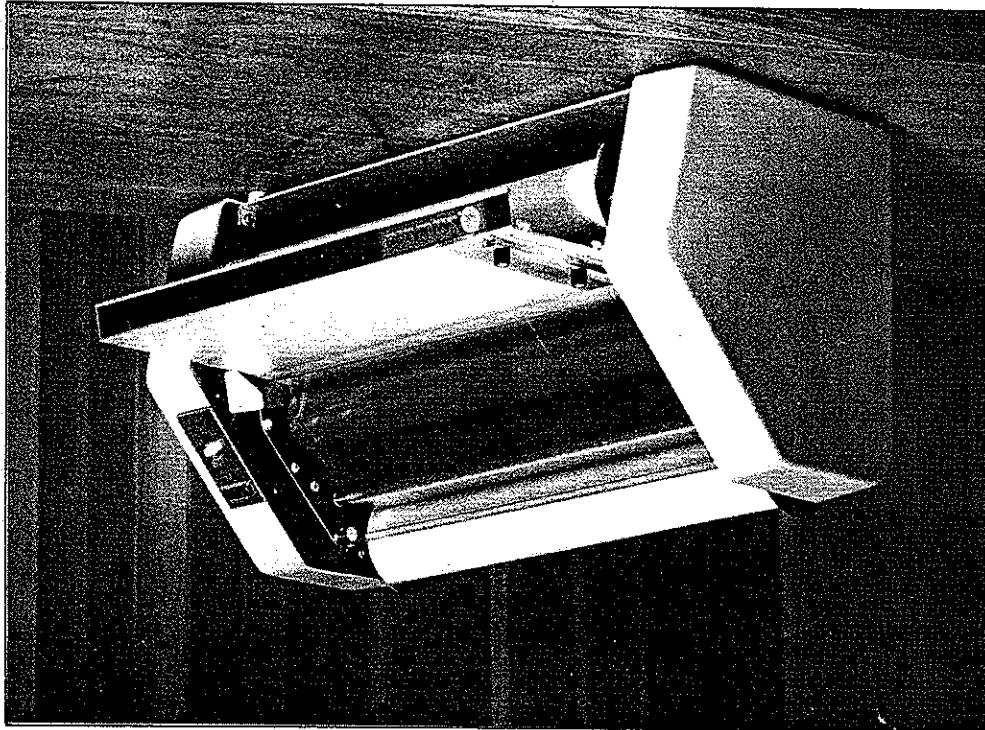


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PART NO.  
REVISED

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312/272-3700

**GBC®**  
*General Binding Corporation*



THIS PARTS MANUAL APPLIES TO ALL LISTED MACHINES  
BEGINNING WITH SERIAL NUMBER 2911000 AND ABOVE.

**LAMINATORS**  
**MODELS 412-LM, 413-LM,**  
**418-LM & 419-LM**

**PARTS CATALOG**

**INTRODUCTION**

These instructions describe the use and function of six (6) General Binding Corporation laminators which, despite their varying widths, are similar in appearance and performance:

U.S.A. MODELS 115 VAC, 50-60 HZ., 1ϕ 409-LM 412-LM 418-LM	FILM WIDTH 9" (22.8 cm) 12½" (31.7 cm) 18" (45.7 cm)	EXPORT MODELS 230 VAC, 50 HZ., 1ϕ 410-LM 413-LM 419-LM
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GBC Laminators apply coated, transparent film to one but usually both sides of documents, photographs, or any sheet-like material. GBC laminating film consists of a polyester film coated one side with polyethylene-heat reactivatable adhesive. The film is applied by heat and pressure with the adhesive contacting the product to be laminated. In the process, the adhesive adheres to the product and the end result is a laminate whose appearance is enhanced and resistance to damage is greatly increased.

