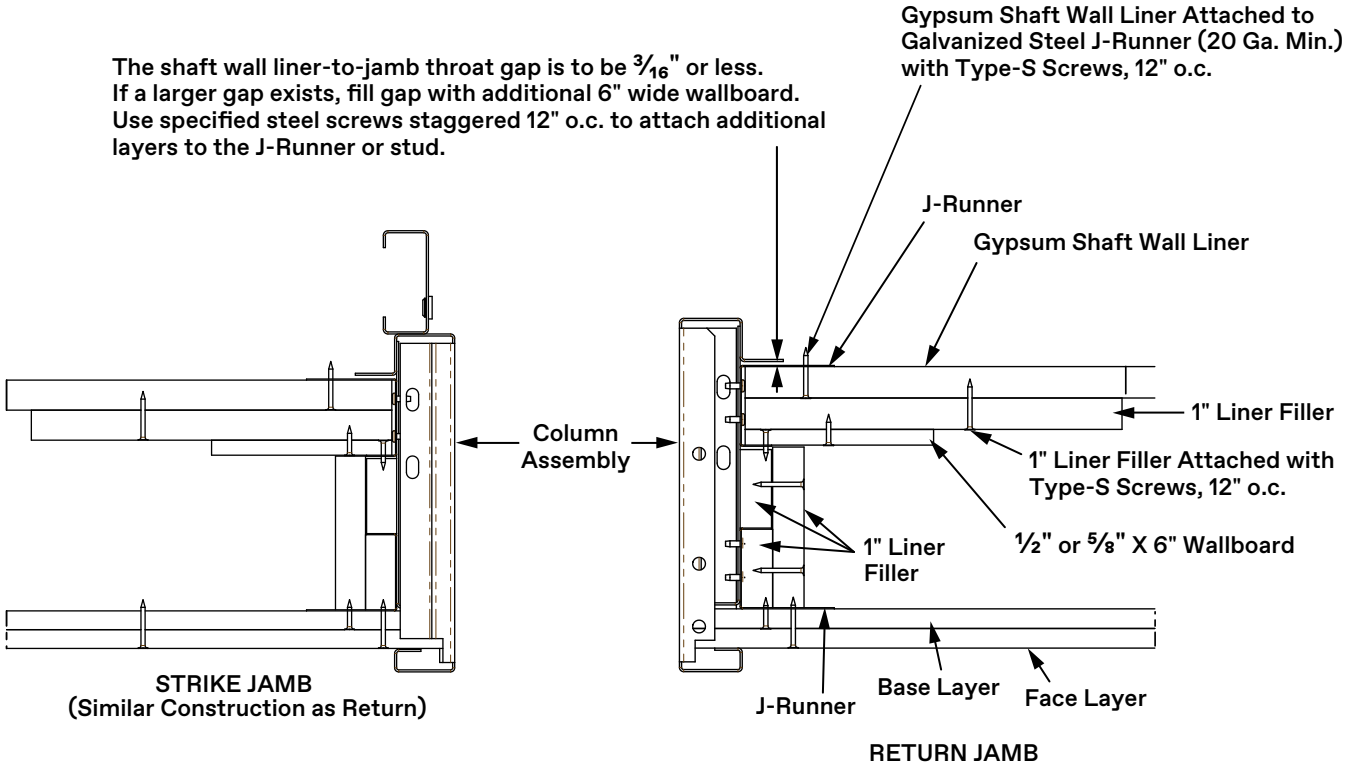
Drywall Interface Details
(continued)

