

KENSOL 25 Manual

ATTENTION!
KENSOL PRESS OPERATORS
IMPORTANT SAFETY PRECAUTIONS

The head of your KENSOL PRESS is driven by either a hand lever or an air cylinder. In order to perform a roll leaf stamping operation, high pressure must be applied by the stamping die on the work.

If an article is smaller than the heater head of your press, the operator should ALWAYS use a manual slide table to load and unload the item. A simple plastic safety gate can be installed to prevent the operator from accidentally placing the hand in the stamping area. Since KENSOL STAMPING PRESSES can be used to mark and decorate articles of many sizes, shapes and materials, it is impossible for the manufacturer to provide a universal safety gate. The PURCHASER SHOULD FABRICATE HIS OWN DEVICE. However, we will gladly assist with sketches or quote on a specially built safety gate upon receipt of sample parts.

In order to start a cycle on a KENSOL PRESS, it is necessary for the operator to use BOT HANDS for each operation or cycle - so necessarily neither hand of the operator could at any time come directly beneath the stamping die - ANY OTHER USE OF A KENSOL PRESS whereby a TIE-DOWN ALTERATION is introduced (where the Press is altered so as to require only ONE hand to start a cycle) in order to obtain faster production, is UNAUTHORIZED by the manufacturer and could result in Injury to the operator.

Air-operated slide tables and turntables are available to increase production rates.

IMPORTANT! AT NO TIME SHOULD AN OPERATOR PLACE THE HAND
DIRECTLY BENEATH THE STAMPING DIE.

Always bear in mind that you are operating a mechanical device and ANY machine can malfunction for one or several reasons beyond the control of a manufacturer, so if this Press does not appear to function as it normally does - shut it off AT ONCE and call it to the attention of your employer.

When setting up or repairing any KENSOL air-operated machine, the electrical power should be shut-off and the air line completely disconnected.

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INSTALLATION AND OPERATING INSTRUCTIONS FOR KENSOL 25, 25T, & 26T STAMPING PRESSES

IMPORTANT SAFETY PRECAUTIONS

SEE PRECEDING PAGE

The Kensol Series of 1-1/2 ton Stamping Presses are available as the hand-operated 25 or air-operated 25T and 26T machines. The hand-operated press can be converted to air at any time in your own shop by purchasing the air parts.

These instructions and the accompanying parts lists cover both the 25, 25T and 26T presses. If your press is the hand machine, skip over sections titled "Air Machine Only". If your press is the 25T or 26T, read all instructions carefully.

SETTING UP THE PRESS

1. UNPACK THE PRESS CAREFULLY. Remove all protective grease. Lubricate press, following instructions found under Maintenance Section. Place the press on a sturdy bench high enough so that the operator can see the work being stamped. Comfort, whether sitting or standing, is very important for both good work and high production. Machine should be placed at such a height that the operators' forearms will be parallel to the floor when his hands are placed on the work table. A 3" diameter hole should be cut in your work bench below the table ram, so that the ram will pass through.
2. "Air Machine Only". Connect air supply from the compressor to the hose connection on the automatic filter, A galvanized pipe for this (1/2"); however, a hose is supplied for a temporary hook up. It is advisable to install an ordinary shut off valve in this line.

The purpose of the air controlling unit is to regulate the air pressure, filter the air, and drop oil into the line to lubricate the air mechanism of the press.

Pressure is plainly shown on the gauge. Turning the pressure regulating valve clockwise will raise the pressure; counter-clockwise will drop the pressure. Open the pet-cook on the bottom of the filter occasionally to allow any water or foreign matter coming through the line to drain off. In exceptionally damp weather, this unit will have to be emptied daily.

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NOTE: If you notice a great deal of water collecting, your compressor tank should be drained and an after-cooler installed in your main air line.

The screw on the top of the automatic oiler will regulate the amount of oil going into the air line. On examining the oiler closely, you will notice a small brass nozzle inside a glass tube directly under the screw. A drop of oil forms on the end of this nozzle and falls off into the air line at regular intervals. About one drop of oil falling every 20 strokes is an ideal setting.

3. HOOK-UP ELECTRICAL CONNECTIONS. Press has two electrical cords, The first goes to the thermostat for heating the head. The second electrical cord goes to the timer box, which controls the operation of other electrical mechanisms. Plug dwell timer cord (25-179) into wall outlet, making certain that your electrical current is the same as required by the press. The timer has an ON-OFF switch and pilot light. The switch should be in the OFF position and the line cord unplugged when the press is not used or is being set up.

OPERATION OF THE PRESS

1. THE HANDLE (25-111). The handle is supplied with both hand and air machines, It is inserted and locked into handle clamp (25-116). When operating by hand, the handle should be brought forward and returned with a smooth (rather than jerky) action. Best stamping results will be obtained if the operator maintains a steady rhythm when operating by hand. A fast "kiss" impression will give the sharpest results.

1A. "Air Machine Only". The Kensol 25T can be operating by hand only when the air pressure is reduced to zero (reading on gauge 25-156). This is done by turning valve (25-154). Before inserting handle (25-111) into clamp (25-116), ALWAYS reduce air pressure to zero. NEVER apply air pressure to machine before removing handle. (Handle could damage the operator's hand or arm if left in the machine when operated by air).

2. THE HEATING SYSTEM. The Kensol 25 press is equipped with two cartridge heaters (25-39), which heats the stamping head, (25-41). The temperature is controlled by a Robertshaw degree calibrated thermostat (25-30). Set plastic knob on thermostat so that it points to the desired setting. NOTE: Roll leaf is formulated to give best results at a certain temperature. This temperature range will be supplied when ordering roll leaf, if requested.

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You will notice that the pilot light on the thermostat glows when the knob is set. This indicates that full current is flowing through the heaters. When the light goes out, you know that the stamping head (25-41) is up to temperature. However, this does not necessarily mean that your type or die is up to heat. Naturally, the head heats up quicker than the chase or pallet holding your type. You should allow a few minutes (after the pilot light goes out) for the chase or pallet to reach head temperature.

As you operate the press, you will notice that the light goes on and off. This is a normal condition, and indicates that the thermostat is doing the job of accurately controlling the heat.

3. "Air Machine Only" - PROPER AIR PRESSURE. We recommend that you never set the regulator (25-154) so that the gauge (25-156) reads below 40 pounds or above 120 pounds. You will have to set the pressure for the particular job you intend to run. Larger die areas and hard materials require higher pressure settings than small die areas and soft items. 60 to 80 pounds is a good setting for normal work. NOTE: Most compressors have an automatic ON-OFF switch. The setting on the regulator should never be higher than the low pressure setting (compressor pressure when the unit automatically goes on), or else you will have fluctuations on the pressure gauge (25-156) and your stamping will not be uniform.

4. "Air Machine Only" - HAND SWITCHES (or foot switch). Press is operated by two hand switches (unless furnished with foot switch) or a single hand control. When depressed together, switches complete an electrical circuit causing four way valve (25-157) to operate. Valve allows air to go into the top of air cylinder forcing stamping head down. Note that as soon as the switches are depressed, the timer starts its cycle,

As soon as the pointer on the timer reaches zero, the timer breaks the electrical circuit, the valve reverses allowing air to go into the bottom of the air cylinder, and the head returns to its up position.

5. "Air Machine Only" - THE ELECTRIC DWELL-TIMER. The electric dwell-timer (25-178) has a pointer and an adjusting knob. To change dwell time, move the knob until pointer is at the desired setting.

6. "Air Machine Only" - DOWN AND UP STROKE SPEED VALVES. The Kensol 25T and 267 is equipped with a down and up stroke speed nut (25-176), (each located on the mufflers (25-175)).

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The speed of the stamping head on the, down stroke is controlled by the back nut. Turning this nut counter-clockwise will cause the head to go down more slowly. This adjustment is useful to prevent cracking when stamping brittle materials, to lengthen the life of soft metal type and dies (lead, etc.), to give a squeeze rather than a snappy impression, and other special applications. Although the head comes down more slowly when the valve is turned out, the head pressure still builds up to the pressure setting on the gauge (25-156). If you slow down the speed of the head with this valve, you will have to set for a longer dwell-time to compensate for the slower head action.

The speed of the stamping head on the up stroke is controlled by the front nut. Turning this valve counter-clockwise will cause the head to return to its up position more slowly. The up stroke speed nut merely prevents the head from banging up against the frame. In normal use it should never need adjustment. However, some of the newer luster leafs, will stamp better if the head is slowed a bit on the up stroke and a slight cooling period is allowed after the hot die leaves the work and before the leaf is stripped away from the piece.

SETTING UP A JOB ON THE PRESS

IMPORTANT! REFER TO SAFETY PRECAUTIONS ON. PAGE I BEFORE PROCEEDING.

1. LOCKING UP TYPE, DIES, SLUGS, CUTS, ETC. There are several different styles of chases, pallet's, etc. available with the Kensol 25 press, See sales literature found at the end of these instructions. Practically any metal type or other printing elements can be used in hot leaf stamping (they must be metal because they must conduct heat). In special applications, such as top stamping on plastic, silicone rubber dies are also used.

It would be helpful to discuss the standard Kensol 25 type and die holders and their uses:

A. The steel hot plate chase: Used for holding any die or cut, both fiat and type high. Dies can be mounted by using screws or OlsenMark Die Bonding Film.

B. Four walled lock-up chase: Used for holding any die or cut (both flat and type high), loose type, Linotype, or Ludlow slugs, and any other printing elements. Flat dies are mounted on the steel block that fits into the four walled chase and is held in place by screws. Type high dies, slugs, loose type, etc. are locked into the recess of the chase (block is removed). Strips of metal are used between lines of type both to provide the necessary space between the lines and to hold the type firmly. On locking up type, dies, etc. in the recess, unfilled areas must be filled with metal spacing. The complete form is locked firmly in place by tightening screws.

