

AL001 AL003 AL010  
AL015 AL030 AL050  
AL100 AL100HD AL160  
AL300 AL300HD AL300RV  
AL300XL AL500  
AL500HD AL560XL AL560  
AL570 AL570XL  
AL580 AL580XL  
AL580-HDX

# OUTSIDE LIFTS



## INSTALLATION & SERVICE MANUAL





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# Section 1

## Introduction

### DEVICE NAME: HARMAR OUTSIDE VEHICLE LIFTS

Indications of Use: The intended use of the Outside Vehicle Lift is to lift, secure and transport an unoccupied mobility device for patients or mobility-impaired persons.

### READ AND UNDERSTAND

Read and understand this manual prior to installation or operation. Having an overall understanding of the lift and proper installation techniques will help you save time, energy and avoid possible injury.

This manual provides instructions for proper installation of Outside Vehicle Lifts. Please refer to the Owner's Manual for operating instructions. Be sure to provide the Owner's Manual to the owner of the lift before it is put into service. Any alterations to the equipment without written authorization by the manufacturer may void the warranty.

## Section 2 Safety

### SAFETY DEFINITIONS



This safety alert symbol appears with safety statements. It means attention, become alert, your safety is involved!

Please read and abide by the message that follows the safety alert symbol.

#### **WARNING**

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

#### **CAUTION**

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

#### **NOTICE**

Indicates a situation which can cause damage to the lift and/or the environment, or cause the lift to operate improperly.

*NOTE: Indicates a condition that should be followed in order for the lift to function in the manner intended.*

### REQUIRED PRACTICES

*NOTE: Installation of this lift requires one person, as long as the one person follows installation instructions, has completed training, has obtained certification on installation, is able to instruct the user on the correct operation and has established a safety and maintenance schedule.*

### Environmental Conditions

The technician shall assess the surrounding conditions and verify that the location is acceptable before performing installation and/or servicing tasks. Installation shall not proceed in inclement weather conditions that jeopardize the technician's safety or ability to complete the installation in a safe manner. Tents, canopies or other outdoor provisions that help protect the work area from weather or other safety concerns are recommended when conditions warrant.

Do not proceed IF, upon visual inspection, the vehicle or hitch has severe rust, structural damage, a possible suspension issue or the battery condition or age are in question.

*NOTE: If you choose to proceed, you do so knowing that the warranty may NOT apply.*

If you do not understand any portion of the installation or operation procedures, please consult our Technical Service Department or authorized mobility dealer. Do not attempt to install or use this lift if you have any hesitation or question. Serious injury or damage can result if proper procedures are not followed.

## Section 3 Preparation

Installations may vary to some degree, but below are the basic tools to have on hand for an Outside Vehicle Lift installation.

If you have any questions, concerns or comments, please contact our Technical Service Department at 800-378-6648 or tech@harmar.com.

### RECOMMENDED TOOLS

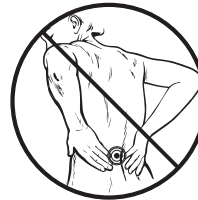
- Stripper, Crimping Tool
- Work Lights (Wired or Wireless)
- Soldering Gun/Iron
- Labeler (for Wiring)
- First Aid Kit
- Box Cutter
- Torque Wrench

### REQUIRED TOOLS

- Socket Set:
  - $\frac{3}{8}$ "
  - $\frac{7}{16}$ "
  - $\frac{1}{2}$ "
  - $\frac{9}{16}$ "
  - $\frac{3}{4}$ "
- Wrench Set:
  - $\frac{7}{16}$ "
  - $\frac{1}{2}$ "
  - $\frac{9}{16}$ "
  - $\frac{3}{4}$ "
  - $\frac{15}{16}$ "

- Allen Wrench:
  - $\frac{1}{8}$ "
  - $\frac{3}{16}$ "
  - $\frac{5}{16}$ "
- Wire Cutters
- Needle Nose Pliers
- No. 2 Flat Head Screwdriver
- No. 2 Phillips Head Screwdriver
- Marking Implement
- Tape Measure
- Multimeter

### UNPACKING THE LIFT



Never attempt to pick up the lift from the box, ground or on/off a vehicle alone.

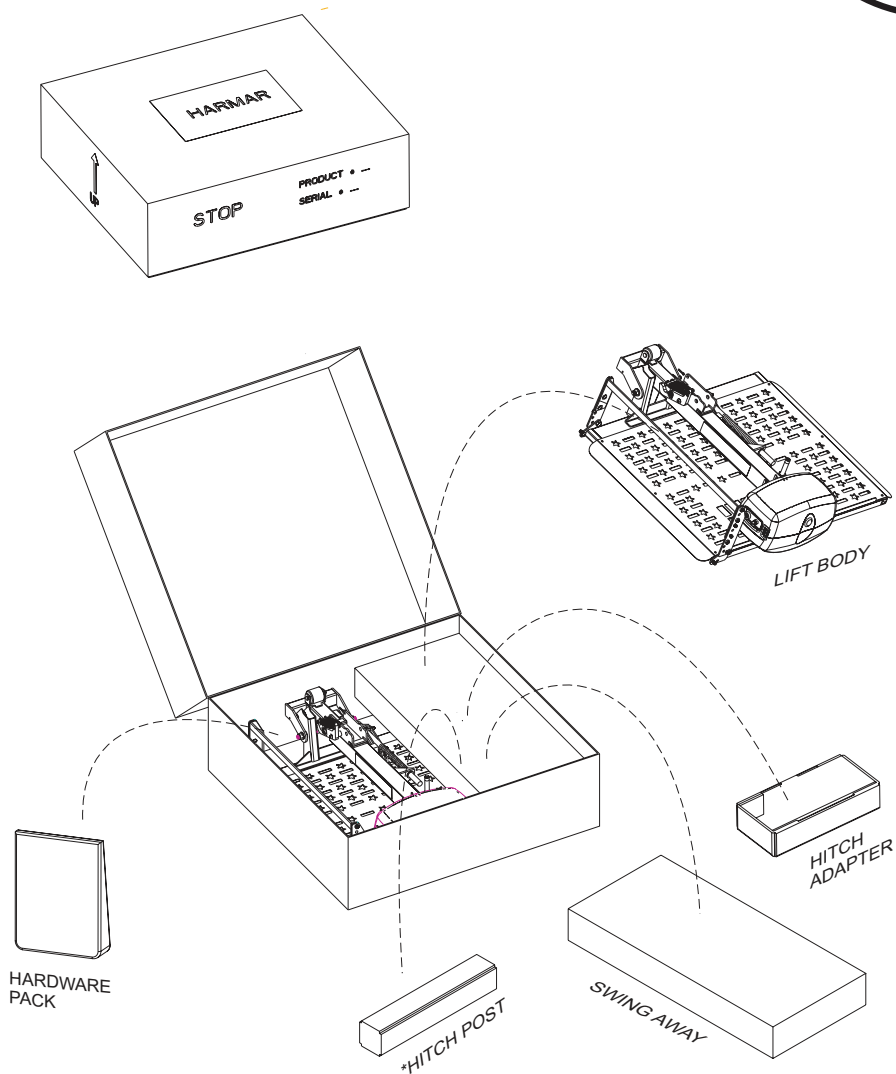
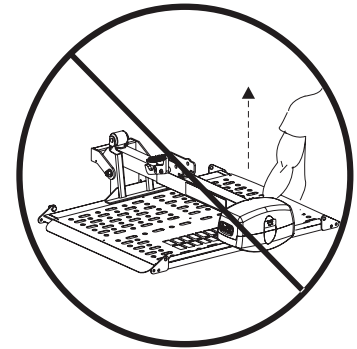
### RECOMMENDED TORQUE TABLE

THREAD DIAMETER	TORQUE (FT-LB)		WRENCH SIZE
	Nylon Lock Nut	Hex Nut	
$\frac{1}{4}$	8	10	$\frac{7}{16}$
$\frac{5}{16}$	17	19	$\frac{1}{2}$
$\frac{3}{8}$	30	35	$\frac{9}{16}$
$\frac{1}{2}$	69	85	$\frac{3}{4}$
$\frac{5}{8}$	135	170	$1\frac{1}{16}$

## CHECKING THE BOX CONTENTS

Before installing the lift, review each part against the packaging checklist to ensure that all parts have been included. If any parts are missing or damaged, immediately contact the dealer who sold the lift. DO NOT attempt to install or use a lift that has missing or damaged parts.

DO NOT  
LIFT  
FROM  
MOTOR  
COVER



\*NOT INCLUDED IF  
AL105 - SWING AWAY  
IS PURCHASED

# OUTSIDE VEHICLE LIFTS: SECTION 3 PREPARATION

## VEHICLE HITCH

1. The Outside Vehicle Lift requires a vehicle that accepts a Class 1, 2, 3 or 5 hitch. Check to ensure that the vehicle is wired using a standard four-connector trailer style of wiring.
2. If you are unsure of the vehicle and hitch capability, contact a local installer who is reputable, insured and competent. The installer's performance affects the customer's perception of your mobility lift installation.

*NOTE: Hitch installation is not possible on every vehicle.*

3. Add the combined weights of the lift, mobility device and, where applicable, the swing-away option. Ensure that the total weight does not exceed the hitch's recommended tongue weight. Many hitches are available on the market, and all are designed to bear a specific amount of weight. *See Figure 3-1.*

The installer must adhere to the vehicle's Gross Vehicle Weight Rating restrictions.

Understand that some states have strict license plate obstruction laws. Acquaint yourself with local and state laws.

4. The receiver tube of the hitch must be installed parallel to the ground. This is a requirement and not a recommendation, as an improperly installed hitch affects the operation of the lift.

Note that some vehicles require the rear suspension to be supplemented. If the vehicle has suspension requirements, the installer should contact a suspension specialist for additional technical support.

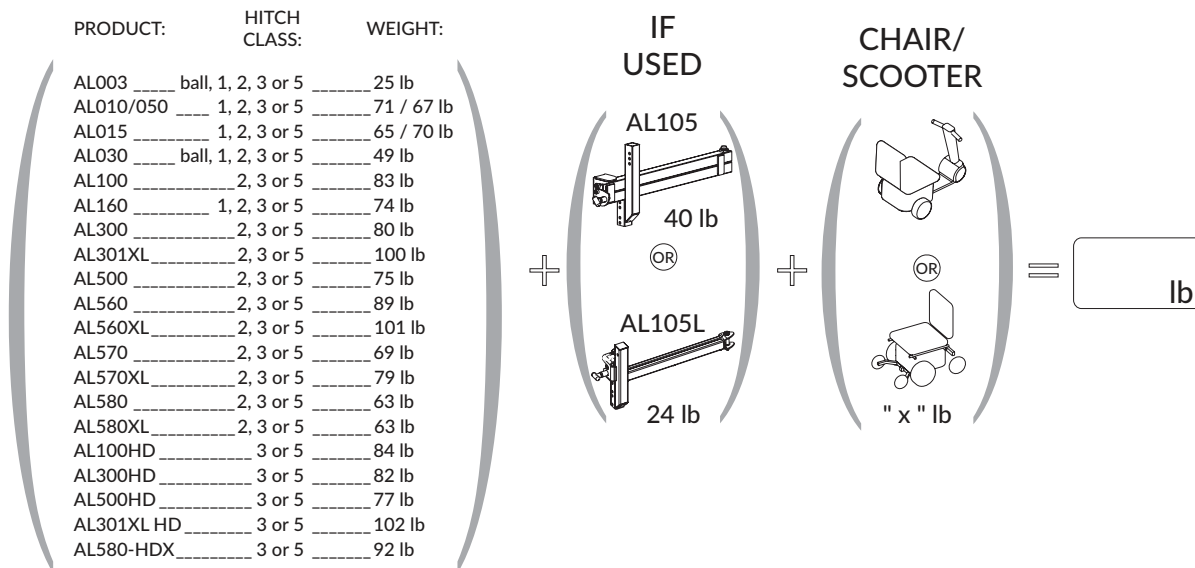


Figure 3-1



## HITCH ADAPTERS

The hitch adapter plugs into the vehicle's trailer hitch and acts as the interface between the lift and vehicle. Hitch adapters are designed to serve the needs of different vehicles.

