



## **E-LIFT II+ SYSTEM WITH SPRING LEVER FOR PRODUCTION DOBBY LOOMS**

Congratulations on your purchase of the E-Lift II+ system. This system replaces the action of treading, eliminating leg strain and fatigue. When you activate the Foot Switch, the motor turns, and selected harnesses rise or fall. The motion is smooth, quick, and precise and does not jar the harnesses.

### **SUPPORT AND WARRANTY**

Your new E-Lift II+ is designed to provide years of dependable service. It 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**

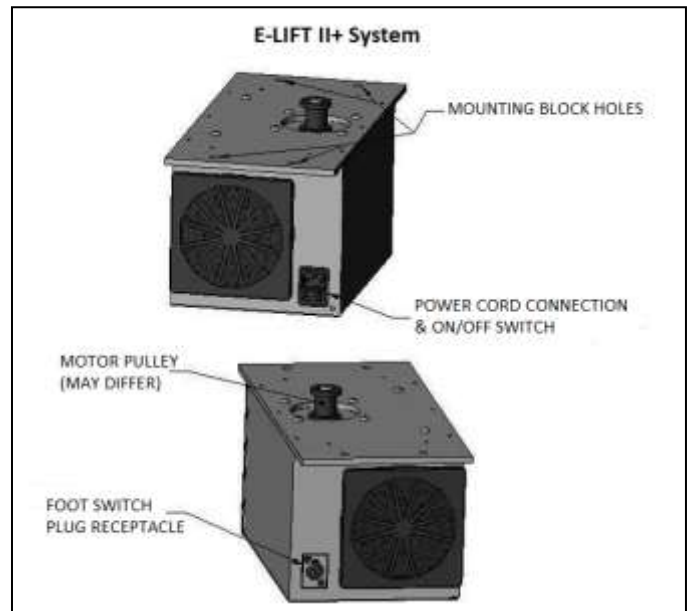
**Review Contents and Hardware** – Please check that you were shipped all parts and hardware listed here, as well as the tools and drill bits that will be required.

#### **Package Contents**

- E-Lift II+ System (1)
- Mounting blocks (2)
- Foot switch & attached cord (1)
- Power cord (1)
- Spring Lever Assembly (1)
- Dobby Arm to Spring Lever Return Cable, two piece with turnbuckle (1)
- E-Lift Cam-Cylinder assembly (1)
- Hardware pack (1)

#### **Required Tools**

- 1/2" & 9/16" wrench
- Socket wrench
- 1/2" & 9/16" socket
- 5/32" allen wrench
- Pliers
- Drill with 11/32 and 25/64 bits
- Tape measure
- Masking tape
- Pencil





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#### Installing the E-Lift-II Box

**\*\* ORIENTATION NOTE:** All directional references are relative the Weaver's position for loom operation, at the Front of the Loom.

1) Remove the Front and Rear Treadle Pulley Support Cross Members and all items associated with the Left and Right Treadle assemblies, including Cables, Pulleys, Rods, Treadles and Treadle mounting hardware. Disconnect the treadle cables at the treadles. Disconnect both cables from the dobbie arm. On older looms, these cables are crimped in place and must be cut to remove them. On newer looms, a plastic insert is used to retain the cable. The plastic insert is removed from the opposite side as the cable entry hole in the dobbie arm by pushing the cable further into its entry hole. It is recommended to mark each cross member for correct positioning, with reference to front/back and up/down, before removing them from the loom.

2) Prior to reinstalling the Cross Members, drill the holes required, as shown in Figures 1 and 2. As they are not all the same size, please refer to the accompanying charts for the correct bit size to use for each hole.

