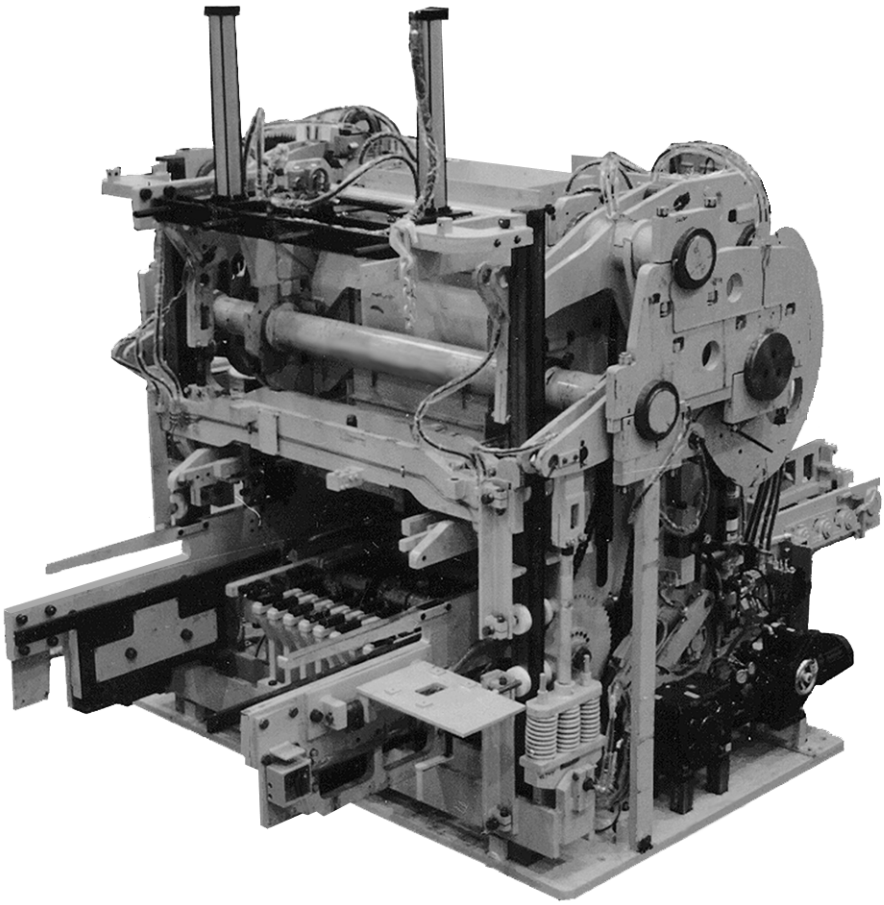
BESSER

ULTRAPAC II

4 AT A TIME



Operation/Maintenance Manual
466361F0502US

February 2005 • US$250

BESSER World Headquarters

801 Johnson St. • Alpena, Michigan, 49707 • U.S.A.
Phone (989) 354-4111

BESSER

COMPANY NAME: .....

SERIAL NUMBER: .....

ASSEMBLY NUMBER: .....

WIRING DIAGRAM NUMBER: .....

INSTALLATION DRAWING NUMBER: .....

ULTRAPAC II
TABLE OF CONTENTS

ULTRAPAC II
TABLE OF CONTENTS

ULTRAPAC II
TABLE OF CONTENTS

ULTRAPAC II
LIST OF TABLES

SECTION 11 MAINTENANCE

ULTRAPAC II
LIST OF ILLUSTRATIONS

SECTION 4 MACHINE SET-UP FOR SPECIFIC MOLD

ULTRAPAC II
LIST OF ILLUSTRATIONS

ULTRAPAC II
LIST OF ILLUSTRATIONS

ULTRAPAC II
LIST OF ILLUSTRATIONS

SAFETY BULLETIN

This notice is issued to advise you that some previously accepted shop practices may not be keeping up with changing Federal and State Safety and Health Standards. Your current shop practices may not emphasize the need for proper precautions to insure safe operation and use of machines, tools, automatic loaders and allied equipment and/or warn against the use of certain solvents or other cleaning substances that are now considered unsafe or prohibited by law. Since many of your shop practices may not reflect current safety practices and procedures, particularly with regard to the safe operation of equipment, it is important that you review your practices to ensure compliance with Federal and State Safety and Health Standards.

IMPORTANT

The operation of any machine or power-operated device can be extremely hazardous unless proper safety precautions are strictly observed. Observe the following safety precautions:


Always be sure proper guarding is in place for all pinch, catch, shear, crush and nip points.


Always make sure that all personnel are clear of the equipment before starting it.


Always be sure the equipment is properly grounded.


Always turn the main electrical panel off and lock it out in accordance with published lockout/tag-out procedures prior to making adjustments, repairs, and maintenance.


Always wear appropriate protective equipment like safety glasses, safety shoes, hearing protection and hard hats.


Always keep chemical and flammable material away from electrical or operating equipment.


Always maintain a safe work area that is free from slipping and tripping hazards.


Always be sure appropriate safety devices are used when providing maintenance and repairs to all equipment.


Never exceed the rated capacity of a machine or tool.


Never modify machinery in any way without prior written approval of the Besser Engineering Department.


Never operate equipment unless proper maintenance has been regularly performed.


Never operate any equipment if unusual or excessive noise or vibration occurs.


Never operate any equipment while any part of the body is in the proximity of potentially hazardous areas.


Never use any toxic flammable substance as a solvent cleaner.


Never allow the operation or repair of equipment by untrained personnel.


Never climb or stand on equipment when it is operational.

It is important that you review Federal and State Safety and Health Standards on a continual basis. All shop supervisors, maintenance personnel, machine operators, tool operators, and any other person involved in the setup, operation, maintenance, repair or adjustment of Besser-built equipment should read and understand this bulletin and Federal and State Safety and Health Standards on which this bulletin is based.

SAFETY SIGNS

Sign	Description	Required
1	All Panels	1
2	Mixer	4
3	Concrete Products Machine	1
	Depalleter	2
4	Mixer	2
5	Skiploader	4
6	Skiploader/Mixer Platforms	8
7	Skiploader/Mixer Platforms	8
8	Vertical: Pallet Transport System	2
	Horizontal: LSC-40A/LSC-100	6
	Pallet Transport System	4
9	Besser-Matic	4
10	Besser-Matic	4
11	Skiploader	4
12	All Panels	1
13	Overhead Block Transfer	4
14	Block Pusher	2
	Pallet Transfer System	4
15	Concrete Products Machine	2
16	Conveyors	12
17	Cuber	8
18	Cuber	3
	Block Turnovers	2
	Slat Conveyors	2

To order safety decals, contact your local Besser representative or the Besser Central Order Department.

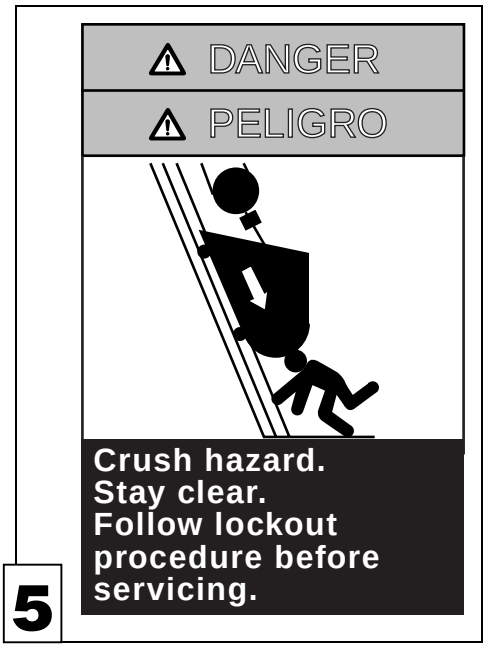
Thank you!

Large: 113236F0409
High Voltage
Width 4 1/2 inch
Height 9 5/8 inch
Small: 113236F0204
High Voltage
Width 2 inch
Height 4 1/8 inch

113237F0410
Mixer Blade Hazard
Width 4 1/2 inch
Height 10 1/4 inch

Vertical: 113240F0307
Crush Hazard
Width 3 1/2 inch
Height 7 1/2 inch
Horizontal: 113239F0604
Crush Hazard
Width 6 5/8 inch
Height 4 inch

114692F100*6*
Nip Points
Width 5 3/4 inch
Height 9 1/2 inch



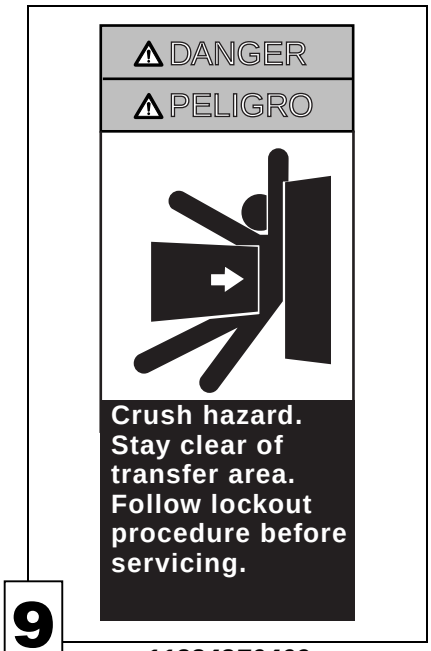
114688F0906
Crush Hazard
Width 6 1/4 inch
Height 9 1/2 inch

114689F0804
Fall Hazard
Width 4 1/2 inch
Height 7 3/4 inch

114690F0805
Falling Objects
Width 4 3/4 inch
Height 8 inch

Vertical: 113244F0410
Crush Hazard
Width 4 1/2 inch
Height 10 inch

Horizontal: 113245F1005
Crush Hazard
Width 10 inch
Height 5 3/4 inch



113242F0409
Crush Hazard
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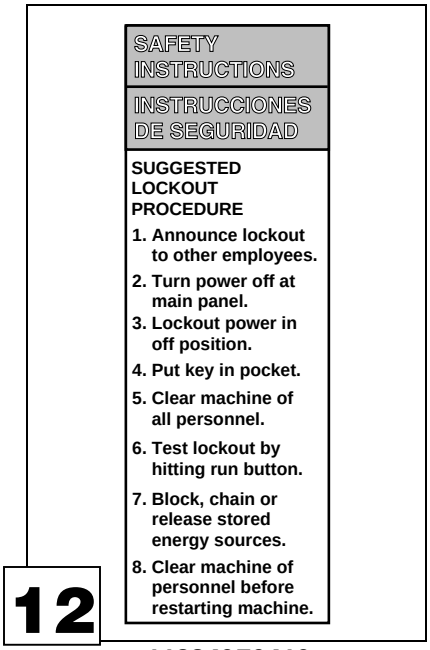
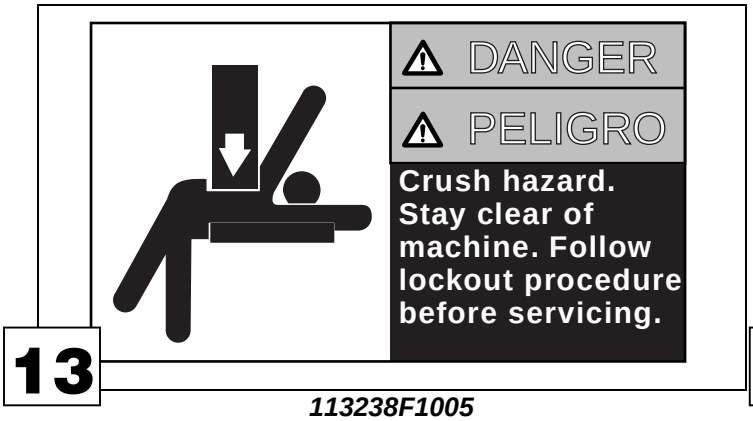
Height 9 5/8 inch

113243F0410
Falling Objects
Width 4 1/2 inch
Height 10 inch

114691F1006
Shear and Fall Hazards
Width 5 3/4 inch
Height 9 3/4 inch



113249F0410
Safety Instructions Decal –
Suggested Lockout Procedure
Width 4 inch
Height 10 inch



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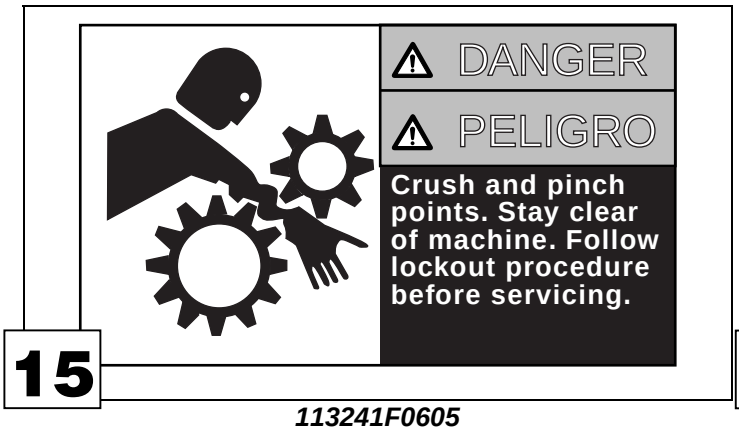
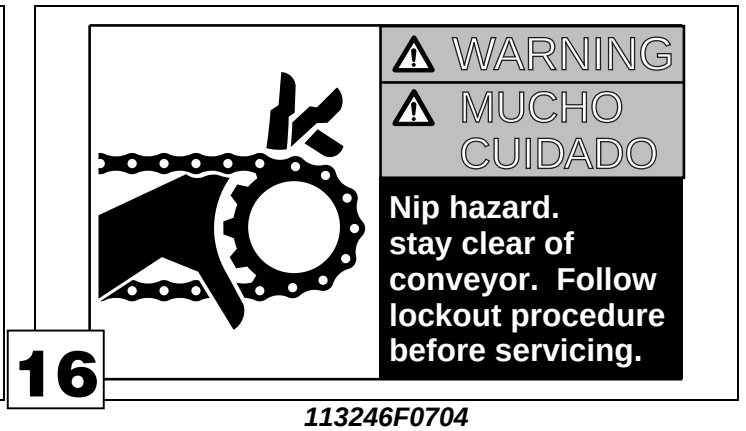
Crush Hazard
Width 10 inch
Height 5 3/4 inch

113248F1006
Crush Hazard
Width 10 inch
Height 6 inch



113241F0605
Crush and Pinch Points
Width 6 5/8 inch
Height 4 inch



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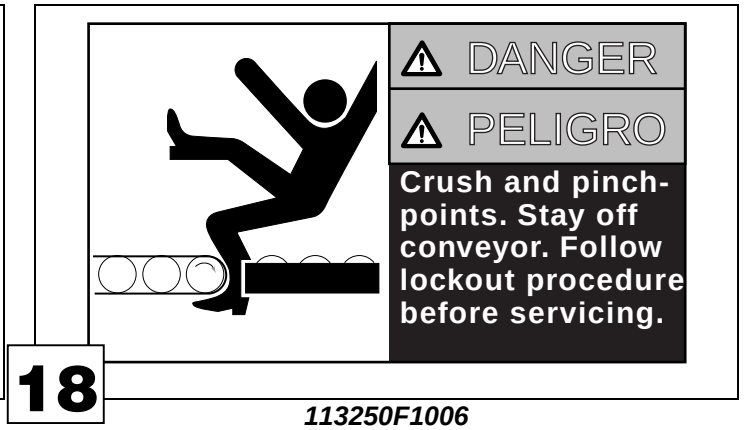
Nip Hazard
Width 7 inch
Height 4 1/2 inch

113247F1006
Crush Hazard
Width 10 inch
Height 6 inch



113250F1006
Crush and Pinch Hazard
Width 10 inch
Height 6 inch

ULTRAPAC II SPECIFICATIONS

TOTAL WEIGHT: 54,000 Lbs [24494 Kg]

AIR LINE FITTING DIMENSIONS: 3/4" [19mm] I.D.

MINIMUM AIR PRESSURE: 80 psi [5.5 bars]

NOISE RATING: 102 to 114 DBA

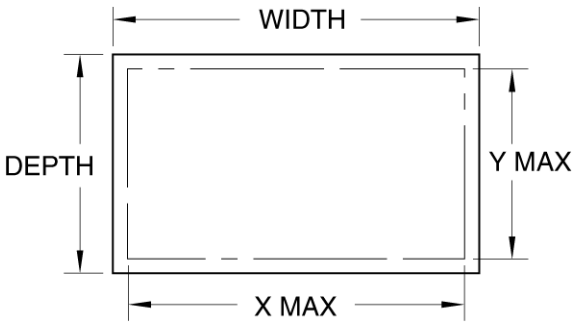
MACHINE SPEED: up to 9 cycles / minute

PRODUCTION CAPACITY: up to 2160 blocks / hour

MINIMUM PRODUCT SIZE REQUIREMENT: 2" high [51mm]

MAXIMUM PRODUCT SIZE REQUIREMENT: 12" high [304.8mm]

PALLET REQUIREMENTS:



WIDTH & DEPTH = Actual size of steel pallet.
XMAX & YMAX = Maximum production area of steel pallet.

WIDTH	DEPTH	THICK.	X	Y	PALLET NO.
38.5” [978mm]	18.5” [470mm]	.375” [9.5mm]	37.5” [953mm]	17.625” [448mm]	453876
38.5” [978mm]	20.5” [521mm]	.375” [9.5mm]	37.5” [953mm]	19.500” [495mm]	463455
38.5” [978mm]	26.0” [9.5mm]	.375” [9.5mm]	37.5” [953mm]	25.000” [635mm]	446635
THICKNESS TOLERANCE: -0.010” [0.25mm] / +0.030” [0.76mm]					

Table A *PALLET REQUIREMENTS*

ULTRAPAC II ELECTRICAL DATA

Plant Power Supply (Volts)	Total Horsepower (HP)	Total Kilowatts (Kw)	Control Panel Transformer (Volt-Amps)	Branch Circuit Distribution Switch (Amps)	Branch Circuit Fuse FRS-R (Amps)	Branch Circuit Feeder THHN	Branch Circuit Feeder Conduit	Short Circuit Interrupting Capacity (AIC)
220V-240V 50 Hz	66.625	49.8	2000	400	250	2.50 AWG 250MM^2	2.0 IN. 51MM	200,000
220V-240V 60 Hz	64.125	47.9	2000	400	250	2.50 AWG 250MM^2	2.0 IN. 51MM	200,000
380V 50 Hz	66.625	49.8	2000	200	175	2./0 AWG 67MM^2	1.5 IN. 38MM	200,000
415V 50 Hz	66.625	49.8	2000	200	175	2./0 AWG 67MM^2	1.5 IN. 38MM	200,000
440V-480V 50 Hz	66.625	49.8	2000	200	125	1 AWG 42.4MM^2	1.25 IN. 32MM	200,000
440V-480V 60 Hz	64.125	47.9	2000	200	125	1 AWG 42.4MM^2	1.25 IN. 32MM	200,000
575V 60 Hz	64.125	47.9	2000	100	100	3 AWG 26.7MM^2	1.0 IN. 25MM	200,000

Table B *ULTRAPAC II ELECTRICAL DATA*

Please consult the table above to find the appropriate electrical data for your ULTRAPAC II. First, find your corresponding plant power supply in the first left column. You will then find the corresponding electrical data on the same row than your power plant supply.

EX: Your power plant supply is 460V at 60 Hz. According to the table, you will then get these values:

PLANT POWER SUPPLY: 460 Volts - 60 Hertz

TOTAL HORSEPOWER: 64.125

TOTAL KILOWATTS: 47.9

CONTROL PANEL TRANSFORMER: 2000 volt-amps

BRANCH CIRCUIT DISTRIBUTION SWITCH: 200 amp

BRANCH CIRCUIT FUSE RECOMMENDED (FRS-R): 125 amp

BRANCH CIRCUIT FEEDER RECOMMENDED (THHN): 1 AWG (42.4mm2)

BRANCH CIRCUIT FEEDER CONDUIT RECOMMENDED: 1.25 in.(32mm)

SHORT CIRCUIT INTERRUPTING CAPACITY: 200,000 AIC

ULTRAPAC II ELECTRICAL COMPONENTS

DEVICE	HORSEPOWER	KILOWATTS
MAIN DRIVE	25	18.7
VIBRATOR-RIGHT	10	7.5
VIBRATOR-LEFT	10	7.5
AGITATOR	5	3.7
BLOCK MOVING BARS	5	3.7
BLOCK MOVING SPEED	0.125	0.1
HEAD VIBRATOR (RIGHT SIDE)	2.0	1.5
HEAD VIBRATOR (LEFT SIDE)	2.0	1.5
CLAM SHELL POWER UNIT	5.0 [7.5]	3.7 [5.6]
TOTAL:	**64.125 [66.625]**	**47.9 [49.8]**

NOTE: Numbers in parenthesis refer to a power plant supply of 50 Hz instead of 60 Hz.

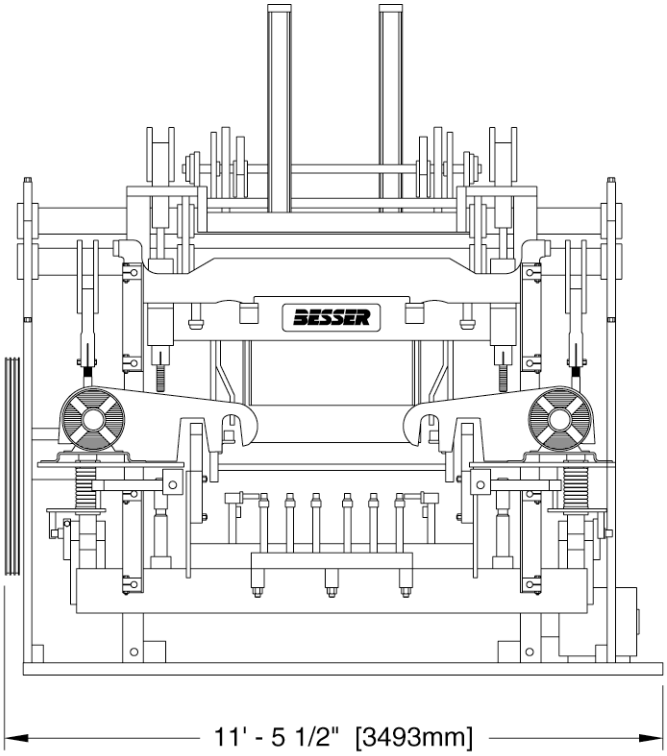
Table C *ELECTRICAL COMPONENTS*

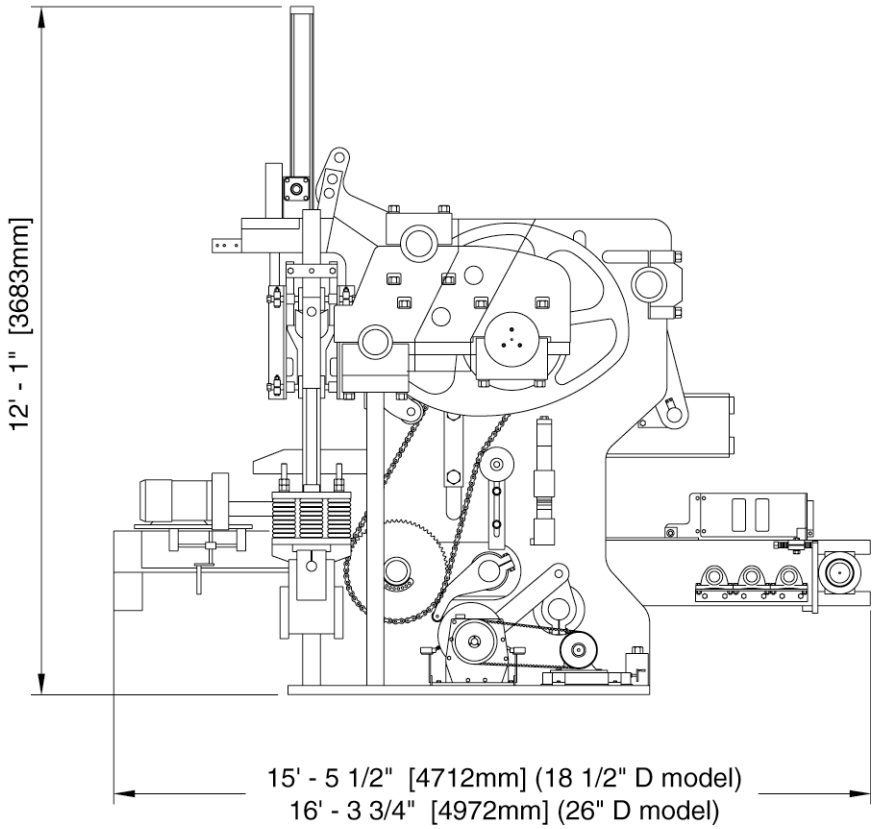
SUMMARY OF ACOUSTICS

Files #	+	MEM #	Frq.	Condition	Distance	Overall		<550Hz		>550Hz	
						C	A	C	A	C	A
1.	+	1/21	5 kHz	Start of cycle	0.5m	112	111	109	100	110	110
2.	+	2/22	5 kHz	End of cycle	0.5m	116	114	112	105	113	114
3.	+	3/23	5 kHz	Start of cycle	0.5m						
4.	+	4/24	1 kHz	End of cycle	0.5m						
5.	+	5/25	5 kHz	Start of cycle	1.0m	111	108	108	98	107	107
6.	+	6/26	5 kHz	End of cycle	1.0m	114	111	112	103	110	110
7.	+	7/27	1 kHz	Start of cycle	1.0m						
8.	+	8/28	1 kHz	End of cycle	1.0m						
9.	+	9/29	5 kHz	Start of cycle	2.0m	110	106	108	96	105	105
10.	+	10/30	5 kHz	End of cycle	2.0m	110	109	109	99	108	108
11.	+	11/31	1 kHz	Start of cycle	2.0m						
12.	+	12/32	1 kHz	End of cycle	2.0m						
13.	+	13/33	5 kHz	Start of cycle/ no pallet	0.5m	113	112	108	103	112	112
14.	+	14/34	5 kHz	End of cycle/ no pallet	0.5m	110	108	107	102	106	106
15.	+	15/35	1 kHz	Start of cycle/ no pallet	0.5m						
16.	+	16/36	1 kHz	End of cycle/ no pallet	0.5m						

Table A *SUMMARY OF ACOUSTIC*

OVERALL DIMENSIONS:





SECTION 1
LOCKING OUT THE MACHINE

	**CAUTION:** For safety reasons, it is IMPORTANT for all personnel to read and understand the following Lock-out procedure.

