

Industrial Dobby Loom User's Manual



AVL LOOMS

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INTRODUCTORY INFORMATION

SAFETY

Before Getting Started:

Please read the entire manual before using the loom.

Warnings:

WARNING:

EQUIPMENT SHOULD ONLY BE USED FOR TEXTILE MANUFACTURING. IF THE EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY THE MANUFACTURER, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED.



WARNING:

ELECTRICAL SHOCK HAZARD. DO NOT TAMPER WITH ELECTRICAL WIRES OR OPERATE THE LOOM WITH SAFETY PANELS OPENED OR REMOVED.



WARNING:

PINCH, CRUSH, AND FINGER CUT-OFF HAZARDS. DO NOT OPERATE THE

LOOM WITH SAFETY PANELS OPENED OR REMOVED. DO NOT PLACE HANDS IN MOVING MECHANISMS OR SCISSORS.



WARNING:

EQUIPMENT PANELS ARE AWKWARD AND HEAVY. TO AVOID MUSCLE STRAIN OR INJURY, USE PROPER LIFTING TECHNIQUES AND A HELPER.

WARNING:

DO NOT POSITION EQUIPMENT IN A WAY TO BLOCK OR IMPEDE ACCESS TO DISCONNECTING DEVICES, EMERGENCY STOPS, OR ON/OFF BREAKER SWITCHES

WARNING:

USE OF CONDUCTIVE FIBER OR YARN ON OR AROUND THIS EQUIPMENT WILL VOID WARRANTY AND MAY DAMAGE EQUIPMENT.

WARNING:

THIS EQUIPMENT IS CLASSIFIED FOR LIGHT INDUSTRIAL ENVIRONMENT ONLY. OPERATION OF HIGH-CURRENT DRAW EQUIPMENT (EX. MIG WELDER) ON THE SAME ELECTRICAL CIRCUITS MAY CAUSE EQUIPMENT FAILURE.

Safety Features:

Covers and shielding separate weaver from moving components where pinch hazards exist. Do not reach under covers and shielding while the loom is operating.

IDL SETUP

INTRODUCTION

Your Industrial Dobby Loom (IDL) is designed to be low-maintenance and easy to use. If you are an experienced power loom weaver, you may initially think this loom is a little quaint. If you're more familiar with handlooms, it may seem impossibly busy and complicated. With a little hands-on experience, however, you'll find that the IDL is just right. Considerable attention has been paid to the needs of the weaver. In addition to those things we know you'll need, we've provided features that we think you'll want. For example, the cloth beam can be removed so that you'll have more working room when sleying the reed and we've placed the main operating controls conveniently front-and-center. Feature for feature, you'll soon discover that the IDL is the best loom in its class.

ABOUT THIS MANUAL

While the IDL is simple to use, there is some information you need to know, like how to start the IDL, how to make adjustments, and what you'll need to do to keep your loom in top working condition.

We have provided detailed steps to follow and illustrations to guide you.

You will also find a Maintenance and Troubleshooting section in the back of the manual.

PREPARATIONS

Your IDL will have been assembled and tested before it left the factory. An AVL technician will, in most cases, have uncrated and installed the loom at your facility, run it, and made any necessary adjustments. It is also likely that someone on your staff will have been oriented to the loom.

SAFETY

The first part of this manual shows the safety warnings and features that apply to the IDL. Anyone who has access to the IDL must be aware of these warnings.

Let's talk about some safety rules that you need to follow to safely use the loom. Remember that any piece of equipment, from a hammer to a buzz saw, can be hazardous if it's misused or misunderstood. The IDL is fitted with a variety of safety devices, but the critical element in using this machine safely is your **ATTENTION TO THE RULES**. The rules are:

1. Never, under any circumstances, remove or disable one of your loom's safety devices.
2. Err on the side of caution: if something seems wrong, assume it is. Stop the loom until you've figured it out.
3. Don't take chances — be particularly careful about your hands.
4. Disconnect both electrical power and air before you do any maintenance on your loom.
5. Don't guess. If you're unsure about anything, and this manual doesn't help, call our technical support number at 800 626-9615.
6. Never stand at the end of the shuttle boxes when the loom is in motion.

BE SAFE!!! You'll come across other safety tips as you read more about your IDL. **PLEASE**, if you read nothing else in this manual, read this safety information!

Stopping your loom safely

It is important to understand how to stop your loom safely, especially if an emergency occurs. Always pay attention to where you are in relation to the moving parts of the loom. Normally, you will use Stop or Pause to stop the loom when weaving.

In an emergency where the loom needs to be stopped immediately, you should use the Emergency Stop. However, anything that has already been placed in motion will complete that motion. For instance, if the shuttle has been thrown, it will not stop until it hits something.

- 1) There are three ways to stop your loom:
 - a. Press **STOP**
 - b. Press PAUSE
 - c. Press EMERGENCY STOP



Figure 1 - Control Panel

Each of these actions will bring the loom to a standstill; but, different situations call for different methods.

Control	Application	What Happens
STOP	To stop the loom at the end of the present cycle. Can be used for any reason.	Loom works to the end of the cycle and stops.
	To resume, press RUN.	The new cycle will begin properly.
PAUSE	To pause the loom mid-cycle for any reason.	Interrupts the loom, mid-cycle.
	Press PAUSE to resume.	The cycle should resume with the next action. Check to make sure the next expected action occurs.
EMERGENCY STOP	To stop the loom immediately.	Stops the loom at the current action. The cycle will not complete.
	Turn the loom on, and press RUN.	The loom resets to the beginning of the next cycle. This may result in a flaw in the fabric if it is not accounted for.

Restarting After an "Emergency Stop"

If you've used this mode, your loom will have stopped somewhere mid-cycle; that is, anywhere between a cloth advance and a beater return. However, when you re-start the loom, it will re-set automatically to the beginning of the next cycle. Whatever weaving operations were yet to go when it was shut down will not be completed. If you continue weaving in the **AUTO** mode, you'll develop a flaw in the fabric.

Note:

Before re-starting the loom, make sure the shuttles are firmly in their boxes and the warp yarns are correctly in place.

- 1) Switch the loom to **Manual** at the Control Panel.

- 2) Determine where you are in the weaving sequence.
- 3) Use the hand control to advance through the remaining steps of the cycle. As a reminder, each cycle consists of the following sequence of steps:

 ADVANCE → DOBBY → SHUTTLE → DOBBY → BEATER →
 BEATER
- 4) Return the loom to **Auto**, press **Run**, and continue.

ADDITIONAL LOOM SETUP

Normally, the IDL is setup by an AVL technician. Depending on the circumstances of your particular installation, you may need to provide some additional setup.

Square and Level the Loom

Please make a note of this process, as it is an important part of the maintenance of your loom. Your 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 to the inside corner of the front right vertical.
 - b. The distance from the inside corner of the rear right vertical to the inside corner of the front left vertical.
- 2) These two measurements should match. If they do not, you will need to adjust the frame slightly.
- 3) Now, using a level, check to see if the frame is level front-to-back, place a carpenter's level along the top of each Top horizontal.
- 4) Check side-to-side by placing the level along the length of the Cloth beam and, again, along the Lower back framing member.
- 5) Depending on the flooring, you may need to use shims under the four corner verticals in order to achieve level.

- 6) Once the loom is square and level, check and tighten all bolts and nuts that connect the frame pieces.

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.

Flexible Air Link

If the air line from your compressor is made of a rigid material (steel pipe, PVC, copper), we suggest that you provide a flexible link between it and the loom. Simply connect a foot or more of ½" air hose between the FR and the end of the compressor line. This link will dampen vibration between your loom and the incoming air line, lessening the possibility of loosened fittings.

Floor Brackets

Your loom is equipped with special shock absorbing pads which will retard its tendency to "walk". In some situations, the loom may need to be anchored to the floor. Brackets made for this purpose are available from AVL.

If you opt to bolt your loom to the floor, be sure to first check that it is square. Bolting the loom to the floor will, over time, reduce the need to adjust the loom for square. It will also reduce the need to make adjustments to the flyshuttle boxes.

Power Supply

AVL strongly recommends that you use a surge protector and an Uninterruptable Power Supply (UPS) with your loom. These will protect the electronics in your loom from power outages and fluctuations.

Note:

If the IDL stops unexpectedly due to a power outage, check the loom carefully for any damage before restarting. Also check the warp and the woven cloth to make sure nothing was damaged.

SETUP YOUR COMPUTER

Your AVL technician should have installed the software for the IDL on your computer and connected it to the Compu-Dobby.

There are several ways to connect the Compu-Dobby to the computer. The most common is with a USB cable.

For complete information on using the software, please see the software manual.

SETUP THE AIR SYSTEM

Compressor

Your compressor must be able to deliver a minimum of 25 cubic feet of air per minute at 115 pounds per square inch.

Filter-Regulator (FR)

The FR (Filter, Regulator) is mounted on the back of the Computer Cabinet. This is where the air line coming from the compressor connects to the loom. The primary function of this device is to control the air pressure coming into the system.

Air pressure is measured in pounds-per-square-inch (P.S.I.). If you're not familiar with pneumatic systems, just think of air as you think of gas in your car. More air equals more power.

You'll see a gauge on the FR and an adjustment knob immediately above it. Turn this knob clockwise to increase pressure. You should start pressure from the FR at 105+ p.s.i. The operating pressure should generally be around 120 p.s.i.