### Proper Measurement and Selecting a Hitch Adapter

1. Measure the bumper distance and the hitch height. The bumper distance is the length from the bolt hole of the trailer hitch to the rearmost point on the vehicle. Hitch height is the distance from the bottom of the hitch receiver to the ground. *Reference page 10 chart.*

**NOTE:** The hitch class is usually imprinted directly on the trailer hitch. You can also determine the hitch class by measuring the inside of the receiver on the trailer hitch. *See Figure 3-2.*

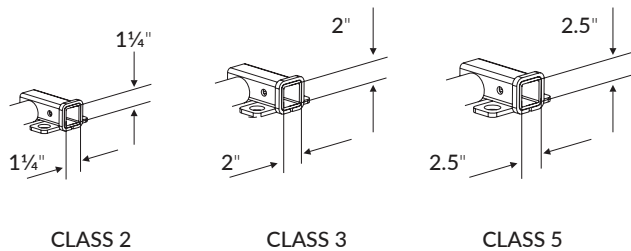


Figure 3-2

**NOTE:** Some shallow hitches (for example, hitches blocked by spare tires) may call for a short hitch adapter. *See Figure 3-3.*

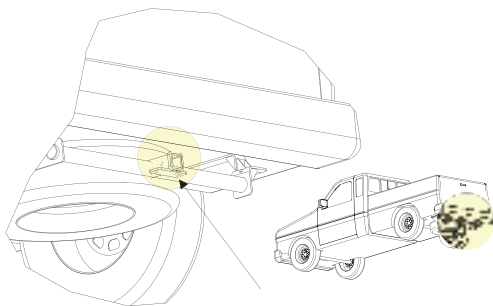


Figure 3-3

The effective range of the hitch adapter varies slightly if the lift is equipped with the standard AL107 hitch post. *See Figure 3-4.*



Figure 3-4

If the lift is equipped with a tail gate/hatch accessibility option (either the AL105 or AL105L swing-away). *See Figure 3-5.*

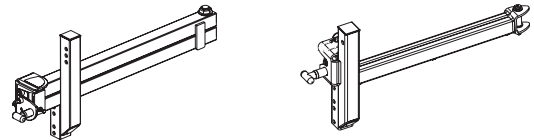


Figure 3-5

If the measurement falls between two numbers (for example, 18 1/2"), round up if the measurement exceeds or equals 1/2". Round down if the measurement falls between two numbers equals less than 1/2". To find the correct orientation with hitch post. *See Figure 3-6.*

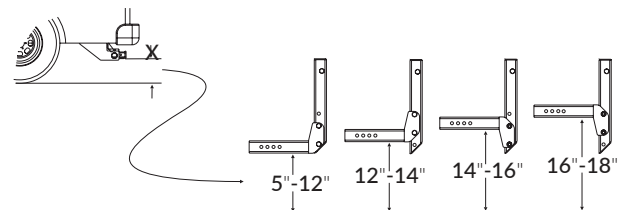


Figure 3-6

To find the correct orientation with a swing-away. *See Figure 3-7.*

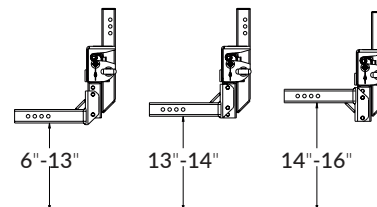


Figure 3-7

# OUTSIDE VEHICLE LIFTS: SECTION 3 PREPARATION

## HITCH ADAPTER SIZE CHART

To find a hitch adapter that will ensure proper lift functionality. *Reference the chart below.*

- HV:** Distance from the ground to the bottom opening of hitch receiver
- D1:** Distance from the center of the pin hole to the furthest point toward the rear of the vehicle.
- D2:** Distance from the center of the pin hole to the furthest point towards the front of the vehicle going through the hitch receiver. In some cases the tire is the furthest point.

**⚠ WARNING**

Only use Harmar-approved hitch adapters with Harmar lifts. Hitch expanders and extenders are strictly prohibited—using them or any other after-market accessory may result in damage to the vehicle, lift and/or personal injury to the user.

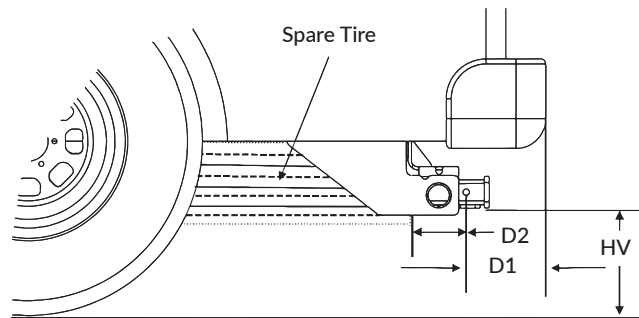


Figure 3-8

STANDARD APPLICATION						APPLICATION WITH SWING-AWAY		
Class	Part#	Description	HV	D1	D2	HV	D1	D2
Class 1	AL121	STANDARD	6"–18"	≤ 7.5"	≥ 1"	6"–16"	0"–7.5"	≥ 1"
Class 2	AL126	STANDARD	6"–18"	≤ 7.5"	≥ 2"	6"–16"	0"–7.5"	≥ 2"
	AL1262	STANDARD: 2" DROP	18"–20"	≤ 7.5"	≥ 2"	16"–18"	0"–7.5"	≥ 2"
	*AL1265	STANDARD 4.25" DROP	20"–22"	≤ 7.5"	≥ 2"	18"–20"	0"–7.5"	≥ 2"
	AL127	EXTRA LONG	6"–18"	7.5"–10.5"	≥ 2"	6"–16"	7.5"–10.5"	≥ 2"
	AL1272	EXTRA LONG: 2" DROP	18"–20"	7.5"–10.5"	≥ 2"	16"–18"	7.5"–10.5"	≥ 2"
	*AL1275	EXTRA LONG: 5" DROP	20"–23"	7.5"–10.5"	≥ 2"	18"–21"	7.5"–10.5"	≥ 2"
	AL128	SHORT	6"–18"	≤ 5"	≥ 1.5"	6"–16"	0"–5"	≥ 1.5"
	*AL1285	SHORT: 4.25" DROP	20"–22"	≤ 5"	≥ 1.5"	18"–20"	0"–5"	≥ 1.5"
	AL111	STANDARD: (FOR AL001 ONLY)	6"–18"	≤ 5"	≥ 2"	N/A	N/A	N/A
Class 3	AL123	STANDARD	6"–18"	≤ 8"	≥ 5"	6"–16"	0"–8"	≥ 5"
	AL123HD	HEAVY DUTY: STANDARD	6"–18"	≤ 8"	≥ 5"	6"–16"	0"–8"	≥ 5"
	AL1232HD	HEAVY DUTY: 2" DROP	18"–20"	≤ 8"	≥ 5"	16"–18"	0"–8"	≥ 5"
	*AL1235HD	HEAVY DUTY: 5" DROP	20"–23"	≤ 8"	≥ 5"	18"–21"	0"–8"	≥ 5"
	*AL1235U	UNIVERSAL: STD - 5" DROP	6"–23"	≤ 8"	≥ 5"	6"–21"	0"–8"	≥ 5"
	*AL1236	STANDARD: 6" DROP	20"–24"	≤ 8"	≥ 5"	18"–22"	0"–8"	≥ 5"

# OUTSIDE VEHICLE LIFTS: SECTION 3 PREPARATION

		STANDARD APPLICATION				APPLICATION WITH SWING-AWAY		
Class	Part#	Description	HV	D1	D2	HV	D1	D2
Class 3	*AL1236HD	HEAVY DUTY: 6" DROP	20"–24"	≤ 8"	≥ 5"	18"–22"	0"–8"	≥ 5"
	*AL1238	STANDARD: 8" DROP	24"–26"	≤ 8"	≥ 5"	22"–24"	0"–8"	≥ 5"
	*AL1238HD	HEAVY DUTY: 8" DROP	24"–26"	≤ 8"	≥ 5"	22"–24"	0"–8"	≥ 5"
	AL124	SHORT: STANDARD	6"–18"	≤ 4"	≥ 3.5"	6"–16"	0"–4"	≥ 3.5"
	AL124HD	HEAVY DUTY SHORT: STANDARD	6"–18"	≤ 4"	≥ 3.5"	6"–16"	0"–4"	≥ 3.5"
	AL1242	SHORT: 2" DROP	18"–20"	≤ 4"	≥ 3.5"	16"–18"	0"–4"	≥ 3.5"
	*AL1242HD	HEAVY DUTY SHORT: 2" DROP	18"–20"	≤ 4"	≥ 3.5"	16"–18"	0"–4"	≥ 3.5"
	*AL1245	SHORT: 5" DROP	20"–23"	≤ 4"	≥ 3.5"	18"–21"	≤ 4"	≥ 3.5"
	*AL1246	SHORT: 6" DROP	20"–24"	≤ 4"	≥ 3.5"	18"–22"	0"–4"	≥ 3.5"
	*AL1246HD	HEAVY DUTY SHORT: 6" DROP	20"–24"	≤ 4"	≥ 3.5"	18"–22"	0"–4"	≥ 3.5"
	AL125HD	HEAVY DUTY EXTRA LONG: STANDARD	6"–18"	7.5"–13.5"	≥ 5"	6"–16"	7.5"–13.5"	≥ 5"
	AL1252	EXTRA LONG: 2" DROP	18"–20"	7.5"–13.5"	≥ 5"	16"–18"	7.5"–13.5"	≥ 5"
	AL1252HD	HEAVY DUTY EXTRA LONG: 2" DROP	18"–20"	7.5"–13.5"	≥ 5"	16"–18"	7.5"–13.5"	≥ 5"
	*AL1255HD	HEAVY DUTY EXTRA LONG: 5" DROP	20"–23"	7.5"–13.5"	≥ 5"	18"–21"	7.5"–13.5"	≥ 5"
	*AL1256	EXTRA LONG: 6" DROP	20"–24"	7.5"–13.5"	≥ 5"	18"–22"	7.5"–13.5"	≥ 5"
	*AL1256HD	HEAVY DUTY EXTRA LONG: 6" DROP	20"–24"	7.5"–13.5"	≥ 5"	18"–22"	7.5"–13.5"	≥ 5"
	*AL1258HD	HEAVY DUTY EXTRA LONG: 8" DROP	24"–26"	7.5"–13.5"	≥ 5"	22"–24"	7.5"–13.5"	≥ 5"
	H300102	RV HITCH: STANDARD	6"–19"	≤ 6"	≥ 4"	6"–17"	0"–4.5"	≥ 4"
*AL12332	RV HITCH: 12" DROP	21"–30"	≤ 6"	≥ 4"	19"–28"	0"–4"	≥ 4"	
Class 5	AL123V	STANDARD	6"–18"	≤ 8"	≥ 5"	6"–16"	0"–8"	≥ 5"
	AL1232V	STANDARD: 2" DROP	18"–20"	≤ 8"	≥ 5"	16"–18"	0"–8"	≥ 5"
	*AL1235V	STANDARD: 5" DROP	20"–23"	≤ 8"	≥ 5"	18"–21"	0"–8"	≥ 5"
	*AL1236V	STANDARD: 6" DROP	20"–24"	≤ 8"	≥ 5"	18"–22"	0"–8"	≥ 5"

\* Not applicable with AL105L

Round measures up if greater than ½" and down if less than ½".

