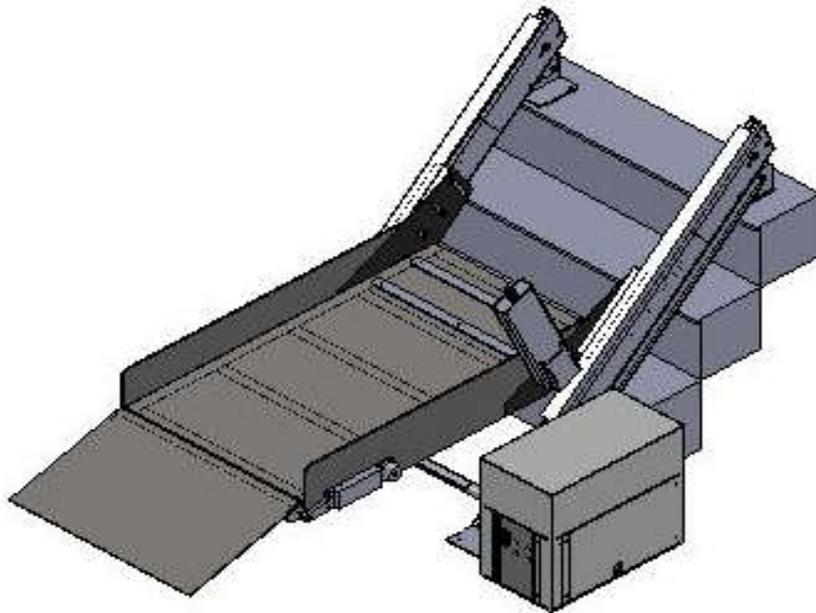


# Butler

## MOBILITY PRODUCTS

A Division of Butler Dynamics LLC



### Inclined Platform Lift Installation Instructions 500, 700, and 750 Lb Capacity Lifts

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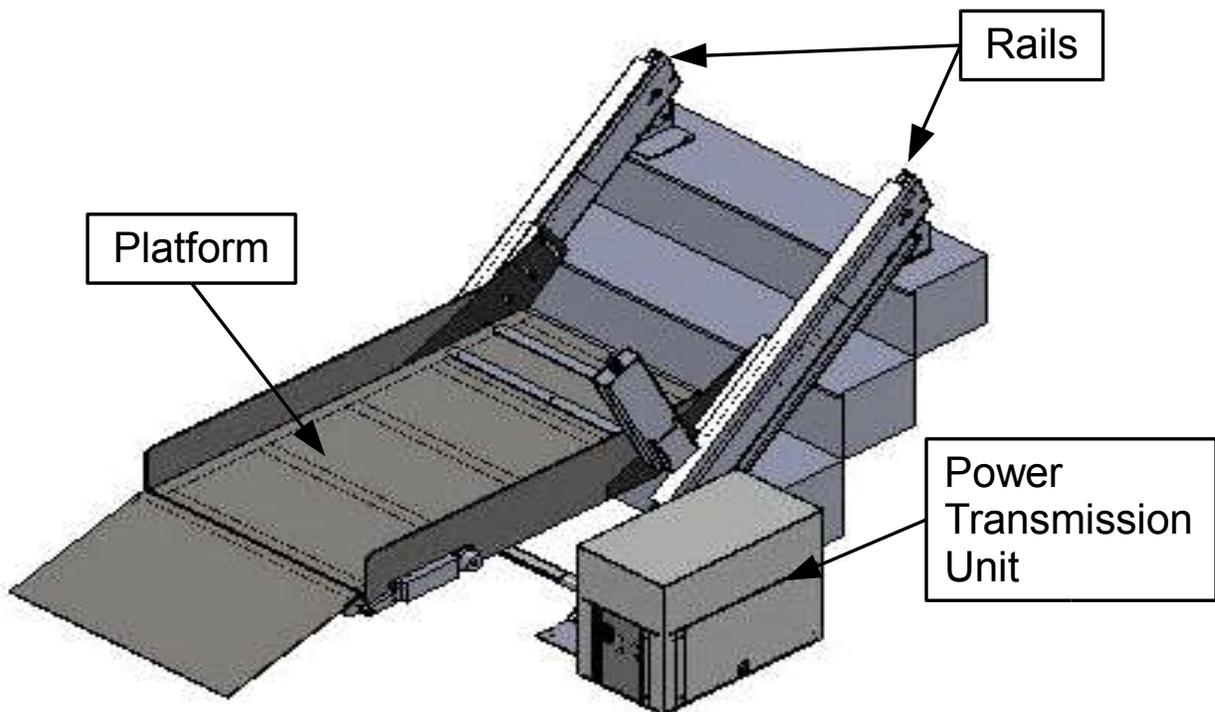
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# Butler Inclined Platform Wheelchair Lift

## Installation Guide

The Butler Inclined Platform Wheelchair Lift (IPL) is precisely manufactured to the specifications on the standard analysis form. Each unit is completely assembled, inspected, and tested to verify correct operation, insure against errors in manufacture, faulty components, or poor workmanship. After testing, the unit is dismantled and crated for shipment in five separate units: the platform, the power unit, the battery backup and two guide rails (see **Figure 1**).



**Figure 1: Overall System Assembly**

These assembly procedures should be carefully followed to ensure that the lift is correctly located, assembled, and anchored into position in relation to the stairs. The lift must be fully tested as described below before the installation can be considered complete. Please feel free to call with any questions during the installation.

The platform and guide rails are heavy and generally require two or three people to carry **each** of them. Once the platform and guide rails are in place, two people can usually complete the assembly.

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## 1. Tools Required for Installation:

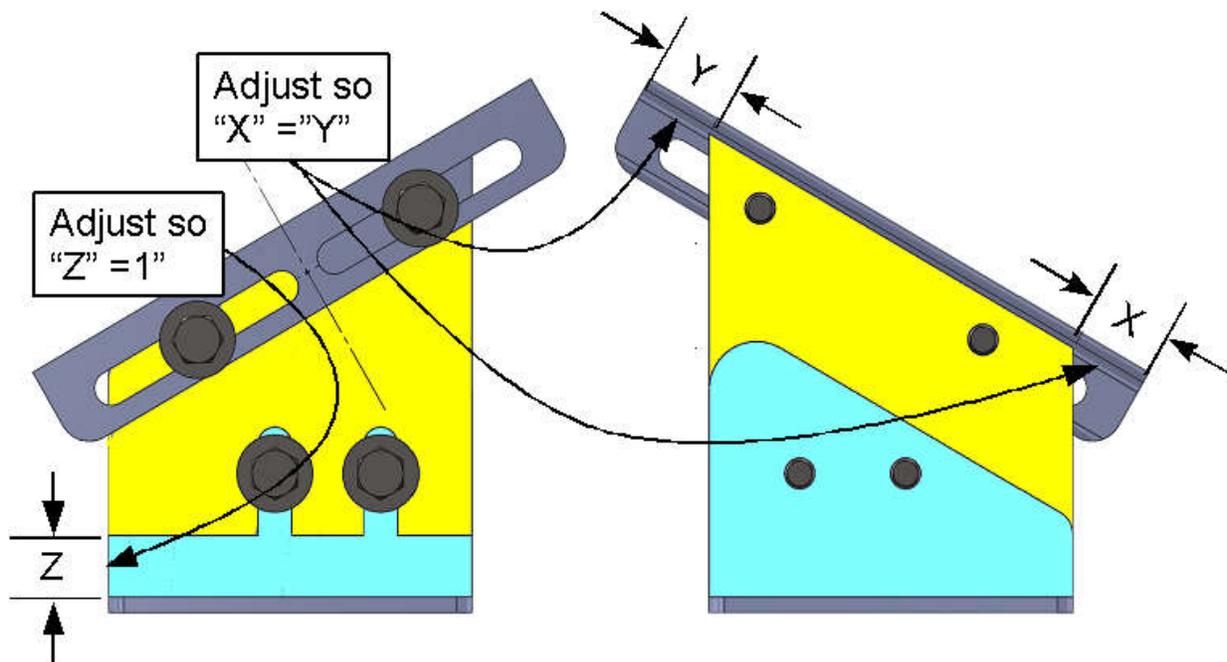
All the necessary screws, nuts, bolts, and other hardware are supplied in a parts bag packed in the power unit accessory parts box. Needed tools include:

- Medium size hammer
- Flashlight
- Electric drill and a hammer-drill if the lift will be mounted on concrete
- Box cutter or similar knife
- A sturdy pry bar for uncrating
- Voltmeter
- Concrete anchors (or Tapcon concrete screws or similar product) and a masonry bit if the lift will be mounted on concrete
- Tape measure
- Small, medium and large screw drivers
- Drift (alignment) pin
- Socket and combination wrenches (up to and including  $\frac{3}{4}$ " sizes)

## 2. Locating the Guide Rails

### A. Install the Legs

The legs and feet attach the upper end of the rail to the stairway or top landing, and are not attached to the rail for shipping. First, attach the feet to the legs with about one inch of space between the legs and foot (see **Figure 2**). Next, attach the leg to the rail. Center the leg in the mounting bracket of the rail.



**Figure 2: Leg Assembly and Adjustment**

### B. Set the Rails

Set both guide rails in approximately the correct location. A cloth or some rosin paper between the upper and lower plates and the stairs or landing will protect the surface.

