MORGAN INDUSTRIES, INC.
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OPERATING INSTRUCTIONS

Morgan-Press Injection Molding Machine

Model G-100T

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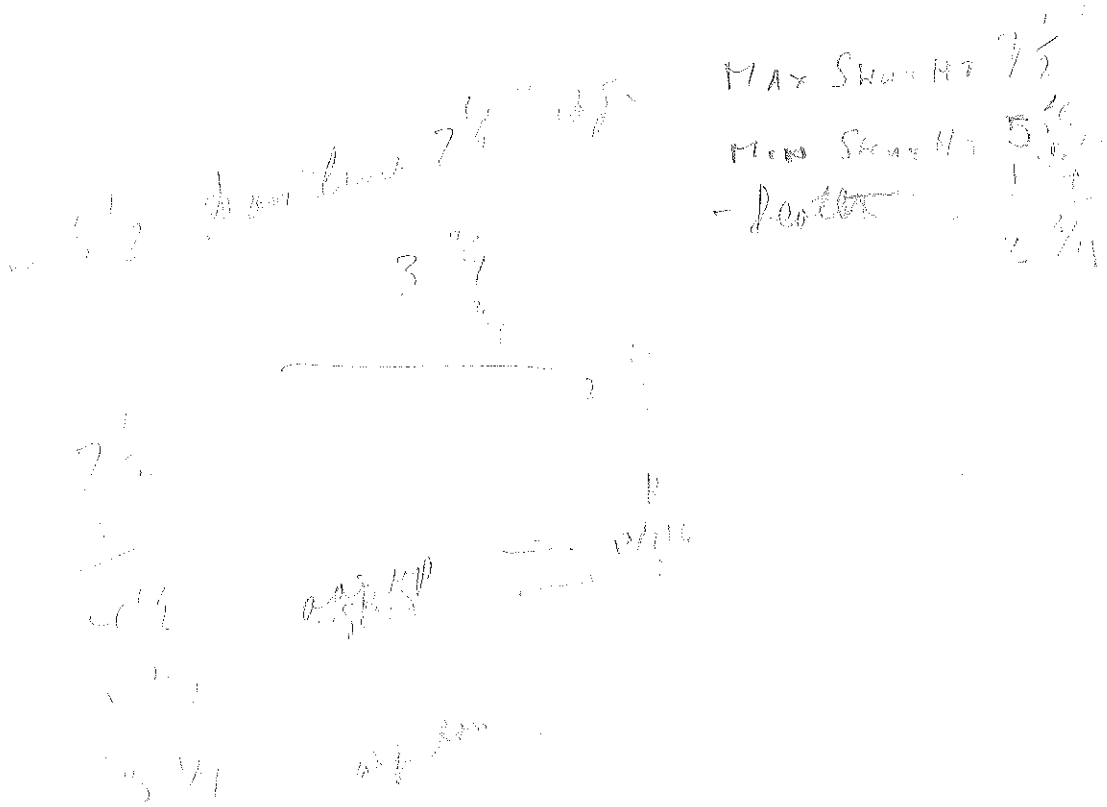

MORGAN INDUSTRIES PRODUCT WARRANTY

LIMITED WARRANTY

Morgan Industries machines and accessories are warranted against all defects in workmanship and materials for a period of one year from date of shipment from Morgan Industries plant. Electrical and pneumatic components are warranted for 90 calendar days from date of shipment. All defects are subject to factory inspection. Morgan may, at its option, (a) furnish new or repaired components in exchange for those found to be defective, in which case the purchaser remains responsible for removal and replacement labor, or (b) request that the defective machine or accessory be returned to Morgan for repair, in which case the purchaser remains responsible for all freight charges.

Please note there is a distinction between "defects" and "damage" as used in this warranty. Defects are covered because we, the manufacturer, are responsible. On the other hand, we have no control over damage caused by such things as accident, transportation, improper operation, misuse, abuse and lack of maintenance after shipment. Therefore, damage for any reason is not covered under the warranty.

Morgan Industries assumes no responsibility for loss of use of the machine or accessories, loss of time, inconvenience, or other consequential damages.

Personnel safety is of primary importance when utilizing this equipment. Insuring safe operation to include maintenance and use of the existing guards and interlock devices is the responsibility of the owner of the equipment. All personnel utilizing the equipment should be properly instructed according to the directions before using equipment.

As the owner, you are responsible for properly caring for and maintaining this equipment. Proper operation of this equipment is also most important. Morgan Industries cannot be responsible for misuse of equipment or modifications to equipment that are not recommended or approved by Morgan. Routine maintenance, safety and operating procedures are contained in your operating instructions.

Morgan Industries is sincerely interested in your satisfaction with its products. Should you encounter a problem in connection with this warranty or have any questions regarding the equipment, please feel free to discuss them with Morgan Industries and/or its representatives. Morgan Industries may be contacted toll-free within the U.S.A. and Canada at 1-800-222-6929.

This warranty is the only warranty applying to Morgan Industries machines and accessories; and it is in lieu of all other warranties expressed or implied.

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MORGAN INDUSTRIES, INC.

MORGAN-PRESS OPERATING INSTRUCTIONS

MODELS G-100T AND G-55T

INTRODUCTION

The Morgan-Press is an injection molding machine with air driven pistons providing the power to clamp molds and inject thermoplastic material into molds. It is designed specifically for economical molding of applications involving prototyping and lower quantity production requirements. Its temperature range capability permits working with most conventional thermoplastic molding materials.

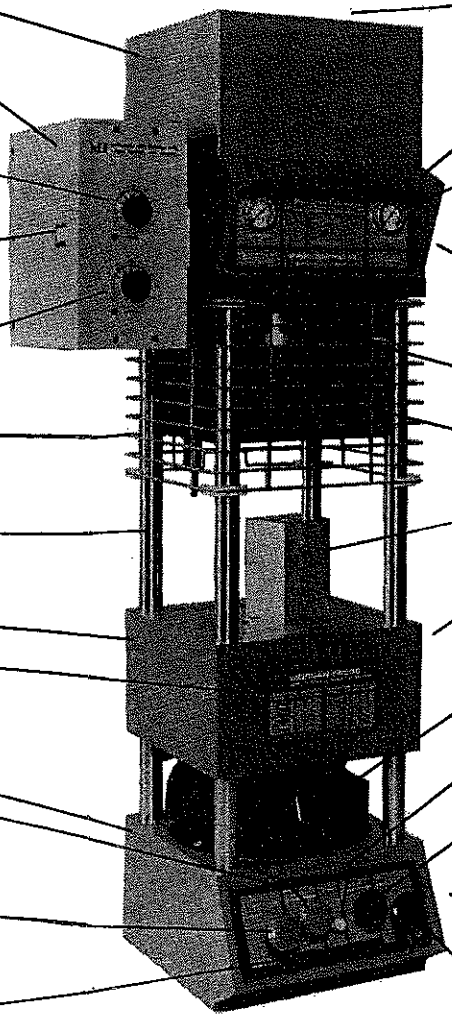
READ THESE INSTRUCTIONS CAREFULLY PRIOR TO OPERATING THE MACHINE noting particularly the precautionary do's and don'ts. Please observe common sense safety practices and use caution when operating the equipment. Proceed carefully until fully familiar with operational characteristics of the equipment. Machine operators should be thoroughly and properly oriented before proceeding unsupervised. We invite you to consult with us to answer your questions or provide additional assistance. Morgan Industries may be contacted toll-free within the U.S.A. and Canada at 1-800-222-6929.

We have included a summary listing of cautions and other important safety and operating checks with these instructions (pages 34 & 35). We suggest that you make extra copies and keep them posted near the equipment as everyday reminders for personnel involved with your machine.

Before altering any portion of this equipment, contact Morgan Industries to discuss any possible hazards. Most importantly DO NOT REMOVE, OVERRIDE OR ALTER THE SAFETY DEVICES.

Various utensils, accessories and optional equipment were shipped with this equipment. The functions and uses for these items are described in this instruction manual.

MORGAN - PRESS®
injection
molding machine



Ram Cylinder Shroud
Temperature Control System Cabinet
Barrel Temperature Controller
Electrical Switch
Nozzle Temperature Controller
Table Guard with clear plastic shields
Stanchion Posts
Table Platen
Temperature Data Chart
Base Casting
Clamp Pressure Regulator (Orange knurled knob)
Clamp Control Valve (Orange knob)
Drop Bars

Injection Speed Control (Not shown)
Mount Plate Casting
Eye Level Pressure Gauges for Clamp and Injection
Material Loading Chute (side, not shown)
Barrel Assembly
Upper Platen Assembly
Mold
Elevating Spindle (side, not shown)
Toggle Clamp Mechanism
Timer Selector
Injection or Pilot Valve Pressure Regulator (black knurled knob)
Ram Power Return (side, not shown)
Injection Control Valve (black knob)

NOT SHOWN

Air Inlet
Electrical Supply Cord
Actuator Pin
Table Gears
Mold Locator Stud
Safety Warning Placards
Rear, Bottom Casting
Rear, Temperature Control Cabinet
Rear, Table Guard
Directly Above Thrust Shaft
Under Mold

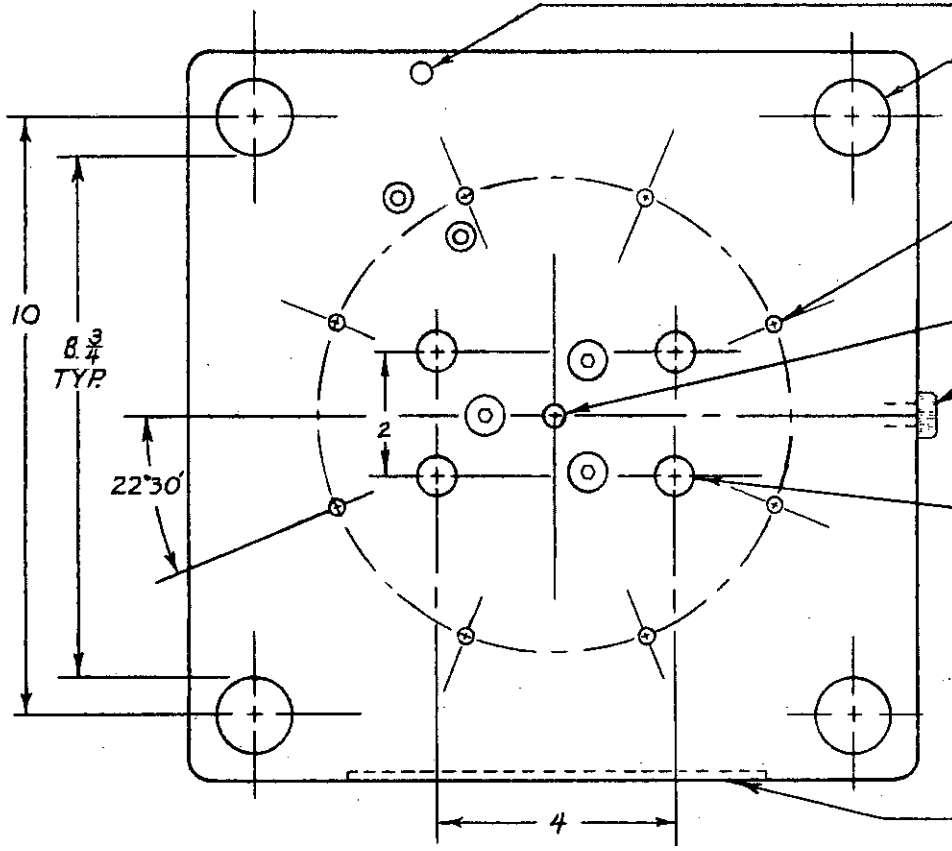


TABLE ACTUATOR VALVE PIN HOLE
WARNING: DO NOT OVERIDE THIS OR ANY OTHER SAFETY DEVICES

STANCHION POST HOLE 1¼ DIA. (4)

THREADED HOLES FOR MOLD CLAMPS
⅜-16 TAP THRU 8 HOLES EQUALLY SPACED ON 8" DIA.
NOTE: PRE-HEAT PLATE #30 HOLE LOCATIONS ARE DIFFERENT

TABLE CENTER LOCATOR (⅝ DIA. STUD)

TABLE ELEVATING SPINDLE

KNOCK-OUT PIN CLEARANCE HOLE (4)
11/16 DIA. TO CLEAR ⅜-16 THREADED ROD

TEMPERATURE DATA LABEL
(FRONT OF MACHINE)

MORGAN-PRESS TABLE PLATEN
PLANFORM AREA

SCALE: NONE	APPROVED BY	DRAWN BY RGJ
DATE: 25 MAY 77		REVISED 6-21-84

MORGAN INDUSTRIES INC. | DRAWING NUMBER

SET-UP INSTALLATION

1. Remove the Morgan-Press from its wooden container.

   NOTE: This shipping container was custom made for transporting the equipment. The container should be retained in case of warranty, service, or other transport requirements.

2. Locate the Morgan-Press in a well ventilated area.

3. Set the Morgan-Press on the workbench where it will be operated before installing Temperature Control System. This control system is fragile so it is best not to physically move machine with control cabinet attached. Mount machine to bench if desired (see Machine Mounting, Page 5).

4. Install Temperature Control System following the step by step directions in the section "Temperature Control and Electrical System." Note: the Morgan-Press should be connected to its own 120VAC/20 amp or 240VAC/10 amp grounded, dedicated electrical outlet. The input electrical power depends on the electrical configuration of your machine.

5. This machine is equipped with Injection Speed Control, No. 70, install the hose, muffler, and pressure control according to the instructions contained in the section "Injection Speed Control, No. 70."

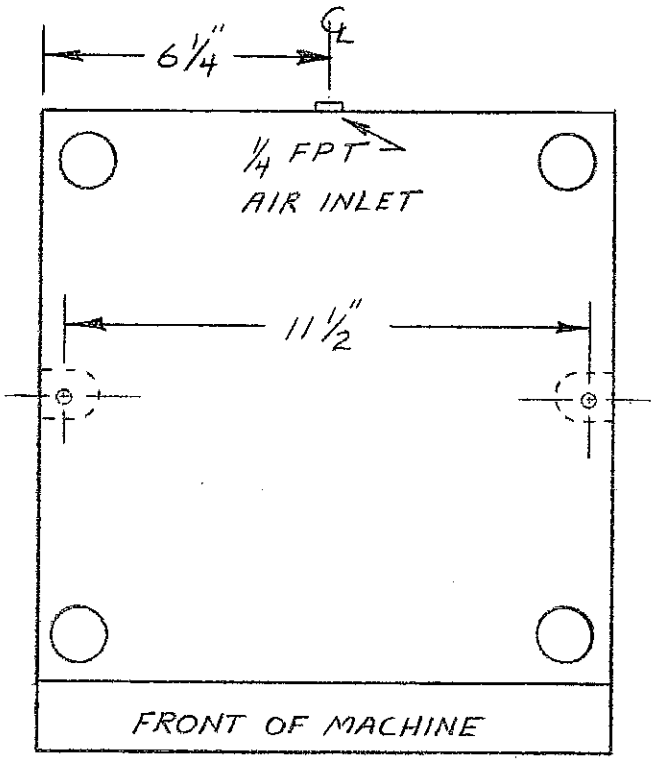
   NOTE: If the Pneumatic Hook-up Kit, No. 95 (Optional) was ordered with this equipment, refer to the Set-Up Instructions for it in the section "Pneumatic Hook-up Kit." Disregard step no. 6 (below) in this instance.

6. Connect main air supply to ¼" FPT air inlet fitting in rear base of machine (See Machine Mounting, page 5, and Pneumatic Hook-Up, page 7). Be sure all air supply lines to equipment are properly filtered and lubricated to ensure trouble-free pneumatic operation.

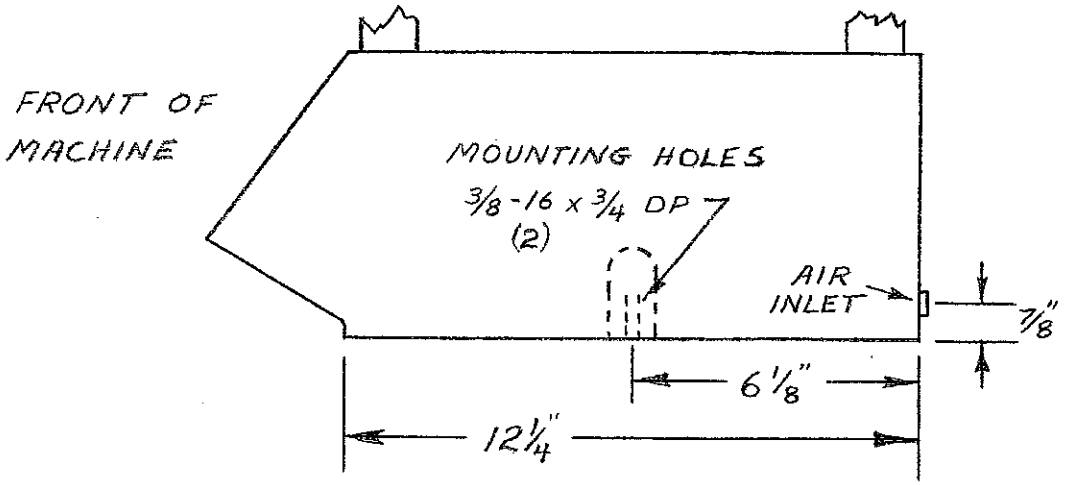
7. Your machine is now ready for operation. Read your instructions thoroughly before utilizing equipment to ensure safe and correct operating procedures.

