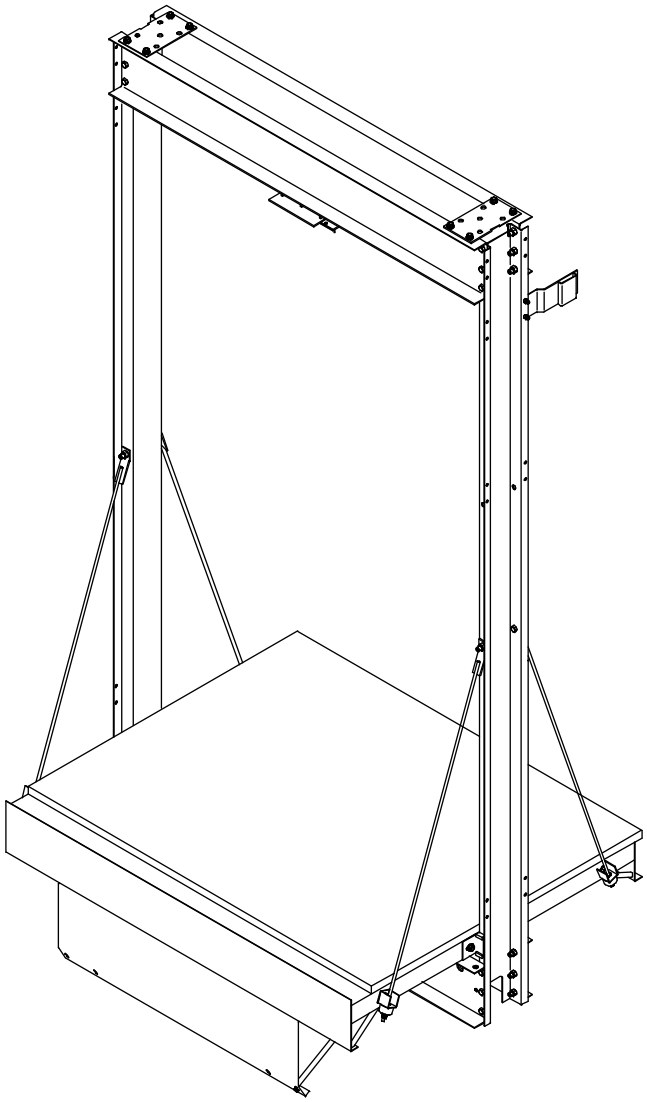
VERTICAL EXPRESS

Trimline Car and Sling



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

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

Manual Number: 89120 v.1.1

Contents

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Safety Precautions

IMPORTANT!

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

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

Terms in This Manual

CAUTION

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

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

Electrical Safety

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

Use the Proper Fuse

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

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

Printed Circuit Cards

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

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

Electrical Safety
(continued)

Mainline Disconnect

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

Test Equipment Safety

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

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

When Power Is On

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

Mechanical Safety

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

Static Protection Guidelines

IMPORTANT!

Read this page before working with electronic circuit boards.

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

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

Handling

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

Shipping

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

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

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

Arrival of Equipment

Receiving

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

Storing

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

Revision Change Bars

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

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Overview

The Trimline® Elevator is designed to meet EN81 standards.

This is a list of major Trimline Elevator components, functional descriptions, and an overview of some critical adjustments and maintenance information. See Figure 1 on page 8.

- Brace Rods - The rods that support and connect the corners of the platform to the stiles. They help hold the platform level, and are attached to the platform by means of an isolation mount.
- Brace Rod Isolation Mount - The bracket that connects the bottom end of the brace rod to the side of the platform.
- Brace Rod Isolation Pad - The neoprene isolation pad placed between the end of the brace rod and the platform mounting bracket.
- Car Sling - The main structural members of the elevator car. They consist of the safety plank, the stiles, and the crosshead.
- Compensation Chain - The chain connected to the bottom of the platform on one end and to the counterweight assembly on the other end to compensate for the weight of the hoist cable as the elevator moves through the hoistway.
- Crosshead - The structural member at the top of the sling. The crosshead is made of formed channel.
- Governor Rope Stile Bracket - The bracket bolted to the stile that attaches the governor rope to the car and guides the governor rope to the governor rope lever.
- Hitch Plate Assembly - The attachment point of the hoist ropes to the car sling, bolted under the crosshead. It contains the loadweigher mechanism.
- Platform - The rectangular surface on which the elevator cab is built. The platform must be installed square and level to provide a basis for the rest of the elevator cab.
- Platform Isolation Pad - The neoprene isolation pad placed between the safety channel and the platform joist. It is the main part of the car noise isolation system.
- Platform Retainer Bracket - The bracket that constrains the platform's movement from front to back in the car sling. It also provides a mounting point for the stile isolation pad.
- Roller Guide Mount - The plate bolted to the ends of the crosshead channels for mounting roller guides. It has a universal hole pattern for both the roller guides and the temporary guide shoes.
- Safety Plank - The bottom member of a traction elevator sling. The safety plank houses the devices necessary to stop the elevator in an emergency situation as well as provide a structural foundation for the elevator cab.
- Stile - The vertical members of the sling that connect the safety plank to the crosshead.
- Stile Isolation Pad -The neoprene pad that is placed between the side of the platform and the stile to prevent metal to metal contact between the two members. It is held in place by the Platform Retainer Bracket.

Specifications

- Maximum Speed: 1200 fpm
- Maximum Capacity: 5000 lb.

Overview
(continued)

