

# **E-Lift II+ Upgrade Installation**

For the FDL with the Classic/Positive Dobby

(Mechanical Dobby, Compu-Dobby® I or Compu-Dobby II)

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## **SUPPORT AND WARRANTY**

Congratulations on your purchase of an **AVL E-Lift II+™**, for your **Folding Dobby Loom**. Your new E-Lift II+ takes the work out of lifting your harnesses and is designed to provide years of dependable service.

Your E-Lift II+ comes with a lifetime of phone and e-mail support and a standard AVL One-Year Warranty for the original owner. For a complete warranty statement, to have warranty service performed, or to get support, please contact AVL at 530-893-4915 or by e-mail to [info@avlusa.com](mailto:info@avlusa.com).

# INSTALLATION

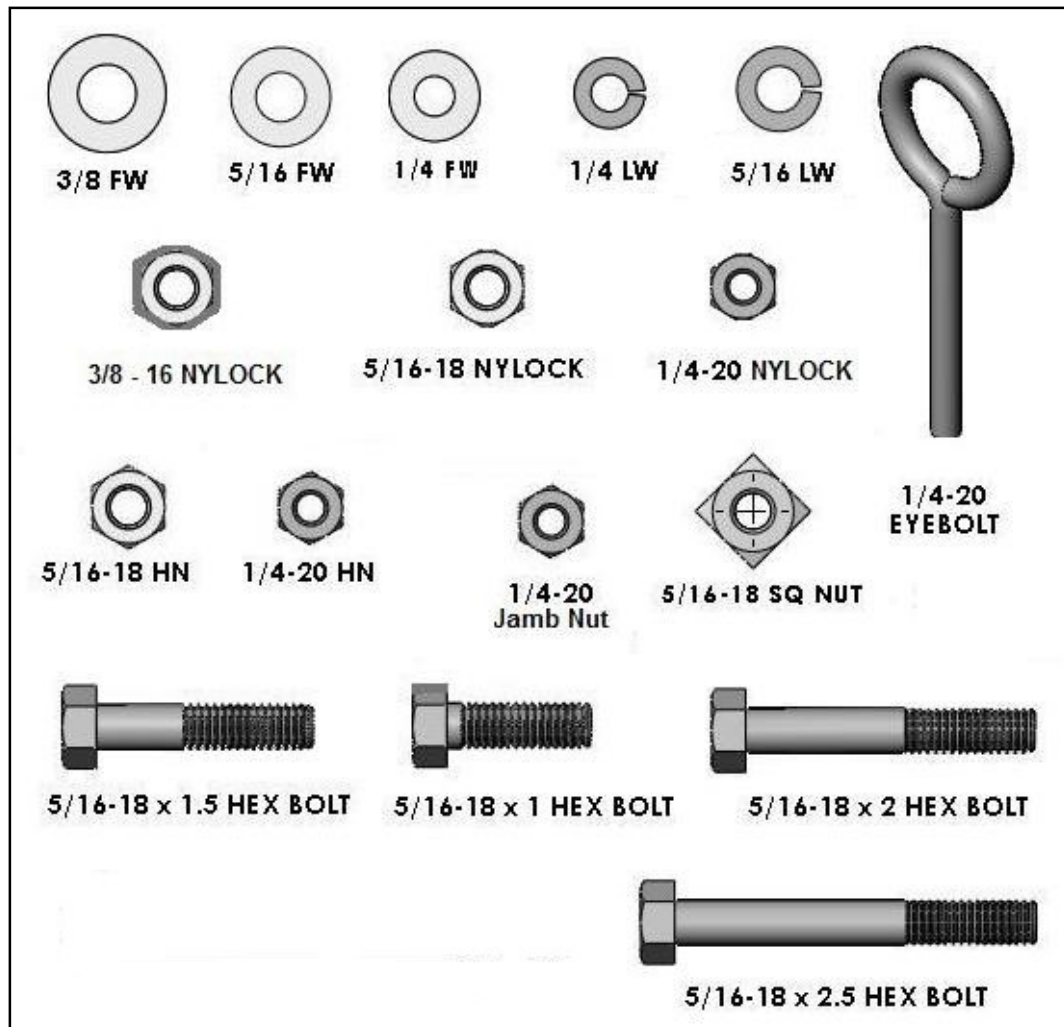
## PACKAGE CONTENTS:

**Note:**

If, upon your inspection of the contents of your package, all pieces listed here are not represented, please contact AVL Looms immediately, prior to installation.