Whenever you have to make adjustments, service the machine, do any kind of checkup or stop production of units, you must lock out the machine. Locking out insures that the machine will not start-up accidentally, thus preventing possible grave injuries. It is a question of safety for all personnel.

When you have to lock out the machine, please follow this procedure:

1. Announce lockout to other employees.
2. Turn power OFF at main panel.
3. Lockout power in OFF position.
4. Put key in pocket.
5. Clear machine of all personnel.
6. Test lockout by hitting run button.
7. Block, chain or release stored energy sources.
8. Clear machine of personnel before restarting machine.

NOTE: You will also find this procedure on a decal affixed on the machine.

SECTION 2
INTRODUCTION

2.1 HOW A CONCRETE PRODUCT MACHINE WORKS

The ULTRAPAC II is a four-at-a-time concrete product machine rated at up to 2,160 units per hour. A concrete masonry unit is made when concrete is fed into a mold and is then vibrated and compacted. Once it has been compacted, it is stripped out of the mold and delivered onto a conveyor. Many types of molds can be fitted on the machine to obtain a wide variety of products.

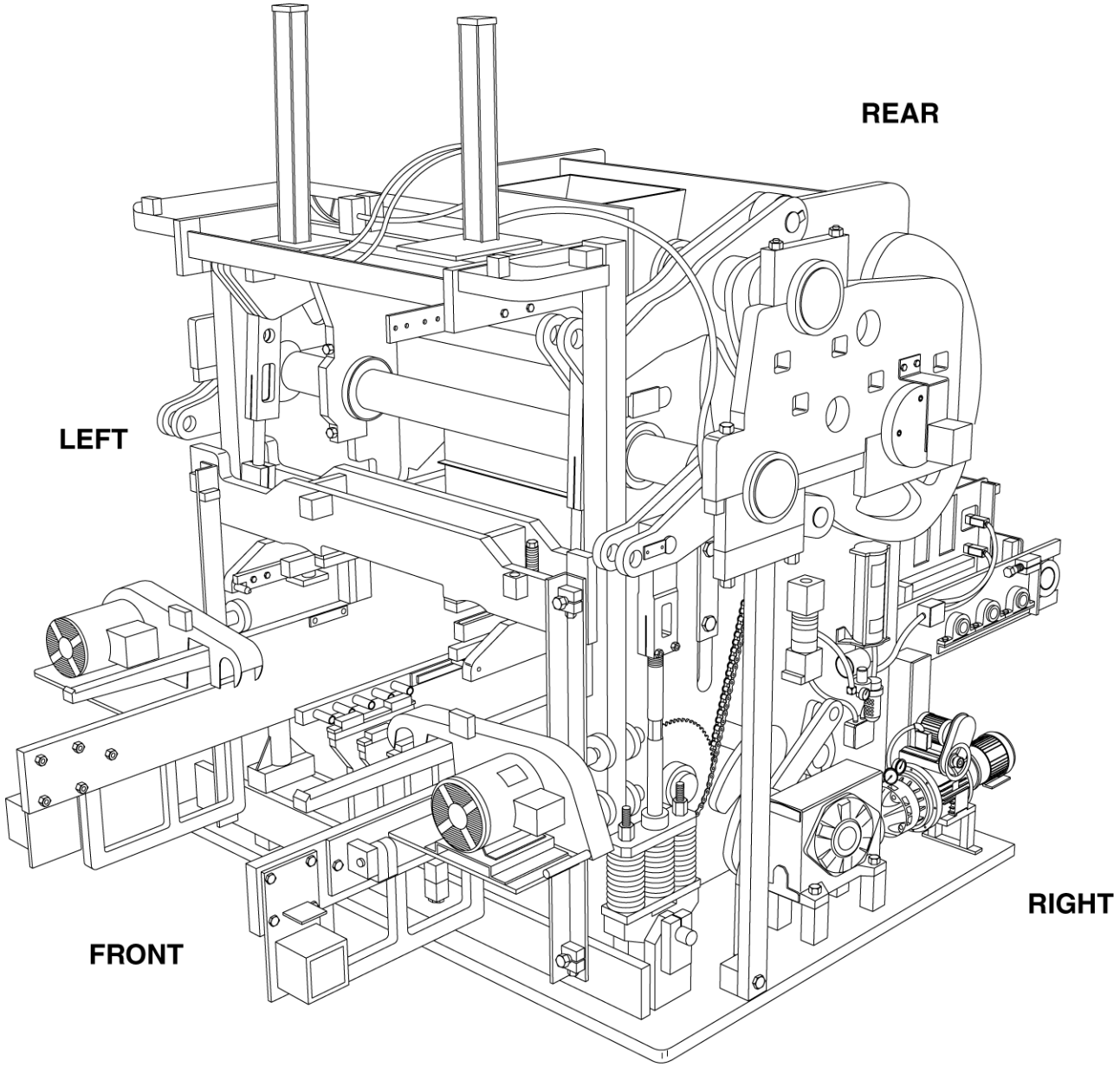
Refer to section 2 “MACHINE DESCRIPTION" to learn about the names and locations of the machine’s components.

Most all of the machine’s movements are controlled by cams located on a main shaft. Some components, such as the Clam gate and the optional Head clamp and Mold insertion device are powered and controlled by hydraulics. As the cams turn with the main shaft, they activate rollers which are connected to link rods which in turn are connected to the components. These components either go forward and back or up and down. One cam brings a component forward (or up) and another brings it back (or down). The main shaft is powered by a motor and a clutch. The motor runs all the time. It is the clutch and brake that will stop and start all machine movements. One of the operation not activated by the main cam is the block delivery arm which feeds empty pallets to the mold and pallet with blocks to the exit conveyor. This component is powered by a motor and is independent because it sometimes has to keep running while the rest of the machine is stopped.

The pallet has to be lifted at one point in the process; a cam does that. A stripper head frame is also connected to two different cams to move it up and down. A stripper head, which is part of the mold, has to be installed on the stripper head frame. This stripper head will press on top of the units to compact them. A pallet receiver frame is located below the stripper head. This component holds the pallet and the mold in place during the concrete unit forming process (stripper head is pressing and the mold is vibrating). The pallet receiver is connected by links to a cam on the main shaft to move up and moves down through gravity. The last two cams will bring a feed box forward and back. This feed box pushes the material (concrete) to the mold. Concrete will fall into the feedbox through a hopper located on top of the machine. An agitator grid placed in the feedbox will agitate the material as it falls in the mold for better distribution of the concrete. The Agitator is powered by a motor located on the feedbox.

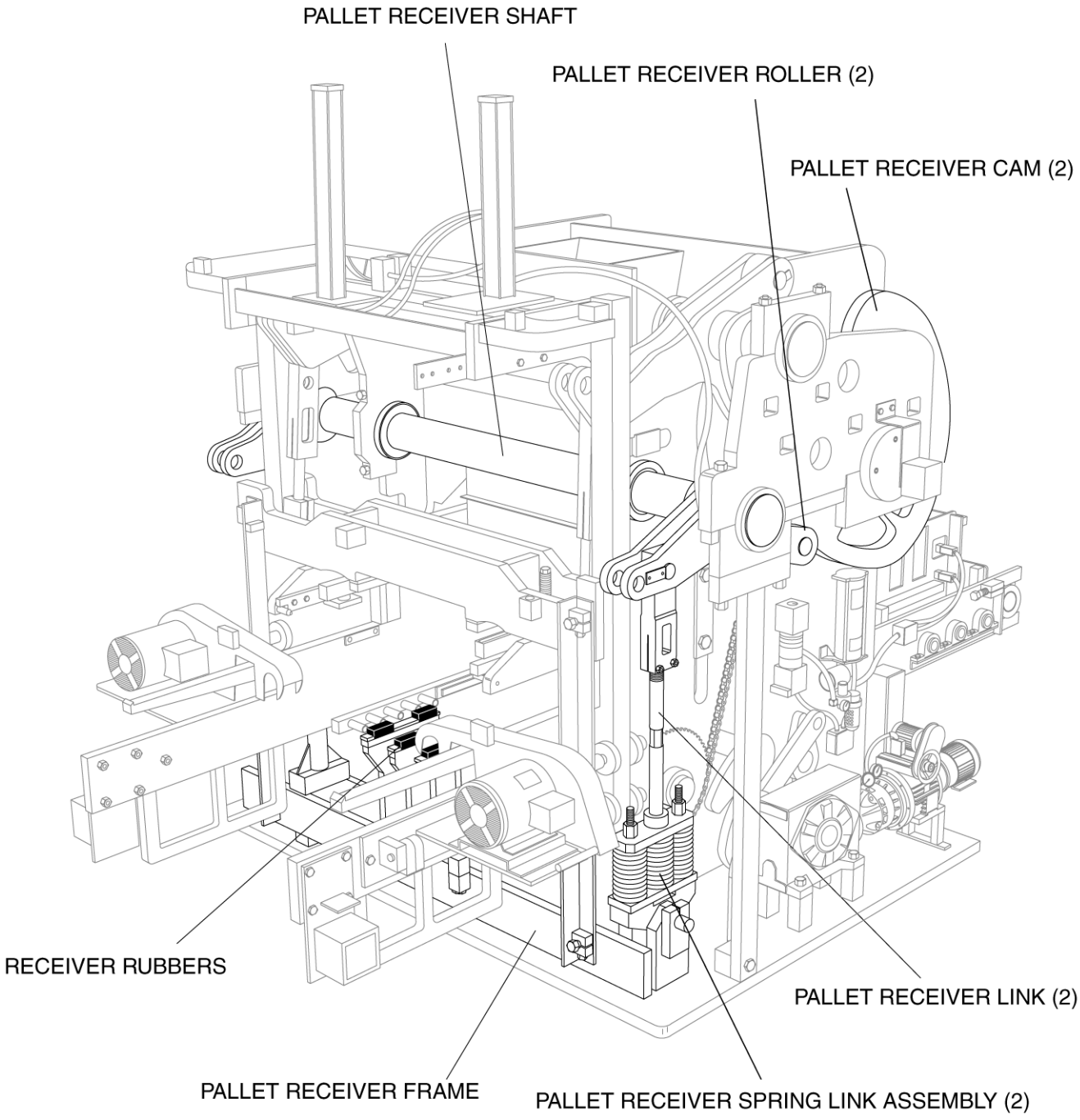
Finally, one motors on each side of the machine vibrate the mold. The vibration occurs when the concrete is fed in by the feedbox and when the units are being compressed by the stripper head. Vibration only lasts a few seconds but it is crucial to making concrete units.

OPERATOR ORIENTATION:
The directions left, right, front and rear, as mentioned throughout this manual are as seen when operator is facing the machine as shown below.

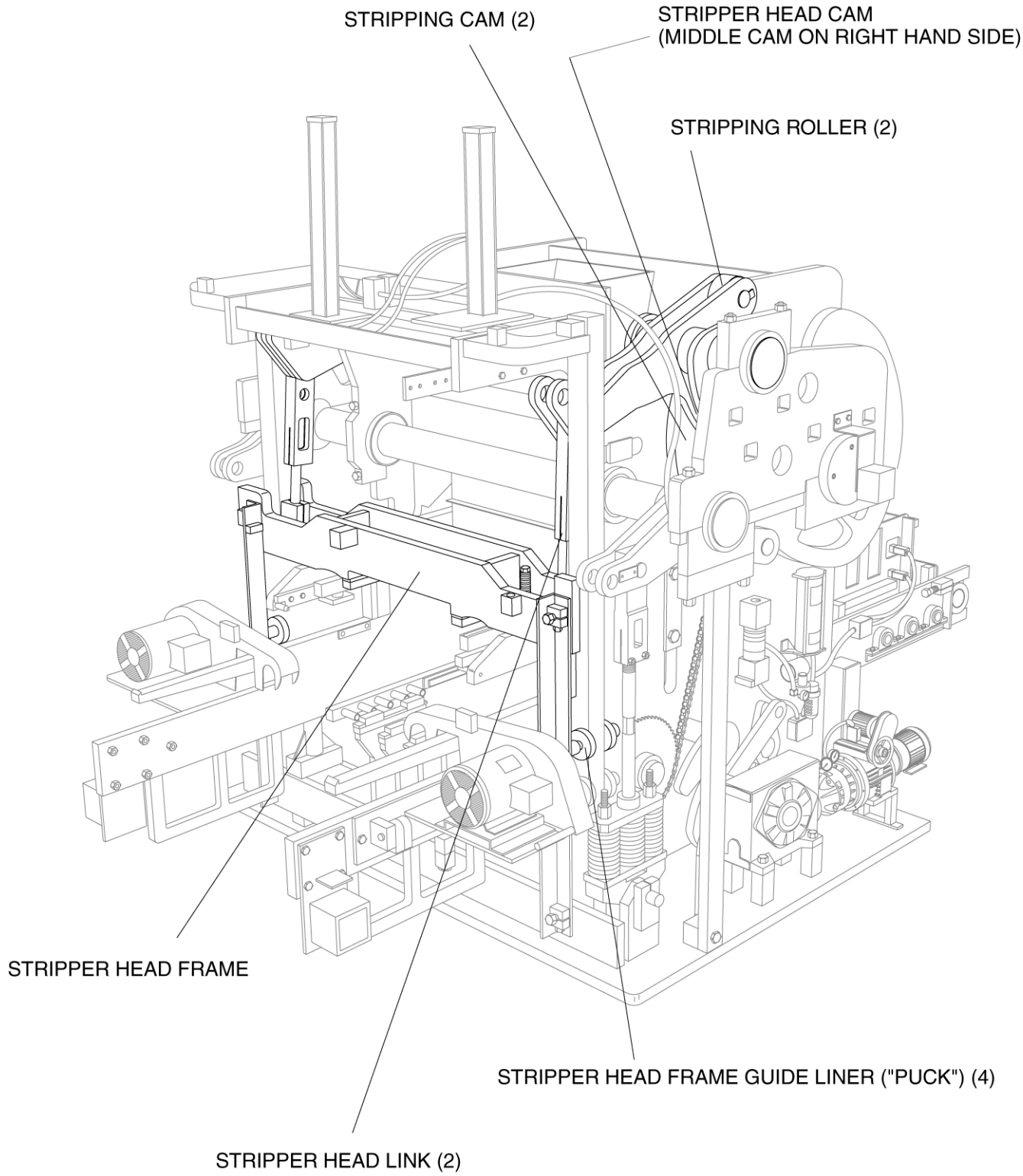


SECTION 3
MACHINE DESCRIPTION

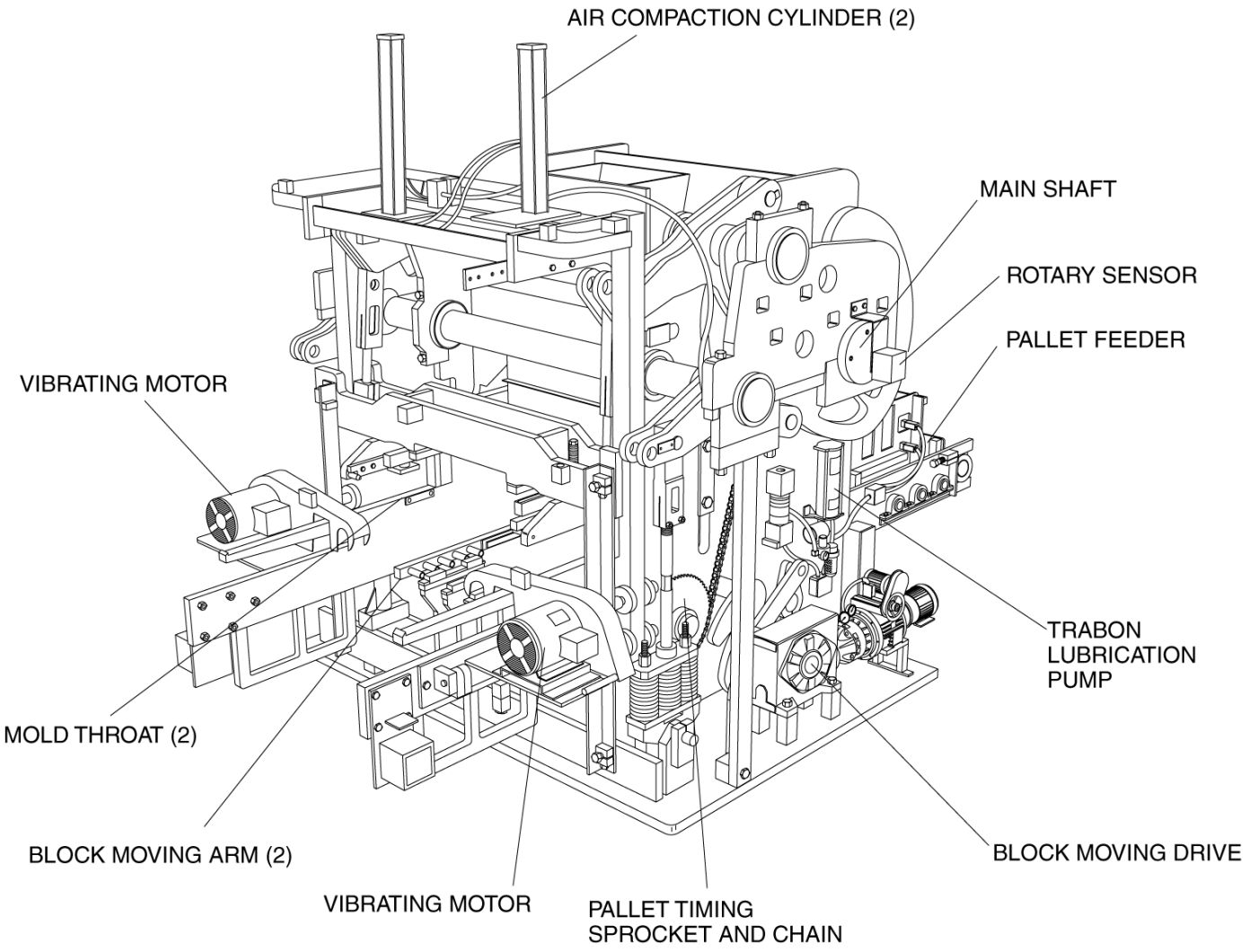
3.1 PALLET RECEIVER ASSEMBLY



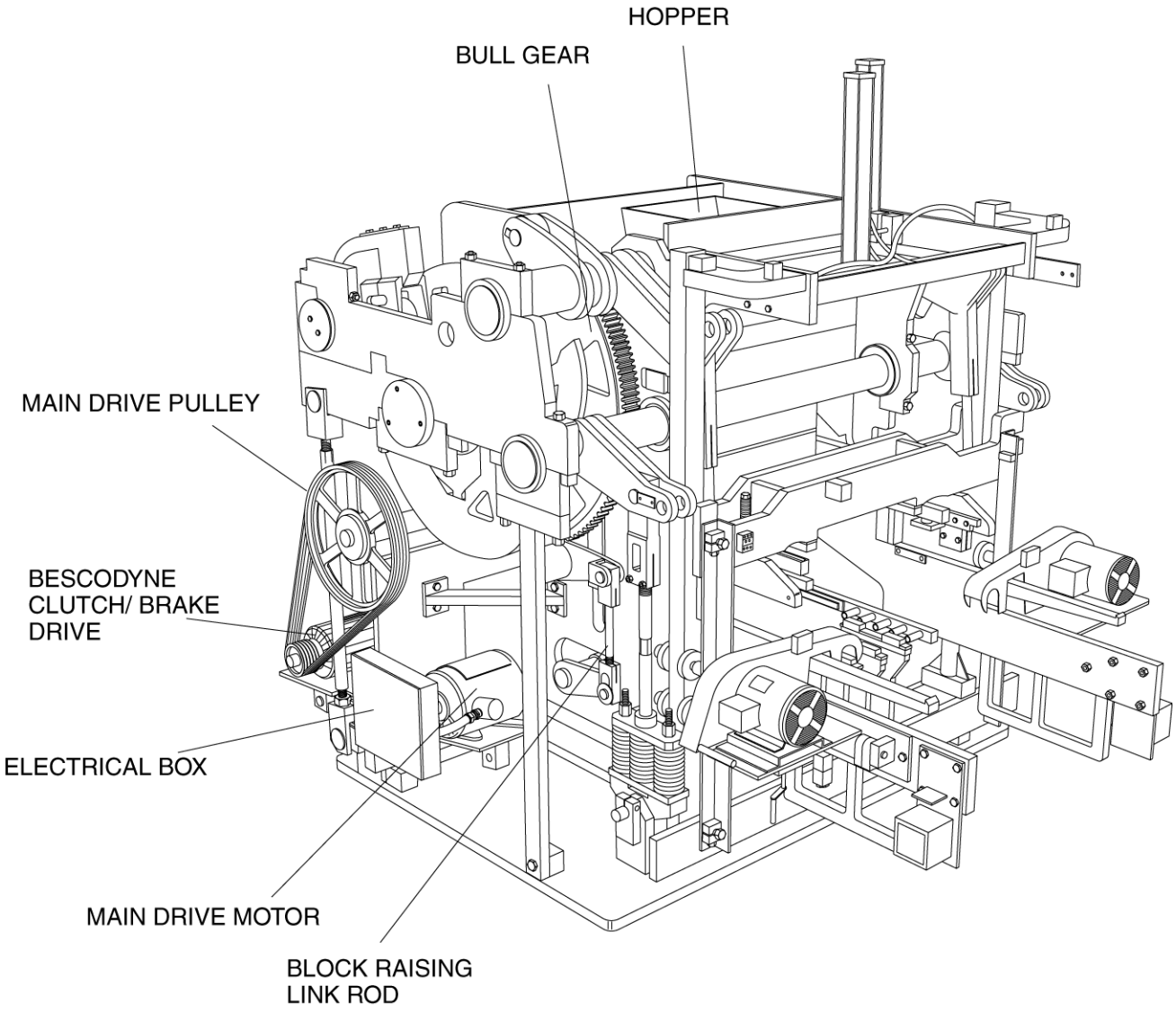
3.2 STRIPPER HEAD FRAME ASSEMBLY



3.3 GENERAL COMPONENTS



3.4 GENERAL COMPONENTS



SECTION 4
MACHINE SET UP FOR SPECIFIC MOLD

4.1 3 5/8" HIGH UNITS IN A 3 7/8" HIGH NON-RAMPED MOLD WITH A 14 3/16" HIGH STRIPPER HEAD ASSEMBLY.

INITIAL CONDITION: No mold in the machine.

The following instructions will put the machine in approximate adjustment without the mold in the machine. Final adjustments will be necessary when concrete units are produced. See sections 5 and 6 of this manual.