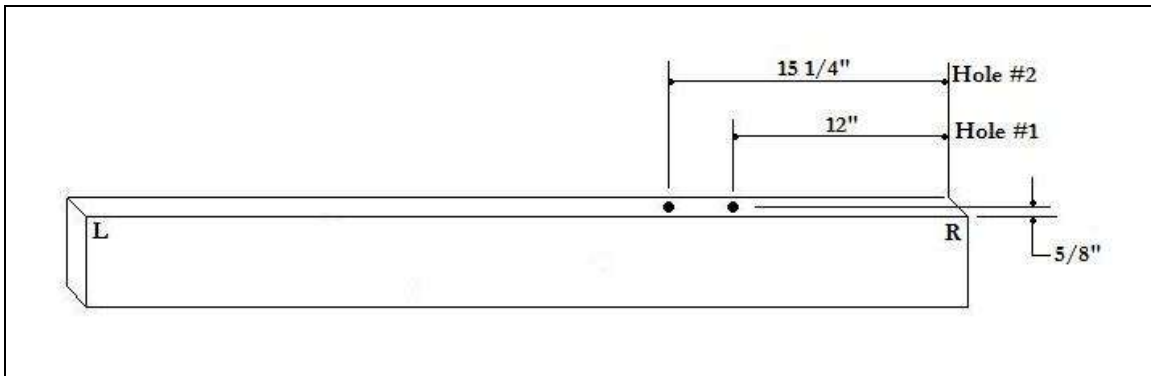


Fig. 1 – Front Treadle Pulley Support Crossmember Holes

HOLE NO.	HOLE ORIENTATION	HOLE SIZE	DISTANCE FROM EDGE	PURPOSE
1	Vertical	11/32"	12"	Mount Motor Box
2	Vertical	11/32"	15 1/4"	Mount Motor Box

Fig. 1a - Front Crossmember Information



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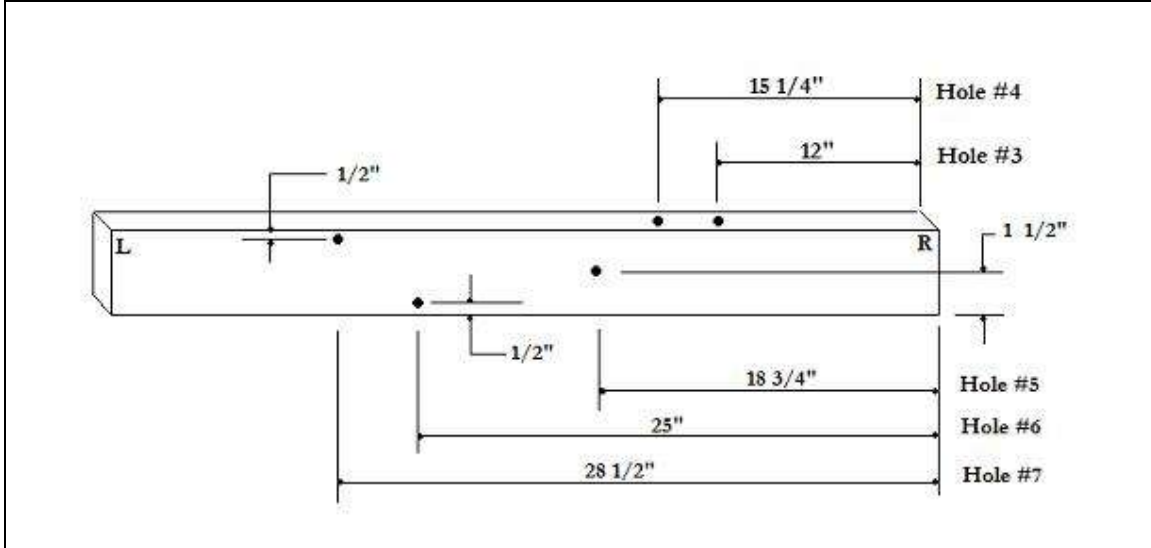


