PAKO CORPORATION

INSTRUCTIONS & PARTS LIST

for the

PAKONOMY DRYER

Congratulations on purchasing another fine Pako product!

We urge you to read the instructions in this folder before operating your new Pako machine. You can expect years of efficient trouble-free service if these instructions are carefully observed.

This folder includes the Instruction Manual and Illustrated Parts List for the machine, with any supplementary bulletins currently available.

If you have any questions about operating or servicing this machine after reading the enclosed literature, please contact your local Pako Distributor or Pako Corporation (attn: Technical Services).

In all correspondence, be sure to give the exact name, model, and Serial No. of the machine (as stamped on the data plate).

So that your machine can be properly recorded for warranty purposes, you should fill out and return the Guarantee Card immediately.

TE-57

PAKO INSTALLATION INSTRUCTIONS

18SS PAKONOMY DRYER

The Pakonomy 18SS in shipped completely assembled, and needs only the following preparation for immediate operation:

1. Set the Dryer on a level surface. Don't put it in an enclosed area where the excess heat won't be carried away.

2. Thoroughly clean the Dryer to remove any travel dust and scum.

3. Carefully remove the protective covering from the drum. Don't apply heat to the drum until the covering is removed and the drum is thoroughly cleaned.

   CAUTION: When you work around the polished drum surface, be very careful not to scratch it. Don't use hard, pointed, or shart tools on the drum surface. Remove finger rings. Wash your hands thoroughly before touching the drum surface.

4. A jar of Pakokleen Drum Cleaner is packed with the Dryer. Clean the drum surface thoroughly with Pakokleen according to the directions on the container. The more carefully you clean the drum surface, the better the gloss you will get on prints.

5. Plug the power cord into a standard 3-hole electrical outlet, 115 volt, 50 or 60 Hz, single-phase.

6. Before operating, be sure to remove anything on top of the Dryer. Restricting the hot moist air will cut down the production rate and could cause damage to the motor from overheating.

7. For procedures on operation, maintenance, and service, consult the Instruction Manual, Form 51-001.

PAKO CORPORATION

Printed in USA 3-68 1200

Form 51-008

PAKO INSTRUCTION MANUAL

18SS PAKONOMY DRYER

Pako Corporation cannot guarantee the satisfactory performance of which the Pakonomy 18SS Dryer is capable, unless it is installed, operated, and maintained according to these instructions.

PAKO CORPORATION • MINNEAPOLIS, MINNESOTA 55440

Printed in USA 3-68 5M

Form 51-001R2
Index B7-2-3

INTRODUCTION

For over 40 years Pako Corporation has provided the world's photographic industry with such fine print dryers as the Liberty, Photocopy, Electrogloss, Economy, and Model 13, 26, and 44 Pakonomys. Our congratulations on buying the latest addition to this outstanding list, the Pakonomy 18SS.

Your new Dryer will handle any size print up to 16 x 20 in. (40.6 x 50.8 cm). It can be used for B/W or color prints, single- or double-weight.

Its mirror-finish stainless steel chrome-plated drum is the ideal surface for glossing B/W or color prints. Or you can matte-finish B/W prints by running them with the emulsion side away from the drum.

This Instruction Manual provides information on operating and maintaining the Pakonomy 18SS for best performance, and on servicing the components. If you need more information, please contact your local Pako Distributor.

The drying of prints, particularly large glossy prints, is subject of many variables -- see "Heat and Speed Settings," Page 4. Consistently high quality prints can be obtained only by constant attention to all these variables.

The 18SS Dryer is designed for light duty and not for heavy production purposes. It will perform at the production rates specified under normal conditions, if given reasonable care and operated according to these instructions.

If you have a volume of work which will load this Dryer several hours a day, you will save considerable time by moving up to one of the larger Pakonomy Dryers which are designed for quantity production.

Specifications:

Width: 24 1/2 in. (62.2 cm)

Height: 15 1/2 in. (39.4 cm)

Depth: 14 3/4 in. (37.5 cm), with feed table up;

24 in. (61.0 cm), with feed table down:

Electrical Requirements: 120 volt, 50 or 60 Hz, single phase (9 amperes).

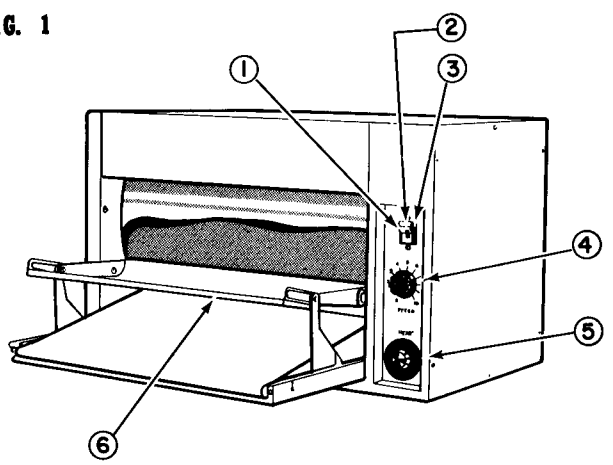
Drum Speed: Variable from 1 1/2 to 10 in/min (4 to 25 cm/min).

Drum Temperature: Controlled by an adjustable thermostat.

OPERATION

CAUTION: Don't set anything on top of the Dryer while it is operating. Restricting the exhaust of hot moist air will cut down the production rate: restricting the motor cooling air can damage the motor.

FIG. 1



① MOTOR SWITCH
Controls power to the Dryer -- doesn't turn on the heat unless the heat switch is also on.

② INDICATOR LAMP
Lights whenever the motor switch is turned on.

③ HEAT SWITCH
Controls power to the heaters.

④ SPEED CONTROL
Adjusts the speed of the drum and apron.

⑤ HEAT CONTROL
Determines the temperature at which the main thermostat switches to standby heat.

⑥ PULL-OUT SHELF
For larger prints.

TO START THE DRYER

1. Open the feed tray.
2. Press the heat and motor switches.
3. Wait 30 minutes before running prints, to allow the drum temperature to stabilize.
4. See also "Heat and Speed Settings", below.

TO FEED PRINTS

NOTE: Most drying problems are caused by improper print processing. Study the recommendations in Pako Service Bulletin G-17 carefully.

Drain the prints before placing them on the Dryer apron. Prints which are too wet will need more heat and/or a slower apron speed to dry. However, don't drain them so thoroughly that they are becoming dry: leave a thin film of moisture on the emulsion.

Glossy

To feed glossy prints, use a sliding motion to lay the prints emulsion up on the apron. This motion will reduce the possibility of their becoming creased, by assuring that the entire back surface of the print is in contact with the apron.

If you are drying a large quantity of prints, the apron may get wet enough to force you to slow down the Dryer. To prevent this:

1. Before placing the prints on the apron, lay them on a piece of clean glass, etc., and squeegee the surface to remove all excess moisture.
2. Lay the prints on the apron. Before they reach the drum, use a sponge to rewet the entire emulsion surface with print conditioner.

Matte

Lay matte prints on the apron emulsion down.

TO STOP THE DRYER

1. Shut off the heat and motor switches.
2. Clean up any dust or moisture on the Dryer.
3. Close the feed tray.

HEAT AND SPEED SETTINGS

Many things affect the production volume of a print dryer:

- -- The type and brand of print material you are drying;
- -- How well the prints were processed;
- -- The temperature and humidity in the room;
- -- The maximum temperature at which the print material can be dried;
- -- The drain time and handling of the paper between processing and drying;
- -- Your housekeeping procedure (especially, how often the apron is changed and how clean you keep the drum surface).
- -- Whether the proper print conditioner was used according to directions.

Therefore, we cannot recommend specific heat and speed settings for the Dryer. You will have to test the Dryer in your surroundings, with each print material you are using.

Whenever you dry a new material, make the following test with a few waste prints:

1. Set the thermostat at "6" for B/W prints, at "5" for color.
2. Set the speed control according to the table below:

   B/W SW glossy ------ "5"
   B/W DW matte ------- "3"
   Color glossy ------- "1"

3. Start the Dryer and run it empty.
4. Wait at least 30 minutes, so the Dryer temperature cycle will have stabilized as much as possible, then place a wet print on the apron and let it go under the drum.
5. If the print sizzles when it gets against the drum, the heat is too high. Turn the thermostat to the next lower number, and repeat the above procedure.

   If the print doesn't sizzle, turn the thermostat to the next higher number and repeat the test.
6. When you have the highest setting at which the print doesn't sizzle, check the prints coming off the drum.

   If they aren't completely dry, or if they develop "oyster-shelling" (curved lines across the face of the prints), turn the speed control to the next lower number.

Never run the Dryer so fast that you must stop intermittently while prints "cook". This erratic operation doesn't give consistent quality results. The speed should normally be changed only when you change to prints of a different weight or type.

Once you have a suitable combination of heat and speed, keep these settings. Don't try to "rush" a batch of prints thru, as this invites trouble.

MATTE DRYING

For the best matte finish, drain the prints thoroughly before drying and run them thru the Dryer at as low heat and slow speed as possible. The paper should barely be dry as it drops from the drum. This is especially important for single-weight matte paper.

The matte print surface is easily marred and must be handled with care. Some materials should not be laid across the apron seam when matte drying.

DRYING COLOR PRINTS

NOTE: Kodak Stabilizer Additive should not be used in the buffer solution for Ektacolor prints which will be gloss-dried on a heated dryer drum, as it causes the prints to stick to the drum surface.

When a batch of prints is processed and waiting to be dried, use plain water for the holding bath. Treat the prints in Pakosol or Pakochrome as recommended, just prior to drying.

With color prints, drying temperatures and apron speed are generally more critical than with B/W prints.

If the Dryer temperature is too high, the prints will be brittle, with increased curl; if too low, the prints will stick to the drum.

STATIC PROBLEMS

Print paper is normally electrically neutral. However, when it is placed in intimate contact with a metal surface (such as a Dryer drum) static electricaty can build up, causing prints to cling to that surface.

This is particularly a problem in dry climates or when the humidity is low (as in winter).

Static problems in these situations can never be completely eliminated, but you can get considerable relief by attention to the following:

- -- Keep the fixing bath at the correct working strength;
- -- Be sure the wash water flow rates and temperature are correct;
- -- Use Pako print conditioner (Pakosol or Pakochrome) exactly according to the directions;
- -- Use Pakostat according to the directions;
- -- Keep the drum and apron clean;
- -- Install a humidifier to maintain a relative humidity of 30 to 40%. Moisture in the air helps to "bleed off" the static charge from the prints so they'll drop free of the drum (it usually makes for a more comfortable working climate, too).

If prints stick close to the drum because of static, pulling them off will only aggravate the condition.

Static attraction is caused by a difference in electrical charge between the print surface and the drum surface. If the print is allowed to remain on the drum for a few seconds, the charges will gradually equalize. Pulling the paper free leaves an unbalanced charge on both surfaces, which makes succeeding prints stick even more.

NOTE: For more information on print drying problems and good drying procedures, see Pako Service Bulletin G-17.

MAINTENANCE

Over 40 years of Pako experience in designing print dryers is built into the Pakonomy 18SS. It will give many years of outstanding service if you operate it as outlined above, and follow the instructions below on cleaning and lubrication.

CLEANING

Keep the drying area clean. Dust and dirt in the air will get on the drum and affect the print gloss.

Wipe clean all exposed parts of the Dryer at the end of each working day, and close the feed tray when the Dryer is not in use.

Apron

Change the apron whenever it begins to get harsh, dirty, or stained by chemicals.

The apron may be washed in a mild soap or detergent in an automatic washer (household or laundromat), and damp dried -- the normal spin dry of the washer is sufficient.

Do not dry it in an electric or gas tumble dryer, and do not permit it to air dry. While still damp-dry, install it on the Dryer and turn the motor and heat switches on. Run the Dryer until the apron is dry, to prevent it from taking a "set" which could cause tracking problems.

If the above drying procedure isn't practical for your operation, dry the washed aprons with a hand iron or mangle at low temperature.

Never wash and reuse the apron after it becomes ragged or badly stretched out of shape.

Drum

The drum surface should seldom have to be cleaned if the prints are properly processed and the Dryer is operated according to the procedures in this Manual.

Of particular importance:

- -- Use the proper Pako print conditioner before drying;
- -- Follow the process recommended by your chemical manufacturer, and don't use exhausted solutions;
- -- Keep the processing solutions clean;
- -- Give the prints an adequate wash;
- -- Run the prints thru the Dryer at the proper heat and speed;
- -- Change the apron when it starts to get dirty.

If the drum surface does get dirty, clean it with Pakokleen Drum Cleaner according to the instructions on the container. If the surface is allowed to get very dirty, you may have to

go over it three or four times with Pakokleen, as the contaminants on the drum surface may not be visible.

