

# Battery Operated Systems (BOS)

*Stair Lift*



## Installation and Service Manual

For Do It Yourself (DIY)

### **WARNING!**

STRICT ADHERENCE TO THESE INSTALLATION INSTRUCTIONS is required and will promote the safety of those installing this product, as well as those who will ultimately use it for the purpose intended.

Any deviation from these instructions will void the LIMITED WARRANTY that accompanies the product. Additionally, any party installing the product who deviates from the INSTALLATION INSTRUCTIONS shall be taken to agree to INDEMNIFY, SAVE AND HOLD HARMLESS the manufacturer from any and all loss, liability or damage, including attorneys fees, that might arise out of or in connection with such deviation.

This stair lift Installation and Service Manual has been written to provide clear and precise instructions for proper installation procedures of the Citia BOS stair lift. Please refer to the *Owner's Manual* for warranty information and operating instructions. The *Owner's Manual* must be given to the owner of the lift before it is put into service.

by ThyssenKrupp Access may void the warranty. If you have questions concerning the installation or service of the Citia BOS please contact the Service Department:  
ThyssenKrupp Access  
4001 East 138th Street  
Grandview, MO 64030  
800-409-3349

Any alterations to the equipment without written authorization

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*Important! It is imperative that this manual be read and understood prior to attempting installation of the stair lift. Also, please observe all cautions and warnings in this manual, as well as labels on the equipment.*

## I. PRELIMINARY CHECKS

### A. INSTALLATION SITE REQUIREMENTS

- Dedicated\* 115 VAC, 60 Hz, 3-wire grounded outlet within 13' of the top or bottom of the staircase.
- Stair angle between 25° and 45°.
- Must be installed INDOORS

\* NEC requirement

### B. TOOLS REQUIRED

- Set of Phillips head screwdrivers
- Tape measure
- 3/8" reversible drill with 3/8" hex socket and a 6" extension
- 3/16" Allen wrenches
- Torque wrench rated to at least 18ft.lbs. of torque
- Safety items: steel toe shoes, safety glasses, gloves, etc.
- Torpedo level
- Tools for removing hand rail if it interferes with the travel of the stair lift
- 13mm socket
- 1/2" combination wrench
- 4mm Allen wrench (included)
- 3mm Allen wrench (included)
- 1/8" Allen wrench
- Something heavy to hold track in place during install.
- Mallet and flathead screwdriver

## C. SHIPMENT

Verify all components are included with the shipment:

### Seat Box:

- Seat assembly

### Chassis Box:

- Chassis assembly (mounted to loading tool)
- (1) Power supply
- (2) Remote controls
- (2) 9 volt batteries for remote controls
- Unit small parts
  - (1) Set of Velcro®
  - (1) Fuse

### Track Box:

- Track pieces (quantity will vary) with gear rack and splice bars
- Track brackets (quantity will vary)
- (1) Charging wire
- (2) Track end caps
- Small parts kit:
  - (1) Tube of lubricant
  - (1) 4" long piece of gear rack for splice timing
  - Fasteners for track brackets and track end caps
  - Track bracket covers (quantity will vary)
  - Splice bars (to be placed in track, quantity will vary)

## II. TYPICAL COMPONENTS



Pictured above is a "Supreme" model. This line of stair lifts features interchangeable seats. The seat on the unit you are installing may not look exactly like this. Regardless, the installation procedures are alike.

## III. INSTALLATION PROCEDURES

Your stair lift will include three boxes:

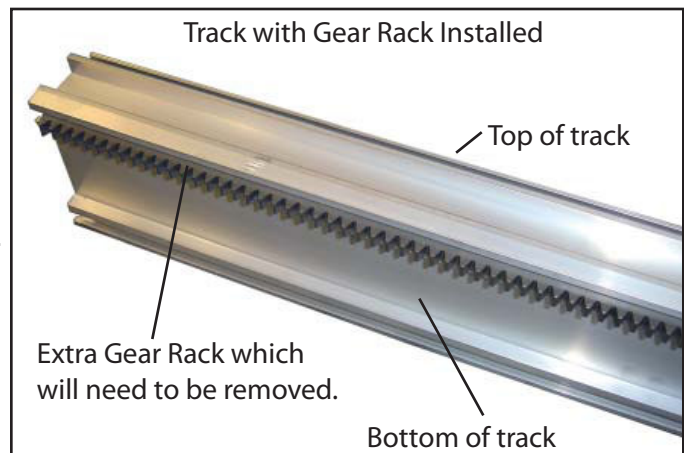
- Track Box
- Chassis Box
- Seat Box

**! IMPORTANT:** The following instructions are for building the track on the floor and then moving it to the staircase. Keep in mind that with regard to ceilings and doorways, a completed track, which can easily exceed 10 feet long, can be very difficult to maneuver between rooms or doorways. Some people may find it easier to assemble the unit directly on the staircase. This is perfectly acceptable, however, please be advised of the inherent danger of falling while working on a staircase due to an uneven stance and smaller working space.

① Begin by laying out your track on the floor and removing any plastic wrap that may be around the track.

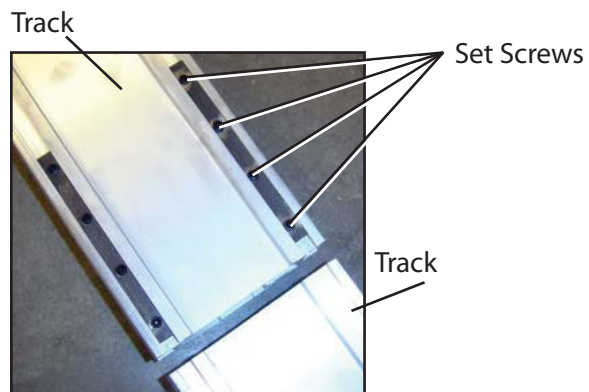
NOTE: While we begin laying out the track on the floor, some people may find it easier to lay out the track on the staircase. If this is easier, you may do it that way, however, make sure you have something heavy to keep the track from sliding down the stairs.

A stock unit may include as few as 1 or as many as 4 custom cut sections of extruded aluminum track. The track is cut at the factory. Make sure the track is positioned so the bottom is facing up. You may have extra gear rack in your track. Gear rack should be installed on the SIDE of the track. If you have any gear rack placed in the BOTTOM of the track, use the supplied 3mm Allen wrench and loosen, but do not remove, the bolts from the gear rack. Once loosened, slide the extra gear rack out of the track.



② Splice all the pieces of track together. With the track laying so the bottom is facing up, line up the sections of track you need to splice together.

③ Loosen the set screws in the splice bars with the 4mm Allen wrench.





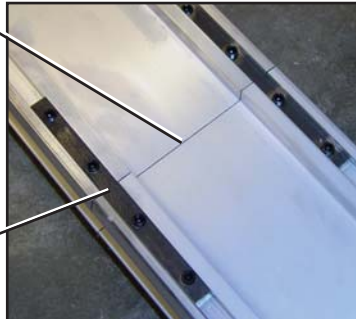
## Tip

If the splice bars do not slide in easily, use the flathead screwdriver and the mallet to gently tap the splice bars into place.

Slide the two pieces of track together so that only a hairline joint remains between them. Center the splice bars on the joint as shown below and tighten the splice bars onto the track.

Note the small, hair-line joint between the two pieces of track.