Fig. 2 - Rear Treadle Pulley Support Crossmember Holes

HOLE NO.	HOLE ORIENTATION	HOLE SIZE	DISTANCE FROM EDGE	PURPOSE
3	Vertical	11/32"	12"	Mount Motor Box
4	Vertical	11/32"	15 1/4"	Mount Motor Box
5	Horizontal	11/32"	18 3/4"	Eye-Bolt (4") for Cord Anchor
6	Horizontal	25/64"	25"	Hex Bolt with Lever
7	Horizontal	11/32"	28 1/2"	J-Bolt for Spring

Fig. 2a - Rear Cross Member Information

3) *Note: Before proceeding with step 3, verify that your Cam-Cylinder assembly axle is held in place with stop collars on the outside of the vertical sideframe castle pieces (legs A & B in Figure 3). Otherwise, proceed to **Installing the Cam-Cylinder** before returning to this step in the procedure.*

Reinstall the Cross Members, remembering to align them as before. Position the E-Lift under the Treadle Pulley Support Crossmembers to align the holes in the E-Lift mounting plate with Holes 1, 2, 3, & 4. Ensure that the E-Lift Power Switch faces to the rear of the loom and the round Foot Switch connector faces the front of the loom. The Motor Box is quite heavy so, if you have a couple of pieces of 2"x4" to slip under the Motor Box, this will help elevate it into position while getting the bolts and Blocks in place.

4) Place one 5/16" x 6" hex bolt and flat washer, from the top of the Cross Member, into each of the four holes and let them hang with the exposed ends pointing to the floor.



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Thread a Mounting Block onto each set of bolts, and then engage the bolts in the corresponding holes in the E-Lift Mounting Plate. Apply the remaining washers, lock washers and hex nuts and tighten.

