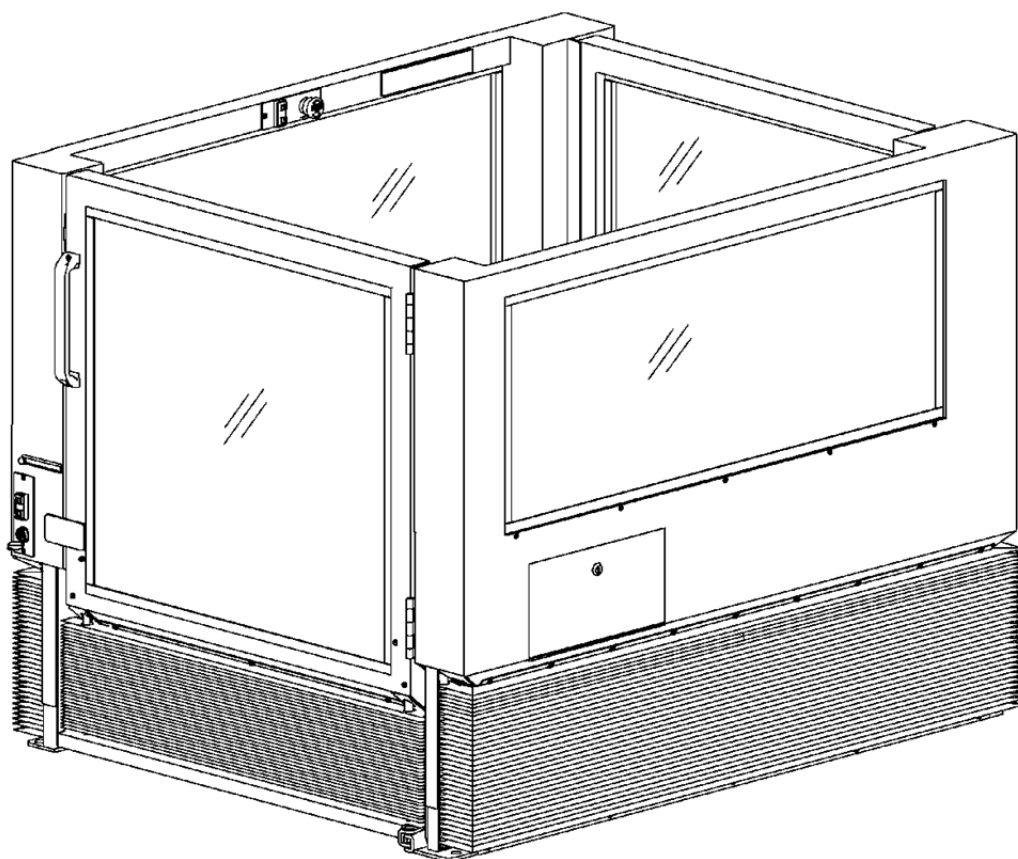


ASCENSION VIRTUOSO ***PORTABLE WHEELCHAIR LIFT*** ***5460P MODEL SERIES***

MAINTENANCE & REPAIR MANUAL

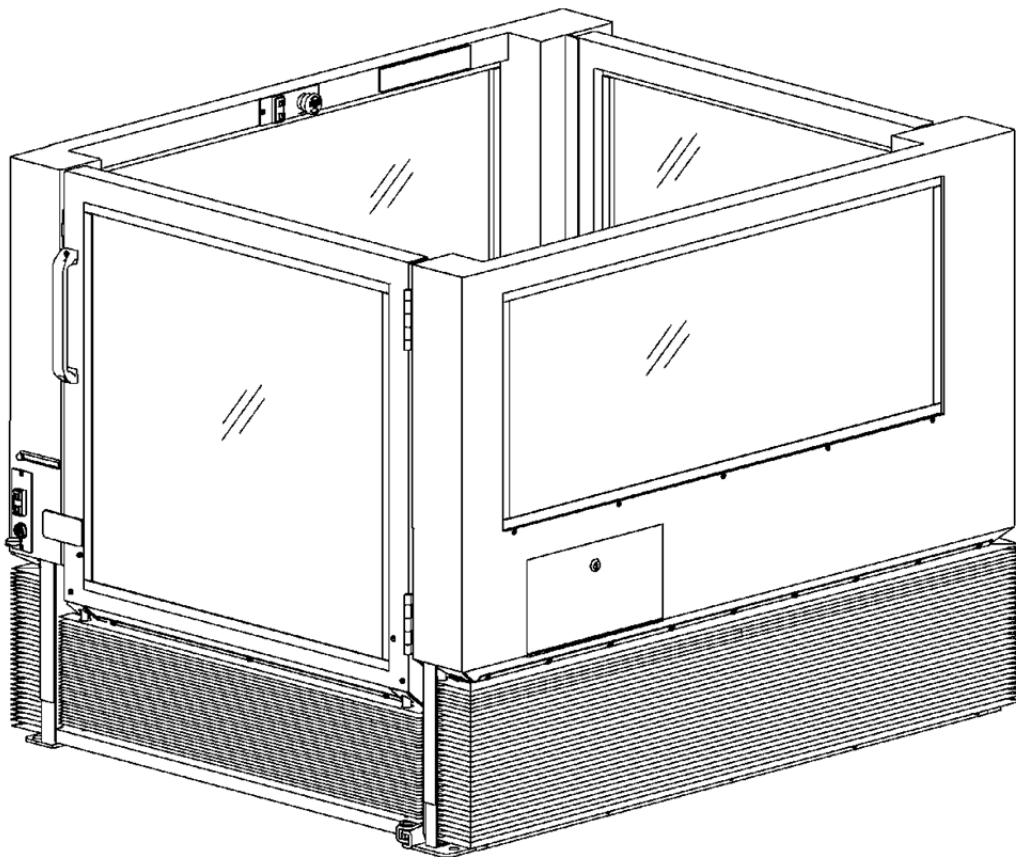


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ASCENSION[®]
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***ASCENSION VIRTUOSO
PORTABLE WHEELCHAIR LIFT
5460P MODEL SERIES***

**MAINTENANCE & REPAIR
MANUAL**



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INTRODUCTION

The purpose of this manual is to provide the necessary information to perform maintenance and repairs on the Ascension VIRTUOSO portable wheelchair lift. This manual is intended to be used by skilled technicians who have experience working on electro-mechanical systems and devices. Furthermore, these personnel should be well-versed in standard industrial safety practices and procedures. The appropriate sections should be read through completely before any repairs are begun.

About This Manual

This manual is divided into six sections:

Section 1 defines terms that are used throughout the remainder of this manual.

Section 2 describes the recommended procedures for performing routine maintenance.

Section 3 covers mechanical repair. This includes component replacement, as well as detailed procedures to disassemble, test, and reassemble major components.

Section 4 covers electrical testing.

Section 5 describes how to compress the lift so that it can be rolled through a narrow doorway and then expanded again for normal use.

Section 6 is a troubleshooting guide. It provides information for locating and correcting any problems with the lift.

Additional Information

The following sources of information supplement this manual:

Operating Manual An Operating Manual is supplied with each lift and includes all the necessary information to set up, break down, store, and transport the lift. It also includes the general safety precautions that should be observed.

Setup and Operation DVD A short setup and operation DVD is supplied with each lift.

Getting Help

If you have a question or problem with the lift, please try to find the solution in this manual. In particular, be sure to review the troubleshooting guide in Section 6. If you are not able to resolve the problem, please contact Ascension as indicated below, making sure that you have the serial number of your lift ready. The serial number can be found on the data plate located inside the lift car on the upper left rail. Also, it is recommended that you contact Ascension while in the immediate vicinity of your lift, as this will reduce the time required to properly diagnose the problem.

Contacting Ascension

Ascension's business hours are 8 a.m. to 5 p.m. Mountain Standard Time, Monday through Friday.

Telephone: 800-459-0400

Fax: 520-881-4983

Email: sales@ascension-lift.com

Website: ascension-lift.com

Mailing Address: Ascension

Customer Service

PO Box 40020

Tucson, AZ 85717-0020

SECTION 1 Terminology

To effectively use this manual, you need to be familiar with the following terms. Refer to the figure on the following page for identification of components. Not all components are shown in the figure.

Access Panel The hinged panels (four total) that provide access to the machinery cabinets.

Back End The end of the lift where the upper landing gate is located.

Base The steel frame that rests on the floor when the casters are removed and supports the operating mechanism.

Control Panel The electrical panel for the lift which contains the power supply, control system relay, and the main power relay. The control panel is located inside the left-hand machinery cabinet.

Dock Plate The hinged plate that bridges the gap between the lift car floor and the upper landing surface when the lift car is at the upper landing.

Front End The end of the lift where the lower landing gate is located.

Lift Car The compartment in which the passenger rides.

Lower Landing Gate The gate that serves the lower landing (ground level).

Machinery Cabinet The enclosures in which the lifting and control mechanisms are located. There is one cabinet on each side of the lift. The contents of the machinery cabinets are accessible through the access panels.

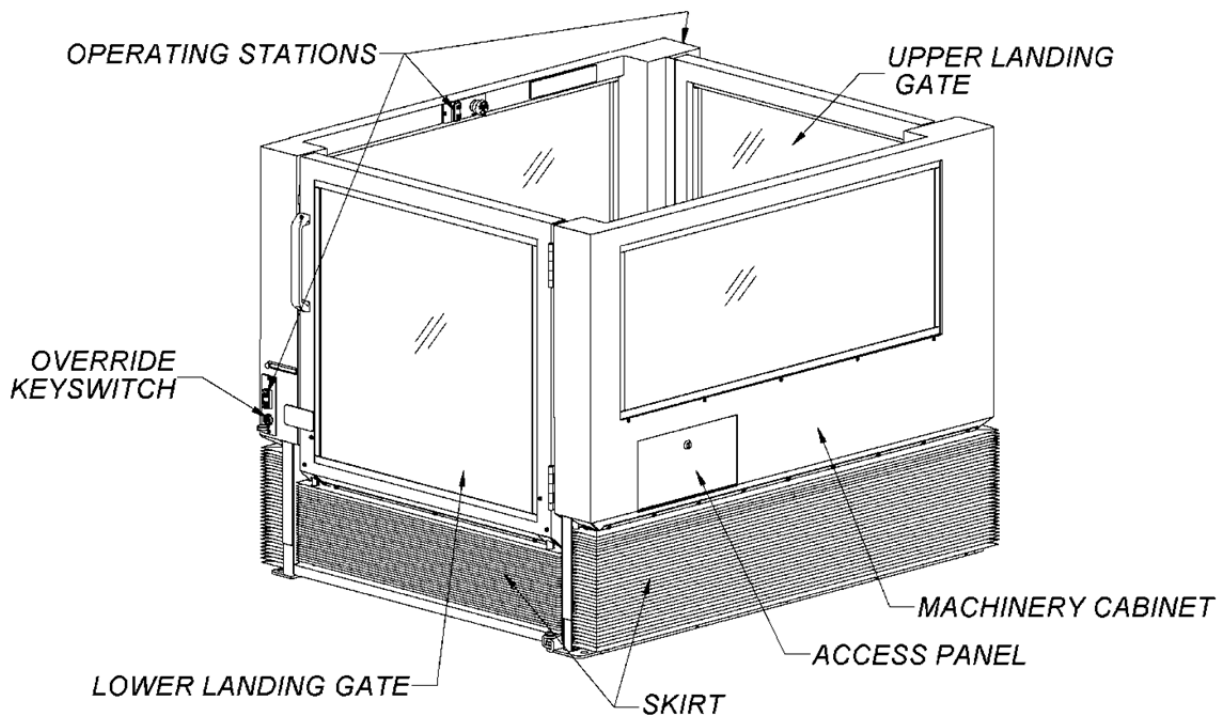
Operating Stations The controls for raising and lowering the lift car. All three operating stations are located on the left side of the lift car. The operating station inside the lift car has an emergency stop switch.

Override Keyswitch The switch used to operate the lift while installing or removing the casters.

Skirt The accordion-style cover which completely encloses the underside of the lift car. The skirt consists of two parts: the lift car skirt, which surrounds the lift car on three sides; and the gate skirt, which protects the area under the lower landing gate.

Upper Landing The stage, platform, or riser that the lift serves.

Upper Landing Gate The gate that serves the upper landing, or stage.



SECTION 2 Routine Maintenance

2.1 *Hydraulic System*

The fluid level of the hydraulic system should be checked every six months. Before checking the fluid level, make sure the lift car is at ground level (i.e., at the lower landing) and off its casters. Then open one of the access panels in the right-hand machinery cabinet and verify that the fluid level in the reservoir sight tube is between the min-max marks on the reservoir.

Inspect the condition of the hydraulic fluid. Change the fluid if it has darkened, appears dirty, or has a strong acrid or burnt odor.

If you need to add hydraulic fluid to the lift, use an ISO 32 grade hydraulic oil, such as Texaco Rando HD32 or 76 Unax AW32 filtered to 10 microns for lifts primarily used indoors. For outdoor lifts use a low-temperature oil such as Amsoil AWF oil. In order to add fluid to the reservoir, pull the top of the flexible sight tube out of the access panel opening, remove the bronze vent plug, and pour the hydraulic fluid into the sight tube.

2.2 *Cleaning*

All parts of the lift except the windows may be cleaned with soap and water or general purpose household cleaners. Use a sponge or soft cloth dampened with cleaning solution. Wipe dry with a cloth after cleaning. *Do not* expose any part of the lift to a direct liquid stream or spray, such as from a water hose.

To clean the windows, Windex or Formula 409 brand window cleaners may be used. To remove scratches, Plastic Polish 2 or 3 is recommended. Plastic Polish is available from Novus, Inc, Minneapolis, Minnesota, item numbers PC-20 and PC-30 respectively.

SECTION 3 Mechanical Disassembly and Repair

3.1 *Important Preliminary Information*

The repairs in this section are to be performed by a skilled technician who has experience working on electro-mechanical systems. Furthermore, the technician should be well-versed in standard industrial safety practices and procedures. In the United States of America, electrical safety procedures are established in OSHA's *Lockout/Tagout – Hazardous Energy Sources Standard* (29 CFR 1920.147).

Familiarity with the setup and operation of the lift is required to effectively perform the repairs listed in this section. This information can be found in the *Operating Manual* provided with the lift.

3.2 *Electrically Isolating the Lift*

This section describes the procedures for electrically isolating the lift, which is necessary in order to safely perform some of the repairs covered in this manual.

To electrically isolate the lift, perform the following steps in the order listed:

1. Turn the disconnect switch in the power cord to the 'OFF' position. Secure it with a lockout hasp and/or padlock.

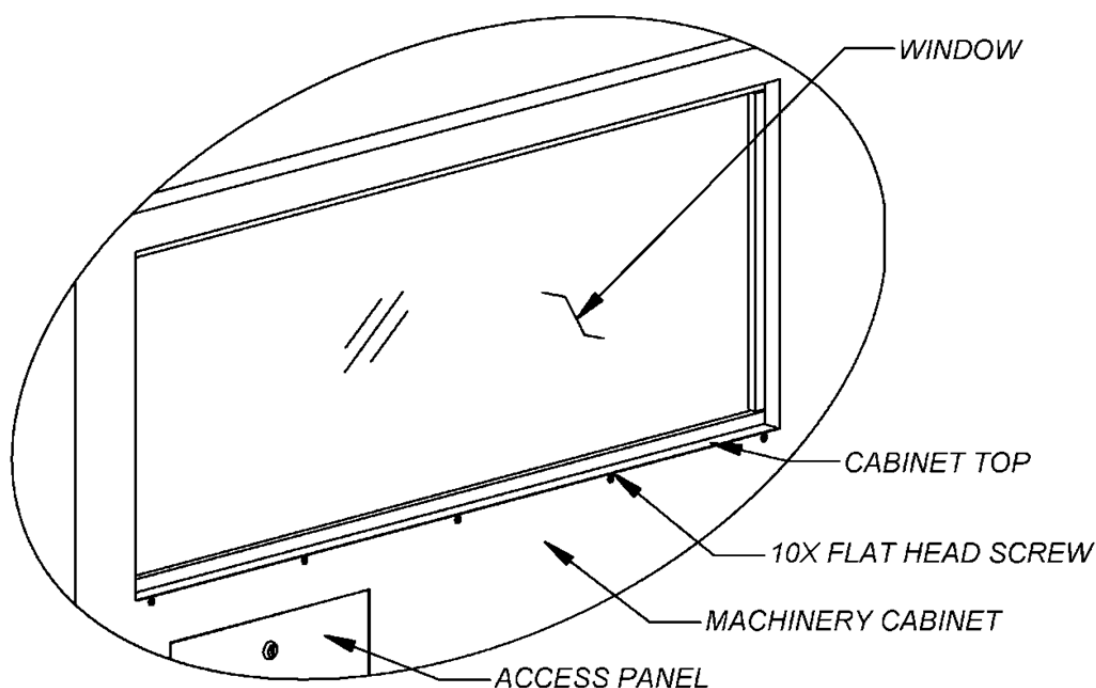
OR

1. Remove the lift's power cord from the wall outlet.
2. Attach a DANGER tag to the end of the power cord and lock out the cord according to the procedures established in OSHA's *Lockout/Tagout – Hazardous Energy Sources Standard* (29 CFR 1910.147).
3. Coil the electrical cord and place it inside the lift car.

3.3 Opening the Machinery Cabinets from the Top

For some of the repairs described in this manual, it is necessary to gain access to a machinery cabinet from the top. The top of either machinery cabinet can be removed by performing the following steps:

1. Remove the window located above the machinery cabinet from its frame. See Section 3.16.
2. Use a Phillips screwdriver to remove the ten (10) flat head screws which hold the cabinet top in place. The top can now be removed from the cabinet. It may be necessary to open an access panel and push from inside the cabinet to pop the top out.