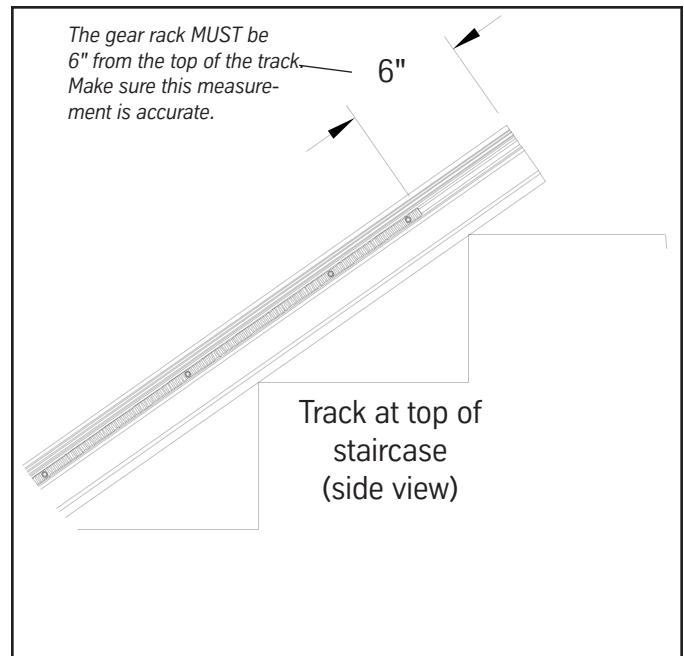
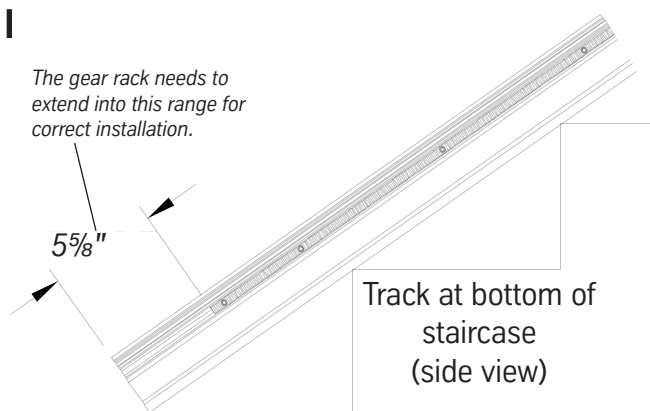
The splice bars are centered on the joint between the two pieces of track.



### A. TIME THE GEAR RACK

- 1 Loosen the set screws in the top sections of gear rack and slide them up until the gear rack in the upper track section is 6" from the top.

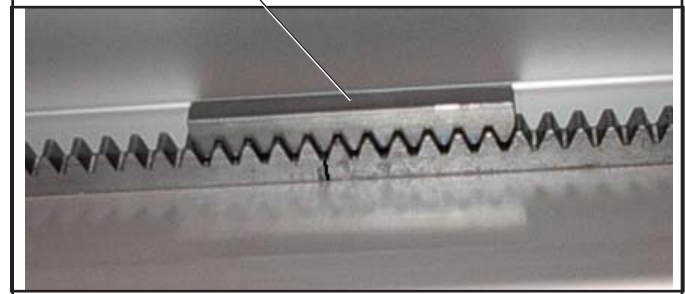
*Note: Multiple sections of gear rack need be slid into the track. This may cause the gear rack to not be flush with the bottom end of the track. This is fine, as long as the gear rack stop no less than 5 5/8" from the bottom of the track. Any longer is fine.*



- 2 Between each piece of gear rack, you will need to "time" the teeth. To do this, use the short piece of gear rack that comes in the small parts box. Push the two pieces of gear rack close to each other and then force the 4" piece of on top of the gear splice, like this:

*A short piece of gear rack is provided in the small parts kit to properly space the gear rack splices.*

*Do not tighten gear rack until the proper spacing has been achieved.*



There may be a gap between two pieces of gear rack when spacing the splice. This is acceptable as long as the distance between the teeth is consistent.

- 3 When the gear rack is timed, use the 4mm Allen wrench to tighten the gear into place.

*Note: There is not a top or bottom end of the gear rack, however the gear rack will be needing to face the wall, i.e., if it's a left hand installation, the gear rack will need to face the left hand wall. Make sure your track is oriented this way.*

## B. DETERMINE WHERE THE TRACK WILL BE INSTALLED

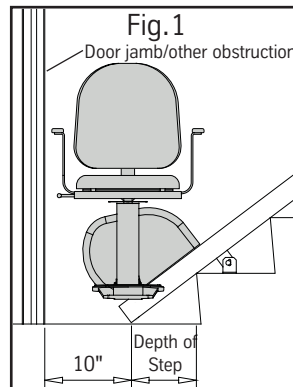
- 1 Double check the orientation of your stair lift.

The chassis box of your stair lift will be marked as either a Left Hand unit or a Right Hand Unit.

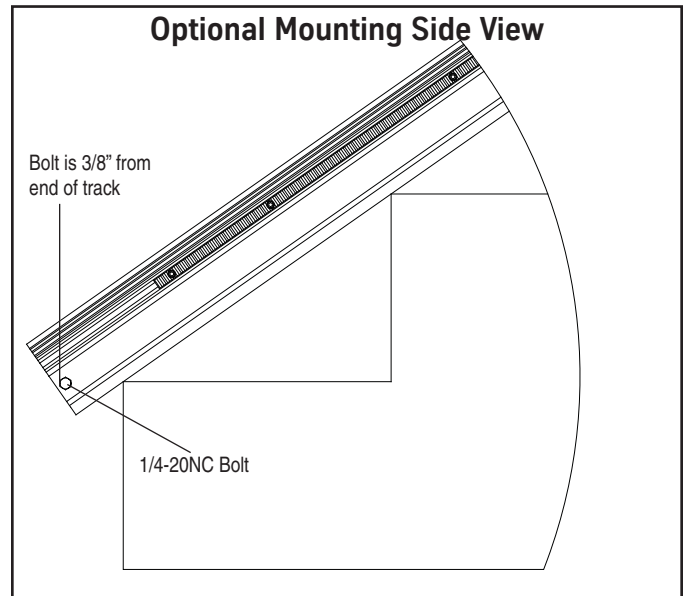
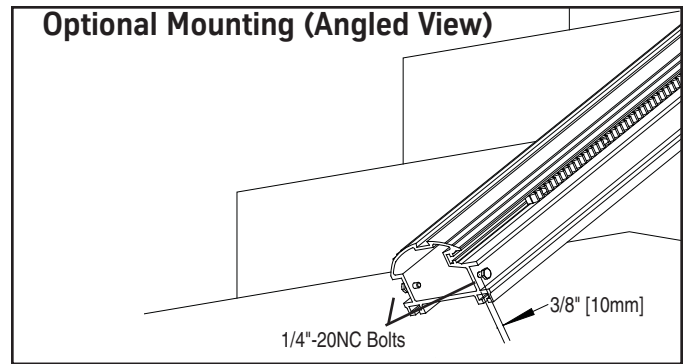
Stand at the bottom of the staircase on which you will be installing the lift. A left hand unit will be traveling up the left side of the staircase and a right hand unit will be traveling up the right hand side of the staircase.

If the handedness of the unit is consistent with the lift you ordered, continue the installation. If the handedness is wrong, please contact the authorized seller for the unit.

- 2 Verify there is adequate clearance at the lower landing for the track and seat. Minimum clearance required beyond the bottom step is 10" plus the depth of one step (see Fig. 1).



*If you will be mounting the track so that it stops at the bottom step instead of the lowest landing, you **MUST** drill a hole through the side of the track and insert at least a 1/4"-20NC bolt (supplied) on each side of end of the track to act as a mechanical stop in case of complete mechanical or electrical failure.*



# An Introduction to T-Bolts

Throughout the installation of the track, you'll be using T-bolts to attach track brackets and a grounding bolt.

A T-bolt can be a tricky thing if you can't see what you're doing, so we've included this handy reference guide to walk you through what should be going on underneath the track.

**This is the stair lift Track on its side:**

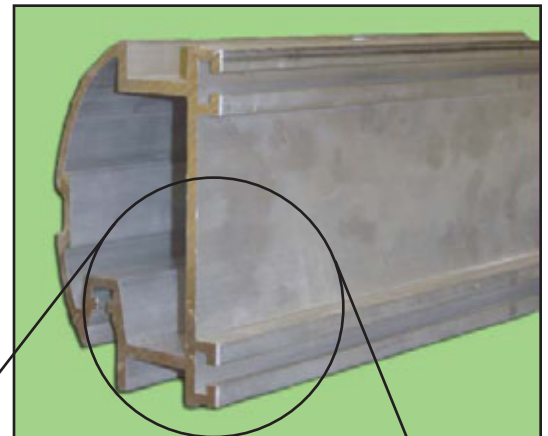


**Your T-Bolts look like this:**



The handy thing about a T bolt is that even when the track is on the staircase, you can reach to the underside of the track, snap the bolt in place and screw it in.