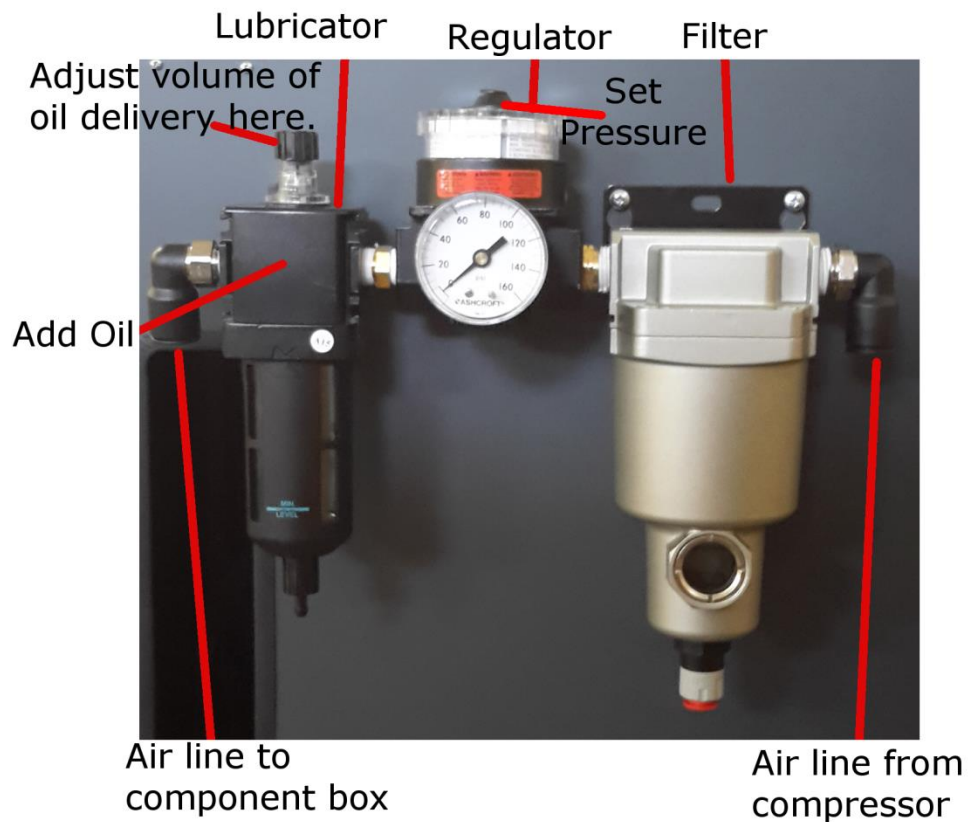


Figure 2 - FRL (may vary)

Regulators

In addition to the FR, there are other regulators that control the amount of air that is delivered to the different loom systems. These are located on the component board in the computer cabinet in the Component box, to the left of the FR. Each regulator has a gauge labeled with the name.



Figure 3 - Regulators

REMEMBER:

Regulators control power. FLOW CONTROLS, discussed below, control the speed at which your systems operate.

Each regulator controls one system and is labeled on the air board in the computer cabinet. Consult the chart below to determine initial operating values for each system. You may find that these settings need to be modified, depending on the weight of your yarns, operating speed, and other factors.

System	P.S.I. Setting
--------	----------------

Beater	60
Cloth Storage	10-20
Dobby	60
Right picker (shuttle)	50
Left picker (shuttle)	50

Cylinder Flow Controls (Speed Controls)

The speed at which each of the loom systems operates is regulated by “flow controls” located at various points on the loom:

Loom System	Flow Control
Cloth Advance	Automatic Advance Cylinder
Harness Lifting	Dobby Cylinder
Box Changing	Box Changing Cylinders
Cloth Storage	Cloth Storage Cylinder

These different systems will operate according to the choreography which you establish. You’ll want the loom to lift, beat, and pick according to your weaving needs at a particular moment. This means you’ll need to set the controls for each of the systems. It sounds much more complicated than it really is and, once you’ve made your initial setting, you won’t need to change them for the balance of your warp. Your installer will make the initial settings. We describe how to adjust these and what they control in more depth later in the manual.

TESTING THE LOOM

You will want to test the loom before beginning to weave the first time, and anytime it has been sitting idle for a long time. Generally when your loom is installed by an AVL technician, they will help you test and run the loom the first time.

To test the loom, open or create a file for plain weave in the software program. Set the software to Loom Control.

We advise that you first operate your loom with empty shuttles. This will give you an opportunity to study the action of the loom and will point out any operating deficiencies. When testing the loom, always start with Manual Loom Control.

PRE-OPERATION CHECKLIST

Anytime you use the loom, you should run through this short checklist before you put the loom in motion:

- Check that the shuttle boxes align with the shuttle race.
- Check that the shuttle boxes traverse their support rods without rubbing or binding (move up and down by hand).
- Check that the air line is connected.
- Check that the power cord is connected.
- Check that the Compu-Dobby is connected.
- Check that the FR and system regulators are at the expected settings.

NORMAL LOOM FIRING SEQUENCE

There is a specific order of events that should successfully complete for the IDL to operate correctly.

- 1) Auto Advance. The warp advances incrementally.
- 2) Dobby Down and Beater Back. The harnesses are opened and the beater is in the back position.
- 3) Shuttle Fires.
- 4) Dobby Up and Beater Forward. The harnesses close and the beater moves forward, beating the new weft yarn in.
- 5) This sequence, 1-4, is repeated.

USING THE IDL

OPERATING THE LOOM

The loom can be operated either in Manual or Automatic mode. Automatic mode will be the mode you use most often for weaving. Manual Loom Control should be used for testing, or correcting a problem. You should put the loom into Manual Control anytime you are making adjustments or corrections to the loom.

Manual Loom Control

In this mode, you will need to push a button on the hand control for each action you want to perform.

- 1) Switch on the Compu-Dobby. Load the pattern you want to use. For testing the loom, load a plain weave pattern.
- 2) Set the **AUTO/MANUAL** control on the Control box to MANUAL.
- 3) Load your shuttles into the shuttleboxes, pushing them all the way against the picker. To test the loom, load an empty shuttle into box #2.
- 4) At the Control box, turn the **TURN ON/PUSH OFF** button clockwise. The loom is now operational.
- 5) Using the hand control that connects to the Control box, depress the **ADVANCE** button once: *the Cloth Beam rotates a degree or so.*
- 6) Depress the **DOBBY** button: *the harnesses lift.*
- 7) Depress the **SHUTTLE** button: *the shuttle shoots.* When testing, test both boxes by pressing the Shuttle button again.
- 8) Depress the **DOBBY** button: *the harnesses drop.*
- 9) Depress the **BEATER** button: *the beater advances.*
- 10) Depress the **BEATER**: *the beater returns.*

If any of the italicized actions did NOT occur, refer to the trouble-shooting guide at the end of the manual. If the loom appears to be operating satisfactorily, proceed to Automatic Loom Control.

Automatic Loom Control

Automatic Loom Control means hands-free operation. Your loom will automatically cycle through its pre-programmed weaving plan; you'll need only to load and replace bobbins as they empty. This will be your usual weaving mode, your production mode.

BE SAFE!! If you need to suddenly stop your loom at any time, push the **EMERGENCY STOP** on the Control Panel.

If you use the **EMERGENCY STOP**, you'll need to pay careful attention to your pattern when restarting the loom. Remember that the **EMERGENCY STOP** will not allow the loom to proceed to the end of the current pick cycle, however, when you restart the loom, it will automatically move to the beginning of the next cycle (see *Restarting After an "Emergency Stop"* on page 9).

- 1) Set the **AUTO/MANUAL** control on the Control box to **AUTO**: the red light on is.

CAUTION:

The next step will put the loom in motion. Be sure that no one is standing at either end of the shuttle race and that all hands are clear of the front of the beater and other pinch points.

- 2) When you're ready, press the green **RUN** button: the green light is on, the red light is off, the loom will run through the weaving cycle continuously.
- 3) Hit the **PAUSE** button at any time to temporarily stop the loom: the green light is off, the yellow light is on, the loom stops. When you are ready to resume, press the **PAUSE** button again: the yellow light is off, the green light is on.
- 4) When you want to stop your weaving session, press **STOP**. The loom will proceed to the end of the current cycle and stop. To shut down the loom, push the **TURN ON / PUSH OFF** button.

REVERSING CLOTH DIRECTION

Sometimes you'll want to reverse the rotation of your cloth; you want to back-up. This is possible on your IDL, but it does require some extra effort and you'll have to unwind the cloth by hand.

- 1) Turn off the Cloth Storage/Regulator Switch at the left side of the loom.

- 2) Lift the Tension Weight Arm to release tension on the warp. You'll want to use a piece of cord to secure the arm to the Upper horizontal on the loom frame.
- 3) Pull the pin at the Cloth Storage beam to disconnect it from the drive hub.



Figure 4 - Cloth Storage Pin

- 4) Remove the spacer clip from the Automatic Advance drive shaft.

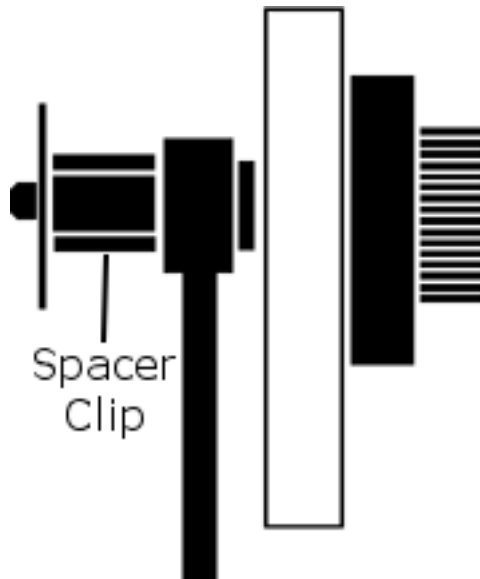


Figure 5 - Auto Advance Engaged

- 5) Disengage the Automatic Advance gear by pushing the axle end toward the center of the loom until the gears are unmeshed and the large washer touches the small bearing housing. Install the spacer clip between the large bearing housing and the gear.

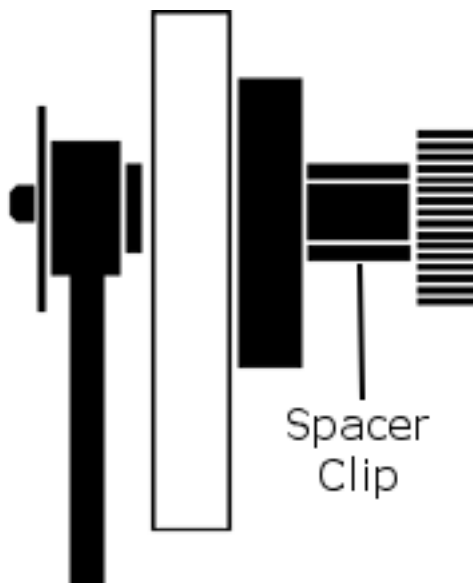


Figure 6 - Auto Advance Disengaged

- 6) Back up the warp.
- 7) Move the Spacer Clip so that the Automatic Advance is engaged.

- 8) Replace the pin on the Cloth Storage Beam.
- 9) Adjust the warp tension.
- 10) Run a few picks on **MANUAL** until the fell line has moved within approximately 6" of the reed.
- 11) Resume normal weaving in automatic mode.

ADJUSTMENTS

You'll need to make certain adjustments to your loom in order to accommodate your changing weaving needs. Most of these adjustments are a matter of refining your preferences as you go or of changing the speed or force at which the loom's mechanisms operate. There are, however, some minimum operating limits that must be adhered to for your IDL to function properly.

