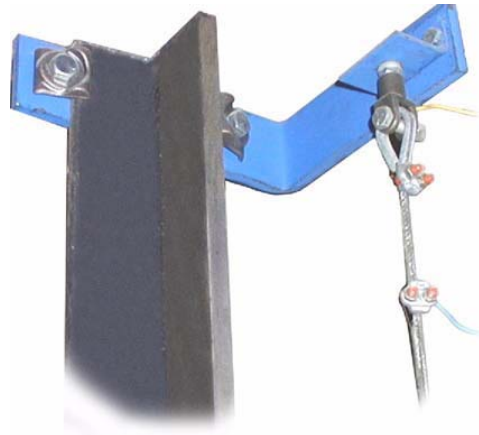




VERTICAL EXPRESS

# Derailment Detector Assembly



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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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# Installation Diagrams

Verify which type of rail application is to be installed, and reference the applicable figure.

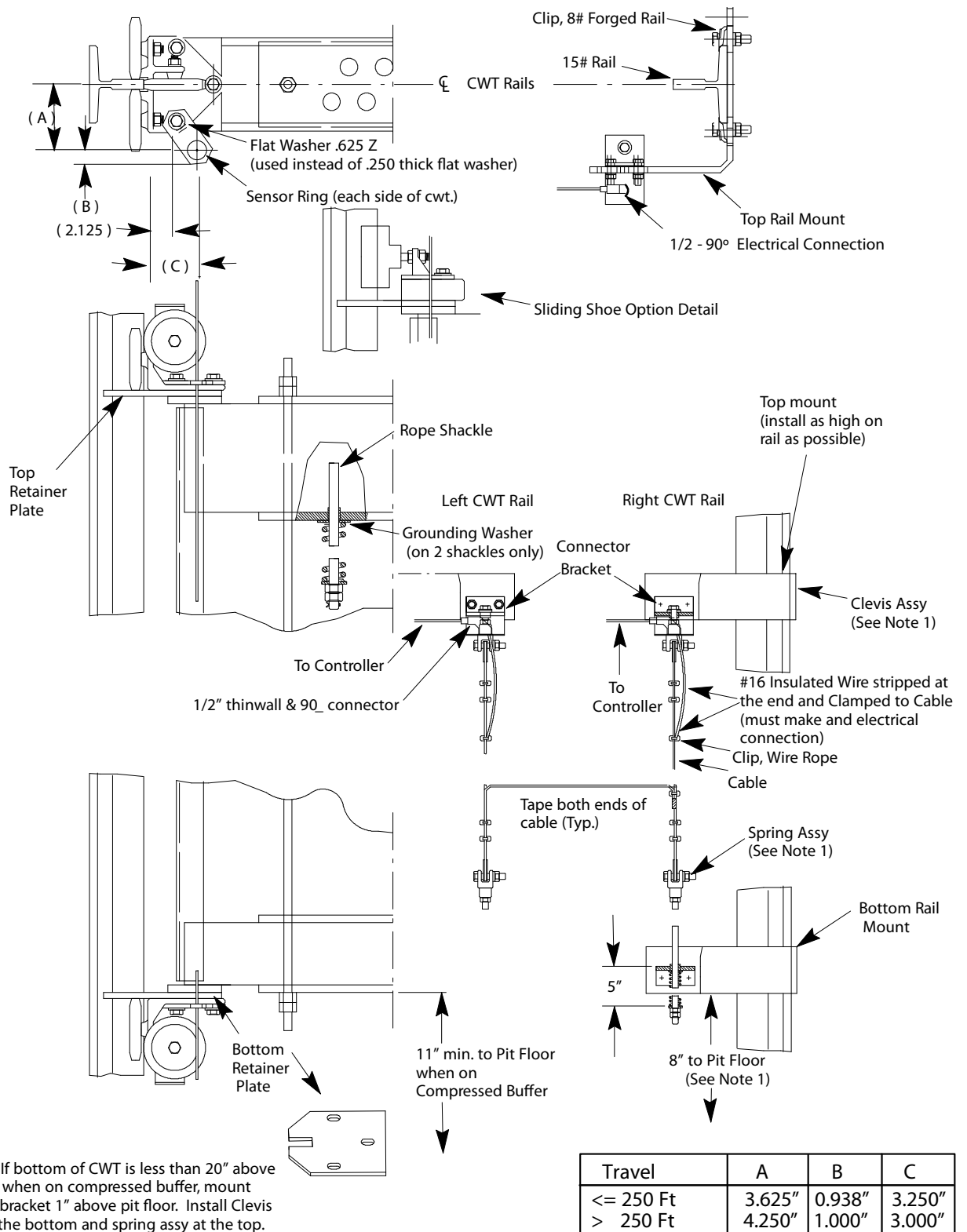