MACHINE MOUNTING

The Morgan-Press should be placed on a sturdy work bench able to support 500 lbs., approximately 26" to 30" high. If desired, the press can be bolted to the bench.



TOP VIEW OF BASE



SIDE VIEW OF BASE

PNEUMATICS

A. Compressed Air Requirements

Line pressures up to 160 psi can be used safely. Lower pressures (below 160 psi) will limit the maximum clamp force and injection pressure output. It is hardly ever necessary to operate the machine at maximum potential output. If, for example, only 100 psi is available from the source (compressor), the machine will still function well; however, the maximum available clamp force from a 20 ton toggle unit will be limited to 12.5 tons and maximum injection pressures will also be correspondingly lower.

There are relatively few molding applications that require the use of the highest attainable clamp and injection pressures. In most situations an input pressure range of 120 to 150 psi is more than adequate for excellent results. Where small parts and easy molding materials are involved 80 to 100 psi will usually be adequate although (at these pressures) some applications become marginal or "undo-able." For practical purposes the minimum air pressure one should provide is 100 psi at 1 cfm; if using high temperature, highly viscous engineering thermoplastic resins, then 120 psi ought to be considered the minimum necessary pressure.

WARNING: DO NOT use more than 160 psi of air pressure. Higher pressure can damage the pneumatic controls and place excessive loads on the machine structure.

It should be noted that air flow (CFM: cubic feet per minute) is as important as the air supply pressure (if not more so). Inadequate air flow to the unit causes severe drops in pressure during actuation of the clamp and injection cycles. This in turn produces a noticeable reduction in the speed of injection. The pressure recovery time is also too slow for good molding results. Short shots or poorly filled parts will occur. These conditions will be more pronounced as the application becomes more critical.

Whatever the pressure, the Morgan-Press will require 1 cfm on a constant basis. This means that a) the source (compressor) will require a holding tank or b) if the source is a long way from the equipment, then large pipe lines (¾" to l" minimum) or a holding tank near the machine are required to ensure adequate flow to the Morgan-Press. Pipe line sizes should flow from larger to smaller sizes but not below ½" pipe size up to the connection at the machine, which is a ¼" FPT air inlet.

The minimum compressor required to adequately operate a press is a one horsepower, two-stage compressor with a 30 gallon holding tank rated to maintain on/off pressures at 120 to 150 psi.

While it is important to ensure sufficient air pressure and flow to a Morgan-Press, attention to mold design and other molding parameters is essential for good results. Such items include: a) generous gating and venting (if possible), b) location of sprue and gates, c) part design, d) material processing conditions (drying, pre-heating), e) mold temperature, to name a few. Frequently low pressures or air flow problems can be minimized or overcome when other good molding parameters are observed.

B. Pneumatic Hook-up

(Refer to page 2 for pneumatic control locations.)

Before connecting the air supply to the back of the base casting, check that the knurled orange knob (labeled Clamp Pressure Selector) and the knurled black knob (labeled either Pilot Pressure Selector or Inject Pressure Selector) are turned counterclockwise until no spring tension remains on shaft (these are the OFF positions). Also, pull out the smooth orange knob (labeled Push to Clamp) and the smooth black knob (labeled Push To Inject). Then open both the table safety guard (up) and the chute (ram) safety guard (pull out).

CAUTION: Machines shipped in a wooden crate are packaged with the table in the up position (clamped). With air supplied to the Clamp Control Valve (Push To Clamp), the table will lower when this valve is pulled out. Be sure that the table and toggle area are clear of personnel and foreign objects before connecting air supply to the unit.

NOTE: Neither the table platen (clamp) nor the ram piston (injection) will function unless their respective safetyguards are properly engaged.

Connect the machine to the compressed air source using 1/4" diameter line. The machine itself has a ¼" female N.P.T. air inlet port located in the rear of the base (bottom) casting. It is essential that the air supplied to the machine is clean and lubricated. A " N.P.T. 160 psi rated Filter/Lubricator between the air supply and the machine is required. Using unlubricated air that is contaminated with dirt or water causes air cylinder, valve and seal malfunctions. Continued use leads to premature wear and damage to major components.

NOTE: A vented shut-off valve on the main air supply is recommended for positive shut-off and lock-out during equipment shutdown and servicing. It should be connected to the inlet side of the Filter-Lubricator unit.

C. Pneumatic Controls

1. Clamp System

The orange knob labeled "Push To Clamp" on the lower panel is the Clamp Control Valve and controls the movement of the table platen or the clamp system. The air cylinder beneath the table platen operates the mechanical toggle clamp which exerts up to a maximum of 20 tons of clamp force at 160 psi air pressure.

NOTE: WHEN CLAMPING AT 10 TONS OR GREATER, THE UPPER PLATEN ASSEMBLY MUST BE USED. (See Upper Platen Assembly section for complete details.) Excessive clamp force (greater than 10 tons) against the nozzle only can damage top casting. THIS CONSTITUTES MISUSE OF EQUIPMENT AND AFFECTS THE WARRANTY.

The knurled orange knob labeled "Clamp Force Selector" on the lower panel regulates the air pressure to the clamp cylinder. Select the clamp force to be applied to the mold by rotating this knob - clockwise to increase, counterclockwise to decrease - as required. The gauge labeled "Clamp Force Tons" on the upper panel (left side) indicates the setting. When lowering pressure settings (for either clamp or injection), turn pressure selector knob counterclockwise until gauge pointer drops below desired setting; then turn knob clockwise until gauge pointer moves up to desired pressure.

NOTE: See "Adjusting Table Height" under Manual Operation Cycle (pages 12 & 13) for complete clamp force adjustment instructions.

2. Injection System

The smooth black knob labeled "Push To Inject" on the lower panel is the Injection Control Valve. It actuates the injection system. The Ram Air Piston in the head of the machine applies thrust to the small Barrel Piston. With 160 psi air supplied, injection pressures at the nozzle can reach a maximum of 9,000 psi for the G-125T, 12,000 psi for the G-100T and 13,500 psi for the G-55T.

For presses equipped with Injection Speed Control, the Ram Air Pressure is controlled by a separate regulator that is mounted on the air supply line. The Pilot Pressure Selector on the lower panel regulates the air pressure to the Pilot valve which opens the main air supply to the Ram Air Cylinder. The pressure supplied to the Pilot Valve is indicated on the gauge marked "Pilot Valve Pressure x 10 P.S.I." on the upper panel. The ideal pressure for the pilot valve is from 50 to 70 psi (the green zone). For additional installation and operating features of this system refer to Section III.

3. Relationship of Clamp Force to Injection Pressures

The clamp force holding the mold closed MUST exceed the total internal pressure being generated within the mold or the mold will separate (flash) during injection.

Example:

Assume injection pressure of 5,000 psi, 30% viscous pressure loss into the cavity, and mold cavity with a 4 sq. in. planform area at parting line;
The internal mold pressure = 5,000 psi x 4 sq. in. x 0.70 = 14,000 lbs. or 7 tons;
Therefore, the clamp force MUST exceed 7 tons.

A good rule is to start with estimated clamp force - low injection pressure. Increase the injection pressure after each cycle until the mold is filling properly. If mold separates (parts flash) at adjusted injection pressure, raise clamp force by one ton increments with corresponding mechanical height adjustment to thrust shaft until mold stays closed during injection.

ELECTRICAL

A. Heater Controls

Two heat controls with a temperature control range of 32°-800°F (0°-430°C) provide the Morgan-Press with its plasticizing (melting) capability. They are located in a separate electrical cabinet mounted on the left side of the Mount Plate (upper casting). They control the Barrel and Nozzle temperature zones. The controllers allow the barrel and nozzle zones to reach and maintain the selected temperatures. See Section IV Temperature Control and Electrical System for technical features.

The proportioning digital temperature controllers have a digital set point and read-out in addition to a very high level of accuracy. During normal operation the process temperature is shown in the upper display and the setpoint temperature is shown in the lower display. To change setpoint temperature simply press the arrow pointing up to raise or the arrow pointing down to lower.

B. Temperature Settings

The chart on the front of the table platen is a general guide to temperature settings required for various materials. This chart is only a guide. Refer to the material manufacturer's information data sheet before processing any thermoplastic. Any person who works with plastic materials should be aware of the cautions, hazards, or special handling procedures that may be required.

When processing a plastic resin that you are not familiar with use an open orifice nozzle. By inspecting the drool or extrusion from the nozzle, the correct processing temperatures can be determined. The temperature is probably too high if the material drooling from the nozzle is discolored, contains gas bubbles, or emits fumes. The temperature is probably too low if the material does not drool or is not in a near fluid state when extruded through the nozzle.

WARNING: AVOID BODILY CONTACT WITH MOLTEN MATERIAL. SEVERE BURNS CAN OCCUR.

Some materials, such as nylon, have narrow ideal injection temperature ranges and vary in a span of only 10°F from a near-solid to a fluid which drools quickly; an additional 10°F may produce extreme gassing and considerable discoloration of the plastic.

Excessive temperature or prolonged heating can cause some materials, such as ABS, to pass through the fluid state and become a carbonized near-solid. Parts made from degraded material may have poor surface finish and impaired physical properties. Degraded material due to prolonged heating can be avoided by maintaining a constant molding cycle.

Acetal polymers must be handled carefully to prevent accidents. For example, the formaldehyde generated by heating acetals is harmful to eyes and lungs. Good room ventilation is recommended when molding these compounds. This material tends to gas freely; therefore molds should be extensively vented or the back pressure will slow the filling. Thorough drying of this hydroscopic material just prior to its use will substantially minimize gassing and enhance ease of processing.

PVC (polyvinylchloride) is another material with extreme temperature sensitivity. It will degrade at both too high a temperature and in a relatively short time at processing temperature. The material will then exhibit extreme degradation and its contacting steel molds or machine components can cause corrosion due to the release of chlorine gases and molecules.

As a general rule, use the minimum temperature at which a material will flow successfully into the mold. Start low and gradually increase the nozzle temperature until good parts are obtained. The barrel setting will usually be 20°-50°F below that of the nozzle.

C. Power Connection

When ready to operate, plug the Morgan-Press into a 120 volt, 20-amp electrical outlet using the three conductor cord supplied. If an extension cord is used, it should be as short as possible and constructed with 14 gauge wire. For a 240 volt Morgan-Press, connect cord to a 240 volt, 10 amp electrical source.

CAUTION: THIS UNIT MUST BE CONNECTED TO A PROPERLY GROUNDED 120 VAC, 2O-AMP OR 240 VAC, 10-AMP DEDICATED OUTLET.

NOTE: The temperature controllers (Watlow Series 988) have been programmed at the factory for general thermoplastic molding applications. They have been put in a lock-out mode to prevent accidental changes. A "User's Manual" from Watlow is supplied which explains the units' features. The factory settings for these units are documented on pages 4.2, 4.34 and 5.9 of the Watlow User's Manual.

MANUAL OPERATING CYCLE

A. Select temperature control settings for the material to be used. Fill the Barrel with granules. (Poly-propylene is a good material for testing new molds or for practice.)

B. Close the timer valve by rotating the knob clockwise until the indicator stops at "0". Do NOT close knob too tightly as damage may occur to the needle and seat.

C. Select clamp force and injection pressure. See PNEUMATICS section for relationship of injection pressure to required clamp force (page 9).

1. Set the clamp force by rotating the orange knurled knob. Then adjust the table height and toggle mechanism as described in section E.

2. For machines without Injection Speed Control set the injection pressure by rotating the black knurled knob on the lower panel.

   On machines equipped with Injection Speed Control, adjust pilot valve pressure to a "6" (the green zone) setting on the pilot valve gauge. Then set the injection pressure on the separate regulator installed near the wall outlet. Then set the speed at the flow control valve at the top rear of machine.

   The injection pressure and speed required for any application depends on many factors such as wall thickness, flow distance, gate size and the thermoplastic to be used. It is best to start low and slow and increase the speed and then injection pressure until a good part is produced. Most applications work well between 3,000 to 6,000 psi. Pressure above 6,000 psi may be required if the part is large or has thin wall sections. Also, some thermoplastics require high injection pressure due to their composition.

D. Place the mold on the table of the Morgan-Press, taking care to locate the mold so that the nozzle seat is beneath the nozzle. Use the table center locator stud supplied whenever possible. (If a Pre-Heat Plate is to be used, locate this on the table center locator stud and place the mold on the Pre-Heat Plate locator stud.)

E. Adjusting Table Height

On Morgan-Press units with toggle clamping mechanisms, it is the combination of air pressure plus mechanical adjustment of the table height which yields the ultimate clamp force. This adjustment is similar to tightening or loosening a pair of vise grip pliers where the screw adjustment is the table height and the squeeze on the handle is the air cylinder pressure.

CAUTION: If a clamp force of greater than 10 tons is needed, the Upper Platen Assembly must be properly used. (See Upper Platen Assembly instructions for more information.) Applying a clamp force of greater than 10 tons directly against the nozzle may result in damage to the Morgan-Press. CLAMPING AGAINST THE NOZZLE ABOVE 10 TONS CONSTITUTES MISUSE OF THE EQUIPMENT AND AFFECTS THE WARRANTY.

1. Set clamp force to minimum that will actuate the table (2 to 3 tons). Raise the table under power to full up stroke position by pushing in the Clamp Control knob with the table guard down (see F1. Clamping, page 14). If mold does not reach the nozzle, the table must be adjusted upward by rotating the Elevating Spindle with the 3/8" Allen Key for this purpose (see diagram page 2). The Elevating Spindle should be pushed in to engage the gears during height adjustment and pulled out before clamping. Turn the spindle clockwise to lower table and counterclockwise to raise table. For short molds (5" or less in height) a simple spacer made of a paralleled aluminum plate can be placed between mold and table.

   If the mold touches the nozzle but does not allow the full toggle stroke, the table must be adjusted downward using the Elevating Spindle and Allen Key. The maximum mold or stack height is 7½ inches. DO NOT ATTEMPT TO ADJUST TABLE HEIGHT WHILE THE MOLD IS IN THE CLAMPED POSITION. Rather pull out the Clamp Control Valve to lower the table with the toggle power, then rotate spindle. Continue up or down adjustment until mold gently touches the nozzle when toggle is in full up position.

2. To attain full clamp force on the mold, adjust clamp pressure gauge to desired setting. The table must then be mechanically adjusted slightly upward in the same manner as above until the toggle lock comes to a full up position while moving over center with a definite "thunk" sound. This is the adjustment which is similar to increasing the tension on a pair of vise grip pliers. This position can be attained after two or three trials. It may be necessary to re-adjust clamp after several operating cycles due to the heat expansion of the mold and equipment plus any nozzle retightening that may be required. (See Nozzle instructions, page 25, for proper tightening procedure.)

   When done with clamp adjustment, disengage the table elevating gear by pulling the spindle out.

   NOTE: Clamp adjustment should be periodically monitored during operation. It may be necessary to re-adjust the table platen height due to heat expansion and mechanical vibration. The proper clamp force is obtained only when the toggle mechanism positively locks over center with a definite "thunk."

F. Molding

Before attempting to mold, wait for both material and mold to reach recommended temperatures. For the material to be ready for injection, it must be correctly heated, free of blisters or gassing, free of lumps indicating unmelted granules and have a smooth glossy exterior. Use caution and wear protective gear when creating an extrusion to examine condition of material. This molten material is under pressure and trapped air or gas may cause the material to pop and splatter when exiting the nozzle. See Plastic Properties Chart in the engineering manual, "Cutting Costs in Short-Run Plastics Injection Molding," or the material (resin) manufacturer's recommended temperatures. Use optional Pre-Heat Plate to heat mold as necessary.

1. Clamping

Remove any plastic drooling from the nozzle with the material feeder-scraper (provided). Do not contact this plastic drool as it stays very hot even after removal. Slide the table guard down until it contacts the table platen and the actuator pin is fully seated in its hole. (The table cannot move until guard is lowered.) To raise table platen rotate the drop bar lever behind the Clamp Control valve knob then push in knob. The table will rise, and the toggle mechanism will close with a definite "thunk" (if properly adjusted). This indicates that full clamp force is being applied to the mold.

CAUTION: NEVER OPERATE THE TABLE UNLESS THE MOLD IS PROPERLY LOCATED. FAILURE TO OBSERVE THIS PRECAUTION MAY CAUSE DAMAGE TO THE MACHINE OR THE MOLD.

WARNING: KEEP HANDS AWAY FROM MOVING TABLE PLATEN DURING OPERATION ON BOTH THE CLAMP AND UNCLAMP (UP AND DOWN) STROKES.

2. Injecting

NOTE: Make sure that chute area guard is snapped completely shut. (The barrel ram piston cannot move until the guard is completely closed.)

The Injection Control Valve activates the injection cycle. The drop bar behind the knob must be rotated before it can be pushed in. After clamping the mold push in the Injection Control Valve knob all the way; the ram shaft will travel downward for a few seconds and stop when the mold is filled. This movement may be observed by looking into the chute.

3. After the ram shaft has stopped its downward travel allow it to dwell for 3 to 10 seconds. The dwell time is governed by the part and mold design. Then pull the Ram Control Valve knob out to release injection pressure. The air will exhaust from the ram air cylinder and the ram shaft will rise. A large spring pushes the ram piston up after the injection cycle.

   For some applications (viscous thermoplastics or long piston travel) the air-powered Ram Return should be used. The Ram Return Valve is located on the right side of the base casting. The knob need only be pushed in for a few seconds or until the Barrel Piston is approximately one inch above the barrel orifice. This movement can be observed through the chute area. (NOTE: The Chute Guard must remain completely closed during the return stroke.)