Synchronized Loom Motion

There is a particular order in which you'll want to adjust each of the loom's mechanisms. When you've finished, all the systems will work smoothly and in concert. We recommend that you proceed as follows:

1. Automatic Cloth Advance
2. Dobby
3. Beater
4. Box Changing
5. Automatic Cloth Storage

Automatic Cloth Advance Speed Adjustment

Note:

Be Safe!!! Put the loom in Manual mode when making any adjustments.

This setting is made at the Automatic Advance Cylinder on the left side of your loom.

- 1) Find the upper-most cylinder, mounted just below the left beater cylinder. You'll see that there are two plastic air tubes coming into the cylinder.
- 2) At both connecting points, there is an adjusting screw. These are the flow controls.

- 3) Use a small screwdriver to turn each screw in or out.
- 4) Turn the screws counterclockwise to accelerate and clockwise to retard the action of the Automatic Cloth Advance.

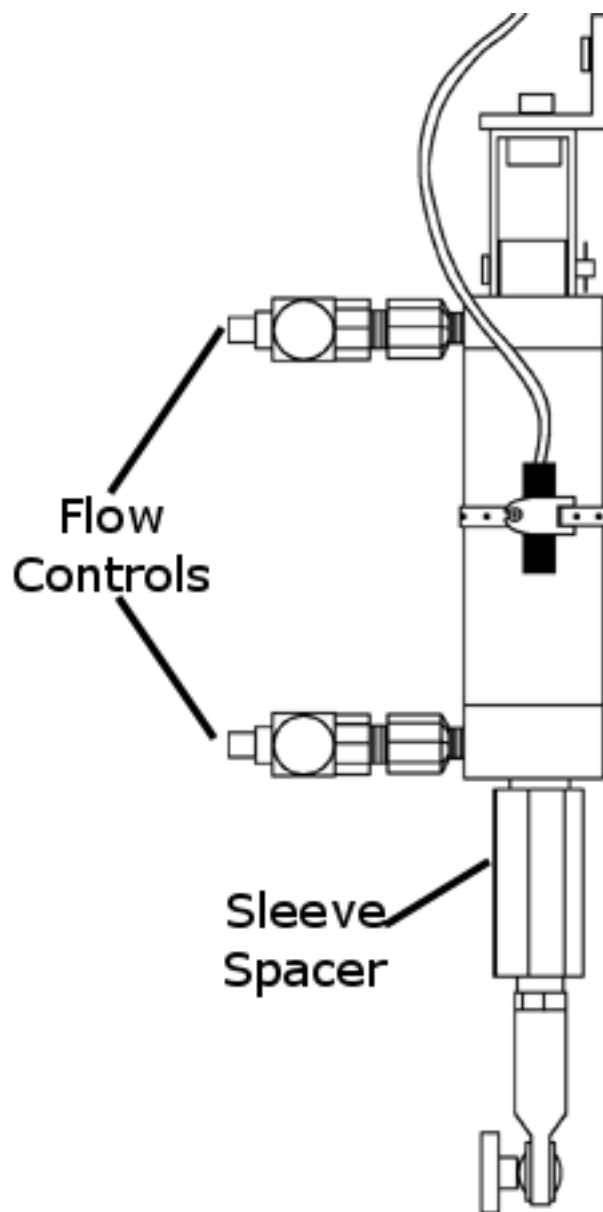


Figure 7 - Automatic Advance Cylinder

Automatic Advance and Cloth Beam Gear Adjustment

To adjust the Automatic Advance and Cloth Beam Gear Mesh:

- 1) Loosen the two bolts holding the left Fafnir VCJT1 bearing.



Figure 8 - Fafnir VCJT1 Bearing

- 2) Rolling the cloth beam toward you, feed a single piece of paper between the small Automatic Advance gear and the larger cloth beam gear, stopping when the paper is trapped between the gears.
- 3) Push down on the Cloth beam to seat the gears into the paper.



Figure 9 - Cloth Beam Gears

- 4) Retighten the VCJT1 bearing.

- 5) Roll the Cloth beam to check for binding between the gears. If the gears are binding you will notice that it gets harder to turn in one spot. If it does, then repeat the procedure with two pieces of paper and so on, until the beam rolls freely.

Dobby Cylinder Speed Adjustment (controls harness lifting)

The speed at which the harnesses are raised and lowered is controlled from the Dobby Cylinder. This is the large air cylinder that extends from the bottom of the dobbie head on the right side of the loom. You set the flow controls on this cylinder in exactly the same way that you adjust those on the Automatic Advance Cylinder.

Remember:

Clockwise retards, counterclockwise speeds.

- 1) Find the cylinder, on the right side of the loom at the bottom of the dobbie head. You'll see that there are two plastic air tubes coming into the cylinder.
- 2) At both connecting points, there is an adjusting knob. These are the flow controls.

- 3) Turn the knobs counterclockwise to accelerate and clockwise to retard the action of the Dobby Cylinder.

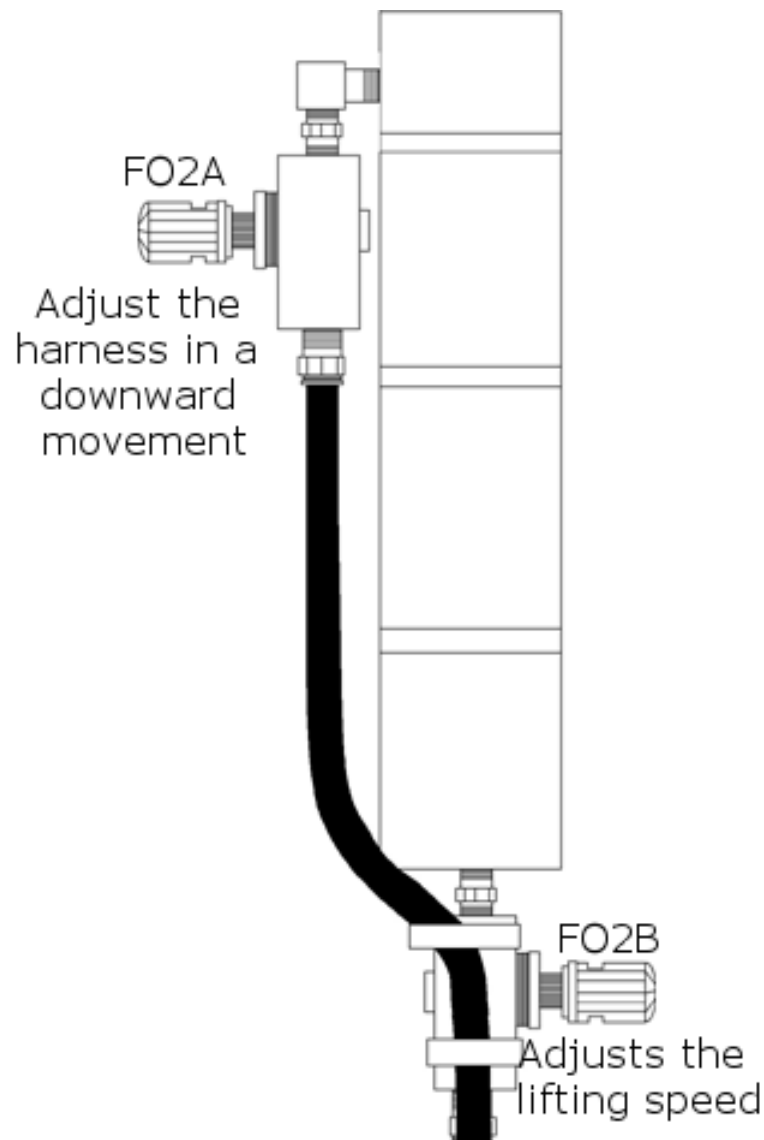


Figure 10 - Dobby Cylinder Speed Adjustment

The action of the harnesses needs to be coordinated with the action of the Automatic Advance.

Shuttle Box Adjustment

The shuttle boxes were adjusted when the loom was first installed at your site, however, over time, they may require some attention. You'll know it's time to check these adjustments if your usually tame shuttle seems suddenly to have become an "unguided missile". There are three alignments essential to satisfactory loom operation:

- Backplate tilt (downward angle)
- Backplate cant (forward angle)
- Shuttle box-to-race alignment

To adjust the shuttle boxes, you will use the bolts attaching the backplate to the side frame first. Once you have the backplate at the right height, you can make minute adjustments to the shuttleboxes by sliding them up or down.

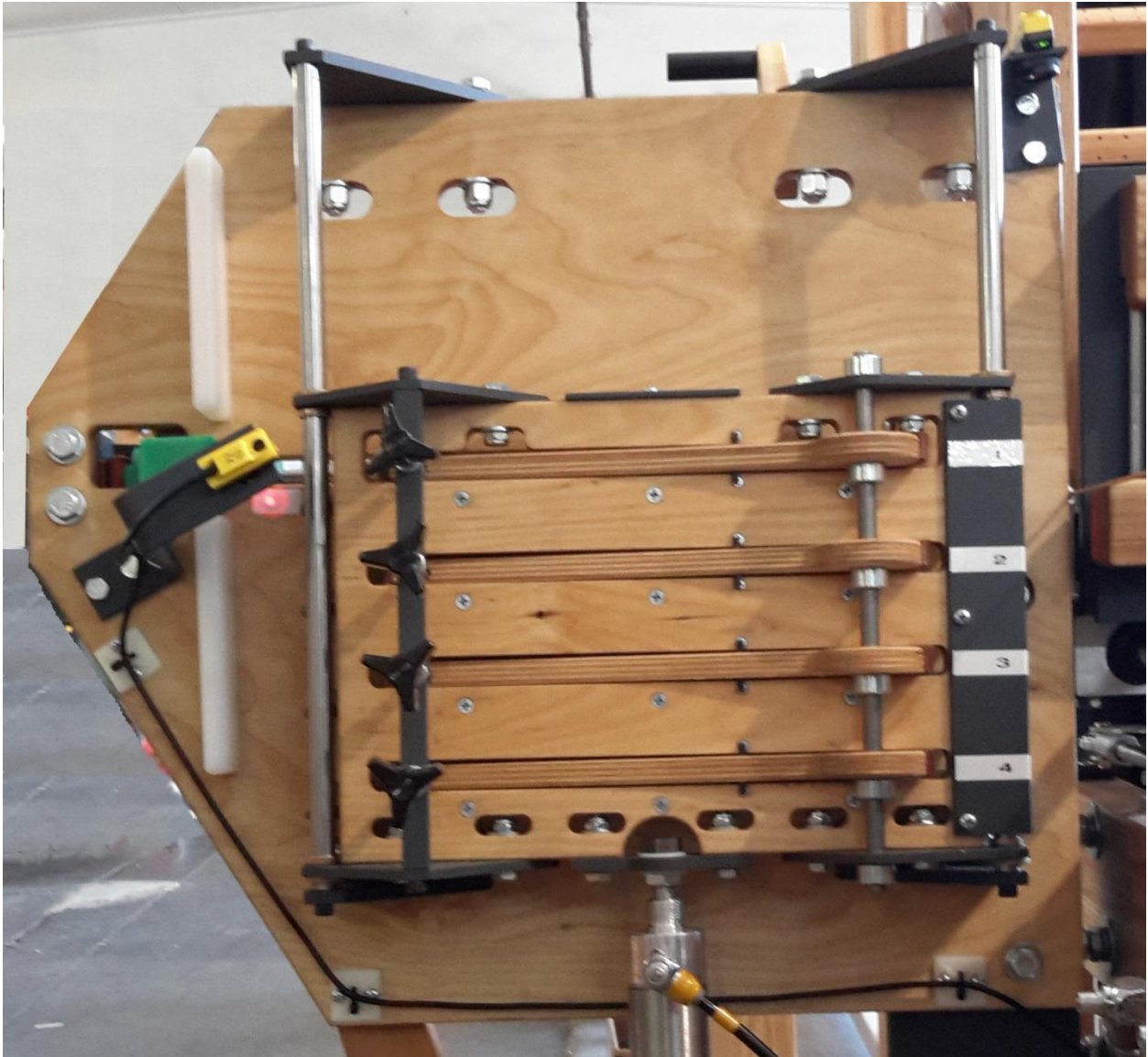
- 1) Loosen the three bolts on the back that attach the backplate to the metal bracket.