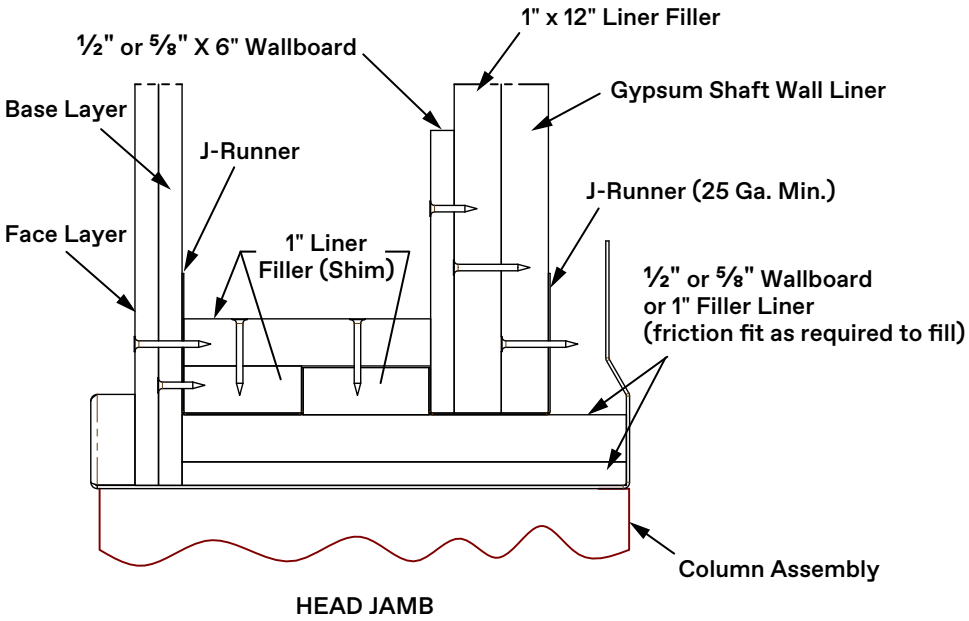
$3^{1}/_{2}$" – $8^{3}/_{8}$" Wall Thickness

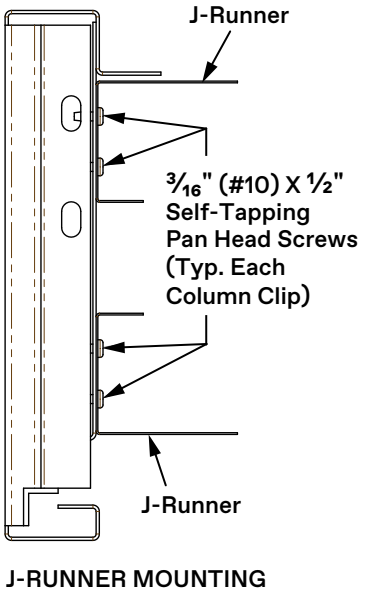


Drywall Interface Details
(continued)

$8^1/_2$" – 24" Wall Thickness





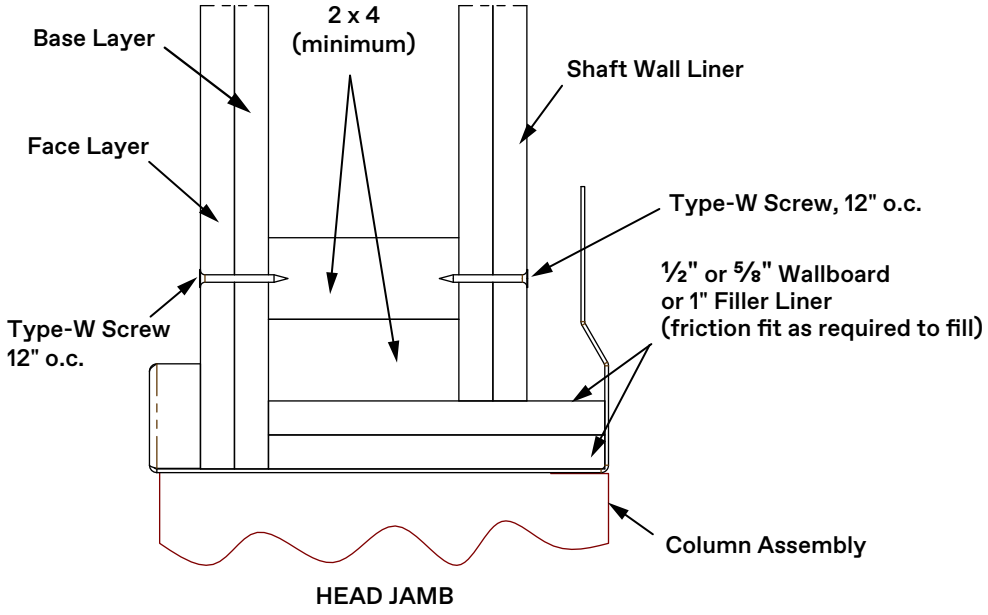


Drywall Interface Details
(continued)