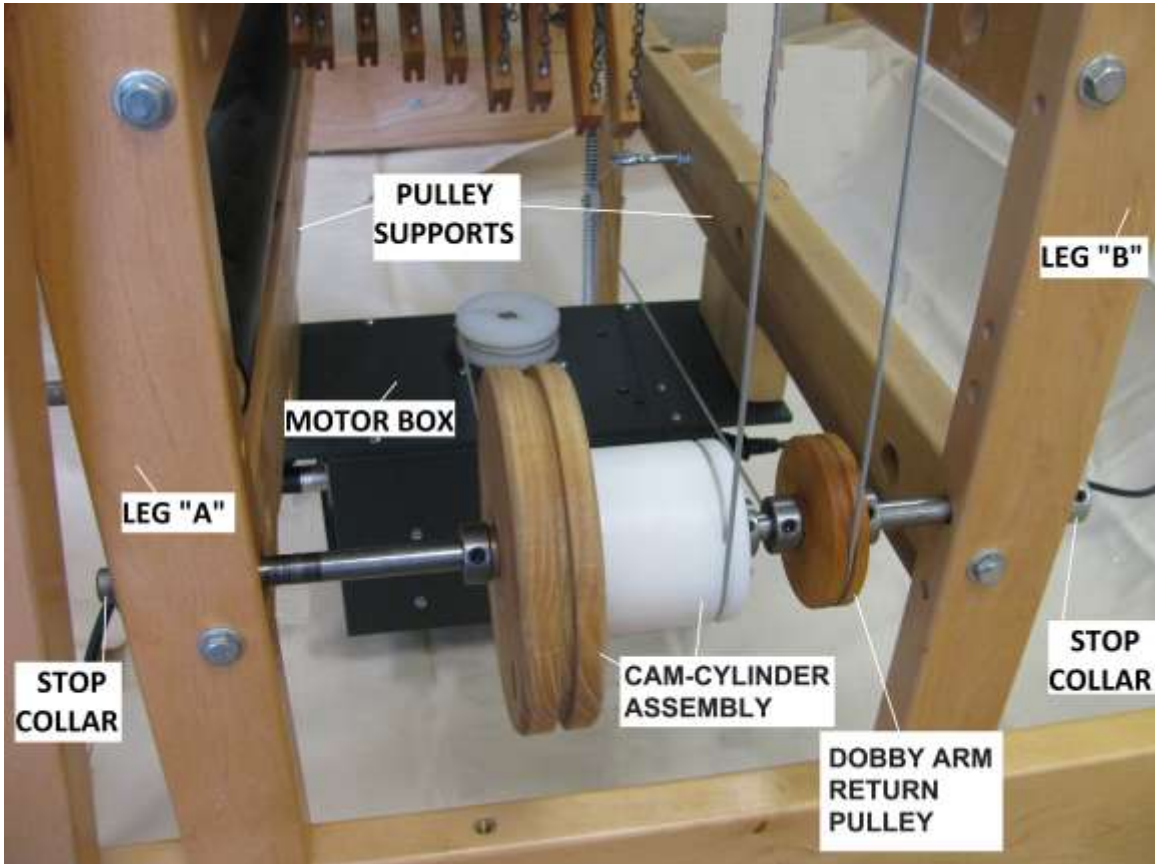


Fig. 3 – Cam and Pulleys (right side view)

#### Installing the Spring Lever Assembly

1) Install the Eye-Bolt for the Spring Lever Cord – (See Figure 2 & 4) From the inside, rear of the loom, into Hole No. 5 of the Rear Crossmember, insert the 5/16 -18 x 4” Eye-Bolt, with one (1) 5/16 –18 Jamb Nut and one (1) 5/16 “ Flat Washer. Secure it, on the outside of the Crossmember, with one (1) 5/16” Washer, and one (1) 5/16 –18 Nylock. This entire sub-assembly should be installed as follows:

- |   |               |                                                |
|---|---------------|------------------------------------------------|
| 1 | 5/16 -18 x 4” | Eye-Bolt                                       |
| 1 | 5/16 -18      | Jamb Nut (as far up on the thread as possible) |



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- 1 5/16 Flat Washer
- Rear Crossmember – Hole #5
- 1 5/16 Flat Washer
- 1 5/16 -18 Nylock Nut

2) Mount the Spring Lever Assembly – (See Figures 2 & 4) Load one (1) 3/8 – 16 x 3 1/2” Hex Bolt with one (1) 3/8 Washer, the Spring Lever (with factory inserted Bushing), and black plastic Spacer. Check to see that the hex bolt holding the Pulley, which is mounted on the side of the Lever, is pointing in the same direction as the hex

