Part Number C05547
Revision 3 - 30 April 1998

BLOC 64 PRG PARISON PROGRAMMER

- **Continuous Extrusion**
- **Accumulator Head**

Service Manual

List Price - $99.95

Revision Record

Revision	Description	Date
Original	Original Issue.	
1	Manual updated.	11/94
	Supplement added to cover the differences between the Bloc 64 PRG Model L141-104 and Model L141-104B.	11/94
2	CE Version Released.	3/96
3	Manual completely revised.	4/30/98

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Section 1

General Information

1. GENERAL INFORMATION

1.1. Introduction

The Moog Bloc 64 PRG is a compact Parison Programming system that has been designed for use as either a retrofit controller or in new machine applications.

In the retrofit role, it can be used to replace older, less sophisticated systems or malfunctioning parison programmers that may no longer be serviceable. With the addition of the proper hydraulics it can also be used to update older blow molding machinery by giving it parison programming capability.

It can provide the parison programming function for new machinery as well, making the machine control system less complex and thus providing easier serviceability for the machine. The possibility also exists to update to a more sophisticated parison programming system later as the molder's needs change.

1.2. About This Manual

Please read this manual carefully before attempting to install or work with the programmer. This document is designed to provide the necessary information to install, calibrate and use the Bloc 64 in common blow molding applications.

The programmer is capable of performing several special functions which are not in common use in the North American blow molding industry. Because they are rarely seen here, these functions are not described in this document. If there is a need to incorporate one of these functions, or if there are any questions concerning any of the information in this document, assistance can be obtained by contacting Moog's Field Engineering Department.

1.3. Parison Programming

"Parison Programming" can be most easily described as varying the thickness of a parison wall at specific points along the length of the parison. This provides uniform wall thickness throughout the part after it has been blown to final shape.

There are many advantages to molding with parison programming. It allows the production of lighter, stronger parts by placing extra material only where it is needed rather than throughout the entire part. This produces cost savings through material usage reduction. Since less material is put into the part, cooling time, and thus cycle time, are reduced. This allows more parts to be produced per shift as well as reducing the energy usage cost per part.

1.4. How Closed Loop Parison Programming Works

In order to accomplish parison programming the mandrel must be moved in such a way as to vary the opening between it and the bushing mounted on the head. The size of this opening, which is called "die gap", is the factor that determines how thick the parison wall will be.

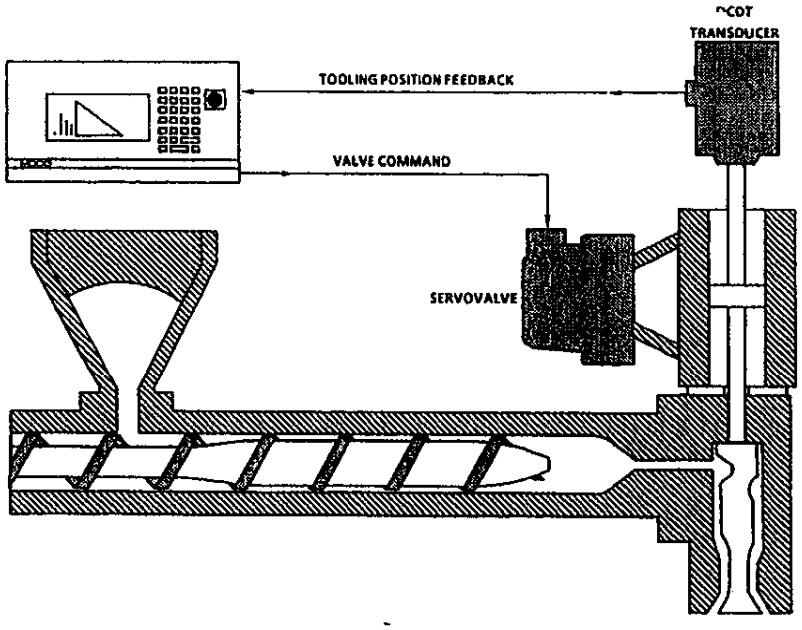
In a parison programming system, the die gap can be varied by using a moving mandrel through the center of a stationary bushing, or the mandrel can be the stationary element and the bushing can be moved. To accomplish this movement the variable element is connected to the piston of a hydraulic cylinder. The piston is then positioned by hydraulic oil which is metered into the cylinder through a servovalve. The servovalve is an electrically controlled device which can flow oil in precise amounts at variable flow rates to move the piston into a specific position at a selected speed.

The position of the mandrel (or bushing) is measured by means of a DCDT position transducer. This transducer monitors the location of the moving element and converts the physical position into an electrical signal that is then fed back to the programmer. The feedback signal is compared to the original position command. If the two match, the correction command to the servovalve is set very close to zero and will remain there until the position of the moving element has changed or a new position command is received.

If the feedback signal does not match the position command, the control will determine the difference between the two and calculate a new correction command that will be issued to the servovalve. This process will continue until the moving element of the tooling is in the proper position.

By creating an electrical "profile" of the part and using this profile as the position command signal, the die gap can be varied to provide a thicker or thinner point along the parison.

Profile points are distributed along the length of the parison by synchronizing the points along the push out of the parison on position type controls (reciprocating screw or accumulator types), or as a function of parison drop time on time based machines (continuous extrusion).



Section 2

Installation

2. INSTALLATION

2.1 Installation Overview

Since there are many makes, models and vintages of blow molding machines it is impossible to give specific instructions as to the mounting, wiring and plumbing schemes to use. Different machines have different requirements that the installer must ascertain before beginning the actual physical installation of the system. A careful examination of the machine and some thoughtful planning beforehand will usually produce a good, serviceable installation.

There are some suggestions that hopefully will make installation smooth and provide many years of trouble free operation.

It is recommended that, if space is available on the machine, the programmer and its various electrical components should be mounted in a separate enclosure. While it may be possible to mount these components in the machine's main electrical cabinet, usually quite a bit of electrical "noise" and heat is generated there. While the Bloc 64 was designed with some degree of tolerance for these conditions it must be remembered that it is, in essence, a computer. To minimize any detrimental effects on the system that can sometimes be created in such an environment, it may be easier and wiser to circumvent any problems before they are created. The old adage "An ounce of prevention..." can definitely apply here.

If using a separate enclosure or not, thoughtful layout of the components can be quite important. Remember, for future troubleshooting it is important to consider accessibility to terminals to allow for voltage readings and the ability to reach fasteners so components can be removed and replaced. Cable routing should also be considered to prevent stretching of cables, straining of connections, and pinch points or sharp edges that could damage a cable or wire.

Transducer and valve cables should be run through a "Sealtite" type of flexible, liquid tight conduit. Although it is much faster and easier to run them over the machine unprotected, enclosing them in conduit provides protection against physical damage as well as protection against insulation breakdown due to airborne chemicals.

Cabling should also be run away from sources of heat (extruders, accumulators, heater bands) and strong electrical fields (motors, transformers, etc.).

The programmer can be mounted anywhere convenient to the operator station but should be located away from areas where it could be damaged by falling objects or flooded by broken coolant or hydraulic lines.

Cable lengths to valves and transducers should be as short as possible to minimize line loss and signal corruption, but long enough to provide movement of machine members for unrestricted operation and machine maintenance. When routing cables it is wiser to avoid possible noise sources or areas of potential damage than to minimize cable lengths.

2.2 Hydraulic Installation

Hydraulic installation involves the mounting and plumbing of filters, servovalve manifolds, cylinders, etc.

If the programmer is being installed as a replacement for another programmer all these components should already be in place. If not, the following suggestions are offered:

Do not reuse old hoses, pipe, fittings or tubing. Contamination in old plumbing is almost impossible to effectively remove and can cause problems in future servovalve reliability. Old fittings that have been painted and assembled with old thread sealing compounds will not only introduce contamination, but are harder to work with and can contribute to added installation time.

Before assembling any new plumbing, inspect it carefully to insure that there are no metal filings or foreign matter left over from cutting or assembly. Now is the best time to clean it out, before it can get into the hydraulic system.

Replace the hydraulic oil or have it analyzed by a reputable lab. Depending on your maintenance program, the oil may not have been checked for some time. Now is a good time to perform any oil related maintenance, ***BEFORE*** the servovalves are installed.

If replacing the oil, remember to filter it as it is being pumped into the machine. New oil right from the refinery is sometimes the dirtiest oil in the shop.

2.2.1 Hydraulic Filtration

Clean oil is the key to reliable hydraulic system operation. Dirt, silt and sludge in the system increase operating temperatures by decreasing heat exchanger efficiency, create excessive wear on pumps, directional and relief valves and valve seats. Contamination breeds contamination by wearing hoses and other hydraulic components from the inside.

Moog servovalves are designed to operate with an ISO code of 14/11. While this may be lower than what you are accustomed to, the benefits of improved filtration will show up not only in increased servovalve life but will help to reduce premature machine wear and the frequency of oil related failures.

Moog offers a full line of filters and filter systems with element ratings starting at 3 microns, flow rates from 10 to 100 gallons per minute, and operating pressures as high as 3,000 psi. There are any number of good filter systems available and, even if a Moog filter is not choosen, it is strongly urged to employ one of these other filter systems on your machine.

High pressure filter assemblies should be plumbed between the high pressure hydraulic supply and the "P" (pressure) port of the servovalve manifold(s). Plumbing from the filter outlet to the "P" port should be completed with steel tubing or pipe.

If the machine employs a hydraulic accumulator to maintain stability in the machine's hydraulic system the filter should be installed after the accumulator and before the valve manifold(s).

2.2.2 Servovalve Manifolds

Servovalve mounting is accomplished with the use of manifolds for each head. These manifolds allow for easy removal of the valves to facilitate flushing or valve replacement in the event of failure.

Moog servovalves used in blow molding are most often internally piloted devices. This means that the manifolds required will have 4 ports that connect to the machine's hydraulic system:

"P" port is the incoming high pressure hydraulic supply to the valve.

"T" or "R" port is the servovalve return to tank.

"A" or "C1" port is one of the controlled ports. This should plumb to one side of the programming cylinder.

"B" or "C2" port is the other controlled port. This should plumb to the other side of the programming cylinder.

Some manifolds may be supplied with an additional fifth port labeled "X". These manifolds are designed for use with hydraulic systems capable of supplying an independent source of pilot pressure. If the need for this port is uncertain, contact either Moog Applications or Field Engineering Departments for additional information.

There is no specification as to which port should plumb to which end of the programming cylinder. The following suggestions are offered:

Try to keep the overall length of the controlled port lines as close to equal as possible.

Keep the servovalve manifold as close to the programming cylinders as possible.

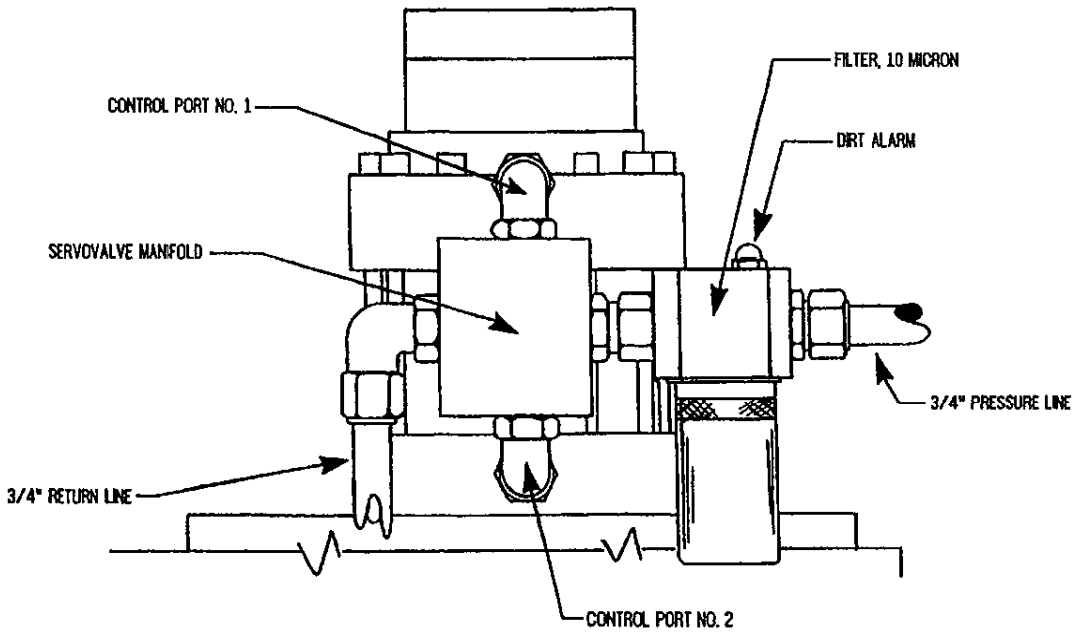
The shorter the length of the controlled port lines, the more accurate position control will be.

Try to plumb all valves the same way. ("A" port to top of all cylinders or "B" port to top of all.) This will reduce confusion and make wiring easier later.

It is **EXTREMELY IMPORTANT** that plumbing between the controlled ports and the programming cylinders be completed with solid tube or pipe. **Do Not Use Hose To Make These Connections!** Hydraulic supply up to the filter and return lines from the servovalve manifolds can be done with hose if desired.

In a great number of cases the solid hydraulic lines that connect the controlled ports to the programming cylinder will provide enough support for the servovalve and manifold combination. If the machine is prone to excessive vibration it would be wise to fabricate some type of bracket to support the servovalve assembly.

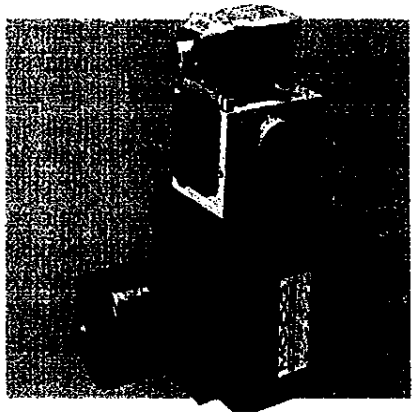
A typical servovalve and manifold installation is shown below:



2.2.3 Servoactuators

A servoactuator is a device which can be used to take the place of the standard hydraulic cylinder. It combines the cylinder, DCDT position transducer and servovalve manifold into one compact, pre-adjusted package. Servoactuators can help reduce hydraulic installation time significantly and make calibration faster and easier.

There are a number of servoactuators with different specifications and mounting hardware available, therefore no specific information will be supplied in this document. Please contact Moog if more information is required on a particular model or type.



2.2.4 Flushing

Once all the hydraulic work is completed the process of flushing the hydraulic system can be started. This step is recommended to remove as much of the foreign matter left behind in the hydraulic system as possible before installing the servovalves.

It is also recommended that the system be flushed, anytime the reservoir is drained and refilled, a cylinder is replaced or rebuilt, or a pump or any other major hydraulic component on the machine is replaced.

The first step in flushing is to remove the servovalves from their manifolds or actuators and replace with the proper flushing blocks. Install the flushing element in the high pressure filter assembly and make sure the dirt alarm has been properly reset. (Flushing elements are identified by a red band printed around the filter element.)

Jog the pumps to insure that there are no major leaks in the hydraulic system. If all looks tight, start the pumps and allow them to run. After a short run time carefully inspect all hydraulic fittings and lines to insure there are no leaks.