   CAUTION: Some thermoplastics that are not up to proper melt temperature will cause a cold Barrel Piston to seize in the barrel bore. To remove a stuck piston from the bore, wait until the resin and the barrel piston are up to processing temperature, then use the Ram Return intermittently (2 second cycles) until the piston is free.

   DO NOT use the Ram Return valve for an extended time period when trying to power return or unstick the piston. If this is done high pressure develops under the Ram Cylinder piston. Then, when the Barrel Piston breaks loose from the material, the ram will return extremely fast. Sudden "breaking loose" of the Barrel Piston could damage the machine.

4. Pull out the orange Clamp Control Valve knob after the Barrel Piston has begun its upward travel. The table will now power return to its lower (unclamp) position. Raise the table guard and remove mold.

   CAUTION: Small light weight molds may stick to nozzle. Use care when removing to avoid burns or having mold drop on the operator's hands.

   NOTE: When either the table platen or chute area guards are raised, the table platen or ram cannot be moved by air in either direction. However, the ram piston will return when the chute guard is open on units that are equipped with Injection Speed Control.

   Also, the table and ram control systems can be operated independently of each other. This facilitates mold placement, clamp adjustment, purging, nozzle changes, et cetera.

5. Remove the part from the mold and examine. Study the list of defects (Table I, page 42) and adjust the running conditions as necessary.

6. Refill the barrel immediately after each shot. Repeat manual cycle and continue adjustments until an acceptable part is produced.

NOTE: If a collar of material builds up around the lower end of the ram shaft above the Barrel Piston, either the injection time cycle is too long, thus allowing melted material to pass between the piston and cylinder walls, or the barrel temperature is too high. Clean off the built-up material using the material feeder-scraper. Be sure that a layer of cold granules is covering the melted material in the barrel before recycling.

DO NOT ALLOW A BUILD-UP OF PLASTIC AROUND THE TOP OF THE BARREL PISTON.

If the granules filled into the top of the barrel gradually rise out, either the barrel temperature is too high (causing the material to gas excessively) or the material granules contain moisture that generates steam within the barrel.

CAUTION: Each family of thermoplastic materials has its own processing characteristics. Proper drying and other handling requirements must be observed. Some polymers when not properly processed present hazards to the work environment. Always begin by following the instructions and suggestions of the material manufacturer.

SEMI-AUTOMATIC OPERATING CYCLE

When all operating conditions are correct and good parts are being produced manually, the Morgan-Press and mold may be converted to semi-automatic operation. Refer to "Semi-Automatic Mold Design, Set-Up and Operating Instructions for Morgan-Press With Upper Platen Assembly" (pages 26-32) for additional mold design and set-up instructions for semi-automatic applications.

A. Add or rework ejector system to facilitate the use of knock-out rods.

B. Mount mold into the unit.

C. The injection cycle can be timed using the Timer Valve located in the center of the lower panel. Start by rotating the timer counterclockwise from 0 to 5. Rotate the timer knob clockwise to lengthen or counterclockwise to shorten the cycle time. The graduations around the timer dial are relative distance markings and are NOT calibrated to any specific time interval. Most cycle settings are attained within the first ¾ turn of the timer dial, usually between 4 and 8. (Time settings become very short and virtually meaningless beyond ¾ turn.)

It is normal to set the timer so the Ram Shaft stops its downward movement and dwells for 2 to 5 seconds. For parts with heavy sections which show sink, increase the size of the gate, if possible, and lengthen the cycle time. Cycle times will vary at the same timer setting with different injection pressure selections (higher pressure, shorter cycle and vice versa)on units without Injection Speed Control. Cycle times will vary on units equipped with Injection Speed Control with different Pilot Valve pressures.

For initial cycle time adjustment: open the chute guard, push in the injection control knob and adjust the timer valve. This allows you to adjust the timer valve without having to clamp and inject plastic. Final adjustment should be made during the actual molding process.

NOTE: Using the injection timer is optional and not necessary for good semi-automatic operation.

D. Rotate safety drop bar behind Clamp Control Valve knob on lower panel and push in. This will raise table platen and toggle mechanism should close with a definite "thunk".

E. After the mold is clamped, rotate the safety drop bar behind Injection Control Valve knob on lower panel and push in. This will start injection. After a few seconds, pull the Injection Control Valve knob out and the injection ram will begin to retract by itself. If the Injection Timer is used, the knob will pop out per time setting.

The Ram Return Valve on right side of base casting may be pushed in to speed up the return stroke. HOWEVER, DO NOT HOLD THE RAM RETURN IN FOR PROLONGED TIME.

F. Pull out Clamp Control Valve knob to lower table platen. Raise table guard and remove part. Refill barrel with plastic resin. Close chute guard completely.

G. Repeat above steps as needed for continuous production.

H. Relationship of shot size to cycle time.

The melt cylinder (Barrel) has a fixed volume. All or part of the molten material may be used in a single shot. As molten material is ejected out through the nozzle, it should be replaced in the top of the barrel with "cold" granules after every injection cycle. As this material works its way down the barrel, it will absorb the heat energy to melt.

It takes approximately 8 to 10 minutes for "cold" granules to melt. The melt temperature of the material regulates how fast it melts. Higher temperature materials will obviously take longer. Any shot size that is over half the barrel melt capacity will limit cycle rate to this melt requirement.

Cycle times vary with each application. Generally, the smaller the shot size, the faster the cycle. Conversely, as the shot size becomes larger, expect a slower cycle. The merits of semi-automating molds and adding additional cavities to molds (thereby increasing shot size) must be balanced against this plasticizing/cycle rate capability as well as other economic considerations.

For example, a semi-automatic mold with two large cavities requiring 1/3 of the shot capacity of the equipment may cycle constantly at one shot every two minutes. A similar mold with four large cavities requiring 2/3 of the shot capacity of the equipment may cycle constantly at one shot every four minutes. In both cases one part every minute is produced. But since a 4-cavity mold costs much more to make, the 2-cavity mold is more economical.

PURGING THE BARREL

A. When to purge

The barrel (material melt cylinder) of the Morgan-Press may require purging (or cleaning out) for several reasons:

1. A thorough change in thermoplastic resins
2. To cleanse the barrel of plastics with contamination, impurities or degradation
3. To remove corrosive or abrasive materials which may attack the steel if left in the barrel cylinder for extended periods
4. To empty the barrel so the cylinder can be polished, honed or otherwise cleaned or inspected
5. To facilitate changing the nozzle
6. To remove polycarbonates and ABS which tend to leave a hard to remove dark film on the barrel wall when left to solidify in a barrel

B. Purging materials

Usually an inert type thermoplastic is sufficient for good results. An inexpensive natural grade of polyethylene or polypropylene gives good results. There are also a variety of specialty purging compounds available from chemical manufacturers.

C. Normal purging procedure

The most common and quickest technique for purging is to free extrude the existing material out of the barrel. The barrel is then immediately loaded with the desired purging material and repeatedly purged until the extrusion is satisfactory.

If an optional Anti-Drool Nozzle #11 is installed in the machine, a "purging mold" is required to compress the shut-off spring on the nozzle (see Anti-Drool Nozzle #11 instructions for sketch of purging mold). This purging mold can also be used with open orifice nozzles as an added safety precaution against material spattering.

The following steps comprise this procedure:

1. Lower the table safety guard with the clear plastic shielding. This protects the operator from any incidental splashing or spattering of HOT molten plastic.

2. Adjust injection pressure to approximately 2,000 - 3,000 psi. For units equipped with Injection Speed Control, open Flow Control Valve approximately 2 revolutions.

3. Close the chute guard.

4. Activate Injection Control Valve.

   CAUTION: AT THIS TIME HOT MOLTEN MATERIAL UNDER PRESSURE IS BEING FREELY EXTRUDED OUT OF THE NOZZLE ORIFICE. THIS MOLTEN MATERIAL IS SUBJECT TO OCCASIONAL SPATTERING.

5. When ram stroke stops release Injection Control Valve.

6. Activate Ram Return Valve until barrel piston is fully retracted.

   NOTE: Operator should observe this movement through the chute area and release valve as soon as the barrel piston is out of the barrel.

7. Refill barrel with purging material or the new material to be molded and close the chute guard.

8. Again, activate Injection Control Valve to extrude additional purging material through the nozzle. The cold granules on the top should begin scouring the barrel and exiting through the nozzle in a lumpy form.

   CAUTION: THIS SCOURING IS WHEN INCIDENTAL SPATTERING IS MOST LIKELY TO OCCUR.

9. After 2 or 3 barrelfuls or when satisfied with the purity of the purging material, begin molding again or shut the machine down.

   NOTE: If purging is part of the shutdown procedure, turn temperature controllers off at the beginning of the sequence. This allows the barrel to cool down during the purging process and may prevent degradation of the material that remains in the barrel.

   When changing from a very hot material to a material with a much lower melt temperature, it is essential to turn the temperature controllers down to the new setpoint at the beginning of the purging procedure. Again, this allows the barrel to cool down during the entire process to avoid burning or overheating the new material.

D. Maximum cleanout technique

This procedure is used for extra thorough contaminant removal, to facilitate nozzle changes, or when the barrel cylinder is to be inspected, measured, polished, honed, etc. It is recommended to do this in conjunction with an overnight shutdown to allow time for the barrel to reach room temperature.

The following steps describe this procedure:

1. Follow steps 1 - 9 in section C, pages 19 & 20.

2. Fill hot barrel with purging material just to the top of the barrel (natural polypropylene or polyethylene is highly recommended for this procedure). Use a packing technique if possible (See section E, page 22).

3. Remove any excess resin from the barrel throat and chute area. Use the material feeder/scraper provided.

4. Loosen nozzle and unscrew ½ revolution. Do NOT remove.

5. Turn temperature controllers off and disconnect electrical source to the machine.

6. Allow barrel to cool to room temperature. (Because of the time involved, cooling off is often planned for overnight.)

7. Finish unscrewing and remove nozzle.

8. Remove plastic rod of solidified purging material which will be inside the barrel. Low ram force (2,000 psi) can be used to break this rod loose from the barrel, but do not use the barrel piston to push solidified rod down through the barrel. (Sometimes this plastic rod pulls out with the nozzle.) The plastic rod should be pulled by hand from the barrel bore if possible.

9. The barrel bore should now be very clean. It is ready for reinstallation of the nozzle and re-use, inspection, measuring, polishing, or honing as required.

E. Packing the barrel with material

This procedure is utilized to get as much plastic resin into the barrel as possible. Benefits of this procedure include a) the "squeezing out" of air pockets in the heated zone, b) obtaining as much molten material as possible for a maximum size prototype shot, c) increasing finished part density, d) helps to minimize voids (bubbles) in parts, and e) helps in "clean purge" procedure to remove undesired particles from wall of barrel.

Packing the barrel is accomplished by repeatedly activating the injection ram and tamping down new material in the barrel while the nozzle is blocked or closed. Open orifice type nozzles are blocked by injecting material into a mold under normal molding conditions and leaving the filled mold clamped against the nozzle during packing. Anti-Drool nozzles have a closed orifice so they can be packed in the unclamp position (i.e. when there is no mold pressing up against the nozzle nose).

F. Techniques for cleaning or polishing the barrel to remove plastic film

There are several different ways to clean or polish the barrel. The appropriate technique used depends on the degree of polishing required.

1. For light duty cleaning a three-dimensional abrasive pad can be rolled and repeatedly worked up and down inside the barrel by hand.

2. For more extensive cleaning the same abrasive pad can be put into a special mandrel (a purchased item made for this type of application) powered by a small, variable speed drill. A one foot long rubber hose or flexible shaft should be attached between the drill and the mandrel to negotiate the angle between the drill and the barrel bore.

3. If the foregoing techniques yield insufficient results, consult Morgan Industries for additional information.

4. After polishing, a clean rag should be run through the barrel bore to remove loose particles.

G. To clean or re-install nozzles, refer to "Use and Service of Morgan-Press Nozzles," (page 25).

SHUTDOWN

When use of the machine is to be discontinued for overnight or longer, adopt the following shutdown procedures:

A. Shutdown without purge

NOTE: Not all applications require purging during shutdown procedure. Polycarbonate and ABS should be purged because they leave a brown film on the barrel wall. Vinyl polymers and copolymers (PVC) should always be purged as they are very corrosive. Also, thermoplastic that is left in a barrel and then re-plasticized will degrade to some extent. This produces a part that may not have the properties of virgin resin.

1. Switch off temperature controls and disconnect the electrical power cord.

2. Check that the Ram Piston is above the barrel.

3. Turn the Clamp, Ram and Pilot Valve regulators off. (They are off when no pressure is showing at their respective gauges.)

4. Disconnect or turn off air line that is supplying the unit.

B. Shutdown with purge

To purge the equipment, disregard steps in section (A) above until after purging:

1. Turn the temperature controllers off or to the proper settings for the material that is used for purging.

2. Remove mold from the machine. If the mold is mounted in the machine, remove the top half and cover the bottom half for protection.

   If an Anti-Drool Nozzle is being used, a purging mold is required (see Anti-Drool Nozzle Instructions). Remove the mold completely from the table platen.

3. Select normal purging or maximum cleanout technique in Purging the Barrel section of the instructions (page 19); then follow those step-by-step directions.

4. When purging is complete, perform steps 1 through 4 in section (A) above.

ADDED PRECAUTION: Open both the table and chute area safety guards to help prevent unexpected actuation of table platen and barrel piston.

USE AND SERVICE OF NOZZLES

A. Nozzle Styles

The two basic styles of Morgan-Press nozzles are ball and flat nose. The ball nose is more conventional and preferred by most Morgan equipment users: its positive radius matching to a concave radius on the mold or sprue bushing provides a positive seal between nozzle and mold. The flat nose is used when a flat sprue seat on the mold is desired, or with parting line molds. The thread size is 1½"-12. There is a ½" spherical radius on the ball nose. Heat treatment and hard chrome plating are standard.

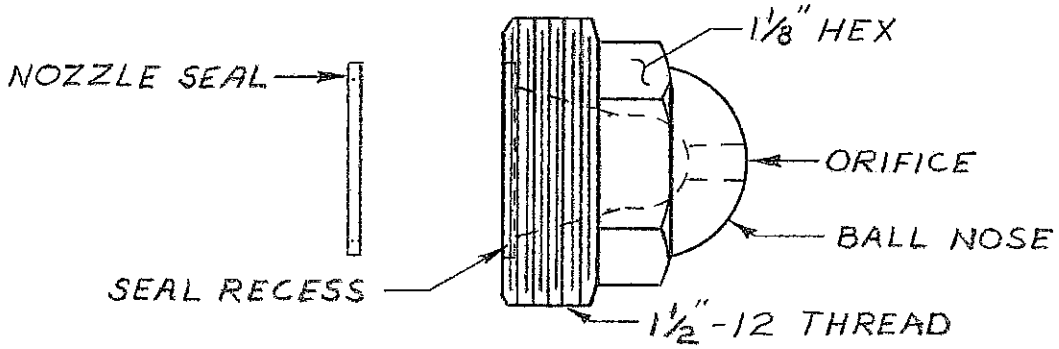
There are three orifice sizes for each nose style (A, B, and C). The "A" nozzle has a 1/8" diameter orifice. It creates more restriction on material flow and matches to correspondingly smaller sprues. The "B" nozzle (3/16" orifice) is the most widely used and is recommended for most applications that do not require an Anti-Drool Nozzle. The "C" nozzle (¼" orifice) is used when larger sprues and runners are needed.

The Anti-Drool Nozzle (#11) is a spring-loaded, shut-off nozzle which is used with "runny" type plastics such as nylon and acetal. It also facilitates packing the machine barrel (melt cylinder) for large single shot requirements. And it maintains a positive material shut-off between shots during semi-automatic operation.

The chart below summarizes the nozzle types and orifice dimensions. For most installations a "B" ball nose nozzle and Anti-Drool nozzle (optional) provide adequate flexibility. Note that part numbers with –125 are for the Model G-125T.

Part No.	Orifice	Orifice Opening
10A & 10A-125	Small	1/8" diameter
10B & 10B-125	Regular	3/16" diameter
10C & 10C-125	Large	1/4" diameter
11A & 11A-125	Shut-off	1/8" diameter
11B & 11B-125	Shut-off	3/16" diameter

Diagram (Standard A, B or C ball nose nozzle shown):



B. Installation and Service

All nozzles screw into bottom of machine barrel. A 1 1/8" wrench is required for tightening and loosening the nozzle. Nozzle must be the same temperature as the barrel for final tightening; and the temperature of the nozzle and barrel should be close to the processing temperature of resin to be used.

When installing a nozzle be sure an aluminum nozzle seal is properly positioned in the seal recess. The nozzle should be very tight so that the aluminum seal forms a complete seat. Proper installation prevents plastic from pushing out between threads and stress-relieves the clamp force exerted on the nozzle threads. Always re-tighten nozzle three or four times after putting it in. Do so after clamp force has pressed against it.

WARNING: DO NOT TIGHTEN A COLD NOZZLE INTO A HOT BARREL.

When removing nozzle it is best to first purge as much remaining material in the barrel as possible. For complete details refer to "Purging the Barrel" section (Page 19). Then loosen the nozzle while barrel is still hot (at the processing temperature of the resin in the barrel) in order to break the threads loose. If possible allow the barrel and nozzle to cool down so that the remaining material solidifies (this helps to minimize excess mess). Finish unscrewing the nozzle and remove from barrel.

WARNING: NOZZLE AND MATERIAL MAY BE EXTREMELY HOT DURING THIS PROCEDURE. USE HEAT PROTECTIVE GLOVES AND APPROPRIATE CAUTION TO AVOID BURNS.

