Ledco Heavy Duty 38" Laminator with Stand

Instruction Manual

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READ ALL PRECAUTIONS & INSTRUCTIONS
CAREFULLY BEFORE OPERATING LAMINATOR

Setup
Instruction
Operation
Lamination
Maintenance

INDUSTRIAL HEAVY DUTY 38/50/60

OPERATIONAL MANUAL

OCTOBER 1996

IMPORTANT: 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.

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 crayon drawings may run together or be smeared, especially if the crayon layer is heavy. Light crayon drawings may not be affected, but test an expendable sample of any item that may not laminate well.

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 gul 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 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 malitriser 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 tipico, ya que es activado por el calor y se tornará negro. Retire también cualquier sujeta-papeles o grapa, puesto que pueden danar 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 ningún 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, las coleccionistas valoran este tipo de artículo en su estado original.

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1-1 INTRODUCTION

The HD-38/50/60 is designed to provide quality lamination of a wide range of papers and materials up to 1/2 inch thick using film up to ten mils thick. Common applications include but are not limited to maps, digital imaging, packaging, posters, instructional aids, signs, presentation materials, photographs, copies (B&W or color), prints, flyers, promotional sheets and many other items. Options include a release liner take-up, extra slitter heads, a footage counter, roll feed, and casters.

To assure 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.

The International "HOT" warning symbol will be placed on the appropriate areas of each laminator.

Le symbole international de mise en garde "CHALEUR EXTREME" sera apposé aux endroits appropries des machines a plastifier thermiques.

El simbolo internacional de advertencia "CALIENTE" serà fijado en los lugares apropriados, en el plastificador.

We take this opportunity to thank you for selecting the HD 38/50/60 laminator and to assure you of our commitment to your satisfaction with our products.

As you unpack your new laminator, please complete the following information. Always have this information ready when calling.

Dealer Where Purchased_____

Installation Date_____ Serial # _____ (located at the back of the laminator, next to the power connector)

WARNING: High temperatures are present and care should be exercised in operating the laminator.

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

ADVERTENCIA: El plastificador produce temperaturas muy altas; tenga cuidado al utilizaro.

WARNING: The laminator should not be operated without the plexiglass safety shield.

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

ADVERTENCIA: No utilice el plastificado sin tener el protector de plexiglass en su lugar.

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

Fax 716-367-2978
Phone 716-367-2392

1-2 FEATURES & BENEFITS

Your new machine has many standard features and accompanying benefits that set it apart from other laminators:

* **Pneumatic power** opens or closes the laminating and pull rollers and gives you precise and independent control of roll pressure. A compressor is built in so that shop air is not required.

* **Removable heat shoes** are Teflon coated to reduce film abrasion. They are easily unplugged and removed to clean or replace the laminating rollers.

* **Built-in retractable slitters** save an enormous amount of cutting time by trimming away side scrap during the lamination process. The two heads can be adjusted independently with great precision.

* **Dual tension knobs** (clutches) for each supply roll mandrel are easy to use and provide as little or as much tension as needed to keep work flat and wrinkle-free.

* **Forced air cooling** is essential when running thicker films, because the lamination needs to be cooled to get good results. These machines have a row of fans mounted above and below the film as it leaves the laminating rollers.

* **Easy access controls** are conveniently located and grouped for effective operation.

* **The safety guard** is built into the feed tray, and the machine will not run without the feed tray in place. Stop buttons on both sides of the machine front and back contribute to a complete safety package. The back rollers are also guarded.

* **Both upper and lower rollers are driven** to minimize the wrinkling or curling that can occur when only one roller is driven.

* **A removable bottom idler bar** makes it much easier to thread film.

* **Standard precision feed tray** has both left and right side guides and is adjustable from a few inches to the width of the machine.

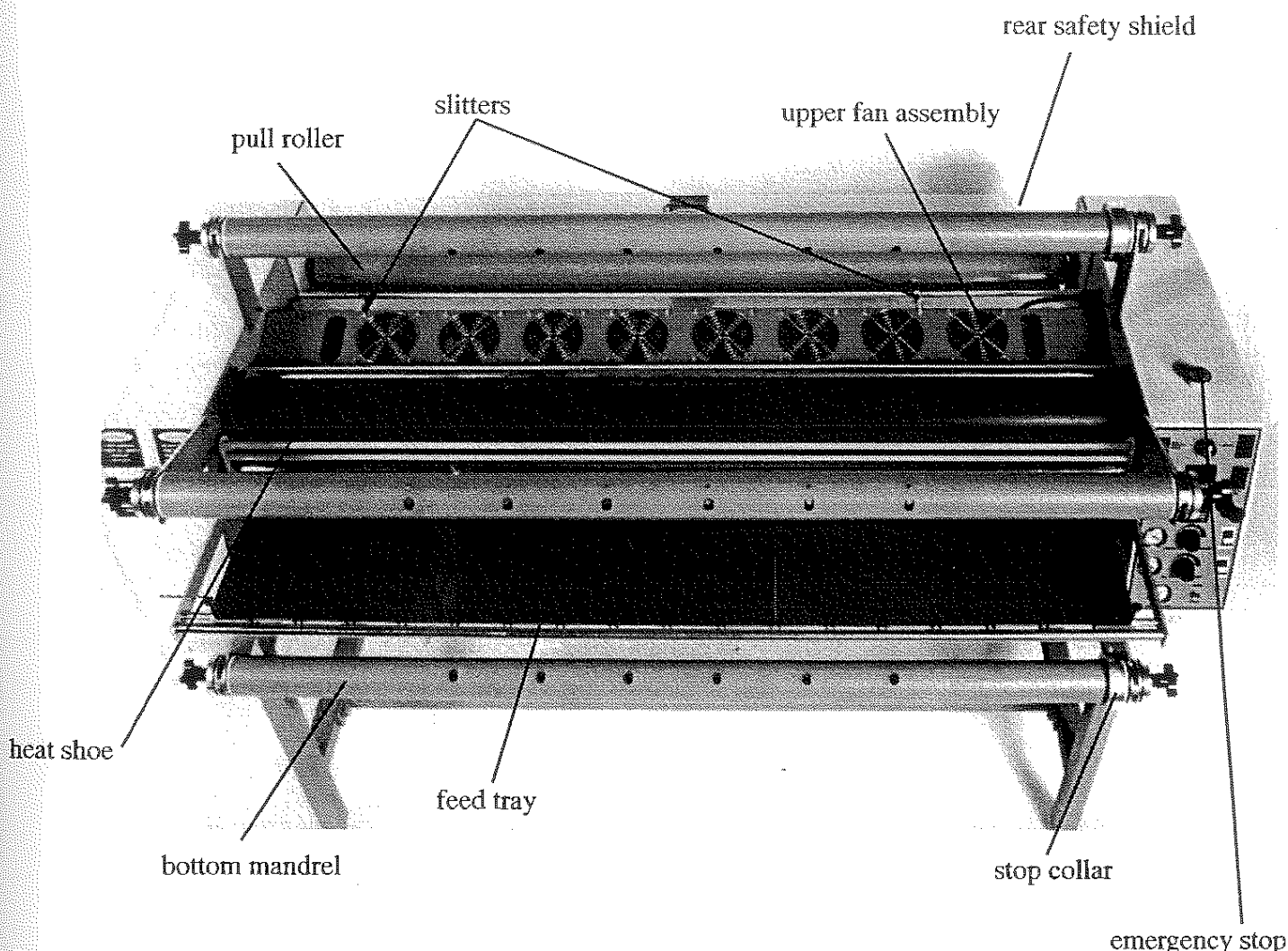
* **A rugged steel stand** is included. Domestic orders are shipped on the assembled stand, while overseas orders are shipped with the stand disassembled, unless otherwise specified.

