



*Elevation Innovation Inc*

877-345-4387  
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**Econo-Lift®**

**DUMBWAITER**

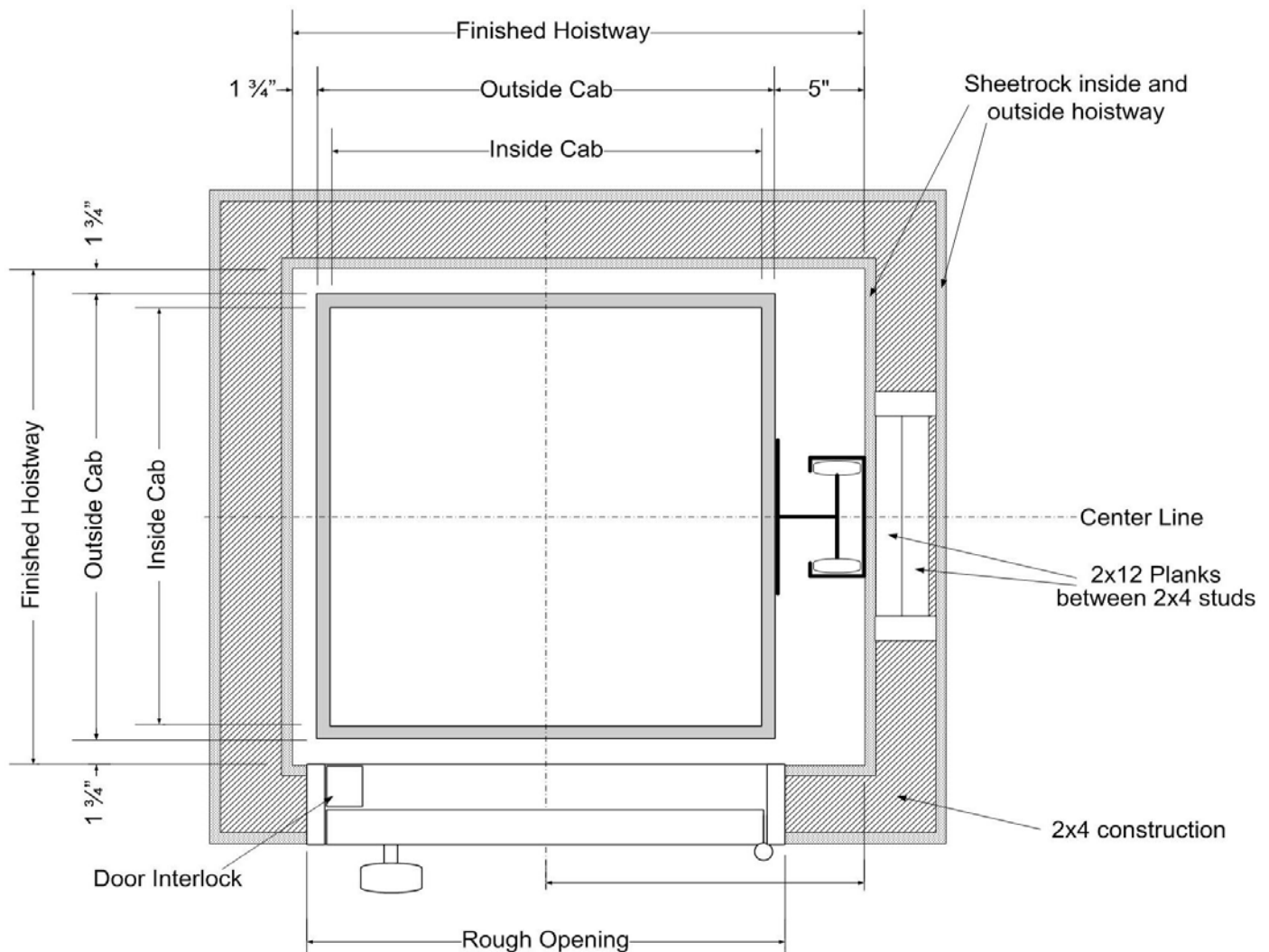
Installation Manual

*“Dumbwaiter Systems”*

# Installation Manual

This manual will cover the installation procedure step-by-step. The installation of this dumbwaiter is easiest if the hoistway is properly prepared. Pay close attention to hoistway drawings and the following notes.

1. Build hoistway to exact dimensions as instructed in the provided drawings. The dimensions indicated in drawings are **FINISHED DIMENSIONS**, after sheetrock has been installed
2. Insure that hoistway walls are built plumb and square.
3. The reinforced rail wall must be built with 2 sets of 2x12 planks as shown in the drawings – the motor assembly, rail, cab, and load are all supported by this reinforced wall.
4. The entire inside of the hoistway must have sheetrock installed prior to starting the installation
5. It is recommended to leave sheetrock off the outside of hoistway wall until installation is complete – this makes running of wire harnesses much easier.
6. Installation of the motor assembly is much easier if one wall on bottom level is left unfinished – once the rail and motor assembly are mounted, this wall can be finished.
7. A machine access door should be installed on the lower level for access to the motor assembly and the controller – **THIS DOOR MUST HAVE A LOCK AND REMAIN LOCKED AT ALL TIMES.**
8. For safety during installation, the installer should install a temporary floor across the hoistway at each of the upper levels. This will prevent people from falling down the dumbwaiter shaft during installation.



**FOR YOUR SAFETY: INSTALL A TEMPORARY FLOOR ACROSS THE HOISTWAY AT EACH OF THE UPPER LEVELS.** This will make installation of the rail easier, and prevent anyone from falling down the dumbwaiter shaft. Leave 6" of space from the reinforced wall for the rail to slide past the temporary floor.

Mark a center line down the load bearing wall. This can be done with a chalk line, or a straight edge.