Nozzle may be cleaned when out of machine. Secure the nozzle in a bench vise and remove large chunks of plastic by chipping them off with a mallet and chisel-type implement. Appropriate techniques to finish clean-up are a) wire brush or non-abrasive deburring wheel (either hand or grinder mounted), b) appropriate solvents for some resins, and c) fluidized bed or molten salt bath furnaces. Removing burnt residues and excess plastic on nozzle and threads aids when re-installing nozzle and when changing materials. The aluminum nozzle seal can usually be re-used but will fit loosely in the nozzle recess until screwed tightly into barrel. If seal cannot be re-used, press fit a replacement into the recess. It is better to use a new seal.

NOTE: CORRECT TIGHTENING IS ESSENTIAL IN PREVENTING DAMAGE TO BARREL OR NOZZLE THREADS.

UPPER PLATEN ASSEMBLY

A. Adjusting the clamp

Reference sketch: Upper Platen Assembly & Typical Mold Base Set-Up

NOTE: Upper Platen can be used with either hand operated or semi-automatic molds.

1. Position Platen Box assembly so that the bottom of lower plate is well above the nozzle. Loosen and re-snug Suspension Screws and raise Adjusting Bolts as needed.

2. Clamp the mold between the table platen and the nozzle. Set clamp force selector below desired force and adjust table height with the mechanical adjustment for proper toggle action.

   EXAMPLE: Set clamp at 9 tons if 15 tons is needed during actual operating cycle. NEVER EXCEED 10 TONS OF CLAMP FORCE APPLIED AGAINST THE NOZZLE. Excessive clamp pressure (greater than 10 tons) against the nozzle can damage top casting. This constitutes misuse of the equipment and affects the warranty.

3. While mold is still clamped, lower the Platen Box Assembly until it touches the mold surface evenly. Unscrew Adjusting Bolts until they touch the platen box top rails.

4. Lightly tighten the Suspension Screws so the platen box will still move by twisting the adjusting bolts, but will not fall due to its own weight.

5. Unclamp mold.

6. Lower the Platen Box by unscrewing the four (4) Adjusting Bolts a ½ turn. This is an initial adjustment (starting point) to insure that the major clamp force is against the platen and not the nozzle.

7. Set clamp force selector to desired tonnage for actual molding.

8. By turning all four adjusting bolts the same amount, raise or lower the Platen Box until proper toggle action is attained. (Usually ¼ to ½ additional turn on each bolt is required.)

9. Tighten Suspension Screws snugly.

   NOTE: The above procedure is used to make a seal between the nozzle and the mold while applying the higher clamp force against the Upper Platen.

Following are basic sketches and instructions to aid the set-up of semi-automatic molds in a Morgan-Press. (Also refer to pages 86, 88, 94, and 96 of Morgan Industries' engineering manual: "Cutting Costs in Short-Run Plastics Injection Molding.")

A. Semi-Automatic Mold Design

1. A semi-automatic mold is mounted in a Morgan-Press with toe clamps securing the lower mold half to the table platen and shoulder bolts suspending the upper mold half from the Upper Platen Box. This means the top of the upper mold half (A Plate) must be drilled and tapped for shoulder bolts and the bottom half must have slots milled for toe clamps (see sketch "Upper Platen Assembly with Semi-Automatic Mold Set-Up for Morgan-Press").

   NOTE: DO NOT use the given dimensions for locating the shoulder bolts on the mold. Instead use the transfer punch procedure as described in step 6 of Section B.

2. An ejector plate with ejector pins and return pins built into the mold acts as an ejection system when brought in contact with the knock-out rods. When the mold opens the molded parts are pushed from their cavities. When the mold closes the ejector plate return pins push the ejection system down into the neutral position (see pages 86 and 94 of manual).

3. A sprue puller insures that the sprue will remain in the lower mold half and does not hang up in the upper part of the mold. It also assists ejection when the ejector plate is activated (see page 86 of manual).

B. Mounting Mold for Semi-Automatic Operation

1. Remove Center Locator on table platen.

2. Remove front and back plates of Platen Box (4 screws each). This is for easier access to mounting hole locations.

3. Lightly clamp mold between the table platen and the nozzle (approximately 3 tons force setting).

4. Lower the Upper Platen Box by loosening the side Suspension Screws until it lies flat across the upper mold half.

5. Check that the nozzle and nozzle seat (sprue bushing) are properly matched (seated to each other) and that the mold base is square to table and toe clamp threaded holes.

6. Use a 3/8" transfer punch to mark the 4 shoulder bolt locations. Punch through the lower plate of the Upper Platen Box and onto the top of the mold. With mold clamped, mark the perimeter of the mold on the table platen with a pencil. This helps in realigning the top and bottom of the mold later.

7. Unclamp mold.

8. Remove upper mold half from machine and drill and tap for 3/8" shoulder bolts (usually 5/16"-18 tap).

9. Replace upper mold half in Morgan-Press and install 3/8" shoulder bolts. The bolts should be long enough for approximately ½" clearance between the nozzle and the mold when in the suspended position (unclamped). The A plate must drop clear of nozzle when unclamped. The shoulder lengths on the bolts are generally 2" to 2½" long. (It is probably easiest to screw in shoulder bolts if mold is reclamped lightly.)

10. Check sliding action of upper mold half. If there is any binding, remove material from the shoulders of the bolts. DO NOT modify the holes in the Upper Platen Box.

11. With upper mold half properly mounted, align and carefully clamp the two mold halves together.

12. Install toe clamps in the slots on the lower mold base and secure clamps to table with 3/8"-16 cap screws. Be sure the screws are long enough for a minimum of ¾" long thread engagement.

13. With mold halves mounted, clamp and unclamp the mold to check for free operation. If the mold is to be heated, check for free operation of mold at process temperature.

14. Replace the front and back plates on the Platen Box.

C. Ejector System Set-Up

1. The ejection system of a semi-automatic mold is activated by knock-out rods installed in the Morgan-Press. The knock-out rods can be made from 3/8"-16 all threaded stock (cut to necessary length). A 3/8"-16 jam nut should be used to lock the knock-out rods in position (See "Set-up for Molds with Ejector Plate" sketch, page 32). Sometimes a manually actuated system (as with levers) is appropriate particularly with side action cores.

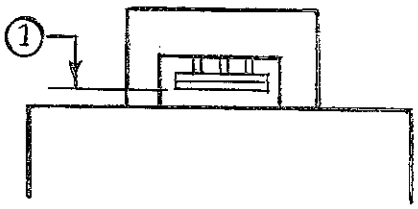
2. With the mold mounted and the table platen adjusted for proper toggle action, place machine in the unclamped position (mold open).

3. Manually move the ejector plate into the up (eject) position.

   NOTE: The eject position may only require a ¼" stroke even if the ejector plate can move farther.

   CAUTION: DAMAGE CAN OCCUR TO THE MACHINE AND THE MOLD IF THE EJECTOR PLATE HITS THE MOLD DURING ACTUAL OPERATION.

4. Measure the distance ① between the table platen and the bottom of the ejector plate (when in the eject position). Record this distance.



5. Remove lower mold half. For aid in relocating the mold, mark its location on the table platen using pencil lines around the lower edge of the mold.

6. Cut knock-out rods to length. They should be long enough to screw into mounting bracket on toggle clamp mechanism and pass through the clearance holes on the table by the amount measured (Step 4) when the table is in the down (unclamp) position.

   CAUTION: Knock-out rods must not extend below mounting brackets such that they interfere with the toggle cylinder.

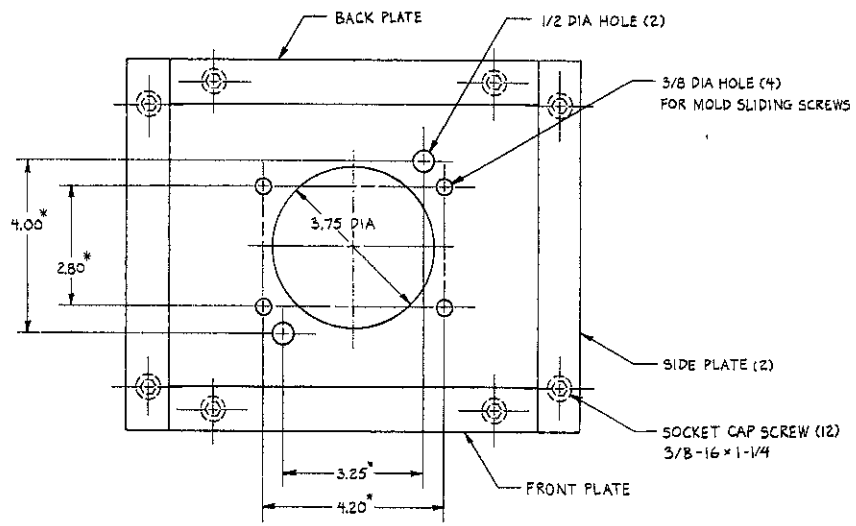
7. Install knock-out rods with jam nut. With the table in the unclamped position, be sure knock-out rods stick up through the table only to the height recorded in Step 4. Adjust all 4 rods to the same height so that they operate the ejector plate simultaneously. Then tighten jam nuts (3/8"-16 hex nuts) against the angle bracket.

   NOTE: Hold knock-out rods so that they are centered in the table holes when tighting the jam nut. If the knock-out rods touch the table hole sides after tighting the jam nuts, use a drift pin and mallet to gently tap the rods near the mounting bracket until they are centered.

8. Replace lower mold half. Make sure it is properly aligned with the upper mold half.

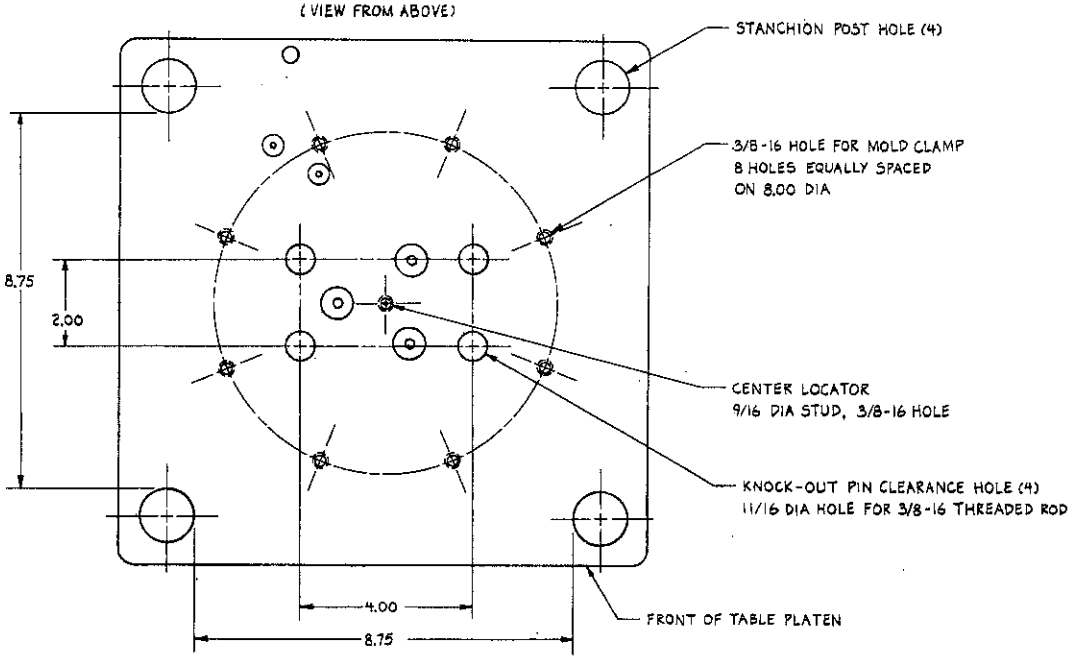
9. Under low clamp pressure, check that ejection system operates smoothly, stroke is proper distance, and there is no binding in opening and closing of the mold halves. Adjust or correct any conditions to the contrary.

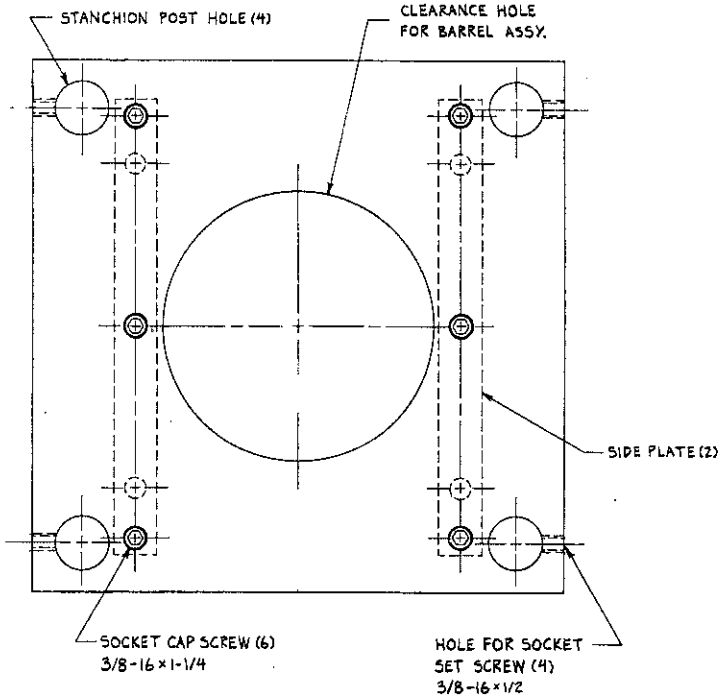
UPPER PLATEN BOX ASSY. (VIEW FROM ABOVE)



* DO NOT USE DIMENSIONS FOR MACHINING MOLDS
SEE 'MOUNTING MOLD' INSTRUCTIONS FOR DETAILS

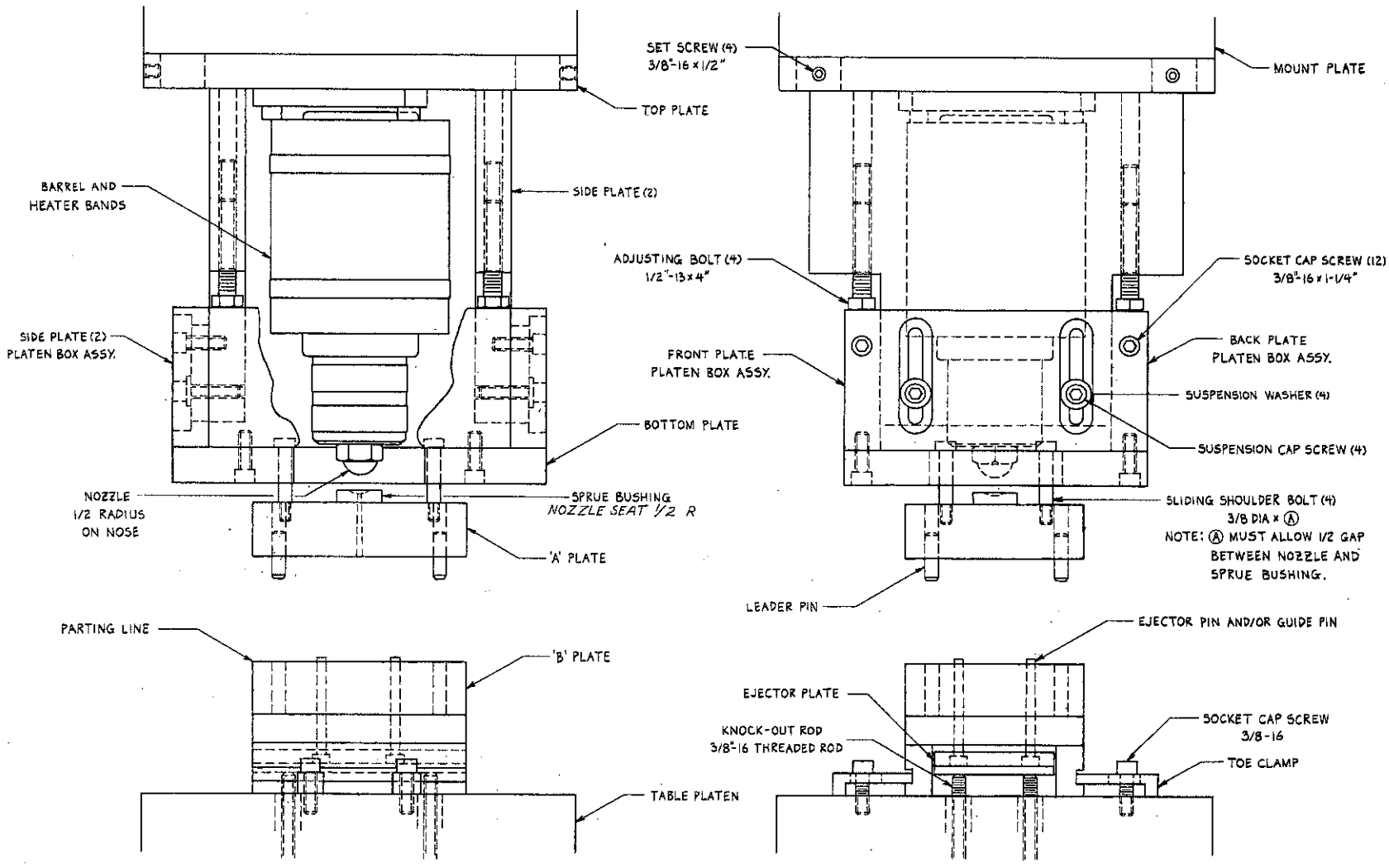
TABLE PLATEN
(VIEW FROM ABOVE)





TOP PLATE
(VIEW FROM ABOVE)