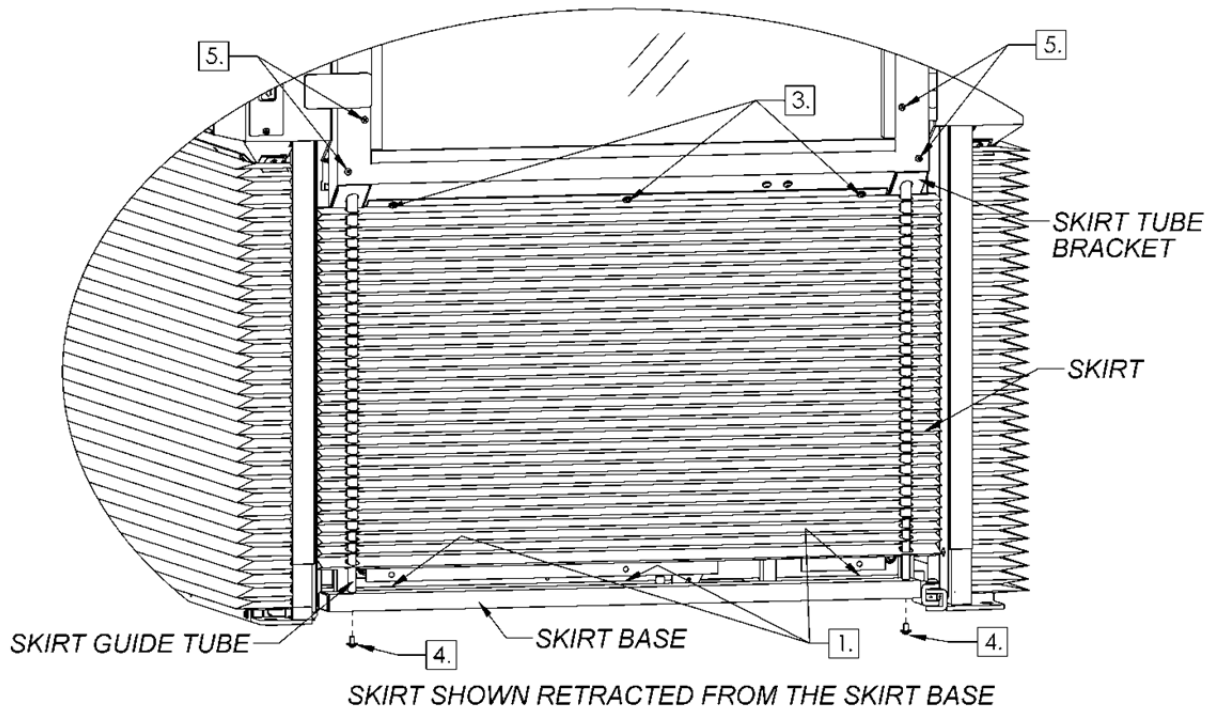


To reinstall the machinery cabinet top, perform the above steps in reverse order.

3.4 Retracting, Removing, and Reinstalling the Safety Skirt

The safety skirt consists of two parts: the lift car skirt, which guards the lift car on three sides; and the gate skirt, which guards the area under the lower landing gate. For some of the repairs described in this manual, it is necessary to gain access to components normally hidden behind the skirt. In most cases, only a small portion of the skirt may need to be retracted; however, sometimes it may be necessary to remove the whole skirt.

To remove the *gate skirt*, perform all of the following steps. If the skirt only needs to be retracted, performing only Step 3 will provide access to many of the components behind the skirt. Refer to the figure below for the location of the fasteners referenced in each step.



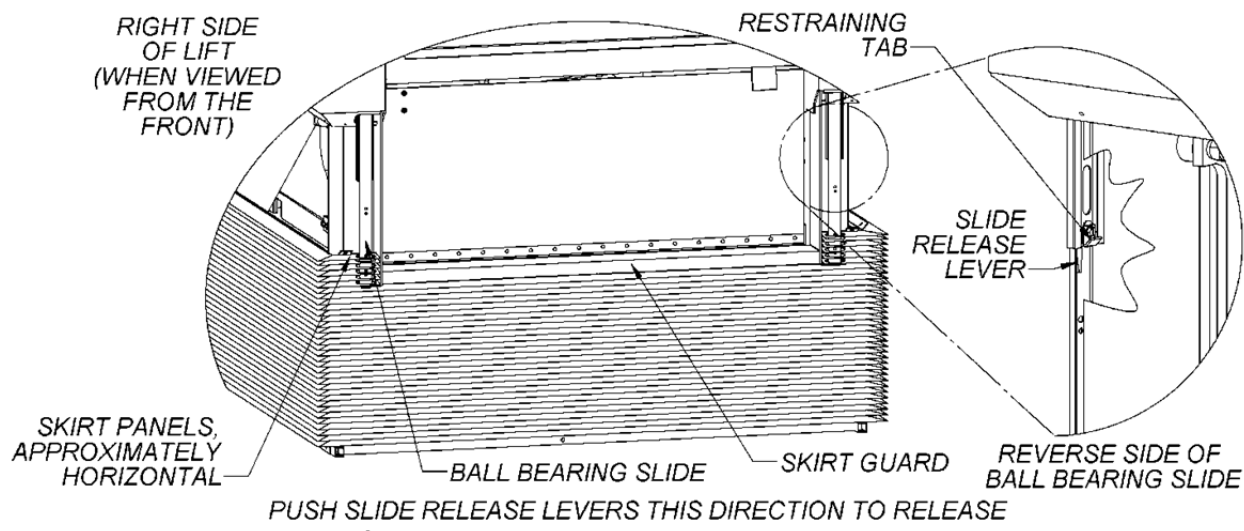
1. Use a 5/16" wrench to remove the three (3) hex head screws that secure the skirt to the skirt base. These screws are located on the top side of the skirt base.
2. Using any operating station, raise the lift car until the car floor is approximately 24" [610 mm] off the ground.

3. Use a Phillips screwdriver to remove the three (3) screws that secure the skirt to the lower landing gate.
4. Use a 5/32" hex key to remove the two (2) button head cap screws and washers that secure the skirt guide tubes to the skirt base. Hold the skirt guide tubes stationary with pliers if necessary while removing the screws.
5. Use a Phillips screwdriver to remove the four (4) screws (two (2) on each side) that secure the skirt guide tube brackets to the lower landing gate and pull the brackets downward, out of the gate. The skirt can now be removed from the gate.

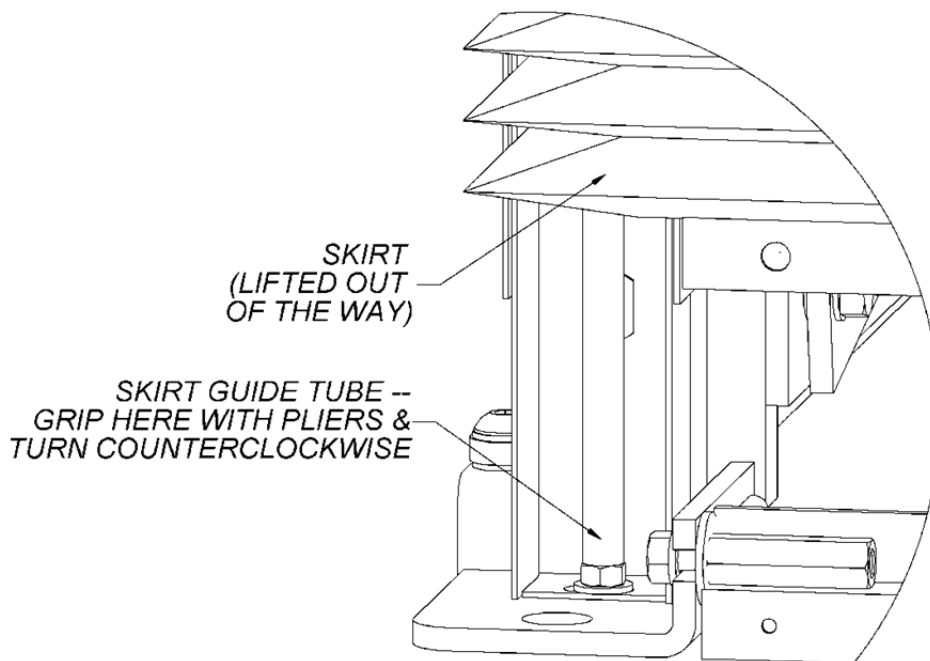
To reinstall the *gate skirt*, perform the above steps in reverse order.

To remove the *lift car skirt*, perform all of the following steps. If the skirt only needs to be retracted, performing only Steps 2 & 3 will provide access to most of the components behind the skirt.

1. If the whole skirt is to be removed, raise or lower the lift car so that the lift car floor is approximately 15" [380 mm] off the ground.
2. Use a Phillips screwdriver to remove the 32 pan head screws that secure the sides of the skirt to the lift car at the top and to the lift base at the bottom.
3. Use a 5/16" combination wrench to remove the four (4) hex head screws that secure the top of the skirt to the lift car, one (1) at each corner. Remove the small skirt support brackets that are freed when these screws are removed.
4. Use a Phillips screwdriver to remove the pan head screw that secures the back of the skirt to the base.
5. In the back, retract the skirt around the ball-bearing slides as shown in the figure at the top of the following page. You will need to hold each skirt panel approximately horizontal to move it past the restraining tab.
6. Remove the (2) 5/16"-18 screws from the lift frame just above the ball bearing slides.



7. Push the ball bearing slide releases toward the right side of the lift and then pull downward on the skirt guard to separate it from the lift car.
8. At the front of the skirt, use pliers or a similar tool to turn the skirt guide tubes counterclockwise until they release from the studs in the base. You will need to lift the corners of the skirt to gain access to the skirt guide tubes.



FRONT RIGHT CORNER OF THE LIFT SHOWN

9. Retract the skirt guide tubes through the slots in the skirt. The skirt is now free of the lift. Use extreme care to support the skirt in its natural position as much as

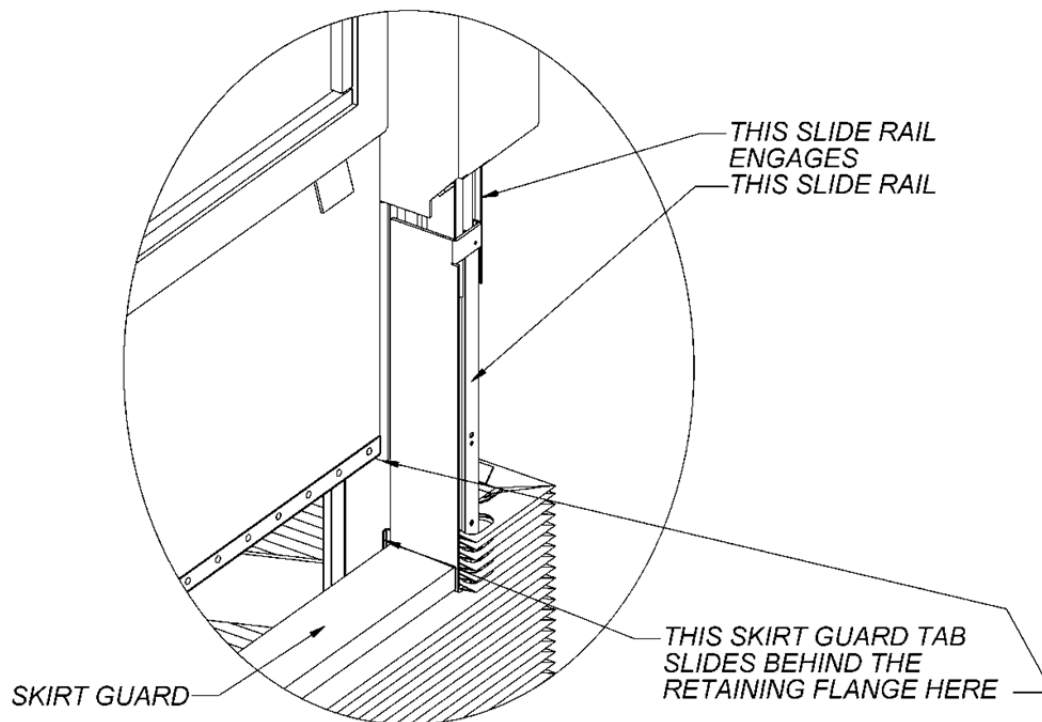
possible while moving it. A minimum of two (2) people is recommended for moving the skirt.

To reinstall the *lift car skirt*, perform the following steps in the order indicated. If necessary, refer to the figures in the skirt removal instructions above for identification of skirt components.

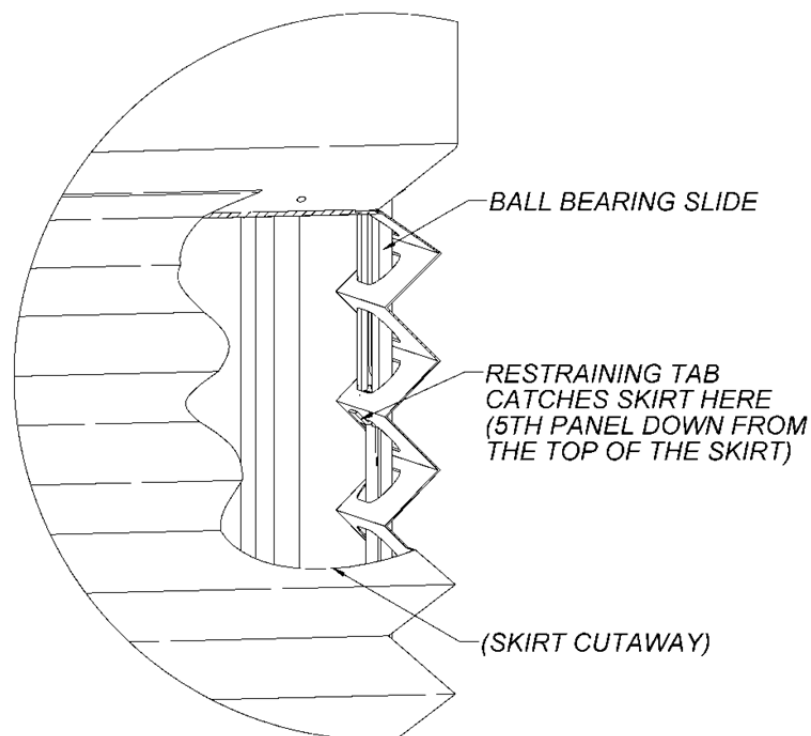
⚠ CAUTION!

In the following step, stay clear of the lift car when it is moving to avoid any pinching and/or crushing hazards.

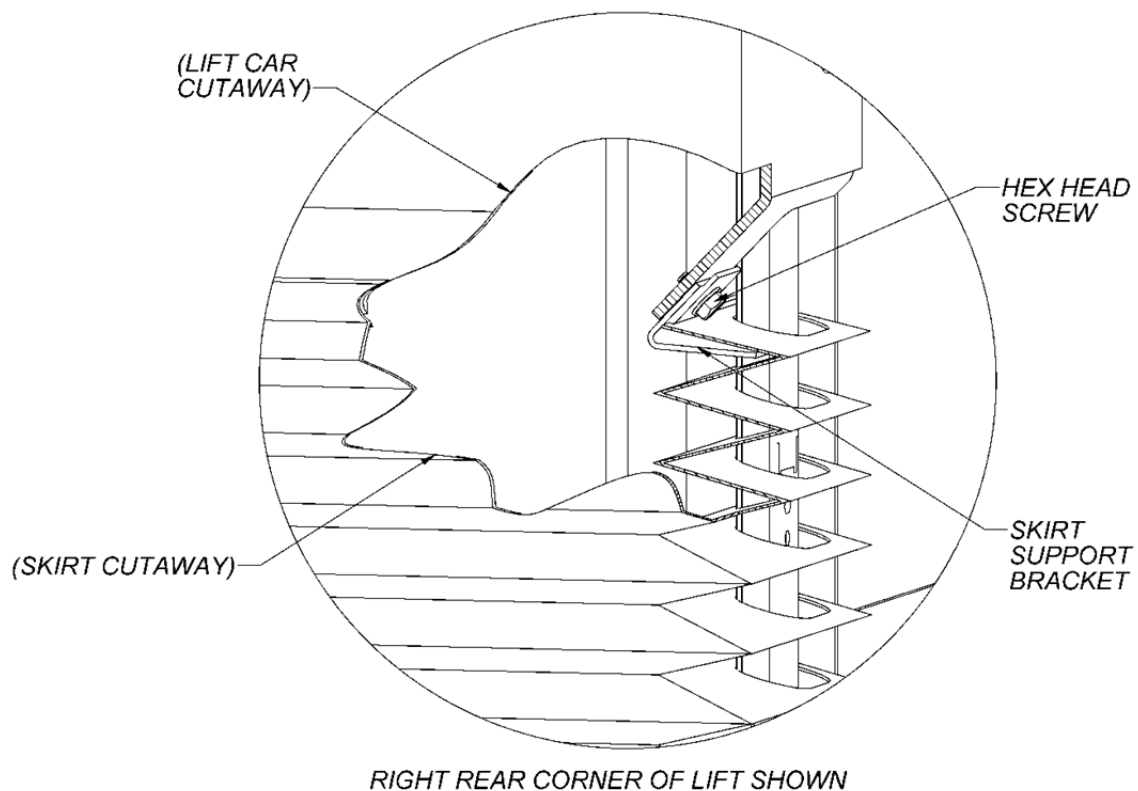
1. Raise or lower the lift car so that the lift car floor is approximately 15" off the ground.
2. Move the skirt into position around the lift car, approximately as it will be located when installed on the lift. Use extreme care to support the skirt in its natural position as much as possible while moving it. A minimum of two (2) people is recommended for moving the skirt.
3. At both front corners of the lift car, lift the skirt guide tubes upward, move the skirt into place, and insert the guide tubes through the slots in the skirt. Then turn the guide tubes clockwise onto the base studs, using pliers to tighten them.
4. In the back, reinstall the skirt guard onto the lift car by performing the following steps. Refer to the figure at the top of the following page as necessary.
 - a. Position the skirt guard underneath the ball-bearing slide rails on the lift car, so that the slide rails on the skirt guard line up with the slide rails on the lift car.
 - b. Move the skirt guard upward, while making sure that the skirt guard tabs slide behind the retaining flanges on the lift car, and that the slide rails on the skirt guard lock into the slide rails on the lift car.
 - c. You will feel and hear a "click" when the ball-bearing slide rails engage each other, and the skirt guard will be held in place. If the skirt guard was installed correctly, the guard cannot be pulled away from the lift car. If this is not the case, use the release levers to release the skirt guard and then reinstall it, taking care to slide the skirt guard tabs behind the retaining flanges on the lift car.
 - d. Reinstall the 5/16"-18 screws into the holes in the lift frame just above where the ball bearing slides enter the frame.