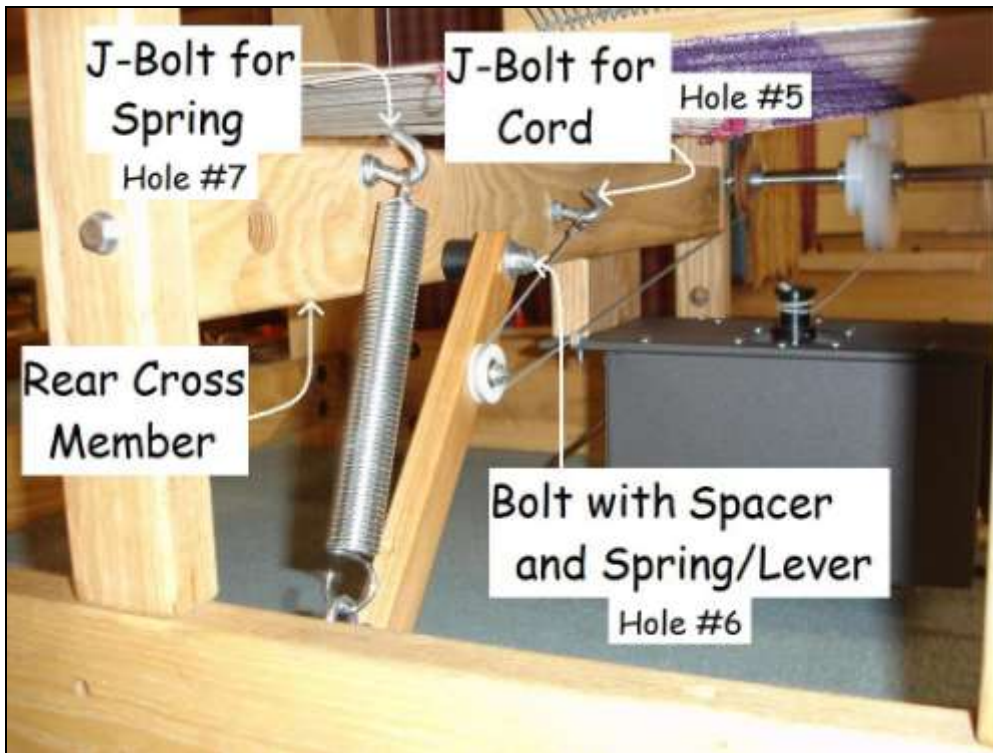


Fig. 4 – Spring Lever and Cords Installed

bolt that holds the Lever assembly. From inside of the Rear Crossmember, insert this Assembly into Hole #6. Secure the bolt on the outside face of the Rear Crossmember with (1) 5/16 Washer and (1) 5/16 – 18 Nylock. This entire sub-assembly should be mounted as follows:

- 1 3/8” – 16 x 3 1/2” Hex Bolt
- 1 3/8” Flat Washer
- 1 - Spring Lever Assembly (install with eyehook facing to the left)
- 1 - Spacer, black plastic



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Rear Crossmember – Hole #7

- 1 3/8" Flat Washer
- 1 3/8" – 16 Nylock

3) Mount the Spring Assembly – (See Figure 2 & 4) From the inside, rear of the loom, into Hole No. 7 of the Rear Crossmember, insert the 5/16 - 18 x 3 1/8" J-Bolt, with one (1) 5/16 – 18 Jamb Nut and one (1) 5/16 " Washer. Secure it, on the outside of the Crossmember, with one (1) 5/16" Washer and one (1) 5/16 – 18 Nylock. This entire sub-assembly should be installed as follows:

- 1 5/16 - 18 x 3 1/8" J-Bolt
- 1 5/16 - 18 Jamb Nut (as far up on the thread as possible)
- 1 5/16 Flat Washer

Rear Crossmember – Hole #6

- 1 5/16 Flat Washer
- 1 5/16 - 18 Nylock Nut
- 1 Large Spring – from J-Bolt to Spring Lever Eye Hook

Hang the Large Spring from the J-Bolt and hook the other end of the Spring to the Eye Hook located on the facing side of the Spring Lever.

**Installing the Cam-Cylinder Assembly and Cables**

*Note: If your Cam-Cylinder assembly axle is not held in place with stop collars on the outside of the vertical sideframe castle pieces (LEGS A & B in Figure 3), you must remove either Leg A or Leg B to proceed. Follow steps 2 & 3 omitting the outside stop collars in step 3.*

- 1) Remove your old Cam-Cylinder Assembly by loosening and removing all stop collars, leaving the one at the far left side of the rod (on the front side of Leg "A") in place, withdrawing the rod through Leg "A" toward the front of the loom.
- 2) Re-insert the Axle through Leg 'A' so the end extends a few inches into the middle space between Legs 'A&B'. As seen in Fig. 3, and in this order, slide the following components onto the axle:

- a. Stop Collar
- b. Cam-Cylinder Assembly

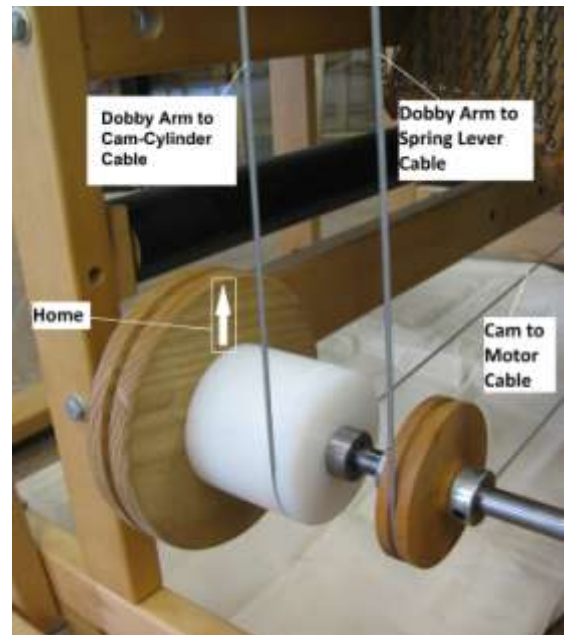


Fig 5 – Cables and Home



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- c. Two Stop Collars
- d. Return Pulley
- e. Stop Collar

**3)** Slide the Axle through Leg ‘B’ and put a Stop Collar on the exposed end of the Axle. Tighten the outside stop collars. For now, leave the others Stop Collars loose.

**4)** Unwrap the Dobby Arm to Cam-Cylinder Cable from the smaller diameter pulley side of the Cam-Cylinder. Route the cable around and under the Cylinder, as seen in Figure 5, then up the outside of the loom, to the Dobby Arm. Slip the crimp into the small hole on the underside of the Dobby Arm and out the other side. Attach the plastic retainer and pull the cable back into the arm.

*NOTE: If you have an older loom with crimp in place cables, your Dobby Arm to Cam-Cylinder Cable will not come pre-crimped. Rather, the crimp will be loose and you will use the crimping tool supplied by AVL to crimp the ferrule onto the cable after it has been inserted through the arm.*

The Cable should be vertically aligned between the Cam-Cylinder and the Dobby Arm above. Adjust the Cam-Cylinder Axle Stop Collars to position the Cam-Cylinder to achieve this alignment. Tighten the stop collars around the Cam-Cylinder.

**5)** The Dobby Arm to Spring Lever Cable is attached to the Dobby Arm in the same manner as the Dobby Arm to Cam-Cylinder Cable. Unwrap the Dobby Arm to Spring Lever Cable. Insert the crimped end of the cable in the small hole on the top of the Dobby Arm and attach the plastic cable retainer as discussed in step 4. Route the cable over the small pulley located on the Dobby Back. The cable must be in the Pulley slot under the Retainer. Now, route the cable down the right side of the Dobby Back to the Dobby Arm Return Pulley as seen in Figure 3. Guide the cable around the Return Pulley, then towards the center of the loom.