## Guide Rail Installation

**Draw a mark 6" below the door opening along the center line. This will designate the bottom edge of the rail.**



The center line on the wall should be visible down the center of each hole in the rail. Drill pilot holes 1/4" before installing lag bolts

**UNDER COUNTER RAIL INSTALL**  
Start rail 7" below top of shaft under the counter for top pulley clearance  
Keep cable clamps very close to thimble.



Insert roll pins in the slots at the top of the 1<sup>st</sup> piece of rail. Leave 1/4" of roll pins protruding from the top of the rail (see image on top of next page).

Mount the rail on the wall using lag bolts provided (1/2" x 3 1/2").

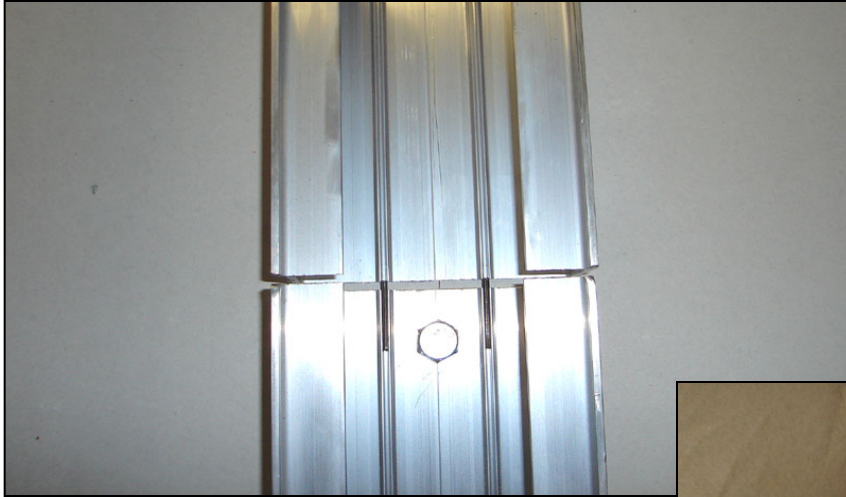
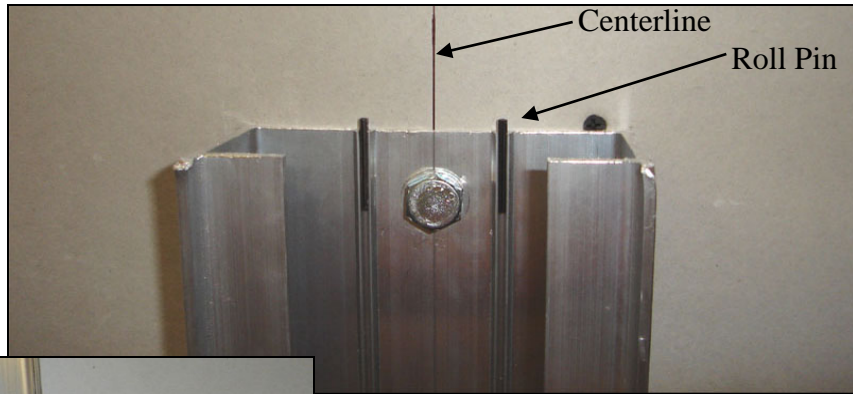
**IMPORTANT: Do not use washers with the lag bolts. CAUTION: Do not over tighten the lag bolts as this will bend the rail and cause problems with trolley movement.**

Confirm that the center line is running down the center of the rail. Drill pilot holes and install lag bolts in remaining holes in the rail.



1<sup>st</sup> rail should be mounted such that the centerline on the wall lines up with the centerline of the rail.

The roll pins should be protruding ¼” out of the rail.



Place the 2<sup>nd</sup> piece of rail in position above the 1<sup>st</sup>. The roll pins should slide in the slots on the 2<sup>nd</sup> rail.

Use a block of wood to tap down on the rail, insuring that there is no space between the rails.

Drill pilot holes and secure the 2<sup>nd</sup> rail in place using lag bolts provided.\

**CAUTION:** Do not over tighten the lag bolts as this will bend the rail and cause problems.

Repeat this process with remaining rails, taking care to keep rails lined up with the centerline.



**Apply supplied grease to left and right side of rail inside to lubricate the sides of the wheels after limit switches and mechanical stops are installed.**

Install the trolley from the bottom of the rail. Lifting on the quick-link will release the brake system, allowing the trolley to move freely

Lift the trolley to a height of 30” above the floor. The brake will engage when you release the quick-link, locking the trolley in that location.



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## Floor Mount:

For the quietest motor operation mount the unit on the floor using the centerline off the wall.

## Wall Mount:

Position the motor assembly against the wall below the rail. Place 2 small 2x4 blocks (or a 4x4) under the motor to lift it from the floor. These will be used as temporary spacers.



Line up the centerline on the wall with the centerline on the motor assembly.

Note: If mounting the motor assembly on the floor, hold the motor frame against the finished load bearing wall so the cable lines up with the top pulley's. As seen above.

Mark the locations of mounting holes on the motor assembly. Drill  $\frac{1}{4}$ " pilot holes and secure the motor assembly to the wall using the lag bolts provided.

Remove the 2x4 blocks from under the motor.



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Set the pulley assembly at the top of the rail. This will stay in place at the top of the rail while you mark for pilot holes.

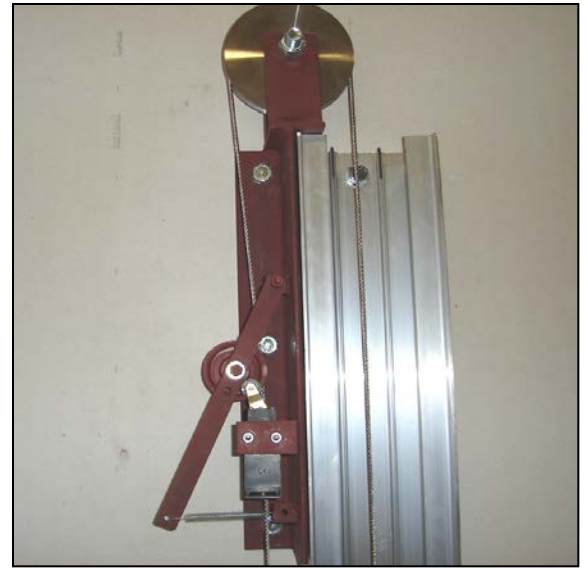
Drill ¼” pilot holes and secure the pulley assembly in place with the lag bolts provided.