Periodically check the dirt alarm on the high pressure filter to see if it has been tripped. If it has, stop the pumps and replace the flushing element with a new one. Reset the dirt alarm and re-start the pumps. Allow them to run while periodically checking the dirt alarm.

The system has been satisfactorily flushed when the pumps run for two complete hours without tripping the filter dirt alarm.

After flushing is complete, turn off the pumps and replace the flushing element with a standard filter element. Replace the flushing blocks with the servovalves. Remember to reconnect the valve electrical connectors.

CAUTION

The flushing element is a LOW PRESSURE element designed to be used in conjunction with the flushing blocks. Failure to replace it with the correct high pressure element after removing the flushing blocks will result in the filter element collapsing and possibly damaging the machine.

NOTE

On some machines when the flushing blocks are installed in place of the servovalves, hydraulically operated devices on the machine are not able to function. The flushing blocks are configured to direct pressure back to tank allowing the system to be flushed at a low pressure. Because of this, no pressure will be created in the hydraulic system.

2.2.5 A Word About Hydraulic Pumps...

One of the most common failures seen in blow molding valves is a buildup of varnish in the valve. This is usually caused by oil overheating and breaking down. Most standard petroleum based hydraulic fluids begin to reach their temperature specification somewhere between 130 - 150 degrees Fahrenheit. While you may never surpass this while the machine is running, it can easily be exceeded when the pumps are off and the machine heats are on. The stationary oil in the valve absorbs the heat being created and can quickly surpass the oil's breakdown point.

To reduce the possibility of this happening it is suggested that anytime the heats are on, the pumps should continue to run. The oil moving through the valve will actually act as a coolant and help to prolong servovalve life.

2.3 Transducer Installation

As mentioned earlier, the Bloc 64 uses DCDT position transducers to feed back programming cylinder position information to the controller. A separate DCDT is required for each individual head.

If servoactuators of the type described in paragraph 2.2.3 are being used, the DCDT is integrated into the actuator package and has been pre-adjusted at the factory. No further adjustment is required.

2.3.1 DCDT Position Transducers

In order to maintain accuracy and repeatability of programming cylinder motion care must be taken when mounting the DCDT tooling position transducer(s).

DCDT's can be mounted with the transducer body as the stationary element and the core as the moving member, or the core can be stationary and the body can move. Whatever method is used, the stationary element must be rigidly mounted on a non-moving portion of the machine frame to provide a reference for cylinder movement.

Please note the following precautions when mounting the transducer:

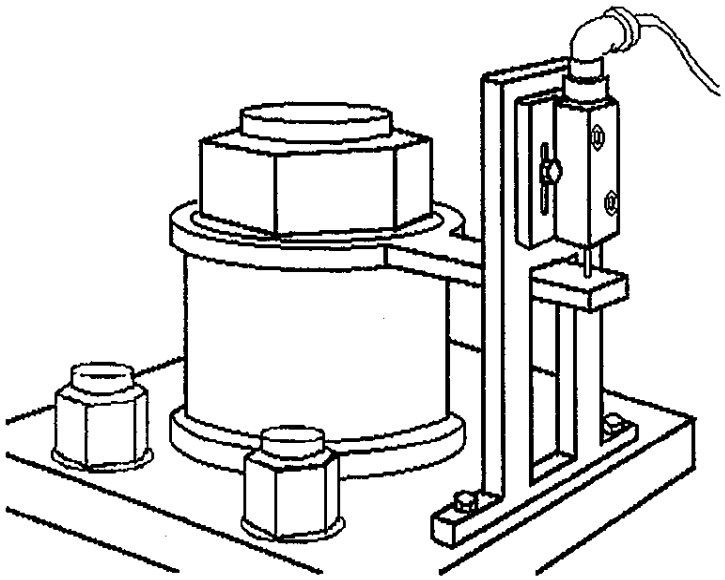
The core must move freely in the body. There should be no side loading of the core nor should the core rod be bent in order to make it align with the transducer body.

Mountings for both core rod and transducer body must be rigid. There should be no free play in any of the brackets and the brackets should be made of a stiff material which will not bend or give with normal machine vibration.

Provision must be made to allow for adjustment of the stationary element of the transducer. The transducer's position will need to be adjusted during calibration to center the programming cylinder in the DCDT's operating stroke. The ability to align the body with the core will also make future DCDT replacement easier.

When designing the DCDT mounting brackets allow for some type of anti-rotational device to keep the core and body properly aligned.

A typical DCDT transducer installation using the moving core method is shown below:



Note the provisions made for vertical adjustment of the DCDT body and the anti-rotational arrangement incorporated to keep the core and body aligned.

2.3.2 Linear Position Transducer (position based applications ONLY)

Since the profile is synchronized to the position of the push out ram, the Bloc 64 requires a means to track the ram throughout the push out stroke. In addition, to keep the profile points properly centered on the parison, the Bloc 64 must have control over the accumulator FULL and EMPTY points. Both of these tasks are accomplished by the signal provided from the linear position transducer.

The transducer can be mounted so that the potentiometer shaft EXTENDS FROM the potentiometer body during push out, or RETRACTS INTO the body during push out, whichever makes for a more convenient mounting method.

As with DCDT's, there are several precautions that should be observed when mounting linear position transducers:

The potentiometer body and shaft must be as parallel to the ram as possible. This will prevent side loading of the transducer shaft and premature failure of the bushings in the transducer body.

The transducer should never be at the full mechanical end of it's stroke in either direction. When mounting be sure that the shaft is at least 0.25 inch from it's stop when the push out cylinder is at full bottom (empty).

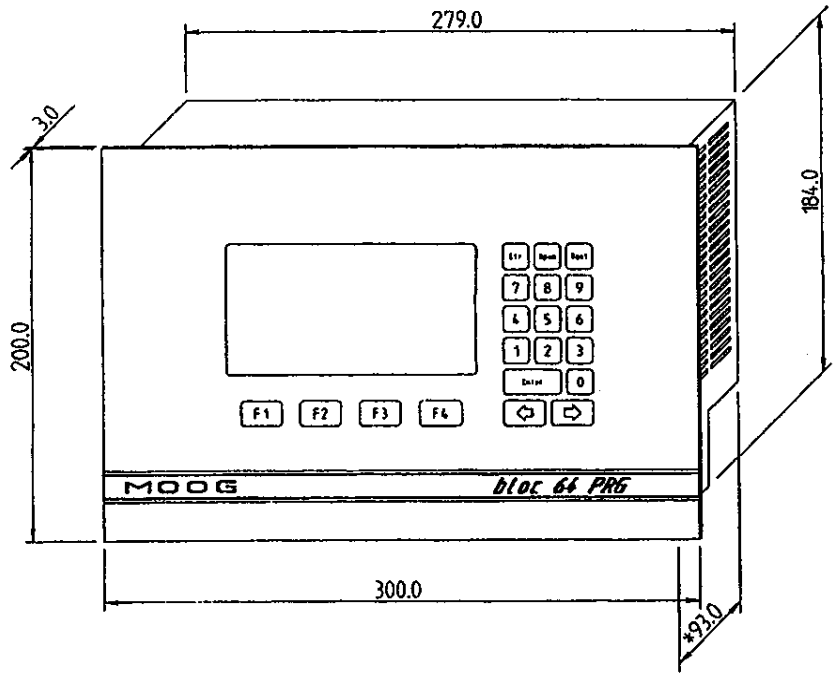
The body should be rigidly mounted to eliminate the possibility of movement caused by machine vibration.

There should be no more than 1/16 inch of end play in the transducer shaft in the direction of ram movement when the shaft is secured to the ram follower assembly.

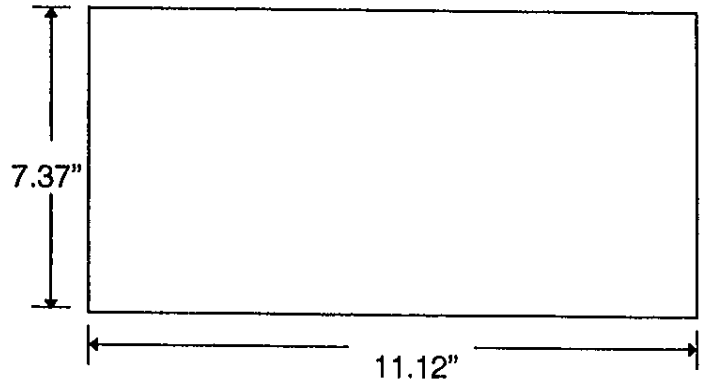
The end of the shaft should never be screwed down tightly to the follower assembly. Instead, the ball joint on the shaft should be allowed to "float" slightly up and down the securing screw. This will reduce any stresses caused by the slight misalignment between transducer and cylinder that are always present.

2.4 Programmer Installation

The overall dimensions of the Bloc 64 are listed in the representation below. All dimensions are in millimeters.



The cutout required to accept the programmer for mounting in a panel is shown in the drawing below.



Recommended mounting screws: 8-32, approximately 1 inch long. Round or pan head machine screws are recommended to prevent possible damage to the face of the panel that could be caused by flat head screws.

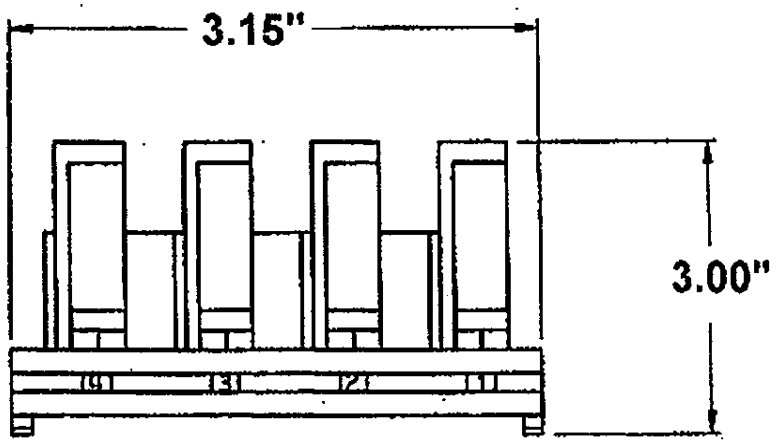
When mounting the programmer, it is recommended that approximately 4 inches of free space be maintained around the programmer to provide for free air flow through the unit. This will provide adequate cooling for the internal components.

2.5 Relay Module, Moog Part No. C05270-2 (Optional)

An optional relay module is available to provide the means for connecting the Bloc 64's discrete outputs to the blow molding machine. Although these output functions do exist in the programmer, their maximum output is limited to 24 volts DC at 200 milliamperes (mA). Any high voltage/high current switching to the machine MUST be performed with relays to prevent damage to the Bloc 64.

The relays are dual pole/dual throw (DPDT) type. The form "C" contact sets are rated at 6 amperes at 250 volts AC or 6 amperes at 30 volts DC. The standard module has four relays, but multiple relay modules may be used if additional outputs are required.

The module itself mounts in the electrical cabinet to a 35 millimeter DIN rail. The rail is available in 6 foot lengths as Moog Part No. A91251-2.



Coil leads are the "bussed common" type which means that one side of each coil is connected to a common bus on the module. In this configuration a single wire back to common is all that is requited for all four relays on a given module. This saves time and simplifies wiring.

Individual wires to drive each of the relays are connected to the terminal strip "Coils".

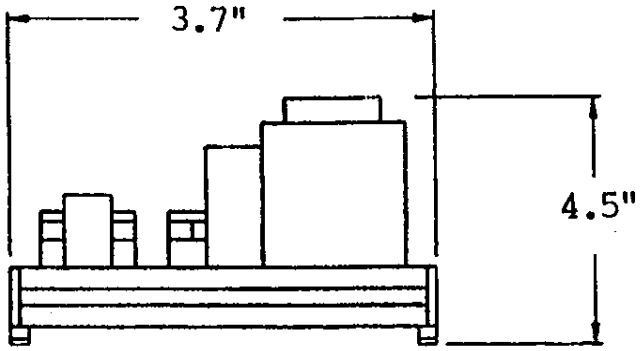
Relay contacts are available at the "Contacts" terminal strip and are marked with the appropriate legend to identify their function:

"C" - Common terminal
"NO" - Normally open contact
"NC" - Normally closed contact

2.6 DC Power Supply, Moog Part No. C05272-1 (Optional)

An external source of 24 volts DC must be provided to operate any output relays used with the Bloc 64. This source MUST be a regulated power supply with a maximum current capacity of 1 ampere at 24 volts.

The optional power supply from Moog is designed to mount to the same type DIN rail used for mounting relay modules.



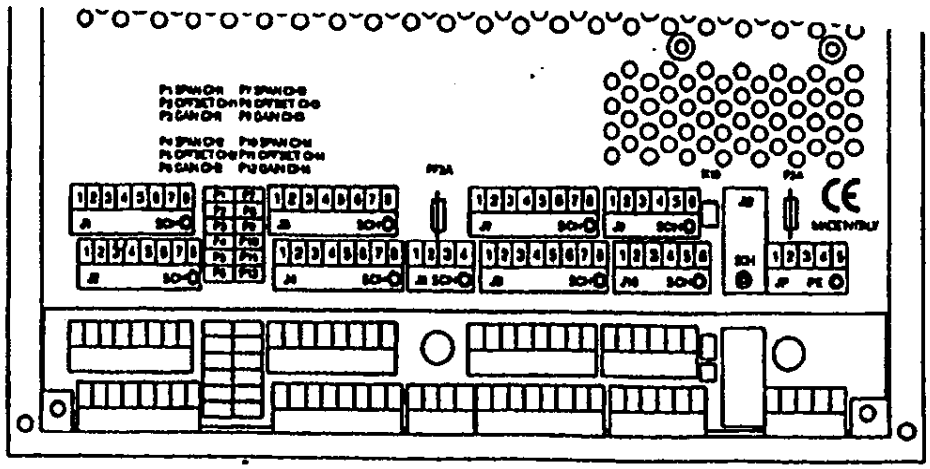
2.7 Electrical Installation

Electrical installation involves the wiring of inputs and outputs to the respective programmer terminals as well as wiring for transducers, servovalves and main power to the programmer.

This document deals strictly with the wiring to the Bloc 64 programmer and it's various components and makes no mention of interfacing the programmer to the machine. Assistance for interfacing can be obtained by contacting Moog's Field Engineering Department.

2.7.1 Connector Location

All electrical connections are made to the Phoenix type plug in terminal blocks located along the lower rear portion of the programmer. The following drawing will help in identifying the location of the various terminal blocks.



2.7.2 AC Power

The Bloc 64 is powered by 100 to 250 volts AC, 50 to 60 Hz. Incoming power is automatically determined by the Bloc 64 so there are no jumpers or switch settings required.