* **All four rubber rolls are interchangeable**. If a laminating roller should become damaged it is possible to replace it with a pull roller.

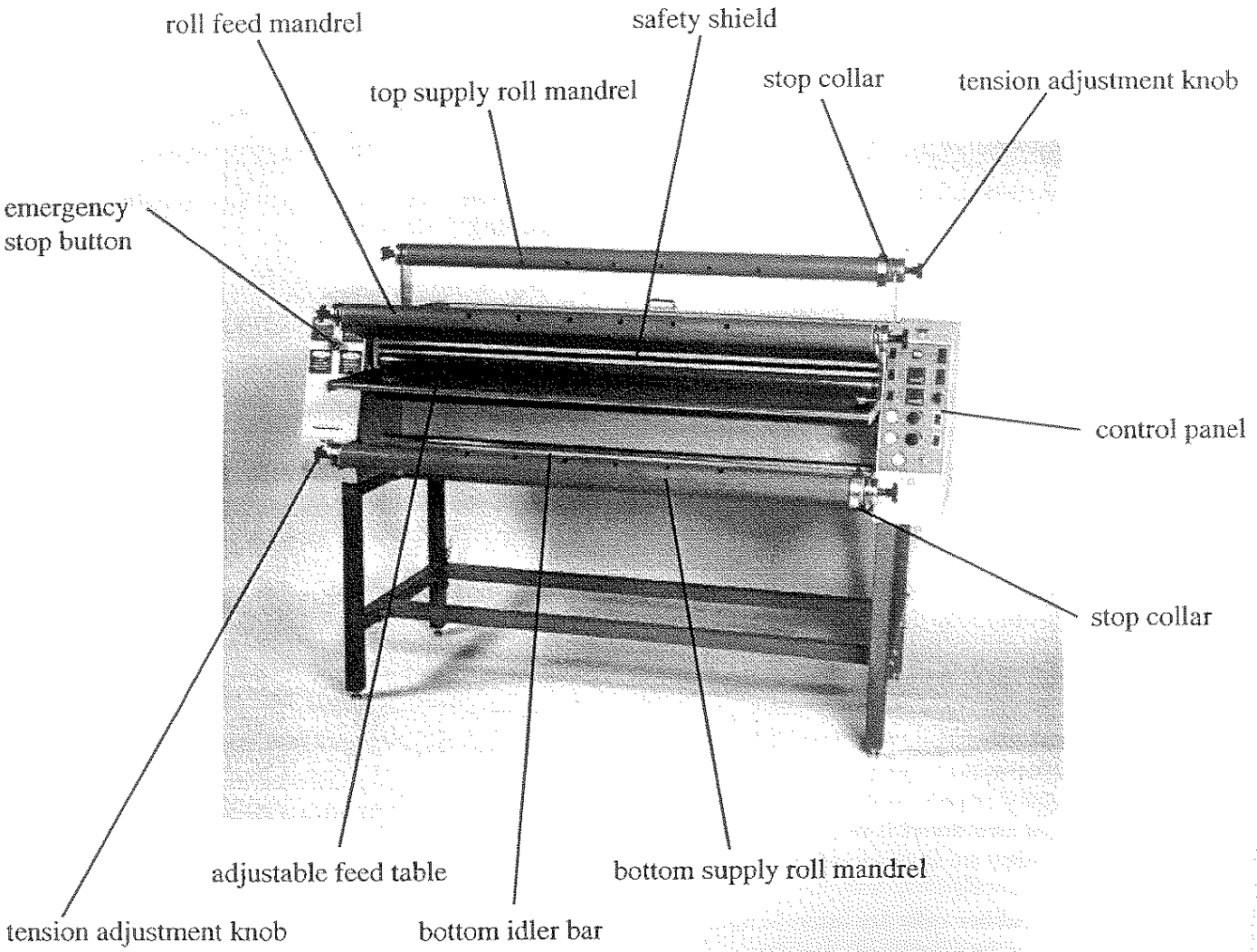
* **Variable speed** control permits production speed ranges from zero to 35 feet per minute.

* **Made in the USA** means better quality , service and parts availability.

TOP VIEW



FRONT VIEW



** removable bottom idler bar is not shown
** roll feed mandrel is standard on HD60 (optional on HD 38/50)

1-3 OPTIONS

* **Roll feed option** allows you to laminate material from a 3" core supply roll mounted just above the feed tray. Designed for digital imaging and industrial applications (standard on HD-60, optional on HD-38/50).

* **Release liner take up assembly** is available for cold laminating applications.

* **Footage counter** enables accurate measurement of film use.

* **Additional slitters** permit multiple-up cutting.

1-4 SPECIFICATIONS

	38	50	60
Max laminating width	38"	50"	60"
Speed	0-35FPM	same	same
Laminating roller diameter	3"	same	same
Supply roll core size	3"	same	same
Recommended film	up to 10 mil	same	same
Max laminating thickness	1/2"	same	same
Max film roll diameter	16"	same	same
Dimensions	60L58H40D	70L58H40D	80L58H40D
Shipping Dimensions	69L66H43D	81L45H50D	92L66H45D
Weight/shipping weight	363/900 lbs	675/1050 lbs	865/1200 lbs
Electrical (single-phase)	220V 8800 watts 40 amps	same 11000 50 amps	same same same
Heater wattage	7200 watts	8400 watts	same
Motor	1/2 HP DC	same	same

**specifications are subject to change without notice

1-5 PRINCIPLES OF OPERATION

The Industrial Series laminators operate by pulling film with a thermally-activated adhesive over a heat source and into a set of laminating rollers. Film from the supply rolls 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 to the item being laminated. The adhesive is pressed into the ink and fibers on the surface of the paper.

The strength of the lamination bond can be checked by cutting 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. Ink and/or paper fibers coming up with the layer of film indicates a good adhesive bond.

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 5-6.

Please note that when doing an X-test on glossy (coated) paper, a good X-test will pull up ink only. The film should not come up easily. When laminating material that is not glossy (uncoated), 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 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 "2-3" film consists of two mils of polyester and three mils of polyethylene. The first number refers to the base layer. The second number refers to the adhesive layer. A mil is 1/1000 of a inch.

Since polyester is the more costly of the two types of plastic generally used in laminating film, a "3-2" film will cost more than a "2-3" film. Both are 5-mil films, but the "3-2" version will seem a little thicker on a piece of laminated material because it will be slightly stiffer. Thermal laminating films are available in many different base/adhesive combinations. Five mil film, for example, can be found in 1-4, 2-3, 3-2 and 4-1 combinations.

In the US 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, also known as co-polymer films; these often have better clarity and are less likely to curl or ripple

-- matte films to eliminate glare or to accept printing or writing; many suppliers offer films with both glossy and matte finishes

-- film with UV inhibitors to protect colors in the laminated material from fading in sunlight

-- 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 mounted without fasteners or tape

-- "liner films" with a protective liner on 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

-- iridescent clear films for special visual effects

-- 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.

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 grippes engage the cardboard core.

Because it does not hold heat well, 1.5 mil film can be the most difficult gauge of film to use. A standard 1.5 mil film will run at about 310 degrees F, while a 3 mil film with the same adhesive type will run at 280 degrees F. Even when applied at 310 degrees F, the 1.5 mil film will not adhere as consistently as the 3 mil film applied at 280 degrees F , or a 5 mil applied at 250 degrees F. For many applications, 5 mil film does a much better job of protecting and enhancing items.

Ten mil film is suggested for those applications that need the most protection and rigidity. Seven mil films are also available.