## Section 4 Installation

### WIRING THE VEHICLE

Improper wiring is the main cause of operation problems with a vehicle lift. Follow the wiring instructions with care. Installing a wiring harness first will ensure there is power to the lift during the installation process and allows the motor to do the lifting for you. If you do not use a wiring harness, you must use a battery pack. The vehicle's wiring harness is located inside the hardware pack. The harness is designed to comply with SAE J1128 requirements. It is approximately 23' long and will accommodate most vehicles.

1. Unwind the wiring harness and lay it flat. The lift end of the harness has a black connector. This black connector goes to the trailer hitch area where the lift will mount. **See Figure 4-1.**

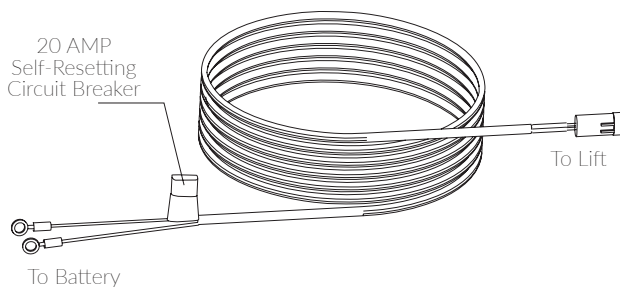


Figure 4-1

2. Start routing the wiring harness at the vehicle's battery. Join the black wire to the negative terminal on the battery. DO NOT attach the red wire until the very end of the installation process. **See Figure 4-2.**

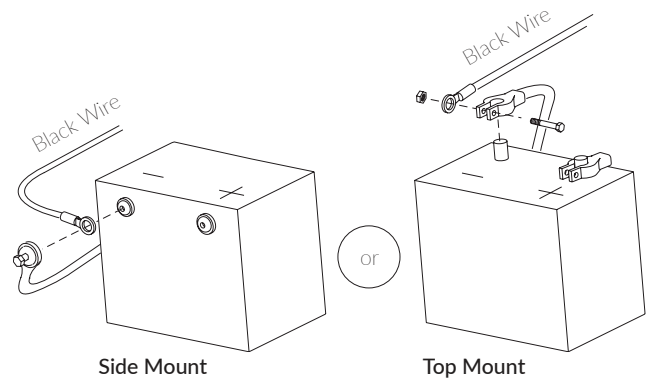


Figure 4-2

### NOTICE

**NEVER** attempt to connect the harness to a secondary power source. Always connect both leads directly to the battery. If the vehicle has a 12-volt supply (for example, a pin connector or secondary 18-volt supply), it must be connected to battery terminals. If you choose to use the battery pack, go to page 14.

3. Route the vehicle harness under and, when possible, through the vehicle back to the bumper/trailer hitch area.
4. Route the wire under and through the vehicle whenever possible, entering the vehicle through the firewall.

## NOTICE

If the installation process requires the wiring harness to run on the underside of the vehicle, direct the harness away from the exhaust system, brake lines, fuel lines and gas tank. Avoid pinch points and sharp edges. Avoid positioning the harness where it can be snagged by debris from the road.

- If you wish to run the harness under the vehicle, use the supplied wire ties to secure the wire against the frame, taking care to avoid moving and/or hot parts such as exhaust.
- If the harness is too long, coil the extra wire and secure it to the vehicle's front bumper using the wire ties provided. See Figure 4-3. **DO NOT** cut or shorten the harness.

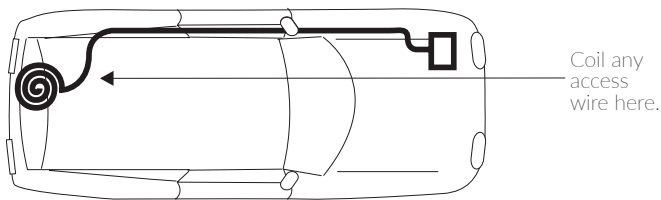


Figure 4-3

5. Once the harness has been routed into the vehicle, remove the protective cover from the pin. See Figure 4-4.

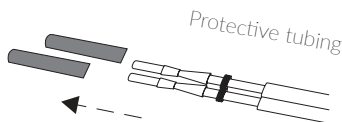


Figure 4-4

6. Examine the retaining flanges on the pin, as they may have become damaged during the process of routing wire through the vehicle. These retaining flanges are crucial to securing the pins inside the connector. Adjust these flanges as needed. See Figure 4-5.

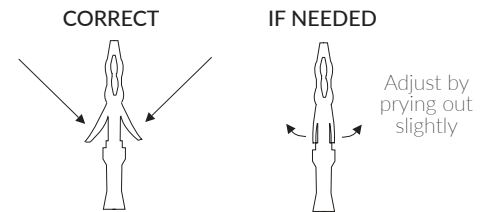


Figure 4-5

7. The connector is marked with an A and B. The A side is for the Red wire and the B side is for the Black wire. If wires are connected incorrectly, the lift will not operate correctly. See Figure 4-6.

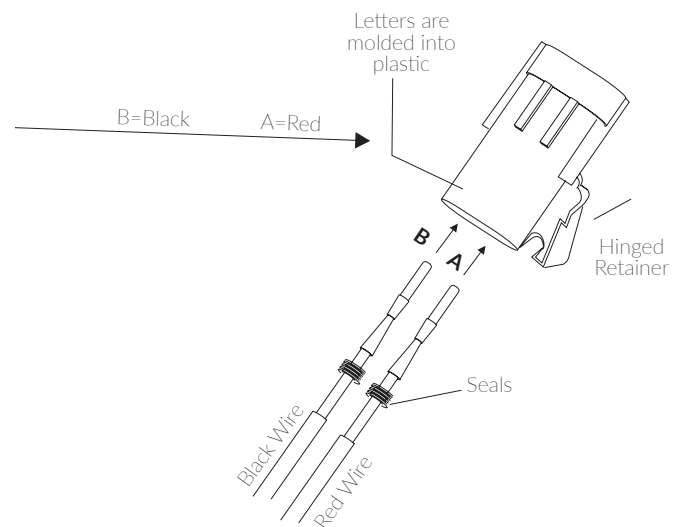


Figure 4-6

# OUTSIDE VEHICLE LIFTS: SECTION 4 INSTALLATION

- Attach the black wire first to the negative terminal and red wire last to the positive terminal on the battery. **See Figure 4-7.**

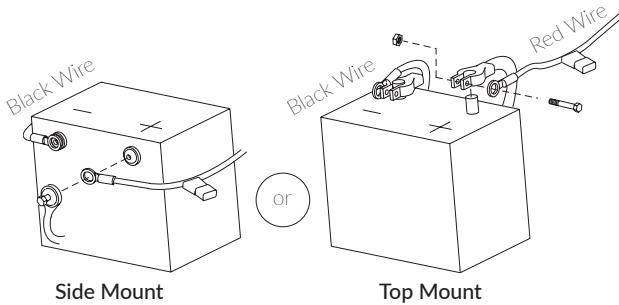


Figure 4-7

**NOTE:** The lift includes a standard two-contact trailer connector. Use this connector for the license plate lamp. If your vehicle is not equipped with the proper connector, use the brown wire to make a wire splice and get the same result. **See Figure 4-8.**

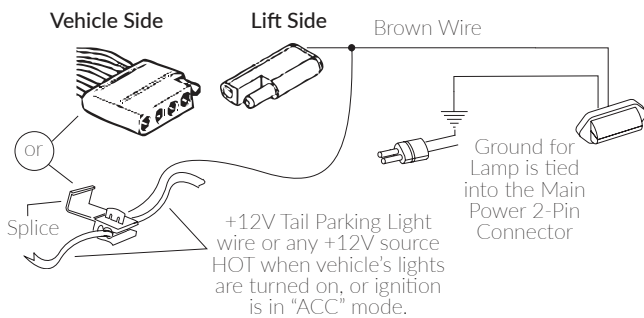


Figure 4-8

## Battery Pack

If a customer is not comfortable with connecting the vehicle power harness directly to the battery of the car, Harmar offers a stand-alone battery pack (AL205).

The battery pack can also be used when hybrid or electric vehicles have a 12-volt battery capable of supplying power to a mobility lift.

## Tech Note: Motor Testing

**NOTE:** Troubleshooting with a test light or voltage meter may lead to a false reading.

When you probe for 12 volts, the reading may indicate a connection even though the connection may not necessarily be sufficient. The lift's motor can draw up to 20 amps at some points, requiring all of the available wire to flow proper current. Poor connections are the main problem associated with a slow, intermittent, warm, poorly performing motor and make the motor more likely to deteriorate prematurely.

If a single strand of a multi-strand wire is making contact, 12V will appear on a meter or test light but will not allow the motor to operate. When troubleshooting, it is always ideal to test both the current and the voltage or run the motor with a known good shop battery or power source.

