

**C.J. ANDERSON & COMPANY**

# Keep your passengers safe!

**With The SAFE-X-IT  
Door Restrictor**

While elevators remain one of the safest forms of transportation, we all need to do our part to ensure that passengers riding elevators are as safe as they can be. This is where the SAFE-X-IT Door Restrictor comes into play. In 2006 there have been at least four deaths directly related to elevators that did not have some type of door restrictor device installed.

You might wonder, "What the heck is a door restrictor". I'll be happy to explain. Door restrictors keep elevator passengers safe by locking the doors when the elevator car is outside the unlocking zone (18" above and below the landing). This device prevents passengers from attempting to escape from an elevator car that has stopped between landings.

How can someone die by trying to escape from a stuck elevator? When an elevator shuts down or faults there's a good chance that it will stop between floors. Depending on the circumstances, the trapped passenger sometimes is able to pry open both elevator and hoistway doors. Once both doors are opened the passenger attempts to get out. In cases where the elevator floor is much higher than the landing floor the following happens. As they jump or lower themselves down to the floor landing, they lose their balance and fall into the opening under the elevator car and down into the hoistway. If you are ever stuck in an elevator, the best thing to do is stay put and call for help by pressing the Alarm Button or by calling out on the Emergency Telephone.

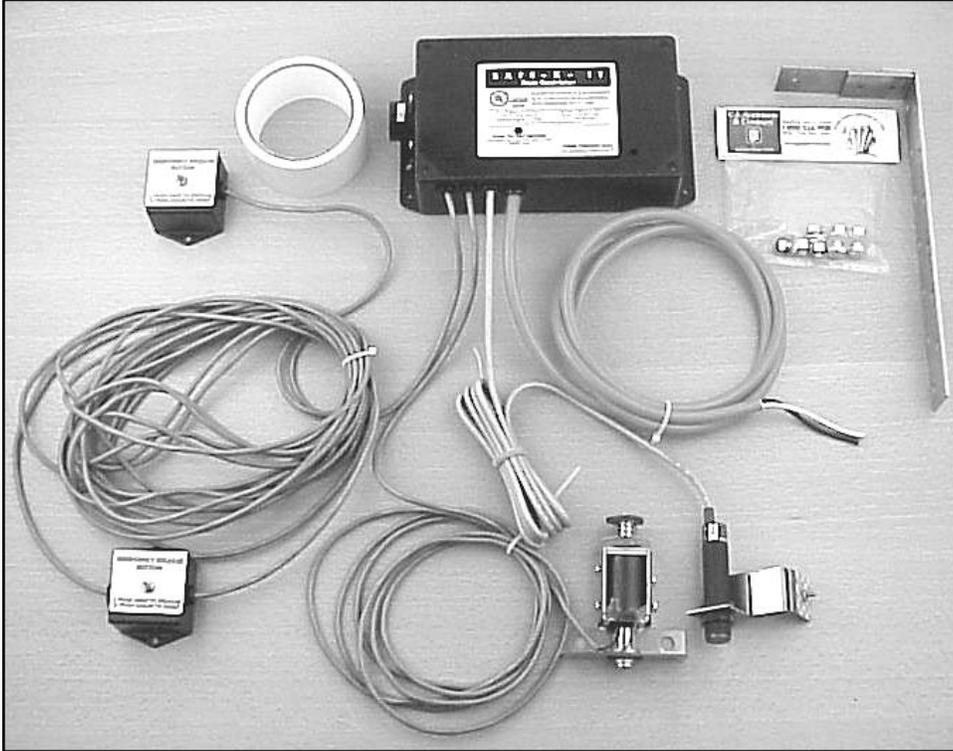
The SAFE-X-IT door restrictor is easy to install and provides peace of mind. It will work on any power or manually operated elevator door, no matter how old the unit is. As long as it's installed correctly and checked for proper operation during monthly maintenance visits it can help save a life.



**C.J. ANDERSON  
& COMPANY**

Helping You One Floor At A Time...Since 1910!