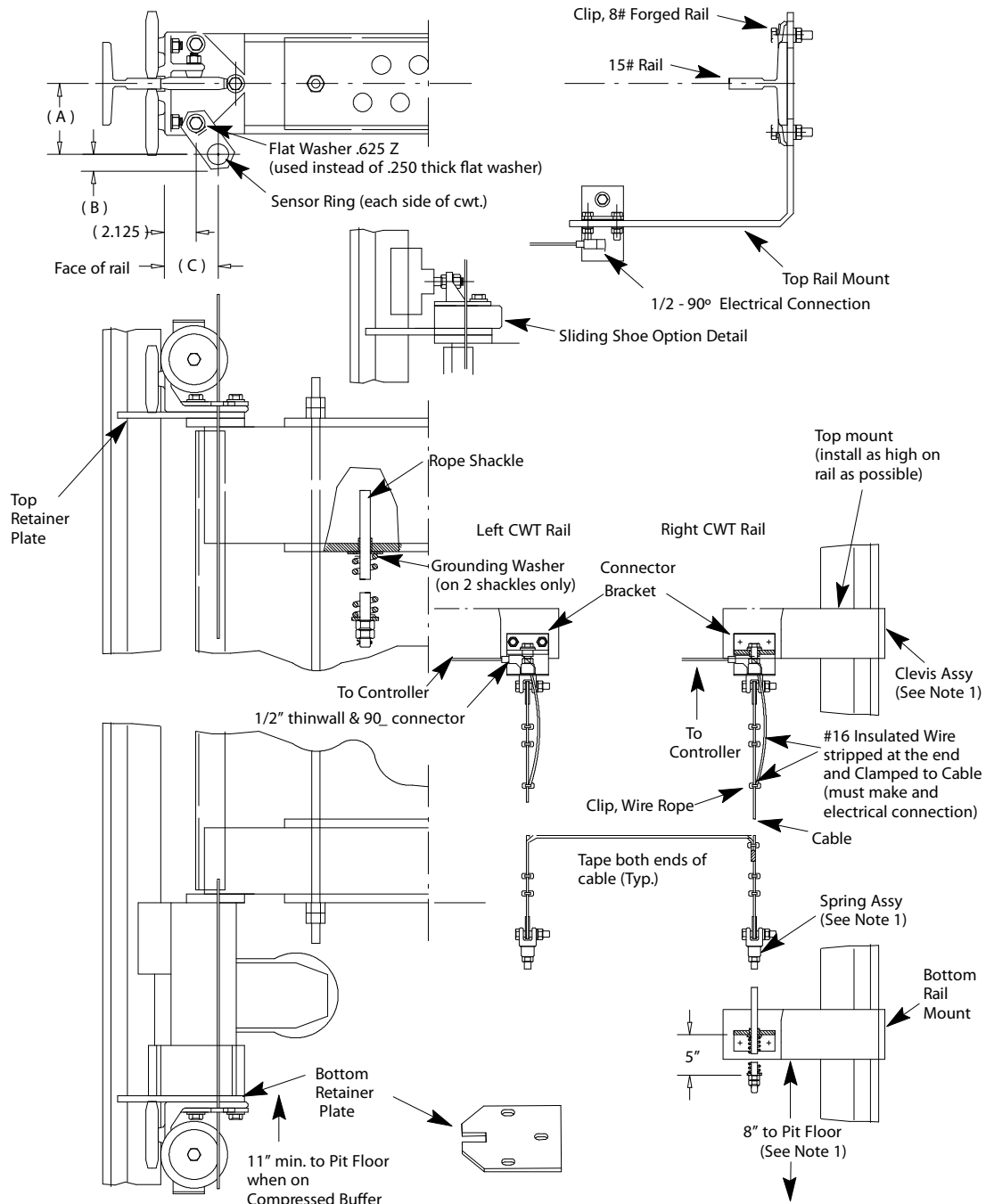


Figure 1 - Derailment Detector - T-Rail Installation without Counterweight Safety

Installation Diagrams

(continued)



Note 1: If bottom of CWT is less than 20" above pit floor when on compressed buffer, mount bottom bracket 1" above pit floor. Install Clevis Assy. at the bottom and spring assy at the top.  
 Note 2: 9" minimum required from centerline of counterweight rail to inside of guard.