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C. Self-centering pallet. Used for holding loose type, Linotype slugs, small type high dies, or other type high printing elements up to 1-1/2 x 6 inches. It is much quicker to lock up loose type and slugs in the pallet because the side walls move in and out equally when the crank is placed on the nut and turned. It is not necessary to fill out the ends of a line of loose type with spaces.

2. POSITIONING THE WORK ON TABLE (25-10). After the type or dies have been set, locked in the stamping head, and brought up to heat, you are ready to position the work on the table (25-10).

If press is an air-operated Kensol 25T or 26T, set machine for hand operation by reducing air pressure to zero (turn regulator (25-154) and insert handle (25-111) into clamp (25-116).

Your Kensol 25 Press is equipped with a 12 x14 inch work table and four side gauges (25-3 and 25-9). The purpose of these gauges is to position the work to be stamped under the dies or type and to hold down fixtures that are necessary for supporting hollow items, etc. The table (25-10) will slide in and out by loosening jib screws (25-16) and pulling post (25-6).

Table set for flat items (paper goods, leather, plastic in sheet form, etc.). When stamping flat articles, it is wise to fasten down (using scotch tape, masking adhesives etc.) a thin sheet of cardboard, fibre board, or a few index cards on the work table (25-10). This provides a little give beneath the item being stamped. NOTE: This makeready material should be changed after every die or type change because it will become embossed after running the job.

After fastening down the makeready material, take a piece of leaf and lay it by hand under the die (dull side down). Make an impression on the makeready by pulling handle down (25-111). Do not apply too much pressure, a light impression is all that is necessary. If, on pulling the handle all the way down, you find that the type does not touch the makeready, raise the table by turning the elevating nut (25-29).

Having made an impression on the makeready material, you can now position the item using the gauges. Set these gauges so that when the item is positioned in the gauges, the imprint will be in the proper location on the article. NOTE: Some stampers prefer to glue strips of cardboard on the makeready as gauges rather than using the guides provided.

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Table set for curved or hollow items (boxes, tool handles etc.). Curved items require a curved or contoured die, or type locked up in a curved holder. Hollow or non solid items must be supported beneath the stamping area to prevent them from cracking or collapsing. If a supporting fixture is required, it should be mounted on a thin piece of steel about 14 inches long. This fixture can then be clamped on to the table (25-10) using "C" clamps or the guides (25-3 and 25-9). The fixture must be positioned under the die by eye. Light impressions can be made on the article and the fixture shifted until the die hits the piece in the proper spot and the curved surfaces match.

3. MAKING A JOB READY. Place the article in position on the table or fixture. Lay a piece of leaf on the impression area and make an impression. If the impression is light in any spot, stick some gummed tape or scotch tape on the bed beneath the weak area. Try another impression, and continue to build up the makeready until the print is uniform depth throughout.

When stamping molded plastic items, it is helpful sometimes to glue a thin sheet of rubber on to the bed or fixture to level the type or die with the plastic being marked.

4. PROPER ROLL LEAF. This is very important. Roll Leaf is available in imitation and pure gold, aluminum, and all popular colors. Colors are available which will print with a flat, gloss, or metallic finish. A sizing makes the roll leaf adhere to whatever material you are stamping. It is important that the roll leaf supplier knows the material you intend to stamp. We will gladly supply you with the desired color, sizing, and tell you the proper temperature to set your machine at.

5. SET THE ROLL LEAF ON THE SPINDLE. (25-81). The roll leaf should be a little wider than the die or type (1/2 inch is recommended). Remove disc, collar, spring assembly (25-80) from the spindle.

Place the proper roll leaf on the spindle so that the dull side will face the work. Replace the collar, spring, disc assembly so that the roll will be held between the two discs (25-78 and 25-80).

Center the roll on the spindle so that the leaf will cover the complete die or type lock-up, allowing about 1/4 inch overlap on each side.

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Bring tail of leaf under both stripper bars (25-103), and between knurled steel roller (25-94) and rubber roller (25-96). These rollers are spread by means of cams (25-63).

Check to see that the roll of leaf runs straight through the press from side to side, and that it covers the die completely. After doing this, snap the cams so that the leaf is held between the two rollers.

Adjust the stripper bars (25-103) by means of nuts (25-98). The bars should be set so that the leaf is kept about 1/2 inch away from the hot die. Make certain that the bars are parallel with the work table. If these bars are not parallel, the leaf will not run thru the machine straight.

Adjust the collar, spring, disc assembly so that the spring applies slight tension to the roll. This prevents the leaf from bowing as it passes through the machine.

The length of roll leaf pull is governed by the position of the rack (25-50) on the draw guide (25-53). The rack is attached to the draw guide by means of thumb screw (25-54). Loosening the screw and moving the rack up will lengthen the pull, while moving the rack down on the draw arm will shorten the pull.

On operating the machine, it is important to allow the handle (25-111) to return all the way up to its rest position or the leaf pull will not be uniform. Try a few impressions, examine the used roll leaf and set the leaf pull adjustment screw (25-54) so that approximately 1/8 of an inch space is left between additional impressions.

If you have a die or type lock up that requires the complete 6 inch leaf pull, and you find that when you set the attachment for maximum pull, you are getting less than 6 inches, you will have to drop the table, so that you are getting the full head stroke of the machine.

You are now ready to run a job, using the handle (25-111).

IMPORTANT! MAKE CERTAIN THAT YOUR SAFETY GATE IS IN PLACE BEFORE PROCEEDING.

6. “Air Machine Only” - GETTING INTO PRODUCTION USING AIR OPERATION.

A. Remove handle (25-111) from the machine.

B. Having performed all the above steps (1 thru 5), set regulator (25-154) for 60 pounds, and turn dwell timer ON-OFF switch ON.

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C. Set timer pointer to read .3 seconds (not to be confused with 3 full seconds).

D. Depress the hand switches (or foot switch). With such a short setting the head will, most likely, not come down far enough to meet the item to be stamped. Gradually increase the dwell-timer setting until the head comes down far enough to meet the piece.

E. After examining the stamp on the piece, you can either increase the dwell time or pressure for more depth, or decrease the dwell time or pressure for the depth.

NOTE: For best results, each impression should have a short linger of the die or type on the piece. Never attempt to get depth by "Burning" the die into the item. Always set for enough pressure, and try to use as short of a dwell time as possible.

F. A normal dwell-timer setting is about .5 seconds. If you find that the stamping head is coming down so slow that the die or type does not meet the piece at .5 seconds, turn the down stroke speed nut (25-176), so that the head comes down faster. An exception to the .5 average setting is the case when lead or other soft metal type is used. To get long life out of this type, slow the head down and use a longer dwell-time setting. NOTE: The dwell timer not only times the actual linger of the die, or type on the piece, but also times the amount of time it takes the head to come from rest position to stamping position.

G. Before proceeding to stamp a production run, set the automatic oiler as explained under SETTING UP THE PRESS section.

IMPORTANT LUBRICATING INSTRUCTIONS

Good results cannot be assured unless the press is operated and lubricated properly. 50% of the repairs made on Kensol equipment have been caused by improper lubrication. We recommend that you instruct your operator to properly lubricate the press EVERY morning before starting work.

There are three types of lubricant required for Kensol Power Presses:

1. SAE #10 OIL WITHOUT DETERGENT OR PENETRATING ADDITIVES
2. SAE #30 OIL
3. OLSENMARK HIGH TEMPERATURE LUBRICANT

If a local supplier cannot furnish the special #10 oil, it can be purchased from us in gallon containers.

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1. Fill the automatic oiler (25-153) with the special #10 oil. (Oil that contains detergent or penetrating additives will attack packings causing valves to bind. This will result in erratic time cycles). Adjust flow of oil as explained on sheet K-25-2. In normal operation this oiler will have to be filled once a week.

2. Using an oil can filled with SAE #30 oil, lubricate the following parts every day:

Rubber roller and steel Knurl roller bearings. There are oil holes in the draw arms (25-84 and 25-85) for this purpose.

Roll leaf ratchet gear (25-65) and rack (25-50). •Bearing surfaces on handle shaft (25-112).

Table ram (25-12).

3. Using a long handled artists brush, lubricate the bearing surfaces of the head ram (25-136) with OLSENMARK HIGH TEMPERATURE LUBRICANT. (A can was supplied with your machine). Lubricate also the ram rack (25-130) and pinion (25-113). You will have to get behind the ram to reach these points.

COMPRESSED AIR REQUIREMENTS

Size of compressor should be as follows to deliver constant pressure of 100 pounds.

600 impressions per hour requires 7-112 C.F.M. of air (1-1/2 H.P. unit)

1000 impressions per hour requires 13 C.F.M. of air (2 H.P. unit)

1500 impressions per hour requires 20 C.F.M. of air (3 H.P. unit)

When piping air from your compressor to the press, we do not recommend the use of rubber hose unless the compressor is within 10 feet of the press. When the compressor is more than 10 feet away, we recommend the following pipe sizes:

Piping air to one press - use at least 1/2 inch pipe

Piping air to two presses - use 3/4 inch pipe

Piping air to more than two presses - use 1 inch pipe

IMPORTANT!

Should you notice that your press is operating abnormally, immediately turn off the heat and dwell timer. Have your maintenance department locate the source of trouble by running through the trouble shooting instructions on the following pages or contact us.

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GENERAL TROUBLE-SHOOTING PROCEDURES FOR KENSOL STAMPING EQUIPMENT

Your Kensol Press was carefully manufactured with high quality materials and components. However, over the long life of this equipment something is bound to go out of order. Whether you have a hand-operated or air-operated press, you should find the solution to your trouble somewhere in these instructions.