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 quaranteed 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 alternations 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 not 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 during a service call. Notice of the defect should be submitted in writing or by phone to Ledco before any steps are taken to repair or return the machine. Phone: 716-367-2392 Fax: 716-367-2978

If the machine is returned, the following should accompany it.
* 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. does offer 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 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.
Phone: 716-367-2392 Fax: 716-367-2978

2-1 UNPACKING AND INVENTORY

The laminator arrives fully assembled, except that some parts such as feed trays and fan assemblies may be packed off the machine to avoid shipping damage. 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, or 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 Ledco **IMMEDIATELY**.
2. Hold damaged goods with container and packing for inspection by the examining agent. Ledco will arrange the inspection.

******DO NOT RETURN ANY GOODS TO LEDCO PRIOR TO INSPECTION AND AUTHORIZATION BY LEDCO.******

3. Submit a copy of the inspector's report to Ledco. Ledco will file the claim with the carrier. Ledco will replace your machinery if necessary. You will be credited for the damaged machinery when the claim is processed.

SHORTAGE

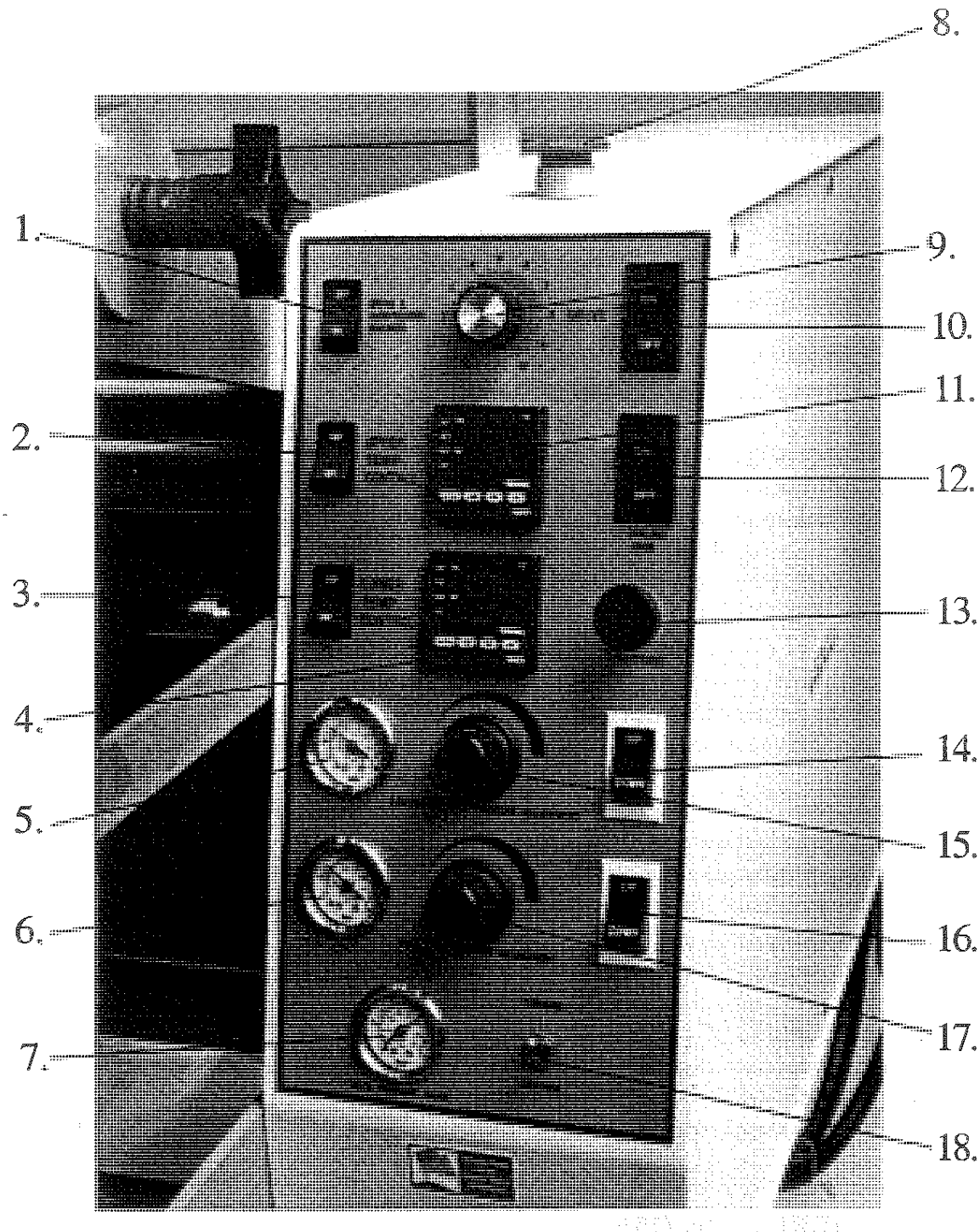
1. Check the packing list notations. The apparent shortage may have been marked as an intentional short-shipped (back-ordered) item.
2. Reinspect the container and packing material, particularly for smaller items.
3. Make certain that the item was not removed by unauthorized personnel prior to complete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



3-2 CONTROL PANEL DIAGRAM HD 38/50/60

1. Drive & compressor breaker
2. Temperature control breaker for top heat shoe
3. Temperature control breaker for bottom heat shoe
4. Temperature control for bottom heat shoe
5. Pressure gauge for laminating rollers
6. Pressure gauge for pull rollers
7. Main pressure gauge
8. Safety stop switch
9. Variable speed control
10. Drive switch on/off
11. Temperature control for top heat shoe
12. Cooling fan on/off switch
13. Slitter bar actuator: pull to engage/ push to disengage
14. Open/close control for laminating rollers
15. Laminating roller pressure adjustment
16. Open/close control for pull rollers
17. Pull roller pressure adjustment
18. Directional switch (forward/neutral/reverse)

4. **DRIVE CONTROLS:** The drive switch (#10) and variable speed control (#9) are on the upper right front panel.

* This machine is equipped with a directional switch:
  Forward, neutral, and reverse (lower right side).
  Push the switch up to forward position to laminate
  Push the switch down to reverse machine.
* Set the speed control (#9) at the desired speed.
* To actuate the silicone rubber laminating and pull rollers, push the drive switch to on.
* To stop the laminator, push the drive switch to the off position.

NOTE: The manufacturer recommends that the operator use the drive switch to turn the machine off rather than the neutral position of the directional switch, failure to do so will cause premature failure of the drive control and/or the motor.

5. **SAFETY CONTROLS:**

**** There are four EMERGENCY STOP BUTTONS (#8), two in the front and two in the back. When any EMERGENCY STOP BUTTONS is pushed in, the rolls automatically open and the drive automatically stops.**

**** The MAIN BREAKER (lower left back panel) will turn off the whole machine when switched to the off position.**

CAUTION!! MACHINE WILL STILL REMAIN HOT FOR A PERIOD OF TIME!!***

3-3 CONTROL PANEL

1. HEAT CONTROLS: Heat controls are located on the right front panel and consist of breaker switches and temperature controls for both top and bottom heat shoes.

* To turn heat on, push switch marked upper or lower temperature control .
* Position the heat setting controls (4&11) at the desired temperature.
  PV (process value): the actual temperature of the heat shoe.
  SP (set point): the temperature set by the operator.
  OUT (green light): will light up while the shoe is heating.
* A fluctuation of plus or minus ten degrees can be considered normal.

2. PRESSURE CONTROLS: Pressure controls are located on the right front panel and consist of a roller pressure gauge, roller pressure regulator and roller up-down switch.