5. Lift the skirt upward on both sides of the skirt guard until the skirt slips past the restraining tabs on the ball bearing slides as shown in the figure below. The restraining tab must catch the skirt on the 5th panel down from the top of the skirt.



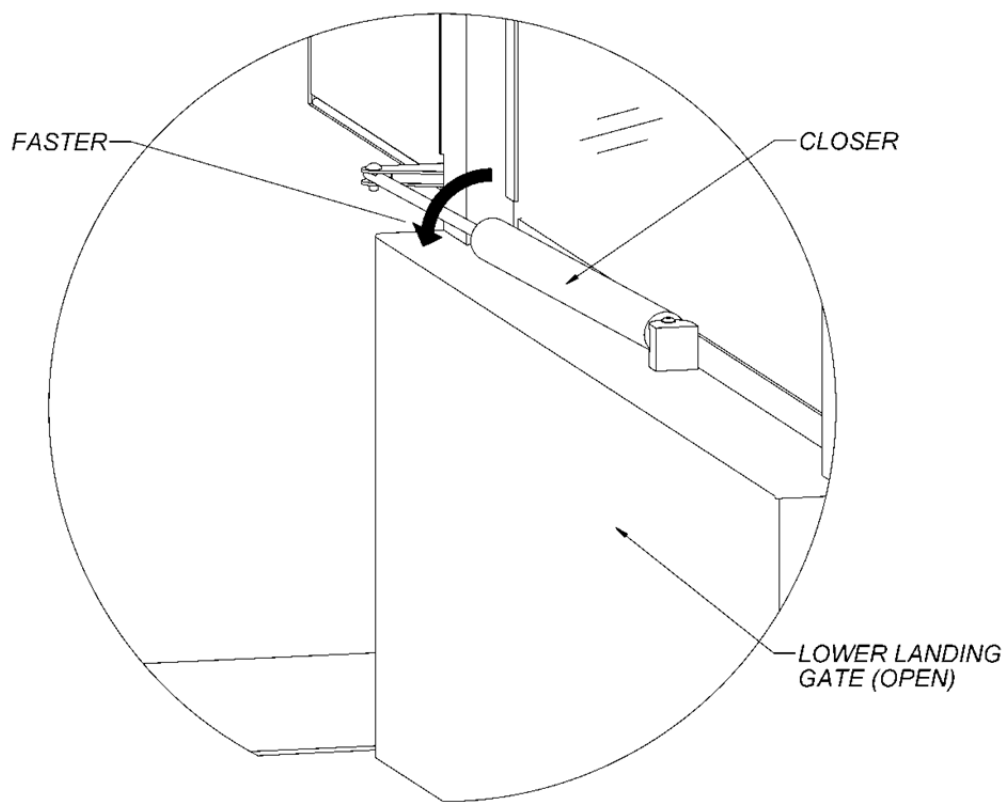
6. Use a Phillips screwdriver to reinstall two (2) or three (3) pan head screws on each side of the lift car to secure the top of the skirt loosely to the lift car.
7. Use a 5/16" combination wrench to reinstall the four (4) hex head screws that secure the top of the skirt to the lift car, one (1) at each corner. Be sure to install the skirt support brackets between the skirt and the lift car frame. See the figure below.



8. Use a Phillips screwdriver to reinstall the remainder of the 32 pan head screws that secure the sides of the skirt to the lift car at the top and to the lift base at the bottom.
9. Use a Phillips screwdriver to reinstall the pan head screw that secures the back of the skirt to the base.

3.5 Platform Gate Closers

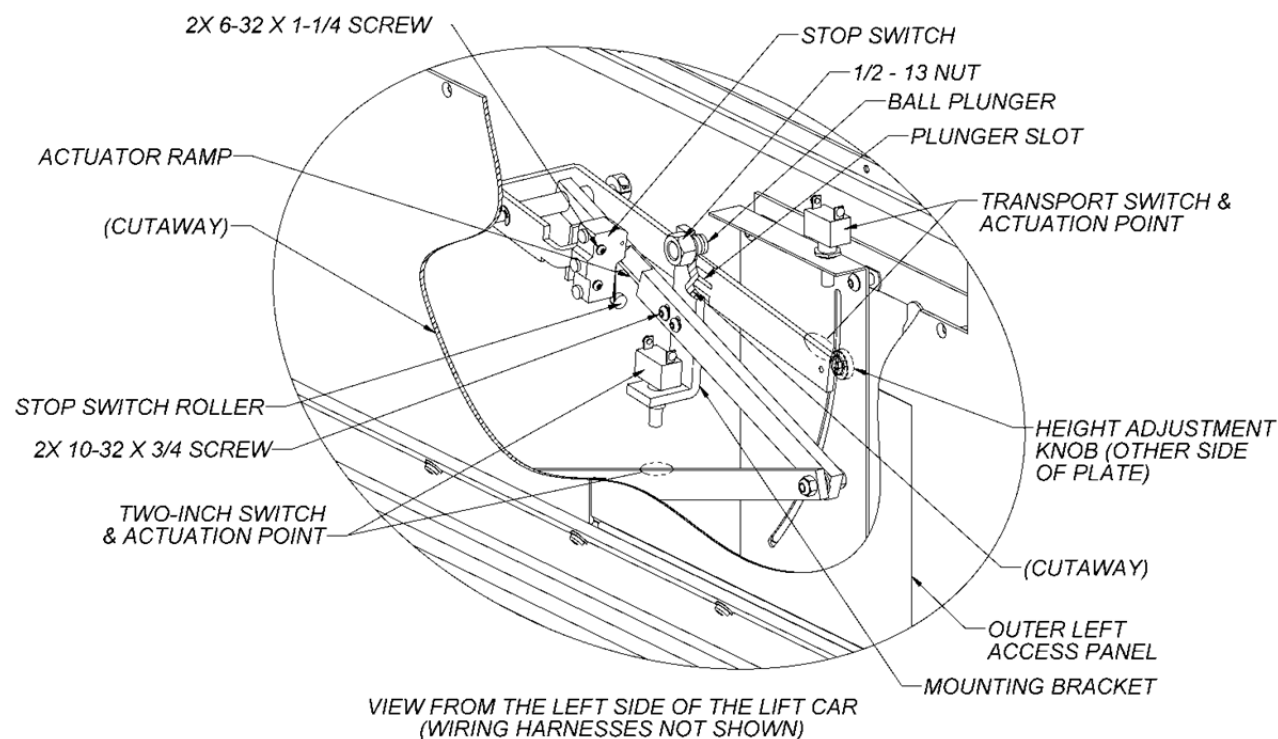
To make a platform gate close faster, turn the gate closer counterclockwise, 1/2 rotation at a time. To make a platform gate close slower, turn the gate closer clockwise, 1/2 rotation at a time. See the figure below.



3.6 Upper Stop Mechanism

The upper stop mechanism sets the height at which the lift car stops at the upper landing. This section describes the procedures for adjusting the upper stop mechanism in the case that it has come out of adjustment. If you are only looking for instructions on setting up the lift to stop at the correct height, refer to the section titled "Setup Instructions" in the *Operating Manual*.

The upper stop mechanism can be accessed either through the outer left access panel or through the top of the left-hand machinery cabinet. Refer to Section 3.3 in this manual for instructions on removing the top of the left-hand machinery cabinet. The two-inch switch and transport switch are of the normally open (NO) type. The stop switch is a single-pole double throw switch with the wiring harness connected to the normally closed (NC) terminal. All three (3) switches can be tested with a standard multi-meter.

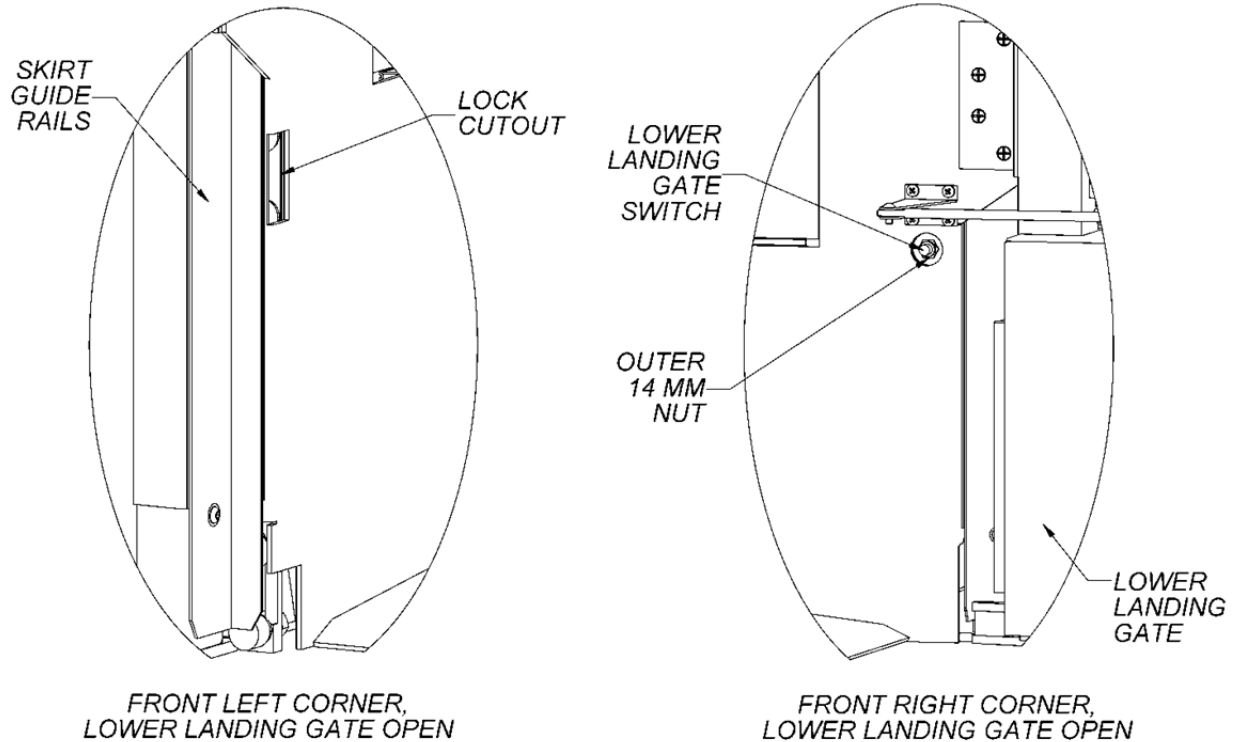


The upper stop mechanism has four (4) adjustable components: the transport switch, the stop switch, the two-inch switch, and the ball plunger. See the figure on the previous page for identification of these components. These four (4) components must be adjusted so that the following four (4) conditions are met:

1. *The stop switch roller is actuated by the actuator ramp at the same time that the ball plunger "clicks" into the plunger slot.* For fine adjustments to the stop switch, use a 1/16" hex key to adjust the set screw at the lever base. For gross adjustments to the stop switch, use a 5/64" hex key to turn the two (2) 6-32 x 1-1/4 mounting screws. Or, to adjust the ball plunger mounting bracket, use a 1/8" hex key to turn the two (2) 10-32 x 3/4 screws. After adjusting the ball plunger mounting bracket, the two-inch switch may need to be readjusted as well (see item 2 below).
2. *The two-inch switch is actuated whenever the lift car is less than two inches off the ground.* To adjust the two-inch switch, use pliers and/or a 5/8" wrench to move the nuts on the barrel of the switch. To check the adjustment of the 2" switch, return the lift car to the ground. Then:
 - a. With the lower landing gate open, depress the lower landing gate switch (refer to Section 3.7), and raise the lift car by holding an operating switch "Up". If the lift car does not stop before it has moved 2" [50 mm] off the ground, the body of the switch needs to be adjusted further from the mounting bracket.
 - b. With the lower landing gate closed, hold an operating switch "Up" to raise the lift car off the ground. If the lift car stops or "jumps" within 4" [100 mm] of the ground, the body of the switch needs to be adjusted closer to the mounting bracket.
3. *The transport switch is actuated whenever the height adjustment knob is in the "TRANSPORT" position.* To adjust the transport switch, use pliers and/or a 5/8" wrench to move the two (2) nuts on the barrel of the switch.
4. *The ball plunger has a positive engagement with the plunger slot.* To adjust the strength of the "click" that is felt when the ball plunger engages the plunger slot, use a 3/4" wrench to loosen the 1/2-13 nut and then turn the ball plunger with a standard screwdriver. Turn the ball plunger clockwise to make the "click" stronger or counterclockwise to make the "click" weaker.

3.7 Lower Landing Gate Switch

The lower landing gate switch senses whether the lower landing gate is open or closed. The switch is located on the lift frame at the hinge side of the gate, about 12" [305 mm] from the floor. Refer to the right-hand figure below. The switch has wires connected to its normally open (NO) contacts and can be tested with a standard multi-meter.



The gate switch is in correct adjustment if the lift car will operate only when the gate is closed. The gate is considered to be closed if the upper locking rod in the gate engages in the lock cutout as the lift car moves off the ground. See the left-hand figure above for the location of the lock cutout.

If the lift car can be raised off the ground with the gate open far enough for the locking rod to fall outside of the lock cutout, then the switch probably needs to be recessed further into the lift car wall. (In this case, the lift car will not go higher than 2" [50 mm] off the ground.) If the lift car stops just after it begins to rise off the ground, then the switch may need to be extended further out of the lift car wall.

You will need to access the back of the switch in order to adjust, test, or replace it. To do so, retract the right front corner of the lift car skirt away from the lift car. If necessary, see Section 3.4 for instructions on retracting the skirt.

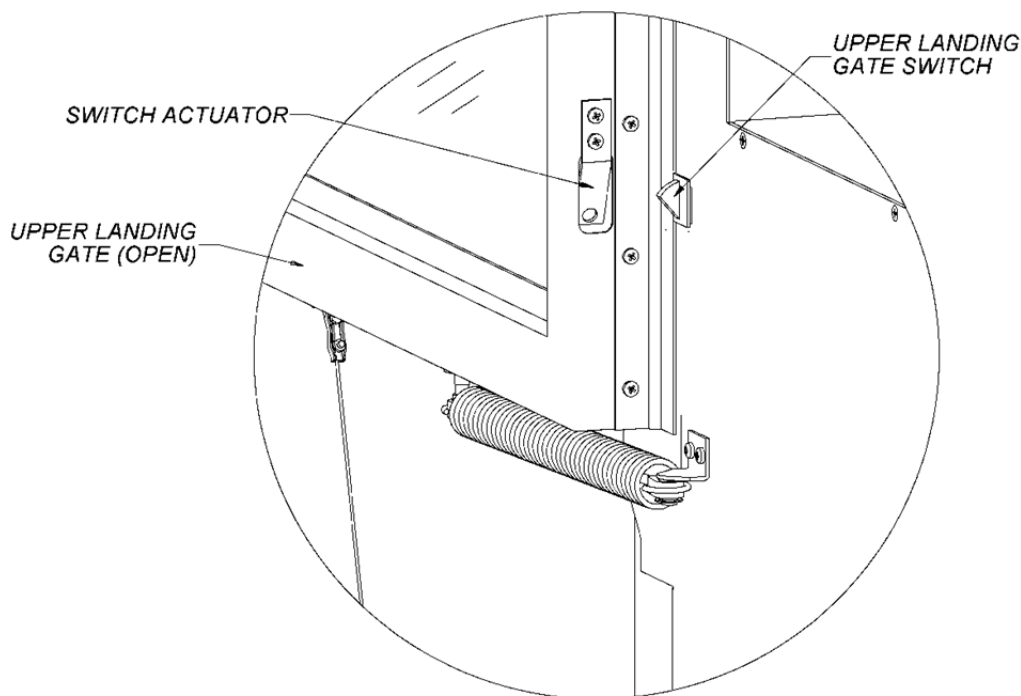
The switch is held in place by two (2) 14 mm nuts. To adjust the switch (i.e., to extend it or recess it), use a 14 mm wrench or socket to loosen the outer nut, move the inner nut as necessary, and then retighten the outer nut. To remove the switch, use a 14 mm wrench or socket to remove the outer nut and then pull the switch out of its mounting hole.

3.8 Upper Landing Gate Switch

The upper landing gate switch senses whether the upper landing gate is open or closed. The switch is located on the lift car at the hinge side of the gate, about 12" [305 mm] from the lift car floor. Refer to the figure below. The switch is of the normally open (NO) type and can be tested with a standard multi-meter.

The upper landing gate switch is in correct adjustment if the lift car will operate only when the gate is closed. The gate is considered to be closed if the gate handle does not protrude beyond the back edge of the lift car. The switch itself cannot be adjusted; however, the switch actuator located on the gate can be adjusted. To adjust the switch actuator, insert a screwdriver or similar tool into the hole in the actuator and then carefully bend it in or out.

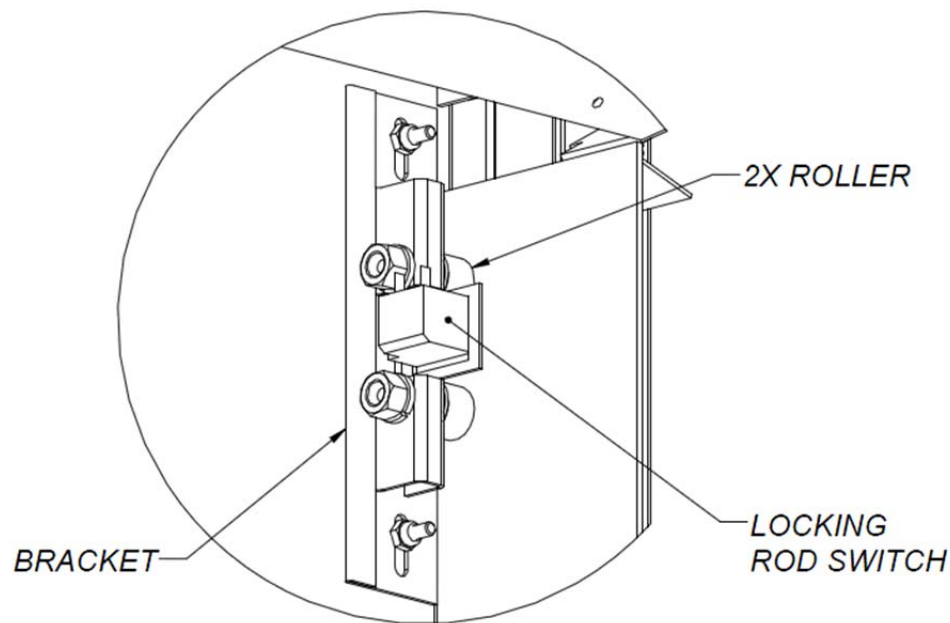
To remove the switch, remove the right-hand machinery cabinet cover (see Section 3.3). With the lift car at least 24" [610 mm] off the ground, depress the tab on the far side of the switch body and push the switch out of its mounting hole from inside the lift car wall.