Power connects to the five terminal block labeled **"JP"** on the back of the programmer. Terminals are assigned as follows:

JP - 1.....AC supply, high
JP - 2.....AC supply, neutral
JP - 3.....no connection
JP - 4.....chassis (earth) ground
JP - 5.....chassis (earth) ground 2

2.7.3 Programming Heads

The Bloc 64 can control up to four independent programming heads. Connections for each head are made on an eight terminal block dedicated to a specific head. Terminal blocks are assigned as follows:

J1.....Head #1
J2.....Head #2
J3.....Head #3
J4.....Head #4

Terminal functions on these four strips are the same. The following describes the function of each terminal on the strip and the wiring to it:

Terminal #1 .....Valve command return..... Valve Red*
Terminal #2 .....Valve command..... Valve Black*
Terminal #3 .....no connection
Terminal #4 .....+15 volts DC..... DCDT Red
Terminal #5 .....-15 volts DC
Terminal #6 .....DC supply return..... DCDT Black
Terminal #7 .....DCDT position signal return ..... DCDT White*
Terminal #8 .....DCDT position signal..... DCDT Green*

* This is the preliminary position for these wires. It may be necessary to change this connection scheme later to provide proper operation of the heads. This will be described in greater detail later in the calibration section of this document.

NOTE

The color codes specified above are valid only when using the following Moog cables:

Valve cable, Moog Part No. A32492-50
DCDT cable, Moog Part No. A43809-50

2.7.4 *Linear Position Transducer (Position Based Applications ONLY)*

As mentioned in paragraph 2.3.2, the linear position transducer provides the programmer with information concerning the position of the push out ram.

The shielded three wire cable terminates at programmer terminal block **J6**.

> **NOTE**
> The wiring for this device is dependent on the direction of transducer rod movement during push out. Please be sure to choose the correct wiring method which coincides with the transducer mounting.

For transducer rods that EXTEND FROM the body during push out:

Terminal #1 ..... +10 volts DC ..... Black
Terminal #2 ..... DC return ..... Red
Terminal #3 ..... position signal ..... White
Terminal #4 ..... chassis ground ..... Shield

For transducer rods that RETRACT INTO the body during push out:

Terminal #1 ..... +10 volts DC ..... Red
Terminal #2 ..... DC return ..... Black
Terminal #3 ..... position signal ..... White
Terminal #4 ..... chassis ground ..... Shield

> **NOTE**
> The color codes above are valid only when using Moog cable, Part No. A32646-50.

Linear position transducers supplied by Moog for use with parison programmers have a resistance value of 10,000 ohms (10 K). The programmers will function properly with transducers that have resistance values as low as 5,000 ohms (5 K). It IS NOT recommended attempting to use transducers with total resistance values less than the 5 K specification.

2.7.5 Inputs Signals

The Bloc 64 can accept up to 10 inputs to initiate different programmer modes or functions. These signals are input to the programmer at terminal blocks **J9** and **J10.** Not all inputs are required for all applications or to make the programmer function properly.

The Bloc 64's input devices are high impedance, solid state, opto-coupled integrated circuits rated at 24 volts DC MAXIMUM, ± 5%. All input signals to the programmer should be switched through normally open DRY CONTACT relays or switches.

CAUTION
Under *NO CIRCUMSTANCES* should machine level voltages be applied to any of the Input (J9, J10) terminals on the programmer!

The locations and brief descriptions of the ten inputs are as follows:

J9 - 1, START This input sets the programmer to row #1 of the profile. It is a REQUIRED SIGNAL for all applications.

J9 - 2, PHOTOCELL 1 Is used to signal the programmer that the parison has reached a predetermined drop point. It is used in conjunction with the extruder speed control function.

J9 - 3, PHOTOCELL 2 Is used to signal the programmer that a second parison has reached a predetermined drop point. It is used with extruder speed control on machines having multiple mold sets and multiple extruders.

J9 - 4, MOLD 1 Is used to signal the programmer that the empty mold is in place to receive the next parison. It is used in conjunction with the extruder speed control function.

J9 - 5, MOLD 2 Is used to signal the programmer that the second station's empty molds are in place to receive the next parison. It is used with extruder speed control on machines having multiple mold sets and multiple extruders.

J9 - 6, INPUT POWER This terminal can have two functions depending on the power source chosen for the inputs. Please refer to paragraph 2.7.6 "Power Source For Inputs for more information.

J10 - 1, REFILL DIE GAP A signal applied to this input will take the programmer out of "Program" mode and position the tooling to the "Standby Die Gap" value set on the "Stroke Setting" screen. The tool will remain in this position until a START signal is applied to the programmer.

This signal is used in position based applications only and is a REQUIRED SIGNAL in these applications.

J10 - 2, NOT USED

J10 - 3, WEIGHT + Will increase the weight of the parison by a predetermined amount by varying the "Weight" setting. This function is only active when used with an external, automatically programmable scale.

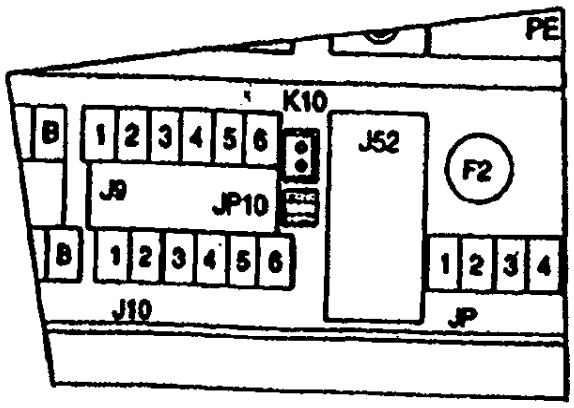
J10 - 4, WEIGHT - Will decrease the weight of the parison by a predetermined amount by varying the "Weight" setting. This function is only active when used with an external, automatically programmable scale.

J10 - 5, SCRAPPED PIECES An external input used to adjust the parts counters on the "Production 1" screen when using the programmer to monitor the quantity of parts produced. This signal can come from an automatic measuring and inspection device or can be input manually via a momentary switch depressed by the operator.

J10 - 5, INPUT POWER This terminal can have two functions depending on the power source chosen for the inputs. Please refer to paragraph 2.7.6 Power Source For Inputs for more information.

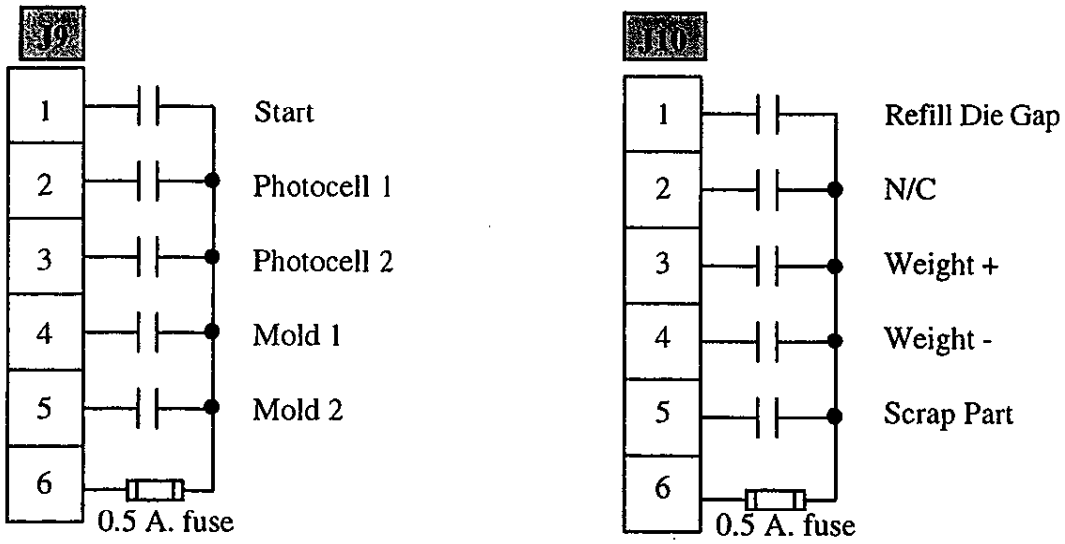
2.7.6 Power Source for Inputs

The programmer's internal power supply may be used as the source for power to the programmer's inputs. If this method is used, locate jumper **JP 10** on the back of the programmer near the **J9** terminal block and position the jumper HORIZONTALLY as depicted in the following drawing:



If an external 24 volt source for power to the inputs is used, the **JP 10** jumper should be positioned VERTICALLY (90 degrees to that shown in the drawing).

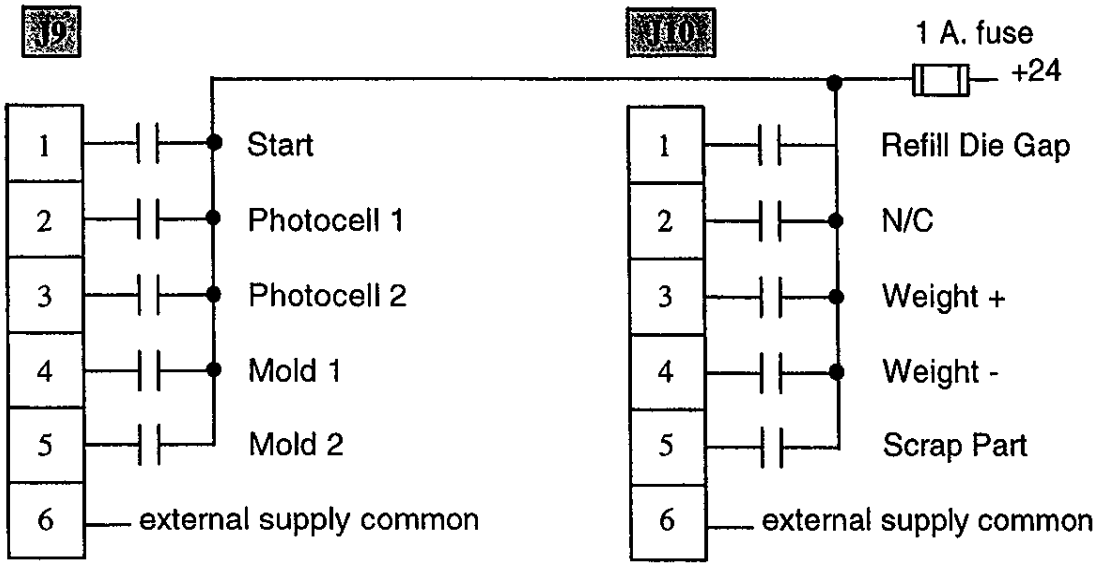
2.7.7 Connections with Internal Power Supply



Power for each of the terminal blocks is available at terminal #6. If more than two or three inputs in total are used, it is recommended splitting the source between the two terminal blocks to provide more even loading of the power supply.

Note the addition of the 0.5 amp fast blow fuses to protect the internal power supply in the event of a short circuit in the wiring. It is STRONGLY RECOMMENDED that this device be installed.

2.7.8 Connections with External Power Supply



Note the installation of the fuse to protect the external power supply in the event of a short circuit in the wiring or a malfunction in the programmer. Note too that the fuse rating has been increased to a 1 amp fast blow fuse because it is now supplying all 10 inputs.

2.7.9 Outputs

There are 11 useable outputs from the Bloc 64 available at terminal blocks **J7** and **J8**. As with the inputs, not all are used in every application nor are all required to make the programmer function properly with the blow molding machine.

The outputs are rated at 24 volts, 200 milliamperes (mA) MAXIMUM and can provide only a single normally open dry contact. It is necessary therefore, to use the programmer's outputs to operate low current requirement relay coils and allow the relays to switch the high voltage/high current loads required by the machine.

Because the outputs from the programmer are dry contacts only, an external power supply MUST BE USED to provide a power source to operate the relays.

CAUTION

DO NOT attempt to use the 24 volt power source available on J9, J10 terminal #6! The current capability at these terminals is extremely small and damage to the programmer may result if it is attempted to source the outputs from here.

The locations and brief descriptions of the outputs are as follows:

J7 - 1, EXTRUDER 1 FASTER Provides a signal to the machine's extruder drive control to increase extruder speed. It is used in conjunction with the extruder speed control function.

J7 - 2, EXTRUDER 1 SLOWER Provides a signal to the machine's extruder drive control to decrease extruder speed. It is used in conjunction with the extruder speed control function.

J7 - 3, COMPARATOR 1 The output associated with "Comparator 1". Will operate according to the ON and OFF points set on the Comparator 1 screen.

J7 - 4, COMPARATOR 2 The output associated with "Comparator 2". Will operate according to the ON and OFF points set on the Comparator 2 screen.

J7 - 5, COMPARATOR 3 The output associated with "Comparator 3". Will operate according to the ON and OFF points set on the Comparator 3 screen.

J7 - 6, END OF FILLING Will energize when the push out ram reaches the Shot Size set point on the Stroke Setting screen. This output is used to override the machine's shot size or end of filling limit switch to stop accumulator refilling. It is a REQUIRED output for position based applications.

J7 - 7, END OF EXTRUSION Will energize when the push out ram reaches the End Of Extrusion set point on the Stroke Setting screen. This output is used to override the machine's empty point limit switch and initiate accumulator refill. It is a REQUIRED output for position based applications.

J7 - 8, +24 VOLTS The point where the external 24 volt power supply connects to the programmer. Power must be connected here to operate the output relays. This connection is REQUIRED if it is desired to use ANY of the outputs.

This terminal is routed through fuse F1 in the Bloc 64. F1 is a 2 amp fast blow fuse that is incorporated to protect the internal circuitry of the Bloc.

J8 - 1, EXTRUDER 2 FASTER Provides a signal to the machine's #2 extruder drive control to increase extruder speed. It is used with extruder speed control on machines having multiple mold sets and multiple extruders.

J8 - 2, EXTRUDER 2 SLOWER Provides a signal to the machine's #2 extruder drive control to decrease extruder speed. It is used with extruder speed control on machines having multiple mold sets and multiple extruders.

J8 - 3, HEATING ON/OFF A master contact capable of turning all machine heater zones on or off. It CANNOT control machine temperatures by itself.

J8 - 4, PRODUCTION STOP Will energize when the required number of good parts produced equals the Requested Pieces set point on the Production 1 screen, or the Maximum Scrapped Pieces count has been reached.

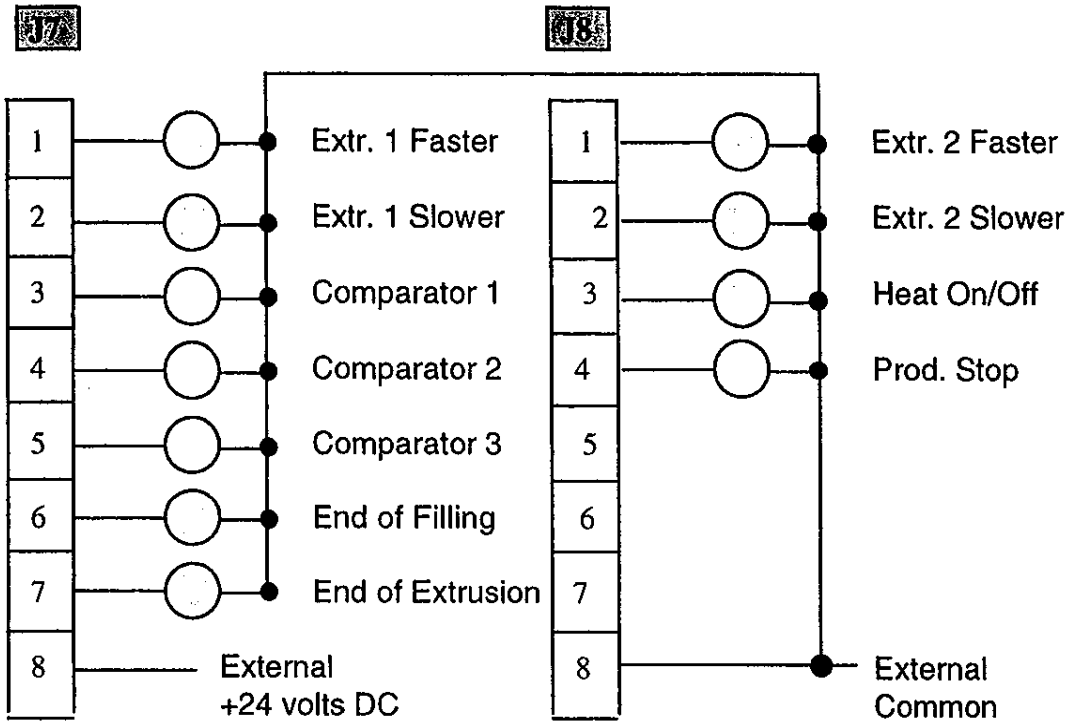
J8 - 5, NOT USED

J8 - 6, NOT USED

J8 - 7, NOT USED

J8 - 8, DC COMMON The point where the common side of the external DC power supply connects to the programmer. Power must be connected here to operate the output relays. This connection is REQUIRED if it is desired to use ANY of the outputs.