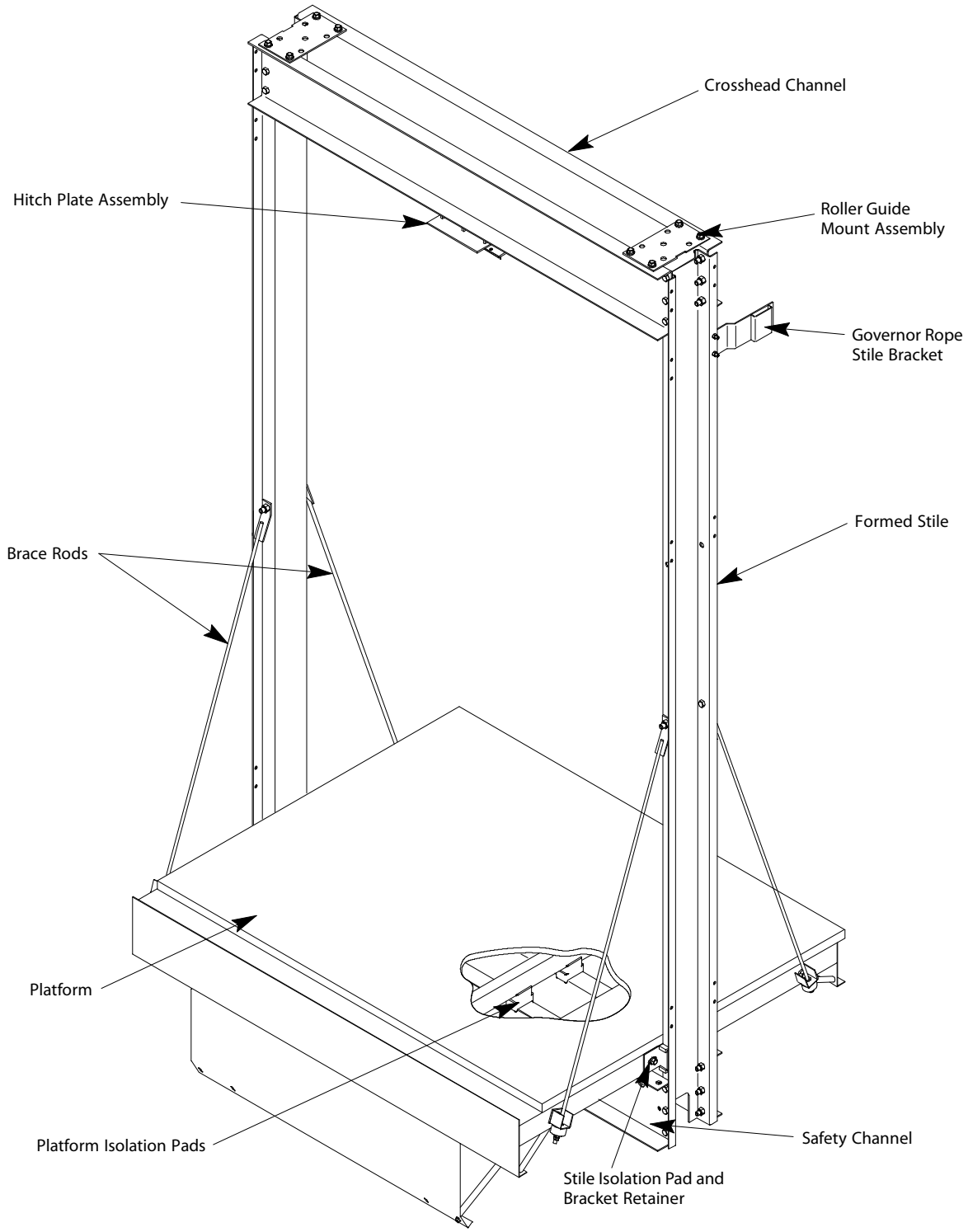

Figure 1 - Trimline Assembly

Installation

Car Assembly

WARNING **Take precautions when lifting to avoid damage to the crosshead.**

Car Sling

1. Position safety channels on a level supporting surface at the bottom landing.
2. Center the two safety assemblies on the rails.
3. Bolt the stiles to the safety channels. Ensure that the stiles are plumb.
4. Install the two crosshead channels to the top of the stile.
5. Check that the sling assembly is plumb and square, and then tighten the bolts.

Roller Guides

1. Bolt the roller guide mount assembles to the crosshead. See Figure 2.
2. Install temporary sliding blocks, (part number 9825575). See the *Roller Guide* manual.

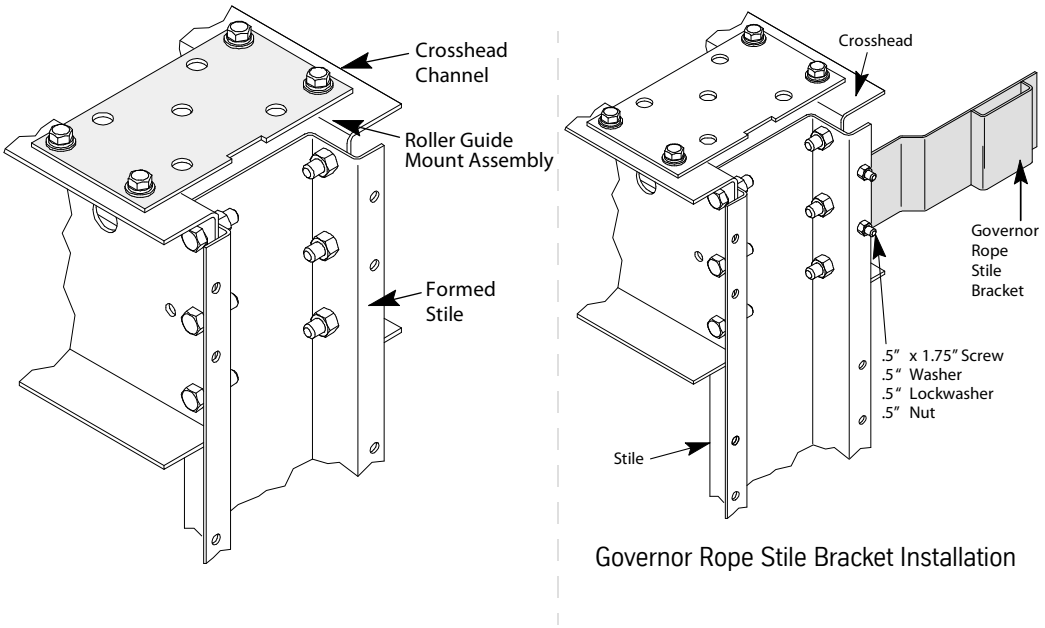

Figure 2 - Roller Guide Mount Assembly

Platform

1. Place the platform on the safety channels.
2. Maintain proper clearance to the hoistway sill, and center the platform on the stiles.

Installation
(continued)

Isolation

Stiles

Note: For an overview diagram, see Figure 4 on page 11.

1. Place the stile isolation pads on the bracket retainers.
2. Keep the brackets tight against the stiles, and bolt the bracket retainer to the side member of the platform. See Figure 3.

Note: The retainer brackets will keep the platform in its proper location while the platform isolation is installed.