## Optimizing Hitch Height

You can change the height of the lift by adjusting the hitch adaptor's orientation and location on a standard hitch adaptor. Changing the height of the lift helps you optimize the vehicle's ground clearance to ensure that the platform lies flat when it reaches the end of its travel. To select the orientation needed for the vehicle based on the hitch height (the distance of the vehicle's hitch receiver to the ground). **Refer to Figure 3-6 on page 9 and chart on page 10.**

## HITCH ADAPTOR INSTALLATION

1. Attach the hitch adaptor to the hitch post, ensuring that the adaptor is properly oriented with the post according to the application's hitch height. **See Figure 4-09.**

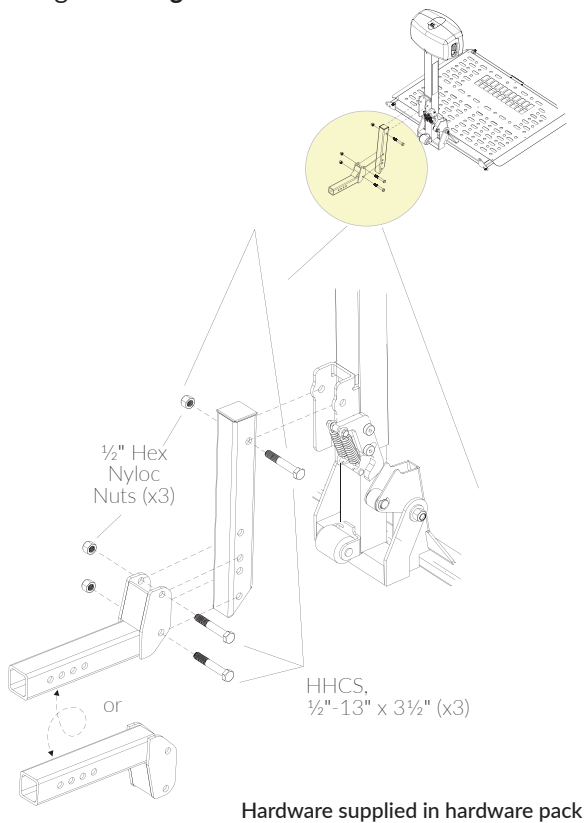


Figure 4-09

2. Attach the hitch post to the lift, but **DO NOT** overtighten it.
3. Insert the hitch adaptor into the receiver on the vehicle's hitch. Secure the adaptor according to the hitch class. **See Figure 4-10.**

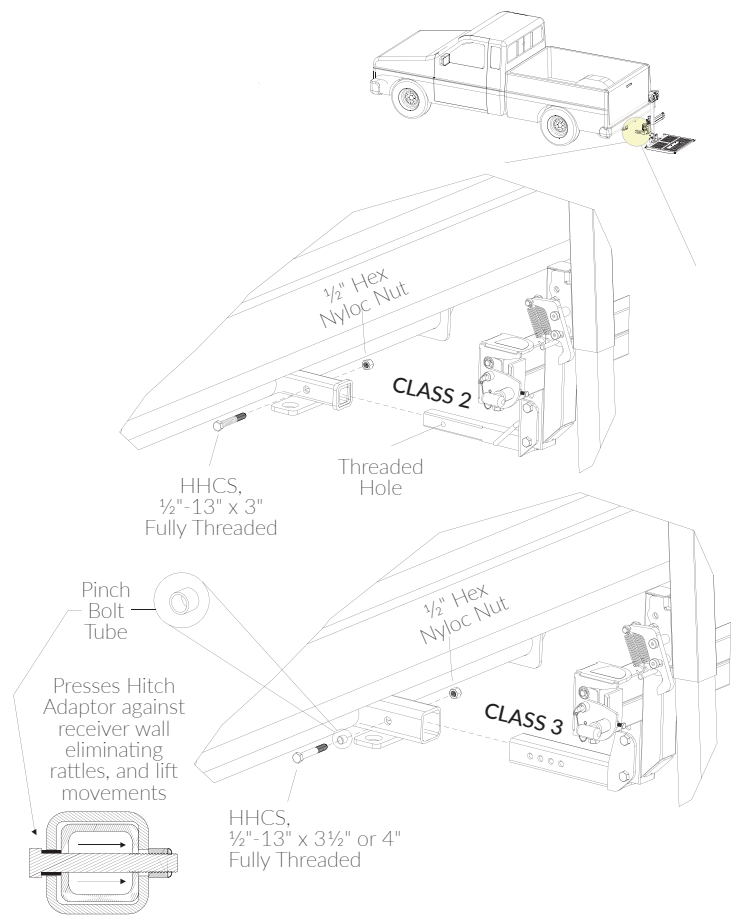


Figure 4-10

**NOTE:** ONLY the standard hitch adaptors or class 3 - 2" drop can be safely inverted.

# OUTSIDE VEHICLE LIFTS: SECTION 4 INSTALLATION

## SWING-AWAY OR HITCH POST INSTALLATION

1. Fasten the hitch adaptor to the vehicle hitch.  
*See Figure 4-11.*

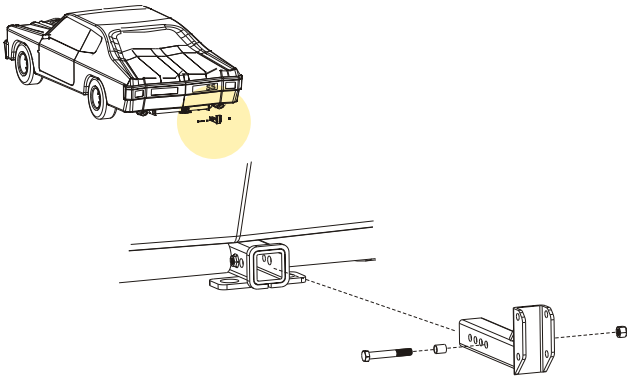


Figure 4-11

2. Fasten the swing away or hitch post to the hitch adaptor. *See Figure 4-12.*

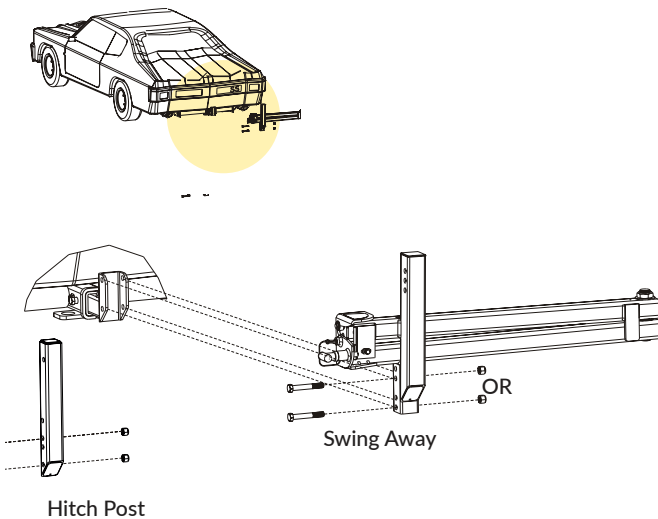


Figure 4-12

### NOTICE

Only class 2 adaptors or greater can be used with swing-away.

3. Position the open box behind the vehicle and connect the wiring harness together.  
*See Figure 4-13.*

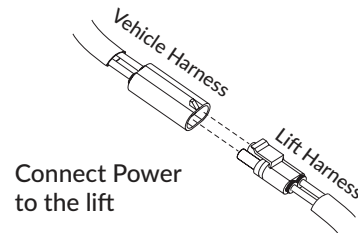


Figure 4-13

4. Stand the lift up, use the switch to line up the hitch post or swing away with the lift and fasten in place. *See Figure 4-14.*

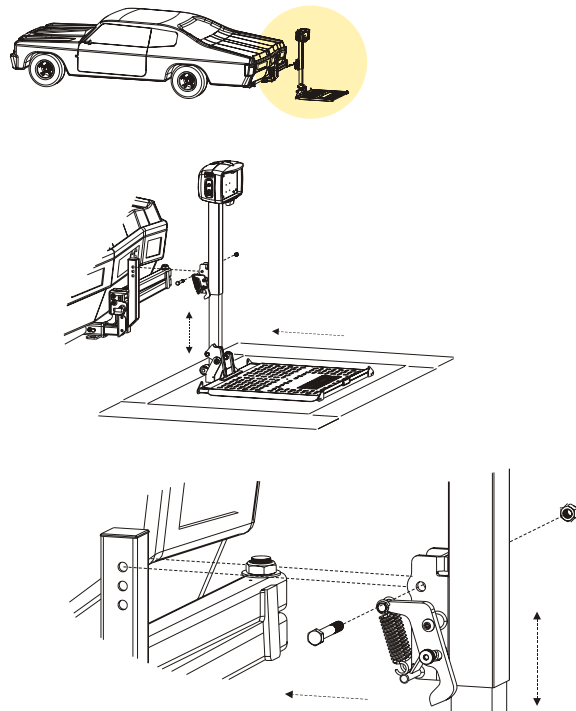


Figure 4-14



## Swing-Away Adjustment Screw

If the model was purchased with a swing-away option, read the following installation instructions. Not needed for AL105L.

1. With the swing-away closed, loosen the nut.
2. Tighten the bolt so the ramp touches the pin in the closed position.
3. Tighten the nut. Open and close the swing-away. *See Figure 4-15.*

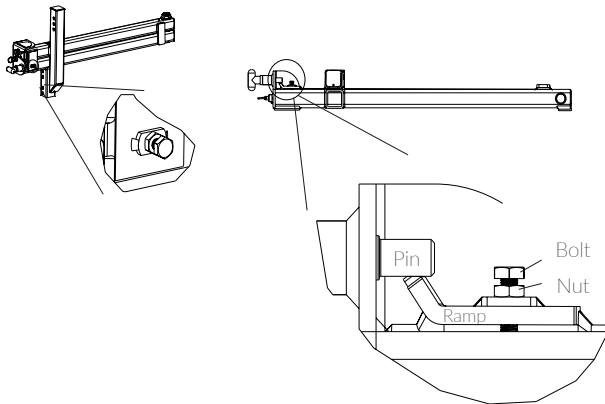


Figure 4-15

4. Verify the T-handle opens freely.  
*NOTE: There should be slight tension when pulling the T-handle.*
5. Verify the upper arm is locked and does not move. *See Figure 4-16.*

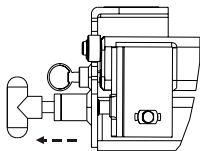


Figure 4-16

## AL030 POWER TOTE INSTALLATION WITH BALL MOUNT HITCH ADAPTOR

1. Install bumper mount of flat bar. *See Figure 4-17.*

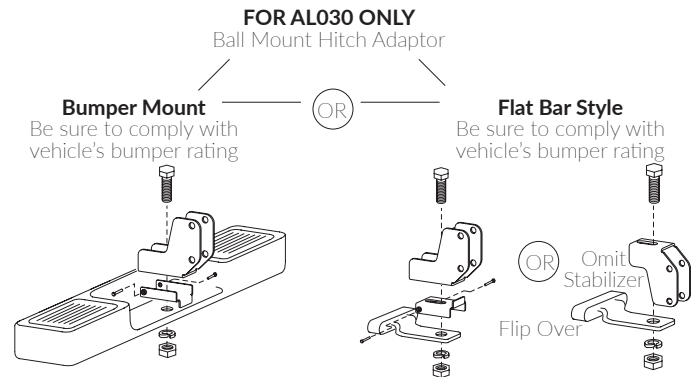


Figure 4-17

2. Install hitch post assembly. *See Figure 4-18.*

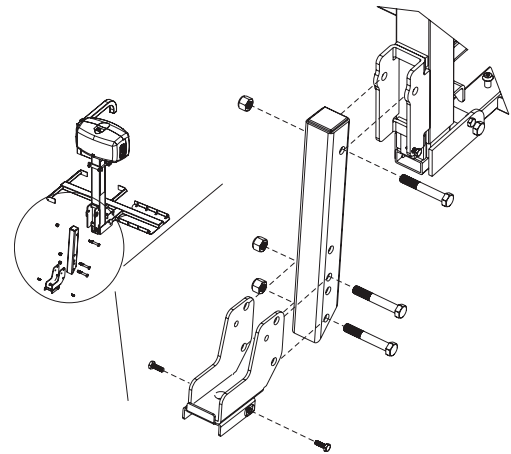


Figure 4-18

### **WARNING**

Do not use ball mount adaptor with swing-away.



