READ ALL PRECAUTIONS & INSTRUCTIONS CAREFULLY
BEFORE OPERATING LAMINATOR

Setup
Instruction
Operation
Lamination
Maintenance

Digital 38 Laminator

OPERATION MANUAL

January 1996

IMPORTANT: Remember that you cannot laminate thermal paper, such as typical fax paper, because it is activated by heat and will turn black. Also, remove paper clips and staples because they can damage the rubber rollers. Be careful about laminating anything that will be affected by heat. For example, the colors in thermal transfer or wax sublimation printer output may run together or smear. Test first with expendable pieces.

Don't laminate one-of-a-kind documents unless you are sure of your laminating skills and can afford to damage or ruin the document.

Don't laminate valuable items such as stamps, baseball cards, autographs, or other collectibles because the value of such items can be destroyed by lamination. Collectors generally value these kinds of items only in their original state.

IMPORTANT: Éviter de plastifier du papier thermosensible, comme le papier de télécopieur, pusqu'll noircira sous l'effet de la chaleur, et enlever les trombones et les agrafes gui risquent d'endommager les rouleaux de caoutchouc. Prendre certaines précautions avant de plastifier des articles susceptibles de réagir à la chaleur comme les dessins au pastel dont les couleurs peuvent baver et se mélanger, surtout si la couche de pastel est épaisse. Les pastels en couche mince peuvent ne pas réagir, mais, en cas de doute, il est préférable de faire un essai avec un échantillon perdu.

Ne pas plastifier les documents importants dont il n'existe qu'un seul exemplaire, à moins de bien maîtriser la technique de plastification.

Ne pas plastifier non plus les articles de collection comme les trimbres, les cartes de baseball, les autographes ou autres, qui peuvent perdre leur valeur pour les collectionneurs s'ils ne sont plus dans leur état d'origine.

IMPORTANTE: Recuerde que no puede laminar papel térmico, tal como el papel de fax típico, ya que es activado por el calor y se tornará negro. Retire también cualquier sujeta-papeles o grapa, puesto que pueden dañar los rodillos de goma. Evite laminar cosas sensibles al calor, por ejemplo, los colores de dibujos hechos en lápiz de pastel pueden no ser afectados, pero ensaye con alguna muestra descartable, en los ìtemes que podrían no laminarse bien.

No lamine ingún documento único, a no ser que esté muy seguro de sus habilidades de laminador y pueda permitirse arruinar el documento.

No lamine artículos de valor, como estampillas, tarjetas de béisbol, autógrafos, u otros coleccionables, ya que su valor puede ser destruido por la laminación. En general, los coleccionistas valoran este tipo de artículo en su estado original.

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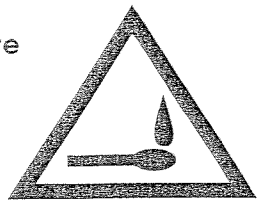
1-1 INTRODUCTION

The **Digital 38** is designed to provide quality lamination of a wide range of papers and materials up to 1/2 inch thick using film up to 10 mils thick. Common applications include but are not limited to inkjet prints, electrostatic prints, menus, posters, instructional aids or visuals, maps, place mats, signs, labels, packaging, certificates, dry-erase charts, presentation materials, photographs, copies (B&W or color), prints, flash cards, game pieces, instruction sheets, flyers, safety notices, engineering drawings, promotional sheets and many other items.

A roll feed attachment and a stand are available options.

To assure you get the best performance from your new laminator, please follow the safety, installation, operation, and maintenance instructions in this manual. Read the manual before using the laminator, keep the manual with the machine, and periodically review the instructions. The manual also contains warranty and parts information. Additional copies are available from the manufacturer at $5.00 each including postage. Please send payment with your order.



NOTICE: The International "HOT" warning symbol will be placed on the appropriate areas of each laminator. Caution should be used to prevent burns to hands and arms.

Le symbole international de mise en garde « CHALEUR EXTRÊME » sera apposé aux endroits appropriés des machines à plastifier thermiques.

El símbolo internacional de advertencia "CALIENTE" séra fijado en los lugares apropiados, en el plastificador.

We take this opportunity to thank you for selecting the **Digital 38** laminator and to assure you of our continuing interest in your satisfaction with our products.

As you unpack your new laminator, please complete the following information and keep this manual in a convenient place.

Dealer Where Purchased _____

Installation Date _____ Serial # _____

WARNING: High temperatures are present and care should be exercised to prevent burns to hands and arms when operating the laminator.

MISE EN GARDE: La machine à plastifier produit beaucoup de chaleur et on doit l'utiliaer avec prudence.

ADVERTENCIA: Hay temperaturas muy altas aquí; tenga cuidado al utilizar el plastificador.

* * * * *

WARNING: The laminator should not be operated without the plexiglass safety shield. These guards protect operators hands and arms from the roller nip points to prevent crushing or tearing of skin.

MISE EN GARDE: Ne pas utiliser la machine à plastifier sans son écran protècteur en plexiglas.

ADVERTENCIA: No opere el plastificador sin tener el protector de plexiglás en su lugar.

Ledco, Inc.
4265 North Main Street
Hemlock, NY 14466
Phone 716-367-2392
Fax 716-367-2978

1-2 FEATURES & BENEFITS

Your new laminator has several standard features that set it apart from other models.

- **Variable speed.** Operates at any speed up to 12 feet per minute. Thicker films are generally applied better at mid-range to lower speeds, while 1.5 mil film should be applied at mid-range to higher speeds.
- **Ease of cleaning.** The silicone rubber rollers and the teflon-coated heat shoes of the laminator should be cleaned regularly. The heat shoes on the Digital 38 swing away in seconds, making it far easier to clean the laminating rollers and the heat shoes.
- **Attached safety shield.** The polycarbonate shield is clear so operators can see their work. It does not conduct heat so they'll be protected from hot areas. It's fixed to the feed tray. The machine will not run if the feed tray and safety shield are not in place.
- **Lamination pressure.** The rubber rollers are spring-loaded and preset to ensure correct and even lamination pressure. The pressure is easy to adjust if required when performing routine maintenance.
- **Feed tray pressure strip.** This strip on the front of the feed tray holds images flat as they go into the laminator, making it easier to handle the light-weight papers sometimes used in digital imaging.
- **Supply roll tension controls.** These simple knobs give operators the control they need to get wrinkle-free lamination...just tighten to increase tension, loosen to decrease tension.
- **Ease of maintenance.** The Digital 38 is made to last. However, some items on a laminator do wear out. Even the high-quality silicone rubber used in the rollers will lose flexibility over time. Extensive use may wear out the rollers, or an operator may cut a roller by accident. Rollers and other key parts can be changed quickly without disassembling the frame.
- **Reverse.** Can be invaluable at times to help avoid problems or clear misfeeds.
- **Right and left adjustable feed guides.**
- **Silicone rubber laminating rollers.** Flexible enough to provide a good edge seal and firm enough to offer a good surface seal. A high silicone content insures a much longer average roller life.
- **Very strong steel cores.** Prevent roller flexing and insure uniform pressure across the width of the laminate, giving you the best quality lamination available in a medium-duty commercial machine.
- **Controls to open and close the laminating rollers.** Make threading easier and allow even heating of laminating rollers during warm-up.
- **100% Made in the U.S.A.**

1-3 OPTIONS

- **Roll feed tray.** When laminating a very long item such as a banner, it is just about impossible to feed it in perfectly straight by hand. By rolling it up on an empty laminating film roll core and putting that core on the roll feed assembly, laminating the longest item becomes relatively easy. The roll feed tray is especially helpful for the owners of poster printers, plotters, banner makers and other digital output devices.

- **Stand.** The Digital 38 can weigh 500 pounds when loaded with film, so not all operators will have a bench or equipment cart sturdy enough to handle it.

- **Release linear takeup.** Many cold laminating films and some other materials with pressure-sensitive adhesives have release liners which must be removed just prior to application to a graphic or substrate. This option is motor-driven and controlled with a clutch to automate the release liner removal. It will be available in early 1996.

1-4 SPECIFICATIONS

Digital 38

Laminating Width	up to 38"
Speed	0-12 FPM
Depth	40"
Length	48"
Height	26"
Weight/shipping wt.	365 / 500 lbs.
Electrical	30 amps 208-240V 50-60 cycle single phase
Electrical Connector	NEMA L6-30P
Max. film gauge	10 mil
Max. laminating thickness	1/2 inch
Max. film capacity	1.5 mil - 3,000 feet 3 mil - 1,500 feet 5 mil - 1,000 feet 10 mil - 500 feet
Lam. roll diameter	3"
Film core size	3"

1-5 PRINCIPLES OF OPERATION

Digital 38 laminators operate by pulling film with a thermally-activated adhesive over a heat source and into a set of laminating rollers. Film from a film supply roll passes over heat shoes to activate a polyethylene adhesive layer on the film. It then passes through rubber rollers to apply pressure and bond the film with the item being laminated. The film's adhesive will actually fuse into the item.

Adhesion may be checked using what we call an "X-test." Cut a large "X" on the surface of a laminated sample with a sharp blade. Use the tip of the blade to pry up one corner of the "X." Grab that corner and pull up the film. If ink and/or paper fibers come up with the layer of film, a good lamination has been achieved. If the film comes up too easily, with no ink or paper, the lamination was probably done at too low a temperature. Check the instructions that may have come with your laminating film and/or the lamination temperature chart in section 5-5.

Please note that when doing an X-test on glossy paper, a good X-test will pull up ink only with the film, because the paper is coated to make it glossy. When laminating material that is not glossy, the paper is often more fibrous and a good X-test will yield ink and paper fibers coming up with the film.

1-6 LAMINATING FILM

Most thermal laminating film consists of two layers: a base layer of polyester and an adhesive layer of polyethylene. The polyester layer forms the harder outer surface of the film and does not melt at laminating temperature. It provides rigidity and protection for your laminated items. The greater the polyester content, the higher the level of protection, rigidity and luster. The polyethylene layer melts at laminating temperature and bonds the film onto the subject material under the pressure of the laminating rollers. As an X-test demonstrates, the adhesive is pressed **into** the paper and fills irregularities in the surface.

The proportion of polyester and polyethylene in a film is usually described with numbers. For example, a "1-2" film consists of one mil of polyester and two mils of polyethylene. The first number refers to the base layer, which consists of polyester in the majority of thermal films. The second number refers to the adhesive layer, which is usually polyethylene. A mil is 1/1000 of an inch.

Since polyester is the more costly of the two types of plastic generally used in laminating film, a "2-1" film will cost more than a "1-2" film. Both are 3-mil films, but the "2-1" version will seem a little thicker on a piece of laminated material because it will be slightly stiffer.

In the U.S. laminating trade, the generally accepted practice is to describe two-sided lamination, or encapsulation, by the thickness of one layer of film. For example, "3-mil lamination" should refer to lamination with two layers of 3-mil film. If you are buying or selling laminating film or lamination services, please make sure both parties understand the film descriptions being used.