✓	Quantity	Description
	1	E-Lift 2+ Motor/ Driver Assembly
	4	E-Lift 2+ Motor/ Driver Mount Brackets
	1	6" Drive Pulley/Cylinder Assembly
	1	Drive Pulley/E-Lift 2 Cable (on Assembly)
	1	Spring Lever Assembly (Screw eyes, Bushing, Pulley installed)
	1	Dobby Arm/Spring Lever Cable with Turnbuckle
	1	1/4-20 x 1 3/4" Eye Bolt
	2	1/4-20 Jamb Nut
	2	1/4 Flat Washers
	1	1/4 Split Lock Washers
	1	# 8370 Spring
	4	5/16-18 x 1" Hex Bolt
	2	5/16-18 x 1 1/2" Hex Bolt
	2	5/16-18 x 2" Hex Bolt
	1	5/16-18 x 2 1/2" Hex Bolt
	19	5/16 Flat Washer
	8	5/16 Split Lock Washer
	1	5/16-18 Nylock Nut
	8	5/16-18 Hex Nuts
	2	3/8" SAE Flat Washer
	2	3/8" Stop Collar
	1	Foot Switch and Attached Cord
	1	Power Cord

**Figure 1 - Front of E-lift****Figure 2 - Back of E-lift****Figure 3 - Top of E-lift**



**Figure 4 - Examples of Hardware**

## REQUIRED TOOLS

- 9/16" & 1/2" Wrench or
- Socket Wrench w/ 9/16" & 1/2" Sockets
- 5/32" Allen Wrench
- Pliers
- Drill with 11/32" and 9/32" Bits
- Tape measure
- Masking or other type of Tape
- Pencil

### ORIENTATION:

All directional references are relative the Weaver's position for loom operation, at the Front of the Loom.

## PREPARING THE LOOM FOR THE E-LIFT II+

### Remove the Treadle Assemblies

- 1) Disconnect the Left Treadle Cable and remove it from the Dobby Arm/Box (Keep the black retainer collar for this installation).
- 2) To disconnect the cable from the Dobby Arm you may need to dislodge the cable retainer in the Dobby Arm using a small screwdriver to push it out.
- 3) Very early looms did not use a cable retainer; instead the cables were crimped in place. If your loom is so equipped, contact AVL as you will need a different cable and rental of a Nico Compression Tool.
- 4) Disconnect the Right Treadle Cable from the treadle. Remove the Left and Right Treadle Assembly from the loom.
- 5) You may need to tip the front of the loom up to access the bolts that hold the Treadle Assembly in place; or you may wish to simply remove the Lower Front Crossmember by removing the retainer bolts that hold it in place. Once the Treadle Assembly is removed, replace the Crossmember.
- 6) Remove the Right Treadle Cable Axle and Left Treadle Pulley from the Treadle Pulley Support Crossmembers. If your Axle is installed with black plastic caps, use pliers to distort and remove them. If your Axle has stop collars at the ends, remove them with the Allen Wrench.

### Drill Instructions/Hole Orientation

- 1) Check to see if the Front and Rear Treadle Pulley Support Crossmembers have the following mounting holes:

<b>HOLE No.</b>	<b>Crossmember PLACEMENT</b>	<b>HOLE SIZE</b>	<b>DISTANCE FROM RIGHT** EDGE</b>	<b>PURPOSE</b>
1	Front	11/32"	37 1/8	Motor Box
2	Front	11/32"	23 15/16	Motor Box
3	Rear	9/32"	41	Spring Assembly
4	Rear	11/32"	37 1/8	Motor Box
5	Rear	11/32"	31	Spring Lever Assembly
6	Rear	11/32"	23 15/16	Motor Box