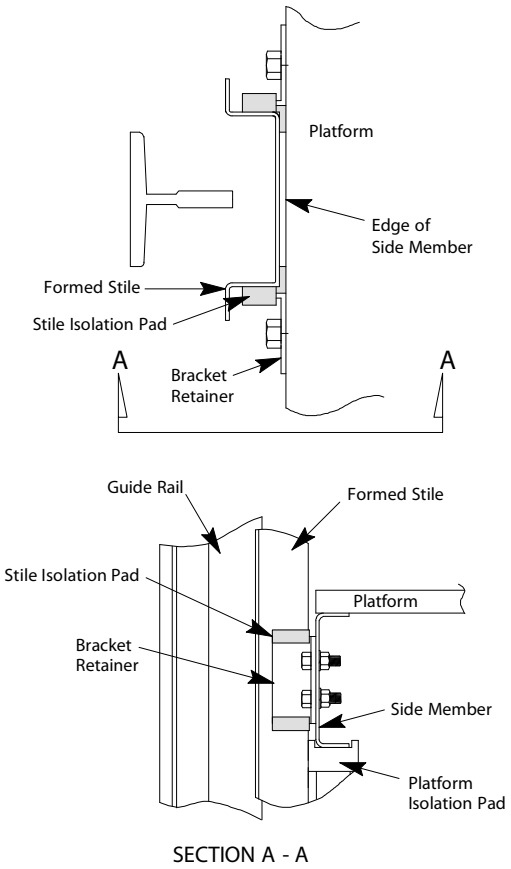

Figure 3 - Stile Isolation

Isolation Installation

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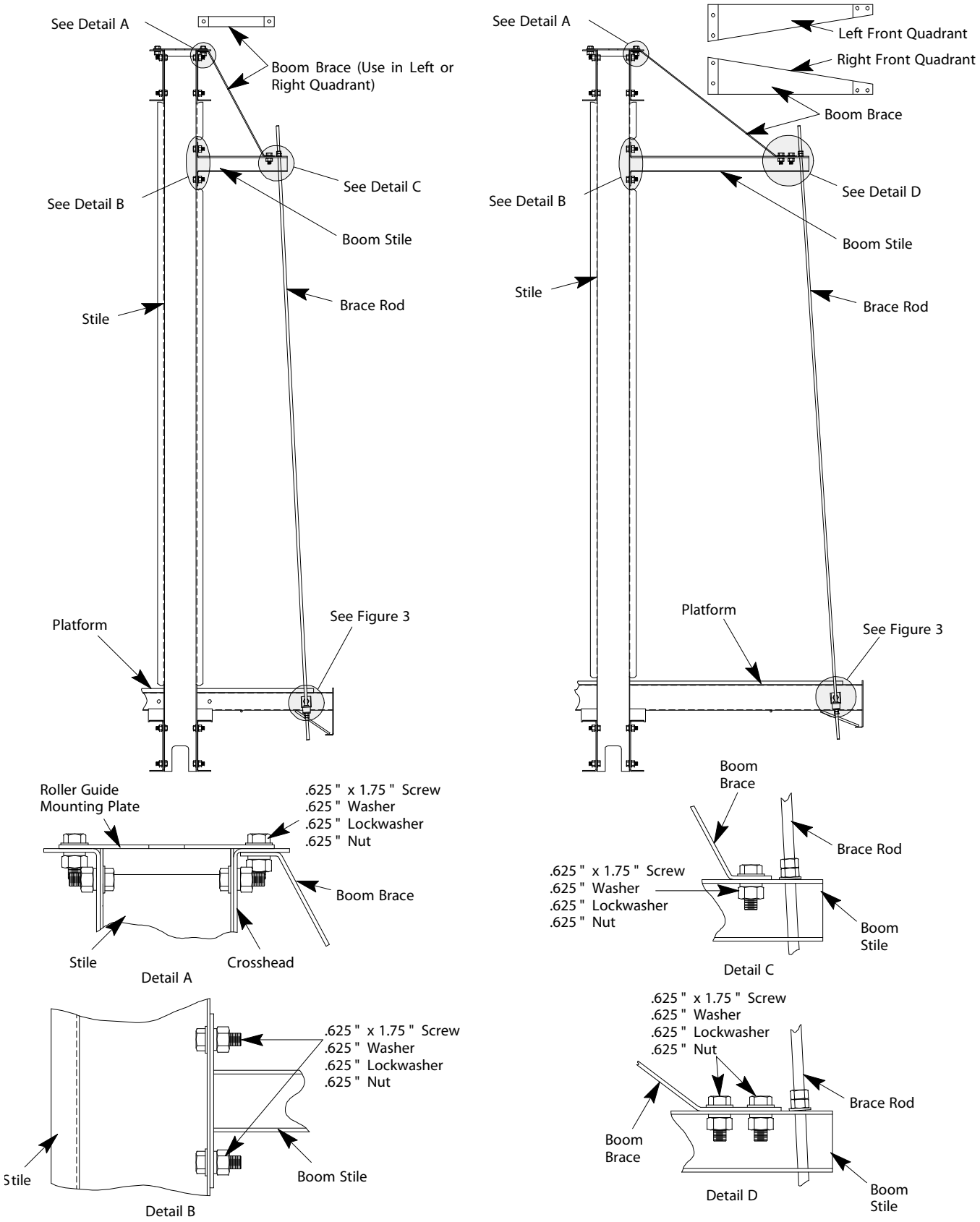


Figure 4 - Overview of Boom Stile Installation and Assembly

Installation
(continued)

Brace Rods - See Figure 5 for the following steps.

1. Bolt the brace rod clips to the platform side members.
2. Slide the brace rod through the brace rod clip.
3. Bolt the brace rod to the stile.
4. Slide the isolation retainer, the brace rod isolation, and the flat washer onto the brace rod. The brace rod isolation must protrude through the brace rod clip and the isolation retainer.
5. Install the brace rod nuts, but do not tighten them.

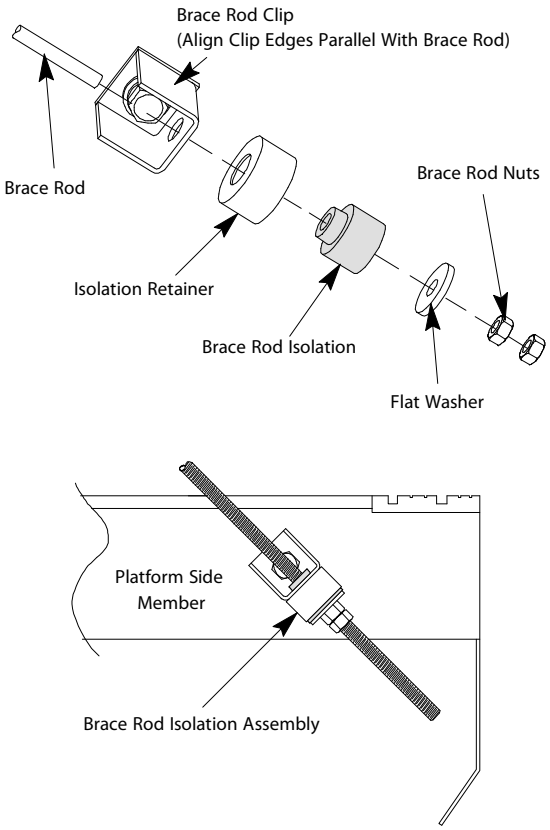


Figure 5 - Brace Rod Isolation

Platform - See Figure 6 on page 13,and Figure 7and Figure 8 on page 14 for the following steps.

1. Place the platform lifting assembly between the platform joists near the center of the platform. Center the lifting assembly on the safety channels to allow room to install the platform isolation pads.
2. Alternate the tightening of the jack nuts to lift the platform evenly.
3. Lift the platform high enough to install the platform pads.

Installation
(continued)

4. Place the isolation pads on the front and rear safety channels under each joist, including the side members according to the chart in Figure 8 on page 14. See Figure 7 on page 14 for pad orientation.

5. Lower the platform onto the pads.

Note: Make sure that the pads retain their position after the platform has been lowered.

6. Remove the lifting bracket assembly.

7. With all of the load on the platform isolation pads, tighten the brace rods until they start to compress the brace rod isolation.