There is a huge variety of thermal laminating films available to suit many different kinds of application. Here are some of the more commonly used "special" film types or film additives:

- film with low-melt adhesives; these often have better clarity and are less likely to curl or ripple when laminating conditions are not ideal
- matte surfaces to eliminate glare, or matte surfaces that will accept printing or writing; many suppliers offer films with both glossy and matte (non-glare) finishes
- film with UV inhibitors to prevent film deterioration in sunlight and protect colors in the laminated material from fading
- thermal film that has a pressure-sensitive adhesive and a release liner on its outer side; for example, a poster with this material laminated on the back could easily be put up without fasteners or tape
- high clarity films; some of these have a protective liner for the top outer surface...after a piece of material has been laminated, trimmed, packed and shipped, the person using the material can remove the protective liner, revealing a surface perfectly free of dust, scratches or abrasion
- opaque or colored films for the back side of a lamination; these can form a border for a laminated piece
- permanently waterproof films for outdoor, underwater or special applications; the most common thermal laminating films are made with water-based primers and will eventually de-laminate if continually exposed to water or weather; truly waterproof films are made with special primers.

Rolls of film may be purchased in different widths. The size of the laminator is the only limitation to the width of the film rolls you can use. If you have a Digital 38, you can use any width roll up to and including 38 inches. You could use 12 or 18-inch rolls, or even a 4-inch roll, for example. Make sure the upper and lower roll widths are the same, and are aligned with each other.

When installing film, always center the rolls of film on the supply roll mandrels so the core grippers engage the cardboard core.

Rolls are also produced with different lengths of film on a roll (250', 500', 1000'). The Digital 38 series will easily accommodate film rolls up to a 10" diameter. Rolls of 1.5-mil film up to 3,000', 3-mil film up to 1,500', and 5-mil film up to 1,000' can be run on this laminator.

Lamination with 1.5-mil film can sometimes present problems because the film is so thin it loses heat easily. It sounds backwards, but 1.5-mil film has to be run at a higher temperature than a 3-mil film with the same adhesive. The higher temperature compensates for the faster rate of heat loss during lamination. A standard 3-mil film is applied at 280 degrees Fahrenheit, while a standard 1.5-mil film must be applied at 310 degrees. Even when applied at 310 degrees, a 1.5-mil film is still more likely to delaminate later.

If the item being laminated is fairly thick, it will pull heat from the film. This will lower the temperature of the 1.5-mil film and prevent it from sticking properly. When laminating thick items with standard 1.5-mil film, it may be necessary to raise the temperature to 330 or 340 degrees. Do not use any higher temperature for any film than is needed to get an acceptable degree of adhesion, as measured by an X-test. Remember there are low-temperature films which should run at much lower temperatures than those cited in this example. (See the chart on film operating temperatures.)

Rolls of film are sometimes spliced. Most film suppliers will mark a splice with colored tape. This way, you can see the splice as a "dash" of color on either end of the roll. If you spot a spliced roll in advance, you can put it on the top supply roll mandrel in order to see the splice coming more easily and avoid putting material under the splice. Or you could put it on the bottom roll if you plan to be laminating items that will never be seen from the back side.

1-7 WARRANTY

This laminator is guaranteed against defects in material and workmanship for a period of one year after date of shipment. Defective parts will be replaced without cost within the warranty period, provided the laminator has not been abused, altered or operated contrary to instructions. Ledco, Inc. shall not be liable for any alterations or repairs except those made with its written consent.

This obligation under warranty shall not extend to the following:

- The adjustment or replacement of parts which are the normal responsibility of the owner. For example, rubber rollers, heat shoe coatings, scratched or chipped paint, loose fasteners (screws, nuts, etc.), or other items that show wear under normal use; i.e. "normal wear parts."
- Normal operating adjustments to heat, speed, tension, etc.
- Parts that are not manufactured by Ledco, Inc. If these items are warranted by the individual manufacturer, their warranty is, in turn, passed on to the original purchaser of the laminator. Ledco, Inc. does nor incur any obligation or liability as a result of the warranties which are the sole responsibility of the appropriate individual manufacturer.

Any laminator which proves defective during the warranty period may be returned to Ledco, Inc. unless it is decided that the necessary repairs can be made by on-site, with or without a service call. Notice of the defect should be submitted in writing or by phone to the dealer or to Ledco before any steps are taken to repair or return the machine. Ledco phones: 716-367-2392 Toll free: (800) 937-9293 Fax: 716-367-2978

If a machine return is authorized, the following should be included:

- Customer name, address and phone number
- Written particulars regarding the malfunction
- Date of Installation
- Serial number of the machine.

- **All returns must have a return authorization number on the outside of the shipping container.**

Send all returned equipment freight **PREPAID** to:

Ledco, Inc., 4265 North Main Street, Hemlock, NY 14466

If your machine needs servicing after the warranty has expired, please contact your dealer. Ledco, Inc. offers technical support if your dealer is unable to assist.

This warranty is expressly in lieu of all other warranties expressed or implied, including the warranties of Merchantability and Fitness For Use and of all other obligation or liabilities of Ledco, Inc., and said company neither assumes nor authorizes any other person to assume it for any other obligation or liability in connection with the sale of this laminator except as provided for above.

Further, this warranty will not apply to any machine or part thereof which has been damaged as a result of an accident, shipping, or as a result of the abuse, misuse, or neglect of the machine. The warranty is also void if the laminator has been altered or repaired by any other than an authorized repair facility or dealer. If you have any questions about this warranty, contact Ledco.

2-1 UNPACKING AND INVENTORY

Except for the **feed tray and options,** the laminator is assembled at the factory. Upon arrival, inspect the unit immediately and thoroughly using the packing list that accompanies the shipment. Please follow these steps to correct any problem with your shipment. Ledco, Inc. cannot accept any responsibility for damage or loss unless you notify us within ten days of receipt of shipment and follow these procedures:

BREAKAGE OR DAMAGE

It is imperative that any shipping damage is reported and a claim is filed with the delivering carrier immediately upon receipt of damaged shipment. The procedure for reporting damage depends on the method of shipment.

Freight, Express, of Truck Delivery

According to the contract terms and conditions of the carrier, the responsibility of the shipper ends at the time and place of shipment. The carrier then assumes full responsibility for the shipment.

1. Notify the local agent of the transportation company immediately.
2. Hold damaged goods with container and packing for inspection by the examining agent. DO NOT RETURN ANY GOODS TO LEDCO PRIOR TO INSPECTION AND AUTHORIZATION BY THE TRANSPORTATION COMPANY.
3. File a claim against the transportation company. Substantiate your claim with the examining agent's report. A certified copy of your invoice is available upon request. The original bill of lading is attached to the original invoice. If the shipment was prepaid, write to Ledco for a receipted transportation bill.
4. Advise Ledco regarding your wish for a replacement.

SHORTAGE

1. Check the packing list notations. The apparent shortage may have been marked as an intentional short-shipped (back-ordered) item.
2. Reinspect the container and packing material, particularly for smaller items.
3. Make certain that the item was not removed by unauthorized personnel prior to complete unpacking and inventory.
4. Call us and send immediate, written notification of the shortage.

INCORRECT SHIPMENT

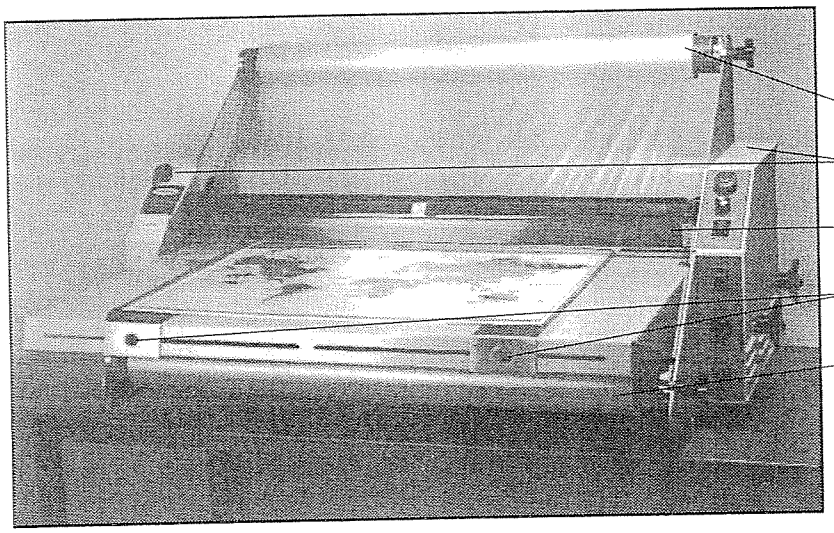
1. If the material you receive does not correspond with your order, notify Ledco immediately. Include the order number and item(s).
2. Hold items until return instructions are received.

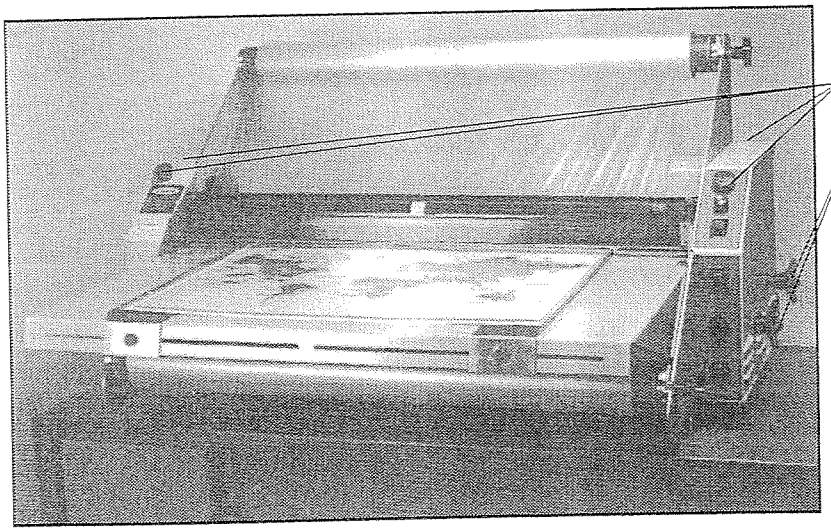
RETURNS

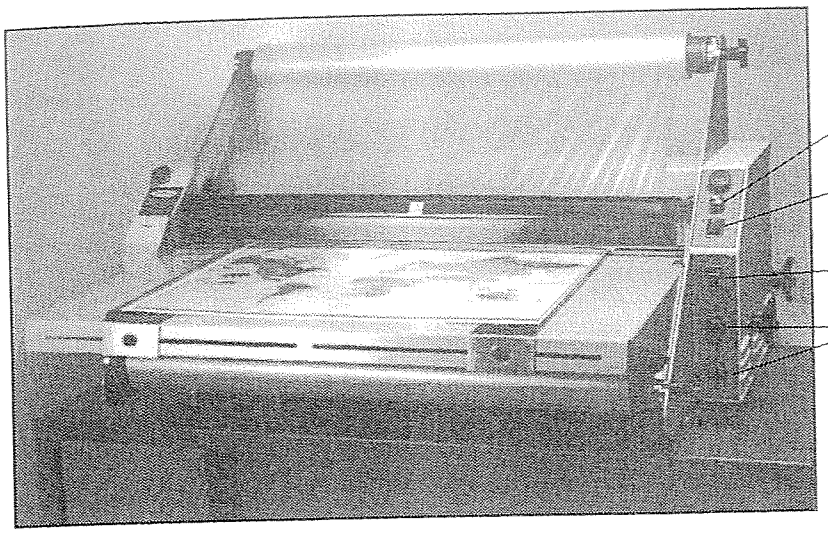
DO NOT RETURN DAMAGED OR INCORRECT ITEMS UNTIL YOU HAVE RECEIVED SHIPPING INSTRUCTIONS AND AN AUTHORIZATION NUMBER FROM LEDCO.

