



Professional Laminating Systems Laminator Operators Manual

SERIES II

Record

| Record Machine Details | Distributor |
|-------------------------------|--------------------|
| Model _____ | |
| Serial # _____ | |
| Date Of Purchase _____ | |
| Date Of Manufacture _____ | |
| Voltage _____ | |
| Inspector _____ | |

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Professional Laminating Systems, Inc.

Hamilton, MT. 59840 406-363-1690

About our company....

The primary goal of PLS is to provide laminating machinery that produces excellent and consistent results at affordable prices. We are able to accomplish this goal through innovative design and engineering practices. The foundation of our system is our patented heated roller, the heart of the lamination process. This roller design not only produces superior finished product but also results in considerable cost savings to our customers. We are a vertically integrated company as we utilize our own fully automated machining facilities, as well as in-house powder coating and roller manufacturing operation. We strive to keep machine designs as simple as possible while providing superior finished product results, excellent reliability, and ease of operation and maintenance. We work very hard to find or design and manufacture components that are precisely matched to their given task. Finally, we believe that maintenance and repair parts should not be a major profit center for our company.

The Revolution Series heated roller system...

Our patented heated rollers were designed to provide a superior finish, good durability, and ease of cleaning, while still being affordable. Our roller design exceeds all finish and quality capabilities seen in competitive heat shoe laminators; such as, but not limited to, superior adhesion, negligible stretch, exclusion of scratches, faster warm up, more capabilities in film and substrate use, more user friendly and nylon, polypropylene and vinyl capable. Class for class our technology exceeds all performance capabilities in competitive heated silicone rollers. Another benefit of this design is ultra-fast warm up times--from room temperature to 250 deg. "F" in about five minutes--high performance models are ready to run in less than 4 minutes. This means that you can turn your new machines on when you need them... and off when not in use. The laminating process utilizes a considerable amount of energy inherent in all processes requiring considerable amounts of heat. And remember, if a commercial laminators putting out thousands of Btu*s of heat when not in actual use, your air conditioning system is putting out even more energy in a futile attempt to cool your facility. This wasted energy can add up to hundreds of dollars a year in unnecessary utility costs. The **Revolution Series** rollers are covered with the finest silicone rubber available that is specifically formulated for our precise application. Final grinding and polishing is accomplished with computerized equipment to insure absolute accuracy and consistency of the finished roller.

CONGRATULATIONS

Congratulations on your purchase of a series II heated roll laminator, manufactured by Professional Laminating Systems Inc. Your laminator has been designed with the latest technology to deliver hours of trouble-free operation and quality results. Your new laminator is a very versatile machine capable of laminating 1.2 through 10 mil films on a wide variety of materials through 3/16" thick. With proper care and maintenance, your laminator will offer you many years of dependable service.

 Please read this manual in its entirety before operating your laminator.

By reading this manual before operation of the machine, you will become familiar with proper set up, operation, and maintenance of the machine and potentially avoid common mistakes or worse.

We stand by our products 100% and welcome your comments and suggestions on how we can better serve your needs and help your business grow.

If you require service, support or materials NOT found through your local representative, please locate us on our web site at www.pro-lam.com or fax our Technical Service Department at Pro-lam 406-363-6145. Include your model number, serial number, date of purchase the dealer through whom it was purchased, a brief description of the service needed, your name, your business name, your address your phone number and your fax number. We will then respond promptly by phone or fax.

We appreciate your continued support and trust that you will receive full satisfaction from your laminator.

WARNINGS & SAFETY

DO NOT OPERATE THIS LAMINATOR WITHOUT FIRST REVIEWING THIS OPERATORS MANUAL IN ITS ENTIRETY.

NEVER OPERATE THIS MACHINE WITH REMOVED, DAMAGED OR MISSING PARTS - SHUTDOWN AND DISCONNECT FROM THE ELECTRICAL SUPPLY.

IF THERE WERE TO EVER BE A MECHANICAL OR ELECTRICAL MALFUNCTION IMMEDIATELY UNPLUG THE MACHINE

NEVER SERVICE THIS MACHINE WITHOUT FIRST DISCONNECTING THE MACHINE FROM THE ELECTRICAL SOURCE.

DO NOT TOUCH THE HEATED ROLLERS AS THEIR TEMPERATURE MAY EXCEED 350 DEGREES FAHRENHEIT.

NEVER ALLOW SHARP OBJECTS SUCH AS KNIVES OR SCISSORS TO CONTACT THE ROLLER SURFACE AS A POTENTIAL SHOCK HAZZARD EXISTS AS WELL AS THE POTENTIAL TO INFLICT SERIOUS AND IRREPARABLE DAMAGE TO THE SILICONE ROLL COVERING OR THE OPERATOR.

CAUTION MUST BE EXERCISED TO KEEP HANDS FROM THE NIP POINT OF THE LAMINATING AND PULL ROLLERS TO AVOID INJURY DUE TO HIGH PRESSURE AND HEAT AT THESE POINTS.

FAMILIARIZE YOURSELF WITH THE REVERSE FEATURE, **DO NOT WEAR LOOSE-FITTING CLOTHING AND JEWELRY AND HAIR MUST BE PUT UP AND KEPT AWAY FROM THE NIP POINT** THESE ITEMS COULD BE PULLED INTO THE LAMINATOR SINCE THE ROLLERS ARE ROTATING.

IF THE SLITTERS (SIDE TRIM KNIVES) ARE USED, USE EXTREME CAUTION WHEN HANDLING THE KNIFE BLADES OR MAKING ADJUSTMENTS, AS THE KNIFE BLADES ARE RAZOR SHARP.

USE MULTIPLE PEOPLE TO UNPACK AND MOVE THE LAMINATOR AS IT WEIGHS IN EXCESS OF 75 POUNDS.

LEAVE REPAIRS AND MAINTENANCE TO A QUALIFIED PERSONNEL.

NEVER LEAVE THE MACHINE UNATTENDED WHILE IN USE.

SHUT THE MACHINE DOWN AND ALWAYS KEEP ROLLERS GAPPED WHILE THE MACHINE IS NOT BEING ATTENDED GAPPING GREATLY EXTENDS THE LIFE OF THE ROLLERS AS WELL AS SAVING \$ IN LOST ENERGY. REMEMBER YOUR NEW LAMINATOR TAKES AS FEW AS 4 TO 5 MINUTES TO WARM UP RATHER THAN 20 OR 30

DO NOT ALLOW THE ROLLERS TO EXCEED 300 DEGREES DOING THIS WILL GREATLY INCREASE THE LIFE OF THE LAMINATING ROLLERS – THOUGH YOUR MACHINE IS PERFECTLY CAPABLE OF RUNNING FILM RATED AT 300 DEGREES PRO-LAM RECOMENDS USING A FILM THAT IS RATED AT A LOWER TEMPERATURE - THIS WILL INCREASE YOUR ROLLER LIFE

DO NOT ADVANCE THE FILM THROUGH THE LAMINATOR WHILE THE ROLLERS ARE COLD THIS MAY RESULT IN THE SURFACE BEING TORN FROM THE ROLLERS BY THE AGGRESSIVE LAMINATING FILM ADHESIVE.

DO NOT PLACE THE LAMINATOR NEAR ANY VENTILATION SYSTEM AS THIS MAY COOL THE ROLLERS.

USE CARE WHEN CHANGING THE LAMINATING FILM AS THE FILM ROLLS ARE VERY HEAVY AND MAY REQUIRE AS MANY AS 3 OR MORE PEOPLE TO LOAD THE SUPPLY ROLLS ALSO USE CAUTION TO AVOID PINCHING HANDS OR FINGERS WHILE LOADING THE ROLL

ELECTRICAL REQUIREMENTS

A **GROUND**ED RECEPTICAL MUST BE USED, MAKE SURE THAT THE RECEPTICAL MATCHES THE MACHINE REQUIREMENTS

| MODEL | | VOLTS | AMPS | PLUG | WATTS |
|----------|--|-------|------|-------|-------|
| PL1200HP | | 120 | 20 | * | |
| PL227 | | 120 | 20 | * | |
| PL227HP | | 240 | 20 | L6-20 | |
| PL238 | | 120 | 20 | * | |
| PL238wf | | 240 | 20 | L6-20 | |
| PL244wf | | 240 | 25 | L6-30 | |

*Conventional plug however the outlet must be dedicated (no other devices on the same circuit).

The electrical installation must meet local and federal electrical codes and a qualified person must make the installation.

If a laminator is hard wired you must install a “disconnect” switch

!!! These Requirements must be strictly adhered to, as an incorrect installation will void your warranty!!!

Specifications

Hard specs

| Model | Dry/Ship weight | Height | Width | Depth |
|-------------------|-----------------|--------|-------|-------|
| PL 1200 w/o stand | 40# / 60# | 21" | 24" | 21" |
| PL 1200 w- stand | 60# / 80# | 51" | 24" | 21" |
| PL 227w/o stand | 70# / 100# | 21" | 39" | 21" |
| PL 227w stand | 90# /120# | 51" | 39" | 21" |
| PL 238wf | 140# / 170# | 50" | 50" | 21" |
| PL 244wf | 170# / 200# | 50" | 56" | 21" |

Models shown in their standard configuration

Film specs:

| Model | Max upper roll | Max lower roll | Max thickness | Max motor speed |
|-------------------|----------------|----------------|---------------|-----------------|
| PL 1200 w/o stand | 11" | 6" | 10 mil+ | 18fpm |
| PL 1200 w- stand | 11" | 22" | 10 mil+ | 18fpm |
| PL 227w/o stand | 11" | 6" | 10 mil | 16fpm |
| PL 227w stand | 11" | 22" | 10 mil | 16fpm |
| PL 238wf | 10" | 22" | 5-10 mil | 7fpm |
| PL 244wf | 10" | 22" | 5-10 mil | 7fpm |

Standard models in their standard configuration

Laminator capabilities

Your new laminator is possibly one of the most capable and fastest laminators available, in its class, to the industry today. It is capable of laminating an extremely wide variety of materials, even some deemed impossible to be laminated. Your laminator is capable of using nearly any film that can be run on a laminator and even more.

Laminator Limitations

Your new laminator, though exceptionally capable, does have its limitations. You will find these as you read this manual and through time and experience. One of the most important things in your laminator is the heated rollers. It is very important that you understand this components capabilities and limitations. Just the same, as a roller can be damaged by touching it with a sharp knife, the roller may be damaged by overheating it. **This limitation, which we will call a duty cycle, will dictate how long your rollers will last.** The beautiful thing about the technology enveloped in your laminators is the responsiveness and quickness of the laminating rollers. One does need to make sure (as with any mechanical electrical device) that you do not exceed the design limitations of your rollers. This is why we stress not to exceed 300 degrees and not to run the laminator more than 20 degrees over the film manufactures recommendations. In addition to this, one needs to make sure that the rollers are not overheated internally. Before operating, take record of the temperature range that the display shows when idle. During operation, one should make sure that the laminator cycles on and off. This can be noted by the slow rise and fall (up to 1 degree a second) around the recorded temperature. If the rollers are unable to achieve the recorded temperature, this is an indication that the heaters are always on and do not get a chance to stabilize internally. This will greatly reduce the life of the rollers. It is highly recommended to use a laminate that is at least 50% (1/2) the width of the rollers and ideally not less than 75% (3/4) of the roller width - the laminate must be run at the center of the rollers

Silicone Vs. Metal

A silicone covered heated roller is the most advanced, accurate and highest quality methods of lamination available to day. Producing superior results to nearly any other process, it is the paramount method. However, there are some common sense differences between silicone rollers and the old metal heat shoe technology. Though the silicone rollers are the greatest advantage to other technologies, it is possibly its greatest weakness. Review the chapter of roller care and maintenance starting of page 65

Keep in mind the following;

- Do not cut the rollers, as with any rubber, they will slit and they will be destroyed.
- Do not overheat the rollers, this is covered in this manual extensively and should be understood.
- Do not allow heat to build up, use the proper width film and turn the machine off when not in use.
- Do not use abrasive materials on the rollers, they are silicone rubber there are many things that are harder than this - they will abrade the rollers - use only the accepted cleaning method.

UNPACKING

Because the series II laminator is available in several different sizes and configurations, some of the following steps may not be applicable to your specific shipment. However, it may be a good idea to read over the following documentation to familiarize yourself with your machine and the technology involved

Typical shipment of the series II laminator is as follows.

- A. Your laminator was shipped as a tabletop model.
- B. Your laminator was shipped with a stand and the stand requires minimal assembly
- C. Your laminator was shipped separated from the stand and your stand does require assembly

Included with your shipment you should find the following possibly in multiple boxes

- 1. Your laminator
- 2. The laminator stand (optional)
- 3. One set (2) of film supply roll mandrels
- 4. Mandrel Towers
- 5. Feed Table
- 6. Control Handle
- 7. Slitter assembly (Optional)
- 8. Release Liner Winder (Optional)
- 9. Hardware kit
- 10. Your operators manual

The following pages address each component of your installation individually.
And is outlined as follows

- 1. Unpack the laminator
- 2. Unpack the stand
- 3. Assemble the stand
- 4. Install stand towers
- 5. Assemble the laminator

LAMINATOR UNPACKING

Your laminator is shipped in one box. Some minor assembly is required. You should clear out sufficient space to unpack the laminator. Make sure this area will provide access to both sides of the laminator as well as the front and back of the machine.

The laminator is packed in specially designed material for shipping your laminator safely. The Packing material should be retained for transportation or for shipping in the event of a warranty or service issue.

In the box with the laminator you should find the feed tray and enclosed hardware. The supply mandrels will be shipped with the stand if the machine was purchased without a stand. The mandrels should be included with your shipment however in a different box.

!!! SEE THE NEXT PAGE FOR LIFT POINTS ON THE SERIES II LAMINATOR !!!

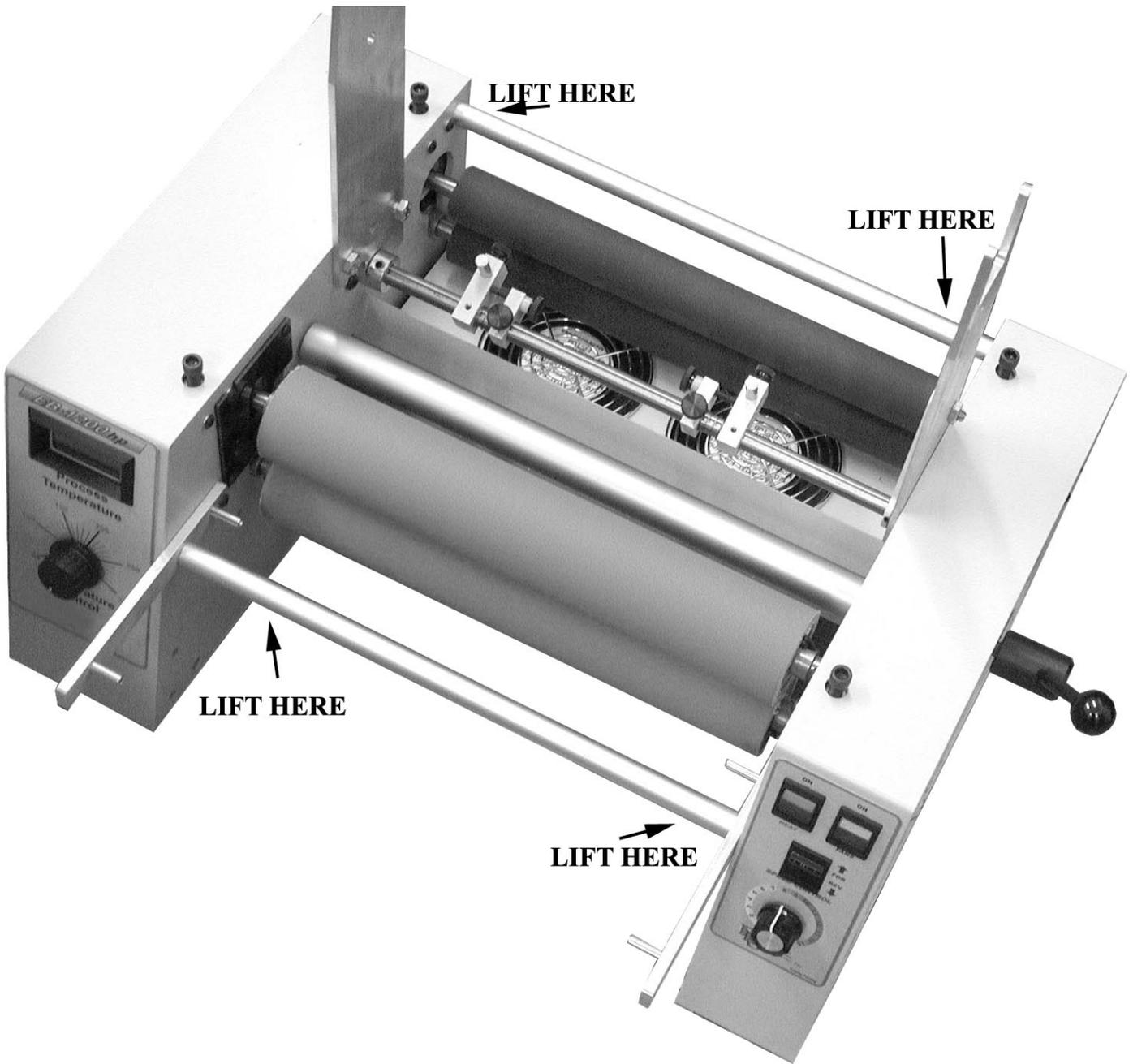
LAMINATOR REMOVAL

1. Remove the feed tray
2. Remove the center piece of foam
3. Using at least two people pull the laminator and remaining packing, by the lift points, from the box. Use great care, the laminator may be quite heavy, dropping it will damage it.
4. Set the laminator on the floor and lift one end at a time and remove the foam shipping caps
5. Remove the remaining packing
6. Set the laminator aside and clear sufficient space for the stand and its packing

Please retain original packing in the event that the laminator must be moved or returned to your dealer for warranty or service.