From our experience we have found that the primary cause of equipment failure is poor maintenance. Equipment should be properly lubricated every day (see Lubrication Instructions in section preceding).

In general, equipment failure can be broken down into two categories:

- (1) Mechanical failure in parts of the press other than air and electrical components
- (2) Failure of air or electrical components

In order to find which of the two categories are causing the trouble on an air machine, you must disconnect your air line, insert the handle and operate the press manually. Make certain that the press is heated to 3000. If the head moves freely with little effort on the handle, you can assume that there is no bind in the ram, mechanical roll leaf attachment and linkage system (toggle machines only). If you have a mechanical pull leaf feed (rather than air pull), make certain the leaf feed is set for maximum pull. If you feel a bind, the trouble is of a mechanical nature and not with the air components.

LOCATING A MECHANICAL FAILURE

15,15T,17T,26,25T & 26T Presses:

(1) Disconnect mechanical roll leaf feed by moving setting-for leaf pull to the bottom of the slide. If press now operates smoothly by hand, there is a bind in the roll leaf attachment. Remove knob at end of knurled roller and disassemble advance mechanism. Examine for broken parts. The rubber roller should turn freely when the rollers are separated by the cams. If you can not rotate the rubber roller freely the bearings are binding.

(2) If press binds with mechanical roll leaf disconnected, the bind must be in the ram. The jibs should be readjusted to allow a smooth sliding action yet maintaining as little play in the ram as possible.

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36,36T,50,60 & 110 Presses:

(1) Run thru step #1 above

(2) If press binds with roll leaf disconnected, the bind could be in the ram, links, pins or main shaft.

LINKS & PINS - The links should move freely on the pins. You can check these by tapping the links or pins from the side with a mallet. The links should shift side to side slightly. If not, you must free up the particular link and pin assembly.

RAM - Having eliminated the links and pins and the roll leaf attachment as a source of trouble, we know that the ram is binding. The fit of the ram is adjusted by loosening the four large bolts found on the ram cap and adjusting the four set screws (found by each bolt) as follows:

Make certain the roll leaf attachment is disengaged. This will give a better opportunity to judge the sliding fit of the ram. This fit should be free, but not sloppy. If sloppy, the head may twist a little and jam up the roll leaf mechanism. The best way to make this adjustment is to work the handle up and down as you tighten and loosen the four bolts. Make sure you loosen only one bolt at a time, and retighten it before going to the next bolt, if you find that it does not lessen the bind. After you find that one particular bolt when loosened frees the ram, you must turn in the corresponding set screw. The bolt can then be tightened. In some cases, it may be necessary to loosen and reset two set screw-bolt combinations. These adjustments are merely a trial and error method. Make sure the head is up to heat and spend some time on this very important adjustment.

LOCATING AN AIR COMPONENT FAILURE

ALL AIR PRESSES:

If you have determined, after converting your press to hand operation, that the air system is at fault, one must localize the trouble to one of these components: Hand (or foot) Switches, Dwell-timer, Air Cylinder, 4-Way Valve, Pilot Valve, or Air-controlling Unit.

Hand (or foot) Switches - Check these by electrically by-passing them as follows. The hand switches, or foot switch, plug into the timer box with a four prong plug. When you pull the plug out, you will notice that two of the prongs are electrically connected to the line cord. Using a jumper (short piece of wire) short out the corresponding two connections in the female receptacle on the timer. **KEEP HANDS AWAY FROM UNDER THE HEAD.** If the head now comes down, you will know that the switches were faulty.

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Dwell-timer - It is very seldom that the dwell-timer will completely fail so that the head will not come down at all. The usual symptom of a faulty timer is an erratic cycle (one impression short, one long, etc.). However, we must mention that there are "normal" inaccuracies in any timer. Slight inaccuracies on a split second cycle must be expected. Look at the pointer on the timer. As soon as the switches are closed, the pointer starts to move, travels to zero, and snaps back to best position (on solid state timers, the pointer does not move. We have wired in an indicator light for test purposes). If this does not happen, the timer is faulty. If the press completely fails to operate, twist and remove the plug that is connected to a BX on the timer. Using the stripped end of a line cord, apply current (either 110 or 220 V, whatever the press is equipped for) directly to the prongs on this plug (goes from timer to pilot valve). The head should come down. KEEP HANDS AWAY FROM UNDER THE HEAD. If the press does not operate, the timer is not at fault in complete press failure.

Air-cylinder, Pilot Valve, 4-Way Valve - These components are really considered as one complete assembly in trouble-shooting. If the ram action of the press is erratic, and we have eliminated the mechanical sections of the press (and the dwell-timer), as the cause of failure, the air assembly must be faulty. The complete assembly is either returned to us for repair or dis-assembled and examined for:

- (1) Broken electrical connection in pilot valve. (This has been checked previously by applying line voltage across the two prong BX cable plug)
- (2) Broken return spring in the four way valve.
- (3) Bind of the spindle in the four way valve. This is usually caused by "O" ring expansion due to the use of oil containing additives.
- (4) By pass of air around 4-way valve spindle or cylinder cups. Again caused by the use of oil with additives (in automatic oiler).
- (5) Corrosion due to excessive water getting into the press.
- (6) Scoring of the walls of the cylinder.

Air Controlling Unit - The air controlling unit consists of an air filter, reducer and gauge, and oiler. Any failure of these parts is usually apparent. The air filter is designed to remove water from the air line. If you find that excessive water is building up so that you have to drain this a few times each day, it would be advisable to have an after cooler installed on your compressor. We can supply repair kits for these components if you find that they are not functioning properly.

SYMPTOM

1. Press will not heat up at all, supply

PROBABLE CAUSE

- a. Blown fuses in electrical
- b. Defective heater or heaters
- c. Loose or broken wire
- d. Defective thermostat

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SYMPTOM

PROBABLE CAUSE

- | | |
|--|---|
| 2. Press will not heat up to operating temperature | a. Defective heater or heaters
b. One fuse blown on 220 line |
| 3. Press overheats (light on thermostat stays on) | a. Defective thermostat |
| 4. Head will not come down | a. Linkage frozen (toggle machine only) Ram frozen
b. 4-way valve or main cylinder jammed due to lack of lubrication (Air machine only)
c. No output from timer
d. No air from supply or not enough pressure |
| 5. Head comes down and stays down | a. Broken spring in 4-way valve
b. Bind in 4-way valve or main cylinder
c. Short in timer |
| 6. Head will not come all the way down | a. Jam in mechanical roll leaf attachment |
| 7. Head slams on up stroke | a. Head check assembly out of adjustment (toggle machine only)
b. Badly worn linkage system (toggle machine only)
c. Bind in ram or linkage (toggle machine only) |
| 8. Machine sluggish both up and down | a. Speed valves closed too far
b. Air line clogged
c. Air lines too small
d. Too low air pressure |
| 9. Blurry impression - not sharp and clear | a. Head shifting due to too much play in ram
b. Die or type holder not locked tightly in head |
| 10. Inconsistent impression some deep, some light | a. Too short of a dwell setting (never go below 0.4 seconds)
b. Poor lubrication
c. Erratic timer
d. Fluctuating air pressure
e. Defective packing in 4-way valve or main cylinder |

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SYMPTOM

11. Erratic leaf pull Mechanically operated roll leaf attachment

Air-operated roll leaf attachment

12. Leaf runs off to one side when pulling

13. Air leaking out of top of main cylinder

14. Air leaking out of check valve (toggle machines only)

15. Oil leaking out of mufflers

PROBABLE CAUSE

- a. rubber roller worn
- b. Knurled roller slipping on its shaft
- c. Defective clutch (late machines)
- d. Loose pawls or broken springs on ratchet leaf feeds (older machines)
- e. Roll leaf tension disc too tight f, Bushings for knurled or rubber roller worn

- a. Check a,b,c,e, & f above
- b. Air pull cylinder not returning all the way
- c. Air pull cylinder moving too fast - adjust speed valves
- d. Air pull 4-way valve defective Delay valve packings defective