Travel	A	B	C
≤ 250 Ft	6.500"	0.875"	7.563"
> 250 Ft	6.875"	1.250"	7.813"

Figure 2 - Derailment Detector - T-Rail Installation with Counterweight Safety

Installation Diagrams

(continued)

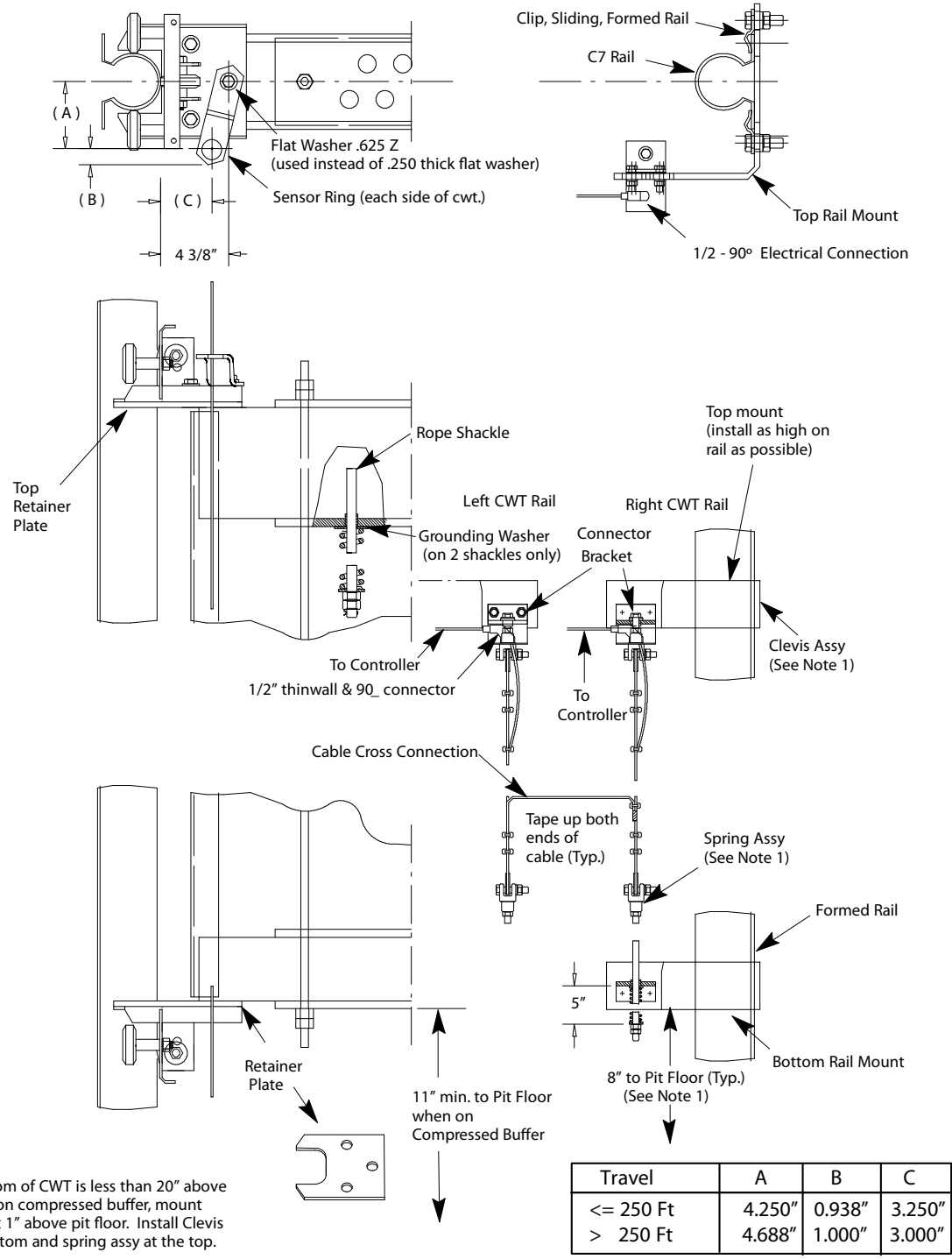


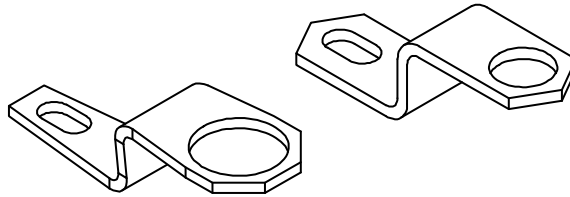
Figure 3 - Derailment Detector - C7 Formed Rail Installation

## Installation

1. Check for adequate clearance between the counterweight and cab or the counterweight and wall.

**Note:** The minimum clearance required to accommodate the detector is 2 1/4 inches.

2. Install a retainer plate under each roller or slide guide base (as applicable).
3. Verify the proper location for the sensor rings, and ensure that they will fit the counterweight.
4. Install two sensor rings (one on each side) at the counterweight.