## LIFTING CABLE

Attach the stainless steel cable to the winding drum.

2-Level Units: Insert the end of the cable with the stop attached into the slot at the end of the drum.

3-Level Units: Insert the cable end into the pre-machined hole in the drum and tighten the set screws.



## LIFTING CABLE

You must install the bottom physical stop as seen on the next page prior to shortening the lifting cable.

Wrap the cable 1 ½ times around the winding drum minimum prior to lifting the cab, staying in the machined grooves. Follow the directions on page 10 for manually running the machine to take out the slack in the cable.

Feed the cable to the right of the small pulley and over the top of the large pulley on the sheave system (above).

Feed the cable end down the center of the rail towards the trolley, taking most of the slack out of the cable. See page 7 pictures at the bottom of the page.

**Slack cable switch on pulley system: When all the slack is out of the cable this switch must be activated – pull the blue button on the switch**

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The cable must be attached to the trolley quicklink using provided material. Three stop units will be pre-terminated.

**The trolley should rest on the bottom trolley-stop with slack in the cable when fully tightened (see bottom pictures this page)**

Cable Clamps

Cable Thimble

Attach the cable thimble to the trolley quick link. Slip three cable clamps onto the cable. Feed the cable end through the cable thimble and through the three cable clamps.

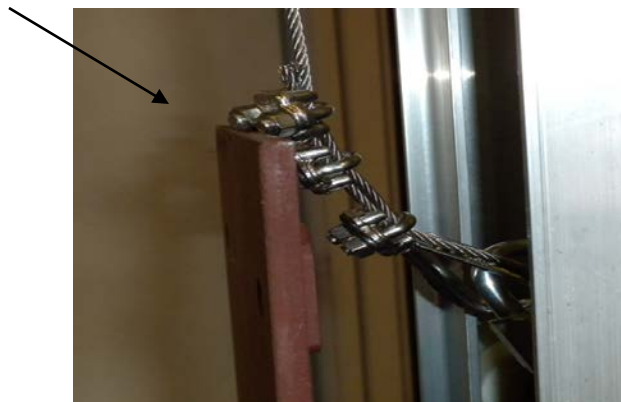
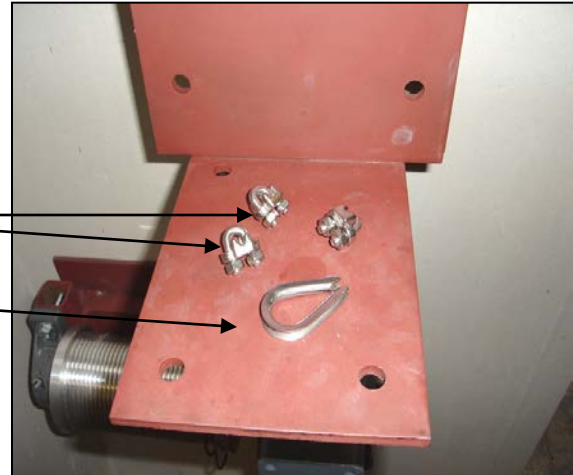
**IMPORTANT:** Arrange the cable clamps such that the curve of the 'U' is wrapping around the cut end of the cable.

Excess cable can be cut or folded and zip-tied as shown.

**IMPORTANT:** Add weight to the trolley equivalent to the cab or mount the cab to adjust the slack cable switch on the sheave assembly (if needed). Otherwise the trolley brake will activate and prevent the cab from lowering.

**Mechanical emergency stops. Mount the top mechanical stop just above the trolley after the unit is activating the final upper limit in manual mode**

**The picture below shows the trolley sitting on the bottom mechanical stop 2"-6" below level 1. Trolley on bottom mechanical stop with cable slack**



**Bottom mechanical stop**

**The limit switches** are used to sense the location of the dumbwaiter cab and stop it at the appropriate level. Each level limit switch will connect to the call box leads marked – L-Switch. As seen to the (right).

The level #1 limit switch is to be mounted vertically as seen to the (right). Peel back the film on the #1 limit switch, exposing the double-sided tape.

Mount the limit switch on the rail approximately 1” above the bottom level of the door opening. Mount the switch as shown, such that the left hole lines up with the groove along the side of the rail. This is temporary until the exact location is determined. You may need to re-position the limit switch to achieve a final location. Then drill a 9/64 hole and use the provided self tapping screw to secure the switch. **The tip of the roller wheel should be 4-3/4” from the wall.**