3.9 Locking Rod Switch

The locking rod switch senses whether the lower landing gate has been locked by the locking rod; the locking rod must lock the gate before the lift car has moved 2" [50 mm] off the ground, or the lift car will stop. The switch is located in the front left corner of the lift car, behind the skirt. The switch is of the normally open (NO) type, and can be tested using a standard multi-meter.

To access the switch for testing or replacement, retract the upper left corner of the lift car skirt while the lift car is on the ground. See Section 3.4 for detailed instructions on retracting the skirt. To remove the switch, depress the switch tab on the lower side of the switch and pull the switch out of its cutout in the mounting bracket. Refer to the figure below for identification of components. Take care not to damage the locking rod switch while removing it.

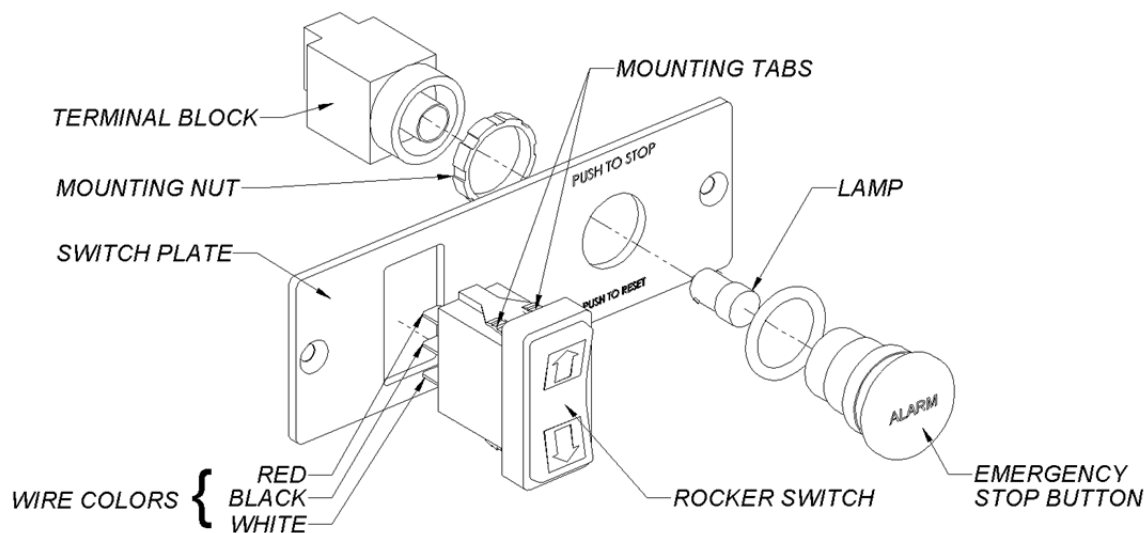


3.10 Operating Stations

The operating stations house the UP/DOWN rocker switches and, on the station inside the lift car, the emergency stop button. To test or remove either of these switches, use a Phillips screwdriver to remove the two (2) screws that secure the switch plate to the lift car and pull the plate away from the lift car. A standard multi-meter can be used to test the switches.

To remove the rocker switch, depress the mounting tabs and push the switch out of its mounting cutout.

To remove the emergency stop button, use the release lever on the contact block to disengage the block from the back of the operator then pull it off. Remove the mounting nut to free the operator from the switch plate.



LIFT CAR OPERATING STATION SHOWN

3.11 Override Keyswitch

The override keyswitch is used in conjunction with an operating switch to raise or lower the lift car when installing or removing the casters. The switch is of the "OFF-Momentary ON" type, and can be tested using a standard multi-meter.

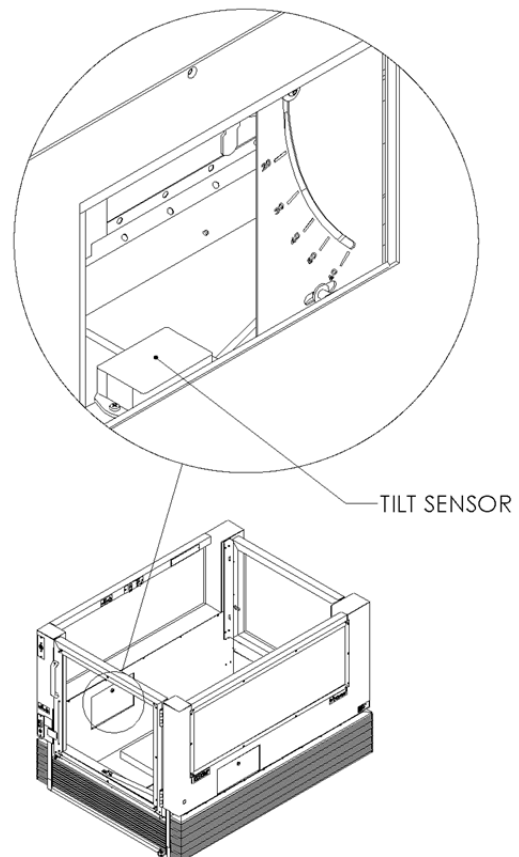
To remove the keyswitch, first remove the operating station on the lower landing end of the lift (see Section 3.10). Then use a 7/8" wrench to remove the nut that holds the keyswitch in place. Finally, use a screwdriver to disconnect the harness terminals and then pull the keyswitch out of the switch plate.

To reinstall the keyswitch, perform the above steps in reverse order. The harness wires are interchangeable.

3.12 Tilt Sensor

The tilt sensor is located next to the height adjustment mechanism in the left-hand machine cabinet. To remove it, remove the (2) sheet metal screws fastening it to the small shelf on the lift frame.

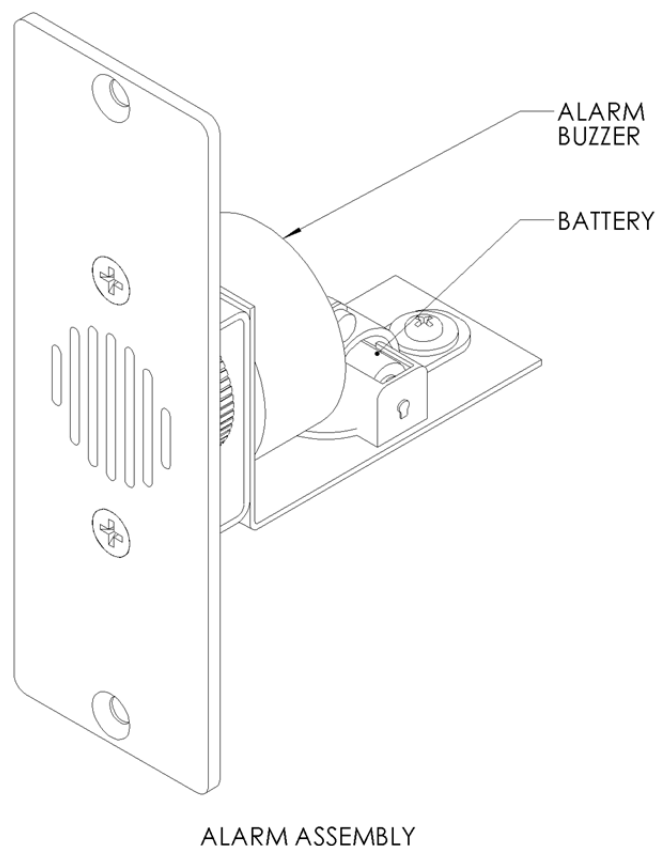
The tilt sensor is wired in series with the gate switches described in Sections 3.7 and 3.8. When the lift is set on level ground, the green light on the top of the tilt sensor illuminates and lift operation is enabled. When the lift is set on an incline greater than 5%, the red light on top of the tilt sensor illuminates and lift operation is disabled.



3.13 Alarm

The lift is equipped with an audible alarm that sounds when the emergency stop button is pressed. To test, press the emergency stop button. Release the emergency stop button to turn off the alarm.

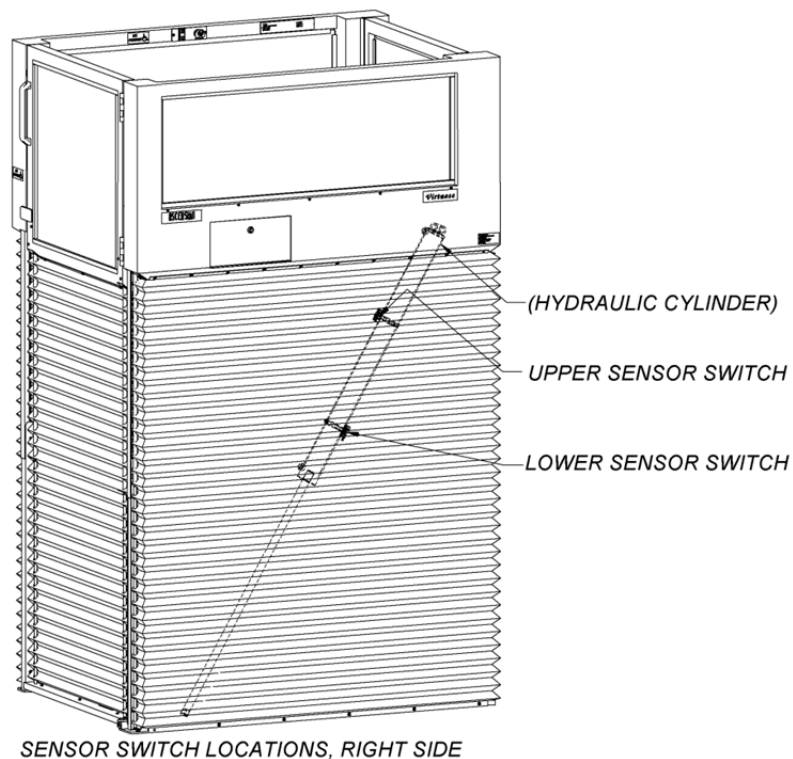
If the alarm does not sound when the emergency stop button is pressed, the alarm battery must be replaced. The battery is located just behind the alarm buzzer, which is mounted at the top left corner of the lower landing end of the lift. Remove the alarm assembly from the front of the lift to access the battery for replacement. Replace battery with style MN21, 23A/KE23A-1, or A23.



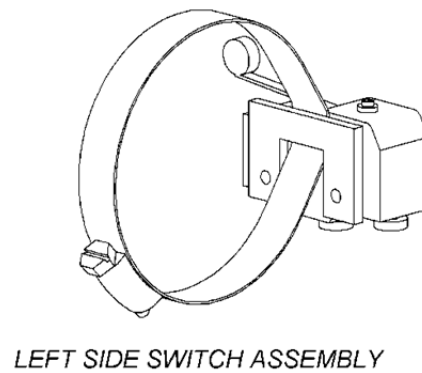
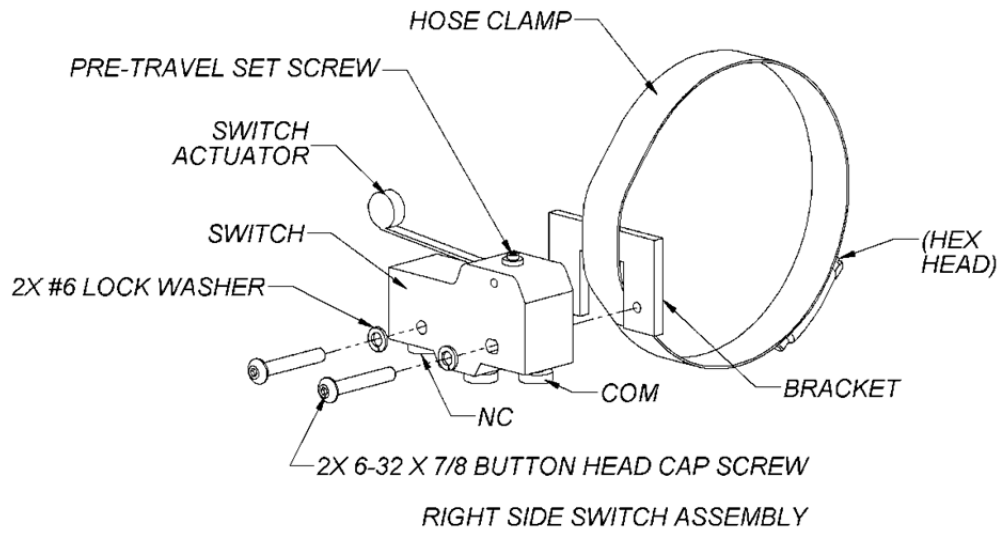
3.14 Skirt Sensor System

The skirt sensor system halts the motion of the lift car when an object or person pushes the safety skirt on the long sides of the lift inward more than 3" [76 mm]. One sensor assembly is located on each of the two hydraulic cylinders and consists of two extension springs that run the length of the hydraulic cylinder and two sensor switches that are actuated by the movement of the springs.

- See the figure below for the locations of the sensor switches. To gain access to the sensor switches, you can:
 - Retract the safety skirt as described in Section 3.4.
 - Move the lift car away from the lower landing with the lower platform gate open (while overriding the locking rod switch and lower platform gate switch) until the sensor switches can be accessed from underneath the lift car floor.
Be sure to turn off the lift's main disconnect at the control box and lock it in the "OFF" position before placing any body parts under the lift car floor.
 - Open a machinery cabinet from the top as described in Section 3.3.



- To shift the position of a sensor switch, loosen the hose clamp that holds it in place, shift the clamp, and then retighten it.
- To remove a switch:
 - Mark the location of the hose clamp on the hydraulic cylinder so it can be put back in the same place.
 - Remove the wires from the switch terminals.
 - Remove the hose clamp and pull the assembly free from the hydraulic cylinder.
 - Remove the two (2) 6-32 x 7/8 button head cap screws that secure the switch to the bracket and hose clamp.
- To install a switch:
 - Refer to the figure on the following page for the orientation of the switch and bracket to the hose clamp. Note that the assemblies on the right and left side are mirror images of each other.
 - Be careful not to over tighten the two (2) 6-32 x 7/8 button head cap screws that secure the switch to the bracket and hose clamp, as this could crack the switch case.
 - The pre-travel on the switch should be minimized such that the switch audibly "clicks" (its contacts close) just as the switch actuator is starting to be depressed. If necessary, adjust the pre-travel on the switch actuator by turning the small set screw at the base of the actuator with a 1/16" hex key.
 - When the switch assembly is installed correctly on the hydraulic cylinder, it will halt the movement of the lift car when the skirt is pushed inward more than 3" [76 mm]. This generally requires that the switch actuator be positioned about .060-.090" [1.5-2.25 mm] from the extension spring that actuates it.
 - The hex head on the hose clamp should be oriented such that it does not impede the movement of either extension spring and does not contact the sidewall of the lift car as the lift car descends.
 - The wiring harness should be connected to the normally closed (NC) and common (COM) terminals of the switch.



3.15 Hydraulic Valves

The hydraulic valves are located inside the right-hand machinery cabinet, and can be accessed through the outer access panel or through the top of the machinery cabinet. See Section 3.3 for instructions on opening the machinery cabinet from the top.

Refer to the following instructions for adjusting or removing any of the four components located in the manifold. It is recommended that you place paper towels below the component to be removed to catch the several ounces of hydraulic fluid that will drip from the manifold as the component is removed. Refer to the figure on the following page for component identification.

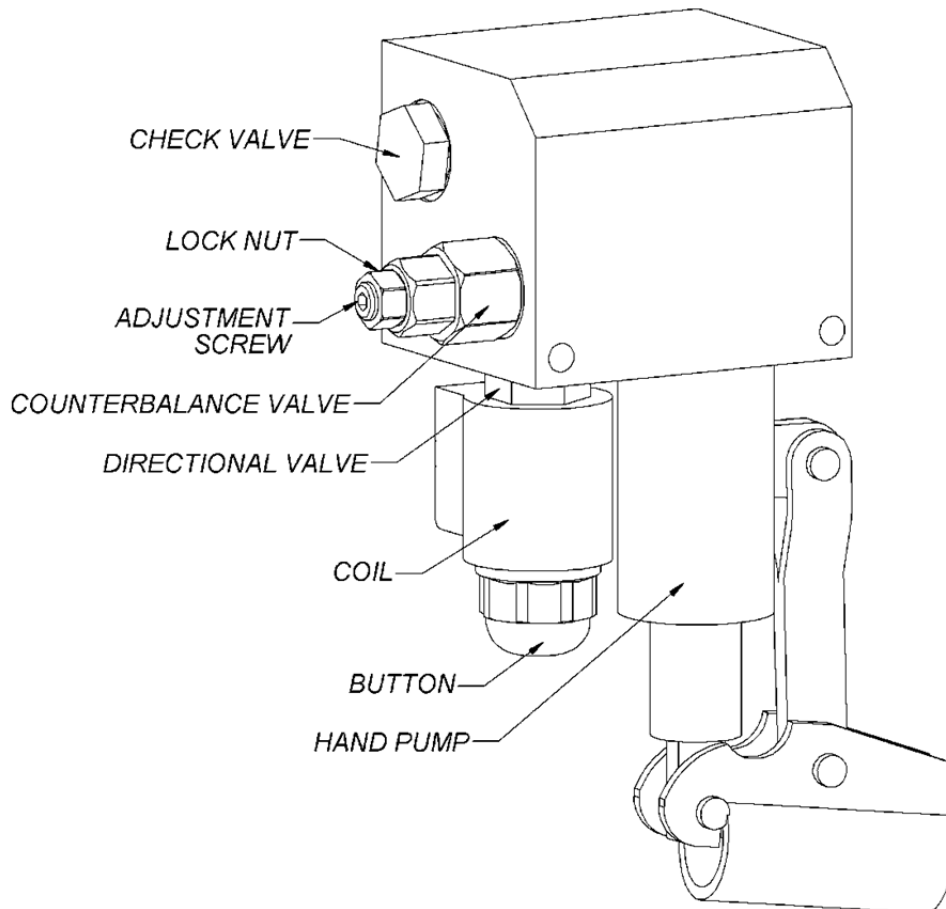
WARNING!