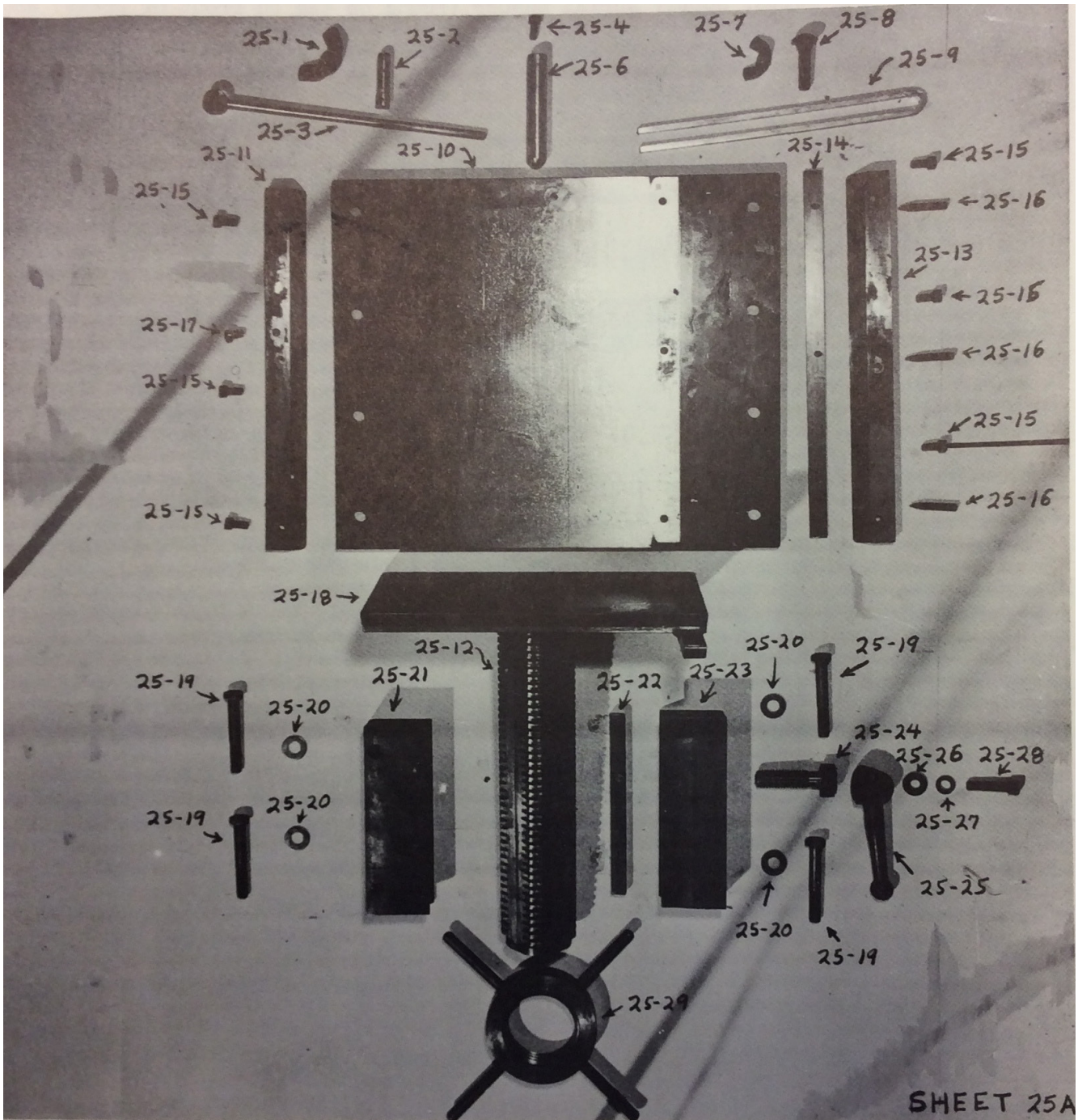
- a. Stripper bars are not level
- b. Rollers are badly worn
- c. One side of steel or rubber roller bearing worn more than other side

- a. Worn top packing in cylinder
- b. Retaining nut may be loose (older machines)

- a. By pass in cylinder or 4-way valve

- a. Incorrect adjustment of automatic lubricator

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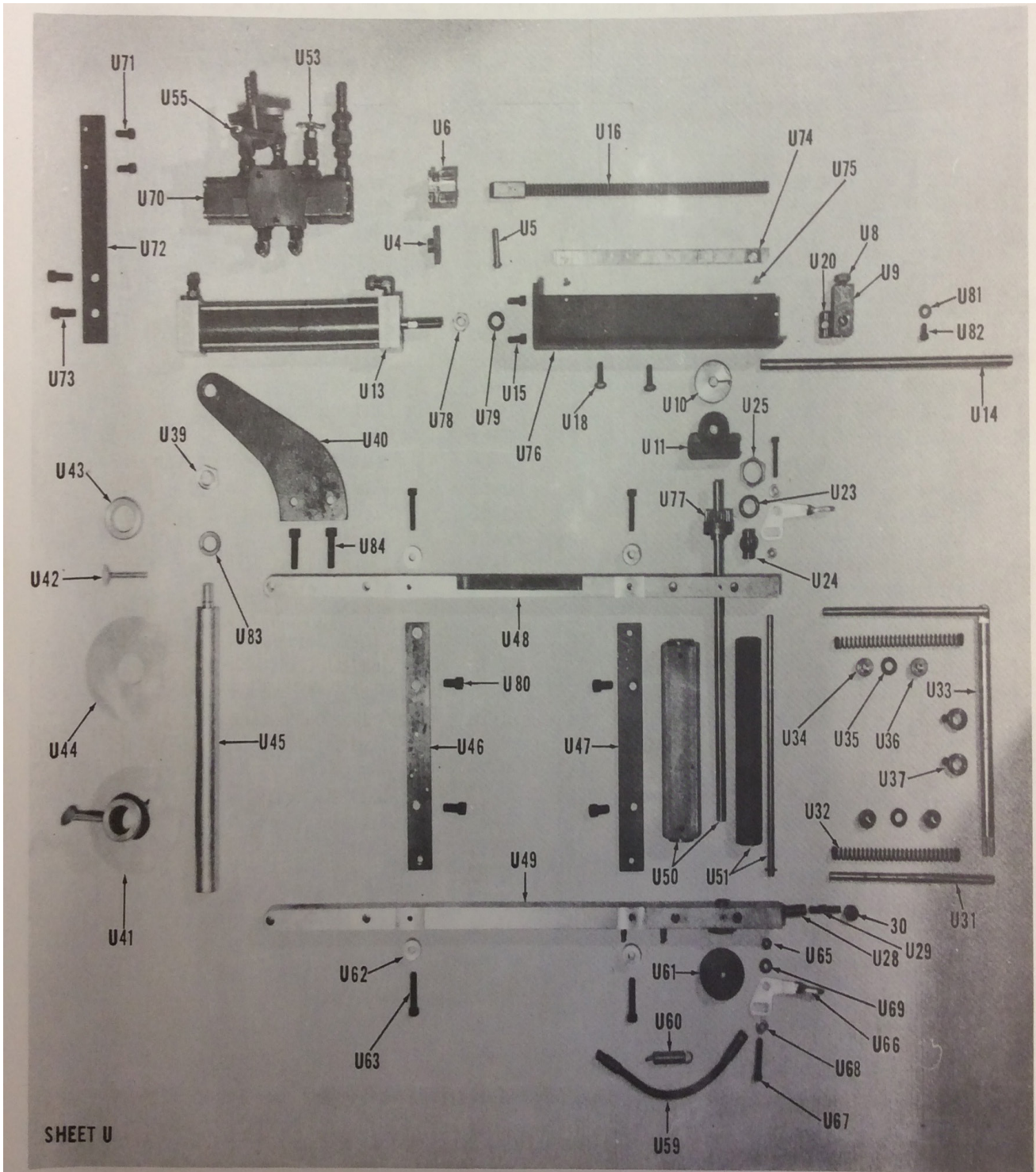
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Parts Sheet for Kensol Equipment - #25A

When ordering parts, supply serial number (found on tag on front of press) and year purchased, whenever possible. When ordering electrical parts, be sure to supply voltage used, and whether used on A.C. or D.C. line.

<u>PART NO.</u>	<u>PART NAME</u>
25-1	Wing nut
25-2	Guide screw
25-3	Work guide-knob style
25-4	Allen screw for post
25-6	Table post
25-7	Small wing nut
25-8	Guide bolt
25-9	Work guide-U style
25-10	Work table 12" x 14"
25-11	Left table rail
25-12	Table ram
25-13	Right table rail
25-14	Table gib
25-15	Allen screw for rail
25-16	Gib screw
25-17	Work table stop screw
25-18	Table ram plate
25-19	Cap screw
25-20	Washer
25-21	Left table ram gib
25-22	Gib shoe
25-23	Right table ram gib
25-24	Table lock cap screw
25-25	Table lock handle
25-26	Washer
25-27	Lock washer
25-28	Allen screw
25-29	Elevating nut

KENSOL 25



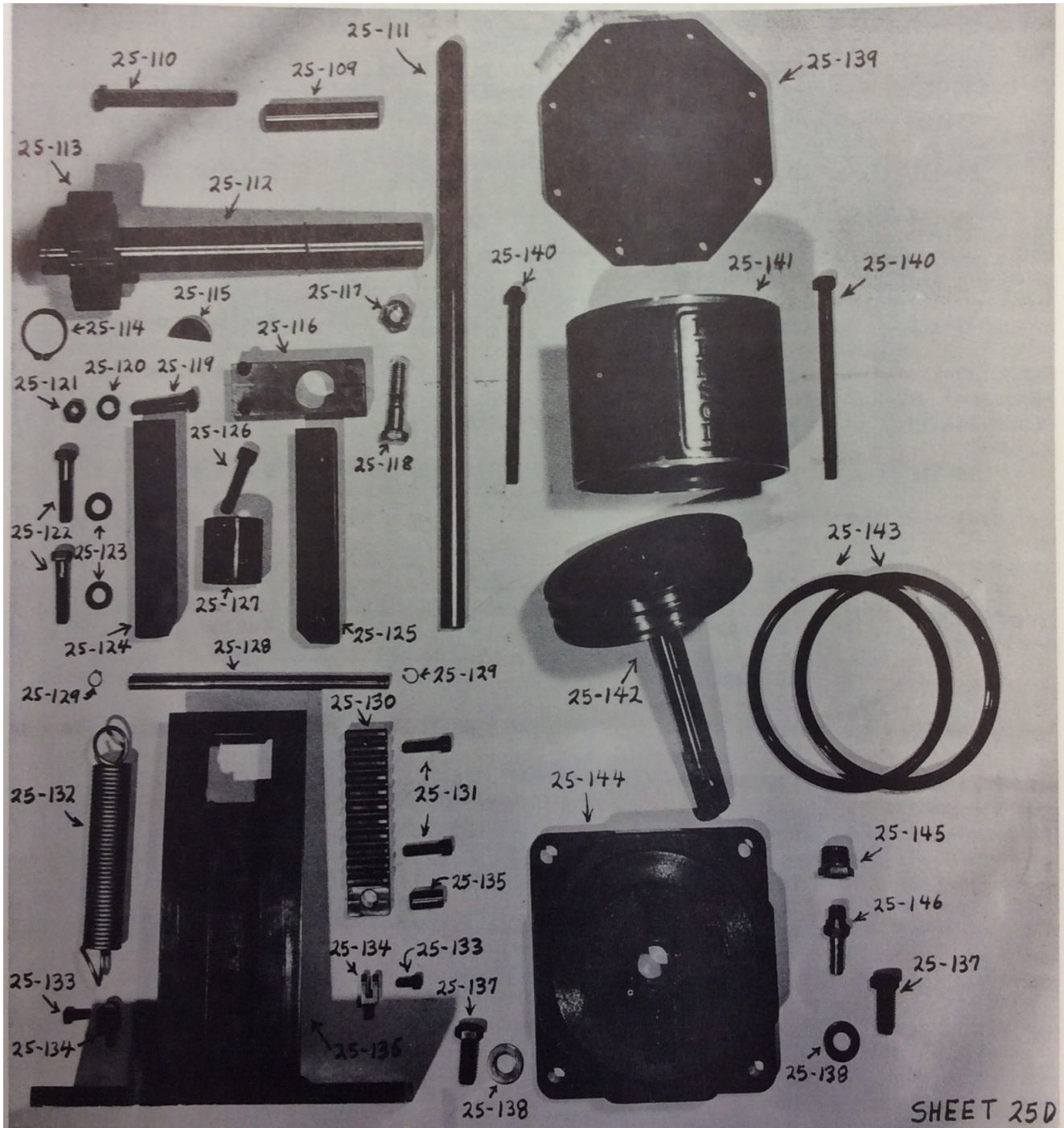
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PARTS SHEET FOR KENSOL EQUIPMENT - #U