2.7.10 Output Connections



3. CONFIGURATION & CALIBRATION

3.1 Overview

At this point the programmer should be installed and wired as required for your application. The hydraulic system should have been tested for leaks and thoroughly flushed as described in paragraph 2.2.4.

The next step is to configure the programmer, properly position the DCDT position transducers and calibrate the programming cylinder strokes and linear position stroke if this is a position based application.

3.2 Initial Power ON After Installation

Turn AC power to the Bloc 64 ON. After power is applied, the programmer will go through it's internal start up sequence. After several seconds with a blank screen, the MOOG logo will appear. This indicates that there were no internal problems detected in the programmer.

After several more seconds, the MOOG logo screen will be replaced by the Parison Set Up screen for head #1.

Screens can now be changed or data can be entered as required.

This is the standard start up routine for the control and it will be repeated every time power to the programmer is turned on.

3.3 Entering Data

In order to enter data on either one of the Configuration screens or any of the Process screens, use the following procedure.

1) Insure a valid Password is entered on Configuration screen 1, field #217.

2) Press and release the **ENTER** key on the front of the programmer. This will enable the cursor and data fields on the screen currently displayed.

3) Using the left and right membrane arrow keys (←, →) you can move the cursor down to the various data fields on the screen. When the cursor is on the data field you wish to change you can enter the desired value. If the field requires a numeric value, it can be entered directly from the numeric keypad. Be sure to fill all spaces on the field using zeros if required. If the field requires a NO/YES (N/Y) choice, press the number zero to change the field to a NO (N), or press the number 1 to change the field to a YES (Y).
After a value has been entered in a data field, the Bloc 64 will compare the requested setting to a range of valid values for that data field. If the requested value falls within that range, the Bloc will prompt "OK?" in the upper right hand corner of the screen. If the requested change is invalid, the Bloc will reject the new value and restore the data field to the value that was there just prior to the attempted change. It will then display the reason for the error in the upper left hand corner of the screen. You can now enter a corrected value in the data field.

4) When you have completed all the desired changes on the screen, press and release the **ENTER** key again. The cursor will deactivate and all your valid changes will be accepted and executed by the Bloc 64.

NOTE
None of the changes will be executed until step 4) is completed.

3.4 Accessing Different Screens

To get to the various screens in the Bloc 64, press the left (←) or the right arrow membrane keys (→) on the front of the programmer. Every time either of these keys is pressed and released you will see the four screen selections at the bottom of the display change. When the desired screen title appears over one of the function keys, press and release the corresponding key (F1, F2, F3, F4). The display will change and present your screen selection.

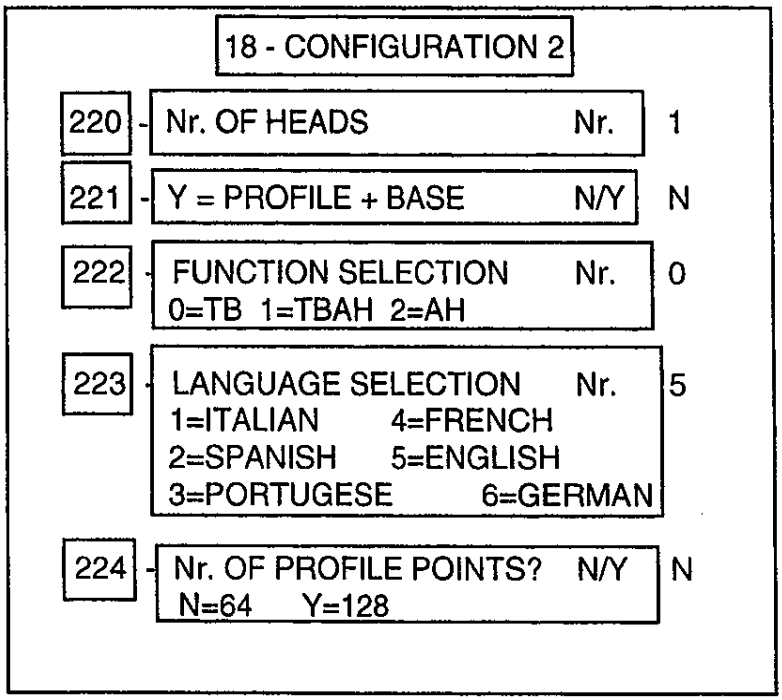
NOTE
The Bloc 64 is capable of displaying information in six different languages, so when initially powered up for the first time you may not find the language you expect. Once the proper language is configured the Bloc 64 will always start with the language you have set. Language selection is made on the Configuration 2 screen.

Complete information on the individual configuration settings can be found in paragraphs 3.5.1 and 3.5.2.

3.5 Configuration

Configuration is matching the Bloc 64 to the specific type of blow molding machine the programmer is installed on and selecting several variables that are not machine specific.

3.5.1 Configuration Screen 2 (CONF. 2)



220 - Nr. OF HEADS Using the numerical keypad, select the number of active parison heads from 1 to 4.

221 - PROFILE + BASE Chooses how the graphical portion of the profile is displayed.

- **"N"** will display only the value of the profile points.
- **"Y"** will display total value of the profile points PLUS weight setting.

222 - FUNCTION SELECTION Chooses the type of blow molding machine the programmer is installed on. Select the corresponding number.

0 ="TB" Time based continuous extrusion
1 ="TBAH" Time based accumulator head
2 ="AH" Accumulator head or reciprocating screw

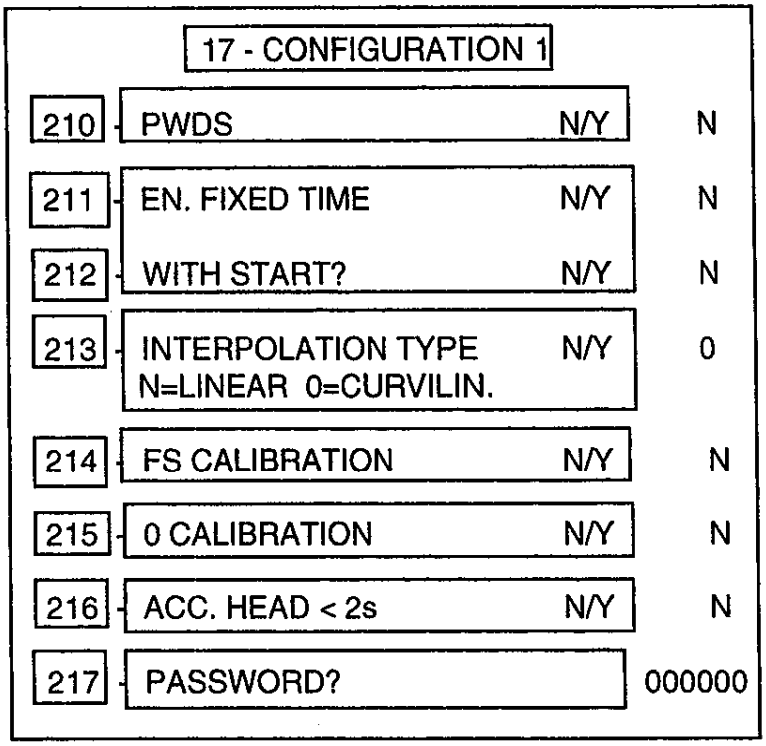
223 - LANGUAGE SELECTION Chooses the language used on the programmer screens. Select the number that corresponds to your choice.

224 - Nr. OF PROFILE POINTS Chooses the number of profile points that make up the parison profile.

- **"N"** profile made up of 64 profile points.
- **"Y"** profile made up of 128 profile point.

3.5.2 Configuration Screen 1 (CONF. 1)

Once Configuration 2 has been completed, the same method described in paragraph 3.4 can be used to locate and gain access to the Configuration 1 screen.



210 - PWDS If the Bloc 64 is operating a PWDS deformable Die Ring set to **"Y"**. All other applications should be set to **"N"**.

211 - EN. FIXED TIME For time based applications only. Automatic profile synchronization is disabled and all profiles will be synchronized to the CYC's time setting on the Head #1 Parison set up screen if set to **"Y"**.

212 - WITH START? For time based applications only. Profile will not sweep until the programmer receives a START signal at J9, terminal #1.

213 - INTERPOLATION TYPE Determines if profile interpolation between Master set points is linear (straight line from one Master to the next) or curvilinear (smooth curve from one Master point to the next).

- **"N"** Will set linear (straight line) interpolation between Master points.
- **"Y"** Will set curvilinear (smooth curve) interpolation Master points.

214 - **FS CALIBRATION** For position based applications only. Used to calibrate the maximum stroke of the accumulator's linear position transducer. More will be explained about this in the calibration section of this document.

215 - **0 CALIBRATION** For position based applications only. Used to calibrate the zero (completely empty) point of the accumulator's linear position transducer. More will be explained about this in the calibration section of this document.

216 - **ACC. HEAD < 2s** Sets the minimum acceptable push out (extrusion) time for a parison at 2.5 seconds or 1.25 seconds. This is active in position based applications only.

- "N" sets minimum time at 2.5 seconds.
- "Y" sets minimum time at 1.25 seconds.

Extrusion times that fall below the minimum values are counted as scrapped parts on the Production 1 screen counters.

217 - **PASSWORD?** This is the field where a valid password must be entered in order to have the Bloc 64 accept any changes to set points or configurations. Passwords are described in more detail in paragraph 4.9.

After all configurations have been selected, cycle the AC power to the Bloc 64.

NOTE

None of the changes on these two Configuration screens will be accepted or acted on by the Bloc 64 until AC power to the control has been turned off, then on again. This is done to prevent the possibility of a configuration change being made while the machine is operating. Such an unwanted change has the potential to damage the machine and possibly cause injury.

3.6 DCDT Position Transducer Adjustment

If Servoactuator assemblies are being used as described in paragraph 2.2.3 you can omit this step and go directly to paragraph 3.7 to check tooling cylinder phasing.

If your installation is using separate programming cylinders and DCDT position transducers you will need to complete this step so you can calibrate tooling strokes correctly.

CAUTION

These operations will be performed with the hydraulic pumps ON. Whenever any part of the tooling stroke calibration is performed ALWAYS REMOVE the mandrel and/or bushing to prevent the possibility of damage or possible injury should a failure occur.

Tools and test equipment required to perform this procedure:

Digital voltmeter
1.5 volt D cell (flashlight) battery
Small straight blade screwdriver (1/8 inch)
Wrench to fit fasteners that secure DCDT to mounting bracket

1) Remove the two wires to the servovalve (black and red) from terminals #1 and #2 of the terminal block for the specific head you are calibrating (J1, J2, J3, J4).

2) Connect a digital voltmeter to the DCDT feedback signal at terminals #7 (common) and #8 (positive) of the terminal block that the valve wires were removed from.

3) Turn AC power to the Bloc 64 on. Start the pumps which supply hydraulic power to the programming cylinders.

4) Connect the flashlight battery to the two wires from the servovalve. (Polarity is not important at this point.) The programming cylinder should move to the extreme of its stroke in one direction. Note the voltage reading and polarity on the voltmeter.

5) Reverse the servovalve wires on the battery. The programming cylinder should now move to the other extreme of its stroke. Again note the reading on the voltmeter.

If the DCDT is properly centered in the cylinder stroke the voltage readings should be of equal amplitude with opposite polarity.

Example: 3.57 volts at one extreme, -3.57 volts at the other extreme, $\pm$0.2 volt.

If the equal but opposite reading is not obtained, position the moveable part of your DCDT installation vertically until the centering requirement of equal amplitude with opposite polarity at extremes of stroke can be met.

6) Reconnect the two servovalve wires to terminals #1 and #2 of the terminal block.

7) Repeat steps 1) through 6) for all programming heads.

Once the DCDT adjustment is completed, check the tooling cylinder phasing described in paragraph 3.7.

3.7 *Programming Cylinder Phasing*

Tools and test equipment required to perform this procedure:

Small straight blade screwdriver (1/8 inch)

CAUTION

These operations will be performed with the hydraulic pumps ON. Whenever any part of the tooling stroke calibration is performed ALWAYS REMOVE the mandrel and/or bushing to prevent the possibility of damage or possible injury should a failure occur.

1) Display the proper Parison set up screen for the head you are calibrating. On the screen set the following fields to these values:

   007 - N=0 UP 1 set to **N, sets tooling motion to diverge**
   008 - TST % set to **075.0, opens tooling to 75% stroke**

2) Start the pumps that supply hydraulic power to the programming cylinders.

3) Press and release the **TEST** key on the front of the programmer. The word "TEST" will appear in the upper left hand corner of the display to indicate the TEST mode is active and the programming cylinder should move downward.

4) Press and release the **TEST** key again. The cylinders should return to their previous position.

   If The Cylinder Fails To Move Or Moves Completely To End

   - Turn the pumps off.
   - Reverse the red and black wires from the servovalve on terminals #1 and #2 on the terminal block.
   - Repeat steps 2) through 4).

   If The Cylinder Moves In The Wrong Direction (UP instead of DOWN)

   - Turn the pumps off.
   - Reverse the red and black wires from the servovalve on terminals #1 and #2 on the terminal block.
   - Reverse the white and the green wires from the DCDT on terminals #7 and #8.
   - Repeat steps 2) through 4).

5) Repeat the above procedure for all programming heads.

3.8 Tooling Stroke Calibration

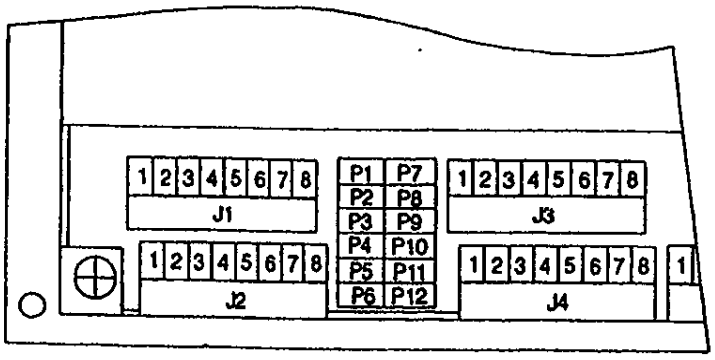
Tools and test equipment required to perform this procedure:

Digital voltmeter
Trimpot adjusting tool or small straight blade screwdriver (1/8 inch)

CAUTION
These operations will be performed with the hydraulic pumps ON. Whenever any part of the tooling stroke calibration is performed, ALWAYS REMOVE the mandrel and/or bushing to prevent the possibility of damage or possible injury should a failure occur.

