

FRANKLIN

MANUFACTURING CORPORATION

MODEL 8000 and 5000

SERIES (Linear Wedge Drive Machines)

OPERATING INSTRUCTIONS

HOT STAMPING MACHINES

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FORWARD

These instructions covering operation of your Franklin Roll Leaf Stamping Press are necessarily general in nature. Specific information and additional help in the operation of the press and decorating your parts are available from Customer Service, Franklin Manufacturing Corporation, 692 Pleasant Street, Norwood, Mass. 02062.

In these instructions, we have tried to outline how the press operates, how to set it up, how to use it, and how to “trouble shoot” it. Before operating the press, you should read the entire booklet.

If your press is equipped with accessories such as meter indicating heat control, air head return, air slide table rotary table, etc., special instructions are included with these standard instructions.

WARNING!!!

1. A hot stamping press applies high pressure with heat to article being marked. Care should be taken by the operator to keep hands free of the stamping area whenever the equipment is connected to air and electricity. When handling large articles, hold them by the sides so that the hands are not under the stamping head. When handling small articles, loading onto fixtures should take place away from the stamping area. **A MANUAL OR AIR SLIDE TABLE SHOULD BE USED WHEN STAMPING THESE SMALL PARTS.**

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A TRANSPARENT SAFETY GATE SHOULD BE INSTALLED TO PROTECT THE OPERATOR. Because this Franklin press is so versatile, it is impossible for Franklin to supply a universal safety gate or slide fixture. A device should be made by the customer to protect his operators. Do not hesitate to consult the manufacturer for advice or quotations on custom built part loading devices, etc.

2. This press is furnished with 2 hand buttons wired so that an operator must press both buttons to initiate a cycle. An antitie down feature is standard on these presses (except where automatic loading features are provided with presses custom built to order).
3. Any attempt by the customer to alter the wiring or construction of this press which renders the two hand anti-down circuit useless IS COMPLETELY UNAUTHORIZED AND PROBABLY WILL RESULT IN SERIOUS INJURY TO THE OPERATOR.
4. This machine was thoroughly tested before shipment. Please remember that any machine can malfunction for a number of reasons beyond the manufacturer's control. If the operator detects any malfunction, this press should be immediately turned off and the shift foreman should be notified at once.
5. It is extremely important to remember that when servicing or setting up this equipment, electrical power should be shut off and the air line completely disconnected to prevent accidental actuation of the stamping head.

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ON RECEIPT OF THE PRESS

Remove the upper portion of the crate from the skid; remove the bolts holding the press and legs to the skid; lift the press with a sling and mount on legs.

ELECTRICAL CONNECTIONS

Connect only to proper power source. It is a good idea to check the voltage at an outlet before connecting the press. Check the tag on the lead wire of the press to see whether your press requires 110, 230 Volt single phase, 230 Volt three phase, 480 Volt single phase, or 480 Volt three phase. Special voltages can be supplied when necessary. Please write for details.

AIR SUPPLY

Air should be supplied through a minimum hose or pipe of 3/8" ID to insure proper press speed. The press is capable of operating at up to 150 PSI with no damage to any component. Minimum available pressure should be 80 PSI to 125 PSI, any less than 80 PSI will result in artificial upper limits on available die pressures. If limited pressure is available at all times, contact Customer Service for information on boosting output of press on low pressure air.

REMOVAL OF PROTECTIVE METAL COATING

The coating on this machinery is easily removable with any petroleum distillate such as kerosene. Just soak a rag and wipe off all sprayed parts where necessary.

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SPECIAL NOTE REGARDING ALL MODEL 8000 SERIES PRESSES

In order to prevent damage to the cam rollers in the press, packing has been placed between the cam roller and the wedge cam prior to shipment. This packing should be removed before the machine is activated. This can be done by manually removing the packing from the top rear of the wedge cam.

ELECTRICAL SYSTEM:

The machine uses three basic electrical circuits.

A 230 VAC three phase current is provided to the machine through a separate disconnect box which is fuseable and located on the upper side of the press. The 230 three phase current is wired through contactor points to two banks of two cartridge heaters wired in series to the outside legs of the input with the center line common to all four heaters.

A second set of lines from the fuseable disconnect switch is wired to the primary side of a 230-120 VAC transformer in accordance with manufacturer's specifications.

A 120 VAC is taken from the secondary of this transformer and provides current for the control elements of the press.