  - a. Remove the appropriate bolt and washer.
  - b. Discard the special 1/4-inch thick flat washer.
  - c. Re-install the bolt, a replacement standard 5/8-inch flat washer, and the sensor ring.

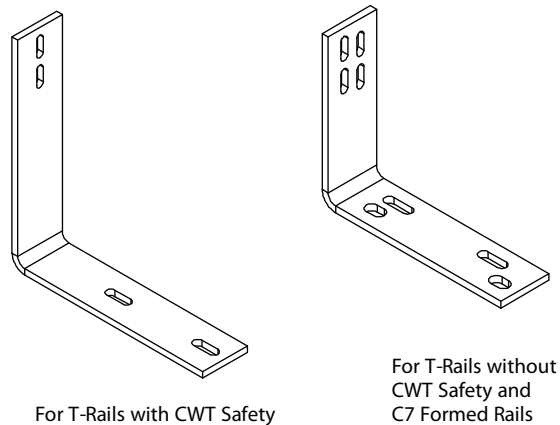


**Figure 4 - Sensor Rings (C7 Formed Sensors Shown)**

5. Install one grounding washer on each of any two counterweight rope shackles.

**Note:** Do not install the bushing on the shackles with the grounding washers.

6. Install top rail mounts at the top of each counterweight rail. See Figure 5.

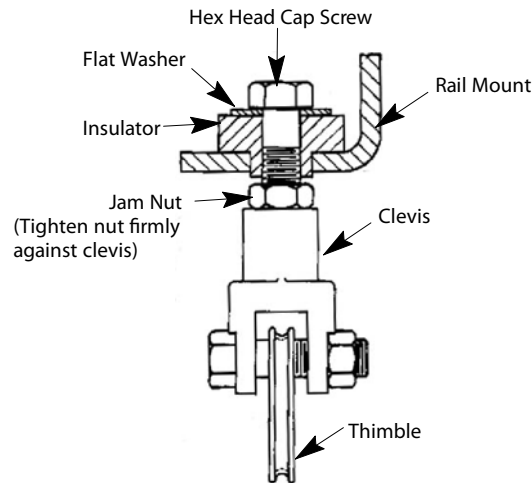


**Figure 5 - Rail Mounts**

## Installation

(continued)

7. Attach the clevis assembly and bracket to the inside of the rail mount. See Figure 6.



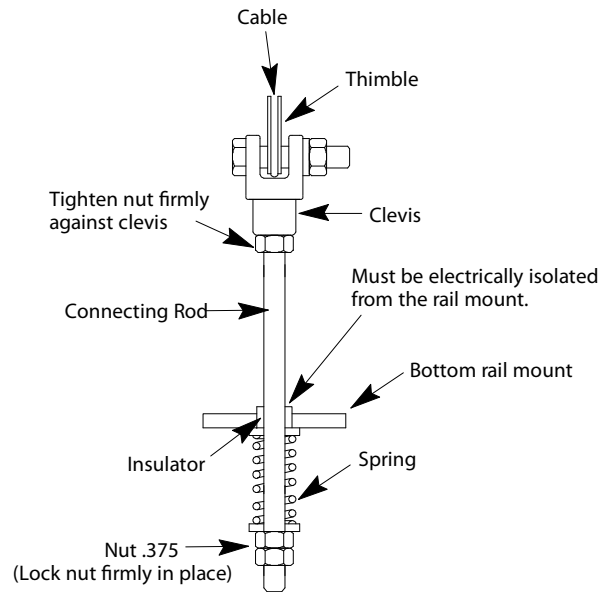
**Figure 6 - Clevis Assembly at Top Rail Mount**