Use a sufficient number of people to remove the laminator from the box as the machine may weigh in excess of 200 pounds.

LIFT POINTS



Make sure that when the laminator is removed from the box it is only lifted by the ends of the tie bars (as shown). PL 1200 shown, if the laminator is wider this is even more critical and may take two or more people to lift it.

!!! DO NOT LIFT THE LAMINATOR BY ANY OF THE COMPONENTS BETWEEN THE FRONT ROLLERS AND THE REAR ROLLERS. - - - DAMAGE MAY ACCURE - - - !!!

STAND

 *The stand is an optional item on certain models and may or may not have been included with the purchase of your laminator.*

Your laminator stand is shipped in one box it may require simple assembly. You should clear out sufficient space to unpack the stand. Make sure this area will provide access to both sides as well as the front and back of the stand.

The Packing material should be retained for transportation and shipping for warranty or service.

Shipped with the stand you will find the film supply mandrels for the laminator and possibly any additional options as you ordered such as a release liner winder.

The hardware used to assemble the stand is packed separately and shipped with the laminator.

The Tools required for assembly are:

1. 1 – 3/16” Allen wrench
2. 1 – 7/16” combination wrench or ratchet

In the box, that the stand is shipped in are the following:

- A. 1 - Right side frame, with or without towers attached
- B. 1 - Left side frame, with or without towers attached
- C. 2 - Spreaders
- D. 4 - Feet or caster wheels (*as ordered*)

Stand Unpacking

Unpacking the stand does not need to be addressed, as it is straightforward.

After the stand is unpacked, consolidate the packing materials and remove it from the assembly area.

 **If the mandrels are unpacked from their boxes be very careful, they have a sharp protrusion in the center of the mandrel that can cut if handled carelessly.**

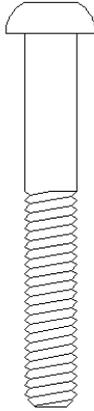
Please retain the original packing in the event the laminator must be returned to your dealer for warranty or service

STAND ASSEMBLY

 These instructions for the stand are correct assuming that the stand frames were delivered with the mandrel towers and feet / wheels installed. If they are not please refer to the included documentation for documentation on this, then refer to the following instructions

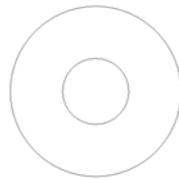
The hardware for assembling the stand was shipped in a parts box that was included in the laminator box.

Hardware Identified as:



5/16-18 Button head
Cap Screw
8 pieces

Socket

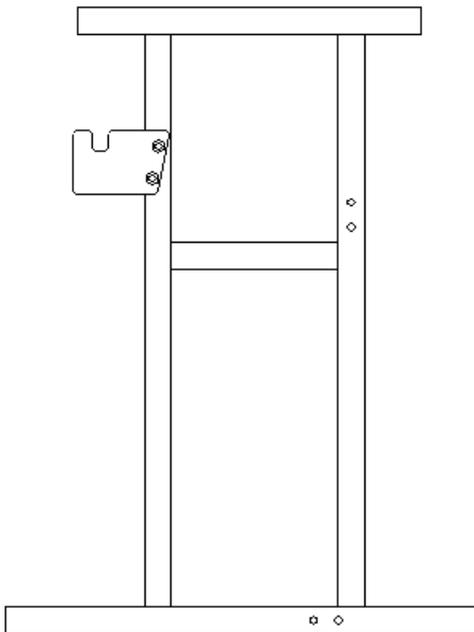


5/16 Flat Washer
8 pieces

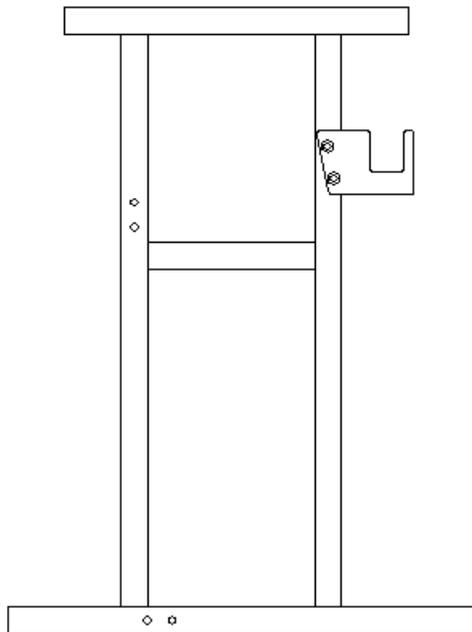


5/16 Split Washer
8 pieces

Stand parts:



Stand Frame Left

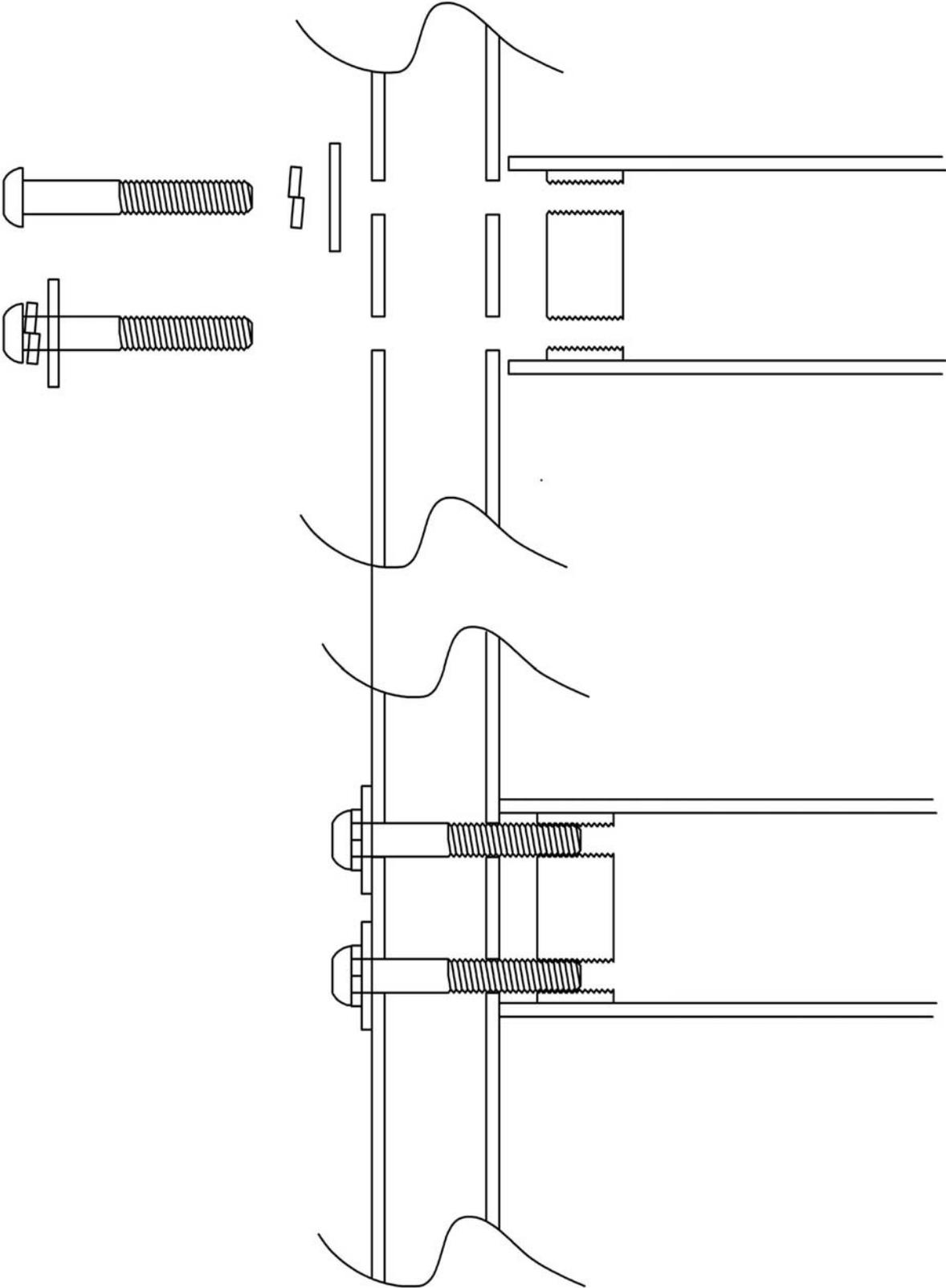


Stand Frame Right



Spreaders, 2 typical

Use the diagrams and instruction on the following three pages as a guide to assemble the stand



Assembled Stand



*When finished your stand should resemble this example from our PL 227hp.
Also Notice the placement of the mandrel towers.*

Stand Assembly Review

Normal Procedure For stand assembly is as follows

1. Position the parts for assembly, layout the parts in their respective locations on the floor
2. Identify left frame piece (has the smaller slot in the mandrel tower).
3. Position the frame so that the aluminum mandrel tower is toward the front and on the right side (inside) of the stand frame (feet down).
4. Install a spreader into the lower holes (spreaders are not directional). Use a 3/16 Allen wrench, do not tighten the screws all the way.
5. Install second spreader onto the left frame piece, in the upper holes
6. Install right frame piece to the spreaders, this should be positioned so that the aluminum mandrel tower is forward facing and inward.
7. Place the stand upside down on a flat level surface, tighten all 8 Allen screws
8. Install any other optional items that may have been included with your laminator using the instructions supplied, if necessary
9. Once the stand is setup make sure that it is sturdy and all screws are tight

 The screw holes on the top of the stand for mounting the laminator are off center. This should be of no concern; this must be this way for correct laminator alignment (the hole should be justified to the right).

Please retain the original packing in the event the laminator must be returned to your Dealer for warrant or service.

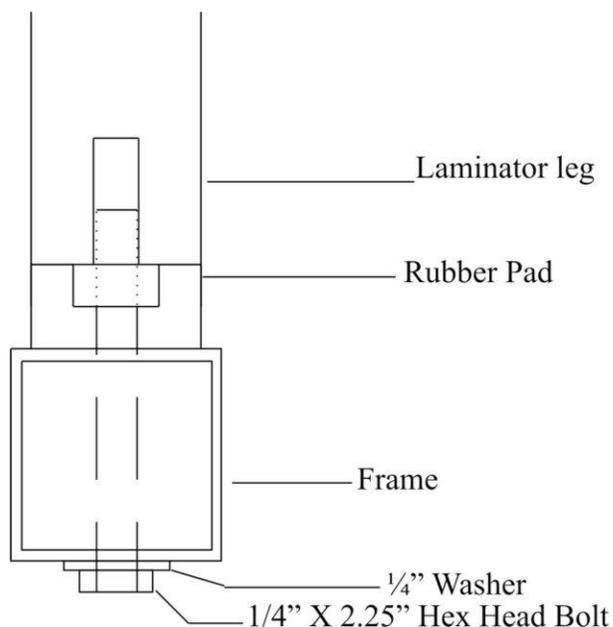
MOUNTING THE LAMINATOR

The laminator is mounted to the top of the stand using the four thru holes on the top of the stand

1. Set the stand in position on a flat level surface.
2. If the laminator arrived with rubber pads on the feet, these must be removed. Using two people, tilt the laminator back while using a 5/32 Allen wrench loosen the cap screw and remove the pad.
3. Make sure that the mounting bolts and pads are properly placed on the stand. The rubber pads should hold the bolts in position securely.
4. Carefully set the laminator on the stand while aligning the legs on the laminator with the pads on the stand.

 Make sure that at least one person holds the laminator from moving or falling until the laminator is completely secured to the frame.

5. Install the 1/4" bolts from the bottom side of the tube, Align holes and start the threads in all four holes do not tighten until all four bolts are started, then tighten until snug. **Do not** over tighten and crush the rubber feet as this may result in laminator misalignment. Typically, tightened the bolt just enough that it just starts to flatten the lock washer.



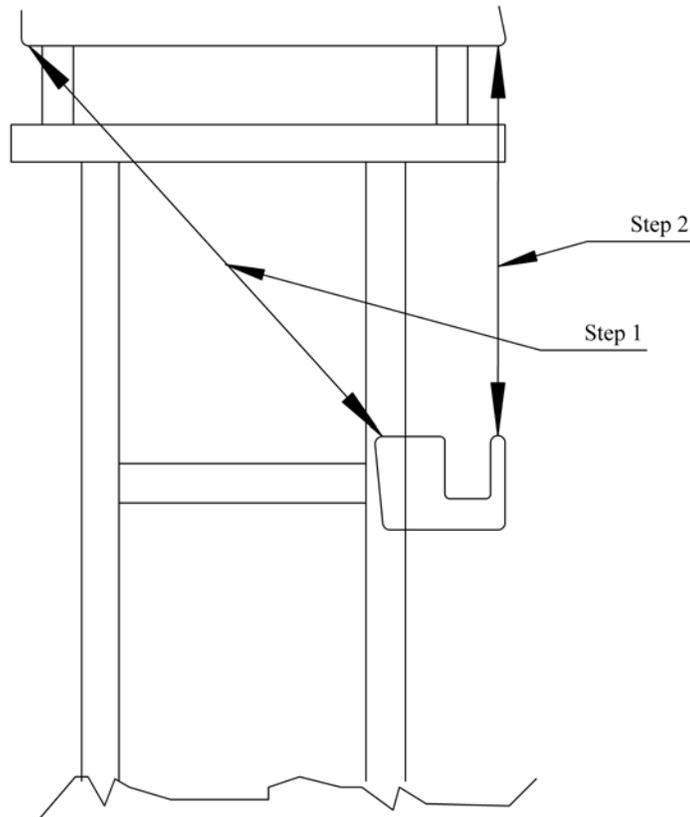
Tower Alignment

If the stand arrived with the towers attached you possibly will not need to follow this alignment procedure however, it is recommended before proceeding make sure that the towers are correctly aligned. Before starting this alignment, procedure makes sure screws are tightened only enough to make moving the towers somewhat difficult. It may be necessary to use a rubber hammer or a block of wood to adjust the towers.

The following procedure is a preliminary adjustment and it should not be the final adjustment
The final adjustment is done with the machine running see page 48.

 The following instructions on the next several pages and page 48 are more critical on our wide format machines and more care should be taken when following them.

1. Measure between the top, rear corner of the mandrel tower to the rear corner of the laminator this measurement should be made the same from the left tower and the right tower. Tighten the top bolt until snug
2. Measure from the lower front corner of the towers to the lower front corner of the laminator these should be made the same.
3. Tighten the lower mandrel tower bolts. Until snug.
4. Recheck alignment then tighten the towers to the frame.



Laminator Assembly

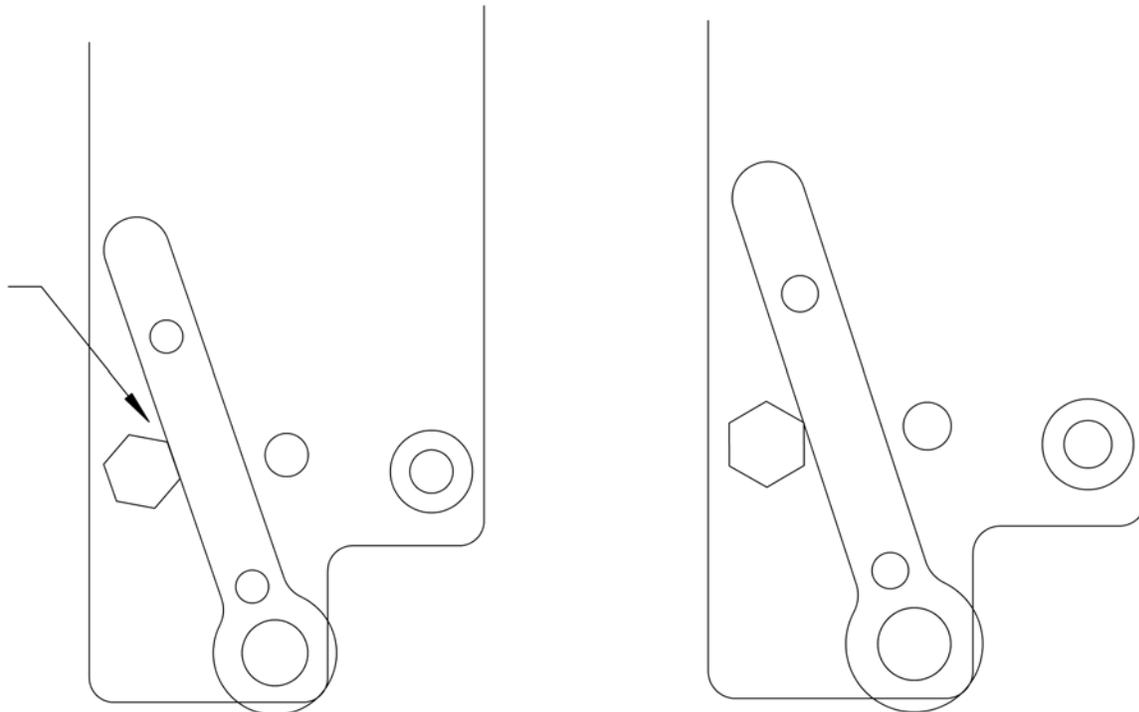
Mandrel Towers

Typical tower configuration on the laminator is either, slitter towers, which include the slitter assemblies attached to it, or our standard towers, which come with machines void of slitters.

Slitter Towers

If your laminator was supplied with slitters, it is typical that the tower will be already attached to the machine and they simply need to be pivoted upright.

1. Position the laminator mandrel towers. Do this by grabbing both towers and at the same time, turn them upright until the holes in the towers are aligned with the holes in the panels
2. Install two 5/16 x 1/2" long, hex head bolts one in each tower
3. Take note that on the right tower the bolt must be oriented so that the side of the bolt is parallel to the side of the slitter-actuating handle (see diagram.). Do not over tighten bolt it is better that it be looser rather than over tightened.