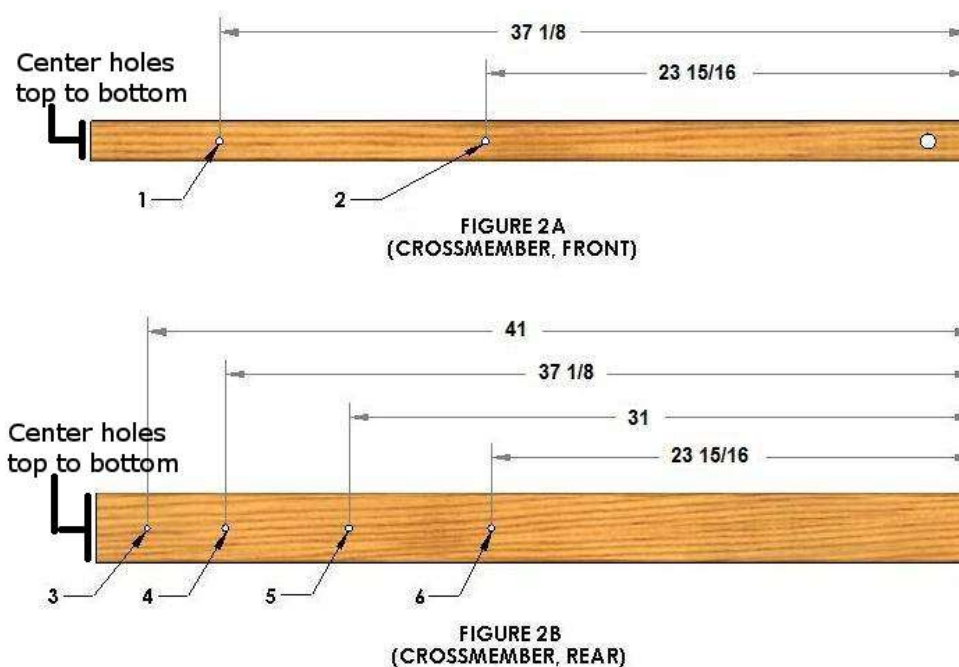
If the (6) six holes are not already present, they will need to be drilled at this time. You may wish to pull the Crossmembers in order to complete this task.

- 1) Remove the hex bolts holding each of the Treadle Pulley Support Crossmembers to your loom.
- 2) Be sure to mark the left and right sides and the inside and outside face of both Crossmembers with tape and pencil prior to removing them.
- 3) Place on a suitable work surface.
- 4) Locations of the holes, as shown in the figure, are measured from the right-side end of the Treadle Crossmembers.

**Note:**

The holes must also be centered top to bottom. Measure the width of the treadle crossmember, divide in half, and place a mark at that point.

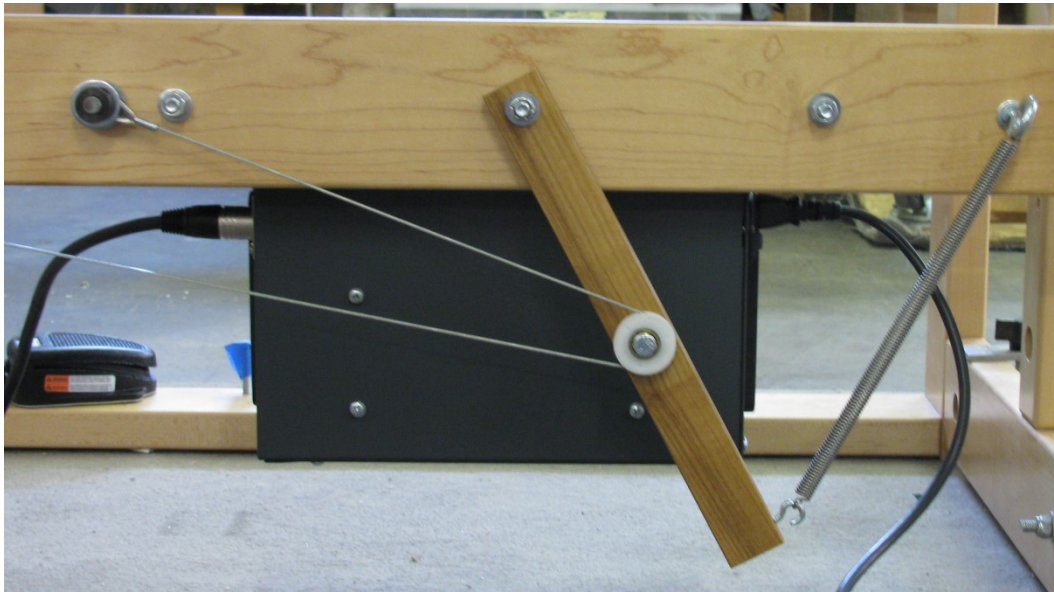
- 5) Drill any holes that are not already in place.