8. Attach the electrical connector bracket to the outside of the rail mount.
9. If the bottom of the counterweight is NOT less than 20 inches above the pit floor when on compressed buffer, move on to Step 12.
10. If the bottom of the counterweight is less than 20 inches above the pit floor when on compressed buffer:
- Mount the bottom rail mount 1 inch above the pit floor.
  - Install the clevis assembly at the bottom, and the spring assembly at the top.
- Note:** Keep the spring assembly as high as possible at a place 8 inches below the ceiling, and no less than 1/2-inch between the rail mount and the rail top.
11. Thread each cable up through the large hole in the sensors on the bottom and top of the counterweight, and then around the thimble at the top rail mount. Secure the cable with two cable clips.
- Note:** Allow exactly 6 feet of additional length on one cable for cross connection.
12. Install the cable cross-connection with sufficient slack to allow each cable to hang plumb. Use two (2) cable clips on each side.
13. Install the bottom rail mounts 8 inches from the pit floor.
14. Mount the spring assemblies to the bottom rail mount. Make sure that the insulator is installed between the cable connecting rod and the rail mount. See Figure 7 on page 12 for the remaining steps in this procedure.
15. Pull the cable around the thimble, compress the spring to one-half of its length, and secure with (2) two cable clips
16. Repeat for the opposite side.

## Installation

(continued)

17. Install a 16 gauge insulated wire to one side of the top rail mounted cables.
  - a. Strip the end of the wire.
  - b. Electrically attach the wire to the cable.
18. Connect the opposite end of the 16 gauge wire to the appropriate controller terminal.
19. Check and adjust the position of the sensors, and then center them on the cable.
20. Run the car through the hoistway, and ensure that the cable remains centered in the sensor hole.