## Section 5

# Chair Preparation

A lift with four securement straps offers two options for attaching strap hooks to the chair—the anchor plate or the U-bolt kit. The lift includes both sets of options.

### ANCHOR PLATE

The anchor plate is a flat plate and may vary in length depending on the mobility device used. The anchor plate attaches to the bottom of any chair or scooter that has a center seat post. *See Figure 5-1.*

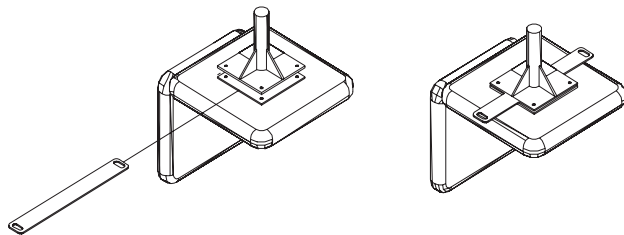


Figure 5-1

The anchor plate should extend about 1½" out from the side of the cushion. To secure the chair to the lift, the user can attach the strap hooks to the anchor plate. *See Figure 5-2.*

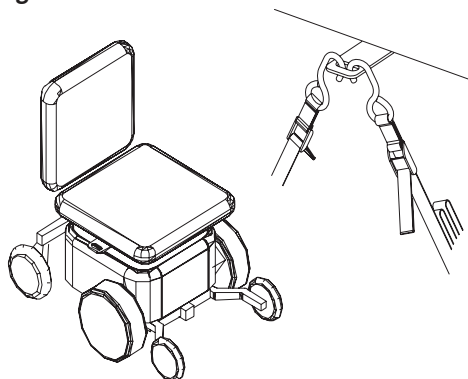


Figure 5-2

### Anchor Plate Installation

1. Remove the seat from the chair.
2. Loosen the screws that attach the plate to the bottom of the seat. Allow enough room to slide the anchor plate between the seat and the seat plate.
3. Attach the anchor plate to the center of the seat plate with the holes on each end extending evenly on each side of the seat.
4. Retighten the screws that hold the seat plate to the bottom of the seat.
5. Replace the seat on the chair.

# OUTSIDE VEHICLE LIFTS: SECTION 5

## CHAIR PREPARATION

### U-BOLT HARDWARE KIT

The U-bolts are used with power chairs or scooters that do not have a center seat post. On this type of chair, the seat is normally attached to a tubular frame. Install the U-bolts, two on each side, to the frame as shown. *See Figure 5-3.*

Ensure that the loop extends to the outside of the chair so the user can attach the strap hooks.

Each chair is slightly different, so the U-bolt placement will differ among models and manufacturers. Place the U-bolts toward the center of the seat if possible. If your seat type requires you to install the U-bolts more toward the front or rear of the seat, aim to install them as close as possible to the center of the seat.

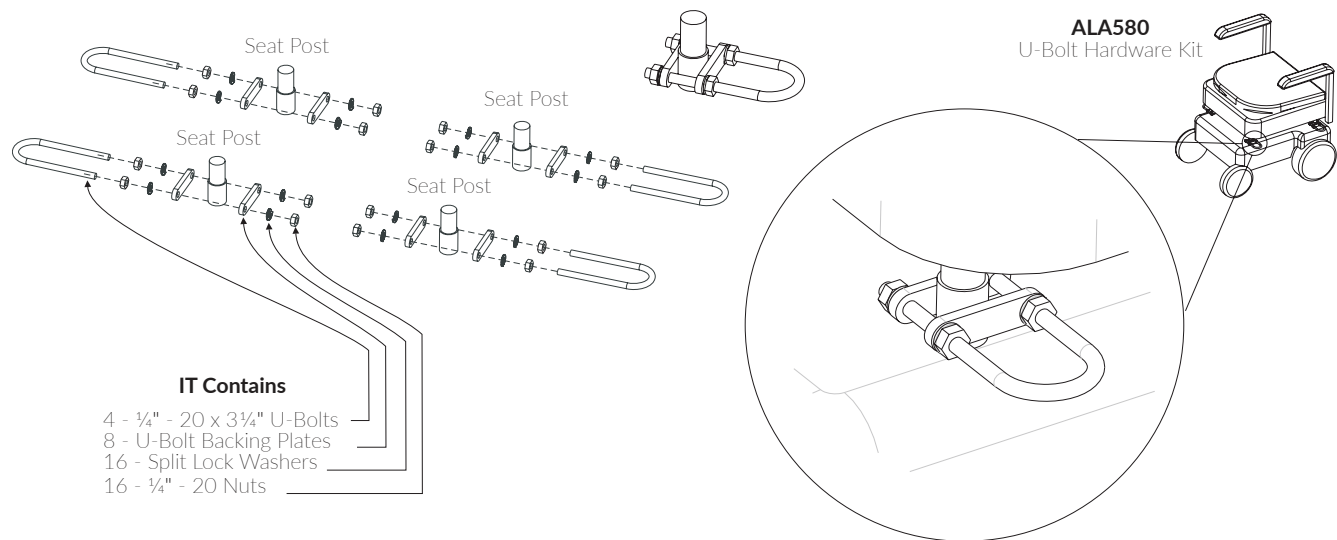


Figure 5-3

## Section 6 Lift Adjustments

### HOLD-DOWN FOOT HEIGHT SETTING

The setting of the hold-down foot is critical to the function of the lift and may cause damage to the lift, scooter and/or person if improperly adjusted. Adjust the hold-down foot using the following instructions to ensure proper pressure to the scooter.

1. With the platform on the ground, run both nuts down onto the hold-down foot, so the foot will not catch onto the scooter's deck. Drive the scooter onto the platform, from left (driver's side) to right, until the rear wheels are positioned in the cradle bar assembly. Stop when the rear tires contact the ramps of the platform.

See Figure 6-1.

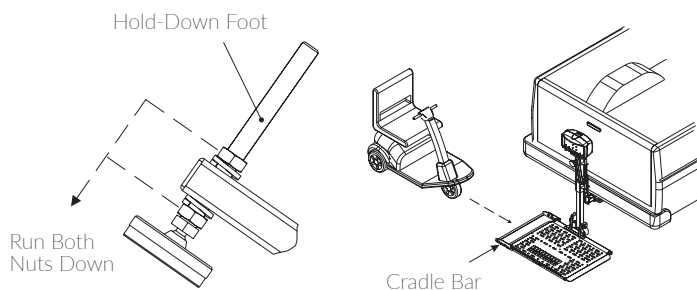


Figure 6-1

#### **CAUTION**

For AL160, be sure that the frame of the scooter is in contact with the platform. The front wheel may have to be rotated.

2. Raise the platform until you hear the motor clutch, which indicates the top of travel. The hold-down foot should be above the scooter's deck. See Figure 6-2.

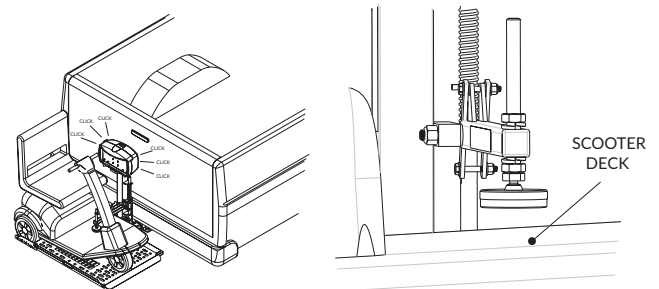


Figure 6-2

3. Raise both nuts on the hold-down foot and allow the foot to rest on top of the scooter's deck.

While holding the stationary nut, run the bottom nut up to the hold-down arm and hand-tighten. Lift the hold-down arm up to eliminate slack and to ensure the arm is at its highest point. There should be pressure on the deck of the scooter and the bottom lock washer should be compressed from the bottom nut.

See Figure 6-3.

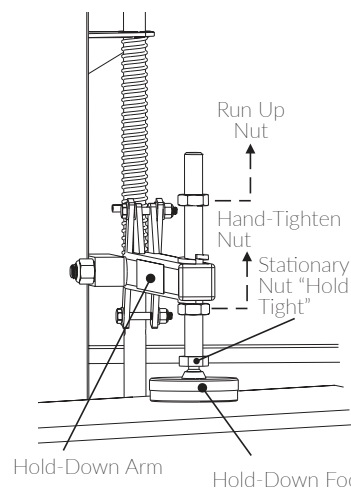


Figure 6-3

# OUTSIDE VEHICLE LIFTS: SECTION 6

## LIFT ADJUSTMENTS

- Adjust the top nut, so the top of the nut measures 2¼" to 2½" above the top of the hold-down arm. Once the measurement has been set, DO NOT adjust the top nut or the stationary nut. See Figure 6-4.

### CAUTION

If the hold-down foot is set too loose, the foot may not have enough pressure to hold the scooter down. If too tight, the foot may cause damage to the scooter and/or lift.

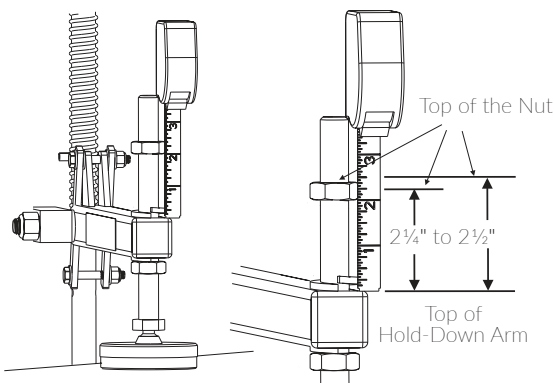


Figure 6-4

- Lower the platform about 5" to relieve pressure from the scooter's deck. While holding the stationary nut in place, run the bottom nut up to the hold-down arm and tighten. See Figure 6-5.

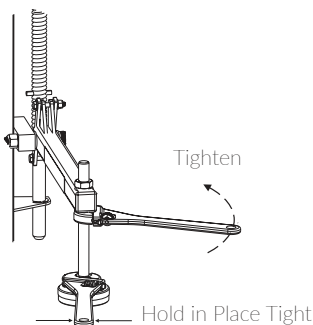


Figure 6-5

### CAUTION

Do not rotate the stationary nut; otherwise, it will change the pressure that was previously set.

## AL100, AL160 & AL300 WHEEL CRADLE ADJUSTMENTS

Add or replace a rear wheel cradle on an outside vehicle lift. Always adjust for tire size.

Assemble components as indicated below. See Figure 6-6.

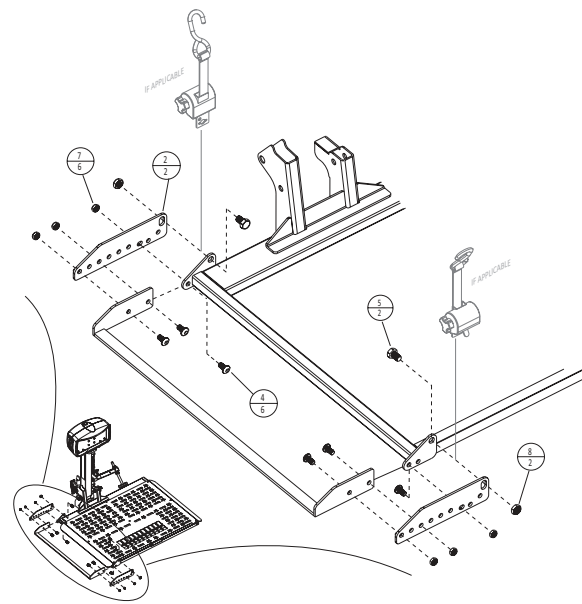


Figure 6-6

Test by positioning scooter onto platform.