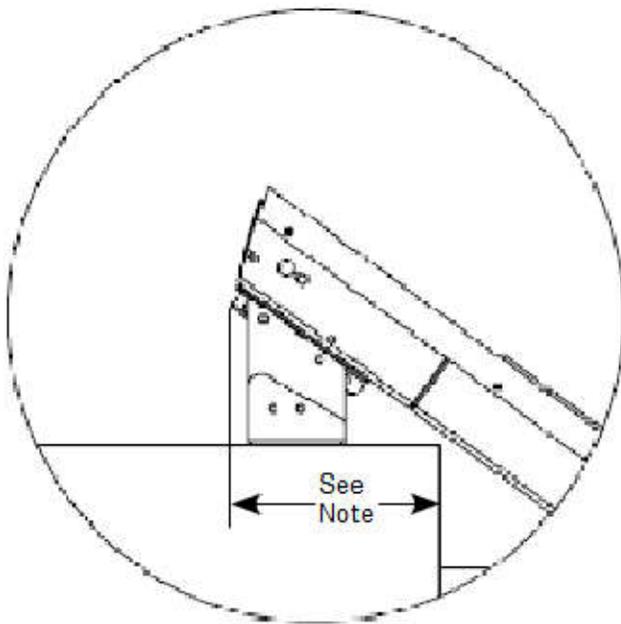
#### 1) Standard Installation:

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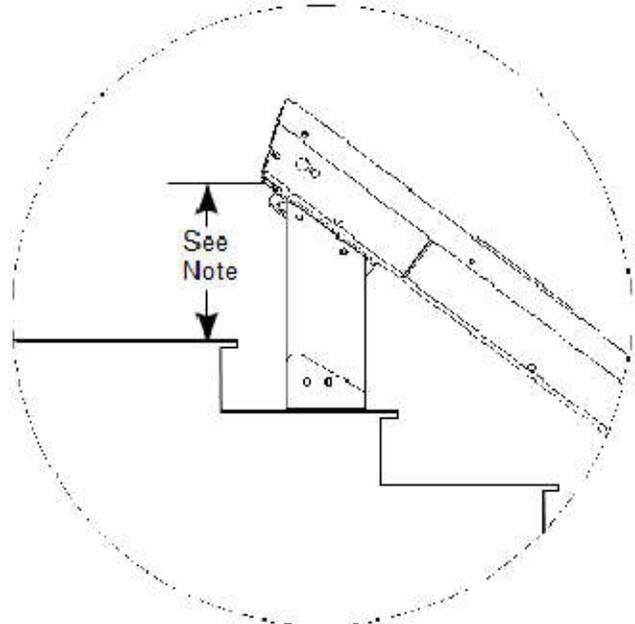
In a standard installation (see **Figure 3**), the upper base plates will sit on the top of the landing and the rails will intrude into the top landing. Please reference customer approved drawings for placement dimensions.

2) **Rails Forward Installation:**

When a doorway or other obstruction is present at the top of the stairway, the lift is built “rails forward” with the guide rails forward (away from the steps) and higher. The guide rails will be set higher above the steps than in a standard installation and come to within one-half inch of the top landing. The upper base plates will rest on the first step, not on the top landing. Please reference approved customer drawings for height dimension.



Standard Installation



Rails Forward Installation

NOTE: Dimensions vary between installations. Refer to approved customer drawings for dimensions.

**Figure 3: Standard vs. Rails Forward Installation**

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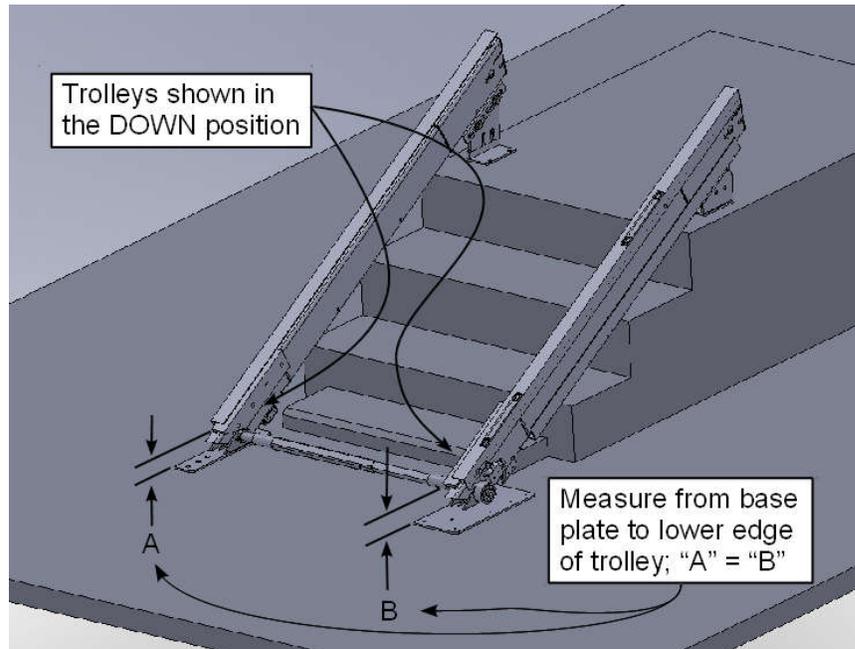
### 3. Installing the Telescoping Drive Shaft Coupling

#### A. Position the Trolleys

Move the trolleys (**Figure 4**) to the bottom of the guide rails before installing the telescoping drive shaft between the rails.

Position the trolleys by measuring from the end of the guide rails to a point on the trolleys as illustrated by dimensions “A” and “B” of **Figure 4**. *Tip:* positioning the trolleys so that the pin holes on each guide rail drive shaft and coupling are facing up makes it easier to align the holes and drive in the split pins.

Note: even if the pin holes on the shaft and coupling are lined up, it *IS* possible to connect them half a turn out of alignment. Use the marks placed on the telescoping drive shafts at the factory to align the left and right halves of the shaft correctly.



**Figure 4: Trolley Alignment**

#### B. Install the Drive Shaft

Push the ends of the drive shaft coupling together so it will clear the guide rail drive shafts extending from each rail.

Place the drive shaft coupling between the drive shafts and extend it so that each end socket of the coupling slides over the drive shafts extending from the guide rails.

Align the two sets of holes in the drive shaft coupling with the two sets of holes in the drive shafts. The coupling should line up with the shafts and slide on fairly easily. If this is not the case, rotate one of the guide rails a little until the shaft lines up with the socket of the coupling. (A small amount of lubricant placed on the drive shafts will allow the coupling to slide on more easily.)

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Check that each of the trolleys is the same distance from the end of the rail, as it is easy to get one shaft half-a-rotation off from the other.

Drive two pins into each end of the coupling with a hammer. (**CAUTION:** Do not attempt to operate with fewer than two pins in each side of the coupling.)

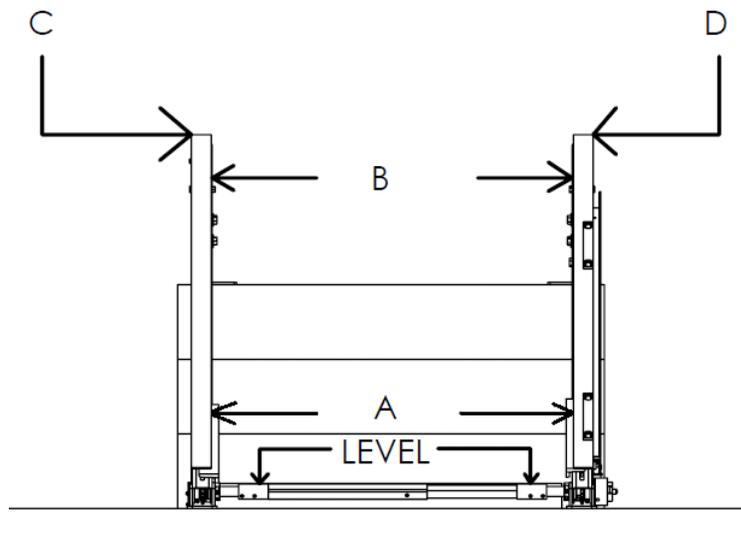
Next, align the hole in the center of the coupling by spreading or closing the distance between the guide rails. When the hole is aligned, install the pin furnished. This will set the proper distance between the guide rails at the lower end.

### C. Verify Rail Placement

Verify that the left-right placement of the rails is correct. Measure the distance between the two guide rails directly above the drive shafts and coupling and set the spacing of the two rails at the top landing to the same distance (dimensions A and B in **Figure 5**).

Use shims under the feet and adjust the legs as required to make the rails parallel and level to each other (C should be level with D in **Figure 5**). Place a level on the axle and shim the feet as needed to make the axle level.

**Note:** The final spacing between the rails will be set when the platform runs to the top of the lift. **DO NOT ATTACH TO THE FLOOR AT HIS TIME.**



**Figure 5: Rail Alignment**

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#### 4. Connecting the Slack/Broken Chain and Lower Limit Switches

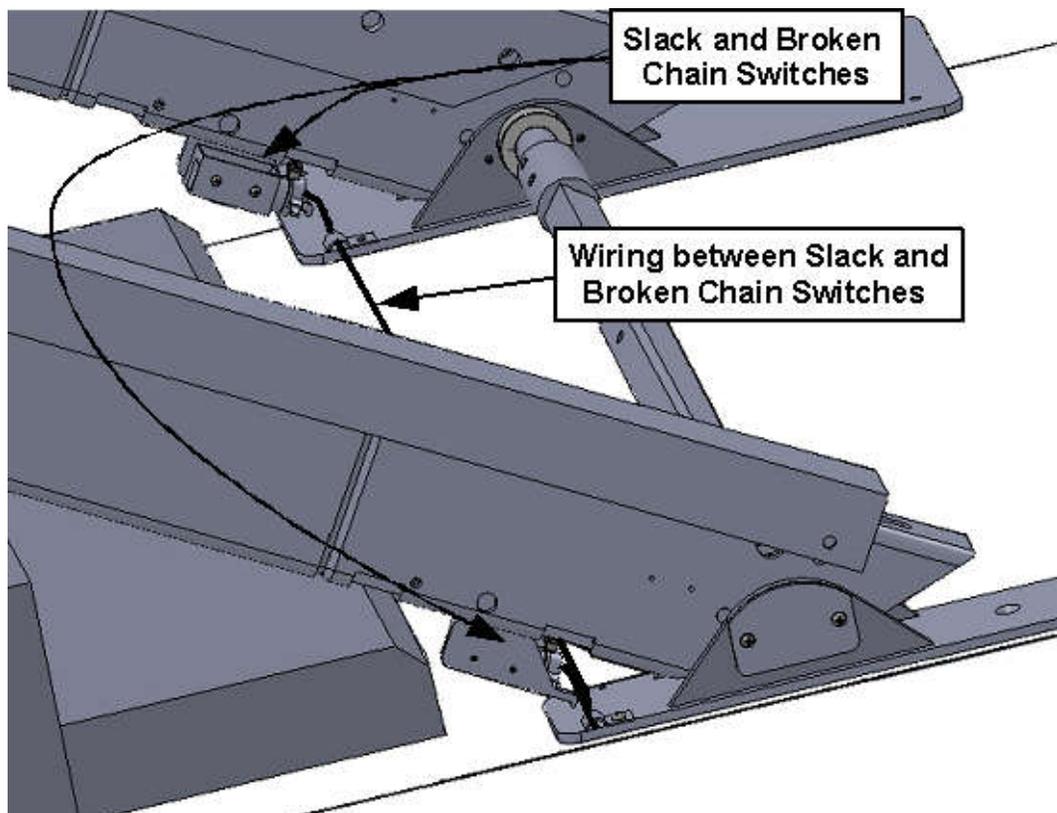
The Slack/Broken Chain Switches and Lower Limit Switch share a four-pin circular connector that plugs into the power unit.

