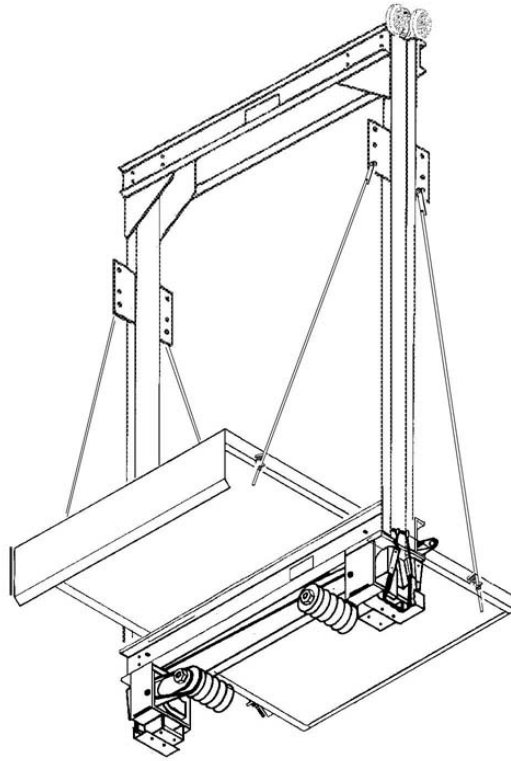


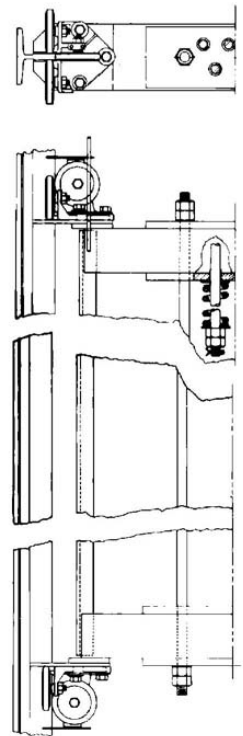


VERTICAL EXPRESS

# Car and Counterweight Frames



CAR FRAME (SLING) AND PLATFORM



COUNTERWEIGHT FRAME

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## Safety Precautions

### IMPORTANT!

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

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

### Terms in This Manual



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



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

### General Safety



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

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

### Electrical Safety

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

#### Use the Proper Fuse

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

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

#### Printed Circuit Cards

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

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

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

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

**Test Equipment Safety**

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

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

**When Power Is On**

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

**Mechanical Safety**

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

## Static Protection Guidelines

### IMPORTANT!

**Read this page before working with electronic circuit boards.**

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

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

### Handling

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

### Shipping

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

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

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

### Arrival of Equipment


#### Receiving

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

#### Storing

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

#### Revision Change Bars



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

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## Overview

The following is a list of the major components of the counterweight frame, sling, and platform. Included is a description of the component and critical adjustment or maintenance information. See Figure 1 on page 8 for illustration.

- **Car Frame** - The main structural members of the elevator car. The car frame consists of the safety plank, stiles, and crosshead.
- **Counterweight Frame** - The structural member that is designed to contain and carry the elevator counterweights. Usually a one-piece welded frame.
- **Crosshead** - The structural member at the top of the sling. The crosshead is commonly made of channel iron and the elevator car is usually hoisted from it.
- **Guide Shoe** - The connection between the sling and the guide rail. These are connected to the four corners of the sling to guide the elevator.
- **Pivot Arm Shaft** - The shaft (located between the safety plank channels) that is the pivot for the safety actuation devices.
- **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 elevator cab.
- **Roller Guide** - The connection between the sling and guide rail. This connection is made with rubber covered rollers to provide flexibility and eliminate noise. Mounted at the four corners of the sling.
- **Rope Lever** - The arm (located on a shaft to the outside of the safety plank) that is used to activate the safety. The governor rope is attached to the Rope Lever.
- **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 the bolster for the elevator cab.
- **Safety Wedges** - The part of the safety that ultimately contacts the rail when safeties are set. These wedges are forced against the rails to stop the car in an emergency situation.
- **Shipping Guards** - Metal plates that are bolted to the safety plank to protect it during shipment. These must be removed before installation.
- **Sling** - See Car Frame.
- **Stile** - The vertical members of the sling that connect the safety plank to the crosshead.
- **Support (Brace) Rods** - Rods that support and connect the corners of the platform to the stiles.