⚠	**CAUTION:** Be sure to mechanically lock out the electrical panel when working on the concrete product machine. Always follow the lockout procedure listed in section 1 of this manual!

NOTE: If any of the pin positions has to be changed, do so with the machine in the stripped-through position (pallet receiver frame resting on blocking and stripper head frame shock absorbers resting on frame.).

4.1.1 The following items should be positioned as shown in figures 4.1 and 4.2:

a. Pallet receiver shaft - position pins in inside holes (short stroke)(see figure 4.1 below).

NOTE: A short stroke is needed here since we are making low units.

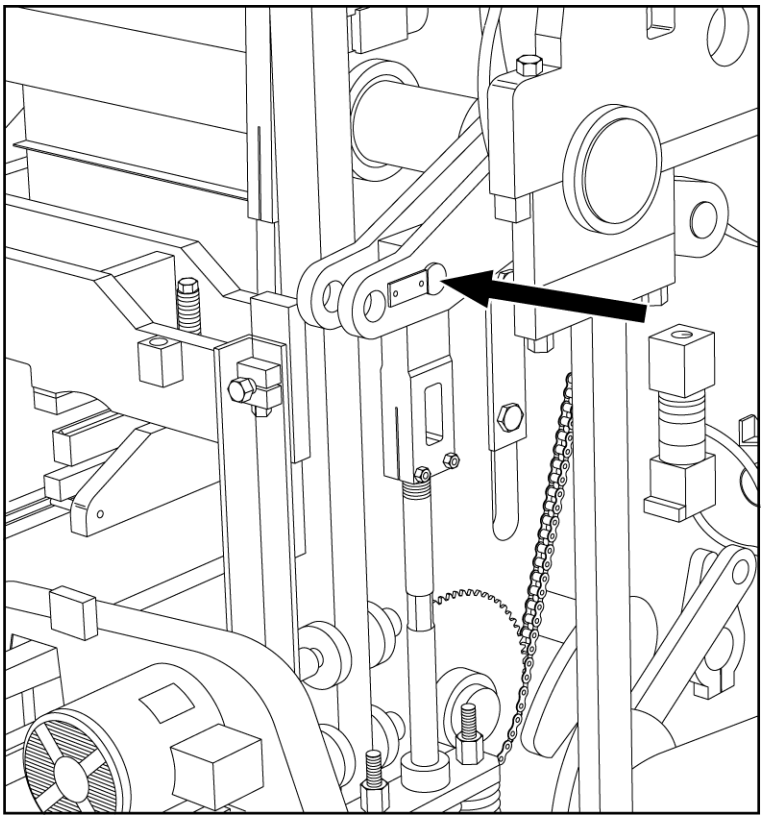


Figure 4.1 *PALLET RECEIVER SHAFT POSITION*

b. Stripper head shaft (A) - position pins in inside holes (short stroke) (see figure 4.2).

c. Stripper head links (B) - position pins in top holes (see figure 4.2). Adjust links to obtain approximately **7 3/4" [197mm]** between link ends.

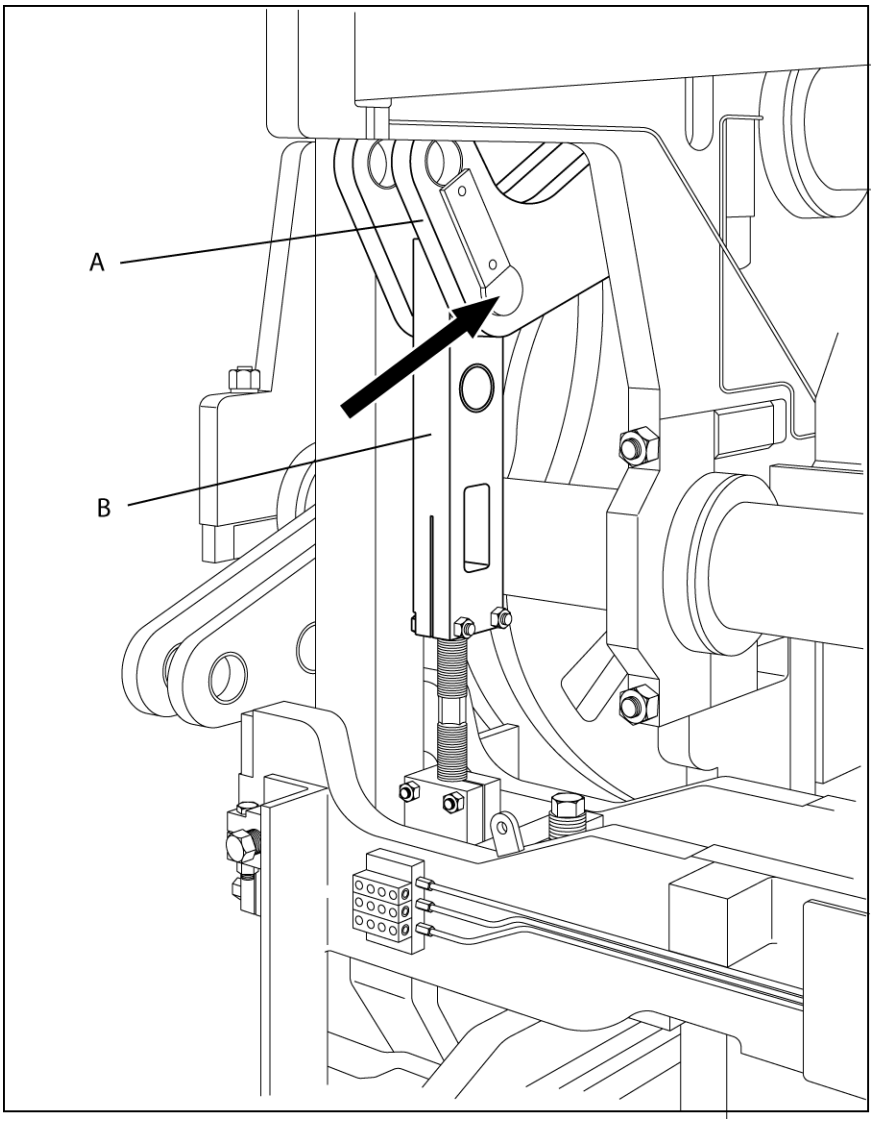


Figure 4.2 *STRIPPER HEAD SHAFT AND LINKS*

4.1.2 Run machine to "first stop" (see figure 4.3) “First stop” is obtained when the punch marks on the right side of the outside cam are in line with the roller.

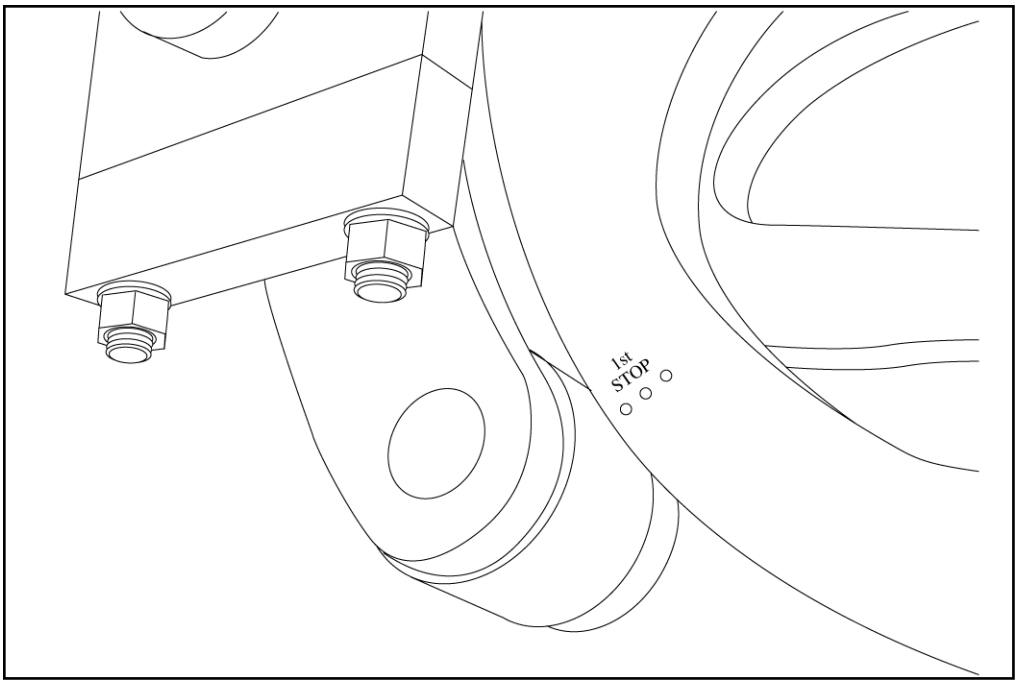


Figure 4.3 *"FIRST STOP" (R.H. SIDE OF MACHINE)*

4.1.3 Adjust the inner frame so that the mold throat is **41 3/8” [1050mm]** above the top on the base plate (figure 4.4). **0.00” [0mm]** of spacers required (no spacers). To do so, follow these procedures:

a. Loosen the "T" clamps on each side of machine that secure machine side plate to mold throat plate. (Figure 4.5)

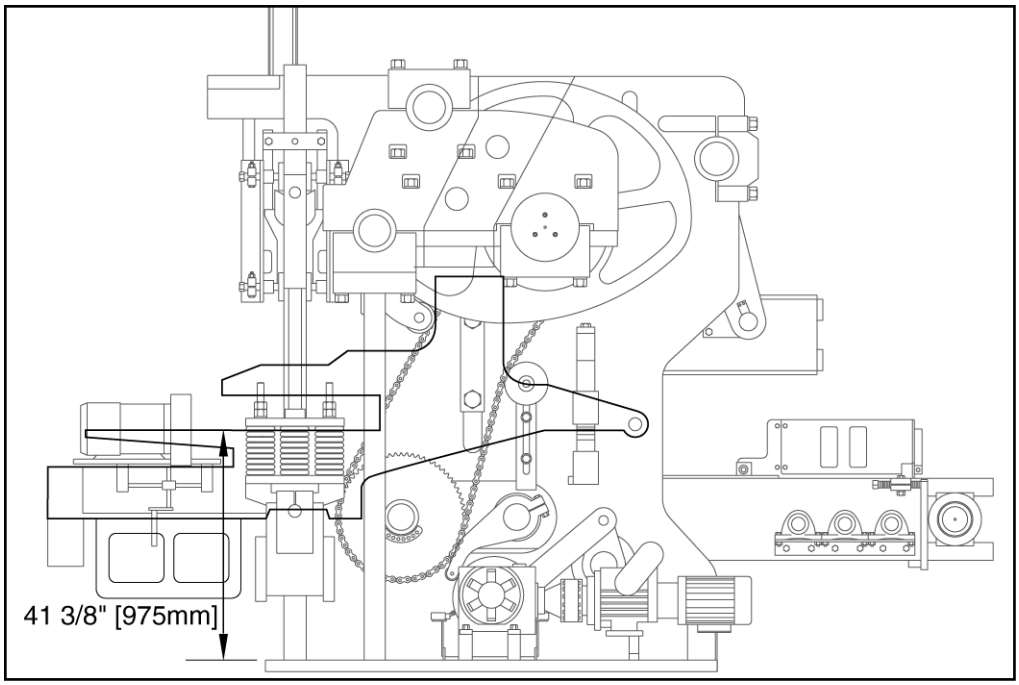


Figure 4.4 *INNER FRAME ADJUSTMENT*

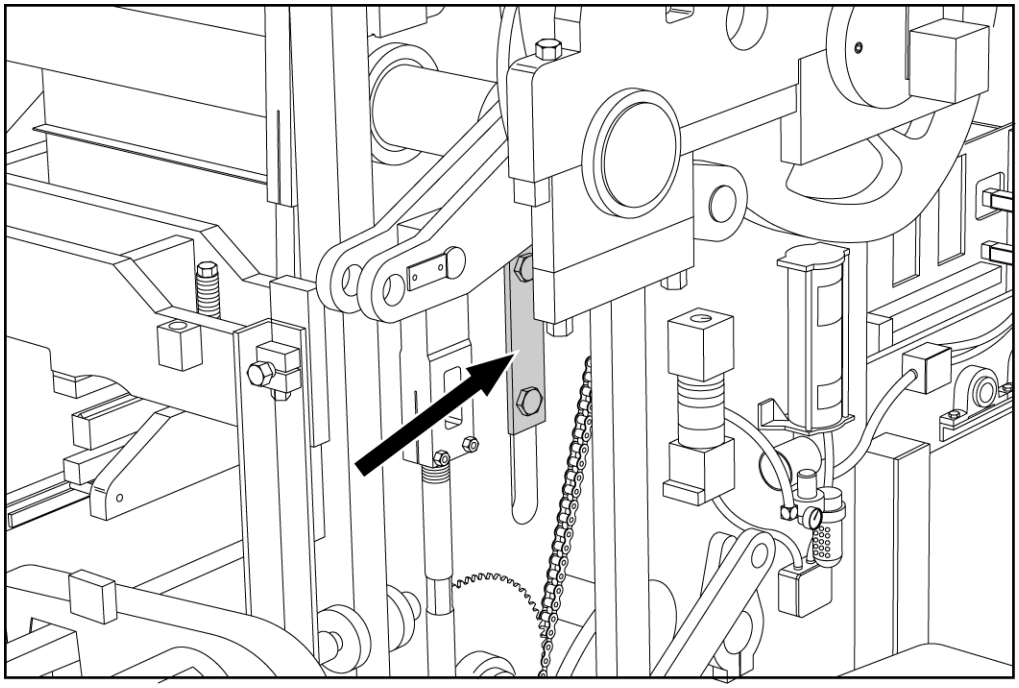


Figure 4.5 *LOOSEN "T" CLAMPS ON BOTH SIDES*

b. Loosen bolts at all 4 corners that secure mold throat assembly (See figures 4.6 and 4.7). Remove top spacers.

c. Raise mold throat frame up using the Graphic Control Display. From the Run Screen, press the **F1** key; you will access the Hand & machine set-up screen (figure 4.8). From this screen press the **F11** key to raise inner frame. Press the **F12** key to lower inner frame. You must raise inner frame just high enough to allow all lower spacers to be removed at all four corners.

d. Slowly lower entire mold throat assembly until supports contact at all 4 corners.

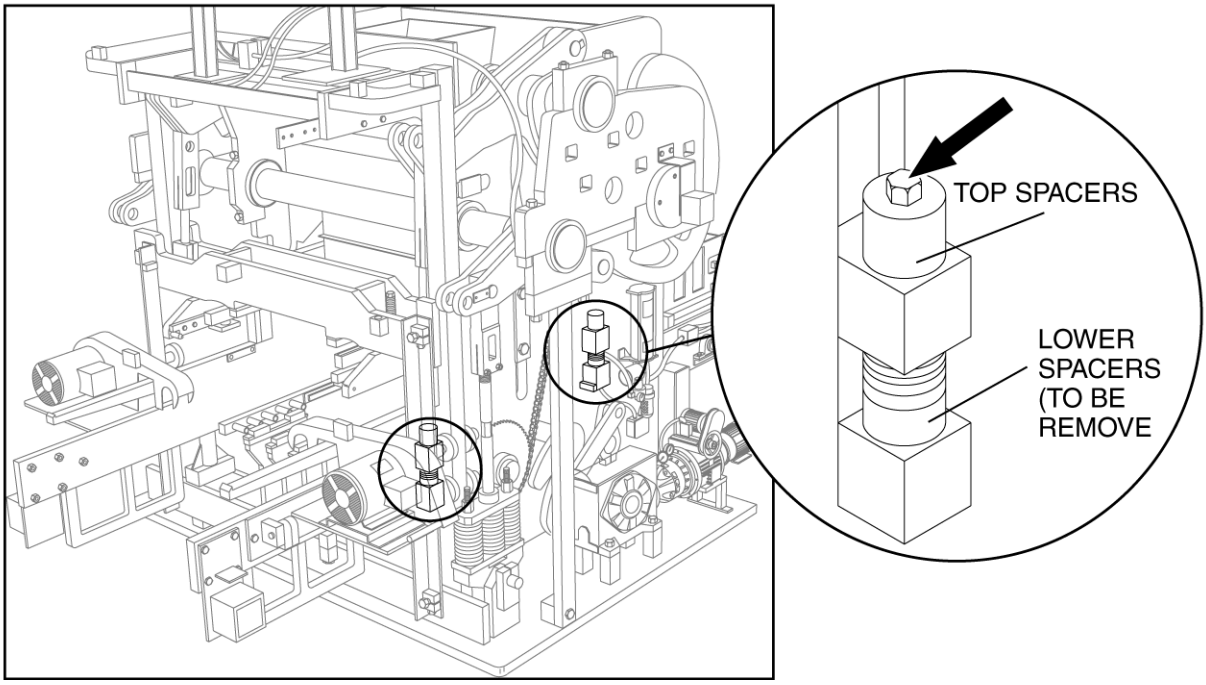


Figure 4.6 *BOLTS AT ALL 4 CORNERS (RIGHT SIDE SHOWN)*

Figure 4.7 *LOOSEN BOLTS*

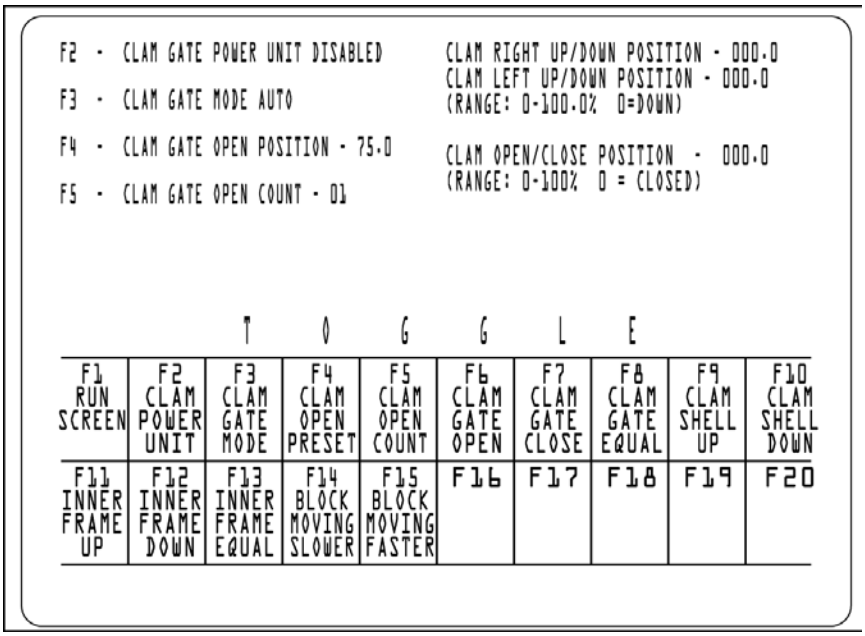


Figure 4.8 *THE HAND & MACHINE SET-UP SCREEN*

e. Store spacers on bottom side of bolt for front bolts and left hand rear bolt. For right hand rear bolt, store spacers on top. Tighten bolts at all 4 corners that secure mold throat plate spacers (see figure 4.9).

f. Tighten "T" clamps on each side of machine that secures machine side plate to mold throat plate. See figure 4.10 below.

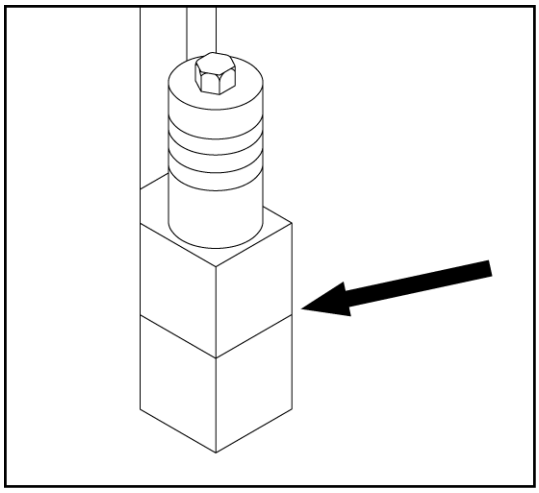


Figure 4.9 *NO SPACERS*

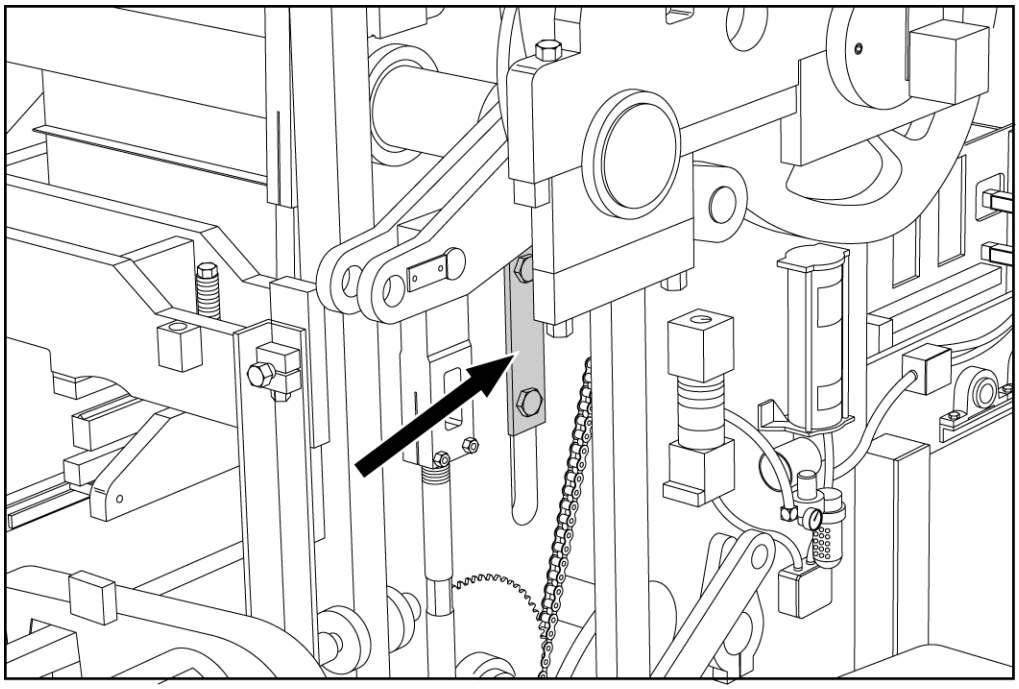


Figure 4.10 *TIGHTEN "T" CLAMPS ON BOTH SIDES*

4.1.4 Install stripping cam insert # 320209 on each side of the machine and one stripper head raising cam insert # 323058 on the right side of the machine (see figure 4.11).

4.1.5 Adjust the pallet receiver frame so that the pallet receiver rubbers are **2 7/8" [73mm]** above the mold throat (see figure 4.12).

Use pallet receiver link rod on both sides of pallet receiver to lower or raise the rubbers as shown in figure 5.14 of page 5.9.