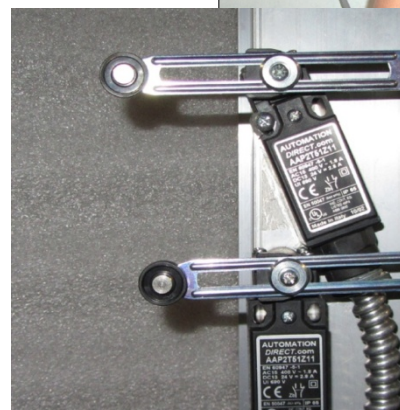
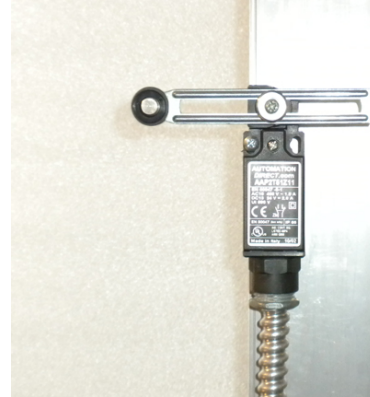
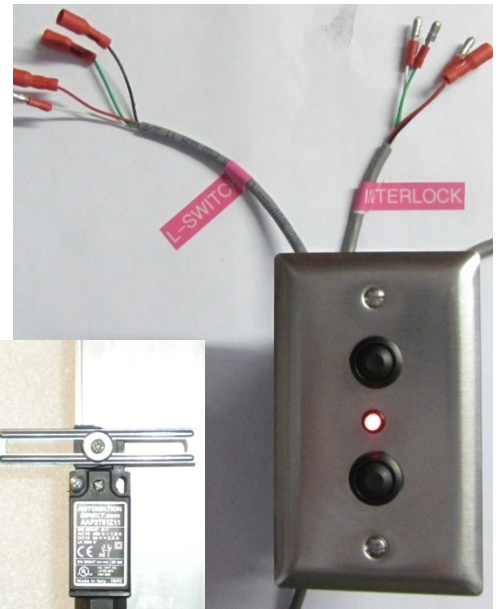
Mount the remaining switches, one for each level in the same way. **The tip of the roller wheel should be 4-3/4” from the wall.**

**SAFETY CIRCUIT** Run the provided 4 wire over the top of the rail that is attached to the Slack Cable limit switch on the sheave pulley assembly. Then install the upper final limit safety switch 4-6” above the top level limit switch. If conduit is required install the switch as seen to the (right) if overhead is an issue. This switch is pre-installed on the 4 wire for non conduit applications.

**DO NOT connect the safety circuit to the controller until you have manually ran the unit in manual mode as described on page 10.**

**IMPORTANT: When the safety circuit is connected the relays will act like call / send buttons. USE CAUTION!**

Use zip ties and sticky back squares provided to tie the wire down such that it will not be touched by pulleys, cable, or the moving trolley.





## CONTROLLER / POWER IN / POWER OUT

Mount the controller in a location that will be convenient and close to the motor.

## CONTROLLER LOCATION

A recommended location is on the back side of the machine room door at the bottom level.

**Power in is - 115Volt 15 Amp single phase.**

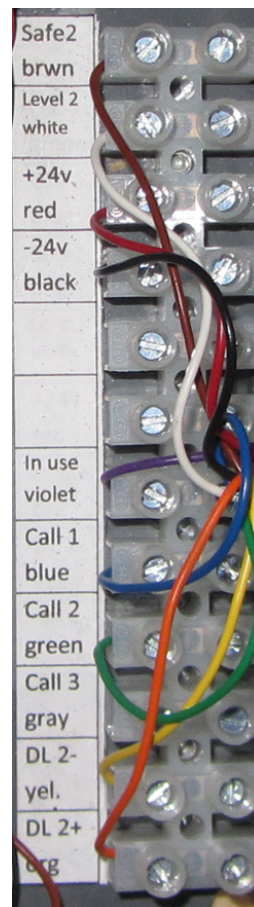
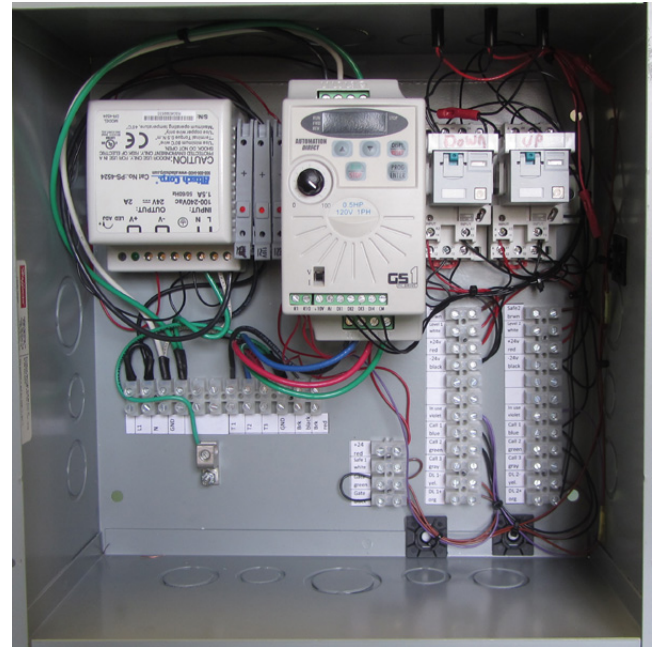
**Position the controller and select enclosure knock out locations** such that cable harnesses can be run through the provided conduit connectors / (romex restraints for non conduit) mounted on sides or bottom of the controller, and the power cord can reach a power source. Install the “power in cord” black wire into L1, the white into N and the ground into GND. Connect the motor wires in the controller color to color – T1= black, T2= Blue, T3= red and GND= Green. Use the provided flexible screw on conduit connector. **Do not run power in and out to the motor in the same conduit connectors as the dumbwaiter call stations and safety harness.**

**Level 1,2 and 3 Terminal strip connection.** Connect the pre-wired floor level call station inside the controller to the corresponding terminal block for each level. This will be designated by the DL circuit (door lock). Example to the right is for level 2 designated by DL 2- and DL 2+

Each connection inside the controller will be marked with a function and color code.

The power in wire and the low voltage wires should be strain relieved inside the controller with the provided romex restraints if conduit is not used.

Use zip ties and sticky back squares to hold harnesses out of path of moving trolley, cable, and the cab.



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## MANUAL MOVEMENT of the motor.

Inside the controller are the up and down relays. There is a green button on each relay that will activate the motor in the desired direction. This is for installing the lifting cable and taking out the slack. Also to manually run the cab up and down the hoist-way to check clearance.