Correct

Notice both bolt and arm lay flush and parallel

Incorrect,

Notice tip on bolt is preventing arm from seating

4. Check that the ball plunger on the tower rests in its indent in the slitter handle
5. Tighten all remaining attaching hardware

Standard Towers Upper

If your laminator was supplied without slitters, the towers will be included with the hardware pack.

1. Install left tower (small slot) using two 5/16 x 1/2" long, hex head bolts.
2. Install right tower (large slot) using two 5/16 x 1/2" long, hex head bolts.
3. Tighten bolts snug (do not over tighten).

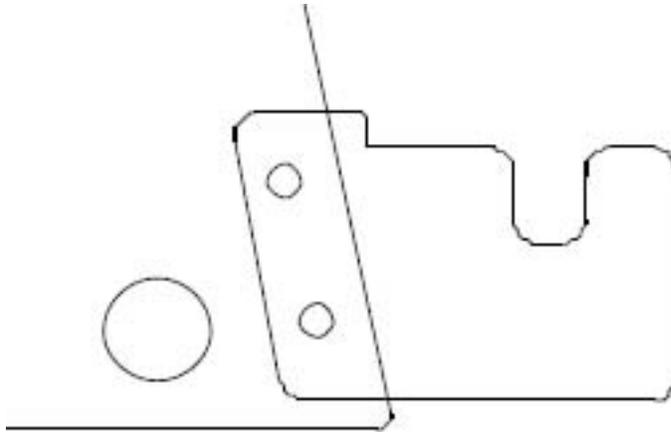
Lower towers

Your machine is available in two different configurations.

- A. Without a stand, your towers will have to be installed on the laminator below the feed tray.
- B. With a stand, your towers should already be installed if not follow procedure "B".

"A"

Lower tower installation is similar to the tower installation for the upper towers.



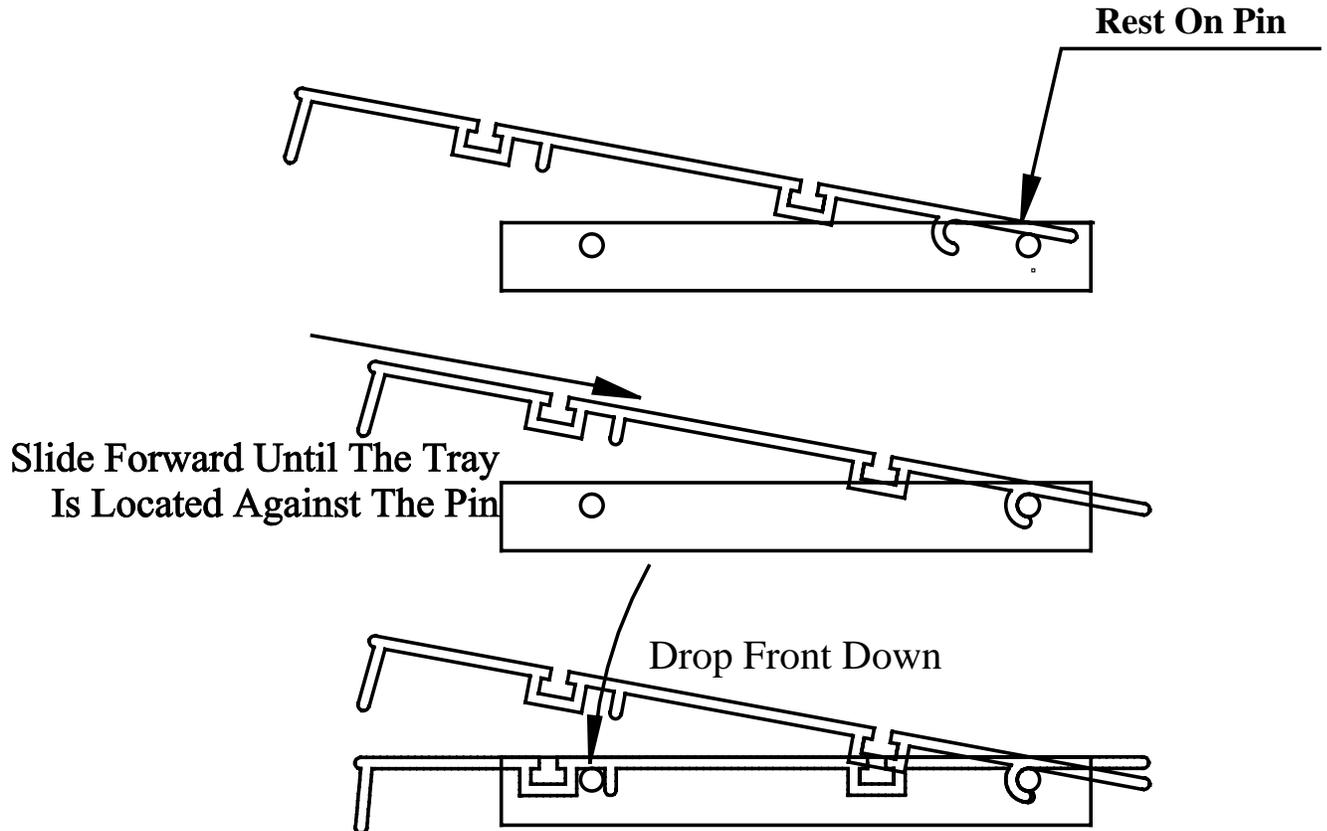
Lower machine tower, left side shown, viewed from left side

"B"

Stand towers should already be installed, if not use the supplied hardware, 1/4" flathead screws and the self-locking, nuts bolt the towers to the stand. The towers should be mounted to the inside of the stand using the similar instructions above. Take note of the pictures on pages 18, 20 and 23, and their respective instructions if necessary

Feed Table Installation

Attach the feed table by introducing the table at a slight upward angle. Engage the semicircular extrusion boss against the 1/4" roll pin protruding from the sides of the feed table brackets. Push and press down until the table snaps into place.



The feed table is removable and is typically removed for installing new film, roller cleaning and service

Remove Protective film

There is a protective film on the side panels of your laminator. Peel this protective film off, it serves the purpose of protecting the side panels in shipment only.

Laminator Setup

Plug the machine into its respective outlet; make sure that this outlet is dedicated or of sufficient rating (no other electrical devices used at the same time on this circuit).

!!!THIS CIRCUIT MUST BE GROUNDED Never Operate The Laminator Without A Ground!!!
Refer to “ Electrical Requirements” on page 12.

To better familiarize yourself with your laminating rollers, review the chapter on roller care and maintenance starting of page 65

Check and familiarize yourself with the following functions

- A. Turn temperature control knob to the lowest setting
- B. Activate Heat Switch--it will glow red and you will see the temperature of the roller indicated in the digital readout widow on the left side of the machine.
- C. Turn the temperature control knob to 200 degrees and allow the temperature to raise 10 or 20 degrees--then turn off the heat switch.
- D. Turn the fan switch on. You will hear the fans run and you will feel air coming out of the fans behind the deflector located behind the lower heat roller. Turn the fans off.
- E. Turn the speed control knob fully counterclockwise and depress the rocker switch (up arrow or forward). Then slowly rotate the control knob clockwise and the rollers will begin to rotate. Turn control knob counter-clockwise and deactivate the switch.
- F. Rotate the gap lever a couple times (located on right-hand side panel). One-half revolution gaps the rollers and one-half revolution pressurizes the rollers.
- G. Turn the heat switch back on and the temperature control to 50 degrees watch the laminator for a minute or so and make sure that the laminator does not continue to heat with the temperature turned down, if so immediately unplug the laminator and contact your dealer.

Always keep the rollers gapped when the laminator is not in use

Laminator Controls

Heat Switch

This switch, located in the upper left of the right-hand control panel activates the heating and temperature control systems incorporated in the rollers. When activated, you will see a numeric temperature displayed in the process control window, located on the left-hand panel. This indication is the actual temperature of the rollers. **Please turn off the heaters and gap the rollers when the laminator is not in use.** By doing so you will not only dramatically prolong the life of the rollers-- you will also save a very sizable sum of money in reduced energy consumption. Your laminator should heat up in 4 – 7 minutes depending on the model so you can shut it off when you don't need it and be just minutes' away from laminating when you do. For a faster recovery, it is quite common to simply turn the temperature down when it is not needed, then back up when it is. Remember:

Never leave the laminator unattended when in use

Always check the temperature control dial setting before activating the roller heating system.

Temperature Control Dial

This knob regulates the process temperature of the laminate. Simply line up the line on the knob with the desired temperature. Operating temperature varies depending on the type, thickness and manufacturer of the laminating film you have selected. Please use the temperatures recommended by the film manufacturer.

Under no circumstances should the dial ever be set beyond the 300-degree Fahrenheit setting or more than 20 degrees beyond the film manufactures recommendations.

After heating up to temperature and before operating, take record of the temperature range that the display shows when idle. During operation, one should make sure that the laminator cycles on and off. This can be noted by the slow rise and fall (up to 1 degree a second) around the recorded temperature. If the rollers are unable to achieve the recorded temperature this is an indication that the heaters are always on and do not get a chance to stabilize internally. This practice will greatly reduce the life of the rollers

Motor Controls

These controls are located near the center and bottom of the right-hand control panel. They control process speed and roller direction.

Speed Control

The speed control knob is used to control the speed of the lamination process. This is a variable control, which sets the lamination speed in infinite increments. The fully counter clockwise position is the minimum or stop position and the full clockwise direction being the top speed of your laminator (see specs for the max available speed).

Direction Control

The direction control switch is located directly above the speed control. This switch is a three-position rocker switch.

Forward is the normal setting and the switch will stay engaged after being depressed.

Reverse is for clearing jams and cleaning rollers. You must keep the rocker depressed for the duration of time you wish to use this direction. Reverse should only be utilized as a last resort--you can normally clear a jam by gaping the rollers.

Off is the center position of this switch is the off position. This switch should remain in the center or off position when the laminator is not in use.

Fans

This switch activates the cooling fans. These fans control the temperature of the film as it exits the heat rollers. Their use depends on numerous variables so experimentation and experience is about the only way you can determine their necessity.

Do not use the fans to facilitate in cooling the laminator during shutdown. Follow the standard shutdown procedure

In general, these fans should be used:

Thicker films (relative to the lamination speed) unless running very slowly

Thin films (1.2-1.8 mil.) during medium to high-speed operation

During slitters use the fans may reduce an adhesive build-up on the slitter blades.

If the film leaves the rear of the machine at an excessive temperature, the film may show:

1. The film may show a rougher surface finish,
2. The film may show marks from the rear roller that are at right angles to the film path
3. The film may hold the shape it finally cools at outside the laminator.
4. Excessive heat may also cause stretch marks the length of the film or around the edges of the paper.

On the other hand, excessive cooling may cause

- A. Downward curl
- B. Foggy areas in the film
- C. Unusual stretch marks.

!!!THE FAN SWITCH MUST REMAIN IN THE OFF POSITION WHEN THE ROLLERS ARE STATIONARY!!!

Failure to turn off the fans while the laminator is in an idle state will result in abnormal roller cooling, especially on the bottom roller. This may show as cold spots (foggy areas perpendicular to the film path) or failure of bottom lamination.

To remedy this either

- I. Allow the rollers to stabilize by gaping the rollers and leaving them undisturbed in this position for 5-15 min (with fans off)
- II. In extreme cases shut down the laminator (see shutdown, page 58) and allow the machine to cool to room temperature and then reheat.
- III. In minor cases, the rollers may be stabilized by very slowly running film through until the cloudy spots disappear. This however, may not be an economical solution.

Gap Control Lever

The roller gap control is located on the right-hand side of your laminator. Its primary purpose is to allow the rollers to "relax" while the laminator is not in use. The rollers may be gaped or closed by rotating the gap control lever **clockwise**. Don't panic if the lever comes off in your hand--you just forgot and rotated it counterclockwise.

The gap control lever is also useful in clearing jams and wraps. When gaped, you can rotate the upper rollers by hand. Please be careful, as the front rollers are very hot.

 The rollers must be in the closed position for successful lamination (encapsulation) to occur.

Please keep the rollers in the gapped position when the machine is not in use.

By gaping the rollers, you will increase their service life as well as insuring superior laminations. If left in the closed position for extended periods, especially when hot, you

- A. Run the risk of "flat-spotting" them. This phenomenon can result in narrow bands running from one side of the laminate to the other during every revolution of the roller.
- B. Cause heat build up at the nip while the laminator is idle with the rollers heated

To ensure a quality lamination it is important that the rollers remain gapped during warm up or while the rollers are stationary for an extended period. Failure to do so will result in hot areas on the film perpendicular to the rollers. To remedy this you need to allow the rollers to stabilize. It is much easier to stabilize hot spots than it is to stabilize a cooled roller. Simply allow the laminate to run through the laminator very slowly for a few revolutions of the roller or until the hot spots disappear.

If it is found that the laminating rollers have flat spots on it due to the rollers not being gapped, simply gap the rollers and allow the laminator to go through several heating and cooling cycles then run the laminator without film until the flat spots disappear. The silicones that we use in our rollers are of an extremely high grade and hold nearly no memory for extended periods. We have never had one roller returned because the rollers did not recover from not being gapped. This issue is typically just a nuisance to the operator.

Idler bars

There are two idler bars on a stand model laminator and three idler bars on a table top model, one for the upper laminate and one or two for the lower laminate. These idler bars help direct the film over the rollers to provide a more consistent heat transfer and a high quality lamination.

Top idler

It is necessary for the laminating film to wrap around this idler for proper lamination. By using the idler rollers on the machine, you increase the time that the rollers heat up the film, which results in a better lamination

Bottom Front Idler

This idler is included on laminators that were shipped for table top models only it is necessary on machines which have the film mounted on the machine so that the film is guided away from the heated roller and around the sliding idler

Sliding Idler Bar

The sliding idler bar is a 1" roller located below the lower heated (front) roller. While the machine is cool, please take a few moments to "practice" raising and lowering it.

Its purpose is to allow the operator to thread the laminating film without burning their fingers.

To raise the roller place your hands under each end of the roller and gently and evenly raise the roller as high as it will go, about 3 inches, and pull it slightly toward you. It will automatically lock in place. To lower it, place your hands under each end of the roller, push it away from you and slightly up then gently lower each end evenly. Do not force the idler if it becomes jammed--gently straighten it out.

Mandrels

**!!!Caution: Use Extreme Care When Handling The Mandrels
Located in the center of the mandrel is the mandrel clip, it is very sharp!!!**

Mandrels:

The 3” mandrels are designed to be used with film that is wrapped adhesive out
The 1” mandrels are designed to be used with film that is wrapped adhesive in.

- If you are using film with the adhesive wrapped opposite you must either use the top mandrel on the bottom and the bottom on the top or if you are using 3” mandrels you may disassemble and flip the center core so that the core clip faces the other direction.
- If you desire to use film that is supplied with a 1” core or a 2.25” core optional mandrels are available. Please contact your dealer regarding this.

The supplied mandrels are marked on the end T for the **Top** Mandrel B for the **Bottom**. In the center of the mandrel is a clip that holds the film core to the mandrel

!!!Be very careful as this mandrel clip may cut!!!

(This is required to hold the film supply roll tightly; the mandrels are designed to work in only one direction so that film removal will be simplified.

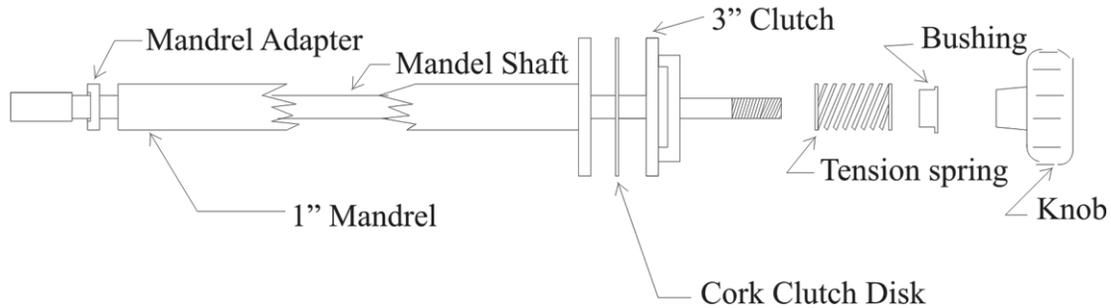
Installation:

The mandrels are removable and simply slip into the mandrel towers the handle must be facing the right side of the machine. It may take two people to lift the mandrel onto the laminator once it has a roll of film on it, it can be quite heavy.

It is a good idea to practice installing the mandrel onto the machine without any film on it so that the process is understood.

You will find that both right and left sides of the mandrel are “keyed” (*the mandrel end pieces must be turned the correct direction in order for it to drop into place into the towers*). **Use care, when installing the mandrel, not to pinch fingers.** It is also necessary to allow the right side of the mandrel to drop into place before the left side.

1" Mandrel Assembly



Tension Control Knob

The tension control knobs are located on the right side of the mandrels that hold the laminating film. They are used to:

- A. Control film tension
- B. Prevent the film rolls from free spooling.
- C. Flatten any film curl
- D. Smooth film lay on the rollers

As a rule, the lighter the tension, the better. The mandrel tension may also be used to assist in keeping the lamination flat. If the laminate curls up when it exits the back rollers, reduce the upper roll tension or increase the bottom roll tension. If it curls down, reduce the bottom roll tension or increase the upper roll tension.

✍ Please remember to use the minimum amount of tension necessary to insure a crease free and high quality lamination.

During single sided laminations use extra attention to assure that there is zero or minimal tension on the film, as of equal importance is an appropriate film of a high quality and in good condition.

In the event that there is excessive film wrinkling on the rollers that show on the laminate, mandrel tension may assist in smoothing this out.