# How to Install Your New SAFE-X-IT Door Restrictor



These instructions are intended for use with the following CJA product. Save this manual for future reference.

ITEM# 636-101  
SAFE-X-IT Door Restrictor

**\*\*\*\*\*WARNING\*\*\*\*\***  
Read this manual before installing!

**\*\*\*\*\*IMPORTANT\*\*\*\*\***  
Prior to putting the door restrictor into operation the rechargeable battery must be charged to 12-15 VDC and the battery terminals must be connected.

6/2003 - 5/2006

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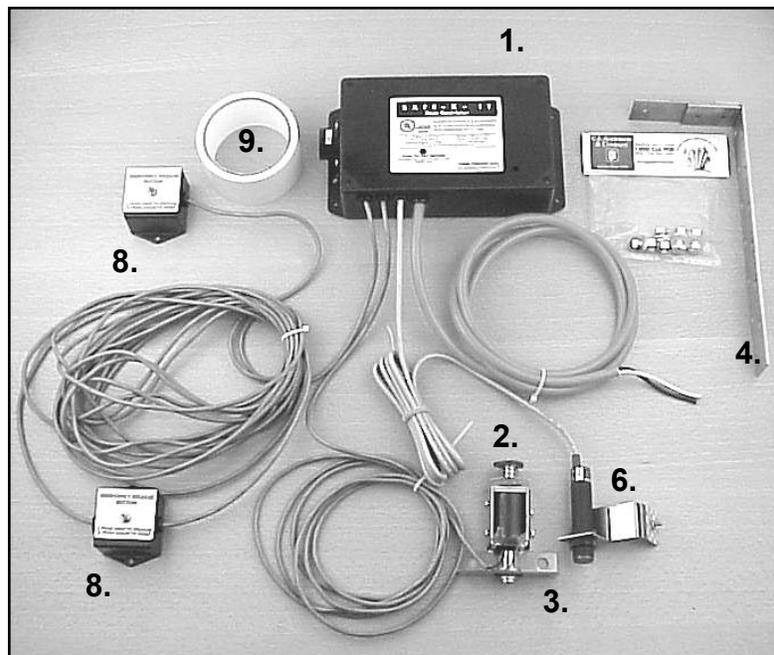
## General

The C. J. Anderson SAFE-X-IT Door Restrictor is designed solely to prevent the opening of passenger elevator car doors when the elevator is outside of the unlocking zone. **IT IS NOT TO BE USED IN LIEU OF, OR AS A SUBSTITUTE FOR, AN APPROVED DOOR INTERLOCK, COMBINATION MECHANICAL LOCK AND ELECTRICAL CONTACT, OR GATE ELECTRIC CONTACT.** The operation, installation procedure, maintenance requirements and warrantee of the SAFE-X-IT Door Restrictor are shown in these instructions.

## Unpacking the Door Restrictor

Before beginning installation check the door restrictor package to insure that all of the following parts are included.

<i>Item Number</i>	<i>Quantity</i>	<i>Description</i>
1.	1	Door Restrictor Control Box, complete with printed circuit board, rechargeable battery, timer and 6 foot main line cable 110VAC
2.	1	Solenoid plunger assembly
3.	1	Top mounting bracket for the plunger
3.	1	Side mounting bracket for the plunger
4.	1	Door restrictor bracket
6.	1	Photoelectric Sensor with 6 foot cable attached
6.	1	Orbital mounting bracket for the sensor
8.	2	Emergency release buttons with 6/10 foot cables
9.	1	Roll of 5 yard, 2 inch wide reflector tape



## Operation

The SAFE-X-IT door restrictor is designed to prevent the car doors from being opened from inside the cab, except when it is in the unlocking zone, up to 18" above and below the landing. This is accomplished by mounting a door restrictor bracket to the car door, positioned to stop the door from opening when the bracket hits an extended solenoid plunger. The plunger is activated or extended when the elevator is out of the unlocking zone. When in the unlocking zone the solenoid plunger is deactivated allowing the bracket to pass under the withdrawn plunger. The operation of the solenoid plunger is controlled by a photoelectric sensor, located on top of the elevator. This sensor detects hoistway reflector tape, which signifies that the elevator is in the unlocking zone. When the sensor sees the tape the solenoid is retracted, permitting normal door operation. When the sensor does not detect the tape the solenoid is activated, dropping the plunger. If someone then tries to open the doors while out of the unlocking zone, the plunger will make contact with the door restrictor bracket preventing the doors from being opened.