**IMPORTANT: Add weight to the trolley equivalent to the cab or mount the cab to adjust the slack cable switch on the sheave assembly (if needed). Otherwise the trolley brake will activate and prevent the cab from lowering.**

**CAUTION: YOU ARE NOW OPERATING IN MANUAL MODE. DUMBWAITER WILL MOVE WHEN DOORS ARE OPEN. CHILDREN MUST NOT BE PRESENT WHEN RUNNING IN MANUAL MODE. CONFIRM PEOPLE AND OBJECTS ARE FREE FROM DUMBWAITER PATH.**

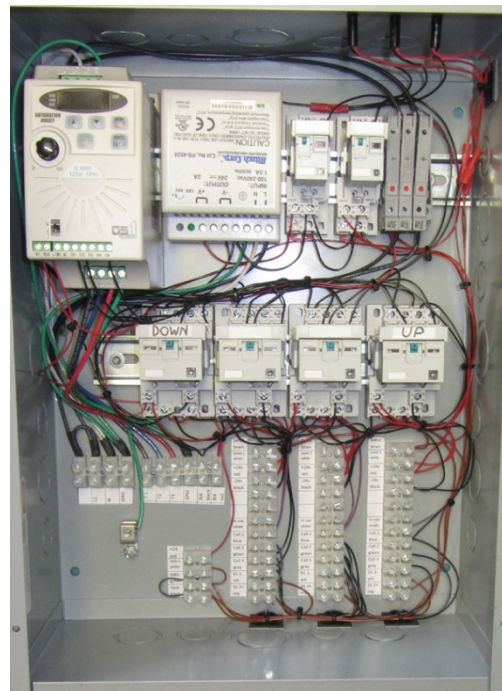
**DO NOT connect the safety circuit to the controller until you have manually ran the unit in manual mode.**

**IMPORTANT: When the safety circuit is connected the relays will act like call / send buttons in automatic mode.**

**USE CAUTION!**

Press the 'UP RELAY' button for up direction and 'DOWN RELAY' button for down direction to move the trolley to each level. **Confirm that the limit switches are engaging** when the trolley is at each level. Take special care to insure the Final Limit switch is engaged when the trolley travels beyond the upper level. Ensure that the adjustable roller on the limit switches is 4-3/4" from the wall to the tip of the roller.

**YOU MUST USE THE DOWN RELAY BUTTON INSIDE THE CONTROLLER TO LOWER OFF THE FINAL UPPER LIMIT.**



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The dumbwaiter can be completely installed through the rough opening if desired. The unit can be installed in 1 day if the doors are on site. The rails are in 7' lengths and the cabs will fit through the door rough opening.

Position the trolley at the 1<sup>st</sup> level.

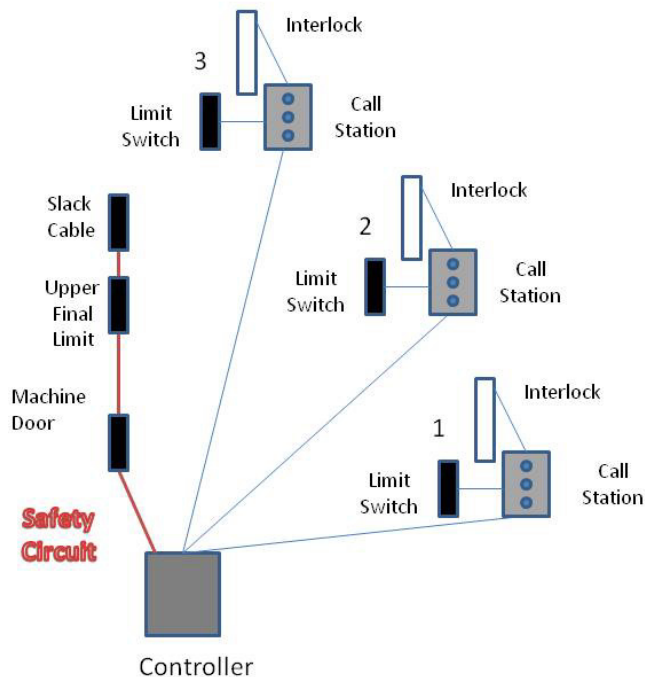
Slide the dumbwaiter cab through the 1<sup>st</sup> level door rough opening and rest the cab on the trolley's steel support. Secure the cab to the trolley with the 3/8 bolts provided.

**NOTE:** If the cab moves out of square in different regions of the hoistway, then shims may be needed between the rail and the wall at the locations where the cab is not square.



If cab hits an obstruction in the down direction, the cable will have slack and the trolley brake will be engaged. To disengage the brake on the trolley, raise the cab upward. Verify the cable is in the proper position on the winding drum and not overlapping itself.

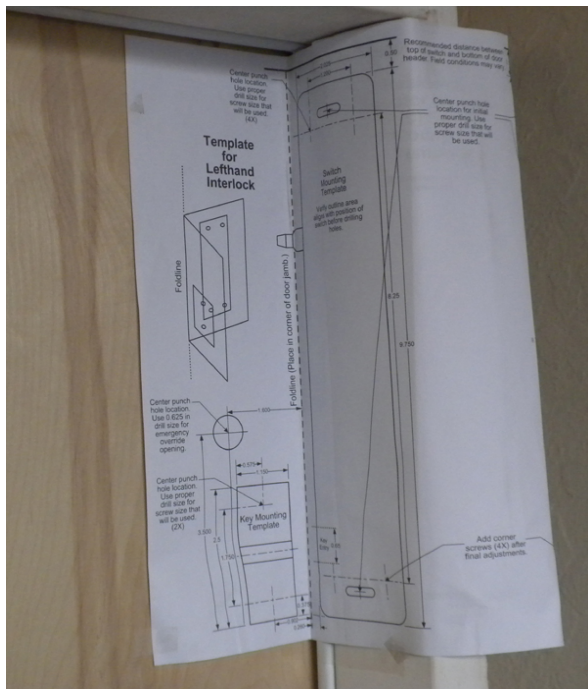
## Econo-Lift Basic Wiring Diagram



# Installation Manual

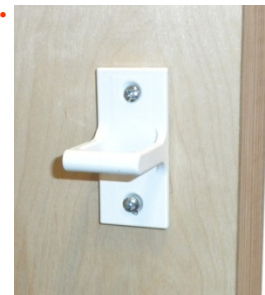
Install the doors at each level. **DOORS MUST HAVE A LATCH TO KEEP THEM SHUT – INTERLOCKS ARE NOT A LATCH.**

The interlocks are mounted in the upper corner of the door jam, on the side opposite the hinges. The interlock ‘keeper’ is mounted on the inside of the door such that it latches with the interlock when the door is closed.