8. Verify that the platform is level, front-to-back, and side-to-side. Adjust the brace arm tension as necessary.

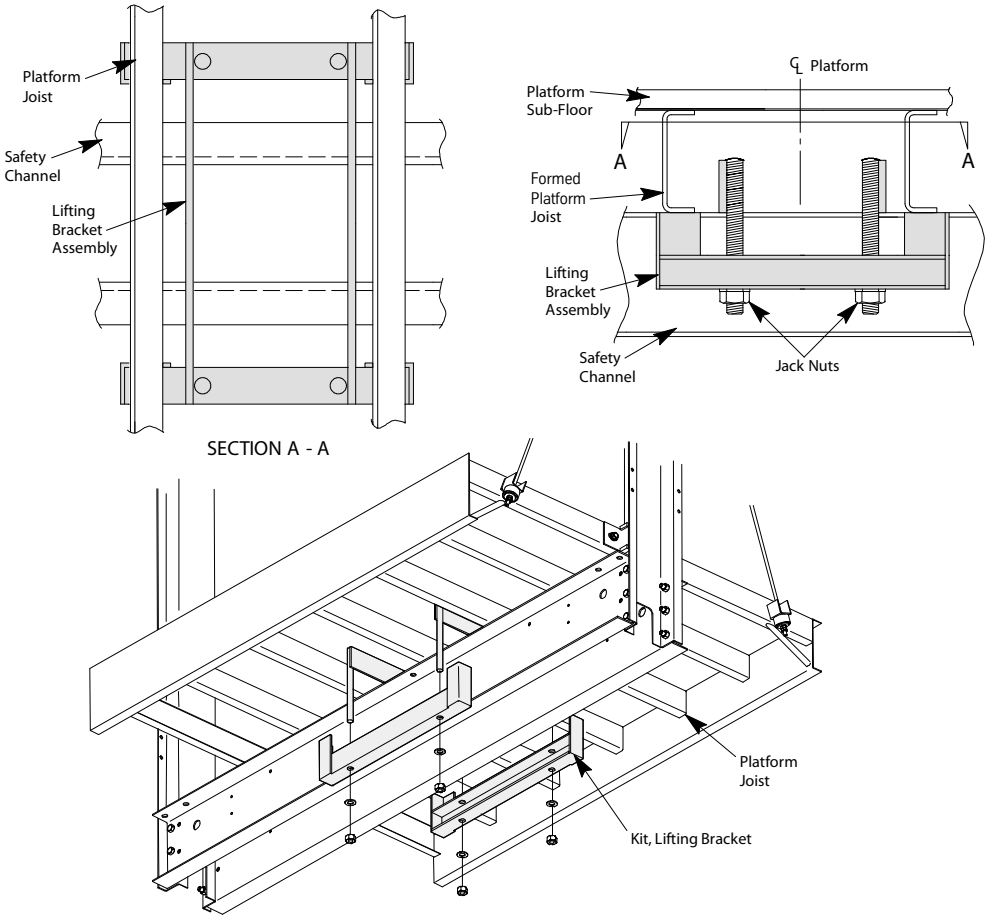


Figure 6 - Platform Lifting

Installation

(continued)

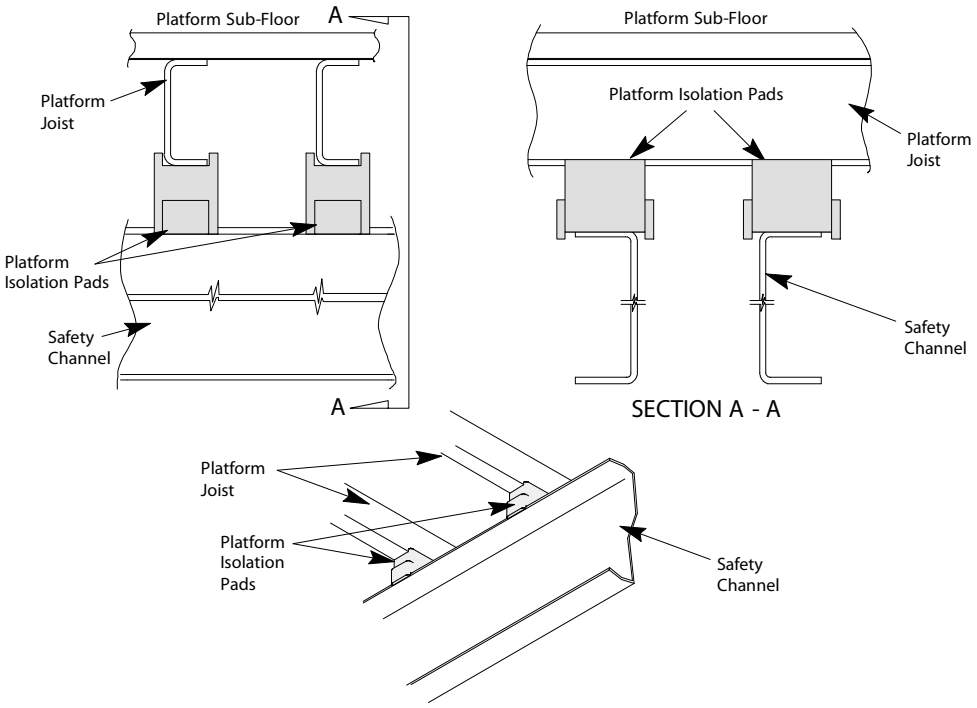
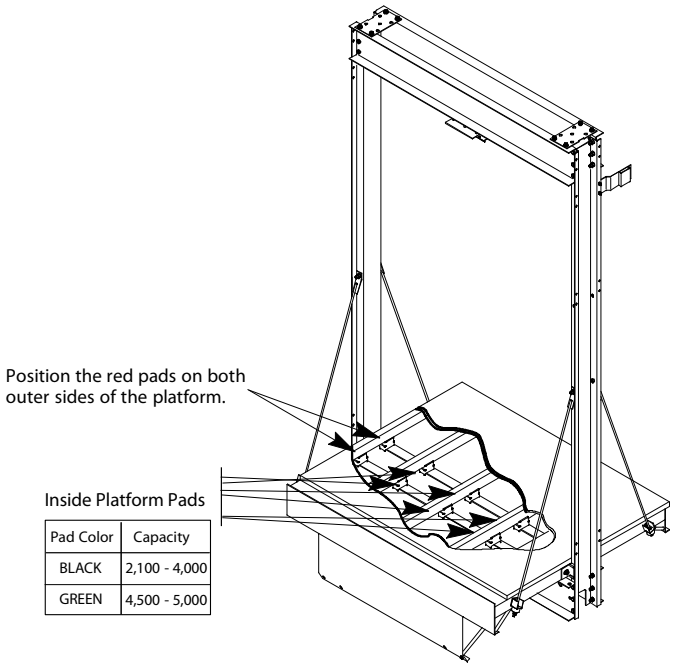


Figure 7 - Platform Isolation



NOTES: Some special contract cabs may require different isolation arrangements. An installation sheet is packed with the isolation pads.