##### A. Slack/Broken Chain Switches

The slack/broken chain switches are the two smaller switches (one switch for each rail) attached to one common cable. Run this cable under the guide rail on the motor side and attach the switches to the rails (**Figure 6**), making sure that the arm of the switches fall into the cutouts under the guide rails as illustrated (see **Figure 7**). Tighten the screws into the pre-drilled and tapped holes in the mounting tabs on the underside of the guide rail. Over-tightening the screws can damage the switches. Secure the cable to the feet with the clips provided.

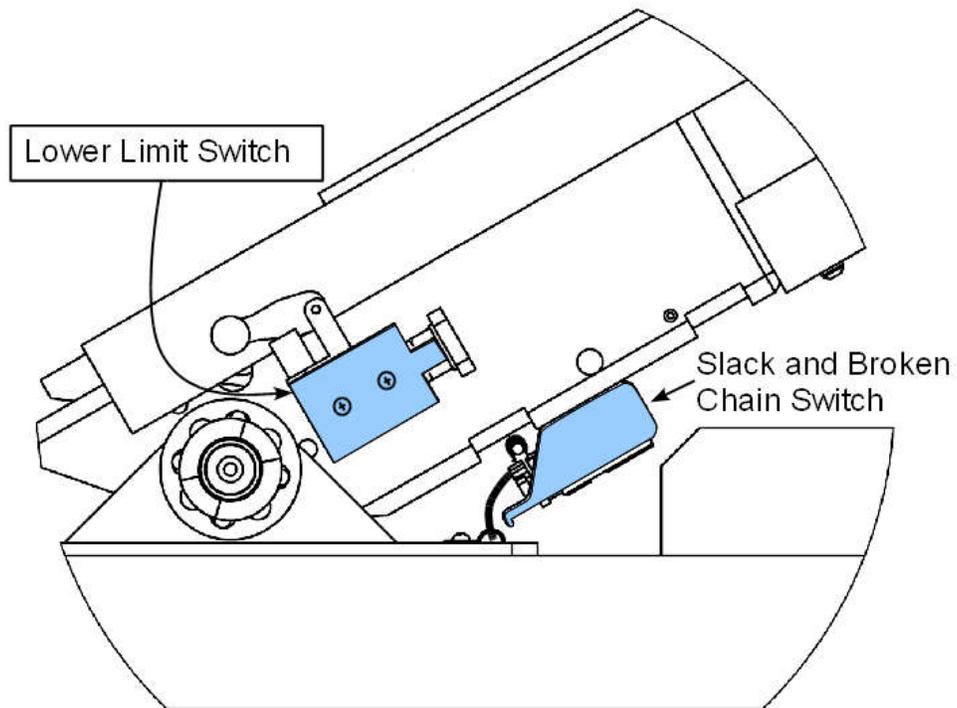
##### B. Lower Limit Switch

The lower limit switch is the largest of the three switches. Attach the switch to the side of the rail near the drive shaft on the side nearest the power unit (see **Figure 7**). Use the pre-drilled and tapped mounting holes provided and tighten the screws. Over-tightening the screws can damage the switch.

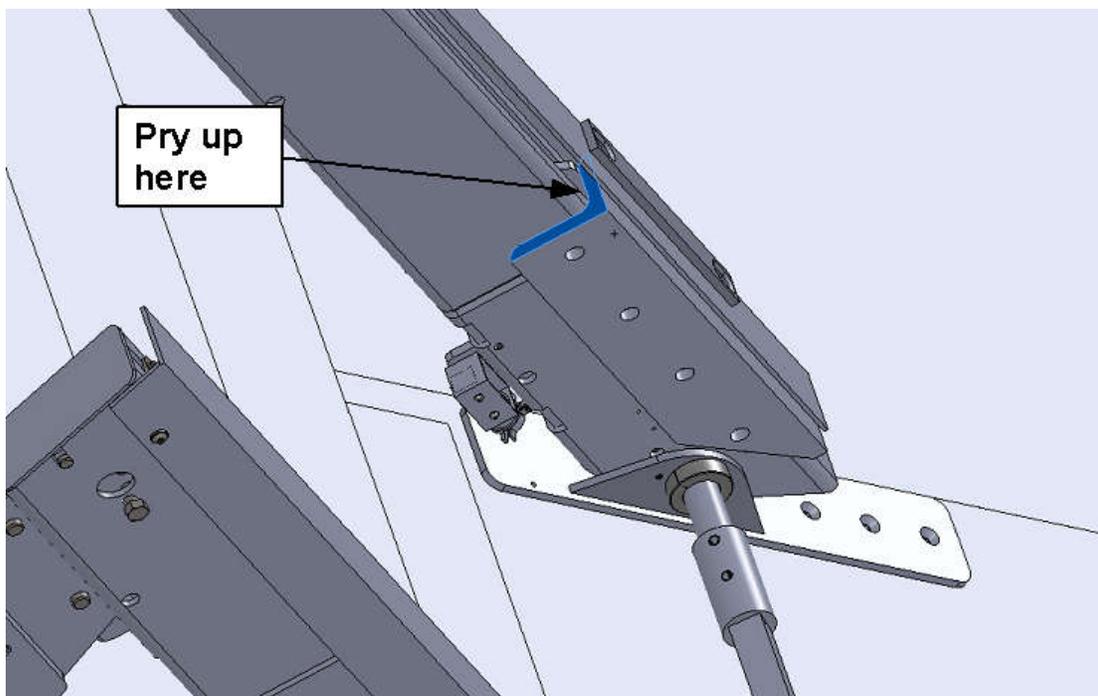


**Figure 6: Slack and Broken Chain Switch Wiring**

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**Figure 7: Lower Limit and Slack and Broken Chain Switches**



**Figure 8: Trolley mount detail**

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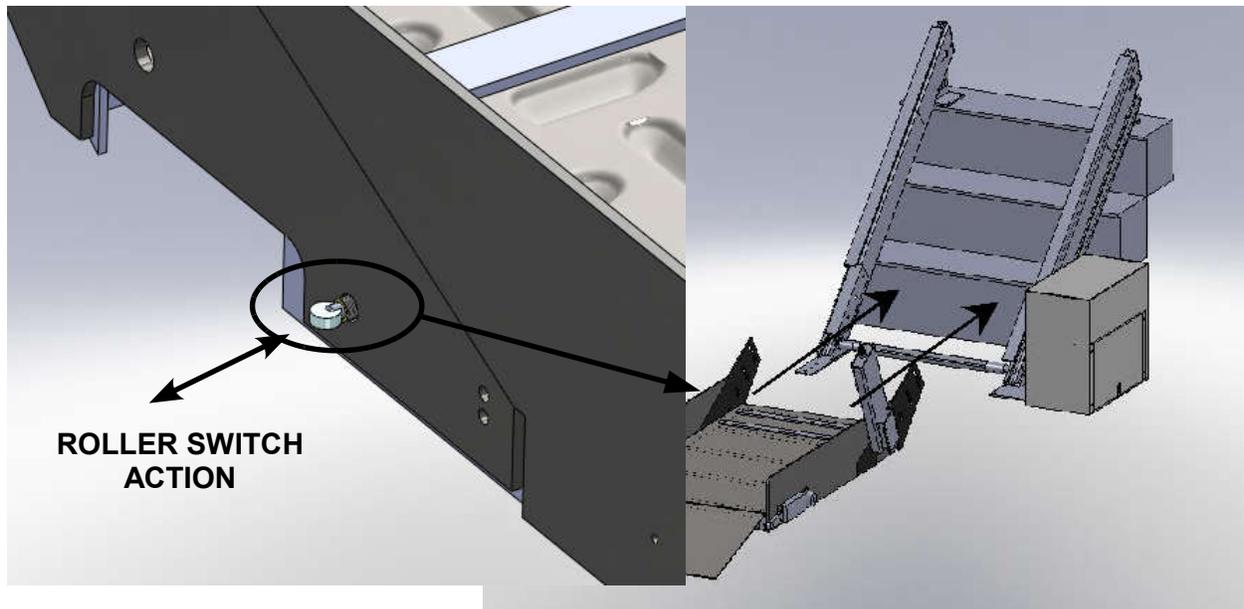
## 5. Mounting the Platform

**CAUTION:** Platforms with the optional Folding Ramp and Guard have a small roller switch on the opposite side of the platform from the power unit (see **Figure 9**). **Be very careful not to damage this switch when mounting the platform.**

Carefully set the platform into position between the two guide rails (see **Figure 9**). Align the four holes on the angle plate bracket located on each side of the platform with the four holes on the side of each trolley, and then install the four hex-key (Allen wrench) button head cap screws on each side. A drift or alignment pin might be helpful. Prying the front or back of the platform with a pry bar may help with aligning the holes.

**Caution:** Be careful not to damage the safety apron on the bottom of the platform or the safety bars at the front and rear of the platform.

Insert a pry bar or large screwdriver between the rail and the trolley at the top of the trolley (see **Figure 8**). Tighten the four button head cap screws while prying the trolley away from the rail. This will preload the trolley bearings into position and prevent platform sag when in use.



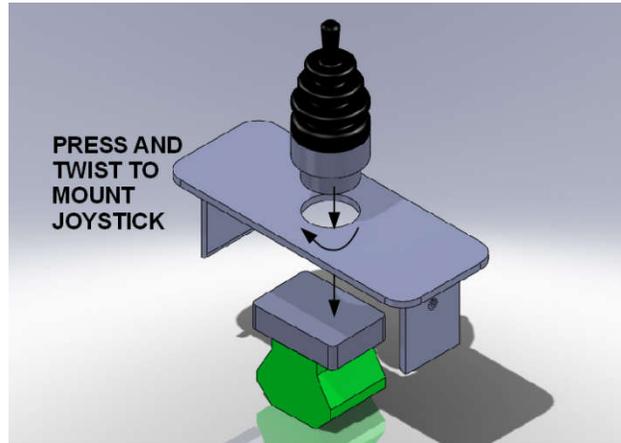
**Figure 9: Platform Installation**

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## 6. Electrical Connections

### A. Install the joystick

Remove the end cap from the control tube. Separate the joystick into two pieces by pushing the terminal block and handle together and twisting counterclockwise. Insert the handle through the end cap and re-attach the terminal block end by pushing together and twisting clockwise (see **Figure 10**). Tighten the two screws in the metal mounting base of the terminal block to secure the joystick to the end cap.