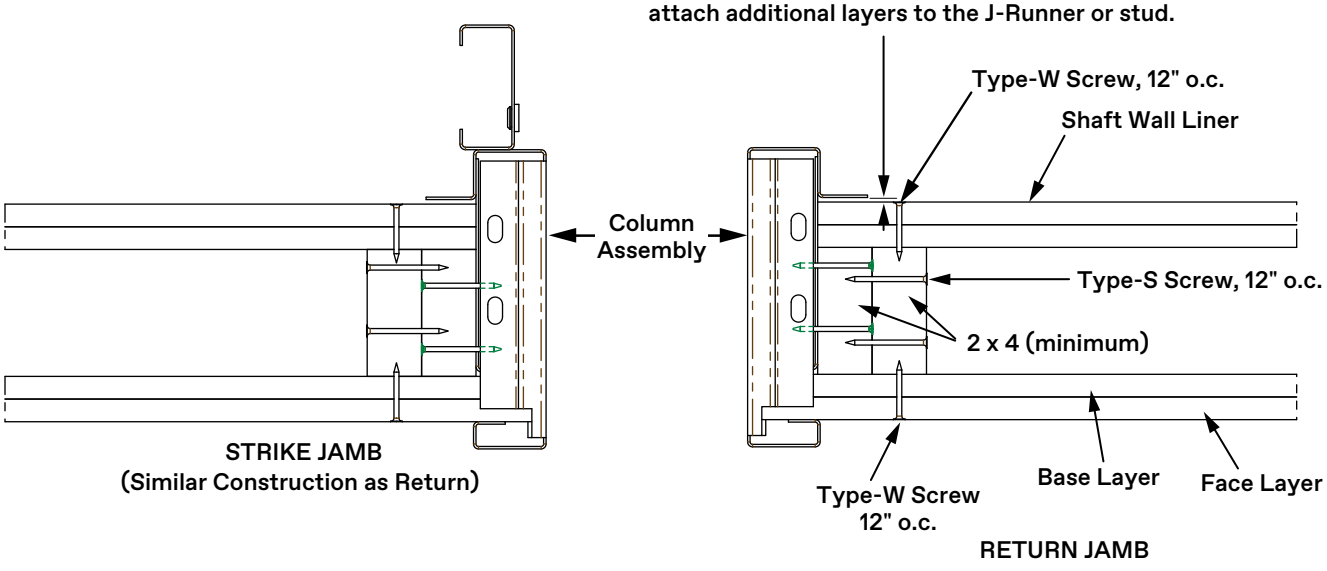
Wood Stud Construction

Gypsum Wall Options (2 hour maximum fire rating)

Option	Shaft Wall Liner	Face and Base Layer
1	1" Type X	5/8" Type X
2	3/4" Type X	
3	5/8" Type X (2 layers)	
4	5/8" Type X (2 layers)	



The shaft wall liner-to-jamb throat gap is to be 3/16" or less.
If a larger gap exists, fill gap with additional 6" wide wallboard.
Use specified steel screws staggered 12" o.c. to
attach additional layers to the J-Runner or stud.

