# V-Series Dobby Loom User's Manual

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## ABOUT AVL

AVL Looms has been in the business of designing and building some of the world's finest handweaving looms since 1976.

Jon Violette, the "V" in AVL, initiated Ahrens and Violette Looms when he approached Jim Ahrens about a partnership in 1977. Mr. Violette, an industrial management professional, had discovered Ahrens' work through his sister who ran the Pacific Basin School of Textiles in Berkeley, where Ahrens was a volunteer advisor.

The two men worked together in the Bay Area for three years until Violette moved the business to Chico, where it officially became known as AVL Looms Inc., and has operated ever since.

In 1982, Mr. Violette was instrumental in the development of the first computerized dobby, then called the "Apple Dobby". He retired from active life in the company in 1987. We have christened this new V-Series Loom in recognition of Jon's contribution to handweaving.

Over the years, many people, from customers to staff, have offered suggestions that have helped us improve our products. Once known for our production looms, AVL has broadened its line considerably and we now offer customers a full spectrum of fine weaving equipment, ranging from our small Home Looms, to our Industrial Dobby Looms, Rug Looms, and Jacquards.

## THE V-SERIES DESIGN CONCEPT

We wanted to design a loom with a dynamic mix of simplicity and sophistication, a "no frills" approach for weavers who want complex weaving capability in a more fundamental package. We've streamlined this loom so you get a lot of harnesses and strength on a small rugged loom.

**RECEIVING YOUR NEW LOOM**

If your loom was assembled by AVL, it will have arrived on a pallet. Looms delivered outside the continental U.S. will probably be further contained within a protective framework. Accessories too large to include with the loom will be located in supplementary boxes. Looms delivered knocked-down will arrive in several large and small boxes.

Please confirm that you received the number of boxes indicated on your copy of the Bill of Lading. If any are missing, please call the delivery company, as you may have parts still roaming the countryside.

**SHIPPING DAMAGE**

Rarely is a loom damaged in shipping, however, if you do discover damage, please call the delivery company immediately. Then call us at 530 893-4915.

Freight haulers are not agents of AVL and only the consignee, that is *you*, the customer, may file a damage claim. It's best if you save your packing materials; some freight companies wish to examine them as part of their claims process. Photographs of the damaged boxes and parts are also beneficial.

AVL will immediately replace the damaged parts and invoice you for them. You, in turn, should present the bill to the freight company. They, in turn, will reimburse us (they always have!). It's inconvenient for all of us, but we'll make an extra effort to get your replacements to you quickly.

**ASSEMBLED OR NOT**

If you purchased your loom pre-assembled, please proceed now to the instructions *Unpacking an Assembled Loom*. If you requested your loom knocked-down, move on to *Assembly* on page 3-1.

## UNPACKING AN ASSEMBLED LOOM

If we assembled your loom at our facility, it will arrive on a pallet, wholly or mostly in one unit.

1) Cut and remove the plastic strapping.

2) Use a screwdriver or other flat implement (not a knife, please!) to separate the top and bottom trays from the cardboard sides.

3) Pull off the cardboard top cap.

4) Lift the sides up and over the loom (they are joined into a single piece).

5) Untape and remove any ancillary boxes. We try always to leave a tab at the end of each piece of tape, so you can pull it off rather than cut it.

6) Get a helper to aid you in lifting the loom off its plywood skids.

7) Move the loom to its permanent location.

8) Carefully untape the beater, harnesses, and all other mechanisms.

9) Replace any cables that have obviously been dislodged.

10) Carefully check the loom for damage.

Once you've installed the Compu-Dobby, your loom will be weaving ready. We'll explain the Compu-Dobby installation later, but first let's make a quick inspection. You may wish to consult the section on *Loom Controls* if any of our part names are unfamiliar to you.

1) Remove the Shelf Retention Pin at the rear of the Harness Pulley Supports. Slide the shelf out and set it aside.

2) Working down from the top of the loom, please verify that:

   a) All Harness Cables are located in their pulleys.
   b) All Harnesses are attached to Harness Cables.
   c) Dobby Cables are not tangled in the Dobby Head.
   d) Harness Springs are connected between Spring Levers.
   e) Treadle Cables are connected and strung over pulleys.
   f) Treadles operate freely.
   g) Swinging Beater swings smoothly, without interference from adjacent parts.
   h) Cloth Advance Handle engages with Cloth Storage Beam Ratchet and advances the beam.
   i) Depressed Brake Pedal(s) releases tension on cables.

3) Replace the shelf.

**BEFORE YOU BEGIN**

Let us offer a few words of encouragement. You may be a little intimidated by the prospect of assembling your new loom — perhaps you don't consider yourself very mechanical or are afraid you'll make some horrendous, irremediable error that will finally prove to the world that you are a complete technical incompetent. Relax; you do many things in your daily life that are more complicated and technically challenging than the thing you're about to do. If at any point you become disoriented, unsure, or outright confused, call us at 530 893-4915. We're here to help. If you're nervous that you might be asking a dumb question, console yourself with the knowledge that with absolute certainty someone else has already asked it. The only dumb question, of course, is the one not asked. Besides, we know you're brilliant — you bought an AVL!

There is a definite advantage in assembling your own loom. You'll come to know it very well, sooner than you otherwise would, and the better you know your loom, the better you'll be able to use and maintain it.

**TOOLS**

First, you'll need tools:

1) Hammer
2) Socket Wrench with 1/2", 7/16", and 9/16" sockets
3) Large Bladed Screwdriver
4) Medium Phillips Screwdriver
5) Large Phillips Screwdriver
6) Scissors
7) Crescent Wrench
8) Level (a small one will do)
9) Occasional Extra Pair of Hands

Packed with your hardware are a few additional tools that you may not have. They'll be there when you need them.

Once you've gathered your tools, open all the boxes and lay the contents out just as you find them. ***Please DO NOT REMOVE the tape from any of the components until we tell you***. Please, too, leave the hardware bags unopened until they are required. Clear away all your packing materials — they'll just be in the way. It's best if you keep your work area as organized and free of clutter as possible.

# V-SERIES - LOOM ASSEMBLY

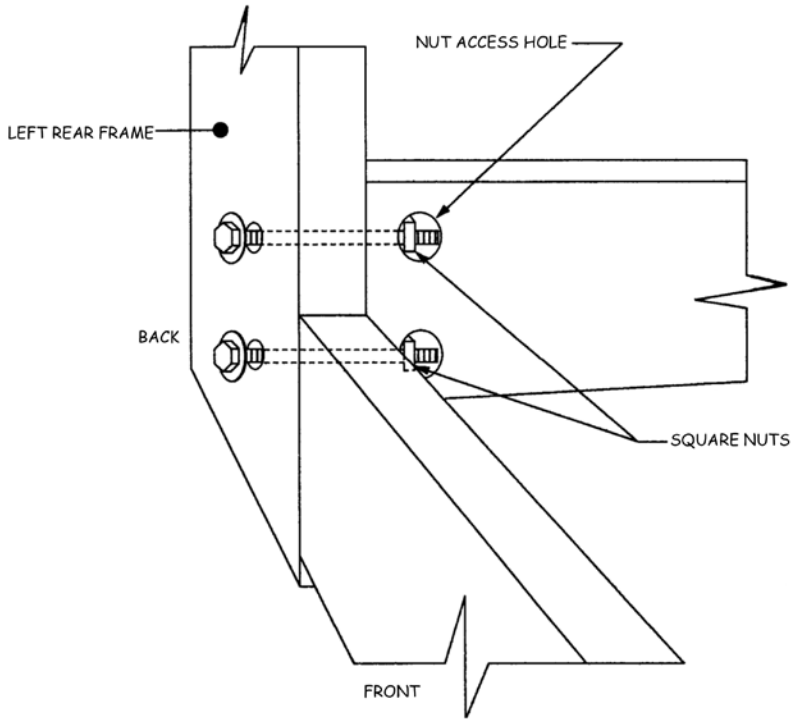
You'll need a space about 5' x 5' to assemble your loom. In addition, a conveniently located desk or table will come in very handy for several of the operations.

Depending on your particular style of work, the entire assembly operation will take between three and eight hours.

## ABOUT THOSE NUTS AND BOLTS

**NOTE**: Given the limited space provided by the nut access holes, it's a little challenging getting the nuts onto the bolt ends. It gets easier with practice. You'll find it helpful to push each bolt in just until it just appears in the access hole. Move the nut into position over the end of the bolt and back it with your finger. Push the bolt in a little further and seat the nut. Slowly turn the bolt clockwise and when the nut engages, tighten it most, but not all, the way down. It's best to leave everything a little loose at first.

Finally, if your fingers are just too big to comfortably manipulate the nut, try backing it with a flat bladed screwdriver.




ASSEMBLING LOWER LEFT BACK CORNER

Fig. 3-1

**LEFT AND RIGHT SIDE FRAME ASSEMBLY** (see Figures 3-1 and 3-2)

1) Locate the Hardware Packets that came with the Frame parts and sort them to check that all parts are present and accessible during assembly.

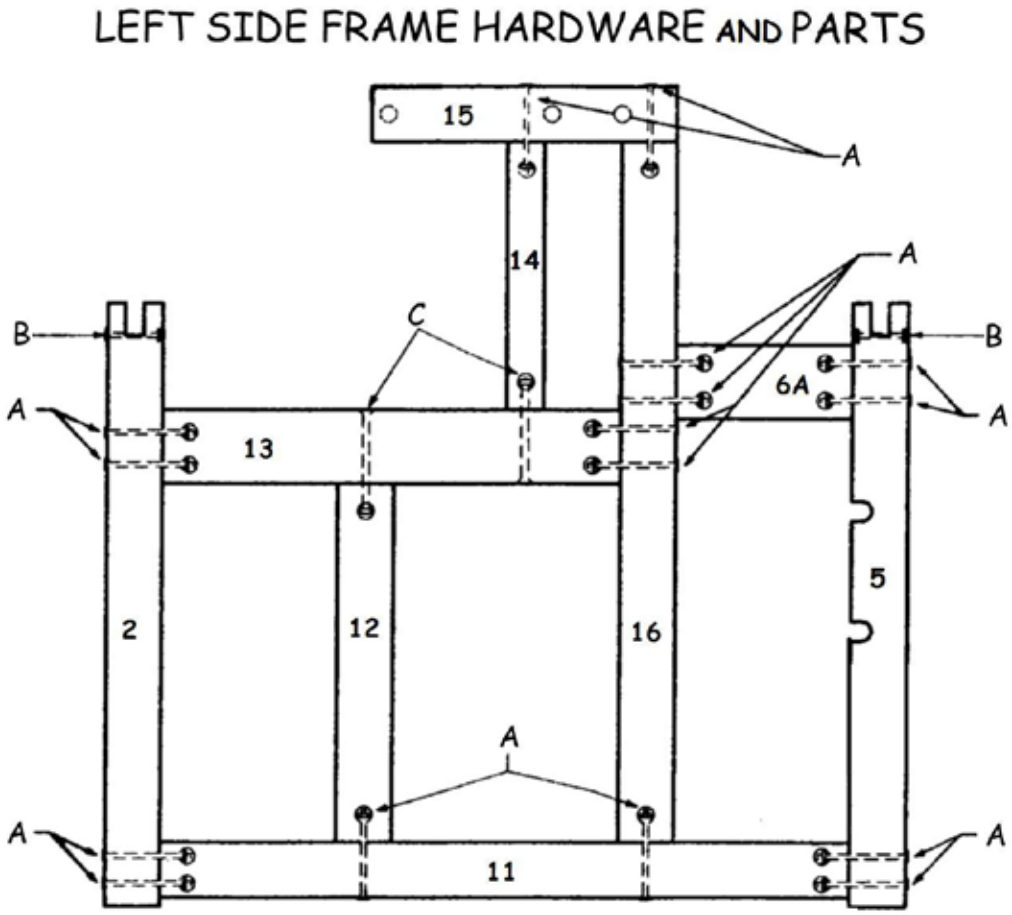
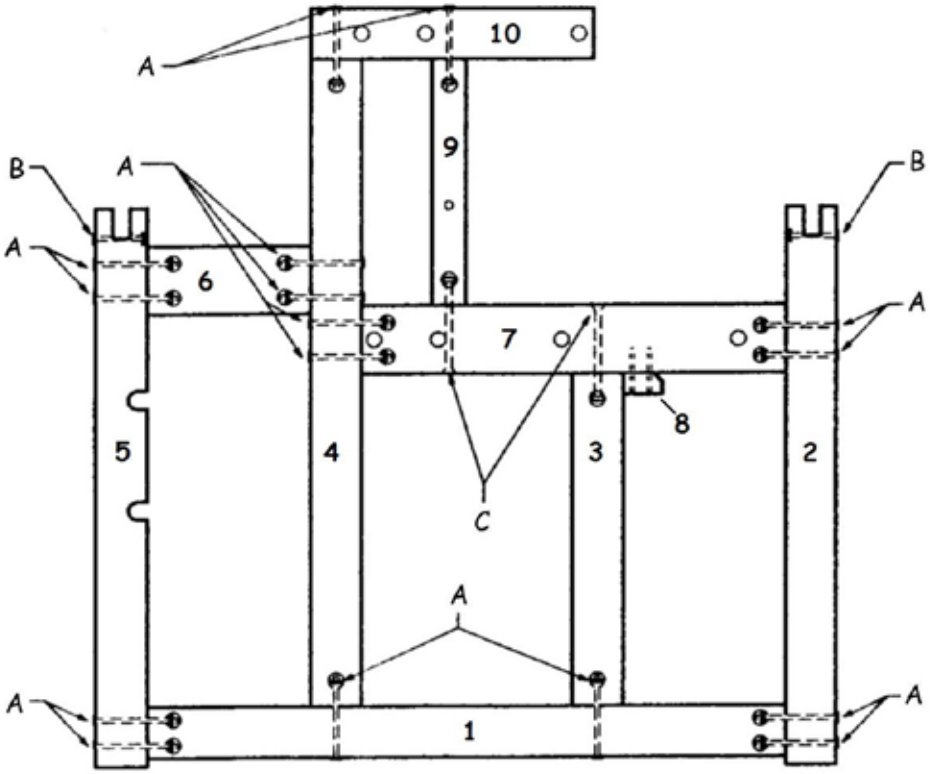



Fig. 3-2

2) Now that your Right and Left Frames are assembled, you will install the Dobby Cam/Pulley Assembly. This Assembly provides mechanical advantage to the right treadle, greatly reducing the amount of effort required for harness lifting. Please refer to Figures 2 through 5, during this Assembly.

3) Locate the Right Side Frame you just assembled. This side is distinguished from the Left Side by the small block mounted to #13 and two holes running through parts #3 and #4. Check that part #3 is loose enough to be pivoted on its axis.

RIGHT SIDE FRAME HARDWARE AND PARTS



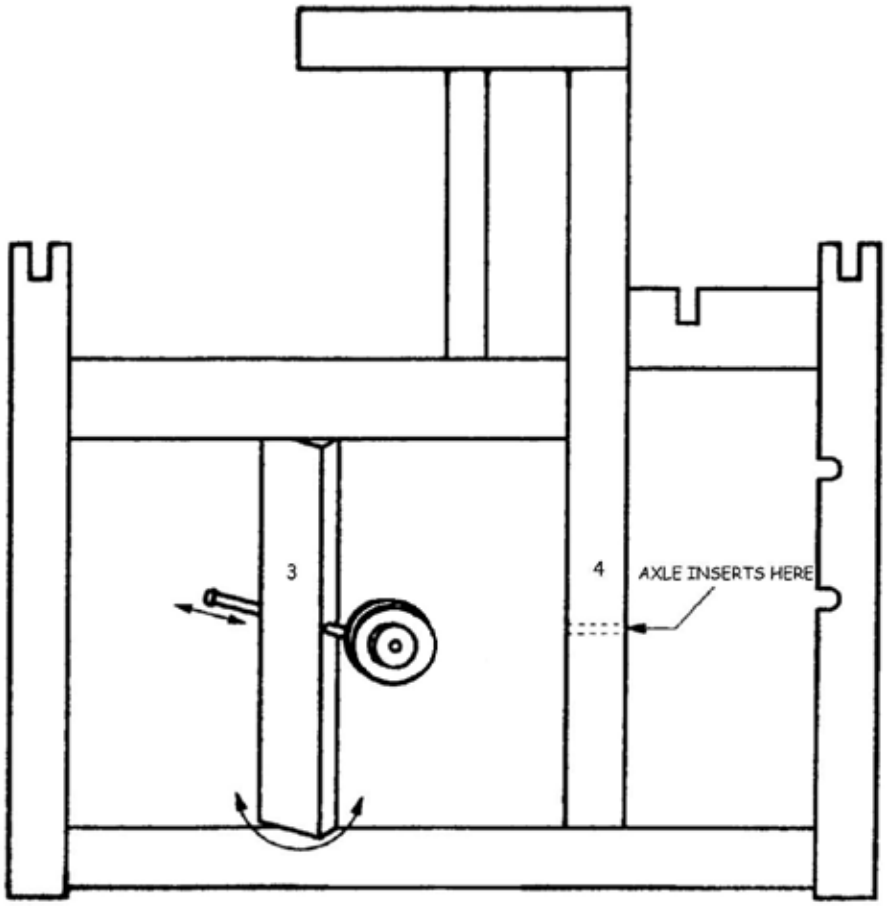

A - CHROME PLATED BOLT X 4-3/4" ASSY.
B - CHROME PLATED BOLT X 3-1/4" ASSY.
C - 1/4" X 5-1/2" HB ASSY.

1 - Bottom Horizontal
2 - Front Vertical
3 - Middle Vertical
4 - Castle
5 - Rear Vertical
6 - Mid Rear Horizontal
7 - Mid Front Horizontal
8 - Handle Stop
9 - Top Vertical Support
10 - Top Horizontal

Fig. 3-3

4) Locate the Cam/Pulley Assembly. Loosen the Lock Collars and withdraw all parts from the Axle. Be sure to take these parts off in their precise order, so that you can replace them exactly as they were shipped to you.

**NOTE**: Make sure there isn't anything (string, tape) lodging the Axle in the cam.




DOBBY CAM CYLINDER INSTALLATION

(RIGHT FRAME VIEW)

Fig. 3-4

5) Insert the Axle from your left side, into the mounting hole in the front face of in part #3 (see Figure 3-4). Push it through the hole until about 1/2 of the Axle is coming out the other side of #3.

6) Rotate #3 about 20 degrees, so that the free end of the Axle points to the outside of the loom and toward you.

7) Thread the Cam/Pulley Assembly and wooden pulley back onto the Axle. Do not tighten any of the Lock Collars at this time. From left to right, the parts should be mounted as follows:

| | | |
|---|---|---|
| a) | 1 | Lock Collar |
| b) | | Right Side Frame #3 |
| c) | 2 | Lock Collars |
| d) | 1 | Cam/Pulley Assembly |
| e) | 2 | Lock Collars |
| f) | 1 | Return Pulley |
| g) | 2 | Lock Collars |

8) Pivot #3 back into position so that the free end of the Axle now points to the mounting hole in #4.