- 2) Adjust the backplate to the correct angle and position.



- 3) Tighten the bolts.

- 4) Loosen the stop collar securing the shuttleboxes on the rail.



- 5) Nudge the shuttleboxes up or down on the front rails to complete your adjustment.

Note:

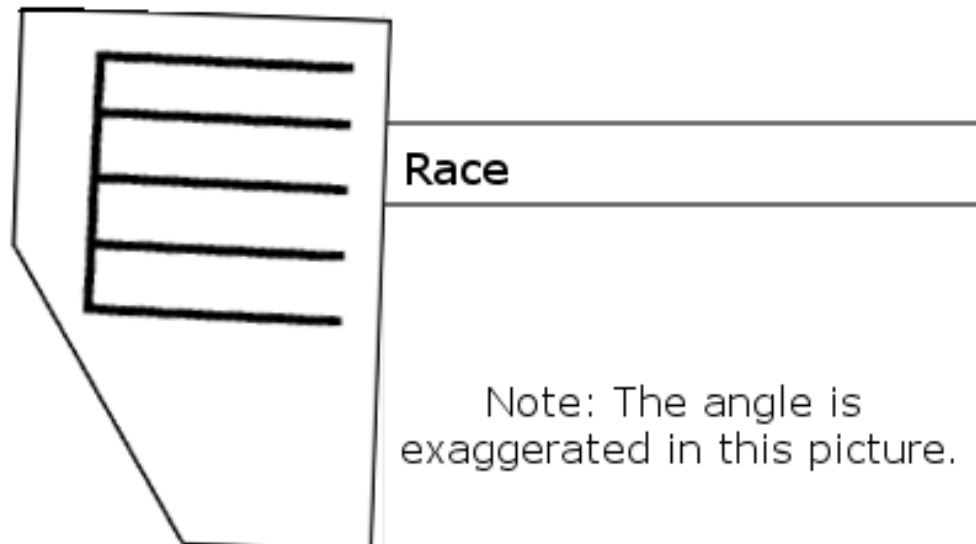
Make sure the cylinders can travel completely to the end of their motion plus a small gap.

- 6) Tighten the stop collar.

Backplate Tilt

The shuttle boxes on both sides should carry a very slight downward angle relative to the shuttle race. This angle will cause the shuttle to “hug” the race as it travels across.

If the boxes are misaligned in the opposite direction, the shuttle will take on an errant trajectory and may launch off the race — obviously creating an unsafe condition.



Backplate Cant

Both shuttle box assemblies must also carry a slight angle towards the reed. In the same way that a bit of downward angle causes the shuttle to stick to the race, a slight canting of the backplates will keep the shuttle properly located against the reed as it travels across the loom.

If the backplate is angled too far back, it will cause the shuttle to bounce off of the reed and exit the loom area. If the backplate is angled too far forward, the shuttle will speed off the race.



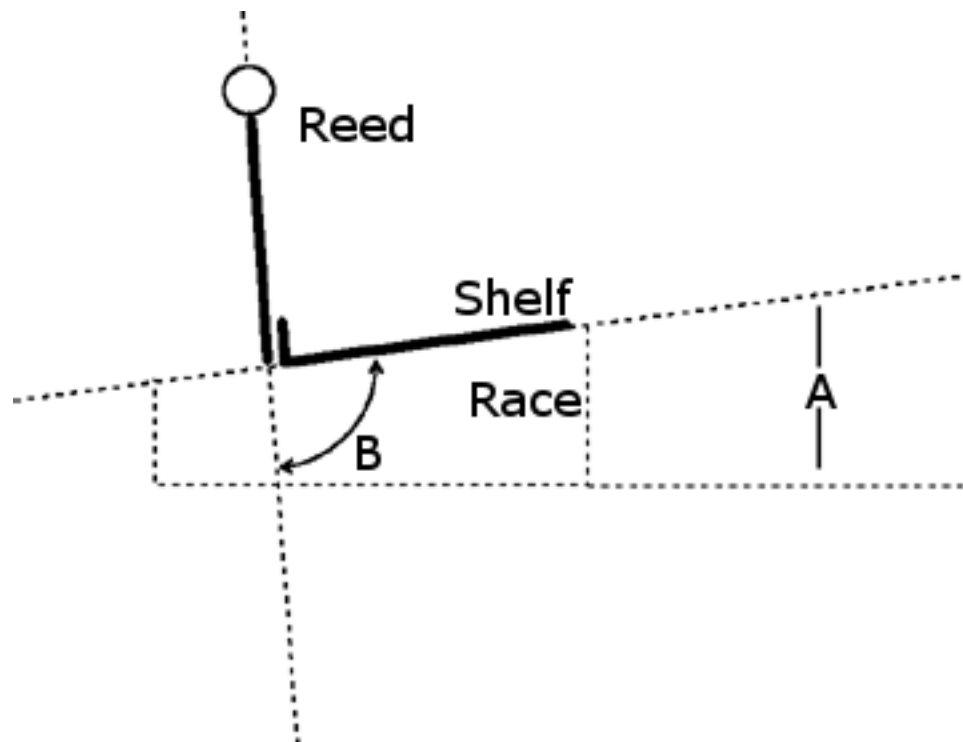
Shuttle Box to Race Alignment

There are two critical alignments to consider here:

- 1) The *leading edge* of each shelf in the Shuttle box Assembly must be at precisely the same elevation as the top of the race (alignment "A" in the diagram below). You may check this by laying a straight edge between a box shelf and the race.

Remember:

The box assembly will be adjusted at a very slight to no angle, so it's only the *edge* of the shelf, immediately opposite the end of the race, which concerns us here. This edge should be at the same height as the top of the race so that the shuttle can make a smooth entry into the Shuttle box.



If the box shelves are either lower or higher than the race, you'll need to loosen the bolts in the large box mounting bracket that attaches the Shuttle box Assembly to the side of the loom. This will allow you to make the necessary adjustment.

- 2) The shelves in the box must be in the same plane as the race. If you sight down the end of the race, you'll note that it's cut on an angle. The angle of the shelves must correspond (alignment "b").

Again, if you need to correct this alignment, loosen the box mounting bracket and move the box assembly into position.

Box Timing

It's important that you get the timing of your boxes right. If a box moves too slowly, the picker will strike a shelf. If it moves too fast, the assembly will be subjected to constant jarring and possible damage. Because the action of the boxes needs to be synchronous, keep the up/down box speed equal.

- 1) Find the cylinder, at the bottom of the flyshuttle boxes. You'll see that there are two plastic air tubes coming into the cylinder.



- 2) At both connecting points, there is an adjusting screw. These are the flow controls.
- 3) Use a small screwdriver to turn each screw in or out.

- 4) Turn the screws counterclockwise to accelerate and clockwise to retard the speed of the shuttleboxes.

Cloth Storage Power Control

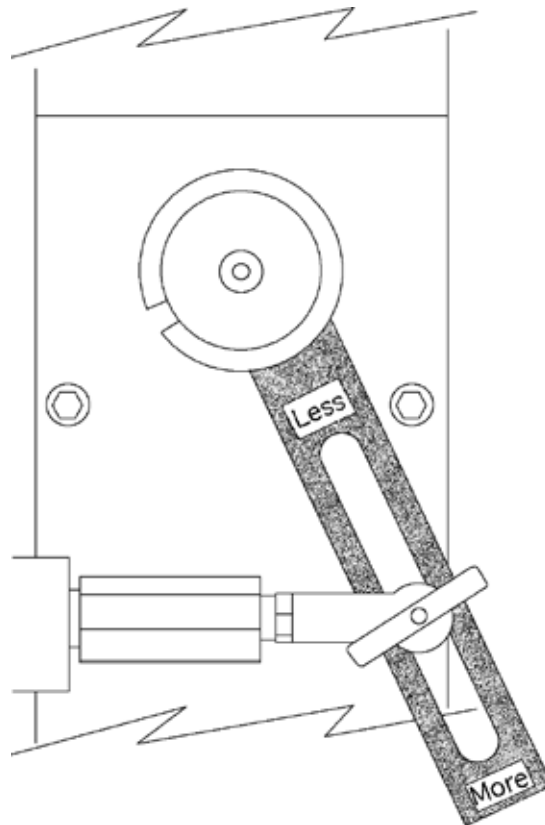
Note that we refer to power, not speed. The only thing you need be concerned about here is that the action of the Cloth Storage Cylinder is not greater than that of the Automatic Advance Cylinder directly above it. If the Storage Cylinder is set to overpower the Advance Cylinder, it will cause the warp to creep. To prevent this, set the regulator gauge at about 10 lbs.; just enough that the cloth storage mechanism keeps slack out of the cloth after it rounds the breast beam.



Figure 11 - Regulators

ESTABLISH PICKS PER INCH (P.P.I.)

The number of picks-per-inch that you'll achieve is determined by the degree of rotation of the Cloth beam. This is established mechanically.