To mount the interlocks, use the paper template provided to mark mounting holes. Fold the template along the dotted line. Position the template in the upper corner of the door, opposite the hinges and use a center punch to push through the paper, marking the hole positions.

**It is highly recommended to drill the 5/8” hole in the door for the emergency door interlock release – see step 4 in the door lock installation instructions provided with the door interlocks.**



Drill pilot holes for each of the mounting points. Use caution when drilling pilot holes for the keeper as you do not want to drill completely through the door. Fasten mounting screws hand tight using a screwdriver. Do not use a drill to fasten these screws as you will risk over tightening.

Mount the interlock such that the keeper locks in place when the door is shut.

Keeper →

**IMPORTANT: MACHINE ACCESS DOOR MUST HAVE A LOCK AND REMAIN LOCKED AT ALL TIMES. MOVING PARTS WITHIN THE MACHINE AREA ARE VERY DANGEROUS TO EVERYONE INCLUDING CHILDREN**

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Install the call stations at each level. The call stations are labeled according to the level. Take care to use the appropriate call station at each level (the length of the cable is different for each level).



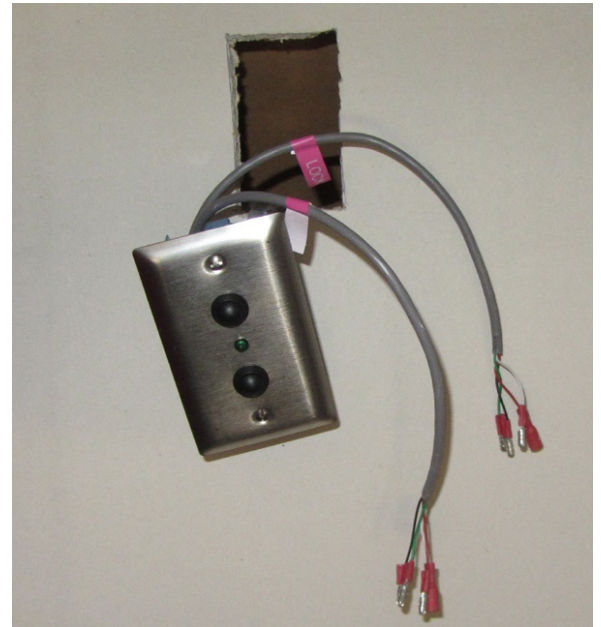
Run the harness from the call station through the hoistway wall to the location where the controller will be mounted.

If the harness is not run through the wall (behind the sheetrock) then the harness must be attached firmly to the wall such that the moving cab, trolley, and cable will not touch the harness.

### Level 1,2 and 3 Terminal strip connection.

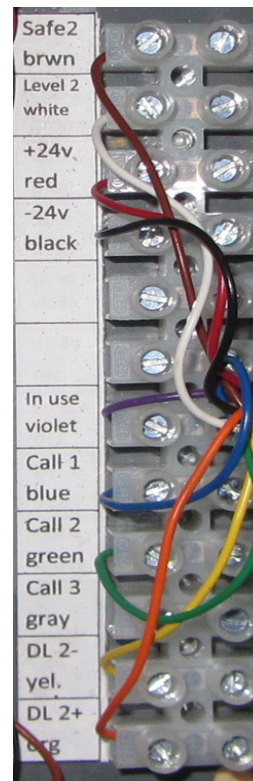
Connect the floor level call box inside the controller to the corresponding terminal block for each level. This will be designated by the DL circuit (door lock). Example to the right is for level 2 designated by DL 2- and DL 2+

Each connection will be marked with a function and color code.



The interlocks have a cable with 4 connectors that attaches to one of the cables hanging from the call station.

The limit switch's have a cable with 4 connectors that attaches to one of the cables hanging from the call station.



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The dumbwaiter is now ready for Automatic Operation. Close the doors at every level.

View the controller led's on top to determine if all safeties are in place. If all 3 led's are lit the safeties are set and you can start operating the dumbwaiter.

If there are any errors, (led light out) then you must troubleshoot. Use the troubleshooting notes and the display matrix provided in the following pages.

## **Level Adjustments**

When running in automatic mode with the cab completely assembled, you may find the need to adjust the limit switch levels. Test the leveling of the cab at each level, calling from up direction and down direction. Do this several times to determine if a limit switch is too high or low. If the level must be adjusted, take a measurement to determine the distance that the limit switch must be moved. Open the door at the level to be adjusted, Propping the door in the open position, then **(make sure the safety circuit is DISCONNECTED from the controller)** in order to move the cab out of the way manually with the up down relays.

Use the controller in Manual Mode **(make sure the safety circuit is DISCONNECTED from the controller)** and use the up down relays to move the cab out of the doorway, leaving access to the limit switch to be moved. Draw a line under and over the limit switch to designate the original location. Remove the limit switch and re-attach at the measured offset. You may choose to first test the location by mounting the limit switch with pressure sensitive tape, prior to permanently mounting it with a screw.

When the new location is confirmed, the limit switch must be permanently mounted. The mounting point should fall in the groove near the side of the rail. Mark and remove the limit switch and drill 9/64 pilot holes in the groove on the rail. Use a thread tapping screw provided to cut threads in the holes. Install the limit switch by hand with a screwdriver. Do not use a drill to fasten these screws as the limit switch may be damaged. Use caution not to over tighten and damage the limit switches.