This circuit is fused with 10 amp cartridge fuses and is provided with a control toggle switch which is located in the upper left-hand corner of the control box panel.

A pilot light located directly above this switch and wired across the 120 VAC circuit, will glow when this switch is in ON position.

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This control switch will also activate the solid state heat control. The solid state heat control unit can be located inside the control box easily, since it is the only unit composed of a printed circuit board with a small relay in the corner.

Power for this unit is supplied to Terminals L1 and L2 on the top surface of the board. A jumper is used between L1 to terminal C for the common. The potentiometer located on the front panel of the control box is used as a remote control for pre-setting the desired temperature. Wires from this potentiometer are connected to P1, P2, and P3 on the circuit board. (Green and White to P1----- Red and White to P2----- Black and White to P3.)

A thermistor probe, which is located in the aluminum or heated portion of the head, provides a signal to this unit to energize the normally open contact when the heated head temperature becomes lower than the pre-set temperature.

The two leads from the thermistor are connected to T1 and T2.

When the thermistor calls for heat, the circuit board generates a 24 volt current to the small relay located in the corner of the control board. A 110 volt is generated across the contact points of the small relay to close the 220 volt contactor, thus supplying current to the cartridge heaters.

A yellow pilot light, located on the panel directly above the heat adjustment, will light and stay lit as long as the thermistor is calling for heat.

The third major circuit is the dwell time control. This circuit provides the necessary electric signals to operate the pneumatic units of the press.

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The main control element of this circuit is a solid state timer.

This unit is also supplied with a plug-in relay, the contacts of which provide 115 volt signals to the control pilot valve of the machine.

Power is supplied to this unit through Terminals 1 and 2 of the Terminal strips located on top of the timer. A toggle switch (Head Switch) is provided to turn this unit off and on and is also used as a safety switch when it is necessary to work directly under the ram. A pilot light (Head On) will light when this switch is in the ON position.

This timing unit is activated by the two hand switches on the press which are wired to Terminals 10, 11, and 12. A jumper is connected between Terminals 1 and 7 to provide a common for this unit. Terminal 9, which is a normally open contact, will produce a continuous 115 volt current to the solenoid for the period of time pre-set on the potentiometer located on the face of the panel. A red pilot light is wired in parallel with this circuit and will stay lit as long as current is being supplied to the solenoid. The two leads from the dwell potentiometer are connected to Terminals 5 and 6. A toggle switch (Set Up Switch) is in this circuit which allows continuous current to the solenoid as long as this switch is open, making it much more convenient to set the proper level of the work table with the head in the DOWN position. The head will return to its UP position when this switch is closed.

A micro switch located on the right side of the frame of the press and activated by a cam which goes up and down with the head, provide the pinch point circuit. The cam should be set so that the limit switch is closed when the head is in the full DOWN position. The two leads from this switch are connected to Terminals 3 and 4 on the timer.

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There is a dual knob control on the potentiometer which provides a fine timing control. The large knob reads on the outside scale while the small knob reads on the inside scale or fractions of a second.

PNEUMATIC SYSTEM:

Air is directed to the ram cylinder ports by an air pilot operated four way valve with spring return. The exhaust ports of this valve are supplied with speed control mufflers to control the speed of the ram up or down. Air is supplied to this valve through the rubber hose which is attached to an in-plant air source, through an air filter, air regulator, and oil unit to the import of the valve. Pilot line pressure is taken ahead of the air regulator and directed to the import of a solenoid operated four way valve.

The normally opened port of this valve is plugged and the normally closed port is piped to the pilot side of the main ram valve, which is mounted on the end of the ram cylinder. When an electric current is applied to the solenoid of the pilot valve by the dwell time control, pressure is applied to one side of the ram valve causing the head to go down as long as the pilot pressure is applied. When the solenoid of the valve is de-energized, the pilot line pressure is exhausted allowing the spring side of the main ram valve to return to its normal rest position causing the ram to return to its normal rest position causing the ram to return to its UP position.

The leaf pull cylinder ports are supplied air by a double pilot operated four way valve with a spring return on one end. Air supplied this valve, is taken ahead of the main ram air regulator through its own regulator and oiler to the import of the valve.

Pilot pressure is supplied to this valve from the same normally closed port of the pilot valve.

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Air enters the pilot system through the leaf pull delay control, pressurizes the spring loaded end of the leaf pull valve, continues past the check valve to the other end of the leaf pull valve, and to the spit valve.