# OUTSIDE VEHICLE LIFTS: SECTION 6

## LIFT ADJUSTMENTS

The cradle's flat bar and platform ramp should contact the wheel between specific positions: *See Figure 6-7.*

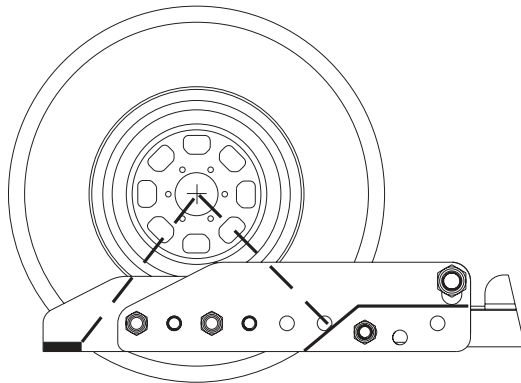
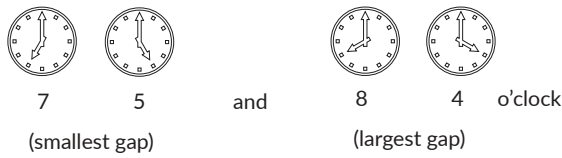


Figure 6-7

Test scooter securement with hold-down foot. Once satisfied with position of scooter's rear wheels, **be sure to tighten ALL fasteners.**

## AL560 & AL560XL PLATFORM ADJUSTMENTS

The thread must protrude out of the top of the nylon portion of all nuts.

### NOTICE

For adjustment purposes, the platform component screws and nuts are loose. You **MUST** tighten the platform component screws and nuts before use. *See Figure 6-8.*

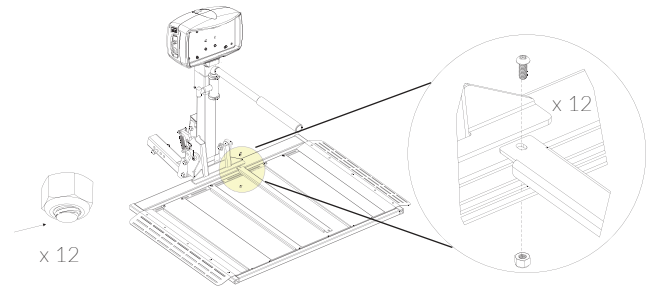


Figure 6-8

1. Estimate the chair's center position depending on the entry preference (driver's side or passenger's side). Locate the drive wheel's position. *See Figure 6-7.* Adjust the two main cradle positions to match. Capture the smaller wheels on the two larger platform skins.
2. Position the chair onto the platform. Verify that the chair is secure and does not move in any direction once positioned between the platform skins and the cradles. *See Figure 6-9.*

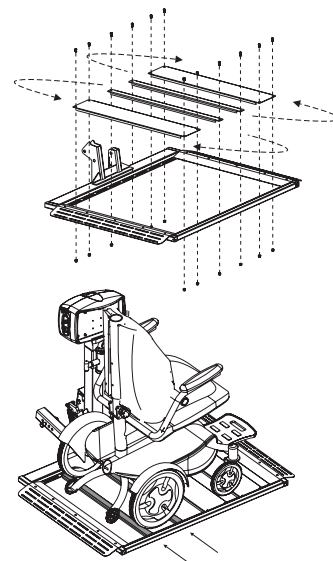


Figure 6-9

# OUTSIDE VEHICLE LIFTS: SECTION 6

## LIFT ADJUSTMENTS

### AL560 & AL580 - HOLD-DOWN ARM ADJUSTMENT

1. Position the chair onto the platform after the cradles have been adjusted. *See Figure 6-10.*

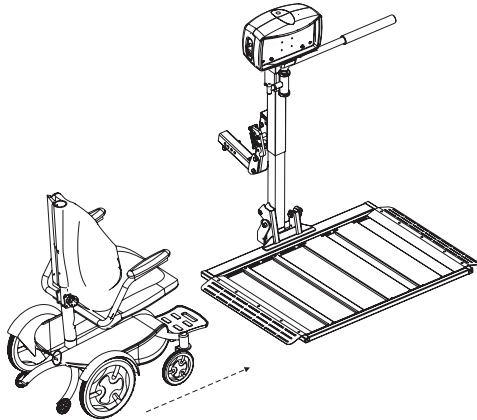


Figure 6-10

2. Raise the platform to top of travel until you hear the motor clutch. *See Figure 6-11.*

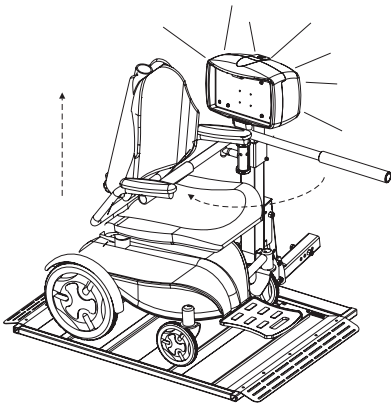


Figure 6-11

3. Loosen the two bolts and nuts in the back of the vertical tube. *See Figure 6-12.* Allow the arm assembly to lower until the arm contacts the seat.

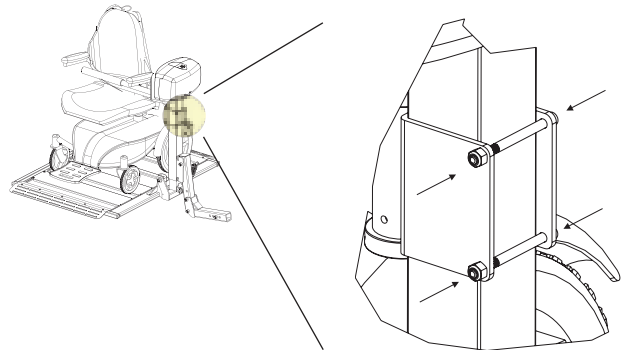


Figure 6-12

4. Lower the platform approximately 2" to 3" and allow the arm to drop along with the seat. Retighten the two bolts and nuts. *Figure 6-13.*

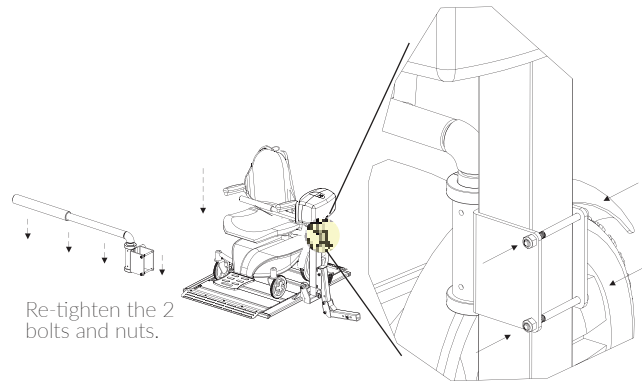


Figure 6-13

5. Run the lift up until the top of travel and when you hear the clutch.

### NOTICE

You can alter the position of the arm by removing the top shaft collar, retracting the T-handle and re-inserting the arm from above or below. *See Figure 6-14.*



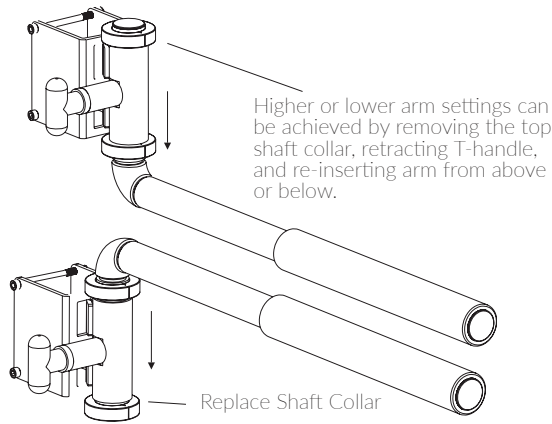


Figure 6-14

This method allows the T-handle to remain on the same side as the key and toggle switches. If you wish to have the T-handle on the opposite side as the key and toggle switches, you can flip the entire assembly.

## NOTICE

Verify that the hold-down arm produces enough pressure on the seat to hold the power chair firmly on the platform. The seat should be somewhat indented by the arm. See Figure 6-15.

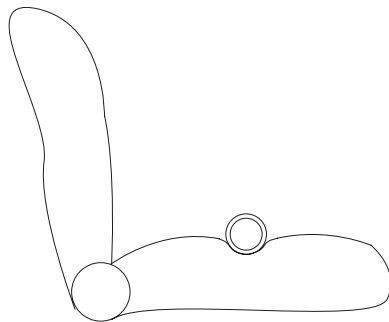


Figure 6-15

## AL580-HDX

The AL580-HDX is built to accommodate most of the complex mid-wheel power chairs produced by major manufacturers. The wheel cradles are preset for the Quantum Edge 2.0 and Edge 3.0 Power Bases. However, suspensions can change the overall ground clearance and some options change the center of gravity.

Every installation **must** be checked and validated to ensure that as much of the wheel is captured before the wheelchair frame makes contact with the platform.

## NOTICE

Having the customer's power chair present with all its adjustments and options installed is required. It is recommended the lift be installed in the vehicle's hitch, and wired with power before proceeding.

The AL580-HDX platform will capture the mid-drive wheels in adjustable gaps and will rest the chair's battery tray on the platform pad. See Figure 6-16.

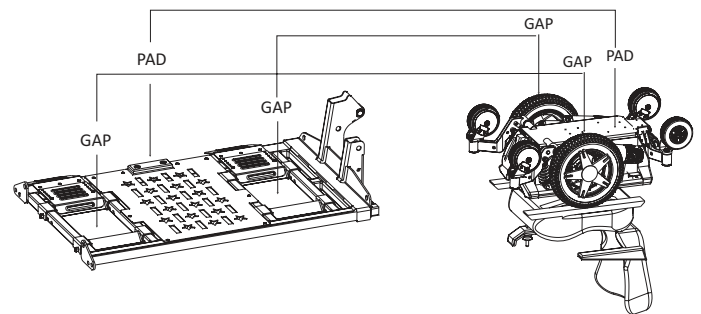


Figure 6-16

1. Position the chair on the platform. Stop when the drive wheels are in the platform gaps. Raise the platform off the ground and inspect the chair. See Figure 6-17.

# OUTSIDE VEHICLE LIFTS: SECTION 6

## LIFT ADJUSTMENTS

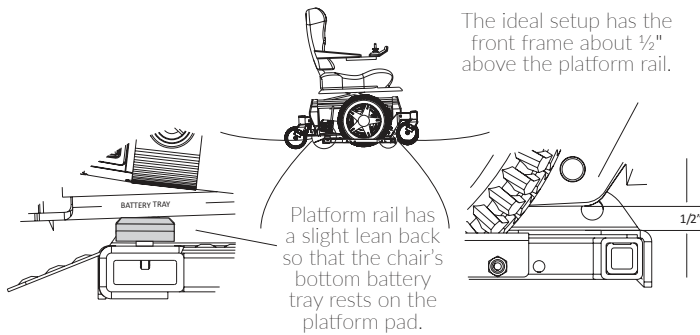


Figure 6-17

- If the chair's front caster frame contacts the platform, or if the chair is leaning too far to the passenger's side, remove one or two of the three platform pads. Always re-attach the top pad with a chamfer using the same screws. The platform **must** have at least the top pad attached. See Figures 6-18 and 6-19.