## **Normal Operation**

- All call / send station led lights are off.
- Controller led's 1, 2 and 3 are on.
- Press the call button for level 'x'.
- Dumbwaiter cab moves to level 'x' and stops.
- Call / send station led for level 'x' is lit solid during movement (in use light).
- Call / send station led turns off.
- Door interlock will unlock when the door is opened. If door does not open, cab is at another level.
- Once door is closed again, the cab can be called to another level
- If cab is already at level 'x', the door can be opened at any time.
- Calls to other floors are not recognized when dumbwaiter is moving. Calls to other floors are recognized when the cab is not moving and all doors are shut and locked.

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## Troubleshooting Notes

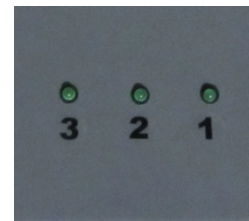
All LED lights on the top of the controller will be on for normal operation.

The LED lights on top of the controller work as following:

Light #1 = Door Lock circuit

Light #2 = Car Gate

Light #3 = Safety Circuit. This includes “slack cable limit” on the sheave pulley, “upper final limit” above the top landing limit switch, and the “machine room door limit” if ordered with one.



**LED light #1 is out, DOOR LOCKS** – Check that all doors are shut and the door keeper’s are securely in the interlock.

**To trouble shoot with an electric meter**, turn the meter on to DC volts and place the negative meter wire on LEVEL 1, 24 V- (negative) and place the positive meter wire to DL+ and DL-. You should have 20-24 Volts on both DL+ and DL-. If you do that circuit is fine. Continue to check LEVEL 2 and 3 to determine the bad circuit. Once the bad circuit is located remove the door lock cover and confirm that the micro-switch on the solenoid with the spring and the keeper are operating correctly.

**To trouble shoot with a jumper wire**, use a small piece of wire and jump between DL+ 1 and DL- 1 on the terminal strip. Then move to LEVEL 2 and LEVEL 3 to locate the bad door circuit. Once the bad circuit is located remove the door lock cover and confirm that the micro-switch on the solenoid with the spring and the keeper are operating correctly.

**LED light #2 is out, GATE** - Check that the car gate is closed, then check all connections to the car gate magnetic switch staring at the bottom of the car, then the hoist-way junction box where the 4 wire and travel cable are connected, then inside the controller on the terminal strip marked Gate (two locations). If your unit does not have a travel cable there must be a jumper wire between the two Gate connections on the terminal strip inside the controller. This will be factory installed but may have come loose.

**LED light #3 is out, SAFETY CIRCUIT** - The first in the safety chain is the **slack cable**, open the bottom floor door with the emergency door lock release using a screw driver to unlock the door. (stick a small screw driver through the hole in the door and lift up on the emergency release). If the car is sitting below the level 1 door location and is on the physical stop, it is the slack cable safety switch that is triggered. To fix this you will need to move the car up in manual mode. **KEEP THE DOOR OPEN** at level 1 (this will allow the relays in the controller to act as manual up and down) move the cab up above the door opening and check that the level 1 limit switch roller wheel is 4-3/4” from the wall to the tip of the roller. If it is at 4-3/4” from the wall to the tip of the roller then confirm that the wire is still connected to all four contacts inside the switch by removing the cover with a small Phillips screw driver. If the wire has become disconnected use the wiring schematic provided in this manual to connect the wires correctly. Ensure that the wire is free from dumbwaiter movement. If all the wire connections are made and the roller is 4-3/4” from the wall the switch may have gone bad. (replace the switch) **Upper final limit switch** – if the cab is just above the top door landing **KEEP THE DOOR OPEN** at level 2 or 3 (this will allow the relays in the controller to act as manual up and down) use the down relay to lower the cab below the door level, check the level 2 or 3 (top) limit switch as explained for level 1 If all the wire connections are made and the roller is 4-3/4” from the wall the switch may have went bad. (replace the switch). The last safety switch if provided is the machine room door switch. Check that the switch is made and all wires are connected. Machine room door limit (white to white), upper final limit (white to white), Slack cable (white to red).

# Installation Manual

## Troubleshooting Notes

### **Call Send station LED light out**

The unit functions but the LED light on the call / send station does not come on the LED light is burned out

### **No Power to the AC drive**

Check the 110 Volt 10 amp fuse. If the fuse is good check the circuit breaker on the main panel for the dumbwaiter.

### **No Power to the power supply**

Check the 110 Volt 2 amp fuse.

### **Power is on to the AC drive and power supply but the dumbwaiter will not move**

Check the 24 Volt 2 amp fuse.