Calibrations for tooling zero point (OFFSET), tooling maximum stroke (SPAN) and loop gain (GAIN) are accomplished with trimpots located on the lower rear portion of the programmer.

There are a total of 12 trimpots (three for each head) located between connectors J1 and J3. The following drawing shows the location and identification for the potentiometers.



Head #1- J1 connector
P1- SPAN
P2- OFFSET
P3- GAIN

Head #3 - J3 connector
P7- SPAN
P8- OFFSET
P9- GAIN

Head #2- J2 connector
P4- SPAN
P5- OFFSET
P6- GAIN

Head #4 - J4 connector
P10- SPAN
P11- OFFSET
P12- GAIN

1) Connect the voltmeter to the feedback from the DCDT on terminals #7 (common) and #8 (positive) on the terminal block for the head to be calibrated.

2) Turn the GAIN potentiometer 20 turns counterclockwise (CCW), then turn five turns clockwise (CW). This is the preliminary gain setting and will be optimized later.

3) Turn AC power to the Bloc 64 On and start the pumps that supply hydraulic power to the programming cylinders.

4) Display the Parison set up screen for the head the voltmeter is connected to and set the following values:

   007 - N=0 UP 1 set to **N, sets tooling motion to diverge**
   008 - TST % set to **000.0, this will move the cylinder to maximum closed**

5) Press the **TEST** key. "TEST" appears in the upper left corner of the screen and the cylinder will move upward. Rotate the OFFSET potentiometer CCW until the cylinder reaches it's maximum upward stroke and the reading on the voltmeter stops increasing. Note the voltage reading.

6) Rotate the OFFSET potentiometer CW until the voltmeter reading is reduced by 0.10 volts. This is the correct zero point.

7) Press the **TEST** key. This releases the TEST mode and the word "TEST" will disappear from the screen.

8) Press the **OPEN** key. The word "OPEN" will appear in the upper left corner of the screen and the cylinder will move downward. Rotate the SPAN potentiometer CW until the cylinder reaches it's maximum downward stroke and the reading on the voltmeter stops increasing. Note the voltage reading.

9) Rotate the SPAN potentiometer CCW until the voltmeter reading is reduced by 0.10 volts. This is the correct span point.

10) Press the **OPEN** key. This releases the OPEN mode and the word "OPEN" will disappear from the screen.

11) Repeat steps 1) through 10) for all other programming heads.

3.9 Loop Gain

Loop gain determines how fast and accurately the programming cylinder will respond to a command from the programmer.

Loop gains for the individual heads were previously set to some approximate values to provide head movement for stroke calibration. It is now necessary to optimize these gains to provide proper response.

Properly set loop gains will provide good, crisp response without any overshoot, oscillation or instability.

1) Display the Parison set up screen for the head to be calibrated.

2) Set the TST% to 050.0 to move the programming cylinder to 50% of calibrated stroke.

3) Start the pumps that supply hydraulic power to the programming cylinders. Verify a MINIMUM of 1000 psi hydraulic pressure available to the servovalves.

4) Press the **TEST** key several times at approximately five second intervals while observing programming cylinder movement. The programming cylinders should move quickly and literally "snap" into position without any overshoot or oscillation.

   If Cylinder Movement Is Sluggish

   - Turn the proper GAIN potentiometer (P3, P6, P9, P12) clockwise in small Increments of approximately ½ turn or less until the cylinder responds properly.

   If Cylinders Overshoot Or Oscillate

   - Turn the proper GAIN potentiometer (P3, P6, P9, P12) counterclockwise in small increments of approximately ½ turn or less until the cylinder responds properly.

5) Repeat steps 1) through 4) for all programming cylinders.

If it is not possible to achieve satisfactory response from the programming cylinders, check the following:

- Insufficient hydraulic pressure to the servovalves (minimum 1,000 psi).
- Check to see that the high pressure filter to the servovalves is not contaminated.
- Possible defective servovalve.
- Check for a loose DCDT core.
- Misalignment and/or binding of DCDT core and body.
- Low gas charge on machine hydraulic accumulators.

3.10 Linear Position Transducer Calibration (position based applications ONLY)

On position based applications (accumulator, accumulator head, reciprocating screw) it will be necessary to calibrate the linear position transducer to the minimum and maximum points of the push out cylinder stroke.

1) Verify that the linear position transducer is wired properly according to paragraph 2.7.4.

2) Display Configuration 1 screen.

3) Move the push out cylinder to its full forward (empty) position.

4) Move the cursor down to field #215 **0 CALIBRATION**. Change the N to Y. The Bloc 64 will "memorize" this as the empty end of the stroke. When this is completed the Y will automatically return to N.

5) Move the push out cylinder to it's maximum stroke (as far toward the full position as possible).

6) Move the cursor to field #214 **FS CALIBRATION**. Change the N to Y. The Bloc 64 will "memorize" this as the full end of the stroke. When this is completed the Y will automatically return to N.

This completes the calibration of the linear position transducer.

3.11 Active Screen Selection

There are 36 screens in the Bloc 64. Not all of them are used in every application. Several have been left blank for later versions of software if future development is required.

Some screens are automatically suppressed when a machine type is chosen on the Configuration screens. Many unneeded screens however, remain active and can add confusion when operating the control. For that reason, the number and choice of active screens can be configured. Active screen configuration can be modified at a later time if the need is found to do so.

CAUTION

NEVER turn off any of the Soft Key or Configuration screens! It may not be possible to retrieve them if turned off. Should this happen, a memory format and software reload of the Bloc 64 would be required. These functions cannot be performed in the field and will require the return of the programmer to Moog.

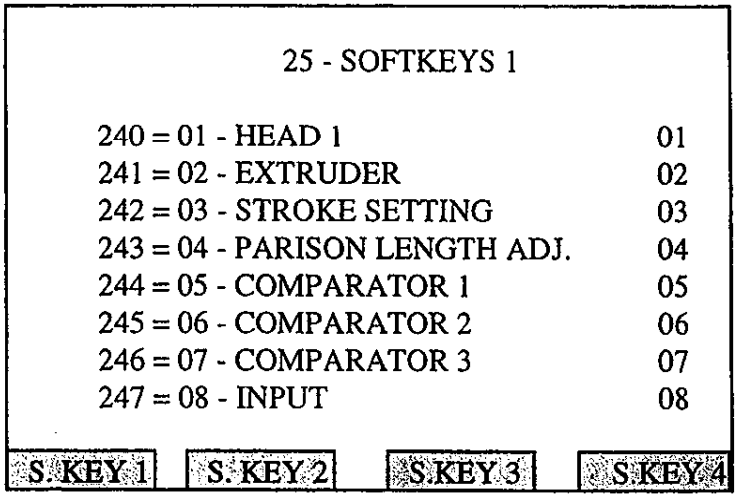
Table 3-1 shows a list of all screens in the Bloc 64 along with their reference numbers. It also shows on which Soft Key screen the selections are found.

Table 3-1. List of Screens and Reference Numbers

Soft Key 1	01 - Head #1	Soft Key 3	19 - Help
	02 - Extruder		20 - Type
	03 - Stroke Setting		21 - Note 1
	04 - Parison Length Adj.		22 - Note 2
	05 - Comparator 1		23 - Note 3
	06 - Comparator 2		24 - Note 4
	07 - Comparator 3	Soft Key 4	25 - Soft Key 1
	08 - Input		26 - Soft Key 2
Soft Key 2	09 - Output 1		27 - Soft Key 3
	10 - Output 2		28 - Soft Key 4
	11 - Auxiliaries 1		29 - Weight Control
	12 - Auxiliaries 2		30 - Setup
	13 - Production 1		31 - Free 1
	14 - Production 2		32 - Free 2
	15 - Production 3	Soft Key 5	33 - Soft Key 5
	16 - Heating		34 - Head 2
Soft Key 3	17 - Configuration 1		35 - Head 3
	18 - Configuration 2		36 - Head 4

There are a total of five Soft Key screens in the Bloc 64 where active screen selection is performed. These Soft Key screens can be accessed the same as any other screen in the programmer. Data is entered in the same way as on the normal programmer screens.

On initial power up of a brand new programmer the screen displayed when Soft Key 1 is selected should be similar to this:



In this particular configuration, the first four choices on Soft Keys 1 are:

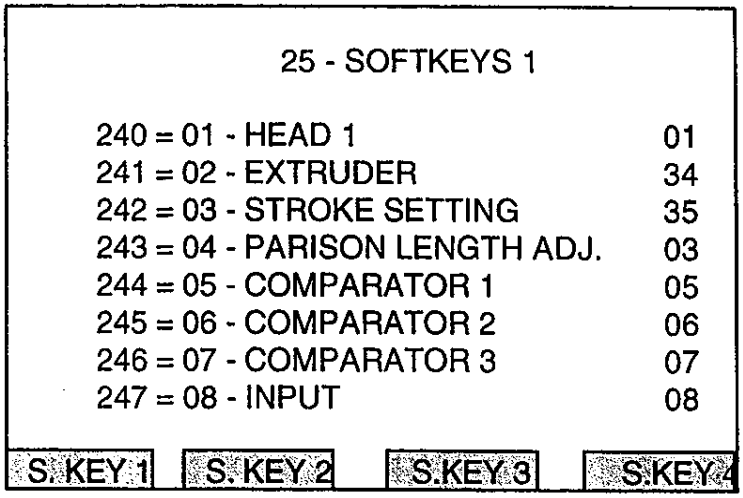
01 - HEAD 1	01
02 - EXTRUDER	02
03 - STROKE SETTING	03
04 - PARISON LENGTH ADJ.	04

And the four choices at the bottom of the Parison set up screen for Head #1 would be

This is because the reference number associated with each of the screens (the 2 digit number immediately preceding the screen title) in the extreme right hand column of the Soft Key 1 screen has these reference numbers in ascending numerical order.

On a three head position based machine, operation of the programmer may be more convenient if the three Parison set up screens and the Stroke Setting screen choices are placed together. Refer to table 3-1 and locate the reference number for Head 2 (reference 34), Head 3 (reference 35), and the reference for Stroke Setting (reference 03).

Returning to the Soft Key 1 screen, change the numbers in the extreme right hand column to look as follows:



The order of choices at the bottom of the Head 1 Parison set up screen would now look like:

The reference number 34 for the Head 2 screen was moved into the second position so it now shows up as the second choice. Reference 35 for the Head 3 is in the third position, so it now shows up as the third choice. Stroke Setting's reference 03 is fourth, so that is where it is displayed. This same method holds true for the remaining screens.

NOTE

Note that the screen titles displayed on the Soft Keys screens DO NOT CHANGE when the reference number on the right side of the screen is changed. In fact, the displayed titles NEVER CHANGE, but the order of choices that scroll across the bottom of the screen change in accordance with the order of the reference numbers in the right hand column.

The screen display sequence begins on Soft Key 1 screen with 01 through 08, 09 through 16 on Soft Key 2 and so forth as indicated in table 3-1.

If the same reference number is used in two different locations, the same screen will appear in two different locations.

Since the Bloc 64 is capable of operating in several different configurations and all functions are not used, it is not necessary to have all 36 screens active. Unwanted or unneeded screens can be turned off simply by entering "00" into the positions after the last active screen.

CAUTION
NEVER turn off any of the Soft Key or Configuration screens!

After all active screen selections have been made, the AC power to the programmer MUST be cycled, the same as after the Configuration selections to have the Bloc 64 accept them.

Section 4

Basic Operation

4. BASIC OPERATION

4.1 Operator Panel

The Operator Panel consists of a 2.625 inch x 5.0 inch florescent back lit LCD display screen. This screen displays all information pertaining to the set up and operation of the Bloc 64.

Directly below the display screen are four **FUNCTION KEYS** with the legends **F1, F2, F3 and F4.** These function keys are used to select the various screens that the Bloc 64 can display. A screen is selected for viewing by pressing the function key which is below the screen choice shown along the bottom of the display.

Directly to the right of the function keys are the **LEFT and RIGHT ARROW KEYS.** These keys have two functions:

- When the cursor is not active and one of these keys is pressed, the available screen selections will scroll across the bottom of the screen in groups of four. When the correct screen choice appears, press the FUNCTION KEY that corresponds to the screen choice.
- When the cursor is active, pressing these keys will move the cursor down to the various data fields on the screen. Data can then be entered in the field the cursor is positioned on.

The **NUMERIC KEYS (0-9)** are used to enter data into the various data fields on the screen.

- Numeric data is entered by using the numeric keys. All spaces in a data field must be filled, using zeros to fill any preceding or following spaces.
- For data fields requiring a N/Y (NO/YES) choice, the number zero (0) will change the field to NO (N). The number one (1) will change the field to YES (Y).

The **ENTER** key is used to activate the cursor and tell the programmer to accept any modified data. Pressing the **ENTER** once will activate the cursor so it can be moved around the display. After data has been entered pressing the **ENTER** key again will instruct the programmer to accept and act on the entered data and de-activate the cursor.

When data is entered into a field, the programmer will check the entered value against a range of valid values for that particular field. If the requested value falls within this range the programmer will prompt "OK?" in the upper right corner of the screen. If the requested value does not fall in the range the programmer will display the error in the upper left corner of the screen and the data field will revert back to the previous setting.

Along the top of the Numeric keypad is a gray faced key bearing the legend **Clr**. This is the CLEAR key and is used remove ALL profile points from the parison set up. The CLEAR key will only function if the cursor is active.

> **CAUTION**
> **The CLEAR function will not remove an incorrect data entry, it will remove ALL the set points from a parison profile and leave a straight line profile at whatever the Weight setting is.**
>
> **Use EXTREME CAUTION when activating the CLEAR function so as not to damage a head or tooling by attempting to drop a parison with too small a Weight setting!**

Also located above the Numeric keypad is a yellow faced key bearing the legend **OPEN.** This key allows the operator to fully open all active profiling heads to the maximum calibrated stroke. This enables the heads to be purged of foreign or burned material without changing any of the normal set up values for parison production.

When the **OPEN** key is momentarily pressed, the word "OPEN" will appear in the upper left hand corner of the screen and a dotted line will appear across the graphical portion of the parison display at the 100.0% level. This is an indication to the operator that the OPEN mode is set and the tooling is completely open.

Momentarily depressing the **OPEN** key again will reset the OPEN mode and restore normal profiling operation.

Next to the **OPEN** key is a second yellow key with the legend **TEST**. The **TEST** key will move the tooling in all active heads to whatever value is set in the TEST field (**TS 1%, 2%, 3%, 4%) .** Each head has it's own TEST value. This allows for the setting of tooling, testing of profile head movement, testing and setting Gains, etc.

When the **TEST** key is momentarily pressed, the word "TEST" will appear in the upper left hand corner of the screen and a dotted line will appear across the graphical portion of the parison display at whatever point is set in the TEST field.