Figure 8 - Platform Isolation Installation

Installation
(continued)

Toe Guard Installation

Rigid Toe Guard

1. Use the 3/8” x 3/4” bolts and nuts to mount the toe guard to the platform.
2. Use locations “A” for right and left hand doors, or locations “B” for center opening doors, and mount the bottom of the braces to the toe guard. See Figure 9.
3. Match drill (7/16” dia.) the bottom flange of the joist or side member for the top of the braces.
4. Use 3/8” x 3/4” bolts and nuts to mount the top of the toe guard brace.

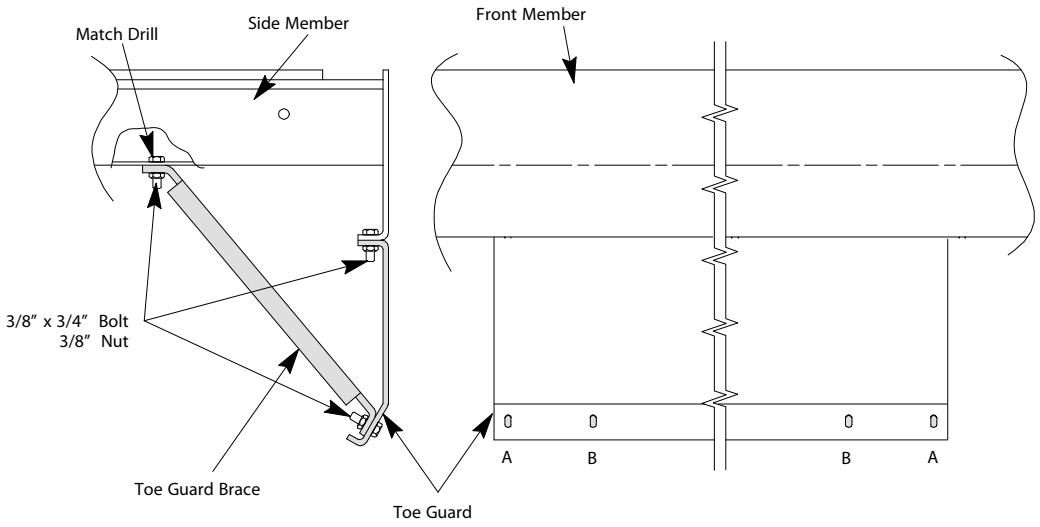


Figure 9 - Rigid Toe Guard Installation

Retractable Toe Guard

1. Mount the toe guard, and then use 3/8” x 3/4” bolts and nuts to slide the assembly to the platform. See Figure 10 on page 16 for all steps in this procedure.
2. Use 3/8” x 3/4” bolts and nuts to attach the toe guard braces to the toe guard assembly.
3. Match drill (7/16” dia.) the bottom flange of the joist or side member, and then use 3/8” x 3/4” bolts and nuts to attach the other end of the toe guard brace.
4. Verify that the toe guard is square and plumb, and that the lower half of the toe guard slides freely within the top half.
5. Place the strike plate on the pit floor against the front wall.
6. Center the plate side-to-side with respect to the toe guard.
7. Mark the pit wall at the top of the mounting slots.
8. Install two 5/8” anchors, and mount the strike plate.

Retractable Toe Guard Installation
(continued)

9. Adjust the strike plate for 1/4” clearance above the pit floor, and level it with respect to the toe guard.

10. To obtain proper operation, the strike plate must be square with the toe guard and make uniform contact across the entire width of the toe guard.

11. Verify the action of the toe guard by lowering the car at inspection speed and observing that the bottom portion retracts correctly.

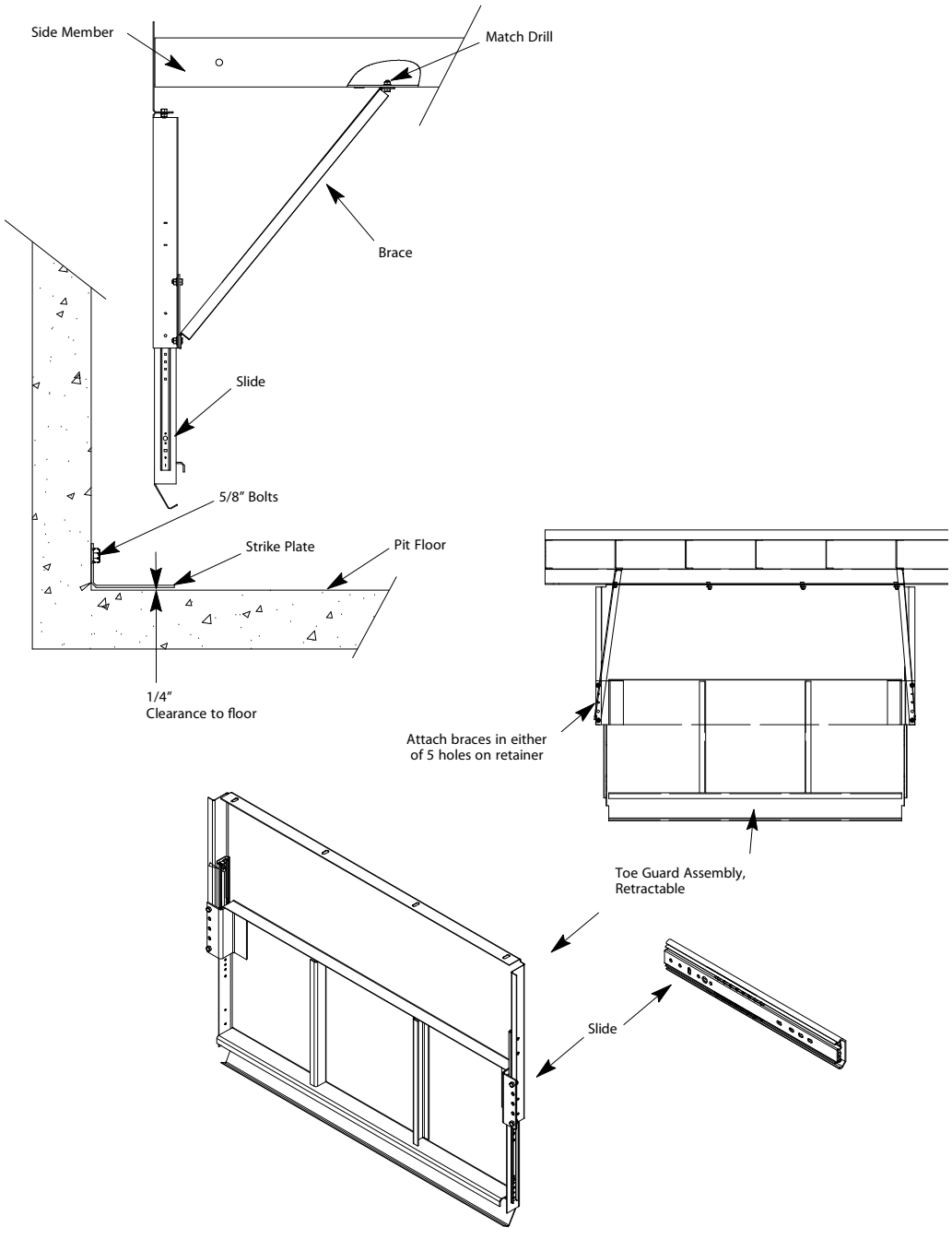


Figure 10 - Retractable Toe Guard Installation

Compensation Chain Sheave Installation

Tie Off Channel Installation

1. Use the platform clips to mount the chain tie-off channel to the platform joist.
2. Adjust the channel location to align the end set of U-bolt holes directly above where the chain will hang. See Figure 11 (below) and Figure 12 on page 18.
3. Tighten the platform clip mounting bolts.