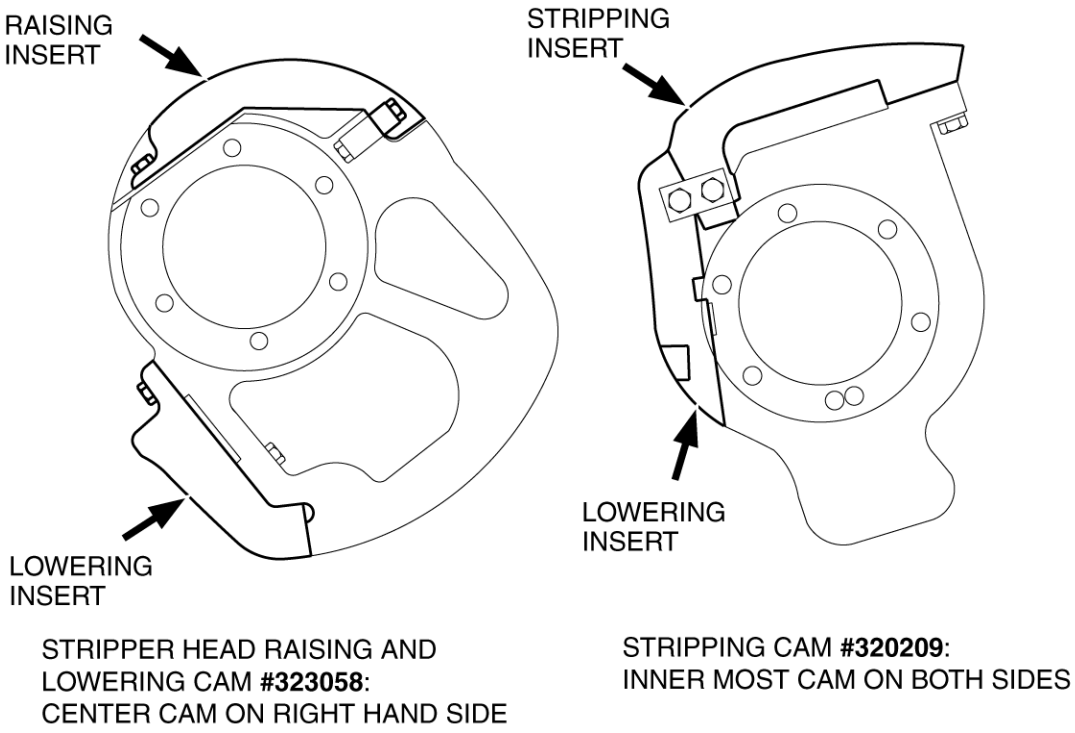


Figure 4.11 *CAM INSERTS*

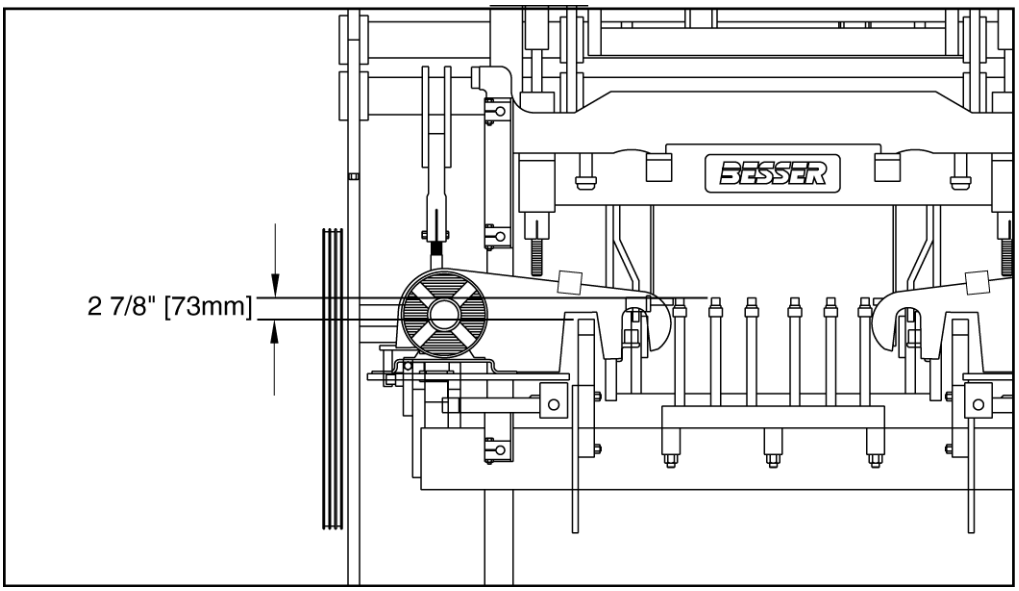


Figure 4.12 *PALLET RECEIVER RUBBERS POSITION*

4.1.6 Adjust the upper height stops so that **7 15/16" [**202mm] extends past the bottom of the castings as shown on figure 4.13.

4.1.7 Adjust the shock absorbers to a dimension 11 15/16" [303mm] (represented by "A" in figure 4.14) from the bottom of the clamp blocks to the bottom of the rubber pads.

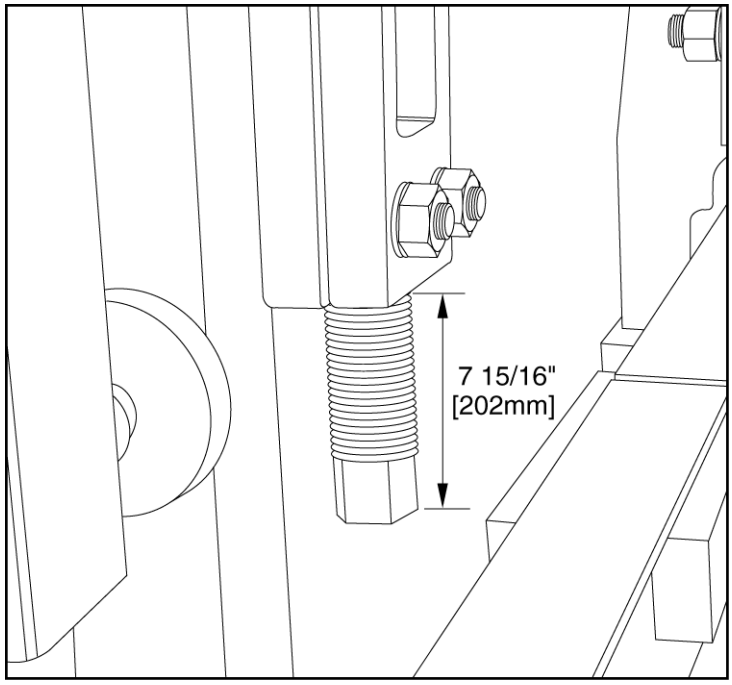


Figure 4.13 *UPPER HEIGHT STOPS*

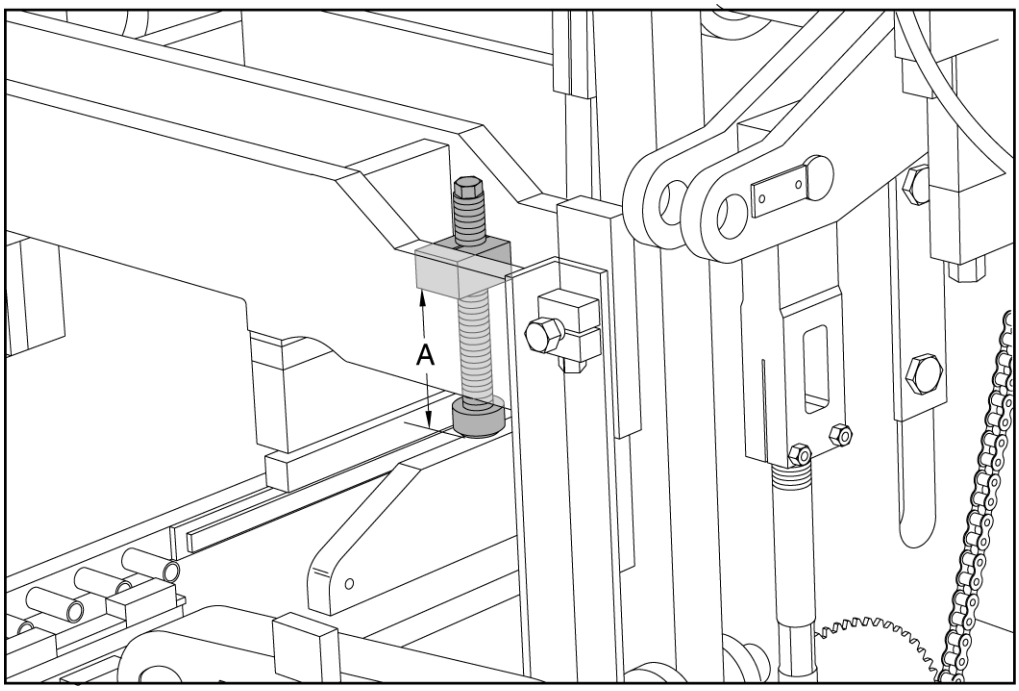


Figure 4.14 *SHOCK ABSORBERS ADJUSTMENT*

4.1.8 The ULTRAPAC II is now ready for the installation of the mold assembly. Follow the directions for installing an attachment in section 5 of this manual. When installing the stripper head, insert **4 3/8" [111mm]** of blocking in addition to the 1 1/2" [38mm] blocks already affixed to the stripper head frame (figure 4.15). The above blocking assumes a stripper head height of **14 3/16" [360 mm]** from the top of the head plate to the bottom of the shoes.

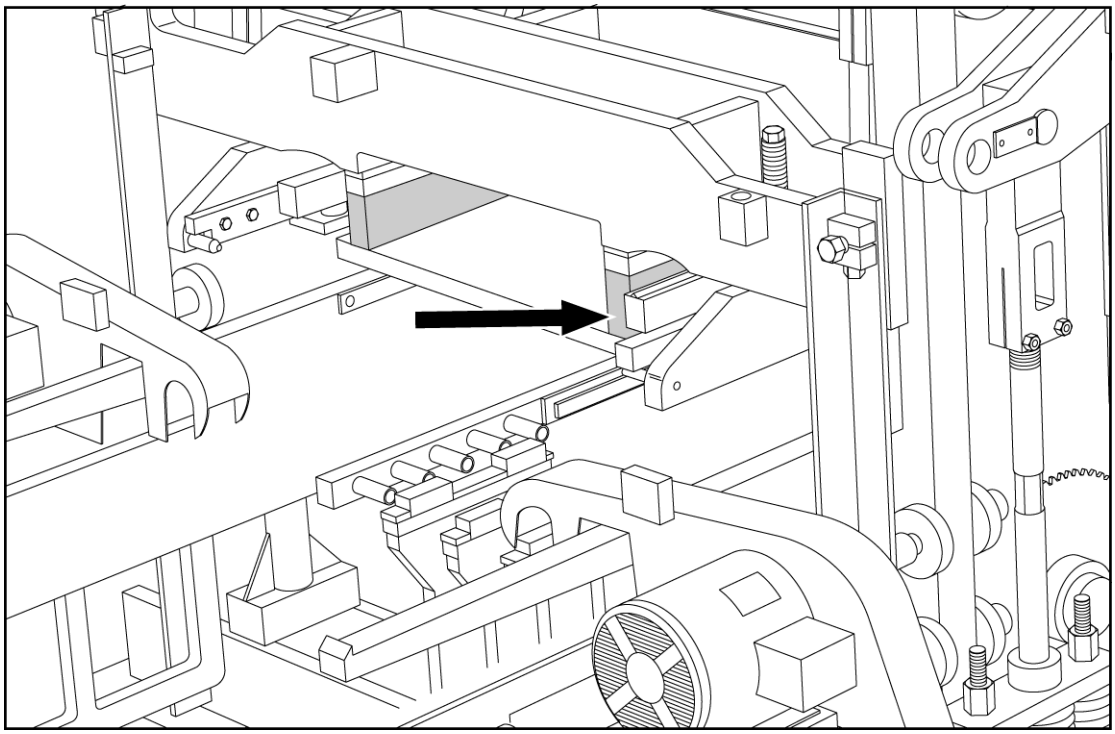


Figure 4.15 *4 3/8" [111MM] BLOCKING UNDER STRIPPER HEAD FRAME*

4.2 5 5/8" HIGH UNITS IN A 6 3/16" HIGH NON-RAMPED MOLD WITH A 14 3/16" HIGH STRIPPER HEAD ASSEMBLY.

INITIAL CONDITION: No mold in the machine.

The following instructions will put the machine in approximate adjustment without the mold in the machine. Final adjustments will be necessary when concrete units are produced. See sections 5 and 6 of this manual.

⚠	**CAUTION:** Be sure to mechanically lock out the electrical panel when working on the concrete product machine. Always follow the lockout procedure listed in section 1 of this manual!

NOTE: If any of the above pin positions has to be changed, do so with the machine in the stripped- through position (pallet receiver frame resting on blocking and stripper head frame shock absorbers resting on frame.).

4.2.1 The following items should be positioned as shown in figure 4.16 and 4.17:

a. Pallet receiver shaft - position pins in inside holes (short stroke)(see figure 4.16 below).

NOTE: A short stroke is needed here since we are making low units.

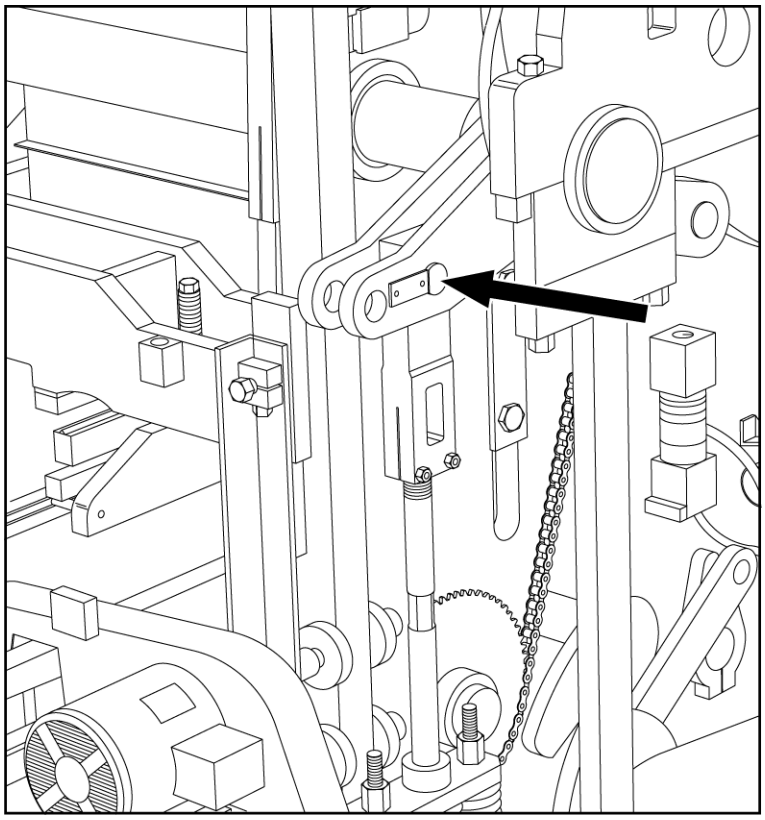


Figure 4.16 *PALLET RECEIVER SHAFT POSITION*

b. Stripper head shaft (A)- position pins in inside holes (short stroke) (see figure 4.17).

c. Stripper head links (B)- position pins in top holes. Adjust links to obtain approximately **7 3/4" [197 mm]** (see figure 4.17) between link ends.

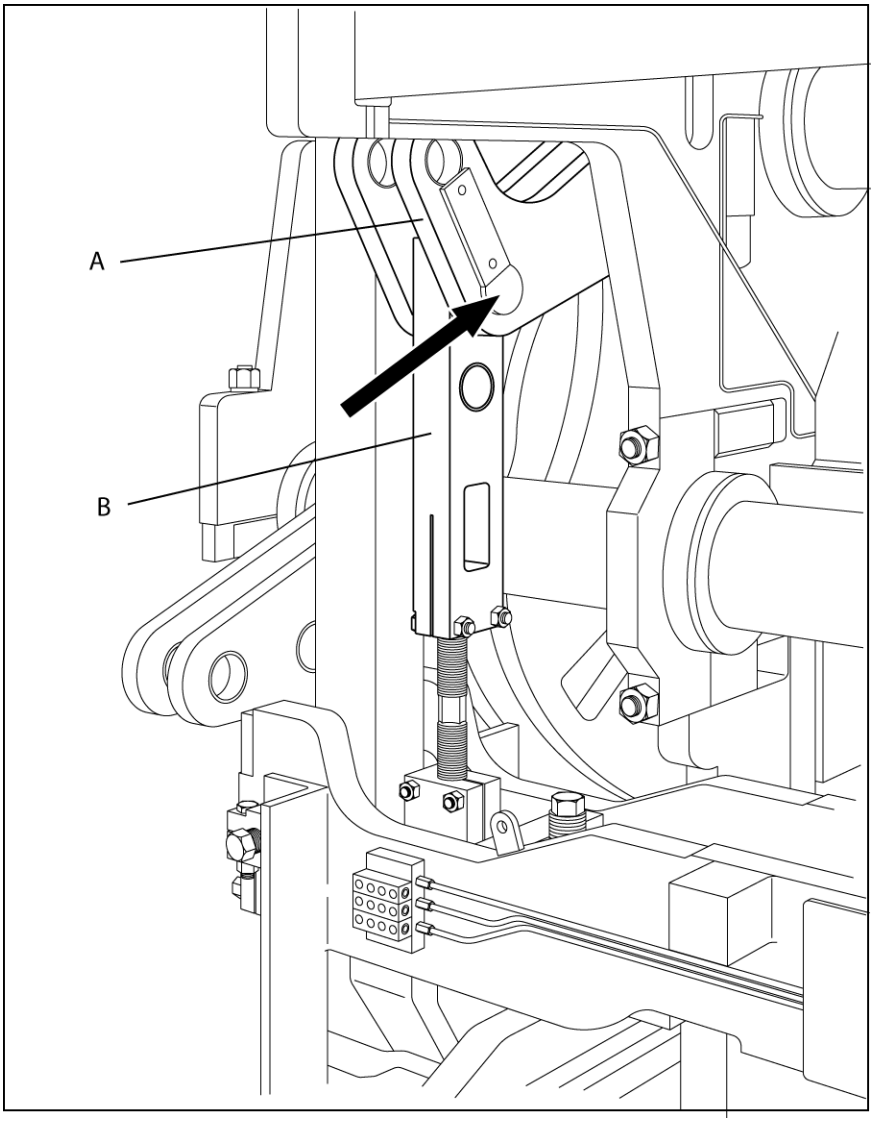


Figure 4.17 *STRIPPER HEAD SHAFT AND LINKS*

4.2.2 Run machine to "first stop" (see figure 4.18)
"First stop" is obtained when the punch marks on the cam are in line with the roller.

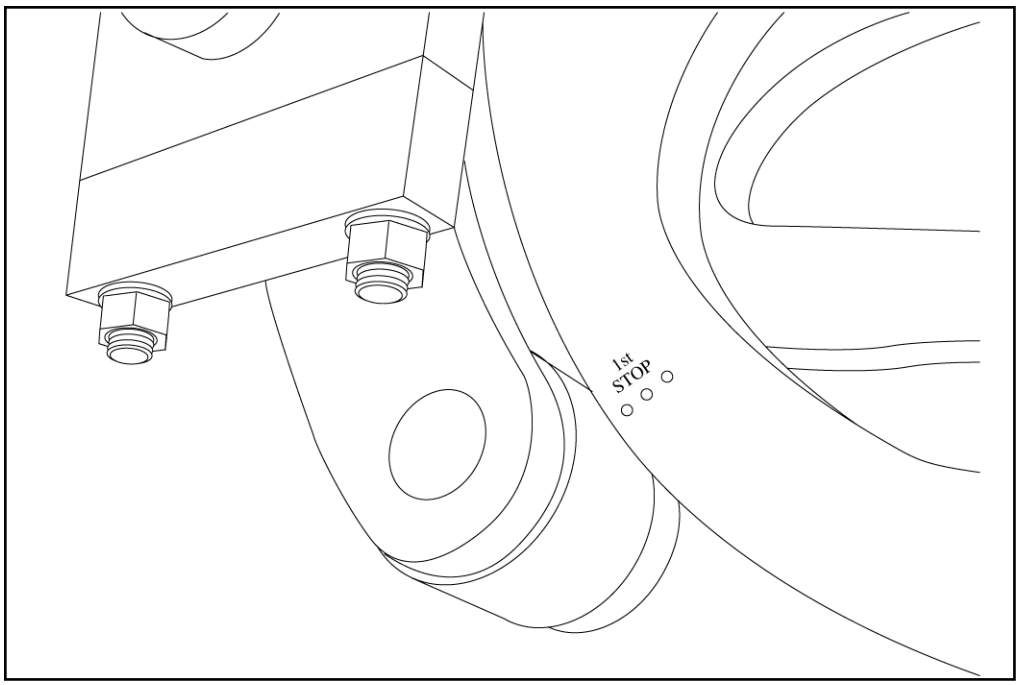


Figure 4.18 *"FIRST STOP". (R.H. SIDE OF MACHINE)*

4.2.3 Adjust the inner frame so that the mold throat is **43 5/8" [1109mm]** above the top on the base plate (figure 4.19).
2 1/4" [57mm] of spacers are required. To do so, follow these procedures:

a. Loosen the "T" clamps on each side of machine that secure machine side plate to mold throat plate (figure 4.20).

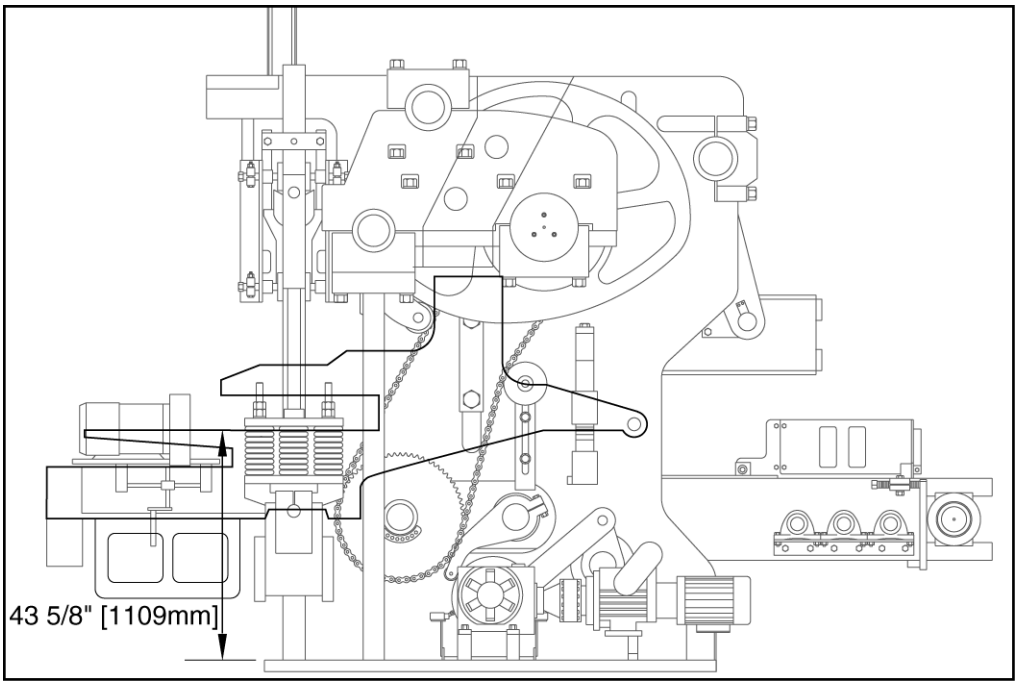


Figure 4.19 *INNER FRAME ADJUSTMENT*

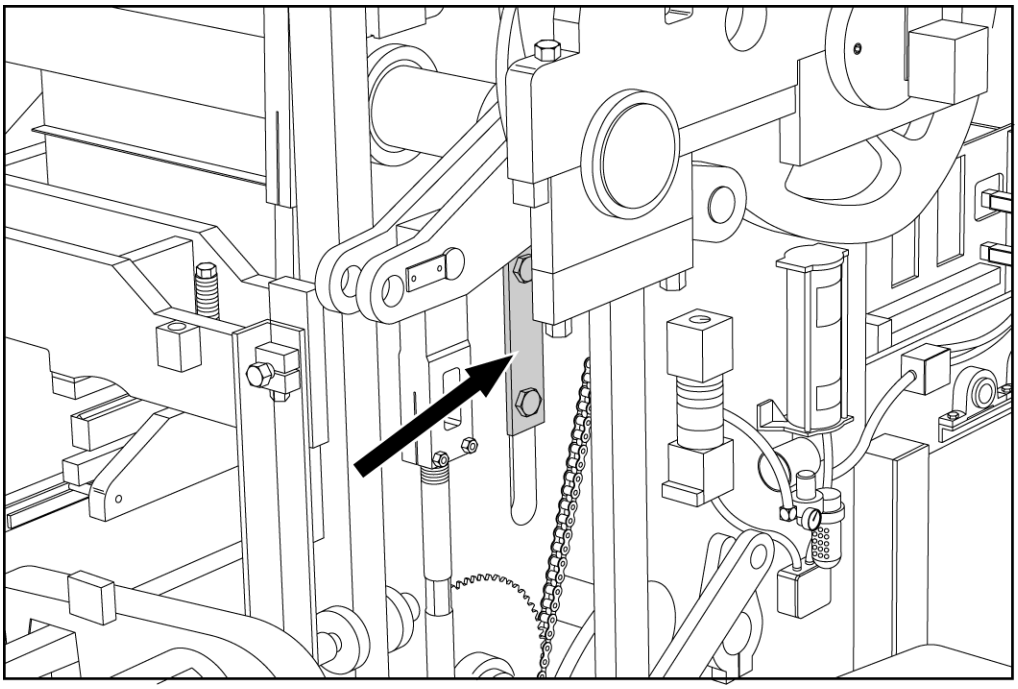


Figure 4.20 *LOOSEN "T" CLAMPS ON BOTH SIDES*

b. Loosen bolts at all 4 corners that secure mold throat assembly (see figures 4.21 and 4.22). Remove top spacers.

c. Raise mold throat frame up using the Graphic Control Display. From the Run Screen, press the **F1** key; you will access the Hand & machine set-up screen (figure 4.23). From this screen press the **F11** key to raise inner frame. Press the **F12** key to lower inner frame. You must raise inner frame just high enough to allow all lower spacers to be removed at all four corners.

d. Slowly lower entire mold throat assembly until supports contact at all 4 corners.