**Laminating Hints**

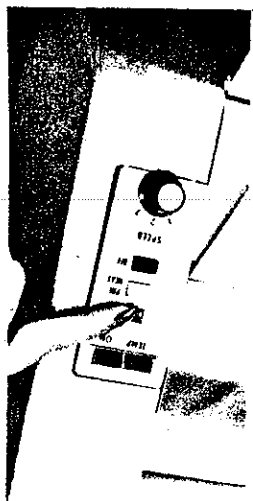
1. Always run test samples before laminating valuable products or documents, to insure proper laminator performance.
2. Feed product to be laminated slowly and evenly into heat roll nip with machine running. Employ side guide. Once product is engaged by the heat rolls, it is committed. Make no attempt to alter product position while in motion except to hold it taut from trailing edge. Wrinkles in laminated product usually are caused by attempts to straighten product which has already been engaged.
3. Do not force product between heat rolls, if product does not enter heat roll nip easily, it is probably
4. Once a product has been engaged by heat rolls, allow laminator to finish job without stopping; for a stop—even momentary—will leave a mark on the rear of laminator and past tear-off blade. This ensures tear-off in the film web and not accidentally into the laminated product.
5. If laminator is turned on shortly after having been turned off and both indicator lights illuminate, wait two (2) minutes before operating the laminator.

**Laminator Operating Controls**

SEE FIG. 1

1. Connect power supply cord to a source of 110/120 VAC, 50-60 HZ, 1ϕ, 30 Amp. power. Export models require 220/240 VAC, 50 HZ, 1ϕ, 15 Amp. power.
2. Depress PREHEAT button. The Red "ON" light will illuminate. The Amber "Ready" light illuminates in 3 to 5 minutes, indicating that the laminator is ready to operate.
3. Depress RUN button to laminate.
4. Depress PREHEAT button to stop laminator.
5. Depress OFF button to shut down machine completely. Red and Amber lights extinguish. If machine has not been previously loaded with film, allow machine to cool and proceed to load and thread film.
6. NOTE: Do not insert materials into laminator until Amber "Ready" light is illuminated. Caution: Laminator drive motor will operate if control switch "Run" button is depressed, even though Amber "Ready" light is not illuminated.