The above describes the operation of the door restrictor in normal operation. However, should a failure occur the system is intended to minimize or eliminate hazard to personnel or property. To accomplish this the solenoid plunger is spring loaded and designed to automatically retract when not energized; thus, if the sensor, solenoid, or door restrictor control box part fails, the plunger is deactivated, releasing the door restriction.

To prevent a firefighter from being trapped in the elevator, it is necessary to over-ride the door restriction when the elevator is placed on Phase II fire service. A contact is provided in the control box, which when connected to the firefighter's key switch in the car operating panel will automatically disable the door restrictor when the firefighter's key switch is turned ON.

In the event of a power failure the door restrictor must continue to function. To accomplish this the door restrictor control box contains a self charging, 4 hour back-up battery which powers the restrictor during an electrical outage. A test button in the control box is used to verify the battery is charged and the restrictor is operating.

To assist in the evacuation of passengers trapped in the elevator the SAFE-X-IT door restrictor comes with two emergency release buttons. These buttons when depressed will release the plunger allowing the doors to be manually opened. The suggested mounting of these is one on top of the car and one near the bottom of the outside of the cab. This will allow authorized personnel to release the door restriction without entering the hoistway, and assist passengers to evacuate the elevator from above or below the floor landing, depending on the location of the stuck elevator. The car top release button can also be used when the hoistway access switch is operated, or when on car top inspection, should it be necessary to open the car doors.

## Installation - Step 1: Control Box

The door restrictor control box is heavy duty ABS plastic which will withstand most abuse, including accidentally stepping on it. However, to prevent a tripping hazard, it is recommended that the door restrictor control box be located under the cross head or other out of the way area.

The door restrictor control box is furnished with a 6 foot long, 3 wire, 120 VAC power cord. Connect the power cord to any convenient 120 VAC power source on the car top. **NOTE: BEFORE CONNECTING THE POWER CORD BE SURE THAT THE PLUS (+) TERMINAL OF THE BACK-UP BATTERY IS CONNECTED.** Cut the power cord to size, or coil and tape down any excess cord to prevent a tripping hazard.

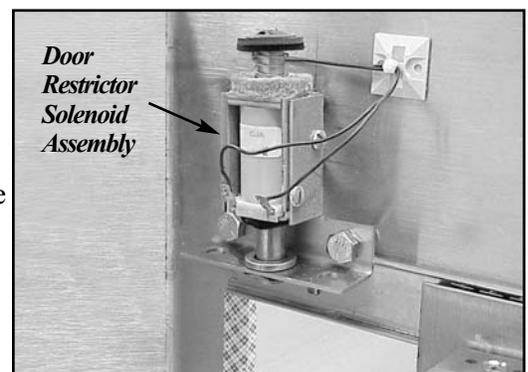


## Step 2: Solenoid Plunger Assembly

The solenoid plunger assembly comes with the top mounting bracket attached. The normal mounting is on the cab header, however a side mounting bracket is also furnished should side mounting be more advantageous.

In selecting the position for the solenoid plunger remember that the plunger and door restrictor bracket must be positioned so that the doors can be opened not more than 4" from inside the car. (Some local codes may be more restrictive).

Once the position has been selected, using the mounting bracket as a template drill two 3/8" holes for the mounting bolts. One inch between these holes drill a 5/8" hole for the plunger. Bolt the solenoid plunger assembly to the car.