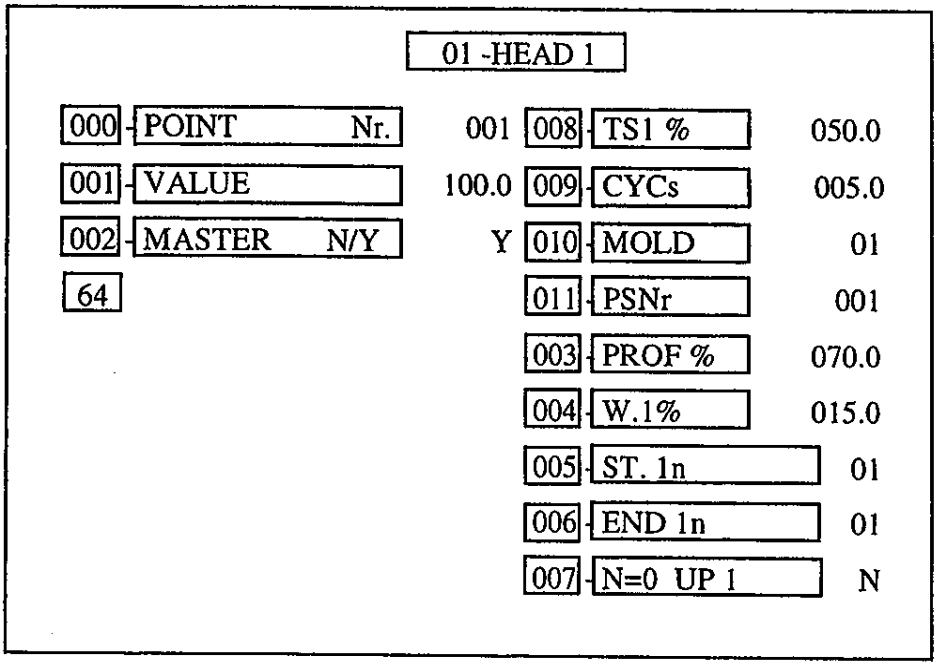
4.2 Parison Set Up Screens

The Bloc 64 is capable of operating up to four independent parison heads and so, has four separate Parison set up screens each having independent profiles, profile settings, weight settings and die movement (converge/diverge) choices.

Since all four screens for Parison set up are identical, only the functions of the Head #1 screen will be described in this document.

4.2.1 Basic Parison Set Up Screen

The following represents the Parison set up screen for Head #1:



Each data field is preceded by a three digit reference number to help in identifying a specific field and function.

The lower left quadrant of the screen is reserved for the graphical representation of the parison profile.

The single column of two digits (showing 64 in the above representation) shows the current row of the profile whose value is being output to the Head #1 servovalve. This value will change as the programmer sweeps through the profile as the parison drops.

000 - POINT Nr Selects the profile point to be entered or modified.

001 - VALUE % Value of the point number displayed in **000**. Also where a numeric value is entered if the point is to become a profile set point or the new value modifies an existing set point.

002 - **MAST. N/Y** Makes a set point a Master set point.
- If a set point is designated a Master set point than all non-set point rows between Master set points will be interpolated to provide smooth movement between the two Master points.
- If the set point is not designated as a Master, the row will accept the entered value, but no other profile rows will change. There will be a distinct "bounce" in the tooling when this row is reached.

003 - **PROF %** Profile range setting. Sets how much of the tooling stroke will be used if a point value is set to 100.0%
- If this value is set to 100.0% and the stroke of the programming cylinder is 0.5 inches, any profile point value set to 100.0% will open the tooling 0.5 inches.
- If this value is set to 050.0% and the stroke of the programming cylinder is the same 0.5 inches, a profile point value of 100.0% will result in the tooling opening only 0.25 inch.

004 - **W.1% (2,3,4)** Weight setting (weight, minimum die gap, thickness, etc.)

005 - **START 1 Nr** Head #2 and #3 start delay. Heads #2 and #3 will not start to profile until the profile on Head #1 has passed this point. This function is used with position based PWDS systems to prevent DFDR deformation until the WDS mandrel has cleared the ring. All non PWDS systems should be set to 01.

006 - **END 1 Nr** Head #2 and #3 profile end point. Heads #2 and #3 profiles will end when the profile on Head #1 reaches this point. This function is used with position based PWDS systems to allow the DFDR to go to it's slack position before the WDS mandrel moves into the refill die gap position.

007 - **N=0 UP 1** Sets the direction of tooling movement.
- Y sets the programmer for CONVERGENT tooling (die closed if down).
- N sets the programmer for DIVERGENT tooling (die closed if up).

008 - **TS 1 % (2,3,4)** Sets how far the tooling will open when the TEST mode is enabled. (**TEST** key on front of programmer is pressed.)

009 - **CYCs** Reference time for profile synchronization in time based applications. This set point has several functions:
- The first parison dropped when the machine is started will be synchronized to this set point.
- If the actual cycle time (measured from START signal to START signal) should exceed this value by a factor of 2 (CYCs x 2) the next parison will be synchronized to this set point.
- Sets the parison synchronization time in the fixed time mode.

010 - MOLD Is the number the Bloc 64 references the set up to.

- The Bloc 64 is capable of storing ten complete set ups in it's memory. These set ups and any changes made to them store automatically and are referenced to the number in this field.
- To recall a set up that has been previously stored, simply change the number in the field to correspond to the "MOLD" number it was stored or created under.

011 - PSNr Sets the profile point where the parison profile will start from (profile shift). If the number set here is not 001, the Bloc 64 will start the parison profile at the profile point specified in this field. When the programmer gets to profile point #64, it will wrap around to point #1 and continue until it reaches this specified point.

> **NOTE**
> There is NO INTERPOLATION between point #64 and point #1. Unless the value of these two points is equal, or very close, there will be a pronounced "bounce" in the tooling as the programmer sweeps through this transition point.

4.2.2 Zoom Mode

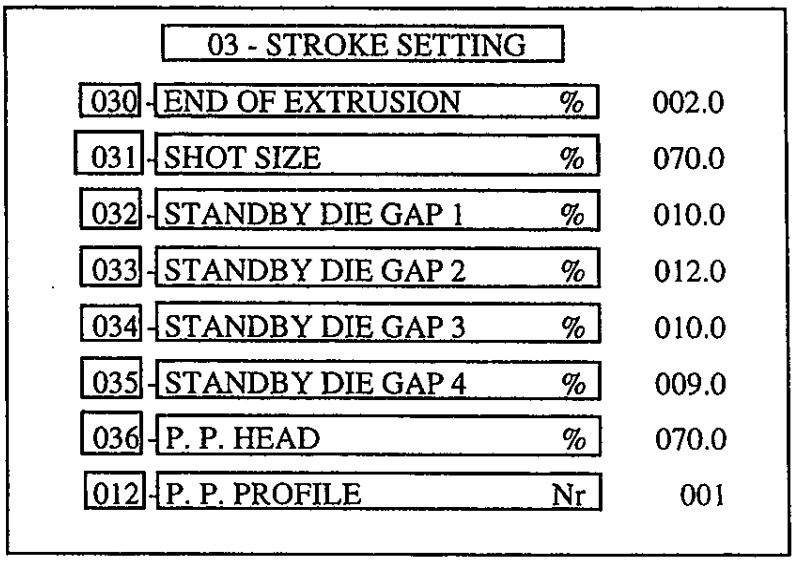
Because the graphical representation of the parison profile on the set up screen had to be made quite small due to space limitations, a Zoom mode has been created to allow expansion of the profile.

By pressing the function key (F1, F2, F3, F4) that corresponds to the head you are working with, the display will change to an expanded parison profile graph. This screen will also display the first eight data fields (000 through 007) without titles. These set points function as described earlier and can be used to modify the set up just as those on the previously described parison set up screen.

The Zoom mode can be turned off by simply pressing the previously mentioned function key a second time to return to the normal set up screen.

4.3 Stroke Setting (Position Based Systems Only)

This screen is available only on systems configured for use on position based systems (accumulator, accumulator head, reciprocating screw). It is automatically suppressed on time based configurations.



030 - END OF EXTRUSION The point where the last profile point ends and where the "End Of Extrusion" output energizes.

031 - SHOT SIZE The point where the first profile point starts and where the "End Of Filling" output energizes.

*** 032-035 - STANDBY DIE GAP 1 (2,3,4)** The position the tooling will go to when the "Refill Die Gap" signal is applied to the programmer. The tooling will remain in this position until the "Start" signal is applied to the programmer.

036 - P. P. HEAD The current position of the push out ram.

012 - P. P. PROFILE The current active profile point.

* Each of the active programming heads has it's own independent Standby (Refill) Die Gap values that can be set as required to control drool or parison cut off.

4.4 Comparators

The Bloc 64 has the ability to provide up to three separate and independent Comparator outputs. These outputs are synchronized to the profile points and each can turn on/off up to four times during a single cycle.

These Comparators function in both time based applications (continuous extrusion) and position based applications (accumulator, accumulator head, reciprocating screw). In position based applications the outputs can be set to energize during the push out (extrusion) portion of the cycle or the refill portion of the cycle as your needs require.

There are three Comparators in the system, each having it's own set up screen. All three comparators function identically and, except for the three digit field reference numbers, all three screens are identical.

4.4.1 Comparator Screen

For the purposes of description this example references Comparator #1 screen.

050 - EN. COMPARATOR this is a general switch that will enable or disable all active comparators. It is duplicated on all three screens and setting any one to OFF (N) or ON (Y) will change the corresponding fields on the other two comparator screens.

051 - ENABLED Will enable (Y) or disable (N) any individual comparator.

052, 054, 056, 058 - ON 1, ON 2, ON 3, ON 4 Sets the profile point where the Comparator output will energize. Each comparator can energize and de-energize up to four times in a single cycle.

053, 055, 057, 059 - OFF 1, OFF 2, OFF 3, OFF 4 Sets the profile point where the Comparator output will de-energize. Each comparator can energize and de-energize up to four times in a single cycle.

060 - ENABLE MARKER Enables a remote parison marker function.

- This feature requires an external device mounted on the machine at the parison head that can move a felt tip marker into position to make a mark on the parison when commanded to and then move away.

061 - **MARKER POINTS Nr** Determines how many marks will be made along the length of the parison.

- If set to 01, the command to mark the parison will be generated at every profile point.
- If set to 02, the parison will be marked at profile point #1 and every second point after that (point #3, #5, #7, etc.)
- If set to 03, the parison will be marked at profile point #1 and every third point after that (point #4, #7, #10, etc.)

062 - **TIPOFF 1** Enables (Y) or disables (N) the Tipoff function associated with Comparator #1.

- When enabled, the tipoff function will occur according to the ON and OFF points that are used to set up the Comparator output.
- When the tipoff function is activated the tooling will move to the position set in the **VALUE %** field.

063 - **VALUE %** This is the position the tooling will move to if the TIPOFF function is enabled.

4.4.2 Setting Comparators During Parison Drop

To set up a comparator to operate along the push out (extrusion) stroke, follow the steps outlined below.

This procedure will set up comparator operation for all applications (position based and time based).

- Go to the proper Comparator screen (1, 2 or 3).

- Starting with "ON 1" and "OFF 1", enter the profile points where you want the comparator output to energize and de-energize. The point for "ON" must be a lower value than the "OFF" point setting.

- If the comparator output must energize more than once per cycle, start with the lowest point in "ON 1" and "OFF 1" and then enter the additional comparator operating points in ascending order working toward "ON 4" and "OFF 4".

NOTE
The comparator output will not energize for any operating points that are not entered in proper ascending order.

- Set the "EN COMPAR." Field to "Y". This is the master to enable all comparators.

- Set the "ENABLE" field to "Y". This enables the individual comparator.

4.4.3 Setting Comparators During Refill (Position Based Applications Only)

If necessary, a comparator can be set to operate during the refill portion of the machine cycle by following these steps.

- Go to the proper Comparator screen (1, 2 or 3).

- Starting with "ON 4" and "OFF 4", enter the profile points where you want the comparator output to energize and de-energize. The point for "ON" must be a higher value than the "OFF" point setting.

- If the comparator output must energize more than once per cycle, start with the highest point in "ON 4" and "OFF 4" and then enter the additional comparator operating points in descending order working toward "ON 1" and "OFF 1".

NOTE
The comparator output will not energize for any operating points that are not entered in proper descending order.

- Set the "EN COMPAR." Field to "Y". This is the master to enable all comparators.

- Set the "ENABLE" field to "Y". This enables the individual comparator.

4.5 Input Screen

This screen shows a complete listing of all the available inputs in the Bloc 64. Fields **110** through **119** give you the function of each input.

To the right of each input function listed is a blank area. Whenever an input goes active, a contrasting square will appear next to the corresponding input to show that the programmer has recognized that input.

NOTE
This screen provides a way to determine if an input signal is being recognized by the programmer. It does not necessarily mean that the appropriate input is not being created by the machine.

There are three additional fields on this screen:

012 - P. P. PROFILE Displays the current active profile point.

036 - P. P. HEAD The current position of the push out ram.

120 - CYCLE TIME Cycle time as measured by the programmer.

4.6 Output Screens

There are two Output screens to accommodate the Bloc 64's 14 total outputs.

Just as with the Inputs described in paragraph 4.5, each function is listed along with a three digit reference number (**130** through **136** on "Output 1", **140** through **146** on Output 2").

Also, just as with the Input screen, there is a blank area to the right of each output function. When an output should go active, a contrasting square will appear next to the corresponding function to show the programmer is signaling that the output should be active.

> **NOTE**
> This screen provides you with a way to determine if an output function is being generated by the programmer. It does not necessarily mean that the appropriate output device has been energized.

4.7 Auxiliary Screen

Auxiliary screens have been added to accommodate additional functions.

4.7.1 Auxiliary Screen 1

This screen provides a way to manipulate stored set ups (MOLD numbers).

010 - SELECTED MOLD Nr Provides the same mold select function as the **010 MOLD** field on the Parison set up screens.

150 - COPY FROM MOLD Nr The MOLD Number to be copied is specified here.

151 - COPY TO MOLD Nr The MOLD Number that information is to be copied into is specified here.

152 - ENABLED N/Y By setting this field to YES (Y) the copy function is executed.

> **NOTE**
> It IS NOT POSSIBLE to copy profiles from one head to another within the same MOLD Number. Only entire files can be copied from one MOLD Number to another.

153 - **DELETED MOLD DATA** The MOLD Number of a set up to be deleted from memory is specified here.

154 - **ENABLED N/Y** By setting this field to YES (Y) the delete function is executed and the MOLD Number specified in **153** is removed from memory.

4.7.2 Auxiliary Screen 2

This screen provides a number of miscellaneous functions.

160 - **DATE - TIME** Displays the current date and time.

161 - **DATE - TIME** Sets the correct date and time.

- The date is set according to the European standard of Date/Month/Year.
- Time is set in European 24 hour format (2:00 PM = 14:00).

167 - **SET TIME N/Y** This field must be set to YES (Y) to have the Bloc 64 accept the date and time change.

> **NOTE**
> The date and time functions are used for the automatic heating schedule only.

168 - **RESET PROD. DATA N/Y** Setting this field to YES (Y) will reset all the parts counters on the Production 1 screen.

169 - **BACKGROUND LCD N/Y** Will change the display of the screens.