**Figure 5 - Location of Holes to be drilled in crossmembers**

## Mount the Spring Lever Assembly

- 1) Load one (1) 5/16 – 18 x 2 1/2" Hex Bolt with one (1) 5/16 Washer, the Spring Lever (with factory inserted Bushing), and (1) 5/16 Washer.
- 2) From outside of the Rear Crossmember, insert this Assembly into Hole #2.
- 3) Secure the bolt on the inside face of the Rear Crossmember with (1) 5/16 Washer and (1) 5/16 – 18 Nylock.



**Figure 6 - Spring Lever with Spring Assembly**

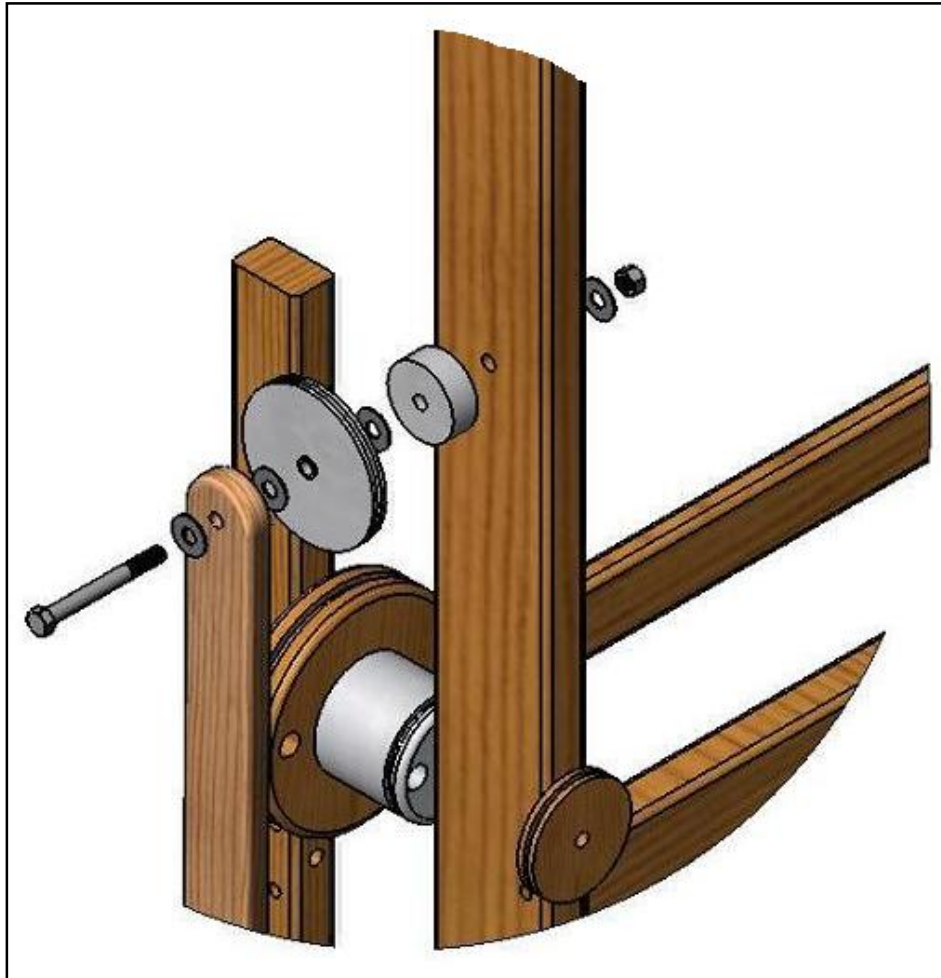
## Mount the Spring Assembly

- 1) From the outside, rear of the loom, insert the 1/4-20 x 1 3/4" Eye Bolt, with one (1) 1/4-20 Jamb Nut and one (1) 5/16 " Washer into Hole No. 6 of the Rear Crossmember,.
- 2) Secure it, on the Inside of the Crossmember, with one (1) 1/4" Washer, one (1) 1/4" Split Lock Washer and one (1) 1/4-20 Jamb Nut. Stretch the #8350 Spring from the Eye Bolt to the Eye Hook centered on the facing side of the Spring Lever.
- 3) Re-install the Treadle Pulley Support Crossmembers to the loom. Take care to place them in the same positions in which they were previously installed.



## Install the 4" Guide Pulley

- 1) For safety remove the Cloth Storage, Separation, and Warp Beam(s);
- 2) Remove the Right Hand Support Arm, Spacer, and Bolt.
- 3) Insert the 3/8"-16x 3 1/2" Hex Bolt provided, with a 3/8" flat washer through the Support Arm then place a 3/8" flat washer, the 4" guide pulley, another 3/8" flat washer, and the 4" guide pulley spacer (with factory installed bushing) onto the Hex Bolt.
- 4) Insert this assembly from the outside of the loom into the hole you previously removed the right hand support arm from. Secure it with a 3/8" flat washer and the 3/8-16 nylock.