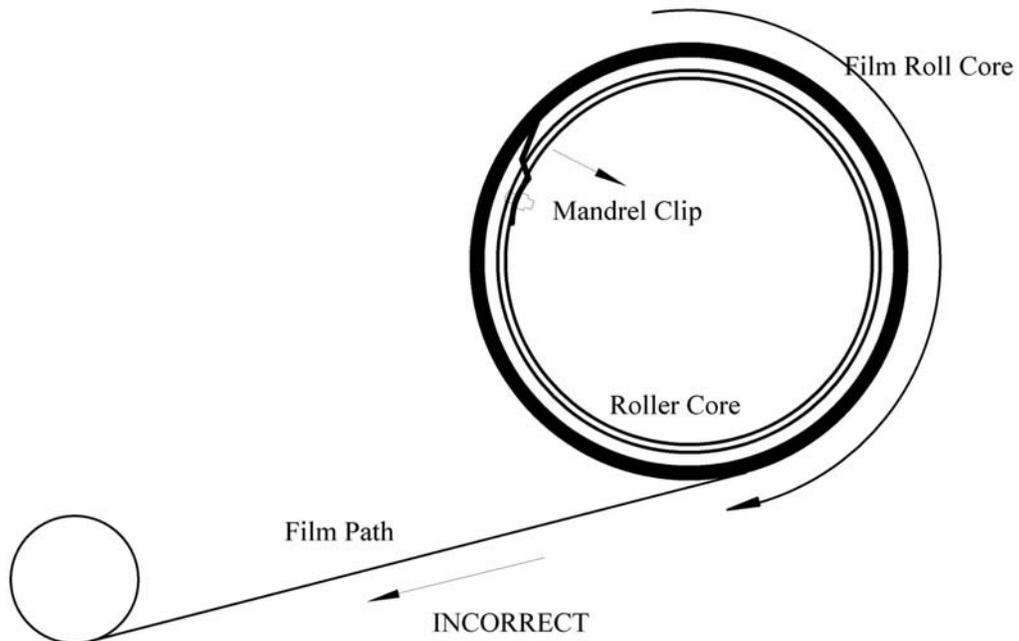
Take careful note of the film direction to the mandrel clip orientation

Mandrel Clip

Each 1-inch mandrel has one mandrel clip and each 3-inch mandrel has two of these clips opposed 180 degrees – use caution so that you do not cut yourself –. These clips are located in the center of each mandrel they are designed to hold the film to the core of the mandrel when in operation and to aid in film removal from the mandrel by allowing the core to slip when turned in reverse. Take note when the laminator is set up whether this clip is holding the mandrel to the film core, or whether it is allowing it to slip. If it is allowing it to slip, the mandrels may be in the wrong position and should be reversed – see also installation instructions on these mandrels

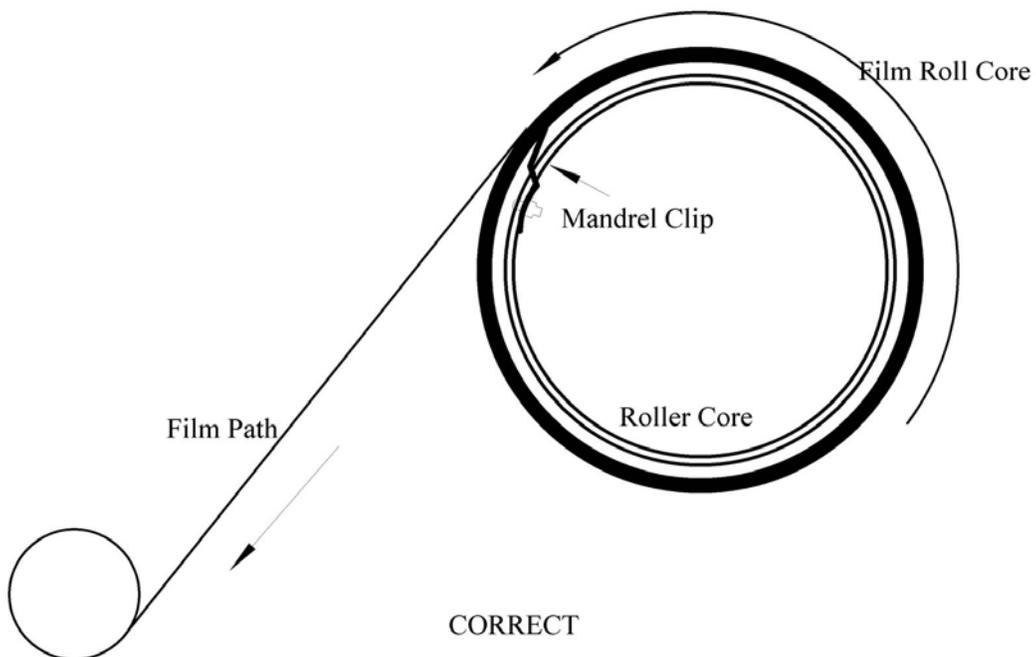
Mandrel Clip

The following diagrams show the proper use of the mandrel clip for film wrapped with the **adhesive out only** if a film is being used that is wrapped with the adhesive in you must reverse the cores for the clip to grip



Take note of the direction of the mandrel clip in relation to the film path and that it would allow the film to slip
Though this is shown as incorrect, it is the correct film path (adhesive touching idler not roller) for adhesive in

IT IS IMPERATIVE THAT THE ADHESIVE SIDE OF THE FILM NEVER TOUCH THE ROLLER



Take note of the direction of the mandrel clip in relation to the film path and that it would **NOT** allow the film to slip
This drawing is viewed from the right, it is assumed the adhesive is wrapped to the outside of the roll

Feed Table

The feed table is used to correctly position the material in relation to the rollers. Located on the surface of the Feed Table are two (or more by option) feed guides. These guides help keep the material being laminated square and aligned with the film edge and, in effect, correctly locate it for slitter operation. These feed guides are adjustable for both angle and position. To adjust the feed guides simply loosen the two knurled knobs located on the top of the guides and slide the feed guide to the desired location.



Adjustment

For a preliminary adjustment to align the feed guides to the slitters locate the feed guide in the approximate desired location. Using a piece of paper align it along the front of the feed table even with the edge. While holding the paper in position, align the feed guide with the edge of the paper. Tighten knurled knobs. This preliminary adjustment should bring the feed guides parallel to the film path and only require very small adjustments. Run a piece of paper through while using the slitters. Take note of the difference in the alignment of the paper from end to end and divide the difference in half. This should be the amount that the feed guide should be adjusted. If the front side of the paper is too far to the right move the backside of the feed guide to the right and vice versa.

Roller Pressure Adjustment Knobs

These adjustment knobs are located in each corner on the top of the side frames, two for the rear and two for the front. They control the amount of pressure that is put on the rollers and the laminate. Typical adjustment is about 1-2 full turns on the front and 0-1 turns on the rear. When running materials thicker than 1/8" always loosen the front adjustment to one turn or less and the rear to one turn or less. To obtain a closer edge seal on thicker papers such as 8 or 12-point cover or card stock it may be necessary to increase the pressure on the front rollers from the factory settings.

Too little pressure on the front rollers will result in poor edge seal and in severe cases a poor surface bond.

Excessive pressure on the front or rear rollers may result in accelerated roller wear, or curled laminate from front to back or corner to corner.

 Roller pressure may affect film curl as the film exits the laminator. The laminate should be checked for curl after a roller pressure adjustment.

SLITTERS

!!!Use caution at all times in the vicinity of the slitter assemblies, as the knives are razor sharp!!!

!!!If there exists any uncertainty about the operators' competence, remove the blades immediately!!!

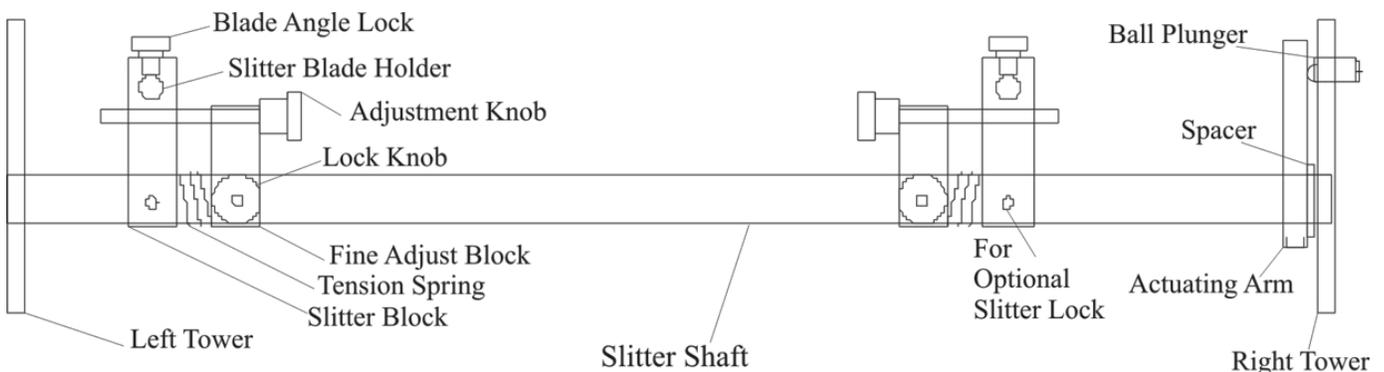
!!!REMEMBER THESE BLADES ARE EXTREMELY SHARP AND ARE CAPABLE OF DISMEMBERMENT OR DEATH THEY SHOULD BE USED WITH EXTREME CARE AND REMOVED WHEN NOT ABSOLUTELY NECESSARY!!!

When the slitters are removed, make sure that they are stored in a safe location as to prevent injury. The slitter assemblies are optional equipment that may or may not have been purchased with the laminator

Slitter Assembly

The slitters may have already been installed on the laminator if so disregard the following several pages. Included with the slitter assembly are the following:

- 1 Set of high capacity towers
- 2 Fine adjustment guides
- 2 Slitter assemblies
- 1 Slitter shaft
- 2 Tensioning Springs
- 1 Shaft collar with an expansion spring or washer
- Appropriate hardware and wrenches for installation and adjustment



Typical slitter installation

Slitter Installation

Disconnect the laminator from the electrical supply before proceeding

1. Remove old towers (if applicable).
2. Assemble the slitter assembly in the order and direction shown on the previous page do not install the razor knives at this time.
3. Install the shaft collar and the expansion spring (locate the expansion spring of spring washer between the tower and shaft collar) on the left side of the assembly (not shown).
4. Being careful not to scratch the side frame, lower the slitter assembly into position.
5. Install the supplied bolts taking note of the bolt with the tapered seat. The bolt with the tapered seat is installed in the right tower in the front hole. Tighten this bolt first then proceed to tighten the remaining three bolts securely. It may take another person to hold this assembly during installation.
6. While pulling the slitter shaft to the right compress the expansion spring fully against the left tower with the shaft collar, tighten securely. This may be facilitated by pushing a slitter block up against the shaft collar with a nearly compressed spring and using a screwdriver, for leverage, push the shaft collar against the spring
7. There are three positions for the slitter bar moving the actuating bar changes these; to install the slitter blades bring the actuating bar back against the upper idler bar. The slitters may now be installed from the back of the machine.

*** Be Careful Not To Cut The Rollers While Changing Blades *
If the rear rollers are cut, it may affect the finish on the film.**

8. Make sure that all the components of this assembly are tight and secure.
9. With the blade angle adjustment screw tightened, turn the blade holder knurled barrel or shaft counterclockwise Using extreme care, install the razor knife blades into the blade holders then carefully tighten the knurled knob.

**!!!DO NOT EVER ALLOW ANY SHARP OBJECT TO GET EVEN CLOSE TO THE
LAMINATING ROLLERS WHEN CHANGING BLADES OR CUTTING FILM NEAR THE
FRONT ROLLERS SHUT OFF THE POWER TO THE MACHINE!!!**

10. Lower the knife assemblies down until they are in the middle position (not trimming) the slitters should stay in this position at all times except when trimming and changing blades the blades should be removed when not in use.
11. Adjust the blade angle. The angle should be set so that the edge of the knife blade just planes the film. Care should be used when adjusting this angle as it greatly affects the finished results. To little of an angle will result in an excessive edge curl and too much of an angle will result in erratic cutting.

Slitter Operation

!!!Use care while using the slitters, as they are sharp!!!

Never load film on the laminator with the slitters in the down or trim position

Always use sharp blades for slitting operations this will increase the quality of the lamination and prevent damage to the rear rollers due to blade binding and breakage

Do not use the slitters to cut materials thicker than 3/64”(approximately .045” Or the thickness of two layers of 10 mil and 2 pieces of card stock)

KEEP HANDS AWAY FORM SLITTERS AT ALL TIMES

Adjustment

1. Align the feed guides on the feed table to the desired location in relation to the film path. Feed a sample piece of paper into the film path.
2. Stop the film advance when the paper is between the front and rear rollers.
3. Turn the adjustment knob until the slitter block and the adjustment block are separated by about 3/8”.
4. Move the slitter blades into the approximate location desired then tighten the knurled knob that locks the adjustment block.
5. Using the actuating arm lower the slitter assembly into the film path.
6. For a more precise adjustment the fine adjustment may now be made by turning the knurled adjustment knob while the film is slowly advancing until the desired edge trim is achieved.

*In general it takes about four complete turns to move the slitter holder 1/8”

 Do not move or adjust the slitter block while it is in the film, without the film moving. You must slowly advance the film and adjust the block or remove it from the film path to do so.

 Never leave the slitters in the “cut” position while threading the film; This may result in slitter breakage and permanent damage to the rear rollers

Slitter angle adjustment

We have provided the following adjustment on our deluxe slitter sets for a higher quality-finished product. *(At the time of publication the only type available)*

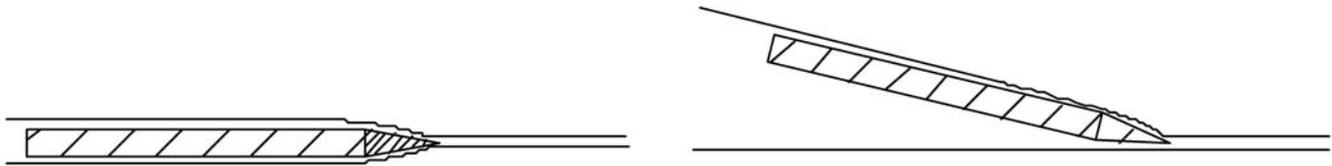
The angle of the cut on the edge of the film is fully adjustable allowing the knife to plane the edge of the film resulting in a minimized edge curl.

To adjust the blade angle,

1. Loosen the blade angle lock $\frac{1}{2}$ turn.
2. Using the diagrams below as a guide, turn the top of the blade holder that protrudes from the top of the slitter block.
3. Tighten the blade angle lock when the desired angle is archived.

In drawing A, the film is cut by the blade and pushed to both sides of the blade resulting in an edge curl on the scrap and the finish piece.

In drawing B, the blade planes the edge of the film resulting in curl on the scrap only.



Changing Blades

These blades are extremely sharp and a high degree of care should be exercised while handling them. It is a good Idea to change or sharpen the blades regularly as this has a direct affect on the quality of the edge finish. We deliberately designed the slitters around an excellent and inexpensive blade (#11 exacto) rather than a proprietary blade so that that this would not be a cost issue with our customers.

1. Retract the blade holders from the film; bring the arm back and against the upper idler bar.
2. Make sure the blade angle lock is hand tight.
3. Turn the knurled area of the blade holder counter clockwise.
4. Remove and replace the dull blade.
5. Tighten the blade holder.
6. If necessary realign the blade angle.

Film

Film Selection

For best results, Professional Laminating Systems Inc. recommends using a film that is;

- Manufactured in the USA or name brand and of good quality. This is due to apparent complexity in the film manufacturing process and the compromise of quality by foreign manufactures that offers no repercussion to their profits.
- Lower temperature, The lower temperature film used, the longer the rollers will last and the fewer problems will occur related to excessive heat on the substrate
- Use a film that is at least 75% (3/4) the width of the rollers if narrower film is used one should make sure that the laminator is run more slowly than usual
- Make sure that the core diameter matches the mandrel size of your machine
- There are a wide range of thickness and types available

Film Type:

ProLam, inc. recommends using film of good quality from a reputable manufacture. There are many different variables consistent with all films. Of which the most significant are:

- Film type - such as polyester, polyethylene, polypropylene, vinyl, nylon and others –
- Film thickness - such as 1.2, 1.5, 1.8. 2, 3, 5, 7, 10, 15, mils thick -
- Film to adhesive ratios - just 5 mil alone is available in 4 or more different ratios –
- Different adhesives – this is one of the most important issues when it comes to laminating especially wide format laminating as there are many different adhesives and many different inks and papers, an adhesive must be used that is compatible with your ink and media.
- Temperature range - from 160 degrees to 300 degrees **never use any laminate rated with a higher melt point** –

Film Threading Procedure

1. Load the laminating film on the mandrels. The mandrels are marked T and B on each end of the mandrels to indicate top and bottom placement (see mandrels on pages 32 thru 34 for proper use).

It is imperative that the dull (adhesive) side of the film never be allowed to contact the heated rollers.