When ordering parts, supply serial number (found on tag on side of press) and year purchased whenever possible. When ordering electrical parts, be sure to tell us whether your machine is wired for 115 or 230 volts A.C.

<u>PART NO.</u>	<u>PART NAME</u>		<u>PART NO.</u>	<u>PART NAME</u>	
U- 4	Connector	(1)	U-46	Bracket	(1)
U- 5	Pin	(1)	U-47	Bracket	(1)
U- 6	Sliding Housing	(1)	U-48	Rear Draw Arm	(1)
U- 8	Lock Screw	(1)	U-49	Front Draw Arm	(1)
U- 9	Stop Block	(1)	U-50	Knurl Roller Assembly	(1)
U-10	Split Knob	(1)	U-51	Rubber Roller Assembly	(1)
U-11	Guide, Rack & Gear	(1)	U-53	Speed control valve	(2)
U-13	Air cylinder	(1)	U-55	On-Off valve	(1)
U-14	Parallel Shaft	(1)	U-59	Friction Belt & Link As.	(1)
U-15	Allen Screws	(4)	U-60	Spring, Friction As.	(1)
U-16	Rack assembly	(1)	U-61	Friction Pulley	(1)
U-18	Hex. Hed. Screws	(2)	U-62	Spacer	(4)
U-20	Lock Pin	(1)	U-63	Allen Screws	(4)
U-23	Bearing Retainer	(2)	U-65	Nut	(2)
U-24	Knurled Roller Br.	(2)	U-66	Cam, Paper Feed roller	(2)
U-25	Lock nut	(2)	U-67	Allen Screws	(2)
U-28	Tension Bearings	(2)	U-68	Flange Bushing, Cam	(2)
U-29	Tension Spring	(2)	U-69	Washer	(1)
U-30	Retainer Nut	(2)	U-70	4-way valve	(1)
U-31	Adjusting Bar	(2)	U-71	Allen Screws	(2)
U-32	Stripper Spring	(4)	U-72	Bracket	(1)
U-33	Stripper Assembly	(2)	U-73	Allen Screws	(2)
U-34	Adjusting nut, Lock	(4)	U-74	Scale	(1)
U-35	Lock Washer	(4)	U-75	Flat head screw	(2)
U-36	Adjusting nut	(4)	U-76	Cyl. Mount Assembly	(1)
U-37	Collar, Rl. Lf. Guide	(4)	U-77	Clutch As. - L.H., 20T	(1)
U-39	Nut	(1)	U-78	Nut	(1)
U-40	Roll leaf bracket	(1)	U-79	Lock Washer	(1)
U-41	Disc & Collar As.	(1)	U-80	Allen Screws	(4)
U-42	Thumb Screw	(2)	U-81	Washer	(1)
U-43	Collar	(1)	U-82	Allen Screws	(1)
U-44	Disc	(1)	U-83	Lock Washer	(1)
U-45	Roll leaf bar	(1)	U-84	Allen Screws	(2)

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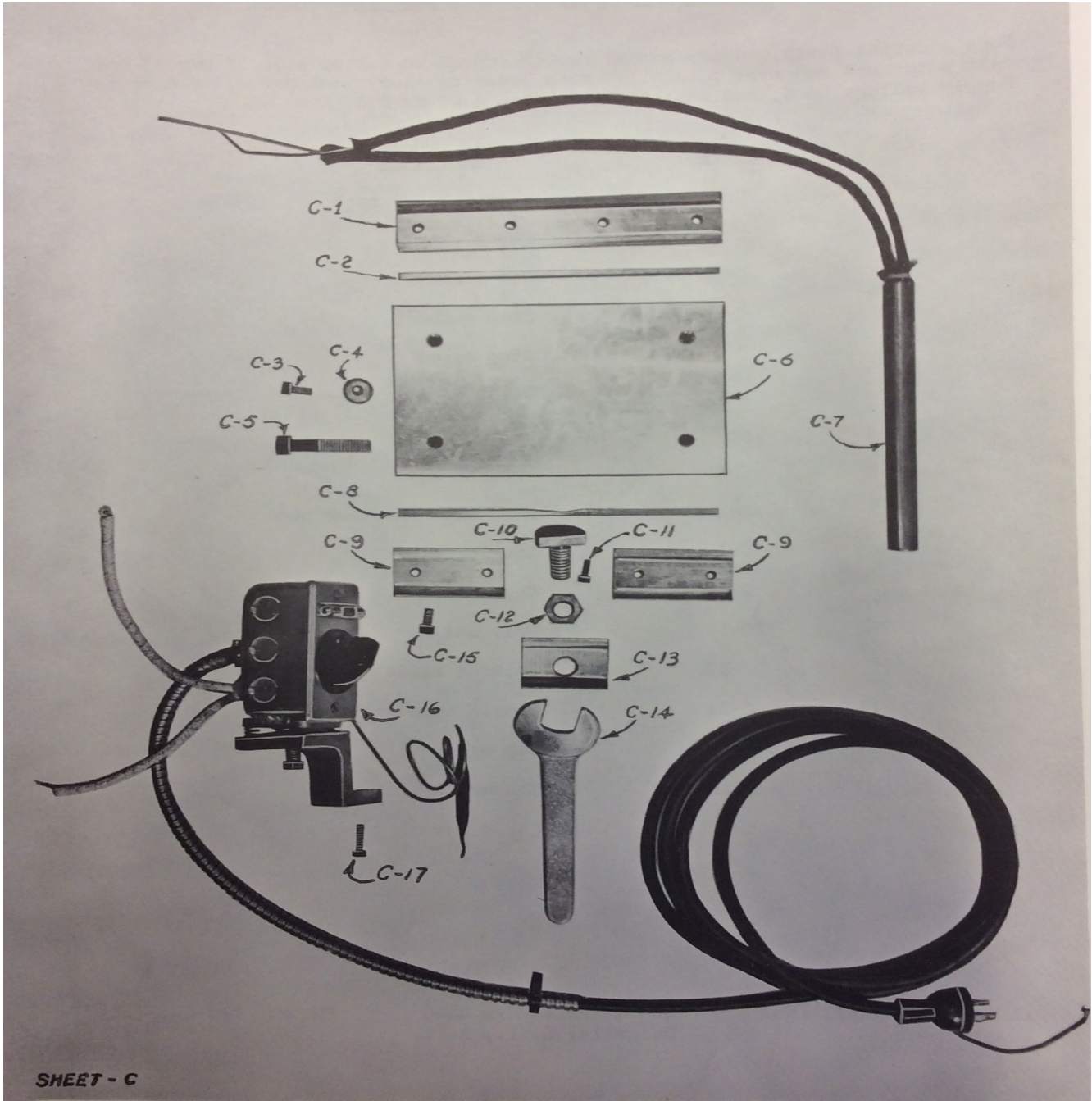
KENSOL 25

Parts Sheet for Kensol Equipment - #25D

When ordering parts, supply serial number (found on tag on front of press) and year purchased whenever possible. When ordering electrical parts, be sure to supply voltage used, and whether used on an A.C. or D.C. line.