CAM/PULLEY ASSEMBLY INSTALLED

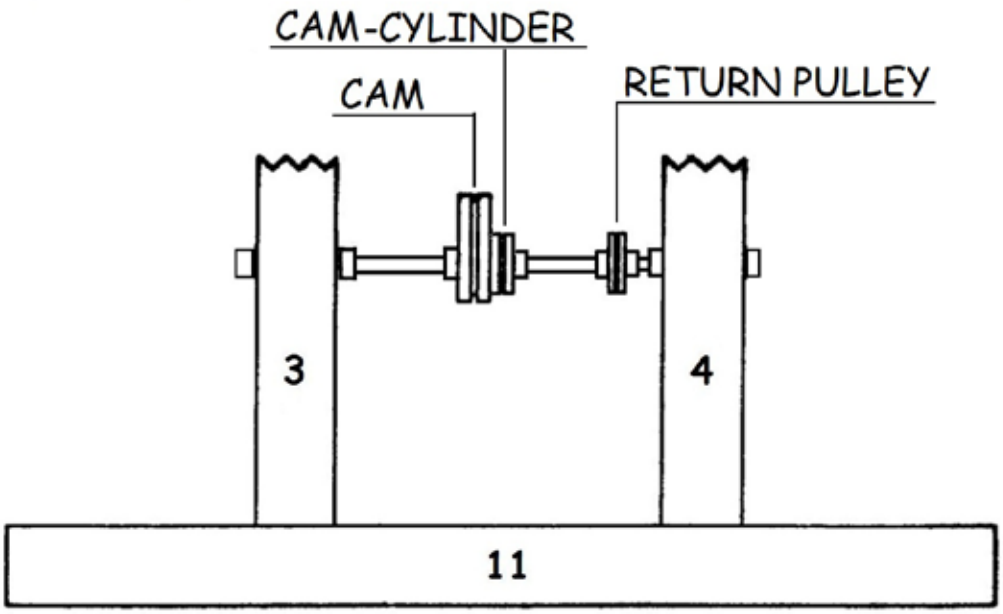



Fig. 3-5

9) Push the Axle through the hole in #4, centering it between the two verticals. Mount the last Lock Collar on the Axle to secure with both ends of the rod in their respective holes.

10) Position the first and last Lock Collars against the face of their respective frame members and tighten them into place. The other parts will be positioned and tightened later.

Assembly of the Side Frames is complete!

**INSTALL THE LOWER REAR CROSS MEMBER (#17)** (see Figure 3-7)

In the next stage of your loom assembly, you'll attach the various members that connect the Left and Right Side Frames. Please refer to Figure 3-7 for parts identification and placement.

The tools you already have at hand will suffice.

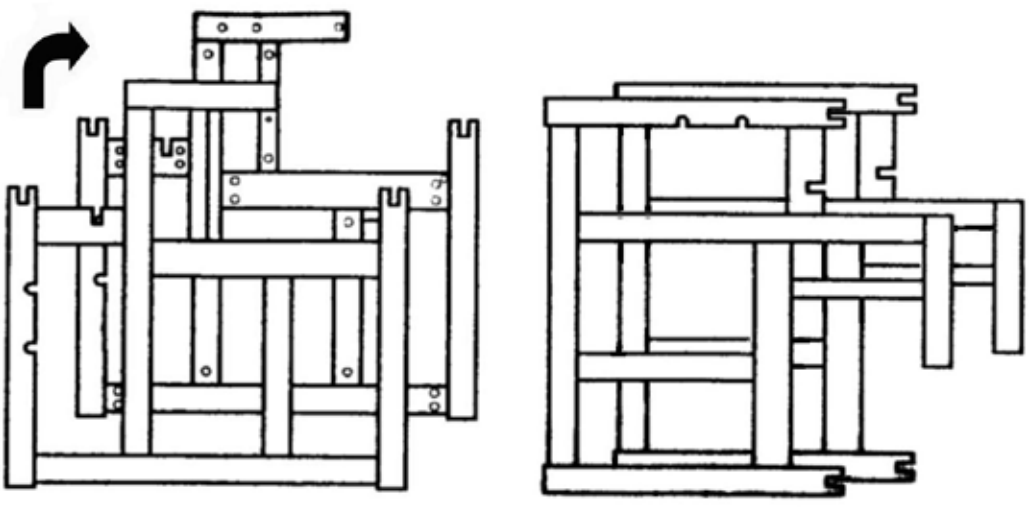
1) Please locate:
   a) Lower Back (#17)
   b) Cross Member Hardware Pack

2) Sort the hardware.

3) Select four 3-1/4" hex bolts, with square nuts. Remove the nuts.

4) Brace both side frames on their feet, about 2' apart, with their access holes facing inward. Put yourself at the front of the frames.

5) Pivot both frames forward 90 degrees so that they lay on their Front Verticals (#2) (see Figure 3-6).



SET BOTH FRAMES SIDE-BY-SIDE ON THE FRONT VERTICALS

Fig. 3-6

6) Locate the mounting holes for the Lower Back (as shown in Figure 3-7), between Parts #1 and #11.

7) Insert the four bolts in their holes, but not so far that they protrude out the other side.

8) Position the Lower Back between the two Side Frames, at the mounting holes, and orient it so that the access holes are facing the floor when the loom is upright.

9) Push the bolts into the access holes at both ends of the Lower Back; add the nuts and tighten to secure the bolt, but not all the way. Final tightening will occur when you square the finished frame.

10) The frame is now self-supporting. Put it back on its feet.

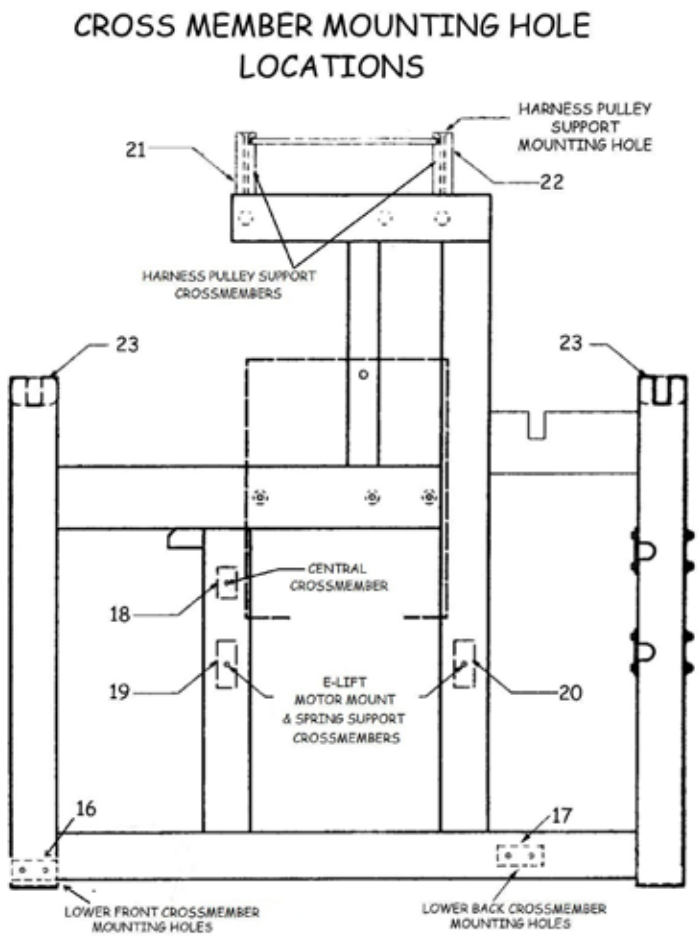



Fig. 3-7

**INSTALL THE CLOTH STORAGE BEAM** (see Figure 3-8)

The Cloth Storage beam **MUST** be installed at this point in the assembly process. Its Axle fits into holes in the Side Frames and once the frames are joined further, it will be impossible to add the beam (refer to Figure 3-8).

1) Locate the Beam mounting holes in each Side Frame. These are about 1" in diameter and lay opposite one another in the Mid Front Horizontals (#7, #13). They are drilled completely through the frames.

2) Locate the Cloth Storage Beam. It has a metal ratchet on one end. Find, too, the Cloth Advance Handle.

3) You'll see that the Advance Handle has an oblong hole at one end. Fit this hole over the Cloth Storage Beam Axle, next to the ratchet, with the black handle pointing to the interior of the loom.

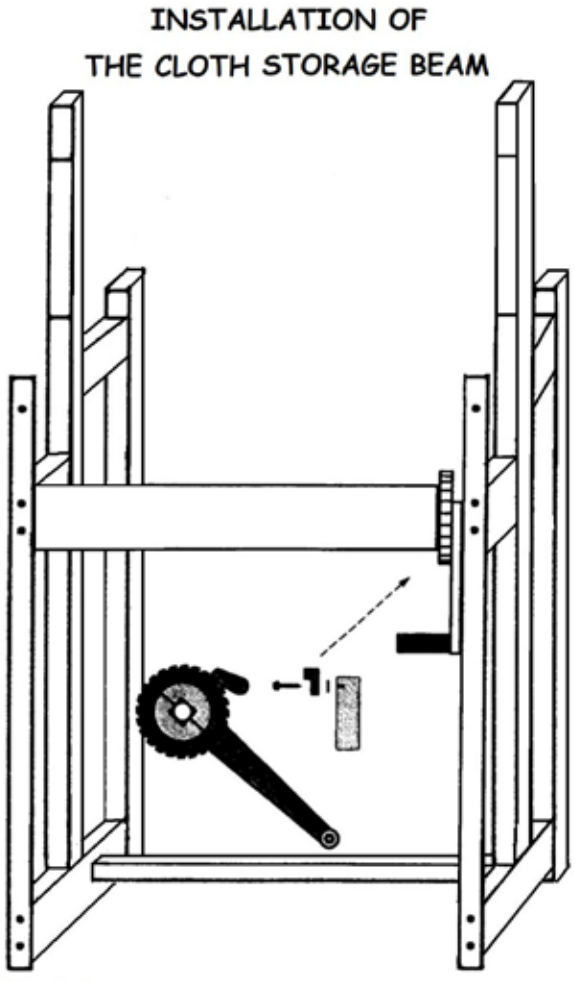



Fig. 3-8

4) Now, with the Handle Assembly to the right side, gently ease the two Side Frames apart and slip both ends of the Beam into their mounting holes.

5) Allow the handle to rest atop the small block installed in the Right Side Frame. Be sure to hold the Cloth Storage Pawl out of the way, when installing the Beam.

6) Screw this assembly into place, in the pre-drilled hole and tighten securely.

7) Push the side frames together. **CAUTION**: Until the Lower Front Assembly is installed, take care not to dislodge the Beam!

**INSTALL THE LOWER FRONT CROSS MEMBER (#16)** (see Figure 3-9)

1) Locate the Lower Front Assembly Cross Member (#16) and Hardware.

2) Select four hex bolts and remove the nuts. Identify the Lower Front mounting holes on the diagram, located at the base of #2R and #2L.

3) Move again to the front of the loom; this time, pivot it away from you and lay it on its Rear Verticals. You may want to rope the two sides together near the Cloth Storage Beam to lend more stability during this maneuver.

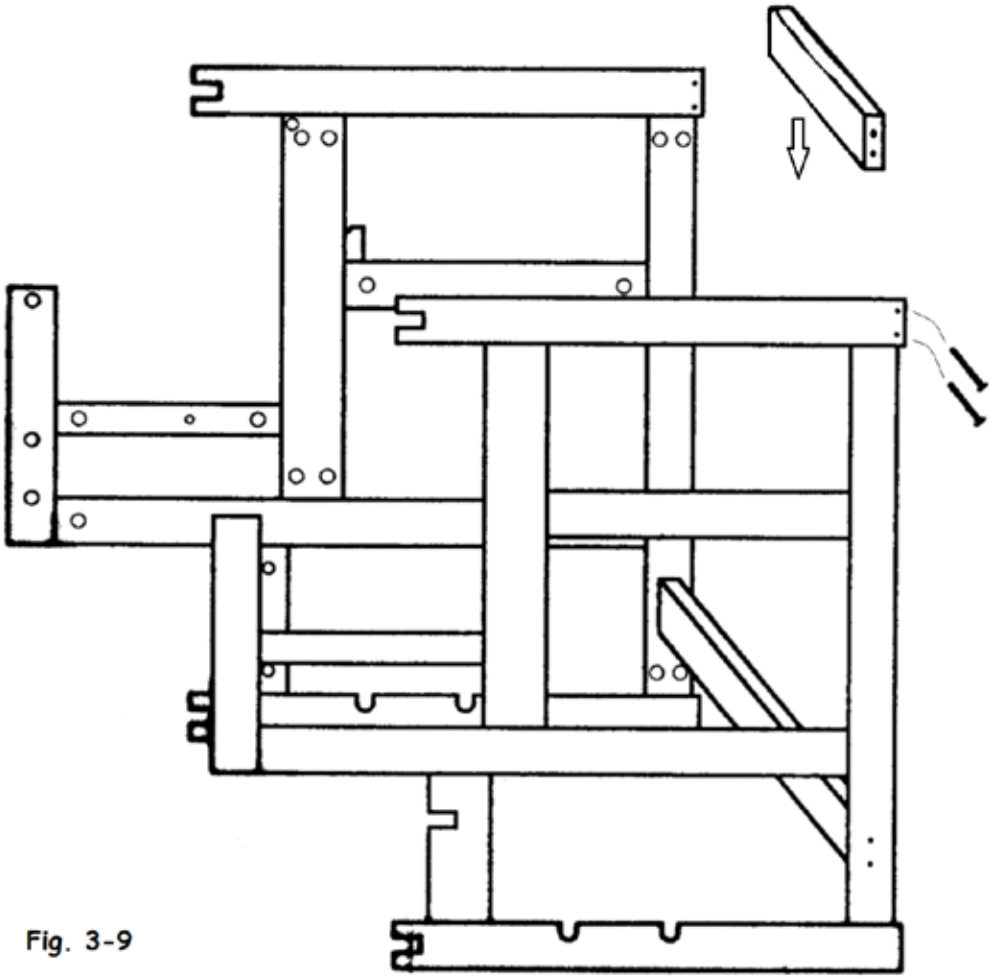


Fig. 3-9

4) Place the mounting bolts, from the outside, in the bottom holes in the Front Verticals, but not so far that they are protruding into the interior of the loom.

5) Bring the Lower Front Cross Member into position, with the access holes facing the bottom of the loom.

6) Push the mounting bolts all the way into the access holes and tighten with the nuts, just enough to secure the assembly.

7) For easier installation in the next step, leave the loom on its Rear Verticals for now. The Frame is now secure enough to support the Cloth Storage Beam in place.

**INSTALL THE BRAKE PEDAL** (see Figure 3-10)

1) If you will be using a single Warp Beam, you'll want to mount the Brake Pedal on the left side of the loom. If you have two Warp Beams, you'll need to mount two pedals; one left, one right. If this is the case, note that the Left Brake Pedal is smaller than the right because of its proximity to the E-Lift Spring Lever Assembly.

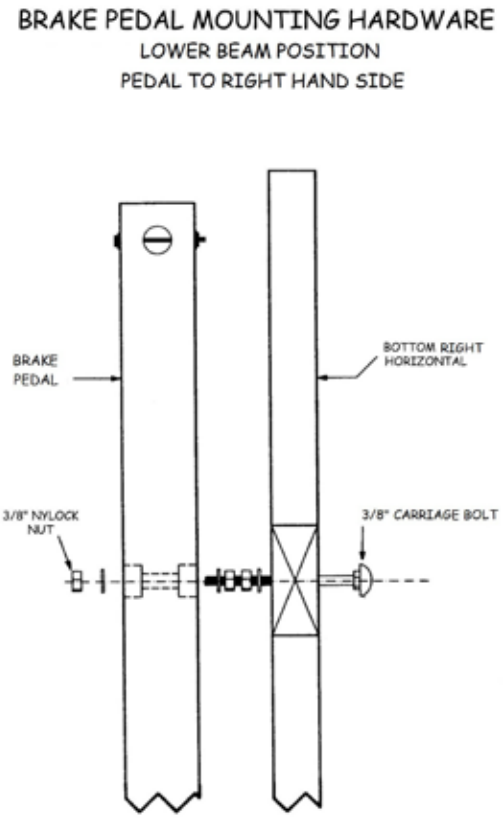



Fig. 3-10 a

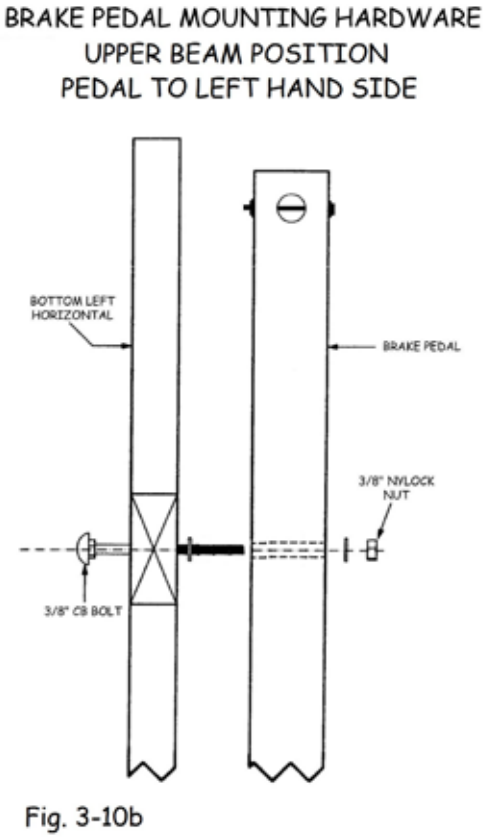



Fig. 3-10b

2) Locate the Brake Pedal Assembly (Assemblies).

3) Remove and set aside the nut, washers, and carriage bolt. Leave the smaller bolt assembly at the end of the pedal in place.

4) Find the Left Brake Pedal mounting hole in #16; located near the bottom of the Left Castle Vertical and immediately above the access hole.

5) Orient this assembly inside the loom, at the mounting hole in the Left Castle (#16), with the long end of the pedal pointing to the front of the loom.

6) Insert this assembly through the mounting hole, using light hammer taps to seat the bolt, if necessary. Mount the hardware and Brake Pedal onto the bolt as follows, securing tightly with the nylock:

Left Side Pedal:
Carriage Bolt
Side Frame
Washer
Brake Pedal
Washer
Low-Profile Nylock

7) For the Right Side Pedal (optional, for second beam), locate the hole at the bottom of #4. Install it to the inside of the #4 vertical, inserting the carriage bolt from the outside. Hardware will be mounted in this order:

Right Side Pedal:
Carriage Bolt
Side Frame
Washer
Jamb Nut
Hex Nut
Washer
Brake Pedal
Washer
Nylock

**INSTALL THE E-LIFT SUPPORTS (#19, #20) AND SPRING ANCHOR**
(see Figure 3-7)

1) The Front Cross Member (#19) has two holes through the flat sides. Orient this piece between Verticals #3 (right side) and #12 (left side), with the rectangular wooden block pointing down and to the inside of the loom.

2) Select two attachment bolts and remove the nuts. Insert them partially, as you have done previously, and, with the Front Cross member in place, install the bolts and secure with the nuts.

3) The Rear Cross Member (#20) has the same block, with more hardware (for the E-Lift Spring Lever) and a second, oblong block, with eye hooks in it, on the top. Position this piece between Verticals #4 and #16. Again, point the wooden block down and all hooks and hardware to face Support #19. This will position the oblong block on top of the support.

4) Select two more attachment bolts and remove the nuts. Insert them partially, as you have done previously, and slip the Rear Cross Member into place. Install the bolts and secure with the nuts.

5) If you have not already done so, take the wrapping off the Spring Support, freeing it from #20. It is bolted loosely in place. Remove the bolt and hardware mounted in the middle of #19. Pivot the Spring Support to bring the free end over the hole in the center/top of #19. Re-install the bolt, bringing it in from the bottom, up through #19 and the Support. The nut and washer will nest in the inset opening. Tighten both bolts firmly into place (see Figure 11).