**Fig. 4 – Expanded 4" Guide Pulley Assembly**



## INSTALLING THE E-LIFT II+

### Mount L-Brackets to E-Lift II+ Motor Box

- 1) Mount the four (4) L-Brackets onto the top of the E-Lift Motor Box.
- 2) Insert the (4) four 5/16-18 x 1" Hex Bolts with (4) four 5/16 Flat Washers from the top, down through the Brackets and the holes in the Mounting Plate, on the top of the Motor Box.
- 3) Hold them in place with (4) 5/16 Flat Washers and (4) 5/16-18 Hex Nuts, as follows:

**Note:**

**Do not completely tighten these Mounting Bolts; leave them slightly loose for later adjustment.**

- 4) When complete, each bolt will be assembled as follows:

1	5/16-18 x 1"	Hex Bolt
1	5/16	Flat Washer
1	-	E-Lift II+ Mount Bracket
1	-	Motor Box Top Mounting Plate
1	5/16	Flat Washer
1	5/16	Split Lock Washers
1	5/16-18	Hex Nut



**Figure 7 - E-lift mounted on loom**

**Install E-Lift II+ Motor Box**

- 1) Position the Box underneath and between the two Crossmembers with the Top Pulley of the Box nearest to the Front Crossmember.
- 2) Insert two (2) of the 5/16-18 x 2" Hex Bolts, with Flat Washers, from the outside, into Holes #3 and #5, of the Rear Crossmember, just far enough to keep them from falling out, while not protruding into the central area.
- 3) Keep the two (2) 5/16-18 x 1 1/2" Hex Bolts, with Flat Washers, close at hand.
- 4) They will need to be inserted, from the front, through the L-Brackets and into the Front Crossmember before the Box can be allowed to hang without additional support.
- 5) Lift the Box into place and push the four (4) Bolts all the way through the Crossmembers and Brackets and tighten in place with one (1) Flat Washer, one (1) 5/16 Split Lock Washer and one (1) 5/16-18 Hex Nut on each Bolt.
- 6) When the Motor Box is correctly in place tighten all eight (8) bolts, at Box and Crossmember Brackets.