* Roller pressure is factory set at thirty pounds.
* Set the gauge (5&6) at the desired pressure by pulling out knob (15&17) turning the control clockwise to increase pressure and counter clockwise to decrease pressure.
* To close both laminating and pull rollers, push control (14&16) to down position. To open rollers, push control to up position.
* When not operating the laminator, the rollers should be in the up position.
* As long as the laminator is plugged in and the breaker switcher are in the on position, air pressure in the cylinders will be maintained. To turn air compressor off, turn the breaker switches to the off position.

NOTE: A tank pressure gauge is located on the lower left of the control panel, and is labeled "MAIN PRESSURE GAUGE" (#7). The reading on this gauge is not related to the setting on the roller pressure controls. The drain valve for the compressor air tanks must be drained every week. Failure to do this can cause premature failure of the compressor.

3. COOLING CONTROLS: It is frequently desirable to cool thinner gauge laminations and almost always necessary to cool the heavier laminations. Your laminator is equipped with a series of fans to provide the cooling required. The fan switch is located on the right front panel (#12).

* To activate the fans, push switch to the on position.
* To turn the fans off, push switch to the off position.

NOTE: The upper fan assembly blows 400 cubic feet of air per fan per minute. The bottom fans are so arranged as to draw from the floor area to insure circulation of the coolest air available, and are rated at 560 CFM per fan:

HD-38.....2 fans on bottom 3 on top
HD-50.....3 fans on bottom 5 on top
HD-60.....4 fans on bottom 8 on top

4-1 SAFETY PRECAUTION

DO NOT OPERATE THIS MACHINE UNTIL YOU HAVE READ AND FULLY UNDERSTOOD THE FOLLOWING SAFETY PRECAUTIONS.

1. Never operate this machine without reminding yourself that a big laminator is a powerful and potentially dangerous tool. If misused, used carelessly, or used without observing the rules of safe operation, very serious injury can result.

2. Never operate this machine without all guards, housings, safety shields, stop switches or other safety devices in place and fully operational.

3. Never operate this machine unless you have been fully trained and have received and understood all operating instructions. Make sure you know how the machine works and how it is controlled.

4. Never operate this machine if it is not working properly or if you notice any abnormality in its performance.

5. Never tamper with, rewire, or bypass any control or safety device on this machine.

6. Always keep all parts of your body clear of the laminating rollers, pull rollers, and heated surfaces of the laminator when the power is on.

7. Remember that even after the machine has been turned off for some time, the laminator's heated parts, and adjoining parts, can remain hot enough to burn you.

8. Never attempt to clean the heated areas, laminating rollers, or pull rollers while the power is on.

9. Never remove the machine housing or attempt any kind of maintenance without disconnecting power to the unit.

10. Always be sure all persons are clear of the machine before advancing or reversing the pressure rollers, especially when multiple operators or observers are present.

11. Never wear loose clothing, ties, jewelry or any item which could be caught in the rollers or machinery when operating the machine. Operators with long hair must put their hair up before running the machine.

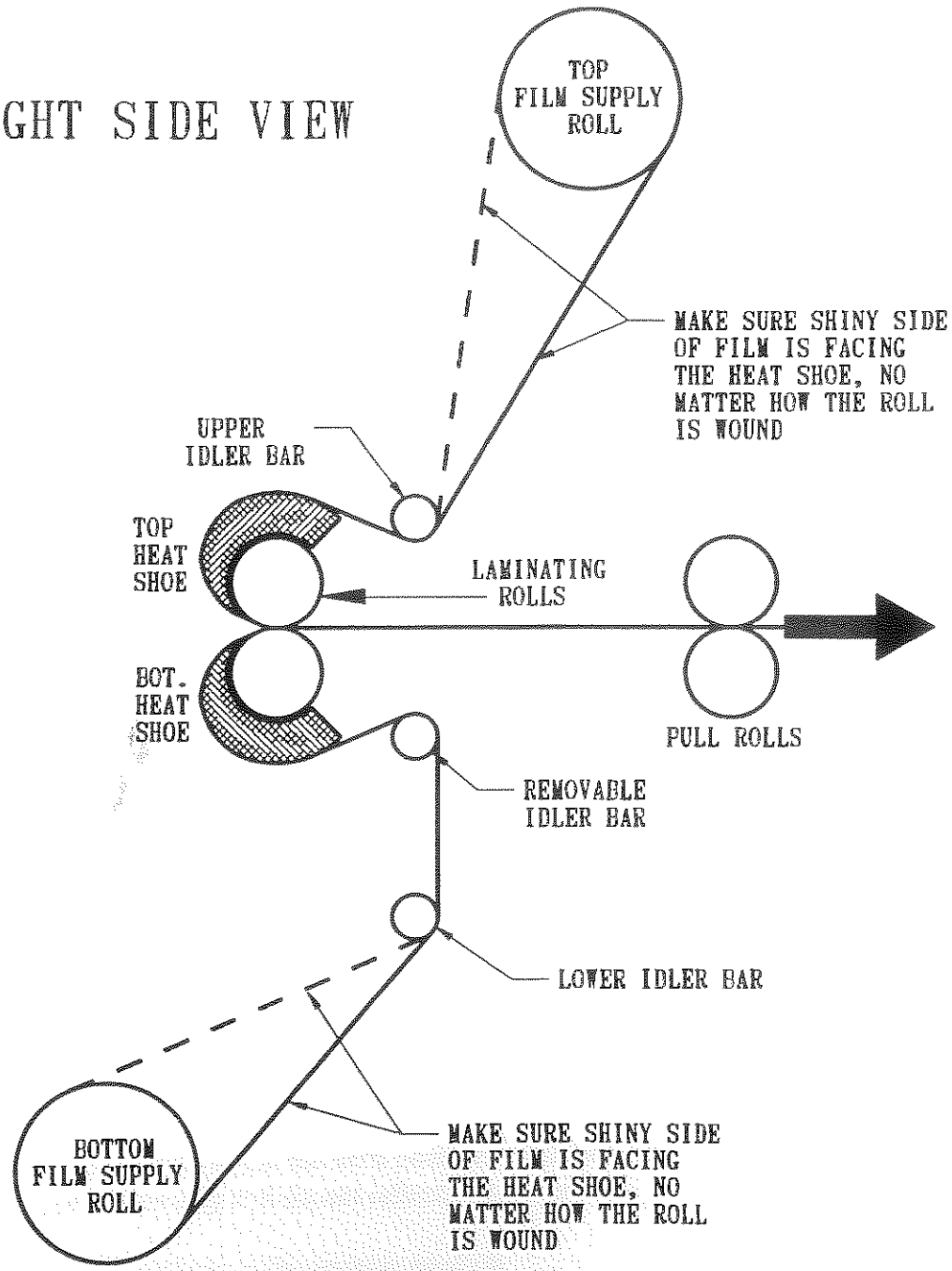
12. Always keep your hands clear of any slitter mechanism or blade except when the power is off and you intend to adjust the mechanism or change a blade.

NOTICE TO EMPLOYER: A copy of these safety precautions must be given to all operators, set-up personnel, maintenance people, and supervisors of this machine. A copy should also be hung on the machine readily accessible and visible to the operator. Additional copies are available upon request.

IMPORTANT: Where a language barrier or insufficient schooling would prevent a person from reading and understanding these safety precautions, you should either translate this information or have it read or interpreted to the person, and get assurance that it is understood.

FILM THREADING DIAGRAM
HD-(38,50,60)"

RIGHT SIDE VIEW



5-2 THREADING THE LAMINATOR
CHARGEMENT DE LA MACHINE
CARGAMENTO DE LA MAQUINA

1. For safety, we suggest threading the laminator while it is cold. Remove the supply roll mandrels and feed tray. The supply roll mandrels are now ready to accept rolls of laminating film, which is usually wound with the adhesive side "out" on rolls of film with a core diameter of three inches.