- **"N"** will produce a blue on white display
- **"Y"** will produce a white on blue display

159 - **BAUD RATE** Sets the baud rate for the Bloc 64's RS 232 port. Maximum baud rate setting is 38400.

4.8 Production 1 Screen

Production 1 screen allows setting a production limit for the Bloc 64. The number of pieces produced, the number of pieces needed to complete the production run, the number of pieces produced per hour and the total number of rejected pieces (via the "Scrapped Pieces input) can be monitored.

170 - REQUESTED PIECES Nr Allows setting the number of pieces required for the production run up to 9,999,999.

172 - MAX SCRAPPED PIECES Nr Allows setting the total number of allowable scrapped pieces in the production run.

173 - CYCLE TIME Minimum value is 0.5 seconds. Maximum value is 300 seconds. Has no known function.

176 - PRODUCED PIECES Keeps a running count of the number of good pieces.

177 - PIECES TO PROD. The number of good pieces needed to complete the production run specified in **170**.

178 - SCRAPPED PIECES Running count of the number of scrapped pieces produced. Information for this field comes from the "Scrapped Pieces" input.

179 - PIECES/HOUR Calculation of the number of good pieces produced per hour of machine run time.

4.9 Password

The Bloc 64 incorporates a user selected password to provide security for the mold set ups and to reduce the possibility of unauthorized personnel making changes to the operating set up or programmer configuration.

When the password lock is set, it is still possible to change the screen on the display. It is also possible to activate the cursor and move it around the screen. If an attempt is made to modify any data fields on the screen, the Bloc will prompt by displaying **"PASSWORD"** in the upper left corner of the screen when the ENTER key is pressed. No data will be changed on the programmer until the proper password is entered on the Configuration 1 screen in data field #217.

The release on the password lock will remain active for five minutes after the last data entry is made. If no data is entered during that five minute period the password lock will automatically become active again, locking out any attempts to change data.

4.9.1 Setting the Password

- Turn AC power to the Bloc 64 off.
- Depress and hold the #9 key. Turn power to the programmer back on WHILE HOLDING DOWN the #9 key until the MOOG logo screen is replaced by the HEAD #1 parison set up screen.
- Display the Configuration 1 screen.
- Press the **ENTER** key.
- Using the Left or Right Arrow keys move the cursor down to data field #217 PASSWORD?
- Using the numeric keypad assign a password up to 999999.
- Press **ENTER.**
- Turn power to the programmer off, then back on.

> **NOTE**
> You MUST turn power to the programmer off and on for the Bloc 64 to accept this new password setting.
>
> The default password for the Bloc 64 is zero (000000). Whenever the default password is used as the password you CANNOT lock out any of the programmer's data fields. The Bloc 64 will ignore any password entered in password field #217.

4.9.2 Releasing the Password Lock

- Display the Configuration 1 screen.
- Press the ENTER key.
- Using the Left or Right Arrow keys move the cursor down to data field #217 PASSWORD?
- Using the Numeric keypad enter the assigned password.
- Press **ENTER.**

This releases the password lock. To reset the lock simply wait five minutes or repeat the above procedure substituting all zeros for the assigned password in the fourth step. The password lock will also automatically become active if power to the programmer is turned off.

Section 5

Bloc 64 - "A" Version

5. BLOC 64 - "A" VERSION

5.1 General Information

The most common version of Bloc 64 PRG in use in North America is referred to as the "B" version and carries Moog model number L141-104B. This is the programmer we have referred to throughout this manual.

There is another version of the Bloc 64 PRG programmer that is sold by Moog. This is the "A" version and carries Moog model number L141-104A.

These programmers are identical in physical size and appearance. There are however, some significant differences in capabilities between the two that greatly influence which programmer should be used for a particular application. These differences must be carefully evaluated before deciding which programmer is best for the job.

5.2 "A" Version Capabilities

The largest market for the Bloc 64 PRG "A" version is the single head blow molding machine who's major use is short volume production runs. This is not to say that the "A" version cannot be used on a single head machine that is dedicated to a specific product, but the "A's" capacity for additional set up storage makes it more suited for the machine that is subject to frequent mold changes.

By referring to the Section 6, Appendix 1 the main differences between the two systems can be seen.

It must be noted that although both programmers have the capacity to run up to four parison heads, the "A" version's capability to operate heads #2 through #4 is VERY LIMITED. Parison profile, refill die gap setting and profile range are all slaves to the head #1 settings. Although each head does have it's own WEIGHT setting, this limited amount of adjustment often makes it very difficult to correct problems that occur on the other three heads.

In applications where two or more heads are used, the expanded adjustment capabilities of the "B" version would indicate that it would be the better choice of the two.

5.3 "A" Version Installation

Installing the "A" version Bloc 64 PRG is identical to installing the "B" version. Hydraulic requirements, wiring, transducers and signals carry over from one version to the next.

Specific information required for installing the "A" version Bloc 64 can be found in Section 2., INSTALLATION.

5.4 Configuration & Calibration

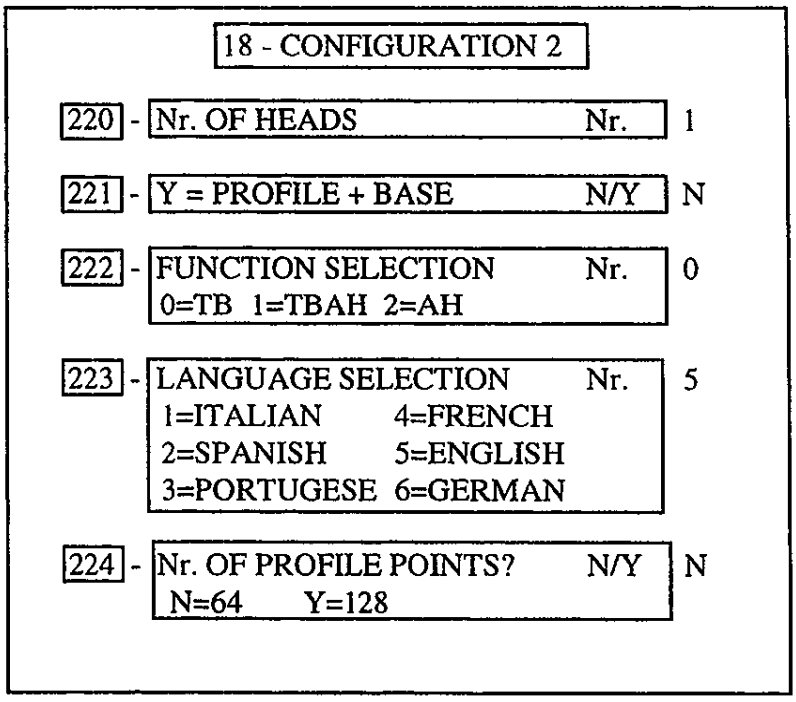
Although the vast majority of the process of configuring the Bloc 64 PRG "A" version is the same as that of the "B" version, there are some minor differences on the Configuration 1 screen. As a result, the entire Configuration will be covered in detail here.

The basic overview and steps for changing screens and entering data are unchanged and can be found described in detail in Section 3., CONFIGURATION & CALIBRATION. Please review paragraphs 3.1 through 3.4.

5.4.1 Configuration

Configuration is the process of matching the Bloc 64 PRG to the specific type of blow molding machine the programmer is installed on and selecting the variables that are application specific.

5.4.2 Configuration Screen 2 (CONF. 2)



220 - <u>Nr. OF HEADS</u> Using the numerical keypad, select the number of active parison heads from 1 to 4. Owing to the limited capabilities of heads 2, 3, and 4 this version programmer is mostly used on single head machines and so will usually be set to "1".

221 - **PROFILE + BASE** Chooses how the graphical portion of the profile is displayed.
- **"N"** will display only the value of the profile points.
- **"Y"** will display total value of the profile points PLUS weight setting.

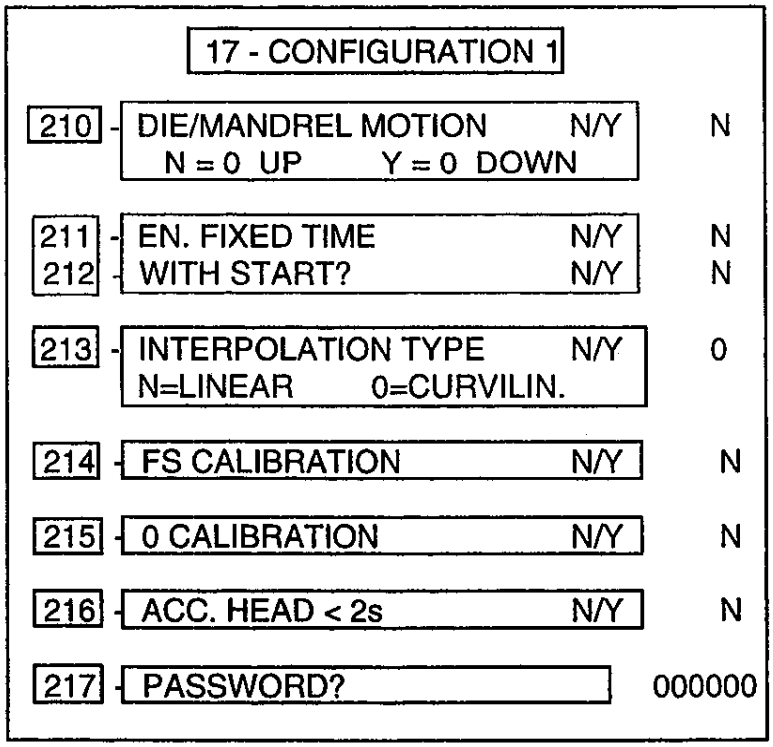
222 - **FUNCTION SELECTION** Chooses the type of blow molding machine the programmer is installed on. Select the corresponding number.
- 0 = **"TB"** Time based continuous extrusion
- 1 = **"TBAH"** Time based accumulator head
- 2 = **"AH"** Accumulator head or reciprocating screw

223 - **LANGUAGE SELECTION** Chooses the language used on the programmer screens. Select the number that corresponds to your choice.

224 - **Nr. OF PROFILE POINTS** Chooses the number of profile points that make up the parison profile.
- **"N"** profile made up of 64 profile points.
- **"Y"** profile made up of 128 profile point.

5.4.2 Configuration Screen 1 (CONF. 1)

Once Configuration 2 has been completed, the same method described in paragraph 3.4 can be used to locate and gain access to the Configuration 1 screen.



210 - **DIE/MANDREL MOTION** This is where the direction for tooling movement will be selected.

- **"Y"**sets the programmer for CONVERGENT tooling (die closed if down).
- **"N"** sets the programmer for DIVERGENT tooling (die closed if up). The single setting here commands tooling motion for all four heads.

211 - **EN. FIXED TIME** For time based applications only. Automatic profile synchronization is disabled and all profiles will be synchronized to the CYC's time setting on the "01-Heads" Parison set up screen if set to **"Y"**.

212 - **WITH START?** For time based applications only. Profile will not sweep until the programmer receives a START signal at J9, terminal #1.

213 - **INTERPOLATION TYPE** Determines if profile interpolation between Master set points is linear (straight line from one Master to the next) or curvilinear (smooth curve from one Master point to the next without sharp points or corners).

- **"N"** Will set linear (straight line) interpolation between Master points.
- **"Y"** Will set curvilinear (smooth curve) interpolation Master points.

214 - **FS CALIBRATION** For position based applications only. Used to calibrate the maximum stroke of the accumulator's linear position transducer. More is explained about this in the calibration section of this document.

215 - **0 CALIBRATION** For position based applications only. Used to calibrate the zero (completely empty) point of the accumulator's linear position transducer. More is explained about this in the calibration section of this document.

216 - **ACC. HEAD < 2s** Sets the minimum acceptable push out (extrusion) time for a parison at 2.5 seconds or 1.25 seconds. This is active in position based applications only.

- **"N"** sets minimum time at 2.5 seconds.
- **"Y"** sets minimum time at 1.25 seconds.

Extrusion times that fall below the minimum values are counted as scrapped parts on the Production 1 screen counters.

217 - **PASSWORD?** This is the field where a valid password must be entered in order to have the Bloc 64 accept any changes to set points or configurations. Passwords are described in more detail in paragraph 4.9.

After all configurations have been selected, cycle the AC power to the Bloc 64.

NOTE

None of the changes on the two Configuration screens will be accepted or acted on by the Bloc 64 until AC power to the control has been turned off, then on again. This is done to prevent the possibility of a configuration change being made while the machine is operating. Such an unwanted change has the potential to damage the machine and possibly cause injury.

5.5 Calibration

After Configuration is completed, calibration can be accomplished. Once again calibration is identical between "A" version and "B" version.

Information concerning Bloc 64 PRG calibration, including DCDT adjustment, programmer cylinder phasing, stroke calibration, loop gains and linear position transducer calibration for position based systems can be found in paragraphs 3.6 through 3.10.

5.6 Active Screen Selection

Because there are some minor differences in the active screen selection process between "A" version and "B" version Bloc 64's, the screen selection process will be reviewed in detail in this section.

5.6.1 Activating/Deactivating Screens

CAUTION

NEVER turn off any of the Soft Key or Configuration screens! It may not be possible to retrieve them if turned off. Should this happen, a memory format and software reload of the Bloc 64 would be required. These functions cannot be performed in the field and will require the return of the programmer to Moog.

There are 32 accessible screens in the Bloc 64. Not all of them are used in every application. Several have been left blank for later versions of software if future development is required.

Some screens are automatically suppressed when a machine type is chosen on the Configuration screens. Many unneeded screens however, remain active and can add confusion when operating the control. For that reason, the number and choice of active screens can be configured. Active screen configuration can be modified at a later time if the need is found to do so.

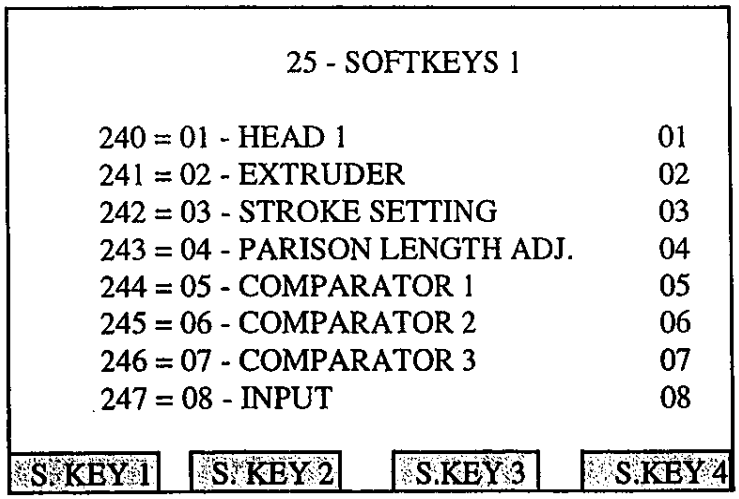
Table 5-1 shows a list of all screens in the Bloc 64 along with their reference numbers. It also shows on which Soft Key screen the selections are found.