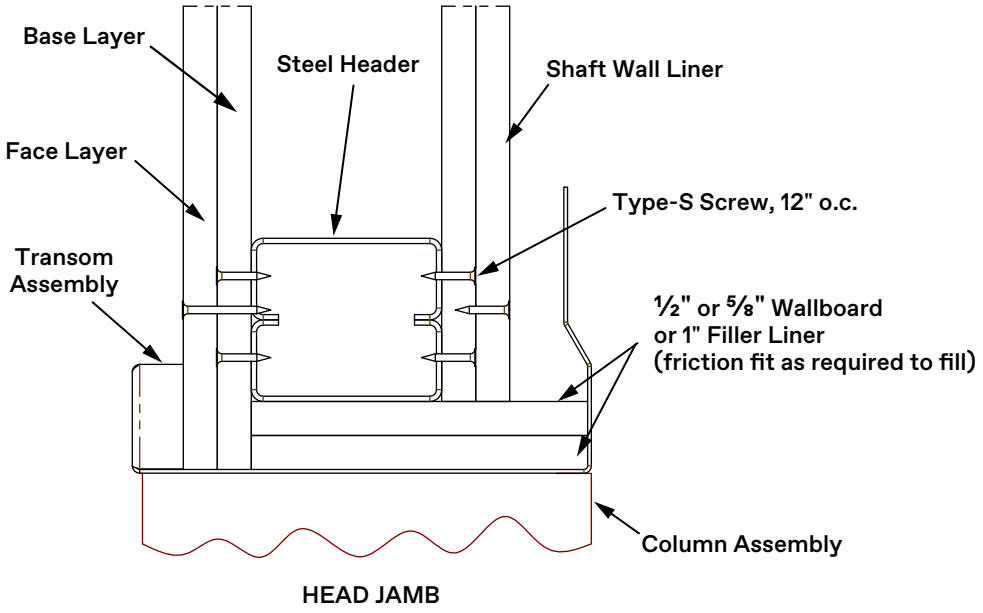


Drywall Interface Details
(continued)

Steel Stud Construction

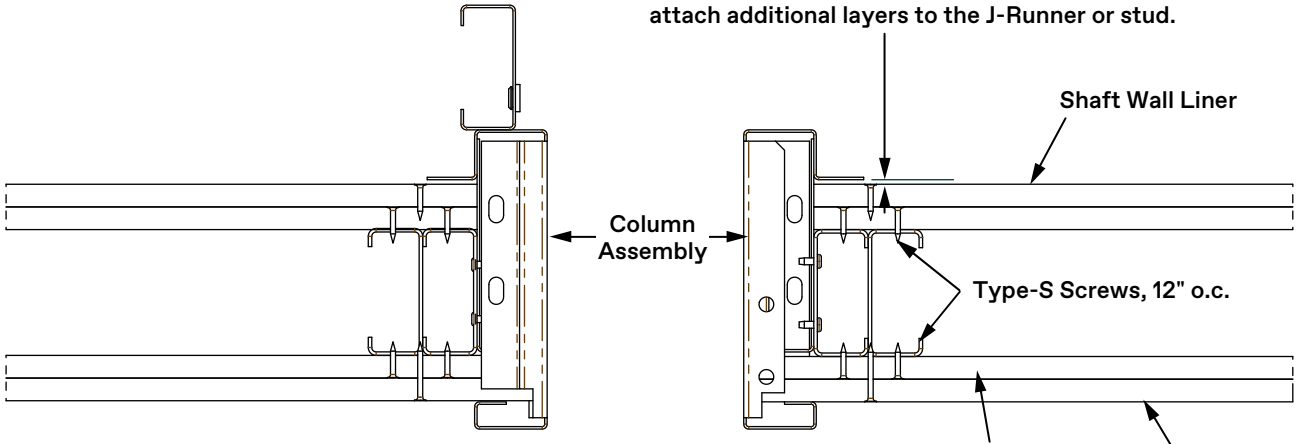
Gypsum Wall Options (2 hour maximum fire rating)

Option	Shaft Wall Liner	Face and Base Layer
1	1" Type X	5/8" Type X
2	3/4" Type X	
3	5/8" Type X (2 layers)	
4	5/8" Type X (2 layers)	



HEAD JAMB

The shaft wall liner-to-jamb throat gap is to be 3/16" or less. If a larger gap exists, fill gap with additional 6" wide wallboard. Use specified steel screws staggered 12" o.c. to attach additional layers to the J-Runner or stud.