Pour plus de sécurité, nous recommandons de charger la machine lorsqu'elle est froide. Enlever les mandrins et le plateau d'alimentation, puls insérer la bobine de film de plastique sur le mandrin. Les films de 3 pouces de diamètre sont généralement enroulés le coté adhésif à l'extérieur.

Para mayor seguridad, se recomienda cargar el plastificador cuando está frio. Retire los rollos de abastecimiento y la bandeja de alimentación, y ponga el rollo de pelicula de plástico, que por lo general esta enrollada con la parte adhesiva por fuera si se trata de una pelicula de pulgadas de diámetro.

2. Position the rubber rollers in the open position.

   ☞**NOTE:** The operator may have to recharge the air system by turning on the drive/compressor breaker and the main breaker.

3. After the air system is charged, make sure all of the breaker switches (1,2 & 3) and the main breaker (in back) are all off.

4. Turn slitter knife holders up, by pushing in the slitter activator #13.

   ☞**NOTE:** The slitting knives are **EXTREMELY SHARP**, and it is recommended that, while threading plastic through the pull rollers, or while working in the slitter assembly area, that the operator move the knife holders to the right and/or left side of the machine to avoid possible contact with the knives.
   The slitting knives are located in front of the pull rollers. These can be adjusted by loosening the large knurled knob on the rear of each blade holder and moving to the side.

5. Remove the feed table assembly by lifting it off the support bars.

   ☞**NOTE:** The guard is designed to prevent accidental operator contact with the heated shoes or revolving rubber laminating rollers. If it is necessary to load the machine when the shoes are hot,
   EXERCISE EXTREME CAUTION TO AVOID THE HEAT SHOES, SEVERE BURNS ARE POSSIBLE!!

6. Remove the top and bottom supply mandrels by lifting from the support slots.

7. Position the roll stop collars. It is necessary to evenly align both top and bottom plastic rolls to insure quality laminations and prevent "fouling" of the laminating and pull rollers with the polyethylene adhesive. If the webs are not properly aligned, the exposed edge of the adhesive will melt on the rollers, necessitating frequent cleaning. To insure proper alignment, your laminator is equipped with roll stop collars. Position the collar on the top mandrel to accommodate the width of plastic to be used. Lock in place by tightening screw.

8. Place the film on the supply roll mandrel as shown in the diagram on page 21. Place the loaded supply roll mandrel on the machine as shown in the picture. The polyester side (usually the shiny side) of the film must go against the heat shoe. The polyethylene side (the dull side) of the film must face the operator.

Remember that the shiny side (polyester side) of the film should always be against the heat shoes.

9. Slide a roll of film onto the top supply roll mandrel. Center the roll. Put the loaded mandrel on the top brackets. Be sure both ends of the mandrel are fully seated in the brackets. Make sure the dull side of the film is facing up and the shiny side is facing the heat shoes during the threading.

10. Refer to the appropriate threading diagram on page 21. With the top roll of film centered on the mandrel and the shiny side facing down, thread the web of plastic under the top idler and then feed the web of plastic by hand over the top heat shoe and through the laminating and pull rolls. **MAKE SURE THE SHINY, OR POLYESTER SIDE, OF THE PLASTIC IS NEXT TO THE HEAT SHOE.**

11. Measure distance from inside the top supply mandrel to the edge of plastic roll.
    - loosen bottom roll stop collar.
    - using measurement, position the bottom collar, lock in place and butt plastic against it.

12. Thread bottom roll of plastic in the same manner as the top roll of plastic was threaded.

    ☞**NOTE:** There are two idlers on the bottom. The one closest to the heat shoe must be removed to ease the threading process, but must be replaced prior to operation.

    - under the idler
    - over the bottom heat shoe
    - thread through the rollers
    - reinstall the removable idler

13. With both rolls threaded and installed in their respective brackets, unwind enough film from the top roll to reach the bottom of the bottom heat shoe. Leave the top web in place. Next, unwind enough film from the bottom roll to reach the top of the top heat shoe. Use a bit of tape to hold the bottom web in place, overlapping the top web. If the machine is being threaded hot, no tape is needed. The hot adhesive of the top web will hold the bottom web in place.

14. Put the feed tray/safety shield on the machine. Put the drive in forward and turn on the drive power. Put the speed control on a low speed. Close both sets of rollers. Turn both supply rolls to produce about two inches of slack in both webs. Use a piece of heavy paper or cardboard to push the overlapped webs of film into the laminating rollers. Once the web begins to go through the machine, make sure the leading edge goes over the slitter mounting bar and into the pull rollers. Turn the drive switch off, if necessary. Keep hands clear of the slitter blades and the pull rollers.

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 á plastifier est concue pour que l'utilisateur se place directement en face du plateau d'alimentation et des commandes, non de biais ou sur un coté de la machine. De plus, pour assurer la sécurité de l'utilisateur, l'écran protecteur doit etre relevé de facon à recouvrir le sabot 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 desenado para funcionar con el operador haciendo se directamente frente al panel de mando y la bandeja de alimentación, y no a un ángulo, o desde un costado de la máquina. Para mayor sequridad 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.

15. Once the web has cleared the back of the machine, turn off the drive. If the machine was threaded cold, turn on the heaters now to proceed with setup. Adjust the set temperature and allow the machine to warm up.

5-3 SUPPLY ROLL TENSION AND OTHER ADJUSTMENTS

1. Now adjust the supply roll tension. First loosen all four supply roll tension knobs, then tighten them (turn clockwise) until they just begin to press on the springs. Another 1/4 to 2 turns (one turn equals 360 degree rotation of the knob) of tension on all four knobs is usually sufficient for 1.5 or 3 mil film. More tension is required for 3mil. or heavier films. More tension is also required as the width of the film increases.

The best way to do the fine adjustment or readjustment of supply roll tension is to observe the film going over the shoes while the drive is on. Turn on the drive. Both laminating and pull rollers must be closed and locked. Adjust the speed to match the expected lamination work.

If the supply roll tension is too loose, some wrinkles can be observed at the leading edges of both shoes. Lines of air may also be observed between the film and the shoes at the leading edges. The visual effect caused by air between the film and the shoes is known as "waterfalling."

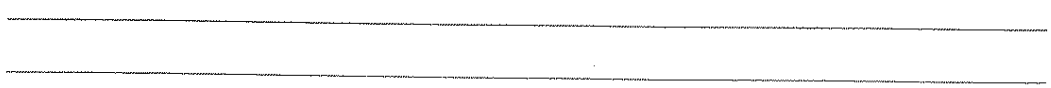
If some wrinkles and/or a waterfalling effect extend about 1/3 of the way across both shoes from the leading edges toward the trailing edges, the supply roll tension is close to "perfect' for most jobs. (The leading edge of the top shoe is the top edge. The leading edge of the bottom shoe is the bottom edge. The trailing edges of both shoes lead into the "nip," where the two laminating rollers come together.)

If the film is going over both shoes without any wrinkling or waterfalling, supply roll tension is too high. If the wrinkling is extending into the nip, supply roll tension is too low. Supply roll tension is not an absolute adjustment. The acceptable range of tension settings is fairly wide. If little wrinkling or waterfalling is visible on the leading edges, tension could be reduced a little. If the wrinkling or waterfalling is extending to the trailing edges, tension could be increased a little. Make sure that top and bottom rollers have about the same tension.

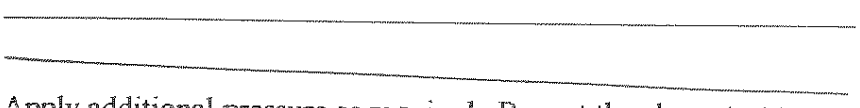
2. What we call the "drape test" is an effective way to evaluate supply roll tension simply by examining the laminate. Run about two feet of film out the back of the machine. Cut the web of film at the exit point. Hold the two corners of the film on the side where it was cut away from the laminator, with the bottom side facing you. Let it drape straight down. If the film hangs perfectly straight and flat, or if there's a small amount of curl in one of the bottom corners, the supply roll tension is set about right.