The T head of the bolt simply drops into the channel on the track. Once the bolt is turned, the T head catches in the channel and a bolt can be tightened down. See pictures below.



### C. INSTALL LOWER END CAP

- 1 Feed the charging wire through the top of the track to the bottom of the track.

*Note: There is no up or down to the wiring harness. Before putting the charging wire in the track, decide where you will be plugging the stairlift unit into the wall. Run the wire so that the end of the charging wire with the extra plug and ring terminal will be on the floor with the plug (see diagram on page 9).*

*For instance, if you will be plugging the unit into an outlet on the bottom floor, make sure the end of the charging wire with the extra plug and ring terminal are exiting the track on the bottom landing.*

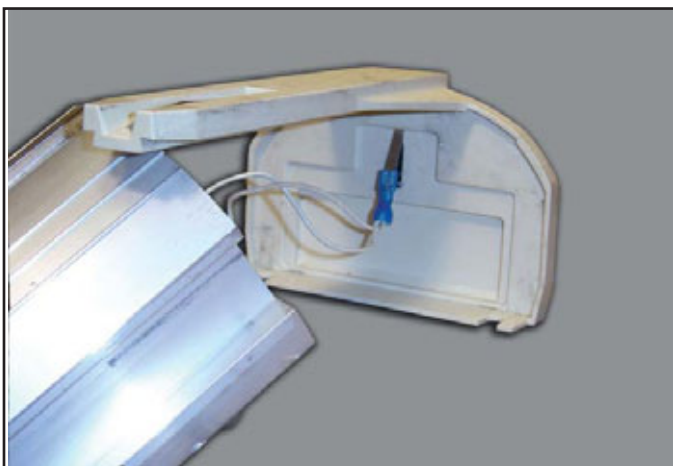


### Tip

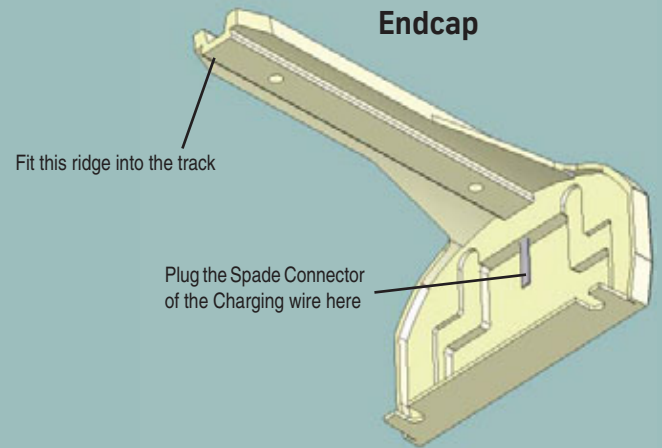
One of the easiest ways to feed the charging wire through the track is to tape the end of the wire to a tape measure and feed the tape measure through the track.



- 2 Plug the spade connector into the metal plug on the inside of the end cap as shown below.

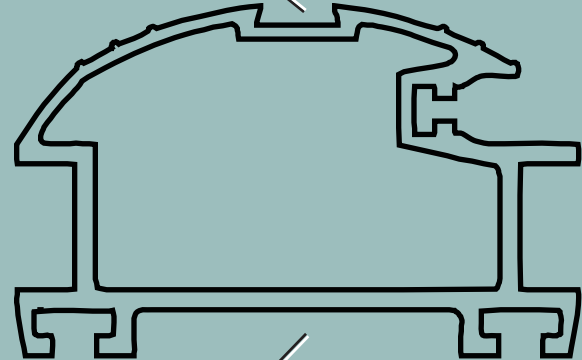


- 3 Slide the endcap on to the bottom of the track



### Track (End View)

The dovetail portion of the endcap fits into this channel



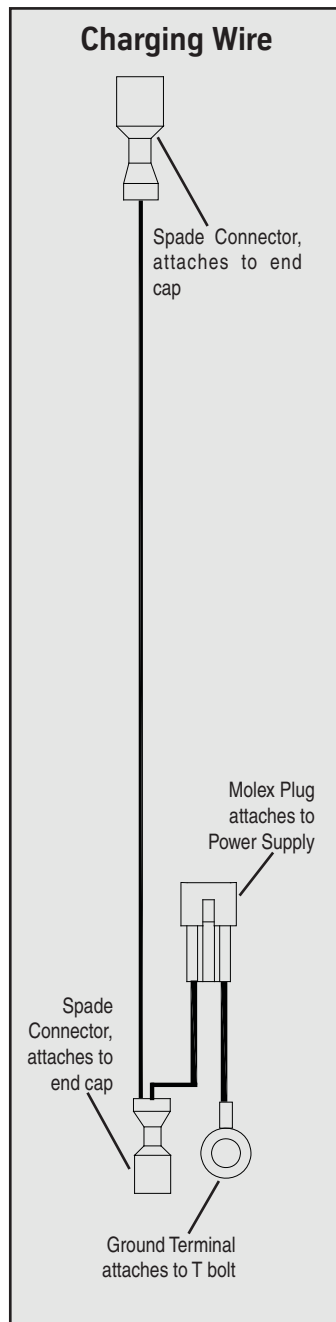
- 4 If your stairlift will be plugged into the wall at the bottom of the staircase, you will have two extra wires protruding from the lower endcap, one with a ring terminal and one with a Molex® plug (see diagram at right). Those other wires will need to be routed to exit between the track and the end cap and then tuck into the channel on the bottom of the track (see illustration above). Take care to make sure that the wires are not pinched.

**NOTE:** *If the power supply will be on the top landing you may skip this step and the next one, but you will need to follow them when you install the upper end cap, because you will have the extra wiring at that end of the track.*

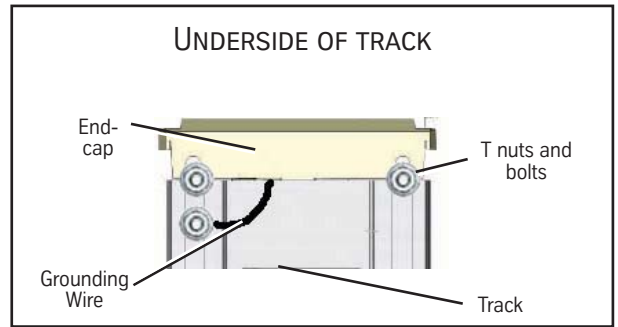


The harness is included with enough wire to cover all installations. Most likely, you'll have more wire than you need. **DO NOT CUT THE WIRE.** Simply place excess wire inside the track.

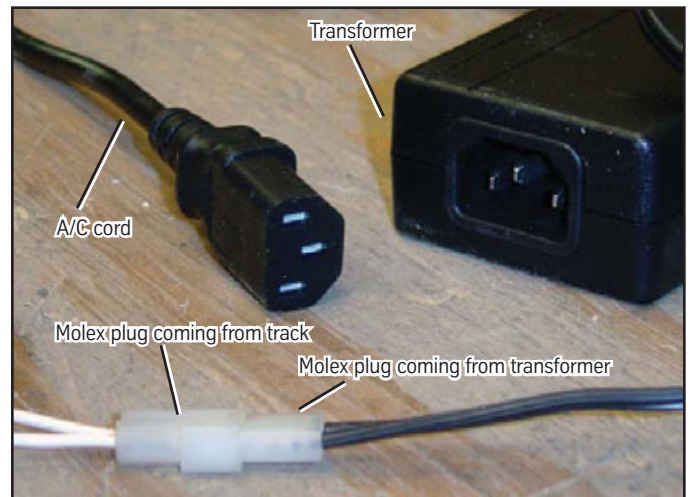
- With the wires now routed out of the track you will need to attach the grounding ring. Insert a T bolt in the track, near the end cap. Slide the Grounding Ring Terminal (see illustration at right) over the T nut you just put in. Screw a nut over the T bolt to tighten down the grounding ring.