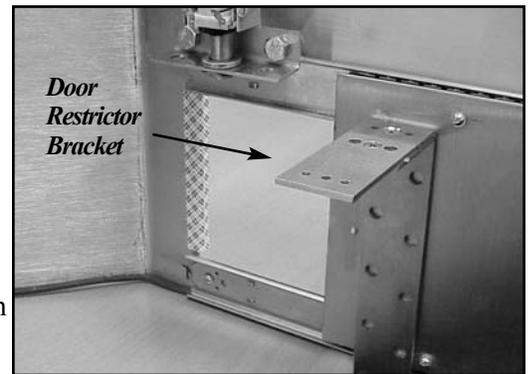
### Step 3: Door Restrictor Bracket

The door restrictor bracket is mounted to the car door with two 5/16" cap screws. The bracket is adjustable Up and Down.

Mount the bracket to the door in the location which will prevent the doors from being opened not more than 4".

Using the up and down adjustment position the bracket so that the part with the 90 degree bend is approximately 1/2" from the bottom of the retracted plunger.

Once positioned horizontal and vertical, firmly secure the bracket to the door. Push the plunger down to insure that the bracket will make positive contact with the extended plunger in the allowable distance.

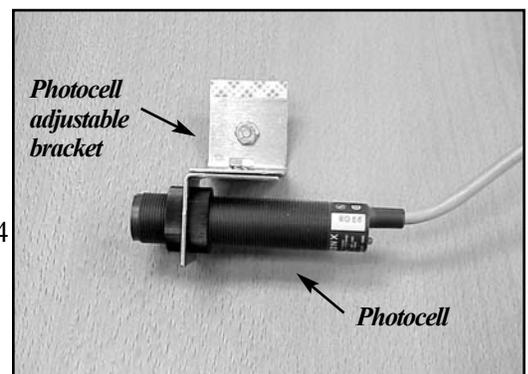


### Step 4: Photoelectric Sensor

The retroreflective photoelectric sensor has an infrared, modulated LED light source. It senses by detecting the presence or absence of the transmitted beam of light after it reflects from the tape provided.

After determining where the reflector tape is to be attached, guide rail, hoistway wall, etc., select an area for mounting the sensor. This area should be as out of the way as possible to prevent accidental contact with the sensor. For optimum dependability it is recommended that the sensor be mounted somewhere between 4 - 20 inches from the reflective tape.

The sensor comes with an orbital mounting brackets along with pressure sensitive tape. This bracket is adjustable both side ways and up and down. Secure the bracket to the selected mounting area using the pressure sensitive tape, or nut and bolt fasteners.



Screw one of the plastic nuts onto the sensor, insert the sensor into the sensor mounting bracket, and screw on the other plastic nut. These nuts are used to lock the sensor in place once the range adjustment is made.

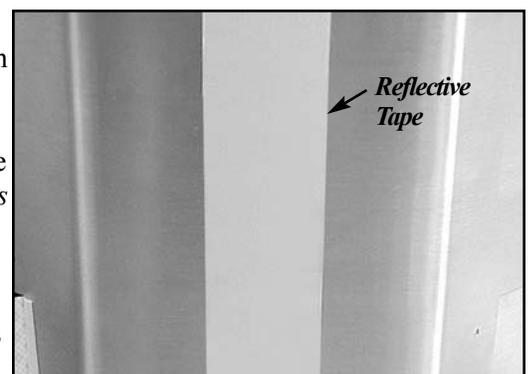
### Step 5: Reflector Tape

Five yards of reflector tape comes with the unit. This is enough tape for a 5 stop elevator if the full 36" unlocking zone configuration is utilized. Additional tape can be ordered from C.J. Anderson.

The Safety Code for Elevators (ASME A17.1a) defines the unlocking zone in Rule 111.12 (c) as follows: *"The doors shall be unlocked when the car is within 3 inches (76 mm) above or below the landing and may be configured to be unlocked up to 18 inches (457 mm) above or below the landing."*

Cut the reflector tape in strips of 36" or less. Attach these strips so that the sensor is pointed at the midpoint of the tape when the elevator is stopped at the landing.