UPPER PLATEN BOX ASSY., TABLE PLATEN, AND TOP PLATE VIEW DWGS.		
SCALE:	APPROVED BY	DRAWN BY SJT
DATE: 9-22-81		REVISED 6-22-84
MORGAN INDUSTRIES, INC.		DRAWING NUMBER



NOTES

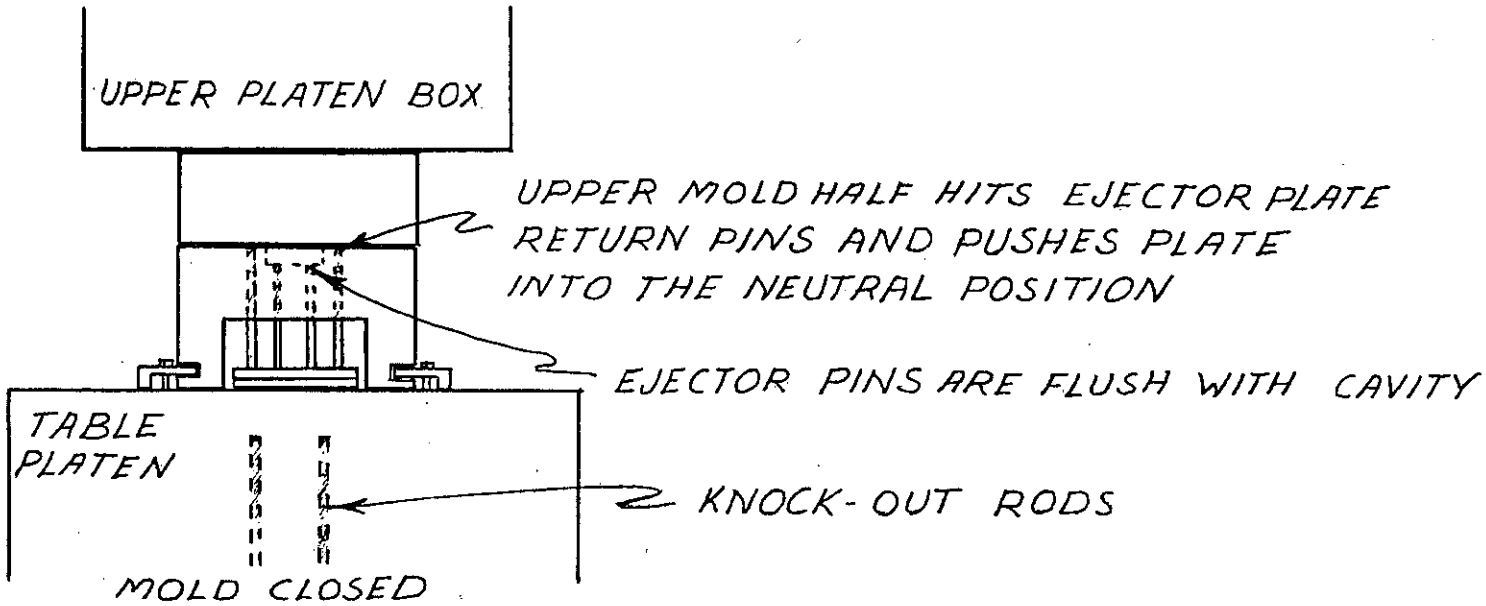
1. MOLD HEIGHT: MINIMUM = 5", MAXIMUM = 7-1/2"
2. SPRUE SEAT OR BUSHING: USE 1" DIA BALL END MILL, BORE 3/32" to 1/8" DEEP, OR UNTIL "DIMPLE" IS 5/8" DIA.
3. SPRUE DIAMETER: 7/32" AT NOZZLE END FOR "B" OR ANTI-DROOL; 5/32" AT NOZZLE END FOR "A".
4. NOZZLES: ALL BALL NOZZLES HAVE 1/2" SPHERICAL RADIUS
   STD "A" NOZZLE = 1/8" DIA ORIFICE
   STD "B" NOZZLE = ANTI-DROOL NOZZLE = 3/16 DIA ORIFICE
   STD "C" NOZZLE = 1/4 DIA ORIFICE

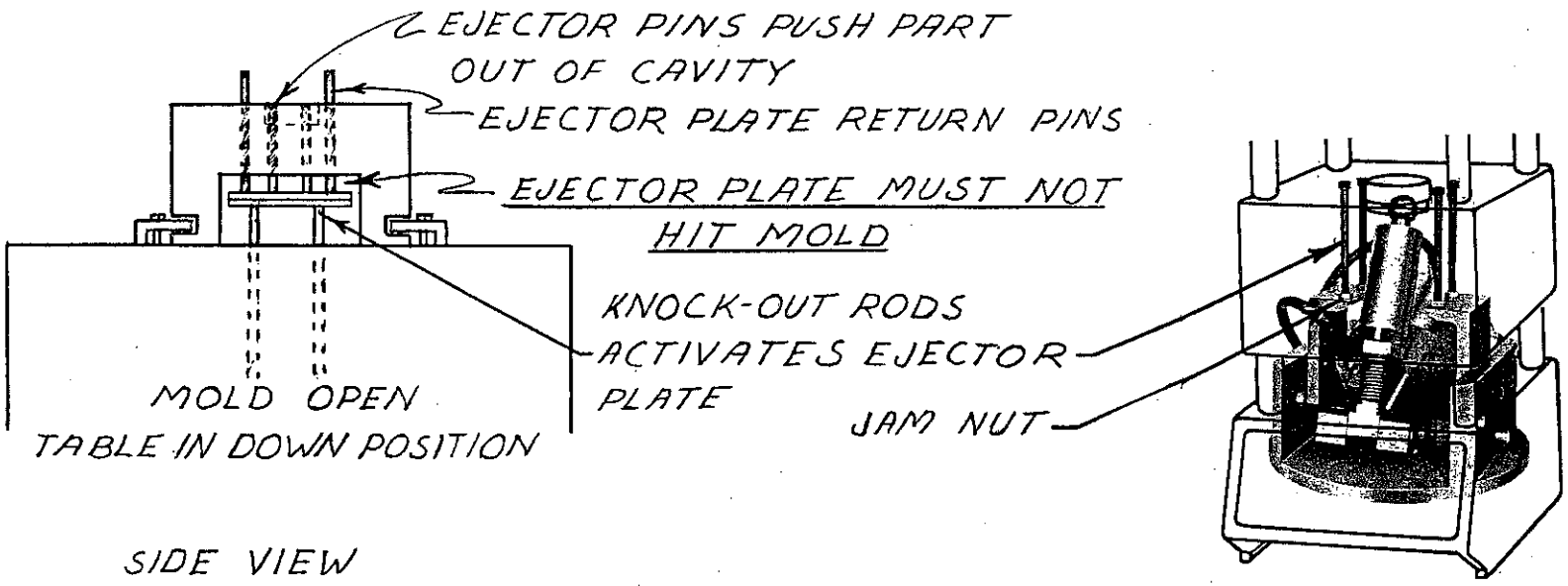
UPPER PLATEN ASSEMBLY WITH SEMI-AUTO MOLD SET-UP FOR MORGAN PRESS

SCALE: 1/4	APPROVED BY:		DRAWN BY STT
DATE: 4/78			REVISED 10/5/81
			REVISED 6/22/84

MORGAN INDUSTRIES, INC. | DRAWING NUMBER

MORGAN-PRESS SET-UP FOR MOLDS WITH EJECTOR PLATE





SIDE VIEW

MAINTENANCE

The Morgan-Press requires very little regular maintenance. However, it is recommended that the following procedures be adopted in maintaining the machine:

A. Maintain the proper oil level in your filter/lubricator and clean the filter regularly, especially of excess water, to ensure proper functioning of the unit. Adjust oiler for approximately one drop of 10 weight non-detergent oil every five cycles. The clean, oiled air acts as a lubricant inside the working parts of the machine.

B. Stanchion posts should be wiped clean and lightly oiled regularly.

C. Put oil in the holes provided on the thrust and pivot arms of toggle mechanism under the table on weekly basis or when dry.

D. Keep dirt, granules and chips out of the toggle area and off the table platen.

E. Grease the table gears every six months.

F. Keep the Ram Shaft clean of excess material constantly.

G. Inspect and clean air cylinders, re-lube and change o-rings once a year. O-ring service kits and instructions are available from Morgan Industries.

H. Keep work area neat and clean.

I. Inspect mechanical toggle parts regularly for signs of wear- particularly pivot points such as the connecting arms and cylinder "ears". Check that set screws are tight. If screws are loose apply medium strength threadlocker compound on threads and secure screws tightly.

PRECAUTION HIGHLIGHTS

To review and repeat cautions and essential steps:

A. READ INSTRUCTIONS. BECOME FAMILIAR WITH OPERATIONAL CHARACTERISTICS OF EQUIPMENT BEFORE PROCEEDING "FULL SPEED AHEAD!"

B. DO NOT EXCEED 160 PSI AIR PRESSURE INPUT.

C. BE SURE TABLE AND TOGGLE AREA ARE CLEAR OF PERSONNEL AND FOREIGN OBJECTS BEFORE CONNECTING MAIN AIR SUPPLY. CHECK VALVES FOR PROPER "OFF" SETTINGS.

D. CLEAN AIR, FILTERED AND LUBRICATED, IS ESSENTIAL FOR PROPER MAINTENANCE AND OPERATION OF EQUIPMENT.

E. ALWAYS CLAMP AGAINST THE UPPER PLATEN ASSEMBLY AND NOT THE NOZZLE WHEN REPEATEDLY CLAMPING MOLDS AT 10 TONS OR GREATER (SEE UPPER PLATEN INSTRUCTIONS).

F. AVOID CONTACT WITH MOLTEN MATERIAL. SEVERE BURNS WILL OCCUR.

G. USE THE ELECTRICAL CORD PROVIDED OR EQUIVALENT. BE SURE OUTLET IS PROPERLY GROUNDED.

H. NEVER OPERATE THE TABLE UNLESS THE MOLD IS PROPERLY LOCATED.

I. DO NOT OPERATE ELEVATING SPINDLE WHILE FULLY CLAMPED.

J. DO NOT LET PLASTIC BUILD UP AROUND THE TOP OF THE BARREL.

K. DO NOT HOLD THE RAM RETURN IN FOR PROLONGED TIME.

L. WHEN MOLDING CORROSIVE MATERIALS, INSURE THAT PURGING IS COMPLETE BEFORE SHUTDOWN.

M. WHEN PURGING BARREL, LOWER TABLE GUARD TO PROTECT OPERATOR FROM INCIDENTAL SPLASHING OF VERY HOT MOLTEN PLASTIC.

N. RAISE THE INJECTION PISTON ABOVE THE BARREL WHEN SHUTDOWN.

0. BE SURE MAIN ELECTRICAL AND AIR SUPPLIES ARE DISCONNECTED FOR COMPLETE SHUTDOWN.

P. DO NOT OVERRIDE THE SAFETY INTERLOCK GUARDS.

Q. DO NOT REMOVE ANY SAFETY SHIELDS, WARNINGS, GUARDS OR DEVICES.

R. EXTENSION CORDS (ELECTRICAL) SHOULD BE AS SHORT AS POSSIBLE AND CONSTRUCTED OF 14 GAUGE WIRE.

S. DO NOT TIGHTEN A COLD NOZZLE INTO A HOT BARREL (SEE NOZZLE INSTRUCTIONS).

T. WEAR SAFETY GLASSES NEAR MACHINE FOR EYE PROTECTION.

U. ALWAYS CONSULT MATERIAL MANUFACTURER'S RECOMMENDATIONS FOR CORRECT HANDLING AND PROCESSING OF THERMOPLASTIC MATERIALS.

V. WHEN WORKING WITH HOT MOLDS, WEAR PROTECTIVE GLOVES AND OTHER APPROPRIATE GEAR.

W. KEEP HANDS AWAY FROM MOVING TABLE PLATEN DURING OPERATION ON BOTH THE CLAMP AND UNCLAMP (UP AND DOWN) STROKES.

BASIC PARTS LIST

REF FIG	ITEM NO	PART NAME	NOMENCLATURE
		BASE CASTING ASSEMBLY	
1, 2, 3	1	Toggle Base Casting	Morgan
2, 3	2	Lower Panel	Morgan
2, 3	3	Control Valve Drop Bar (2)	Morgan
2	4	Clamp Air Regulator	Monnier #105-1000-2OS
2	5	Ram or Pilot Valve Air Regulator	Monnier #105-1000-2OS
2	6	Clamp Control Valve	Lexair #M384-0602
2, 3	7	Ram Control Valve	Lexair #M382-1306
2	8	Timer Valve	Clippard #MNV-2
3	9	Ram Return Valve	Lexair #M382-0601
	10	Clamp Control Valve Muffler (2)	Allied Witan #C28
	11	Injection Control Valve Muffler	Allied Witan #P28
1	12	Reservoir Cover	Morgan
1	13	Reservoir Gasket	Morgan
		TABLE ASSEMBLY	
1, 2, 3	14	Table Platen	Morgan
2, 3	15	Table Guard	Morgan
	16	Clear Plastic Shield (4)	Morgan
2	17	Post Slider, Table Guard (8)	Morgan
2, 3	18	Actuator Pin	Morgan
1	19	Table Actuator, Interlock Valve	Air & Hydraulics #321004
3	20	Elevating Shaft	Morgan
1	21	Elevating Gear	Martin Gear #BS12182A
2, 3	22	Temperature Data Label	Morgan
3	23	Up/Down Label	Morgan
	24	3/8" Allen Key with molded handle	Morgan
		MOUNT PLATE ASSEMBLY	
1, 2, 3	25	Mount Plate	Morgan
1, 2, 3	26	Shroud	Morgan
2, 3	27	Upper Panel	Morgan
2	28	Clamp Pressure Gauge	USG #1½" P590 160# 1/8"CBM
2, 3	29	Ram or Pilot Valve Pressure Gauge	USG #1½" P590 160# 1/8"CBM
1	30	Ram Actuator Interlock Valve	Air & Hydraulics #321204L
1	31	Chute Cover	Morgan
3	32	Chute Guard	Morgan

REF FIG	ITEM NO	PART NAME	NOMENCLATURE
		TEMPERATURE CONTROLLER CABINET	
2	33	Controller Cabinet	Morgan
2	34	Cabinet Door	Morgan
	35	Mounting Bracket	Morgan
2	36	Nozzle Temperature Control	Watlow Series 988
2	37	Barrel Temperature Control	Watlow Series 988
	38	Electric Cord	Cord Set 120V14-3 #C886
	39	Strain Relief	Heyco #3216
	40	Terminal Strip	Marco #TB 3000-10
2	41	Rocker Switch	#LTILA51-6S-BL-RC-NBL
	42	Mercury Relay (120 V)	Durakool AFM 20-303-M
	42	Mercury Relay (208/240 V)	Durakool BF-7120DV
		TOGGLE CLAMP MECHANISM	
		Base Plate Assembly (All welded)	
1, 2, 3	43	Base Plate w/ sides & angle brackets	Morgan
		Cylinder Assembly	
1, 3	44	Cylinder with front cover	Morgan
1	45	Cylinder Back Cover	Morgan
	46	Cylinder Cover Retainer Bracket (2)	Morgan
1	47	Cylinder Piston	Morgan
1	48	Cylinder Drive Shaft	Morgan
1	49	Cylinder Piston O-Ring	Parco #568-429 Buna-N
1	50	Back Cover O-Ring Seal	Parco #568-162 Buna-N
1	51	Drive Shaft O-Ring (2)	Parco #568-214 Buna 90
3	52	Cylinder Pivot Dowel Pin (2)	SPS Unbrako 5/8" x 1¾"
		Thrust Shaft Assembly	
1, 3	53	Threaded Shaft	Morgan
1	54a	Shaft Sleeve (Welded) with:	Morgan
	b	Steel Ball	1½" Steel Ball
	c	Ball Retainer	Morgan
	d	Bevel Gear	Martin Gear #BS1236-2A
1	55	Ball Socket	Morgan
		Connecting System	
1, 3	56	Connecting Arm (2)	Morgan
1	57	Connecting Arm Dowel (2)	SPS Unbrako 5/8" x 4"
1	58	Shock Absorber Pad (2)	Morgan
1	59	Pivot Shaft	Morgan

REF FIG	ITEM NO	PART NAME	NOMENCLATURE
		TIE BAR ASSEMBLY	
1, 2, 3	60	Stanchion Post (4)	Morgan
1	61	Stanchion Nut (8)	Morgan
1	62	Stanchion Washer (12)	Morgan
		UPPER PLATEN ASSEMBLY	
1, 2, 3	63	Top Plate	Morgan
2	64	Side Legs (2)	Morgan
2	65	Side, Lower Box (2)	Morgan
3	66	Front/Back, Lower Box	Morgan
3	67	Bottom Plate	Morgan
1	68	Spring Clip, Table Guard	Morgan
		BARREL ASSEMBLY	
1	69	Barrel	Morgan
1	70	Flange	Morgan
1	71	Flange Spacer (3)	Morgan
1	72	Barrel Insulation Collar	Morgan
1	73	Barrel Heater Band (G-55T - 700W)	Glenn #3036 S1Y-36"
1	73	Barrel Heater Band (G100T - 1300W)	Glenn #3066 S1Y-36"
1	74	Nozzle Heater Band (500W)	Glenn #2424 S1Y-36"
	75	Thermocouple Bayonet Adapter (2)	Gordon #TH298-1
	76	Thermocouple (2)	Gordon #10DJBDB036A
2, 3	77	Barrel Heat Guard/Insulation	Morgan
1	78	Silicon Bolt Spacer (3)	Morgan
1	79	Metal Bolt Spacer (3)	Morgan
1	80	Barrel Bolt (3)	3/8-16 x 5" SHCS
1	81	Nozzle "A", "B" or "C" (Ball or Flat Nose)	Morgan
		RAM CYLINDER ASSEMBLY	
1	82	Ram Cylinder	Morgan
1	83	Ram Cylinder Cover	Morgan
1	84	Ram Cylinder Piston	Morgan
1	85	Ram Shaft	Morgan
1	86	Barrel Piston (O.D. must be sized)	Morgan
1	87	Ram Cylinder Piston O-Ring	Parco #568-443 Buna N
1	88	Ram Shaft O-Ring (2)	Parco #568-117 (Viton)
1	89	Ram Return Spring	Morgan
1	90	Ram Cylinder Gasket	Morgan
1	93	Ram Shaft Lock Nut	SPS #31FK-1216