- If your track will not be resting on the lower landing, but will be ending on the lowest step, insert a second T bolt and bolt the endcap on from the bottom (see below)

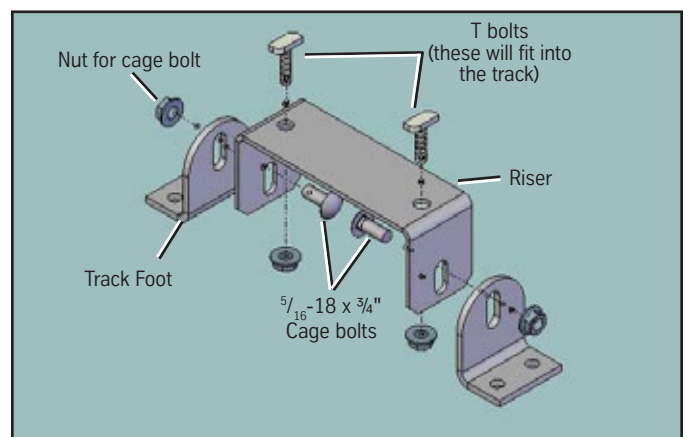


- Provide power to the unit by plugging the molex plug from the track into the matching plug from the transformer, then plug the A/C cord into the other end of the transformer. Finally, plug in the A/C cord to the wall.



## D. ASSEMBLE MOUNTING HARDWARE

- The track brackets come in 5 pieces: 1 riser, 2 feet and 2 covers for the feet. Assemble as illustrated. When installing the T bolts into the track bracket, make sure to thread the bolts on, but do not tighten yet.



## E. MOUNT TRACK TO THE STAIRCASE



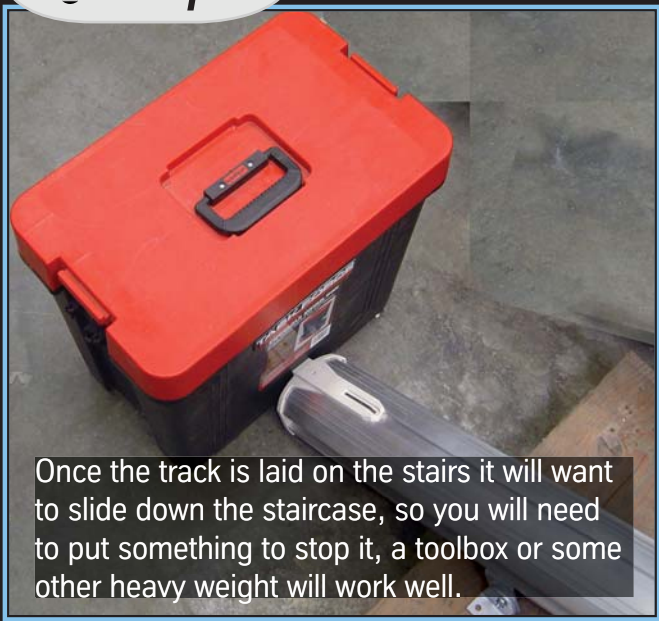
### Tip

It's a good idea to put down a drop cloth during your install so when you slide the track around on the staircase you don't mark up carpet or scratch hardwood stairs.

- 1 Lay track along staircase. Make sure that:
  - The gear rack is facing the wall
  - The lower end cap is installed
  - The charging wire is oriented correctly



### Tip



Once the track is laid on the stairs it will want to slide down the staircase, so you will need to put something to stop it, a toolbox or some other heavy weight will work well.

- 2 Position the track in the middle of the staircase with the underside of the track resting across the stair nosings, and the lower track end cap resting on the lower landing. With the track placed in the middle of the staircase you'll have adequate room to reach under and adjust the track brackets
- 3 The track brackets attach to the track with the supplied T bolts. You will need to place 3 brackets per 8' section of track. If you have spliced 2 pieces of track together, you will need to place a track bracket on the step directly above and the step directly below the splice. A typical placement will have one bracket at each of the following positions:
  - ⇒ 1st tread at the bottom of the stair

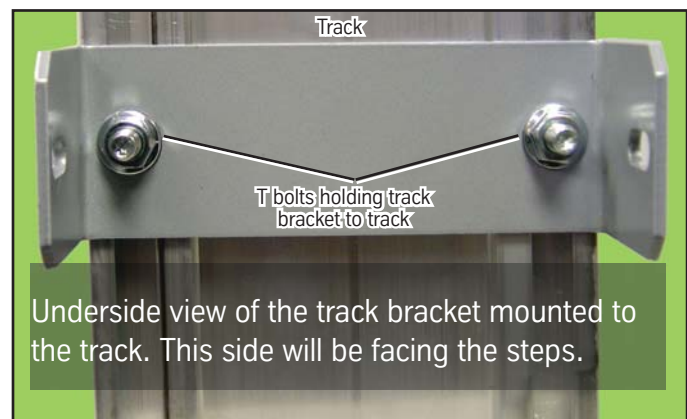
- ⇒ Tread below the top landing
- ⇒ Tread above a track splice
- ⇒ Tread below a track splice
- ⇒ Center of each section of track

*Note: These instructions are for mounting to a standard wood staircase. For installation on hard surface stairs, anchors may be needed and different screws may be required. Consult floor manufacturer for details*



- 4 Place the brackets on the steps where you will be installing them.
- 5 Slide each bracket under the track.

- 6 Use the T nuts to attach the track to the brackets.



- 7 For more specific help with T nuts refer to pg. 7
- 8 Use a wrench to tighten everything up and slide the track over 3½" from the wall.
- 9 Verify that both the bottom of the track and the top are 3½" from the wall. If they are not, the stairlift will not travel straight.

*Note: This distance is needed for clearance of the seat back in the riding and swivelled position.*

- 10 Attach the track mounting brackets to the staircase. The brackets attach to the stair treads with wood screws.

The bottom of the track should be touching the nose of stairs once the brackets are bolted down.



Track Bracket installed.

- 11 Snap on the track mounting bracket covers.



Track Bracket cover installed.

- 12 Lightly lubricate the entire length of gear rack. Lubricant is provided in the small parts kit.

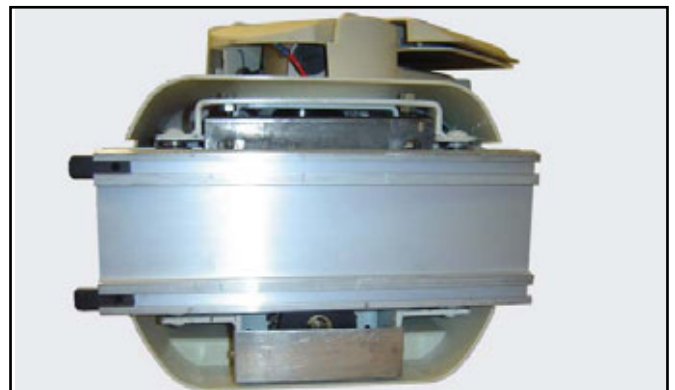
## F. INSTALL THE CHASSIS ASSEMBLY INTO THE TRACK

**NOTE:** If you will need to change remote frequencies on the call/send remote controls do this PRIOR to mounting the chassis on the track. With the chassis close to the wall, it may become difficult to remove the shroud and access the control board. Refer to Step C of the Service Information for instructions on changing the frequency of the remote control.

- 1 Cut open the stair lift box, pull out the unit which will be attached to a plank of wood.
- 2 Use the plank to support the unit, and carefully transport the unit to the top of the staircase.
- 3 Do not carry the unit by the plastic shroud! Doing so could cause the unit to come away from the shroud and cause serious injury!



- 4 Unbolt the mounting plates to free the stair lift unit and load tool. There will be two bars protruding from one end.