If the bottom edge is curling toward you, there is too much tension on the bottom roller. If the bottom edge is curling away from you, there is too much tension on the top roller. If the two bottom corners are curling in opposite directions, supply roll tension is too high on both top and bottom. Both novice and experienced operators of laminators tend to use too much supply roll tension. The best amount of supply roll tension is the least amount that will do the job.

3. Stop the machine for approximately fifteen seconds to allow the laminating rollers to leave an indentation on the plastic web, known as a "dwell line". Allow this " dwell line" to pass through the pull rollers, so that it can be observed. The "dwell line" should be approximately 3/8" wide at each edge of the web of plastic and possibly a little narrower in the center. It should look similar to this:



If the laminating rollers are not balanced properly, the "dwell line" will look something like this:



Apply additional pressure as required. Repeat the above test to see if the rolls are balanced properly.

5-4 LAMINATING

1. Turn on the power and the heaters.

-- Set the temperature. The small green output light will come on while the machine is warming up, approximately twenty minutes.

-- When the two heat indicators are at the desired temperature the machine is ready to laminate.

-- Open both sets of rollers.

-- Put the drive direction switch in forward and turn on the drive. This allows the laminating rollers to turn and get evenly heated while the machine is warming up. Evenly heated rollers contribute to the quality of the lamination.

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 rethreading of the machine. When it is necessary to laminate at temperatures in excess of 310 degrees - such as for poster board - 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 GARGE: Ne jamais laisser la température dépasser 310F lorsque le film est chargéet que la machine n'est pas utilsée, 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 (160 C), par exemple poure plastificer des affiches, tirer un peu plus de film pour lui donner du mou de manière a ce qu'il ne soit pas tendu sur les sabots chauffants. On emplechera ainsi que le film fonde lorsqu'il n'advance pas.

ADVERTENCIA: No permite que la temperatura exceda los 310F (160 C) mientras el plástico está cargado y el plasatificador no está en uso. El plástico puede desintegrarse, lo que requeriria limpiar y recargar la máquina. Si es necesario laminar a temperaturas más elevadas que 310 F, como cuando se lamina cartón para carteleria, hale un exceso de pelicula del rollo de abastecimiento para proveer huelgo, evitando que la película quede muy agretada contra las zapatas calefactoras. Evitará asi que el plástico se derrita el periodo de tiempo en que la pelicula no está avanzando.

2. During warmup, the actual temperature will sometimes overshoot the set temperature by more than a few degrees. Then when lamination is begun, the actual temperature may initially drop below the set temperature. Unless these temperature swings are extreme there is no cause for concern.

The heat controllers each contain an intelligent processor which gauges the heat requirements of any job being run on the laminator. The processor adjusts the power to the heat shoes to keep the actual temperature steady and close to the set temperature.

This process of gauging and adjusting the heat takes a few minutes, so the actual temperature will become more stable as you continue to laminate.

3. Add or remove feed tray sections and position the two side sections for the work to be performed.

4. Check the supply roll tension per the instructions in the previous section. Make sure the top and bottom supply rolls have about the same tension.

5. Once the machine has come up to temperature you are ready to laminate. Close the pull rollers first, then close the laminating rollers. Adjust the film speed as required. Once the film starts to move, watch it as it passes over the heat shoes. Allow any wrinkling to clear out before inserting material to be laminated. Each time you stop the advance of film, whether by opening the rollers or turning off the drive, slack will form in the web of film. It will take a few inches of film to get the slack and the resulting wrinkles past the shoes.

6. Examine the film as it exits the machine. If there are bubbles or wrinkles in the film, it could mean there is not enough tension to draw the film tight and smooth over the heat shoes. It could also indicate that the rollers are not closed.

7. As mentioned earlier in this operators' guide, many users tend to use too much supply roll tension. Some film such as 1.5 mil, requires very little tension. Here are some indicators that you might have excessive supply roll tension.

-- usually loud squealing (many films will squeal a little)
-- necking (the web of film gets narrower as it goes across the shoe)
-- no waterfalling or wrinkling anywhere on the shoe... the film is perfectly smooth and tight across the surfaces of both shoes (please see the previous section on adjusting supply roll tension).

If the film curls up as it leaves the machine, loosen the top supply roll mandrel (turn counterclockwise) and/or tighten the bottom supply roll mandrel (turn clockwise).

If the film curls down after it leaves the machine, tighten the top supply roll mandrel (turn clockwise) and/or loosen the bottom supply roll mandrel (turn counter-clockwise). In making these adjustments, make sure that top and bottom supply roll tension are kept about equal.

8. When running films of 3 mil or above, turn the fans on before beginning to laminate. "Waves" or "ripples" tending to run through the center of the laminated web are usually caused by forgetting to run the fans, or setting too high a temperature for the film being used.

"Heat wrinkles" are formed when the film as 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 laminate, not to cool the machine.

9. This machine is equipped with a directional switch: forward/neutral/reverse. Turn to the forward position to laminate, or to reverse as required. The manufacturer recommends the stop switch be used to stop the laminator rather than the neutral position of the directional switch. To remove anything which may become lodged between the rubber laminating or pull rollers, remove the feed tray assembly, and open rollers. Switch control to reverse if required.

10. A unique feature of the laminator is the provision for driving both top and bottom pull rollers and laminating rollers. This feature provides an even distribution of heat on a continuous basis to the laminating rollers prior to startup, or when laminating production is temporarily halted.

TO KEEP THE LAMINATING ROLLERS HOT WHEN LAMINATOR IS NOT IN PRODUCTION:

-- Open the laminating rollers then open pull rollers.

-- Turn off cooling fan.

-- Turn directional switch to forward.

-- Turn motor drive switch to on.

-- Turn the variable speed control to the minimum position. The laminating rollers will revolve in proximity to the heat shoes when these steps are followed. This eliminates the chance for imperfections in the finished lamination caused "cold spots" on the laminating rollers.

-- The laminator becomes capable of accepting thick materials, without roll slippage because the top and bottom rollers are driven.

-- Driven rollers also minimize the "curling effect" in the finished lamination by providing balanced power to the laminating and pull rollers.

11. The laminator is designed to operate with the operator directly facing the control panels and feed tray assembly.

-- For operator safety, the feed table/heat shoe guard, an integral component of the feed table assembly, MUST BE IN ITS DESIGNATED POSITION when the temperature of the heat shoes is in excess of normal room temperature, or when the drive switch is in the forward position.

5-5 RECOMMENDED TEMPERATURE SETTINGS

The laminator is usually set at 300 degrees Fahrenheit at the factory. This is the best temperature setting for the particular 1.5 or 3 mil film used during testing. Many users will be changing the temperature to 310 F for a standard 1.5 mil film, or to 280 F for a standard 3 mil film.

Your first source of information about recommended film application temperatures and operating characteristics should be your film suppliers. If you do not know the source of your film, or if the supplier cannot provide the information, please use the following table as a guide.

FILM	THICKNESS	TEMPERATURE SETTING	FAN POSITION
1.5 mil	.0015 inch	300 to 315 degree range	OPTIONAL
3 mil	.003 inch	275 to 300 degree range	ON
"1-4" 5 mil	.005 inch	275 to 300 degree range	ON
"3-2" 5 mil	.005 inch	260 to 275 degree range	ON
1.5 mil (on thick paper)	.0015 inch	310 to 340 degree range	OPTIONAL
3 or 5 mil (low-melt)	see above	200 to 260 degree range	ON

NOTE: It is possible that variances from recommended temperature settings may be necessary due to material thickness, ambient temperature, humidity or quality of laminating material.