**Figure 7 - Spring Assembly**

## Wiring

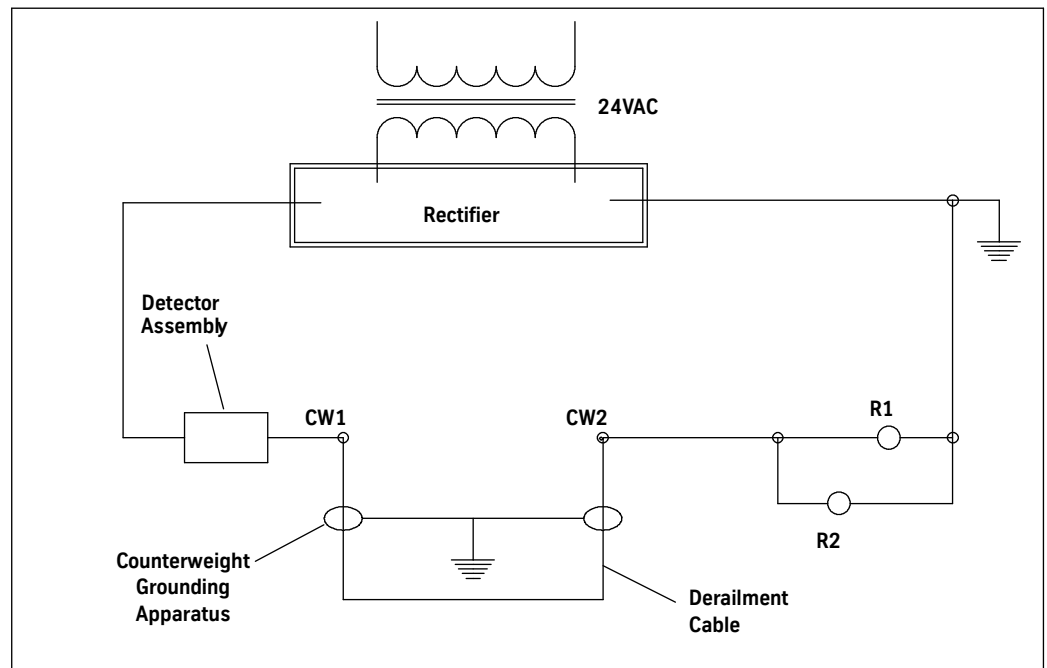
### Wiring Tests

1. Verify that all mechanical and electrical installation has been completed. See Figure 8 on page 13 for all steps in this procedure.
2. Reset the circuit breaker.
3. Run the car Up and Down at contract speed several times to make sure the cables do not short out on the sensors during normal service.
4. Run the car to the top landing.
5. Turn the controller door switch to OFF, and the Auto/Inspection switch to INSPECTION.
6. With the I/O Screen displayed, select the proper car in IMS.
7. Right-click on the I/O Screen, and select METERED LOGIC from the pull-down menu.
8. From the pit, deflect one cable to the sensor and verify that the CWD input goes low (turns gray), on the IMS I/O Screen.
9. Reset the counterweight derailment circuit breaker, and then repeat Step 8 for the other cable.

## Wiring Tests

(continued)

10. Exit the pit, and reset the counterweight derailment circuit breaker.
  11. Turn the Auto/Inspection switch to AUTO with the door switch remaining OFF.
  12. Right-click on the IMS I/O Screen for the car being tested, and then select ENABLE I/O INJECT from the pull-down menu.
  13. Click on the red box (in the upper left hand corner block of the I/O screen) for the car being tested.
- Note:** The box should turn blue, which will turn off the I/O in the CPU.
14. Use the IMS Car Remote FAST to enter a car call near the bottom landing.
  15. Wait until the car reaches high speed, and then click the CWD input on the I/O screen until the input turns blue.
  16. Verify that the operation is correct for counterweight derailment.
  17. Click on the CWD input until the input turns gray.
- Note:** The input will turn gray for a short period and then turn red, the proper state if the counterweight derailment circuit breaker is reset.
18. Right-click on the I/O screen, and select Disable I/O Inject.
  19. With the doors OFF, run the car several floors and verify proper elevator operation.
  20. Return the elevator to service.