SERVICE KITS AVAILABLE

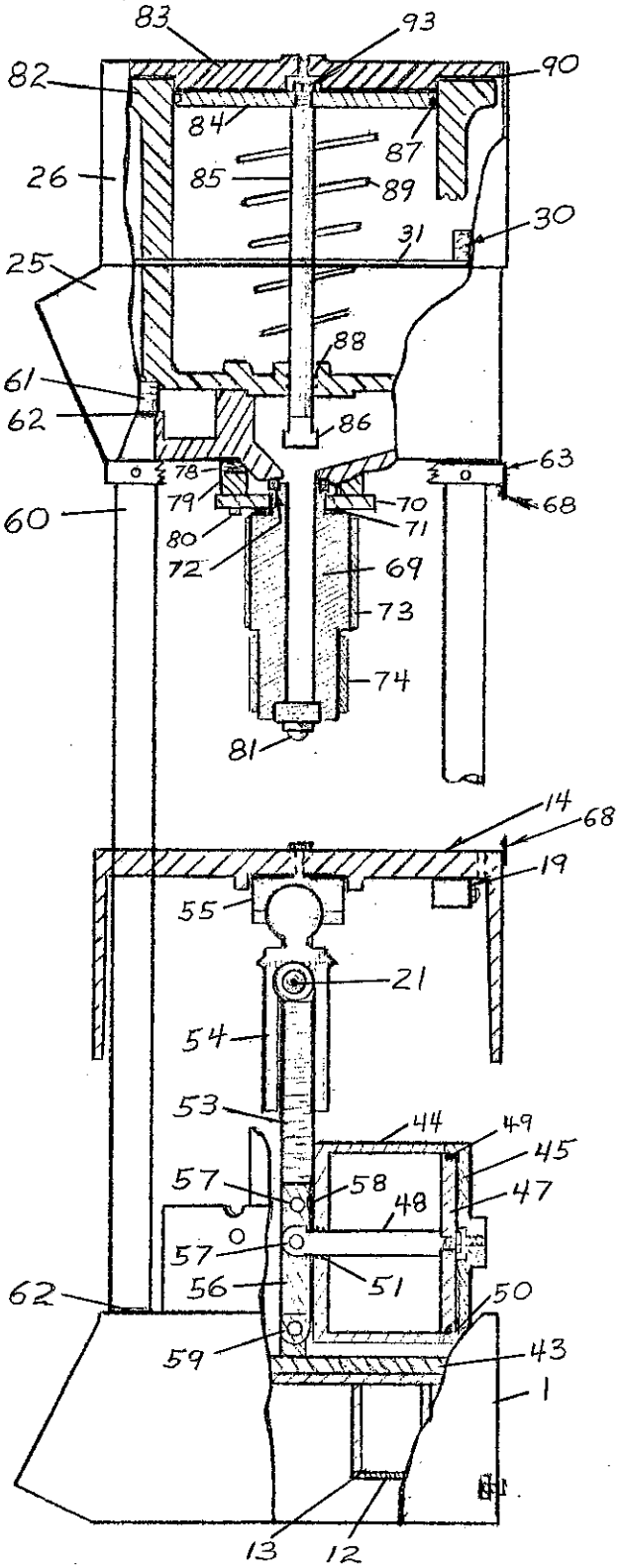
N/A	Regulator Repair Kit	Monnier #11513
N/A	Regulator Repair Kit (for #70)	Watts #RKR10Y M3
N/A	Ram Cylinder Service Kit	Morgan
N/A	Toggle Cylinder Service Kit	Morgan
N/A	Warning Label Kit	Morgan
N/A	Table Guard Plastic Shield Kit	Morgan
N/A	Table Wire Guard Kit	Morgan
N/A	Barrel Cleaning Kit	Morgan

Designate model and serial number when ordering. Also specify thread size (for threaded parts), if known.

NOTE: Specifications on older models may vary. Brass fittings, tubing, small screws & hardware, labels, wire, & small electrical components not listed.

MORGAN-PRESS MODELS G-125T, G-100T & G-55T

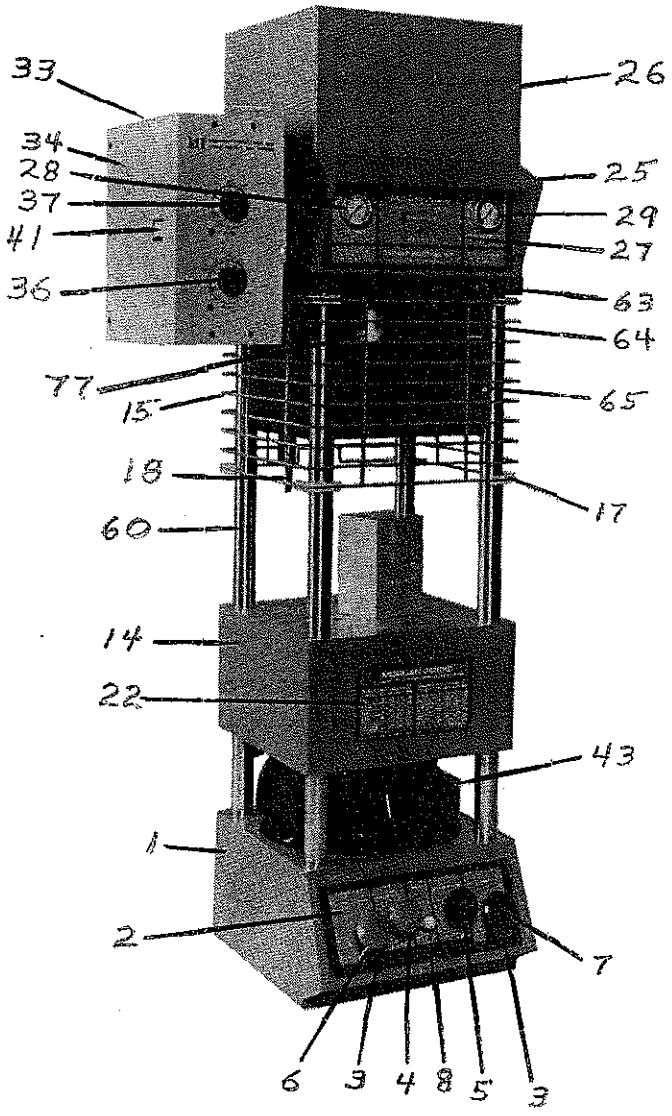
FIGURE 1 (CROSS-SECTION)



1 Toggle Base Casting
12 Reservoir Cover
13 Reservoir Gasket
14 Table Platen
19 Table Actuator, Interlock Valve
21 Elevating Gear
25 Mount Plate
26 Shroud
30 Ram Actuator, Interlock Valve
31 Chute Cover
43 Base Plate
44 Toggle Cylinder with Front Cover
45 Toggle Cylinder Back Cover
47 Toggle Cylinder Piston
48 Toggle Cylinder Drive Shaft
49 Toggle Cylinder Piston O-Ring
50 Toggle Back Cover O-Ring Seal
51 Toggle Drive Shaft O-Ring (2)
53 Toggle Threaded Thrust Shaft
54 Toggle Thrust Shaft Sleeve
55 Toggle Ball Socket
56 Toggle Connecting Arm (2)
57 Connecting Arm Dowel (2)
58 Shock Absorber Pad (2)
59 Pivot Shaft
60 Stanchion Post (4)
61 Stanchion Nut (2)
62 Stanchion Washer (12)
63 Upper Platen Top Plate
68 Spring Clip, Table Guard (2)
69 Barrel
70 Flange
71 Flange Spacer
72 Barrel Insulation Collar
73 Barrel Heater Band
74 Nozzle Heater Band
78 Silicon Bolt Spacer (3)
79 Metal Bolt Spacer (3)
80 Barrel Bolt (3)
81 Nozzle
82 Ram Cylinder
83 Ram Cylinder Cover
84 Ram Cylinder Piston
85 Ram Shaft
86 Barrel Piston
87 Ram Cylinder Piston O-Ring
88 Ram Shaft O-Ring (2)
89 Ram Return Spring
90 Ram Cylinder Gasket
93 Ram Shaft Lock Nut

MORGAN-PRESS MODELS G-125T, G-100T & G-55T

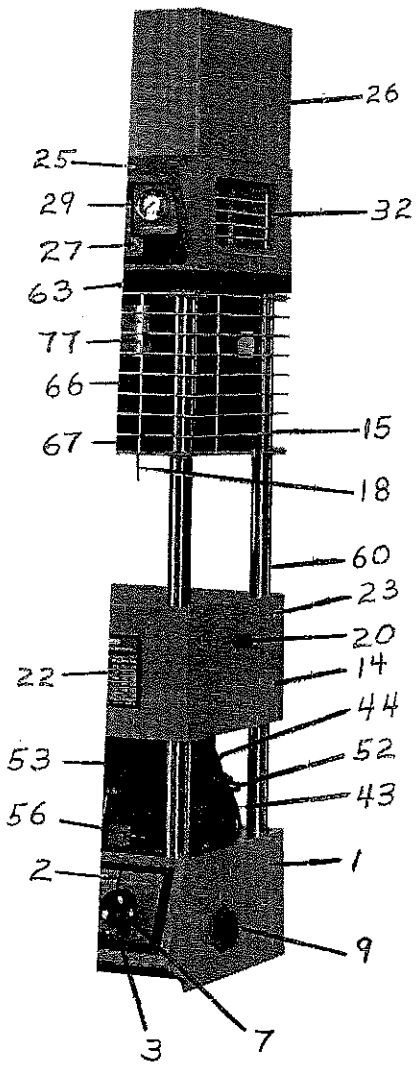
FIGURE 2



1 Toggle Base Casting
2 Lower Panel
3 Control Valve Drop Bar (2)
4 Clamp Air Regulator
5 Ram or Pilot Air Regulator
6 Clamp Control Valve
7 Ram Control Valve
8 Timer Valve
14 Table Platen
15 Table Guard
17 Post Slider, Table Guard (8)
18 Actuator Pin
22 Temperature Data Label
25 Mount Plate
26 Shroud
27 Upper Panel
28 Clamp Pressure Gauge
29 Ram or Pilot Valve Pressure Gauge
33 Controller Cabinet
34 Cabinet Door
36 Nozzle Temperature Control
37 Barrel Temperature Control
41 Rocker Switch
43 Base Plate Assembly
60 Stanchion Post (4)
63 Upper Platen Top Plate
64 Upper Platen Side Leg (2)
65 Upper Platen Lower Box
77 Barrel Heat Guard/Insulation

MORGAN-PRESS MODELS G-125T, G-100T & G-55T

FIGURE 3



1 Toggle Base Casting
2 Lower Panel
3 Control Valve Drop Bar (2)
7 Ram Control Valve
9 Ram Return Valve
14 Table Platen
15 Table Guard
18 Actuator Pin
20 Elevating Shaft
22 Temperature Data Label
23 Up/Down Label (Not Shown)
25 Mount Plate
26 Shroud
27 Upper Panel
29 Ram or Pilot Valve Pressure Gauge
32 Chute Guard
43 Base Plate Assembly
44 Cylinder with Front Cover
52 Cylinder Pivot Dowel Pin (2)
53 Threaded Shaft
56 Connecting Arm (2)
60 Stanchion Post (4)
63 Upper Platen Top Plate
66 Upper Platen Lower Box
67 Upper Platen Bottom Plate
77 Barrel Heat Guard/Insulation

TABLE I

DEFECT	POSSIBLE CAUSES	CORRECTIVE ACTION
Mold not full (short shot)	Material too cold	*Raise barrel and nozzle zone temperatures
	Mold too cold	*Apply heat to mold
	Insufficient cavity venting of mold	Rework mold to allow more venting
	Injection pressure too low	*Raise injection pressure
	Time cycle too short	Increase injection cycle time
	Gates and/or runners too small	Increase the size of runners and gates
Flashing at mold parting lines	Injection pressure too high for clamp force selected	*Lower injection pressure or raise clamp force, or both
Part discolored	Heat too high	*Lower selected temperatures
	Cycle time too long	Shorten cycle time
Excessive "sink" in part	Part design	Avoid thick sections
	Injection pressure too low	*Raise injection pressure
	Gate too small	Adjust mold to allow more gating
	Cycle time too short	Increase injection cycle time
	Material too hot	*Lower nozzle and barrel temperatures
	Mold too hot	*Cool mold
Surface of part streaked, blistered, and/or bubbles in part	Moisture in material granules	*Dry material thoroughly before molding
	Material temperature too high	*Lower nozzle and barrel temperatures

*For proper molding conditions first check material manufacturer's recommendations, or see Plastic Properties Chart in the engineering manual, "Cutting Costs in Short-Run Plastics Injection Molding." If pressures or temperatures significantly higher than normal are required, it is most probable that the runners and gates are too small and mold venting is inadequate. Excess injection pressure can actually pre-stress molded parts and cause them to be inherently defective. Overheated parts can have degradation, discoloration and impaired physical properties. Eliminating mold design deficiencies will ensure better molding results under the correct temperatures and pressures.

TABLE II

APPLICATION PROCESSING DATA SHEET

For future reference and ease of set-up in a future run, record in a log or on a chart the molding specifications which were used to produce good parts.

It is recommended to record the following data:

PROJECT NOMENCLATURE:

Part Name _____ Print Number _____

Part/Shot Size _____(oz.) or _____cu.in. Mold I.D.#_____

Quantity Required _____ Set-up Time _____ Molding Time _____

Material Name & Grade_____

*Material: Drying Time _____hr; Drying Temperature_____°F

MACHINE OPERATING PARAMETERS:

Machine Model_____ Serial No._____ Nozzle _____

Mold Temperature _____°F; Mold Set-up: Semi or Manual

Barrel Zone Temperature_____°F; Nozzle Zone Temperature_____°F

Clamp Tonnage _____ tons

Injection Pressure _____x 1000 psi; Injection Speed (# turns)_____

Pilot Valve Pressure (if applicable) _____x 10 psi

Injection Cycle Time (including dwell)_____sec Timer Setting_____

Total Cycle Time (Clamp to Clamp) _____sec./min.

NOTES/COMMENTS:_____

_____

_____

_____

_____

*Some materials will produce better surface finish and shorter cycle times if the granules are pre-heated and dried. See material manufacturers' recommendations. (Also, you may refer to the Plastics Property Chart in the engineering manual, "Cutting Costs in Short-Run Plastics Injection Molding," to determine general drying requirements.)

MORGAN-PRESS

TEMPERATURE CONTROL SYSTEM #20-988

The Temperature Control System #20-988 provides the Morgan-Press user precise control over melt temperatures of thermoplastic resins. Among the benefits of this electronic, solid state, temperature control system:

- ¶ Facilitates the processing of high performance engineering plastics due to more accurate and stabler melt temperatures. Included among these resins (but not limited to them) are the following: polyetherimide, polyphenylene sulfide, polycarbonate, polysulfone, polyether sulfone (PES), polyetheretherketone (PEEK), polyesters and phenylene oxides.

- ¶ Improves control accuracy over melt temperatures of resins by eliminating wide temperature drifts.

- ¶ Plasticizing (melt) rates of thermoplastics are increased when the melt temperature is accurately maintained.

- ¶ The proportioning control prevents temperature setting "overshoot" during initial warm up. Some temperature sensitive materials (vinyls, nylon) will degrade at even nominal overshoots.

- ¶ The temperature control range of 0 to 800°F (-18 to 425°C) enables the processing of a wide variety of both low and high temperature resins.

- ¶ The plug-in controllers enable fast and easy modular service, if required.

This system features two standard 1/8 DIN electronic temperature controllers made by Watlow. The temperature control range is 0-800°F (-18 to 425°C) with very high accuracy level. They are three-mode, time proportioning programmable units with digital set point and readout.

The system is contained in a custom cabinet designed for mounting on a Morgan-Press. It has all necessary hardware, electrical components, thermocouple sensing probes, schematics, and set-up instructions. This system is partially installed on your Morgan-Press and the cabinet is fully assembled. However, due to shipping and packaging requirements it is necessary to mount the controller cabinet to the upper casting of the machine and to connect the wires from the heater bands and thermocouple probes to their proper terminals in the controller cabinet.

CONTROLLER CABINET INSTALLATION INSTRUCTIONS

NOTE: Install Temperature Control System prior to installation of Injection Speed Control. Read these instructions completely before attempting installation.

1. Attach 2½" long plastic conduit pipe to right side of control cabinet using a conduit nut on each side of control cabinet wall to secure.

   NOTE: Plastic conduit needs to be located so that the end of the tube extends 2 l/8" from the outside of control cabinet.

2. Use the 3/8"-16 x 3/4" sockethead screws provided to mount cabinet bracket to side of upper casting with the drilled and tapped holes.