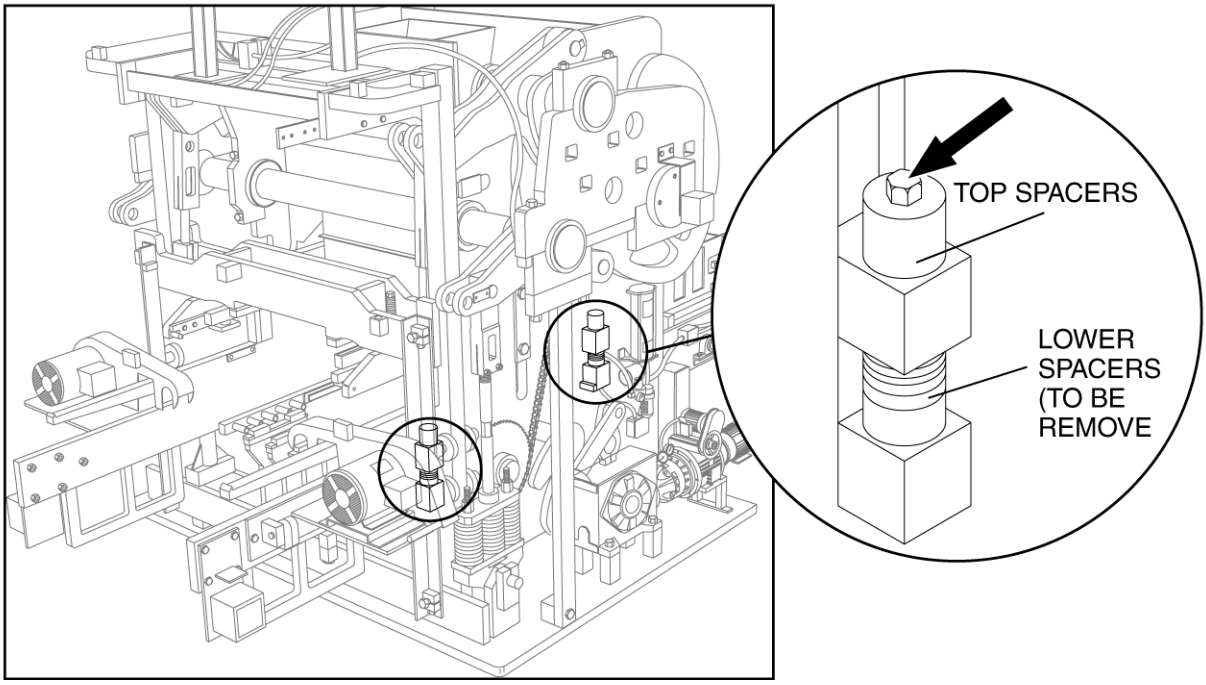


Figure 4.21 *BOLTS AT ALL 4 CORNERS (RIGHT SIDE SHOWN)*

Figure 4.22 *LOOSEN BOLTS*

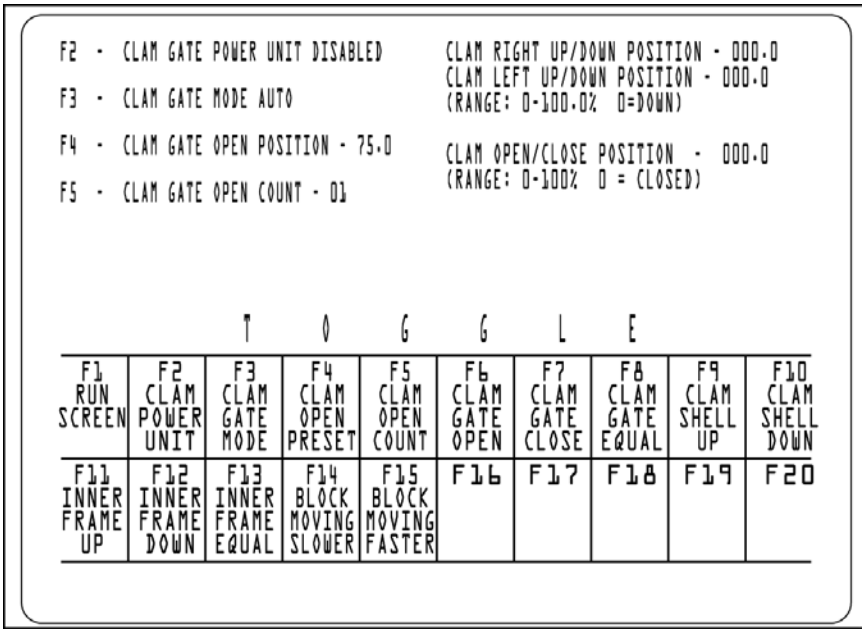


Figure 4.23 *THE HAND & MACHINE SET-UP SCREEN*

e. Store spacers on bottom side of bolt for front bolts and left hand rear bolt. For right hand rear bolt, store spacers on top. Tighten bolts at all 4 corners that secure mold throat plate spacers (see figure 4.24).

f. Tighten "T" clamps on each side of machine that secure machine side plate to mold throat plate. See figure 4.25 below.

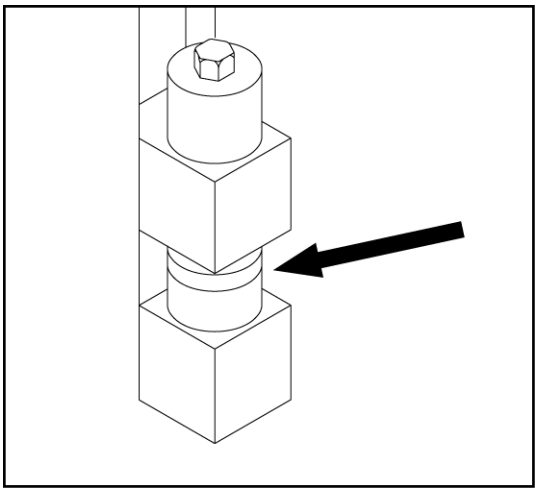


Figure 4.24 *2 1/4" [57MM] OF SPACERS*

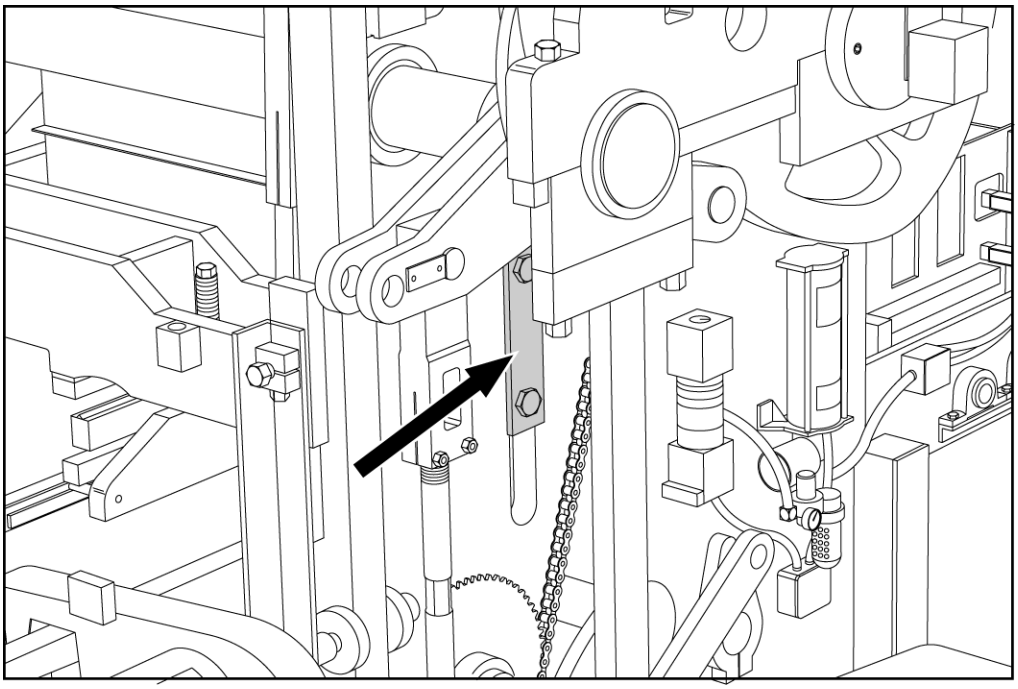


Figure 4.25 *TIGHTEN "T" CLAMPS ON BOTH SIDES*

4.2.4 Install stripping cam insert # **371731** on each side of the machine and one stripper head raising cam insert
371729 on the right side of the machine (see figure 4.26).

4.2.5 Adjust the pallet receiver frame so that the pallet receiver rubbers are **5/8" [16mm]** above the mold throat (see figure 4.27).

Use pallet receiver link rod on both side of pallet receiver to lower or raise the rubbers as shown in figure 5.14 of page 5.9.

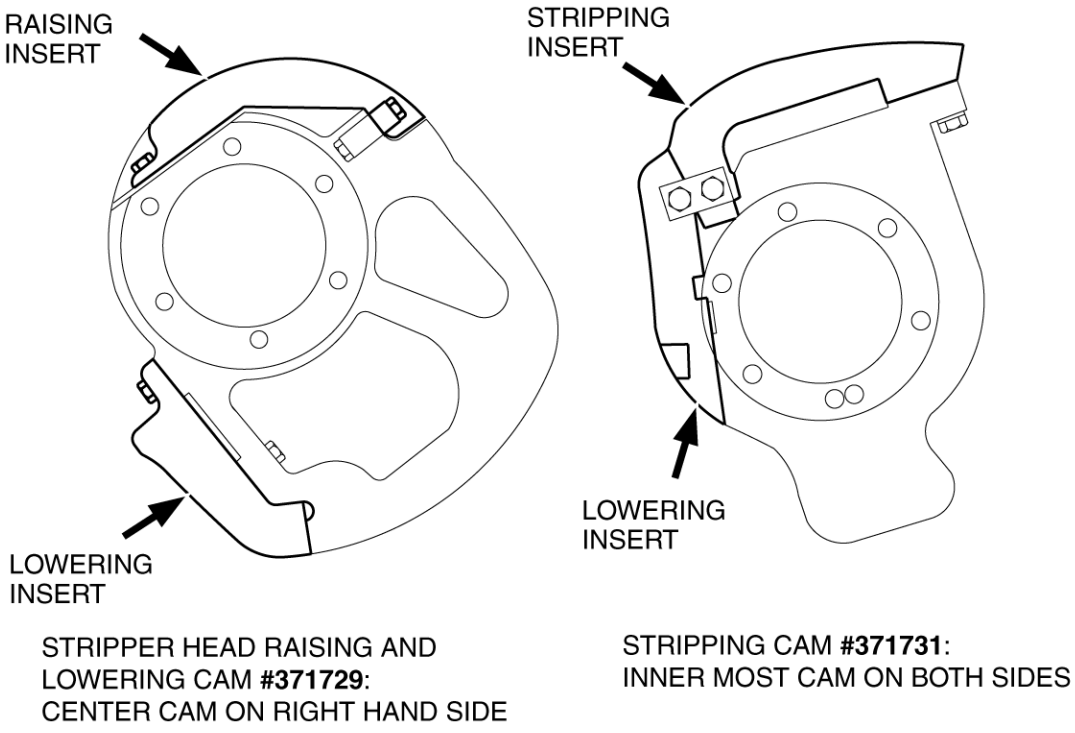


Figure 4.26 *CAM INSERTS*

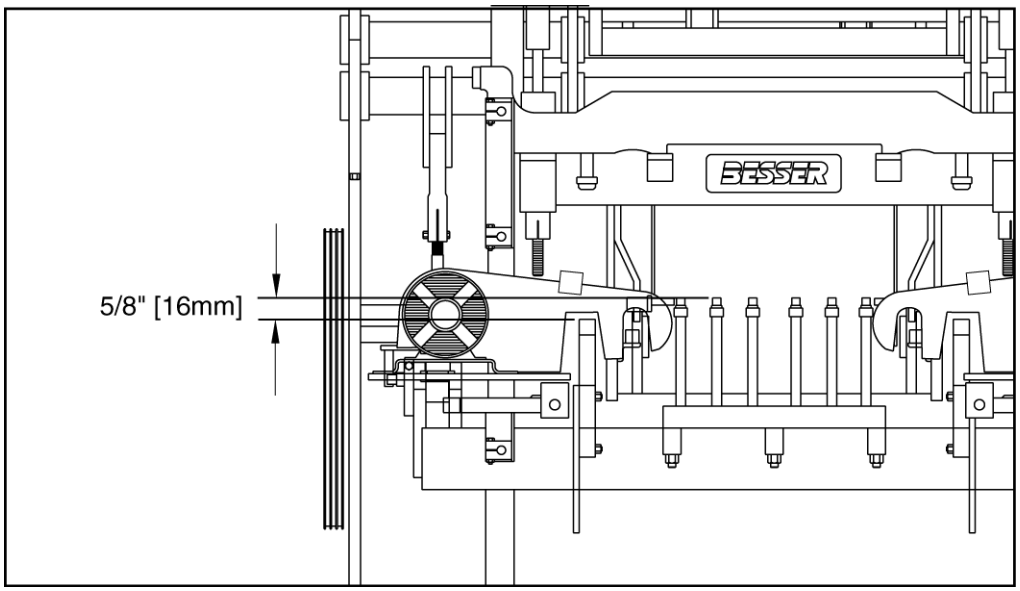


Figure 4.27 *PALLET RECEIVER RUBBERS POSITION*

4.2.6 Adjust the upper height stops so that **7 11/16" [195mm]** extend past the bottom of the castings as shown on figure 4.28.

4.2.7 Adjust the shock absorbers to a dimension **7 7/16" [189mm]** (represented by "A" in figure 4.29) from the bottom of the clamp blocks to the bottom of the rubber pads.

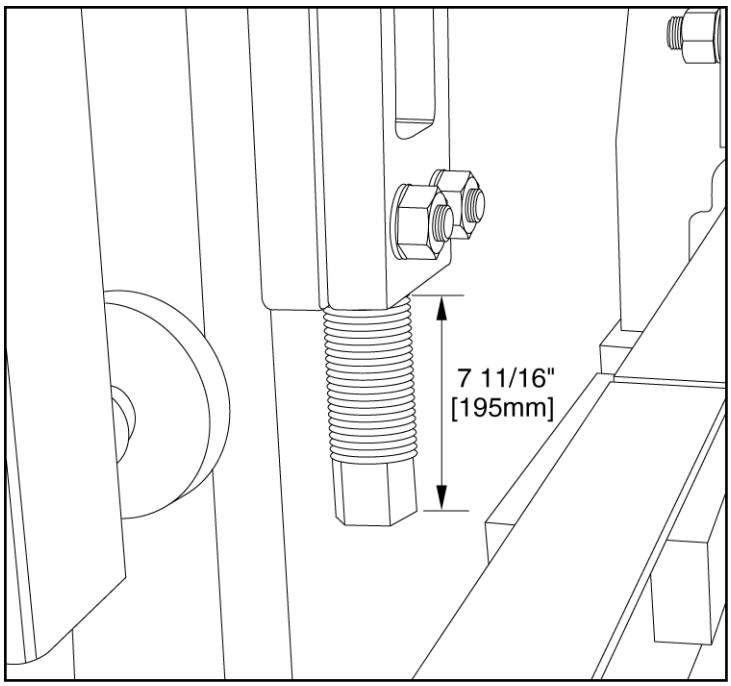


Figure 4.28 *UPPER HEIGHT STOPS*

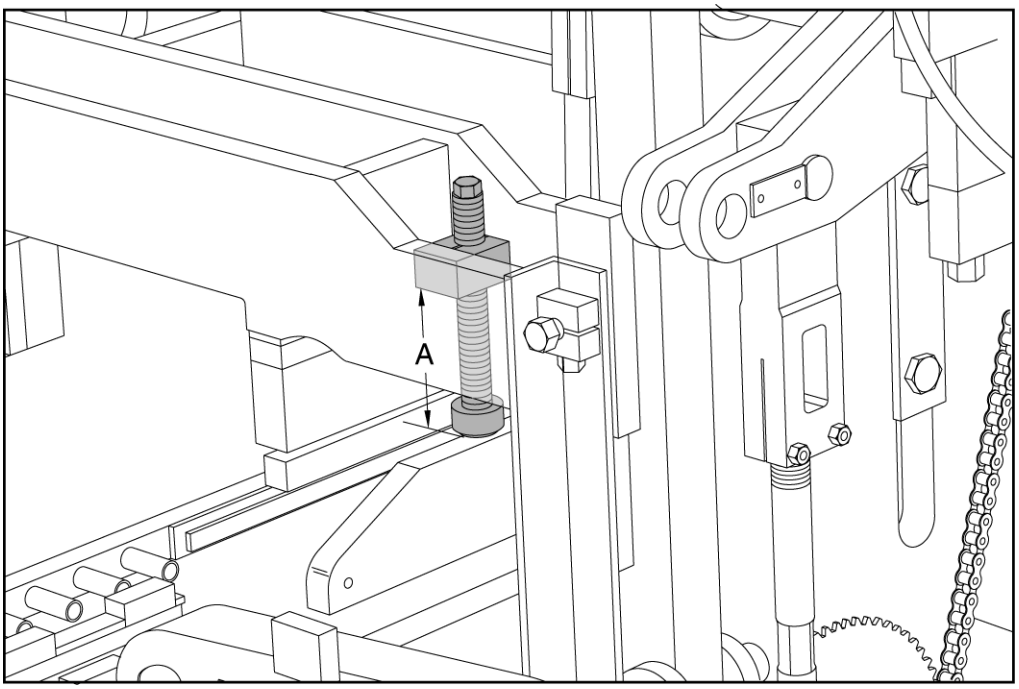


Figure 4.29 *SHOCK ABSORBERS ADJUSTMENT*

4.2.8 The ULTRAPAC II is now ready for the installation of the mold assembly. Follow the directions for installing an attachment in section 5 of this manual. When installing the stripper head, insert **2 1/8" [54mm]** of blocking in addition to the **1 1/2" [38 mm]** blocks already affixed to the stripper head frame (figure 4.30). The above blocking assumes a stripper head height of **14 3/16" [360mm]** from the top of the head plate to the bottom of the shoes.

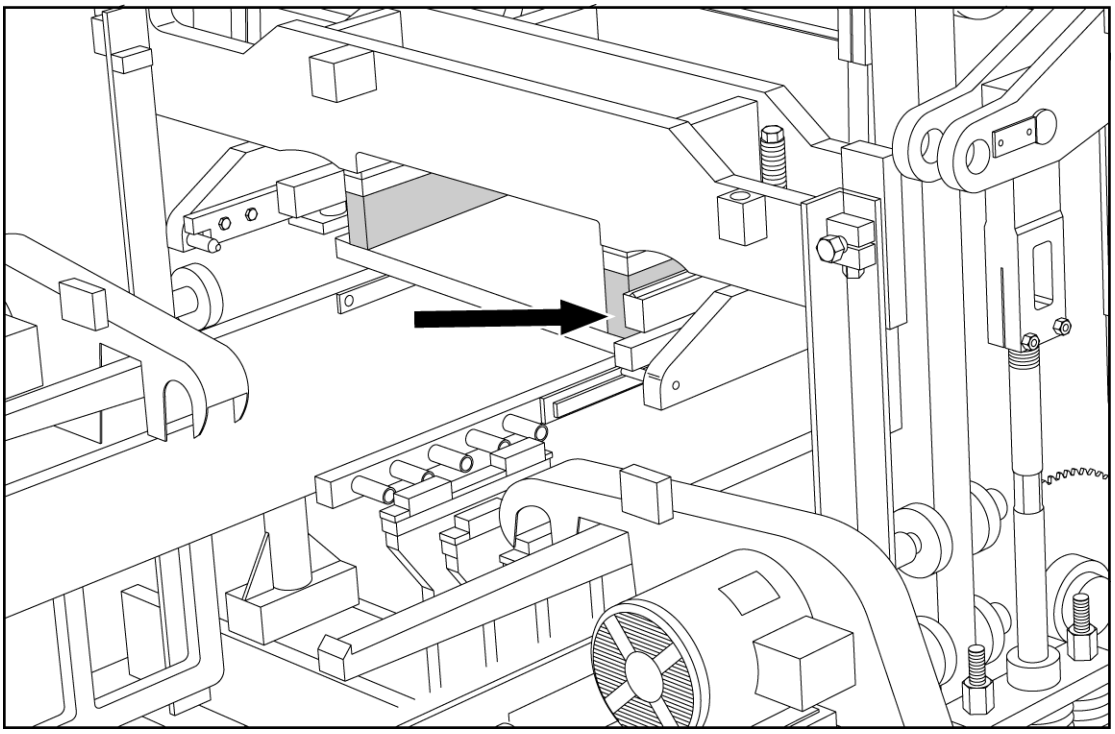


Figure 4.30 *2 1/8" [54MM] BLOCKING UNDER STRIPPER HEAD FRAME*

4.3 80 MM HIGH UNITS IN A 86 MM HIGH NON-RAMPED MOLD WITH A 360 MM HIGH STRIPPER HEAD ASSEMBLY.

INITIAL CONDITION: No mold in the machine.

The following instructions will put the machine in approximate adjustment without the mold in the machine. Final adjustments will be necessary when concrete units are produced. See sections 5 and 6 of this manual.

⚠	**CAUTION:** Be sure to mechanically lock out the electrical panel when working on the concrete product machine. Always follow the lockout procedure listed in section 1 of this manual!

NOTE: If any of the above pin positions has to be changed, do so with the machine in the stripped- through position (pallet receiver frame resting on blocking and stripper head frame shock absorbers resting on frame).

4.3.1 Run machine to "first stop" (see figure 4.31).

"First stop" is obtained when the punch marks on the cam are in line with the roller.

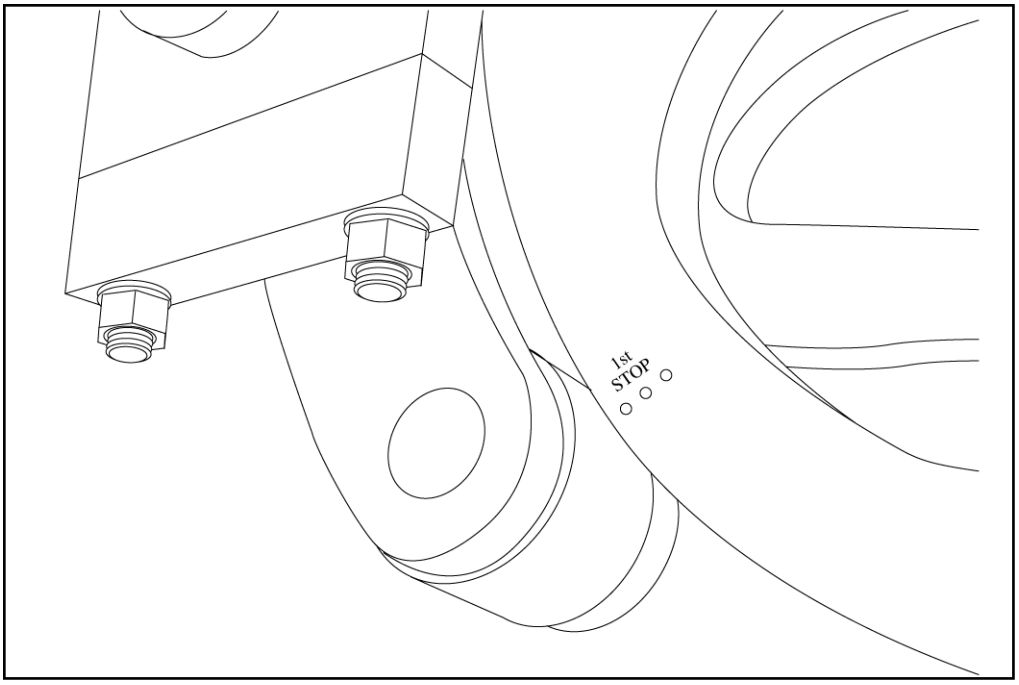


Figure 4.31 *"FIRST STOP" (R.H. SIDE OF MACHINE)*

4.3.2 Adjust the inner frame so that the mold throat is **1133mm [44.625"]** above the top on the base plate (figure 4.32). **83mm [3.25"]** of spacers are required. To do so, follow these procedures:

a. Loosen the "T" clamps on each side of machine that secures machine side plate to mold throat plate (figure 4.33).