The lift car MUST be either at the lower landing or secured in place before the COUNTERBALANCE VALVE or CHECK VALVE is loosened or removed. Failure to do so could result in the lift car dropping and/or high pressure hydraulic oil leaks.

- Counterbalance Valve: If the lift car "bounces" as it descends while fully loaded, then the adjustment screw on this valve may need to be tightened. To do so, loosen the lock nut using a 1/2" wrench, turn the adjustment screw clockwise 1/4 turn using a 5/32" hex key, and then retighten the lock nut. Test and repeat as necessary until the "bouncing" has been eliminated. To remove this valve, use a 7/8" wrench. When reinstalling the counterbalance valve, torque it to 18.5-22.0 ft-lbs [13.6-16.2 N*m].
- Check Valve: This valve cannot be adjusted. Use a 7/8" wrench to remove the valve from the manifold. When reinstalling the valve, torque it to 25-30 ft-lbs [19-22 N*m].
- Directional Valve: This valve cannot be adjusted. This valve can be removed while the lift car is not at the lower landing provided that the counterbalance valve is working correctly. However, if the lift car starts to descend while you are turning this valve out of the manifold, immediately tighten the valve back into the manifold; the counterbalance valve is malfunctioning and must be replaced (with the lift car at the lower landing). Before removing this valve, pull the electrical harness connectors off of the coil terminals. Then remove the black button by turning it counterclockwise,

and pull the coil off the valve. Finally, use a 7/8" wrench to remove the valve from the manifold. When reinstalling the directional valve, torque it to 18.5-22.0 ft-lbs [13.6-16.2 N*m].

- **Hand Pump:** The hand pump cannot be adjusted. The hand pump can be removed while the lift car is not at the lower landing provided that the counterbalance valve is working correctly. However, if the lift car starts to descend while you are turning the pump out of the manifold, immediately tighten it back into the manifold; the counterbalance valve is malfunctioning and must be replaced (with the lift car at the lower landing). Use a 1-1/4" wrench to remove the hand pump from the manifold. When reinstalling the hand pump, torque it to 25-30 ft-lbs [19-22 N*m].



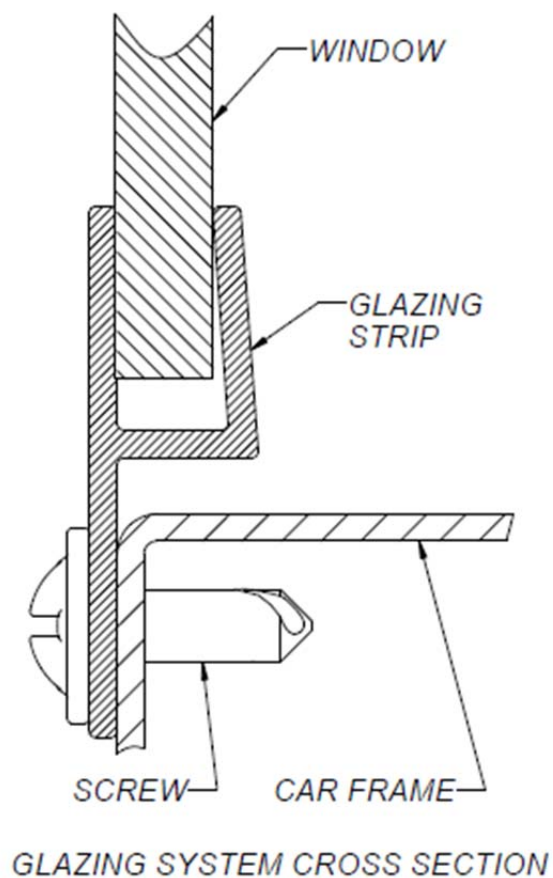
HYDRAULIC MANIFOLD WITH VALVES

3.16 Windows

The windows on the lift are pinched in the channel of a glazing strip which is attached to the lift frame with screws. See the figure below.

To remove a window, remove each of the screws attaching the four glazing strips to the lift's exterior. The window and strips can then be removed as a single unit.

To reinstall a window, position the window assembly in its original installation orientation and reinstall screws. Note that in some locations there may be a gap between the bottom of the glazing strip channel and the lift frame to allow clearance for the fillet welds at the corners of the frame; this is normal.

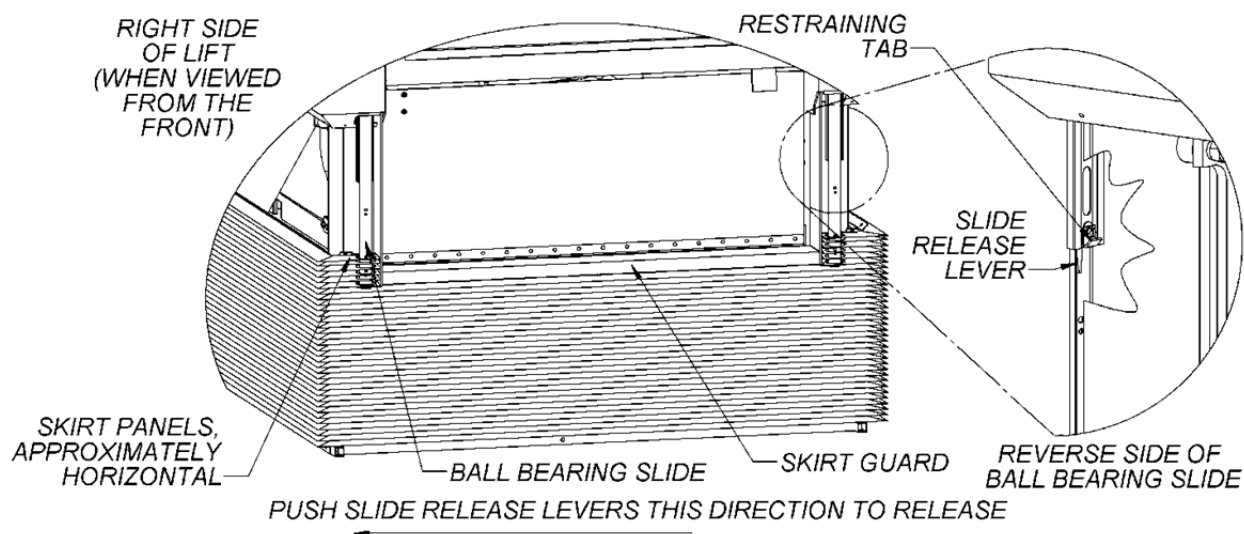


3.17 Skirt Guard

The skirt guard is located on the upper landing side of the lift car, below the gate. The skirt guard blocks the dock plate from deploying when the lift car is at the lower landing, but slides out of the way as the lift car moves away from the lower landing.

To detach the skirt guard from the lift and safety skirt, perform the following steps:

1. Raise the lift car so the lift car floor is at least 15" [380 mm] off the ground.
2. Detach the protective skirt from the long sides of the lift car by removing the ten (10) pan head screws on each side that secure the sides of the skirt to the lift car.
3. Use a 5/16" combination wrench to remove the two (2) hex head screws that secure the top of the skirt to the lift car on the upper landing side, one (1) at each corner. Remove the small skirt support brackets that are freed when these screws are removed.
4. Remove the (2) 5/16"-18 screws from the lift frame just above the ball bearing slides.
5. Retract the skirt around the ball bearing slides as shown in the figure below. You will need to hold each skirt panel approximately horizontal to move it past the restraining tab.

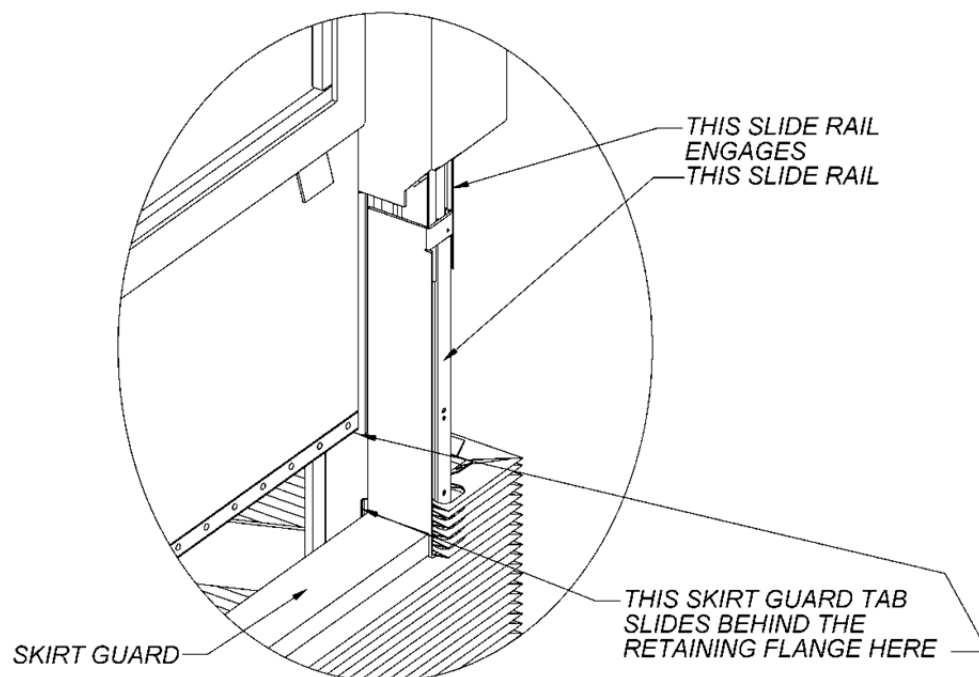


6. Push the ball bearing slide release levers as shown in the figure above and then pull downward on the skirt guard to separate it from the lift car.

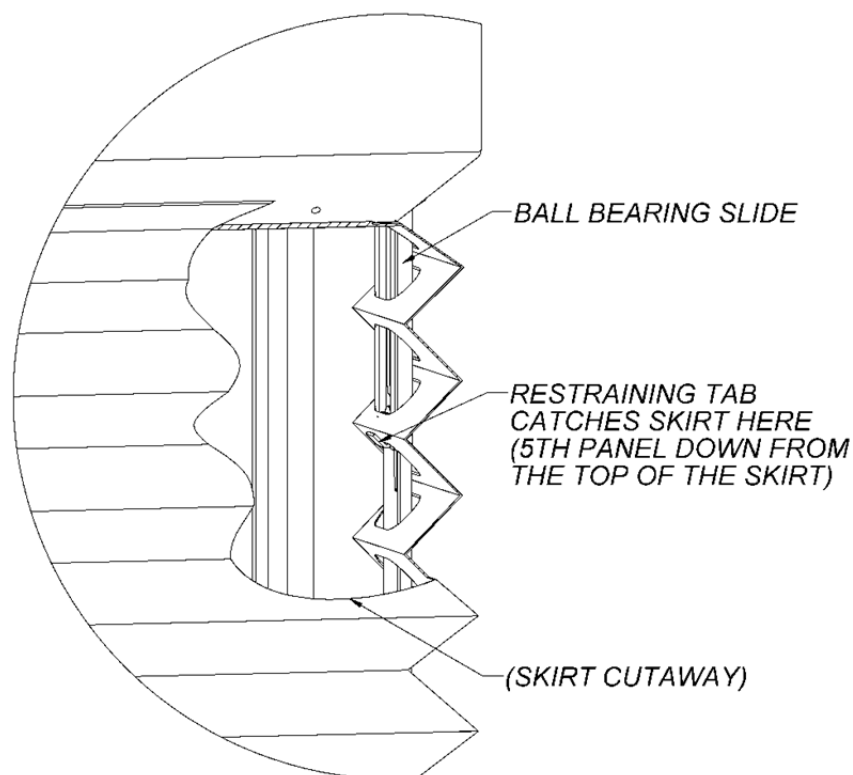
7. Remove the three (3) hex head screws that secure the skirt to the skirt guard using a 5/16" wrench.
8. Use a 3/32 hex key to remove the two (2) 8-32 x 3/16 button head cap screws that secure the ball bearing slide rails to the skirt guard. The guard can now be freed from the safety skirt.

To reinstall the skirt guard, perform the following steps. If necessary, refer to the figures in the skirt guard instructions above for identification of components.

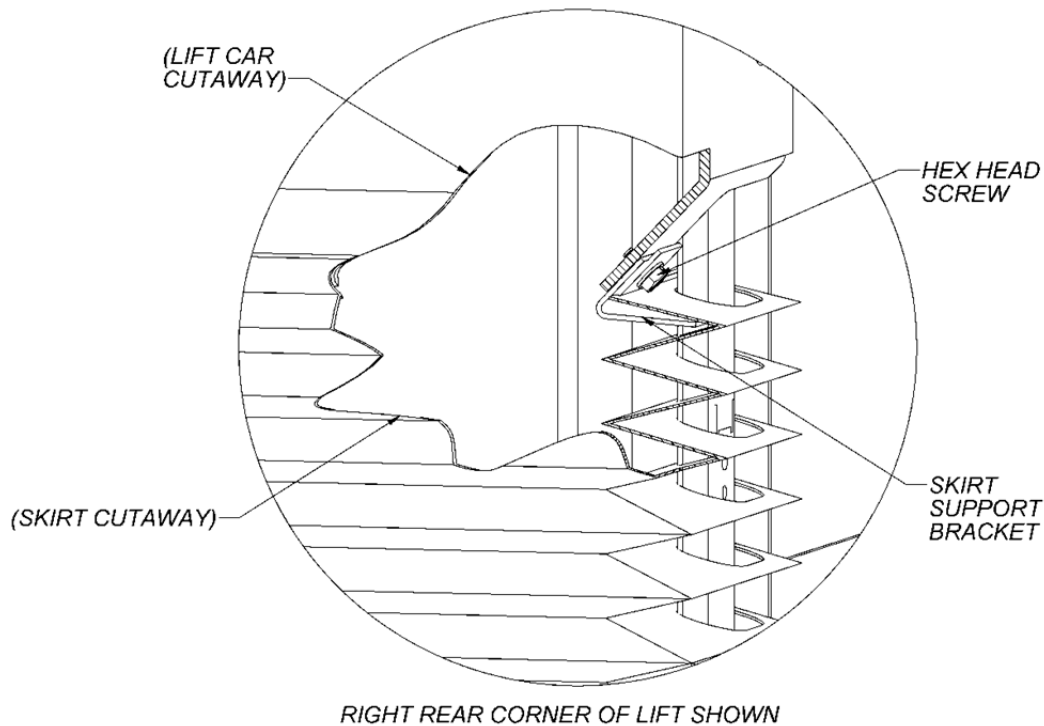
1. Thread the ball bearing slide rails through the skirt slots and the rectangular cutouts in the skirt guard and secure them in place using the two (2) 8-32 x 3/16 button head cap screws. The screws should be approximately centered in the horizontal slots in the ball bearing slide rails.
2. Use a 5/16" wrench to secure the skirt to the skirt guard with the (3) hex head screws removed in Step 6 above.
3. Position the skirt guard underneath the ball bearing slides on the lift car, so that the slide rails on the skirt guard line up with the slide rails on the lift car.
4. Move the skirt guard upward, while making sure the skirt guard tabs slide behind the retaining flanges on the lift car, and the slide rails on the skirt guard lock into the slide rails on the lift car. See the figure at the top of the following page.
5. You will feel and hear a "click" when the ball bearing slides engage each other, and the skirt guard will be held in place. If the skirt guard was installed correctly, the guard cannot be pulled away from the lift car. If this is not the case, use the release levers to release the skirt guard, and then reinstall it, taking care to slide the skirt guard tabs behind the retaining flanges on the lift car.
6. Reinstall the 5/16"-18 screws into the holes in the lift frame just above where the ball bearing slides enter the frame.



7. Lift the skirt upward on both sides of the skirt guard until the skirt slips past the restraining tabs on the ball bearing slides as shown in the figure below. The restraining tab must catch the skirt on the 5th panel down from the top of the skirt.



8. Use a Phillips screwdriver to reinstall two (2) or three (3) pan head screws on each side of the lift car to secure the top of the skirt loosely to the lift car.
9. Use a 5/16" combination wrench to reinstall the two (2) hex head screws that secure the skirt and skirt support brackets to the lift car, one (1) at each corner. Be sure to install the skirt support brackets between the skirt and the lift car frame. See the figure below.