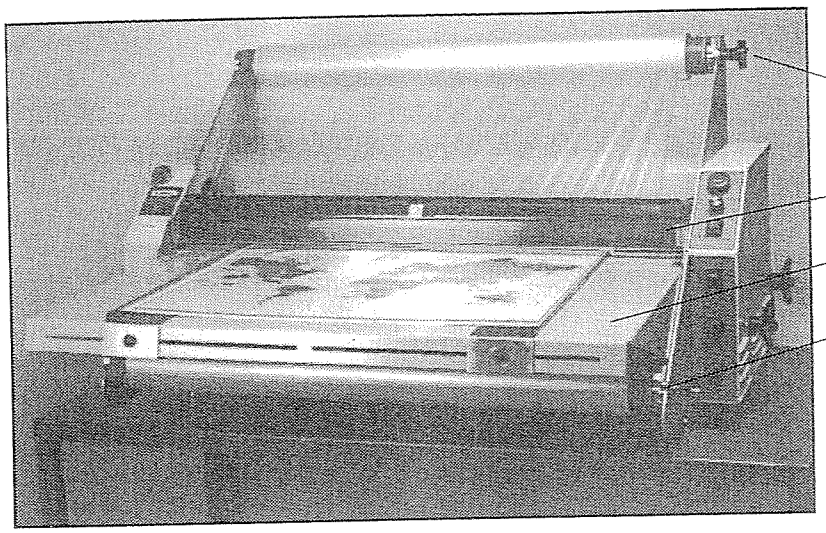
3-1 PRODUCT ILLUSTRATIONS & NAMES OF PARTS

The photos below and on the following pages identify major components and operating controls. Refer to them as you study the installation, operating and maintenance procedures described in this manual.






Speed control
Forward-stop-reverse switch
Heat on/off
Top and bottom temperature controls


Top supply roll tension knob
Safety shield
Feed tray
Bottom supply roll tension knob

4-1 SAFETY PRECAUTIONS

MISE EN GARDE
ADVERTENCIA O PRECAUCIÓN

1. High temperatures are present and care should be exercised in operating and maintaining the laminator. Even after the machine has been turned off it will remain hot for an extended period of time, and electrical current is still present in some areas.

   Étant donné les températures élevées produites par cette machine à plastifier, on doit user de prudence lors de son utilisation et de son entretien. Même une fois l'alimentation électrique coupée, la machine demeure chaude longtemps.

   Hay temperaturas altas aquí y debe tenerse cuidado durante la operación y el mantenimiento del plastificador. Aún después de haber sido desconectado, el plastificador permanecerá caliente durante un período prolongado.

2. Always make sure the power cord is not placed under the laminator where it might get over-heated from proximity to the bottom heat shoe. This will shorten the life of the cord and may cause electrical shorts exposing user to risk of electric shock and may be a possible fire hazard.

   On doit éviter que le cordon d'alimentation ne passe sous la machine et soit exposé à la chaleur élevée produite par le sabot chauffant inférieur.

   Asegúrese que el cordón eléctrico nunca esté debajo del plastificador, donde podría ser recalentado debido a la proximidad de la zapata calefactora inferior.

3. The safety shield should remain attached to the feed table and in position at all times. The laminator will not run with feed table off. Safety shields prevent operator access to nip point of rollers which can cause crushing of hands and arms and tear skin.

   L'écran protecteur doit être bien en place et on ne doit jamais l'enlever. Pour charger la film, il suffit de le faire basculer vers l'avant.

   El protector de seguridad debe permanecer fijado a la máquina, en su posición, en todo momento. Puede ser elevado mientras se carga la película plástica.

4. Use caution when operating the laminator to prevent ties, jewelry, hair, and clothes from being caught in the machine, as they may be caught in the nip point of rubber rollers and cause injury to arms or hands.

   Prendre les précautions nécessaires pour éviter que vêtements, bijoux, cheveux, etc. ne soient happés par la machine.

   Tenga mucho cuidado al operar el plastificador, para impedir que corbatas, joyas, o ropas sean atrapadas en los mecanismos de la máquina.

5-1 SETUP & OPERATION

With the laminator on an unobstructed, level surface, perform the following checkout before threading the machine with film.

WARNING: Make sure the power supply cord is clear of the underside of the machine prior to operation to avoid overheating the cord.

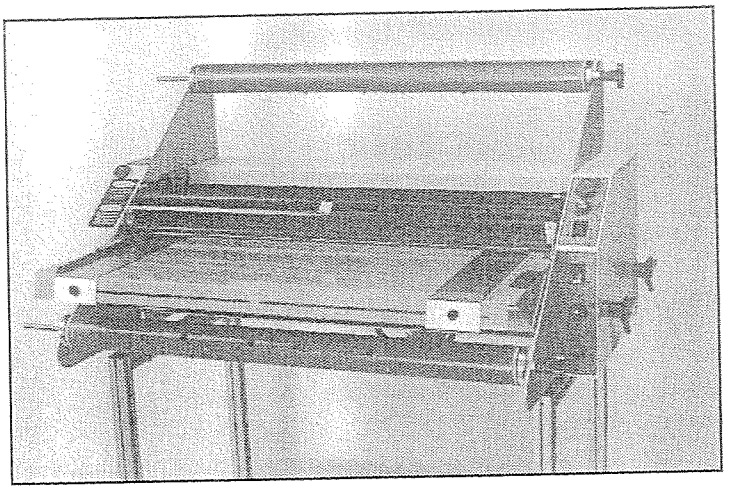
MISE EN GARDE: S'assurer que le cordon d'alimentation ne passe pas sous la machine, ce qui l'exposerait à la chaleur élevée produite par le sabot inférieur.

ADVERTENCIA: Antes de operar la máquina, asegúrese que el cordón electrico no está debajo de la misma, para evitar el recalentamiento del cordón.

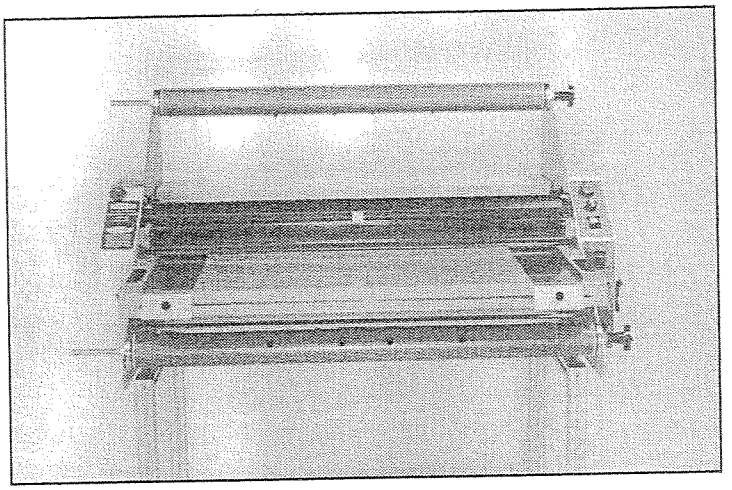
1. Remove the protective paper from the safety shield. Put the feed tray on the machine.
2. Plug the machine into a working outlet of at least 30 amps. Turn on the master switch at the back of the machine. Make sure all four stop buttons are disengaged. Turn the heat on.
3. Notice that the "WAIT" light is now on. If you do not want the machine to warm up at this time, turn the heat off and unplug the machine.
4. Set the desired temperature. The upper knob controls the top heat shoe and the lower knob controls the bottom heat shoe. The "WAIT" light will go off when the set temperature is reached.
5. The laminating and pull rollers are shipped in the open position. Turn the roll pressure control knobs (the large knobs on right side of the machine) counterclockwise to engage the rollers. Open and close the rollers several times. Notice that if you turn the knob clockwise as far as it will go the rolls are open. If you turn it counterclockwise you can hear and feel the rollers close and lock. Leave the rollers open if you are not going to thread the machine now. Always leave the rollers open when you turn off the machine. Always make sure the rollers are open for shipping. Close the rollers when you are going to thread the machine.
6. Press the forward drive switch on. The pull rollers and the laminating rollers should rotate.
7. Turn off the drive.
8. Turn the heat OFF and master switch OFF.

5-2 Threading the Laminator

1. Although this machine can be threaded cold, most operators feel it's easier to thread while it is warming up or already hot.

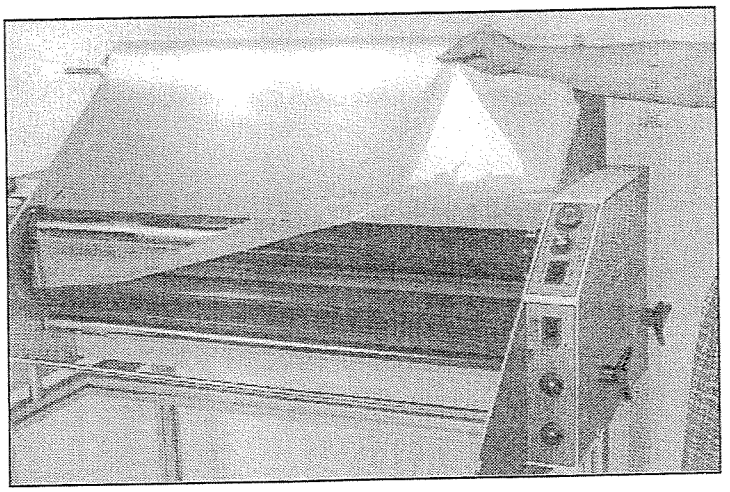


2. Remove the supply roll mandrels and the feed tray. The supply roll mandrels are now ready to accept loading of the film rolls, wound with the polyester (shiny) side in. When viewed from the front of the machine, the core grippers on both top and bottom supply roll mandrels should point away from the heat shoes (and away from each other). The tension control knobs should be positioned on the right. If you have rolls of film on which the material is wound in the opposite direction (shiny side out) exchange the top and bottom supply roll mandrels so the core gripper positions are reversed.