**Remove the Original Cam-Pulley Assembly**

- 1) Loosen the right-hand stop collar located on the Cam-Pulley Axle on your loom.
- 2) Pulling it to your left, withdraw the Axle and remove the Cam-Pulley Assembly and Dobby Return Pulley.

**Note:**

**When you replace the axle, you will move it higher on the loom into a different set of holes.**

- 3) Once the side of the Cylinder is exposed, use your sley hook to reach in and pull out the retainer, releasing the Cylinder/Turnbuckle Cable from the Cylinder, leaving the other end attached to the Turnbuckle/Dobby Arm.
- 4) Keep the retainer nearby. You will be re-using the cable in the next step.

## Attach the Cylinder/Turnbuckle Cable and Replace Cam-Pulley Axle

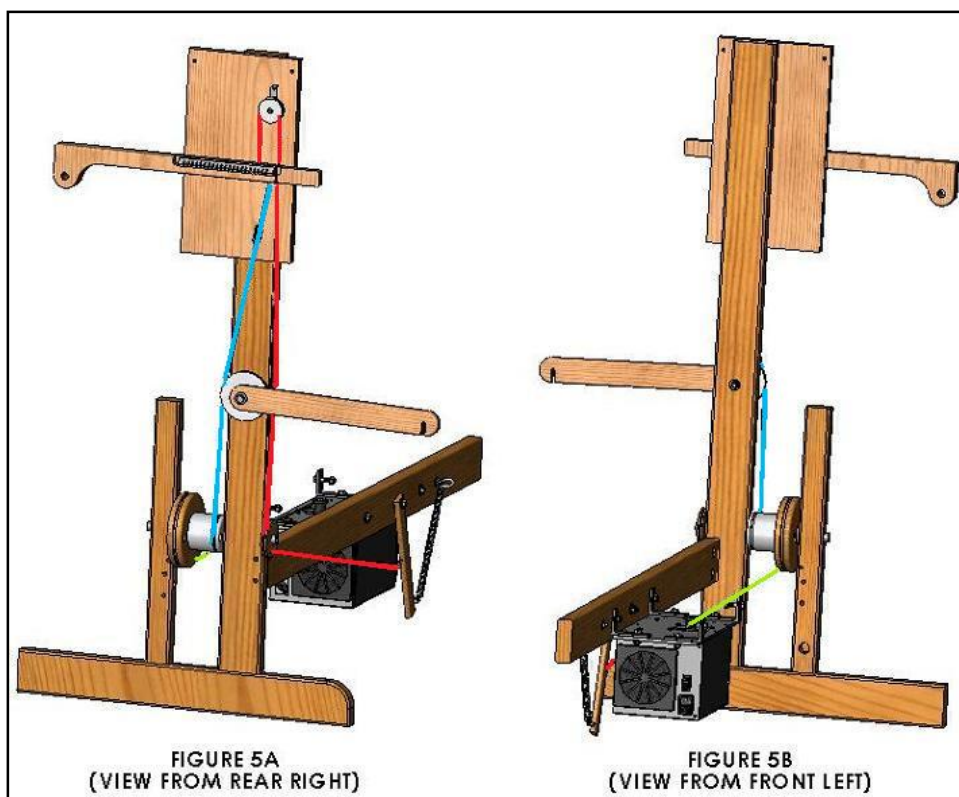
- 1) Attach the Turnbuckle/Cylinder Cable (shown in Blue, Fig. 5) to the new Cylinder, using the retainer to hold the Nico tip in the new Cylinder.
- 2) Locate the holes above the set you removed the axle from. Use the topmost holes when replacing the axle.
- 3) Insert the axle, from the Left through the topmost holes, through the Front Side Vertical Support (Castle) so the end extends slightly into the middle space between Side-members and in the order shown below slide the other components onto the Axle.
- 4) When completed this Assembly will be mounted on the 3/8" Rod as follows:

1	3/8"	Stop Collar
1	-	Front Side Member
1	-	Cam/Cylinder Assembly (6" Circular Wooden Pulley/Cam & Cylinder)
1	-	Rear Side Member
1	-	Dobby Return Pulley (Now For the Spring Lever/Slide Plate Cord)
1	3/8"	Stop Collar

## INSTALLING THE CABLES

### The Spring Lever/Dobby Arm Return Cable

- 1) The cable (Shown in Red) has a copper crimp/Nico and a loop fastened with a crimp/Nico at the other end.
- 2) Insert the copper crimp end, from above, down through the center of the three holes in the Dobby Arm.
- 3) Secure with the cable retainer.
- 4) Route the cable as shown.