You'll note that the Adjusting Lever is connected to the rod end of the Automatic Advance Cylinder by a locking T-handle. If you loosen this knob, you can move the rod end up or down in the slot. When you move the rod end up, the Cloth beam rotates more and you have fewer picks per inch.

Your IDL is provided with four Automatic Advance sleeves. Each of these will cover a different pick range. The smaller the sleeve, the *fewer* picks per inch.

There are two ways to adjust your pick count:

- 1) By increasing or decreasing the stroke of the adjusting lever. Move the gear higher in the slot to decrease the stroke, or lower to increase the stroke.
- 2) By exchanging one sleeve for another of a different size. See the chart below to determine the correct sleeve to use for the PPI you want.

SLEEVE	LEVER POSITION	PICKS PER INCH
#1 (1-5/16)	Top	4
	Middle	5
	Bottom	7
#2 (1-13/16)	Top	6
	Middle	9
	Bottom	14
#3 (2-5/16)	Top	16
	Middle	20
	Bottom	30
#4 (2-9/16)	Top	25
	Middle	40
	Bottom	60

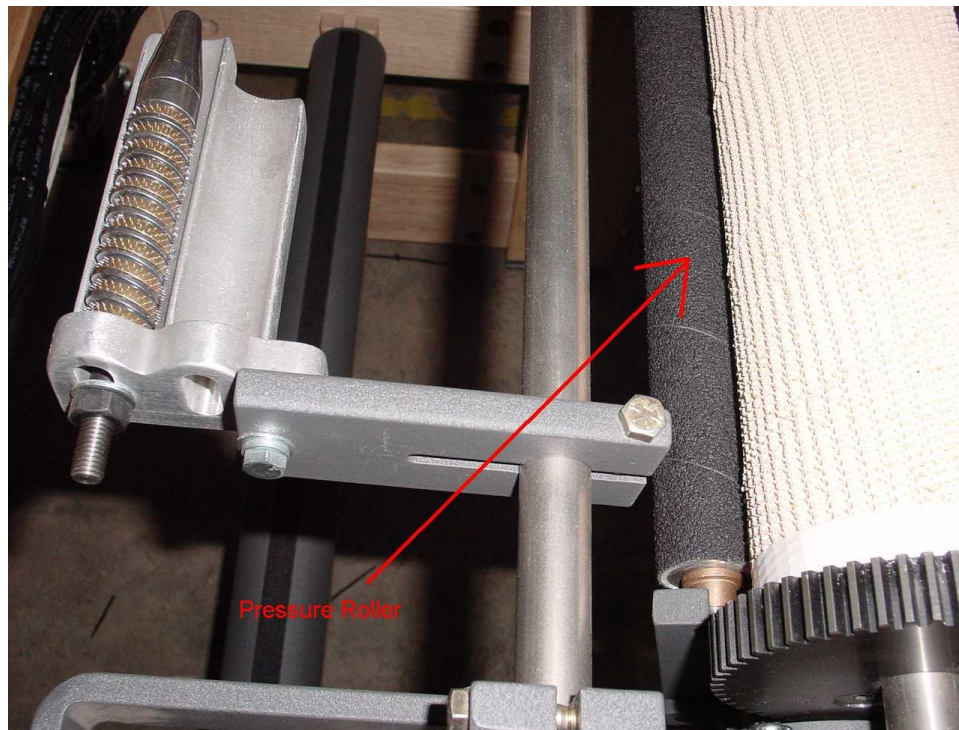
These pick counts are approximations and are related to warp tension and by how hard the weft is beat into the warp. Increasing the warp tension and how hard you beat can increase the pick count.

PRESSURE ROLLER

The Pressure Roller allows you to weave without using your Cloth Storage system. So you can cut off your work at any time without losing warp tension.

To start:

- 1) Pull the warp approximately 10" beyond the Cloth beam.

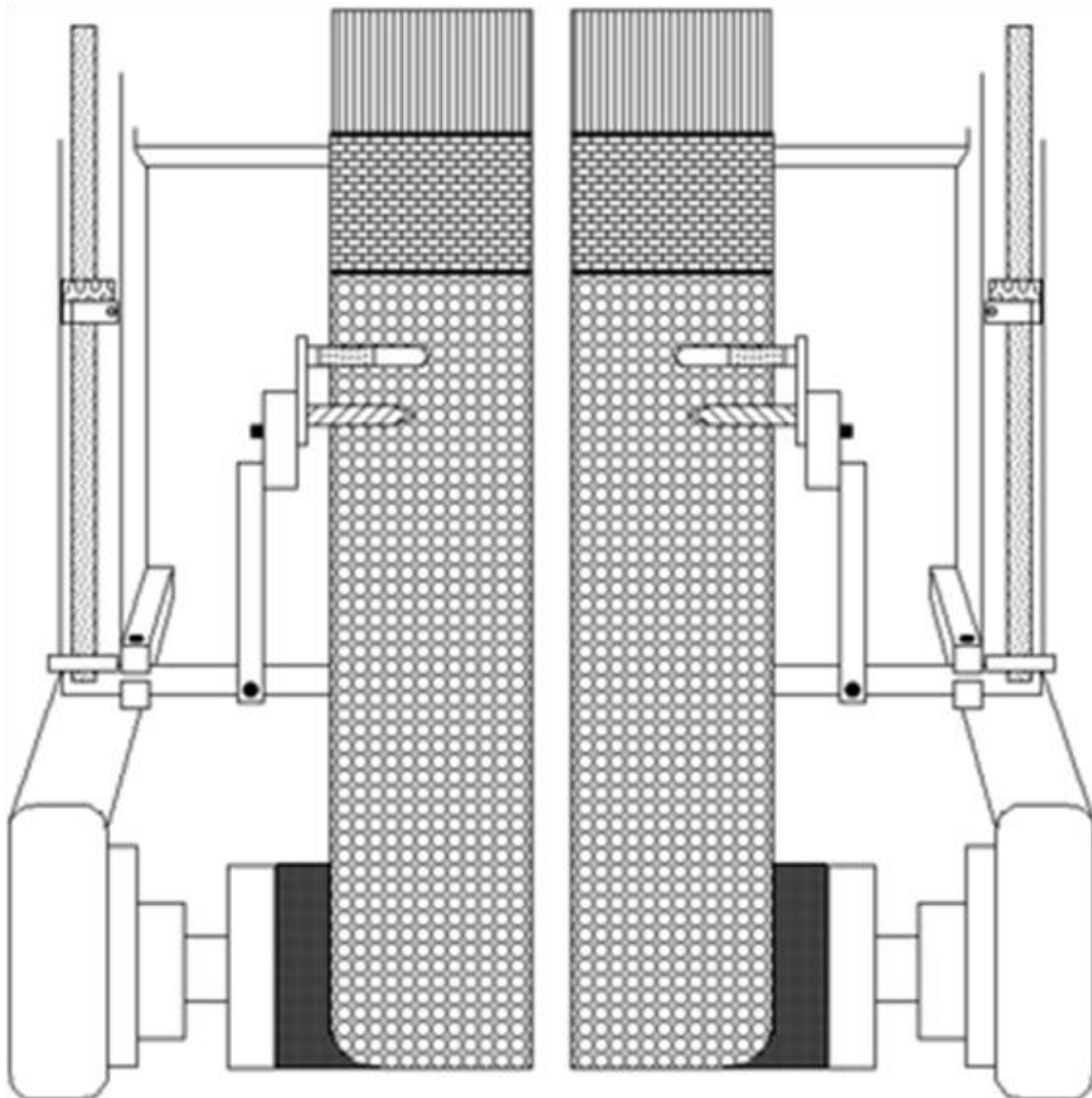


- 2) Push the Pressure Roller into the warp under the Cloth beam until it snaps into place.
- 3) To remove the roller, relieve tension (two knobs in front under the Cloth beam), push the arm, and remove the roller.

TEMPLE SYSTEM (TO PREVENT DRAW-IN)

The Temple System is used to maintain a good selvage and prevent draw-in. You need to weave a few inches so you have enough selvage to work with. It consists of two rollers (barrels), working in tandem, which grab the selvage and prevent it from drawing in.

This device looks complicated, but is, in fact, relatively easy to work with. Refer to the accompanying illustration and step-by-step instructions for guidance in using this system.



Setting the Temple Rollers

- 1) Check the routing of your fabric against the illustration.

- 2) Loosen the adjusting bolts on the Temple Holder Bracket so that it's somewhat movable.
- 3) Swing the Temple holder bracket up and in, so that it is about 1/4" below the warp, with the selvage just touching the inside of the bracket.
- 4) Open the shed.
- 5) Bring the holder up until the ridges on its platform just contact the bottom of the warp. The platform should be parallel with the warp.
- 6) Tighten the Temple Holder Bracket adjusting bolt.
- 7) Slide the temple assembly into its slot on the holder bracket. Seat the roller atop the warp and lock it down.
- 8) Check to be sure that everything is properly tightened down.

The selvages should run freely across the bracket.

Temple Rings

Using a Temple System is somewhat of an art and opinion varies amongst weavers about things like the choice of rings and the length of the needles. However, we can offer some useful guidelines to help get you started.

We provide you with a set of general purpose rings. If the needles are holding the selvage sufficiently well, and isn't causing looping or leaving a perforated line in the warp, you're doing fine. If, however, you're having problems, you made need to investigate different rings. As a rule of thumb, heavier yarns need rings with longer and fewer needles. Finer yarns require rings with more and shorter needles.

For additional information, please contact an AVL Customer Service Representative.

WARP TENSION

The warp tension device on your loom offers a number of advantages; chief amongst these is that it allows you to set tension in extremely fine degrees that remain constant as your beam surrenders warp. Unless you've used other AVL equipment, you're probably not familiar with this way of keeping tension. If you find the concept a little foreign, be patient; we promise that you'll soon recognize its merit.

Set Tension

- 1) Move the weight to its rearmost position, until it nearly touches the wooden pulley at the near end of the arm.
- 2) Advance the warp until the tension arm rises and the cable begins to slip on the brake drum (of the warp beam).
- 3) Ultimately, you'll want the arm to ride horizontally. As you advance the warp, the arm should rise no more than 45° above horizontal and then fall back to horizontal.
- 4) If the arm is riding above horizontal, let the adjusting cord out at the spring. If it's riding low, take up cord.
- 5) Check the tension in your warp. If it's loose, move the weight out on the arm. Advance the warp a little and check again. Continue in this way until you have exactly the tension you want.

Most weavers find that they can weave with less tension using this system.

If you've laid on a very heavy warp, you may need to add weight to the arm. Additional weights can be obtained from AVL. Conversely, warps comprised of extremely fine yarns may require a lighter weight. AVL can provide you with a half-weight if you so desire.