<u>PART NO.</u>	<u>PART NAME</u>	<u>PART NO.</u>	<u>PART NAME</u>
25-109	Handle stop	25-128	Spring mount bar
25-110	Cap bolt	25-129	Tru-arc ring
25-111	Handle	25-130	Ram rack
25-112	Handle shaft	25-131	Allen screws
25-113	Pinion	25-132	Ram return spring
25-114	Tru-arc ring	25-133	Allen screw
25-115	Woodruff key	25-134	Lower spring mount
25-116	Handle clamp	25-135	Dowel pin
25-117	Nut	25-136	Ram and ram plate
25-118	Cap bolt	25-137	Cap bolt
25-119	Cap screw	25-138	Washer
25-120	Lock washer	25-139	Top cylinder casting
25-121	Nut	25-140	Cylinder tie rods
25-122	Cap screws	25-141	Cylinder sleeve
25-123	Washers	25-142	Piston
25-124	Left ram gib	25-143	"O" rings
25-125	Right ram gib	25-144	Bottom cylinder casting
25-126	Allen screw	25-145	Bushing
25-127	Cylinder shaft nut	25-146	Hose connection

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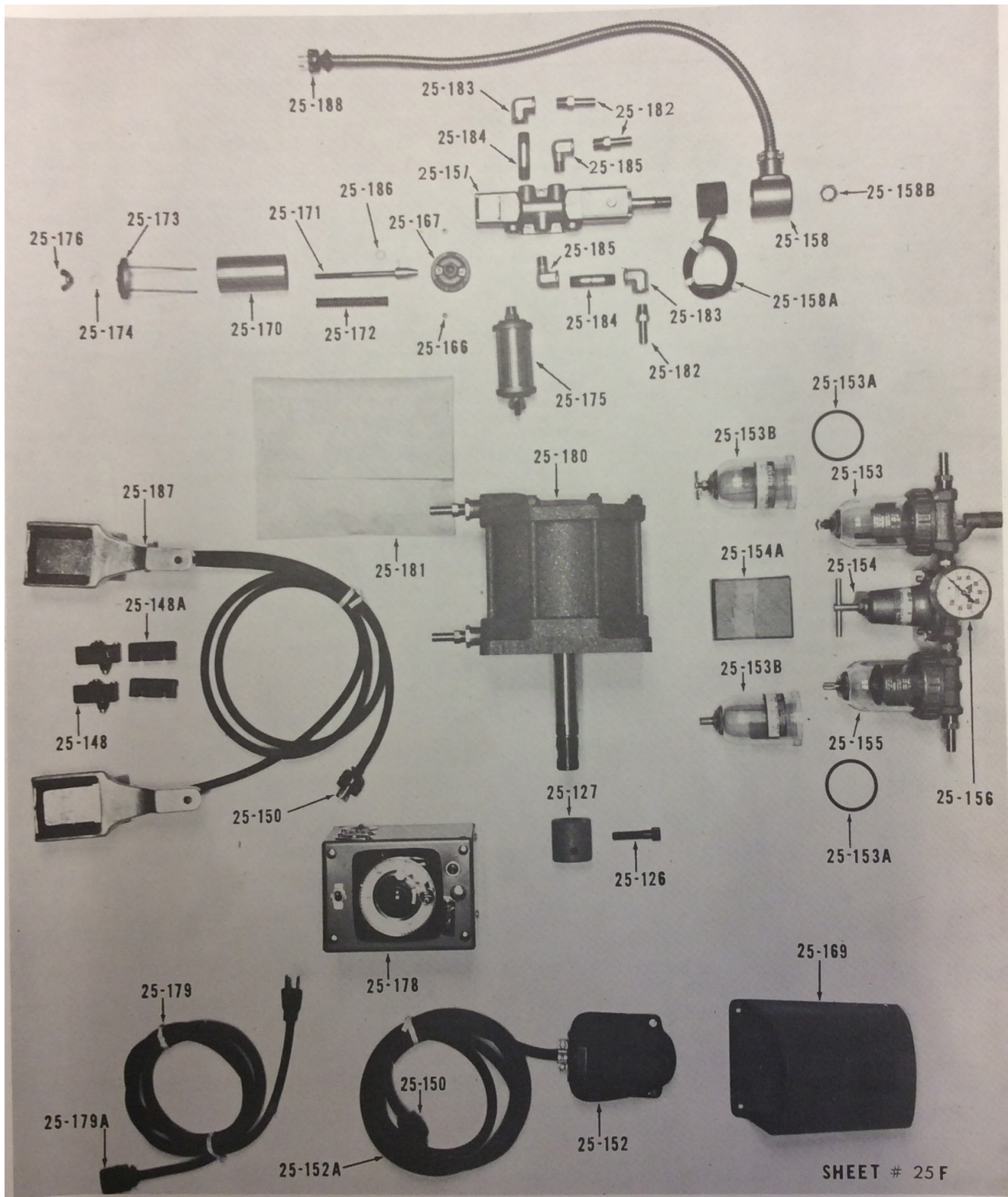
KENSOL 25

Parts Sheet for Kensol Equipment - #C

When ordering parts, supply serial number (found on tag on side of press) and year purchased whenever possible. When ordering electrical parts, be sure to supply voltage used, and whether used on an A.C. or D.C. line.

<u>PART NO.</u>	<u>PART NAME</u>
C-1	Heating head rail
C-2	"Back" key
C-3	Cap screw
C-4	Stop washer
C-5	Stop screw
C-6	Heating head
C-7	Heater
C-8	"Front" key
C-9	Rail set - Heating head
C-10	Locking stud
C-11	Cap screw
C-12	Hex. nut
C-13	Locking slide
C-14	Single open end wrench
C-15	Cap screw
C-16	Thermostat assembly
C-17	Cap screw

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SHEET # 25 F

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PARTS SHEET FOR KENSOL EQUIPMENT - #25F

When ordering parts, supply serial number (found on tag on side of press) and year purchased whenever possible. When ordering electrical parts, be sure to tell us whether your machine is wired for 115 or 220 volts A.C.

<u>PART NO.</u>	<u>PART NAME</u>		<u>PART NO.</u>	<u>PART NAME</u>	
25- 126	Socket Hd. Screw	(1)	25- 171	Valve Stem	(1)
25- 127	Cylinder Shaft Nut	(1)	25- 172	Spring	(1)
25- 148	Micro Switch	(4)	25- 173	Top Muffler Casting	
25- 148A	Micro Switch Cover	(4)		Assy.	(1)
25- 150	Twist Lock Plug	(1)	25- 174	Washer	(1)
25- 152	Foot Switch Assy.	(1)	25- 175	Speed Control Muffler	
25- 152A	Foot Switch Cable	A.R.		Assy. (comp.)	(2)
25- 153	Lubricator	(1)	25- 176	Wing Nut	(1)
25- 153A	"O" Ring	(2)	25- 178	Timer Assy. (comp.)	(1)
25- 153B	Bowl	(2)	25- 179	Line Cord Assy. (comp)	(1)
25- 154	Regulator	(1)	25- 179A	Twist Lock Receptacle	(1)
25- 154A	Regulator Rpr. Kit	(1)	25- 180	Cylinder	(1)
25- 155	Filter	(1)	25- 181	Cylinder Packing Kit	(1)
25- 156	Air Gauge	(1)	25- 182	Hose Fitting	(3)
25- 157	4-Way Valve	(1)	25- 183	Elbow	(3)
25- 158	Coil Housing	(1)	25- 184	Nipple	(2)
25- 158A	Coil	(1)	25- 185	Elbow	(2)
25- 158B	Coil Nut	(1)	25- 186	Star Washer	(1)
25- 166	Muffler Nuts	(2)	25- 187	Dual Hand Switch	
25- 167	Bottom Muffler Cast.	(1)		Assy. (comp.)	(1)
25- 169	Foot Switch Housing	(1)	25- 188	Twist Lock Plug	(1)
25- 170	Muffler Screen	(1)			

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KENSOL- OLSENMARK ROLL LEAF STAMPING SUPPLIES including Lubricants for Kensol Equipment

OLSENMARK ROLL LEAF

For all materials, such as plastics, paper, wood, cloth, leather and coated metals. A complete line of roll leaf available: bronze, silver, hi-lustre metalized gold, silver, and metalized colors: pure gold-24 carat; a complete assortment of colored leaf:

1. FLAT

2. ENAMEL

3. TRANSPARENT

All the above leaf available for metal die stamping and silicone rubber stamping on the first surface (top) and the second surface or back side. Special Matching colors are available and special application roll leaf, such as heavy coated black and white to cover parts to be metalized or sprayed.

TYPE AND DIES

Brass- Fine quality type in many attractive faces. Recommended for all materials. Send for catalog with prices.

Steel- will stand up in long runs, even on hardest (plastic) materials. Send for catalog with prices.

Servol- Hard, durable, deep mat, composition white metal type. Contains no lead. Made especially for hot stamping. Not recommended for wood or hard plastics. Very economical. Send for catalog with prices.

Dies - Brass and Steel - Flat and contoured. Submit art work of the copy and a few samples of the item. Work will be studied and price submitted.

SILICONE RUBBER DIE STAMPING MATERIAL:

Olsen Mark Silicone Rubber Die Sheets are flat, thin sheets of silicone rubber bonded to aluminum. Various thicknesses of silicone-aluminum combinations are available. Available in 80 durometer and also in 60 durometer.

HOW THE MATERIAL IS USED:

Silicone rubber dies are used in the roll leaf process as a means of depositing roll leaf onto raised areas in molded plastic. A sheet of silicone-aluminum material is cut slightly larger than the raised area you wish to coat with roll leaf. This silicone plate is mounted on a die holder, and is heated in the head of the stamping press. When the die is brought down to meet the raised portions of the item (with the roll leaf mounted between), the roll leaf coating is released onto those raised portions which the die contacts. The rubber "gives" enough to pick up imperfections caused by shrinkage, tool marks, etc.

THICKNESSES AVAILABLE:

1/32" Silicone bonded to 1/8" aluminum backing 1/16" Silicone bonded to 1/16" aluminum backing
1/32" Silicone bonded to 42" aluminum backing 1/16" Silicone bonded to 1/16" aluminum backing
1/8" Silicone bonded to 34" aluminum backing

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MAKEREADY MATERIALS:

Red Makeready Board- "Hard," board for plastics 12" x 12") .025" thick.

Cardboard- Smooth, firm, thick, ideal for all genera' stamping.

Black Tar Board- Hard, smooth 'A" thick. 12 sheets 10" x 17 1/2"

Rubber Sheeting- 60 durometer, approximately XS" thick. Vulcanized to a cloth backing.