When pilot pressure is applied, no shifting of the leaf pull valve, no leaf advance occurs. When the signal is removed, however, air bleeds from the spring and through the delay valve at the controlled rate. The check valve prevents bleeding at the other end of the valve. At some time, determined by the rate of bleed (adjustment of delay), the pressure on the spring end is lowered enough to permit the captured air on the other end to shift the valve against the spring. Leaf pull begins. At the end of the extension stroke of the cylinder, the spit valve is tripped, air between the check valve and the spit valve is exhausted, allowing the spring to return the leaf pull valve to the rest position, causing the cylinder to retract.

1. CONNECT AIR HOSE.

Ideally this supply should be 100 PSI on the low setting of the plant air compressor for the best press operating conditions. The Franklin hot stamp machine requires at least 50 PSI for pilot operation of the four-way valves used.

2. ADJUST AIR PRESSURE REGULATOR.

The main ram regulator should be adjusted in accordance with information noted in depth of stamping penetration control in the Machine Control Section of these instructions.

3. PLUG IN ELECTRICAL POWER.

Be sure to note whether machine is 115 VAC, 220 VAC Single Phase, or 220 VAC three phase and connect only to appropriate outlet.

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4. TURN ON POWER SWITCH

Red pilot light should glow when this switch is in the ON position. This pilot light is located directly above the power switch.

5. HEAD SWITCH

The head switch should be in OFF position. The amber pilot light directly above this switch will not glow when this switch is in the OFF position.

6. SET HEAD TEMPERATURE CONTROL

Set head temperature control to OFF position. This will be accomplished when the setting knob is turned counter clockwise as far as it will go.

7. LOWER WORK TABLE

It will be necessary to lower the work table at least 2 ¾" above the stamping level of a fixtured part using a linear wedge press or, at least 3" above the stamping level of a fixtured part when using a direct air cylinder press.

8. REMOVE DOVETAIL FROM HEAD OF PRESS

Remove dovetail from head of press by loosening the clamp and sliding the dovetail out parallel to the dovetail.

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9. INSTALL OR ATTACH DIE TO FACE OF DOVETAIL PLATE

Die should always be mounted with the artwork centered on this plate. This will prevent uneven pressure on the die or rocking of the head under pressure if die is not mounted directly under the ram.

10. RE-INSTALL DOVETAIL IN HEAD AND SNUG CLAMPS

It is important not to tighten clamps too tight at this point since expansion during heating of the head will place undue pressure on the clamp threads when heating.

11. PLACE SET-UP SWITCH IN DOWN OR OFF POSITION.

12. SET FINE ADJUSTMENT ON DWELL TIME CONTROL.

Set the fine adjustment on the dwell time control to zero and the coarse time to 1 second.

13. TURN ON HEAD SWITCH

Turn on head switch and cycle press by depressing both hand safety switches at the same time. Hand switches should be held until head is down before releasing, since pinch point circuit will allow the head to return to its UP position automatically, if this is not done.

14. CYCLE SEVERAL TIMES.

Cycle several times readjusting coarse time on dwell until time is set so head will descend to the bottom of the ram stroke and hesitate slightly before returning to the UP position.

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15. PRE-ADJUST LEAF PULL SPEED CONTROLS.

Pre-adjust the leaf pull speed controls so leaf pull cylinder runs smooth without any jerky motion. The speed should be only fast enough to prevent the jerky condition and no faster. Final adjustment will be made on this control later in setup procedure.

16. PRE-ADJUST LEAF DWELL.

Pre-adjust the leaf dwell so the knurl and rubber roller do not start until the head is in a full UP position. This adjustment will also be finalized later on in this setup procedure.

17. PUT SET UP SWITCH TO ON OR UP POSITION AND CYCLE PRESS.

Head should now stay in down position. CAUTION: WHENEVER THE SETUP SWITCH IS BEING USED, BE CAREFUL NOT TO PUT YOUR HAND BETWEEN THE TOP OF THE HEAD AND THE BOTTOM OF THE MAIN FRAME UPPER CASTING BECAUSE SHOULD POWER FAIL WHILE THE HEAD IS IN THE DOWN POSITION, THE HEAD WILL RETURN IMMEDIATELY.

18. POSITION FIXTURE.

Position fixture with part in place on the work table.

19. RAISE WORK TABLE.

Raise work table until stamping surface is in contact with the die and continue to raise the table until it is snug. Clamp or bolt fixture into place.

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20. ADJUST PINCH POINT CAM.