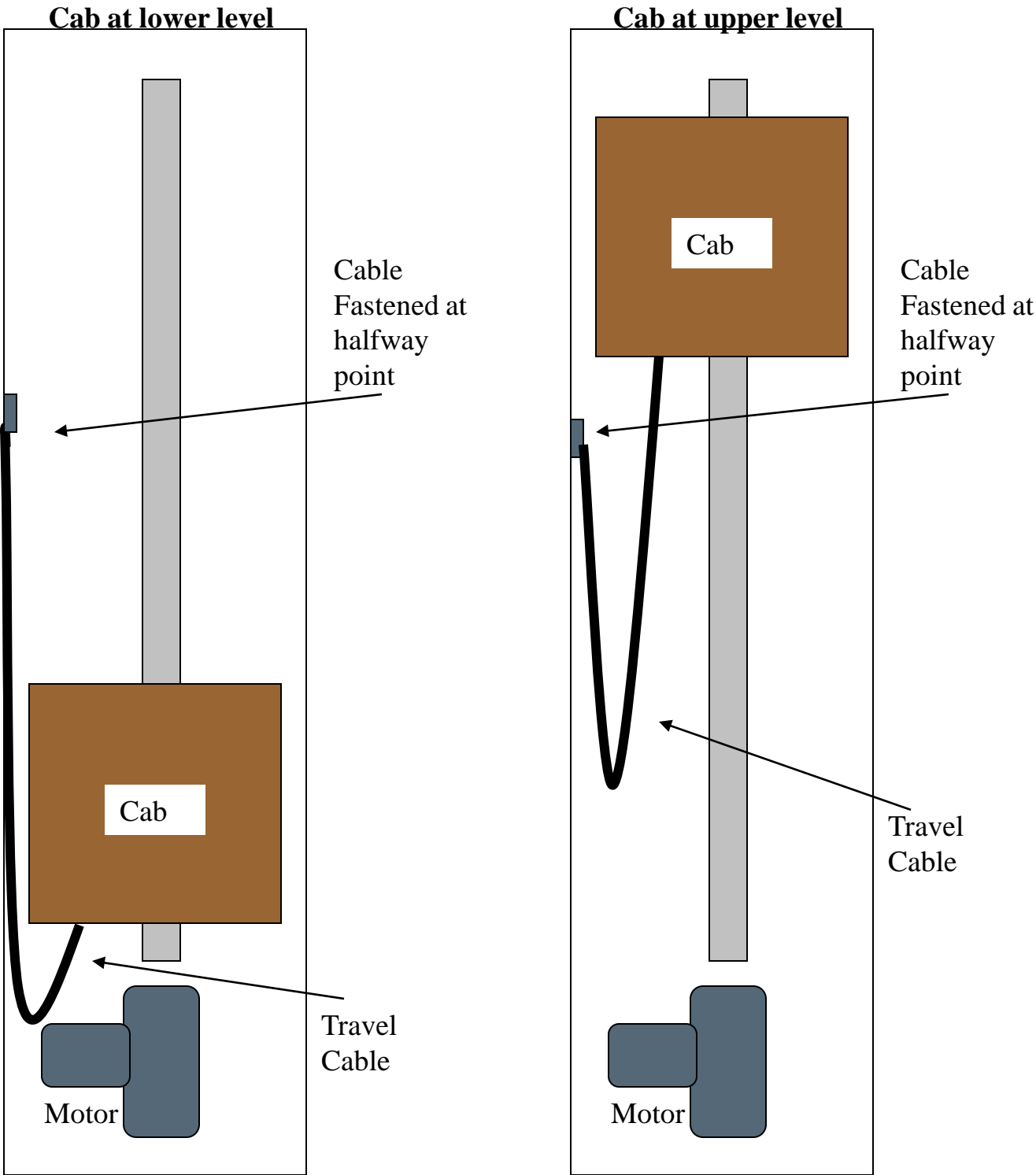
### **Parameters for the GS1 drive 60Hz**

<b>0-00</b>	<b>Voltage</b>	<b>230</b>	<b>5-01</b>	<b>70</b>
<b>0-01</b>	<b>Amps</b>	<b>2.4</b>	<b>6-00</b>	<b>0</b>
<b>0-02</b>	<b>60HZ</b>		<b>6-01</b>	<b>0</b>
<b>0-03</b>	<b>RPM</b>	<b>1620</b>	<b>6-02</b>	<b>0</b>
<b>0-04</b>	<b>RPM</b>	<b>1890</b>	<b>6-03</b>	<b>0</b>
<b>1-00</b>	<b>0</b>		<b>6-04</b>	<b>0</b>
<b>1-01</b>	<b>0.5</b>		<b>6-05</b>	<b>0</b>
<b>1-02</b>	<b>0.5</b>		<b>6-06</b>	<b>0</b>
<b>2-00</b>	<b>1</b>		<b>6-07</b>	<b>1</b>
<b>3-00</b>	<b>1</b>		<b>6-08</b>	<b>130</b>
<b>3-01</b>	<b>0</b>		<b>6-09</b>	<b>0.1</b>
<b>3-16</b>	<b>60Hz</b>		<b>6-10</b>	<b>150</b>
<b>3-17</b>	<b>2.4</b>		<b>6-11</b>	<b>150</b>
			<b>6-30</b>	<b>01</b>



# APPENDIX A

## Installation of Gate Switch and Travel Cable



## APPENDIX A Continued

The Travel cable is pre-wired at the factory to a single gang box to be installed in the hoist-way and ready to connect to the controller and the cab.

**VERY IMPORTANT:** The travel cable must be hung inside the hoist-way with an anchor point at the halfway point of the dumbwaiter travel, **ON THE LEFT SIDE OF THE RAIL IN THE CORNER OF THE HOIST-WAY.** The cable should be hung such that it avoids contact with anything. Connect it to the cab as far away from the main guide rail wall as possible so the cable has the widest possible bend in it. When the cab is on the bottom floor the cable should droop below the cab but not touch the floor.



## APPENDIX B

### Installation of EMT

Commercial dumbwaiters require control cable to be run in EMT conduit.

If your codes require complete EMT use flex from the junction box to allow for limit switch adjustment. The switch will need to be installed vertical with double sided tape and one self tapping screw as shown, **you will also need the adjustable limit roller arm provided by us to 4-3/4" from the wall to the end of the roller wheel.**



Proper installation of the EMT will insure the control cable cannot catch on any moving parts. Consult with your local inspector prior to installation to familiarize with the local codes.

# Installation Manual

## APPENDIX C

### Overhead motor and sheave

Mount motor as close to the top of the shaft as possible using the centerline on the winding drum to align with rail centerline.

#### **Double pulley for over 18' of travel**

Mount the sheave assembly the maximum distance down from the winding drum (minimum 24" from the winding drum to the first sheave wheel) for a two stop and 30" for a three stop, using the centerline on the sheave assembly to align with the hoist-way centerline.

\*\*\*With a top stabilizer roller on the cab you need a minimum of 8" of rail above the top of the cab for over travel and top physical stop.

#### **18' of travel or less overhead sheave**

Mount the unit above the track 1-2" and the right edge of the assembly is 4" left of the track center line.