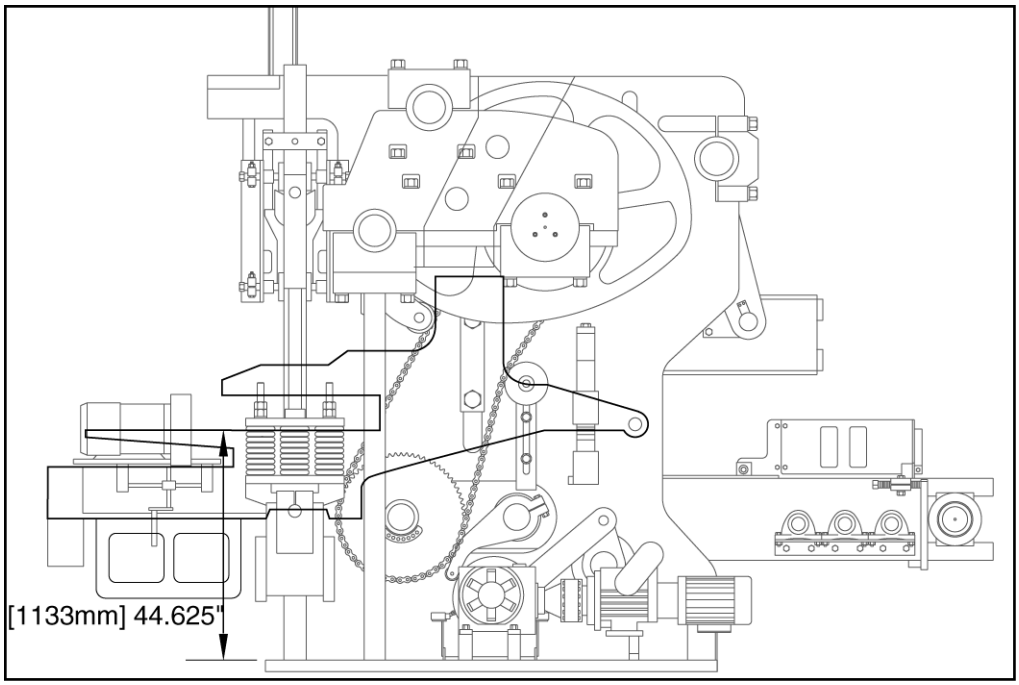


Figure 4.32 *INNER FRAME ADJUSTMENT*

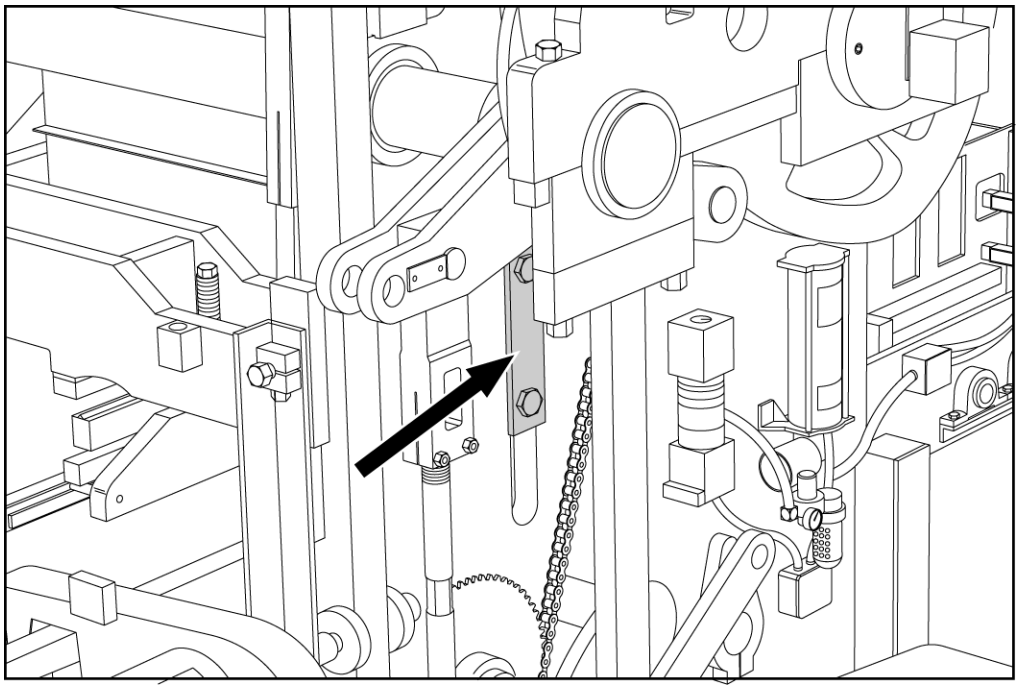


Figure 4.33 *LOOSEN "T" CLAMPS ON BOTH SIDES*

b. Loosen bolts at all 4 corners that secure mold throat assembly (See figure 4.34 and 4.35). Remove top spacers.

c. Raise mold throat frame up using the Graphic Control Display. From the Run Screen, press the **F1** key; you will access the Hand & machine set-up screen (figure 4.36). From this screen press the **F11** key to raise inner frame. Press the **F12** key to lower inner frame. You must raise inner frame just high enough to allow all lower spacers to be removed at all four corners.

d. Slowly lower entire mold throat assembly until supports contact at all 4 corners.

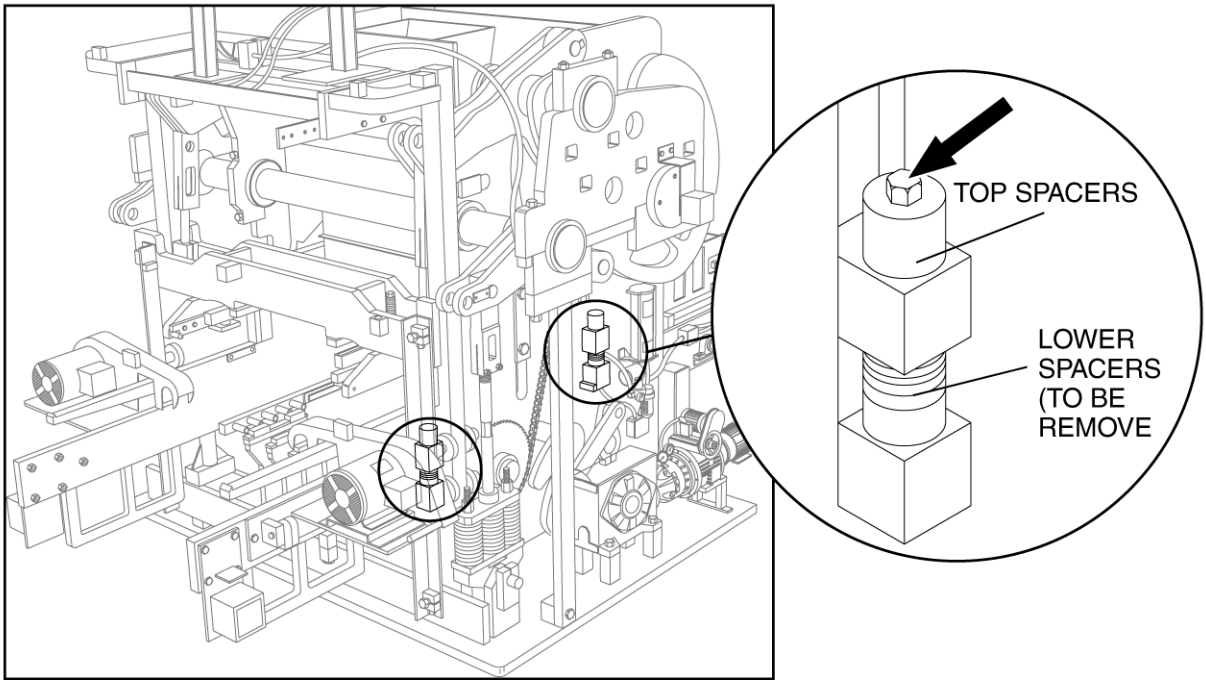


Figure 4.34 *BOLTS AT ALL 4 CORNERS (RIGHT SIDE SHOWN)*

Figure 4.35 *LOOSEN BOLTS*

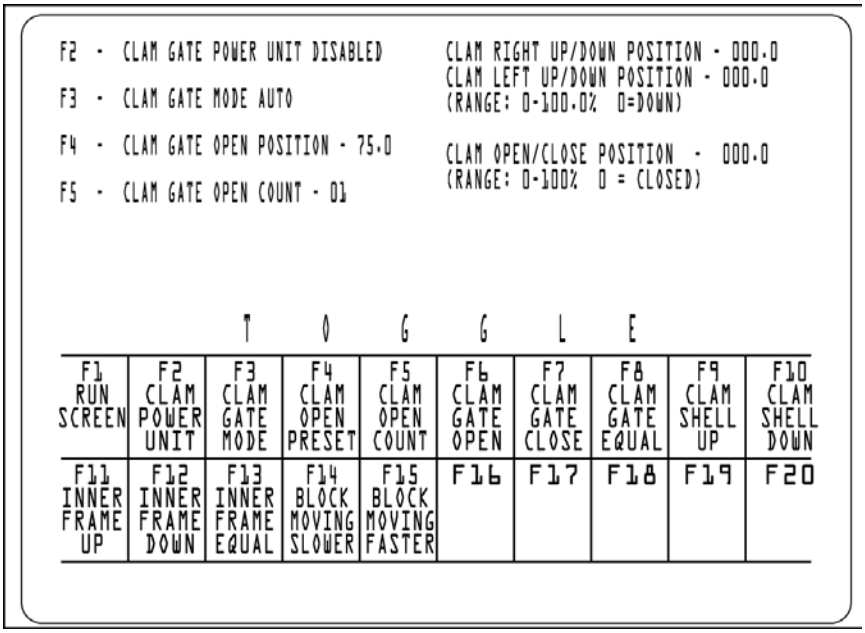


Figure 4.36 *THE HAND & MACHINE SET-UP SCREEN*

e. Store spacers on bottom side of bolt for front bolts and left hand rear bolt. For right hand rear bolt, store spacers on top. Tighten bolts at all 4 corners that secure mold throat plate spacers. (See figure 4.37).

f. Tighten "T" clamps on each side of machine that secure machine side plate to mold throat plate. See figure 4.38 below.

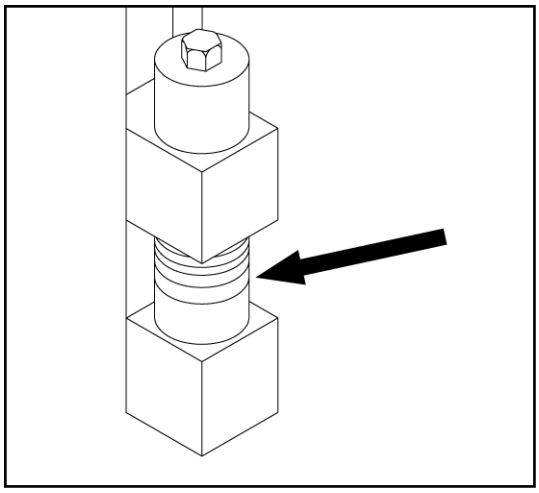


Figure 4.37 *83MM [3 1/4"] OF SPACERS*

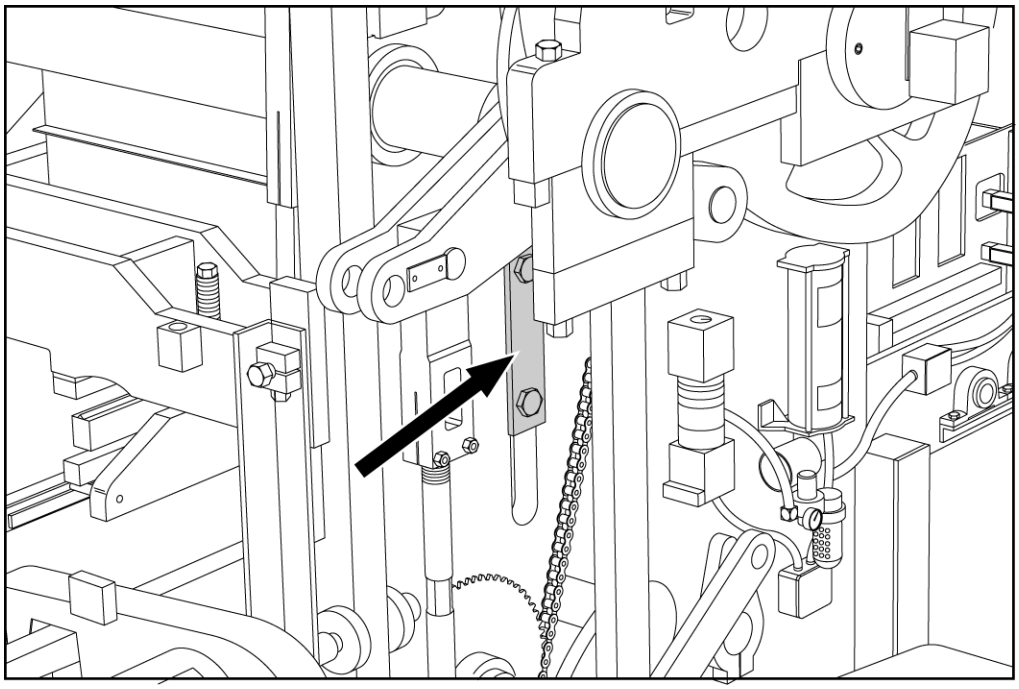


Figure 4.38 *TIGHTEN "T" CLAMPS ON BOTH SIDES*

4.3.3 Remove the stripping cam insert from each side of the machine. This concrete unit is run without any stripping cam insert (see figure 4.39).

4.3.4 The following items should be positioned as shown on figures 4.40 and 4.41.

a. Pallet receiver shaft - position pins in inside holes (short stroke)(see figure 4.40).

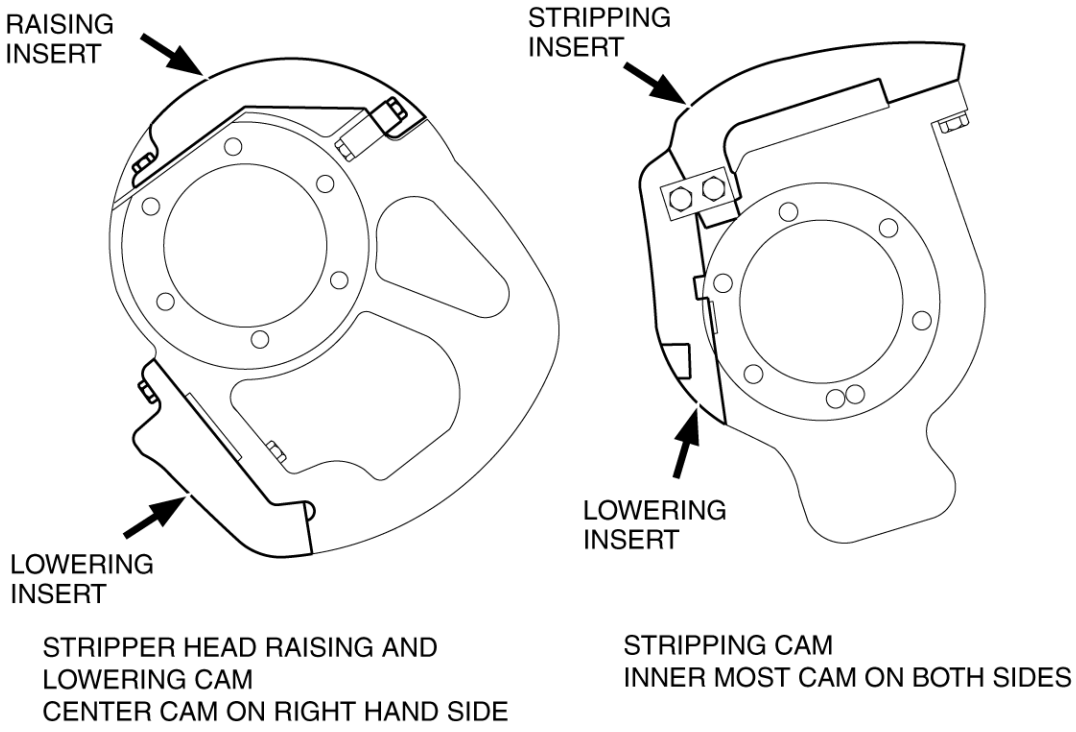


Figure 4.39 *REMOVING STRIPPING CAM INSERTS*

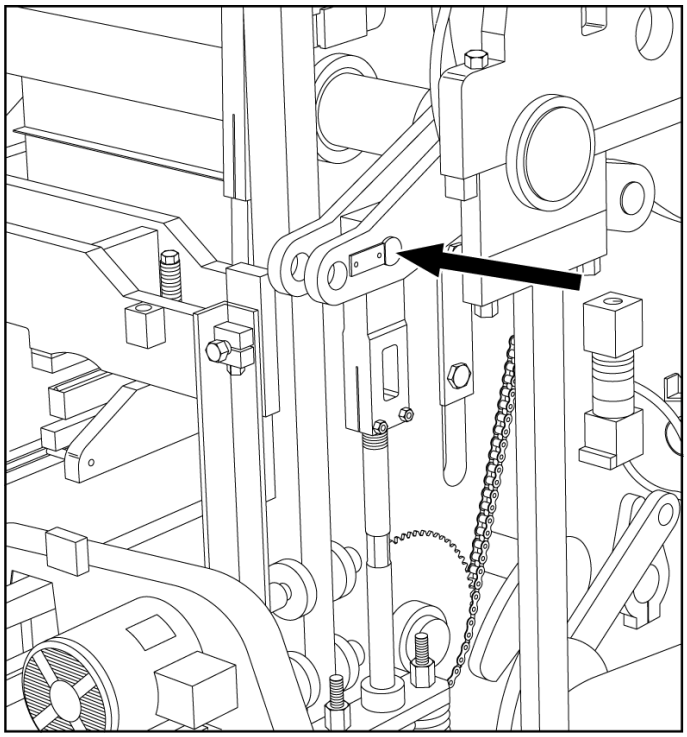


Figure 4.40 *PALLET RECEIVER SHAFT POSITION*

b. Stripper head shaft (A) - position pins in inside holes (short stroke) (see figure 4.41).

c. Stripper head links (B) - position pins in top holes. Adjust links to obtain approximately **105mm [4 1/8"]** between link ends (see figure 4.41).

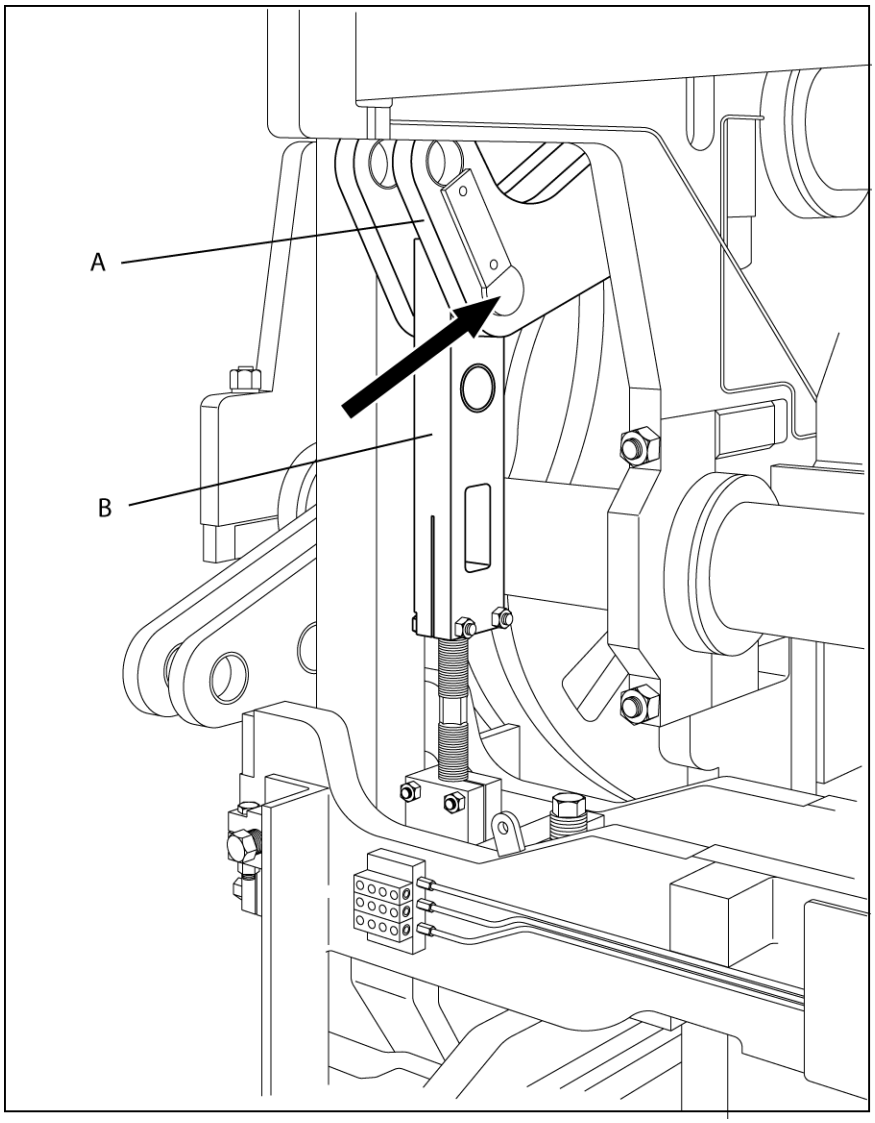


Figure 4.41 *STRIPPER HEAD SHAFT AND LINKS*

4.3.5 Run machine to "first stop" and adjust the pallet receiver links to obtain a dimension of **1219mm [48"]** from the top of the base plate to the tops of the pallet receiver rubbers (see figure 4.42). This adjustment should expose approximately **600mm [23 5/8"]** of link rod between the upper link end and the boss on the spring assembly (see dimension "A" on figure 4.43).

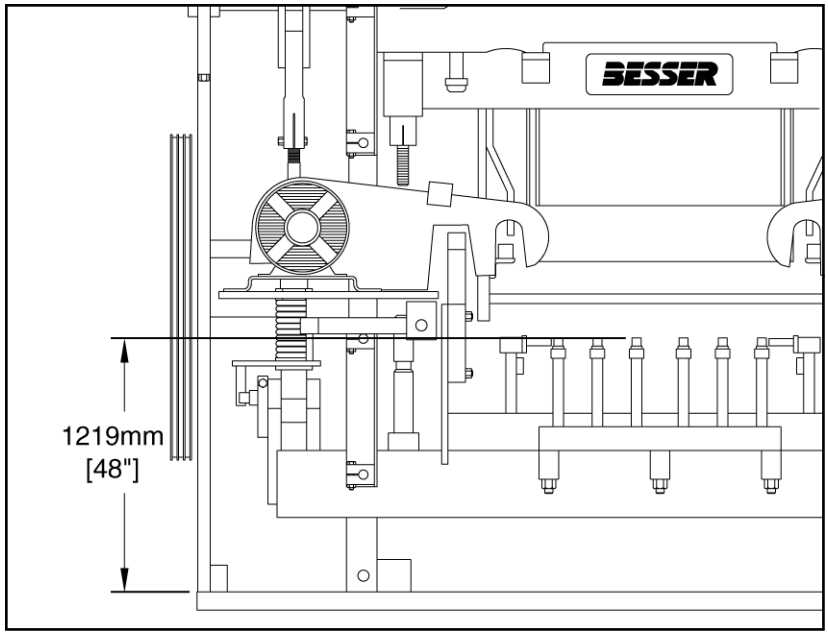


Figure 4.42 *PALLET RECEIVER RUBBERS ABOVE BASE PLATE*

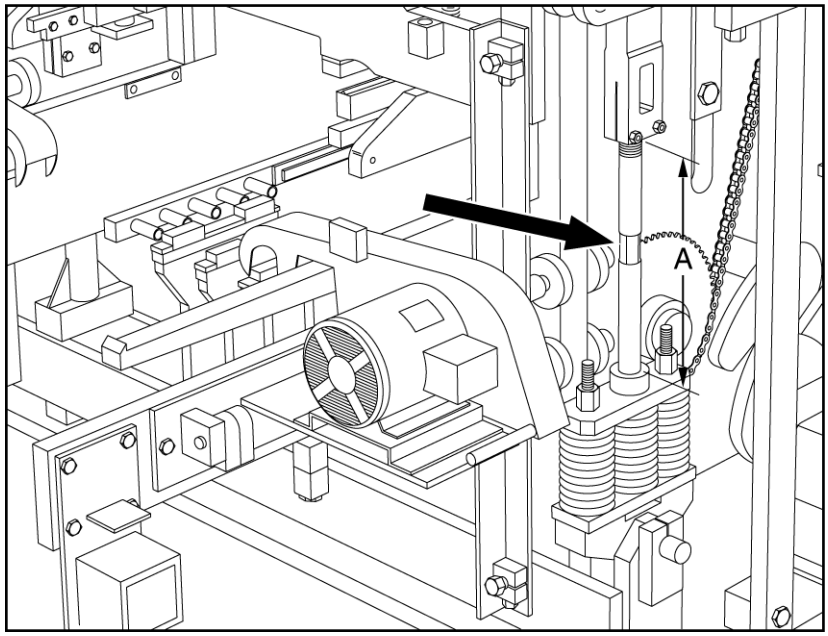


Figure 4.43 *LINK ROD*

4.3.6 Adjust the upper height stops **(part #047356)** so that **170mm [6.675"]** extend past the bottom of the castings (figure 4.44).