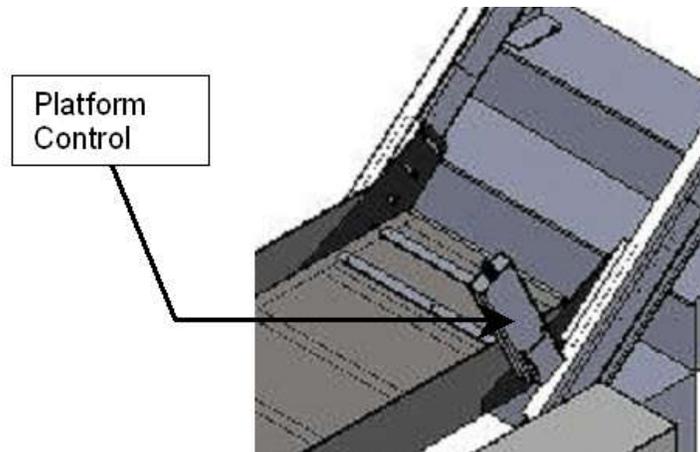


**Figure 10: Joystick Assembly**

### B. Connect the follow cable

Locate the follow cable, which is attached to a protective “link conduit”, on the power unit side of the guide rail. Feed the RJ-45 plug through the right-angle conduit adapter and mate the plug with the receptacle in the control tube. Attach the cable bracket to the base of the control tube by screwing two 10-32 round head screws and lock washers into the drilled and tapped holes.

Re-attach the platform control switch to the platform control tube.



**Figure 11: Platform Control**

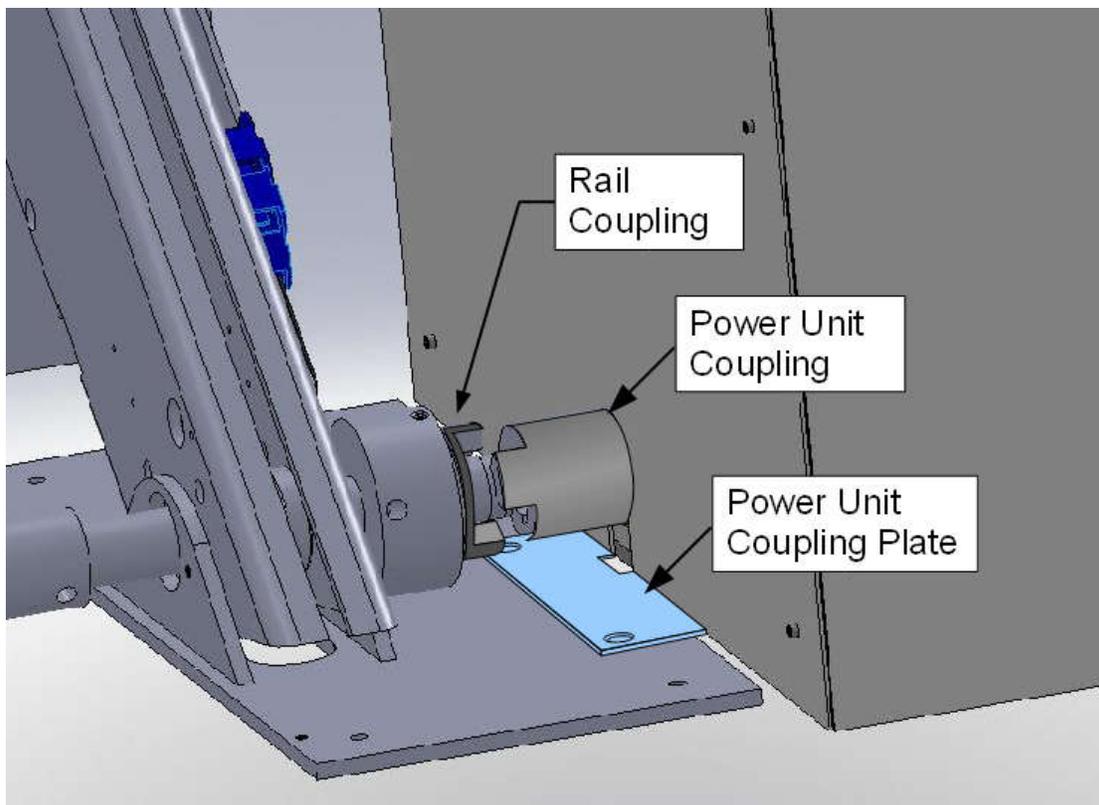
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## 7. Installing the Power Unit

### A. Rail and Power Unit Coupling

The power unit coupling corresponds to the rail coupling on the drive shaft extending from the guide rail as shown in **Figure 12**. The teeth need to be aligned before the couplings may be mated together; this is easily done with the ratcheting feature of the rail coupling.

- 1) Simply turn the rail coupling in the ratcheting direction (counterclockwise for right-hand drive, clockwise for left-hand drives) to align the two teeth of the rail coupling with the power unit coupling teeth.
- 2) Line up the coupling on the power unit with the coupling on the drive shaft and push the power unit toward the rail until they mate up (see **Figure 12**). Be careful not to move the guide rails. Do not anchor the power unit to the floor until Section 9.
- 3) Place a small level between the two couplings after they are mated. Make sure that the two couplings are as close to alignment and as level as possible. Shim the power unit and/or the rails as needed if the couplings are not aligned or level.
- 4) Attach the coupling plate from the power unit to the mounting foot with the provided 3/8-16 bolts and lock washers



**Figure 12: Power Unit Alignment**

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## B. Connecting the Cables

Three cables connect to the power unit with circular plastic connectors; the guide rail, slack/broken chain and lower limit switch, and lower call-send cable. Each connector is unique and cannot mate to the wrong location.

- 1) The slack/broken chain and lower limit switches are wired into the same four-pin circular connector. Insert the connector into the lower left jack (J1 on Figure 13). Rotate the body of the connector until it matches the receptacle, then plug it in and turn the coupling ring clockwise approximately one turn (until you feel a “click”) to complete the mating.
- 2) The lower call-send switch (Figure 14) connects through a seven-pin connector (J3 on Figure 13). Insert the connector into the lower right jack. Rotate the body of the connector until it matches the receptacle, then plug it in and turn the coupling ring clockwise approximately one turn (until you feel a “click”) to complete the mating.
- 3) The guide rail cable also carries the upper call-send switch (Figure 14) and platform controls/follow cable. It exits the rail near the foot and connects through a 14-pin connector (J2 on Figure 13). Insert the connector into the upper center jack. Rotate the body of the connector until it matches the receptacle, then plug it in and turn the coupling ring clockwise approximately one turn (until you feel a “click”) to complete the mating.

## C. Switch Installation

- 1) Mount the upper call-send station (Figure 14) at a location convenient to the top of the lift and from where all lift operation is visible.
- 2) Mount the lower call-send station (Figure 14) at a location convenient to the bottom of the lift and from where all operation is visible.

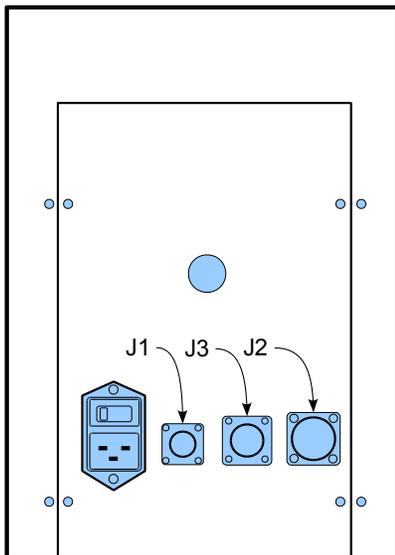


Figure 13: Power Unit Connector Locations

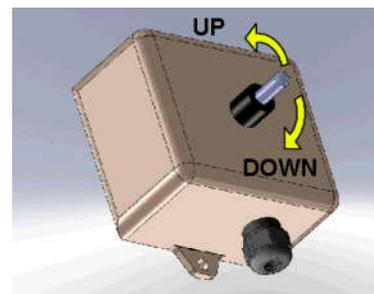


Figure 14: Upper and Lower Call Station

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## 8. Adjustments, Testing, and Final Check

**Note:** In this step, if the rails are not the correct distance apart, the platform will pull on the rails and correct the distance between them as it approaches the top landing, and the upper base plates may scratch wooden stairs or landings. A cloth or some rosin paper between the plates and the stairs or landing will protect the surface.

### A. Initial Checks

Plug the power unit into the battery back up (UPS) and connect the cord from the UPS into a **Dedicated** outlet. (see section 8C for the proper UPS installation.) Turn on the lift using the rocker switch on the power unit next to the power connection. Cautiously operate the lift. Verify the following:

- 1) Correct travel direction with the joystick and lower call station.
- 2) Step clearance – Run the platform a short distance up and down, making sure it misses the nose of the step. Adjust per Section B1 if it does.
- 3) Ramp: Set the platform at the bottom position with the ramp on the floor. Step onto the platform to access the joystick. Hold the forward ramp down with your foot to prevent ramp from folding as the ramp starts to move. The platform should stop when the side roller clears the actuator. The folding ramp must be released to resume travel.
- 4) Press on the rear bar switch – upward travel should be stopped and prevented. The rear bar switch and travel control (joystick or call station switch) must be released before travel is resumed.
- 5) Raise the platform, reach underneath the platform, and press on the apron switch – downward travel should be stopped and prevented. The apron switch and travel control (joystick or call station switch) must be released before travel is resumed.
- 6) Magnetic sensor: return the platform to the bottom. Press on the lower limit switch (if not engaged), release the switch, run the platform up about one foot, and back down. The platform should slow as it approaches the bottom.
- 7) Upper Limit: Ride the platform to the upper landing while making sure it misses the nose of each step. The platform should slow as it approaches the top, and be barely moving as it stops. Adjust per Section B1 and B2 as needed to stop level and within ½ inch of the top landing.
- 8) Reach inside the rail end and depress the right-hand roller switch (upper over travel). Push in the platform Emergency Stop, then press and hold the upper call down switch (approximately 10 seconds) while holding the over-travel switch. The platform should move down slowly and stop when either switch is released. It will not travel for more than one second. Twist the Emergency Stop out and ride the platform down.
- 9) Multiple travel controls: the platform should stop if a second travel control is actuated. All controls must be released before travel may resume.