3. Bolt cabinet to mounting bracket with the ¼"-20 x 3/4" hex head screws provided.

4. Lift up Top Shroud of machine and locate heater band wires and thermocouple leads. Note that all wire leads are marked with blue and red markings.

5. Insert all wire leads through conduit (3/4 Plastic Tube) and into control cabinet.

6. Replace Top Shroud.

7. Connect wires in control cabinet as follows:

   NOTE: Refer to electrical schematic for location of TI0, T9, T8 and T7.

   a. Connect the fiber cloth covered wire marked in **blue** to the inner most terminal of the barrier strip marked with **blue** dye on screw head(TI0).

   b. Connect the fiber cloth covered wire marked in **red** to the next inner terminal of barrier strip marked with **red** dye on screw head (T9).

   c. Connect the fiber cloth covered wire marked in **blue** to the next inner terminal of the barrier strip marked with **blue** dye on screw head (T8).

   d. Connect the fiber cloth covered wire marked in **red** to the next inner terminal of the barrier strip marked with **red** dye on screw head(T7).

8. Connect barrel thermocouple wires ("shrink tubing covered" leads with **blue** shrink tubing near the end) to **top** barrel controller:

   a. **White** lead to terminal #9 (Has **white** dye on screw head)

   b. **Red** lead to terminal #10 (Has **red** dye on screw head)

9. Connect nozzle thermocouple wires ("shrink tubing covered" leads with **red** shrink tubing near the end) to the **lower** nozzle controller:

   a. **White** lead to terminal #9 (Has **white** dye on screw head)

   b. **Red** lead to terminal #10 (Has **red** dye on screw head)

10. Function test the controllers:

   a. Connect electrical power to machine.

      NOTE: This unit should be plugged into or connected to its own 120VAC/20 amp grounded electrical outlet or supply.

   b. Turn on controllers with rocker switch located on left side of cabinet. Unit is on when rocker switch light is on.

   c. When unit is ON two displays appear on the face of each temperature controller. The upper display on each controller is the temperature of the melt cylinder (barrel and nozzle zones), and the lower display is the setpoint temperature. To change setpoint temperature simply press the arrow pointing up to raise or the arrow pointing down to lower. For an initial test warm up set temperature of both zones to 200°F (90°C).

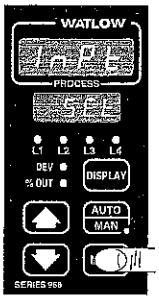
   d. Check to see if heater bands are radiating heat. This is done by observing the increase of the process temperature settings on the controllers. After one minute the temperatures will have increased by approximately 5 degrees. If the bands are not heating, unplug machine and recheck connections.

PRE-SET PROGRAM VALUES

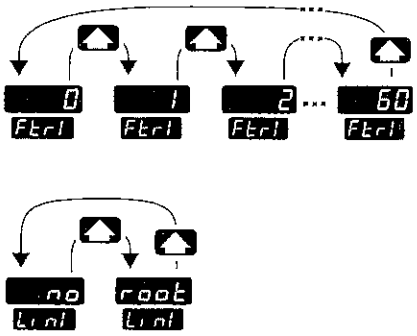
The temperature controllers have been programmed at the factory for your machine and have been put in a lock-out mode to prevent accidental changes. The factory programmed values are appropriate for thermoplastic molding applications in the materials melt processing ranges. The specific values are notated on the following pages which are excerpted from the User's Manual (pages 4.2, 4.34. 5.9 and 6.2).

Setup-Input

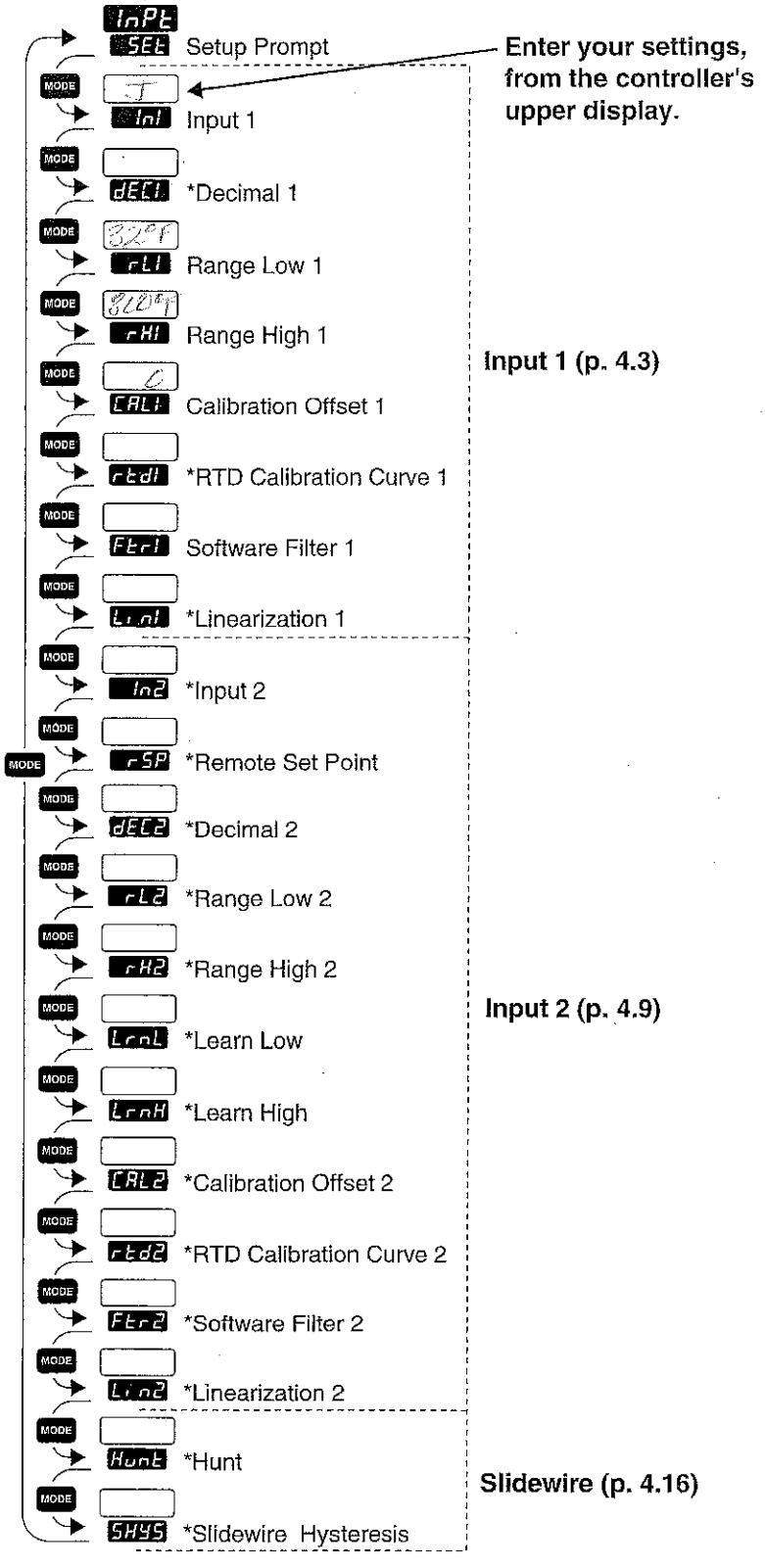
Reaching the Input Menu



❸ Select the Input Menu, then press the Mode key MODE to step through the prompts.



❹ Press the Up-arrow key ▲ or the Down-arrow key ▼ to select one of the prompt values.



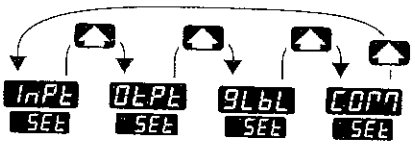
***Prompts may not appear, depending on controller configuration.**

Figure 4.2 -
The Input Menu.

Setup-Global

Reaching the Global Menu

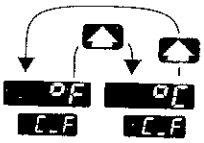
❶ Begin in the Display Loop, and press the Up-arrow key and Down-arrow key simultaneously for three seconds to reach the Setup Menus.

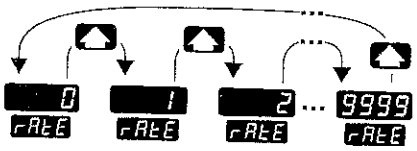


Input Menu p. 4.2 | Output Menu p. 4.18 | Global Menu p. 4.34 | Communications Menu p. 4.44

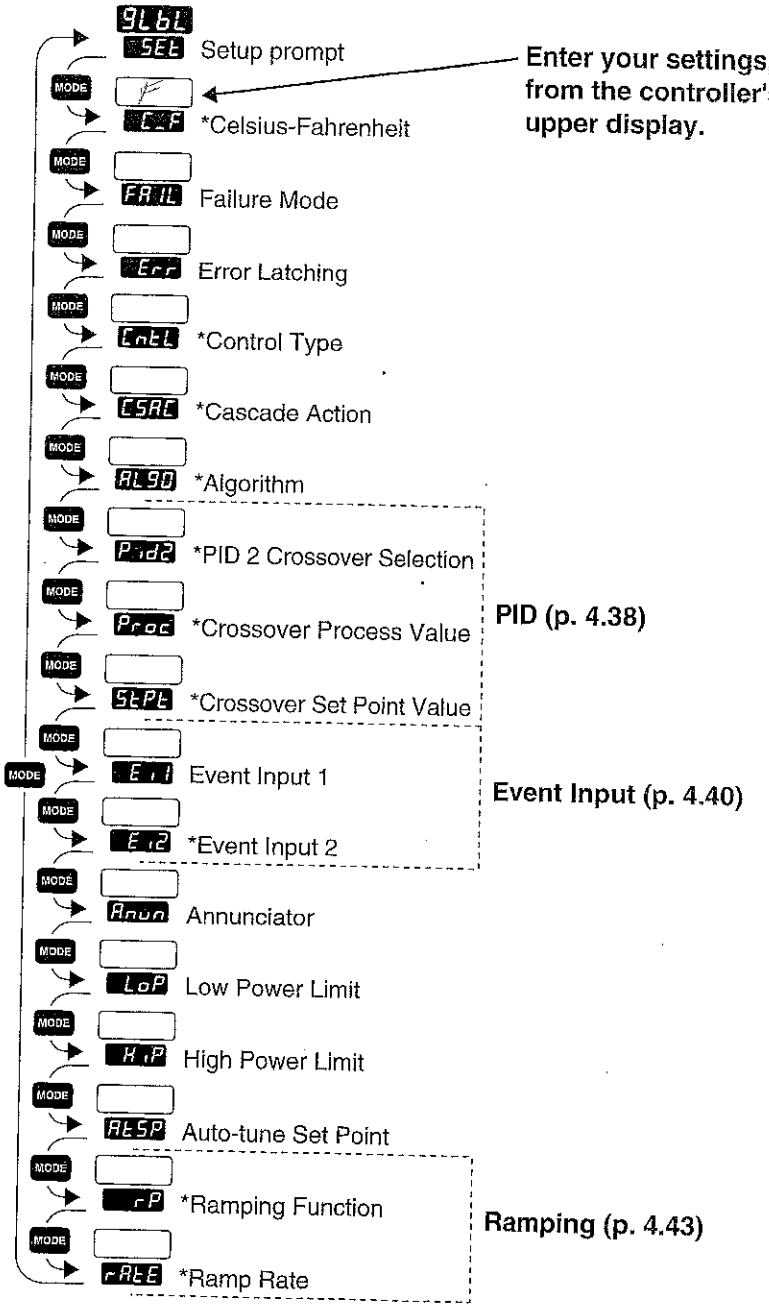
❷ Press the Up-arrow key to select one of the Setup Menus.

❸ Press the Mode key to step through the prompts.





❹ Press the Up-arrow key or the Down-arrow key to select one of the prompt values.

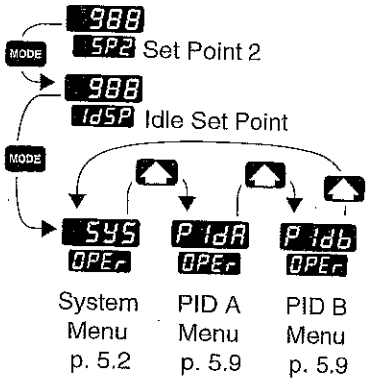


***Prompts may not appear, depending on controller configuration.**

Figure 4.34 - Navigating the Global Menu.

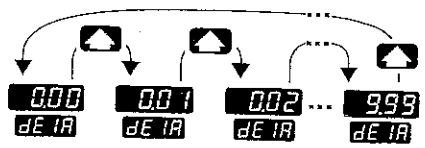
Reaching the PID Menus

❶ Begin in the Display Loop, and press the Mode key MODE to reach the Set Point 2 prompt SP2, the Idle Set Point prompt IdSP or the System Menu SYS.



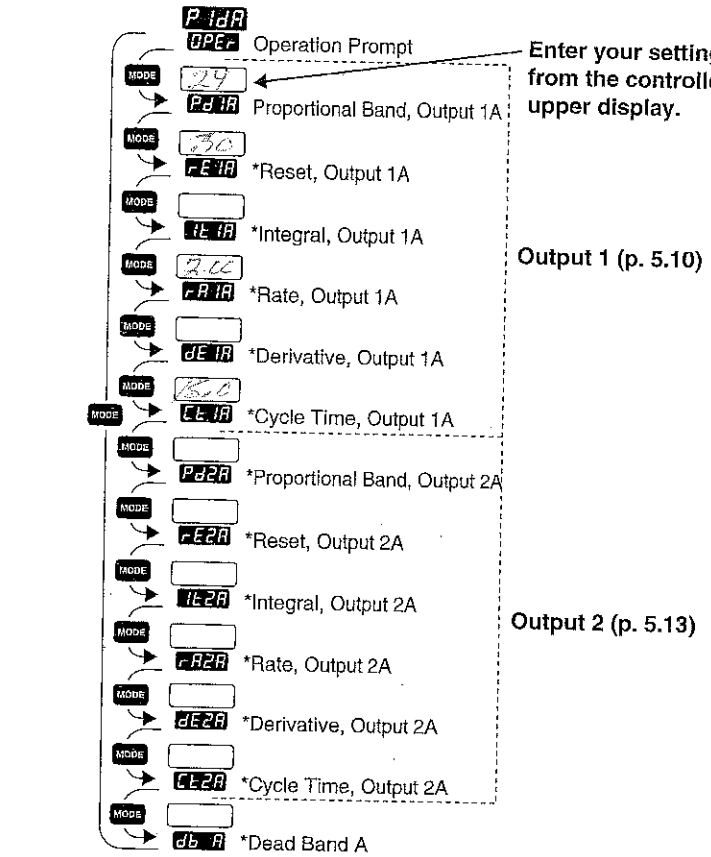
❷ Use Mode key MODE to step past the Set Point 2 prompt SP2 and the Idle Set Point prompt IdSP, if they appear (see prompt information). Upon reaching the Operation Menu prompt OPEr use the Up-arrow key to select a menu.

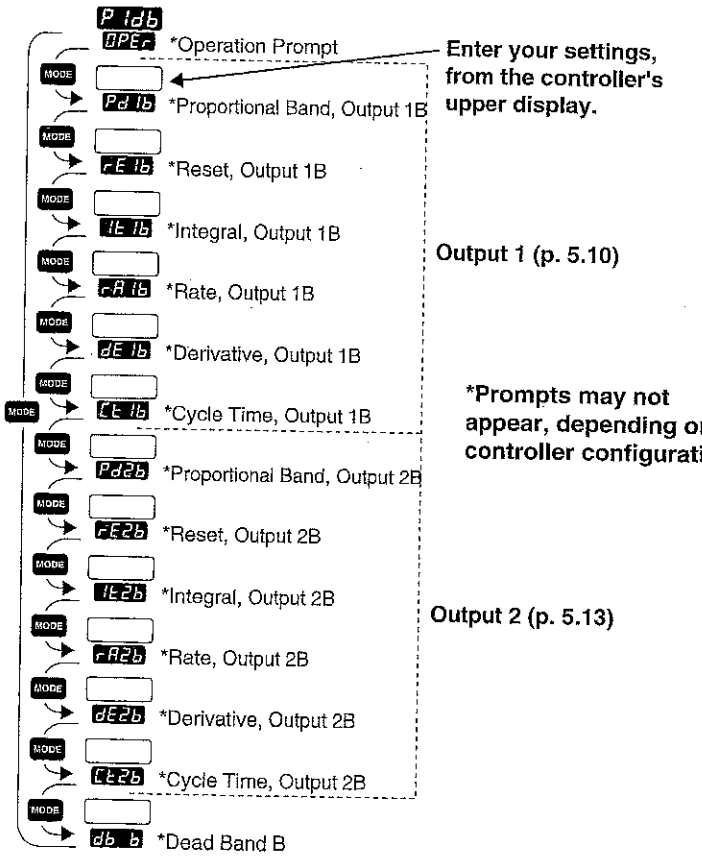
❸ Press the Mode key MODE to step through the prompts.



❹ Press the Up-arrow key to step through the prompt values. The Down-arrow key backs through the values.

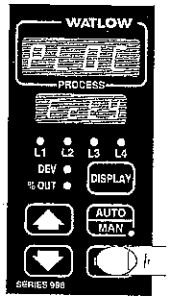
Figure 5.9 - The PID Menus.