4.3.7 Install the **445mm (17 1/2")** shock absorbers **(part #395992)**. Adjust the shock absorbers to a dimension of **300mm [11.812"]** (represented by "A" in figure 4.45) from the bottom of the welded clamp block to the bottom of the rubber pad.

4.3.8 Install sheave **(part #112339F2075)** on the drive motor.

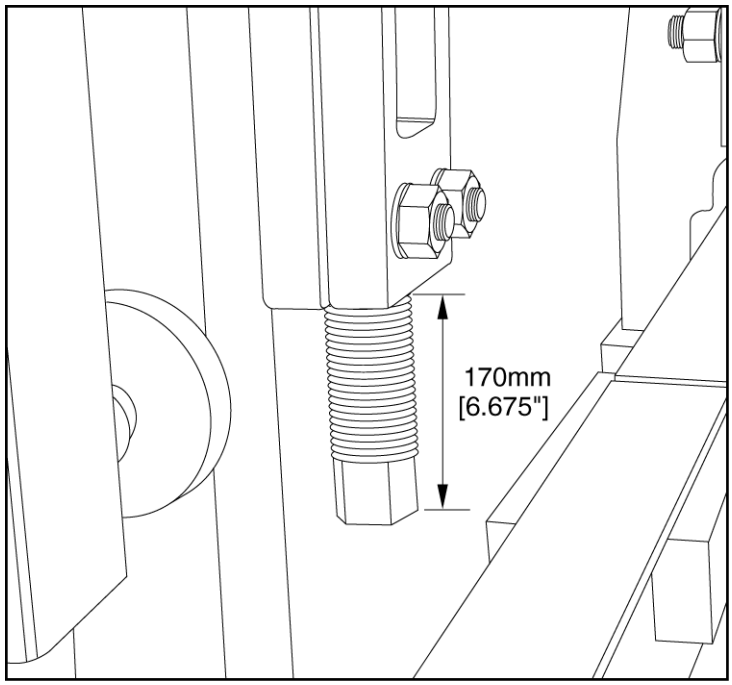


Figure 4.44 *UPPER HEIGHT STOPS*

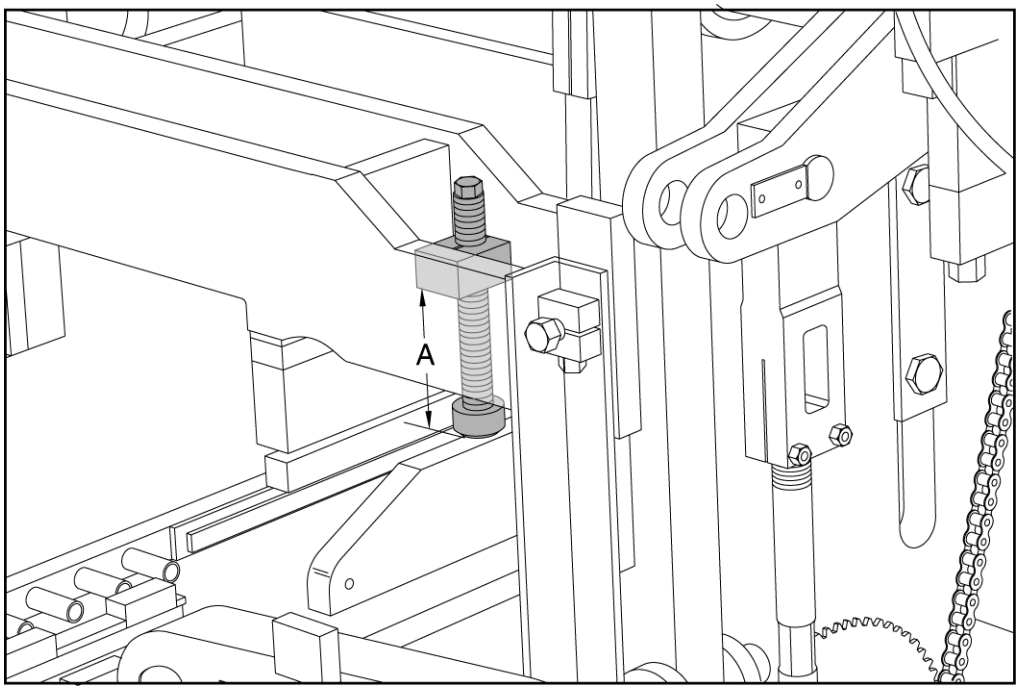


Figure 4.45 *INSTALLING SHOCK ABSORBERS AND ADJUSTING*

4.3.9 The ULTRAPAC II is now ready for the installation of the mold assembly. Follow the directions for installing an attachment in section 5 of this manual. When installing the stripper head, use **356mm [14"]** long bolts **(part #087159)** and insert **95mm [3 3/4"]** of blocking in addition to the **38mm [1 1/2"]** blocks already affixed to the stripper head frame (figure 4.46).

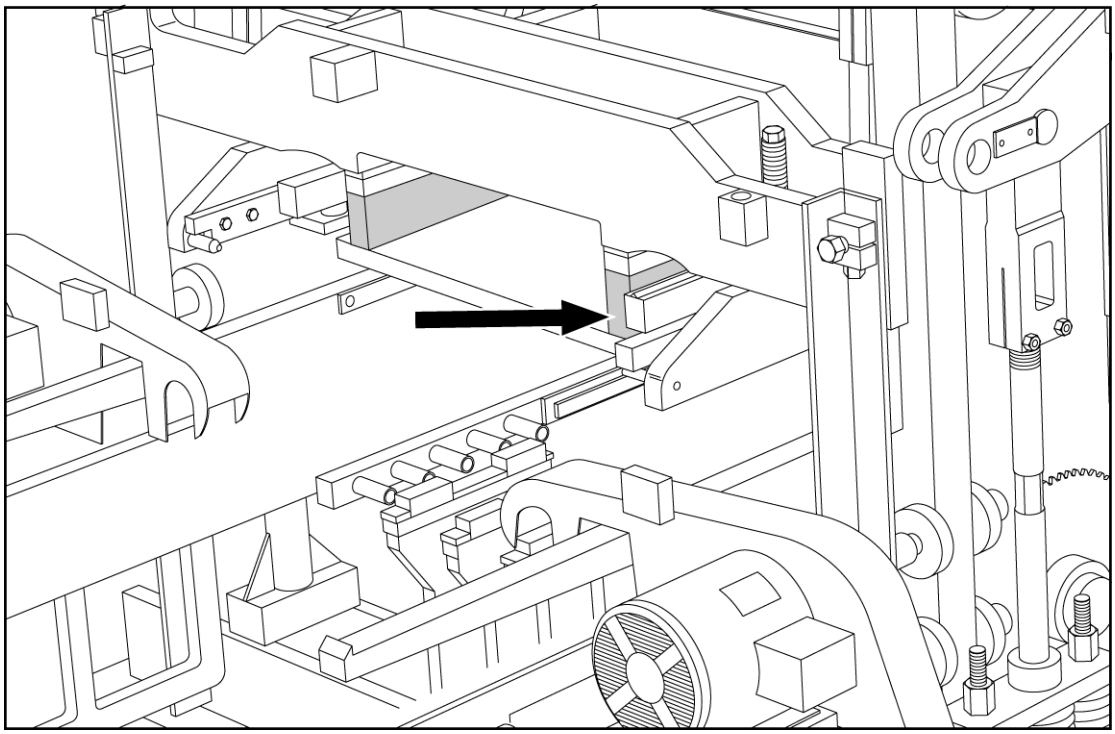


Figure 4.46 *95MM [3 3/4"] BLOCKING UNDER STRIPPER HEAD FRAME*

4.4 60MM HIGH UNITS IN A 67MM HIGH NON-RAMPED MOLD WITH A 360MM HIGH STRIPPER HEAD ASSEMBLY.

INITIAL CONDITION: No mold in the machine.

The following instructions will put the machine in approximate adjustment without the mold in the machine. Final adjustments will be necessary when concrete units are produced. See sections 5 and 6 of this manual.

⚠	**CAUTION:** Be sure to mechanically lock out the electrical panel when working on the concrete product machine. Always follow the lockout procedure listed in section 1 of this manual!

NOTE: If any of the above pin positions has to be changed, do so with the machine in the stripped- through position (pallet receiver frame resting on blocking and stripper head frame shock absorbers resting on frame).

4.4.1 Run machine to "first stop" (see figure 4.47).

"First stop" is obtained when the punch marks on the cam are in line with the roller.

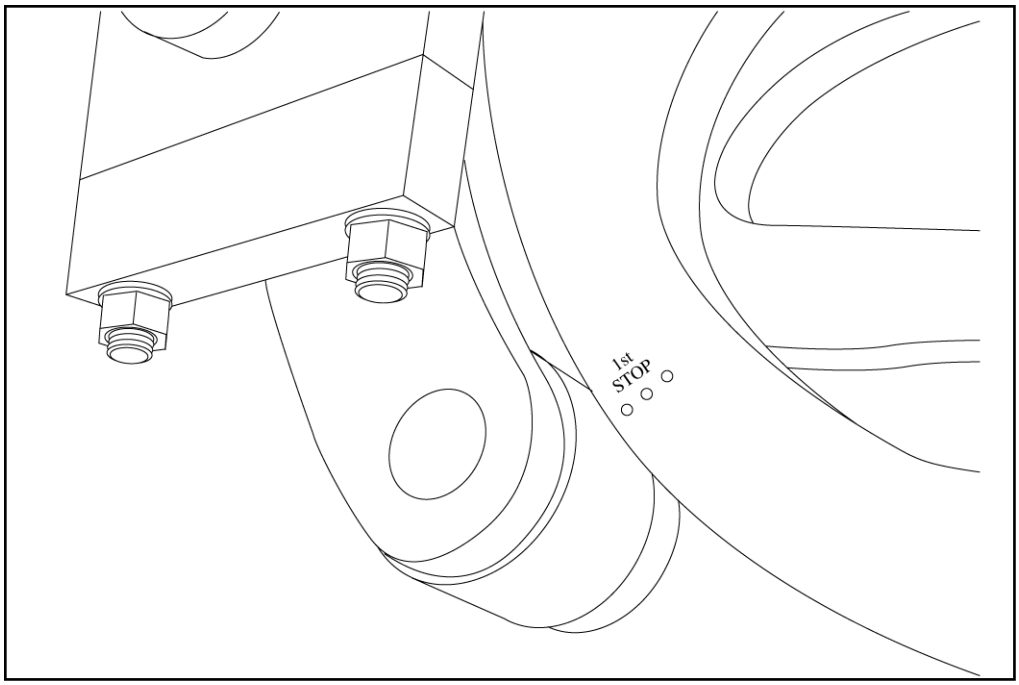


Figure 4.47 *"FIRST STOP" (R.H. SIDE OF MACHINE)*

4.4.2 Adjust the inner frame so that the mold throat is **1114mm [43.875”]** above the top on the base plate (figure 4.48). **63mm [2 1/4”]** of spacers required. To do so, follow this procedure:

a. Loosen the "T" clamps on each side of machine that secure machine side plate to mold throat plate. (figure 4.49).

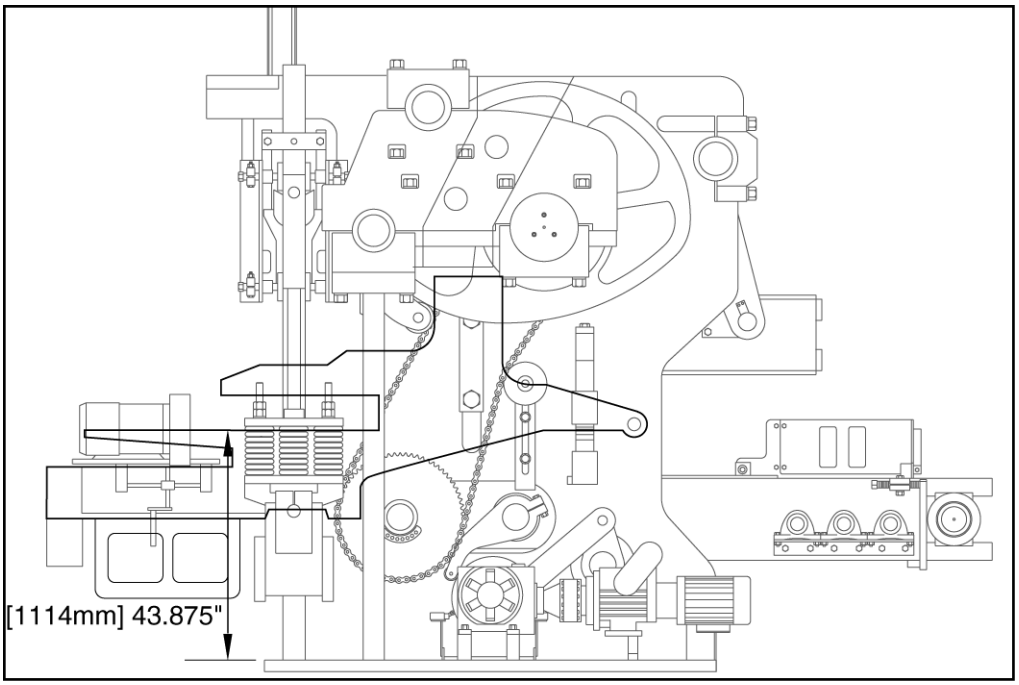


Figure 4.48 *INNER FRAME ADJUSTMENT*

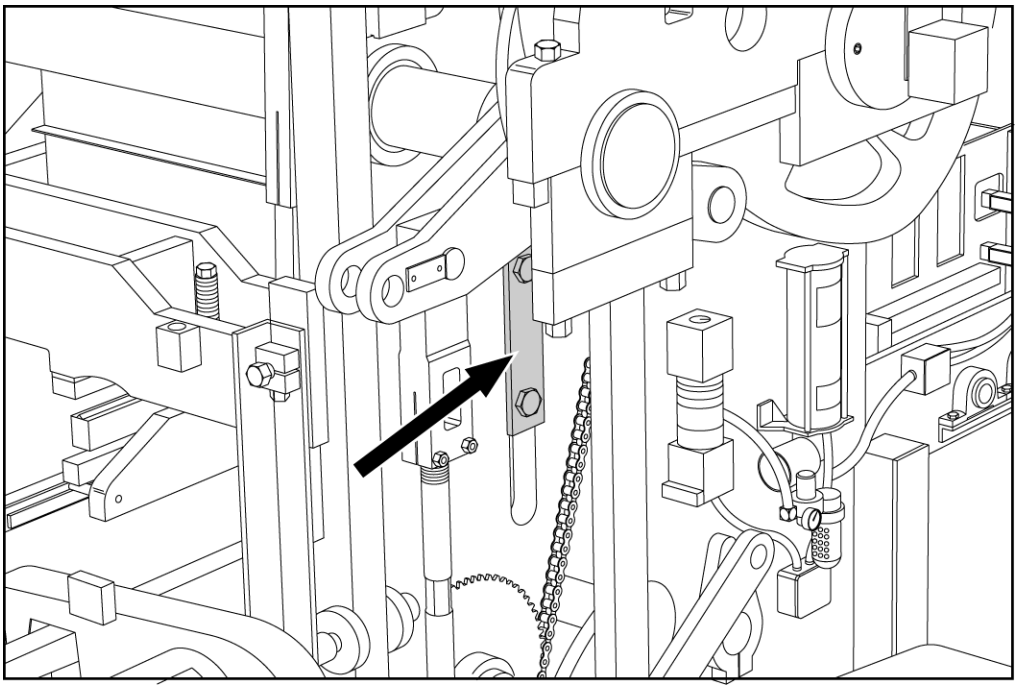


Figure 4.49 *LOOSEN "T" CLAMPS ON BOTH SIDES*

b. Loosen bolts at all 4 corners that secure mold throat assembly (figure 4.50 and 4.51). Remove top spacers.

c. Raise mold throat frame up using the Graphic Control Display. From the Run Screen, press the **F1** key; you will access the Hand & machine set-up screen (figure 4.52). From this screen press the **F11** key to raise inner frame. Press the **F12** key to lower inner frame. You must raise inner frame just high enough to allow all lower spacers to be removed at all four corners.

d. Slowly lower entire mold throat assembly until supports contact at all 4 corners.

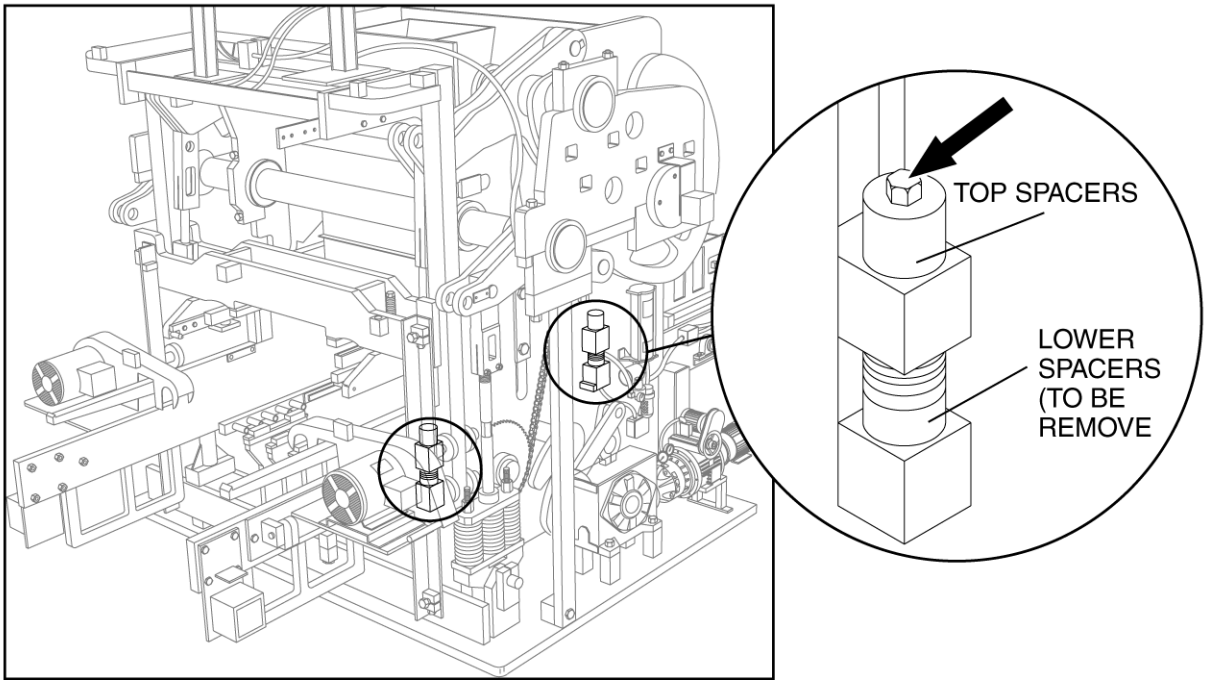


Figure 4.50 *BOLTS AT ALL 4 CORNERS (RIGHT SIDE SHOWN)*

Figure 4.51 *LOOSEN BOLTS*

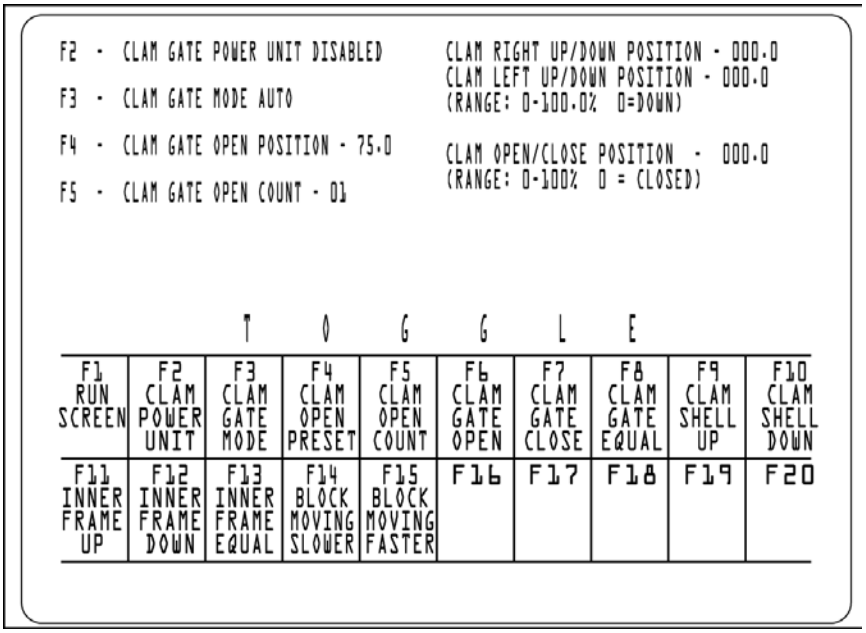


Figure 4.52 *THE HAND & MACHINE SET-UP SCREEN*

e. Store spacers on bottom side of bolt for front bolts and left hand rear bolt. For right hand rear bolt,store spacers on top. Tighten bolts at all 4 corners that secure mold throat plate spacers (see figure 4.53).

f. Tighten "T" clamps on each side of machine that secure machine side plate to mold throat plate. See figure 4.54 below.

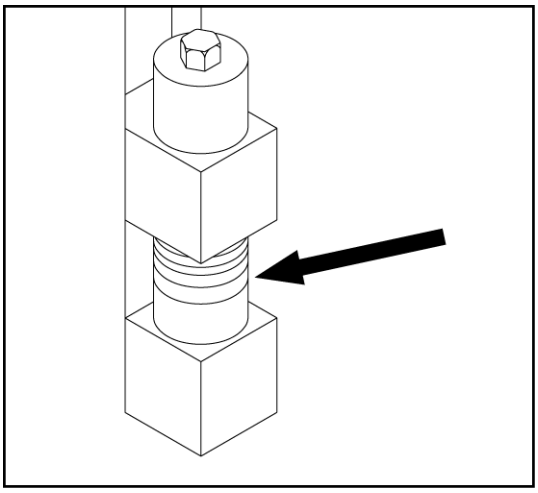


Figure 4.53 *63MM (2 1/2") OF SPACERS*

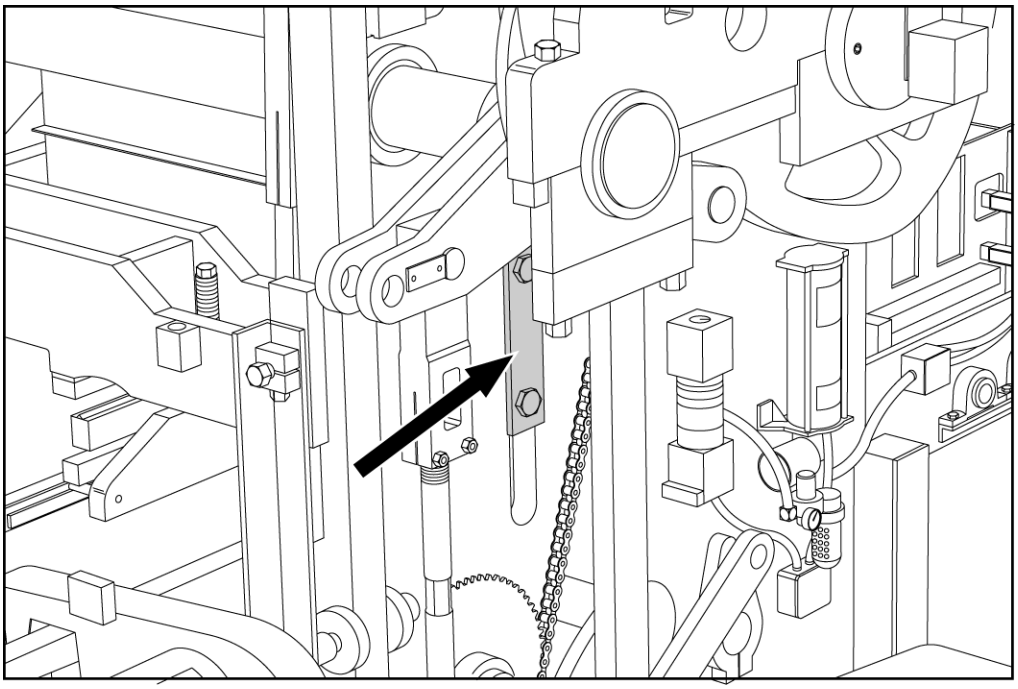


Figure 4.54 *TIGHTEN "T" CLAMPS ON BOTH SIDES*

4.4.3 Remove the stripping cam insert from each side of the machine. This concrete unit is run without any stripping cam inserts (see figure 4.55).