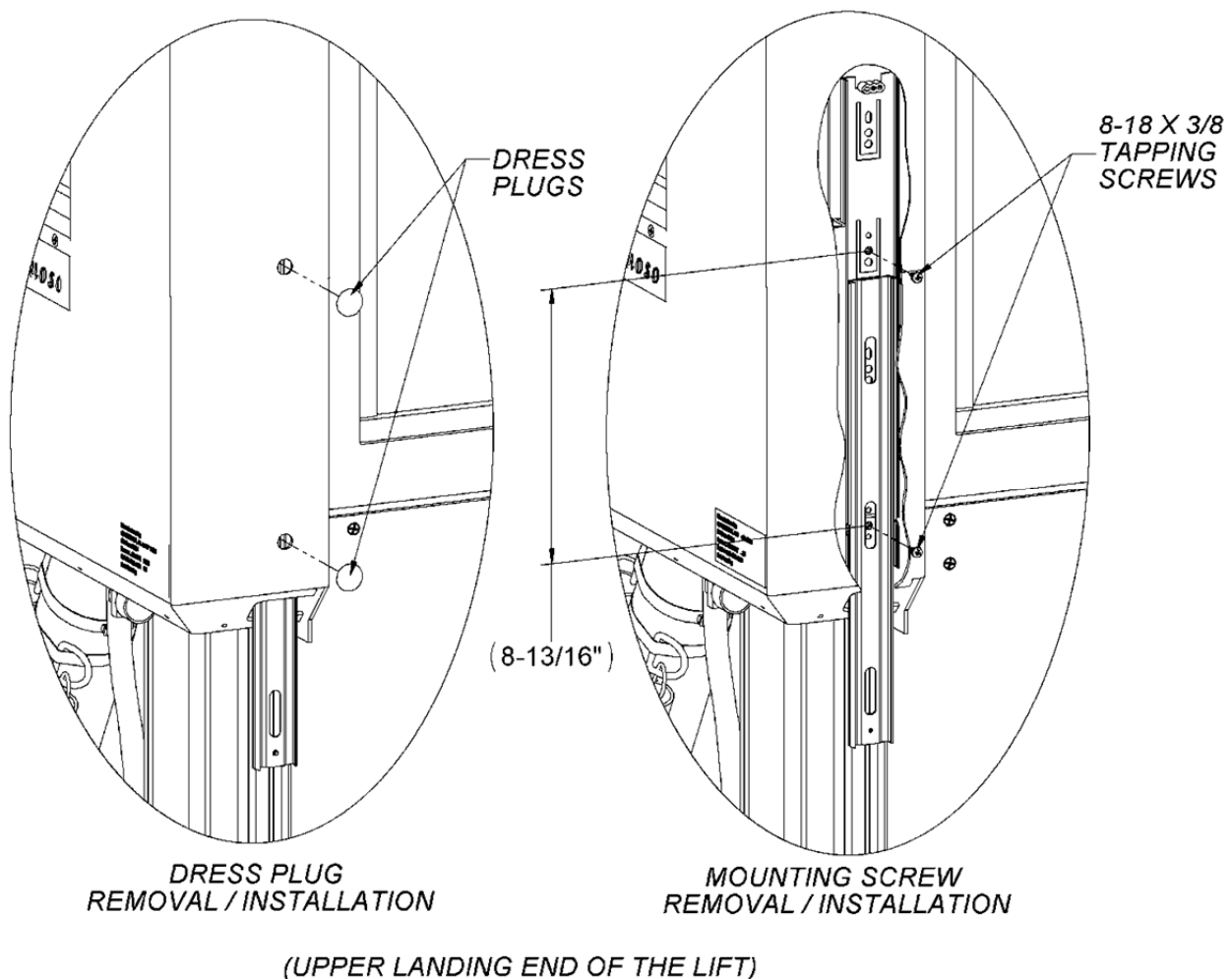
10. Use a Phillips screwdriver to reinstall the remainder of the ten (10) pan head screws that secure the sides of the skirt to the lift car.

To remove the portion of a ball bearing slide that is mounted to the lift car:

1. Complete steps 1-6 in the instructions above for removing the skirt guard from the lift car.
2. Use a blade or small standard screwdriver to pry the two (2) dress plugs out of the lift car frame in the corner in which you are removing the ball bearing slide. See the figure on the following page.

3. Use a Phillips screwdriver to remove the two (2) 8-18 x 3/8 self-tapping pan head screws that are now accessible. You may need to shift the position of the movable portion of the ball bearing slide to expose the screws. Be sure to catch the screws as they are removed.

To install a ball bearing slide into the lift car frame, reverse the above instructions. Be sure to install the two (2) 8-18 x 3/8 self-tapping pan head screws through the ball bearing slide holes indicated in the figure below. It is recommended that you mark the correct holes with a marker on the ball bearing slide before attempting to install the slide inside the lift car frame so that it is clear which mounting holes are correct.



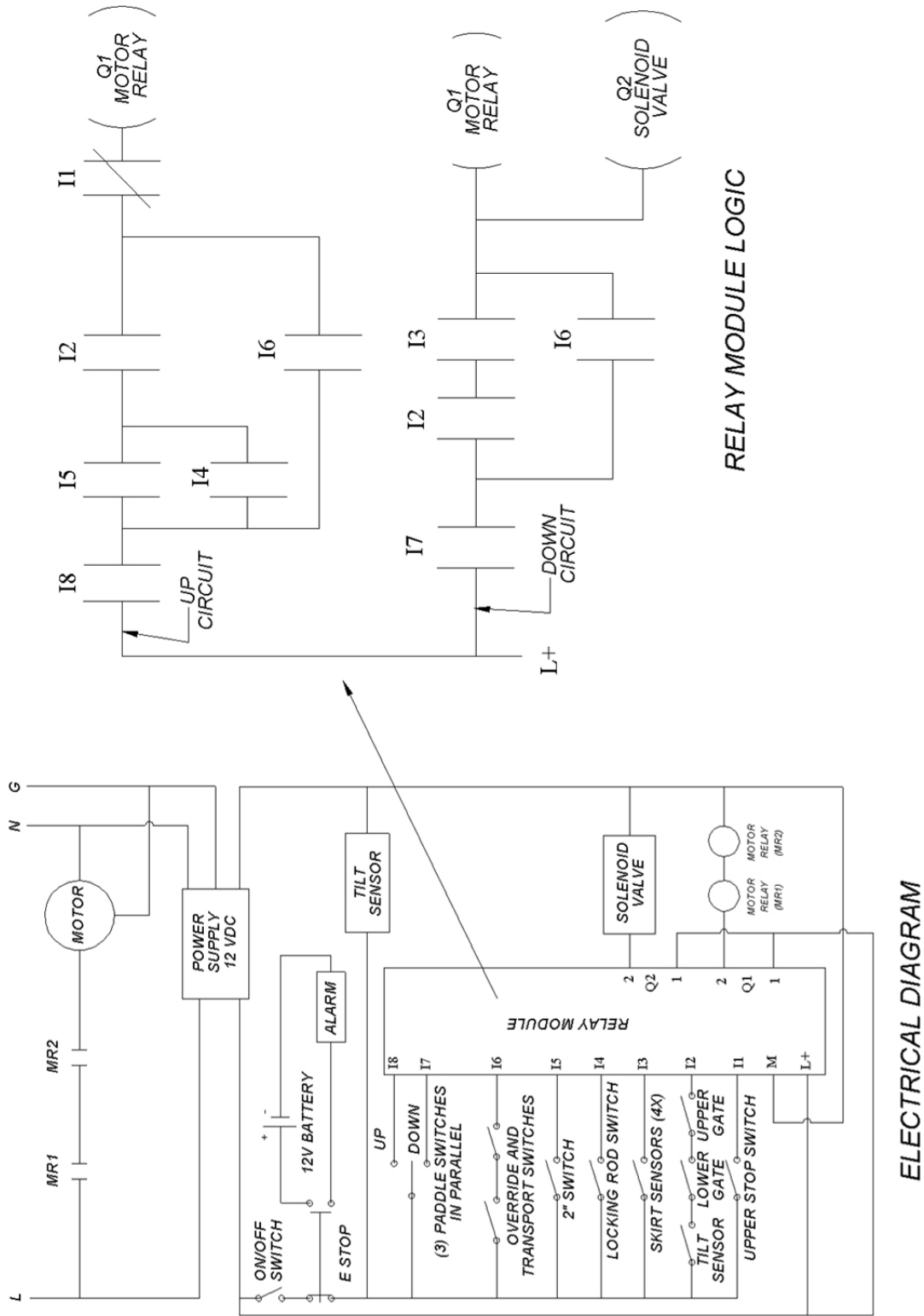
SECTION 4 Electrical Testing

This section contains information that will enable a skilled and experienced electrician to service the lift. The logic diagram for the lift is shown on the following page.

⚠ CAUTION!

When working on any part of the electrical system, industrial electrical safety practices should be rigorously adhered to, including:

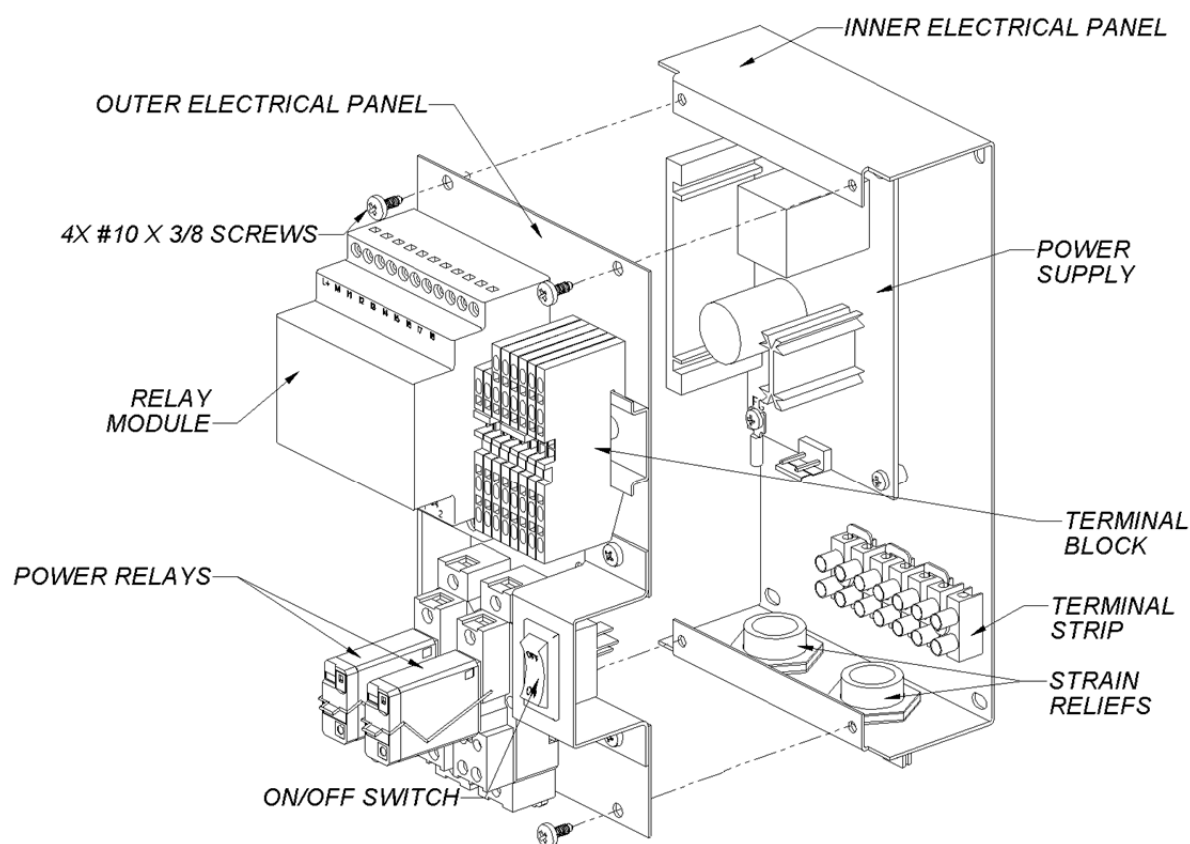
- ***Danger Tags: While repairs are underway, a danger tag should be attached to the plug of the electrical cord to advise personnel that the lift is being serviced. Additionally, the plug should be locked out according to the procedures established in OSHA's Lockout/Tagout – Hazardous Energy Sources Standard (29 CFR 1910.147).***
- ***Two-man rule: As a minimum, two (2) people should be present while repairs and tests are being performed.***
- ***Do not leave the lift unattended with the plug connected to the service outlet while the electrical system components are exposed. Remove the plug if it is necessary to leave the lift, no matter how briefly.***
- ***Be cognizant as to the electrical status of the lift (i.e., whether it is powered or not). When in doubt as to whether a circuit or component is powered, test it first!***



4.1 Access to the Electrical Panel

The electrical panel can be accessed through both access panels in the left-hand machinery cabinet. If additional access space is needed, the top of the left-hand machinery cabinet can be removed (refer to Section 3.3 for instructions).

Refer to the figure below for identification of the major components on the electrical panel.



ELECTRICAL PANEL & MAJOR COMPONENTS
WIRING HARNESES AND CONNECTORS NOT SHOWN

4.2 Testing the Switches

Each of the lift's switches can be tested by locating the switch, removing the switch from the lift if necessary, and checking for continuity across the contacts on the back of the switch. See the table below for information on the type of each switch and in which section of this manual to find information on accessing the switch.

Switch	Type	Section
Transport Switch	SPST, NO	3.6
Two-Inch Switch	SPST, NO	3.6
Upper Stop Switch	SPDT, NC circuit used	3.6
Lower Landing Gate Switch	SPDT, NO circuit used	3.7
Upper Landing Gate Switch	SPST, NO	3.8
Locking Rod Switch	SPST, NO	3.9
Emergency Stop Switch	Push-to-break	3.10
Rocker Switch	(Mom. On)-Off-(Mom. On)	3.10
Override Keyswitch	Off-(Mom. On)	3.11
Tilt Sensor	SPDT, NO circuit used	3.12
Skirt switch (4x)	4x SPDT, NC circuit used	3.14
ON/OFF Switch	On-Off	4.1

Alternately, most of the lift's switches can be tested at the relay module, which operates on 12 VDC power. Before performing any checks at the relay module, verify that the module itself is receiving power (refer to Section 4.3). If the module is receiving power, then the function of the lift's switches can be verified by testing for continuity across the relay module's contacts as shown in the following table.

Component	Relay Module Contacts	Circuit is closed when:	Circuit is open when:
Rocker Switch	I8-L+	Rocker is pushed up	Rocker is at rest or pushed down
	I7-L+	Rocker is pushed down	Rocker is at rest or pushed up
Transport Switch and Override Keyswitch	I6-L+	Height adjustment knob is in transport location and override keyswitch is turned "on"	Height adjustment knob is not in transport location and override keyswitch is turned "off"
2" Switch	I5-L+	Lift car is less than 2" [50 mm] off the ground	Lift car is more than 2" [50 mm] off the ground
Locking Rod Switch	I4-L+	Upper locking rod is engaged (lift car is more than 2" [50 mm] off the ground)	Upper locking rod is disengaged (lift car is less than 2" [50 mm] off the ground or lower landing gate is open)
Skirt switches (4x)	I3-L+	Skirt hangs freely; not pushed in	Object pushing in on skirt
Gate switches and tilt sensor	I2-L+	Gates are closed and lift is on level ground	Either gate is open or lift is not on level ground
Upper Stop Switch	I1-L+	Switch is not engaged by upper stop mechanism (lift car is not at the upper landing)	Switch is engaged by upper stop mechanism (lift car is at the upper landing)

4.3 *Testing the Relay Module*

The relay module (Smart Relay) is located on the outer electrical panel. See Section 4.1.

A green light on the relay module indicates that it is receiving power and is ready for use. Note that the relay module requires 6-8 seconds to initialize after it receives power (i.e., the lift is plugged in), during which time the relay light is red. Always give the module time to initialize before performing any testing on it.

To test the function of the relay module, refer to the logic diagram on page 36.

If the relay module is not receiving power, check for and correct the following conditions as necessary:

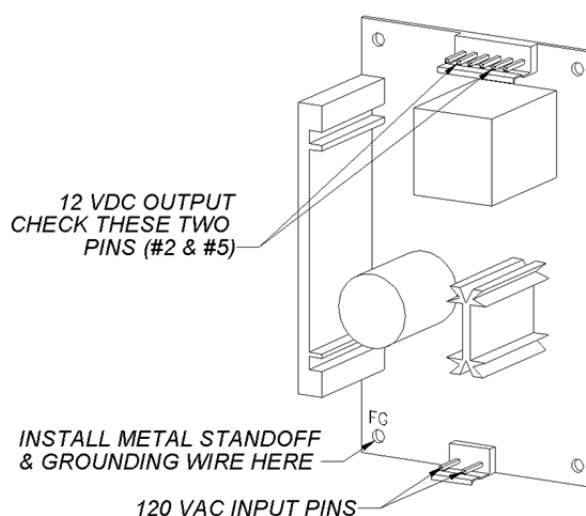
1. The lift is not plugged in. Plug the lift in.
2. The service outlet does not have power. Plug the lift into an outlet that does have power.
3. The GFCI on the power cord has been tripped. Reset the GFCI.
4. The power supply is not supplying 12 VDC. Refer to Section 4.4 to check it.
5. There has been a wiring harness or connector failure. See the Electrical Diagram on page 36 to continue troubleshooting, or contact Ascension.

4.4 Testing the Power Supply

The power supply is located on the inner electrical panel. See Section 4.1. To gain access to the power supply, use a Phillips screwdriver to remove the four (4) #8 x 3/8 screws shown and then pull the outer electrical panel out of the way. The lift must be plugged in and turned on to perform the following tests.

To test the power supply output, disconnect the harness that plugs onto the supply output from the power supply and check for a 12 VDC drop across the terminal posts indicated in the figure to the right.

To test that the power supply is receiving power, disconnect the harness that plugs onto the power supply input and check for a 120 VAC[†] drop across the harness connector sockets that correspond to the terminal posts indicated in the figure to the right.



If the power supply is receiving 120 VAC[†] but is not putting out 12 VDC, test the fuse located beside the 120 VAC[†] input posts. If the fuse is good, then the power supply must be replaced. To detach the power supply from the inner electrical panel, remove the four (4) mounting screws and four (4) standoffs. When reinstalling the power supply, be sure to install the metal standoff behind the screw located in the lower left corner of the power supply, and attach the spade terminal on the grounding wire underneath the screw head in that location as well.

[†] Electrical ratings may differ on lifts outside the USA. Check lift data plate for electrical ratings.

4.5 Testing the Power Relays

The power relays are located on the outer electrical panel. See Section 4.1. The lift must be plugged in and turned on to perform the following tests.

Checking for AC Supply Power

While the motor is not running, use a multi-meter to check for 120VAC[†] across Power Relay 1 terminal '11' and Power Relay 2 terminal '11'. If the voltage across these terminals does not match the lift's rated voltage, check the AC power connections on the inner electrical panel. See Section 4.1.

Manually Overriding the Power Relays

CAUTION: The following test may cause the lift to move.

To manually override the power relays, push the small override buttons on the front of both relays simultaneously. If the relays are connected to AC supply power, this should cause the motor to run and the lift to move.

Releasing either override button should cause the lift to stop. If releasing the override button on either relay does not cause the lift to stop, that relay must be replaced.