2. Insert each mandrel into one of the rolls of film paying very careful attention to the threading diagram drawing with respect to the direction the film unwinds. Center the film on the mandrel and measure the distance between the ends of the film roll and the white disk on the mandrel. These measurements should be made the same between the top and bottom mandrels.
3. Carefully place the loaded mandrels into their respective saddles on the mandrel towers. The fit is snug to ensure absolute repeatability when you replace or change laminating film. Recheck the distance from the film to the disk to make sure the spacing of both rolls is identical. Recheck to make sure that the adhesive side of the film will not contact the roller when it is threaded.
4. Lower the sliding idler bar (located under the bottom roller).
5. Turn speed control to zero and depress the direction switch to the forward position.
6. Pressurize the rollers by rotating the lever located on the right-hand side of the machine clockwise 180 degrees. You will feel the gapping cam lock into position.
7. Activate the heating system to the temperature specified by film manufacture and allow the rollers time to reach process temperature (a novice user may want to thread the laminate on the laminator before turning on the heat in order to prevent burns).
8. Pull enough film from the upper roll to allow it to hang about 4-6" below the lower heated roller. While being absolute sure that the adhesive side of the film cannot touch the roller, bring the film around (behind and under then forward and up between the idler and the laminating roller) the top idler, that is located immediately behind the top heated roller. Bring the film over the top of the heated roller down to or past the center point of the lower roller. The film will be in contact with the heated rollers and you will see the adhesive begin to melt if the heaters were turned on,
9. Pull about 1-½ feet of film from the lower roll, bring the film below the lower front idler roller (*if the laminator includes a stand this idler may not exist as it is not required*). With the sliding idler roller in lowered position, wrap the film *around* the sliding idler roller (*below the sliding idler, toward the back. up behind then over the top and to the front again*). While making absolutely sure that the adhesive (dull) side will not come in contact with the roller,
10. If the laminator heat has not been turned on, now is a good time to do so then wait for the laminator to reach temperature
11. Bring the film from the lower idler roller around and onto the laminating rollers. The film from the lower supply roll should now stick to the upper film. Make absolute sure that the adhesive is not in contact with the rollers and is facing outward.

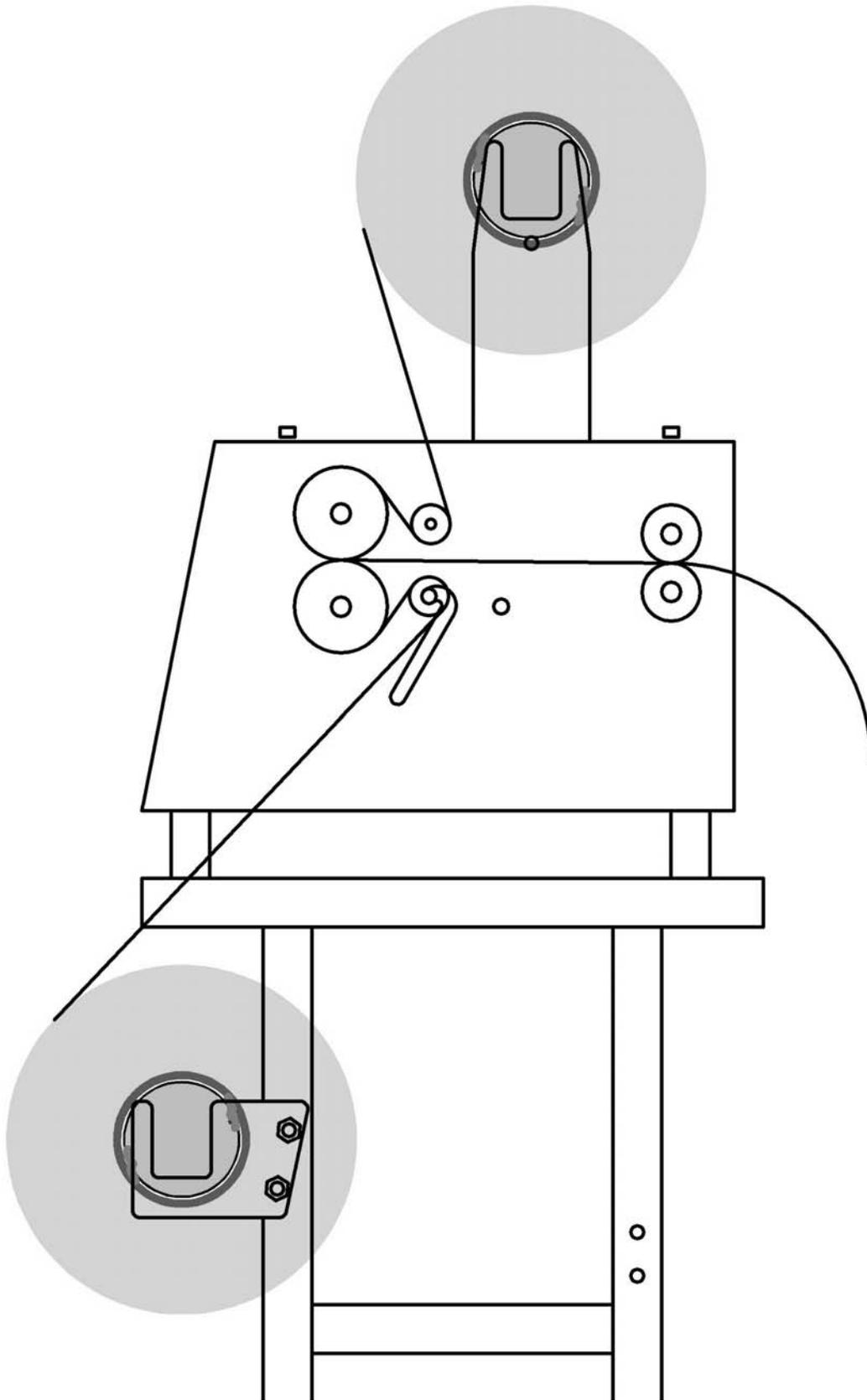
12. Raise the lower idler roller to its upper position (if the film is correctly installed, the adhesive should be facing and in contact with the idler rollers – not the laminating rollers).
13. Now you are ready to complete the threading process. Using a threading card, (included with some laminating film) or a piece of light card board at least 65% as wide as the laminating film and at least 10" long
14. While running the rollers very slowly forward, immediately push and follow the laminating film between the two rollers with the feeding card.
15. When the threading card contacts the nip (where the two heated rollers contact each other), slowly advance the speed control knob while pushing the threading card. Keep the speed as slow as possible. The card will be pulled into the rollers.
16. Immediately monitor the area between the front and rear rollers. You must make sure that the threading card advances directly to the nip between the rear rollers.
17. After the feeding card has exited the machine and is at least 1-foot away from the rollers stop the machine and cut the feeding card from the lamination web. Be extremely careful that the rollers are not contacted with any sharp object as this could damage the rollers and cause poor lamination surface quality
18. Continue to advance the laminating film through the machine. The film will begin to "straighten and flatten itself out". Stop the machine and check both side edges of the film to be certain the top and bottom laminates are precisely lined up. You may need to slide one of the supply rolls a bit to obtain perfect alignment. You will need to slowly run a few feet of film to allow any side adjustments to take affect.
19. To facilitate this process of straightening and flattening the film, it may be necessary to run the feeding board through the laminator again, this will aid in straightening the film. Another trick may be to put tension on the supply roll with your hand to temporarily increase mandrel tension, it may also be necessary to run your hand over the film just behind the idler rollers where there are creases, this may aid in smoothing them.
- 20. If the lamination does not smooth out you must align the towers to the machine see page 23 for the preliminary alignment and then see page 46 for the final alignment.**
21. Also, monitor the film tension as it passes over the heated rollers. Adjust the tension using the knobs located on the mandrels. Keep tension as light as possible while keeping wrinkles and creases that appear on the face of the rollers to a minimum. If there are no wrinkles or creases, the tension is probably too tight. You will find, through experience, that a considerable number of wrinkles can be tolerated before you have a finish quality problem. The trick is to use as little tension as possible or no tension at all. If you use too much tension, the film may stretch, curl or twist.
22. Spend a little time at this point to make sure that "all is well" and you have clear and properly aligned film.

23. Once you have everything adjusted and working well, please take a moment to mark the film roll location on the film mandrels with tape or a marking pen. This step will save you a lot of time and wasted film next time you change the film. When you replace your film rolls you will be able to slide the new film up to this mark if it is the same width roll as the last. Optional with the three inch mandrels are film core stops. After the film has been accurately located, as previously noted, slide the film roll stops against the end of the film roll. Tighten the screws on the film roll stop.
24. Replace the feed table, line up the guides to suit your application and you are ready to begin laminating.
25. To laminate, simply bring the machine up to the desired temperature and rotate the gap control knob to pressurize the rollers. Place the material you desire to laminate on the feed-table, depress the speed control direction switch to the forward position and slowly rotate the speed control knob to the desired process speed. When your lamination exits the machine, turn the speed control knob CCW. to zero. If you have completed all of your laminating chores, gap the rollers and turn the direction control, fans and heaters off.

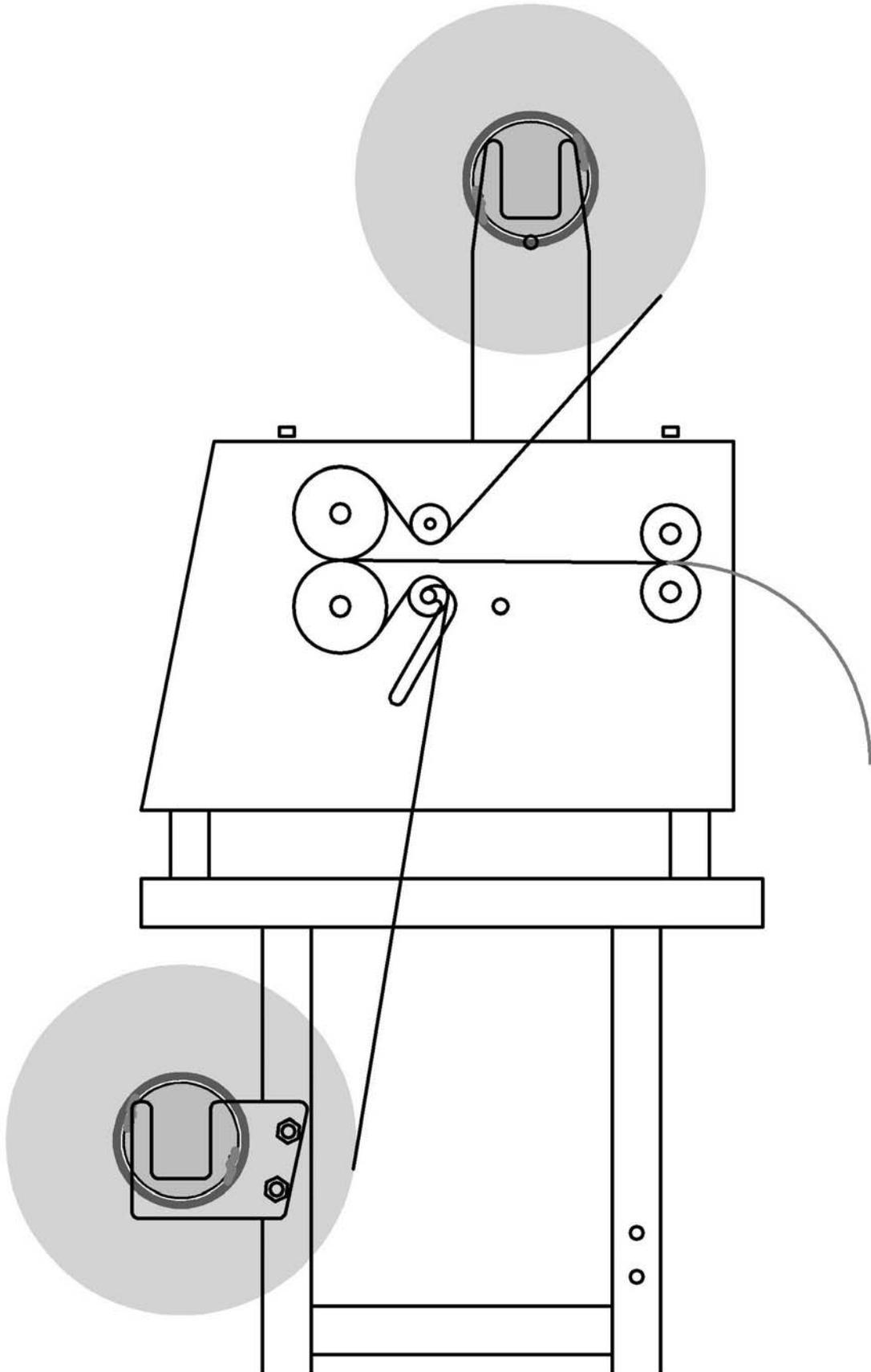
For a higher quality lamination

- A. Always laminate with the film centered on the roller
- B. Clean the rollers between each film change
- C. Regularly check the finished film quality
- D. Never operate the laminator near a fan or vent
- E. Use the fans whenever possible when using the slitters
- F. Only allow the fans to be on while the laminator is in use
- G. Change blades when they dull
- H. Always gap the rollers after use
- I. Use minimal pressures and tension, just enough to get the job done

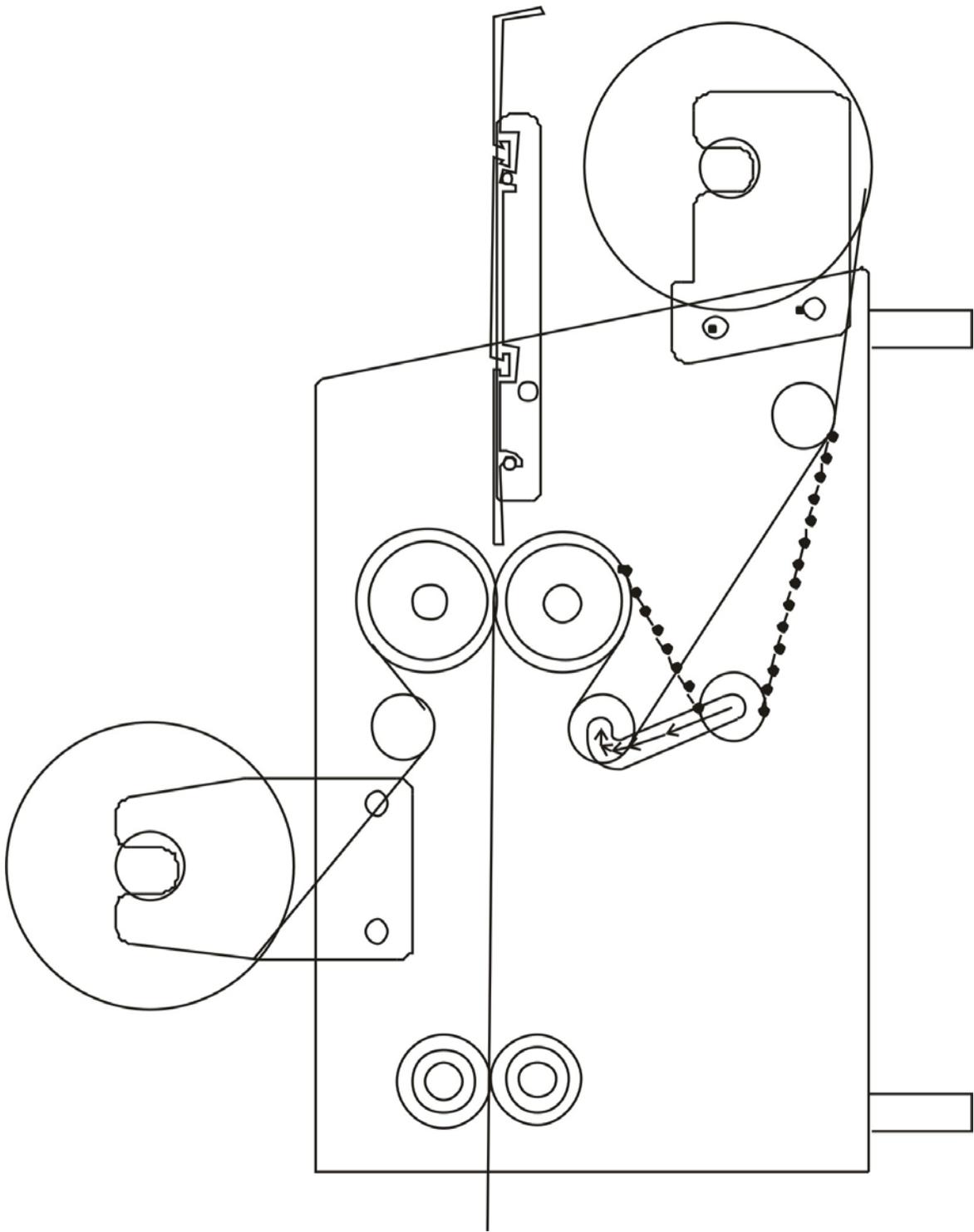
Threading Diagrams



Threading diagram, adhesive **OUT**, 3" mandrels



Threading diagram, adhesive **IN**, 3" mandrels



Tabletop model shown with adhesive in (reverse wrapped)

Film Tuning

Once the laminator has been set up and the film threaded, the laminator should be fine-tuned to the film that you are using. Once the laminator has been fine-tuned, it is not as crucial to adjust the machine for subsequent film rolls. It may however be necessary to review this paper when one is having problems with the film. The following may be best accomplished by using the thinner films available, such as 1 – 2 mil films but should easily be performed with a thicker film.