Adjust pinch point cam so pinch point limit switch will be closed with the head in the Down position.

21. TURN OFF SET UP SWITCH.

Head should return to a full UP position.

22. TURN OFF HEAD SWITCH.

23. RAISE TABLE.

Table should now be raised about a quarter of a turn adjustment nut to the final table elevation. See Machine Control Instructions.

24. ADJUST TEMPERATURE CONTROL

Adjust Temperature control and wait for head to heat. Pilot light should glow when heaters are on. This amber pilot light is located directly above the heat control adjustment dial. Press should be up to heat when pilot light turns off the second time. Heaters will now be automatically turned off and on to maintain the heat setting after the press reaches heat.

25. PLACE FOIL ON PART.

Place foil on part by tearing a piece from the roll large enough to cover the stamped area with coated side down.

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26. TURN ON HEAD SWITCH

Turn on head switch and cycle press. Recycle press as necessary using fresh part and foil with each cycle until a complete stamping is made. Increase or decrease the dwell control until this is accomplished.

27. TURN OFF HEAD SWITCH.

28. THREAD AND POSITION FOIL.

Thread and position foil as noted in Machine Controls Section of instructions.

29. TURN ON HEAD SWITCH AND CYCLE PRESS AS NECESSARY

30. ADJUST FOIL LENGTH, CYCLING PRESS AS NECESSARY

31. RE-ALIGN ROLL LEAF IF NECESSARY.

32. ADJUST AND FINALIZE LEAF PULL FEED AND DWELL CONTROL AS NECESSARY

33. FINALIZE STRIPPER BAR ADJUSTMENT.

34. CYCLE.

Cycle until three satisfactory stampings are made in succession.

35. PRESS IS NOW READY FOR PRODUCTION.

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MACHINE CONTROLS:

Introduction

The Franklin Hot Stamp Machine has four basic areas of control. A good understanding of these control areas is essential before a setup is attempted.

The four areas of control are heat control, fusion cooling control, foil pull control, and depth of stamping penetration control. Each of these control areas have two or more adjustments of electrical, pneumatic, and mechanical and/or combinations of adjustments of these elements.

Depth of Stamping Penetration Control

Molded plastic parts which are to be decorated using the hot stamping process will always have a certain amount of variation in the wall section. No matter how well a part is fixtured, it is rare that the stamping area will be totally parallel with the die surface. It is necessary that the die make contact with the lowest level in the area to be stamped in order to obtain a complete transfer of the stamping foil.

Since different engineering plastics have different hardnesses, it is obvious that the different head pressures must be applied to the stamping die in order to penetrate the substrate being stamped.

When using a metal die on styrene, ABS, acrylic, etc., it will require approximately 1 ton per square inch of stamping impression area in order to penetrate this material to the proper depth. For materials such as general purpose polyethelene, soft polyvinyl, or other materials of this Shore hardness range, it will take approximately ½ ton per square inch of impression area. By extrapolation then, the material in the middle range

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Shore hardness, i.e., cellulose acetate will require about $\frac{3}{4}$ of a ton of pressure per square inch of impression area.

The basic adjustment then to be made in this control area is the PSI adjustment of the ram air regulator. The first step is to arrive at the total impression area of the metal die. This may be estimated, measured directly, or in some cases, where die detail is intricate a planimeter may be used to measure the actual artwork. Once the square inch area is know, the following formulas may be used to arrive at the proper PSI adjustment of the ram regulator, when using a metal die.

Eight Ton Machine	12.5	x	Sq.	In.	=	PSI
Five Ton Machine	20	x	Sq.	In.	=	PSI
Two Ton Machine	50	x	Sq.	In.	=	PSI
One & One-Half Ton Machine	66.6	x	Sq.	In.	=	PSI
One Ton Machine	100	x	Sq.	In.	=	PSI

When a silicone rubber die is used, in order to tip the raised portions of normal engineering materials, silicone rubber die which is normally between 60 to 70 Shore hard will normally give before the harder plastic material.

When using a rubber die then for tipping, the basic rule is to allow 300 PSI per square inch of stamping area in order to assure the rubber die, in this case, will give enough to make a good thermal contact with the lowest point in the stamping area.

Hence, once the square inch area is known, the following formulas may be used to arrive at the proper PSI adjustment of the ram air regulator, when using a rubber die.