## Overview

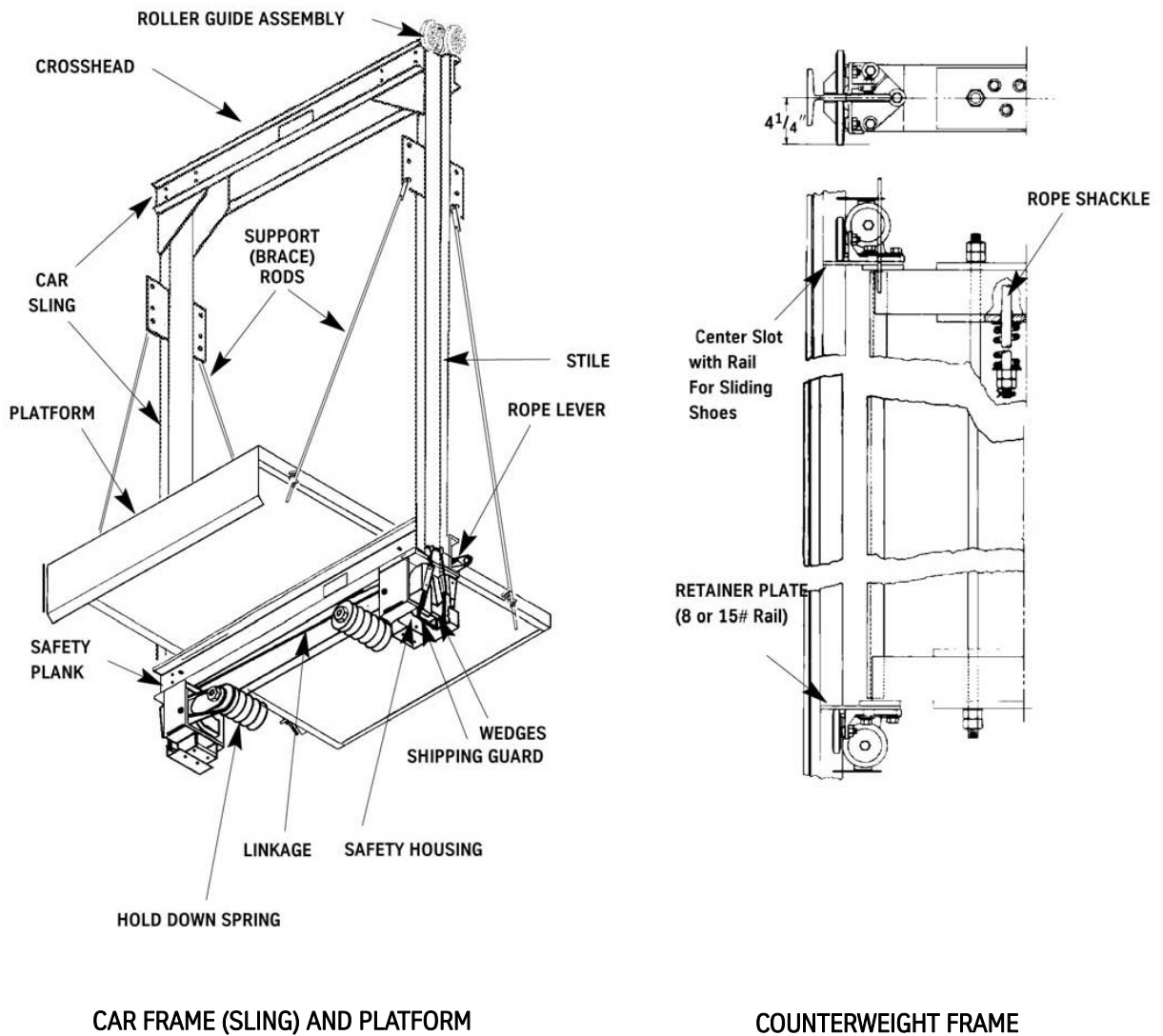


Figure 1 - Overview

## Installation - Car Frame and Platform

For all steps in this procedure, see Figure 2 on page 10.

### Safety Plank

1. Wash the bottom section of rails.
2. Cut two pieces of unistrut 36" long and place around the face of each main rail in the pit.
3. Remove the shipping guards from the safety plank.
4. Hoist the safety plank between the rails and land it so the safety wedges land on the unistrut. S  
**Note:** Confirm that the rope lever is positioned in the same quadrant of the hatch as the governor.
5. Level the safety plank by placing shims under the unistrut supports.
6. Center the safety plank between the rails.