To make it a little easier to learn, we've created a quick reference for you to follow. You may want to copy it and keep it at the loom.

Arm above horizontal	=	Release cord at the spring
Arm below horizontal	=	Take-up cord at the spring
Warp too loose	=	Move weight out
Warp too tight	=	Move weight in

Troubleshooting Tip

The brake drum on the warp beam may, in areas or times of high humidity, swell a bit where the end grain is exposed. This swollen grain can prevent the tension cable from slipping as it should. When this happens, the tension arm will develop a habit of rising and then suddenly dropping.

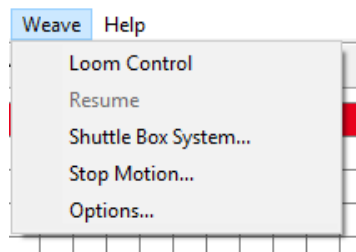
To correct this problem, unwind the brake cable and lightly sand the grain in the cable race of the drum. Use a very fine grade of sand-paper (220-400#) and sand as little as possible.

Note:

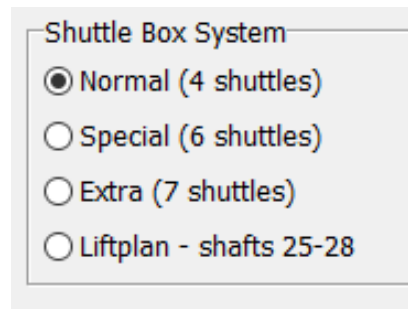
Never, under any circumstances, should you apply a wax, or finish, or otherwise treat the cable race on the drum.

SHUTTLE BOX SYSTEM

- 1) When you click on the Shuttle box System in the Weave Menu, the Shuttle box System Window opens.



- 2) Choose the Shuttle Box Mode that is appropriate for your project.



The three Shuttle box Modes:

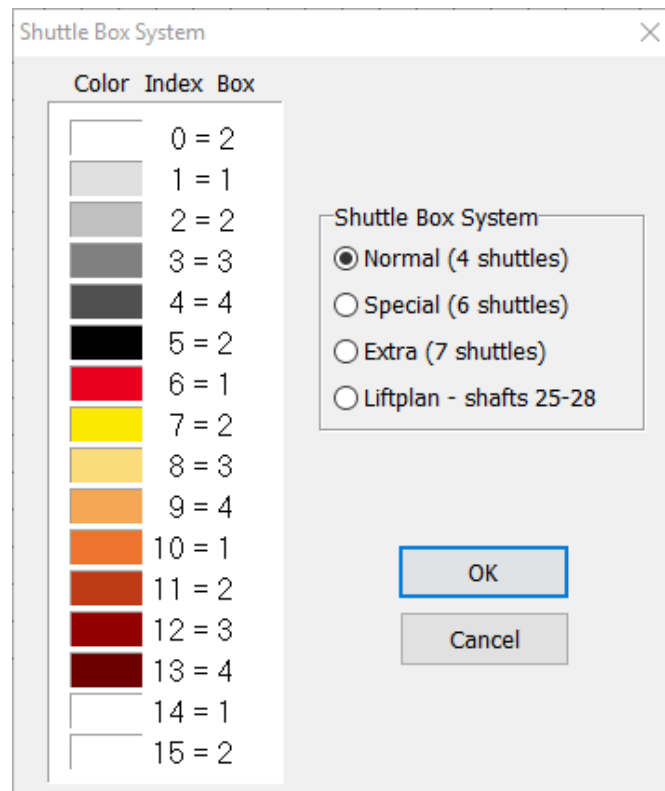
- **NORMAL:** one to four shuttles.
- **SPECIAL:** up to six shuttles -- designed for Tartan weaving. There must be an even number of picks of each color.
- **EXTRA:** seven shuttle weaving.

When you are designing your pattern in WeavePoint, each color you use has an index number assigned to it. *WeavePoint* for IDL uses these numbers to "tell" the loom which shuttle to launch. The index numbers in WeavePoint correspond to the shuttle boxes on the loom, as you will see in the Shuttle Box System dialog box.

Shuttle Boxes are numbered from top to the bottom – Shuttle Box 1 is the top box, 2 is the next one down, then 3; 4 is the bottom box.

Normal Mode

NORMAL is the mode used for most weaving and is the simplest to understand.



Shuttles move from box 1 on one side to box 1 on the other side; from box 2 to box 2; from box 3 to box 3; and from box 4 to box 4. The Shuttle boxes on both sides move up and down together.

While any of the indexed colors can be used, it is usually simplest to use the first five indexed colors (0-4) to indicate the color usage in the pattern draft. If desired, you can change the color associated with any index Number to the color you will actually be using by employing the Color Dialog.

If you are using one color and one shuttle, use the color with index Number 0 and place the shuttle in box 2 -- either right or left.

If you are using two colors and two shuttles, use the colors with index Numbers 1 and 3 and start the shuttles in box 1 right and 3 left. This helps keep the threads from catching on each other, especially good for pick and pick weaving, i.e., shadow weave or Summer and Winter.

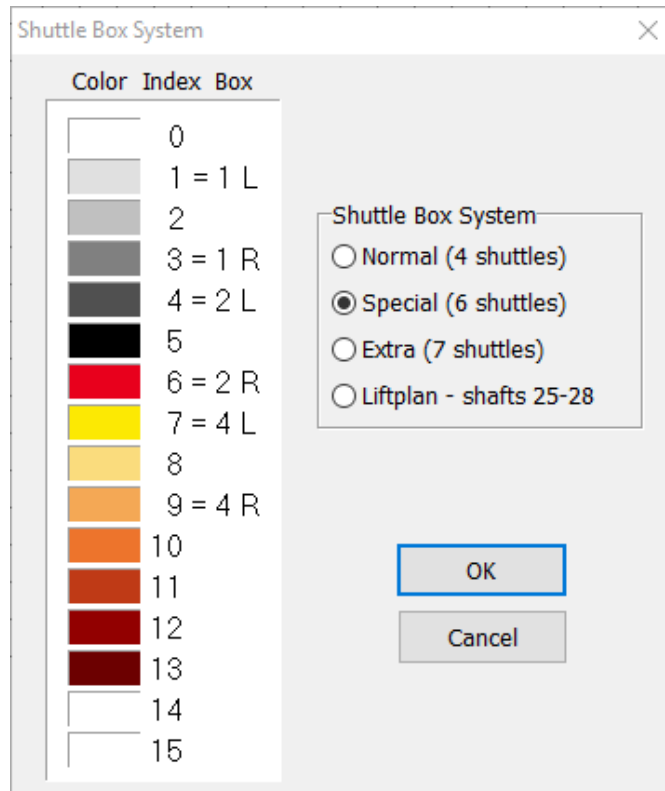
Index	Shuttle Box
0	2 - Right or Left
1	1 - Right
2	2 - Right
3	3 - Left
4	4 - Left

If you are using three or four colors and shuttles, place the shuttles as indicated in the table.

In NORMAL mode, your design can have any number of picks of any color in any order.

Special Mode

SPECIAL is the mode designed especially for weaving Tartans. You can have up to six shuttles. The following table shows which index Numbers to use in the pattern and how to arrange the colors in the shuttle boxes. In order for this mode to work correctly, each shuttle must throw two picks in a row.



Index	Shuttle Box
1	1 Left
3	1 Right
4	2 Left
6	2 Right
7	4 Left
9	4 Right

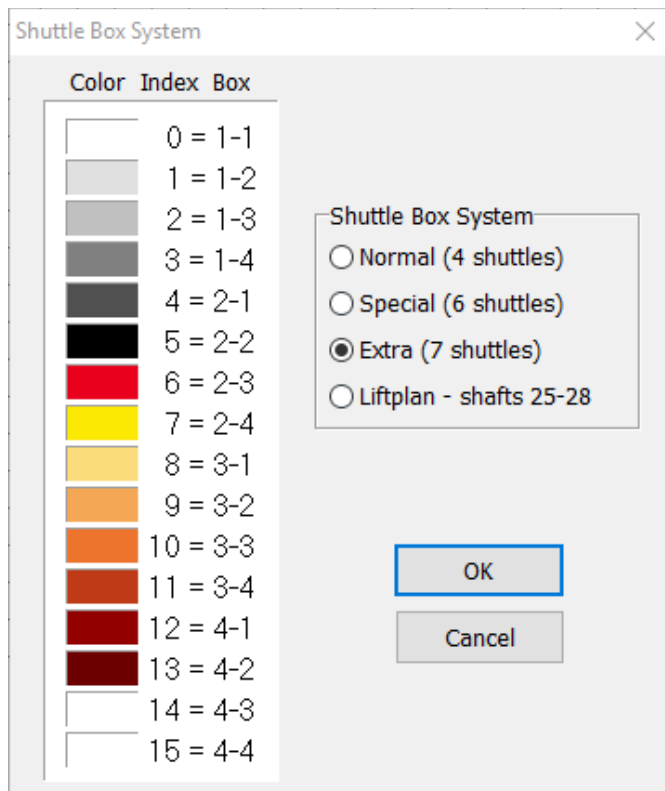
You will notice that Shuttle box 3 remains open on both sides. These boxes are left open to accept any of the six shuttles from either side on the first pick of a pair of picks; on the second pick, the shuttle returns to its original location.

Note: There must always be an even number of picks of each color in the design.

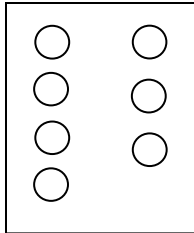
Authentic Tartan setts always have an even number of ends and picks of each color. The vast majority of Tartan setts use six or fewer colors. Many only use three or four, for these it is possible to use the NORMAL mode. For setts calling for more than six colors, it is possible to use the optional STOP MOTION feature to stop the loom; switch to Manual operation; throw a seventh or eighth shuttle by hand; and then go back to the Automatic operation.

Extra Mode

EXTRA is the most complicated mode and is used for weaving with seven shuttles. Both sets of shuttle boxes move independently. Before assigning shuttles/colors to specific box locations, the possible shuttle moves must be determined.

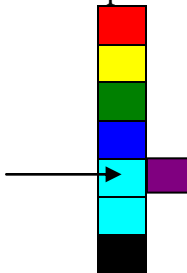


An easy way to work out the possible moves is to use seven dots arranged as shown. Place colors in each dot in any order to start, they may need to be rearranged to gain the desired result or the color rotation may need to be changed.