LOCATION AND INSTALLATION OF CROSSMEMBERS AND SPRING SUPPORT

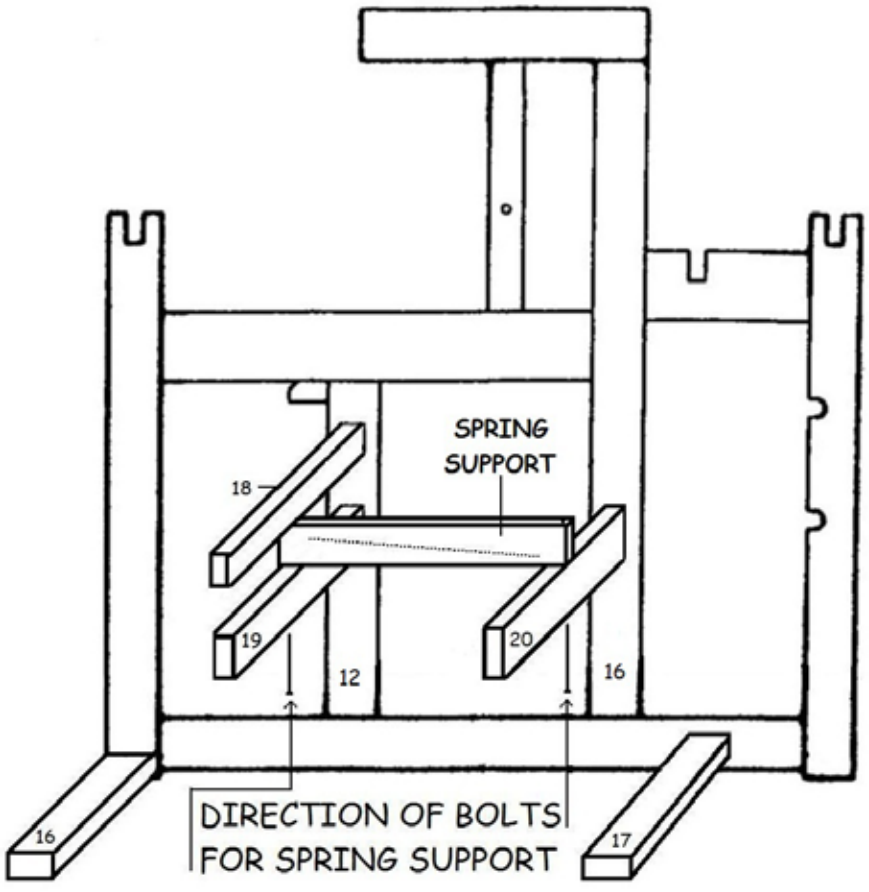



Fig. 3-11

6) You're quickly becoming a Master Loom Builder; have you noticed? Give yourself a quick pat on the back.

**INSTALL CENTRAL SUPPORT CROSS MEMBER (#18)**
(see Figure 3-11)

1) Locate the Central Support Cross Member #18 and prepare two mounting bolts, with washers and square nuts for mounting.

2) Position this Cross Member as follows:
   a) Between #3 and #12.
   b) At the two holes located just above the Front Spring Cross Member (#19).
   c) With the access holes at either end pointing to the back of the loom.
   d) This will place #12 directly over the access hole for the second bolt that secures the Spring Support in place.

3) Insert the bolts, with washer, from the outside, through the ends and secure with the nuts. Tighten securely.

4) One more set of Cross Members and you'll be hanging the Dobby, then the beater and harnesses. Soon, you'll be finished!

**SQUARING THE COMPLETED FRAME**

Now that you have completely assembled the Loom Frame, it is time to assure that the frame is square and level. Tightening of all bolts for the Frame Sides and Cross Members has been put off for this procedure.

Please make a note of this process, as it is an important part of the maintenance of your loom. The many features of this loom will perform better and give more years of service if this process becomes a part of your regular loom maintenance.

1) Using a tape measure, note these measurements:
   a) The distance from the inside corner of the Rear Left Vertical (5L) to the inside corner of the Front Right Vertical (2R).
   b) The distance from the inside corner of the Rear Right Vertical (5R) to the inside corner of the Front Left Vertical (2L).

2) These two measurements should match. If they do not, you will need to adjust the frame slightly, by pushing and pulling at the corners, until they do match. The Frame will then be square.

3) Now, using a level, check the verticals at the corners and the cross pieces at bottom and top. Depending on the flooring, you may need to use shims under the four corner verticals in order to achieve level.

4) Once the loom is square and level, then you must check and tighten all bolts and nuts that connect the frame pieces.

5) Over time, due to the shaking and movement the loom experiences during use, these connections will shake loose, requiring periodic checking and tightening. Make a check of these components a regular part of your loom maintenance.

**INSTALL THE HARNESS PULLEY SUPPORT ASSEMBLY (#21 AND #22)**
(see Figure 3-12)

1) Locate this assembly. It is comprised of two pieces of wood (Parts #21 and #22), a little wider than your loom, held together by three sets of pulleys, two sets of which are close to one end. The entire assembly is held together by shipping wrap and tape. Do not unwrap it until the unit is in place and ready to secure.

2) From your hardware pack, select four 1/4” x 5-1/2” Flat Head Machine Screws and 1/4” Square Nuts.

3) Orient the Harness Pulley Support Assembly on top of the top horizontals, #10 and #15, so that the end with the two rows of pulleys is at the right side of the loom and the small plaque with your loom’s serial number facing to the front of the loom. It should overhang about 4” on the right side (as shown in Figure 3-12).

MOUNTING THE HARNESS PULLEY SUPPORT ASSEMBLY

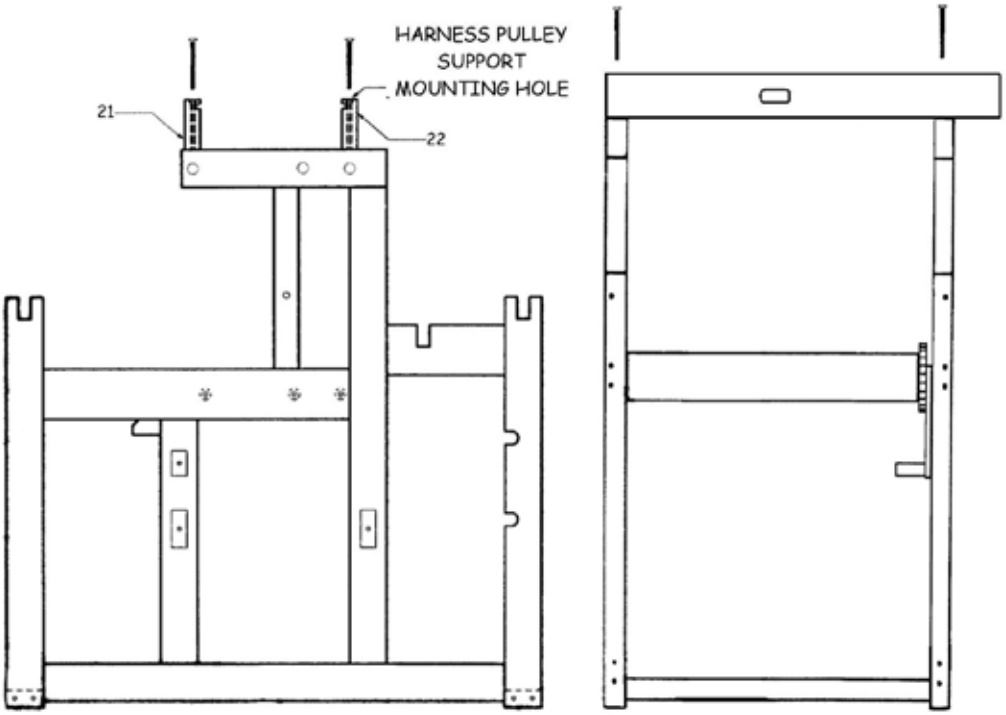



Fig. 3- 12

4) Align the four mounting holes in the Pulley Supports with those in the Top Horizontals. If you are not able to align the holes without removing the packing strips, ***take extra caution to move the Horizontals into place without pulling them apart***.

5) Cut and carefully remove the packing tape, if you have not already done so.

6) From above, insert the Flat Head Machine Screws into the four mounting holes, punching holes in the plastic. Now remove the plastic and add the square nuts. Tighten securely.

7) Remove the top shelf held between #21 and #22 by pulling the retainer pin (located at the back of the rear Harness Pulley Support) and sliding the board out to one side. Set the shelf aside while the harnesses are mounted into place.

8) Take a moment to breath and appreciate your progress. You've achieved something like the pinnacle of the assembly process. Everything's a down hill coast from here.

**INSTALL THE DOBBY BACK (FOR YOUR COMPU-DOBBY)** (see Figure 3-13)

Your Compu-Dobby is comprised of two parts:

- The Dobby Back –This is the mechanical side of the Dobby; the flat board to which are mounted the Dobby Cables, Slide Rods, and Slide Plate.

- The Compu-Dobby – This is the electrical side of the Dobby; containing the solenoids and processor that enable the commands from your computer to fire the correct solenoids. This is mounted to the Dobby Back for safe shipment, in a very special box. Please, if at all possible, retain this box, in the event the Compu-Dobby must be returned to AVL Looms for warranty work or servicing.

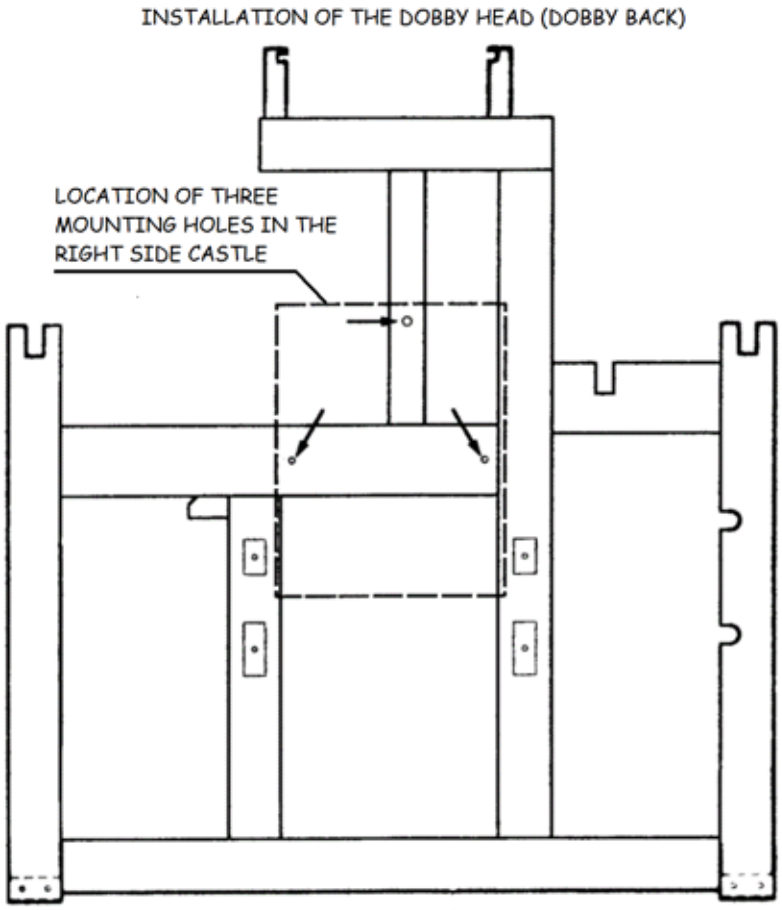



FIG. 3-13

1) Remove the Compu-Dobby from the Dobby Back, by removing the four black thumbscrews at the sides. Replace the thumbscrews in their holes and store the Compu-Dobby in the shipping box for the time being. The Dobby Cables are now exposed. Please exercise caution to avoid creating bends in these Dobby Cables.

2) Figure 3-13 shows the location of the three mounting holes pre-drilled in the right side castle. Note that three mounting bolts protrude from the back of the Dobby Back. If any of these have come loose, you'll need to reposition them from inside the Dobby Box. Note that each bolt head seats in a recess in the wood.

3.) Remove the nuts and washers from the mounting bolts and carefully align the Dobby Back over the corresponding holes located in the right side of the loom frame (as shown in Figure 3-13). You can drape the bundled harness cables up and over the top of the pulleys located directly above the Dobby Back.

4) From inside the frame, slip a washer onto each bolt end, then thread on a hex nut. Tighten with a 1/2" socket.

**INSTALL HARNESS ASSEMBLIES AND SPRINGS**

It's time to add some of the muscle and sinew to your loom: the Harness Cables, Harnesses, and Harness Springs. If you ordered your loom with Texsolv heddles, you'll need to assemble your harnesses now. Please follow the directions below. If your loom is equipped with metal heddles, proceed immediately to step #1 of the harness installation instructions. You may wish to save space by mounting the Harness Frames as they are completed.

**MAKE TEXSOLV HARNESS ASSEMBLIES**

1) Locate the …
   a) Harness Sticks
   b) Harness Wires
   c) Texsolv Heddles
   d) Harness Cables
   e) Harness Springs

2) The sticks are divided into two groups: top and bottom sticks. The hooks on the top sticks are closer to the center. The hooks in the bottom sticks then, are closer to the edges.

3) Select one top and one bottom stick. Lay them on a table top parallel to one another, about 12” apart. Orient them so that the hooks point away from the opposite stick.

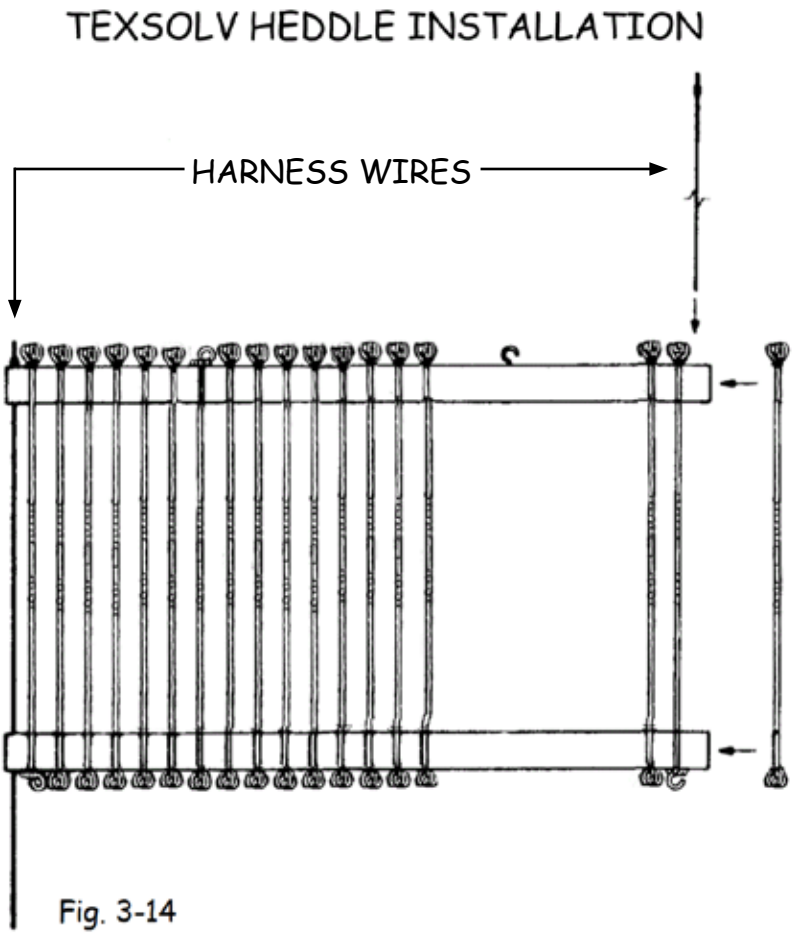



Fig. 3-14

4) Thread 50 heddles onto the sticks (we provide 50 heddles per harness, plus 200 extra). Move all of them to the center, positioning two at each of the outer ends of the sticks.

5) Select two harness wires and slide one through the end hole of the top stick so that the copper fitting at the end of the harness wire is at the top. Insert the blank end of the wire through the end hole of the bottom stick.

6) Add the second harness wire. Move one heddle out to either end of the harness, immediately adjacent to the harness wire. These two heddles will be helpful in maintaining the rectangular shape of the harness until and after it is hung in place.

7) If you wish to save space by mounting each harness as it is assembled, proceed to the next section now, for instructions on hanging the harness and installing the springs.

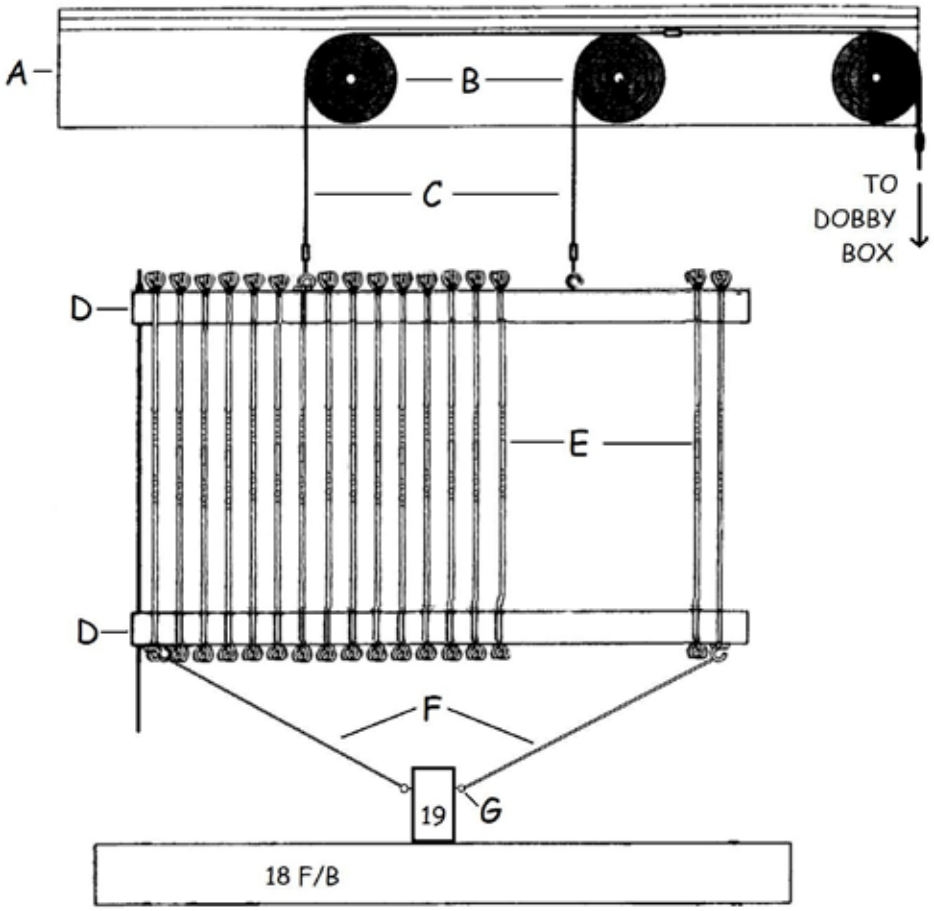
**INSTALL THE HARNESSES AND SPRINGS** (see Figure 3-15)

The Harness Pulley Support has a top that serves as a shelf and slides out to give you access to the pulleys. If you have not done so by now, please remove the shelf by pulling the pin in the center rear Harness Pulley Support and sliding the shelf out to one side.

8) Locate the bundle of harness cables. Remove the ties and select one. You'll see that each cable has two terminal ends, a long and a short, each ending in a loop. A small berkeley clip is mounted in the loop at the opposite end of the cable.

9) It will be easier to begin by hanging the rearmost harness and then, mounting each in succession, moving towards the front. Take the Dobby Cable nearest to the rear of the loom. Notice it ends in a small loop.

HARNESS SYSTEM WITH SPRINGS




A - HARNESS PULLEY SUPPORT
B - HARNESS PULLEYS
C - HARNESS CABLES
D - HARNESS STICKS
E - HEDDLES
F - HARNESS SPRINGS
G- SPRING HOOKS
18 F/B - E-LIFT MOTOR SUPPORT
19 - SPRING SUPPORT

Fig. 3-15

10) It will be necessary to squeeze the sides of the berkeley clip, to expose the hooked ends and allow the insertion of the Dobby Cable loop into the hook. You may wish to use pliers for this operation. Once you have attached the Harness Cable to the Dobby Cable. Lay the cable over the rearmost pulley at the right hand side. Now, orient the longest end of the cable over the pulley furthest from the Dobby and the shortest leg over the pulley in the middle set.