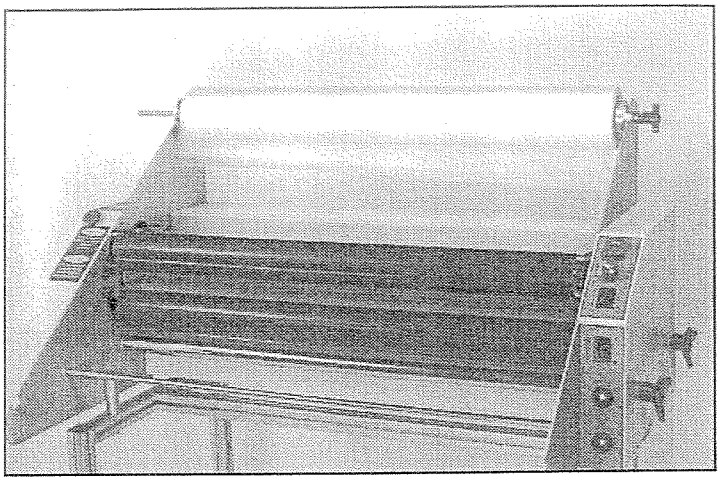


3. Slide a roll of film onto the top supply roll mandrel, turning the roll slightly to slide the gripper inside the core. Center the roll. Make sure the dull side of the film is facing up and the shiny side is facing the heat shoes during the threading.

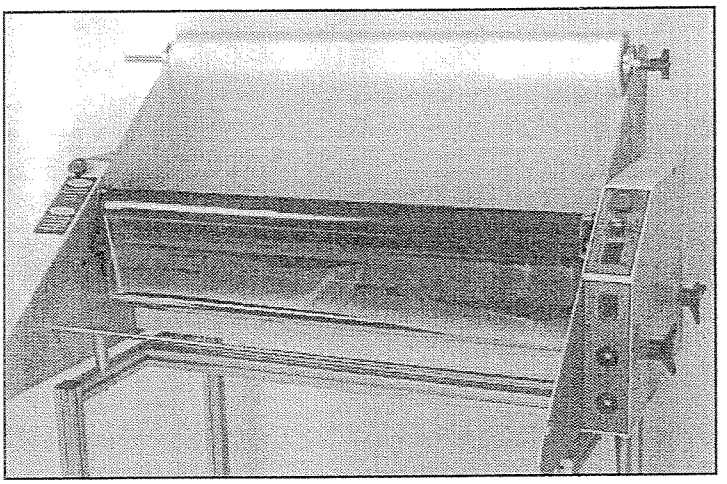
   NOTE: The pointed metal pieces protruding from the supply roll mandrels grips the cardboard core of the film supply roll to prevent slippage. When placing a roll of film on the mandrel, twist the film supply roll in the direction away from the point on the gripper, or the gripper may break or become dislodged from its mounting.



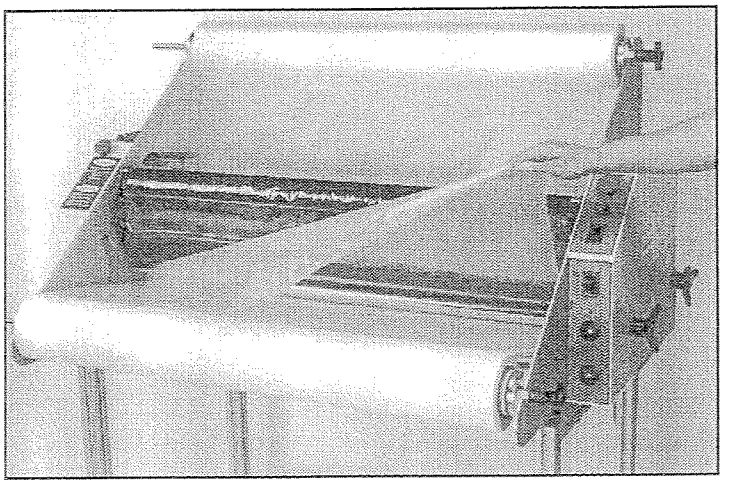
4. Center the roll on the mandrel and place the mandrel in the top brackets. This is a job best done with two people, even if the roll of film is not very heavy. With a person holding each end of the mandrel, it is easy to put both hexagonal fittings into their respective brackets. Make sure they are both fully seated. Attempting to load the film on the laminator by yourself may result in a back strain or other injury.



5. Review the threading diagram one page over. Run the film from the top mandrel and drape it across the top heat shoe. **Remember, the shiny side of the film must always go against the shoe.** The dull (adhesive) side must face away from the shoe. With the top roll of film centered on the mandrel and the shiny side facing down and draped over the top heat shoe, you are now ready to load the bottom supply roll mandrel.

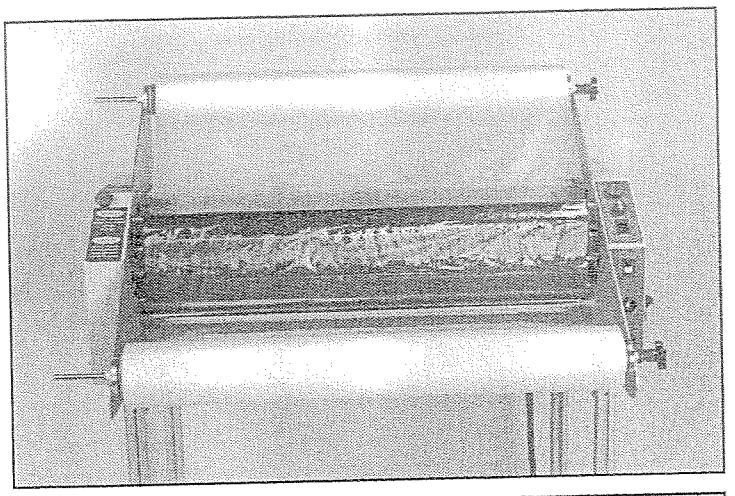


6. Load the bottom roll of film onto the mandrel in the same manner as the top roll. Remember, the shiny side of the film must always go against the shoe. The dull (adhesive) side must face away from the shoe. Make sure the two rolls are aligned with each other before going to the next step. Pass the web around the idler bar under the bottom heat shoe. Pull the bottom web up and drape it over the top web. When the machine is hot, the two webs will stick to each other. If threading while cold, use tape to hold the bottom web in place.

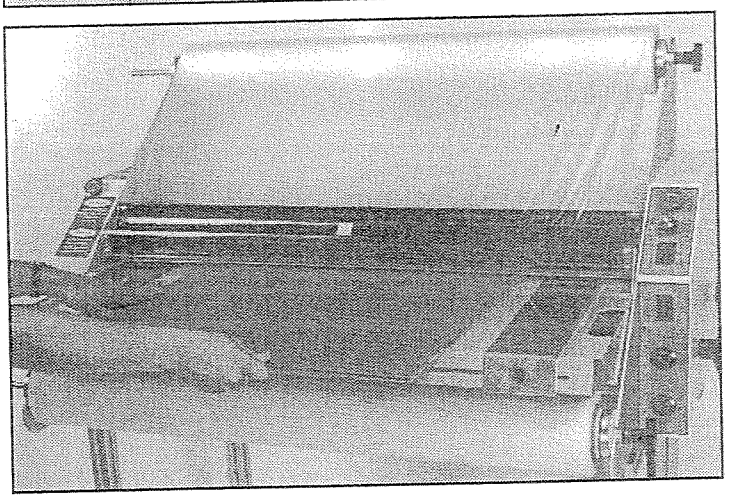


7. With both rolls threaded and installed in their respective brackets, unwind the top and bottom supply rolls about a half-turn each. This will provide enough slack in the web to allow the feed tray to slide on easily.

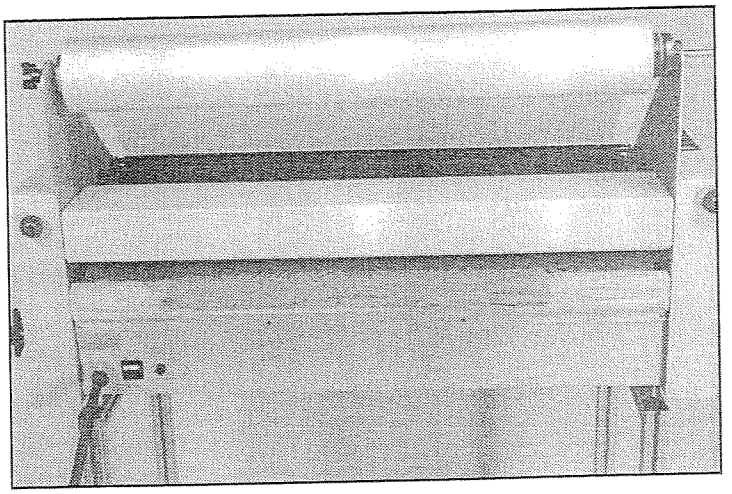
8. Slide the feed tray into position. Remember the drive will NOT engage without the feed table in place.



9. Make sure there is still enough slack in the web. Close the laminating rollers with the two large knobs on the right side of the unit. With the film draped over the two heat shoes, push one edge of the threading card between the heat shoes so that the film is firmly positioned against the laminating rollers. Make sure the rubber rollers are in the closed position. If a threading card is not available, any piece of card stock or poster board will work.



10. Push the forward drive switch. If the film and the card are in the nip (the point where the laminating rollers meet) the film and the threading card will start into the laminator and will pass through both sets of rubber rollers. When the threading card has cleared the back of the machine, press the STOP switch.