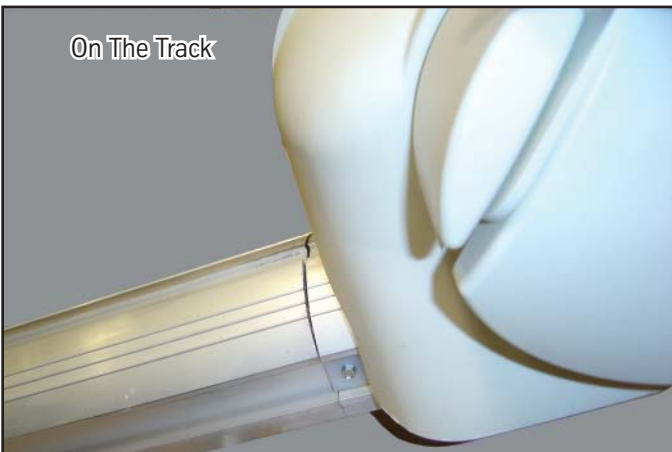
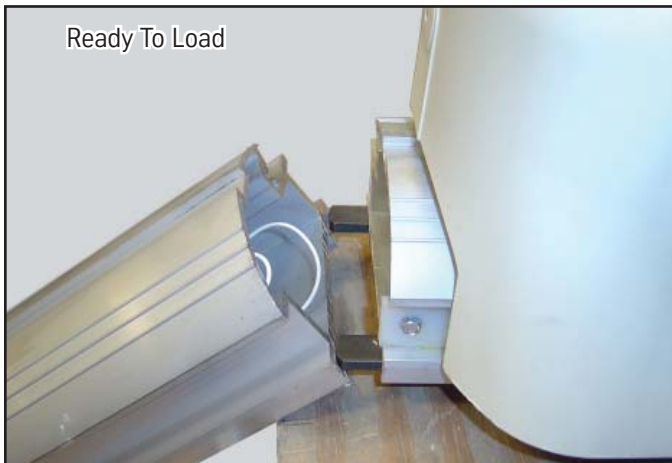




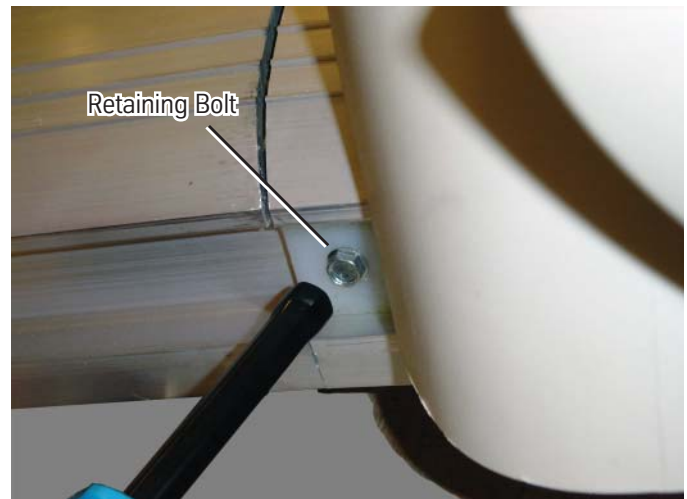
## Tip

Before loading the unit on the track, take the power wires and lead them through the piece of starter track the stair lift is mounted on, that way, they won't fall down into the track.

- 5 Line up the splice bars of the starter track with the top end of the track bolted to the staircase. Lift the unit and insert the splice bars into the track.

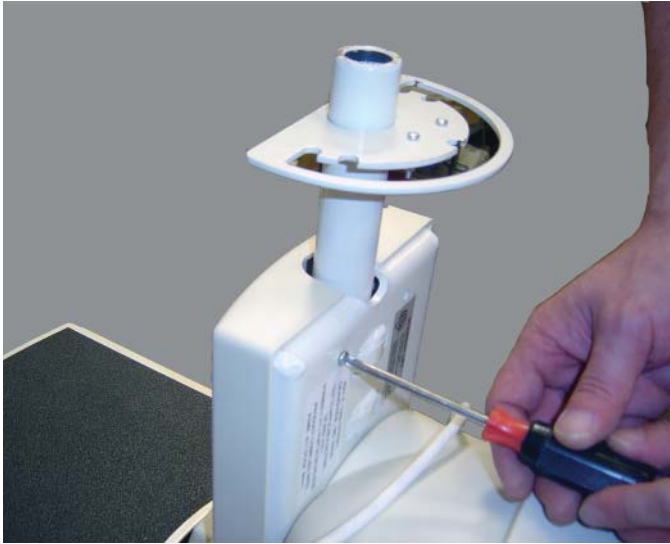


- 6 Grip the seat post and gently pull the chassis up the track, not to move it, but just to take enough pressure off the retaining bolt. Remove the bolt from the starter track and gently slide the unit down the track until the chassis is fully on the mounted track and the gears have engaged.



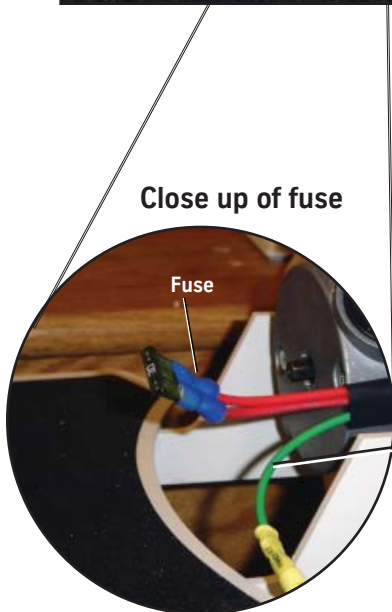
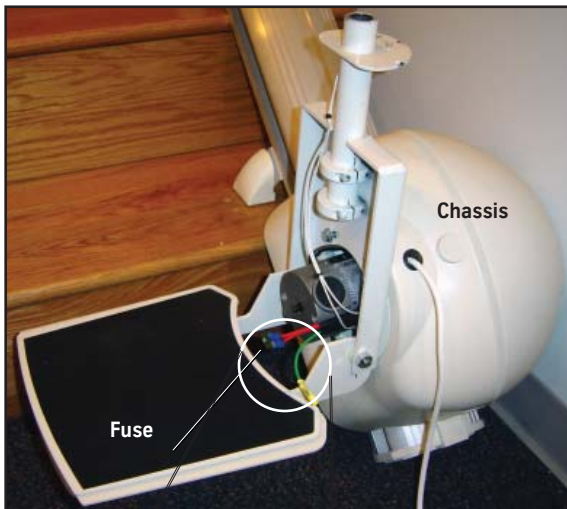
- 6 Remove the starter track.
- 7 Install the top endcap by attaching the terminal of the charging wire to the terminal on the inside of the top end cap. Insert (1) T-bolt in each T-slot at top of track, then fasten the end cap to the upper end of the track with nuts provided.

## G. INSTALLING THE FUSE



Remove the front cover of the stairlift by removing the screws located under the seat post

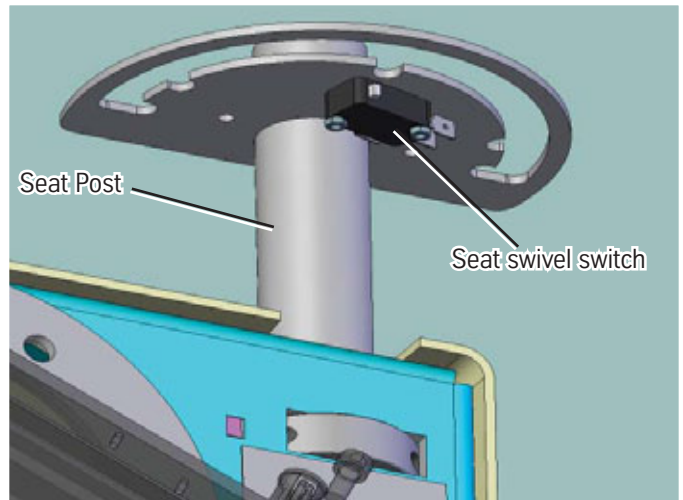
- 1 Install the fuse into the two spade connectors.