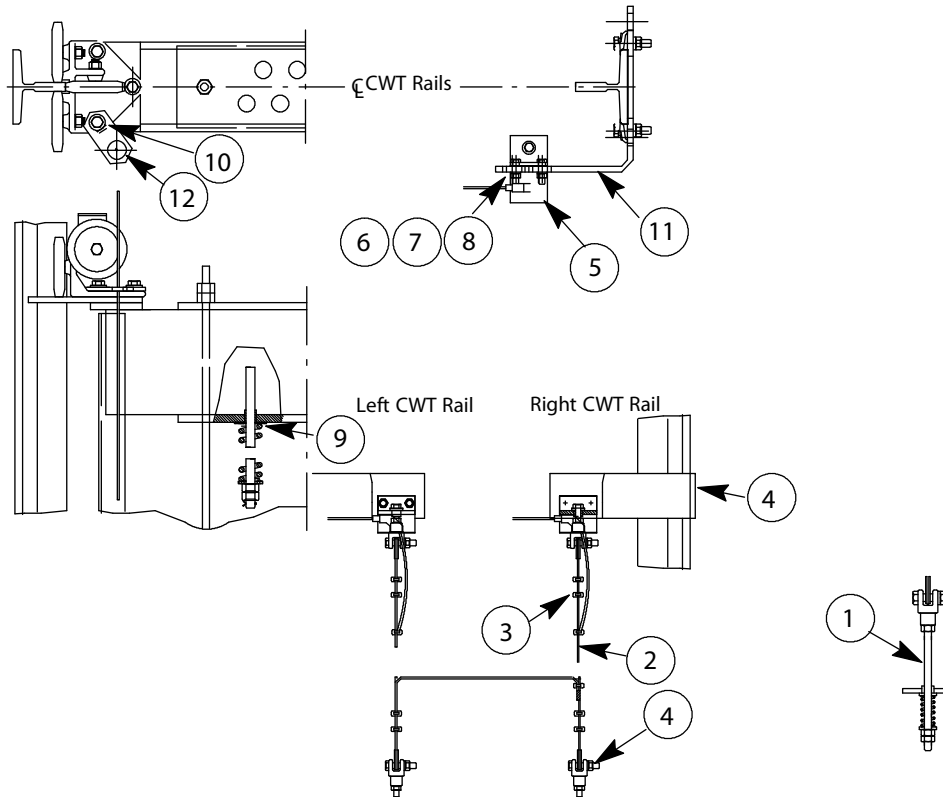


NOTE: Circuit resistance 1-5 Ohms per 100 ft. of travel

Figure 8 - Derailment Detector Assembly Wiring Diagram

# Replacement Parts

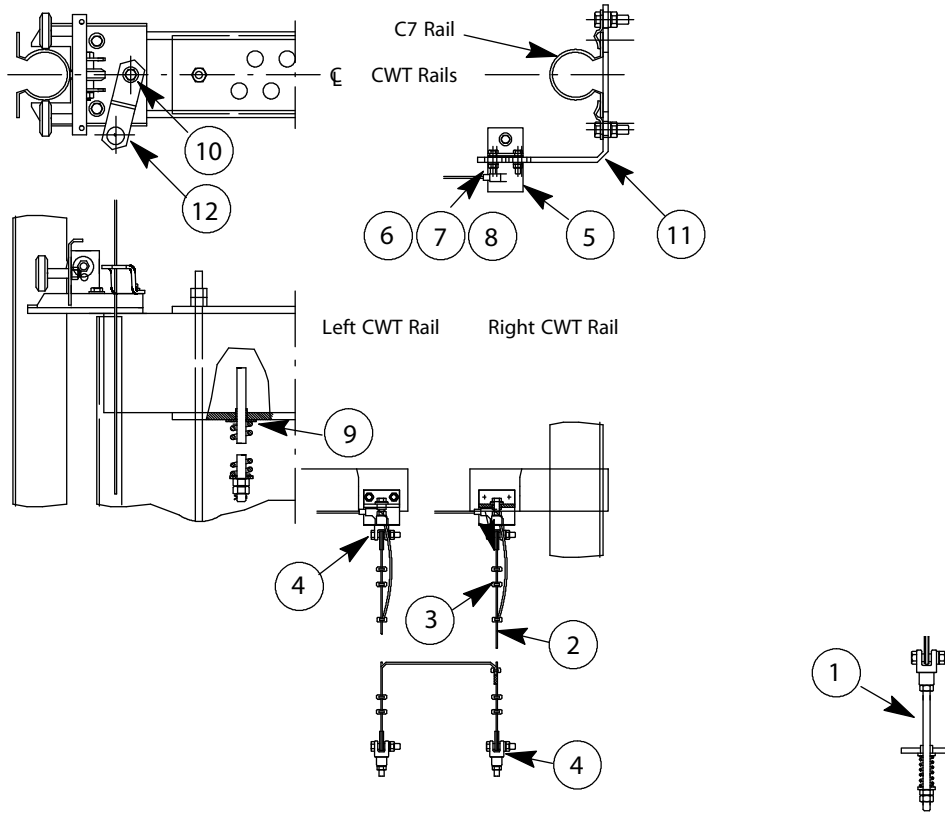
## T-Style Rail



ITEM	PART NO.	PRINT NO.	DESCRIPTION
1		100461	Spring and Clevis Assembly with mounting bracket
2	9871421	77142	Aircraft Cable 1/8"
3		78025	Clip, Wire Rope
4		100450	Clevis Assembly with mounting bracket
5		100443	Bracket for Electrical Connector
6		700407	Washer, LWHR 3/8" C
7	9700407	700564	Nut, NH 3/8" Z
8	9701229	700338	Screw, CSH 3/8" x 1 1/4" Z
9		100283	Grounding Washer
10		70166	Washer, FWA, 5/8" Z
11		100279	Rail Mount without CWT Safety
		142938	Rail Mount with CWT Safety
12		100280	Sensor without CWT Safety <= 250 ft.
		138005	Sensor without CWT Safety > 250 ft.
		147129	Sensor with CWT Safety <= 250 ft.
		142937	Sensor with CWT Safety > 250 ft.



C7 Formed Rail



ITEM	PART NO.	PRINT NO.	DESCRIPTION
1		100461	Spring and Clevis Assembly with mounting bracket
2	9871421	77142	Aircraft Cable 1/8"
3		78025	Clip, Wire Rope
4		100450	Clevis Assembly with mounting bracket
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8	9701229	700338	Screw, CSH 3/8" x 1 1/4" Z
9		100283	Grounding Washer
10		70166	Washer, FWA, 5/8" Z
11		100279	Rail Mount
12		736BA1	Sensor <= 250 ft.
		736BB1	Sensor > 250 ft.

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