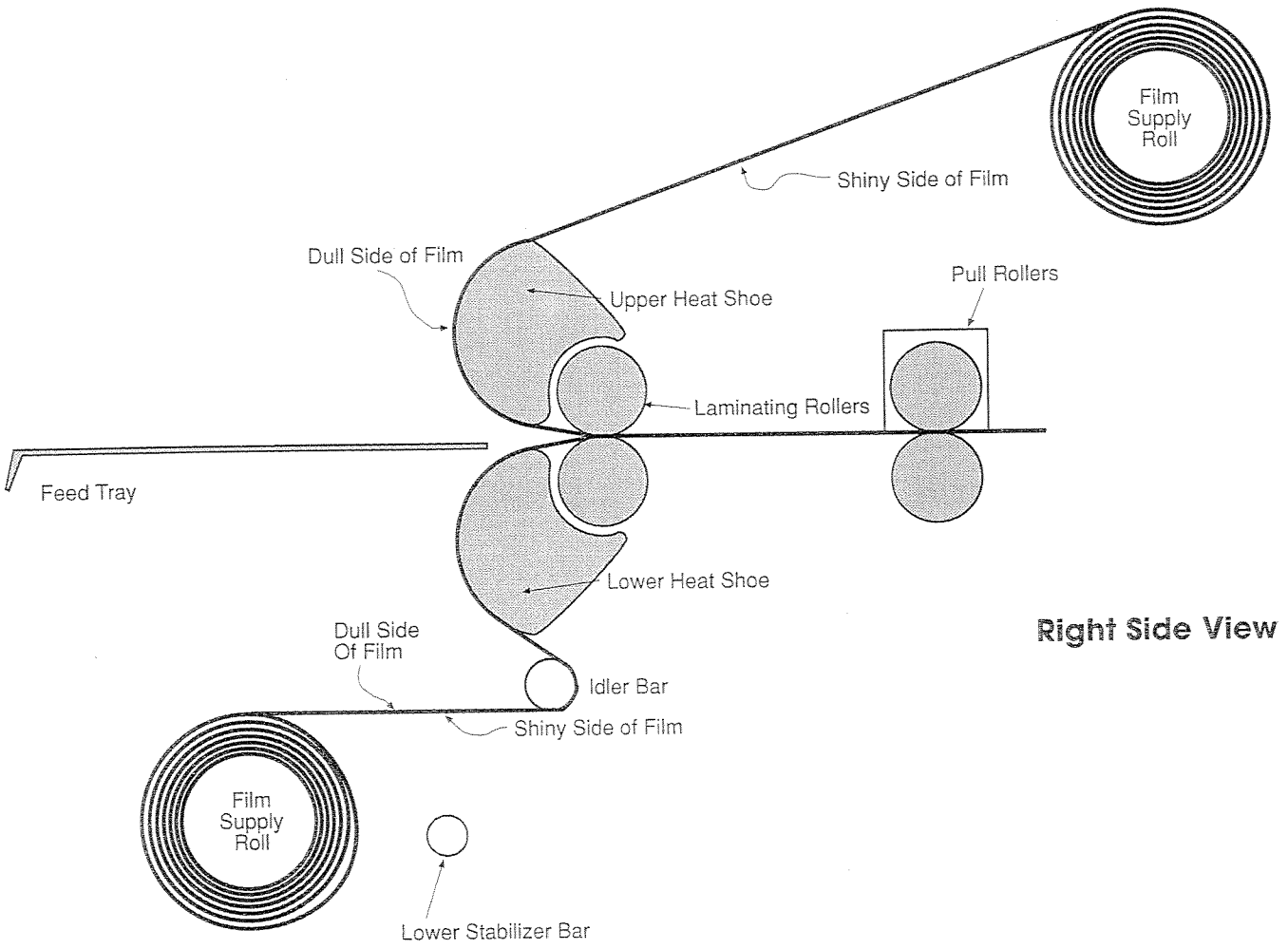


CAUTION: The laminator is designed to be run with the operator directly facing the control panel and feed tray, not at an angle or from the side of the machine. For operator safety, the safety shield must be in position over the upper heat shoe when the machine is ON, or when the drive switch is in the forward position.

MISE EN GARDE: La machine à plastifier est conçue pour que l'utilisateur se place directement en face du plateau d'alimentation et des commandes. De plus, pour assurer la sécurité de l'utilisateur, l'écran protecteur doit être relevé de façon à recouvrir le sabor chauffant supérieur lorsque la machine est sous tension (ON) ou que l'interrupteur-moteur est en position de marche avant (FORWARD).

ADVERTENCIA: El plastificador está diseñad para funcionar con el operador estando directamente ente al panel de mando y la bandeja de alimentación, y no a un ángulo, o desde un costado de la máquina. Para mayor seguridad del operador, el protector de seguridad debe estar en su lugar, encima de la zapata calefactora superior, cuando la máquina está encendida, o cuando el interruptor de mando está hacia adelante.

5-3 Film Threading Diagram



5-4 LAMINATING

1. If the machine is not already on and warmed up, first make sure the power cord is plugged in. Set the temperature and turn on the machine and the heat.
2. The laminator will be ready to operate in about 20 minutes.

WARNING: Never permit the temperature to exceed 310 degrees Fahrenheit while film is threaded and the laminator is not running. The film could disintegrate and require cleaning and re-threading of the machine. When it is necessary to laminate at temperatures in excess of 310 degrees - such as for poster board when using 1.5-mil film - pull some excess film off the film supply rolls to provide slack so the film is not tight against the heat shoes while the machine is heating. This will keep the film from melting when the laminator is not advancing film.

MISE EN GARDE: Ne jamais laisser la température dépasser 310°F lorsque le film est chargé et que la machine n'est pas utilisée, car le film risque de fondre, auquel cas il faudrait nettoyer la machine et procéder à nouveau au chargement du film. Lorsqu'il est nécessaire d'utiliser une température de plastification supérieure à 310°F, par exemple, pour plastifier des affiches à l'aside d'un film de 1, 5 mil, tirer un peu plus de film pour lui donner du mou de maniére qu'il ne soit pas tendu sur les sabots chauffants. On empêchera ainsi que le film fonde lorsqu'il n'avance pas.

ADVERTENCIA: No permita que la temperatura exceda los 310°F (160°C) mientras el plástico está cargado y el plastificador no está en uso. El plástico puede desintegrarse, lo que requeria limpiar y recargar la máquina. Si es necesario laminar a temperaturas más elevadas que 310°F - como en el caso de cartón para cartelería, cuendo se plastifica con película de 1,5 milésimas de pulgada (0,04 mm) - hale un exceso de película del rollo abastecedor para prover huelgo, evitando que la película quede muy apretada contra las zapatas calefactoras mientras la máquina entra en régimen. Evitará así que el plástico funda durante el período de tiempo en que la película no está avanzando.

4. Position the feed guides, if needed for precision feeding. You will get the best results by centering items in the web of film.
5. Check and balance the supply roll tension on both rolls. Start by loosening both knobs until there is no pressure on the springs. Tighten each knob until it just begins to press on its spring. For a preliminary adjustment, put three or four turns of tension on each knob.
6. Turn the fans on using the rotary switch located next to the master power switch on the back of the machine. Fans should be utilized when laminating with films 3.5 mils or thicker.
7. Once the machine has come up to temperature, you are ready to make final adjustments of the supply roll tension. With the heat ON, the rollers CLOSED, push the FORWARD button.

   Watch the film as it passes over the heat shoes. If there is some waviness in the film at the leading edge of both shoes, supply roll tension is perfect. The leading edge would be the top of the top shoe and the bottom of the bottom shoe, the edges that first contact the film. If there is no waviness in the film at all, there is too much supply roll tension. Loosen both knobs a small amount and check again.

   If the waviness or wrinkling extends into the laminating rollers, tension needs to be increased. Always keep the amount of tension the same on both rolls. Waviness which extends across 10 to 30 percent of the shoes indicates acceptable supply roll tension.
8. When starting the machine to begin lamination, let at least 10 inches of film go through the rollers before inserting the items to be laminated. This takes out slack in the film and removes the cooler strip of film that forms just in front of the nip when the laminator is hot but film is not being advanced. This also removes any areas of film with excess adhesive that may have pooled just beneath the shoes.

Examine the film coming out the back of the machine. If bubbles or wrinkles appear in the film, this means there is not enough tension to draw the film tight and smooth over the heat shoes. Turn the tension control knobs clockwise to increase the tension.

If the film is stretching, and gets narrower as it goes across the shoes, supply roll tension is much too high, and the temperature setting may also be too high for that film.

Film that is 1.5-mil thickness requires very little tension.

REMEMBER TO TURN BOTH THE TOP AND BOTTOM TENSION CONTROL KNOBS THE SAME AMOUNT TO KEEP TENSION THE SAME ON TOP AND BOTTOM ROLLS. If the film curls up or down after it leaves the machine, read the above section on supply roll tension again and readjust the supply roll tension on both rolls.

If the tension appears balanced, but you notice waves or ripples toward the center of the web of film as it comes out the back, the temperature may be too high or the lamination speed may be too high for that film. These waves in the film are called "heat wrinkles." These heat wrinkles are formed when the film has not cooled enough before coming out the back of the machine. For the best results, the film should be cooled below melt temperature while it is pulled tight and perfectly flat between the laminating rollers and the pull rollers. If it gets out the back of the machine while still at or above melt temperature, heat wrinkles can form. The major reason for fans on a laminator is to cool the film, not to cool the machine.

5-5 RECOMMENDED TEMPERATURE SETTINGS

Refer to the following table for recommended temperature settings.

Film	Thickness	Temperature Setting
1.5 mil	.0015 inch	290 to 320 degree range
3 mil	.003 inch	225 to 280 degree range
"3-2" 5 mil	.005 inch	228 to 280 degree range
1.5 mil on heavy poster or thicker paper	.0015 inch	320 to 340 degree range
10 mil	.010 inch	225 to 260 degree range

Please note the wide range of temperatures listed, especially for heavier films. This does not mean any film that thick can be run anywhere within the given range. There are "standard" or high-temperature and "low-melt" or low-temperature versions of all film thicknesses. Some low-melt films work at lower temperatures than others. It is important you buy your film from a vendor who can tell you the following additional information about any film you choose, in addition to its thickness:

— suggested melt-temperature range
— polyester/polyethylene content
— how well the adhesive will stick to the kinds of images you'll be protecting and enhancing
— its clarity

Other variables which can affect recommended temperatures include ambient temperature, humidity, and the thickness of the material being laminated, especially when thinner films are being applied.

Temperature may exceed 310 degrees when laminating poster board or other thick items with 1.5-mil film on a continuous basis, but when the machine is stopped, turn the heat off if the setting is in excess of 310 degrees. **Never set the heat above 350 degrees with film in the laminator. Temperatures over 300 degrees are not needed except with 1.5 mil film. Film that is 3 mils or thicker is generally run at 280 degrees or less.**

5-6 SIMULTANEOUS LAMINATING AND MOUNTING

Laminating and Pressure Sensitive Mounting

There are several different ways to simultaneously mount and laminate. The one preferred by most experienced users, especially those in digital imaging, is to hot laminate while mounting with a pressure-sensitive adhesive at the same time. The advantages of pressure-sensitive mounting for digital imaging applications are covered in Section 5.7.

Section 5.7 of this manual also details how to coat your foam core or other mounting board with a layer of pressure-sensitive adhesive. Or you can buy board already coated with an adhesive and its release liner.

Cut a piece of your pre-coated substrate (mounting board) slightly larger than your image. Peel back about 4 inches of the release liner on the edge which will be put into the laminator first (leading edge).

Use that exposed adhesive to position and align your image on the board. Being careful to keep the leading edge of the image aligned and wrinkle-free, smooth it down onto the exposed adhesive. The image does not need to be trimmed to final size first, since finish trimming of board and image will be done together after laminating.

When the laminator is threaded and up to temperature, put the leading edge of the board with its image under the feed strip on the leading edge of the feed tray. The feed strip should lift easily to accommodate substrates up to 1/2 inch thick. The laminator should be set 10 or 20 degrees hotter than what you would use on that film for standard laminating. The fan should be turned off.

Keep the board in that position. Do not let it advance far enough to touch the shoes yet. Make sure the laminating rollers are closed and locked. The pull rollers should be closed but not locked. Start advancing the film. Once the film which was resting on the shoes has been advanced, push the board squarely into the nip.

Hold onto the release liner. Do not let the release liner go under the safety shield The curl of the release liner will help keep the image off the board until it gets close to the laminating nip.

Laminating both sides of the item helps save the setup time which would be wasted in preparing the machine for one-sided lamination. Other problems with one-sided lamination are detailed in Section 5.7.