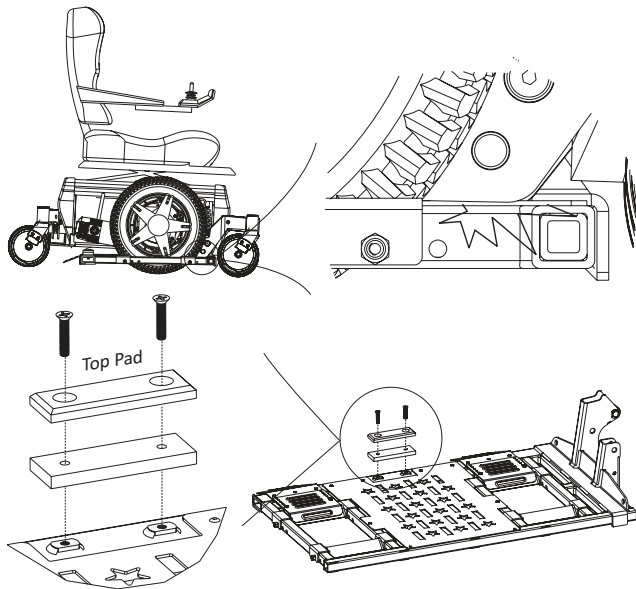


Figure 6-18 and Figure 6-19

- If the chair is leaning to far too the driver's side of the vehicle, move the passenger side wheel chock away to create a bigger opening. See Figure 6-20.

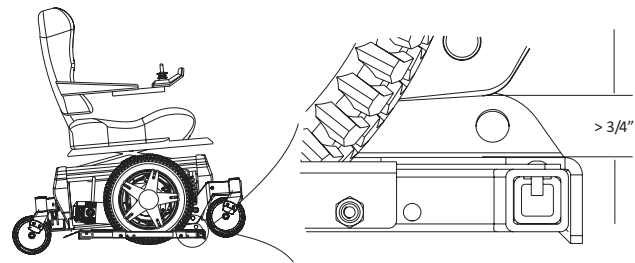


Figure 6-20

- Using a  $\frac{3}{16}$ " hex drive and  $\frac{7}{16}$ " wrench, remove the bolt and nut from each side of the platform. See Figure 6-21.

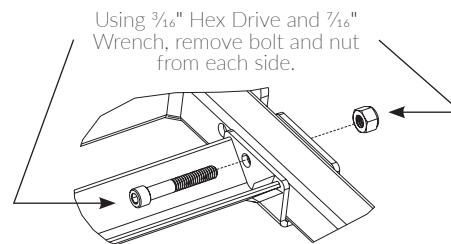


Figure 6-21

- Adjust platform as required.
- Use bolt to hold platform in place.
- Test platform with chair. Once satisfied, fasten platform in place with nyloc nut. See Figure 6-22.

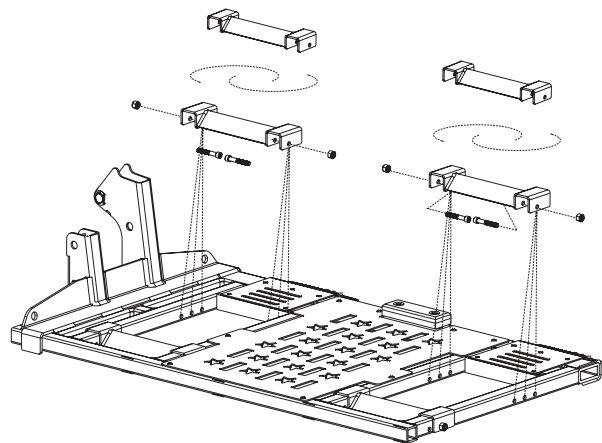


Figure 6-22

## NOTICE

The wheel chock's hole is designed to be off center, allowing 1/2" increments. Rotate the wheel chock 180 degrees to move the ramp by 1/2". See Figure 6-23.

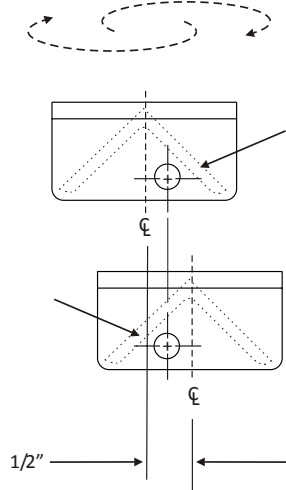


Figure 6-23

- Adjustments may also be done with the driver's side wheel chocks for chairs with smaller drive wheels, or to adjust for better center of gravity.

The platform's wheel ramps will also need to be adjusted. Using a #2 Phillips screwdriver, remove the ramps. See Figure 6-24.

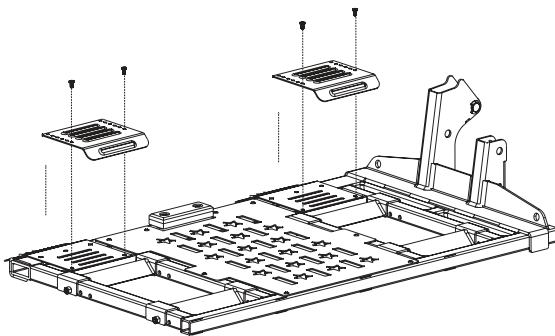


Figure 6-24

- Once satisfied with the wheel chock positions, replace the entry ramps. See Figure 6-25.

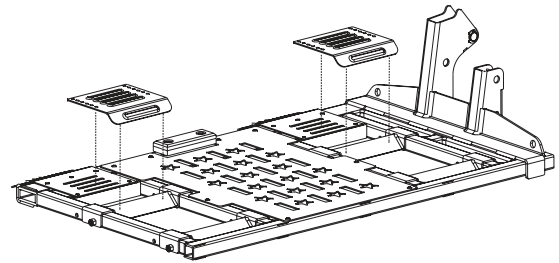


Figure 6-25

Start by laying both angled portions of the ramps on the angles of the wheel chocks and rest on top of the stationary ramps as indicated. With the ramps laying on top of the wheel chocks, find "PEMS" pressed in the stationary ramps. See Figure 6-26.

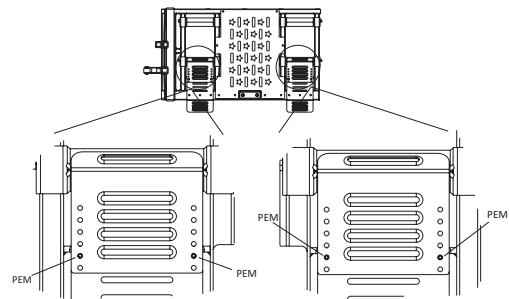


Figure 6-26

Find the closest alignment with the multiple holes of the upper ramps and "PEMS" while the upper ramp is pressed against the wheel chock angle. See Figure 6-27.

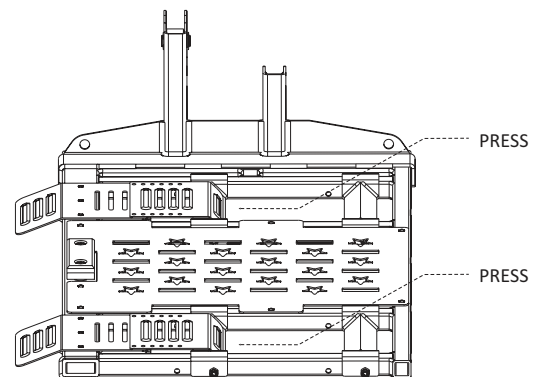


Figure 6-27

# OUTSIDE VEHICLE LIFTS: SECTION 6

## LIFT ADJUSTMENTS

6. Reattach the ramps using a #2 Phillips screwdriver. See Figure 6-28.

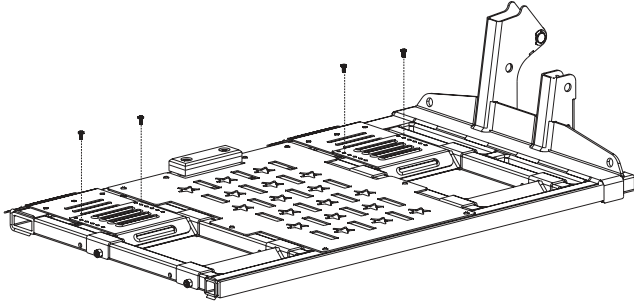


Figure 6-28

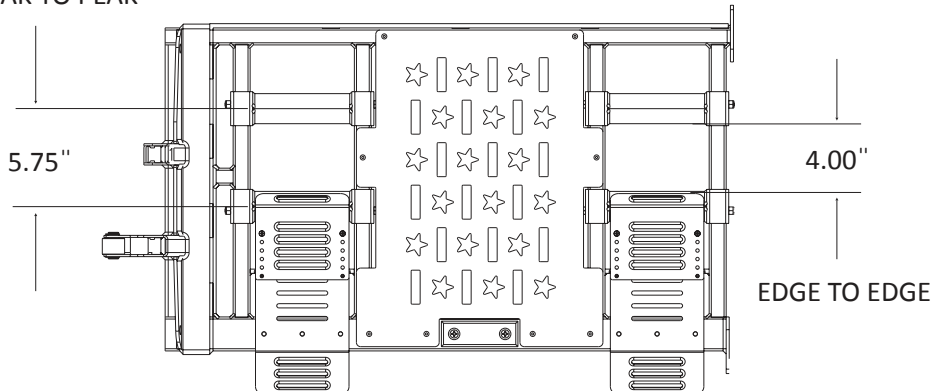
7. Test the positioning by running multiple cycles, loading and unloading the power chair. Be sure the end user is informed and comfortable with positioning the chair on the platform.

### References for AL580-HDX

Range of setup: Adjustable in 1/2" increments.

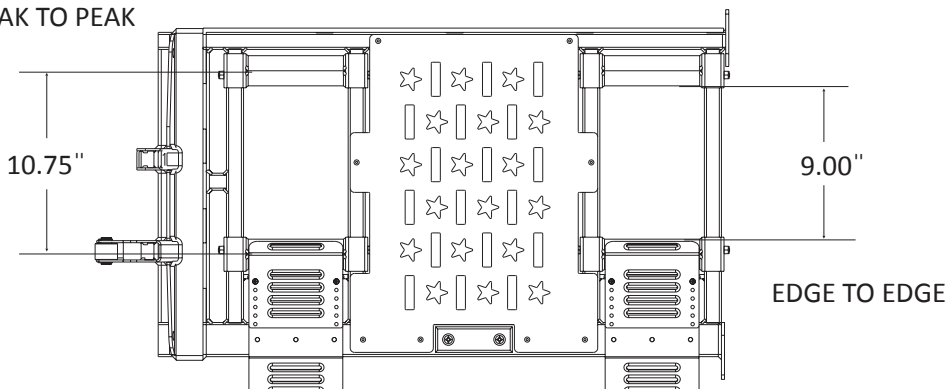
#### Smallest Platform Gaps

PEAK TO PEAK



#### Largest Platform Gaps

PEAK TO PEAK



## Section 7 Troubleshooting

The following procedures are reserved for the approved installer/dealer. Do not attempt these procedures without the proper knowledge of the automotive electrical circuitry.