11) Check that the cable is not twisted on itself — this will cause problems when you are weaving.

12) Take up the Harness Frame you assembled earlier. Orient the frame so the hooks that are set closest together are at the **TOP** of the frame.

13) Hang the harness from the cable you just installed, looping the two ends of the Harness Cables onto the eyehooks.

14) Locate two harness springs. Fasten one of these springs to the bottom eyehook on the right side of the harness and loop the other end over the correlating eyehook mounted on the right side of the Spring Support immediately below the harnesses. Repeat for the left-hand spring.

15) This completes the installation of one Harness Assembly. Now repeat steps 1 through 14 for each remaining harness. Check your work periodically; it's easy to connect the wrong harnesses or springs into the wrong set of eyehooks.

**INSTALL THE BEATER ASSEMBLY** (see Figure 3-16)

Your V-Series Loom comes equipped with a Bottom Swing Beater.

1) Locate the box containing the Beater Assembly. Attached to the assembly are bags with mounting hardware. In them you will find:
   a) Beater Supports (2)
   b) Shuttle Race
   c) Beater Top
   d) Beater Legs (2)
   e) Reed (1)
   f) Reed Support (1)
   g) Hardware Package (1)

2) Locate the two Beater Supports and find the predrilled holes, one each, on the Lower Horizontals, #1 and #11, just below and forward of where the Verticals, #3 and #12, meet the Lower Horizontals. There is one for each side of the loom, so we'll start on the right side. Please refer to Figure 3-16 for correct placement.

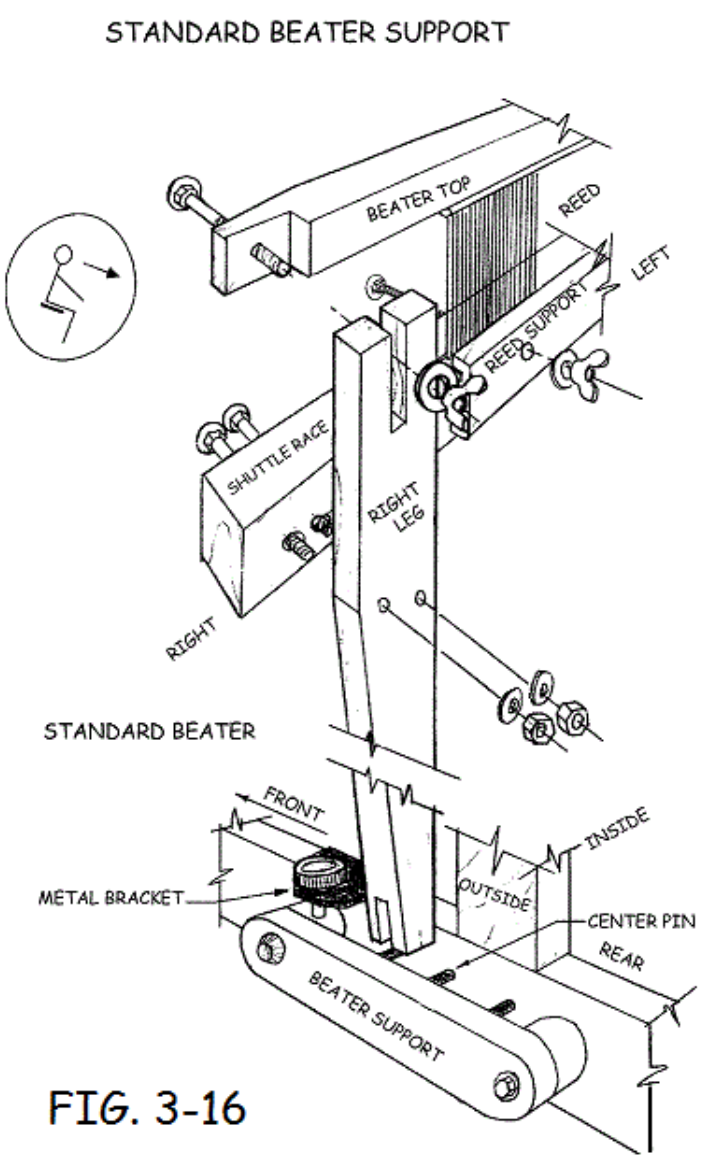



FIG. 3-16

3) Orient the right-hand side support so that the round spacer and metal pins are facing toward the side of the loom and the spacer with the threaded rod and the metal bracket is to the front of the loom. The metal bracket will overlap the Lower Horizontal.

4) Remove the lock nut and washer from the bolt in the rear spacer and insert the bolt through the right Lower Horizontal. Slip the washer and nut back on and tighten the nut just to the point where is almost cinches the two parts together. You want to leave it a little bit loose so that the Beater Support can pivot during adjustment. Since the nut is a locknut, it will not loosen.

5) Now locate two 1-1/2” long screws located in the beater hardware package. Position the metal bracket that’s attached to the front of the Beater Support over the two pre-drilled holes and insert the screws. Tighten them down.

6) Repeat this process for the left side.

7) Position the Shuttle Race at the front of the loom, so that it is resting on the Horizontals, #7 and #13, above the Beater Supports. Orient it so that the lengthwise groove that runs along one side is to the top and facing toward the rear of the loom. Now empty your hardware bag onto a table top. Pick up the four 1/4” x 2-3/4” carriage bolts with washers and hex nuts.

8) Now locate the Beater Legs. Notice that they have been marked to designate left and right. Using each leg, orient them so that, with the bottom slot riding in the center pin in the Beater Support, the tapered side of each leg faces away from the loom. As shown in Figure 3-16, insert the bolts, from the front of the race, through the race, and into the two corresponding holes in each Beater Leg. Attach the washers and nuts and tighten ***only slightly***. Repeat this procedure for the other side of the loom making sure that the tapered side of the leg is always facing away from the loom. Attach the washers and nuts leaving them loose for the moment.

9) Center your reed in the slot.

10) Now orient your Beater Top so that the groove is facing down and the cut outs at either end are facing toward the rear of the loom. Insert 1/4” x 2” carriage bolts into the holes located at each end, starting them from the front. Placing the Beater Top over the race and reed, slide the bolts into the slots at the top of the Beater Legs and once the reed is securely inside the groove in the Beater Top, attach the washers and wing nuts and tighten them to hold, but wait for adjustment in the next step before tightening fully.

11) Center the Beater Assembly in the loom.
   a) Place a level in the center of the race and adjust the height of each side, using the black adjustment knob at the metal plate on the Beater Support. These enable you to raise or lower the race on either side, to ensure the race is level.
   b) Once the race is level, holding the Beater Top at its center and push the Beater all the way back, to meet the Beater Bumpers. Ensure that both sides of the Beater are touching the bumpers.
   c) Check that the legs are spaced equally from the outer sides of the loom. Adjust as needed, with slight horizontal movements to the Beater Top. This insures that the legs will not rub on the loom frame.
   d) Continue holding the Beater against the bumpers and tighten the bolts that attach the Beater Legs to the Shuttle Race and the Beater Top to the legs.

**INSTALL THE WARP BEAM/S**
(see Figure 3-17)

For ease of installation, you may wish to jump to the sections in this manual for installation of the E-Lift II and Compu-Dobby, prior to proceeding with the install of your Warp Beam/s. Otherwise, later in this process, you may find it necessary to remove these beams for easier access to the loom. Once you have completed those steps, return to this section and proceed from here.

The loom is designed to carry two Plain Warp Beams or a single Sectional Beam. Plain Beams may be used in either the upper or lower position. A Sectional Beam may only be mounted in the upper position.

If you intend to use two beams simultaneously, an additional assembly needs to be fixed to the Rear Verticals. We'll explain all that a bit later.

If you are using a single Plain Beam or a Sectional Beam, install it in the upper position.

1) Locate your Warp Beam and the axle pockets located on the front edge of the Rear Verticals.

2) Loosen the little bolts that hold the flat beam retainers over the two pockets.

INSTALLATION OF TWO PLAIN BEAMS AND HANDLES

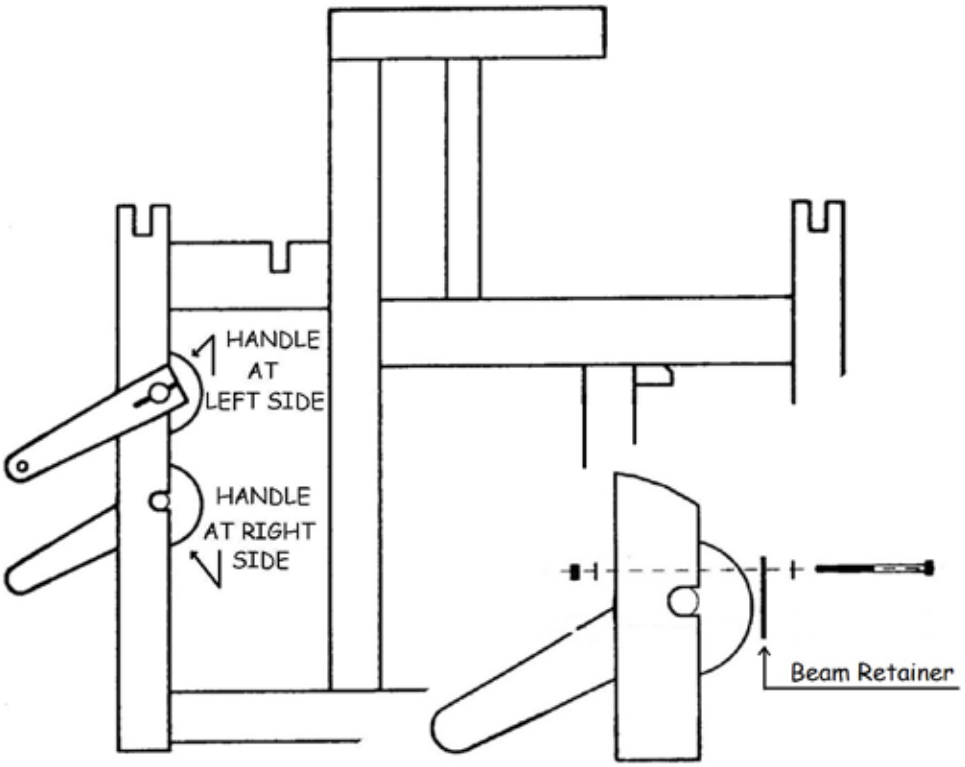



Fig. 3-17

3) Swing the retainers aside and position the Beam in place. Bring the warp beam into position. If you are using the upper location, orient the beam so that the long end of the axle extends to the left of the loom (opposite the Dobby Head).

4) Seat the Beam in the axle pockets and, holding the Beam in place, rotate each retainer back down, to safely secure the Beam.

5) Locate the Warp Beam Handle and remove its hardware.

6) Slip the handle over the protruding end of the Beam Axle. Insert the bolt and secure with the washer and nut. Note that the handle is connected with a carriage bolt, the head of which must fit into its stamped recess.

7) Follow the same procedure to mount a second, Lower Beam. The Lower Beam should be oriented so that the handle is on the Dobby Side (right hand side) of the loom. Remember, a Sectional Beam can only be mounted in the upper location.

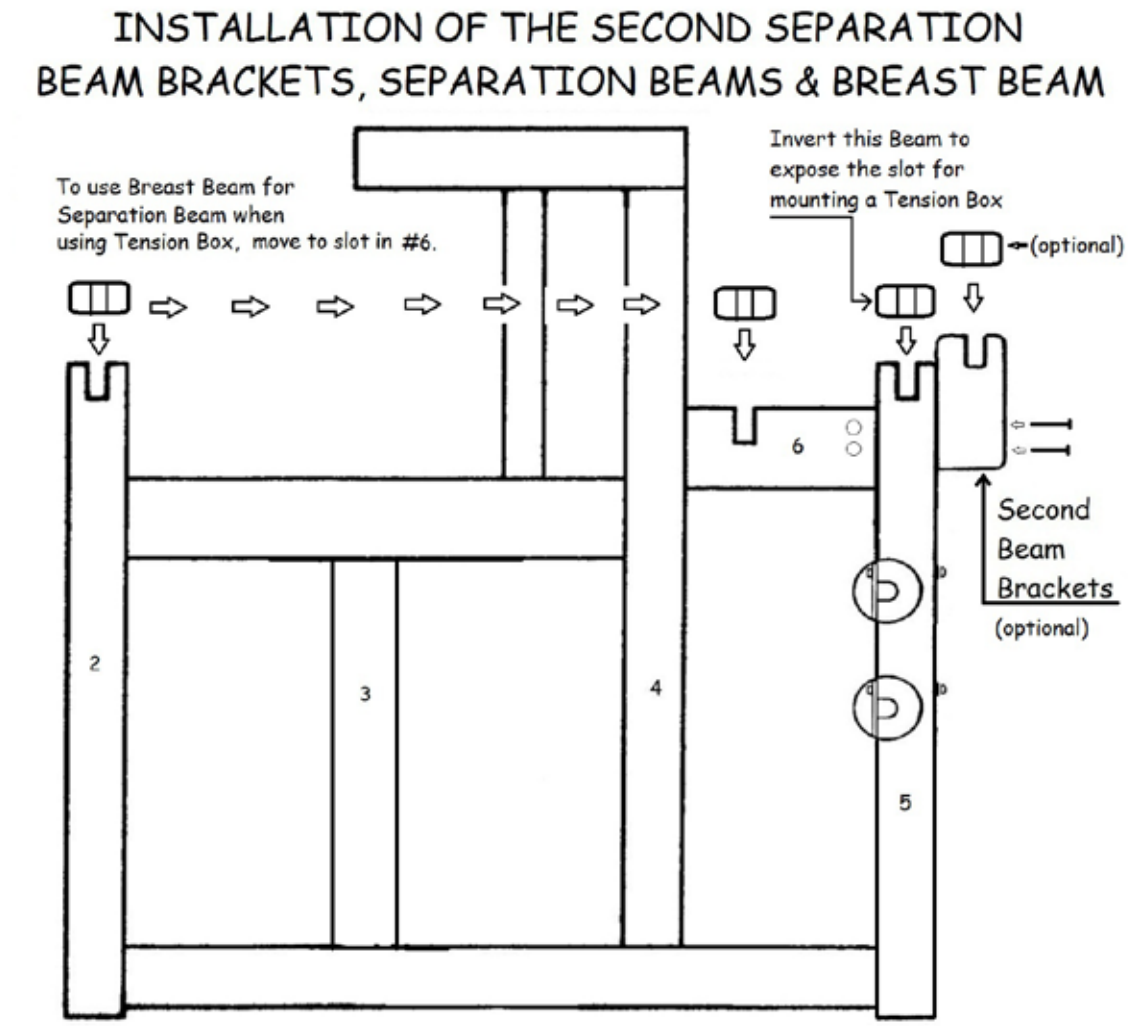



Fig. 3-18

**INSTALLATION OF THE BREAST BEAM AND SEPARATION BEAM/S**

Your package includes one Breast Beam and a Separation Beam for each Warp Beam ordered. These Beams are identical. Each has a deep groove running the length on one side and an extension at each end to fit into the cut-outs at the top of the Front (#2L,R) and Rear (#5L,R) Verticals. Simply drop the Beams into the cut-outs (as shown in Figure 3-18).

The slots will face down when installed and used as Separation Beams. Figure 3-18 shows the placement of the Breast Beam, when it is to be used during wind-on from a Tension Box. The First Separation Beam will be inverted to expose the slot, converting the Beam into a Track and Mount for your Tension Box!

If you have a Second Warp Beam, you will need to install a bracket for the second Warp Separation Beam, as follows:

**BRACKETS FOR SECOND WARP SEPARATION BEAM** (see Figure 3-18)

**NOTE**: If you ordered a loom with two Warp Beams, these brackets and hardware will have been packed with the Side Frame Parts.

As noted above, if you intend to use two Warp Beams in your weaving, you'll need to attach a set of brackets to the Rear Verticals. These Warp Separation Beam Brackets support an additional cross member which is used to direct the warp from your lower Beam to the harnesses.

1) Locate the two Separation Beam Brackets. They are identical, so you needn't be concerned about left and right. As shown in the diagram, these brackets bolt into the top of the back edge of the Rear Verticals.

2) We've pre-installed the mounting bolts in the brackets. Remove the square nuts from the bolt ends, push the brackets into place, and tighten the bolts against the square nuts placed in the access holes on the inside face of Horizontals #6L and #6R.

**MOUNT THE BRAKE CABLE SYSTEM**

1) You've already installed your Brake Pedal(s), now you need to add the Cable/s and Spring/s.

INSTALLATION OF THE BRAKE PEDAL - LEFT SIDE

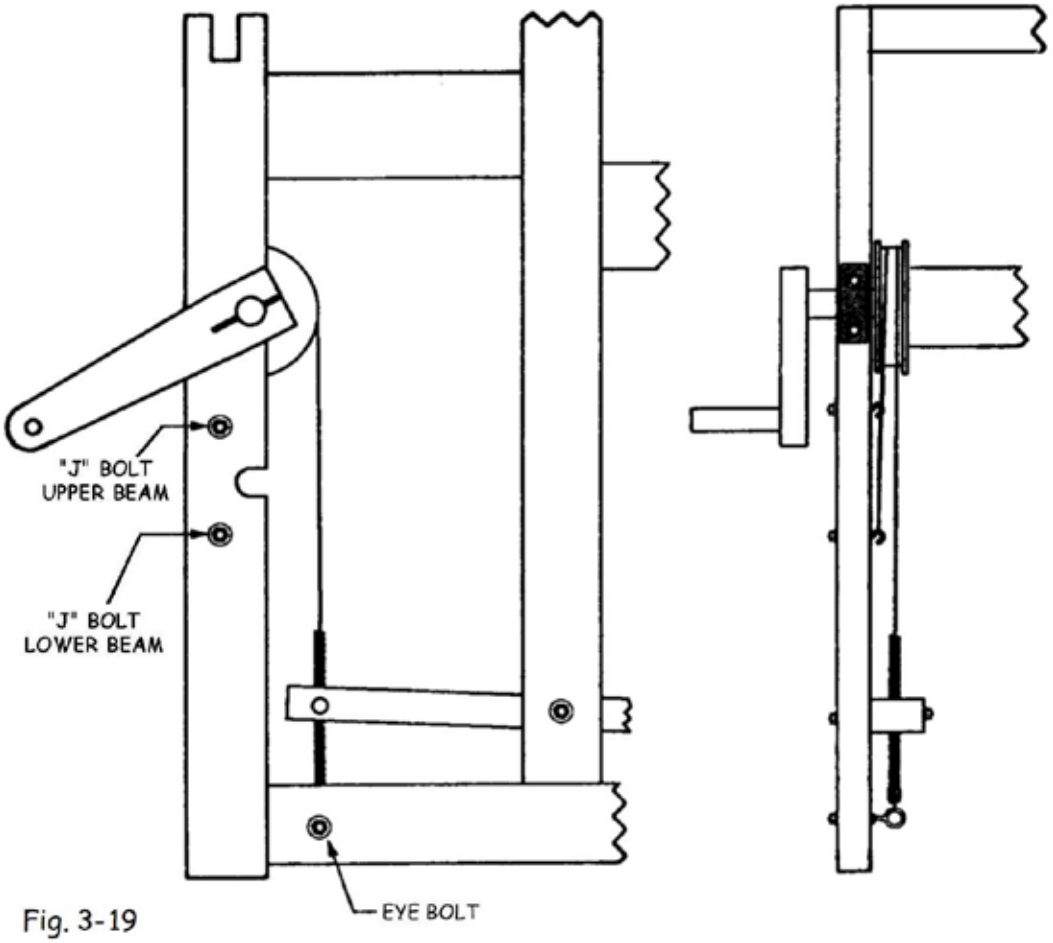



Fig. 3-19

2) Brake Cables come in different lengths, depending on the type of Beam you're using, and its location. Your Cable Assembly/ies are individually bagged and marked, but if you become confused, consult the table below:

| Beam Type | Cable Length (length is tip of loop to tip of clip) |
|---|---|
| 1/2 Yard Sectional | 76-5/8" |
| Upper Plain Beam | 53-3/4" |
| Lower Plain Beam | 47-5/8" |

3) Select the poly bag with the appropriate Cable Assembly. You will receive one assembly for each Warp Beam ordered. It will contain:
   a) 1 — Steel Brake Cable
   b) 1 — Tension Tie-Up with Toggle
   c) 1 — "J" Bolt assembly
   d) 1 — Eye Bolt/Spring Assembly

4) Figure 3-19 indicates the holes for the cable mounting hardware.