Another advantage of laminating both sides of foam core and some other substrates is that it minimizes the curl which those substrates are subject to over time.

No adjustment of the laminating rollers is required. Because they are spring-loaded, they will open appropriately for any board up to 1/2 inch thick. When using 1/2" thick substrates, closer laminating rollers, but do not lock them.

After the lamination is complete, trim the board and its now resident image to the finished dimensions.

Final finishing steps may include edge grippers for hanging, many types of framing, edging with plastic U-channel, or putting a leg on the back in the case of countertop displays.

Laminating and Dry-Mounting

Items may be simultaneously laminated and dry mounted using dry mount tissue. This is a tissue made of a heat-sensitive adhesive. This tissue may be purchased from laminating film suppliers and art or photo supply vendors. Film of 3 mils or thicker is suggested for best results.

1. With the heat on, open the rubber rollers by turning the roll pressure control knobs. Turn on the drive switch to allow the rubber rollers to heat evenly. Set a slow speed. Set the temperature at least 30° higher than for normal lamination.
2. Completely cover the back of the item to be mounted with a sheet of mounting tissue. There should be some excess.

3. To keep the tissue from slipping, tack it in place at the top edge with a glue stick. Trim the tissue to the size of the item.
4. Using the glue stick, tack the item to the mounting board, graphic side up.
5. Close the rubber rollers to allow the film to pass through the laminator. Start the drive in FORWARD. Allow the wrinkles from slack in the film to disappear.
6. Insert the mounting board into the laminator, placing the tacked edge into the rubber rollers first. When the item is fed into the rubber rollers, lamination is achieved at the same time the adhesive on the dry mount tissue is activated by the heat from the film and the laminating rollers.
7. Note: To prevent curling (of foam board, for example) and save set up time, laminate both sides.
8. During mounting and some other processes, the fan is not needed and may even create problems. Automatic operation of the fan can be turned off with the black rotary switch just to the right of the master power switch on the back of the machine. Be sure to turn the switch on again for regular laminating.

5-7 COLD APPLICATIONS

Cold Mounting

The Digital 38 is designed to be a cold laminator and mounting device as well as a hot laminator/mounter.

There are many different methods and sequences for laminating and mounting, but the most common procedure used with digital images is to first hot laminate and then cold mount. Cold adhesives adhere better and more reliably than dry mount (hot) adhesives when it comes to the various plastics, coated papers, and coated mounting boards often used in digital imaging.

The DI-38 can be used to apply adhesive film to mounting boards. Boards can also be purchased pre-coated with pressure-sensitive adhesive and a release liner.

Most rolls of adhesive have a single release liner. This release liner goes against the top laminating roller of the machine. The heat shoe can be swung out of the way so that the liner and adhesive do not touch it. If the stop pins prevent the shoe from completely clearing the web, they may be pulled out with a pair of pliers. The top shoe brackets can then rest on the ends of the pull roll guard. This will not affect your Ledco warranty.

However, it is not essential that the heat shoe be moved for this application, since it is the release liner side of the product which touches the shoe. If this work is run after a hot laminating job, the heat left in the shoes helps the adhesive to flow. It is not necessary to allow the machine to cool.

Cold laminators are one-sided laminators with very few exceptions, while most hot laminators encapsulate, or coat both sides. When laminating only one side, you must not allow exposed adhesive to go into the machine. Make sure the material being coated is at least as wide as the roll of film. Overlap pieces or use scrap paper between pieces to keep adhesive off the rollers.

Thread the machine by putting a large piece of scrap paper or cardboard through the open rollers. Stick the adhesive to this threading card, close the rollers, and begin to laminate. Keep feeding scrap paper so that the adhesive does not start a wraparound on the rollers.

Adjust the unwind tension to remove any wrinkles from the material. Do not use any more tension than needed or ;you may stretch the material.

Begin to feed the mounting boards, butting each up against the one ahead. Cut the boards apart with a utility knife on the back end.

Once your boards are coated, or if you buy them pre-coated, you are ready to mount any graphic. There are many methods for sizing and trimming, but most operators pick a board slightly bigger than the graphic and trim board and graphic together after mounting.

Peel back about two inches of the release liner on one end of the board. Use this exposed adhesive to position the laminated graphic on the board. Slide the positioned end of the board into the

laminator, holding the graphic up with one hand. Pull off the release liner before it goes into the nip. Pick up the mounted item at the back of the machine. Trim sway the unwanted portions of the graphic and the board at the same time.

For information on simultaneous laminating and mounting, see the previous section of this manual.

Cold Laminating

Cold laminating is less likely to be used than hot in most digital imaging applications for several reasons:

- Cold laminating does not allow true encapsulation
- It does not offer the same degree of permanent protection
- Cold films are several times as costly as hot films
- Items to be laminated on the sides must be run through the machine twice, so labor is at least doubled

Cold films are better for certain applications, such as overlaminating vinyl. Films for protecting images printed on vinyl should be made of vinyl themselves so that the flexibility of the vinyl substrate is not impaired. Polyester films are not recommended over vinyl because of their stiffness.

If a very flexible, conforming substrate is not required for the application, an image is better printed on paper than on vinyl.

When cold laminating, the threading process is similar to that described above for mounting adhesives. One difference is that outside surface of the film goes against the top laminating roller, while the adhesive side of the film should be facing the operator. The release liner should be taped to an empty core on the release liner takeup attachment.

When laminating only one side, you must not allow exposed adhesive to go into the machine. Make sure the material being coated is at least as wide as the roll of film. Overlap pieces or use scrap paper between pieces to keep adhesive off the rollers.

Thread the machine by putting a large piece of scrap paper or cardboard through the open rollers. Stick the adhesive to this threading card, close the rollers, and begin to laminate. Keep feeding scrap paper so that the adhesive does not start a wraparound on the rollers.

Adjust the release liner takeup tension so that the release liner is pulled away from the film just after it goes under the idler bar.

Adjust the supply roll unwind tension to remove any wrinkles from the material. Do not use any more tension than needed or you may stretch the material.

Begin to feed the images, overlapping them or running scrap paper between them. Be careful not to allow exposed adhesive to go into the rollers to avoid wraparounds.

The roll feed option can be used in two ways with cold overlaminating. A roll of printed material (one long image or many images) can be put on the roll feed mandrel for lamination in one non-stop process. Or a roll of inexpensive "release" paper can be run under the whole process to keep exposed adhesive out of the nip while laminating a series of pieces.

For those customers who need cold lamination exclusively, Ledco manufactures its Econocraft line of pressure-sensitive machines 25 to 50 inches wide. They can handle substrates up to an inch thick and as wide as the particular machine.

5-8 PREVENTING AND SOLVING PROBLEMS

Please read this section BEFORE you begin to use your machine.

PROBLEM: Wrinkling of the material as it goes into the laminating rollers.

SOLUTION: Sheets which are going to be laminated have sometimes been rolled, folded, or wrinkled. It is always desirable and sometimes essential in these cases to smooth out the item as it passes over the feed table and through the rolls to ensure an even lamination without wrinkles.

First make sure the leading edge of the item is flat, and gets inserted under the pressure strip and straight into the nip. As soon as the item starts to go into the rollers, pull back and to the sides on the trailing corners of the item to pull out any folds or wrinkles. Maintain the back-and-away pressure until your fingers get up to the safety shield.

If material has been rolled up, take the curl out of it on a table edge before laminating. If some curl remains, it may be helpful to insert the item with the curl down so the leading edge is pressed against the feed tray. This will help flatten the curl until the item gets into the laminator. Then follow the directions above and pull back and away on the trailing corners.

PROBLEM: Wrinkling of the film around the material being laminated.

SOLUTION: This is normal and inevitable on any laminator when laminating thicker sheets. These wrinkles will be trimmed away with the scrap, so they do not affect appearance. Because the rollers are being held apart by the paper or cardboard, they cannot press equally on the plastic around the paper. This creates wrinkles that tend to look like the waves of a boat, radiating out through the clear part of the web from the sheet of material.

PROBLEM: When two pieces of material are laminated side by side, the plastic adheres to one piece but not the other.

SOLUTION: To get maximum efficiency from the film rolls, you can feed several items into the laminator side by side. However, severe wrinkling can occur if these items are of unequal thickness, because the laminating roller are lifted off the thinner items by the thicker items. When laminating items side by side, it is important to arrange them so that thicknesses are the same on everything that will be in the nip together.

PROBLEM: Wrinkling of the plastic on a laminated piece of material.

SOLUTIONS: Make sure you have enough supply roll tension to take the wrinkles out of the film before it gets past the heat shoes. (See Laminating, section 5-4)

Make sure the film is threaded properly (see Threading the Laminator, section 5-2).

PROBLEM: Wrinkling occurs in the film on the laminated item, AND the rolls of film move from side to side on the supply roll mandrels.

SOLUTION: Check the supply roll mandrel. You'll probably find that the mandrels are reversed. Take the rolls of film off and switch the mandrels.

When the supply roll mandrels are reversed the core grippers point in the wrong direction to hold the rolls of film . Because the cardboard cores are turning on the mandrels, there is no supply roll tension control and the rolls of film are able to slide from side to side on the mandrel.

PROBLEM: Film gets wrapped around the pull rollers.

SOLUTION: While threading a laminator when the shoes are cold, the loose ends of the unlaminated web are particularly susceptible to "wraparound" on the rear rollers. To minimize this possibility, pull the threading card after it emerges from the pull rollers until the film clears the exit table. Open the rollers. Let the threading card hang from the back of the machine until the machine is warmed up. Then close the rollers and run some film until a laminated web has started to emerge from the pull rollers. Then stop the web, trim the film from the back of the unit and retrieve the threading card.

If "wraparound" does occur while the laminator is cold, you can easily unwrap it by reversing the direction of the rubber rolls, permitting the laminator to release the film from the rolls.

PROBLEM: Film gets wrapped around the laminating rollers while the machine is hot.

SOLUTION: Leave the heat on so that the adhesive does not harden, and follow these steps.

WARNING: Be very careful not to touch the heat shoes when the machine is hot.

MISE EN GARDE: Ne pas toucher les sabots chauffants lorsque la machine est chaude.

ADVERTENCIA: Tenga mucho ciudado en no tacar las zapatas calefactoras cuando la máquina está en régimen (caliente).

ATTENTION:

1. Remove the feed tray.
2. Cut the film supply on the top and bottom, just above and below the heat shoes.
3. Loosen the film from the heat shoes and grip the two loose ends, holding them together. Put the upper shoe into its raised position. Re-attach feed table.

4. Hold down the REVERSE button with one hand and pull out some of the web with the other, or ask someone to help you. Be careful not to pull the laminator off your table or stand.

5. Continue to press the reverse drive switch and allow the film that is wrapped around the laminating rollers to pull out. You may have to pull hard, so be careful not to move the machine as you do this. You don't want a laminator falling on your toes.

WARNING: Holding down the reverse drive switch may cause reverse wraparound. Press briefly, then release the switch and check the results. Press the switch again if additional backing up is needed. Stop if you feel the film being pulled back into the rollers.