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## B. Adjustments

The platform should stop level and within one half inch of the top landing.

### 1) Stair Clearance

If the platform should touch a step on the way up, the safety bar at the rear of the platform will be pushed in and the bar switch will stop the lift.

- Pull the entire lift away from the steps. Several inches of lateral adjustment are available where the top mounting brackets attach to the rail.
- Raise the rails a little at the top by loosening the two bolts at **Figure 2** and raise or lower the rails. **Caution: changing this height can change the angle of the platform!** Be sure that both rails are exactly same height and angle.

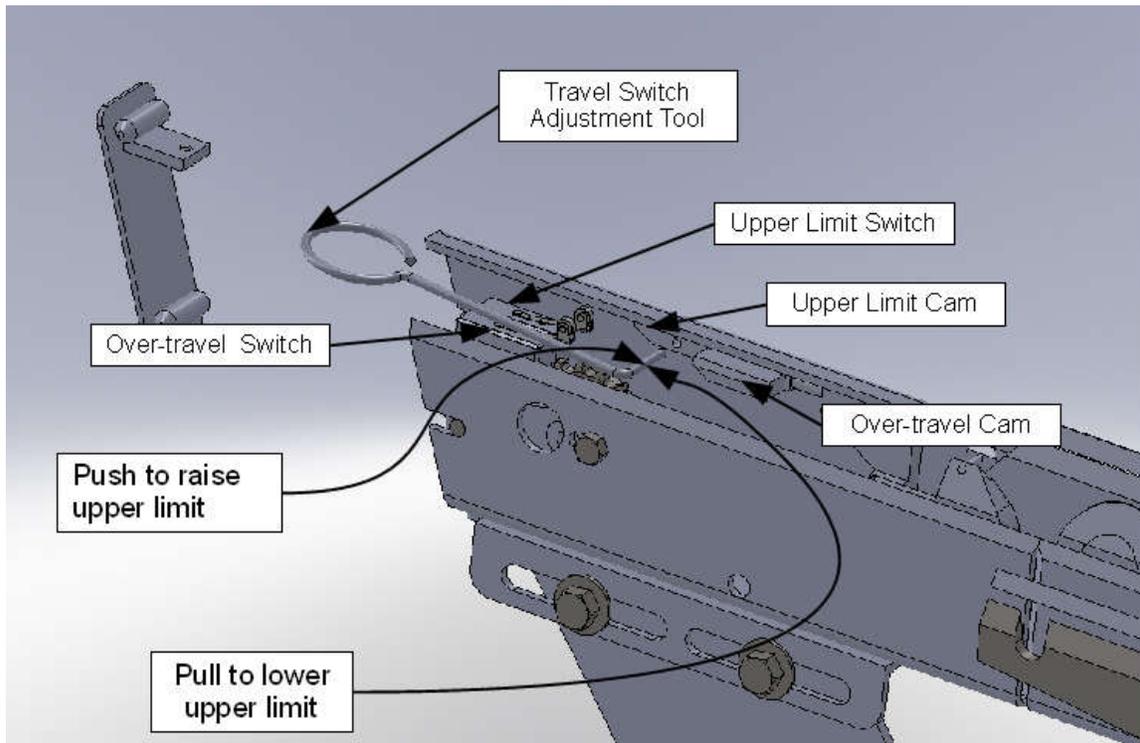
### 2) Upper Limit Adjustment

When the platform reaches the **top landing**, it should stop exactly level with the top landing. The height at which it stops is controlled by the **upper limit switch**. The upper limit switch and the over travel (safety) switch are located at the top of the rail on the motor side, under a cover. See **Figure 15**.

The device that actuates the top limit and over travel switches is called a cam. It is located on the trolley inside the rail on same side as the power unit and held in place by spring tension and friction. DO NOT rotate the cam when adjusting.

- If the platform stops below the level of the landing, push the cam downward (toward the bottom of the stairs) This will make the platform run a little higher before the cam actuates the switch.
- If the platform stops above the landing level, pull the cam upward (toward the top of the stairs) to stop the platform level with the top landing. This will make the cam contact the switch a little sooner.
- It is better to adjust this in several small increments rather than trying to do it in a single step.
- If correct positioning cannot be achieved with the cam, the micro switches located in the top of the guide rail on the power unit side may also be adjusted forward or backward to obtain the proper stopping position.

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**Figure 15: Upper Limit and Over Travel Switches**

### 3) Lower Limit Switch Adjustment

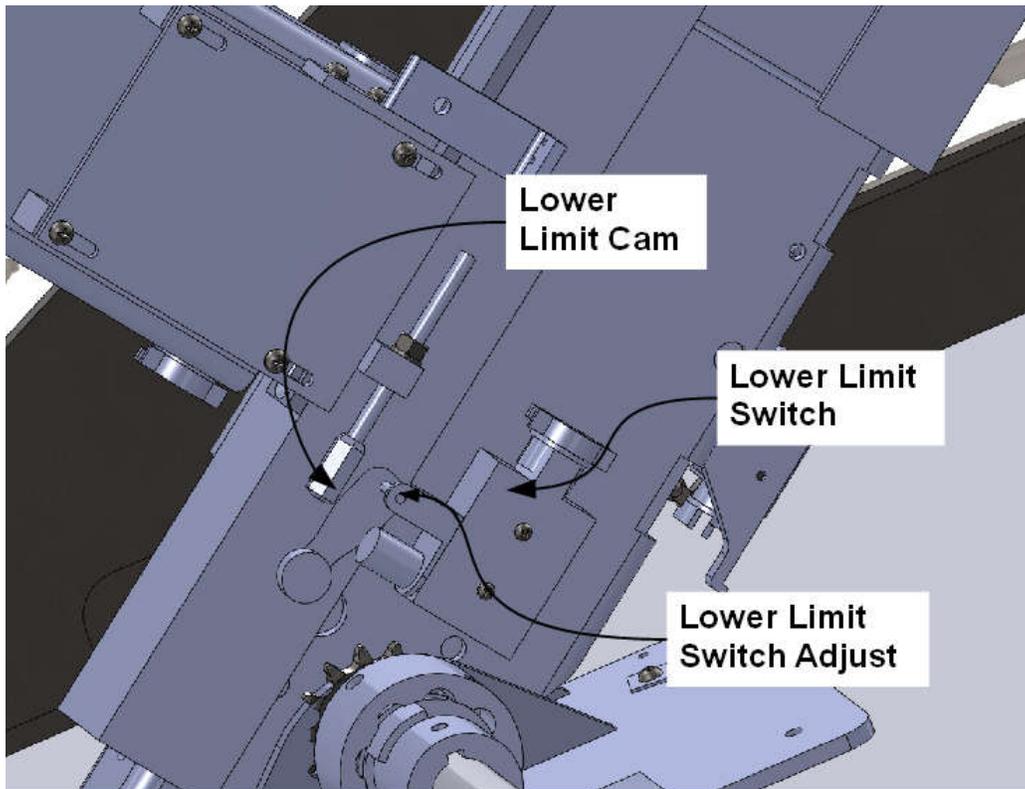
After the top position has been set, run the platform to the bottom and check the setting of the lower limit switch. A limit switch cam attached to a threaded rod, mounted on the side of the platform at the bottom of the platform control tube, actuates the lower limit switch (Figure 16). If the lower limit switch fails to actuate or is out of adjustment, the platform will then contact the floor and either the apron switch or the ratcheting safety clutch will prevent damage to the platform.

The gradual deceleration triggered by the magnetic sensor allows the platform to be moving very slowly when it stops, so the lower limit adjustment is critical to a gentle stop. Adjust the lower limit switch cam if the platform hits the floor too hard or stops above the floor:

- To stop the platform sooner (higher), adjust the lower limit switch cam away from the stairs.
- To allow the platform to travel lower, adjust the lower limit switch cam back toward the stairs.

Adjust the lower limit switch if the cam does not meet the cam – loosen the bolt (marked as “Lower Limit Switch Adjust” in **Figure 16**) and rotate the arm so it meets the cam. Tighten the bolt and verify operation.

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**Figure 16: Lower Limit Switch and Cam**

**4) General Check:**

After adjusting the limit switches, run the unit up and down several times, checking to make sure that the platform stops at the right place at top and bottom, does not contact any stairs, that the trolleys are not rubbing the rails and the unit is running freely. Test the platform Emergency stop button to make sure it stops the platform while ascending and descending, and that pulling the button out permits the platform to run again.

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### C. Battery Backup

The UPS (uninterruptible power supply) provides temporary operating power to the lift during periods of power loss and line voltage regulation during periods of high or low voltage. It also has power, overload, and battery status indicators.

Butler Mobility's Power Transmission Unit and UPS (battery backup) have been subjected to rigorous testing and certified as a system. Warnings in the Triplite manual about using the battery backup with a motor are not applicable because the AC drive controls the current drawn by the motor and the UPS is not subjected to the typical high starting current draw of the motor.

Plug the UPS DIRECTLY into a **Dedicated** 120V outlet (a circuit breaker wired with only one outlet). Do NOT use an extension cord. Do NOT use a GFI circuit or outlet.

The UPS will go through a self-check when plugged in. Press and hold the ON/OFF button to select the UPS mode if the Line power LED is flashing.

Contact the factory if the red battery charge indicator is on for more than 12 hours.

**Test UPS operation ONLY BY OPENING THE BREAKER DEDICATED TO THE LIFT – unplugging the UPS will result in an ungrounded lift and possible damage to the UPS and lift.**

INDICATOR / SWITCH	FUNCTION OR DESCRIPTION
	MODE button - Press and hold for approximately two seconds if Line Power LED is flashing to select the UPS mode.
	Line Power – Green for normal UPS mode, flashing when in “Charge only mode” to indicate no backup available
	Voltage regulation – on if UPS is correcting for high or low line voltage
	Overload – RED light for overload while on battery power
	Battery Power – YELLOW when on battery power
	Battery Charge – RED for low charge
	Horn (alarm) – press to cancel alarm

## 9. Secure the Lift to the Stairs and Floor

Once the unit is running smoothly, you are ready to fasten the unit down.

Install the provided anchor screws into the floor through the holes of the bottom base plate on each guide rail. Next, secure the power unit, by installing the anchor screws through the base of the power unit and into the floor. Use the inserts provided or other means of mounting if on concrete.