5-6 SLITTER OPERATION

1. The slitters on the HD-38/50/60 can be moved independently from the sides of the machine, even while lamination is in progress. The slitter heads are mounted on a steel bar with a adjusting knob on each knife holder. The slitters must be positioned manually. Additional slitters may be ordered.

2. To engage the slitters, pull out the slitter knob (#13) on the control panel (right side), while the film is being slowly advanced. It may be necessary to pull the film up for the blades to break through the film.

Do not do this with your fingers! Use an implement such as a rule or a screwdriver. always take care to keep hands clear of the slitter blades when threading film or otherwise working around that section of the laminator.

Ne pas utiliser les doigts pour effectuer cette opération. Se servir djun objet tel ou un tournevis. Prendre garde de ne jamais approcher les mains des lames de la découpeurse lorsqu'on charge la machine ou que l'on effectue d'autres opérations dans cette partie de l'appareil.

No use los dedos para realizar esta tarea. Emplee un objeto como una regla o un destornillador. Tenga cuidado en no acercar las manos de las laminas de corte cuando está cargando la máquina con la pelicula de plástico o realizando otra tarea en esta parte de la máquina.

3. When using the slitter, items being laminated must be fed into the machine squarely, or the slit edges will not be parallel with the edges of the items. The edge seal or edge trim will be uneven if the leading edge of each item is not fed at right angles to the edges of the web of film.

5-7 PREVENTING AND SOLVING PROBLEMS

Please read this section before you have a problem.

PROBLEM: Wrinkling of the material as it goes into the laminating rollers. This problem usually occurs when laminating an item that has been folded, rolled, bent or wrinkled.

SOLUTION: Make sure the leading edge of the item being laminated is laying flat and is inserted parallel to the laminating rollers.

It is sometimes essential to smooth out an item as it passes over the feed table and through the rollers to ensure an even lamination without wrinkles. Smooth from the center of the item, back toward the trailing edges. Once the item starts to feed, you may also pull back and to the sides on the corners of the trailing edge.

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 until just before the nip.

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

SOLUTION: This is normal and inevitable on any laminator, especially with thicker material. 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 pull equally on the plastic around the paper. This creates wrinkles that tend to look like the bow 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, wrinkling can occur if these items are of unequal thickness, because the laminating rollers are lifted off the thinner items by the thicker items. When laminating items side by side, it is important to arrange them so that the thickness is the same.

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 supply roll tension, section 5-4)

Make sure the film is threaded properly (see threading the laminator, section 5-2). The most frequent operator error is threading the film under the bottom stabilizer bar instead

of under the bottom idler bar. The threaded film should not touch the bottom stabilizer bar. When the bottom web of film is threaded around the stabilizer bar instead of the idler bar, the film will tend to wrinkle and often will not adhere. The top side of the item will not be affected.

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

SOLUTIONS: Check the supply roll mandrels. You'll probably find the mandrels are reversed. Take the rolls of film off and reverse the mandrel or mandrels which are backwards. (see supply roll mandrel diagrams)

When the supply roll mandrels are reversed the core grippers (we sometimes call them "dogs") 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 the film cold, the loose ends of the unlaminated web are particularly susceptible to "wrap-around". To minimize this, pull the threading card after it emerges from the pull rollers until the film clears the exit table. Then cut off the excess film flush with the pull rollers prior to laminating. Use caution when first starting to laminate, being careful that the thin, unlaminated web does not get caught in pull rollers or laminating rollers.

If "wrap-around" does occur while the laminator is cold, you can easily correct 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: Leaving the heat on so that the adhesive does not harden, follow the following 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: No toque las zapatas calefactoras cuando la máquina está caliente.

1. Remove the feed tray.
2. Cut the film on the top and bottom, just in front of the idler bars.

3. Loosen the film from the heat shoes and grip the two loose ends, holding them together.

4. Turn the drive switch to the reverse position.

5. Turn on the drive at a very low speed and allow the laminator to back out the film that is wrapped around the rolls. Pull the film off the roller.

WARNING: Keeping the machine in reverse may cause a reverse wrap-around if the film is not getting pulled off the roller. You may need to pull on the film with a lot of force while stopping and starting the drive.

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 á-coups sur l'interrupteur et vérifier le résultat chaque fois.

ADVERTENCIA: Apretar mucho tiempo el interruptor de marcha atrás puede causar bobinado inverso. Apriételo brevemente, luego suéltelo y observe el resultado. Apriételo nuevamente si se requiere más marcha atrás. Pare si nota que el plástico hala hacia atrás, volviendo sobre los rodillos.

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 GARGE: Ne jamais tenter de dégager un film enroulé en le coupant avec une lame tranchante. Vous entaillerez le caoutchouc des rouleaux, ce qui occasionnera des frais majeurs de reparation qui ne sont pas couverts par la garantie.

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 en una cuenta de reparaciones mayor, que no esta cubierta por la garantia.

If this method does not work, let the machine fully cool. Remove the heat shoes and cut the wrap-around off the roller with a small pair of scissors, working the point and the cutting edges away from the rubber to avoid damaging the roller. Then clean the rollers per the instructions in section 6-3.

PROBLEM: Not noticing that the rolls of film are almost used up (one roll of film always runs out before the other.)

WARNING: If the film is run through the laminator without being matched to an opposing 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 coté adhésif, qui se trouvera contre le rouleau de plastification, y adhérera, ce qui provoquera un enroulement "monstre: trés difficile à défaire puisque le film adhère d'abord au rouleau, puis à lui-meme a mesure qu'il s'enroule. Il faut agir rapidement avant que la colle durcisse. Procéder de la facon 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 pelicula de plastico 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 dificil de deshacer porque el plastico adhiere tanto al rodillo como a sì mismo, a lo largo de toda la longituh de la película de plastico acumulada sobre el rodillo. Es mejor 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 and then rethread new rolls. When putting film on a laminator, always use two rolls of matched length and width.

Experienced users may leave the pieces 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, 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.

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

When laminating posters or other thicker material with 1.5 mil film, the paper itself can absorb enough of the heat from the film to drop the adhesive below its 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 to 340 degrees F will usually do the job.

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 if 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: A milky, hazy line about an inch wide appears periodically across the width of the web immediately after initial warm-up. (LAMINATING, section 5-5, steps 3&4).

SOLUTION: The rollers are not evenly heated, and the cold side of the rollers is preventing the adhesive from melting. When warming up the machine, keep the rollers open and keep the forward drive on at low speed.

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

SOLUTION: To a certain extent, it is normal for some 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 resin 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 and clean the heat shoes periodically (see section 6-2). 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 build-up or dirt 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 6-3.

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 a HD 38/50/60 the pull rollers are identical to the laminating rollers and could be substituted if still in good condition.

PROBLEM: The film shrinks as it passed 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, and make sure both ends of the power cord are firmly engaged. There are fuses inside the laminator, but dead outlets and loose power cord connections are the most common causes of this problem.

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

SOLUTION: Increase the temperature. That cloudiness is a function 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.

PROBLEM: Bubbles in the center of the web and/or film not sticking to the center of an item.

SOLUTION: This problem can be caused by excessive laminating roll pressure. Putting too much pressure on the laminating rollers actually decreases pressure in the center of the web.

The other likely cause of this symptom is worn rollers. For example, if hundreds of thousands of 18-inch wide sheets are laminated on a 38-inch machine, the center of the rollers can get worn down more than the ends of the rollers. In this situation, the

laminating rollers should be replaced. The rollers worn in this way are not suitable for use as pull rollers.