FIG. 1



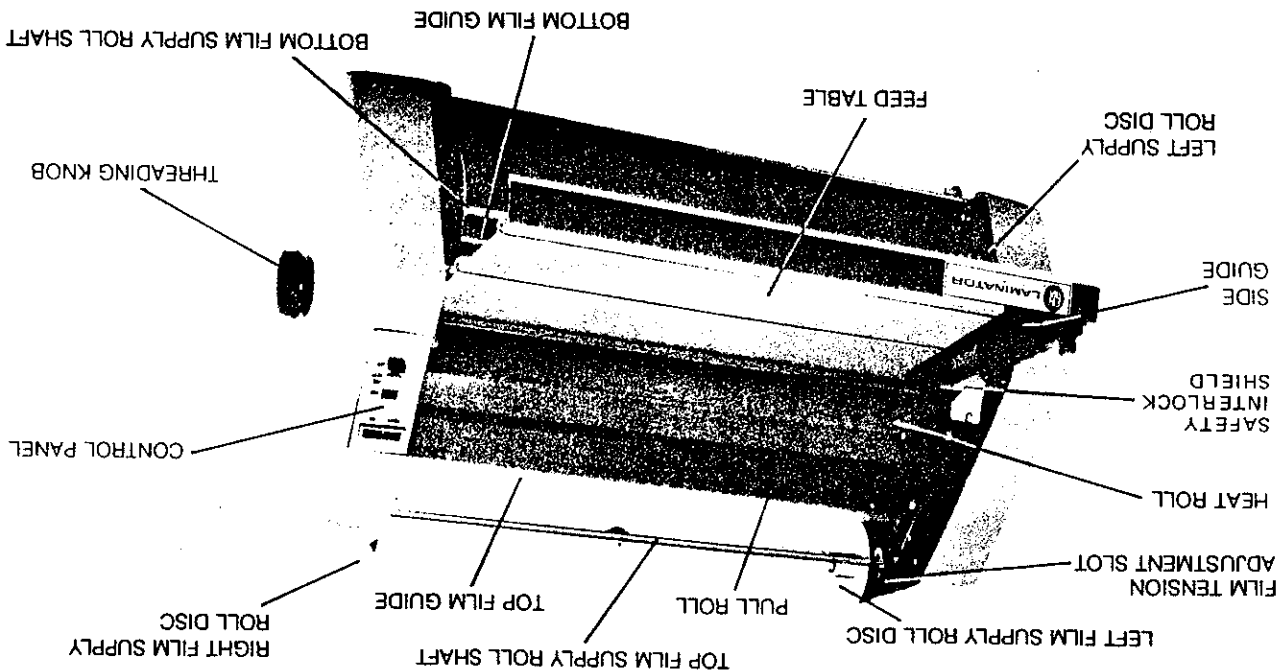


FIG. 2

**Loading and Threading Film**

SEE FIGS. 1, 2, 3, 4, 5

GBC laminators employ two rolls of film, one on top and one on bottom. Use film rolls of identical width and similar diameter and center them in laminator. The shiny side of **regular** film must contact heat rolls. The dull side of the film contains heat-reactivable polyethylene adhesive. Use care when installing **delustered** film, since both sides appear similar. GBC film rolls always contain adhesive wound on the inside.

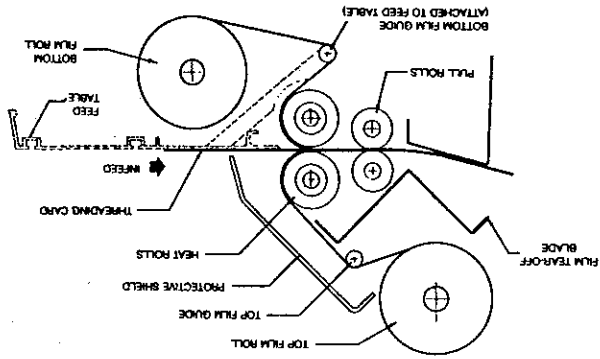
1. Release cam locks and raise interlock safety shield. Then remove feed table.
2. Remove top and bottom film supply shafts from laminator.
3. Remove the loose, right side discs from film supply shafts. Depending upon width of film rolls, readjust left side discs with allen wrench supplied with laminator.
4. Slide film rolls onto right ends of film supply shafts.
  - A. Position film on top shaft with film unrolling from bottom **towards** operator.
  - B. Position film on bottom shaft with film unrolling from bottom and **away from** operator.
5. Replace side discs on supply shafts and press firmly into film cores until both left and right side discs are flush with film rolls.
6. Install loaded film supply shafts into laminator by inserting left ends into mounting socket and seating right ends into mounting bracket slots. Make sure film unrolls properly.
7. Unroll film from top roll and drape over top film guide and both heat rolls. Unroll film from bottom

8. Install feed table and lower interlock safety shield, and rotate cam locks into position.
9. Depress PREHEAT button. Red "ON" light will illuminate. Amber "Ready" light illuminates in 3-5 minutes, indicating laminator is ready to operate.
10. Depress RUN button. Turn threading knob clockwise and urge cardboard through laminator until both it and film are engaged by the pull rolls. Upon engagement, release cardboard and run laminator until the now-laminated cardboard ejects from rear of laminator. Stop laminator by depressing PREHEAT button.
11. Grasp cardboard and—with a quick upward motion—sever film against tear-off blade at ejection slot.
12. Set side guide where desired. Laminator is now ready to laminate material.
13. When shutting down laminator completely, insert a sheet of paper and run laminator until it projects several inches from rear. Depress OFF button.

**NOTE:** To adjust film tension, insert short end of allen wrench into film tensioning adjustment slot. Manually turn film roll (either direction) until wrench engages. Rotate film roll towards you to decrease tension; rotate film roll away from you to increase tension. Directions given are while facing front of laminator.