Table 5-1. List of Screens and Reference Numbers

Soft Key 1	01 - Head #1	Soft Key 3	17-Configuration 1
	02 - Extruder		18 - Configuration 2
	03 - Stroke Setting		19 - Help
	04 - Parison Length Adj.		20 - Type
	05 - Comparator 1		21 - Note 1
	06 - Comparator 2		22 - Note 2
	07 - Comparator 3		23 - Note 3
	08 - Input		24 - Note 4
Soft Key 2	09 - Output 1	Soft Key 4	25-Soft Key 1
	10 - Output 2		26 - Soft Key 2
	11 - Auxiliaries 1		27 - Soft Key 3
	12 - Auxiliaries 2		28 - Soft Key 4
	13 - Production 1		29 - Weight Control
	14 - Production 2		30 - Setup
	15 - Production 3		31 - Free 1
	16 - Heating		32 - Free 2

There are a total of four Soft Key screens in the Bloc 64 where active screen selection is performed. These Soft Key screens can be accessed the same as any other screen in the programmer. Data is entered in the same way as on the normal programmer screens.

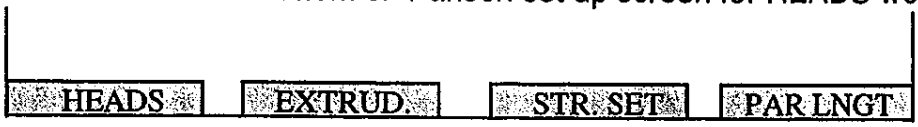
On initial power up of a brand new programmer the screen displayed when Soft Key 1 is selected should be similar to this:



In this particular configuration, the first four choices on Soft Keys 1 are:

01 - HEAD 1	01
02 - EXTRUDER	02
03 - STROKE SETTING	03
04 - PARISON LENGTH ADJ.	04

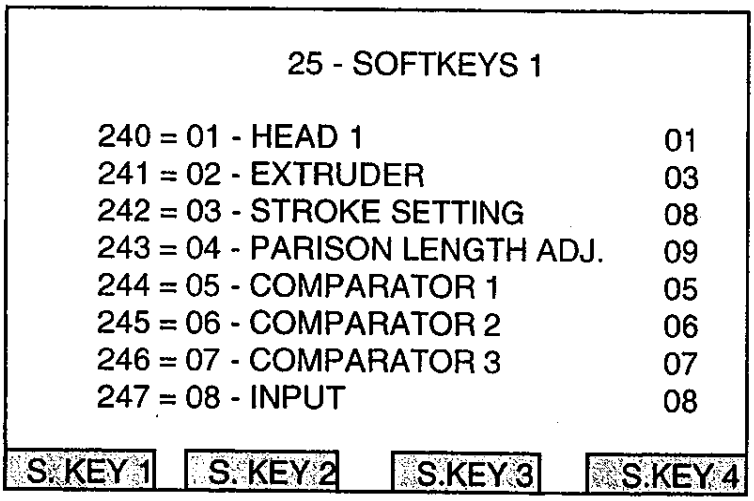
And the four choices at the bottom of Parison set up screen for HEADS would be



This is because the reference number associated with each of the screens (the 2 digit number immediately preceding the screen title) in the extreme right hand column of the Soft Key 1 screen has these reference numbers in ascending numerical order.

On a position based machine, to place the HEADS screen, STROKE SETTING screen, INPUT screen and OUTPUT 1 screen choices together, refer to table 5-1 and locate the reference number for Stroke Setting (reference 03), Input (reference 08) and Output 1 (reference 09).

Returning to the Soft Key 1 screen, you would change the numbers in the extreme right hand column to look like this:



The order of choices at the bottom of the Head 1 Parison set up screen would now look like:

The reference number 03 for the Stroke Setting screen was moved into the second position so it now shows up as the second choice. Reference 08 for the Input screen is in the third position, so it now shows up as the third choice. Output 1's reference 09 is fourth, so that is where it is displayed. This same method holds true for the remaining screens.

NOTE

Note that the screen titles displayed on the Soft Keys screens DO NOT CHANGE when the reference number on the right side of the screen is changed. In fact, the displayed titles NEVER CHANGE, but the order of choices that scroll across the bottom of the screen change in accordance with the order of the reference numbers in the right hand column.

The screen display sequence begins on Soft Key 1 screen with 01 through 08, 09 through 16 on Soft Key 2 and so forth as indicated in table 5-1.

If the same reference number is used in two different locations, the same screen will appear in two different locations and both will function properly.

Since the Bloc 64 is capable of operating in several different configurations and all functions are not used, it is not necessary to have all 32 screens active. Unwanted or unneeded screens can be turned off simply by entering "00" into the positions after the last active screen.

CAUTION

NEVER turn off any of the Soft Key or Configuration screens!

After all active screen selections have been made, the AC power to the programmer MUST be cycled, the same as after the Configuration selections to have the Bloc 64 accept them.

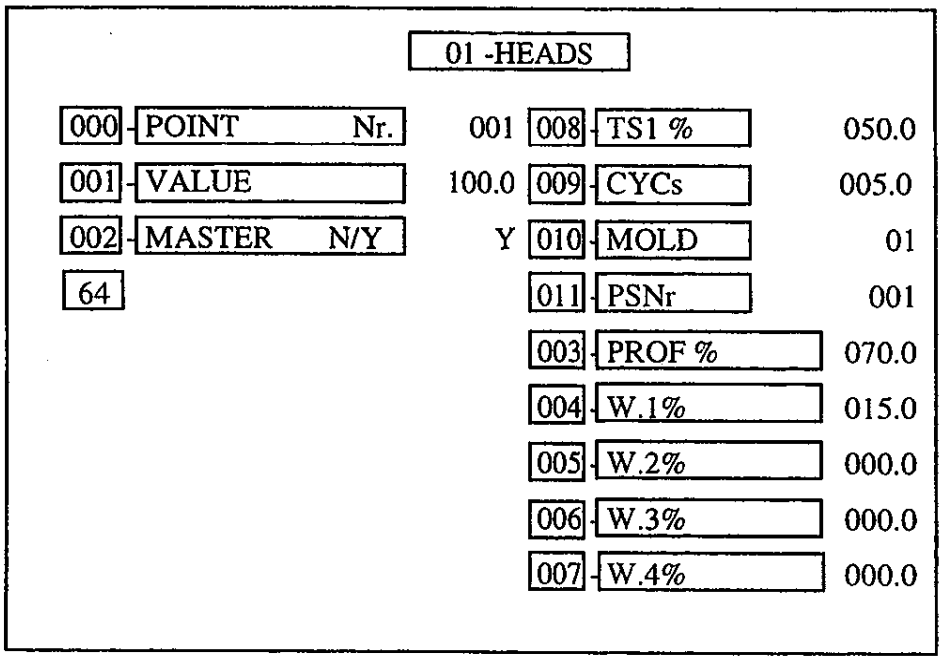
5.7 Basic Operation

Operation of the Bloc 64 "A" version is little different than the "B" version described in Section 4., BASIC OPERATION.

Operator panel layout, keys and key functions are consistent between "A" and "B" so the description for the Operator Panel in paragraph 4.1 on page 4-1 remains unchanged.

Because there are minor differences in the parison setup screen and Stroke Setting screen, these two will be covered in greater detail.

5.7.1 Parison Setup Screen (01-HEADS)



Each data field is preceded by a three digit reference number to help in identifying a specific field and function.

The lower left quadrant of the screen is reserved for the graphical representation of the parison profile.

When configured for time based operation, the single column of two digits (showing 64 in the above representation) shows the current row of the profile whose value is being output to the programming servovalve(s). This value will change as the programmer sweeps through the profile as the parison drops. This function is not active and not displayed when configured for position based applications.

000 - **POINT Nr** Selects the profile point to be entered or modified.

001 - **VALUE %** Value of the point number displayed in **000**. Also where a numeric value is entered if the point is to become a profile set point or the new value to modify an existing set point.

002 - **MAST. N/Y** Makes a set point a Master set point.

- If a set point is designated a Master set point than all non-set point rows between Master set points will be interpolated to provide smooth movement between the two Master points.
- If the set point is not designated as a Master, the row will accept the entered value, but no other profile rows will change. There will be a distinct "bounce" in the tooling when this row is reached.

003 - **PROF %** Profile range setting. Sets how much of the tooling stroke will be used if a point value is set to 100.0%

- If this value is set to 100.0% and the stroke of the programming cylinder is 0.5 inches, any profile point value set to 100.0% will open the tooling 0.5 inches.
- If this value is set to 050.0% and the stroke of the programming cylinder is the same 0.5 inches, a profile point value of 100.0% will result in the tooling opening only 0.25"

004 - **W.1%** Weight setting (weight, minimum die gap, thickness, etc.) for head #1.

005 - **W.2%** Weight setting (weight, minimum die gap, thickness, etc.) for head #2.

006 - **W.3%** Weight setting (weight, minimum die gap, thickness, etc.) for head #3.

007 - **W.4%** Weight setting (weight, minimum die gap, thickness, etc.) for head #4.

008 - **TS 1 % (2,3,4)** Sets how far the tooling will open when the TEST mode is enabled. (**TEST** key on front of programmer is pressed.)

009 - **CYCs** Reference time for profile synchronization in time based applications. This set point has several functions:

- The first parison dropped when the machine is started will be synchronized to this set point.
- If the actual cycle time (measured from START signal to START signal) should exceed this value by a factor of 2 (CYCs x 2) the next parison will be synchronized to this set point.
- Sets the parison synchronization time in the fixed time mode.

010 - **MOLD** Is the number the Bloc 64 references the set up to.

- The Bloc 64 is capable of storing forty complete set ups in it's memory. These set ups and any changes made to them store automatically and are referenced to the number in this field.
- To recall a set up that has been previously stored, simply change the number in the field to correspond to the "MOLD" number it was stored or created under.

011 - **PSNr** Sets the profile point where the parison profile will start from (profile shift). If the number set here is not 001, the Bloc 64 will start the parison profile at the profile point specified in this field. When the programmer gets to profile point #64, it will wrap around to point #1 and continue until it reaches this specified point.

NOTE
There is NO INTERPOLATION between point #64 and point #1. Unless the value of these two points is equal, or very close, there will be a pronounced "bounce" in the tooling as the programmer sweeps through this transition point.

5.7.2 Zoom Mode

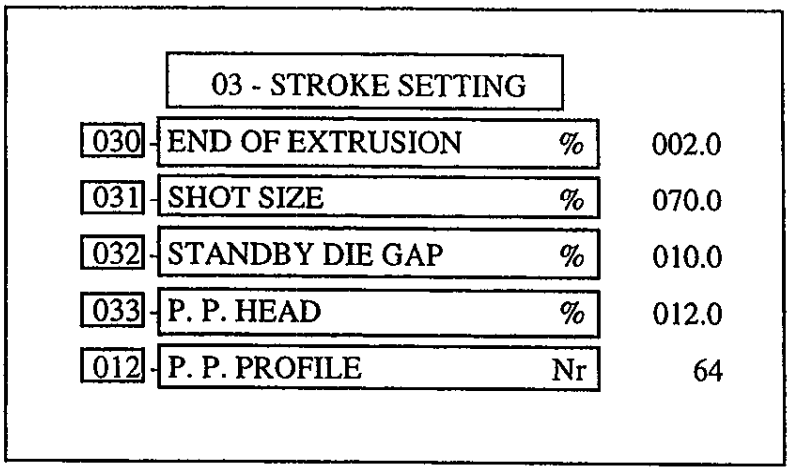
Because the graphical representation of the parison profile on the set up screen had to be made quite small due to space limitations, a Zoom mode has been created to allow expansion of the profile.

By pressing the function key (F1, F2, F3, F4) that corresponds to the 01-HEADS screen, the display will change to an expanded parison profile graph. This screen will also display the first eight data fields (000 through 007) without titles. These set points function as described earlier and can be used to modify the set up just as those on the previously described parison set up screen.

The Zoom mode can be turned off by simply pressing the previously mentioned function key a second time to return to the normal set up screen.

5.7.3 Stroke Setting (Position Based Systems Only)

This screen is available only on systems configured for use in position based applications (accumulator, accumulator head, reciprocating screw). It is automatically suppressed on time based configurations.



030 - END OF EXTRUSION The point where the last profile point ends and where the "End Of Extrusion" output energizes.

031 - SHOT SIZE The point where the first profile point starts and where the "End Of Filling" output energizes.

032 - STANDBY DIE GAP The position the tooling of all heads will go to when the "Refill Die Gap" signal is applied to the programmer. The tooling will remain in this position until the "Start" signal is applied to the programmer.

033 - P. P. HEAD The current position of the push out ram.

012 - P. P. PROFILE The current active profile point.

5.7.4 Comparators

Detailed information on the Comparator function is available in paragraph 4.4, Comparators.

5.7.5 Input Screen

Detailed information concerning the Input screen is available in paragraph 4.5, Input screen.

5.7.6 Output Screens

Detailed information concerning the Output screens is available in paragraph 4.6, Output screens.

5.7.7 Auxiliary Screens

Detailed information concerning the functions on the Auxiliaries 1 and 2 screens can be found in paragraph 4.7, Auxiliary screens.

5.7.8 Production 1 Screen

Detailed information concerning the functions on the Production 1 screen can be found in paragraph 4.8, Production 1 screen.

5.7.9 Password

Detailed information concerning the setting and use of the password function can be found in paragraph 4.9, Password.

Section 6

Appendix 1

6. APPENDIX 1

6.1 General Specifications

The Bloc 64 meets the European Community standards for electrical noise immunity and radiation (CE).

PROGRAMMER POWER

AC ELECTRICAL SUPPLY.....100 to 250 volts, 50 to 60 Hz
MAXIMUM CURRENT DRAW.....50 VA
INTERNAL FUSE .....2 amp, fast blow (F2)

INPUTS

DC VOLTAGE .....24 volts nominal
MAXIMUM INPUT VOLTAGE.....29 volts
DC CURRENT DRAW.....10 milliamperes nominal per input
CURRENT RANGE .....6 to 15 milliamperes
MAXIMUM ALLOWABLE RIPPLE.....10 %

OUTPUTS

DC VOLTAGE .....24 volts nominal
MAXIMUM OUTPUT VOLTAGE.....29 volts
DC CURRENT AVAILABLE.....200 milliamperes typical
MAXIMUM OUTPUT CURRENT .....250 milliamperes
MAXIMUM ALLOWABLE RIPPLE.....10 %
INTERNAL FUSE .....2 amp, fast blow (F1)
All outputs supply +24 VDC. Loads must have a common power return.

TEMPERATURE

MINIMUM OPERATING TEMPERATURE.....32 F (0 C)
MAXIMUM OPERATING TEMPERATURE.....104 F (40 C)

6.1.1 Model 141-104A

MAXIMUM NUMBER OF PARISON HEAD 4
- Common, single parison profile
- Common, single profile range
- Common, single refill die gap (position based configuration)
- Independent weight settings for each head

STORAGE CAPACITY ..... 40 set ups maximum
MAXIMUM NUMBER OF INPUTS ..... 9 pre-assigned functions
MAXIMUM NUMBER OF OUTPUTS ..... 11 pre-assigned functions

6.1.2 Model 141-104B

MAXIMUM NUMBER OF PARISON HEADS 4
- Independent parison profile for each head
- Independent profile range for each head
- Independent refill die gap for each head
- Independent weight setting for each head

STORAGE CAPACITY ..... 10 set ups maximum
MAXIMUM NUMBER OF INPUTS ..... 9 pre-assigned functions
MAXIMUM NUMBER OF OUTPUTS ..... 11 pre-assigned functions