**NOTE:** The green wire is for diagnostic purposes only, and does not need to attach to anything.

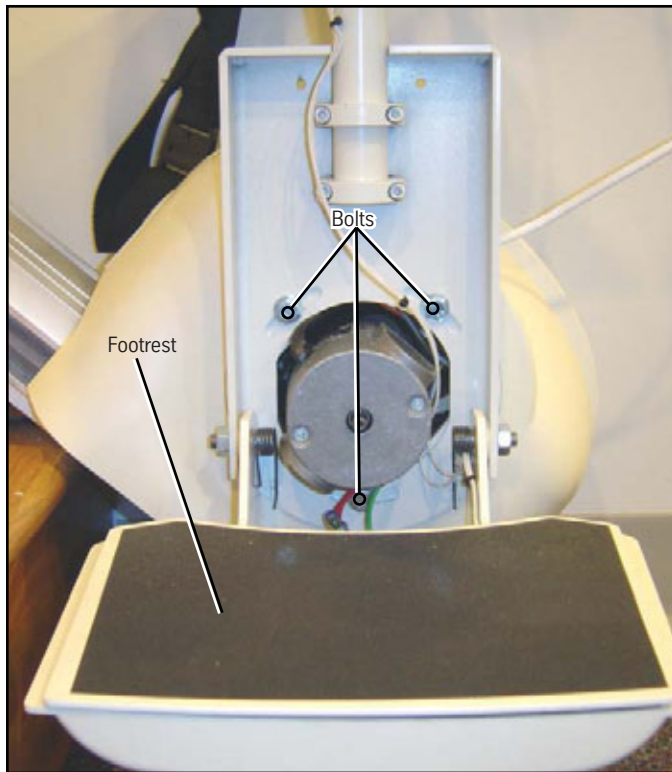
## H. TEST RUN THE CHASSIS

- 1 Operate pendant control to verify that the stair lift will go up and down properly, while holding the seat swivel switch in. The seat swivel switch is located on the back of the seat post (see illustration below) and the unit will not run if the switch is not pressed in. Normally, the seat on the unit will actuate the switch, but because there is no seat, you will need to do this manually.




## I. LEVEL THE SEAT HUB

- 1 Loosen the three (3) bolts on the chassis behind the footrest.
- 2 Place a torpedo level on either the seat hub or the footrest.
- 3 Rotate mounting bracket on the bolts until the seat mounting shaft is vertical and plumb.



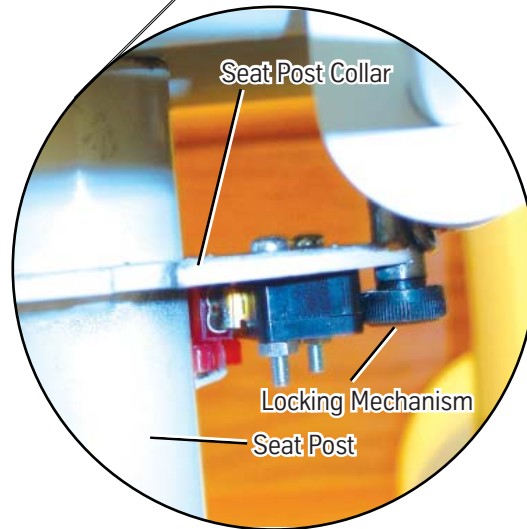
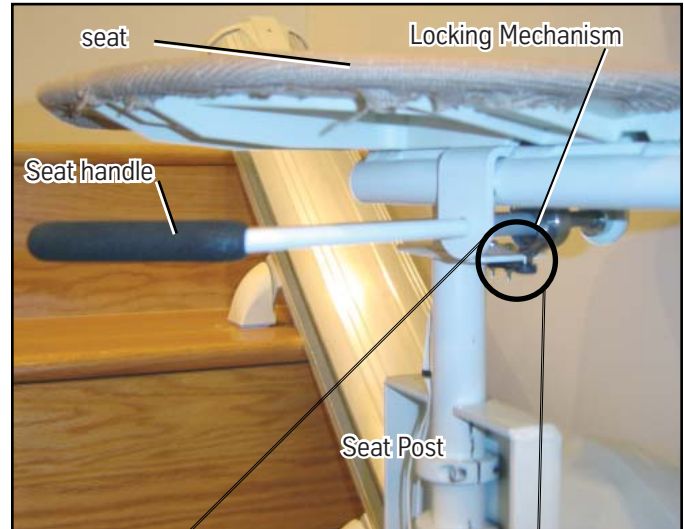
Note: If you run out of slot, remove the bolts and replace them in different holes until the seat will plumb to vertical.

- 4 Tighten the bolts.

 It is very important to torque the nuts to a minimum of 18 ft. lbs. (24.4 Nm) to lock the seat hub into place.

## J. INSTALL THE SEAT

- 1 Place the seat assembly onto the seat shaft.
- 2 Rotate the swivel seat handle and slide the seat fully onto the shaft. Release the handle and make sure the seat locks into position.
- 3 Rotate the swivel seat handle and check that the seat locks in the loading, riding, and unloading positions.



## K. ADJUST SEAT HEIGHT IF DESIRED

- 1 Loosen the Allen screws on the two seat clamps.
- 2 Slide the seat up or down as desired and tighten the screws.



- 3 Install the front seat mounting cover into position.

## L. REMOTE CONTROL LABEL

- 1 Apply the appropriate directional label to the face of the remote control, depending upon whether it is a right hand or left hand installations. Confirm direction of remote buttons first.

*Note: Refer to Step C of the Service Information for instructions on changing the frequency of the remote control.*

## M. CHARGING THE BATTERIES

- 1 Connect the power supply to the charging harness.  
**NOTE:** The batteries come from the factory with a small amount of charge already in them.
- 2 Plug the power supply into an electrical outlet.
- 3 Charge batteries for at least 12 hours.

## N. VELCRO PENDANT CONTROL

- 1 Apply one side of Velcro to back of pendant control and the other to the unit, so pendant will adhere to the unit. Placement of pendant control is up to the customer, The manufacturer recommends the arm of the unit. Velcro will hold pendant to unit when unit is not in use.

## O. CHANGING THE ORIENTATION OF THE PENDANT HOLSTER

The stair lift comes with a Pendant Holster attached under the armrest.

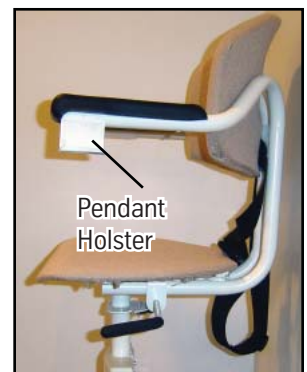
The pendant holster comes from the factory already attached, however, you may need to change which side the holster is attached to for the comfort of the user.

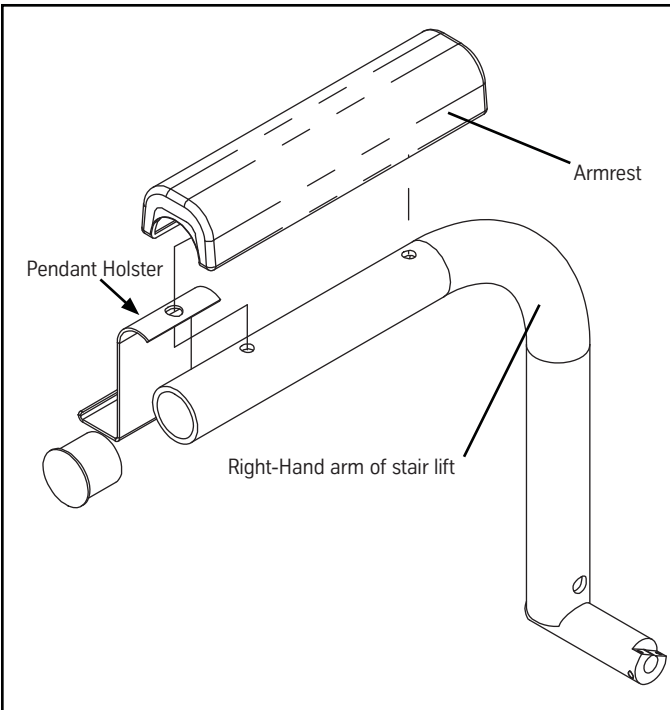
The holster attaches in one of two ways depending on which model of stairlift you're installing.