As a last resort (and only if the drum can't be cleaned with Pakokleen) use Bon Ami cleansing powder. Never use Poli-Klene or any other abrasive on a drum surface. If you have to use Bon Ami, there is something wrong either with the processing of your prints or the maintenance of the Dryer.

CAUTION: When you work around the polished drum surface, be very careful not to scratch it. Remove finger rings, and wash your hands thoroughly before handling cleaning cloths or touching the drum surface. Never use cleaning cloths more than once, and use only the lint-free cloths furnished by Pako (Part No. 16-117) or their equivalent.

LUBRICATION

Every 6 months (or 1000 hours of operation), put 1 or 2 drops of SAE-10 oil in the drive motor bearings.

The squeegee roller and the left end of the apron drive roller turn in Oilite bearings which need no lubrication.

The apron shaft bearings normally don't need lubrication. However, if the shafts don't turn, very light lubrication (preferably silicone) is permissible.

SERVICE

The following tools are needed to disassemble the 18SS Dryer:

-- a screwdriver
-- 8-32 and 10-24 Allen wrenches
-- 3/8 in. (10 mm) open-end wrench
-- 7/16 in. (11 mm) open-end wrench

FIG. 2

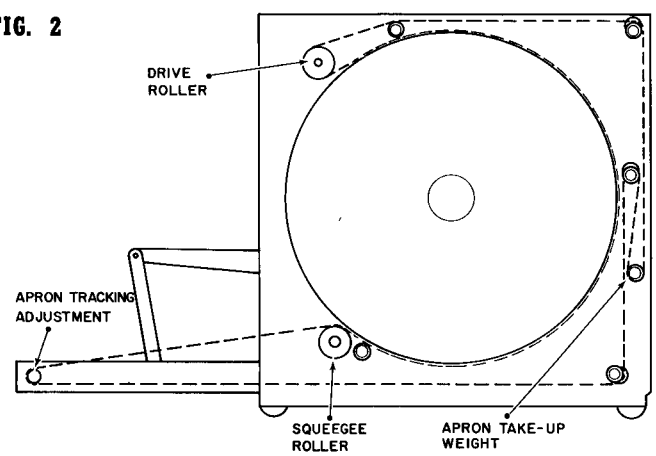
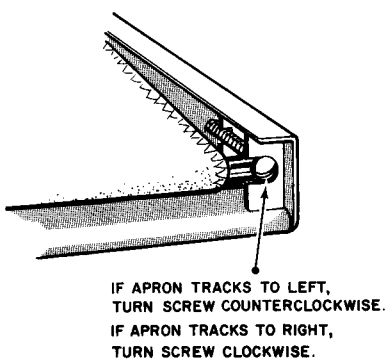


FIG. 3



Apron

CHANGING THE APRON

CAUTION: Use extra care, so you don't damage the drum surface.

1. Remove the top cover (six screws).
2. Remove the left side panel (six screws).
3. Remove the apron take-up weight from the rear of the Dryer.
4. Remove the four apron rollers.

   NOTE: When the Dryer is shipped from the Factory, the apron rollers are secured in their slotted holes by tabs. The first time you change the apron, bend these tabs out of the way so the rollers can be removed.

5. Remove the drive roller (two screws and the bearing on the left end).
6. Pull down on the squeegee levers and remove the squeegee roller.
7. Loosen the wing nut (at the rear of the Dryer) which holds the thermostat bulb bracket. Loosen the screw at the other end of the bracket. Lower the bracket: you won't have to remove it.

   CAUTION: Don't move the bracket so far that you break the capillary.

8. Slip the apron off the bulb bracket.
9. Remove the apron tracking shaft.
10. Pull the apron out of the Dryer.
11. Install the new apron in reverse order of the above. See also Fig. 2.

NOTE: The apron guide shaft has a 1/8 in. (3 mm) bow in the center, for better tracking. The shaft must be installed with the bow in, toward the Dryer.

12. Be sure the apron isn't wrinkled between the squeegee roller and drum.

13. Check the apron tracking (see below).

ADJUSTING THE APRON TRACKING

During the first 15 to 30 min of operation with a new apron, pay particular attention to the apron tracking. If allowed to mistrack then, it will take a "set" and you are more likely to have persistent tracking problems with that apron; if it isn't allowed to mistrack when new, later tracking problems are unlikely.

If an apron does mistrack, turn the adjusting screw half a turn at a time, as indicated in Fig. 3.

If you can't get the apron to track straight, check that the Dryer is level and square. If necessary, loosen the six screws in the top cover, level and square the Dryer, then tighten the screws to hold the frame rigid.

Drum

CAUTION: When you work around the polished drum surface, be very careful not to scratch it. Don't use hard, pointed, or sharp tools on the drum surface. Remove finger rings. Wash your hands thoroughly before touching the drum surface.

TO REMOVE THE DRUM

1. Remove the apron from the top of the Dryer. See Steps 1 - 5 of "Changing the Apron," above.

   Lay the apron on the table near the Dryer, so you will be able to set the drum on it without scratching the polished surface.

2. Remove the right side panel (six screws).

3. Disconnect the three heater element wires (one from the heat switch, one from the thermostat, and one from the terminal strip).

4. Remove the two screws (one at each end) which secure the drum lifters.

5. Raise the drum by the lifters.

6. Reinstall in reverse order.

To get the two drum lifters parallel, set the drum upside down on the lifters on a flat table before tightening the set screws in the collars.

You will have to have someone feed the heater element wires thru the opening in the right end while you insert the drum. Be sure the lifters are sliding in the slots on both ends.

See the wiring diagrams, Pages 8-11, for reconnecting the heater wires.

Be sure to install the two lifter lock screws before you reattach the top and side panels.

Electrical System

TO REMOVE THE DRIVE MOTOR

1. Unplug the Dryer.

2. Remove the top cover (six screws) and right end panel (six screws).

3. Disconnect the motor wires.

4. Support the motor and remove the two bolts holding it in the Dryer.

   NOTE: It is advisable to lay the Dryer on its face so that the mounting bolts will be accessible if dropped.

5. Reinstall in reverse order. Make sure the drive pin in the motor shaft engages the slot in the drive shaft.

TO REMOVE THE MOTOR BRUSHES

The drive motors which have the small plastic snap-on cover caps over the motor brushes have removable brushes (Brush Kit - Pako No. 203-54). To disassemble the motors with the removable brushes, follow the procedure below.

NOTE: Do not remove the plastic cover cap unless it is absolutely necessary. Usually once the cap has been removed, it cannot be reused again.

1. Remove the drive motor as outlined under "To Remove the Drive Motor."

   NOTE: It is advisable to lay the Dryer on its face so when the drive motor is removed, the mounting bolts will be accessible if dropped.

2. Remove the old cover caps (snap loose), springs and worn brushes.

   If the motor armature or commutator has been damaged and needs to be replaced, proceed to Step 3. If not, proceed to Step 6.

3. Separate the motor from the gear reducer by taking out the necessary screws. Remove the fan blade and take off the motor end caps by removing the two long screws.

4. Remove the armature from the motor housing.

5. Reassemble the motor, except for the motor brushes, in reverse order of the above.

6. Install the new brushes, with the springs, making sure the brushes seat properly on the commutator. Snap on the new cover caps.

   Don't cause any unnecessary stretch or compression on the springs during the installation of the motor brushes.

TO REMOVE THE HEATER ASSEMBLY

1. Unplug the Dryer and allow the heater elements to cool for at least a half hour.

2. Remove the drum (see above).

3. With an Allen wrench, loosen the set screw in the collars holding each lifter to the drum ends.

4. Pull off the collars and lifters.

5. Remove the drum end where the wires come out (three screws).

6. Carefully pull the drum end away from the drum.

7. Pull the heater assembly out of the drum.

TO REMOVE THE CONTROL THERMOSTAT

1. Unplug the Dryer.

2. Remove the right side panel (six screws).

3. Disconnect the power wires from the thermostat.

4. Pull off the thermostat knob.

5. Remove the thermostat (two screws).

6. Bend the three clips holding the bulb and capillary to the bulb bracket. It will probably be easier to remove the apron take-up weight to get more working room.

7. Pull the bulb and capillary out the hole in the right end.

8. Reinstall in reverse order.

TO REMOVE THE LIMIT THERMOSTAT

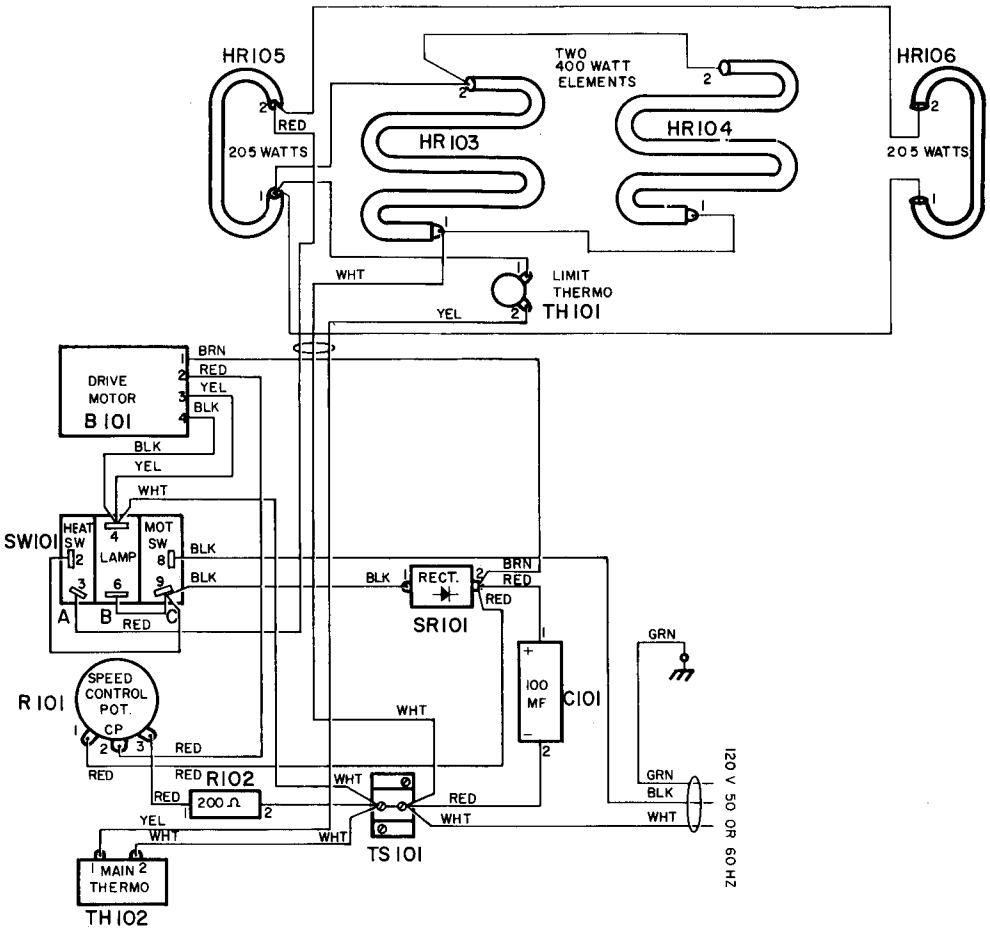
1. Remove the heater assembly (see above).

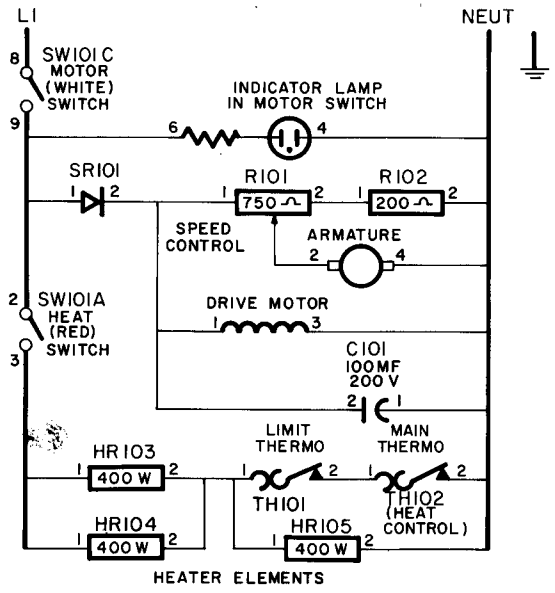
2. Disconnect the two wires from the limit thermostat.