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Eight Ton Machine	1.88	x	Sq.	In.	=	PSI
Five Ton Machine	3	x	Sq.	In.	=	PSI
Two Ton Machine	7.5	x	Sq.	In.	=	PSI
One & One-Half Ton Machine	10	x	Sq.	In.	=	PSI
One Ton Machine	15	x	Sq.	In.	=	PSI

It should be noted, these same basic formulas may be used in arriving at the proper tonnage machine to use when projecting work orders.

The next adjustment in this control area is the elevation control for the work table itself.

If a direct air cylinder drive is used, the piston of the ram cylinder should never be allowed to completely bottom out. This will allow the air press to automatically adjust to varying part thickness of the plastic casting.

When using a linear wedge drive machine, the table is normally cranked up until it makes solid contact with the die in the head down position. The setup switch is turned off then allowing the head to retract upward. The table adjustment nut is given about a quarter turn clockwise in order to raise the table slightly higher than the contact point. This will allow the wedge to travel in farther, driving it so far in to compensate for a thicker part. The linear wedge can be considered adjusted properly when the moveable cam follower bearing on top of the ram is just going around the corner upon the bottom of the wedge.

The last adjustment of this control area is the ram down speed, which is controlled by the speed control muffler located on the exhaust part of the main ram valve. The proper exhaust can be located by holding your hand over the two exhaust valves and cycling the press. The one which blows air on the down stroke of the press is the one to adjust for the down stroke speed. The screw on top of this muffler may be turned clockwise to slow down the down stroke, or turned counter clockwise to speed up

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the down stroke. The jam nut should be securely tightened when this adjustment is made.

The object is to provide the ram with enough down peed without an impact force. If the ram is allowed to come down with too fast of a speed, it tends to emboss the part before it has a chance for the surface of the stamp area and the coating on the foil to reach a fusion temperature without proper pressure which is needed for a good thermal bond, since the part may be embossed too deeply by the hammering action.

Heat Controls

The heat is controlled on the machine by two adjustment elements. The first control element, either a thermostat or solid heat control can be considered a rough heat setting, while the dwell time control can be considered a fine heat adjustment.

Since, very simply, hot stamping is the fusion of a coated plastic material to the surface of a compatible plastic material, the rough or heat control setting is dependent upon the substrate to be stamped. Hot stamping foils manufactured by different manufacturers will not always require the same amount of heat even though stamped on the same substrate. The approximate heat control setting then, should be one recommended by the foil manufacturer, or through experience.

Minor heat adjustments, using the thermostat or solid state heat control, can take up a good deal of press production time by the time the heated head levels out as the result of a heat change. Consequently, the dwell time control can be effectively used for minor heat adjustment without the loss of production time in setting up.

The dwell control timer regulates the time in seconds or fractions of seconds, that the die stays in contact with the work before the head returns to its

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normal up rest position. Obviously, the longer the head is in contact with the work, the more heat is transferred from the die to the work.

It should be noted that the dwell timer is turned on at the same time the ram receives a signal to do down. The dwell time, then also includes the travel time of the head from the UP position until contact with the work. Therefore, uneven air supply to the press can change the downward stroke speed of the ram creating a variance in actual dwell contact with the work, and cause inconsistent stamping results.

For this reason, the ram air regulator must never be adjusted higher than the low point of the plant air supply system.

Fusion Cooling Control

After a stamping is made, the melted surface of the casting which is stamped and the melted plastic coating which is also in a melted condition can be pulled apart if the foil is stripped too quickly. This causes an incomplete transfer of the stamping foil since the melted plastic on the back of the foil can adhere just as easily to the foil carrier as it can to the melted plastic surface. There are three adjustments in this control area to counter this condition.

The first adjustment area is the element of the press called the stripper bars. The stripper bars provide an additional function of keeping the foil away from the hot die when the head is in the UP position. The stripper bars are the two parallel bars which the foil is strung under from the play out roll to the pinch rollers or pull rollers. The vertical bars of this elements are spring loaded to allow the die to press on top of the leaf and the casting on the down stroke of the machine. Ideally, these bars should be blocked so that the parallel bars will be stopped at the same level as the stamping, the head continues to travel downward as the vertical stripper bars are pushed up

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through the frame against the spring load until die contact with the work while the stripper bars hold the foil on the stamping surface as the spring

load and the vertical bars unload, then finally strip the foil from the work when the vertical bars reach the jam nut which may be adjusted on the top of the vertical bars. The travel time then, of the head on the up stroke, between the time the die leaves the work and the stripper jam nuts are contacted, stripping the foil allows the necessary cooling time for the fusion.