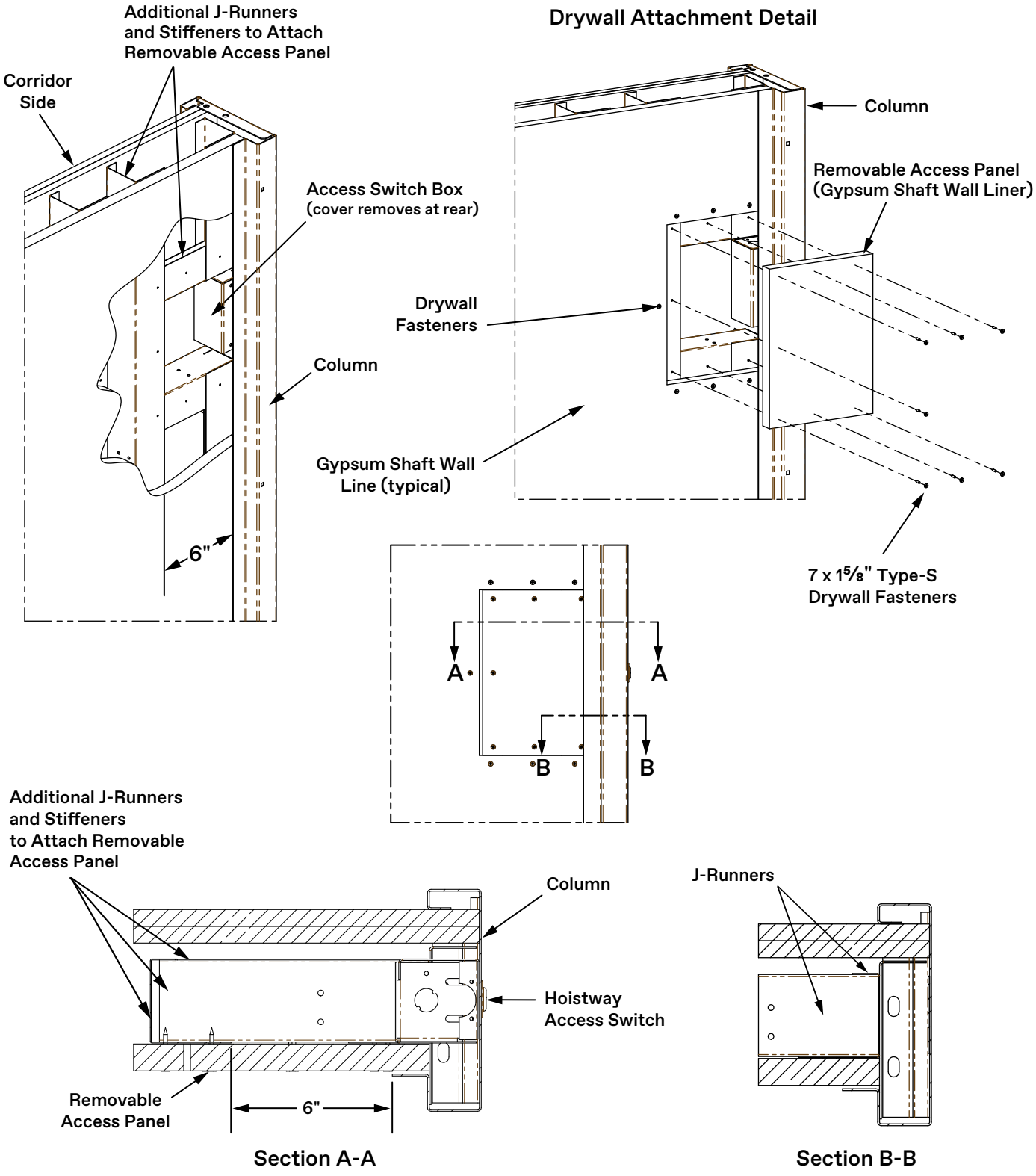


STRIKE JAMB
(Similar Construction as Return)

RETURN JAMB

Drywall Interface Details
(continued)

Access Switch Box



VERTICAL EXPRESS

9280 Crestwyn Hills Memphis, TN 38125
Tel: (866) 448-3789 (toll free) Fax: (901) 877-8099
www.verticalxpress.com