3. Remove the screw holding the thermostat to the heater assembly.

4. Reinstall in reverse order.

120 V 50 OR 60 HZ, SER. NO. 1-1210





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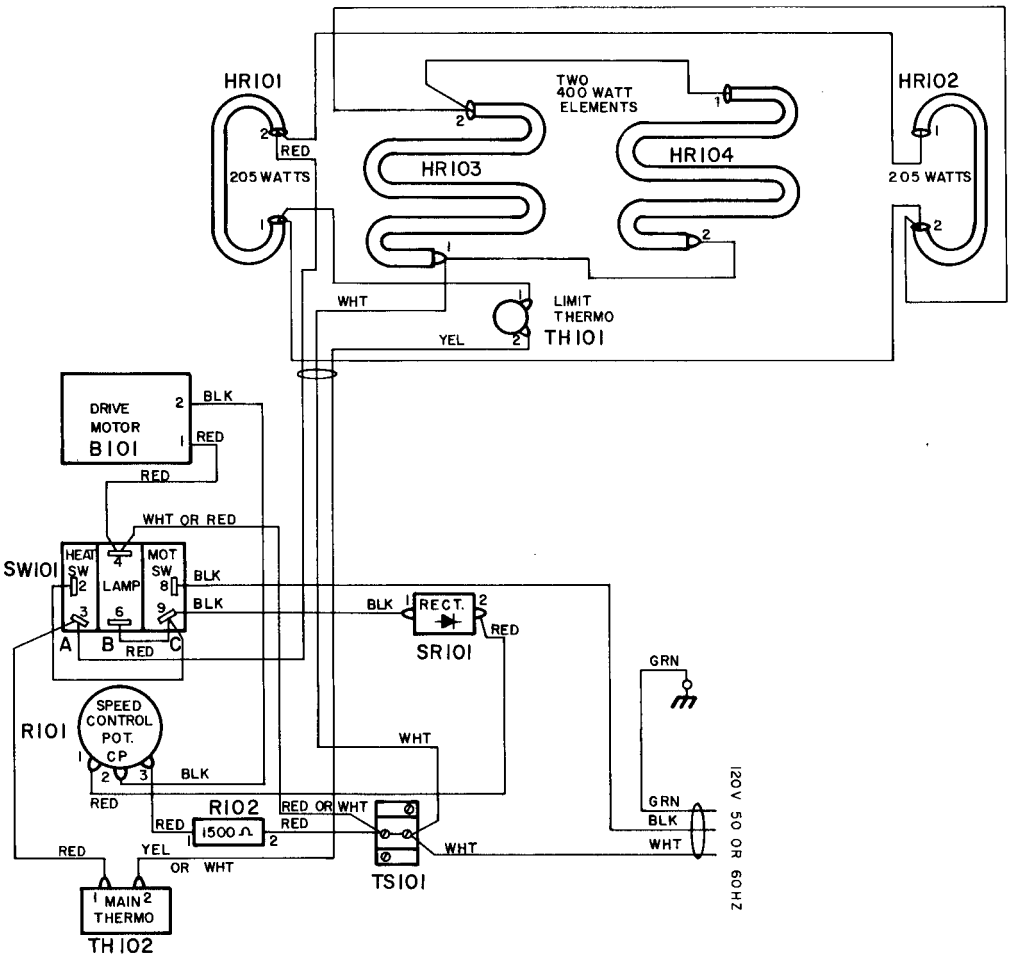

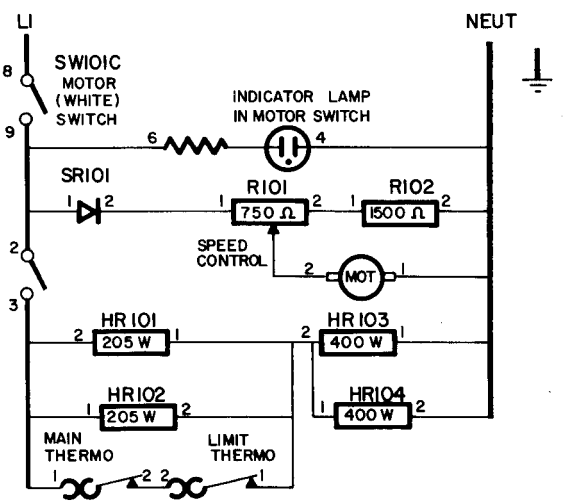

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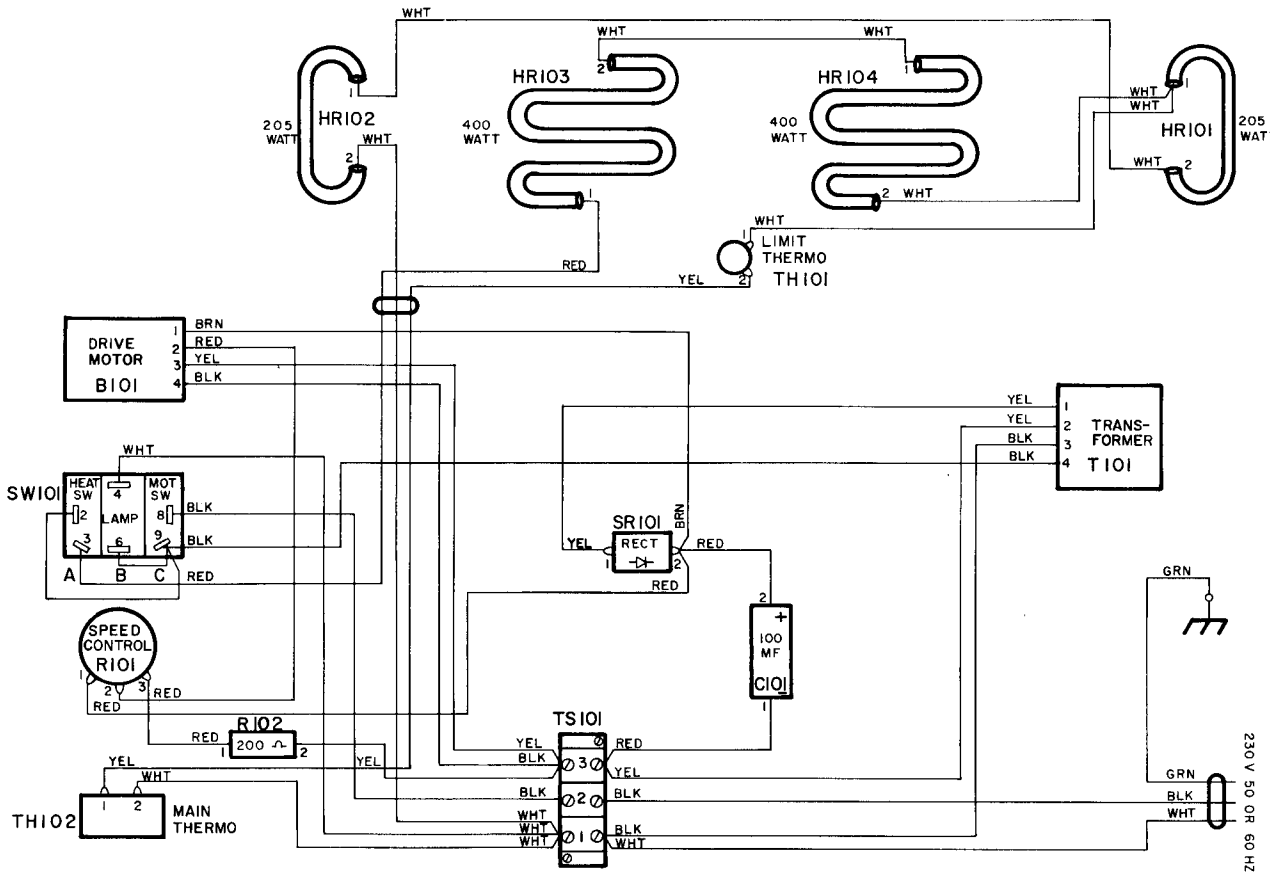

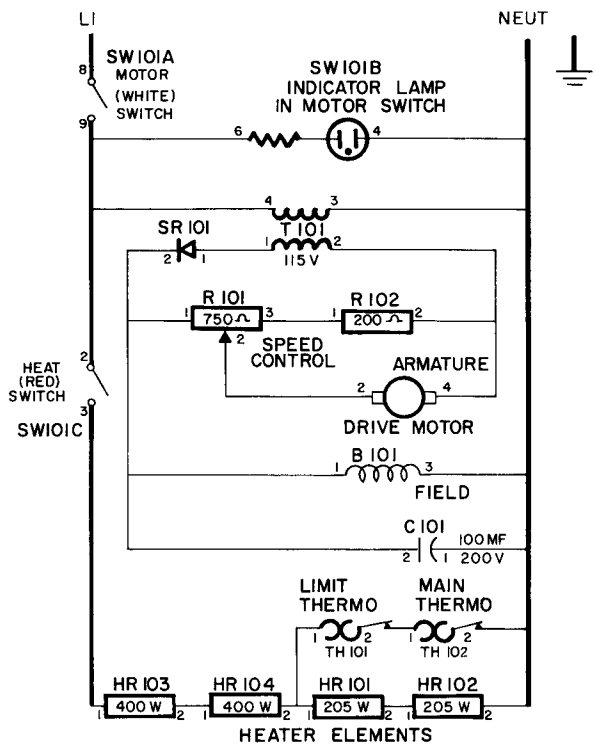

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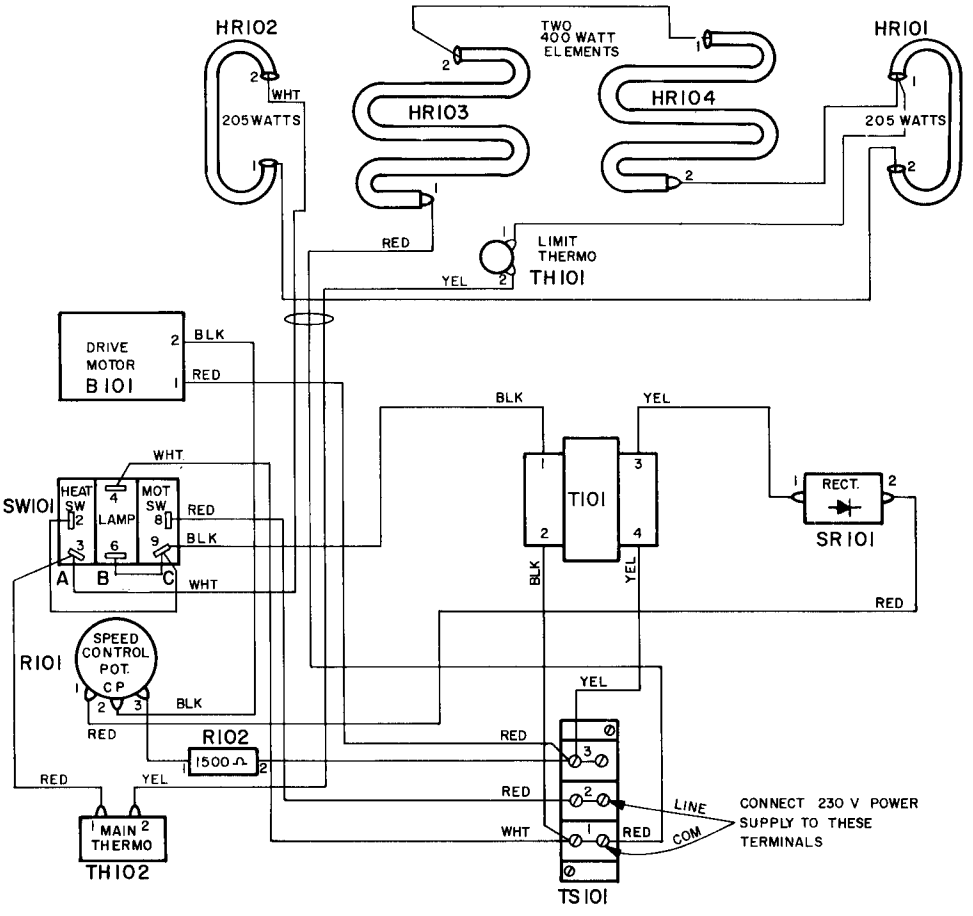
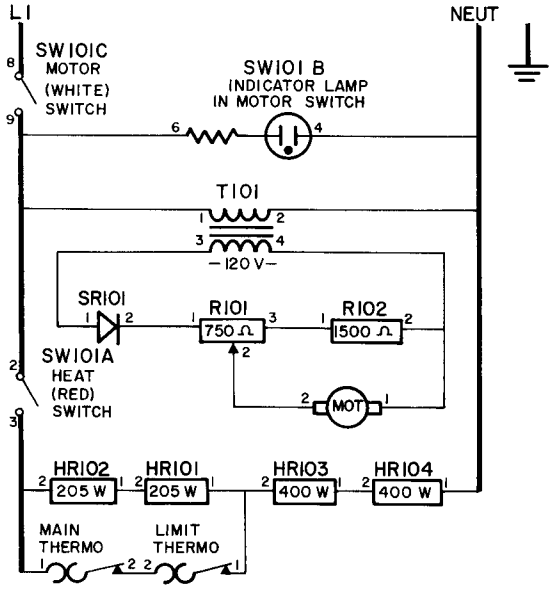
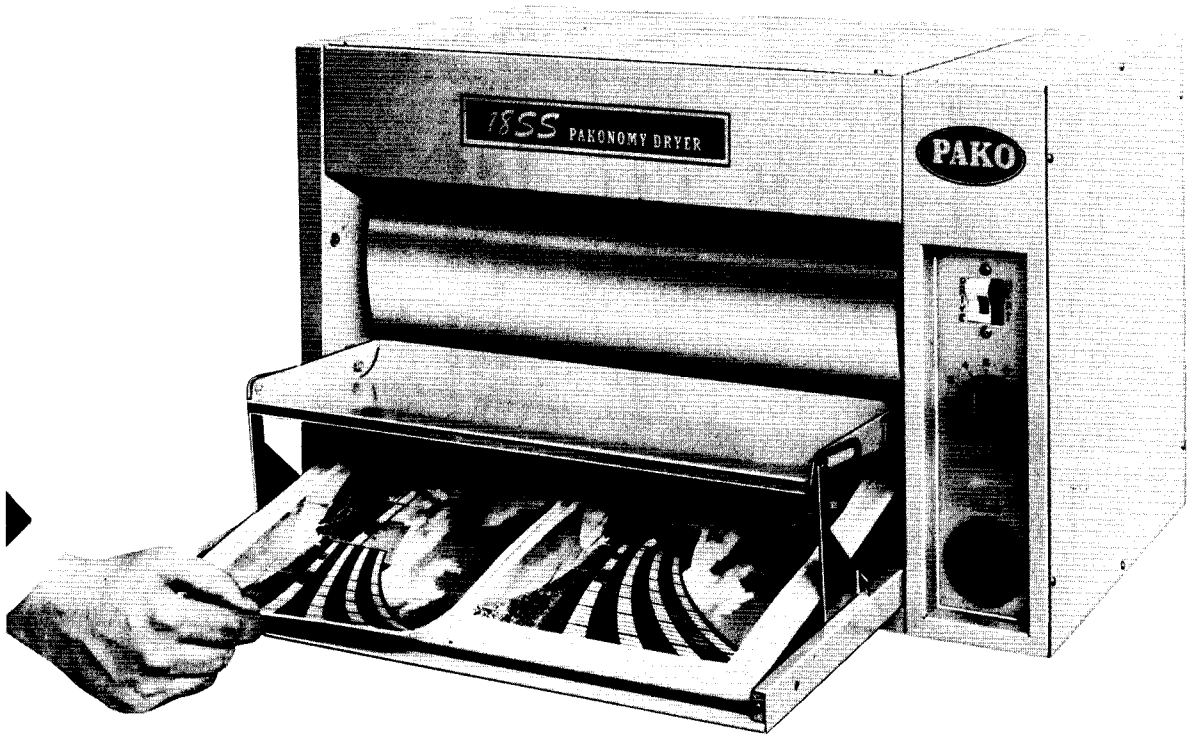