Replacing the Power Relays

To replace a power relay, first electrically isolate the lift according to the procedures in Section 3.2. Next, push the metal hold-down clip down off the top of the relay and pull the relay out of its socket. Insert the new relay into the socket and pull the hold-down clip back onto the top of the relay to secure it.

It is normal for one or both relays to be missing the tab connected to their NC contact. This tab is removed during factory installation so that the NC terminals on the relay socket, which are unused, are never powered with live voltage. When replacing the relays, removal of this tab is optional.

[†] Electrical ratings may differ on lifts outside the USA. Check lift data plate for electrical ratings.

SECTION 5 Lift Compression/Expansion

The VIRTUOSO lift can be compressed to a width of 33 inches in order to move it through a narrow doorway. This section describes the procedures for compressing the lift and then expanding it again. A toolkit is available for purchase from Ascension that contains several of the tools required for the process; however, the owning facility may use its own tools in place of the kit if desired.

The following tools are required for the compression/expansion process. Items with an asterisk (*) are included in the Ascension Toolkit.

- Operating Manual
- 6" [150 mm] length of duct tape or similar
- Safety glasses for all personnel
- Phillips screwdriver (power screwdriver preferable)
- Standard screwdriver
- 5/32" hex key
- 3/16" hex key
- 9/16" combo wrench or ratchet wrench
- Two (2) 7/16" combo wrenches or ratchet wrenches
- 5/16" combo wrench
- 3/16" or 1/4" punch*
- Pry bar*
- Hammer (dead-blow preferred)*
- Two (2) weld clamps* or C-clamps
- Two (2) straps with ratchet buckles* (optional)
- 60" [1524 mm] long spreader tube* or bar or 2x4 board (optional)
- Instructional DVD* (optional)

Be sure to read through all of the instructions in Section 5 before starting the process.

5.1 Compressing the Lift

To compress the lift, complete the following steps in the order listed. Boxed step numbers correspond to boxed numbers in the referenced figures.

⚠ WARNING!

NEVER place your head or torso under any part of the lift car.

⚠ CAUTION!

Wear safety glasses at all times while performing the following procedures.

1. Electrically isolate the lift in accordance with the instructions in Section 3.2 of this manual.
2. Prop the lower landing gate open using the hold-open washer on the door closer. Then use the hand pump in the right-hand machinery cabinet to raise the lift car until the lift car floor is approximately 15 inches off the ground.
3. Remove the lift car skirt (*not* the gate skirt). See Section 3.4 of this manual for instructions.
- 4.** (Refer to Figure 5.1, next page) Open the upper landing gate and disconnect the dock plate tether from the gate by removing the two (2) Phillips #10 x 3/4" flat head screws that secure the footman's loop to the gate.
- 5.** (Refer to Figure 5.1) Disconnect the closer spring from the upper landing gate. To do so, use a standard screwdriver or needle-nose pliers to remove the e-clip from the post on the gate, and then slip the spring off the post. For convenience, leave the hydraulic damper (located inside the spring) attached to the gate.
6. (Refer to Figure 5.1) Disconnect the dock plate from the lift by removing the following fasteners:
 - 6.1** Two (2) Phillips #10 x 1/2" flat head screws that secure the dock plate hinge bracket to the lift car floor in the back, center of the floor.
 - 6.2** Four (4) 1/4-20 x 1/2" button head screws with lock washers that secure the dock plate hinge bracket to the lift car sides, two (2) on each side. (Use a 5/32" hex key.)

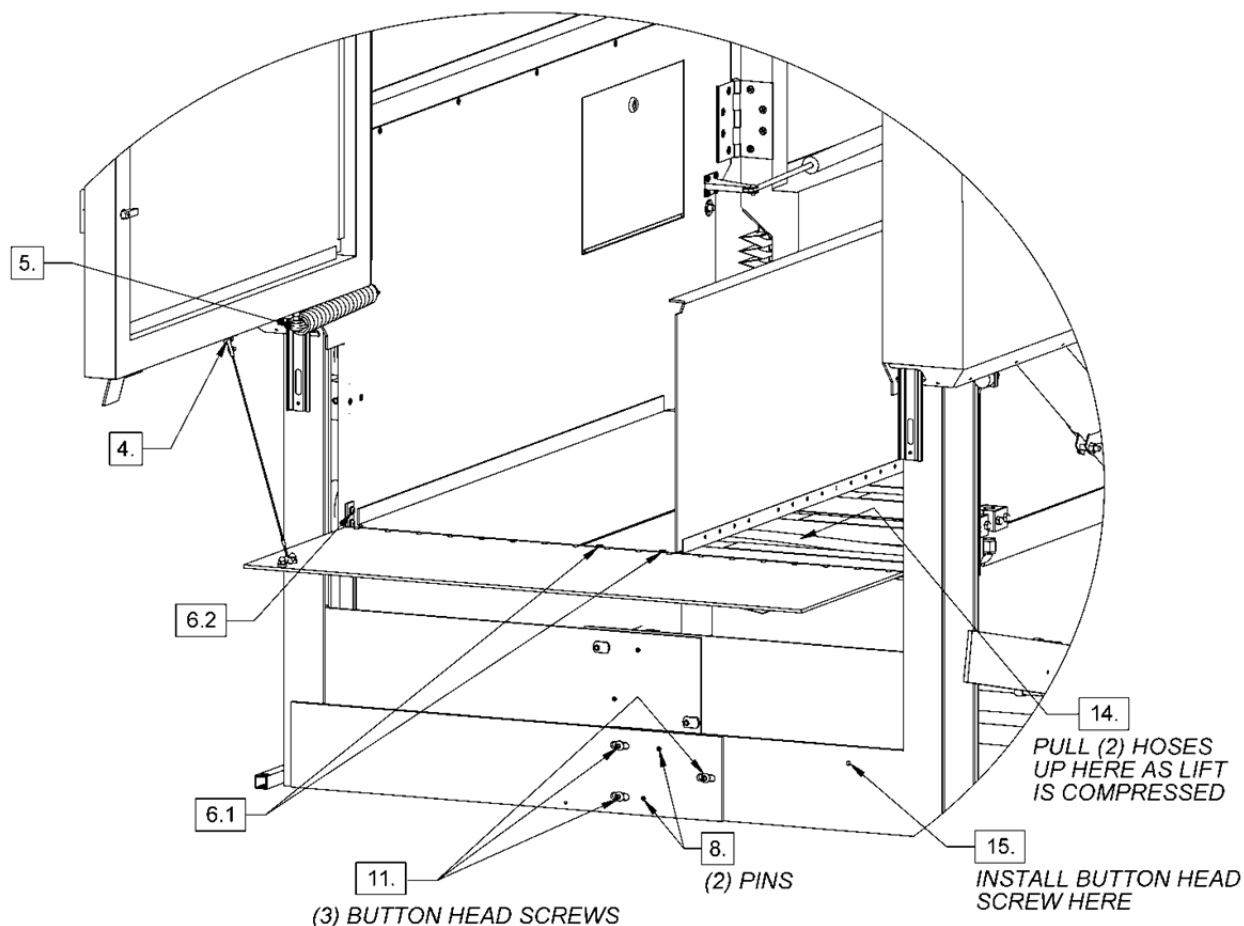


Figure 5.1 (Upper Landing Gate View)

7. Fold both floor sections up and secure them together in the raised position using duct tape or a similar method.

⚠ CAUTION!

In the following step, stay clear of the lift car when it is moving to avoid any pinching and/or crushing hazards.

8. (Refer to Figures 5.1 & 5.2) Use the hand pump to move the lift car upwards until the car floor is approximately 36" [915 mm] off the ground. Then use a 3/16" or 1/4" punch to remove the five (5) spring pins from the back cross members. After removing the spring pins, use the hand pump to move the lift car downwards until the lift car floor is approximately 15" [380 mm] off the ground again.
9. (Refer to Figure 5.2, next page) Use two (2) 7/16" combo wrenches or sockets to remove the four (4) 1/4-20 x 1 hex cap screws, four (4) 1/4-20 nuts, and eight (8) washers from the front base members.

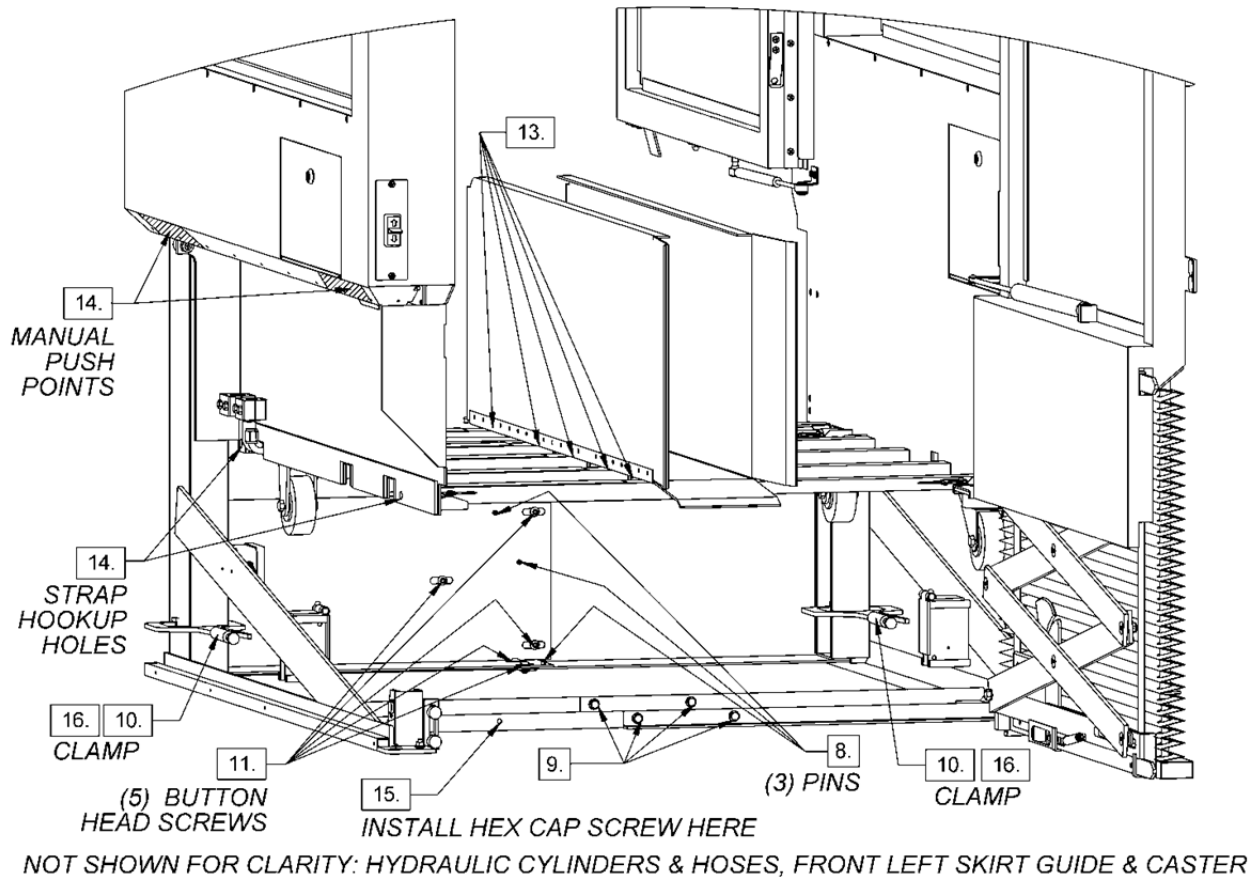


Figure 5.2 (Lower Landing Gate View)

10. (Refer to Figure 5.2) Install two (2) welding clamps or C-clamps in the location shown. These clamps should hold the vertical rails together securely.
11. (Refer to Figures 5.1 & 5.2) Use a 3/16" hex key to remove the eight (8) button head screws from the back base cross members.
12. Install the four (4) casters into the lift car brackets. Use the lock pins to secure the casters on the left side of the lift car. Use two (2) spring pins (removed in Step 8 above), or two (2) 1" to 1.5" long flat head screws, to secure the casters on the right side of the lift car. If using the spring pins, insert the pins into the caster bracket holes until they are just past flush with the top surface of the caster brackets.
13. (Refer to Figure 5.2) Use a 9/16" combo wrench or socket to loosen the ten (10) 3/8-16 x 3/4" hex cap screws that hold the floor members together. These screws are located underneath the car floor. They do not need to be completely

removed, but they should be backed nearly all of the way out of the floor members.

⚠ CAUTION!

As the sides of the lift car are pushed together in Step 14 below, pull the flexible hoses at the back of the lift car up into the empty space on the left side of the lift car. See Figure 5.1. Failure to do so could result in damage to the hydraulic hoses.

14. (Refer to Figure 5.2) Open the upper landing gate, and then push the sides of the lift car together until the lift is narrowed to the required width. The lift can be pushed together manually, by gripping at the locations shown. Or, if necessary, the straps provided with the Ascension Toolkit can be used, installed in the holes at the locations shown and routed underneath the lift car. See Figure 5.6 on page 53 for instructions on operating the strap buckle.
15. (Refer to Figures 5.1 & 5.2) Install one (1) 5/16-18 x 5/8" button head cap screw (removed in Step 11) into the back base cross members and one (1) 1/4-20 x 1" hex cap screw with 1/4-20 nut (removed in Step 9) into the front base cross members in the locations shown.
16. (Refer to Figure 5.2) Remove the clamps from the back of the lift.

⚠ CAUTION!

In the following step, stay clear of the lift car when it is moving to avoid any pinching and/or crushing hazards.

17. Use the hand pump to lower the lift car to the ground and then raise the base off the ground. Take care that the swivel casters do not catch on the hydraulic cylinders as the lift car is lowered. The lift can now be rolled through a doorway.

5.2 Expanding the Lift

To expand the lift, complete the following steps in the order listed. Boxed step numbers correspond to boxed numbers in the referenced figures.

⚠ WARNING!

NEVER place your head or torso under any part of the lift car.

⚠ CAUTION!

Wear safety glasses at all times while performing the following procedures.

1. Electrically isolate the lift per the instructions in Section 3.2 of this manual.
2. Use the hand pump to raise the lift car until the lift car floor is approximately 15 inches off the ground.
- 3.** (Refer to Figure 5.3, next page) Install two (2) welding clamps or C-clamps in the locations shown.
- 4.** (Refer to Figures 5.3 & 5.4, page 50) Remove the button head cap screw from the back cross members, and the hex cap screw and nut from the front cross members.

⚠ CAUTION!

As the sides of the lift car are spread apart in Step 5 below, push the two flexible hydraulic hoses into their normal position. See Figure 5.4. Failure to do so could result in damage to the hydraulic hoses.

- 5.** Spread the lift car apart to its normal width. Spread the lift manually by gripping at the locations shown in Figure 5.3. Or, if necessary, use the strap and spreader tube as shown in Figure 5.5 on page 51. The paint on the upper surfaces of the small floor members is scored where the edges of the large floor members should be located when the lift car is spread to the correct width.

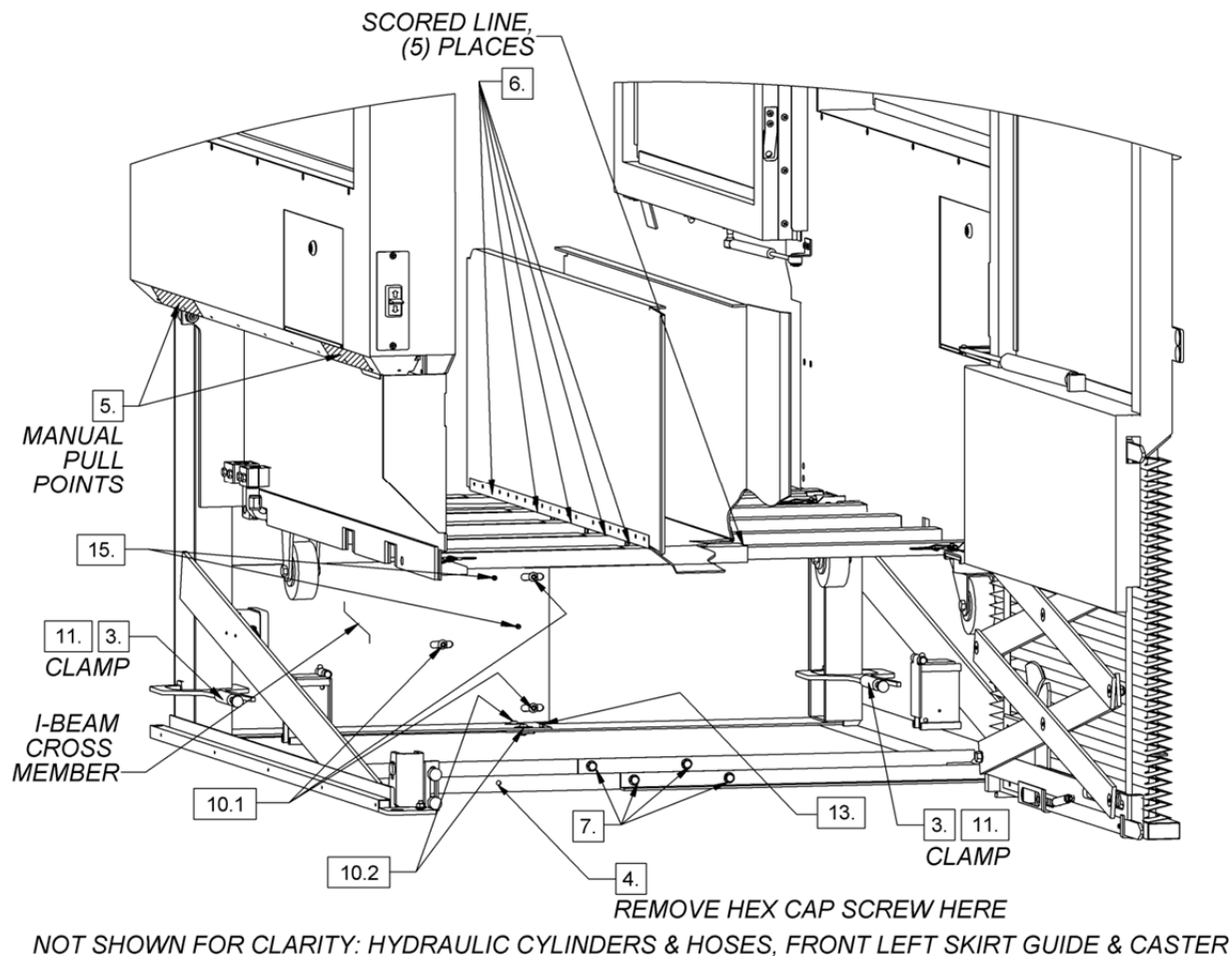


Figure 5.3 (Lower Landing Gate View)

6. (Refer to Figure 5.3) Tighten the ten (10) 3/8-16 x 3/4" hex cap screws which fasten the floor members together. Take special care to align the scored lines on the top of the smaller lift car floor members with the edges of the larger lift car floor members before tightening these screws.
7. (Refer to Figure 5.3) Use two (2) 7/16" wrenches to reinstall the four (4) 1/4-20 x 1 hex cap screws, four (4) 1/4-20 nuts, and eight (8) washers into the front base supports. Leave these screws and nuts very loose for now. The screws should be installed so that the screw heads are toward the front of the lift and the lock washers are under the nuts.
8. (Refer to Figure 5.4) Use a 3/16" hex key to turn the four (4) adjustment screws (two (2) on each side) at the back of the lift car exactly three (3) full rotations counterclockwise.