**Note: It may not be possible to run a full 18" above or below terminal floors. In these cases position the sensor to the actual unlocking area.**



Prior to affixing the tape clean all grease and dirt from the mounting surface. Remove the tape backing and attach the tape vertically. The 2" wide tape will compensate for minor vertical misalignment.

## Step 6: Adjust Timer/DCL Contact

As the elevator is moving, the sensor will detect the reflective tape on each floor. This means the plunger will retract and drop as it passes each floor. This is not harmful, but it will affect the life of the plunger, therefore, a dual solution to this problem is build into the restrictor system. These are using a timer to delay activation of the plunger, or using a door close limit or “running” contact to signal activation of the car door. These cannot be used together. The door restrictor unit comes wired for using the timer. If the DCL is to be used be sure to turn the timer down to Zero (0) seconds and remove the T1 - T2 jumper on the printed circuit board.

The delay relay timer (0-10 seconds) is in the Door Restrictor Control Box. Set the timer for the number of seconds it takes for the elevator, at full speed, to pass the reflector tape. General guidelines are:

50 fpm - 4 seconds
100 fpm - 2 seconds
150 fpm - 1.5 seconds
200 fpm - 1 second

These guidelines can be used for the initial settings, but the final adjustment will have to be made by determining the setting that will permit the car to pass a floor without activating the plunger. This doesn't have to be an exact setting, as long as the relay will time out prior to the car coming to a complete stop and the door starts to open. **CAUTION: DO NOT SET THE TIMER TOO SLOW OR THE DOOR, WHEN OPENING, WILL HIT THE ACTIVATED PLUNGER.** When adjusted correctly, the final setting will not deactivate the plunger when passing a floor at full speed, but will time out prior to the door opening.

As an alternate to the delay relay timer a Door Close Limit (DCL) contact is provided on the printed circuit board. This contact can be wired to the door close limit on the door operator. When the car doors start to open the contact will deactivate the plunger allowing the doors to be opened. This DCL contact can also be wired to any of the “running” contacts in the elevator control system. To use the DCL contact it is necessary to remove the jumper T1 - T2 and set the time to zero (0) seconds. This disconnects the timer from the system.

## Step 7: Fireservice Override

When Phase II of the Firefighter's Service is implemented the door restrictor must be disconnected to give the Firefighters complete control of the elevator. To accomplish this it is necessary to bring wires from the Phase II key switch ON and HOLD contacts in the elevator cab to contacts E1 - E2 in the door restrictor control box. This will deactivate the door restriction until the Firefighter's key in turned to OFF.

## Step 8: Emergency Release Buttons

The emergency release buttons are intended to be used by authorized personnel assisting in the evacuation of trapped passengers. Be sure that these release buttons are mounted in locations that can be easily reached while standing in the hallway with the hoistway doors open.

The emergency release buttons are prewired to the door restrictor control box. The one for mounting on the car top has a 6 foot cable and the one to be located near the car bottom has a 10 foot cable. These also come with pressure sensitive tape for ease of mounting, or they can be fastened with sheet metal screws.

After mounting the buttons in the selected locations, test each button to insure that the door restrictor retracts and the buzzer sounds when the button is depressed. The buzzer signifies that the door restrictor is disabled and it will continue to buzz until the release button is depressed again, reactivating the door restrictor.



## Preopening Doors

For pre opening doors that begin to open 18" above or below the landing a preopening door operator module can be purchased separately. This easy to install module prevents the door operator from preopening until the sensor reads the tape and picks the door restrictor solenoid.