To fasten the upper base plates, run the platform up to the top landing. Make sure that the pads on the bottom of the upper base plates are lying flat. To adjust these pads, lower the platform to the bottom of the stairs to take the weight off the rails at the top. Support the rail, then loosen the two bolts at **Figure 2** just enough to permit each upper base plate to move and find its position on the landing level. Tighten them when you are done. **Run the platform to the top again to make sure it does not touch any steps.**

Secure the base plates to the top landing (or top step) with the provided anchor screws. Use the inserts provided or other means of mounting if on concrete.

Install the wood filler strip (furnished with unit) between the back edge of the platform and lower step. This wood filler can be fastened to the floor with screws through the pre-drilled holes.

**The lift is now ready for operation.**

We at Butler Mobility thank you for installing our Inclined Platform Wheelchair Lift. We hope the installation went smoothly... we are always available if you have questions or problems.

Butler Mobility Products,  
A Division of Butler Dynamics LLC  
629 Lowther Road, Lewisberry, PA 17339  
717-938-4253; 717-938-4238 (fax); [www.butlermobility.com](http://www.butlermobility.com)

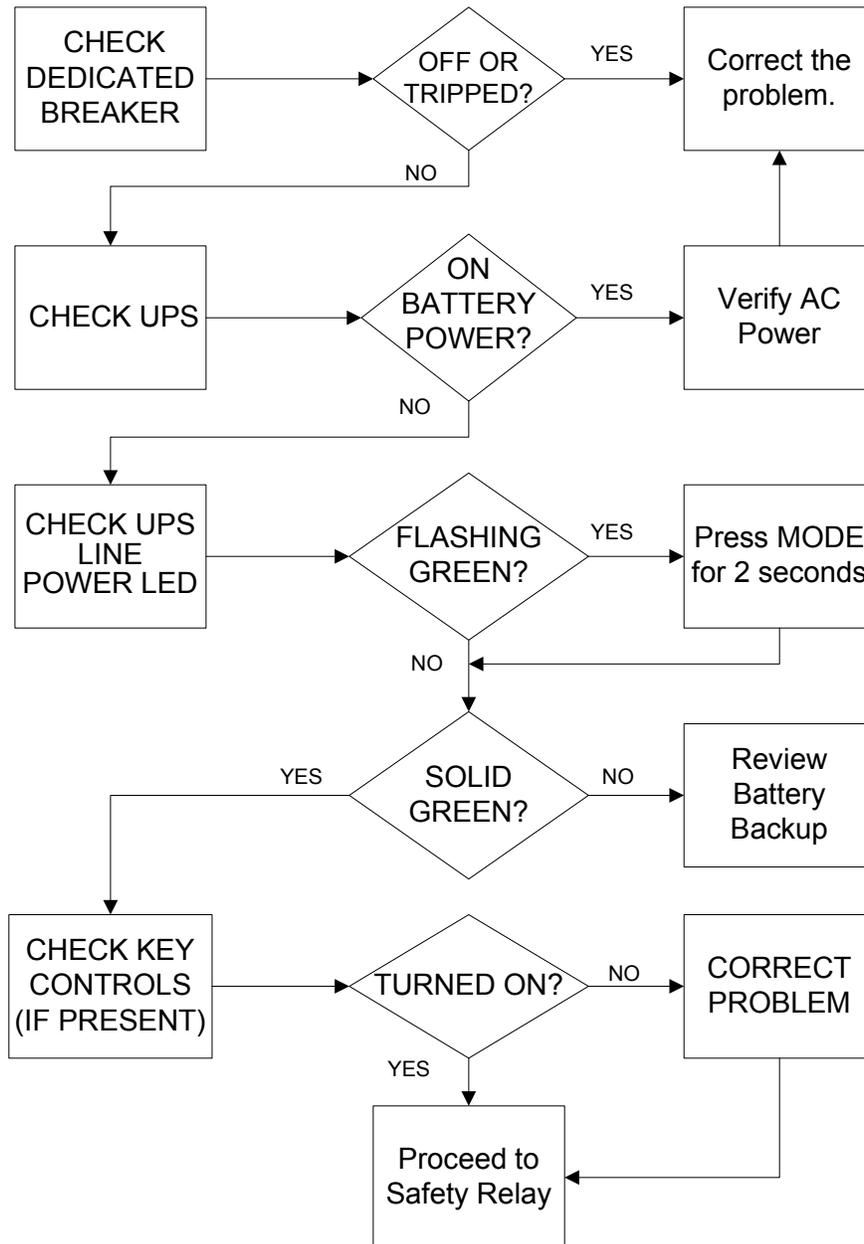
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## 10. Basic Troubleshooting

Note: voltage measurements such as “0 V” and “24 V” are made by securing the voltmeter negative lead at lower TB9 (the 24 V power supply ground), or a point connected to it, such as the range of lower terminal blocks TB6 to TB10. Place the voltmeter positive lead on the screw terminal at the point to be measured. Reference **Figure 20** for component locations.

### A. Check the following if the lift fails to operate:

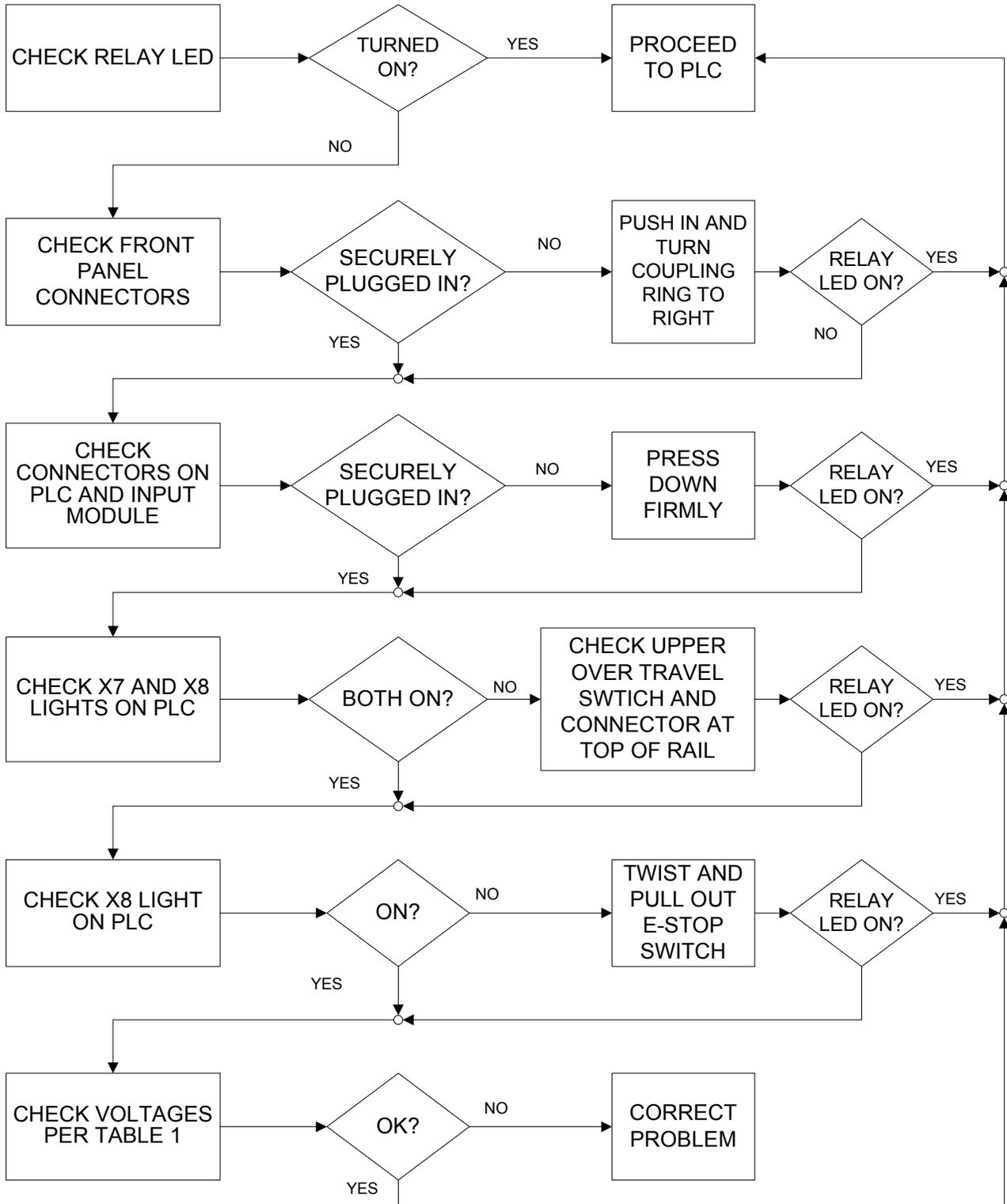
- 1) Power: check the power with Figure 17.