Note: If a 2-chain arrangement is to be used, repeat Steps1and 3 for the second channel.

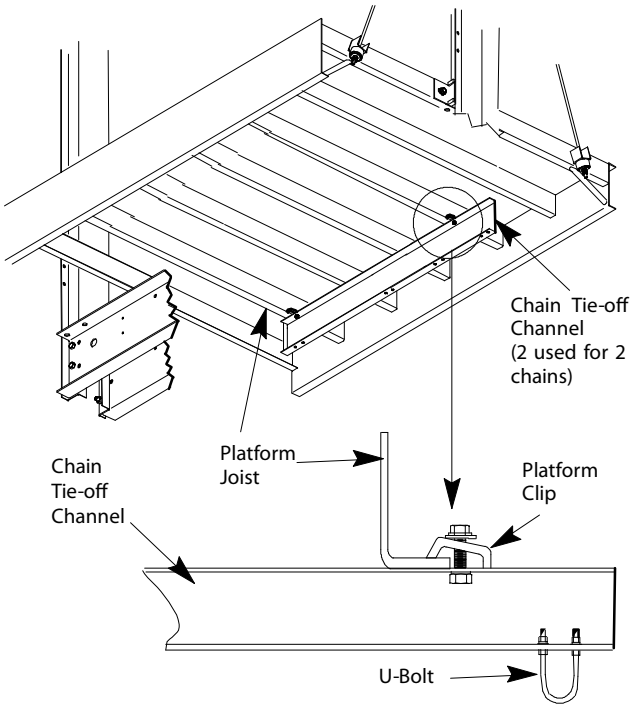


Figure 11 - Tie Off Channel Installation

Chain Installation: Car

1. Install a mesh cable grip 48” - 60” from the end of the chain. See Figure 12 on page 18.
2. Wrap electrical tape on the grip.

Note: Start on the opposite end from the chain hanger.

3. Install a U-bolt in the holes at the end of the tie-off channel
4. Use an S-hook to attach the cable grip to the U-bolt in the end of the channel.
5. Insert a second U-bolt through the last loop at the end of the chain and install it in holes that are 24” to 36” from the first attachment. See Figure 12 on page 18.

Notes:

- The loop of extra chain will provide assurance that the chain does not become entangled. In the event that the chain does become entangled, the S-hook will open and allow the extra chain to fall freely, reducing the chain tension caused by the entanglement.
- A mesh cable grip is used to attach the compensating chain to the S-hook. This cable grip facilitates installation and easily allows future length adjustment.

Compensation Chain Sheave Installation

(continued)

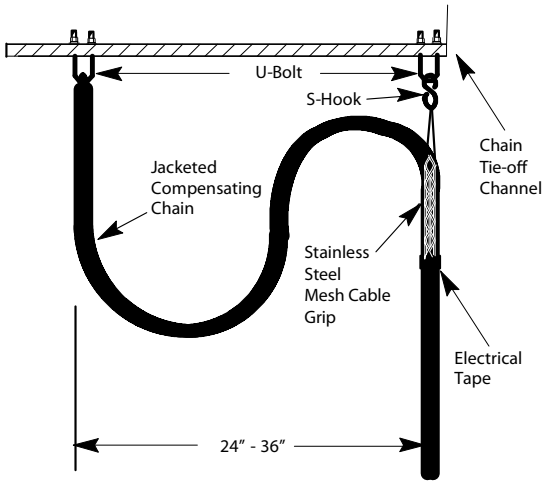


Figure 12 - Typical Car Connection

Chain Installation: Counterweight

CAUTION

When moving the car, carefully feed the chain so as not to twist or kink the chain.

1. Move the car up until the counterweight is at the bottom landing.
2. Attach the "Z" bracket to the bottom of the counterweight frame strike plate. See Figure 13.
3. Determine the proper length for the chain. See the Natural Loop Diameter section.
4. Cut the chain to length.
5. Insert a U-bolt through the last loop at the end of the chain, and then install it on the counterweight "Z" bracket.

Note: If a second chain is required, Repeat Steps 1 through 5.

6. Run the car through the entire hoistway and verify that the chain tracks properly.

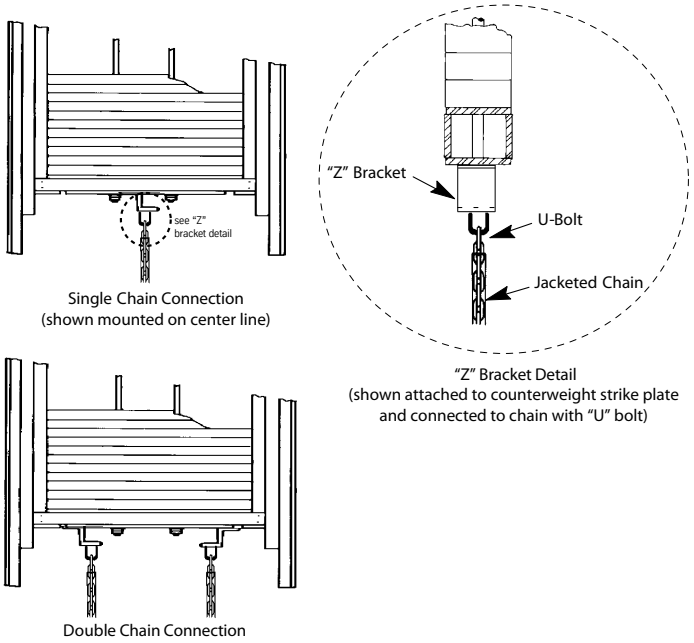


Figure 13 - Counterweight "Z" Bracket

Compensation Chain Sheave Installation
(continued)

Natural Loop Diameter

It is important that the compensating chain hangs in a way which retains the natural loop diameter. This diameter varies with the size of the chain.

The loop diameter should be slightly exceeded rather than reduced, especially if the chain is guided.

CAUTION

If the loop diameter is less than specified, the bottom of the chain will bell out as the car travels. This may cause damage if the chain comes in contact with hoistway components.