PAKO

ILLUSTRATED PARTS LIST

PAKONOMY MODEL 18SS DRYER



WHEN ORDERING
GIVE MODEL AND
SERIAL NUMBER
ON NAME PLATE

HOW TO USE THE PAKO ILLUSTRATED *Exploded View* PARTS LIST

Illustrations (Pages 2-4)
Each Figure illustrates a major assembly.

Numerical List (Page 4)
Lists all part numbers in numerical order.

Procedure
- See Illustration of major assembly.
- Locate and list the individual parts or assemblies required.
- Refer to Numerical List for part name.
- Contact your Authorized Pako Distributor for prices.

Hints for Better Service
- Remember that parts wear in groups. Replace associated parts in groups for best service.
- Include set screws, lock rings, bolts, etc.
- Parts not listed are not available except as part of an assembly.

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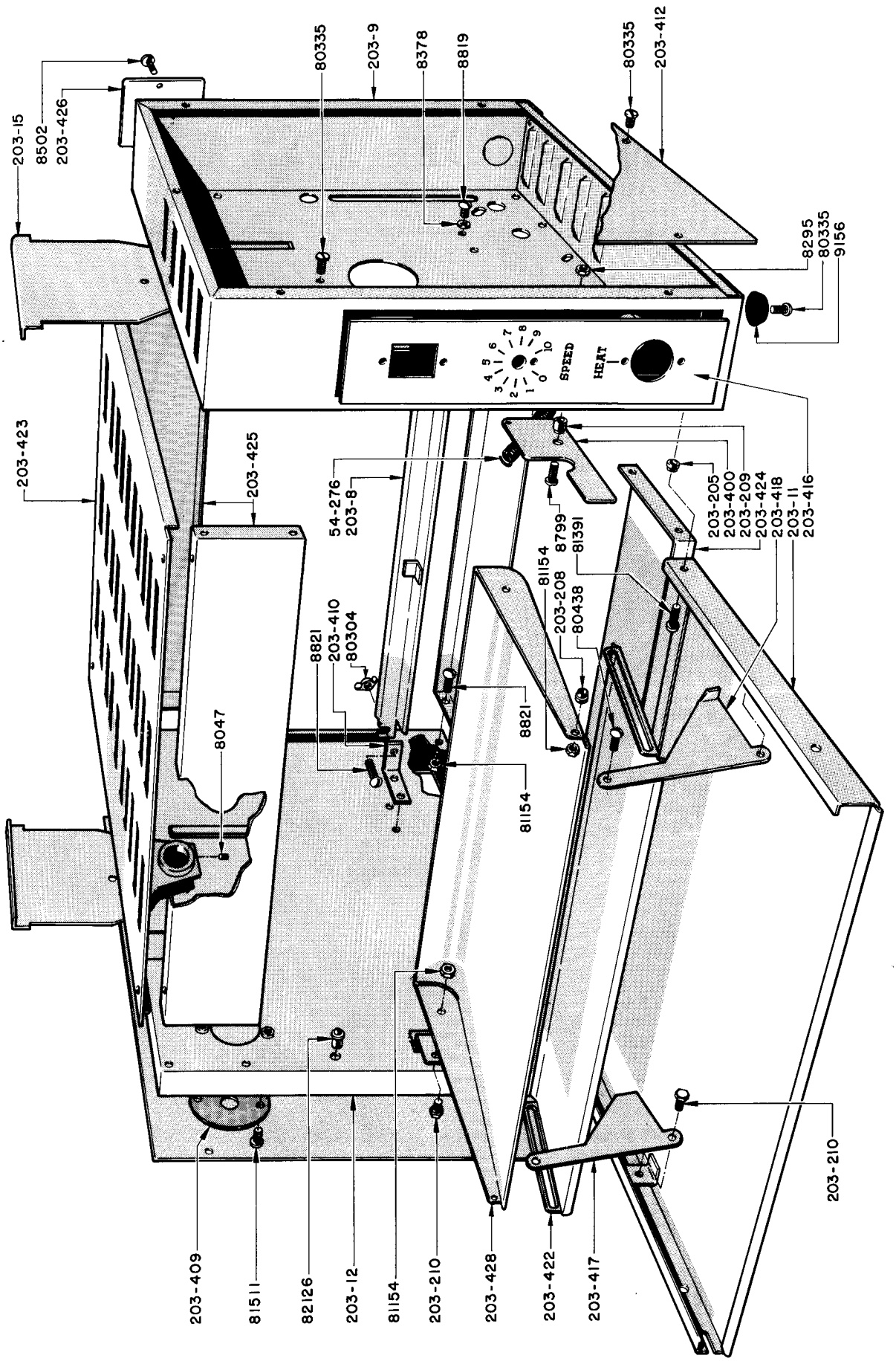
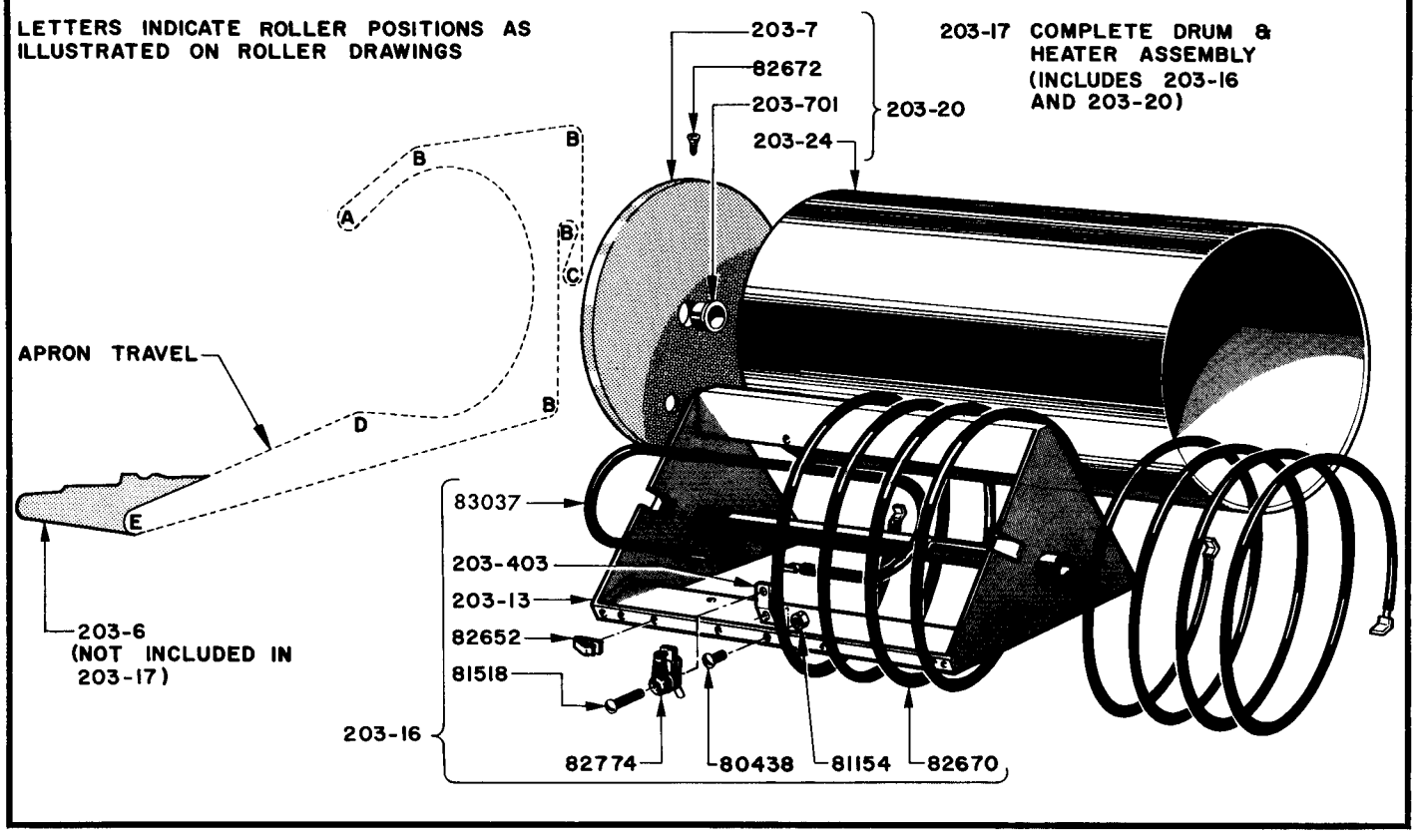
PRINTED IN U.S.A. 5000 3-68