**Figure 8 - Installed cam-pulley assembly and cable routes**

## CONNECT THE FOOT SWITCH AND POWER CORD

- 1) Turn off the E-Lift Power Switch.
- 2) Connect the Foot Switch Signal Cord to the front of the E-Lift II+ (now facing the right side of the loom).
- 3) Connect the female end of the Power Cord at the back of the housing, now facing the left side of the loom.
- 4) Be sure they are both completely, firmly inserted.
- 5) It is best to plug the Power Cord into a surge-protector.

### NOTE:

Use of an inexpensive outlet strip or light duty extension cord may interfere with the operation of your E-Lift II+.

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## ADJUSTING TO THE “HOME” POSITION

The E-Lift motion replicates the action of treading. Your initial position in treading is with the left treadle down/right treadle up. At this position, the dobbie can select the proper harnesses for the next shed. This position is much like the “home” position, which is the ideal position for shed selection for the E-Lift. And for the E-Lift II+, the home position is location of the motor shaft at power on.

In order for the E-Lift to function properly, your last step in this procedure *and* your first step every time you power on the E-Lift II+ is to set the home position.

- 1) Turn off the E-Lift II+ power switch.
- 2) Unwind the E-Lift II+ Motor Pulley until there is a generous amount of slack in the Cam to Motor Pulley Cable.
- 3) The Dobby Arm should be in contact with the top bumper stop in rear Dobby Side.

**NOTE:**

**If the Dobby Arm is not on the bumper you will need to troubleshoot the cause.**

- 4) Turn the E-Lift II+ Motor Pulley clockwise (as looking down towards the pulley) to wind the Cam to Motor Pulley Cable onto the E-Lift II+ Motor Pulley without overlap.
- 5) Continue winding until the Dobby Arm moves down from the bumper approximately 1/16<sup>th</sup> inch.
- 6) In this position the Dobby Arm Insert should be position approximately 1/8<sup>th</sup> inch above the swage balls on the dobbie cables.
- 7) Power on the E-Lift II+. Home position is now established.

# USING THE E-LIFT

## MODE SELECTION

The E-Lift II+ is programmed to operate in one of two modes: double shed or single shed. When the E-Lift II+ is powered on, it is defaulted to the double shed mode.

### The Double Shed Mode

With one pedal action on your part, will complete every lifting cycle, beginning and ending with the open shed. For example, assume you have just completed a shot and the shed is still open. You depress the foot switch and the shed closes, the dobby advances to the next pick, and the shed opens – all as a single, continuous movement. You will very quickly develop a rhythm and will find there is ample time to beat while the shed is transitioning the Open-Close-Open Cycle.

### The Single Shed Mode

This mode will require two pedal actions, on your part, to complete the cycle: once to open the shed, and once to close the shed.

### Switching Between Modes

- 1) In Double Shed Mode, press and hold the foot switch for a count of ten and at the next foot switch activation the E-Lift II+ will be in Single Shed Mode.
- 2) In Single Shed Mode, starting at Dobby Arm Down/Open Shed position press and hold the foot switch for a count of ten to make a change to Double Shed Mode.

#### Note:

**Holding the foot switch when starting at home position (the opposite of Dobby Arm Down/Open Shed) will not switch between modes.**

## SHUTTING DOWN THE E-LIFT II+

When you turn off the E-Lift II+, the motor will lose its holding power and the Dobby Arm will reposition itself to a neutral-weight position. If you turn

off the E-Lift II+ with it in home position it will remain in that position for next time.