**Option 1:** There are two screws under the armrest which attach the armrest to the chair arm. Undo these screws, remove the holster, reattach the armrest and install on the other side.

**Option 2:** If there are no visible screws on the bottom of the armrest, the armrest is most likely snapped into place by the use some plastic, cone shaped clips.

To change, gently pry up on the armrest carefully as not to break the clips. Once detached, slide the pendant holster off and re-attach the armrest. Do the same on the other arm to attach the pendant holster (see illustration at right).





## IV. COMPLETION PROCEDURES

### A. COMPLETION CHECKLIST

The following features must be verified as operational before the stair lift can be released for use:

- Upper and lower limits:** Verify the lift stops automatically at the top and bottom of the track.
- Final limits:** Verify the lift is inoperable in both directions when each final limit switch is pressed.
- Running Clearance:** Verify the lift clears all obstructions.
- Track Mounting Brackets:** Verify all track mounting brackets are securely attached to the stair treads, the track and at the pivot points.
- Track Splice:** Verify track joints are smooth and free of burrs and gaps.
- Gear Rack:** Verify the gear rack is sufficiently lubricated.
- Track End Covers:** Verify the track end covers are securely fastened to the track.
- Track:** Verify the inside of the track is free of foreign objects.
- Chassis Rollers:** Verify the chassis roller axles have been lubricated.

#### Footrest:

- Verify the footrest clears all stair nosings.
- Verify the lift stops when the footrest runs into an obstruction.
- Verify the footrest folds up and stays in the up position.
- Verify the unit does not beep when it stops at the upper and lower limits. The unit will beep if stopped and not on the charging strip



### Seat:

- Verify the seat is level.
  - Verify the seat swivels 70° towards each landing and locks into position.
  - Verify the lift will not operate when the seat is not locked in the riding position.
  - For optional folding seat: Verify the seat will fold up and stay in the up position.
  - Verify the seat belt works properly.
- Clean Up:** Verify the lift is free of all grease, dirt, etc.

## V. E.T.L. REQUIREMENTS

This E.T.L. listed stairway lift must meet the latest ASME A18.1a specifications for the E.T.L. listing to be valid.

The following rules must be complied to at the installation site.

### Rule 7.1.1

A free passage width of no less than 20 in. shall be provided. If the seat and platform can be folded when not in use, the distance shall be measured from the folded position.

### Rule 7.1.2

The structure on which the equipment is installed shall be capable of safely supporting the loads imposed.

### Rule 7.1.3

The installation of all electrical equipment and wiring shall conform to the requirements ANSI/NFPA 70.

### Rule 7.6.4

At no point in its travel shall the edge of the footrest facing the upper landing be more than 24 in. above the step or landing as measured vertically.

### Rule 7.7.2

No lift shall be installed to operate on a greater incline than 45 deg. as measured on the mean.

## VI. SERVICE INFORMATION

### A. GENERAL SPECIFICATIONS

**Rated Load:** 375 lbs. (170 kg)

**Speed:** 18-25 fpm (dependant on angle of install and load)

**Travel:** 32' max. (track length)

**Power Supply:** Dedicated\* 115VAC, 60 Hz, 3-wire grounded outlet

**Incline Limits:** 25° to 45°

ETL Listed when properly installed

### B. STANDARD EQUIPMENT

**Drive System:** Rack and pinion

**Motor:** .5 hp, 24 VDC

**Motor Controller:** SoftStart/SoftStop

**Brake:** Self locking worm gear

**Seat:**

- Standard - 18" wide fixed seat with two fixed arms OR
- Select - 18" wide fixed, upholstered seat with OR
- Excel - 19" wide folding seat with two fixed arms
- Seat belt
- 70° locking swivel at upper and lower landings

**Controls:** Low voltage up-down hand-held control on

unit and two wireless remote controls

### Safety Devices:

Footrest obstruction sensor

Swivel seat cut-off switch

Final limits

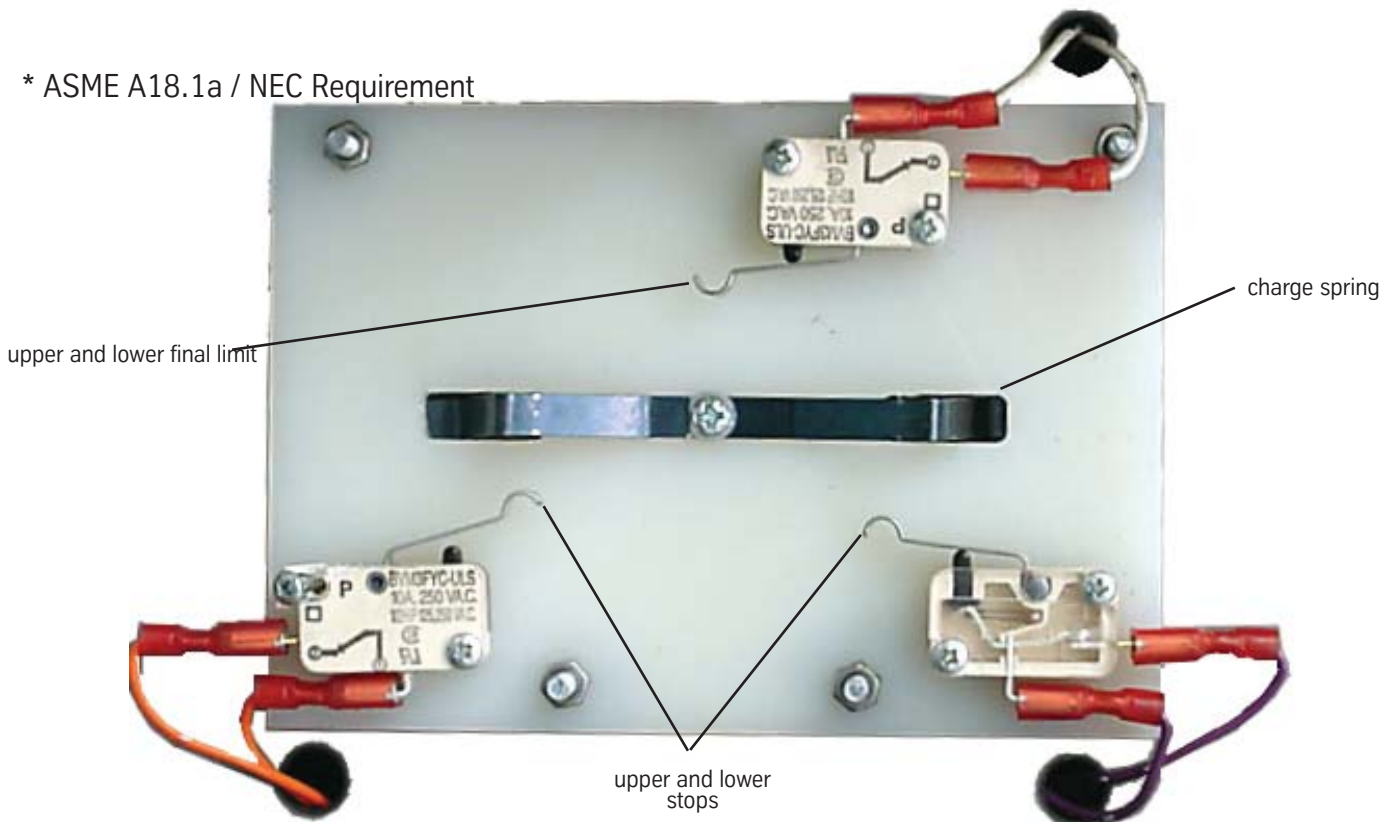
**Warranty:** Five years on drive train (motor and gear)

Two years on all component parts

### Notes:

- *The BOS model stair lifts are battery powered. Two 12V batteries are wired in series to provide 24V to the control system. The batteries are charged by a 33VDC power supply plugged into the 115 VAC outlet. The batteries are charged only when the lift is parked at the upper or lower landing.*
- *The call/send controls (transmitters) use infrared signals. There are two infrared sensors located on the chassis access cover. There is a combination of 4 different frequencies the transmitters can be set to (both transmitters must be set to the same frequency).*
- *There is a half second delay after a control button is pressed before the lift starts to move. After the lift stops, the up/down controls are disabled for 3 seconds.*

\* ASME A18.1a / NEC Requirement



### C. CONTROL BOARD OPERATION NOTES

#### Caution!

The control board is sensitive to static charge. To avoid damage, touch a metal surface on the lift to discharge yourself of static charge. Never touch the chips on the control board.