5) Mount the "J" and eye bolts, making sure that each points to the inside of the loom. The "J" bolt should also point down.

6) Use a 7/16" wrench to remove the nut from the bolt in the end of the Brake Pedal, then slide the bolt most of the way out.

7) Insert the tip of the bolt through the three strands of cord that create the loop, with the toggle remaining above the pedal.

TENSION ADJUSTMENT FOR BRAKE PEDAL

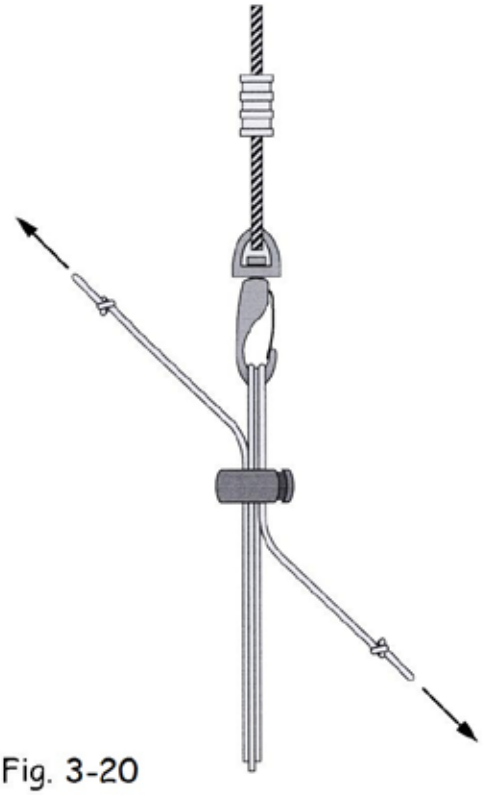


Fig. 3-20

8) Push down on the end of the brake pedal so that you can attach the spring to the same bolt. You'll have both the tie-up and the spring on the bolt.

9) Push the bolt back through the pedal and replace the nut.

10) Hook the loop at one end of the cable on the proper J-bolt. Bring the cable immediately up and around the exterior side of the Brake Drum. Wrap it around the Brake Drum; it will pass over the top of the drum three times. Take care **not** to cross the cable on itself.

11) When you've just enough cable remaining to almost reach the brake pedal, collect the three loops of the cord into the snap hook.

12) Check again to make sure the cable isn't crossed on itself.

13) Use the toggle on the tie-up to adjust the tension on the pedal. To increase tension, pull the two ends of cord away from the toggle (as shown in Figure 3-20). To decrease the tension, squeeze the buttons on either side of the toggle and move it up and down on the looped ends.

**INSTALL THE SHELF**

You're nearly finished! – it's time to install the shelf.

1) Orient the shelf so that the felt strips on the bottom will lay atop the three sets of Harness Pulleys when the shelf is in place. These act as Cable Retainers and will keep your Harness Cables properly located during lifting of the harnesses.

2) Slide the shelf into the grooves in the Harness Pulley Supports.

3) Insert the retention pin into its hole. It will, and should be, tight. It will loosen over time.

4) If you cannot push the pin all the way into the shelf, check that you haven't put the shelf in backwards.

**INSTALLATION OF THE E-LIFT II** (see Figures 3-5 and 3-11)

The E-Lift II replicates the action of treadling. 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.

You may recall that, earlier, you installed the Interior Cross members #19 and #20, along with the Harness Spring Support (see Figure 3-11). There are some hardware and smaller parts secured to these Cross Members. It is to pieces, #19 and #20, that we shall now return.

**INSTALL THE E-LIFT II MOTOR BOX**

1) From the packaging, remove the black E-Lift Motor Box and the hardware bag. Place the Motor Box beneath parts #19 and #20, orienting it so the two electrical switches face the back of the loom, the small circular plug is to the front, and the four holes in the top plate of the Motor Box align with the matching holes in the wooden Support Blocks. As the Motor Box is quite heavy, you may wish to put something under the Motor Box to hold the top plate flush with the bottom of both wooden Support Blocks.

2) Take the four 5/16 x 2” hex bolts, with lock washers and square nuts from the hardware pack. Remove the square nuts.

3) Insert the bolts, with lock washers, from the bottom, up through the top plate and support blocks. Secure with the square nuts, on top.

4) Notice that there is a long Lever bound to #20. Release this; it will hang down for the moment.

**INSTALL THE CAM-TO-MOTOR-CABLE**

5) Now look to the Cam you installed (see Figure 3-5). The cable is wrapped around it and sealed down with plastic wrap. Remove the wrap and unwind this Cam-to-Motor-Cable. Be sure to find the small cotter pin that is attached to the end of the cable at the copper fitting. Remove it from the cable and keep it safe for the next three steps.

6) Wind the cable over the top of the Cam, toward the outside of the loom, back around, under the Cam, and over to the pulley mounted on top of the Motor Box.

7) Pass the cable across the front of the Motor Pulley, around to the left and into a hole on the pulley's barrel. The tip of the cable will now be visible in a hole on the top, flat side of the pulley.

8) Pull the tip of the cable out the top of the pulley and replace the small cotter pin at the tip of the cable. This will prevent the cable from pulling out and allow for the cable to be taken up and let out from the pulley as it turns.

**INSTALL THE CAM-CYLINDER-TO-SLIDE-PLATE CABLE**

9) Immediately to the right of the larger Cam is the Cam-Cylinder. Remove the wrap and unwind the Cam-to-Slide-Plate Cable. This cable ends in a loop.

10) Manually lift the slide plate that slips up and down on the slide rods, mounted to the Dobby Back. If you lift it far enough, it will pass over the little dobby balls. Several of them will act as support for the slide plate.

11) A large hole located in the center of the bottom plate of the Dobby Back is not exposed. Slip the loop up through the hole and drop it over the open tip of the large, opened eye bolt on the underside of the slide plate.

**INSTALL THE SPRING AND THE RETURN CORD**

12) Unpack the spring and slip one end of it onto the eyebolt at the tip of the lever.

13) Hook the other end of the spring onto the J-bolt at the left side of #20.

14) The return cord is already attached to the top, right side of the slide plate with a Quick Link. Undo the twist tie and straighten out the cord. Check to see that the Quick Link is vertically aligned and that the cord is coming over the pulley and held in place with the retainer that pivots on the pulley bolt.

15) Move to the rear of the loom and maintain some tension on the cord as you bring it down the side and under the Return Pulley and over the top of the pulley mounted on the rear E-Lift Support Mount Block.

16) Continue pulling on the cord toward the left side of the loom. Loop the cord under the pulley mounted on the lever and bring it over the pulley, back toward the center of the loom.

17) With one hand maintaining tension on the cord, grasp the bottom of the lever with the other hand and pull it, against the spring tension, back toward the loom center. Take care not to pinch fingers between the spring and the lever. Use the slack created in the cord to extend it back toward the right side of the loom and the waiting eye bolt.

**COMPLETING INSTALLATION OF THE E-LIFT II**

18) Now that the cord and cables are installed, it is time to check that the Cam and pulleys are aligned to allow for smooth, vertical movement. Use an allen wrench to tighten all six lock collars securely in place (please refer to Figure 3-5). The Cam and pulleys should be allowed to turn freely, but without and lateral wiggle.

19) Locate and connect the foot switch cord to the front of the E-Lift II. Connect the female end of the power cord at the back of the housing (be sure it's completely inserted). Turn off the E-Lift II power switch. Plug the male end of the power cord into a good quality 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.

**SETTING THE HOME POSITION**

Before you use the E-Lift II, you must set the "home" or neutral position:

20) Turn off the E-Lift II power switch. Unwind the cord on the Motor Box Pulley and bring the Dobby Slide Plate to its upper most position.

21) Rewind the Motor Pulley Cord, making sure the Dobby Slide Plate remains at least approximately 1/4" above the ball on the rear most Dobby Cable (or cylindrical crimp if you have Dobby Wires). Turn on the E-Lift II power switch.

You have now set your Home Position and may start to weave!

**SELECTION OF SINGLE OR DOUBLE ACTION MODE**

The E-Lift II is programmed with two modes: Double- or Single-Shed selection.

The Double-Shed™ mode completes every lifting cycle with the shed open. 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 Dobby advances to the next pick, and the shed opens — 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. To use the Double-Shed mode, find the selector switch located at the rear of the E-Lift II and set it to the "On" position (see Figure #5).

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. If you wish to use the Single-Shed mode, ensure that the Double-Shed mode selector switch in the "Off" position.

**REQUIRED MAINTENANCE FOR THE E-LIFT II**

You'll need occasionally to clean the air filter, which is located on the front of the E-Lift II 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 FOR THE E-LIFT II**

The E-Lift II Pulley-Cam, pulley to slide plate and counterweight cables may stretch with extensive use. If after setting your Home position, you find that the counterweight is hitting the floor with the shed open, this is likely the cause. To adjust, simply push the cable through the Cam-Pulley and re-tie the knot to a shorter length. For the counterweight cable, tie a knot in the cable at a location where it won't run over a pulley in normal operation.

Inspect the cables 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 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 info@avlusa.com to place your order or to arrange service.

**INSTALLATION OF THE COMPU-DOBBY** (see Figure 3-13 for parts and placement)

1) Take the Compu-Dobby from its protective box and have the four thumbscrews free from the Dobby Back and at hand for this installation.

FIGURE 3-21 – SOLENOID TIPS ALIGNED CORRECTLY

2) Check to see that all of the little black plastic tips on each solenoid appear concave, when viewed from above. They can be easily turned with a slight touch (see Figure 3-21).

3) Before proceeding further, locate the four mounting holes in the narrow sides of the Dobby Back. Behind each hole, seen from the interior loom, there is what appears to be the head of a standard slotted screwdriver. This is the end of the barrel nut that will secure the tip of each thumbscrew. Be sure these slots are aligned horizontally. Use a screwdriver to rotate them into place.

4) Bring the Compu-Dobby up to the Dobby Back and align the four mounting holes located on the edge of the sides, with the four holes on the sides of the Dobby Back. The Compu-Dobby is heavy and must be grasped and supported from the bottom. We suggest using a pot-holder or pad to make this more comfortable on your hands.

5) Align the four sets of holes and insert one thumbscrew into each. Wait until all are installed before tightening completely.

6) Prior to tightening, press the Compu-Dobby flush against the loom castle. There is a little bit of play in the holes and the solenoids will perform best if they are positioned correctly.

7) Attach the power cable to the Compu-Dobby at the plug by the power Switch located on the lower, front of the unit.

8) Attach male end of the beige RS-232 serial cable at the female connection on the lower, front of the unit and the female end of the cable to the male serial port on your computer or, using a high-speed serial adapter, to a USB port on your computer.

9) Please refer to your weaving software manual for further information about the computer interface with your Compu-Dobby.

# V-SERIES - WARPING THE PLAIN BEAM

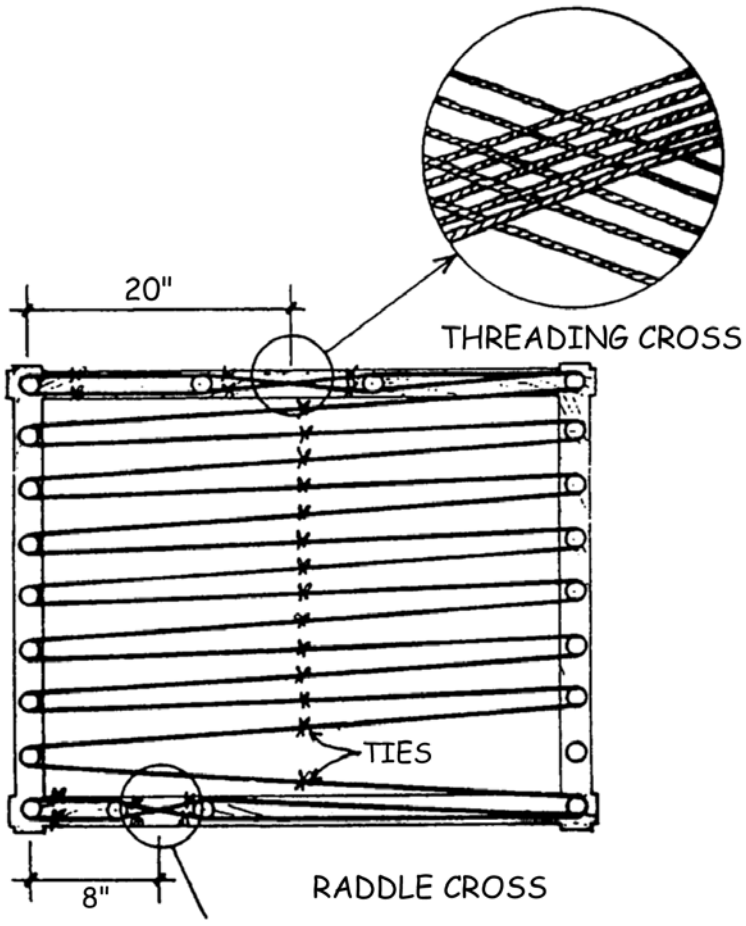
If you have ordered only a Sectional Beam, proceed to the section titled *Warping the Sectional Beam*.

Various warping methods can be adapted to the AVL loom. However, we recommend the following method in which the warp is first wound on to the Plain Beam with the use of a Raddle. Please study this method and try it. We have found that it aids in getting a uniform warp tension, especially when dealing with long warps.

**CREATING TWO CROSSES**

To begin, wind the warp on a warping board or reel. Make sure you put in two crosses, one at each end of your warp:

1) The Threading Cross (each thread crosses the next thread in opposite directions; all are secured in a single loop).



2) The Raddle Cross (warp threads are tied in groups, depending on how many ends will be put in each section of the raddle).

In the Threading Cross, each thread crosses the next thread in opposite directions and all are secured in a single loop at the axis of the cross. The number of threads in a Raddle group can be determined by the number of ends to be placed in each section of the Raddle.

**SECURING THE CROSSES**

Before removing the warp from the board or the reel, secure the crosses. Use four ties to secure each cross, in addition to the tie at the cross axis. These ties go on each side of both pegs holding the cross.

It is usually a good idea to use different color threads for the ties on the tops of the pegs and another color to tie the bows underneath the pegs. By color-coding your ties, you are less likely to twist the warp later.

**REMOVING THE WARP FROM THE WARPING BOARD**

Remove the warp from the warping board by chaining or by winding on the kitestick. Start from the Threading Cross and proceed to the Raddle Cross.

Since the capacity of the warping board is limited, for wide warps you will end up making a number of mini-warps and taking them off individually.

**ADJUSTING THE TENSION DEVICE**

In Chapter 3, you installed the Brake/Tension Device. Before winding on the warp, there are a few small things to take care of on the loom. First, check the tension device to make sure the rope is wrapped three times around the tension drum and that the rope end is clipped to the spring, which is held by the Hook Bolt. Test that you are able to turn the Beam in a clockwise direction. If this proves difficult, you can let some length out of the nylon cord by pressing on the toggle button and moving the toggle up and down on the cord. This will allow you to turn the beam backwards during winding and the Beam will be stabilized the beam when at rest. Don’t forget to retighten the cord when you are ready to thread the heddles!

# V-SERIES - WARPING THE PLAIN BEAM

**ATTACHING THE RADDLE**

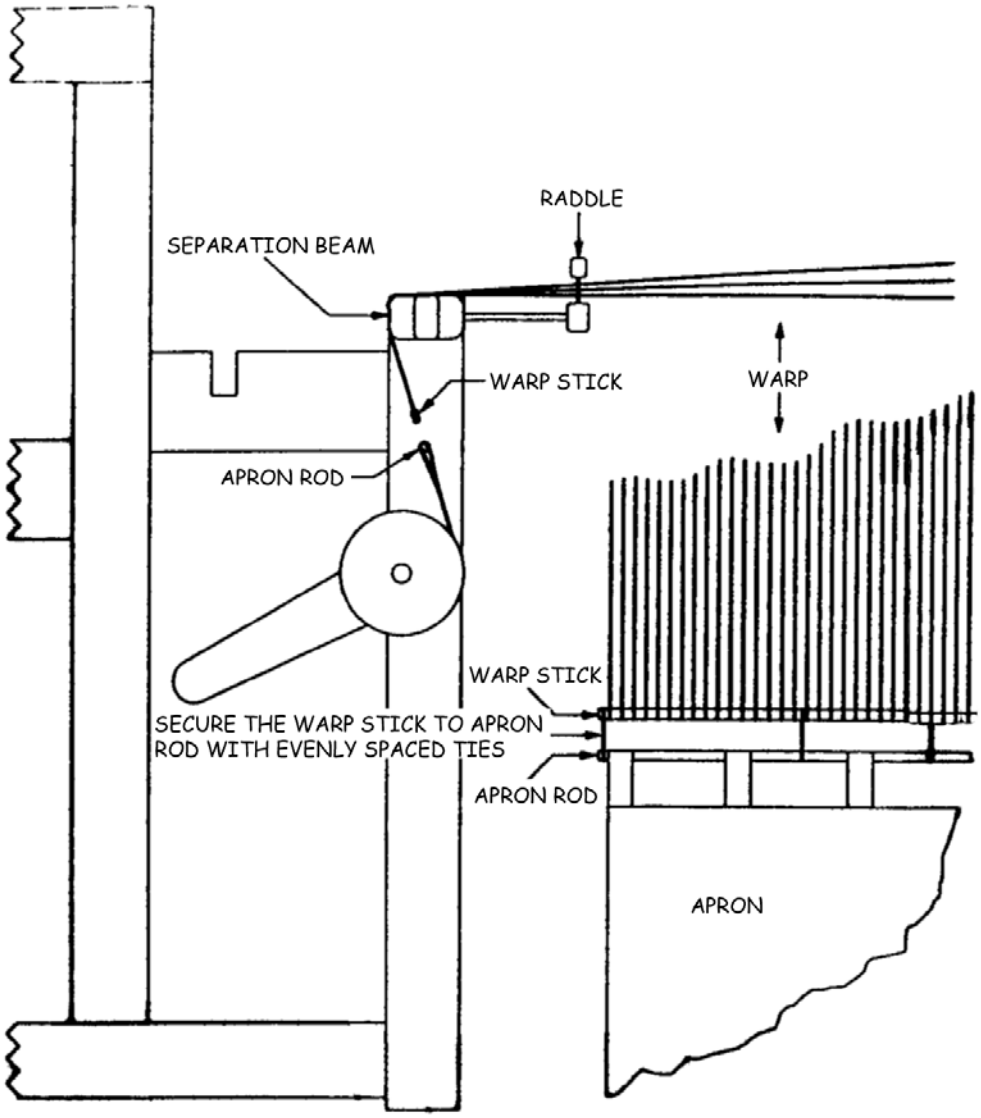
Now secure the Raddle to the back of the loom. If you have an AVL Raddle, simply slip the mounting rods into the set of holes in the back of the rear vertical members.

**WINDING THE APRON**

Standing at the left side of the loom, with the handle in front of you, the warp will be wound on in a counter clockwise direction. Put your apron on the beam with velcro and wind your beam in the counter clockwise, so that your apron is wound on the beam.

**ATTACHING THE WARP TO THE APRON**

Bring the apron around the Separation Beam and put the metal rod through the sleeve at the end. You can also lash your warp sections onto that rod or you can attach another rod which has been slipped through the loop at the end of the warp with the Raddle Cross.