Inspect the Loop

Upon completion of the installation, the loop must be checked.

1. Measure the following two (2) horizontal distances between the compensating chain. See Figure 14.
   a. Start about 3 feet from the bottom of the loop.
   b. Start about 6 to 8 feet from the bottom of the loop.
2. Verify that these two dimensions are equal (within 1/2 inch). If not, the tie-off channel must be moved to ensure that the chain hanging from the counterweight is parallel to the chain hanging from the car.

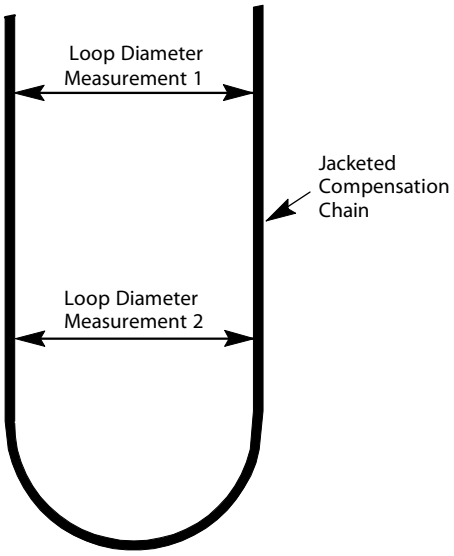


Figure 14 - Loop Diameter

Multiple Chains

Frequently, two lengths of chain (each equal to 1/2 of the weight required) are installed. Two compensating chains are used:

- when one chain is not sufficient to balance the car and its load

  or

- when the compensating chain cannot be hung from the center of the counterweight or car due to use of a single buffer.

Note: It is very important that the two chains remain parallel when the car is running.

Compensation Chain Sheave Installation
(continued)

Chain Guide Sheave Installation

On jobs where it is impossible to have a natural curve, a guide sheave is installed.

1. Mount the counterweight rail tie bracket to the counterweight rails. Ensure that it is level. See Figure 15.

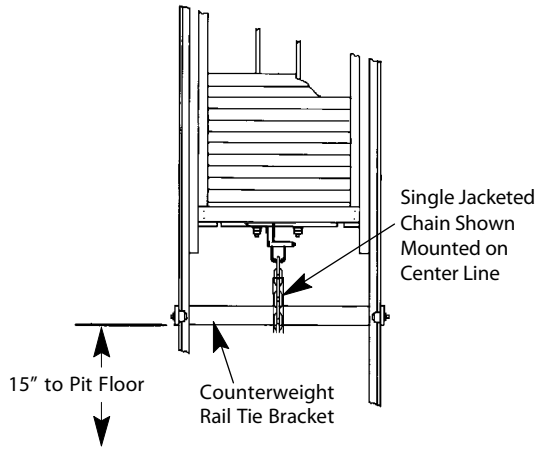


Figure 15 - Counterweight Tie Bracket Location

2. On the compensating chain sheave assembly, remove the lower bolt from the chain sheave mounting bracket and loosen the upper bolt.

3. Loosen the pivot bolt and remove two 1/2" nuts from one side of the sheave shaft and from the same side of the threaded rod.

4. Spread the sheave strap and rotate the loose end to expose the sheave. See Figure 16.

5. Set the sheave into the chain loop and place the sheave mounting bracket over the counterweight rail tie bracket.

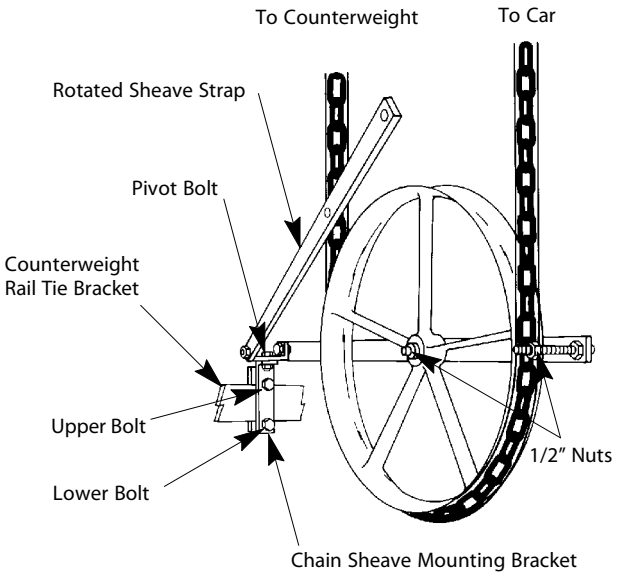


Figure 16 - Chain Guide Sheave

Chain Guide Sheave Installation *(continued)*

6. Swing the sheave strap back into place on the sheave shaft and threaded rod.
7. Replace and tighten the two 1/2" nuts.
8. Reinstall the 1/2" lower bolt into the chain sheave mounting bracket.
9. Hand-tighten the upper and lower bolts in the bracket.
10. Align the sheave assembly with both runs of chain – Slide the sheave mounting bracket along the counterweight rail tie bracket while allowing the sheave assembly to rotate at the pivot bolt.
11. Tighten the pivot bolt and the two sheave mounting bracket bolts. See Figure 17 on page 22.
12. To ensure the sheave is properly aligned, run the car UP and DOWN the hoistway at inspection speed.

Notes:

- If further alignment is necessary, loosen the pivot bolt and sheave mounting bracket bolts and repeat Steps 10, 11 and 12.
- If two chains are required, use Steps 10, 11 and 12 to install the second sheave.
- If the counterweight run of chain is too close to the edge of the platform at the bottom landing, make adjustments to the counterweight rail tie bracket.

13. Attach the sheave spring tie-down bracket to the pit floor directly under the attachment hole.
14. Install the tie-down spring from the tie-down bracket to the sheave assembly.
15. Check for proper operation of the chain sheave assembly at contract speed.

Note: When construction dirt has been minimized and before the car is turned over for passenger use, the roller or slide guide must be installed and adjusted. See the *Roller Guide* manual.

Maintenance

Annual

Visually check the platform isolation pads and the brace rod isolation pads for signs of wear.

Quarterly

- Visually check the running clearance of the compensation chain and sheave.
- Check the sheave tie-down spring tension.
- Inspect the chain for any signs of contact with hoistway members.