It is obvious then, the lower the stripper bars are set, the longer the cooling time or the slower the up ram speed, the longer the cooling time.

The up ram speed control can be adjusted in the same manner that the speed down control is adjusted.

The final adjustment of this control area is the foil dwell control. If the foil advances before it is stripped from the work on the up stroke of the press, this can also pull the fusion apart causing an incomplete transfer.

The Pneutrol flow control valve located near the leaf pull four-way control valve can be adjusted to delay the leaf pull from acting until the head is in the full up position.

The round control knob of this valve is screwed clockwise for longer dwell and counter clockwise for a shorter dwell. The jam nut should be firmly secured when this adjustment is finalized.

Oil Pull Controls

In order to make the adjustments in this control area, foil must be strung through the foil pull mechanism.

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The two clamps on the play-out roll arbor are loosened and the outer clamp, spring and disc, are removed leaving the back arbor clamp and disc on the arbor.

The roll of foil is now slipped on the arbor with the coated side of the foil facing right so it will be next to the work when pulled under the stripper bars. The outer disc, spring and clamp are now slid on the arbor with both clamps left loose. The end of the foil then is strung under the stripper bars coated side down, and the end placed between the knurled and rubber pinch rolls. Turning the rubber roll using the large pulley knob, the foil is rolled through the pinch roll from bottom to top and allowed to hang free. The square knobs which release the pressure between the rubber and knurled roll are now turned clockwise to allow the foil to be adjusted front to back between the pinch rolls.

The foil is now aligned front to back so that there is an even amount of foil extending over the stamping area on the front side as well as the back. The back clamp on the play-out arbor is now tightened. The front clamp is pressed against the play-out foil spring and the clamp tightened. Enough pressure should be put on this clamp spring to cause a drag when the foil is given a quick jerk. The rubber roll pressure knobs are now against the knurled roller. Foil play should now be taken up by turning the rubber roller by hand to tighten the foil between the play-out roll and the pinch rolls.

It should be noted that the parallel stripper bars should be parallel to the work table, since an angle on these bars will cause the foil to track to the high side of the bar. It should also be noted that the small rubber bumper washers on the parallel bars are not foil guides but bumpers for the stripper bars when making contact in the down position. These rubber bumpers should be placed to the front and back extreme ends of the parallel stripper bars and against the vertical bars on each end. Without a part in the machine, the head should be cycled. It is not necessary that the head reach the full

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down position in order to make the foil pull work. As soon as the head starts down, the hand switches should be released and the foil advance will begin at the end of the foil dwell adjustment.

The two flow control valves on either end of the leaf pull cylinder may now be adjusted so the pull of the foil by this cylinder in both directions, will be even and without jerky motions. If the foil pull is set too fast, it tends to jerk more foil from the play-out roll than is required to keep the foil tension taut under the stripper bars which can cause an inconsistent foil pull length.

The tension spring on the play-out roll can also be adjusted in conjunction with the speed controls on the pull cylinder to prevent this from occurring.

The foil end can now be wrapped around the rewind roller and any play in the foil between the pinch roll and the rewind roll taken up by turning the pinch rolls by hand.

The foil pull length is now adjusted to the minimum length of the job to be stamped. It is normal to have about an eighth of an inch space between transfers.

Although the air regulator controlling the air to the leaf pull cylinder valve is normally preset at the factory to 80 PSI, it should be set below the low point of the in-plant air system, prior to the speed control adjustments.

The jam nuts on the flow control valves should now be securely tightened.

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LUBRICATIONS INSTRUCTIONS

8100 (8 Ton) & 8500 (15 Ton)

1. LUBRICATOR: FILL LUBRICATOR BOWL THREE QUARTER FULL WITH ANY GOOD GRADE OF 10 W NON DETERGENT OIL.
2. ROTATE KNOB COUNTERCLOCKWISE APPROXIMATELY $\frac{1}{4}$ TURN SO THAT ONE DROP OF OIL WILL ENTER THE AIR SYSTEM FOR EACH TWENTY CYCLES OF THE PRESS. THIS CAN BE DETECTED BY OBSERVING THE GLASS BUBBLE ABOVE THE LUBRICATOR.
3. THE GIBS ON THE RAM ASSEMBLY SHOULD BE GREASED WITH ANY GOOD ALL PURPOSE GREASE ONCE A WEEK FOR AND EIGHT TO TEN HOUR PER DAY OPERATION.