# V-SERIES - WARPING THE PLAIN BEAM

**INSERTING STICKS IN THE RADDLE CROSS**

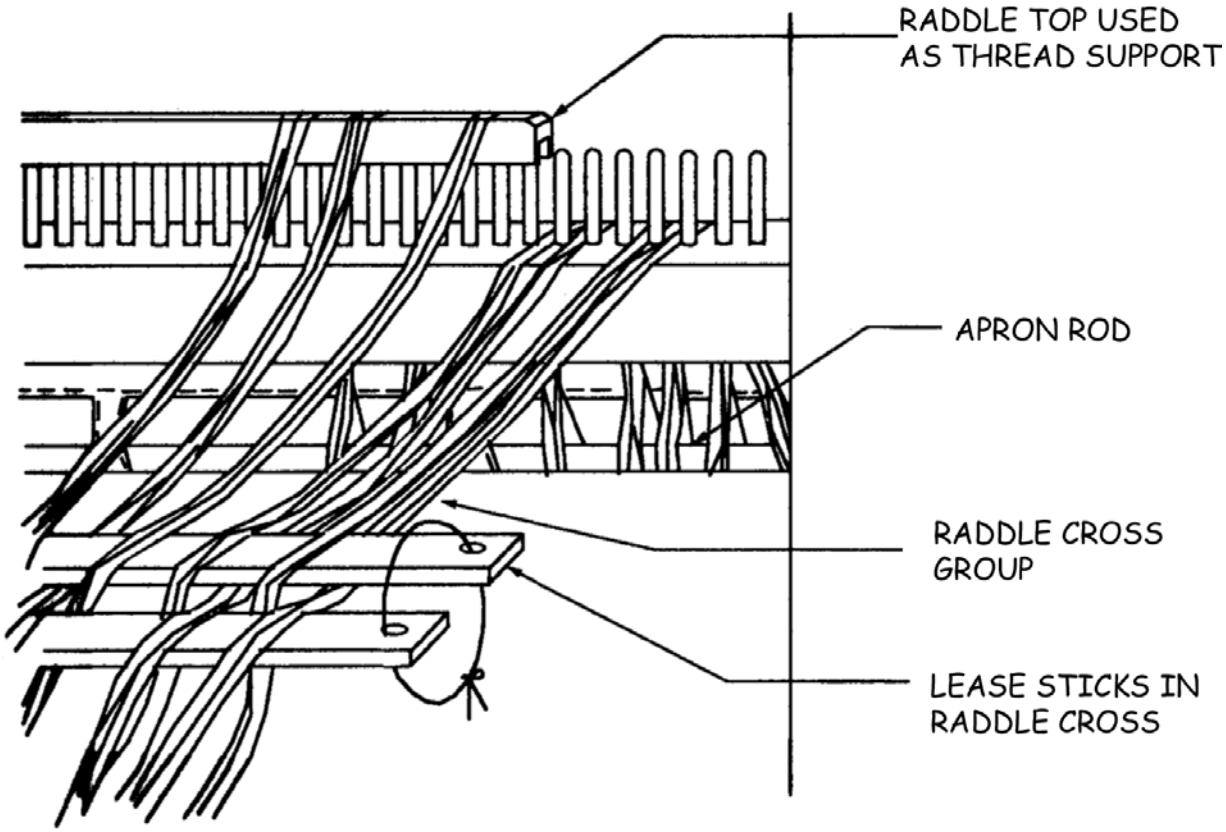
Place two lease sticks in either side of the Raddle Cross and secure together with string through the holes in the ends of the sticks. Now remove the ties from the Raddle Cross and spread the warp out on the sticks.

Measure the center of your Raddle to use it as a center of your warp. The warp threads should either go through the middle of the Raddle or be offset four inches to the right.

**FEEDING THE RADDLE**

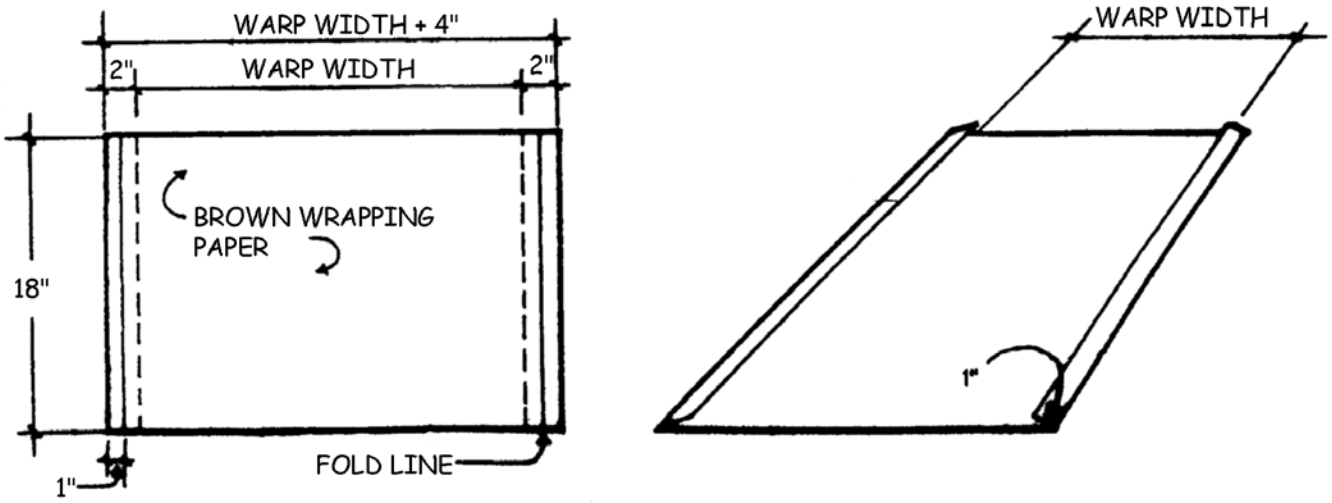
To feed the Raddle, distribute yarns across the Raddle by dropping each Raddle Cross group into a dent in the Raddle.

If you are using an AVL Raddle with a sliding cover, slide it on after the Raddle is threaded and secure it with two or three cord ties so it can't come off. Remove the Raddle Cross sticks when this is completed.



**PREPARING THE PAPER**

Prepare the paper for winding between the warp layers. Again, for the most professional results, and fewer tension problems, we suggest that the warp be as smooth, tight, and compact as possible. This would mean not using corrugated paper or sticks as they will make the warp too soft and/or lumpy. Corrugated paper is just too soft and the warp can never be wound tight enough with it. Heavy wrapping paper works well; seventy pound craft paper is good. If you are going to be using smooth, slippery warp yarns like fine linens or perle cottons, the edge yarns are going to need extra help in order not to slip off the sides. To do this, cut your paper four inches wider than the warp width and then fold over the edges an inch on each side. Be sure the warp is wound between the two folded edges not overlapping them.




PREPARED PAPER WITH FOLDED EDGE

**WINDING THE WARP**

When winding the warp on from the back, i.e., with the warp spread out in back of the loom, turn the crank in a counter-clockwise direction so that the warp comes in from the bottom.

Remember, wind the warp on tightly under a lot of tension. This will vary with each warp material, but a good rule to remember is that the tension of the wound-on warp must as greater as the tension during the weaving operation. You will need one person to hold a warp under tension on the back and one person to wind the warp on the beam using a handle. The person winding the warp can also insert the paper. For a wide, heavy warp, several helpers may be required.

If you have to do it yourself, you can use the jerking method. Make one turn around with your beam crank and then go to the back of the loom and jerk one narrow section (2-3 inches in width) at a time to make the newly wound warp tight on the beam. The idea of this method is that the warp does not need to be under tension all the time, but the part that is on the beam has to be tight. Make another turn, go to the back of the loom, and jerk all the sections again and so on. If you have a wide warp, you might need to do up to ten jerking motions after each turn.

**THREADING CROSS**

When you come to the end of your warp, insert lease sticks at either side of your Threading Cross. Tie the two sticks together at each end.

**REMOVING THE RADDLE**

When the warping is completed, free the warp from the Raddle. If you have an AVL Raddle, first untie the security strings, lift the Raddle top off, and remove the warp from the Raddle. Afterwards, replace the top on the Raddle and leave it in its place on the back of the loom if so desired as it will not interfere with the weaving process. Then be sure to bring the end of the warp around the Separation Beam so that it now travels into the loom.

Using a strong cord, suspend the lease sticks between the Separation Beam and the Harnesses.

Now remove the five ties from each Threading Cross and spread the warp out on the sticks.

**USING TWO BEAMS**

There will be times when you will want to use more than one warp, which cannot be put together on one beam.

You will have to put them on separate beams with separate tension systems.

**WHEN DO YOU NEED TO TENSION YOUR WARPS SEPARATELY?**

When weaving:

1) Very different size yarns.

2) Yarns with different stretching qualities.

3) Different densities.

4) Different structures.

5) Supplementary warp techniques (because some warp threads do not interlace as often as others).

6) A group of special yarns for selvedges and borders. Loops, piles, or puckers like seersucker.

7) More then one layer with different setts in each layer.

8) More than one layer with a different pick count in each layer.

**SETTING TWO BEAMS**

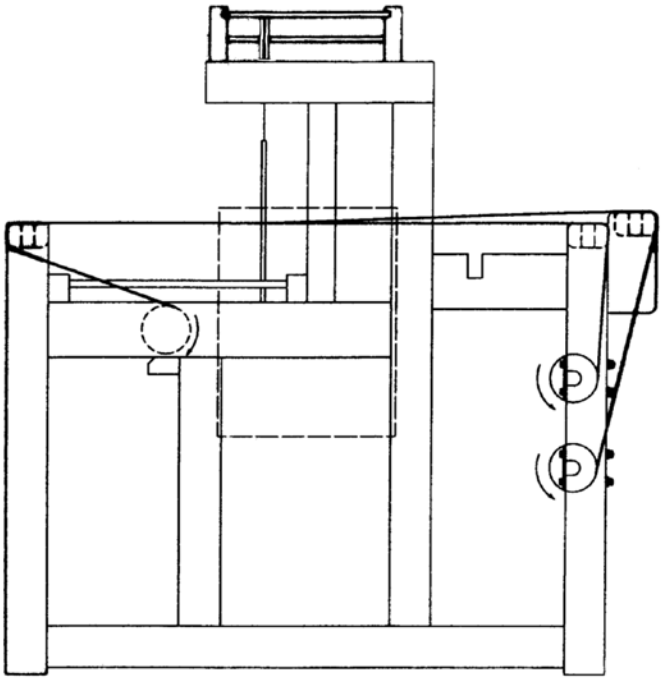
If you are confident in setting one beam, it is just as easy to set up a loom with two beams. It might take twice as much time and you do need to be more careful not to mix sequences.

For those who ordered the second Plain Beam, it is wound in the same manner as the first Warp Beam except your second beam will be in the bottom position, with the Handle at the right side of the loom. *This means your wind-on direction will now be clockwise.*

1) Wind each warp on the beam the same way you would do it if there were only one beam on the loom (plain or sectional). Make a cross and have a pair of lease sticks with a cross in each warp.

2) See enclosed picture for warp routing.

3) Proceed with a threading as if you only had one beam/one cross. Follow your threading instructions and take special care which thread from which pair of lease sticks comes next.



WARP ROUTING

**MORE THAN TWO WARPS, ONLY ONE BEAM? SEPARATE TENSIONING!**

If you have more than two warps to set and not more than two beams, you need to weight/tension your additional warps separately (do the same if you only have one beam and more than one warp to set).

1) Make your warp sections on the warping board and take them off the board in a chain, on a kite stick, or just in a plastic bag.

2) Make sure that each bundle is not too thick. You will know when you need to divide each bundle if you feel that all the threads are not being tensioned evenly.

3) The weight needs to have a strong loop of string on it so the warp bundles can be slip knotted into it. This makes it easy to undo the slip-knot and move the weight when it climbs up to the back beam and must be let down again.

4) The weight also needs to be adjustable. Plastic bottles, with handles, filled with water are perfect. You can also use fishing weights, washers, nuts, bolts. They are not as easily adjustable as water bottles, but take less space. The closer to the floor you can hang them, the less often you need to re-position them.

# V-SERIES - WARPING THE SECTIONAL BEAM

The AVL Sectional Beam is designed to be warped in sections with the use of a Tension Box. The yarn travels directly from cones or spools, which are mounted on a rack behind the loom, through the Tension Box, and onto the Beam. Throughout the warping process, the Tension Box automatically keeps a constant and uniform tension on the warp. Not only does this system save time, but it makes it possible to wind on very long warps which would never fit on a warping board or reel.

## SECTIONAL BEAM CALCULATION

First, you must calculate the number of spools or cones of yarn you will need. Each section is wound onto the Sectional Beam separately; therefore, you'll need to have one spool or cone for each end in that section (if your section is 2" wide, with sixteen E.P.I., that would be thirty-two spools or cones of yarn).

**NOTE**: It used to be that all sections were 2" wide. On an AVL Sectional Beam with metal hoops, you can decide to use 1", 2", or any number of inches sections. You can simply add more hoops in the pre-made holes or take them out.

To prepare for Sectional Beam warping, we need to calculate:

- how many spools we need to wind
- how many yards do we need to wind on each spool
- total yardage for the project

- <u>NUMBER OF SPOOLS?</u>
  Sectional Beaming requires the use of as many spools loaded with thread per individual section as your Ends Per Inch, or planned sett in the reed, dictates.

  To calculate the actual number of spools required, we need to know:
  - how many EPI (this is the sett) are you going to use in the warp
  - what SIZE of SECTIONS (1" or 2") will you use on the Beam

  If your warp is set at 24 epi per 1", you will need 24 spools for a Sectional Beam with 1" sections or 48 spools for a Beam with 2" sections.

Therefore we can say:

**# OF SPOOLS = EPI x SIZE OF THE SECTION**

- NUMBER OF YARDS PER SPOOL?
  To calculate the number of yards per spool, we need to know:
  - the LENGTH OF THE WARP
  - NUMBER OF SECTIONS on the Beam

  We calculate the number of sections by dividing the WIDTH OF THE WARP by the SIZE OF THE SECTION. If the warp width is 30" and we are using 2" sections, our number of Sections is 15.

  All together, we can say:

  **# OF YARDS PER SPOOL = LENGTH OF THE WARP x # OF SECTIONS**

- TOTAL YARDAGE?
  If it is a single color warp or if a color sequence is repeating in each section, the same spools or cones can be used to wind all the sections needed for the warp.

  **TOTAL YARDAGE = # OF SPOOLS X # OF YARDS PER SPOOL**

It is important to make these calculations in advance so that you can purchase your yarn in spools or cones corresponding to the amount of yardage needed on each. Sometimes this is not possible and you will need to wind your own spools from yarn that is in larger packages. For doing this, you will need empty plastic spools, a bobbin winder (preferably electric), and a yardage counter. These items are available from AVL.

**EXTENSION CORDS**

You might want to make a permanent set of Extension Cords to use when warping the Sectional Beam. Extension Cords are also called "apron cords" and serve the same function as the apron on the Plain Beam. They give you "reach" from the Warp Beam and allow you to weave every possible inch until the end of the warp touches the last Harness you are using. Make them out of a strong non-stretchable linen or cotton cord. You will need to make one Extension Cord for each section in your Sectional Beam. For each Extension Cord:

1) Measure a piece of cord long enough to reach from the axle of the Warp Beam, at least one and a half revolutions around the Beam and then reach to the back most Harness.

2) When measuring the length of the cords, take into account that, when the warp is attached to the Extension Cord, the lark's head of the Cord and overhand knot of the warp will fall between the Crosspieces of the Sectional Beam, not on them. This will keep the warp smooth on the Beam without going over the knots created when attaching the warp to the cords.

3) Now double that length and cut it.

4) Take the two ends of the cord and knot them together, using an overhand knot.

5) All Extension Cords should be exactly the same length, so it's better to cut all you will need before proceeding.

**FEEDING THE SPOOL RACK**

Next, place a Spool or Cone Rack about five or six feet behind your loom. Place the spools or cones for the first warp sections on the Cone Rack.

Make sure you put each thread through the metal eye on the spool rack so the threads do not get tangled.

When arranging the spools on the Spool Rack, it doesn't matter whether you go top to bottom or bottom to top, the important thing is to be consistent in vertical columns and to place the spools in the order that the threads are in the warp.

# V-SERIES - WARPING THE SECTIONAL BEAM

**THE TENSION BOX**

This is an essential tool for Sectional Warping, which:

1) Puts threads under even tension.

2) Spreads threads to the proper width of the section.

3) Makes a thread-by-thread cross.

**TENSION BOX HEDDLE INSTALLATION INSTRUCTIONS**

If this is your first time to use a Tension Box, you need to install heddles on the harnesses of your Tension Box.

Your Tension Box is delivered with one bundle of one hundred heddles. These are held together with twist ties. Leave these on for now. Refer to the upcoming diagram to familiarize yourself with the Tension Box and its parts. Push down on one of the harnesses until it stops. This causes the other harness to go up. You will use that later for making a Threading Cross. Right now we'll need to use it to help in the assembly of the heddles to the harnesses.

1) Remove the "heddle retainer" of the harness that is up, using a phillips head screwdriver.

2) Notice there are four twist ties holding the heddles together. Separate the top two. Insert the top bar (of the harness that is up) into the space created by pulling apart the twist ties. Insert the bottom bar (of the harness that is up) into the space created by pulling apart the bottom two twist ties, making certain that the heddles aren't' twisted. Now remove the twist ties.

3) Count off fifty heddles and cut the loop at the top between the 50th and the 51st heddle.

4) Now put the four twist ties back on the fifty heddles that were the last to go on the harness.

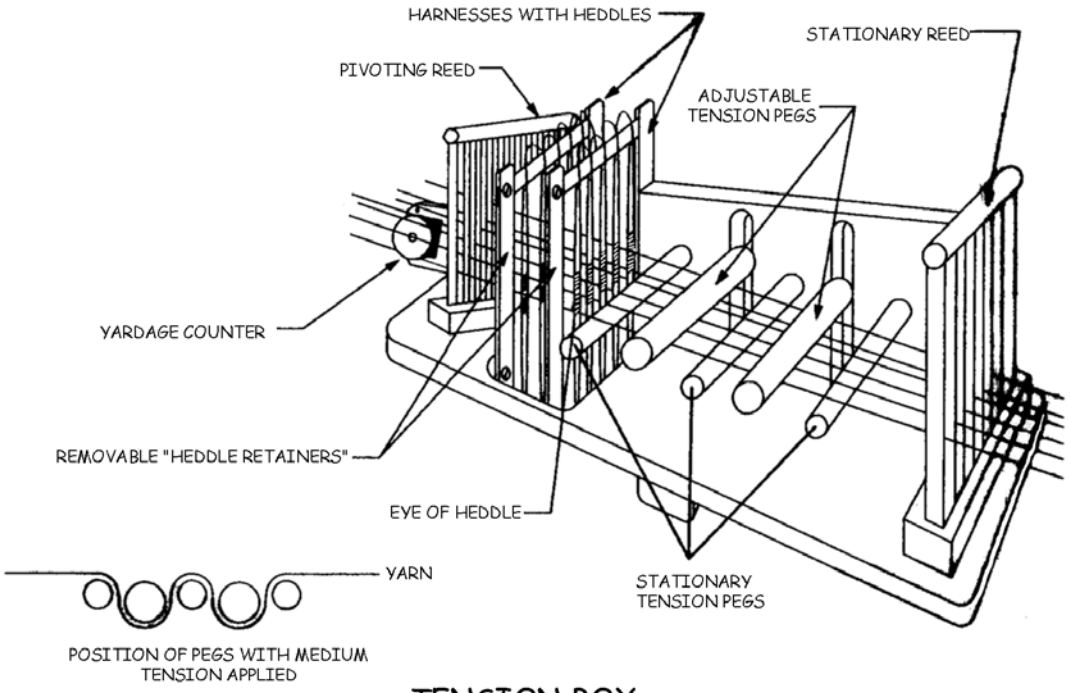
5) Remove these fifty and reattach the "heddle retainer".