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. Beacuse of the potential volume of support calls, we do encourage the use of the dealer network as much as possible.

6-1 MAINTENANCE

DANGER: 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 or cleaning any part of the unit.

Use extreme caution to avoid Hot Surfaces which may remain hot for a period of time even if there is NO POWER to your machine.

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 performing maintenance on 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 longtemps après que le courant a été coupé.

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

Ne jamais porter de vetements amples, de cravate ou de bijoux, etc. (ces articles peuvent etra happés par les engrenages ou les roulequx de caoutchouc).

ADVERTENCIA: sea extremadamente cuidadoso siempre que realice tareas de mantenimiento en su maquina.

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

Sea extremadamente cuidadoso en evitar superificies calientes, que pueden permanecer calientes durante cierto tiempo, aún después de estar cortada la corriente.

Tenga sumo cuidado 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, corbata o joyas (que peuden ser atrapadas por engrenajes o rodillos de goma) mientras está realizando trabajos de mantenimiento en la máquina.

6-2 GENERAL CLEANING

Cleaning the laminator daily or weekly will help prevent dirt or adhesive build-up on the rubber rollers and heat shoes and will improve the performance of the unit.

6-3 CLEANING THE HEAT SHOES

During normal use, excess adhesive from the film will often cling to the heat shoes, especially near the edges. Film coating powders can also build up on the shoes, and will tend to increase friction between the film and the shoes. This type of build-up may not be visible, and it may adversely affect lamination in a number of ways. Film squealing loudly as it passes over the shoe can sometimes be a symptom of this problem.

Some films naturally tend to squeal, with or without coating powder build-up, but cleaning the shoes usually helps reduce squealing and helps prevent more serious problems.

To clean the 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.

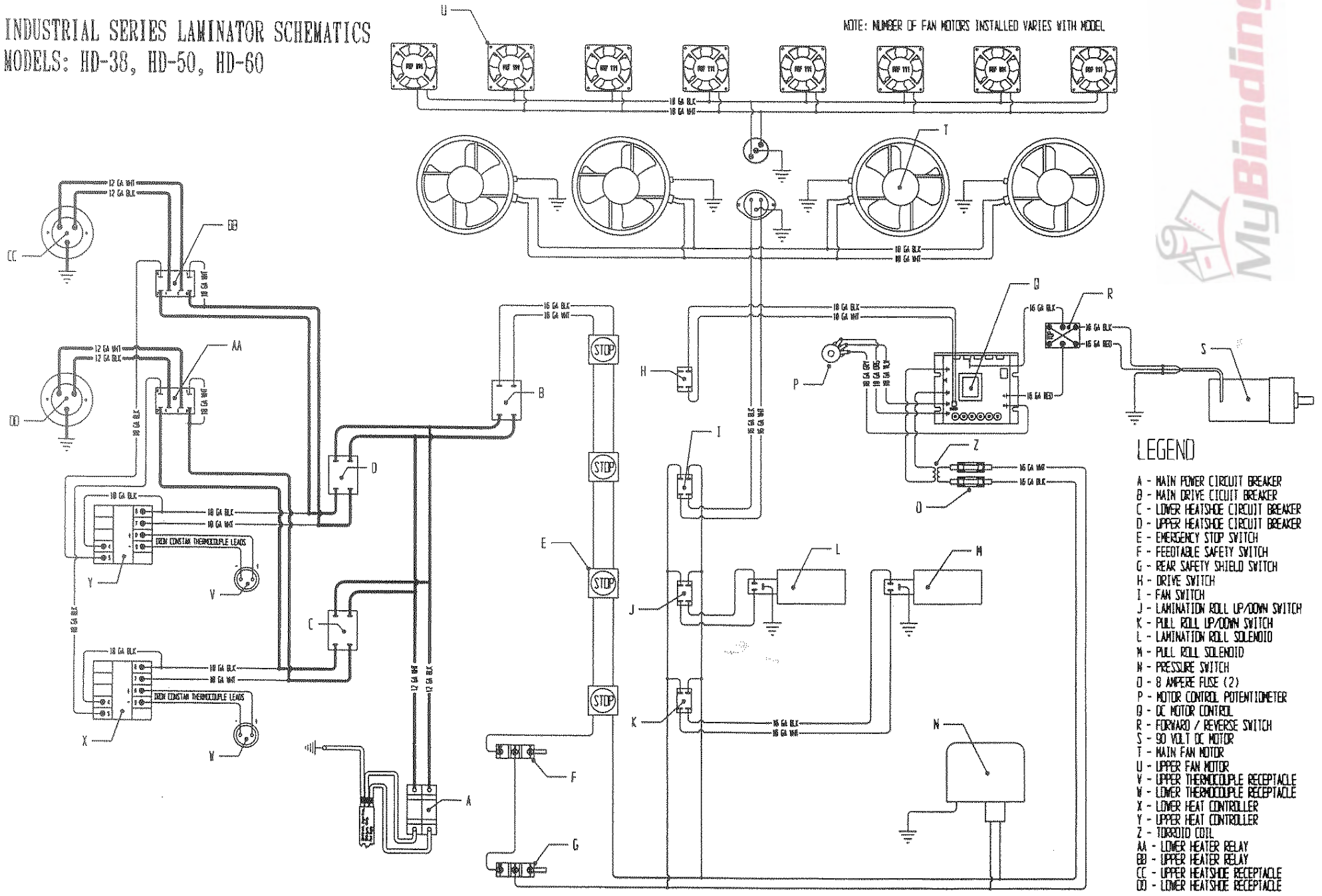
6-4 CLEANING THE RUBBER ROLLERS

Both the laminating rollers and the pull rollers need regular cleaning. Collectively these are referred to as the rubber rollers.

To clean the laminating rollers, turn off the master power switch and unplug the machine. Remove the heat shoes. The upper shoe can be simply lifted off its mounting bolts and the wiring disconnected. The bottom shoe is easily removed by taking out the mounting bolts.

Clean the rubber rollers with a mildly abrasive cleaning pad such as a white Scotch Brite 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 mar the surface. Do not use sharp metal objects or steel wool as these will also mar the rollers.

INDUSTRIAL SERIES LAMINATOR SCHEMATICS
MODELS: HD-38, HD-50, HD-60



LEGEND

A - MAIN POWER CIRCUIT BREAKER
B - MAIN DRIVE CIRCUIT BREAKER
C - LOWER HEATSHOE CIRCUIT BREAKER
D - UPPER HEATSHOE CIRCUIT BREAKER
E - EMERGENCY STOP SWITCH
F - FEEDTABLE SAFETY SWITCH
G - REAR SAFETY SHIELD SWITCH
H - DRIVE SWITCH
I - FAN SWITCH
J - LAMINATION ROLL UP/DOWN SWITCH
K - PULL ROLL UP/DOWN SWITCH
L - LAMINATION ROLL SOLENOID
M - PULL ROLL SOLENOID
N - PRESSURE SWITCH
O - 8 AMPERE FUSE (2)
P - MOTOR CONTROL POTENTIOMETER
Q - DC MOTOR CONTROL
R - FORWARD / REVERSE SWITCH
S - 90 VOLT DC MOTOR
T - MAIN FAN MOTOR
U - UPPER FAN MOTOR
V - UPPER THERMOCOUPLE RECEPTIACLE
W - LOWER THERMOCOUPLE RECEPTIACLE
X - LOWER HEAT CONTROLLER
Y - UPPER HEAT CONTROLLER
Z - TOROID COIL
AA - LOWER HEATER RELAY
BB - UPPER HEATER RELAY
CC - UPPER HEATSHOE RECEPTIACLE
DD - LOWER HEATSHOE RECEPTIACLE