Form 51-1R2
Index B7-5-1

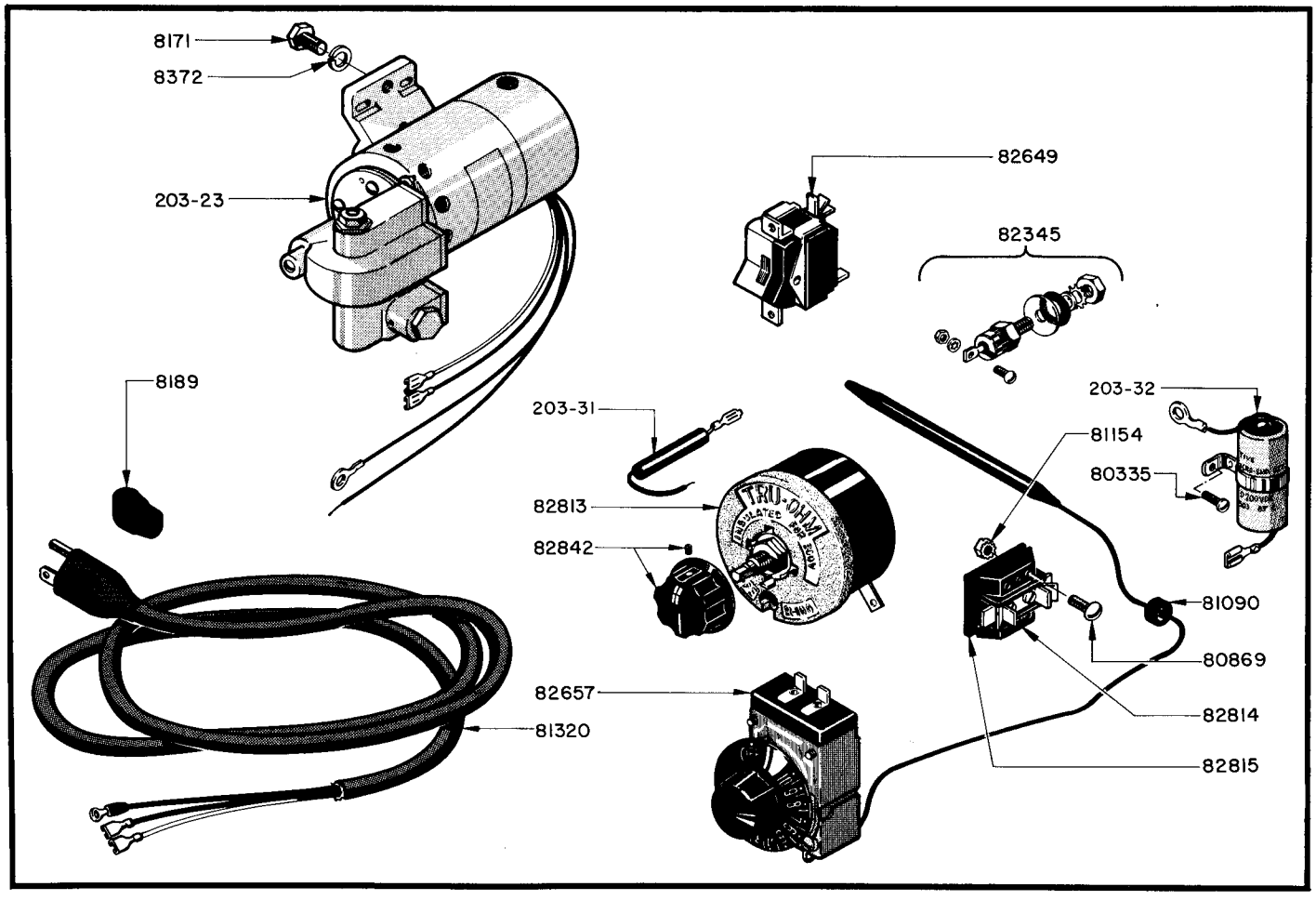


IMPORTANT — To avoid possible errors, be sure to give Serial number and name of machine when ordering parts.

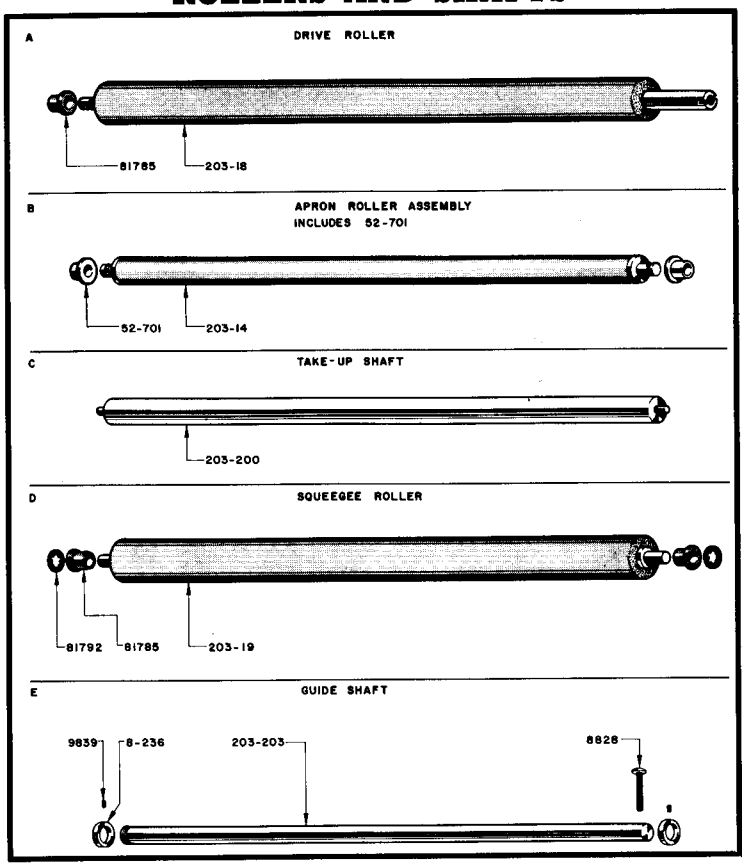
DRUM AND HEATER ASSEMBLY



ELECTRICAL COMPONENTS



ROLLERS AND SHAFTS



ORDER BY PART NO.	PART NAME	Quantity Per Machine
203-6	Apron assembly	1
203-7	End assembly, drum (Includes 203-701)	2
203-8	Support assembly, bulb	1
203-9	Frame assembly, right	1
203-11	Table assembly	1
203-12	Frame assembly, left	1
203-13	Spindle assembly	2
203-14	Roller assembly, apron	4
203-15	Support assembly, drum	2
203-16	Heater assembly	1
203-17	Drum and heater assembly	1
203-18	Roller assembly, drive	1
203-19	Roller assembly, squeegee	1
203-20	Drum assembly (Exchange allowance $25.00)	1
203-23	Motor assembly, drive (Replaced by 203-44 on Machine Serial No. 1211 and higher. Also see 203-46)	1
203-24	Shell, drum (Not sold separately—See 203-20)	
203-28	Cord assembly	1
203-31	Resistor assembly. Used on Machine Serial No. 1210 and lower (Replaced by 203-45 on Machine Serial No. 1211 and higher)	1
203-32	Capacitor assembly	1
203-44	Motor assembly, drive (Used on Serial No. 1211 and higher)	1
203-45	Resistor assembly (Used on Machine Serial No. 1211 and higher)	1
203-46	Motor conversion assembly (Used on Machine Serial No. 1210 and lower)	1
203-200	Shaft, takeup	1
203-203	Shaft, guide	1
203-205	Bushing, table	2
203-208	Bushing, tray	2
203-209	Bushing, arm	2
203-210	Stud, link	4
203-400	Arm, squeegee	2
203-403	Bracket, thermostat	1
203-409	Plate, bearing	1
203-410	Bracket, bulb	2
203-412	Panel, side	2
203-416	Plate, control	1
203-417	Link, left tray	1
203-418	Link, right tray	1
203-422	Extension, tray	1
203-423	Cover	1
203-424	Angle, base	2
203-425	Member, top cross	2
203-432	Plate, data	1
203-428	Tray, print	1
203-701	Bearing	
8-236	Collar	2
52-701	Bushing, apron roller	2
54-276	Spring, brake	2
8047	Screw, set	2
8171	Screw	2
8189	Relief, strain	1
8295	Nut	2
8372	Washer	2
8378	Washer	6
8502	Screw	2
8799	Screw	2
8819	Screw	6
8821	Screw	16
8828	Screw	1
9156	Bumper	4
9839	Screw, set	2
80304	Nut, wing	1
80335	Screw	23
80438	Screw	3
80869	Screw	2
81090	Grommet	1
81154	Nut	26
81320	Cord, electric power (Replaced by 203-28)	1
81391	Screw	2
81511	Screw	2
81518	Screw	4
81785	Bearing	3
81792	Ring, retaining	2
82126	Catch, ball	2
82345	Rectifier	1
82649	Switch, 115V, 15 amp	1
82652	Clip, cable	14
82657	Thermostat	1
82670	Heater, 400 watt	2
82672	Screw	6
82774	Thermostat	1
82813	Rheostat (Used on Machine Serial No. 1210 and lower. Also see 83256)	
82814	Block, terminal	1
82815	Strip, marker	1
82842	Knob, rheostat	1
83037	Heater, 205 watt	2
83256	Rheostat (Used on Machine Serial No. 1211 and higher. Also see 82813)	

NOT ILLUSTRATED

16-117	Wiping cloths	1
9660	Pin, roll (Used on the 203-23 motor assembly)	1
83082	Spring, brush (Used on 203-23 motor assy.)	2
83083	Holder, Brush (Used on 203-23 motor assy.)	2
83084	Brush assembly (Used on 203-23 motor assy.)	1
83919	Cap, Brush (Used on 203-44 motor assembly)	
83920	Brush (Used on 203-44 motor assembly)	
83921	Spring, Brush (Used on 203-44 motor assembly)	
203-54	Brush Replacement Kit (Used on 203-44 motor assembly)	

†Not illustrated

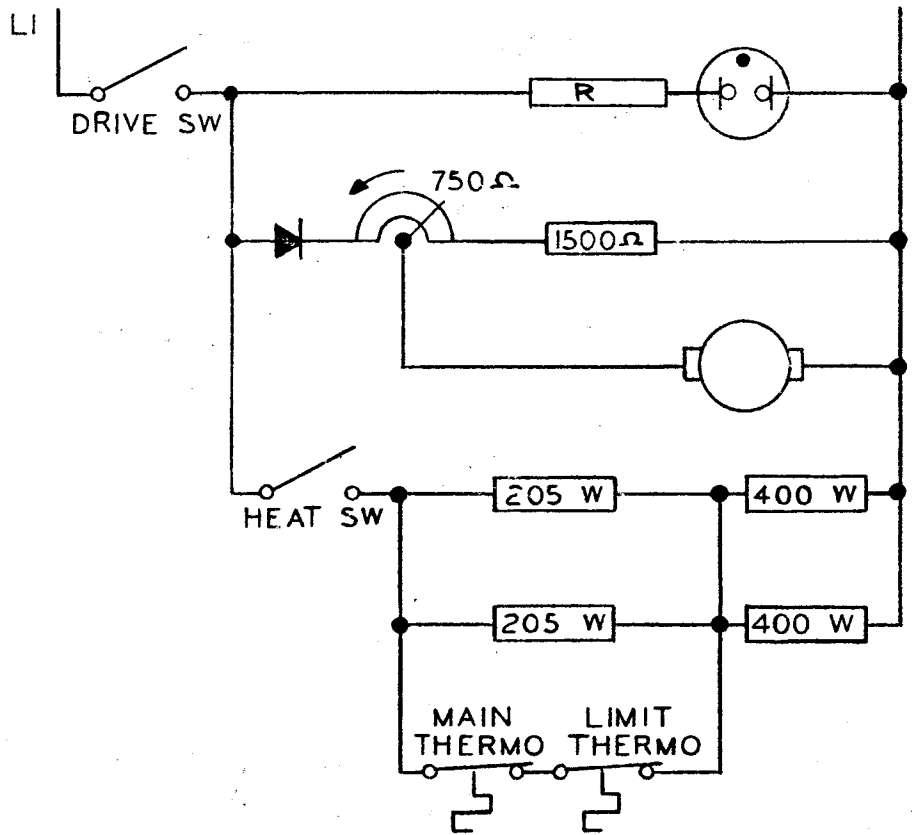
*Indicates repair parts to be checked most frequently and replaced for best operation.

All right and left parts are so designated from the operator's position facing the machine.

Special Components for 230 Volt Operation

Standard 115 V. 60 Cy. Part No.	230 V. 60 Cy. Part No.	PART NAME	Qty. Per Machine
203-16	203-26	Heater assembly	1
203-17	203-27	Drum and heater assembly	1
82649	83057	Switch	1
**	83036	Transformer	1
82814	83058	Strip, terminal	1
82815	83059	Strip, marker	1

**Denotes additional part not in basic assembly.



203-1903

120 VOLT, 60 CYCLE
SINGLE PHASE, 2 WIRE

APRONS FOR PAKO PRINT DRYERS

INSTALLING THE NEW APRON

Refer to the Instruction Manual for your Pako Dryer for instructions on installing this new apron. If you don't have a copy of the Manual, they are available from your local Pako Distributor:

Pakonomy, Model 13, 26, 26M, 26S, 26W, 26GW, 44	Form 52-001
Pakomax; Model 18SS Pakonomy	Form 51-011
Electrogloss	Form 2-007
Economy; Economy 48	Form 48-010
Pakoline, Model 62	Form 60-012
Pakoline, Model 66	Form 68-005
Pakopak, Model 1, 2 & 3	Form 91-001

NOTE: For a longer usable life, Pako aprons are deliberately cut as short as possible. If you install an apron on a Pakonomy Dryer with static eliminator rollers (see the Instruction Manual), you may have to leave out these two rollers for the first day until the apron stretches.

Watch the apron during the first few hours of operation, and correct any drifting to the side before the apron gets creased. If the apron *does* get creased, moisten it thoroughly with a sponge, turn the dryer heat on, and carefully guide it thru the dryer until the crease irons out.

APRON MAINTENANCE

Change the apron whenever it begins to get harsh, dirty, or chemical stained.

It may be washed in a mild soap or detergent in an automatic washer (household or laundromat), and damp dried -- the normal spin dry of the washer is sufficient.