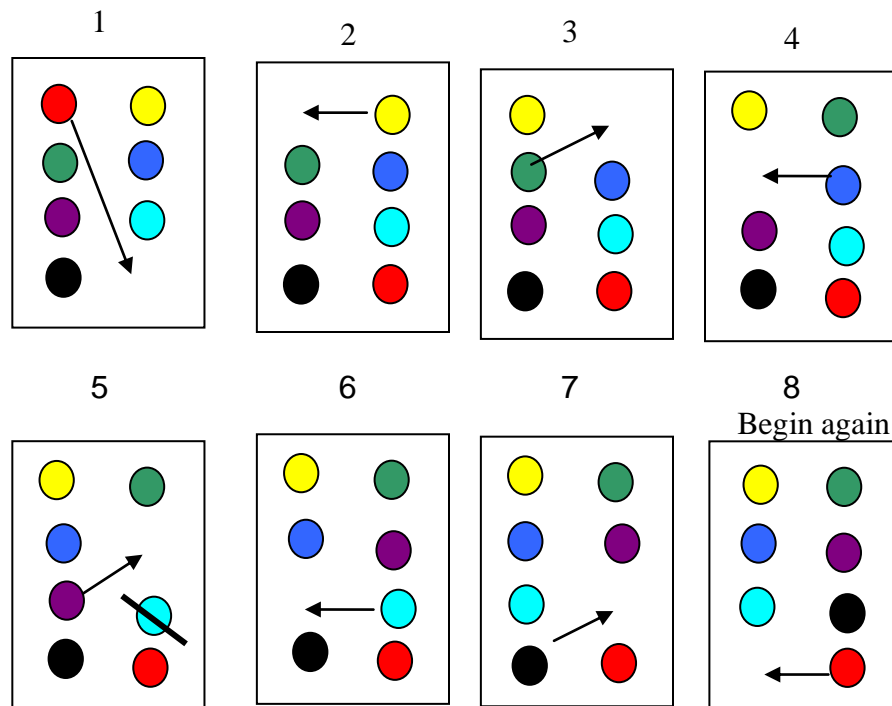


Review the proposed color rotation below. The first color to be used is on the left, move it to the open space on the right. The next color is on the right and moves to the open space on the left. Then the third color moves to the open space on the right. The fourth color moves from right to left. At the fifth color change we see that there is not an open box to accept the aqua shuttle. It is necessary to either change the color rotation or try a different starting arrangement and start again at step 1. Continue moving the colors from side to side, rearranging or editing as needed. Go through the full repeat several times to be sure it is a valid arrangement.

Proposed
color repeat



SHUTTLE MOVES



It is not possible to throw aqua here. Either change to a color on the left or try a different beginning arrangement.

When the desired result is achieved, arrange the shuttles in the boxes as indicated in the table below.

EXAMPLE:

Use the color order established in the exercise above to determine shuttle placement and the index numbers to use in the pattern draft. Use the Color Dialog as needed to change the hue associated with a particular index number. Shuttles would initially be loaded as in the chart below.

SHUTTLE BOXES			
Index #	Left	Right	Index #
#12	4	4	#15
#11	3	3	#10
#6	2	2	#5
#1	1	1	OPEN

Determine which Index number to use for each shuttle/color by consulting the chart that opens when you check EXTRA in the SHUTTLE BOX SYSTEM dialog and the results of your shuttle movement exercise.

Index #	Left Box	Right Box
Index #0	1	1
Index #1	1	2
Index #2	1	3
Index #3	1	4
Index #4	2	1
Index #5	2	2
Index #6	2	3
Index #7	2	4
Index #8	3	1
Index #9	3	2
Index #10	3	3
Index #11	3	4
Index #12	4	1
Index #13	4	2
Index #14	4	3
Index #15	4	4

In the example above, red moves first and travels from box 4 on the left to box 1 on the right. Index #12 provides that movement.

Next, yellow moves from box 4 right to box 4 left. Index #15 provides that move.

Then green moves from box 3 left to box 4 right. Index #11 provides that move.

Blue moves from 3R to 3L – Index #10

Purple moves from 2L to 3R – Index #6

Aqua moves from 2R to 2L – Index #5

Black moves from 1L to 2R – Index #1

After the initial movements, the on-board central processing unit keeps track of where each shuttle is and launches the one called for in the weft color grid as the weaving progresses.

MAINTENANCE

MAINTENANCE

General

Shuttles

You'll probably find that most of the problems you encounter, at least until you've become familiar with the characteristics of the loom, involve shuttles. Each time you change from one yarn to another, you'll need to fine tune the binders on the shuttle boxes and adjust the tensioners in the shuttles themselves. You may also need to change the pressure setting at Regulators SV 4 and 5 which control the shuttles. Very heavy yarns may require that you turn your shuttles around, so that the yarns feed out between the shuttle body and reed. This lessens the shuttle's tendency to veer or yaw away.

The shuttle boxes are fitted with various optical sensors. These are part of a larger "traffic control system" — not unlike a modern railway switching system — that prevents two shuttles from firing simultaneously. Keep these, and the reflectors opposite them, free of accumulated lint. If, for some reason, two shuttles do present at the same time, this system will shut the loom down: the shed will open slightly and the loom will abruptly turn off.

Air Quality

Poor air quality will produce a number of problems. This can't be stressed enough. Dirt, oil, and moisture in your air delivery system can clog and erode valves and other air components. Affected valves may operate sluggishly or not operate at all. Always use a clean air source.

Square and Level the Loom

This should be done when the loom is initially setup and periodically afterwards. Depending on the amount of use your loom receives, you should square and level your loom every few months. If you have bolted the loom to the floor, it will not be necessary to perform this task as often.

In order for your loom to function properly, it must be level, front-to-back and side-to-side. To check front-to-back, place a carpenter's level along the top of each Top horizontal. Check side-to-side by placing the level along the length of the Cloth beam and, again, along the Lower back framing member. If you find that the loom is significantly out of level, you'll need to either correct the floor or shim the legs of the loom.

To square your loom, measure its diagonals, front to rear. These should be equal.

Maintenance

The industrial Dobby Loom is designed to require very little maintenance. We suggest that you observe the following regime; however, you may find that your particular weaving environment requires that you do these things more or less often.

DAILY

- Clean any lint away from the optical eyes and the Compu-Dobby.

WEEKLY

- Check the oil level in the lubricator.
- Clean the Compu-Dobby filter (soap and water, air dry).
- Check the loom frame bolts for tightness.

MONTHLY

- Lubricate the Shuttle Box Spring (with Teflon spray or silicone, "TRI-FLOW", for example).
- Clean and grease zerk fitting on the Cloth beam Axle (with any bearing grease).

TROUBLE- SHOOTING

BASIC TROUBLESHOOTING TIPS

Anytime you are troubleshooting a problem on the loom, stop the loom and put it in Manual mode. The following tips indicate what you should check when you are seeing a given problem. Following this section is information on how to deal with specific issues.

Shuttle Doesn't Fire

- Check that shuttle has boxed completely
- Check if the shuttle sensor is out of adjustment
- If more than one shuttle is presenting:

A shuttle may have been placed in the wrong box
A drafting error may have been made; check the program

Shuttle Won't Stay On Race

- The bobbin is improperly wound
- A knot in the weft is catching on the shuttle tensioner
- The Bobbin is nearly empty and out of balance
- The Shuttle boxes need to be adjusted

Shuttle Doesn't Box Completely

- Insufficient air pressure
- The binder (shuttle brake) is too tight
- The shuttle boxes need to be adjusted
- Knotted weft yarn may have hung in the tensioner and impeded shuttle travel; usually, but not always, it stops or derails shuttle

Loom Fires on Empty Box

- Shuttle sensor out of adjustment

Loom Stops -- Red Light Is On

- Empty bobbin
- Two shuttles presenting

Loom Stops -- Green Light Is On

- Sensors out of adjustment

Harnesses Drop or Don't Lift

- Compu-Dobby out of adjustment
- The harness springs are too tight

Automatic Cloth Advance Inoperable

- Reed Switch is not properly located

Inconsistent Pick Count

- Check the cable at the Tension Arm — it may be crossed
- If the tension is loosening, the black plastic cord lock on the tension tie-up (in the Tension Arm cable) may be slipping; re-set the tension and tie-off with a piece of cord

Loose Shed

- You are exceeding the pick count that is possible with the yarn being woven; this is especially a problem with thick yarns at high pick counts
- Check the warp tension

ADJUSTING THE COMPU-DOBBY

In order for your Compu-Dobby to function properly you'll need to make one adjustment. This adjustment is made at the front of the Dobby head. ***This is the critical adjustment. Without this, your Compu-Dobby won't work.***

There are two retention brackets that hold the Compu-Dobby unit into the Dobby Head. The set screws in the middle of these brackets are your adjusting points.

Your goal is to locate the Compu-Dobby unit so that when each solenoid is extended, it pushes the corresponding cable into a slot in the metal bar on the Dobby Arm.

If you take a moment to look up into the Dobby Head, you'll see that each solenoid pushes against a wooden lever (like a piano key), and that each lever in turn moves a cable into position against a multi-slotted black metal bar (the Dobby Arm Insert, by name).

There are two things to check here:

- That each cable is centered side-to-side in the corresponding slot in the black metal bar (Dobby Arm Insert). If the cables fall to the left or right of the slots, you'll need to adjust your Dobby Arm Insert.

- That each solenoid tip is approximately centered side-to-side on its corresponding Dobby Finger strip.

The trick is to adjust the Compu-Dobby unit in or out until the cables are each deposited just to the rear of each slot. If the cables are pushed too far back or not back far enough, the harnesses will not lift properly.

Note:

The technician who installed your loom will adjust the Compu-Dobby initially. Time and use may cause the Compu-Dobby to require re-adjustment.

- 1) On the computer, setup a liftplan that will lift the first and last harness on the loom.
- 2) Set the loom on manual.
- 3) Back the set screws holding the Compu-Dobby out. Slightly loosen the hex nuts through which each screw is threaded.
- 4) Send the liftplan to the loom and use the hand control to activate the dobbie. You should hear the solenoids activate (they make an abrupt snapping sound). If this doesn't happen, repeat your treading.
- 5) Return to the Compu-Dobby unit and, peering in from the bottom; verify that the two solenoids are extended.
- 6) Pull back on the Compu-Dobby unit so that it rests against the adjustment brackets.
- 7) Now use the 1/8" Allen wrench to turn the left set screw clockwise. This will cause the Compu-Dobby unit to move forward.
- 8) Continue to turn the screw until the left-most extended solenoid just pushes its steel cable to the rear of the slot in the Dobby Arm Insert.

REMEMBER:

The cable should just touch the rear of its slot. If it is pushed too far back, it will cause problems later with your harness lifts.