**Figure 17: Power Checks**

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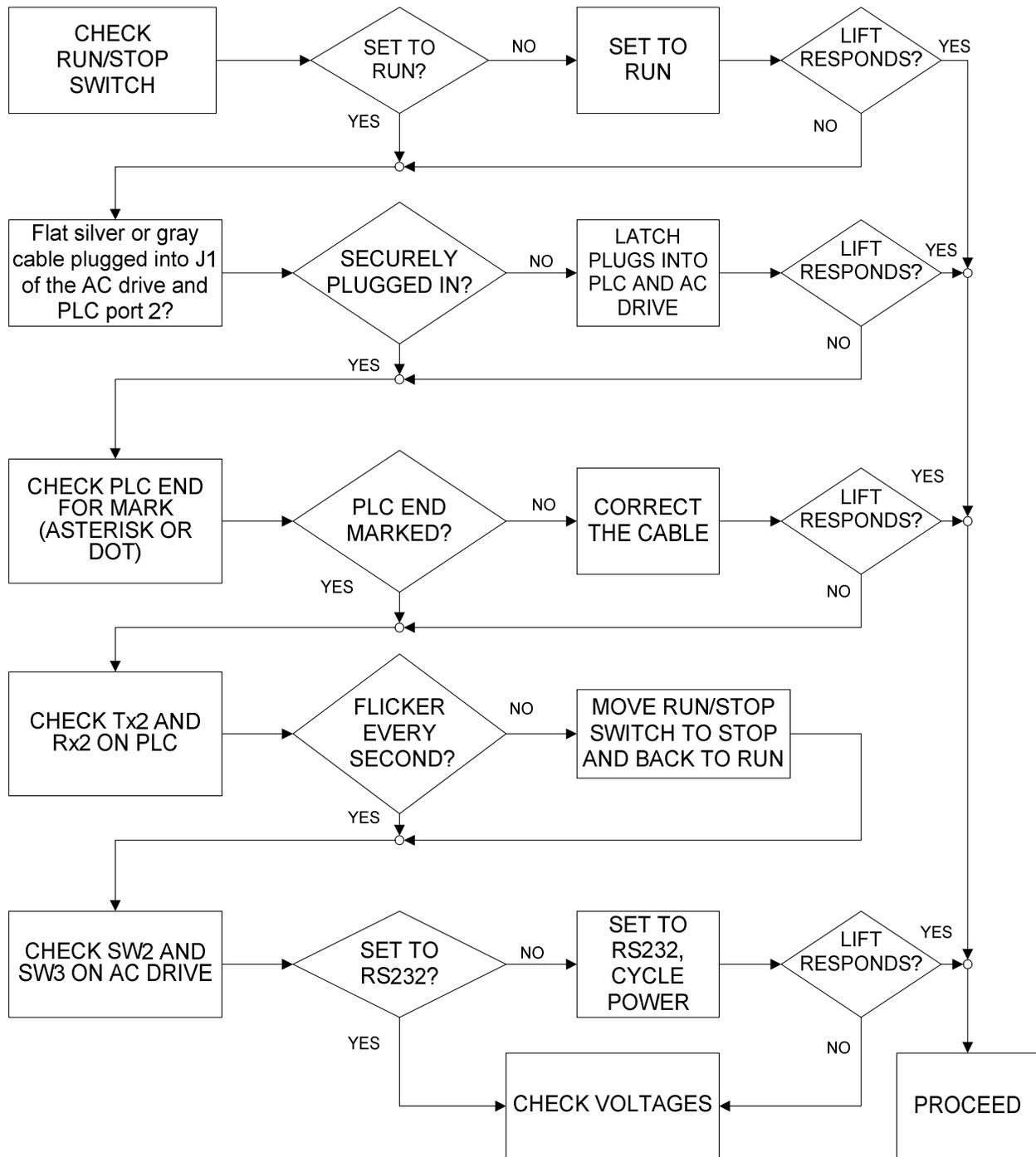
2) Safety Relay: Is the LED on the relay lit? If not, proceed with Figure 18. Otherwise, proceed to check the PLC.



**Figure 18: Safety Relay Checks**

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3) Programmable Logic Control: If the safety relay is lit but the lift is not responsive, proceed with the flow chart of Figure 19.



**Figure 19: PLC and AC Drive Troubleshooting**

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4) General troubleshooting tips and operation notes:

- Slack and broken chain switches share the J1 connector with the lower limit switch. If one is not working, the other may not.
- PLC power up and change from STOP to RUN: the PLC Y6 lamp should flash quickly for about 3 seconds, then the Tx2 and Rx2 lamps will flicker for about ¼ of a second before a brief flicker once per second, and the Y6 lamp will be on steadily.
- The PLC's Y6 lamp will flash slowly (once per second) if the E-Stop or upper over travel switch is opened.

**Table 1: Safety Relay Test**

Component	Test point	Voltage	Condition
Power supply	Relay term A1	24 V	Normal operation
Safety relay, Slack Chain switch	Relay term A2	0 V	E-stop out, slack chain and over travel closed.
E-Stop Switch	PLC input X8	0 V	E-stop switch pulled out
Over-travel switch	PLC input X7	0 V	E-stop out, over travel closed

**Table 2: PLC Indicator Status**

Indicator	Normal Status	Condition
Power	ON	Power present
Run	ON	Program running. Run/stop must be in RUN position
ERR	OFF	Call for help if lit
Tx2, Rx2	Flickering	Communicating with AC drive

*Note:* the ERR indicator may appear to be dimly lit, but this is actually some light spilling over from the RUN lamp. If lit or flashing, it will be as bright as the PWR lamp.

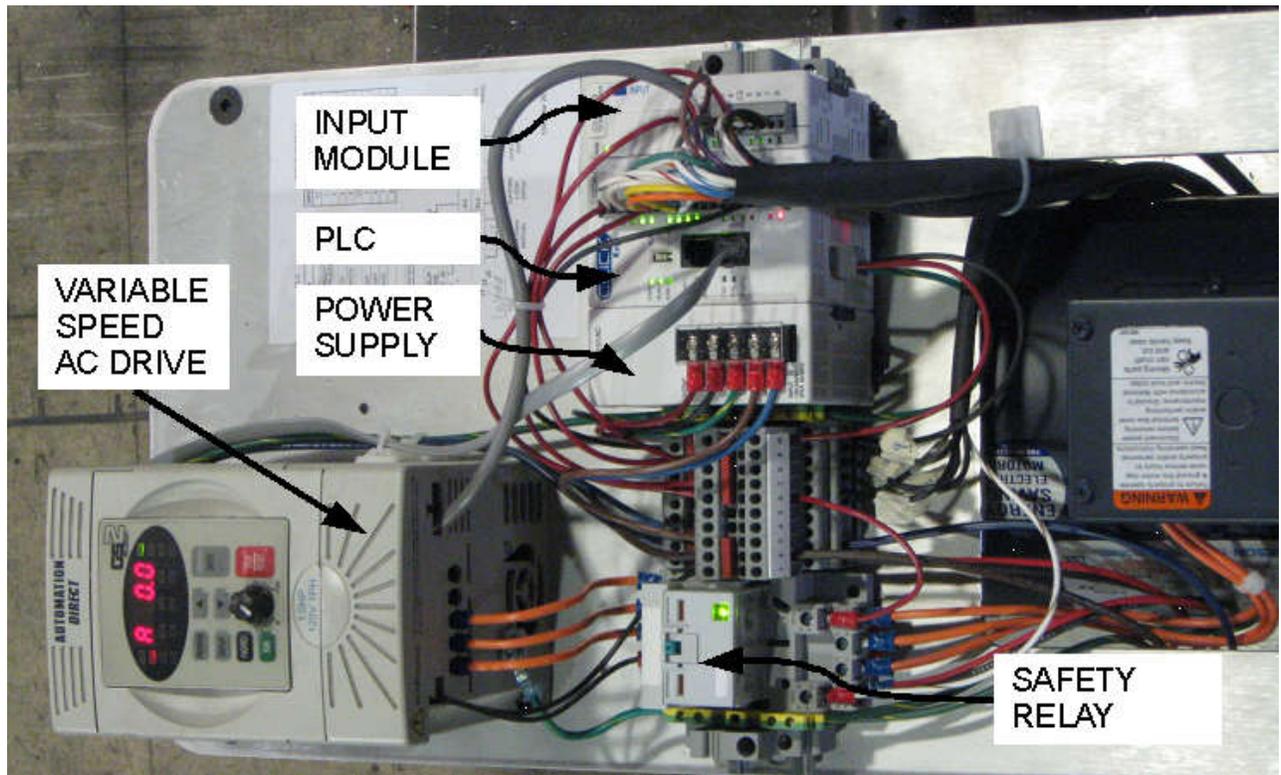


Figure 20: IPL Power Unit Components

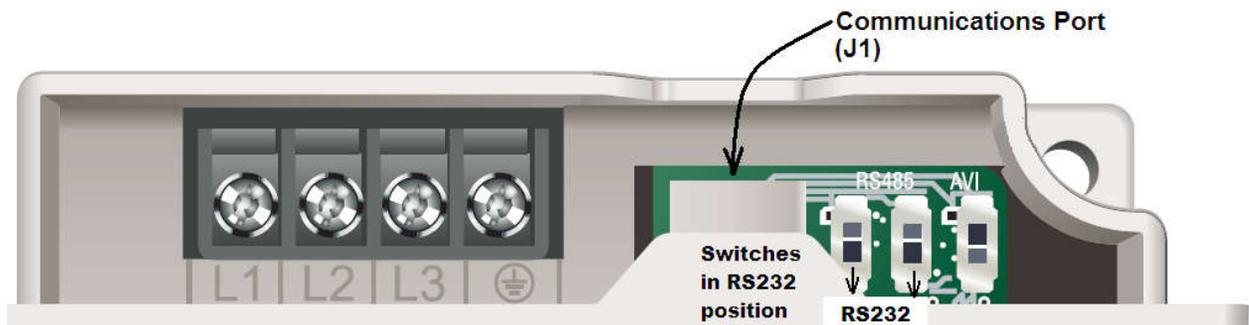
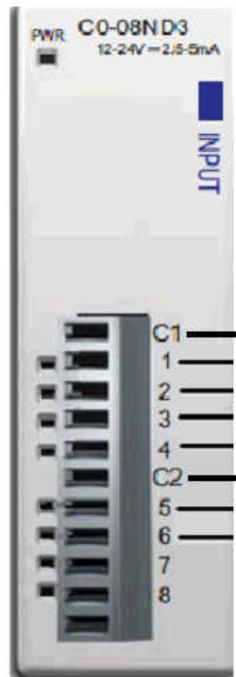
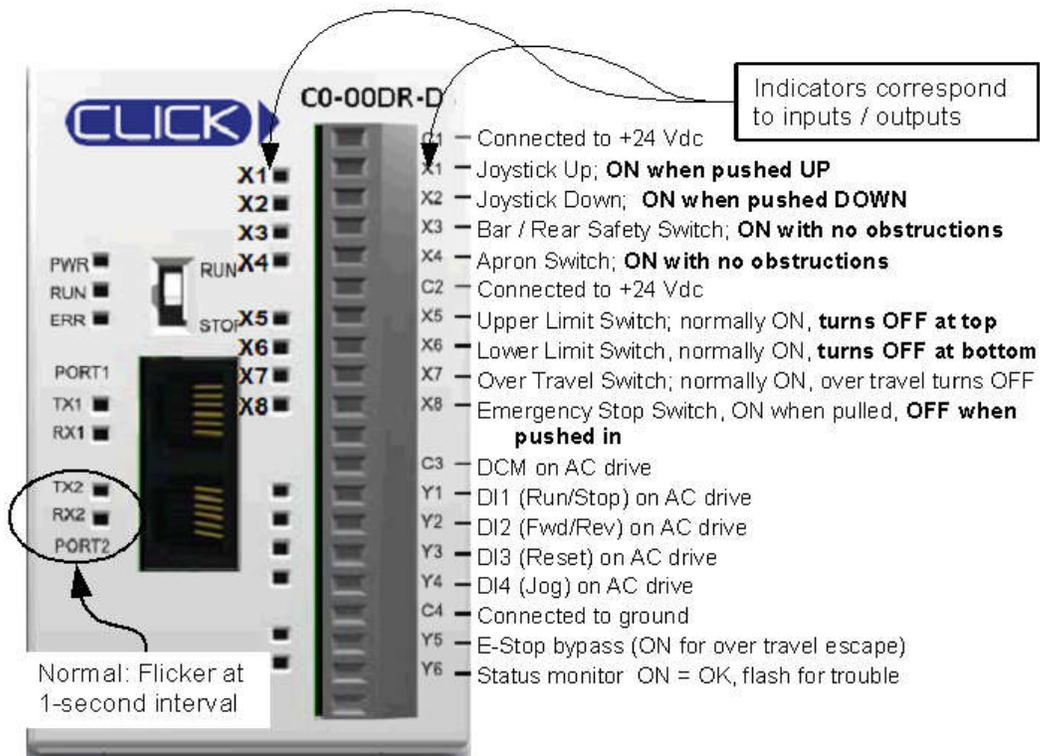