1. Mandrels Alignment.

- A. Loosen the mandrel towers just enough that the weight of the film roll doesn't move them but you can do so forcefully or, with a rubber hammer.
- B. Make sure that the film is very close to the center of the supply rolls (measure the difference between the distance from the right mandrel tower to the right side of the film roll and then the left side, adjust half the distance of the difference or until centered).
- C. Loosen the mandrel knobs until loose enough to allow the film to spin smoothly but not free wheel.
- D. Turn on the machine and heat to operating temperature.
- E. Slowly run film through the machine while watching how the film comes off the supply roll. This should be even and straight and you should see a line at which the film separates from the supply roll this line should be parallel with the rollers or the floor. OR feel the film for slack on either side of the web coming off of the supply roll you will notice that one side is loose and the other is tight and uncoiling the roll. The mandrel knob must be tight enough to cause some tension on the supply roll but not so tight that the film stretches when it is coming off the roll.
- F. Adjust the mandrel towers a very small amount at a time until the film is coming off the roll straight or parallel with the rollers. On the bottom, if the film separates late or is loose that side should be lowered or the other side raised. On the top, if the film separates late or is loose the tower on that side should be brought forward or the other tower pushed back
- G. This setup procedure should only have to be done one time or when adjustment is lost

2. Adjust the mandrel tension.

- A. Typically, the mandrel tension is used to smooth the laminating film as it comes over the rollers into the nip and when to adjust film curl.
- B. If the film is coming over and through the rollers wrinkled, you may add a small amount of tension to the mandrels in attempt to alleviate this. In some conditions, it is possible for the tension to be too great and actually cause wrinkles.
- C. If too much tension is applied to the mandrels, it can also cause excessive stretch and will result in unsatisfactory lamination.
- D. Single sided lamination should be as loose as possible

- E. Use the mandrel tension to cancel film curl. If the film is curling down loosen the bottom mandrel knob and vice versa, If this cannot be reduced by loosening the mandrel knob it may be counter-acted by tightening the mandrel knob that is opposite of the curl (in this scenario the top idler).

3. Temperature.

- A. Temperature settings are an issue of experience and can affect a wide variety of issues.
- B. Too high of a temperature can cause problems such as blistering, delamination, over heating of the material, insufficient cooling or distortion of the film.
- C. Too low of a temperature may result in unsuccessful lamination, future delamination fogging in the film or insufficient adhesion
- D. Do not confuse some of these issues with bad film or film that is incompatible with the adhesive or paper

4. Roller pressure.

- A. Use sufficient pressure to encourage heat transfer and adhesion.
- B. Do not use more pressure than is necessary.
- C. Increased rear roller pressure increases stretch.
- D. Increase front roller pressure decreases stretch.

5. Speed.

- A. Speed setting is somewhat relative to temperature; faster roller speed results in a cooler lamination, slower roller speed results in more temperature saturation into the film and paper.
- B. Keep in mind when setting the speed that the fans must cool the lamination down to the point of the lamination adhesive being set – before the lamination exits the rear rollers.
- C. For production, higher speed lamination it may be possible to increase the speed slightly after the rollers get “heat saturated” keep in mind that you must not increase the temperature 20 degrees over the manufactures recommendation. Never run the machine over 300 degrees.

 Do not pull or twist on the film as it exits the rear rollers, as this will adversely affect the film even to create problems in the film on the front rollers. And resulting in a poor lamination.

Film Replacement

It is recommended to remove or replace the film just before the supply rolls run out of film. This will prevent the film adhesive from inadvertently contacting the rollers.

Never advance the film through the laminator without first heating the rollers. This will prevent the possibility of tearing the roller covering from the film being “glued” to the rollers, especially when a film with an aggressive adhesive is used

When changing film Rolls simply cut the top and bottom film from the machine (be careful not to get close to the rollers with any sharp object). Run the laminate until there are just a few inches left before one of the webs of film go thru the rollers. Replace the film per previous instructions except stick the new film to the film that is left in the machine. Once stuck, the new film will be pulled thru by the old film.

Film Removal

It is recommended to remove the film just before the supply rolls run out of film. This will prevent the film adhesive from inadvertently contacting the rollers

Never advance the film through the laminator without first heating the rollers. This will prevent the possibility of tearing the roller covering from the film being “glued” to the rollers.

1. Make sure the rollers are **NOT** gapped.
2. Allow the rollers to cool to the point just below the melting point of the film.
3. Put the sliding idler in its open position.
4. Cut the film from the upper supply roll several inches above the upper idler. **Be extremely careful so that you do not touch the rollers with the device you are using to cut the film!!!**
5. Cut the film from the lower supply roll several inches below the idler in its down position **be extremely careful so that you do not touch the rollers with the device you are using to cut the film with !!!**
6. Cut the film several inches behind the rear rollers (not between the front and back rollers). **Be extremely careful so that you do not touch the rollers with the device you are using to cut the film!!!**
7. Carefully advance the film until the end of the laminate is just coming around the front laminating rollers.
8. Stop the film short of running thru the rollers so that no adhesive gets on the rollers.
9. Gap the rollers.
10. Remove the film by pulling it back out the front of the laminator.

Laminator Operation

Fans / Cooling

This switch activates the cooling fans. These fans control the temperature of the film as it exits the heat rollers. Their use depends on numerous variables so experimentation and experience is about the only way you can determine their necessity.

Do not use the fans to assist in cooling the laminator during shutdown. Follow the standard shutdown procedure

In general, these fans should be used for:

Thicker films (relative to the lamination speed) unless running very slowly

Thin films (1.2-1.8 mil.) during medium to high-speed operation

During slitters use the fans may reduce an adhesive build-up on the slitter blades.

If the film leaves the rear of the machine at an excessive temperature:

1. The film may show a rougher surface finish,
2. The film may show marks from the rear roller that are at right angles to the film path
3. The film may hold the shape it finally cools at outside the laminator.
4. Excessive heat may also cause stretch marks the length of the film or around the edges of the paper.

Excessive cooling may cause

- A. Downward curl
- B. Foggy areas in the film
- C. Unusual stretch marks.

!!!THE FAN SWITCH MUST REMAIN IN THE OFF POSITION WHEN THE ROLLERS ARE STATIONARY!!!

!!!THE FAN SWITCH MUST REMAIN IN THE OFF POSITION WHEN THE ROLLERS ARE STATIONARY!!!

Failure to turn off the fans while the laminator is in an idle state will result in abnormal roller cooling, especially on the bottom roller. This may show as cold spots (foggy areas perpendicular to the film path) or failure of bottom lamination. To remedy this either:

- I. Allow the rollers to stabilize by gaping the rollers and leaving them undisturbed in this position for 5-15 min (with fans off)
- II. In extreme cases shut down the laminator (see shutdown, page 58) and allow the machine to cool to room temperature and then reheat.
- III. In minor cases, the rollers may be stabilized by very slowly running film through until the cloudy spots disappear. This however, may not be an economical solution.

Mounting:

It may be desirable for heat activated foam board to cool under pressure which would mean you would have to turn the fans off and allow the rear rollers to cool the adhesive when the board contacts them

Speed:

Speed is a function that is very much related to roller temperature, paper temperature, room temperature, laminate thickness or paper thickness however, several guidelines may help.

- Typically when the film is cold it is somewhat foggy and when it heats up to temperature it becomes clear while laminating, a good guideline for general lamination is to watch the film as it comes over the roller, it should become clear before it hits the nip on the laminating rollers
- The thicker the film the slower the speed-
- The higher temperature rating of the film the slower the speed -
- The thicker the paper the slower the speed -
- Foam board – keep the machine running very slowly possibly 1-3 feet per minute depending on your model –

Temperature:

ProLam, Inc recommends following the temperature guidelines consistent with the type film you are using. Since temperature requirements are different from manufacture to manufacture and film to film there are literally thousands of variables out there and ProLam, Inc is unable to publish a list of every film and our recommendations for that film

Several temperature guidelines to follow:

- Start at the manufactures recommendation
- If the film remains cloudy raise the temperature 10 degrees and try it –
- If you see excessive rippling in the film lower the temperature 10 degrees at a time
- Speed and temperature are somewhat related; if you find that Increasing the temperature alleviates some issues slowing the laminator may have similar results.
- If the reason that the temperature is increased is a desire for more speed do not increase the temperature more than 20 degrees beyond the manufactures recommended temperature and **never over 300 degrees**
- If there are unusual problems when the temperature is increased, return it to the recommended temperature and try laminating with the old setting again.
- If the film does not stick, try slowing the machine and then raising the temperature 10 degrees. If raising the temperature does not help, try decreasing the temperature. If this does not work, and you are already following the manufactures recommendations this more often times is a problem with the adhesive rather than temperature.

After heating up to temperature and before operating, take record of the temperature range that the display shows when idle. During operation, one should make sure that the laminator cycles on and off. This can be noted by the slow rise and fall (up to 1 degree a second) around the recorded temperature. If the rollers are unable to achieve the recorded temperature this is an indication that the heaters are always on and do not get a chance to stabilize internally. This practice will greatly reduce the life of the rollers

Do Not Ever Operate the laminator over 300 degrees. If this is necessary, don't otherwise serious damage may result

Roller Pressure:

General:

Roller pressure is adjusted by turning the cap screws on the top of the laminator.

More pressure may be needed if a thicker stock is being used, and an edge seal is desired. Keep in mind that there are limitations to what your laminator can do. These limitations depend on film thickness and paper thickness. Our PL1200 hp, which is our 12" model, is capable of putting an edge seal on *index* stock with 1.8-mil film. Our 27" laminator is capable of just putting an edge seal on *card* stock with 1.8-mil film. For example, though the 27" is capable of an edge seal on 1.8 mil and cardstock it may not be able to put an edge seal on card stock when two pieces of cardstock are side by side. In contrast, if a thicker film were used, such as, five mil, you should be able to laminate card stock side by side and achieve a satisfactory edge seal

If you are trying to get an edge seal on thicker stock, especially with thinner film, you may notice some stretching or wrinkling around the corners of the lamination in many cases this is simply due to a film choice as different films will respond differently. If you are using thick paper in order to end up with a lamination that has more body, it may be more viable to use a thinner paper with a thicker laminate to do so.

When making adjustments take note of how much each screw is turned when adjusting, this way one can make sure that each side is evenly adjusted left to right and also easily returned to the factory setting

When adjusting the pressure you should find a definite point at which roller pressure is to the minimum, this is characterized by an instant point at which the adjustment screws are easier to turn. What you feel at this point is the bottom of the adjustment knob failing to make contact with the spring pad when the spring pad is at its uppermost position (when applying pressure make sure that this point is used as a starting point. When the pressure knobs are fully relieved there is a certain amount of preload that still exists on the rollers.

Wide Format:

The wider laminators 38" and 44 " models are very sensitive to roller pressure, the roller pressure adjustments on the wide format laminators have less to do with edge seal and more to do with surface bond.

On the wide format laminators, it is possible to get enough pressure on the rollers that they actually bow. If you notice the film is coming around the roller smoothly but when the laminator is run there is air pockets in the center or the film adheres poorly to the center it is possible that you have too much pressure on the rollers.

Mounting / foam board:

Typically, when mounting to 3/16" foam board it is desirable to use normal or less pressure. If the primary use of the machine is for mounting, it is recommended that the roller pressure be relieved.

When mounting, it may be necessary to guide the item through the machine, especially when the item goes through the rear rollers. This may take a little push to keep the machine from stalling when there is roller pressure and the laminator is running very slowly

Single sided:

During single sided lamination, it is best to use as little pressure as possible on the front and rear rollers. For single sided laminating, roller pressures play an important role in a flat lamination. For the more experienced user it may be found that by using a small amount of rear roller pressure it will tend to curl the laminate down

Laminating

General Two-sided lamination:

✍ It is highly recommended that, the product being laminated is meticulously inspected and tested for compatibility, before running a large job. No one likes surprises. Also be aware that certain items cannot be laminated such as thermal paper printouts often used in things such as faxes, receipts, sonograms and many labeling devices. Valuable one of a kind items, also offer a high risk. If there is **ANY** doubt as to a successful lamination, a high quality copy should be made and that copy laminated.

The digital display will read the actual temperature of the rollers. As your laminator warms up, you will see the digital display increase as the temperature rises to the desired temperature setting. When the temperature reaches the desired setting you are ready to laminate, there is no need to allow the temperature to stabilize before using. As you run film through the laminator, it is normal for the temperature to vary by a few degrees or so this will depend upon temperature, speed, film, line voltage, materials being processed, ambient room temperature and air flow across the rollers.

One of the most important things with your laminator are the roller may be damaged by overheating it. **This limitation, which we will call a duty cycle, will establish how long your rollers will last.** The beautiful thing about the technology enveloped in your laminators is the responsiveness and quickness of the laminating rollers. One does need to make sure (as with any mechanical and/or electrical device) that you do not exceed the design limitations of your rollers. This is why we stress not to exceed 300 degrees and not to run the laminator more than 20 degrees over the film manufactures recommendations.

✍ One needs to make sure that the rollers are not overheated internally. Before operating, take record of the temperature range that the display shows when the machine has achieved its set temperature. During operation, one should make sure that the heaters cycles on and off. This can be noted by the slow rise and fall (up to 1 degree a second) around the recorded temperature. If the rollers are unable to achieve the recorded temperature, this is an indication that the heaters are always on and do not get a chance to stabilize internally. This will greatly reduce the life of the rollers.

✍ Do not pull or twist on the film as it exits the rear rollers, as this will adversely affect the film even to create problems in the film on the front rollers. And resulting in a poor lamination.

Until the confidence of the operator has increased it is advisable to run the laminator slower rather than faster. Then increase the speed, if necessary, when you are comfortable with the result and the quality

To test your lamination for adhesion; cut out a piece of product and separate the layers you should find that the paper will split in half, one half adhered to each side of laminate. Familiarize yourself with this test so that you get a “feel” for a successful lamination. Alternately, one can take a sample, cut an “X” thru only one layer of laminate, and attempt to split the laminate apart at this point. See troubleshooting for adhesion.

Single sided Lamination:

The Series II laminators may be used for single side lamination with specifically the smaller models for items such as book covers. These laminators are capable of laminating short-run one-sided applications

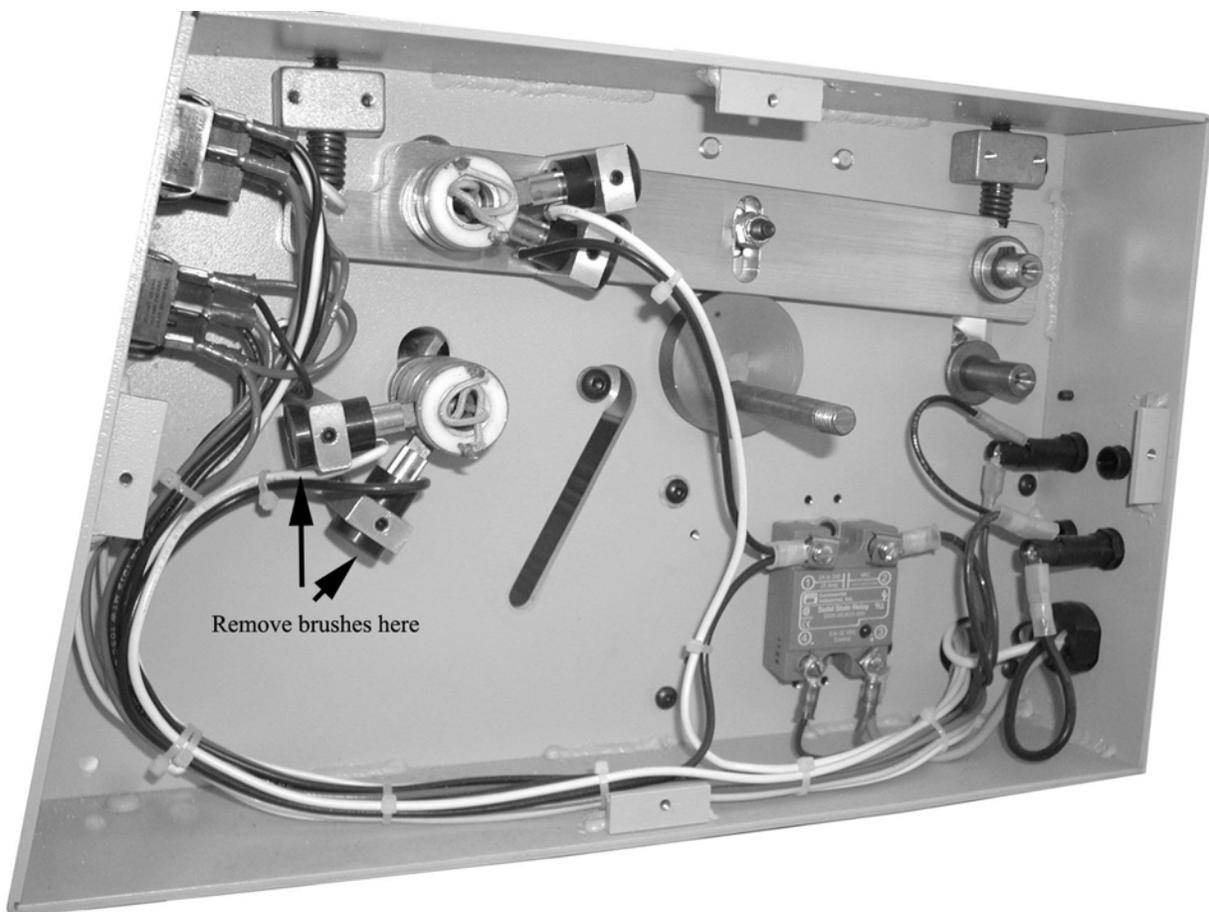
One sided – general:

1. For good results the laminate that you use should be specifically designed for one-sided applications ProLam recommends using nylon films these film typically are designed to breath and move with the paper however many of our customers successfully use polypropylene and vinyl.
2. We recommended you use a laminating film that is slightly narrower than the product being laminated so to prevent the adhesive on the film from touching the laminating rollers.
3. Try to not allow any film adhesive to contact the bottom roller. Some film adhesives stick to our rollers others do not.
4. While threading, the films make sure to follow the threading card with a scrap page that is wider than the film. This page will sit between the two laminating rollers to minimize film contact.
5. While laminating, either butt the pages together or overlap (shingle) the pages and trim the paper after lamination.
6. Use minimal or no tension on the mandrel. This greatly affects film curl.
7. Always laminate using the top roller NEVER the bottom roller. This will overheat the machine and cause permanent damage to the roller.
8. Always gap the rollers when not in use.
9. Use of the fans will affect film curl.

Production run one-sided lamination

For production run one-sided lamination, the machine requires a simple modification as follows. Make sure to follow all safety procedures as described in this manual.