- 9) Hold the set screw stationary with the Allen wrench and use your wrench to snug down the hex nut. This will lock the adjustment. Repeat this procedure on the other side.

NOTE:

The key point is that the solenoids won't work properly unless they are fully extended. So, **WHEN IN DOUBT, BACK IT OUT!** In other words, better to have solenoids away from the dobbie fingers than too close. This is a bit counter-intuitive, but it is critical. If the first and last harnesses work, then all the rest will follow.

If your harnesses are either not lifting or are dropping, the Compu-Dobby unit requires further adjustment. Check the position of the cables relative to their slots. Again, each should just touch the rear of the slot where the solenoid is extended -- too far in or out and it won't behave properly.

Once you've established that you're getting good lifts, you may assume that the Compu-Dobby unit is adjusted. Please make sure you've tightened the hex nuts on the adjustment brackets.

- 10) Finally, create a peg plan that fires two solenoids at a time. Set up either a 2/4 twill or a 2/2 twill so you can treadle through and see each shaft lift.

ADJUSTING THE SHUTTLE SENSORS

Symptom: the picker is firing when there is no shuttle in the box.

Remember:

ALL ADJUSTMENTS AND OBSERVATIONS MUST BE MADE WHILE LOOM IS ON AND IN THE MANUAL MODE!

Adjust the shuttle sensors - in the PLC, when the shuttle is in the right box, #12 will light and #13 for the left side box.

You need to check the alignment of the sensors mounted at the side and in front of the shuttle boxes. The sensor on the side has a green light on the end that will light when the shuttle is in the box. If the shuttle is not in the box, it should have an orange light.

The sensor on the front checks to see if the bobbin is out of thread. It will normally be green. It will turn orange when the bobbin is out of thread and the reflective tape on the bobbin is exposed. This sensor will stop the loom when the bobbin is out of thread. You will not normally see it change color, as it happens too quickly.

To make the adjustment

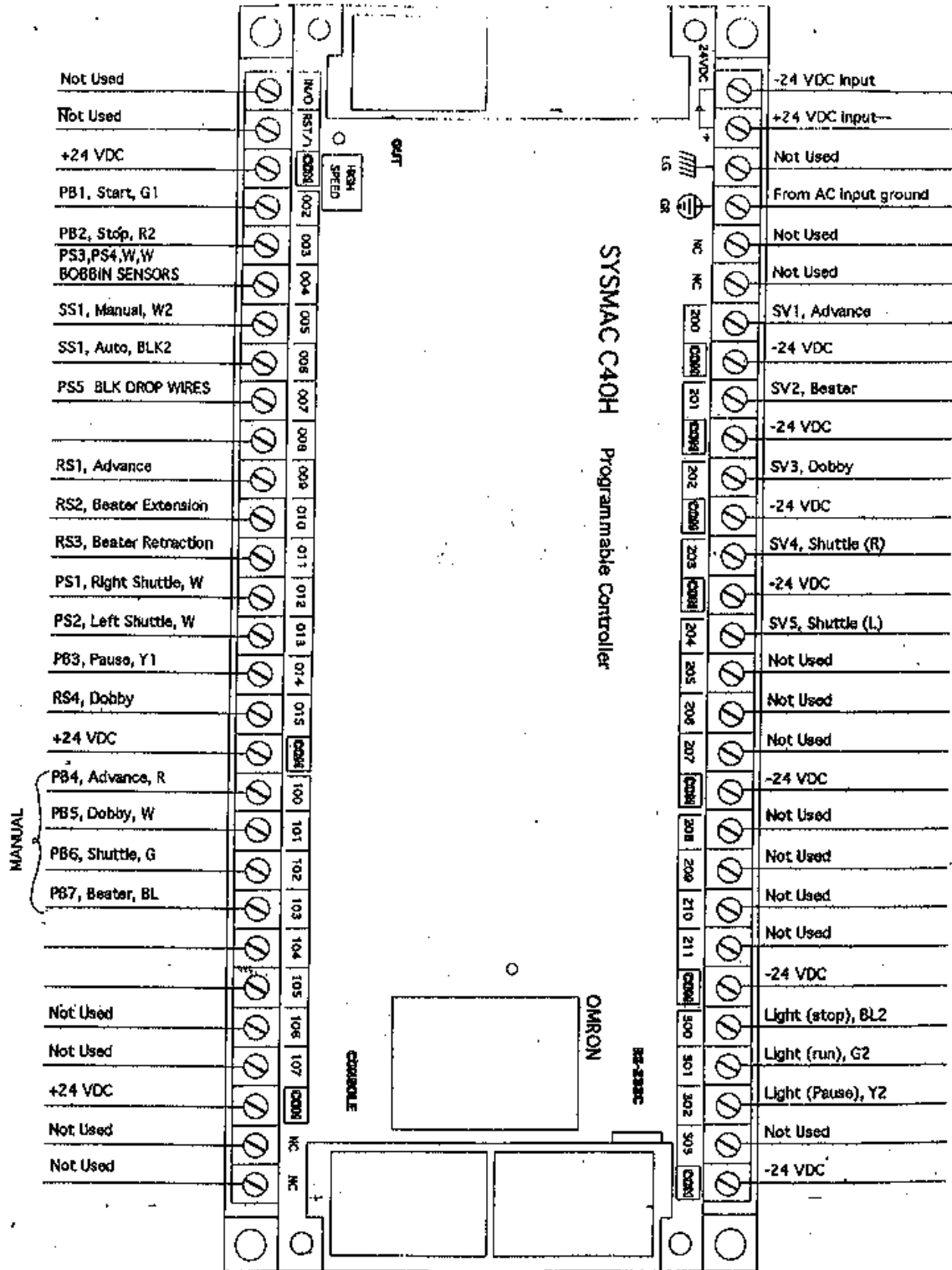
- 1) Remove the shuttles.
- 2) Loosen the bolts that hold the shuttle sensors in place slightly.

- 3) Adjust the alignment until the light is the right color. Test by placing the shuttle in the box and seeing if the light turns green.
- 4) Carefully retighten the bolts.

TROUBLESHOOTING THE PICKER CYLINDERS

- 1) With the loom turned off, move the Picker Arm back and forth, checking for any pressure that might result in binding and hampering the movement of the Arm, including the Picker Slot, the Picker at the Shuttle Shelf, the hardware mounts for the Arm to the Picker and Arm Pivot.

DIAGRAM OF THE PLC



THE FINE PRINT

AVL CUSTOMER SERVICE

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: sales@avlusa.com

AVL WARRANTY

Limited Warranty: The benefits of this warranty accrue solely to the original purchaser of AVL Looms, Inc. products, as defined below.

Your warranty covers:

New Looms: AVL Looms, Inc., a California corporation ("AVL") warrants to the original purchaser of any AVL loom (each, a "Product") that the Product will be free from defects in materials and workmanship during the limited warranty period described herein. The limited warranty coverage begins (a) the day the Product is installed if installed by a professional from AVL, or (b) on the date of shipment from AVL to the original purchaser if the Product is not installed by AVL (the "Effective Date"). Except as set forth under the section entitled "What is Excluded?" below, AVL will, for a period of two (2) years from the Effective Date (the "Original Warranty Period"), repair or replace the defective part(s) of the Product with a repaired, renewed, or comparable part (whichever is deemed necessary or proper by AVL) if it becomes defective or inoperative or fails to perform according to AVL's specifications. Any repair during the Original Warranty Period will be carried out without charge to you for parts (except applicable taxes, if any). You will be responsible for all labor in connection with installation of the parts and service upon the Product, as well as the cost of shipping involved.

New Accessories, Loom Upgrade Parts, and Replacement Parts: Subject to the limitation contained in subsection (i) under the section entitled "What is Excluded?" below, AVL warrants to the original purchaser of any accessory, loom upgrade parts, or loom replacement parts (the "Additional Part") that are sold by AVL that such Additional Part will be free from defects in materials and workmanship for ninety (90) days from the date of purchase. In the event that any Additional Part is physically damaged or physically defective and if such defective Additional Part is returned to AVL within ninety (90) days of the date of purchase, AVL will provide a replacement Additional Part at no charge. The sole remedy for this warranty shall be limited to the replacement of the defective Additional Part. You are responsible for all shipping charges (including applicable taxes) incurred with returning the defective Additional Part.

All New Products and their components (including replacement Product and its components) are covered only for the Original Warranty Period. When the warranty on the original Product expires, the warranty on any replacement Product, or components also expires. After two (2) years from the Effective Date, you pay for any replacement or repair, including all parts, all labor and shipping charges (including applicable taxes).

Your warranty does not cover:

1. Labor charges for installation or set-up of the Product, as well as any labor charges required to install, disassemble, troubleshoot, or reassemble the Product.
2. Any taxes imposed on AVL for Product replacement or repair under this warranty.
3. Installation, performance of, or repair of: cabling, electrical, or accessory attachments used with the Product.
4. Product replacement or repair because of misuse, accident, repair by any party other than AVL, or other cause not within the control of AVL. Please note that removing any parts from the Product for any reason voids the warranty.
5. Incidental or consequential damages resulting from the Product.
6. A Product that has been modified or adapted to enable it to operate in any country other than the United States or any repair of Products damaged by these modifications.
7. Electrical and pneumatic components, each of which carries a one (1) year warranty from the Effective Date.
8. Jacquard components function beyond 98%. A Jacquard module is considered to be operating within specification if 98% of all hooks are operating as commanded.
9. Computing equipment, such as a Personal Digital Assistant or a Personal Computer, which are manufactured by a third party(ies) and which may be under warranty through the original manufacturer. AVL is not responsible for any warranty coverage that may be offered concerning these products and you must contact those manufacturers directly regarding any available warranty coverage.

The performance or functionality of any software that is sold either together or separate from the Product. The AVL warranty covers only defects in the Software Media, namely the CD-ROM media such as a broken CD-ROM or a defect in the CD-ROM that would prevent the CD-ROM from being read by your personal computer's CD-ROM drive. .

AVL RETURNS POLICY

Any order that has left AVL in transit to the customer is considered fulfilled. Parts and accessories not covered under warranty must be returned to AVL within 60 days from the date of shipment from AVL. The purchase price of the item(s) is refundable less a 15% re-stocking fee based on the total purchase price. No refunds will be given on shipping or handling. The buyer is responsible to return the merchandise in "as new" condition at their expense. Any item received showing wear or damage is not eligible for return and will be promptly returned to the customer COD unless some other arrangement is made. Looms and custom-made items, special order items, parts made for pre-1998 looms, used and reconditioned items are not eligible for return.