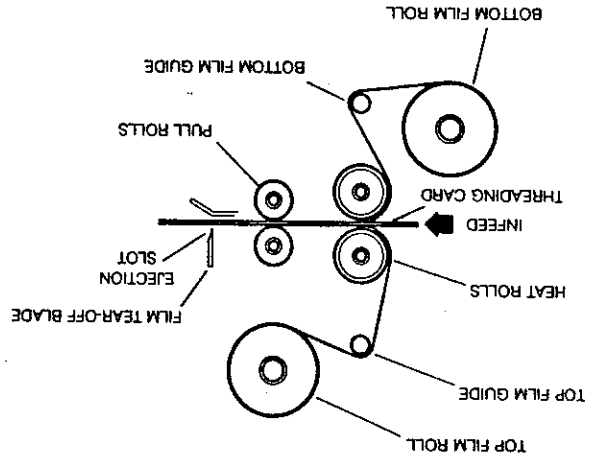
Film Threading Diagram

FIG. 5



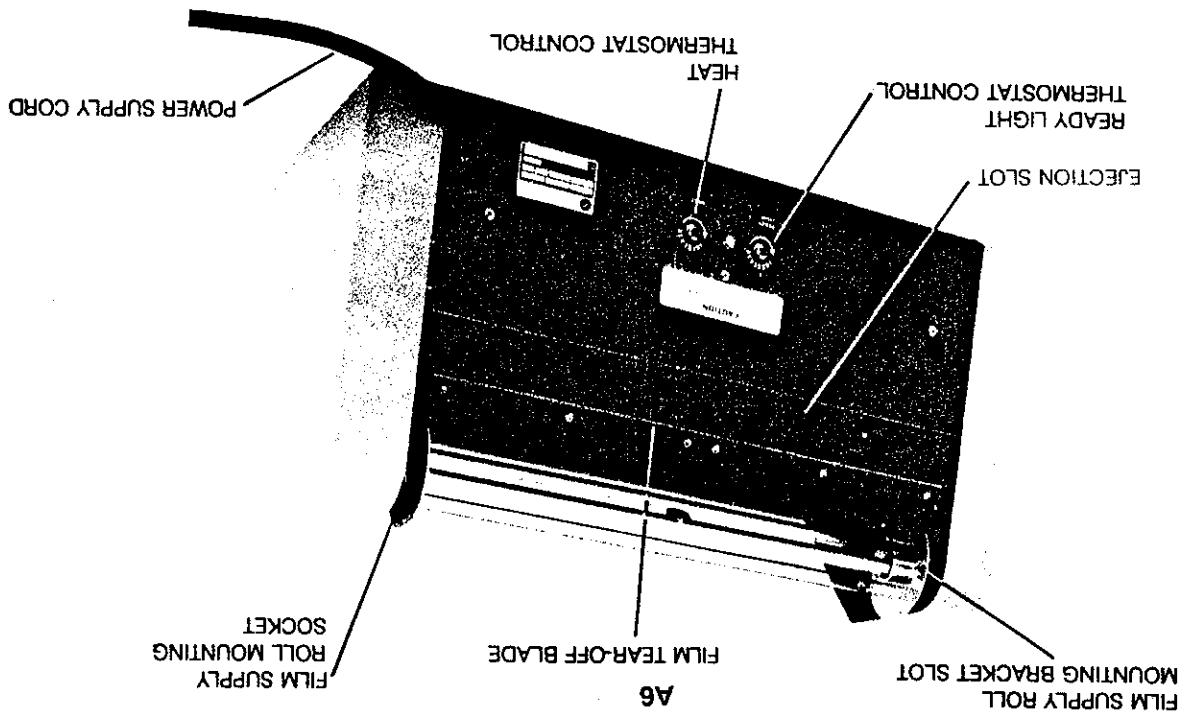
412LM & 418LM  
413LM & 419LM

FIG. 4



409LM & 410LM

FIG. 3



A6

## Theory of Successful Laminating

However, the ultimate in integrity requires 210°F. (99°C.). A user can check bond by separating film from product and noting whether fibers stick to the polyethylene. If fibers are removed, the bond between paper and polyethylene is likely to be as good as is technically possible to achieve. If no fibers are removed (and no doubts exist with respect to bondability as described in Section 1), a thermostat adjustment—increasing heat roll temperature—may rectify the situation. Thickness of the product bears heavily on the ultimate integrity of the bond, since the thicker a product, the more heat is extracted from the heat rolls—which tends to lower temperature below the critical 210°F. (99°C.). GBC laminators are capable of running continuously at not less than 210°F. (99°C.) interfacial temperatures with typical office paper whose thickness varies from 0.0035" (.09 mm) to 0.005" (.13 mm). Thicker product may extract heat faster than the machine can put heat in, and after 20 feet (6.1 m) or so, the interfacial temperature may drop below the critical point. Generally speaking, most card stocks whose thickness is on the order of 0.012" (.30 mm) thick can be laminated on a continuous basis.

### 3. Total encapsulation of product, with a complete film-to-film border, is often recommended to prevent an otherwise successful laminate from splitting or separating within itself.

Total encapsulation of a product, of course, prevents splitting from casual abuse of a corner or edge of the laminate, and obviously, moisture vapor or liquid cannot enter to weaken the laminated product.

Flush cutting of laminated product, or even slightly into the product, yields a neat, trim appearance but renders the product sensitive to splitting at the edges, and particularly at corners. The split occurs within the product and not at the adhesive-product interface.

Flush cutting also leaves a paper edge exposed to the atmosphere and any moisture vapor it contains. However, this may be of little consequence unless the laminate is exposed to an actual liquid, whereupon the fibers within the product loosen from one another and splitting occurs.

To obtain the ultimate in a successful laminate, three factors should be present:

### 1. The product to be laminated should be receptive to, and capable of attaining, a good bond with molten polyethylene adhesive.

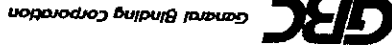
Most paper products can be laminated with a high degree of integrity. This is because molten polyethylene cements to individual fibers of the paper surface. The rougher the surface texture, the more fibers are exposed to adhesive and the better the bond between adhesive and product. Many substances are applied to paper products which impair bond between fibers and the molten adhesive. Clay and ink affect this bond. While good adhesion occurs between molten adhesive and ink or clay, poor adhesion may exist between ink or clay and its parent paper. Accordingly, the lamination process will be adequate, but the overall laminate may lack some integrity.

Some paper and card stocks are coated with silicones, wax, or varnish which inhibit the ability of molten polyethylene to stick tightly to individual paper fibers. In such cases, a superficial bond develops which may be adequate, depending upon intended use of the finished laminate. Smooth surfaces, especially photographic, metallic, and plastic, are difficult for polyethylene to bond to, since no fibers are exposed for the adhesive to contact. Again, a superficial bond does not have the same integrity as when bonded to typical office paper.

Product containing moisture will not laminate well since the fluid converts to steam, forms bubbles, and impairs lamination.

### 2. At the moment of lamination, the product-polyethylene interface—both top and bottom—must reach a stick-seal temperature of at least 210°F. (99°C.).

All GBC laminators intended for polyester-polyethylene films are factory adjusted to produce not less than 210°F. (99°C.) at product-film interfaces with typical 20 lb. (75.2 g/m<sup>2</sup>) paper on a continuous laminating basis. Superficial bonds develop at lower temperatures, and the finished laminate may be adequate for its intended use.



# MAINTENANCE AGREEMENT

To insure the quality performance and long life built into your precision GBC business machines, be sure to take advantage of this outstanding coverage that includes free inspections, . . . all at one low price. Without our Extended Maintenance Agreement a service charge for time, travel, and parts must be made for each call. The GBC Extended Maintenance Agreement on this machine decreases your maintenance cost to a minimum while protecting your valuable investment at the same time. Contact your local GBC Branch Office for full details or write to:

**National Service Department**

Model	Laminating Width	Product Size	Product Sheet Size	Paper Weight	Film Gauges	Operating Speed	Electrical Power Required	Electrical Power Operating
409-LM 410-LM	9" (22.8cm)	Up to 9" (22.8cm)	Any Length	Tissue thin up to 1/16" (1.59mm) Card Stock	.0015" (.04mm) and .003" (.07mm)	5'-0" (1.52 m) per minute	110-115 VAC 50-60 Hz 1 φ 30 Amps.	115 VAC 60 Hz 1 φ 6 Amps.
418-LM 419-LM	12" (30.5cm)	Up to 12" (30.5cm)	Any Length				110-120 VAC 50-60 Hz 1 φ 30 Amps.	115 VAC 60 Hz 1 φ 10 Amps.
412-LM 413-LM	18" (45.7cm)	Up to 18" (45.7cm)	Any Length				110-120 VAC 50-60 Hz 1 φ 15 Amps.	115 VAC 60 Hz 1 φ 5 Amps.
409-LM 410-LM	18" (45.7cm)	Up to 18" (45.7cm)	Any Length				110-120 VAC 50-60 Hz 1 φ 30 Amps.	115 VAC 60 Hz 1 φ 12 Amps.
418-LM 419-LM	18" (45.7cm)	Up to 18" (45.7cm)	Any Length				110-120 VAC 50-60 Hz 1 φ 30 Amps.	115 VAC 60 Hz 1 φ 12 Amps.
412-LM 413-LM	18" (45.7cm)	Up to 18" (45.7cm)	Any Length				110-120 VAC 50-60 Hz 1 φ 30 Amps.	115 VAC 60 Hz 1 φ 12 Amps.

Model Number	Dimensions (with feed table installed)	Machine Weight	Shipping Weight	Machine Weight
409-LM 410-LM	Width = 15 1/4" (38.7cm) Length = 15 1/4" (38.7cm) Height = 12 1/4" (32.4cm)	34 lbs.	43 lbs.	36 lbs.
412-LM 413-LM	Width = 20 1/2" (52.1cm) Length = 15 1/4" (38.7cm) Height = 12 1/4" (32.4cm)	43 lbs.	51 lbs.	47 lbs.
418-LM 419-LM	Width = 25" (63.5cm) Length = 15 1/4" (38.7cm) Height = 12 1/4" (32.4cm)	47 lbs.	51 lbs.	47 lbs.

## MACHINE SPECIFICATIONS

1. Only use threading knob initially when threading laminator. Do not rotate knob once film is engaged in pull rolls.

2. During each use, check ejection slot to ensure film exits properly.

3. When leaving laminator in heated condition, but not running, for any great length of time, insert paper or card stock into machine, letting it protrude from entrance and exit slots.

4. Avoid touching heat rolls when in heated condition.

5. When not in use, protect laminator from dust with protective cover supplied with machine. ALLOW LAMINATOR TO COOL BEFORE COVERING.

6. The heat and pull rolls should be kept reasonably clean of polyethylene which has cozed out from film edges during lamination. Accurate alignment of top and bottom film webs will minimize this problem. To clean heat rolls, disconnect power cord and allow heat rolls to cool slightly. Swing interlock safety shield up and out of the way. A light deposit of polyethylene can be removed with an ordinary rubber eraser. Heavier accumulations require use of a green Scotch Brite pad. Rub rolls lightly until the polyethylene balls up and can be brushed or blown away. DO NOT USE A SHARP CUTTING EDGE TO TRIM OR SCRAPE THE ROLLS.

7. Two (2) thermostats are used to control operation of the laminator and are mounted independently.

The right thermostat (as viewed from rear of laminator) controls heat roll temperature and may be adjusted with a small screwdriver to increase or decrease temperature according to direction indicated on nameplate. A 1/2-turn in either direction will alter temperature about 5°F (3°C). After adjustment, check results by laminating test material. The left thermostat controls the point at which approximate lamination temperature has been reached. The amber pilot light illuminates, and lamination can be operated by depressing RUN button. If adjustment appears necessary, use screwdriver to make 1/2-turn in either direction to produce a temperature alteration of about 5°F (3°C).