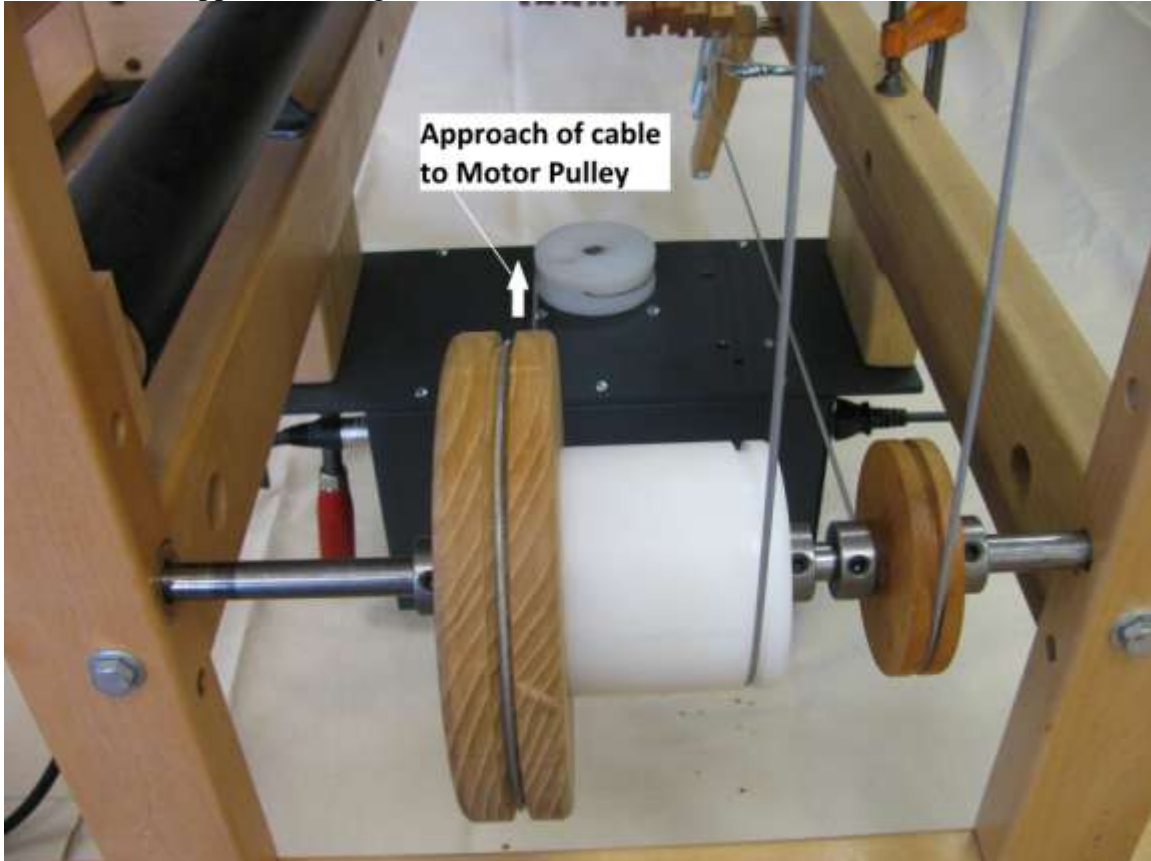
Bring this cable over to the Spring Lever and loop it around the Pulley on the side of the Lever. The Return Pulley has remained unfixed in its location. Be sure it is now aligned with the Pulley on the Lever and tighten the two lock nuts at either side, securing it in place. Now, you will need to pull against the Spring in order to bring the looped end of the cable around the Pulley on the Lever and back toward the right side of the loom, to anchor it at the J-Bolt waiting at hole #5. See Figure 4.

**6)** Un-tape the Cam to Motor Cable, which is wound around the Cam. One end of the cable is secured to the Cam in such a way that it is angled toward the floor. Continue this path, guiding the free end of the cable down and around the bottom of the cam, and across to the Motor. Run the cable across the front of the Motor Pulley, around and in the



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small hole located in the groove of the Pulley. Secure with the hitch pin provided. See Fig. 6. Rotate the Motor Pulley clockwise to take the slack out of the cable. Ensure that the cable does not overlap itself. When you have finished this step, the wrap of the cables should appear as in Figure 6.



*Fig. 6 – Path of Cam to Motor Cable*

7) Turn off the E-Lift Power Switch. Connect the Foot Switch cord to the front of the E-Lift Motor Box. Connect the female end of the Power Cord at the back of the housing (be sure it's completely inserted). Plug the male end of the power cord into a surge-protected power strip, preferably the same one as used for your Compu-Dobby as this will allow you to turn on the loom more easily.



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*Fig 7 A & B: Spring Lever Position at Dobby Arm Up (Left) & at Dobby Arm Down (Right)*

Congratulations! You've done the hard part and you are almost ready to reward yourself with a well-deserved cup of tea. Before you do, you need to make two adjustments, spring lever tension and setting the home position. Then, I promise that you'll soon be weaving!

**Setting Home Position** (See Fig. 5) Each time you power up your E-Lift you must set "Home" position. This adjustment is very important as it tells the E-Lift when the Dobby Arm is in the upper position, which is where it changes harness selection.