6) Now push down on the harness that is up, making the other harness come up.

7) Remove the heddle retainer.

8) Pull apart the top two twist ties and insert the top of the harness (which is up) into the space created. Pull apart the bottom two twist ties and insert the bottom of the harness into the space created.

9) Reattach the heddle retainer.




TENSION BOX

**POSITIONING THE TENSION BOX**

First bring the Front Beam to the back of the loom and mount it in the two notches located on the Mid-Rear Horizontals (see part #6A, page _____). Next, flip the Separation Beam at the back of the loom, exposing the side with the groove in it. If you have two Warp Beams and have mounted the Separation Bar for that beam, remove it for this process.

Mount the Tension Box in the groove, with the Counter facing into the loom. The Tension Box is fastened to the Separation Beam with a small cross piece and wing nuts. This will stabilize the Tension Box and allow it to travel smoothly from one section to another. The wing nuts can be released for the Tension Box to move easily from side to side. Each time the Tension Box is moved and centered properly for a particular section, the wing nuts must to be tightened again.

**THREADING THE TENSION BOX**

The best way to thread the Tension Box is to take one thread from the furthest left cone (as you face the Cone Rack, with your back to the loom) and thread it all the way through all the parts of the Tension Box, nearest to the back plate of the Box, then the next thread all the way through. It works best to use the threads from the rack in a vertical order rather than a horizontal order.

Now let's go through the sequence for threading the Tension Box. First, move the two adjustable Tension Pegs up above the Stationary Pegs or remove them completely. Now, using a sley hook, draw the thread through the Rear (stationary) Reed. Since this reed is eight dents per inch, you will divide the E.P.I. into eight to find out how many ends will be in each dent (with sixteen E.P.I, put two ends in a section). If your E.P.I. does not divide equally by eight, you can either vary the number of ends in each dent (with twenty E.P.I., alternate two and three ends in the dents) or thread the dents a little wider than two inches (with twenty E.P.I., put two ends in each dent; with forty ends, the reed will be sleyed 2-1/2" wide).

Next, bring the thread straight through the Tension Peg section, between the larger adjustable Tension Pegs and the smaller, stationary Pegs or just above the smaller stationary Pegs if you have removed the larger ones.

Thread the first end through one heddle on the Front Harnesses, nearest to the back plate. The next end will go through the first heddle on the rear Harness. Repeat this, alternating harnesses for the rest of the ends. The heddle system will be used later to create the Threading Cross.

Now thread the end through the front Pivoting Reed. Here you have a choice of using an eight dent or ten dent reed. Pick the one that can be sleyed evenly and as close to the desired section width as possible. If you cannot get the exact width of the section, sley your reed slightly wider. This will make it just slightly wider than the space between the hoops. The section will be narrowed down by pivoting the Reed. Never sley the reed narrower than the section on the Beam because it is critical that the ends wind on evenly across the width of each section. If the ends are set too narrow at the Pivoting Reed, there is no way to expand it.

After the Tension Box is completely threaded, move the larger Pegs downward and tighten their wing nuts securely, to apply tension to the yarns. The further down the Pegs are moved, the more tension will be applied to the yarn. This is an adjustable system as different yarns require more or less tension. With a heavy wool, the Pegs may only need to be moved half-way down, whereas with a fine silk, the Pegs may need to be moved all the way down and the yarn wrapped an extra time around one of the stationary Pegs to get the proper tension. Once you have adjusted the tension correctly, do not change it during the winding of the Beam, as long as you are using the same type of yarn.

Once the Tension Box has been threaded, it is not always necessary to rethread it. If you need to change spools or cones, simply tie the new ends on to the old ends just before the rear stationary reed and pull gently on the old ends until the new ends have come all the way through the box.

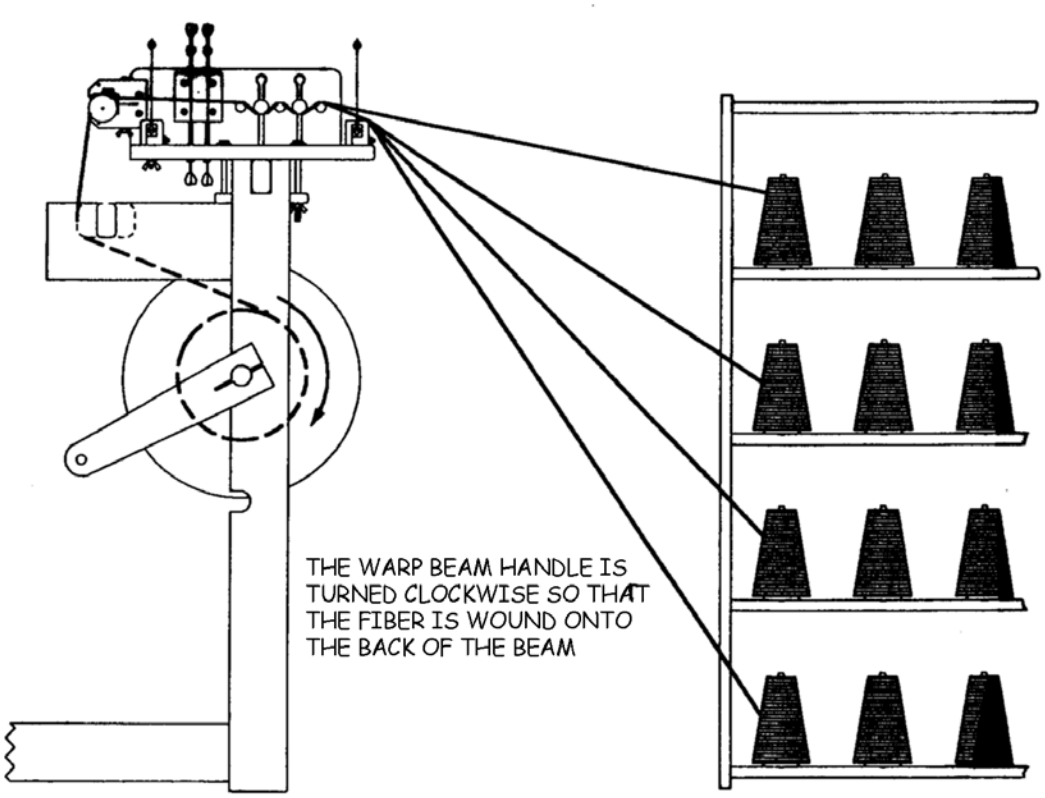
# V-SERIES - WARPING THE SECTIONAL BEAM

**WINDING THE WARP**

In Chapter 3 you installed the Brake/Tension Device. Before winding on the warp, there are a few small things to take care of on the loom. First, check the tension device to make sure the rope is wrapped three times around the tension drum and that the rope end is clipped to the spring, which is held by the Hook Bolt. Test that you are able to turn the Beam in a clockwise direction. If this proves difficult, you can let some length out of the nylon cord by pressing on the toggle button and moving the toggle up and down on the cord. This will allow you to turn the Beam backwards during winding, while stabilizing the Beam when it is at rest. Don't forget to retighten the cord before you begin threading the heddles!

Before you start winding the warp, the Extension Cord must be attached to the Beam and the section of the warp to the Extension Cord.

First, wind the tied end of the Extension Cord around the Beam Axle. At the knot, separate the two ends and pull the other end of the cord all the way through and tighten the Extension Cord around the axle.



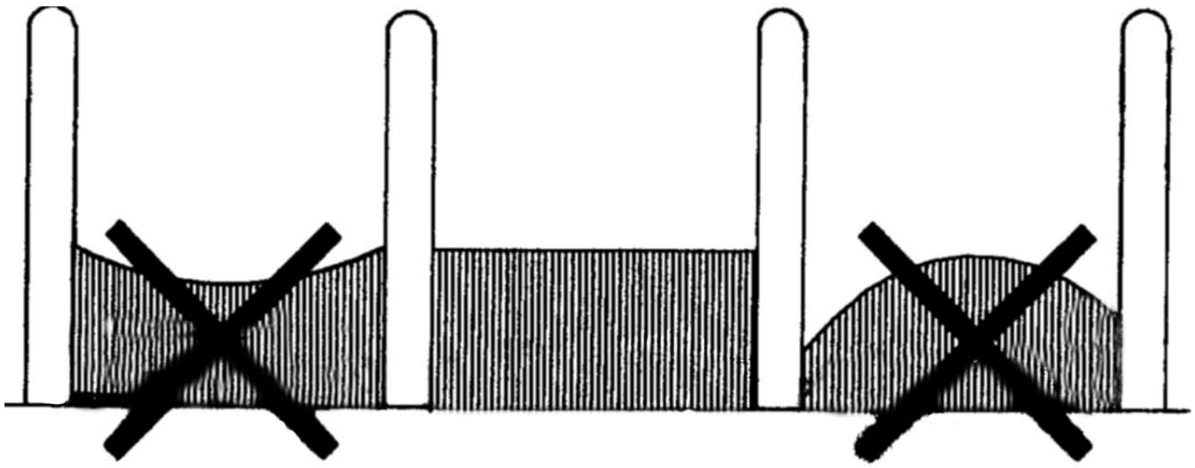

WINDING ON THE WARP

Next, tie an overhand knot near the end of the warp threads from one section and slip that knot into the opening of the larkshead knot you create in the Extension Cord. Pull it tight.

Line up the Tension Box approximately over the section you will be winding.

**ADJUSTING THE SIZE OF THE SECTION**

Now, slowly wind about one revolution onto the Beam. As you wind, you will need to fine-tune the placement of the Tension Box along the track. When it is centered properly, tighten down the wing nuts under the Tension Box. At this point, you can pivot the "pivoting reed section" so that the yarn comes close to, but doesn't quite touch, either the hoop to the left or the hoop to the right. Now tighten the wing nut under the pivoting reed. This shouldn't need to be readjusted until you are using yarn of a very different size in another section.



Extra care to correctly center and adjust the width of each warp section will result in more perfect tension while weaving.

Make sure that the threads are going on to the Beam in flat layers. If you notice that warp piles up at the hoops, the section of the warp is too wide. If the warp falls down at the hoops, the warp section is too narrow.

If any of the above is happening, gently unwind the warp (into a box, perhaps) and pivot the front reed on the Tension Box again until you get perfectly flat layers. This is very **important**, otherwise you will end up having different length threads in one section, since the circumference of the Beam within the section is not going to grow evenly. This uneven tension will end up causing lots of tension problems.

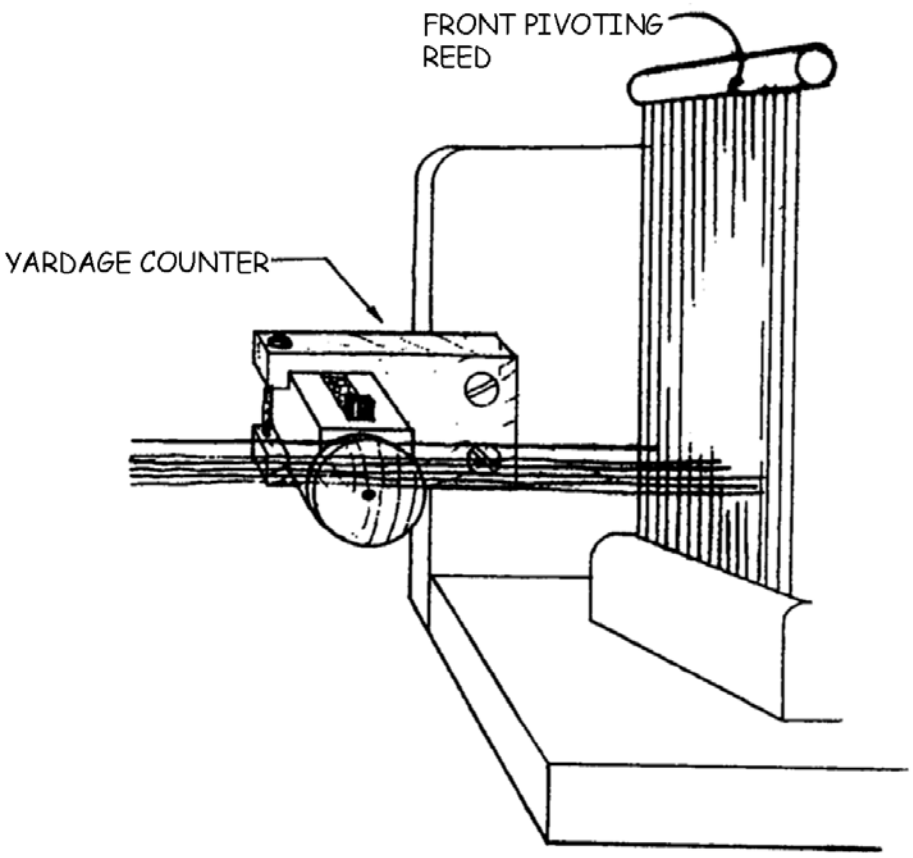
**COUNTING TURNS OR YARDAGE**

To determine the length of the warp you are putting on the Beam, you need to count either turns, revolutions, or yards.

To count turns, you can do it in your head, but it is more reliable to use a digital or mechanical revolution counter.

Counting revolutions even with a digital counter will only give the approximate warp length, because the circumference of the Beam will increase slightly with each rotation. This is called "Beam Build Up".

To count yards with a Yardage Counter while warping the Sectional Beam, you need to place the Yardage Counter at the front of the Tension Box. You should use an extra thread for measuring yardage, because if you use one of the threads from your warp section, that particular thread would have a different tension once you start weaving. The extra thread you use for measuring purposes can then be reused for each section.




ATTACHING YARDAGE COUNTER
TO TENSION BOX

**CREATING THE CROSS**

When there is about a half-yard left to be wound onto the Beam, it is time to make the Threading Cross. Simply push on the rear Heddle Frame of the Tension Box, making half of the threads go up and the other half go down.

Now slip in an 8” piece of contrasting thread (called a c) through the opening (called a Shed) created between the threads above and the threads below. Position this Marking Thread about halfway between the Tension Box and the Separation Beam (AKA the Breast Beam).

Now push down on the front Heddle Frame, making the other half of the threads go up. You may need to give a gentle tug to the section, behind the Box, to help the threads separate into the new Shed. Now take one end of your Marking Thread and bring it through this Shed. The two ends of the Marking Thread should now be together. Tying them in a bowknot, you have just made the Cross. Continue to wind the first section on, until the Cross is nearly on the Beam. Cut the ends, and secure to the section using a piece of masking tape.

Continue winding all the sections in the same manner by moving the Tension Box along its track.

Remove the Tension Box from its track in the Back Beam and flip the Beam over.

Replace the Separation Beam into its former position atop the front verticals, with the groove facing down, the better to now serve you as the Breast Beam.

**INSERTING STICKS IN THE THREADING CROSS**

When all the winding is complete, remove the rubber tape, unwind a few feet of warp from each section, and slip one lease stick through the path created at one side of each Marking Tie. Now slip another lease stick through the path created by the other side of each Marking Tie. Secure the lease sticks together, leaving about two inches between them, using masking tape or string through the end holes of the lease sticks. Now bring the lease sticks, with the warp ends, around the outside of the loom and over the Back Beam, so that warp travels towards the center of the loom (harnesses).

**READJUSTING THE TENSION**

Now tie the lease sticks on the side of the loom so that they are at eye level when you are in your threading position.

To keep the warp from slipping forward during the threading process, retighten the tension rope around the pulley and tension drum and clip the rope end to the spring.

**COMBINING SECTIONAL AND PLAIN WARPING**

If you are winding a very fine warp, say forty ends to the inch or more, and do not have or do not want to wind a lot of spools or cones, it may be more convenient to wind separate warp sections on a warping board or reel and go from there directly to the Sectional Beam. If you decide to do this, however, your warp will be limited in length by what will fit on the warping board or reel. If you choose this method, follow these steps:

1) Calculate number of threads for each section on your Sectional Beam.

2) On the Warping Board or Warping Wheel, make "baby warps" for each section on your Beam.

3) Make crosses at each end: raddle cross on one side and thread-by-thread cross on the other.

4) Take the warp off the board or reel by taking off the thread-by-thread cross first.

5) Put the warp threads from a first "baby" warp in the Raddle, making sure that threads are spread evenly and that they are creating flat layers when wound on the Beam. Put the raddle top on or secure warp threads with rubber bands.

6) Instead of a regular raddle, you can put a mini-raddle in place of the front reed on the Tension Box. In this case, the Tension Box is used only for guiding threads into the sections. It is not necessary to sley threads in the Tension Box, either through the harnesses or through the back reed, and you do not need to adjust tension with the Pegs.

7) Attach each baby warp to the Extension Cords and proceed as in regular Sectional Beaming procedure.

8) Since you are not using the Tension Box for tension, be sure to keep it taut manually.

9) When you come close to the end of the section, take the reed cover off and continue winding the rest of the baby warp.

10) Secure that section to the Beam and continue to the next one.

If you wish to utilize the Tension Box to maintain tension on your warp during the Wind-On phase, it will be necessary to make a Cross at both ends of your warp. If you can make your warp slightly longer, you can use the extra length to leave in your Tension Box for the purpose of tying on the subsequent sections.

# V-SERIES - THREADING, SLEYING, & TYING ON

## PREPARATION FOR THREADING

To prepare for threading, tie the threading cross-sticks in a comfortable and visible position between the Back Beam and the harnesses.

You may also find it helpful to raise the harnesses. To raise all the harnesses, turn on the E-Lift, with the Double Action off, and pedal once. It is not necessary to turn on the Compu-Dobby at this time.

It is helpful to remove the Breast Beam and the Beater for further comfort and accessibility.

The important thing in threading is your comfort. Take the time to position everything so that your body feels at ease while threading.

## THREADING THE HARNESSES

Now we're ready to thread the loom. If you are right handed, it is recommended to start at the right side of the warp. Grasp one group of ends in your left hand and your sley hook in your right hand. Direct the "hook end" of the sley hook through the "eye" of the first heddle you need to thread. Pull the thread through (for example, if you had a straight draft on eight harnesses, your first thread would go through the eye of a heddle on the 8th harness. The second thread would be threaded through the eye of the first heddle on the 7th harness, the third thread through the first on the 6th harness, and so on).

Some weavers mark the center heddle on each harness and thread from center, out to each side. This allows for leaving an equal number of heddles at both sides of the harnesses, when threading is completed.

**UNUSED HEDDLES**

After threading is complete, make sure that the unused heddles are all pushed to the far sides of the harness sticks between the screweyes and the ends of the harness sticks. For balance, there should be approximately equal numbered groups of unused heddles on both sides of each harness. In some cases, such as a very wide warp with a lot of unused heddles on the ends of the harnesses, you may need to tie each group of unused heddles into a tight bundle with tie tapes or string to keep them from falling off the ends of the harness sticks or you may wish to take heddles off the loom altogether. In the first six months of using a new loom with polyester heddles, the heddles stretch out to adjust to the harnesses. For this reason, we do not recommend removing heddles from the loom for six months.