*Always disconnect the 115 VAC power and disconnect the fuse when working on the lift.*

#### First Power Up

To turn the controller board on after connecting the fuse, press the unit controls Up or Down pendant switch. The seat must be in the locked position and no obstructions can be in the way of the footrest.

Once the controller board has been turned on, it will stay on as long as the battery charger remains connected.

#### Remote Control (Transmitter) Frequencies

The standard wireless remote controls (transmitters) use infrared signals. One button on the transmitter is UP and other button is DOWN. There are two infrared sensors (receivers) located on the chassis access cover.

A combination of 4 different transmitter frequencies allow for more than one lift in a single home. The two transmitters must be set to the same frequency (for each lift). *For example 1 to 1, 2 to 2, etc.*

#### To change a frequency:

Ensure the infrared receivers (in chassis cover) are connected to the control board. Use the seat control to move the lift away from the end of the track. Take the back off of the transmitters and set the red jumpers (in each transmitter) to the same code. Change the corresponding code in the control board J1 (see chart). Press and hold the yellow "learn" button on the control board, then press and hold one of the up/down buttons on one of the transmitters. The controller board should beep and the lift start to move after you release the transmitter button when the frequency has been successfully changed.

Note that if the lift is on an upper or lower limit switch, the frequency may not be able to be changed.

To access the controller board the footrest support and shroud must be removed. The footrest plug can be temporarily jumpered out while changing frequencies.

### D. CONTROL BOARD DIAGNOSTICS

The control board contains LED's that indicate various functions or faults. A slow flash is 1 second on and 1 second off, a quick flash is .25 seconds on and .25 seconds off.

#### Steady Green on PWR LED - Run Mode

Battery voltage is above 21 VDC and the lift is running. A green test lead by the fuse allows the battery voltage to be measured without removal of the shroud

#### Slow Flash Green on GRN LED - Stop Mode

Battery voltage is above 21 VDC and the lift is stopped.

#### Steady Yellow - Caution Low Battery

Battery voltage is between 11 VDC and 21 VDC.

#### Slow Flash Yellow - Under voltage

Battery voltage is below 11 VDC.

#### Quick Flash Yellow - Charging

Battery is charging. Charging begins approximately 2 minutes after lift reaches upper or lower limit.

#### Slow Flash Red - Emergency Stop

Either the final limit switch has been tripped, the swivel seat switch is not in the operating position, or there is an obstruction in the footrest path. If the final limit switch has been reached the stair lift must be manually moved using an 8mm socket.

#### Steady Red - Current Limit

Motor is loaded more than 120% of its rating. The motor will continue to run in current limit for a preset time, however, the speed will be reduced. The unit will sound 2 rapid beeps.

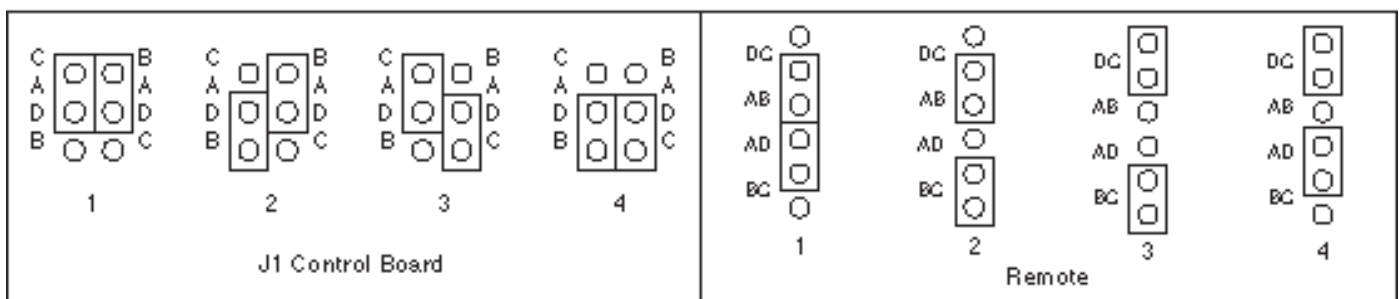
*Note: Higher currents will allow for less run time.*

#### Quick Flash Red - I<sup>2</sup>T

The motor has been overloaded for too long and the lift has timed out. If the motor reaches 160% of full load for 6.0 seconds the unit will time-out. To recover from this mode, the lift must be put into stop mode. The unit will sound 2 rapid beeps.

#### Quick Flash Red/Yellow - Short Circuit

Short circuit is an unrecoverable fault and may only be reset by disconnecting and reapplying the battery. Short circuit may be caused by an excessive overload on the motor or failure of the MOSFET power devices.



## E. CHARGING CIRCUIT

The charging circuit produces a DC voltage of 33 volts plus or minus one volt. This must be read between the charge strip on the charge (+DC) cam to the gear rack on the track (-DC).

If you are not receiving 32 to 34 volts DC check the following:

1. Verify that the power supply/charger is plugged into the wall outlet. Check for 115 VAC at outlet.
2. Verify that the charger is producing the 33 volts. This is done by checking voltage from B+ (pointed end of plug) to B- (flat side of plug).
3. If this is all correct, verify the ring terminal B- is mounted to a T-bolt on the track and tighten down the nut to secure the ring terminal. This will ensure that the proper ground is made through the T-bolt or screw. Reconnect power supply.
4. If you still do not get the 33 volts DC, verify that your charging station is hooked up to one of the white wires leading from the B+ wire. Check voltage.
5. If you still do not get the 33 volts DC verify that the gear rack screw on top and bottom of each piece of gear rack is tight. This will ensure proper grounding of the gear rack.

When the unit has been parked at the charge station for three minutes, it should be receiving charge. If the unit starts to beep while on the charge station, the unit is still not receiving charge. Check the following:

1. Check that the charge springs are contacting the tabs on the track.
2. Verify that all wires in the unit are connected properly and that polarity is correct.

Remove the shroud to check DC voltage at charge spring between 'charge +' and 'charge -' on board.

The unit should now be receiving the 33 volts DC needed for proper charging of the batteries.

## F. UP/DOWN LOGIC

When the lift is commanded to run, the controller board will immediately sound a single beep and the lift will pause momentarily before moving.

If the lift is commanded to stop by releasing a control switch/button, the lift will decelerate to a stop in 1.5 seconds. However, if the switch/button is pressed again, before the lift has reached a complete stop, the lift will immediately start to accelerate.

The lift has a fixed acceleration rate of 3.0 seconds.

The priority of the input signal to the lift for a direction command is dependant on which input was received first.

## G. BEEP ALERTS

The controller board will sound a single 0.35 second departure beep upon receiving a signal to run.

The controller board will sound a 2.5 second beep upon receiving a signal to run if the battery voltage is low (11.0 VDC to 21.0 VDC) and will not run.

The control will sound two rapid beeps if current overload occurs

The controller board will beep on and off for 20 seconds once every five minutes when the charger is not connected.

## H. WHAT TO DO IF THE LIFT IS STUCK ON A FINAL LIMIT SWITCH (MANUALLY LOWERING THE LIFT)

- ① Remove the seat mount shroud.
- ② Remove the fuse.  
Note: Never perform manual lowering with the stair lift circuit connected.
- ③ Insert an 8mm socket over the hex shaft located at the end of the motor. Rotate the shaft to move the stair lift off of the final limit switch.
- ④ Install the fuse and cover

# I. TROUBLESHOOTING FLOWCHART WHEN LIFT WON'T RUN