- 1) Enter Single Shed Mode and close the shed, returning the E-Lift II+ back to the home position.
- 2) Now, you can turn off your E-Lift II+.

If you turn off the E-Lift II+ with an open shed, the harness weight will drop rapidly. Don't panic – you didn't hurt your loom! However, you will need to reset home position. To avoid this scare the next time you shut down the loom and to ensure your loom is at the home position and ready to weave for later, always close the shed before turning off the E-Lift II+

## **MAINTENANCE AND TROUBLESHOOTING**

### **REQUIRED PERIODIC MAINTENANCE**

Based on the studio's air quality and types of fiber you weave, the air filter elements on your E-Lift II+ will need periodic cleaning. The filter elements are located on the front and back of the E-Lift II+ housing. To clean, unsnap and remove the plastic baffle/covers. Remove the foam elements and carefully wash them in warm soapy water. Be sure the elements are completely dry before you replace them.

### **SUGGESTED MONTHLY MAINTENANCE**

Inspect the cables for wear, especially where they move over a pulley. Do this on a monthly basis if you weave regularly. If you find cracked/worn insulation, replace the cable with a genuine AVL cable.

Check the supporting hardware and re-tighten if loose.

Your E-Lift II+ is designed to provide years of dependable service. When replacement parts, such as the air filter or cables are needed, AVL is your source. AVL can also rebuild your E-Lift II+ when it reaches the end of its wear cycle. Please contact us at 530-893-4915 or [sales@avlusa.com](mailto:sales@avlusa.com) to place your order, arrange service, or answer any questions you may have regarding this product.



## TROUBLESHOOTING

For each of the issues noted below, contact AVL should the troubleshooting steps fail to correct problem.

### **E-Lift II+ does not do anything when pressing the foot switch.**

- 1) Verify that the E-Lift II+ is powered on.
- 2) Verify that the power cord is fully inserted in the Power Entry Module on the E-Lift II+.
- 3) Plug the power cord directly into wall socket bypassing any extension cords, power strips or surge protectors.
- 4) Verify that the E-Lift II+ internal fan is rotating.
- 5) Wait 30 seconds before depressing the foot switch.

### **When I turn off the E-Lift, the harnesses crash down.**

- 1) Verify that the E-Lift II+ is in home position before powering off. See **Shutting Down the E-Lift II+** section above.

### **When I turn on the E-Lift, it is not at home position.**

- 1) Verify that the E-Lift II+ is in home position before powering off. See **Shutting Down the E-Lift II+** section above.

**After weaving for some short period the Compu-Dobby stops changing sheds, then on a subsequent E-Lift movement the harnesses crash down.**

- 1) The home position was not properly set. See **Adjusting To The Home Position** section above.

### **One of the E-Lift cables keeps coming off its pulley.**

- 1) The home position was not properly set. See **Adjusting To The Home Position** section above.

**My shed is too small.**

- 1) Verify that the home position is properly set. See **Adjusting To The Home Position** section above.
- 2) Verify that all cables are properly routed and on their respective pulleys.

**Dobby Arm does not rest on the upper bumper in the rear Dobby Side with E-Lift II+ powered off.**

- 1) Verify that the E-Lift II+ is powered off.
- 2) Verify that there is sufficient slack in the Cam/E-Lift II+ Motor Pulley for the Dobby Arm to move freely to upper extent of travel.
- 3) Verify that the Cam/Cylinder, pulleys and spring lever can all rotate freely on their axles.
- 4) Verify that all cables are routed correctly and in their proper pulleys.

**Sometimes when I press the foot switch, nothing happens.**

E-Lift II+ programming requires that it complete all its steps prior to acting on additional foot switch input. When complete, it monitors the inputs or states to determine whether it is being called upon for a next action. If you depress the foot switch while the program is still process, it will create an erroneous state input. The processor will address the erroneous state once the previous step is completed. However, since the erroneous state cannot result in motor action, nothing happens other than a moment of wasted processor time.

- 1) To avoid this issue, wait until the E-Lift motor has completed its movement before depressing the foot switch.