### Stiles

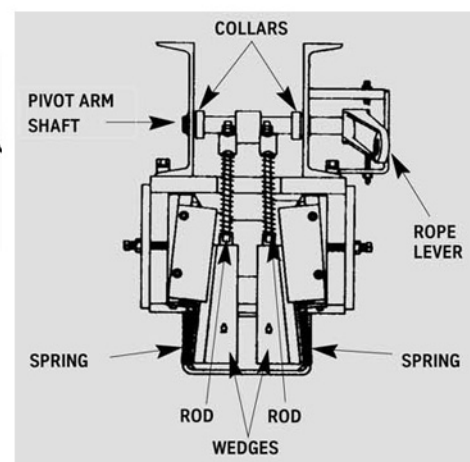
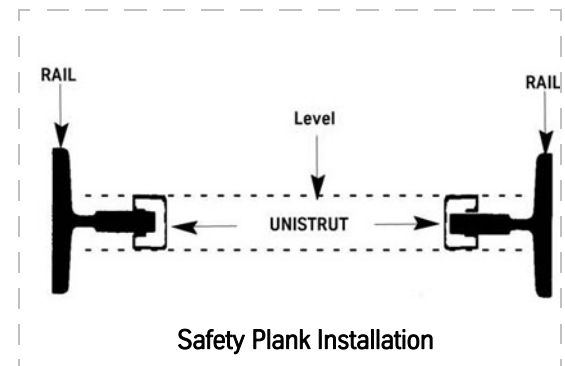
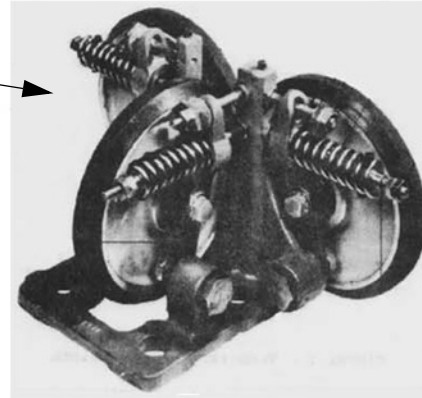
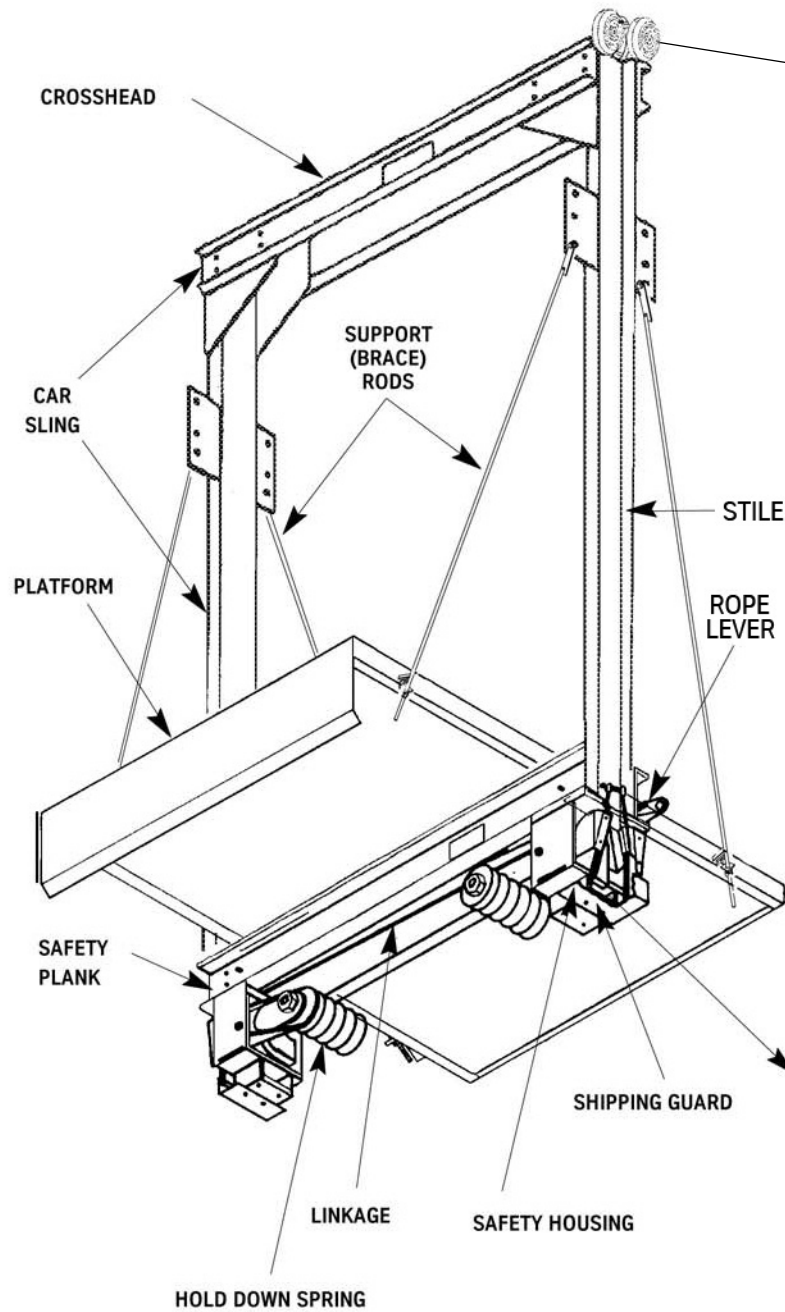
1. Install a roller guide, or guide shoe, assembly at the top of each stile.
2. Mount the stiles on each end of the safety plank and secure the top of each to the rail with rope.
3. Bolt the bottom of each stile to the safety plank and leave these bolts loose.
4. Remove the ropes from the stiles.
5. Bolt the crosshead pieces to the stiles loosely and center the crosshead between the rails with the roller guides or guide shoes.
6. Tighten all bolts.