## Emergency Power Loss Buzzer

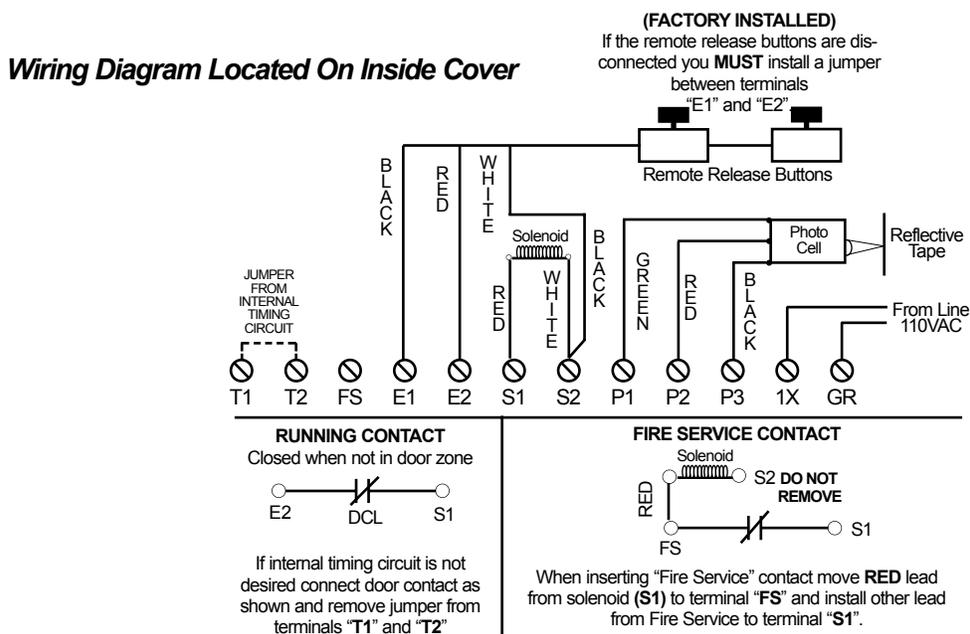
The SAFE-X-IT is equipped with a emergency power loss buzzer that notifies passengers of the elevator that service is required. If you are notified by a building manager that there is a high pitched tone coming from the hoistway it means that the line power to the unit has been lost. The SAFE-X-IT will continue to function for a period of 4 hours until the 12V battery is exhausted.

## Maintenance

The SAFE -X- IT, as any electrical mechanical device, requires routine inspections and maintenance to insure that it is operating and adjusted properly, that the back-up battery is fully charged, etc.

It is recommended that during each inspection the following is done: (1) check the plunger action to insure it is not binding or sticking, (2) check the back-up battery charge by use of the test button in the control box, or a meter, (3) check that the sensor has not moved and is aligned accurately on the reflector tape, (4) check that the reflector tape on each landing is clean and unobstructed, and (5) check all fastenings and connections to insure they have not worked loose.

## Wiring Diagram



## Warranty

The SAFE-X-IT Door Restrictor has the same Terms & Conditions, Limits of Liability and Warranty as all other C. J. Anderson & Company products. The complete terms and conditions, liability limits, and warranty are shown in detail on pages 122-123 of our catalog. If you do not have a copy of our catalog we will send you one upon request. These instructions do not expand, reduce, modify or alter the warranty statement and no warranty or remedy in favor of a customer or any other person arises out of these instructions.

## Replacement Parts

<u>Part#</u>	<u>Description</u>
636-101	SAFE-X-IT Complete Unit
636-102	Control Box Assembly - Battery Not Included
636-103	Battery
636-104	Sensor
636-105	Solenoid Assembly
636-106	Side Solenoid Mounting Bracket
636-107	Emergency Release Buttons - 2 per Package
636-108	Door Bracket
636-109	Tape - 5 Feet
636-110	Pre Opening Door Module

## About the Company

C.J. Anderson & Company has been manufacturing elevator components since 1910...all over the world! What this means to you is over 95 years of elevator experience as close to you as your telephone. From small button orders to complete fixture/controller packages, our team prides itself on being your partner.

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Position the sensor so that the light beam will strike the reflector tape at an angle, this improves reliability. Lightly tighten the vertical mounting bolt.

Mount a piece of tape so that the sensor can now be aligned properly. With power applied shift the sensor from side to side and up and down until the beam is reflected from the tape and the LED is off. Shift the sensor in one plane to find the two extreme positions where the LED is on. Position the unit midway between the two positions. Repeat shifting and positioning the sensor in the other plane. Pass an object between the unit and the reflector to insure operation. Tighten the sensor and two mounting brackets.