**SLEYING THE REED**

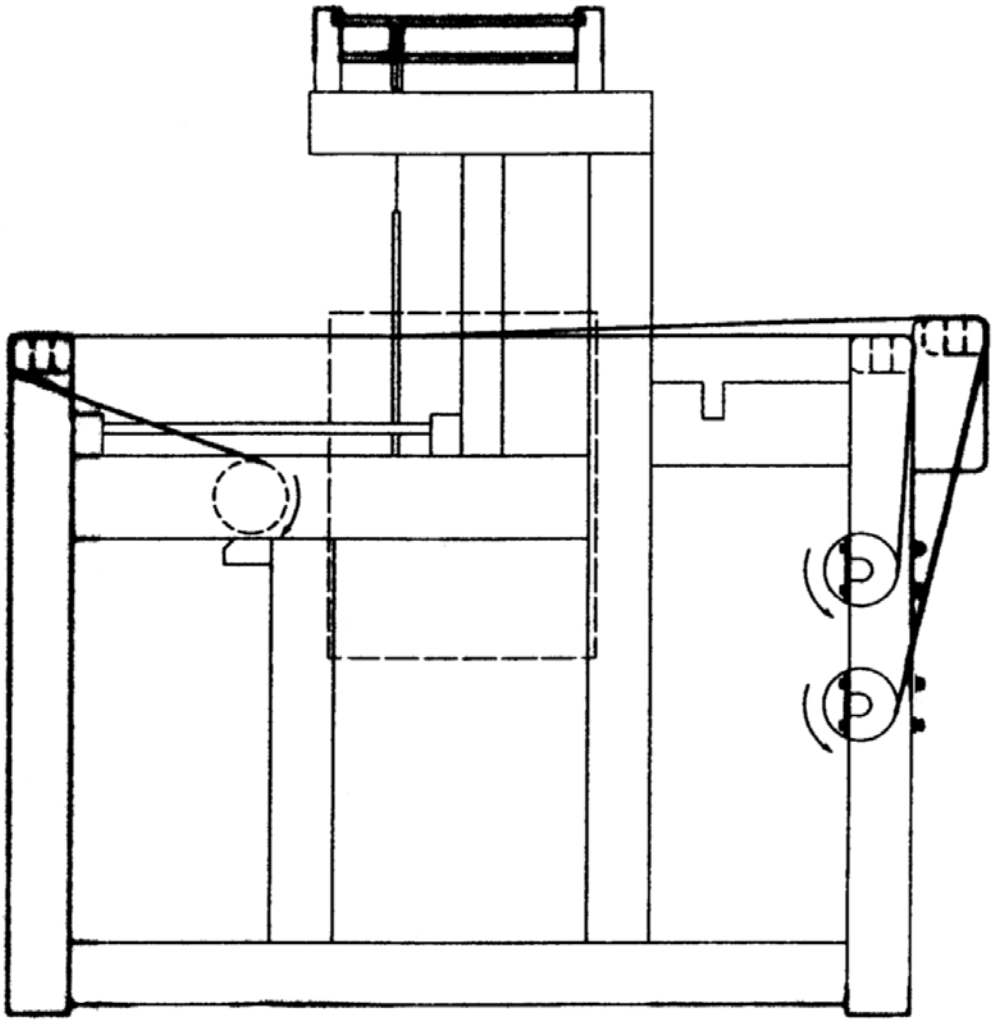
Now sley the warp ends through the reed. Some weavers start from the right side; some from the left; some in the middle. But, in all cases, be sure to measure accurately before starting so that the warp will be centered in the reed (or offset four inches to the right if the warp on the beam is already offset). Weavers have various ways of positioning and stabilizing the reed between the harnesses and the Breast Beam for ease during the sleying process.

**TYING ON TO THE APRON**

Now that you have your warp ends ready to tie, we need to prepare the apron. The ends will be tied to the apron rod.

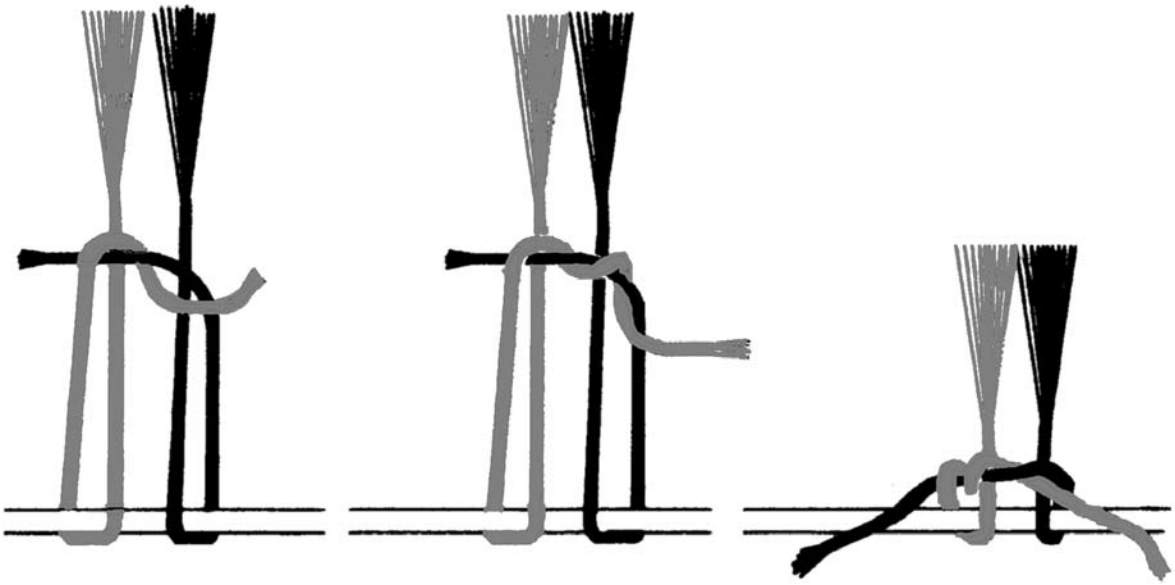
Notice that the apron has two hemmed ends. One end has loops on it and the other end has a velcro strip. The Cloth Storage Beam also has a velcro strip. Measure to find the center of the Beam and, using tape, mark the center above the velcro strip. Find the center on the apron, at the end with the velcro and fold it in half, with the velcro doubled on itself and facing out. Match center of your fold to the center of the Beam velcro, with the apron length hanging to the floor. Press the velcro strips together firmly, while pulling gently toward each side of the beam, making sure it is centered.

Now you can remove the tape marker and, turning the top of the Beam away from you, wind so the apron is wrapped once around, holding itself in place. Route the apron underneath the Cloth Beam and, towards the harnesses. Spread it out flat and center it over the Cloth Beam and insert the metal rod into the loops at the hem.



WARP ROUTING

Now tie the ends to the metal rod. Starting from the middle, bring a first bundle toward you over the apron rod, then around and under it. Divide it in half and bring one half up on each side of the bundle. Use the ends to tie a surgeon's knot. It is the same as the first tie you make tying a shoelace, except you loop the end through twice. This kind of knot is very good for hold and readjusting the tension.



Start with one section in the middle, then the far right and the far left outside ones. Work your way in. After tying the knot, pull only until you feel some resistance and tighten the knot and proceed to the next section.

By now, the sections that were tied first maybe quite a bit looser than the ones tied last. To correct this, you do not need to untie the knots, simply grasp the ends and pull them away from you, then re-tighten the knots, remembering to only pull until you feel, what is now, a uniform resistance at each group. Repeat this until all of the sections are at approximately the same tension. It is important to remember at this point, that you are not tying to achieve weaving tension, only *uniform* tension across the width of your warp. Attaining weaving tension is what the Cloth Beam Ratchet is for!

**TYING ON TO AN OLD WARP**

A new warp can be tied on to an old warp, thus eliminating the threading and sleying process, if the new warp introduced into the loom uses the same threading pattern and E.P.I. as the last warp. This process is especially good for production weavers as it saves time. It also takes less concentration and there is less chance of making mistakes in threading.

The tying on process starts when you are finishing the last warp on the loom. Before you cut off the fabric from the old warp, make sure to leave enough unwoven warp to extend one foot behind the harnesses, through the heddles, and about six inches past the reed when the beater is in its rear position. Now open two opposite tabby sheds and insert the lease sticks into these sheds behind the harnesses. Secure the sticks together with tie tapes through the holes.

Now carefully cut the fabric from the loom and tie bundles of warp coming through the reed together with a half-knot so the yarn can't slip back through the reed. Cut the warp in back (leaving one foot past the lease sticks) and also use a half-knot to tie bundles of yarn together for security.

After winding on the new warp on the Beam, you can sit behind the loom, on a small stool and tie corresponding yarns from the two sets of lease sticks together. An overhand or weaver's knot work well. This may seem slow at first, but you will work up a faster rhythm with some practice. A good goal to reach would be to tie 200 to 250 ends together an hour.

When all ends are tied together, go to the front of the loom and gently pull on the bundles of yarn going through the reed to pull the new warp through the heddles and reed. You may find that turning small bundles of the warp in a circular, clockwise motion will help the through the heddles and reed. Then tie on to the apron.

**E-LIFT II**

1) Power Switch

2) Double-Action Switch

3) Cable Functions

4) Explanation – works independently of the Compu-Dobby

**BRAKE SYSTEM**

Your V-Series Loom is equipped with a locking brake system. This means that the Warp Beam will be held absolutely captive — will not release warp — until you depress the Brake Pedal. It's fairly foolproof and affords very taut warps. When your fell has moved as far forward as you're comfortable, and you wish to advance your warp, quickly depress the pedal with a short, tap-type motion and crank the warp forward with the Cloth Advance Handle. You will have one Brake Pedal per Warp Beam and you'll need to depress them separately, if you wish to advance from two Beams, maintaining two separate tensions.

If you find that the Brake Cable is not releasing properly, even when you've fully depressed the pedal, try releasing a little of the nylon cord from the toggle, in short increments. If this is unsuccessful, you may need to remove the Warp Beam Tension Cord and lightly sand the groove in the brake drum (use 220# sandpaper or finer). In times of high humidity especially, the grain at polar sides of the drum may raise and prevent the cable from slipping. **Never, under any circumstances, should you apply wax, talc, or other finishes to the groove**. The wood here needs to be raw for the mechanism to operate as intended.

If you remove the Brake Cable, please be sure, when you reinstall it, that the looped end is secured to the "J" bolt, that the cable is drawn immediately up from this bolt and around the back of the drum (x3), and that it then routes down the front of the drum where it connects to the spring at the pedal. Be sure the cable does not cross over itself at any time.

If the cable is installed in the wrong direction the Beam will turn easily toward the front of the loom and you will be unable to establish good tension.

# V-SERIES - LOOM CONTROLS

**CLOTH STORAGE SYSTEM**

The Cloth Storage System consists of the Cloth Storage Beam (immediately in front of your knees), the Cloth Storage Apron, and the Cloth Advance Handle and pawl.

As directed in the preceding warping instructions, you'll secure the front of your warp to the Cloth Storage Beam via the apron. Use the handle at the right of the Beam to advance the warp and raise the tension. Simply release Warp Beam tension by depressing the Brake Pedal(s) as described above, push the handle forward to engage in the toothed ratchet, and rotate it down. It will wrap the warp onto the beam and draw the fell away from the Beater. The Pawl is that finger device that engages in the ratchet. Its job is to keep the Beam from rolling backwards and it must be engaged to hold the tension.

**REMOVABLE BREAST AND SEPARATION BEAMS**

You will have either two or three of these Beams. They are interchangeable and, besides enhancing the structural integrity of the loom and giving you a convenient armrest, serve to establish the warp in its horizontal plain. The Beam at the front of the loom is called a Breast Beam; the Beam at the rear, the Back Beam, or Separation Beams, in the event you have two Warp Beams. Illustrations in the Assembly Instructions identify the mounting position of the second Separation Beam, if you have one. These Beams can be moved to the interior slot to help with winding-on and threading.

**SWINGING BEATER**

The Swinging Beater is a standard feature of the V-Series Loom. You may square (or "rack") it by loosening the four bolts that attach it to its arms, bringing it fully forward and retighten, while holding it firmly in place. The Swinging Beater will not take a good adjustment unless a reed is in place.

The angle of the race can be adjusted to one of three positions furnished by the three steel pins in the Beater Support. The slots in the lower end of the Beater Legs will easily fit over these. Be sure both sides are on matching pins.

The height of the Beater can be adjusted as well, by turning the three-pointed Knob mounted to the bracket on the Beater Support, to raise or lower the support. You may wish to use a small level to ensure that you have made equal adjustments to both sides of the Beater.

**SECTIONAL BEAM**

If you have purchased a Sectional Beam, you will find it to be extremely adaptable to your needs. Because each of its hoops is removable, you may create sections of any width you like, provided they are calculated in one-inch increments. Tying on to the beam is explained in the section entitled *Sectional Beam Warping*.

There are two things to remember:

1) You may only use a Sectional Beam in the upper position and …

2) The loom will not accommodate more than one Warp Beam if you are using a Sectional Beam.

**PLAIN BEAM**

The Plain Beam is provided with an apron, which will allow you to maximize the length of your warp. You may use two Plain Beams at a time; however, if you do so, please orient them so that the handle on the *Upper* Beam is to the *left* side of the loom and the handle on the *Lower* Beam is to the *right*.

**DOBBY HEAD AND COMPU-DOBBY**

The Dobby Head is that many-cabled box hanging from the right of your loom. It works in tandem with the Compu-Dobby and together they provide the interface between your computer and loom. The operation of the Compu-Dobby is explained in its own manual and we won't reprise those instructions here. Suffice it to say, that it is extremely important that you achieve and maintain a good adjustment of the Solenoid Box. If this device is out of tune, your harnesses will behave erratically.

These are the basic components on your loom. You've a world of weaving ahead you, so best get started!

**HARNESS SPRINGS**

There are two springs of for each harness. The purpose of these springs is to stabilize the harnesses and encourage their vertical fall when the shed is released. Some threadings, such as Summer/Winter, call for many more ends to be carried on one or two harnesses. In this instance, you may experience "Harness Float". An indication of this problem is the looseness of heddles on a particular harness, above the warp ends, and the ends pushing against the top of the heddle eye. If you find that this is interfering with your looms ability to create a clean shed, you may wish to order a few extra springs to help alleviate this problem, mounting a second spring on the eyehooks, below.

**HARNESSES**

You will have ordered your AVL A-Series with either polyester or metal heddles. The supporting harnesses (or shafts) are different for the two heddle types: metal heddles, whether twisted wire or flat steel, are suspended from steel heddle bars mounted in rigid frames; polyester heddles are carried on Harness Sticks, top and bottom. In all cases, the harnesses are stabilized at the bottom by a series of spring-tensioned levers, Spring Levers. These hold the harnesses down and prevent your heddles from *floating*.

Some weavers like metal heddles because they feel these are easier to thread; others prefer the lighter and quieter polyester heddles.

On occasion you will find that one or more of your harnesses will misbehave. That is more likely to happen with harnesses with Polyester Heddles. There are a finite number of things that can cause these problems.

## TABLE 1 / HARNESSES

| Symptom | Possible Cause | How to Fix it |
|---|---|---|
| A.) One or more top harness stick collapses; it assumes a diagonal angle and one leg of the harness cable from which it is suspended goes slack. | 1.) Your heddles are bunched together towards the center of the harness or on one side only. This is a problem because the heddles are part of the harness structure. | Move a few heddles to each end of your harness sticks; just to the inside of the harness wires that connect the top and bottom sticks. That way your harnesses will be balanced. |
| | 2.) The harness cable supporting the shaft has come out of its pulleys at the top of the loom. | Trace the cable back through its pulleys in the Harness Pulley Support and make sure that the cable is properly seated. Check the action of the Dobby Cable as well. Make sure that it moves easily up and down. If the Dobby Cable seems to bind, check for debris in the hole where it comes through the Dobby Top. You may need to use a very thin piece of wire to dislodge accumulated yarn dust or other debris. |
| B.) The heddles float; they are lifted upwards by the warp thread when you tension the warp and your shed is not even or not large enough. | 1.) The tension in your warp is greater than the tension in the springs that hold the harnesses down. | Take up a link or two in the chain that spans the Harness Spring Levers for that particular harness. Check the result and take-up more links if you feel you need more hold-down tension. Do not try to make all chains the same size. The size will depend on how much tension is required for each harness depending again on the number of threads going through that harness. |
| C.) One or more harnesses that are supposed to raise don't. | 1.) Left treadle isn't being pressed all the way down. | Concentrate on getting both treadles all the way through their travel. |
| | 2.) Dobby arm out of adjustment. | Realign the dobby arm according to the assembly instructions. |
| | 3.) Dobby cables out of finger slots. | Rearrange the cables according to the assembly instructions. |
| D.) Harnesses don't raise properly. | 1.) Harness cables have been hooked to the wrong harness. | Rearrange the cables. |
| | 2.) Chains from the spring levers have been hooked to the wrong harnesses. | Rearrange the cables. |
| | 3.) Copper hooks on the spring levers have been bent. | Straighten the hooks with pliers. |
| E.) Harnesses jam up on each other. | 1.) Heddles are not distributed evenly over the harness sticks. | Redistribute the heddles evenly on both sides from the center of the harness sticks. |
| | 2.) Harness wire that connects the harness sticks has jumped out and got stuck in the heddles of the other harness. | Pull the wire out, make sure it does not catch any heddles, and replace it to just connect the top and the bottom harness sticks.<br><br>If you have a large number of extra heddles on each side, you might want to tie them in bundles to prevent getting caught by the harness wires. |

## TIGHTENING THE BOLTS

The single most important thing you can do to extend the life of your loom, and preserve its operation, is tighten the bolts that hold its frame together. These will loosen over time, due to changes in its environment and to your own creative exertions. A loom which is allowed to become loose-jointed will certainly cost you weaving time, perhaps affect the quality of your work, and definitely become older than its years.

| Loom Parts | Lubrication and Cleaning |
|---|---|
| Shuttles, Shuttle Race, Single-Box Flyshuttle Picker Grooves | Paste Wax |
| Slide Rods (sliding beater rods, bobbin winder) | Steel Wool |
| Axles (pulleys, spring levers, overhead beater) | Silicon Spray |
| Warp Beam Metal Rods (where metal works against the wood frame) | Paraffin |
| Warp Beam Brake Drum | Sandpaper |

## LUBRICATION AND CLEANING

There are several mechanisms on your loom which will benefit from the occasional light application of an appropriate lubricant. Not all lubricants are suitable in the weaving environment. Machine oils and greases, for example, may provide plenty of slick, but they also capture yarn dust and will, over time, actually impede the action of your loom.

## CLEANING THE E-LIFT FILTERS

Occasionally you will need to clean the air filters, which 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 filters are completely dry before you replace them.

## CHECKING CORDS AND CABLES

Check all cords and cables for wear. All machines wear and cords are usually the first things that fatigue on a loom.

**TOOL KIT AND SPARE PARTS**

Here's a list of the basics, nice-to-have-around items:

1) Minimum Tools

- [ ] Socket Wrench with
  - [ ] 7/16", 1/2", 9/16" socket
- [ ] 6" or 8" Crescent Wrench
- [ ] Medium Standard Blade Screwdriver
- [ ] 4-1 Screwdriver or Medium Phillips and Standard Screwdrivers
- [ ] 1/8" Allen Wrench
- [ ] Level
- [ ] Paste Wax
- [ ] 0000 Steel Wool Pad
- [ ] 220# Sandpaper
- [ ] Paraffin Wax

2) Spare Parts You Might Consider Having

- [ ] Spare Treadle Cable (left/right)
- [ ] 6' length of 350# Braided Dacron
- [ ] Cord (for emergency repairs)

AVL offers free technical support to the original owner of all our looms. This means if you ever have a problem, you can call, fax, or e-mail us and we'll help you find a solution. Please take advantage of this service; your satisfaction is extremely important to us.

Customer Service Phone: (530 893-4915)
Fax: (530) 893-1372
E-Mail: info@avlusa.com

**AVL WARRANTIES**

Your loom carries a full warranty on parts and labor for two years from the date we ship it to you. Your Compu-Dobby is fully warranted for two years. If a part wears or breaks during this period, we will replace or repair it at our discretion, but at no charge to you.

**AVL RETURNS POLICY**

All goods, excepting software, may be returned for refund within thirty (30) days of the shipping date.

A 15% restocking fee will be assessed for all but defective items.

AVL will pay all shipping costs for defective items within the continental United States for the entire warranty period. Special provisions apply for the return of looms (please contact your sales person for more information).

AVL will generally return repair or replacement items via UPS Ground service. Additional charges for expedited shipping are the responsibility of the customer.