### Platform

1. Locate the collars positioning the safety actuating pivot arm shafts. Loosen one of these collars on each shaft, ensure there is no binding, and re-tighten the collar.
2. Position the platform on the safety plank, and loosely install the stile-to-platform bolts and support rods.
3. Adjust the platform to the proper distance from the rail on each side.
4. Level the platform side-to-side and front-to-back, and tighten the mounting bolts and brace rods.
5. Once the platform is adjusted and tight, cut off any excess of the brace rods.
6. Hoist the sling off the unistrut and land it on timbers so that the bottom roller guides or guide shoes can be installed and adjusted.

#### Notes:

- On 1-to-1 roped jobs, install the hitch plate so that the ropes are centered between the rails.
- If there is an odd number of hoist ropes it may be necessary to offset the hitchplate.
- On 2-to-1 roped jobs, install the compound sheave centered on the crosshead.

**Installation***(continued)***8-inch Roller Guide Assembly****SAFETY****Figure 2 - Car Frame and Platform Installation**

## Installation - Counterweight Frame

For all steps in this procedure, see Figure 3.

1. Determine distance from pit floor to bottom of counterweight frame with the car level at the top landing (i.e., height of the buffer+ buffer stand (if required) +counterweight run by + calculated rope stretch).
2. Cut two pieces of lumber to the length determined in Step 1.  
**Note:** The timbers must be able to hold the weight of the counterweight frame and 25% of the counterweights.
3. Wash the bottom section of counterweight rails.
4. Stand counterweight frame on its side and install the top and bottom roller guides or guide shoes on one side of the frame.
5. Hoist the counterweight frame between its rails and land it on the timbers cut in Step 2.
6. Install the top and bottom roller guides or guide shoes on the remaining side of counterweight frame.  
**Note:** On jobs roped 2-to-1, install the compound sheave centered on the top of the counterweight frame.