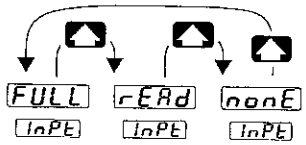


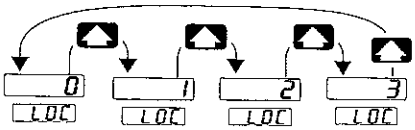
Factory-Panel Lockout

Reaching the Panel Lockout Menu

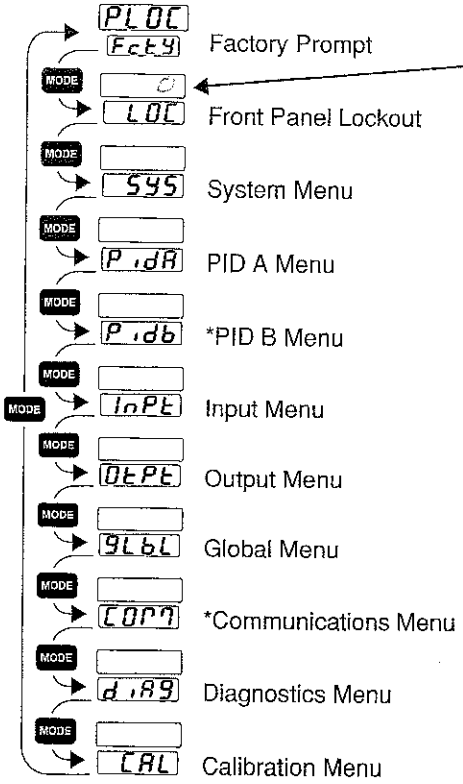


❸ Select the Panel Lockout Menu, then press the Mode key MODE to step through the prompts.



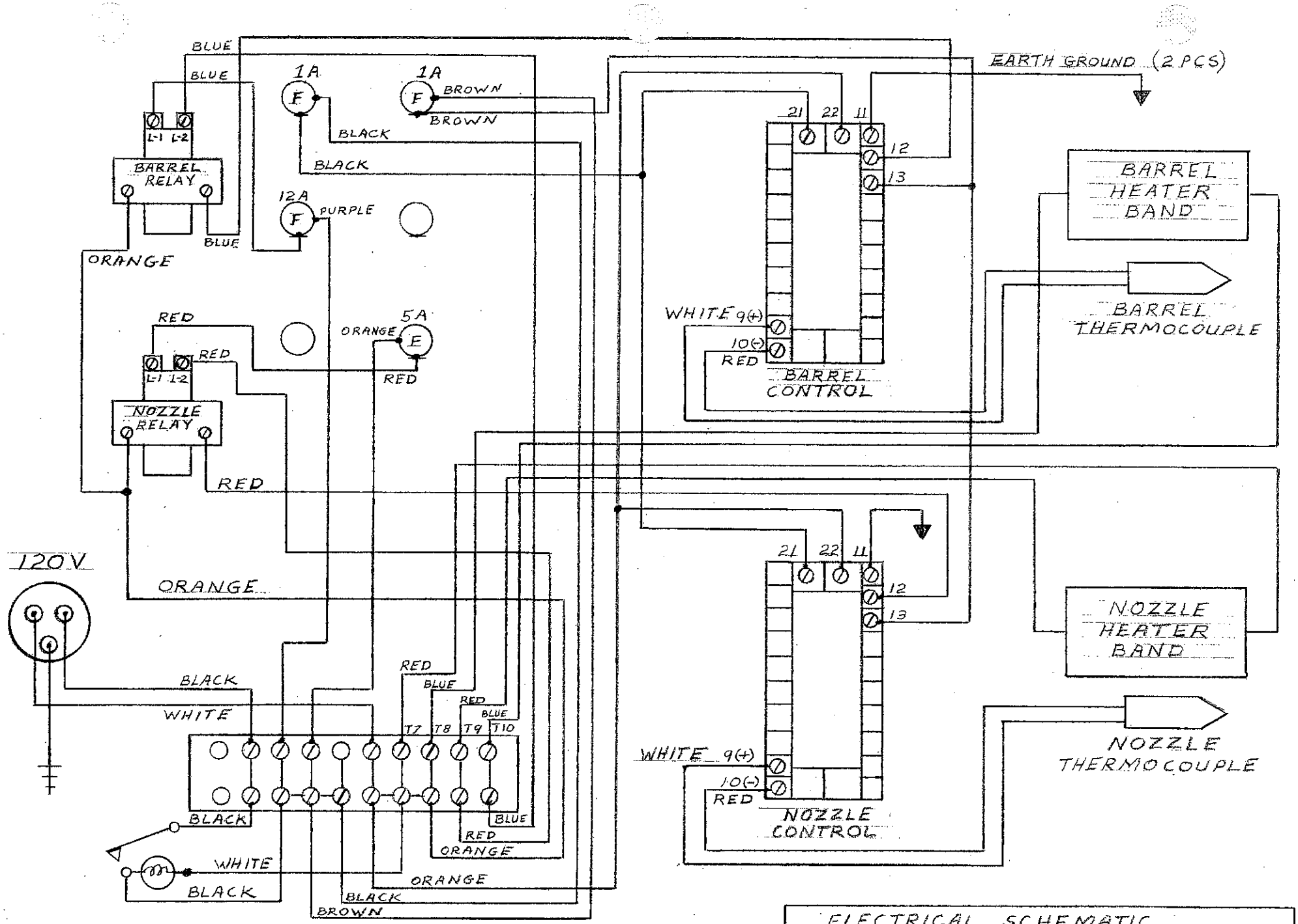


❹ Press the Up-arrow key ▲ or the Down-arrow key ▼ to select one of the prompt values.



***Prompts may not appear, depending on controller configuration.**

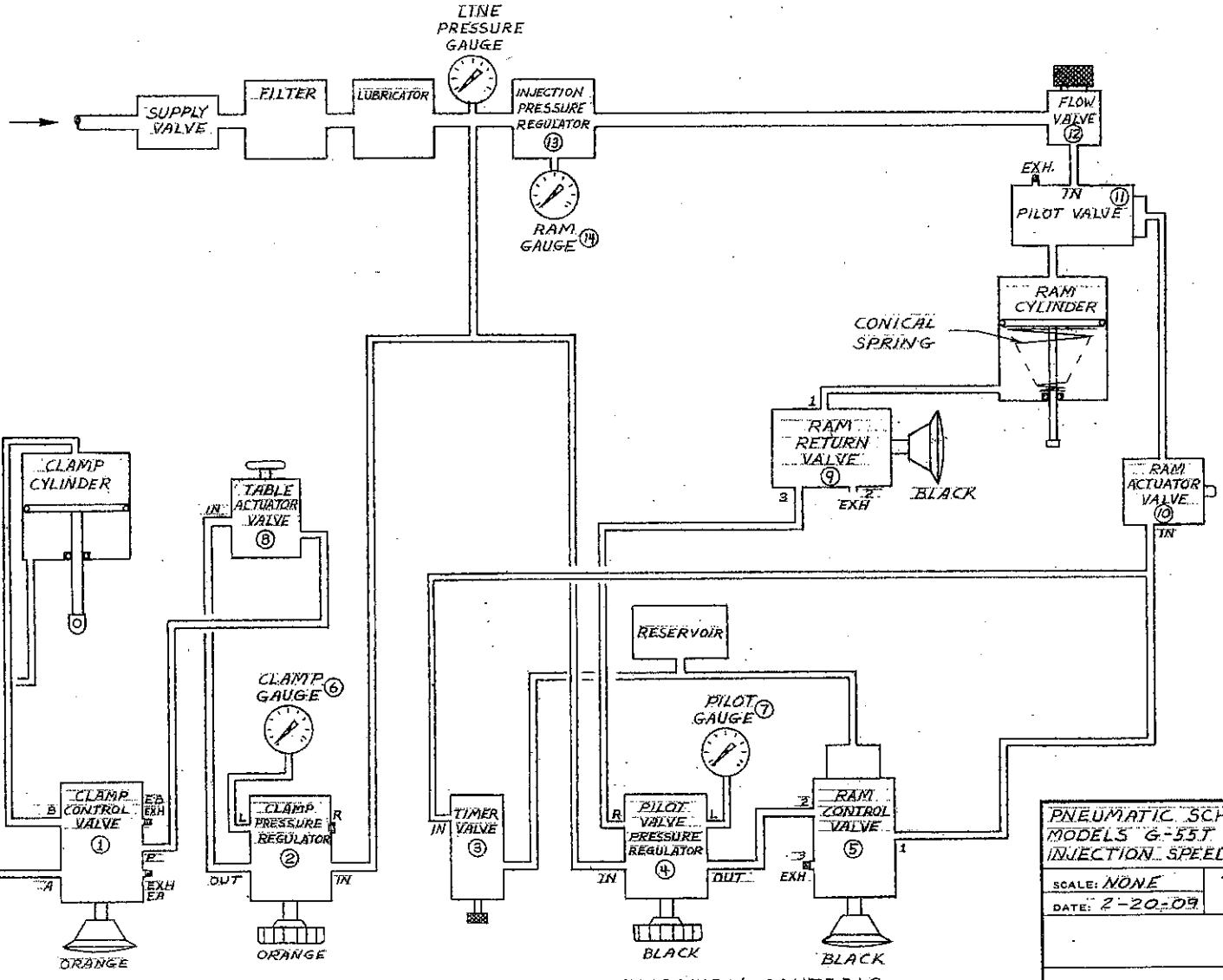
Figure 6.2 - The Panel Lockout Menu.



(F) = FUSE

CONTROLLERS: WATLOW 988

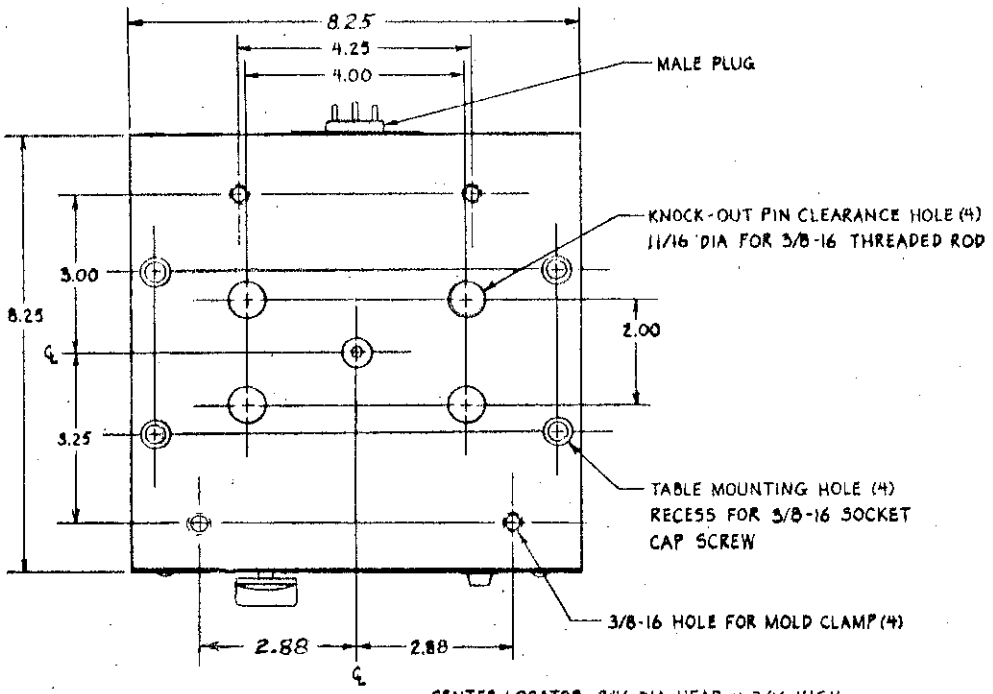
ELECTRICAL SCHEMATIC
MORGAN - PRESS G-100T & G-125T
MORGAN INDUSTRIES INC 5-11-06

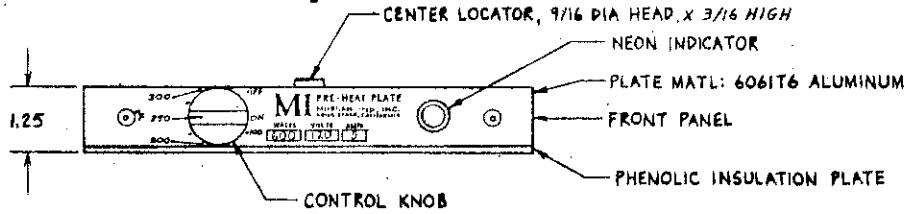


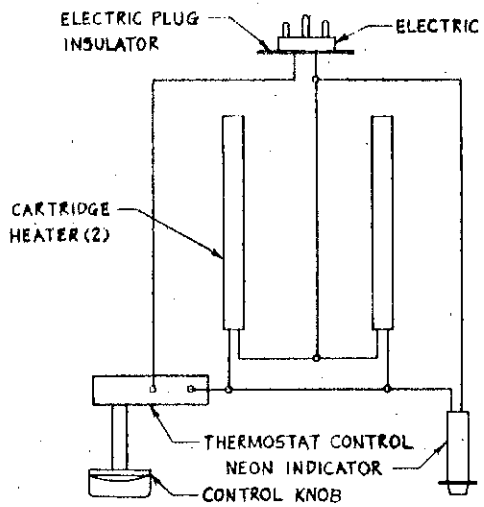
ITEM	MANUFACTURER & PART NUMBER
(1)	LEXAIR # M384-0602
(2)	MONNIER # 105-1000-2DS
(3)	CLIPPARD # MNV-2
(4)	MONNIER # 105-1000-2DS
(5)	LEXAIR # M382-1306
(6)	U.S. GAUGE # 166174A (0-20)
(7)	U.S. GAUGE # 166174A (0-16)
(8)	AIR + HYDRAULICS # 321004
(9)	LEXAIR # M382-0601
(10)	AIR + HYDRAULICS # 321204
(11)	FABCO # 34SP-3
(12)	ALKON # UN-4
(13)	WATTS # R11-03-D
(14)	U.S. GAUGE # 166174A

PNEUMATIC SCHEMATIC - MORGAN-PRESS
MODELS G-55T G-100T G-125T
INJECTION SPEED CONTROL

SCALE: NONE	APPROVED BY	DRAWN BY AGJ
DATE: 2-20-09		
MORGAN INDUSTRIES INC.		DRAWING NUMBER







THERMOSTAT CONTROL	AMERICAN #B-200A
NEON INDICATOR	DRAKE #6073-001-634
ELECTRIC PLUG INSULATOR	MORGAN
ELECTRIC PLUG (MALE)	TOWER #1069-4
ELECTRIC CORD	VOLEX #17952
CONTROL KNOB	DAVIES #1500 BLACK
CARTRIDGE HEATER	WATLOW #G4A94 120 V-300 W
PART DESCRIPTION	PART NUMBER

ELECTRICAL SCHEMATIC & PARTS LIST

PRE-HEAT PLATE ASSEMBLY DRAWING,
ELECTRICAL SCHEMATIC & PARTIAL PARTS LIST

SCALE: 1/2	APPROVED BY	DRAWN BY STT
DATE: 12/74		REV: 12/81

MORGAN INDUSTRIES, INC. — DRAWING NUMBER

NOZZLE ADAPTER #14

The Nozzle Adapter provides a ball seat to match the ball nose nozzle on the Morgan-Press. Some uses of the adapter include the following:

a) It is used as a tool to allow the use of reverse tapered sprues (see below).

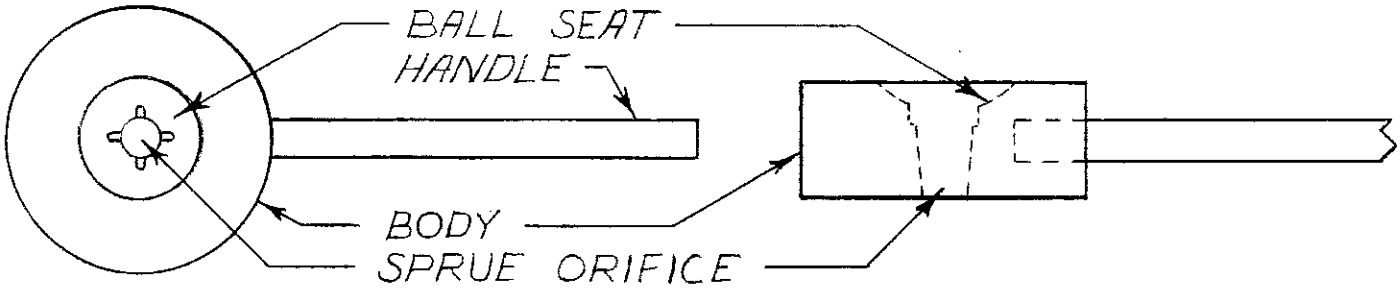
b) It facilitates quick testing of prototype molds prior to machining a ball seat on top plate of mold, or before installing a sprue bushing.

c) It protects the top surface of mold from damage or wear.

d) It allows the use of parting line type molds.

e) It permits experimentation with sprue diameters up to a maximum of 1/4".

Description (see drawing): Consists of 1 1/2" round by 5/8" thick steel, case-hardened and hard-chromed, with a 1/2" spherical radius ball seat (to match ball noses of Morgan-Press nozzles) and a tapered and serrated short sprue (orifice) through the center. It has a 1/4" round handle which extends 2 1/4" for easy handling.



Application: The sketch below shows a typical use of the Nozzle Adapter. When used with a reverse tapered sprue (as shown), the mold is usually opened first (so that the part comes off of the core). Then by simply rotating the adapter the sprue will break off at the gate and pull out. A light tap on a work bench top will eject the sprue from the adapter. Other examples of nozzle adapter usage can be found in Morgan Industries' engineering manual, "Cutting Costs in Short-Run Plastics Injection Molding," (see pages 33, 37, 39, 41, 53, and 59).