1. Unplug the machine. Never work on the laminator while it is energized.
2. Remove the right-hand side panel
3. Remove the lower roller brushes these are located inside the machine on the end of the lower roller. On the end of the roller is a slip ring. Contacting the lower slip ring are two brushes contained in two brush holders. These brushes must be removed. On the backside of the brush holder is a cap that holds the brush in place remove this cap on both of the brush holders. The spring that the brushes are attached to will move out, you may now pull on this to remove the brushes.
4. Replace the caps and side panels. Keep these brushes for future use.



Board Stock / Mounting

Your series II laminator is capable of laminating and encapsulating a wide variety of materials up to ¼” thick

When laminating board stock the roller pressure adjustment knobs must be fully relieved.

The speed at which board stock is laminated should be much slower to allow the laminator to heat the board sufficiently.

Wide format printer paper may shrink when laminated depending on the type and moisture content this may cause a wide variety of problems.

We recommend using either a heat sensitive board or an adhesive such as 3m-77 and applying the paper to the board stock prior to lamination

Cold Lamination / Pressure Sensitive

Your laminator is very capable of laminating one-sided cold lamination using either the machine itself or the optional release liner winder. The instruction for threading your laminator using the machine itself is on the next page. The instructions for the use of the optional liner winder should be supplied with the kit.

Several points to be aware of when laminating using a cold pressure sensitive laminate are:

- Remove the anti-static tinsel any time that the adhesive may contact it
- It may take more mandrel tension than heated film to acquire the desired effect
- If there is not a release liner to protect the idler from the adhesive you may omit the idler-when threading
- A low temperature (100-150) may greatly improve the output and anneal the film
- If a two-sided lamination is desired laminate one side, remove the piece from the film web and laminate the other side.
- Pay extra attention that the film does not wrap around the rollers since the adhesive is in contact with the rollers, especially the rear rollers
- When finished make sure that the film is removed or there is a piece of paper protecting the rollers from the adhesive when not in use
- Do not use a temperature great enough to actually liquefy the adhesive.
- Make sure that the adhesive is not so aggressive that it damages the laminating rollers

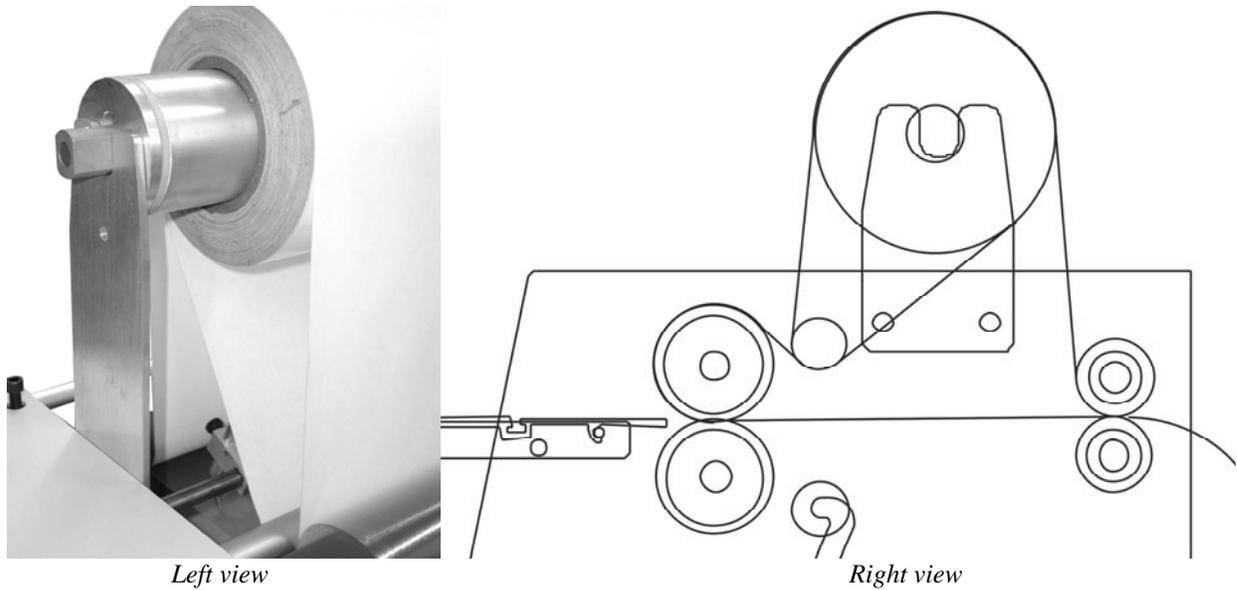
Cold laminating roller pressures

When cold laminating, it may be necessary to increase roller pressures on the front, more than typical, for proper adhesion. Rear roller pressure will increase tension on the release liner.

Speed for cold laminating

We recommend using less speed until one is confident of the surface adhesion, slowing the machine down will increase the dwell time and allow the adhesive to flow longer

Film diagram for threading pressure sensitive film without the use of a release liner winder



Notice the path of the release liner

Thread laminate as typical. However, before feeding laminate through machine separate the liner from the laminate and remove it while the film is being threaded. After the film is through the back rollers by about one foot remove the release liner at the upper idler roller but make sure that the release liner is in contact with the idler, not the adhesive. Bring the liner over the top of the upper film roll down to just before the back rollers. At this point either, gap the rollers and manually thread the release liner through the rear rollers then ungap or, while slowly advancing the film, thread the liner through the rear rollers. After there is about four inches of liner beyond the back rollers stop the motor and grab the liner from the back of the machine and lift firmly this will eliminate any slack that is between the idler roller and the rear rollers, this may need to be done periodically during lamination to take up excess slack.

- It may be necessary to increase the rear roller pressure.
- Be careful during lamination not to let the laminate wrap the rear rollers.
- Use extreme care while using any slitter assembly to prevent wraps and injury to ones self or the laminating rollers
- It may be necessary to remove the anti-static tensile or thread the film under it, if the film sticks to it
- It may be necessary to guide the film from the back of the machine during lamination if there are any areas in the lamination large enough to stick to the machine frame

Rotary Press

Your laminator is capable of being used as a rotary press this process is very similar to cold laminating / mounting or pressure sensitive laminating. PIs Inc. manufactures a laminator that is cold capable only. the model number will start with a “R” this will designate a cold press only and this model will be void of most functions except speed control.

It may be necessary to set the temperature at 100 or 125 degrees on models so equipped

The most common uses for this technique is to laminate two materials such as paper to adhesive backed material for cover making or book making and for laminating masking in the sign industry

Nearly all of the surfaces of your laminator are not magnetic including the front laminating rollers, mounting to magnetic materials is not a problem

- Do not roll materials that may damage the rollers
- Do not allow adhesives that may damage the rollers to contact them
- Do not roll sharp or abrasive materials
- Do not allow materials to wrap on the rollers
- Do not press materials thicker than 3/16
- The amount of pressure is limited to the amount of pressure available do not supplement

 See cold laminating for additional relevant information.

Shutdown

The Laminator should be shutdown when not in use for a period longer than five minutes. If the laminator is left on while not in use the roller temperatures may drift and cause poor lamination. The standard shutdown procedure is as follows:

1. Clear the laminated material from the laminator (paper not film).
2. Shut off the fan switch.
3. Shut off the heat switch or reduce temperature below 160 degrees.
4. Reduce roller pressure if needed.
5. Gap the rollers.
6. Place the motor direction switch to its mid point or off position.

Attention: After a long, high speed run on a high performance model laminator, while using a high temperature film (275 degrees Fahrenheit or more), it may be necessary to slow the laminating rollers to a stop or run the last 5-6 sheets of material at a rather slow speed. This will prevent the rollers from overheating due to the built up core temperatures.

The fans should never be used to aid in cooling the laminating rollers during shutdown

Remember, when the laminator is not heated up DO NOT advance the film

In the instance that highly aggressive thermal adhesive has adhered to the rollers, running the machine cold may damage the rollers

Regular Maintenance

Before beginning a procedure, always read it thoroughly

Never remove any service panels from the machine without first disconnecting the electrical supply.

Cleaning the Laminator

The surface areas of the machine should be periodically cleaned with a damp cloth and a mild detergent. Do not spray any cleaning solution on or near the laminator as this may cause irreparable damage to the rollers.

Roller cleaning

Removal of an adhesive build up on the rollers should be done during every film change
To clean the front rollers: Remove the film and mandrels, remove the feed tray, Heat the machine to temperature and then using a rough cotton cloth, wipe the adhesive off the rollers leather gloves may be needed as protection from the high heat. Most film adhesives are easily removed from the rollers,

Under no circumstances should any abrasive material be used to clean the rollers

To aid in cleaning the rollers isopropyl alcohol of 98% or better (or any roller wash designed for heated silicone laminating rollers only) may be used to separate the adhesive from the rollers. After removing the adhesive from the rollers, use isopropyl alcohol of 98% or better to remove any dust or remaining adhesive from the rollers.

Use caution when using alcohol or any flammable solvent to clean the rollers

Always disconnect the laminator from the electrical supply before cleaning.

Rubbing pad compound

The only regular lubrication required on your laminator is the rubbing pad assembly.

The rubbing pad is located on the right hand side of your laminator, inside the panel on the swing arm near the end of the top laminating roller it consists of a virgin felt pad saturated with a high temperature lubricant

The lubricant used on this component is an unique high temperature electrical insulating grease that does not harden it is recommended that this lubricant (rubbing pad compound) be purchased through your dealer or through us directly

Rubbing Pad Compound: - - - PLS Part# M-2001

Application of this item should be made when the display temperature starts to fluctuate erratically

When the machine is opened for service the integrity of the rubbing pad and related components should always be inspected

Rubbing Pad Ass - - - PLS Part# M-2002

The equivalent of a ¼” bead of compound should be applied perpendicular to the rollers onto the slip ring once applied run the machine without any film on it for about 10 minutes. If the temperature does not stop to fluctuate, inspect the brushes.

Brushes

Power brushes only need to be replaced when damaged; it is very unusual for these to wear out

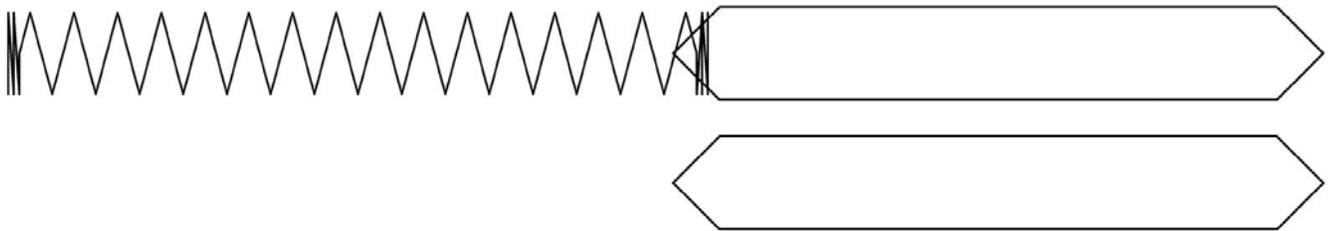
Temperature sensor brushes periodically need to be replaced.

These brushes are made of a copper alloy and will wear with time. If the rubbing pad dries out and no longer provides a lubricant to the brushes, wear will be greatly accelerated.

The brushes are manufactured with a radial point ground on each end of the brush.

Wear may be identified by the amount that this tip has worn off. The brush may be removed and turned around to use the point on the other end just as long as there is still enough taper on the old end so that the spring can keep the brush centered.

If replacement brushes are needed these may be purchased through your dealer or through us directly



Rtd brush, note taper on each end (magnified view brushes are only 1/8 diameter)

Replacement alloy brushes- - PLS Part # M-2003-B

When the brushes are inspected, take note of the condition of the slip ring and that it has not been grooved to badly. If it is seriously grooved and gulled, it should either be polished with scotch brite or replaced. If after replacing the brushes, the condition continues, see temperature fluctuation in troubleshooting.

Slip Ring - - - PLS Part # M-2004

Cleaning the Slip Ring

This procedure must be performed if there is an erratic and sudden fluctuation in the displayed temperature while the laminator is in operation. Follow these steps and all safety precautions. This procedure is only necessary if the temperature fluctuates when the upper roller is rotated by hand and the roller direction is in the off position.

1. Disconnect the laminator from the electrical supply and allow it to cool.
2. Gap the rollers.
3. Remove the left-hand side panel.
4. Inside the left-hand side panel protruding from the upper roller is the slip ring for the Temperature controller.
5. Using scotch brite or a similar material, remove the carbon and oxidation build up from the slip rings. Rotating the upper roller by hand may facilitate this process.
6. Apply rubbing pad compound. See rubbing pad compound on page 59.

Cleaning the motor

This procedure must be performed only after the slip rings have been cleaned and the displayed temperature continues to fluctuate **only** while the motor is operating and the front upper roller is gapped and stationary. This is not typical; this should only be performed as a last option.

1. Disconnect the laminator from the electrical supply.
2. Remove the left side panel upper fan deflector and fan panel.
3. Remove the motor mounting screws accessible from the inside of the left frame.
4. Remove the chain and rotate the motor to access one of the brushes on the side of the drive motor. Remove one of the brushes making sure to keep track of the direction the brush is removed.
5. Apply a very small amount of slip ring compound to the contact area of the brush.
6. Replace the brush making sure that it is replaced the same direction it was removed.
7. Replaced the motor and chain. Apply mild pressure to the motor for chain tension and tighten the motor bolts.
8. Replace the side panel, upper fan panel and fan deflector.
9. Plug the laminator in and run the motor for a few minutes on the maximum setting.

Roller lubrication

The bearings in your laminator are permanently lubricated; they typically require replacement rather than lubrication. Replacement of your bushings is quite unusual, the bearings that are installed into your laminator are rated for a much more severe duty than your laminator could possibly see. If you must, you may oil the bushings on the laminator using a 10-weight synthetic high temperature oil. Unplug the machine. Using a long small tube type applicator apply two drops of oil to the roller shafts next to the respective bushings. Do not get any oil on the rollers and do not damage the rollers with the applicator.

Mandrels Lubrication

The mandrels are also permanently lubricated and **MUST NOT** be lubricated as the lubricant will migrate and destructively affect the friction characteristics of the clutch face and clutches. Hub replacement is the only solution to wear.

It would be absurd to lubricate the mandrel spring bushing.

If one finds it necessary to lubricate the mandrel knob, remove the knob, find a ½-13 (coarse thread) bolt that has threads about 2” in length and apply a dry lubricant, such as dry graphite, to the threads. Thread the knob on it, turn the knob through the screw threads several times. Remove the knob, blow it off, and wipe off any excess graphite from the outside. Reinstall the knob.

Chain Lubrication

When the machine is open for maintenance take note of the condition of the chain and sprockets and lube if necessary.

The chain should be periodically lubricated, with a high temperature grease (gl 4), when necessary.

When applying grease, make sure to keep the inside of the machine clean and wipe up any old grease that has dripped onto the machine panels

Cam lubrication

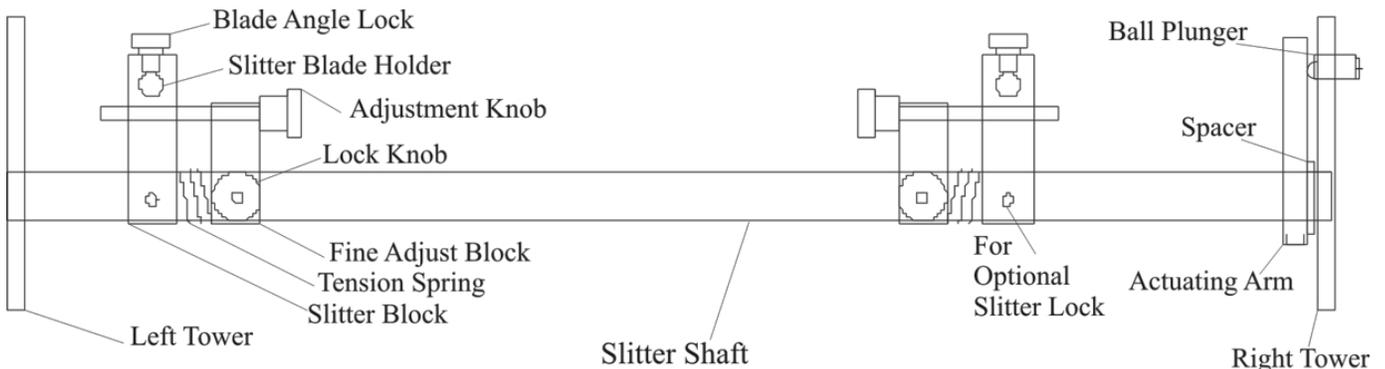
When the machine is open for maintenance, take note of the condition and existence of grease on the cam and following surfaces if necessary grease with a high temperature grease

Pressure Block Screw Lubrication

It may be necessary to lubricate the pressure block screw threads if it becomes difficult to turn

1. Remove the screw take note of how many turns it takes to remove each screw so that it may be returned to its original setting once replaced.
2. Using a high temperature grease or an anti-seize compound, apply it to the threads and the tip of the screw
3. Replace screw, verify success

Slitter Assembly Lubrication



The slitter assembly requires lubrication when any adjustment is difficult

Use a graphite – lithium high temperature grease

Lubricate all surfaces subject to friction - - Adjustment screws, slitter shaft, slitter knobs slitter blade holders and pivot points

Do not lubricate the towers or actuating arm

Use grease sparingly

Adjustment knob

Do not remove the adjustment screw to lubricate, turn the screw out, lubricate, and then turn it in until the screw is seen on the other side of the blade holding block. Lubricate the end that is sticking out and turn the screw through its full travel several times. A small amount of grease build up next to the block is normal, if excessive wipe most of it off

Shaft

If necessary remove the old grease with a solvent, remove any oxidation, burrs or foreign substance from the shaft using scotch brite./

Apply a thin film of grease to the slitter shaft with a rag, make sure that a small amount of grease is also in the slot.