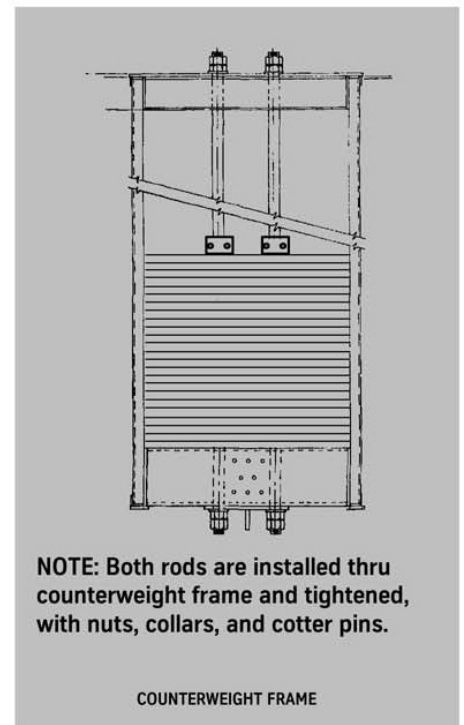
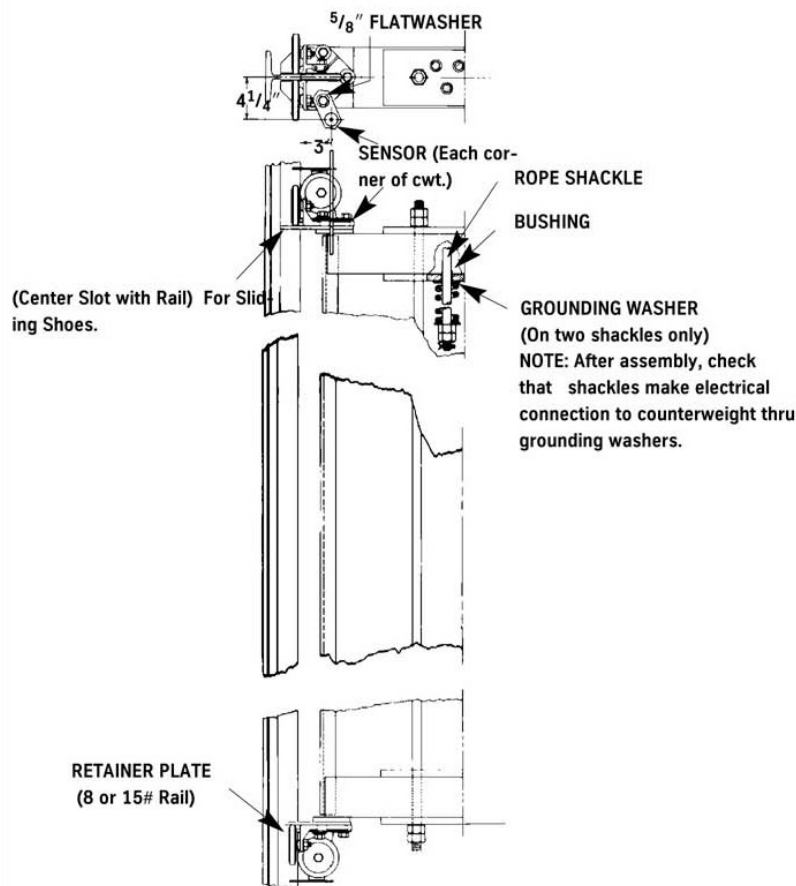


Figure 3 - Counterweight Frame Installation

Maintenance

The following is a guide for normal job conditions. The regularity of visits and the maintenance done must be adjusted based on individual job conditions.

**Monthly** - Inspect or adjust older roller guides, or guide shoes, on both car and counterweight.

**Annual** - Perform an annual test on the car and counterweight safeties, if applicable.

Troubleshooting

The following is a list of common problems and their possible causes:

- 1. Vibration During Ride - Worn or maladjusted roller guides or guide shoes.
- 2. Noisy Operation - Worn bearings in roller guide, or lubrication for slide guide shoes.

Replacement Parts



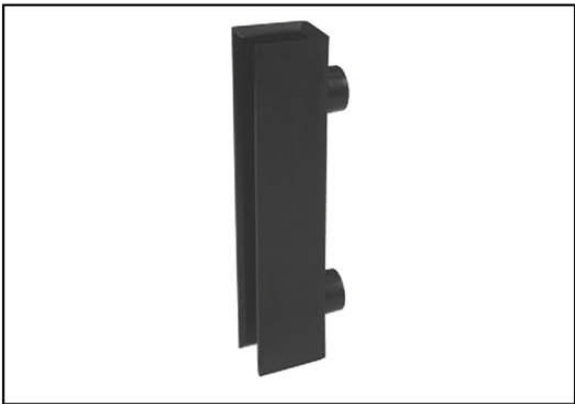
ITEM 1  
3" Counterweight Roller Guide Wheel



ITEM 3  
8" Roller Guide Wheel



ITEM 2  
4" Roller Guide Wheel



ITEM 4  
Guide Shoe Nylon Liner

ITEM	PART NO.	PRINT NO.	DESCRIPTION
1	9872309	37230	3" Counterweight Roller Guide Wheel
2	9832774	63277	4" Roller Guide Wheel
3	9831824	63182	8" Roller Guide Wheel
4	9805266	10526	Guide Shoe Nylon Liner



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