1. Be careful when troubleshooting with the voltage meter. The instruments will detect voltage but may not indicate a tear or poor connection in the wiring. An instrument may give a false reading since it will only indicate that there is some wire connection, but this wire connection may not necessarily be sufficient.

See Figure 7-1.

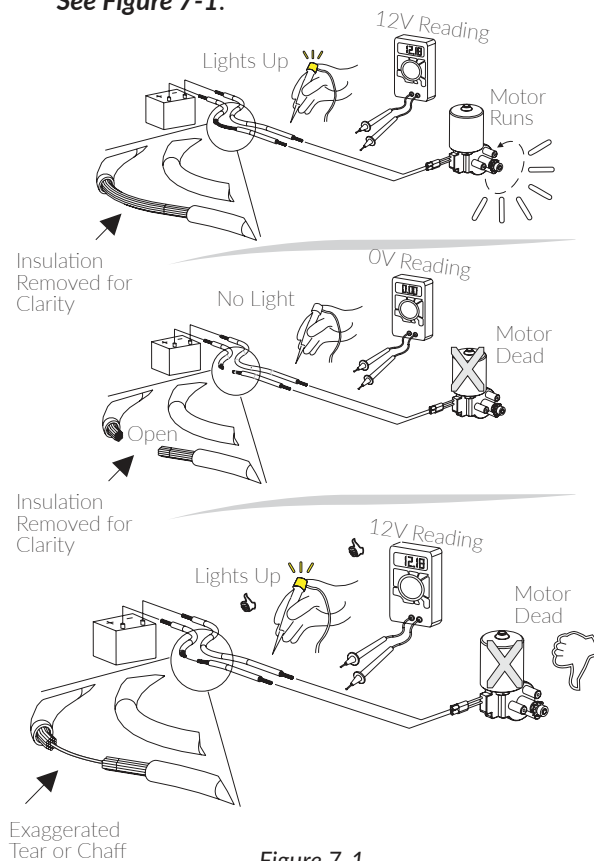


Figure 7-1

2. Examine both voltage and current. As an alternative, isolate sections of the lift wiring using the process of elimination with a known-good/fully charged 12V automotive battery or a known-good/fully charged power chair/scooter battery.
3. Inspect the full length of the wiring harness to ensure the insulation is not torn. The lift's vehicle power harness running through or under the vehicle is subject to a possible short from road debris rubbing against the vehicle's frame.
4. Verify the functionality of the circuit breaker. The circuit breaker is located about 6" from the connections to the vehicle's battery. The breaker will self-reset if overloaded. However, use an ohmmeter or test light to verify that the breaker is functioning or replace the circuit breaker with a new or known-good circuit breaker and perform the following tests.

# OUTSIDE VEHICLE LIFTS: SECTION 7

## TROUBLESHOOTING

### TROUBLESHOOTING TABLE

PROBLEM	CAUSE	SOLUTION
<ul style="list-style-type: none"> <li>The lift does not operate.</li> <li>The lift operates slowly or intermittently.</li> </ul>	Bad electrical connection(s)/Circuit breaker	<p>Check and clean all connections that might be loose or dirty. The lift motor requires quality electrical connections to operate at full capacity. Any break in the wiring will slow down the motor and will cause it to deteriorate prematurely.</p> <p><i>NOTE: Be careful when troubleshooting with a test light or voltmeter. These instruments may give false indications.</i></p> <div data-bbox="899 722 1333 995" style="text-align: center;"> <p>AUTOMOTIVE TEST LIGHT      VOLTAGE METER</p> </div> <p style="text-align: center;"><i>Figure 7-2</i></p>
The license plate light does not work.	The four-prong connector is not wired.	The license plate light runs from the four-prong trailer plug located on the vehicle harness that powers the lift. Most hitch installers will install this type of wiring when the hitch is installed. If no such plug exists, it may be wired directly to a tail light or the license plate light (brown wire only [+]).
A ratcheting sound occurs when the lift is all the way up or down.	Actuator clutch	<p>In the UP direction, the ratcheting sound indicates normal overload protection and <b>MUST</b> be heard since it indicates platform is all the way up and that the chair/platform is secure.</p> <div data-bbox="803 1419 1421 1675" style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>NOTICE</b></p> <p><i>DO NOT allow the lift to ratchet as it goes DOWN. Only lower the platform level to the ground level. DO NOT begin to raise the car with the lift; the lift can be damaged.</i></p> </div>

PROBLEM	CAUSE	SOLUTION
Extra length of wire leads to the lift motor.	Wire was provided for the optional swing-away.	The extra wire is provided in case a swing-away option is used with the lift. If a swing-away is not installed, coil the extra wire and zip-tie it to the frame, out of the way of any moving parts. Leave the extra wire in case you need a swing-away installation in the future.
The lift does not reach the ground.	The incorrect hitch adaptor was installed.	Check the attachment of the hitch adaptor to the hitch post on the back of the lift. <b>See Hitch Adaptor Installation on page 15.</b> The normal range of lift operation is 5" to 16" to the bottom of the hitch receiver of the vehicle. Any higher vehicles will require a different hitch adaptor.

## MANUAL OVERRIDE

In the event of a power failure (for example, if your car battery dies), you can still operate the lift using the manual override system.

### ⚠ WARNING

Always disconnect the power from the lift by unplugging the two connector plugs before attempting to use the manual override to avoid electrical shock.

1. Unplug power to the lift. *See Figure 7-3.*

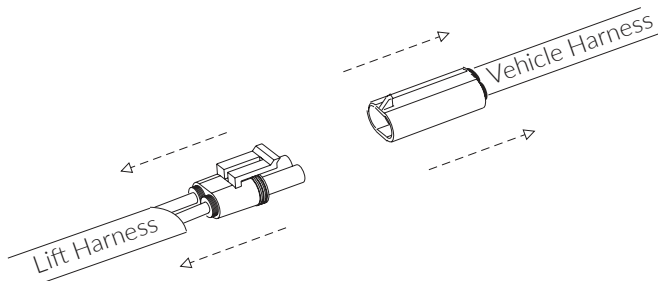


Figure 7-3

2. Using a coin or key, remove the cap on the top of the motor cover. *See Figure 7-4.*

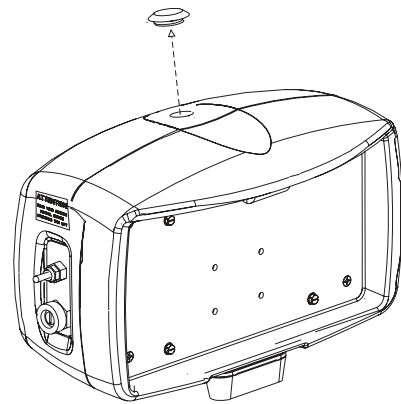


Figure 7-24

3. Insert a  $\frac{3}{8}$ " socket wrench into the actuator and rotate the hex shaft. *See Figure 7-5.*

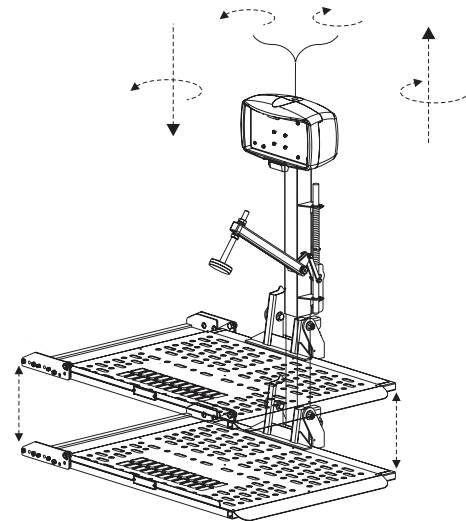
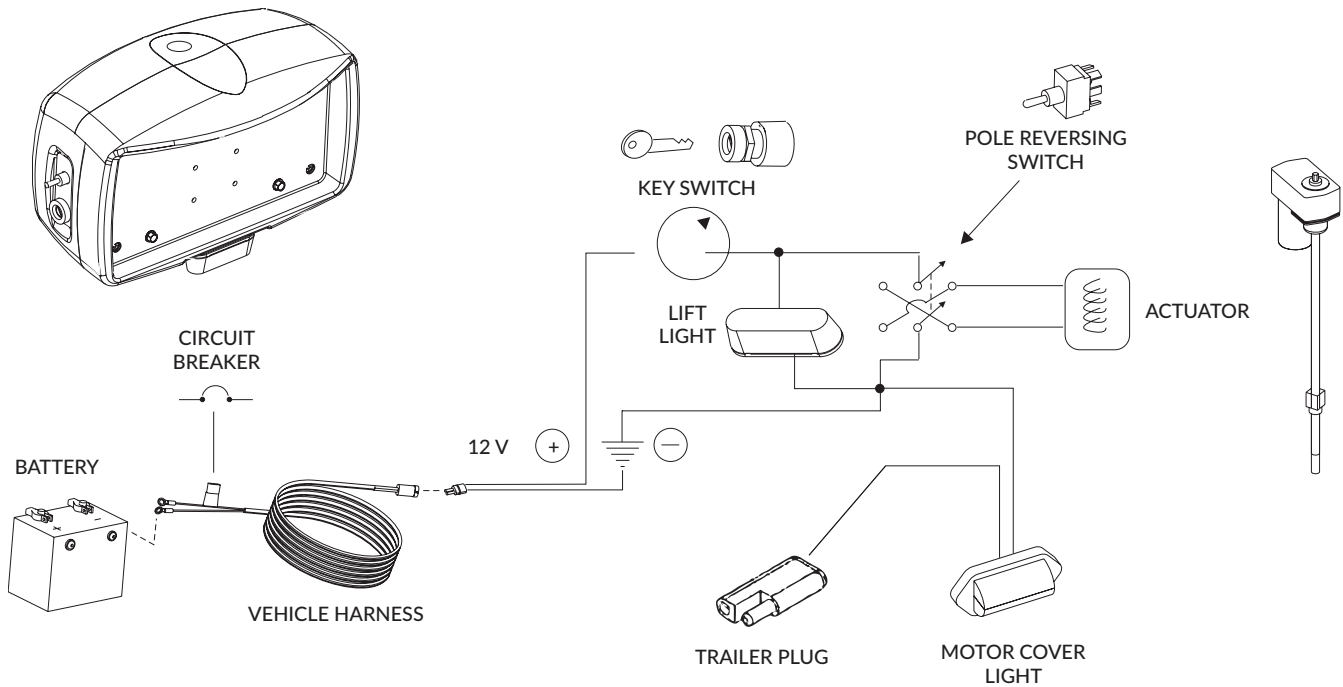


Figure 7-5

# OUTSIDE VEHICLE LIFTS: SECTION 8 MOTOR COVER WIRING SCHEMATIC

## Section 8 Motor Cover Wiring Schematic













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