Do not dry the apron in an electric or gas tumble dryer, and do not permit it to air dry. While still damp-dry, install it on the Dryer and turn on the drive and heat. Run the Dryer until the apron is dry, to prevent it from taking a "set" which could cause tracking problems.

If the above drying procedure isn't practical for your operation, dry the washed aprons with a hand iron or mangle at low temperature.

Never wash and reuse the apron after it becomes ragged or badly stretched out of shape.

NOTE: For information on proper procedures to avoid print drying problems, refer to Service Bulletin G-17. This bulletin, available from your local Pako Distributor, contains valuable information on:

- processing prints for best glossing;
- glossy drying problems;
- matte drying problems;
- static, creasing, and stain prevention.

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SERVICE BULLETIN

PAKO CORPORATION • MINNEAPOLIS, MINNESOTA 55440

SUBJECT: PAKO Solutions

BULLETIN G-11R5

Pako Solutions are formulated for use with Pako and other manual, automatic, and continuous processing equipment. This Bulletin describes the advantages and directions for use of Pakosol, Pakofine, Pakochrome, Pakostat, Pakowett, Pako-kleen, and Poli-Klene.

NOTE: *Solutions may vary slightly in color from batch to batch. This is inherent in the ingredients and will not of itself affect the usability of the solutions.*

PAKOSOL

Pakosol is a highly concentrated, multipurpose print conditioner for B/W prints, cut or strip, glossy or matte, single- or double-weight.

— Prints glossed in a dilute solution of Pakosol are soft and pliable with a beautiful glossy finish. One gallon of Pakosol will gloss more than 150,000 single-weight average-size amateur prints, or 18,000 8" x 10" (20.3 x 25.4 cm) prints.

— When used as a flattening agent for either matte or glossy prints, Pakosol produces flexible flat prints, ideal for mounting. One gallon will gloss and flatten over 50,000 single-weight, average-size amateur prints, or 6000 8 x 10's.

— Used continuously, it prevents the accumulation of foreign material on glossing surfaces. It leaves no harmful residue or scum. This eliminates the necessity of time-consuming, periodic drum cleanings which can be injurious to the glossing surface. The dryer drum is cleaned and preserved automatically, which means longer drum life and clean, highly-glossed, flat, flexible prints.

> **NOTE:** *The above is true only if the prints are properly processed and adequately washed.*

— It speeds print drying.

Pakosol is more highly concentrated than competitive solutions. It goes farther, is more economical to use. You can replenish the original solution for longer life and greater economy.

Directions for Mixing Working Solution

The following quantities are recommended for a normal room temperature of 70°F (21°C) and 40 to 50 relative humidity. If the humidity is higher, use less Pakosol: if lower, use more. For glossing, dissolve 2 fluid ounces of concentrated Pakosol per gallon of water (15.6 cc per liter).

For flattening (glossy or matte), dissolve 8 fluid ounces of concentrated Pakosol per gallon of water (62.4 cc per liter).

Directions for Use

Treat fixed and washed single-weight cut prints for 5 minutes in the dilute working solution; treat double-weight prints 8 minutes. For best results, agitate the prints in the solution during treatment.

> **CAUTION:** *Don't soak the prints too long in Pakosol. Soaking for a shorter time is better than letting them soak too long.*

With mechanical print dryers, follow the instructions supplied with the dryer.

> **NOTE:** *Keep the fixer fresh, and wash the prints thoroughly.*

To get a good writing surface when glossing photo post cards, use a minimum solution concentration and immerse not more than 1 minute.

Pakosol doesn't spoil when stored. If only a few prints are processed, it can be reused for several days if it doesn't become contaminated.

Directions for Replenishing

For glossing, replenish with about 1 fluid ounce of Pakosol per gallon of dilute solution (7.8 cc per liter) for every 2000 amateur-size single-weight prints treated. The exact amount to replenish can be better determined in actual use.

For flattening, replenish with about 3 fluid ounces of Pakosol per gallon of dilute solution (23.4 cc per liter) for every 2000 amateur-size single-weight prints treated.

PAKOFINE

Pakofine is a highly concentrated multipurpose conditioner, formulated for B/W prints processed and dried in a continuous strip processing line. It can also be used for cut prints.

A dilute solution is placed in a tray between the continuous processor and continuous dryer, and the prints are passed thru the solution before entering the dryer.

— Pakofine improves print gloss.

— It increases print flexibility, insuring top-quality flat prints ready for mounting.

— It aids uniform print drying.

— It encourages uniform release from the drum surface.

— Used continuously, it prevents the accumulation of foreign material on the drum surface, reducing the frequency of time-consuming drum cleanings which can be injurious to the glossing surface.

Directions for Mixing Working Solution

Dissolve 1 fluid ounce of concentrated Pakofine per gallon of water (7.8 cc per liter). Use this dilute solution to fill the conditioner tray.

Directions for Use

After each day's operation, drain and thoroughly clean the conditioner tray.

Each morning refill the tray with fresh dilute solution.

Directions for Replenishing

Replenish the solution in the conditioner tray every 2 hours of operation, by adding ⅛ fluid ounce of Pakofine per gallon of dilute solution (1.3 cc per liter).

PAKOCHROME

Pakochrome is a highly-concentrated multipurpose conditioner for paper-base color print material, either cut or strip.

— Pakochrome aids uniform print drying.

— It encourages uniform release from the drum surface.

— It improves print gloss.

— Used continuously, it prevents the accumulation of foreign material on the drum surface, reducing the frequency of time-consuming drum cleanings which can be injurious to the glossing surface.

Directions for Mixing Working Solution

Dissolve 2 fluid ounces of concentrated Pakochrome per gallon of water (16 cc per liter). Use a clean enamel, stainless steel, or inert plastic container for mixing the solution.

Directions for Use

With continuous processing equipment, the prints should pass thru the dilute solution just before entering the dryer.

Dip cut prints in the dilute solution for a few seconds, drain off the excess moisture, then immediately place the prints on the dryer.

Do not leave the prints in the dilute solution longer than a few seconds. With some materials, a slightly stronger concentration may be necessary.

Every 4 hours of operation, drain and thoroughly clean the conditioner tray, then refill with fresh dilute solution.

PAKOSTAT

Pakostat is a static-reducing solution for cut or strip prints, either B/W or color. When added to Pakosol, Pakofine, Pakochrome, or other print conditioners, it will minimize static in the prints and make print handling much easier.

> **CAUTION:** *Pakostat will loosen dirt or foreign matter. Be sure the container is clean to avoid contamination which may cause unsatisfactory print gloss.*

Directions for Use

Add ½ fluid ounce (15 cc) of Pakostat to each gallon of diluted print conditioner (4 cc per liter). Do *not* add Pakostat to concentrated conditioning solutions.

Directions for Replenishing

When you replenish the print conditioner, also add ¼ fluid ounce (8 cc) of Pakostat per gallon of dilute solution (2 cc per liter).

PAKOWETT

Pakowett is a super-concentrated wetting agent which may be used in dilute solution. One gallon will do the work of 20 or more gallons of other similar preparations.

— It speeds film drying 30 to 40 percent, when used as a final bath in film processing.

— It reduces spotting or streaking of film by water.

— It eliminates manual wiping or sponging, a cause of scratches.

— It reduces air bells in developer solutions, and can also be used with stop baths and fixers. It also permits even and more rapid penetration of the solutions.

— It is ideal for photo retouching and art work on glossy surfaces. Adding a little to water colors or opaque will pro-

mote smooth application and even spreading with either air or hand brushes.

Directions for Mixing

For Treating Film Before Drying. To make a working solution, add 1 fluid ounce of concentrated Pakowett per 25 gallons of water (30 cc per 100 liters).

In Film and Print Processing Solutions. To make a working solution, add ⅓ fluid ounce of concentrated Pakowett per quart of water (10 cc per liter).

In Water Colors or Opaque. To make a working solution, add ⅓ fluid ounce of concentrated Pakowett per quart of water (10 cc per liter).

Directions for Use

For Treating Film Before Drying. Immerse the film in the dilute solution for 1 to 3 minutes before drying. For best results, mix a fresh batch daily, or more often if contaminated.

In Film and Print Processing Solutions. Add ⅛ fluid ounce of working solution per gallon of developer, stop, or fix (1 cc per liter). If the solutions are being replenished, add the working solution in the above proportions to the replenisher also.

In Water Colors or Opaque. Add 1 or 2 drops of working solution per fluid ounce of mixed color or opaque (1 or 2 drops per 30 cc).

PAKOKLEEN

Pakokleen is a safe, non-abrasive, efficient cleaner for all polished dryer drums. It is particularly effective in removing print emulsion and splicing adhesives.

Frequent drum cleaning should not be necessary if Pako print conditioners are used as directed.

Rules

1. The drum should be cool for easier cleaning.
2. Use only a soft clean cloth, to prevent scratching the drum surface.
3. Keep away finger rings, buttons, or any other hard or sharp objects which can scratch the polished surface.

Directions for Use

1. If Pakokleen has separated in the container, shake or stir it until it is thoroughly mixed.
2. If necessary, remove the apron or rollers to get at the drum surface.
3. Wet a small cloth and use it to apply Pakokleen to the drum, rubbing the area thoroughly and repeatedly. Use enough water to work up a light suds; if the cleaner on the drum is the consistency of paste, the cloth isn't wet enough.
4. Use a larger wet cloth to wipe the area clean. Rinse out the cloth often to keep it clean.
5. Turn the drum and repeat the above cleaning operation on another area until the entire surface has been cleaned.
6. Wet another large cloth, wring it out almost dry, and wipe away any streaks left from the previous wiping.
7. A final polishing with a clean dry cloth is advantageous but not required.

After cleaning, the surface should feel very slick when wiped with a dry cloth. If it doesn't, repeat the entire cleaning operation. If the drum has been allowed to get very dirty, you may have to go over it thoroughly three or four times to get it clean.

> **NOTE:** *Some exhausted chemicals, if not washed out, can contaminate the drum without being visible. If you are having sticking problems you will probably have to scrub the drum three or four times. The apron* **must be changed** *at this time or the drum surface will be recontaminated almost immediately.*

Before running production work, condition the dryer drum by running thru a quantity of scrap prints which have been treated in a print conditioner.

POLI-KLENE

Poli-Klene is a stainless steel polish and cleaner.

— It removes chemical and surface deposits.

— It leaves an invisible repellent coating which resists chemicals and water and helps to prevent new deposits and stains.

— It adds luster to the surface.

Directions for Use

Apply a small amount of Poli-Klene to a damp cloth. Polish with a straight-line motion in the direction of the polished line pattern of the stainless steel surface (do *not* use a circular motion).

Wipe with a wet (not dripping) sponge and polish with a dry soft cloth.

> **CAUTION:** *Poli-Klene is an abrasive polish. Don't use it on painted surfaces or highly reflective surfaces such as ferrotyping drums or plates.*

PAKO CORPORATION
MINNEAPOLIS, MINNESOTA 55440

SERVICE BULLETIN

PAKO CORPORATION • MINNEAPOLIS, MINNESOTA 55440

BULLETIN G-17R1

SUBJECT: Print Drying Problems

CONTENTS

GENERAL

NOTE: *Although this Bulletin is written with cut print drying in mind, much of the information also applies to continuous processing and drying. For further information on the latter, see the Instruction Manuals for the individual machines.*

To force-dry prints with heat, they must be correctly processed and the heat and machine speed when drying must be properly coordinated.

Overheating causes discoloration, cockling or buckling of the edges, an "orange peel" effect in the body of the print, or fleck marks and dull spots. The gelatin emulsion dries more rapidly than the paper back, thus curving the print in the direction of the paper grain. The corners dry out first, then the edges, and finally the center. This sets up stresses and strains in the paper which are exaggerated by forced drying.

Running the dryer too fast causes the prints to stick to the drum, as they are not dry after completing a cycle around the drum.

Improper processing causes most of the other defects which appear in dried prints.

CAUTION: *Never dry color prints on a Pako Drum which isn't made of stainless steel. The Pako Warranty applies only to drums used as recommended.*

PROCESSING PRINTS FOR BEST GLOSSING

B/W Prints

NOTE: *See also the recommendations of the paper manufacturer.*

Developing. Expose the prints so they will develop out in normal time. Avoid forcing the development.

Stop Bath. Use an efficient stop bath to increase the life of the fixer (don't use discarded fixer for the stop bath). Don't leave the prints in the stop bath longer than necessary.

Fixing Bath. Agitate the prints in the fixing bath to be sure every print is completely fixed. Partially fixed prints and products of the exhaused fixer tend to corrode even the most corrosion-resistant drum surface. Check the fixer regularly for contamination, and be sure it isn't exhausted. Don't allow the

prints to soak in the fixer longer than necessary. Don't use too much hardener in the fixer.

Washing. Don't wash prints in cold water: the temperature of the wash water should be near the temperature of the processing solutions. Wash the prints long enough to get a good wash. A long wash in cold water is hard on the paper and doesn't remove the fixer.