WARNING: Do not try to cut the plastic off the roller with a knife or other sharp instrument. You will end up cutting the rubber rollers and turn an inconvenience into a major repair bill not covered by warranty.

MISE EN GARDE: Si l'on appuie trop longtemps sur l'interrupteur de marche arriére, le film risque de s'enrouler dans l'autre sens. Appuyer par à-coups sur l'interrupteur et vérifier le résultat chaque fois. On doit relâcher l'interrupteur si l'on se rend compte que le film s'engage entre les rouleaux.

MISE EN GARDE: Ne jamais tenter de dégager un film enroulé en le coupant avec une lame tranchante. On entaillerait ainsi le caoutchouc des rouleaux, ce quit occasionnerait des frais majeurs de réparation qui ne sont pas couverts par la garantie.

ADVERTENCIA: Apoyar sobre el interruptor de marcha atrás puede causar bobinado inverso. Apriete brevemente, luego suelte el botón y observe el resultado. Apriete el botón nuevamente si requiere más marcha atrás. Pare si nota que el plástico hala hacia atrás, volviendo sobre los rodillos.

ADVERTENCIA: No intente separar el plástico del rodillo cortando con un cuchillo u otro instrumento filoso. Terminará cortando los rodillos de goma y convertirá una incomodidad menor en una cuenta de reparaciones mayor, que no está cubierta por la garantía.

6. Once you've gotten all the film off the rollers, clean the heat shoes and the rubber rollers per the instructions in the maintenance section of this manual.

PROBLEM: One roll of film runs out before the other.

WARNING: If film on one supply roll is run through the laminator without being matched to an opposing roll of film, the adhesive exposed to the rubber rollers will stick to the laminating rollers and create a world-class wraparound. This type of wraparound is difficult to clear because the film adheres to the roller and to itself for the entire length of the accumulated film on the roller. It's best to clear this right away, before the adhesive hardens. Follow the steps above to clear.

MISE EN GARDE: S'il n'y a qu'un film dans la machine, le côté adhésif, qui se trouvera contre le rouleau de plactification, y adhérera, ce qui provoquera un enroulement « monstre » très difficile à défaire puisque le film adhère d'abord au rouleau puis à lui-même à mesure qu'il s'enroule. Le cas échéant, il faudra agir rapidement avant que la colle durcisse. Procéder de la façon indiquée ci-dessus pour régler le problème.

ADVERTENCIA: Si el plástico de uno de los rollos de abastecimiento pasa por el plastificador sin ser igualado por una película de plástico del rollo opuesto, el adhesivo expuesto a los rodillos de goma adherirá a los rodillos de laminación y causará un bucle monumental. Este tipo de bucle es muy defícil de deshacer, porque el plástico adhiere tanto al rodillo como a sí mismo, a lo largo de toda la longitud de película de plástico acumulada sobre el rodillo. Es mator deshacerlo inmediatamente, antes de que endurezca el adhesivo. Siga los pasos indicados más arriba para lograrlo.

SOLUTION: To avoid this problem, stop the laminator before either roll runs out, cut the webs of film, and remove the two near-empty rolls of film. Throw the plastic away or use it in a pouch laminator, if appropriate. Re-thread the machine.

Experienced users may leave the lengths of film remaining over the shoes and in the rollers to help thread the new film. When the machine is warm, the ends of the new rolls can be easily tacked to the already threaded pieces because the adhesive layer facing outwards will be sticky. Be careful not to burn yourself on the heat shoes.

PROBLEM: Film is not properly adhered or starts to come off sometime after lamination.

SOLUTION: Unless there is something wrong with the film or type of film, this problem comes from film being run at too low a temperature. Check the heat setting on the laminator. (See Recommended Temperature Settings, section 5-5). If the film is not sticking to the item, it is likely that more heat is required.

If you are using 1.5 mil film, this problem can occur if you are running the machine too slowly. Because 1.5 mil film is thin and therefore loses heat easily, it can cool off too much between the heat shoes and the roller nip if it is run too slowly.

When laminating poster board or other thick material with 1.5-mil film, the paper itself can absorb enough of the heat from the film to drop the adhesive below melt temperature. The film may start to come off immediately or it may start to fall off after a few days. The solution here is to run the work at a higher temperature. About 320-340 degrees will usually do the job. (See the notes on 1.5-mil film in section 1-6.)

If you are running five to 10-mil film, you may have the same problem if you try to go too fast. In this case, the thicker film may not have enough time on the heat shoes at high speed to reach its adhesive melt temperature. Thicker films can be run at low speeds with no problem.

Sometimes you may see film detach from an item along one edge (the edge that was put in first). This happens when the material is put all the way into the nip before the machine is started. The area of film between the shoes and the nip can cool off too much while the machine is idle. The adhesive may not be hot enough to stick.

The way to prevent this is to let a few inches of film go though before putting in sheets to be laminated. This serves other purposes, besides ensuring the front edge of the piece will be properly sealed. It gives the machine a chance to take up the slack that develops in the film whenever the machine is stopped, and it prevents the following problem as well:

PROBLEM: A laminated item comes out with a large "oily" spot on or near the leading edge.

SOLUTION: It's not oil that causes this effect, but excess adhesive. When a machine is left heated but idle for a few minutes or longer, the adhesive from the film over the shoes can form droplets that tend to accumulate near the center of both webs of film. When the drive motor is started and a sheet of material is put in immediately, this excess adhesive saturates an area of paper, creating what looks like an oily spot. The solution, as mentioned above, is just to let a few inches of film go through before feeding in your work.

Anytime you are laminating unfamiliar or costly items, it is a good idea to start with an expendable sample or test piece. Laminating a test piece first gives you an indication of the results you'll get and also takes care of any pooled adhesive.

PROBLEM: The machine produces a continuous squealing noise when laminating.

SOLUTION: To a certain extent, it is normal for laminating film to squeal as it is pulled over the heat shoes under tension. This noise is produced via the same principles that make a violin squeal. Some of the compounds put on film to keep it from sticking to itself seem to act like rosin on the bow of the violin — they enhance the noise.

To minimize squealing, run the laminator with the least amount of supply roll tension that will do the job of removing wrinkles from the web of film. Make sure you are not using a higher temperature than needed. Also clean the heat shoes periodically (see section 7-2). If the noise gets really objectionable, use a different type or different brand of film.

PROBLEM: The laminated material seems to have a pitted surface or irregular surface that does not match the texture of the paper being coated.

SOLUTION: This is usually caused by adhesive buildup on the rubber rollers, but may be caused by any matter stuck to the rollers, such as a piece of paper. Inspect the rubber rollers and if they need cleaning refer to section 7-3.

Irregularities in the surface of the film can also be caused by cuts or other damage to the rubber rollers, especially the laminating rollers. On some models, the pull rollers are identical to the laminating rollers and could be substituted if still in good condition.

PROBLEM: The film shrinks as it passes over the heat shoe (known as "necking" in the laminating trade).

SOLUTION: Reduce the heat and/or the supply roll tension. The film is not shrinking so much as it is being stretched by excess heat and tension, causing the web to get narrower as it is pulled over the shoes.

PROBLEM: No power is getting to the laminator.

SOLUTION: Make sure there is power at the electrical outlet being used. Dead outlets and loose power cord connections are the most common causes of this problem. Make sure none of the stop buttons are pushed in. Remember that the feed tray and safety shield must be in place to enable power.

PROBLEM: Wavy or rippled sections in the laminate, especially toward the center of the web.

SOLUTION: These "heat wrinkles" are caused by excess temperature and/or speed for the film being used. Slow down the motor and/or use a lower appropriate temperature for that particular film.

PROBLEM: General haziness or cloudiness in the film after lamination.

SOLUTION: Increase the temperature. That cloudiness is a symptom of incomplete adhesion. On a variable speed machine loaded with thicker film, it may be that the film is being run too fast and is not getting enough time on the heat shoes.

FOR PROBLEMS NOT LISTED HERE, CONTACT YOUR LEDCO DEALER. IF THE DEALER DOESN'T KNOW THE ANSWER, PLEASE ASK THE DEALER TO CONTACT LEDCO AND GET BACK TO YOU. YOU ARE ALSO WELCOME TO CONTACT US DIRECTLY WITH ANY PROBLEM AT 716-367-2392. BECAUSE OF THE POTENTIAL VOLUME OF SUPPORT CALLS, WE DO ENCOURAGE THE USE OF THE DEALER NETWORK AS MUCH AS POSSIBLE.

6-1 INSTRUCTIONS FOR OPTIONS

ROLL FEED TRAY

When laminating a very long item such as electrostaci prints or banners, it is just about impossible to feed it in perfectly straight by hand. With the roll feed tray, laminating the longest item becomes relatively easy. The roll feed tray is especially helpful for the owners of poster printers, plotters, banner makers and other digital output devices.

To laminate with the roll feed tray:

1. Roll up the item on an empty laminating film roll core making sure it's not telescoped. This insures it is rolled up perfectly straight.
2. Place the core on the roll feed tray mandrel. It doesn't matter if the image is face up or not, since both sides of the item will get the same lamination. Adjust for a moderate amount of unwind tension with the tension knob. Make sure that as the item unwinds, the direction of unwind allows the gripper on the mandrel to dig into the core and not slip on the core.
3. Feed the leading edge of the item under the feed assembly idler bar into the nip rollers just as if you were feeding an individual sheet. If you have enough blank paper ahead of the image portion of the item, cut the leading edge to a blunt point. This makes it easier to feed the item in without wrinkling.

   An optional technique is to feed a sheet of scrap paper into the nip as a leader. Stop the leader when there is about two or three inches remaining outside the safety shield. Place the banner edge on the edge of the leader and tape it securely. Then start to laminate.

7-1 MAINTENANCE

There are no user-serviceable parts inside the machine. Please refer internal maintenance to qualified personnel.

Warning: Always use extreme caution when performing maintenance on your machine.

Always make sure the machine is unplugged and that there is NO power to the machine when working on any internal machine parts. Failure to do so exposes operator to danger of electrical shock and hazard of moving gears and rollers.

Use extreme caution to avoid Hot Surfaces which may remain hot for a period of time even after the heat has been turned off.

Use extreme caution to avoid pinch points at the nip of rubber rollers. Never have rubber rollers turning while performing maintenance to your machine.

Never wear loose clothing, ties or jewelry (which may become entangled in gears or rubber rollers) while operating or maintaining your machine.

Mise en garde: La prudence est de mise lorsque l'on effectue l'entretien de cette machine.

S'assurer que le cordon d'alimentation est débranché et que la machine est mise hors tension avant de toucher à des pièces internes.

Prendre garde aux surfaces chaudes. Ces surfaces demeurent chaudes longemps après que le courant a été coupé.

Tenir les doigts et les objets loin des rouleaux de caoutchouc. Ne jamais faire tourner les rouleaux pendant l'entretien de la machine.

Ne jamais porter de vêtements amples, de cravate ou de bijoux, etc. (ces articles peuvent être happés par les engrenages ou les rouleaux de caoutchouc).