Black Thin Rubber Makeready- .011 thick

Cork Makeready- 12" x 12"

KENSOL POWER PRESS LUBRICANTS:

High Temperature Grease- for ram and ram pins - over 50% of breakdowns are caused by improper lubrication. Ordinary SAE-30 oil, applied to the ram and ram pin, breaks down when operating at higher stamping temperatures. Especially used on high temperature silicone rubber roll leaf stamping. Good for temperatures up to 600 degrees Fahrenheit. A pound can includes long handled application brush.

Light #10 Oil- for automatic oiler (internal) lubrication of compressed air parts. This oil does not contain detergents or penetrating additives which will attack packings, causing valves to bind and resulting in erratic time cycles.

TOOLING

Jigs and Fixtures. Work will be studied and price submitted.

MISCELLANEOUS:

Die Bonding Film- Die Bonding Film is a quick, strong method of bonding metal dies to flat die chase.

Double Sided Sticky Tape- is a two sided strong adhesive tape which is used for holding fixtures in place on bed of press.

Type Boxes-

Wood- 49 compartments with sliding cover, type cannot fall out of place even if box is turned over.

roll leaf hot stamping

Hot stamping as a decorating technique is not new to the plastics industry—but what is new is the accelerated pace at which it is today beginning to move as one of the more versatile techniques adaptable to an ever-broadening range of plastics applications. At one time somewhat lost among the welter of available decorating methods (spray painting, silk screening, offset printing, to name a few), at one time thought to be most suitable for decorating small plastics products such as compacts and containers, and at one time basing its claims for importance very largely on its adaptability to applying bright metallic colors (i.e., gold, silver, aluminum), hot stamping is today starting to make big noises.

Foils are cheaper and better (with two-, three-, and four-color patterns starting to creep in), machinery is faster and more versatile (even including the ability to stamp all four sides of a box simultaneously), and marketing has become more aggressive (extending into automotive, industrial, toy, and sign fields in addition to the more conventional cosmetics and packaging areas). Even the hot stamping industry itself, which has traditionally looked on plastics decorating as its number four market, is now predicting that it may pass packaging and book binding outlets within the next few years and may eventually go on to take over the top slot from greeting card decorating.

New developments

Foils: While the average cost of foil has come down from \$1.25 per 2400 sq. in. in 1963 to 75¢ at present, it is really the improvement and advances scored in the foils themselves that have created more of the economic excitement. About four years ago, the industry began to experiment with the rotogravure printing of more than one color onto the carrier. The result: woodgrain patterns. From this point, it was a natural progression to the newer and more dramatic multi-colored foils that are now being made available. Although still in their infancy, the multi-colored foils, by enabling two, three, four, and more colors to be transferred to the plastic product with one hit from the press, have opened new dimensions for hot

stamping's possibilities. There are currently several suppliers of such foils as well as others who offer heat transfer systems (by which decoration or printing already on the paper foil is transferred to the product by use of a hot stamping press) for feeding into the conventional hot stamping presses; the majority of foil manufacturers supply the more traditional type of roll leaf material.

Machinery: Simultaneous with foil developments, activities in the machinery end of the business have been aimed primarily at automating and speeding up the hot stamping operation. Thanks to turntable devices, new hopper feeds, and new positioning mechanisms, from 5000 to 7000 imprints an hour are possible—compared to the 500 to 1500 imprints/hr. of a few years back. And there are those who believe the figure still can be upped significantly. With multi-station machines, it is already considered more economical to go hot stamping when you're dealing with anything over ½ million pieces (i.e., on a multi-station machine).

The machines on the market today span a broad range that runs from small, hand-operated presses to 20-ton automatic units (and manufacturers claim they can go even higher, if necessary). Because of the diverse uses to which hot stamping may be put, there is also concentration on more specialized, custom-built machines. Units, for example, are available today that can perform such wizardry as automatically sorting out a variety of different polystyrene swizzle sticks, hot stamping them, and ejecting them ready for packaging at speeds well over 5000 units/hour. One of the fastest of the current crop of machines on the market can stamp out up to 12,000 toothbrush handles every hour.

In terms of machinery, however, one of the more significant recent breakthroughs—again with emphasis on the customizing of machinery—has been in multihead stamping units, capable of hitting all four sides of a box-like beverage case simultaneously to perform the entire decorating job in one pass.

Nor will such versatility necessarily be limited only to flat surfaces. Several manufacturers already claim the abil-

ity to stamp bottles and tubes completely around a full 360°, without smearing where decorations or printing overlap.

Applications and markets

But multi-colored foils are just one aspect of the general upgrading that has been taking place over the years. Over-all, today's foils offer improved color stability, brilliance, and luster. More specifically, advances have been made in tailoring foils to meet specific market requirements.

For example, suppliers have come up with improved pinhole-free foils specifically for application to plastics signs and displays, or clear automotive instrument clusters, especially those that are backlighted. In such uses, pinholes that might be overlooked on opaque surfaces show up as glaring mistakes when back-lighted, and have heretofore required spray or masking backups.

Transparent colors also can be applied via hot stamping, again enabling the sign and display field to achieve some striking effects in back-lighting.

Also available: improved luminescent and fluorescent colors over a broader color range; special hard-surface, hard gloss leaf with outstanding resistance to abrasion and detergents (with special emphasis on the TV and washing machine markets); foils that transmit glossy colors to polypropylene; hard-surface leaf for decorations that require resistance to alcohol, oil, or solvents; and non-fogging leaf for many automotive applications (e.g., horn buttons).

As already indicated, boosters for hot stamping believe there is still much ahead for the technique. Some think the day is close when they will be able to supply a complete service that will enable plastics to be decorated easily, as paper is today.

They believe, too, that there is a vast potential in post-coloring parts molded in natural or white—the idea being to reduce inventory and to facilitate the always difficult job of color matching that is a continual problem in such areas as the automotive market. Detroit, in its need to color complement the interiors of the many different models and styles available in each line, has often had to forego the economies of a long

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run to concentrate on shorter run, specially "color matched" components. In this connection, it should be noted that Ford Motor Co. recently installed hot stamping equipment at its new Saline, Mich. molding plant (General Motors has been using such equipment for some time), and that the foil industry is already supplying it with "matched" colors being used to decorate acrylic hub cap centers and horn rim centers.

The trend to more decorated parts in the plastics industry, in general, is also a contributing factor in the growth of hot stamping. A few years back, for example, it was enough to turn out serviceable houseware. Today this same part must be decorated to enhance its merchandising appeal. And since many such housewares are based on the polyolefins, hot stamping may be able to make inroads. Similarly, the plastic toy industry is turning more to hot stamping for products like space helmets, trucks, boats, etc. The increasing list of code approvals for plastic piping and cable, requiring identifying printing, has also helped boost hot stamping. And, of course, there are always those old standbys for stamping: packages, cosmetic containers, cups and knobs.

In addition to all this, decorators find that they can do things with stamping that cannot be done economically by other methods. Metallic foil, for example, can be produced with high gloss or dull finish. The dull finish will become important in the months ahead now that the automotive safety regulations demand a toning down of many of the bright, reflecting, glare-producing surfaces now in use. Another advantage is that this type of foil is basically non-tarnishing. It also offers a clearer, sharper imprint that safety engineers find very satisfactory.

Because hot stamping is mechanical, it does a more even coating job than many other methods. This is important for critical coloring jobs like those required for back-lighted signs.

The process*

Roll leaf hot stamping can be used on any thermoplastic without pretreatment of its surface. Fine line designs are reproducible on most thermosetting plastics, and the process has been used commercially on metal parts previously sprayed with acrylic paints.

* By Frank J. Olsen, Kensol-Olsenmart Inc., 40 Melville Park Rd., Melville, N.Y. 11719

One major advantage of roll leaf stamping as a method of marking and decorating is that such difficult-to-mark materials as polyethylene and polypropylene can be stamped without special surface treatment.

Basically, hot stamping is a technique involving use of a stamping press, an engraved metal die or flat silicone rubber pad, roll leaf material or foil, and a nest, jig, or fixture which supports and positions the item to be marked.

The stamping die mounts in the heated head of the press, the item to be marked being positioned directly below on the press's worktable. A roll of stamping leaf is mounted so that it will pass between the die and item to be stamped. When the heated die forces the stamping leaf against the plastic and pressure is applied, heat softens the plastic surface and transfers the roll leaf coating into depressions made by the die. When raised areas are to be marked, a flat silicone rubber pad is used instead of a die.

With each impression the strip of roll leaf advances to an unused portion via an automatic roll leaf attachment. Since roll leaf stamping is a "dry" method, the stamped item can be handled immediately without fear of smearing the mark. The time required to complete this marking cycle will normally vary from 1 to 5 sec. depending upon degree of hardness of the object, its resistance to heat, boldness of the mark, stamping die temperature, and pressure applied by the die.

A hot stamped plastic item will have its metallic or pigment coating "inlaid" into depressions made by the heated metal die, or laid onto molded-in, raised areas by use of the silicone rubber pad. Although the majority of plastic applications for hot stamping are connected with thermoplastics, thermosetting materials also can be hot stamped using sharply engraved, hardened steel dies under relatively high heat and pressure.

One advantage of hot stamping is that it can be applied to both flat and contoured surfaces. In order to mark a contoured surface, the die is accurately shaped to match the part. The "up" and "down" action of a standard hot stamping press can mark curvatures up to 90° or one-quarter the circumference of a cylindrical (round) shape. The rotary hot stamping presses currently available to decorate completely circular objects utilize mandrels which rotate the objects

across metal or silicone rubber dies.