Every few days, check print drippings with the American Standard test for determining residual fixer content, ASA No. PH 4.30 (1962).

For best results, the water should be filtered with a Pako Super Life Filter. Unfiltered water contains foreign matter which will be transferred to the face of the prints.

For more information on water for photoprocessing, see Service Bulletin G-9.

Pakosol. Using Pakosol to condition B/W prints is particularly important, and Pako won't guarantee the drum if you don't. Pakosol has been specially developed to give a high gloss, to hasten the release of the prints from the drum, and to give flatter prints. It also lessens the amount of heat needed for perfect glossing.

Follow the instructions on the container, and agitate carefully to be sure all print surfaces are completely covered. Don't agitate so strongly that you get air bubbles on the prints.

For more information on Pako solutions, see Service Bulletin G-11.

General. Drain the prints before placing them on the dryer apron. Prints which are too wet will need more heat and/or a slower apron speed to dry. Leave only a thin film of moisture on the face of the prints.

Prints which are fixed in exhausted fixer or washed in cold water won't be washed properly and will carry silver onto the drum surface — the drum will then have to be thoroughly cleaned with Pakokleen.

A long soaking in any solution or wash does nothing to improve the process, and tends to stretch or soften the paper, making it harder to get smooth flat prints without cockled edges and wrinkles.

Beware of foam or bubbles in baths; they leave a film of bubbles on the print surface, which can lead to fleck marks. Washing problems caused by bubbles will be reduced if you use a Pakolux Washer.

Color Prints

For color prints, follow the processing schedule of the paper manufacturer. Don't let the prints soak longer than recommended in any solution, and be sure to give them an adequate wash.

Use Pakochrome as recommended on the container. Follow the instructions carefully, and be particularly careful not to leave the prints in the Pakochrome longer than recommended.

GLOSSY DRYING

The glossy surface of cut prints is more susceptible to defects and irregularities than that of strip prints, mostly because of the absence of quality controls over the processing and drying. The time, temperature, solution strengths, and washing of cut prints are often uncontrolled variables from day to day and even within the day.

Because of these variables, it is hard to say of any one thing that it is the precise cause of a glossing problem. However, you can divide the causes roughly into two general classes according to whether the gloss is restorable. To do this, soak the defective prints for seven or eight minutes each in water, then in the appropriate Pako print conditioner, and re-dry them. You may have to repeat this a second or third time.

If you get a good gloss when you re-dry the prints, one or more of the following things happened the first time:

1. The moisture film on the print surface was uneven.
2. There was too much air in the wash water.
3. Portions of the prints were air-dried by over-draining.
4. The emulsion was over-hardened.
5. The drum was too hot relative to the speed of the machine or the coldness of the wash water.
6. The drum was heated too high for too long between batches.
7. Algae, dust, lint, or other foreign particles were present (wash water not filtered).
8. The paper was in poor contact with the drum.
9. The print conditioner was worn out or contaminated.

If, on the other hand, the gloss cannot be restored, the following additional things may be wrong:

1. The fixing was incomplete because the prints matted in the fixer, or because the fixer was worn out.
2. The prints were underexposed and overdeveloped. If they remain too long in the alkaline developer, they cannot stand the acid in the stop bath (especially if it is fresh).
3. The chemical baths and wash water weren't kept in proper balance, or the pH of the stop or fixer was off.
4. The particular batch of paper won't take a good gloss. This is a remote possibility, to be checked only after all other tests and corrective actions have failed.

MECHANICAL ADJUSTMENTS FOR IMPROVING GLOSS

1. Square and level the dryer. Use a carpenters' square to be sure that the uprights or legs are vertical and parallel. Use a level on the feeding table and similar vital frame parts which should be horizontal and at right angles to the vertical parts.

   To correct, loosen all brace bolts slightly, square the frame, then retighten the bolts carefully.

2. If the prints release from one edge of the drum more slowly than from the other, if dull spots in the gloss are large or widely scattered, or if the prints crease diagonally, test the contact of the prints on the dryer drum.

   To do this, lay strips of wrapping paper 2" wide by 24" long (5 x 60 cm) side-by-side lengthwise of the apron and

about 4" (10 cm) apart. The leading ends should be even. Run the strips about 4" under the drum, then stop the machine and pull out the strips one by one. If the pressure is lighter on one side:

Pakonomy: *Tighten the squeegee roller tension springs on that side.*

Economy: *Raise the opposite rear leg.*

Electrogloss: *Raise the bed rail on the same side at the front end.*

3. The squeegee roller must have a uniformly straight or even surface, and be soft enough to indent easily under finger pressure. If the rubber has "bloomed" on the ends, if the surface is hard or scaly, or if the roller isn't straight, replace the complete roller assembly or install a new rubber tube.
4. Replace any wobbly ball bearings on the squeegee rollers. Worn bearings can drop one end of the roller lower than the other, causing uneven pressure against the drum.
5. Change the apron whenever it begins to get harsh, dirty, or chemical stained.

   Aprons may be washed in a mild soap or detergent in an automatic washer (household or laundromat), and damp dried — the normal spin dry of the washer is sufficient.

   Do *not* dry the apron in an electric or gas tumble dryer. Do not permit the apron to air dry, but immediately install it on the dryer. Turn the dryer drive and heaters on, and run them until the apron is dry. This will prevent the apron from taking a "set," which could cause tracking problems.

   If the above drying procdeure isn't practical for your operation, dry the washed aprons with a hand iron or mangle at a low temperature.

   Aprons should not be washed and reused after they become ragged or badly stretched out of shape.
6. On air-heated dryers, set the thermostat at 200° F (23.5° C) or less if necessary to get a good gloss. For air-heated Pakonomy Dryers, see the Instruction Manual, Form 52-001.

   On water-heated models, 180-190° F (82-87.5° C) is the best setting.
7. Set the motor speed so prints will drop off (at the proper temperature) just as they emerge from under the apron. Don't run so fast that you have to stop the machine intermittently while prints "cook." This erratic operation doesn't give consistent quality results. The speed should normally be changed only when you change to prints of a different weight or type.

   NOTE: *The safe temperature at which a sheet print can be dried is about 180-190° F (82-87.5° C) at the point of contact with the drum surface. If the production rate is too slow at the desirable temperature setting and the proper related speed, it is best to invest in a second machine to get the necessary production and a perfect gloss, rather than to increase the temperature.*

When you have a suitable combination of heat and speed, keep those settings. Don't try to "rush" a batch of prints thru, as this invites trouble.

If poor gloss continues after making the above adjustments, you will have to take one or more of the steps outlined under "Gloss Defects," below.

GLOSS DEFECTS

There are several types of defects which can be fairly easily recognized:

— Pinholes.

— Shallow fleck marks.

— Deep, flat-bottomed pits.

— Blisters.

— Dull grainy areas along the leading edge of prints, across the corners, or elsewhere.

— Dull spots around lint or other foreign matter embedded in the surface of the paper.

— Long irregular drying marks.

— Edge lift.

Pinholes

Pinholes in the emulsion are caused by:

— Too rapid shrinking of the gelatin.

— Emulsion overhardened because of too strong a stop bath or fixer, and/or too much soaking in each.

— Water that is too cold and a drum that is too hot.

— Worn-out Pakosol.

— Dirt in the wash water or Pakosol.

Recommendations:

1. Dry at lower heat and/or slower speed.
2. Soften the emulsion by providing warm water (near the processing temperature) for washing; or warm the Pakosol to 80-85° F (26.5-29.5° C); or use an extra bath of 5-10% sodium carbonate; or treat prints for a shorter time in the stop bath and fixer.

   If the time interval is fixed (as with a Printmachine), check the pH of the stop bath. Try regular fixer, mixing your own formula instead of ready-mixed fast-acting (quick-penetrating) fixers. Or try replacing the second fixing tray in the Printmachine with a wash tray. With fast fixers it is often better to have the second fixer one-third the strength of the first.
3. Replenish the Pakosol or replace it with fresh solution more often.
4. Use a Pako Super Life Filter in the wash water supply line.

Shallow Fleck Marks

Fleck marks are usually caused by poor contact between the print and drum, uneven wetting of the print surface, air bubbles or foam, or excessive heat.

Recommendations:

1. Test the contact as outlined under "Mechanical Adjustments for Improving Gloss," above.

2. The prints should have an even film of moisture over the entire surface. Dry paper won't gloss. Avoid overdraining, but keep the prints from draining onto the dryer apron by holding them off to one side or by supporting them on an absorbent towel when feeding prints to the drum.

3. Air bubbles in the wash water are caused by forcing water thru an orifice (Mesurflo or Pako Regulator Valve) under high pressure. To eliminate them, install a pressure reducing valve about 20 feet (6 meters) ahead of the restriction (in both the hot and cold lines).

   Foam may appear in Pakosol or other print conditioning baths, especially when mixed in soft water or agitated excessively.

   Antifoam additives are available under various trade names, and are very effective in preventing foam formation. Foam may also be sponged off the print surface, but don't wipe the prints dry.

4. The surface temperature at the point of contact should not exceed 180-190° F (82-87.5° C). Excessive heat can "fry" the emulsion like an egg in a hot pan, until the surface has no gloss at all.

5. Be sure the fixer doesn't contain too much hardener.

Deep Flat-bottomed Fits

Deep pits result from a combination of excessive drum heat and water or chemicals trapped in the emulsion (especially when cold). A steam explosion results.

Recommendations:

1. Reduce the heat.
2. Reduce the dryer speed.
3. Wash with water that is near the processing temperature.

Blisters

Blistering can be caused by:

— Solutions which are too warm.

— Rough handling.

— Defective paper stock.

— Drops of water on the apron under the print.

— Too low a pH in the stop bath or fixer.

Dull Grainy Areas

Dull grainy areas in the prints can have several causes:

— Overdraining leads to partial air drying of exposed edges and corners.

— Too cold a print on too hot a drum causes the lead edge of the print to "sizzle."

— If fixing is incomplete, "free" or insoluble silver compounds in the emulsion will break down in the presence of heat.

— Prints too long in alkaline developer cannot tolerate fresh acid stop bath, and the emulsion will break down.

Recommendations:

1. Coordinate the machine heat and speed with emulsion hardness.

2. With the cooperation of the manufacturers whose paper and chemicals you are using, determine the average number of prints (total area) of the size you are making that can be processed in your equipment in the volume of solutions used. Keep well within the limits — chemicals are cheaper than other materials and time.

   The manufacturer would also like to have matched chemicals used with his paper for best results.

3. Check the recommended relative acidity of the stop bath and fixer with quick (partial) tests, using pH paper furnished in quality control kits. Chemically check the completeness of fixing and washing. Test solutions are available at photographic supply stores in bottles wtih glass applicators.

4. Another partial test of fixer exhaustion is to suspend a small clipping of undeveloped film in the tray. While the fixer is fresh, record the clearing time. When twice the time is required for clearing, throw it away.

5. Test for residual fixer in the prints. Use a prepared test solution, or test drippings from washed prints in dilute potassium permanganate. The purple color will disappear in the presence of excessive fixer.

   NOTE: *Tests 3, 4, and 5 above are only partial tests. For a complete checking system, use the quality control service manuals provided by the manufacturers of sensitized goods.*

Dull Spots Caused by Foreign Matter

Every speck of algae, lint, or other foreign matter that is deposited on the print surface and pressed into the emulsion when squeegeed dries with a dull area around it. Use a hand magnifying glass to determine what the material is, then search for the source.

Recommendations:

1. Keep the tanks or trays clean.

2. If you are manually processing, strain freshly-mixed solutions before using them. In a Printmachine, use a 13-3-304 Filter Group in the final tray.

   If you are using a continuous processing system, be sure to change the filters in the circulation-filtration lines as often as necessary.

3. Use a commercial water filter on the incoming water supply and/or a Super Life Filter on individual washers.

4. Hang a piece of sheet copper in wash trays to kill algae. See also Service Bulletin G-9 for information on algae.

5. Protect the dryer with a dust cover at night.

6. Clean the dryer drum occasionally with a damp cloth to remove dust and chemical deposits. When washing the drum, use a mild pure soap or a modern detergent. Use Pakokleen if the surface is seriously contaminated. Don't use abrasives that would remove the protective film of Pakosol and gelatin which have built up on the drum.

Long, Irregular Drying Marks

This is an irregular pattern of small dull spots, caused by surplus water from the prints mixing with old chemicals in a soiled apron. The solution runs down the drum a little way, dries there, and then the pattern is picked up by the next wet print dried on that spot.

Recommendations:

1. Don't dry prints with a dirty apron.
2. Don't spill chemicals on the apron.

Edge Lift

The edges of the prints may be dull if:

— The emulsion is too hard.

— The heat is too high.

— The contact is poor.

— The surface of the prints isn't moistened evenly.

— The prints are over-drained.

Print Sticking

There are several causes of sticking prints.

If they drop off, but slowly:

— The heat may be too low.