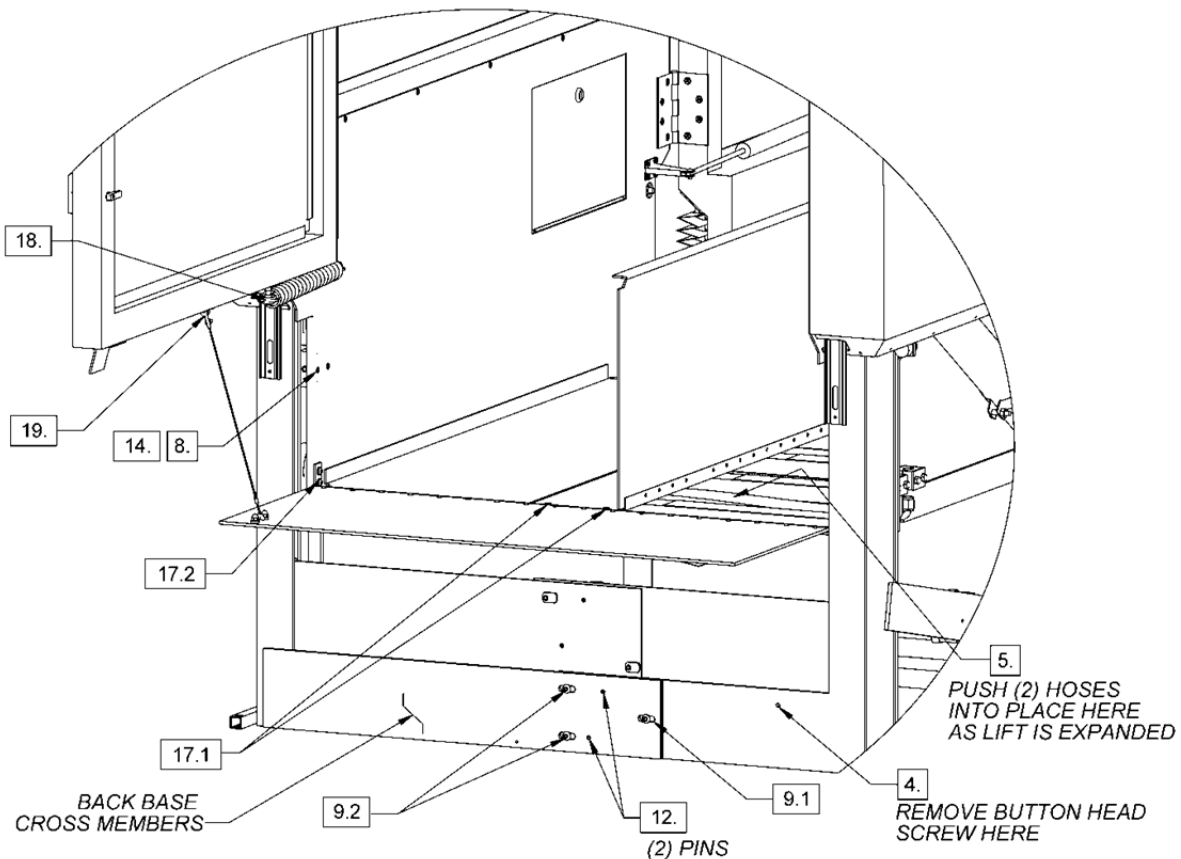


Figure 5.4 (Upper Landing Gate View)

9. (Refer to Figure 5.4) Thread the following fasteners into the back base cross members in the locations shown:

9.1 one (1) 5/16-18 x 5/8 button head screw

9.2 two (2) 5/16-18 x 1/2 button head screws

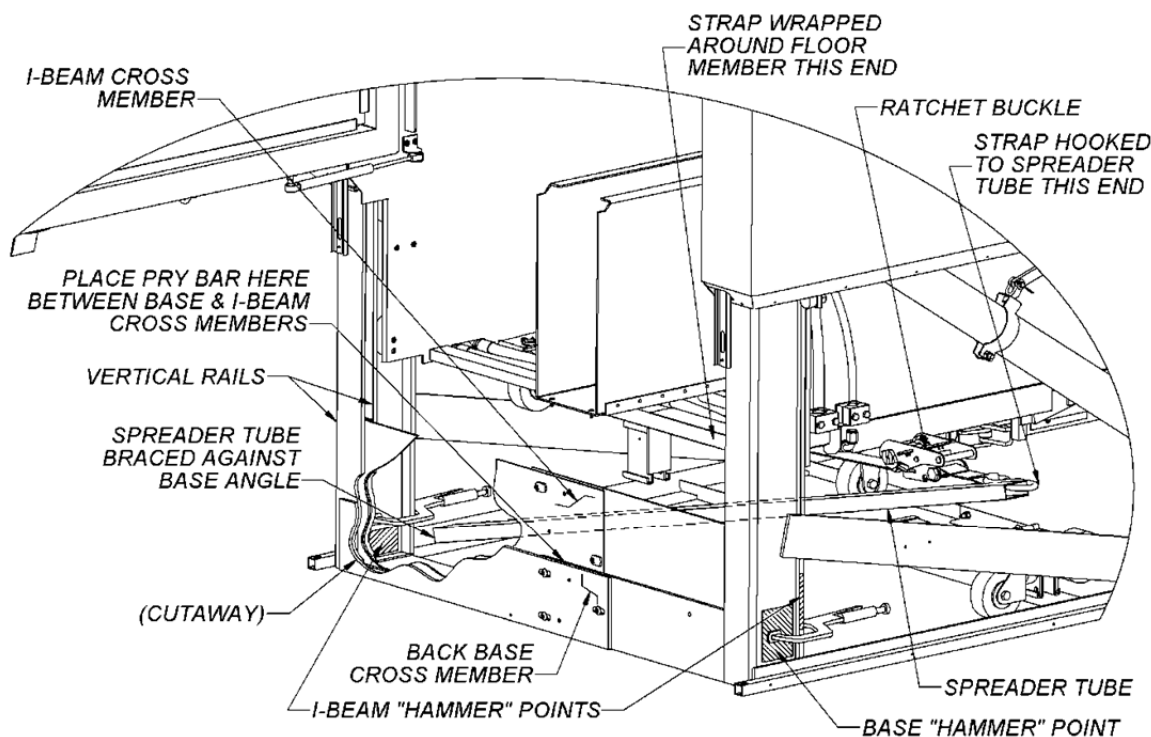
Tighten the screws and then back them off one (1) full turn counterclockwise. You may need to use a hammer or pry bar to align the holes in the cross members (refer to Figure 5.5).

10. (Refer to Figure 5.3) Thread the following fasteners into the back I-beam cross members in the locations shown:

10.1 three (3) 5/16-18 x 5/8 button head screws

10.2 two (2) 5/16-18 x 1/2 button head screws

Tighten the screws and then back them off one (1) full turn counterclockwise. You may need to use a hammer or pry bar to align the holes in the cross members (refer to figure 5.5).



TO SPREAD THE LIFT CAR USING A STRAP AND SPREADER TUBE:

1. BRACE THE SPREADER TUBE AGAINST THE BASE ANGLE AS SHOWN
2. WRAP THE STRAP AROUND THE FLOOR MEMBER SHOWN AND HOOK IT TO ITSELF
3. HOOK THE OTHER END OF THE STRAP TO THE SPREADER TUBE
4. OPERATE THE RATCHET BUCKLE TO PULL THE CAR APART

NOTE: THIS IS MOST EFFECTIVE AT THE BACK OF THE LIFT AS SHOWN, BUT CAN BE DONE AT ANY LOCATION FRONT-TO-BACK ON THE LIFT

TO ALIGN THE HOLES IN THE I-BEAM CROSS MEMBERS AND THE BASE CROSS MEMBERS:

1. SIDE-TO-SIDE: USE A HAMMER ON THE "HAMMER" POINTS SHOWN FOR THE I-BEAM AND BASE; OR, ATTACH THE RATCHET STRAP TO THE VERTICAL RAILS TO PULL THE SIDES TOGETHER
2. FRONT-TO-BACK: INSERT THE PRY BAR WHERE SHOWN

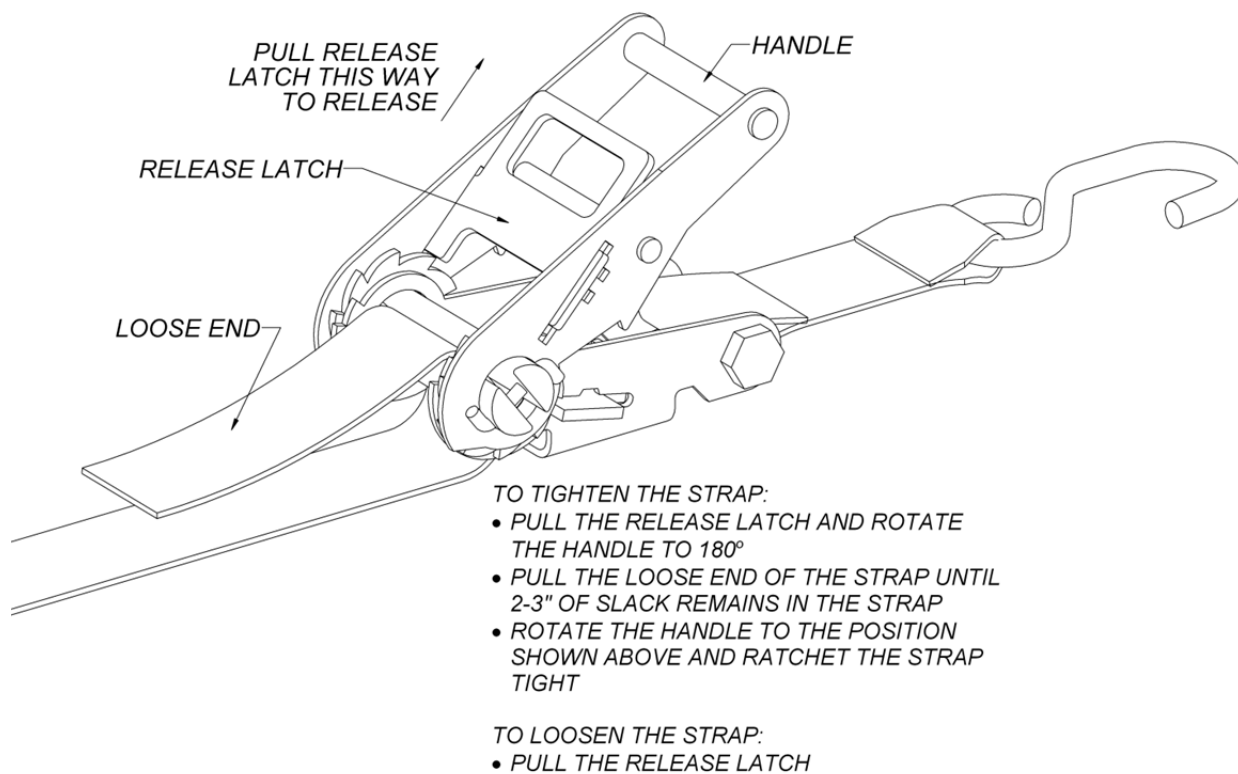
Figure 5.5 (Upper Landing Gate View)

11. (Refer to Figure 5.3) Remove the two (2) clamps installed in Step 3.
12. (Refer to Figure 5.4) Install two (2) spring pins into the back base cross members.
You may need to use a hammer or pry bar to align the holes in the cross members (refer to Figure 5.5). Then tighten the three (3) button head screws (from Step 9) in the back base cross members.
13. (Refer to Figure 5.3) Install one (1) spring pin into the horizontal I-beam cross members. You may need to use a hammer or pry bar to align the holes in the cross members (refer to Figure 5.5).

14. (Refer to Figure 5.4) Use a 3/16" hex key to turn the four (4) adjustment screws (two (2) on each side) at the back of the lift car exactly three (3) full rotations clockwise.
15. (Refer to Figure 5.3) Remove the two (2) spring pins from the lift car caster brackets (on the right side of the lift car) and install them into the vertical I-Beam cross members. You may need to use a hammer or pry bar to align the holes in the cross members.
16. Tighten the five (5) button head screws (from Step 10) in the I-beam cross members.
17. (Refer to Figure 5.4) Reattach the dock plate to the lift car by installing the following fasteners:
 - 17.1 Two (2) Phillips #10 x 1/2 flat head screws that secure the dock plate hinge bracket to the lift car floor in the back, center of the floor.
 - 17.2 Four (4) 1/4-20 x 1/2 button head screws with lock washers that secure the dock plate hinge bracket to the lift car sides, two (2) on each side. (Use a 5/32" hex key.)
18. (Refer to Figure 5.4) Reconnect the gate closer spring to the upper landing gate and then reinstall the e-clip to keep it and the hydraulic damper in place.
19. (Refer to Figure 5.4) Reconnect the dock plate tether to the upper landing gate using the footman's loop and two (2) #10 x 3/4 flat head screws.
20. Tighten the hex cap screws installed in Step 7 above.
21. Reinstall the lift car safety skirt. Refer to Section 3.4 of this manual.
22. Return the lift car floor to its normal position and pump the lift onto its wheels.
23. Move the lift to the desired location and set it up according to the instructions in the *Operating Manual* and then verify the correct operation of the lift as described in Section 5.3.

⚠ WARNING!

Verify the correct operation of the lift, as described in Section 5.3, before using the lift. Failure to do so could result in serious injury to the user.



Ratchet buckle instructions for the straps supplied with the Ascension Toolkit

Figure 5.6

5.3 Verification of Operation

Before the lift can be used to transport passengers, its correct operation must be verified. After the lift has been set up in the desired location, its operation must satisfy the following requirements:

1. The lift operates as described in the Setup Instructions of the *Operating Manual*.
2. The lift car will not move up or down if either gate is open.
3. The lower landing gate is locked when the lift is more than 2" [50 mm] off the ground.

If the operation of the lift does not satisfy the above conditions, review and/or repeat the reassembly steps as necessary to correct the problem. Additionally, the troubleshooting tips in Section 6 of this manual may be useful in restoring the lift to operating condition.

WARNING!

DO NOT use the lift until its correct operation has been verified. It is absolutely imperative for the safety of the lift passenger that the lift is functioning correctly. If any of the above conditions is not met, and the problem cannot be corrected by reviewing or repeating the reassembly steps, contact Ascension immediately.

SECTION 6 Troubleshooting

The table below presents the necessary information to perform basic troubleshooting on the lift. The numbers in the Section column refer to sections within this manual. For the sake of completeness, many of the items in this table are of a setup and operational nature and are not specifically addressed in this manual. Please refer to the *Operating Manual* for these items.

Problem	Possible Cause	Remedy	Section
Lift car will not elevate or lower when an operating switch is activated	Electrical cord is not plugged in	Plug in electrical cord	N/A
	Emergency Stop is depressed	Turn clockwise to reset	N/A
	Lift is turned off	Turn the lift on	N/A
	GFCI is tripped	Reset the GFCI	N/A
	Cord disconnect switch is OFF	Turn disconnect switch to ON	N/A
	No power at the service outlet	Check breaker for the outlet or plug electrical cord into another outlet	N/A
	One or both gates are open	Close both gates	N/A
	Lift is set up on incline greater than 5%	Move lift to level surface	3.12
	Lower landing gate switch is out of adjustment	Adjust the lower landing gate switch	3.7
	Upper landing gate switch is out of adjustment	Adjust the upper landing gate switch actuator	3.8
	Component failure	Electrical testing -- possible component replacement	4.2
Lift car will elevate but will not lower	Skirt is obstructed/pushed in	Remove obstruction from skirt	3.14
	Rocker switch failure	Try alternate rocker switch; replace switch if necessary	3.10
	Directional valve failure	Replace directional valve	3.15
	Relay module failure	Electrical testing -- possible component replacement	4.3

Problem	Possible Cause	Remedy	Section
Lift car will not go more than 2" [50 mm] off the ground	Lower landing gate locking rod is not engaging	Adjust the upper lock rollers	N/A
	Locking rod switch failure	Test locking rod switch & replace if necessary	3.9
	Two-inch switch out of adjustment	Adjust two-inch switch	3.6
Lift car will not go more than 10" [250 mm] off the ground	Lift is in transport mode	Set the upper height knob properly per the <i>Operating Manual</i>	N/A
Lift car does not stop automatically at the upper landing	Upper height knob is not set correctly	Set the upper height knob properly per the <i>Operating Manual</i>	N/A
	Upper stop switch failure	Replace upper stop switch	3.6
	Upper stop mechanism is out of adjustment	Adjust upper stop mechanism	3.6
Motor runs but lift car does not elevate	Hydraulic fluid level is low	Fill hydraulic fluid reservoir	2.1
	Break in hydraulic circuit	Repair break and fill hydraulic fluid reservoir	2.1
	Directional valve stuck open	Replace directional valve	3.14
	Lift car is overloaded	Reduce load on lift car until load is equal to or less than the rated load	N/A