Move the slitter assemblies through their travel on the shaft re-grease until smooth movement is felt.

Laminator antistatic

Anti-Static Tinsel is designed for optimum performance. It eliminates static with the “self energizing” or inductive principle. That is, when sharp points are present in a strong electrostatic field, interchange of electrons occur between the sharp points, thereby ionizing air, and eliminating or neutralizing static electricity. The tinsel does not have to touch the film.

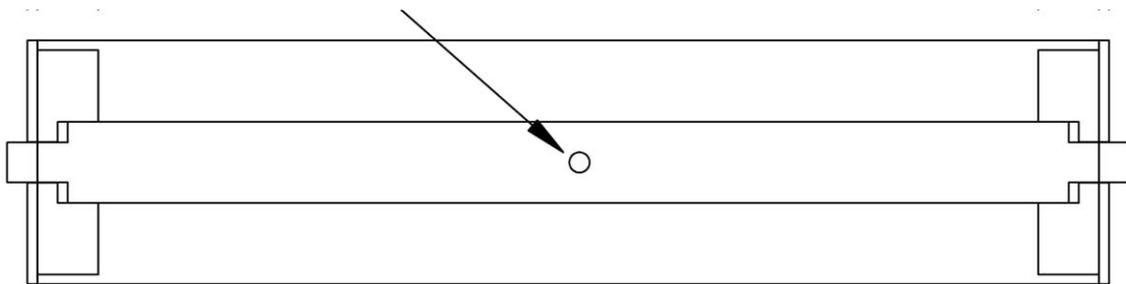
Replacement

Anti-Static Tinsel is constructed of finer copper strands to obtain a sharper point. The strands are interspersed to obtain the maximum interchange of electrons: but not so dense as to make it an easy collector of paper dust and other foreign particles. Since clean sharp points are essential, tinsel should be replaced whenever it becomes “dirty” with foreign substances or when an increase in static is noticed. Often a good indication of this is an increased tendency of the film to wrap around the rear rollers

Antistatic Bar - - - PLS Part# M-X005-X *Include model#*

Release Liner Winder anti static

The release liner winder has an internal antistatic bar that rubs against the inside of the tube and grounds to the shaft. If this fails, there will be a remarkable and quite annoying static charge that is built up. If the static bar is removed, this static charge will accumulate until it can bridge the 1” gap to discharge. To replace the anti static bar lie the liner winder tube on a table, while using a punch with a small tip, so that it sits in the taper on the end of the shaft and drive the shaft and the plastic hub out. Replace tinsel and reassemble.



Antistatic bar location on the release liner winder shaft

Roller Care And Maintenance

This paper is applicable to the revolution series heated laminating rollers built by professional laminating systems only. Using these guidelines on other laminators or rollers could cause serious damage to the roller these guidelines should be used in addition to the instructions and manual provided with your machine.

Precautions:

- Before attempting to perform the following, you must read and understand this paper in its entirety and read and understand your operating manual and any other documentation relevant to any procedure that you may attempt. Follow all safety precautions stated or unstated.
- Do not burn yourself, the rollers are very hot, use gloves.
- Keep any sharp or metal objects away from the rollers if you must cut the film off the machine allow a 6” “buffer zone” away from the rollers.
- Keep all clothing and jewelry away from the machine if you have loose fitting clothing remove it or tuck it away (such as a tie, jewelry or jacket) and keep your hands and fingers away from the rollers while in operation

About your rollers:

Your laminating rollers are possibly the most advanced heated laminating roller in the industry they are engineered (and patented) specifically for high performance, high quality, energy efficiency, and ease of operation. They are manufactured from some of the best materials available, for their application, to the industry, utilizing technologies only developed in the last few years. We are constantly developing new technologies and formulas for our laminators to meet the extreme demands of the laminating process.

Roller Failure:

The following most often causes this:

- Overheating the rollers
- Exceeding the designed speed and temperature for the specific film
- Cutting the rollers with a knife or other sharp object
- Failure to clean the rollers regularly resulting in the adhesive “burning” into the rollers thus causing the molecular link in the silicone to fail resulting in pitting on the roller surface.
- Running the laminator cold with an adhesive build up on the rollers. When the adhesive is cold, it will adhere to the laminating film and the silicone if you are using a film with a highly aggressive adhesive it is possible that it will pull on the silicone rollers causing pitting near the edges of the film. We have engineered silicones with high release capabilities and have nearly eliminated this problem however it may still occur when you combine this issue with the previous issue of “burn in”.

Operating Guidelines:

Temperature:

1. Never exceed 300 degrees set temperature or displayed temperature when operating the laminator.
2. Do not set the temperature control more than 20 degrees above the recommended temperature of the film and never above 300.
3. Remember, since your laminator takes about 5minutes to warm up it is unnecessary to leave the laminator turned on while it is not in use.
4. While in operation take note of the displayed temperature before you start laminating, if you see that the displayed temperature has dropped and is unable to achieve its prior setting slow the motor on the laminator – your film type and material has too high of a heat demand. Don't confuse this with temperature fluctuation (extreme, dramatic variations in temperature that change by tens or hundreds of degrees *see maintenance), or cycling (successive changes in temperature up or down due to the heater turning on or off usually varies by no more than 5 degrees one or two degrees at a time and will always “crossover” or meet the correct temperature)

Film:

1. Use laminating film as wide as possible at **least** $\frac{3}{4}$ the width of the roller and never less than half the width of the roller. (It would be ideal to use film that is the same width or $\frac{1}{4}$ ” wider than the roller width.) When using narrow film operate the laminator slower than its capabilities.
2. The lower the temperatures of the rollers the longer they will last keep this in mind when ordering film. For example: We would recommend a film that is rated at 250 degrees rather than 290 though this is not a rule in any way.
3. Take several moments to make absolute sure when you load the film on the machine that the adhesive side of the film DOES NOT touch the rollers. The few seconds that it takes to do this will save a tremendous amount of time in cleaning off the adhesive
4. When using your laminator for one-sided applications you must follow guidelines provided for you in your manual. Use the top roller for one sided applications
5. Always keep the film in the general center of the roller.

Roller Cleaning:

1. Never use an abrasive material on the roller this could cause damage contact pro-lam technical support before attempting this.
2. Never use solvents not specifically recommended for cleaning heated silicone laminating rollers.

3. Professional Laminating Systems recommends using methyl alcohol (methanol) or DX330 manufactured By PPG both of these products are flammable and toxic and should be used with extreme caution in a well-ventilated area with the machine disconnected and no flame source.
4. Pro-Lam recommends using a course cotton mechanics cloth (NAPA part # 7601036).
5. Remove the film from the machine
6. Heat the laminator about 10 degrees beyond its normal set point (no hotter than 310 degrees). Keep in mind that the rollers get really hot and can easily burn you, wear loose fitting thick leather gloves if necessary, welding gloves can be purchased from your local welding supply, Grainger or Automotive supply.
7. Disconnect the Laminator and “wipe” off the adhesive using the course cotton cloth this may take a bit of work depending on the amount of time that the adhesive has been on the rollers and the type of adhesive it is it may also be necessary to reheat the machine if it cools.
8. If you find it necessary to use a roller wash to clean your rollers, follow all safety guidelines applicable to the process.
9. Allow the machine to cool and then use methanol or DX330 to remove any dust and grease from the rollers.

Film Wrap

1. DO NOT use an knife or any object that can damage the rollers to remove the film from the rollers.
2. Heat the machine to operating temperature.
3. Remove any film, from the machine, that can be removed (supply rolls, tail, etc.), keep track of the end (or beginning) of the film wrap this will be where you start.
4. Very carefully cut the film between the front roller and back roller (if there is any) Remove the film from the non-offending roller.
5. Gap the rollers.
6. Find the end (or beginning) of the film wrap and unwrap the film from the roller. This may take some time and be quite tedious you may have to use the motor to move the roller forward or back.
7. Once you have removed the film you will have to clean the rollers refer to roller cleaning for this. It may be necessary to use the DX330 while the laminator is heated to remove the adhesive (follow all precautions, use respirator if necessary etc).

Maintenance:

- Clean rollers when it is necessary or at every film change.
- In the unusual occurrence of temperature fluctuation refer to the relevant paper regarding this or contact tech support.

Troubleshooting

Overview

Before any troubleshooting is made on the quality of the finished film, please confirm the following

1. The rollers are clean and do not have excessive adhesive deposits.
2. The film used is of the same type, manufacture, thickness and temperature range.
3. Allow the laminator to cool to room temperature with the rollers gapped and then reheat - this will dissipate any cold or hot spots or rollers of unequal temperatures.
4. Make sure that the electrical circuit the laminator is connected to is of sufficient power and dedicated - This will prevent fuses from blowing and breakers from tripping.
5. Quickly inspect the laminator and its components for obvious failures or any broken components, i.e., Broken mandrel clips-loose or misaligned towers, functional idler rollers, ECT.

If the extent of your problem exceeds the documentation in this manual please find our online troubleshooting available at: www.pro-lam.com

Available online will be the latest in laminating troubleshooting and repair issues along with additional technical support on-line or via e-mail Or contact the dealer through whom this laminator was purchased.

Common Errors

- Sliding idler in the down position or incorrectly fed film
- Rollers Left gapped
- Film on backward (adhesive on the rollers)
- Incorrect temperature
- Fans not used
- Too much mandrel film tension
- Film curled around machine and blocking inflow of cooling air
- Incorrect tower alignment

Rollers

| | |
|---|--|
| Rollers cut, gouged, ripped, blistered, bubbled | Replace |
| Erratic Temperature Fluctuation | Clean slip ring |
| Rollers cold when laminating | Slow down motor |
| Insufficient edge seal | Roller pressure |
| Wrinkling film | Re-align towers, Add small amount of tension |
| Will not stop heating | Unplug+ Contact technical support |
| Will not heat | Contact technical support |

Motor

| | |
|-------------------------|---|
| Erratic speed, low | Set too slow, |
| Erratic speed, mid, | Contact tech support |
| Erratic speed, All | Reduce mandrel tension, contact tech support |
| Will not run | Check switch, dial, and fuses |
| Noise | Gear noise is acceptable if it gets worse replace The motor is the major source of noise |
| Noise / runs at minimum | Contact Tech support |

Temperature

| | |
|--------------------------------------|-----------------------------------|
| Erratic Temperature Fluctuation | Clean slip ring |
| Will not heat beyond “X” temperature | Contact Tech support |
| Will not stop heating | Unplug+ Contact technical support |
| Will not heat | Contact technical support |
| Not enough heat | Slow motor down |

Display

| | |
|---|---|
| Erratic temperature Fluctuation | Clean slip ring |
| Display shows -1 | Shorted signal from sensor |
| Display shows 1 | Open signal from sensor |
| Display shows 440 degrees+ | Shorted signal |
| Display shows nothing | Turn on heat |
| Display shows “Bat” | Incorrect voltage, unplug, contact tech support |
| Shows temperature much different than set point | Allow machine to sit idle if it continues to rise unplug the machine, contact tech support |

Other

| | |
|---|------------------------------------|
| No function | Check fuses and breakers – plug in |
| Switch works – light does not light | Replace |
| Motor drive chain makes noise | Misaligned sprockets – loose chain |
| Mandrels do not hold film from slipping | Wrong mandrel / broken clip |
| | |

Film

Typical problems, Follow list for topic in sequence, the first solution will be the most common.

| | |
|---|---|
| Film is foggy, on rollers and in lamination | Decrease speed |
| | Increase temperature |
| | Defective Film |
| Film is foggy, clear on rollers foggy in lamination | Decrease temperature |
| | Defective Film |
| Film does not stick / poor adhesion | Decrease speed |
| | Increase temperature |
| | Increase roller Pressure |
| | Incompatible film adhesive with project |
| | Defective Film |
| Bubbles / air pockets in film only, not near edge | Film is not running flat at nip, increase tension |
| | Film is not running flat at nip, decrease tension |
| | Not enough pressure for application, increase |
| | To much pressure (rollers bending), decrease |
| | Defective Film |
| Bubbles / air pockets in lamination | See troubleshooting for film |
| | Defective Film |
| Bubbles in edge seal | Not enough pressure available, increase |
| | Paper to thick for film / laminator |
| | Speed to great to conform, Slower |
| | Temperature to low for adhesive flow, increase |
| | Film to thin for adhesive flow |
| Bubbles between sheets perpendicular to rollers | Not enough pressure available, increase |
| | To much pressure (rollers bending), decrease |
| | Film to thin for adhesive flow |
| | Temperature to low for adhesive flow, increase |
| | Sheets to close, allow more space |
| Bubbles in edge seal parallel to the rollers | Too hot, decrease temperature |
| Blistering / random bubbles on paper | Too hot, decrease temperature |
| | Paper moisture content too high |
| | Incompatible film / temperature for the ink used |
| | Defective Film |
| Optical distortion in film / wavy / puddles | Too hot for film base, decrease temperature |
| | Too slow – Film base distorting, speed up |
| | Too Much Pressure, decrease |
| | Defective Film |
| Optical distortion in film parallel to rollers | Motor pulsating, increase speed |
| | Motor pulsating, reduce mandrel tension |
| | Supply roll bouncing, increase mandrel tension |
| | Film stretching and rebounding, decrease tension |
| | Roller pressure too great, reduce |
| Irregular bonding | Decrease speed |
| | Increase roller pressure |
| | Defective Film |

Film cont.

| | |
|--|--|
| Stretch marks | Decrease mandrel tensions |
| | Decrease rear rollers Pressure |
| | Defective film |
| Curl up | Decrease top mandrel tension |
| | Increase lower mandrel tension |
| | Turn on / off fans |
| | Defective film |
| | Increase rear roller pressure |
| | |
| Curl down | Decrease Lower mandrel tension |
| | Increase upper Mandrel Tension |
| | Turn off / on fans |
| | Decrease rear roller pressure |
| | Defective film |
| Twist in film | Uneven roller pressures right to left /front to back |
| | Unmatched film buy matched film rolls (rare) |
| | Defective film |
| Waves in film perpendicular to rollers | Turn sheet sideways, paper grain wrong |
| | Too hot, decrease temperature |
| | Check film alignment |
| | Increase rear roller pressure |
| | Incompatible paper, paper shrinking excessively |
| | Moisture content incorrect, preheat / temper paper |
| | Paper shrinking, preheat / temper |
| | Moisture content incorrect, let paper stabilize |
| | Incompatible film |
| | Defective film |
| Waves in film at angles | Incompatible paper |
| | To hot for paper / ink |
| | Check film alignment |
| | Incorrect roller pressures, decrease pressure |
| | Incorrect mandrel tension, decrease tension |
| | Defective Film |
| Waves in film perpendicular to rollers | Insufficient rear roller pressure, increase |
| | Speed up motor |
| | Check film alignment |
| Waves, small, in edge seal | Increase film thickness |
| | Decrease paper thickness |
| | Decrease roller pressures |
| | |
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LIMITED WARRANTY

THE WARRANTY

Professional Laminating Systems Inc. (referred to as “Pro-Lam”) warrants this laminator frame to be free from defects in material and/or workmanship for a period of One (1) year from the date of its original purchase for use.

All electrical parts and rubber rollers are warranted free from defects in a material and/or workmanship for a period of ninety (90) days from the date of its original purchase for use.

This warranty does not cover damage or failure caused by or attributable to Acts of God, abuse, misuse, Improper or abnormal usage, faulty installation improper maintenance lightening of other incidence of excess or abnormal voltage.

Pro-lam is not responsible or liable for indirect, special, or consequential damages arising out of or in connection with the use or performance of the product or other damages with respect to loss of property, loss of revenue or profit, or cost of removal, installation of reinstallation

In the event of a defect in material or workmanship during the warranty period Pro-Lam and/or its authorized dealer, will repair or replace (at its option) your laminator under the conditions of this Warranty. Pro-Lam will do so at its expense for the cost of labor and materials but not for shipping and delivery charges.

LIMITATIONS, EXCLUSIONS AND OTHER RIGHTS:

. Pro-Lam disclaims liability for implied warranties of merchantability, fitness for any particular purpose, or otherwise, after the terms of this warranty.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

CLAIM PROCEDURE

If you discover a defect or malfunction during the period to which this warranty applies, you must follow this procedure:

- Contact the Pro-Lam Dealer from whom the laminator was purchased and they will handle your warranty issues for you.
- Or, contact Pro-Lam 1806 hwy. 93 Hamilton MT 59840 or fax 406-363-1690 and explain the reason why you believe there is a defect or malfunction in the laminator including the date and conditions under which the defect or malfunction occurred.
- Include in your letter a copy of the sales slip or other proof of date or purchase of the laminator.

Upon receipt of your letter, Pro-Lam or the said distributor will make a preliminary determination of its responsibility to repair or replace under this Warranty.

If Pro-Lam denies responsibility, it will explain its decision in writing. You may then submit new or additional facts or request information on repair of the laminator at your own expense.

If Pro-Lam accepts responsibility, it will notify you in writing to bring or ship, at your expense, the laminator to Pro-Lam. Optionally, the customer or Pro-lam may also choose to send the part to the location of the machine for on-site service by either the customer or the dealer

When Pro-Lam receives the laminator (under no conditions is Pro-Lam responsible for damage in transit), it may then determine upon inspection that this warranty does or does not apply.

If the warranty does not apply, you will be told the reason and the cost to you of repair and return. You must then authorize Pro-Lam or the said distributor to make the repairs and/or return the laminator to you.

Include with your authorization a purchase order or bank check or money order to cover all costs. (Please note: personal checks must clear the bank before the repairs are begun.) If you fail to, do so within sixty (60) days of Pro-Lam's notice to you, Pro-Lam is free to return the laminator to you C.O.D. for you to pay the shipping cost on delivery.

If you fail to pay C.O.D. charges and the laminator is returned to Pro-Lam, we will then dispose of it.