In hot leaf stamping, efficient and economic production requires:

- 1) Stamping equipment of the proper size and pressure range.
- 2) Roll leaf formulated for the particular plastic to be decorated.
- 3) An accurate die set of the loose type, or a silicone rubber pad.
- 4) A surface that will both properly support the areas to be marked and position the marks in the desired areas.

Stamping equipment must have a stamping area large enough for the size mark to be made, and a frame large enough to accommodate the overall dimensions of the item to be stamped. It must be capable of developing whatever pressure will be required for the work (pressure required depends upon size of the mark, hardness of the material and its resistance to heat).

A stamping press should have an adequate heating system controlled by an adjustable thermostat. The head should be capable of being heated quickly and maintaining temperatures up to 450° F. In stamping operations, temperature settings vary from 175 (for cold operating leaf) to 450° F. (for silicone rubber pad stampings and some plastic marking). Once set a thermostat must control temperature accurately. This is extremely important, as too low a temperature for a given roll leaf causes it to release incompletely, resulting in a partial print. Too much heat causes the leaf to overflow and fill in an impression so that sharpness of detail is lost.

An accurate, adjustable dwell control on the press is necessary, too. Softer plastics such as vinyl and polyethylene require shorter dwell or "kiss" impressions; harder plastics (polystyrene and, the phenolics) require longer dwell time. On any material, fine line detail requires a shorter dwell period than bold lettering.

Finally, a stamping press should have an adjustable pressure control. In general, rules applying to dwell apply to pressure. It is important to have control of head speed on both the down and up strokes. For best results the stamping die should contact the object only for the time required to transfer coating from the roll leaf carrier strip. When the die is brought away from the object, it is recommended that the carrier strip should remain in place, if only for a mere fraction of a second "setting time." Most materials can be stamped using

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a fast down stroke or "hit." But a brittle object or one not of uniform thickness requires slower head speed so that die heat will soften the material. Peeling the carrier strip off the item is accomplished on the upstroke, and is called "stripping action."

Stripping action is controlled by upstroke speed of the stamping head, position of the "stripper bars" and advance of the roll leaf carrier strip. Naturally a slow up stroke of the stamping head will allow the carrier strip to remain on the object a fraction of a second before stripping the leaf.

A press has two stripper bars riding up and down with the head to keep leaf away from the hot die. Stripper posts are adjustable up and down and are spring loaded. They must be adjusted so that the horizontal bars always are parallel with the press bed. Many times, one stripper bar will be set lower than the other to help stripping action. This technique also prevents air from being trapped between leaf and object, and trapped air can cause shadows in high luster foils. If a maximum cooling (setting) time is required before leaf is peeled from the object, the stripper bars can be dropped as much as 2 in. below the die in order to effect this.

Roll leaf usually advances on the upstroke of the stamping head after an impression is made. However, when using high luster colors or metallics that have a tendency to stick, it is advisable to set the machine so that leaf advances on the down stroke. Many machine makers solve this problem by having delayed roll leaf advance action built into the upstroke mechanism.

Basically there are three types of stamping equipment: handfed, hand-operated; hand-fed, power-operated; and automatically-fed. Hand-operated equipment will prove satisfactory for limited production runs and intermittent use. However, the operator must be skilled because the uniform dwell time and pressure required for good results are under his control.

Power equipment is either motor driven or air operated. Motor driven equipment may be had with accurate heat and adjustable pressure controls, but dwell time and head speed are difficult to adjust. And the motor driven press will not compensate satisfactorily for thickness variations commonly found in many items. Therefore air operated machines are most popular because all three variables

(heat, dwell time and pressure) can be controlled accurately, and because compensation for thickness variations is automatic.

Hydraulic and air-hydraulic hot stampers now in use develop the extremely high pressures required for large metal die stamping on beverage cases and other large items.

Proper formulation of roll leaf is of utmost importance. Roll leaf consists of a thin carrier strip of acetate, cellophane or polyester film coated on one side. A wide variety of coating formulations is designed to give maximum adhesion with various materials.

In general, there are three types of pigment foils and three types of metallics. Pigments are available for stamping either matte (non-glossy) finish or glossy finish, or stamping with transparent color. Glossy colors are most popular because of their appearance and excellent abrasion resistance.

Transparent foils, actually dye coatings rather than pigment colors, are used for decorating automotive deck medallions, horn buttons, etc. A part usually is hot stamped from the back (second surface), then vacuum metallized for an interesting metallic effect. Transparent foils also are used on household appliance dials and escutcheons to be back lighted. Special "masking" colors, simulated wood grained foils and "day glow" colors are available, too.

Metallic foils are coated with suspensions of bronze or aluminum powder, with vacuum plated aluminum and with pure gold. Within the past few years the vacuum metallizing process has been adapted to roll leaf manufacturing, and use of roll leaf stamping as a method for decorating molded plastic items has therefore increased tremendously.

Manufacture of metallized imitation gold, silver and colors is a complex operation requiring several steps. Polyester film must be used as the carrier when making a metallized foil. Acetate and cellophane will give off gas and become brittle during the metallizing process. The film first is coated with a release agent with which to transfer the coating from carrier strip to plastic during the stamping operation. If the foil is to be chrome finished the release coating is clear. If the finish is to be gold colored, the release coating is dyed to the desired shade of yellow. (Naturally, other color metallics can be made using the appropriate dyes. It is important that dyes used be as

color-fast as possible to prevent fading.) Then the carrier strip is vacuum metallized in a chamber. A final sizing coat is applied to facilitate adhesion to the plastic.

Usually made in 24-in. width, roll leaf normally is supplied in 200-foot lengths wound on one-inch diameter cores. It also can be purchased in continuous length rolls of up to 1000 ft. for high speed applications. The supplier usually slits the leaf to whatever width a job calls for. When ordering roll leaf, specify the plastic being marked, whether a metal or silicone rubber die will be used and whether the part will be painted or metallized before or after stamping.

Roll leaf dies usually are made on a pantograph machine or chemically by etching the metal. Engraving depth is obtained by routing, and the die is hand finished to eliminate burrs that would tear roll leaf and give ragged looking results. Curved dies are engraved from blanks shaped to match contours.

Hardened tool steel dies are recommended for long production runs on hard materials (phenolics, polystyrene, acrylics). It is important not to have steel dies hardened before they have been tested to see if they match the parts to be stamped.

As mentioned previously, silicone rubber is used for stamping or "selectively metallizing" raised letters, figures, trademarks, panels, etc. Desired markings are engraved into the mold. (We recommend the mold maker engrave to a depth of at least 35 mils.) When the article is molded, the areas are raised from the piece's surface. These raised areas can be either on the viewing side of the item (its first surface) or on a clear item's back side (its second surface).

The rubber has enough "give" to compensate for slight variations in an article, and may be had in sheet form vulcanized to thin sheets of aluminum or steel, simplifying mounting of the die to the heated head of a press. Silicone rubber dies should be mounted as close to the heat source as possible and, since silicone rubber is a comparatively poor conductor of heat, stamping head temperature must be held at approximately 400° F. to maintain the 300° F. die face temperature most roll leaf requires. Other printing elements are available besides steel and silicone rubber.

When stamping soft materials (paper, vinyl plastic, etc.), brass or deep

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etched zinc, magnesium or copper dies can be used. Inexpensive etched dies also are used for making samples on hard plastics. Movable type can be had in many sizes and styles. Hot stamping type is made of composition metal, brass or steel, and lead foundry type, Linotype, Ludlow and other lead printing elements can be used for short runs on soft materials.

The final roll leaf stamping component is the supporting surface, jig, or fixture which positions an item accurately under the stamping die and supports it properly when pressure is applied. If the part is not supported rigidly, work will shift out of level and cause stampings of uneven depth. Poor support also is likely to cause a brittle item to crack or craze.

If the desired mark is to be applied over a hollow section in a product, a nest, shaped accurately to conform to the hollow section, must be made.

Preparing a job: After providing a properly matched supporting surface, bond a piece of hard, smooth paper or cardboard to the surface under the stamping area. Then make an impression on the item put in position on the supporting surface.

Examine the impression. Make weak or light spots heavier by building up the surface under the item with various thicknesses of paper wherever necessary. Air-operated stamping presses will compensate for thickness variations found in multi-cavity molding of plastics. However, because of improper molding cycles, molding heat variations, and poor mold design, sink marks and other imperfections will appear. In many cases, you can overcome this problem by bonding a thin sheet of firm rubber or cork to the face of the supporting surface as a leveler.

Many shops have minimized make-ready problems by hot stamping directly at the molding machine while items still are hot. This reduces spoilage due to cracking and crazing and produces finer quality stamping with less pressure and better adhesion. Many molders cut costs and spoilage on large, single cavity items by having the machine operator stamp and pack with very little added effort.

Being involved constantly with decoration and marking of all materials, we see fine and poor quality hot stamping. Yet at very little additional ex-

pense, high quality results can be obtained with a few basic principles.

Design considerations: Proper design of an item to be hot stamped is of utmost importance. The design engineer should:

1) Consider decoration of an item when designing, making certain that its stamping area will remain uniform from one cavity to another and insuring proper support of a hollow item since pressure is to be applied.

2) Not place knockout pins, mold marks, gate areas, or ribs in or under a stamping area.

3) Consider the material flow so he won't have excess weakness in the stamping area.

4) Design the item so that stamping will be done over an area of uniform wall thickness. If a thin wall is adjacent to a heavy wall, he will probably encounter varying shrinkage in the heavy wall.

5) Highly polish his mold in the stamping area. Tool marks and other imperfections will be magnified when metallic or high luster foils are applied.

6) Raise the area at least 0.035-in. if he intends to "top" stamp a raised area with silicone rubber.