Chain Guide Sheave Installation

(continued)

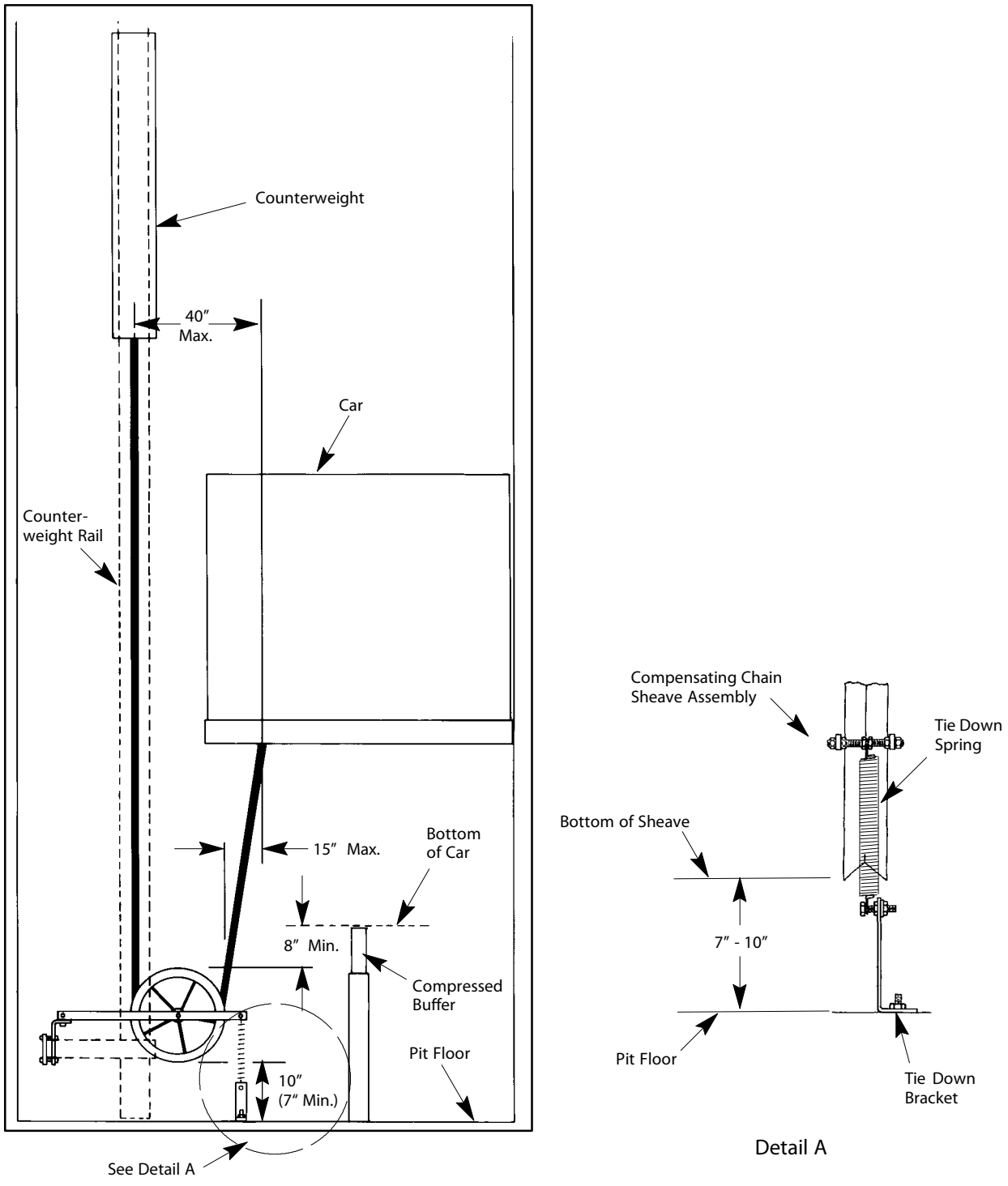
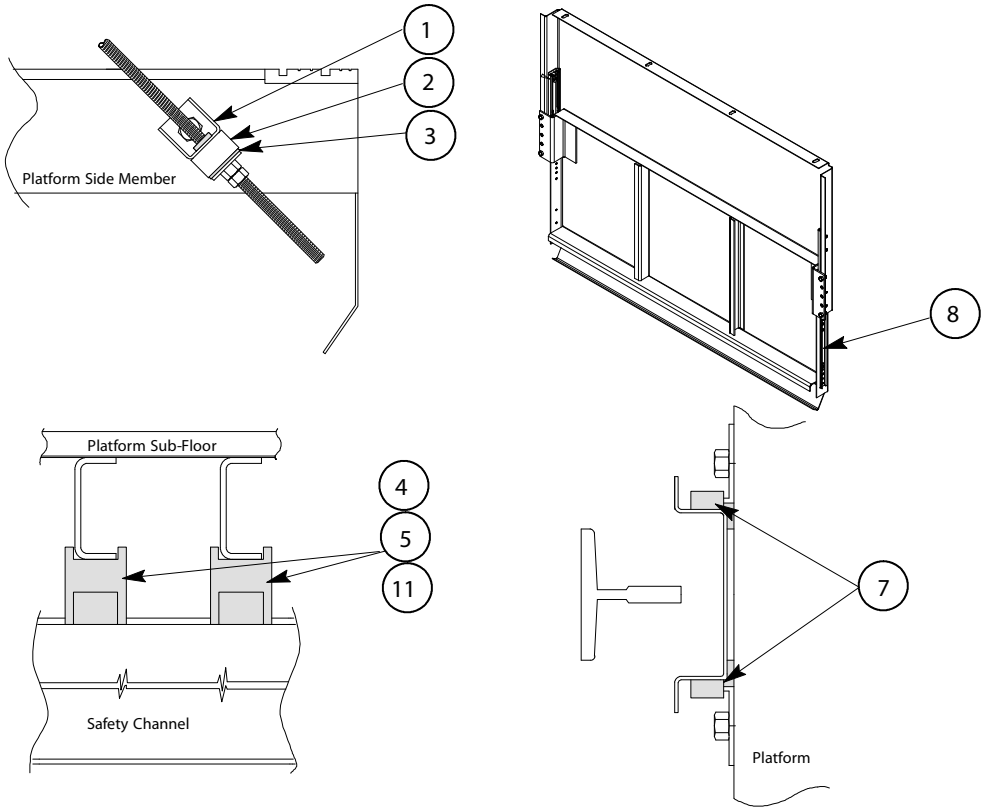


Figure 17 - Chain Guide Sheave Arrangement

Replacement Parts



ITEM	PRINT NO.	DESCRIPTION
1	277AY1	Weldment, Clip, Brace Rod
2	711CE1	Retainer Clip, Isolation, Brace Rod
3	534AN1	Isolation, Brace Rod, Neoprene
4	534AP1	Isolation Pad, Platform (under 4000 lbs. capacity)
5	534AP2	Isolation Pad, Platform (over 4000 lbs. capacity)
6	534AP3	Isolation Pad, Platform (4 required on all elevators at side member locations due to cab/door operator weight)
7	534AV1	Isolation Pad, Stile
8	454DJ1	Slide, Full-Extended Side Mount
9	200JH	Kit, Lifting Assembly (not shown)
10	42943	Spring, Sheave Tie-Down (not shown)
11	134202	Sheave, Compensating Chain (not shown)
12	224AB1	Cable Grip, Traveling Cable (not shown)

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Vertical Express

P.O. Box 2019 Memphis, TN 38101 Tel: (866) 448-3789 (toll-free) Fax: (901) 261-1807 www.verticalxpress.com