— The contact may be poor.

> **NOTE:** *Poor contact on one end of the drum is sometimes incorrectly analyzed as uneven heating.*

— The solutions may be exhausted or contaminated.

— Static may be present. See "Miscellaneous Problems," below.

— The wash water may have been too warm, or the drum temperature may have been above 210° F (99° C), so that the gelatin melted and deposited on the drum.

If the prints will not come off unless soaked and rubbed off, it is because silver from incompletely fixed prints (due to matting in, or exhaustion of fixer) has deposited on the drum and sulfurized there. Contamination from incomplete washing and chemical-impregnated aprons is probably present also. It will ultimately pit and deplate the drum surface. Prevention by quality control is the best cure. When sticking has occurred, use only Pakokleen Drum Cleaner, elbow grease (rubbing lengthwise of the surface), and a clear water rinse.

MATTE DRYING

You will get the best matte finish if the prints are thoroughly drained (or better yet, blotted), and are put thru the dryer at low heat and slow speed. The paper should be barely dry as it drops from the dryer. This is especially important for single-weight and light-weight papers.

Overheating can change the tone of the print, cause brown spots, give the print a lavender tinge (if there is residual fixer in it), or cause a shiny spot where the face of the print has touched a wet spot on the apron.

Overdrying results in print cracking, curling, and handling problems.

Upright Cut Print Dryers with Double Aprons

Under-drainage of the prints or failure to blot them enough necessitates use of too much heat, with the resultant problems mentioned above. It is also the cause of such mechanical troubles as inability of the blotting rollers to absorb moisture, binding of the aprons because they are wet, "slicking" of the rubber covered surface of the drive roller, and general wear-and-tear on the apron and drive gear.

The blotting rollers should be changed frequently. One set should always be drying out and ready to replace the saturated set. The heat should be left on for at least 20 minutes after the last batch of prints has been dried, so the aprons will dry out; otherwise the canvas will shrink tight onto the "oven" walls during the night. The aprons will then slip on the drive roller, will polish the rubber, and won't progress unless assisted by hand.

Wrinkling is caused by:

1. Air pockets under prints which don't lie flat on the apron.
2. Prints with upturned corners.
3. Some soft emulsion prints (especially long ones).
4. Stiff or curved prints which strike the inner apron while still held in the blotting rollers and then turn upward before turning downward to go thru the machine.

There are several possible remedies:

1. Lay the prints flat on the apron with the narrow edge forward and either parallel with or cornerwise to the blotting rollers. They may be placed face down or face up, whichever gives the best results.
2. For prints less than 12 inches long, try increasing the diameter of the top blotting roller by wrapping more cloth around it.
3. For longer prints, try removing the top roller completely and placing the prints face up.

> **NOTE:** *The above information applies only to dryers manufactured by Pako Corporation.*

Matte Drying Negative Color Prints

There is no practical method of force-drying cut sheet negative color prints with a full matte finish (air drying produces a semi-matte finish). Air-drying in the Pako Drycab isn't ideal, as the prints curl and buckle while drying.

You can get an excellent matte finish, however, by gloss-drying color prints on a Pako drum dryer, then spraying the prints with a finish such as Marshall's Matte-Finish Pre-Color Spray.

Pakonomy 26W or 26GW Dryers and Pakopaks, with chrome-plated stainless steel drums as standard equipment, will give you the finest results on color prints. The water-heated drums provide a maximum drying rate at precisely controlled temperatures. The finished prints are flat, free of wrinkled edges, and perfect for dry mounting or framing.

For lower quantity production, use a Model 26S Dryer, or a Model 13 with a 16-2680 drum. The Pako Economy or Economy 48 Dryers can also be equipped with a 16-2557 drum of chrome-plated stainless steel for drying color prints.

MISCELLANEOUS PROBLEMS

Creased Prints

Creased prints are usually caused by a stiff, dirty apron, or poor distribution of the squeegee roller tension (see "Mechanical Adjustments for Best Glossing," above).

Lines of weakness can also develop in the paper stock (especially in larger size prints) if you wash too long or violently.

Creasing can sometimes be avoided or minimized by placing a rod across the top bar of the machine base ahead of the drum (under the apron), to cause the prints to approach the drum at a downward angle that matches the circumference of the drum.

Staining

A yellowish stain on the back of prints can be caused by:

1. Faulty fixing.
2. Incomplete washing.
3. The use of brass containers for solutions.
4. Exhausted Pakosol, Pakofine, or Pakochrome.
5. Wet spots and chemical contamination on the apron.

The various color print processes also have characteristic staining problems, which are discussed in other Pako publications.

Dryers used for color prints often stain the backs of B/W prints if both are dried on the same machine. This can be avoided or minimized by frequent apron changes.

Static

Print paper is normally electrically neutral. However, when it is placed in intimate contact with a metal surface (such as a Dryer drum) static electricity can build up, causing prints to cling to that surface.

This is particularly a problem in dry climates or when the humidity is low (as in winter).

Static problems in these situations can never be completely eliminated, but you can get considerable relief by attention to the following:

— Keep the fixing bath at the correct working strength;

— Be sure the wash water flow rates and temperature are correct;

— Use Pako print conditioner (Pakosol or Pakochrome) exactly according to the directions;

— Use Pakostat according to the directions;

— Keep the drum and apron clean;

— Install a humidifier to maintain a relative humidity of 30 to 40%. Moisture in the air helps to "bleed off" the static charge from the prints so they'll drop free of the drum (it usually makes for a more comfortable working climate, too).

If prints stick close to the drum because of static, pulling them off will only aggravate the condition.

Static attraction is caused by a difference in electrical charge between the print surface and the drum surface. If the print is allowed to remain on the drum for a few seconds, the charges will gradually equalize. Pulling the paper free leaves an unbalanced charge on both surfaces, which makes succeeding prints stick even more.

PAKO CORPORATION

MINNEAPOLIS, MINNESOTA 55440

PAKO®

WARRANTY

PAKO Corporation guarantees each new PAKO Product and each PAKO Part to be free from defects in workmanship and material.

PAKO obligation under this warranty is limited to making good at PAKO factory any Part or Parts of the Product, which, within **12** months from the date of purchase, shall be returned to PAKO with transportation charges prepaid, and which, on examination, shall be found to have been thus defective.

This warranty shall not apply to any PAKO Product whose unsatisfactory performance is due to:

—Instability of sensitized materials or chemical concentrations and replenishing rates or chemical and wash water immersions or sequences.

—Lack of applied adequate quality production control procedures as recommended by the sensitized material and chemical suppliers.

—Inadequate continuous maintenance and cleanliness procedures, as recommended for PAKO Product operation.

—Lack of sufficient volume of sensitized materials for economical PAKO Product operation.

—Changes in characteristics or process procedures made by suppliers of sensitized materials or chemicals after delivery of the PAKO Product to the User purchaser.

This warranty shall not apply to any PAKO Product which shall have been repaired or altered outside of the PAKO factory, nor which has been subject to misuse, negligence or accident, nor which has had the serial number or name altered, defaced or removed. Neither shall this warranty apply to any PAKO Product in which other than PAKO Parts have been used.

PAKO Corporation will assume no responsibility for loss of materials, labor or time necessary for PAKO Product operation.

This warranty is expressly in lieu of all other warranties, expressed or implied, and PAKO neither assumes nor authorizes any representative or other person to assume for PAKO any other liability in connection with the sale of PAKO Products or PAKO Parts.

PAKO CORPORATION
Minneapolis, Minnesota, U.S.A. 55440

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PAKO®

GUARANTEE

The **Pakonomy 18 SST Dryer** which you are now installing is guaranteed against defective materials and workmanship for a period of **12** months—

PROVIDING—You record it at the factory within a period of ten days after installation.

Please tear off the card, fill in complete information as requested, and MAIL IT IN AT ONCE! Your guarantee becomes effective only if this information is received at the factory.

PAKO CORPORATION

Tear Off and Mail

PAKO®

GUARANTEE

The **18SST Drum** which you are now installing is guaranteed against defective materials and workmanship for a period of **12** months—

PROVIDING—You record it at the factory within a period of ten days after installation.

Please tear off the card, fill in complete information as requested, and MAIL IT IN AT ONCE! Your guarantee becomes effective only if this information is received at the factory.

PAKO CORPORATION

Tear Off and Mail

PAKOSTAT solves the age-old problem of STATIC in prints.

Concentrated PAKOSTAT when added to Pakosol, Pakofine, Pakochrome or other print conditioning solutions, will MINIMIZE STATIC in prints. Makes print handling much easier. Ideal for cut or strip prints, either black and white or color.

A little PAKOSTAT goes a long way. Only ½ ounce to each gallon of mixed conditioning solution. Solutions may be replenished by adding small amounts of PAKOSTAT.

MINIMIZE STATIC the CHEMICAL way with PAKOSTAT... *it's concentrated.*

PAKOFINE CONDITIONER

A glossing aid and drum conditioner for continuous black and white print processing.

- ★ Improves gloss
- ★ Aids uniform drying and release from drum surface
- ★ Increases flexibility of prints
- ★ Minimizes curling
- ★ Eliminates need for frequent drum cleaning

Only one oz. per gallon of water. To be used with Pakopak Dryers. May be replenished.

PAKOCHROME SOLUTION

Highly concentrated multi-purpose color print conditioner.

- ★ Special conditioner for paper base Color Print Materials
- ★ Aids uniform drying and release from drum surface
- ★ Improves gloss
- ★ May be replenished

Use 2 ozs. of Pakochrome to each gallon of water. Treat prints a few seconds in dilute solution.

PAKOKLEEN DRUM CLEANER

For quick, long-lasting cleaning of drum surfaces either chromium plated or stainless steel.

- ★ Specially for the mirror finish surface of photographic dryer drums.
- ★ A clean drum means clean spotless prints.
- ★ Genuine Pako Product.

the solution* to better prints...

PAKO®

PAKO CORPORATION
6300 Olson Memorial Highway, Minneapolis 40, Minnesota

PAKO FOR PROGRESS

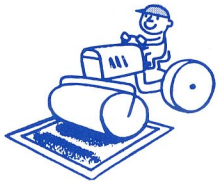
For better print and film conditioning

CONCENTRATED PAKOSOL

- ★ FLATTER PRINTS
- ★ FAST PRINT DRYING
- ★ SUPERIOR GLOSSY PRINTS

FOR GLOSSING—Beautiful glossy finish with just 1 part PAKOSOL to 64 parts water. Gloss over 150,000 prints per gallon of PAKOSOL.

FOR FAST PRINT DRYING—Just a little PAKOSOL allows increasing the drum speed and drying more prints in less time.



FOR FLATTER PRINTS—Only 8 ounces of concentrated PAKOSOL per gallon of water assures soft pliable prints, eliminating mechanical flattening. One gallon will flatten and gloss 50,000 single weight prints.

A LITTLE GOES A LONG WAY

PAKOSOL is so easy to use. Just add water and PAKOSOL solution is ready to use. Replenish by adding small amounts of concentrated PAKOSOL.

Only PAKOSOL offers the "*plus factor*"—Drum Protection. PAKOSOL cleans and preserves the drum surface of mechanical dryers.

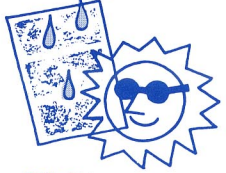
PAKOSOL is the only glossing solution made by a manufacturer of mechanical print dryers.

As PAKOSOL contains no harmful elements to metals it is shipped in non-breakable plastic containers, both gallon and quart size.

USE CONCENTRATED PAKOSOL

NEW CONCENTRATED SUPER PAKOWETT

- ★ SPEEDS FILM DRYING
- ★ REDUCES WATERMARKS
- ★ EASIER FILM HANDLING
- ★ SUPER CONCENTRATED—GOES FURTHER, LASTS LONGER!



FOR FAST FILM DRYING—SUPER PAKOWETT cuts film drying time 30% to 40%. Just 30 drops (1.5cc) of SUPER PAKOWETT makes one gallon of wetting Solution. One ounce of SUPER PAKOWETT added to 25 gallons of water provides an efficient solution, assures fast drying.

REDUCES SPOTTING AND STREAKING—SUPER PAKOWETT may be added to Chemical Solutions to help reduce "spotting" and "streaking" of film by water. Reduces airbells, improves quality.

FOR EASIER FILM HANDLING—SUPER PAKOWETT eliminates the manual process of wiping or sponging film. Makes film pliable and easy to handle.

SUPER PAKOWETT is super concentrated. One gallon will last much longer than similar preparations. As a result, SUPER PAKOWETT costs less.

SUPER PAKOWETT is ideal for photo retouching and art work on glossy surfaces. Add a small amount to water colors or opaque for smooth application with airbrush or hand brush. SUPER PAKOWETT is packaged in handy gallon and quart reusable plastic containers.

USE CONCENTRATED SUPER PAKOWETT

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