Figure 21: AC Drive Switches and Connections

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**NOTE:**  
 OFF = 23 - 24 Vdc  
 ON = 0 - 1 Vdc

- C1 - Connected to +24 Vdc
- 1 - Upper call UP, ON when pushed up
- 2 - Upper call DOWN, ON when pushed down
- 3 - Magnetic Sensor, normally ON, OFF when at magnet near top or bottom
- 4 - Connected to +24 Vdc
- 5 - Lower call UP, ON when pushed up
- 6 - Lower call DOWN, ON when pushed down
- 7
- 8

**Figure 22: PLC and Input Module Connections**

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## B. Lift Control and Operation

- 1) Controls: normally open (NO) UP and DOWN inputs, and are actuated by connecting them to the 24 V ground (0 V on power supply). That path is provided by the platform joystick and the upper and lower call-send toggle switches. See Table 4.
- 2) PLC inputs X1 and X2 are connected to the platform joystick.
- 3) Input module Input 1 and Input 2 are connected to the upper call station.
- 4) Input module Input 5 and Input 6 are connected to the lower call station.
- 5) PLC inputs X3 through X8, Input 3: connected to normally closed (NC) switches. See Table 3.

**Table 3: PLC Switch Inputs**

INPUT	SWITCH	FUNCTION
X3	Rear Bar	Sense obstructions on the stairs while traveling up. The platform will stop quickly; release the travel controls and then engage downward travel to back away from the obstruction.
X4	Apron Switch	Sense obstructions below the platform while traveling down. The platform will stop quickly; release the travel controls and then engage upward travel to back away from the obstruction
X5	Upper Limit	Stops travel at the top of the rails
X6	Lower Limit	Stops travel at the bottom of the lift
X7	Over travel switch	This safety switch removes power to the motor (by releasing the safety relay) if the platform travels too far past the upper limit switch. Traveling too far past the upper limit switch may cause damage to the lift. It will never open in normal operation
X8	Emergency stop	Normally mounted on the control tube; push it in to stop the lift very quickly in case of an emergency, or to prevent operation of the lift. Twist and pull to release the switch.
Input 3	Magnetic sensor	<p>A magnetic sensor in the control tube is triggered by magnetic strips on the rail cover located near the top and bottom of the lift. It signals the PLC to slow platform travel about six inches from the top and bottom.</p> <p>The platform will travel slowly under the following conditions:</p> <ul style="list-style-type: none"> <li>• Downward travel near the bottom landing.</li> <li>• Upward travel near the upper landing.</li> <li>• Initial start-up until the lower limit switch has been activated.</li> <li>• PLC memory corruption.</li> </ul>

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### C. Over-travel Escape

The lift will be stopped by the over-travel switch if the upper limit switch fails to operate. If the platform has stopped above the upper landing, then the unit has possibly gone into over-travel. This has occurred because the upper limit switch has failed to stop the platform at the upper landing. Opening the over-travel switch renders the lift inoperative until the failure is corrected.

Until the over-travel issue is resolved, follow the subsequent steps to move platform down out of the stairway:

Press in the E-Stop button on the platform. At the upper call station or on the platform control, press and hold the toggle switch in the down direction for about 10 seconds or until the platform moves slightly down. (reference **Figure 14**) Platform will run about 1 second in the down direction, just enough to release the over travel switch. Pull out the E-Stop button on the platform. The unit should now operate with the normal controls in the down direction.

### D. Slack and Broken Chain Switches

These switches are not normally activated (see **Figure 7**). If connector P1 (see **Figure 13**) is tight, then check to see if these switches are activated.

If the safety relay is not engaged and there is no electrical contact through the switches, try to physically move the switch levers and see if the switches are opening and closing.

If the switches are activated, try tightening the chain by adjusting the tension at the top of the rail and see if the switch lever moves up. Manually move the switch lever to see if the output changes and the relay turns on.

If the chain is cannot be tightened, it may have broken and the safety pawls have opened against the rail. The platform may have to then be supported and removed from the trolleys to keep from obstructing the stairway.

### E. Switch Bypass

**Slack/broken chain bypass** – if the slack chain switches have opened, but the chain is still good, connect terminal A2 of the safety relay to PLC terminal Y5.

**Over-travel bypass** – see section C (above) or jumper terminal X7 to the power supply ground (lower TB9).

**Emergency Stop bypass** – jumper terminal X8 to X7.

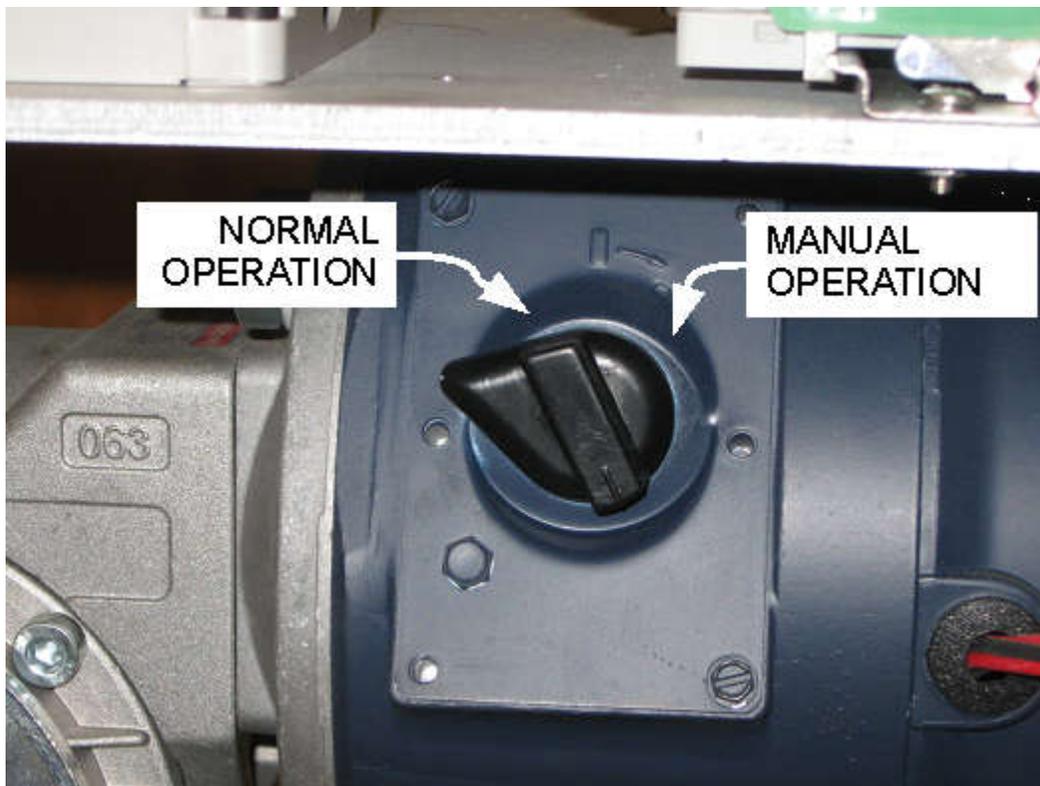
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## F. MANUAL LOWERING

A spring applied / electrically released brake located between the motor and gearbox. It is released by the AC drive and the safety relay when the motor is actuated. (The safety relay must be engaged for the brake to be released.) Manual override (release) is performed by turning the knob on the side of the brake ¼ turn clockwise. It will be re-applied after power is applied and then removed.

To lower the lift manually:

- 1) Unplug the power unit and set the power switch to OFF.
- 2) Verify the steps, area under the platform, and lower landing are clear of people and obstructions.
- 3) Remove the power unit cover and the plastic cup shown in **Figure 13**;
- 4) Manually release the brake as shown in **Figure 23**.
- 5) Turn the motor shaft with a ½" open-end wrench. The platform will travel about one inch per seven turns of the motor shaft.



**Figure 23: Brake Operation**

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**Table 4: Power Unit Input Wiring**

<b>LOCATION / FUNCTION</b>	<b>CONNECTOR</b>	<b>TERMINATION</b>	<b>WIRE COLOR</b>
<b>PLATFORM</b>			
UP	J2-6	PLC, X1	WHITE / BLACK STRIPE
DOWN	J2-2	PLC, X2	WHITE / RED STRIPE
BAR SWITCH	J2-1	PLC, X3	WHITE
APRON SWITCH	J2-5	PLC, X4	GREEN
GROUND	J2-8	LOWER TB8	BLACK
E-STOP (IN)	J2-3	PLC, X8	WHITE / BLUE STRIPE
E-STOP (OUT)	J2-7	PLC, X7	BLUE
<b>UPPER CALL</b>			
UP	J2-10	IN 1	BROWN
DOWN	J2-14	IN 2	GRAY
GROUND	J2-11	LOWER TB6	BLACK
<b>LOWER CALL</b>			
UP	J3-1	IN 5	WHITE / BLACK STRIPE
DOWN	J3-2	IN 6	WHITE / RED STRIPE
GROUND	J3-3	LOWER TB5	BLACK
<b>RAILS</b>			
UPPER LIMIT	J2-13	PLC, X5	ORANGE
OVER-TRAVEL	J2-12	PLC, X7	YELLOW
UPPER LIMIT and OVERTRAVEL GND	J2-9	LOWER TB7	BLACK
LOWER LIMIT	J1-3	PLC, X6	WHITE / ORANGE STRIPE
LOWER LIMIT GND	J1-4	LOWER TB9	BLACK
SLACK CHAIN (OUT)	J1-1	RELAY A2	WHITE / BRN STRIPE
SLACK CHAIN (IN)	J1-2	PLC, Y5	WHITE / BLUE STRIPE