- 1) Turn off the E-Lift power switch. Unwind the E-Lift pulley to allow the Dobby Arm to move to its upper most position.
- 2) With the Dobby Arm in its upper-most position, rewind the Cam to Motor Cable, taking up all of the slack in the cable and moving the dobbie arm within a 1/16" of the rubber bumper at the top of the rear slot in the dobbie housing. *Note: It is crucial that in this position the dobbie arm insert be above the swage balls on the dobbie cables.*
- 3) Turn on the E-Lift power switch. Once the motor is powered up, it locks the motor pulley position in place. You have now set your Home position.

***TIP:*** Many customers have found it advantageous to create a visual cue on the Cam to identify Home position. This enables you to more quickly and easily set it without having to look up to the dobbie. To begin, note the vertical arrow on the Cam in Figure 5. It represents the Home marking. Now, set the Home position using the procedure above. Using a 2" strip of masking tape, apply the tape vertically at the 12 o'clock position on the rear of the Cam. Then draw a vertical arrow on the tape pointing to 12 o'clock.



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### Adjusting Spring Lever Tension

The purpose of the Spring Lever assembly is to return the dobbie arm to its upper position. The overall goal is to accomplish this with minimal tension in order to reduce system wear. To accomplish our goal, we need to adjust the Spring Lever Assembly as follows.

- 1) With the Home position set and the E-Lift powered on pull down on the Dobby Arm and note its return. The Dobby Arm should return to the Home position.
- 2) Locate the turnbuckle on the Dobby Arm to Spring Lever cable. Loosen the turnbuckle jam nut and adjust it to its most open position. Repeat the arm test in step 1. You will notice that the arm does not return to the Home position, rather it will stop its return about  $\frac{1}{4}$  -  $\frac{1}{2}$ " below the Home position.
- 3) Incrementally, adjust to close the turnbuckle and test (as in step 1) until the test results in the Dobby Arm returning to the Home Position. Give the turnbuckle one last half turn adjustment to close, and then tighten its jam nut.

You have now officially finished installing your new E-Lift!

### OPERATION

#### MODE SELECTION

The E-Lift II+ is programmed with two modes: Double-Shed or Single-Shed selection. The default starting mode is Double-Shed, which means that each time you power up the E-Lift it will be in Double-Shed mode.

The Double-Shed™ mode begins and ends every lifting cycle with an open shed. For example, assume you've just completed a shot and the shed is still open. You depress the foot switch and the shed closes, the dobbie advances to the next pick, and the shed opens in the next pick—all as a single continuous movement. You'll very quickly develop a rhythm and will find there's ample time to beat while the shed is transitioning between Open-Close-Open.

In Single-Shed mode, you activate the foot switch once to open the shed; and again to close the shed. In other words, you achieve one action per activation. **It is recommended that you close the shed prior to shutting off the E-Lift; and you must be in Single-Shed mode to accomplish this task.**



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To switch modes: For a transition to an open shed, depress the foot switch and hold for a count of 10 seconds. This action causes the internal programming to switch to the Double-Shed mode. To explain the ‘transition’ idea further, by definition every foot switch activation in Double Shed is a transition to an open shed. However, in Single-Shed mode you must be in a closed shed for the foot switch activation to cause a transition to open shed.

### **MAINTENANCE AND REPLACEMENTS**

#### Required Maintenance

- You’ll need occasionally to clean the air filter, which is located on the front of the E-Lift housing. To clean, unsnap and remove the plastic baffle. Remove the foam element and carefully wash it in warm soapy water. Be sure the element is completely dry before you replace it.

#### Suggested Maintenance

- Inspect the Cable for wear, especially where they move over a pulley. Do this monthly if you weave regularly.
- Check the supporting hardware and re-tighten if loose.

Your E-Lift 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 when it reaches the end of its wear cycle. Please contact us at 530-893-4915 or [info@avlusa.com](mailto:info@avlusa.com) to place your order or to arrange service.