Advertencia: Sea extremadamente cuidadoso siempre que realice tareas de mantenimiento en su máquina. (Coloque la sección de "Advertencia(s)" en tipo más grande).

Asegúrese siempre que la máquina está desenchufada y que no hay NINGUNA energía aplicada a la máquina, mientras esté trabajando con partes internas de la máquina.

Sea extremadamente cuidadoso en evitar superficies calientes que pueden permanecer calientes durante lcierto perfodo de dlempo, aún después de desconectar la fuente de calor.

Sea extremadamente cuidadoso en evitar puntos de constricción en las pasadas de los rodillos de goma. Nunca tenga los rodillos de goma en movimiento mientras realiza trabajos de mantenimiento en su máquina.

Nunca vista ropa suelta, corbatas o joyas (que puedan ser atrapados por engranajes o rodillos de goma) mientras opera o realiza tareas de mantenimiento en su máquina.

GENERAL CLEANING

If you have a dusty work environment, cleaning the laminator every week helps prevent dirt build up on the rubber rollers and heat shoes.

7-2 CLEANING THE HEAT SHOES

Adhesive from the edges of the film will often cling to the heat shoes.

Heat the machine to full laminating temperature to soften the adhesive. Put on oven mitts or heavy gloves to protect your hands. Using a clean, soft, dry cloth, gently rub the adhesive or other contaminants off the shoes. Never use any abrasive material or rub too hard on the shoes, because you may remove the teflon coating.

You may dampen your cleaning cloth with soapy water or a mild water-based cleaning solution, but make sure you carefully insulate your hands from possible steam burns if you do this. The steam formed when water hits the hot surface can penetrate both the cleaning cloth and your gloves.

7-3 CLEANING THE RUBBER ROLLERS

Both the laminating rollers and the pull rollers need occasional cleaning. Collectively these are referred to as the rubber rollers. The upper heat shoe on the Digital 38 swings away in seconds, making it far easier to clean the laminating rollers.

To clean the laminating rollers:

1. Remove the film from the laminator and allow the machine to heat up with the rollers open and turning slowing. By getting the laminating rollers hot, it will be easier to remove any adhesive built-up on the rollers.

2. Using a potholder or oven gloves, lift the top heat shoe up and back and then lower it onto the stop pins or the top of the pull roll cover (if the pins have been removed).

   Loosen the two bolts which hold up the bottom heat shoe and lower the bottom shoe. This exposes both rollers so they can be cleaned much more easily than if the heat shoes were in the way.

   WARNING: Never clean the rollers while they are turning. While turning, the rollers may catch your fingers and cause injury, or they may catch your cleaning materials and damage the laminator. Unplug the power cord while cleaning the rollers or performing other maintenance on the machine. Clean one section of the rollers, then plug the machine back in and use the reverse button to rotate the rollers for cleaning the next section. Set the speed very low to easily control the rotation. Keep hands and clothing clear of the rollers while they are turning. Unplug the machine again before you resume cleaning.

   MISE EN GARDE: Ne jamais nettoyer les rouleaux pendant qu'ils tournent afin d'éviter de se blesser et d'empêcher que le produit de nettoyage n'endommage l'intérieur de la machine. Débrancher le cordon d'alimentation avant le nettoyage ou tout autre travail d'entretien. Nettoyer d'abord la partie apparente des rouleaux, puis, à` l'aide de la commande de marche arriére, les faire tourner de façon à pouvoir en nettoyer toute la surface. Faire tourner les rouleaux le plus lentement possible pour qu'il soit facile de les immobiliser à l'endroit voulu, Ne pas approcher les mains ou les vêtements des rouleaux en rotation. Débrancher à nouveau la machine avant de poursuivre le nettoyage.

   AVERTENCIA: Nunca limpie los rodillos de goma mientras estén girando. Al estar girando, los rodillos pueden atrapar sus dedos y lastimarlos, o pueden atrapar sus artículos para limpieza y dañar el plastificador. Desenchufe el cordón eléctrico mientras está limpiando los rodillos, o realizando otras tareas de mantenimiento en la máquina. Limpie una sección de los rodillos, luego enchufe la máquina y use el botón de marcha atrás para girar los rodillos y limpiar la sección siquente. Establezca una velocidad muy baja, para controlar la rotación más fácilmente. Mantenga las manos y la ropa alejadas de los rodillos mientras están gurando. Desenchufe la máquina otra vez antes de continuar con la limpieza.

   Clean the rubber rollers with a mildly abrasive cleaning pad such as a white Scotch Brite (Trademark of 3M) pad which may be purchased in the household section of your grocery store (the green pads are too abrasive). Use mildly soapy water to clean the rollers. Rub firmly but do not scrub the rollers vigorously as this might harm the surface. Do not use sharp metal objects or steel wool as these might also damage the rollers.

   The pull rollers should also be cleaned in the same manner. Do not clean the rollers while they are turning. Be sure to reposition and secure the upper heat shoe before beginning to laminate.

7-4 LUBRICATION

Drive Chain

Drive chain and sprockets on all models should receive a light coat of gear lube or heavy grease (preferably lithium grease) after each 1000 hours of operation.

8. PARTS LIST

ITEMS/COMPONENTS	DESCRIPTION
8042200	Digital 105 Machine
H380 004.4	Friction Washer, 1/8 x 1/2 ID x 2-3/4 OD M
H380 040.4	Rubber Roll C
H685 015.4A	Sup Roll Dog 3" C
H850 133.4	Cam C
LAB10	Warning Label, Safety Shield, 3" x 3"
LAB20	Caution Label, Loose Clothing
LAB30	Always Read Instruction Manual Label
LAB40	Always Disconnect Power Label
LAB50	Danger Electrical Hazard Label
LAB65	LC 38 Heat Label
LAB 66	LC 38 Drive Label
LC25 005.4	Zippy Hand Cutter #K353 By Alvin
LC38 002.4	Supply Roll Tube
LC38 007.4	Supply Roll Pressure Plate
LC38 011.4	Supply Roll Shaft
LC38 012.4	Anti-Wrap & Pull Roll Safety Shield
LC38 013.4	Bottom Pull Roll Anti-Wrap Shield
LC38 023.4	Supply Roll Hex Adapter
LC38 024.4	Outer Supple Roll Hex Adapter
LC38 031.4	Top Inner Rubber Roll Spacer
LC38 032.4	Top Left Outer Rubber Roll Spacer
LC38 033.4	Bottom Rubber Roll Spacer
LC38 048.4	Feet Mounting Shaft Extension
LC38 052.4	Idler Tube for Digital 105
LC38 054.4	Top Rubber Roll Idler Sprocket Bracket
LC38 055.4	Bottom Rubber Roll Chain Adjuster
LC38 056.4	Top Front Rubber Roll Pressure Plate
LC38 057.4	Bottom Rubber Roll Pressure Plate
LC38 058.4	Top Rear Rubber Roll Pressure Plate
LC38 059.4	Pressure Plate Shaft
LC38 060.4	Heat Shoe
LC38 064.4	Heat Shoe Spacer
LC38 065.4	Heat Shoe Bracket for Digital 105
LC38 067.4	Bottom Heat Shoe Fastener
LC38 068.4	Top Heat Shoe Fastener
LC38 074.4	Safety Shield for Digital 105
LC38 090.4L	Left Side Panel for Digital 105
LC38 090.4R	Right Side Panel for Digital 105
LC38 092.4	Cooling Plate
LC38 093.4	Motor Cover
LC38 094.4BL	Side Housing Base Section Left
LC38 094.4BR	Side Housing Base Section Right
LC38 094.4L	Left Side Housing
LC38 094.4R	Right Side Housing
LC38 095.4L	Left Housing Panel
LC38 095.4R	Right Housing Panel
LC38 096.4A	Feed Table
LC38 097.4L	Feed Table Guide Left
LC38 097.4R	Feed Table Guide Right
LC38 098.4	Feed Table Guide Block
LC38 099.4	Feed Table Knob Nut
LC38 100.4	Anti-Curl Strip
LC38 110.4	Spreader Bar
LC38 130.4	Cam Shaft
LC38 131.4	Cam Spacer
LC38 170.4	Safety Switch Bracket
LC38 190.4	Safety Shield Bracker L/R
LC38 200.4	Standoff, #EN194-18-18, 1/4" HEX/1"
LC38 343.3	Wiring Harness for LC38
LC38 344.4	#TFE7TW-0000TEFLON Tubing for HT Sensor
PRB056C	3" SPLY Roll End BRG .127
PRB059	NYLINER 8L2FF
PRB064	Snap BSHG LG .875 HOLE/.125T/.625ID
PRB086A	Delrin Idler Bearing (Replces PRB086)
PRB087	1L008 Bearing
PRB089	FB1418-10/BRG W/LBR
PRB091	T&B #3304 STRN RELF BSHG
PRB094	SF-1620-12 Oilite Flange Bearing
PRC081	Brady Press Clip MCNY 125ONA/OR 1A872
PRC086	#35 Chain Roll
PRC087	#35 Chain Conn Link
PRC100	8GA 3-Cond Blk So Cord
PRC109	7/8" Shaft Collr 2x738
PRC212	Trakstat Control T1DA0318 Kit LC LAM
PRF121	Fan Guard 4C742 Large
PRF126	Fuse Holdr 354801-GY
PRF130	4C829 Fan for HD 60"
PRF131	Littlefuse 12Amp #313012
PFR132	5 Amp Fuse =312005, Littlefuse
PRH140	#29403 Black Cam Shaft Handle HD
PRH170	Cartridge Heater, .625DIAM.X38", 220V 2300W
PRK172	DK 90 HD SUP Roll Knob
PRL195	Red Light 220V 5/16 36HEN2111
PRM200	Bodine Motor #4185, 1/4 HP DC Gearmotor
PRM218A	Minarik Speed Control 115-240VAC
PRR225	4042-0070 Risers
PRR231	HD Relay, Omron 8D175, W/BRKT 8D671
PRR236	30A Plug Hubble 2621
PRS054A	#E22LLB2 Cutler Hammer Actuator for Emergency
PRS055A	Contact Block E22B1 Cutler Hammer
PRS057	30A Breaker LC38, 3XC73
PRS058	Carling Switch, #TIIM-5B-1S-BL-FW, FOR/REV
PRS059	Carling Switch, #T1GK51S-BL-FW, 15A
PRS224	HD25 Press Spring
PRS234	Supply Roll Tension Spring #9-1604-11
PRS313	6X289 Lever Type Microswitch D&38
PRS320	35B12 Idler Sprocket for Digital 105
PRS321	35B25 Lam. Roll Sprocket for Digital 105
PRS322	35B24 Pull Roll Sprocket for Digital 105
PRS323	35B19 Drive Motor Sprocket, Digital 105
PRT301.5	MIV Term Blk 110V Subassy
PRT309	Kulka Termnl Jumper 601J
.2141830	1/2 X 7/8 Shoulder Bolt

9-1 USER NOTES