4.4.4 The following items should be positioned as shown on figures 4.56 and 4.57:

a. Pallet receiver shaft - position pins in outside holes (long stroke)(see figure 4.56).

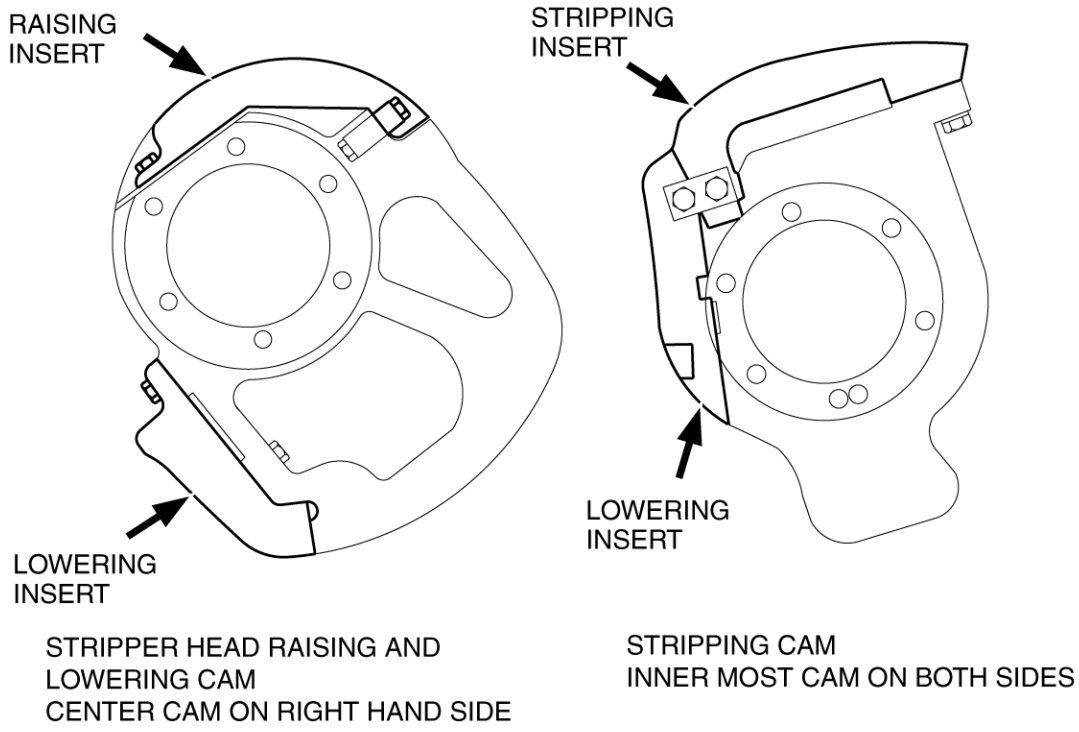


Figure 4.55 *STRIPPING CAM INSERTS*

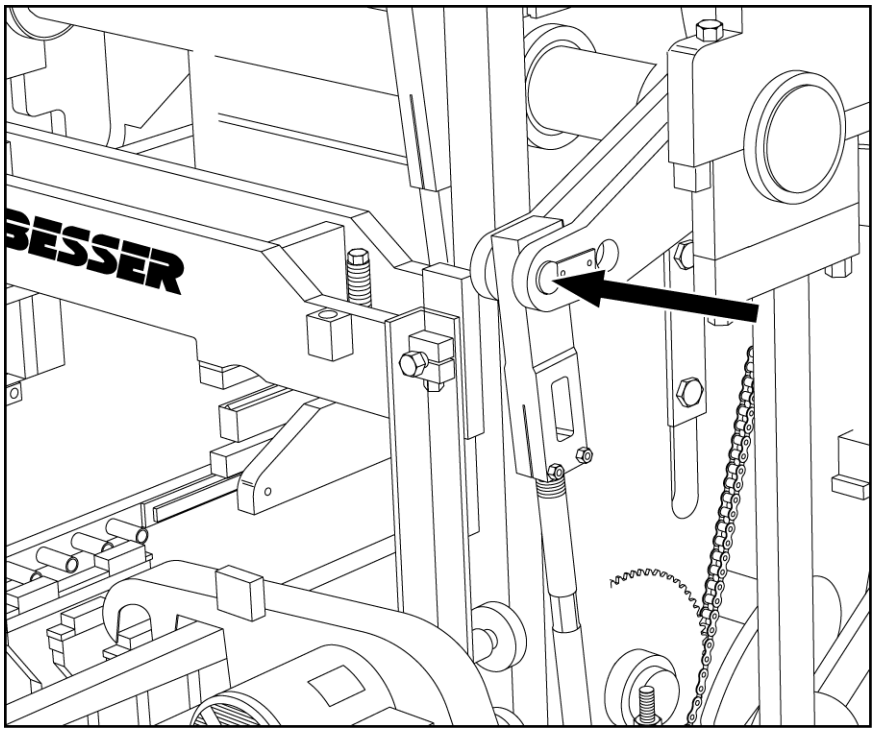


Figure 4.56 *PALLET RECEIVER SHAFT POSITION*

b. Stripper head shaft (A) - position pins in inside holes (short stroke) (see figure 4.57).

c. Stripper head links (B) - position pins in top holes. Adjust links to obtain approximately **105mm (4 1/8") between link ends** (see figure 4.57).

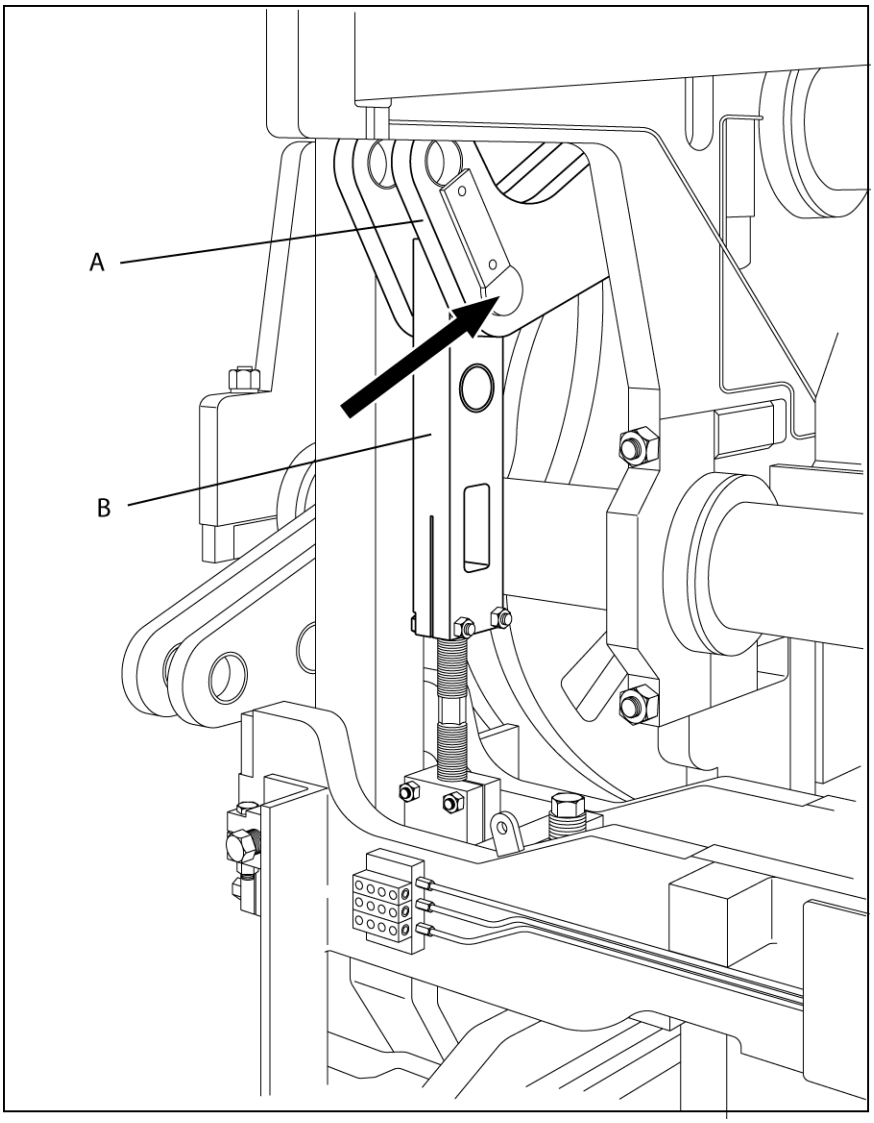


Figure 4.57 *STRIPPER HEAD SHAFT AND LINKS*

4.4.5 Run machine to "first stop" and adjust the pallet receiver links to obtain a dimension of **1219mm [48"]** from the top of the base plate to the tops of the pallet receiver rubbers (see figure 4.58). This adjustment should expose approximately **600mm [23 5/8"]** of link rod between the upper link end and the boss on the spring assembly (see dimension "A" on figure 4.59).

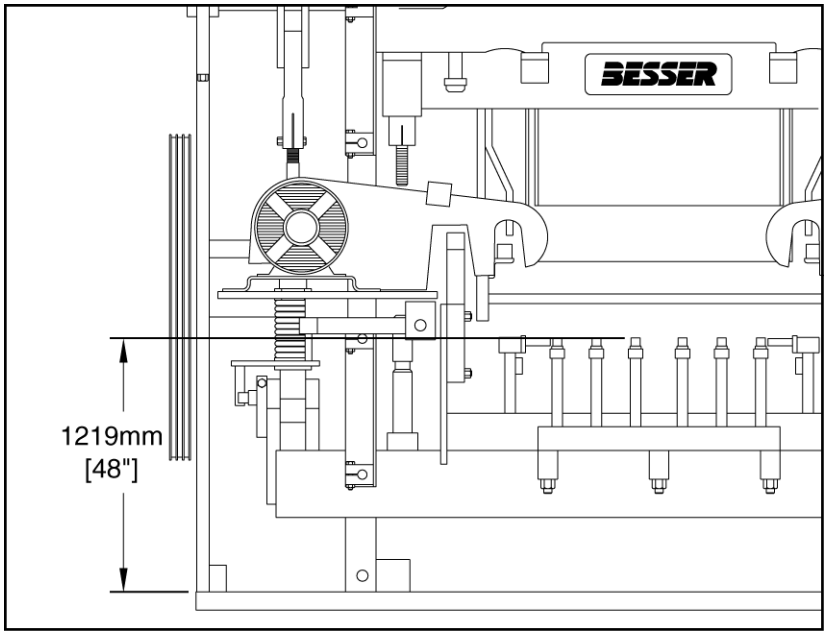


Figure 4.58 *PALLET RECEIVER RUBBERS ABOVE BASE PLATE*

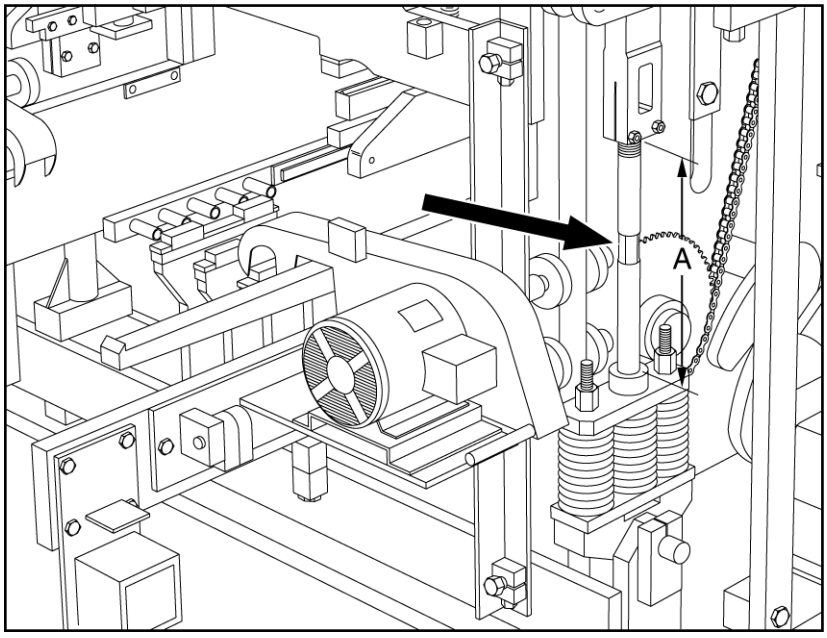


Figure 4.59 *LINK ROD*

4.4.6 Adjust the upper height stops **(part #047356)** so that **170mm [6.675"]** extend past the bottom of the castings (figure 4.60).

4.4.7 Install the **445mm [17 1/2"]** shock absorbers **(part #395992).** Adjust the shock absorbers to a dimension of **300mm [11.812"]** (represented by "A" in figure 4.61 from the bottom of the welded clamp block to the bottom of the rubber pad.

4.4.8 Install sheave **(part #112339F2075)** on the drive motor.

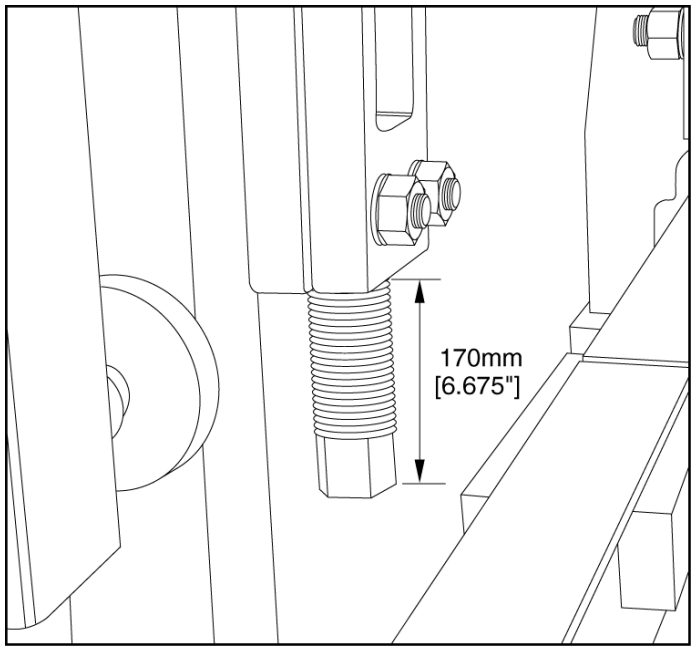


Figure 4.60 *UPPER HEIGHT STOPS*

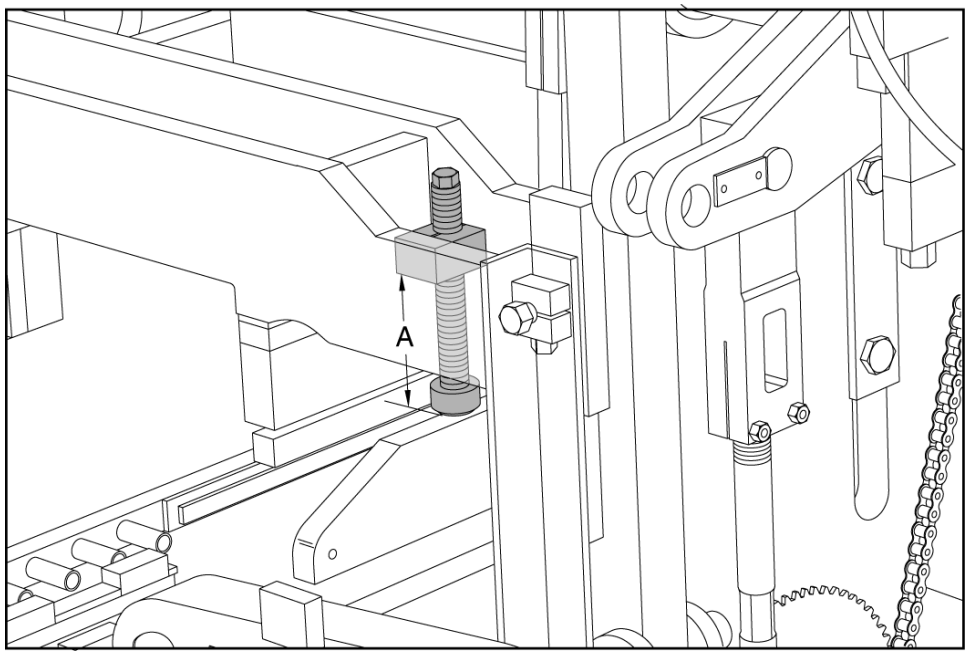


Figure 4.61 *INSTALLING SHOCK ABSORBERS AND ADJUSTING*

4.4.9 The ULTRAPAC II is now ready for the installation of the mold assembly. Follow the directions for installing an attachment in section 5 of this manual. When installing the stripper head, use **356 mm [11"]** long bolts **(part #087159)** and insert **95mm [3 3/4"]** of blocking in addition to the **38mm [1 1/2"]** blocks already affixed to the stripper head frame (figure 4.62).

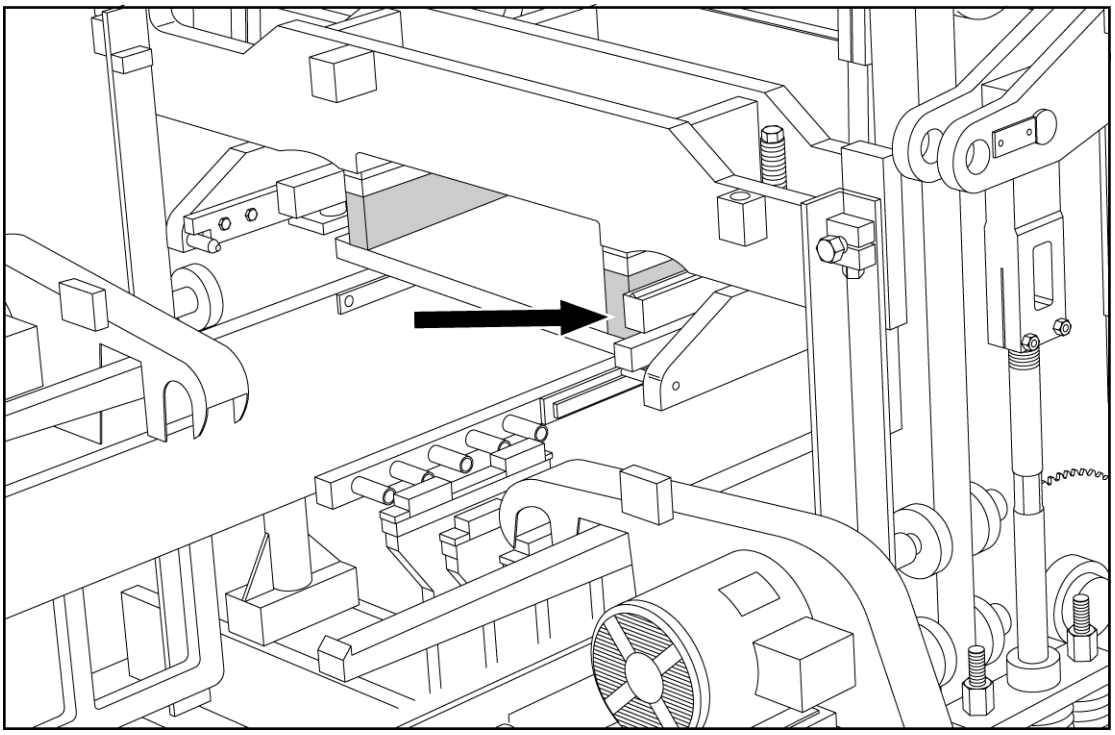


Figure 4.62 *95MM (3 3/4") BLOCKING UNDER STRIPPER HEAD FRAME*

SECTION 5
MOLD & STRIPPER HEAD INSTALLATION

NOTE: AS AN INITIAL CONDITION, IT IS ESSENTIAL YOU REVIEW SECTION 4 "MACHINE SET UP FOR SPECIFIC MOLD" BEFORE GOING THROUGH THIS SECTION.

5.1 BESSER MOLD ASSEMBLY & TORQUE REQUIREMENTS.

Longer mold life can be achieved by observing a few basic rules. Be sure to clean all parts and mating surfaces thoroughly before assembly. Always be sure parts are properly aligned and use proper torque requirements. To assure that parts are square, start with a good working surface (mold jig). A visual inspection is suggested to make sure parts are not burred or scored.

NOTE: Always start with new lock washers and use only a brass hammer.

NOTE: Use an adequate torque wrench to tighten at the proper torque.

5.1.1 Outside division plates should be torqued to 625 - 675 LB-FT, (930 - 1005 N-M). Outside division plates with cutouts for face liners should be torqued to 175 - 195 LB-FT (260 - 290 N-M).

5.1.2 Threaded inside division plates should be torqued to 40 - 50 LB-FT, (60 - 70 N-M). Tanged inside division plates should be torqued to 100 - 120 LB-FT, (150 - 180 N-M).

5.1.3 End liners should be torqued to 100 - 140 LB-FT, (150 - 210 N-M).

5.1.4 Core bars should first be fitted initially front and back.

5.1.5 Core bars should be torqued to 70 - 90 LB-FT, (105 - 135 N-M). Align front and back as uniformly as possible to the mold side bars. Check cores for center between division plates to assure uniformly block dimensions. (A wire can be secured through the hold down bolt heads as a safety to prevent the bolts from coming loose during constant vibration.)

5.1.6 Vibrator bolts should be torqued to 220 - 300 LB-FT, (330 - 450 N-M).

5.1.7 Stripper shoes should be torqued to 65 - 75 LB-FT, (100 - 110 N-M).

5.1.8 Align the stripper shoes.

5.1.9 Secure plungers to stripper head plate - 100 - 140 LB-FT, (150 - 210 N-M).

5.1.10 Center vibrator weights as close as possible to assure uniform vibration and that the nuts face towards the outside of the mold. Double weights should be located 0.5" [12.5mm] from edge of bearing enclosure.

NOTE: If the machine is equipped with optional Smartpac vibration system, vibrator weights are factory-positioned on shaft.

5.2 JOGGING AND RUNNING THE MACHINE.

There is two ways to operate the machine: you can jog it, or simply run it. Run the machine when you want to cycle it. Jog the machine when you want to stop the machine at a precise position. All controls to jog or run the machine are located on the Graphic Control Station (please refer to section 9 for more details).

5.2.1 To run the machine, follow this procedure:

a. Push the "MAIN DRIVE START" button.

b. With the main drive running, turn the "CLUTCH" selector switch to "ON". The machine starts cycling.

5.2.2 To jog the machine, follow this procedure:

a. Turn the "CLUTCH" selector switch to "JOG".

b. Depress and release the "JOG" button to move the machine gradually as the main drive is functioning.

5.3 REMOVING A MOLD

Follow this step by step procedure in order to remove a mold and stripper head from an ULTRAPAC II.

5.3.1 Run machine to “first stop” (feed box all the way forward). See figure 5.1.

5.3.2 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

5.3.3 Remove cut off bar and agitator grid.

5.3.4 Make sure no one is standing on or near machine and turn power back on. Hit MCR reset button and start drive motor.

⚠	**DANGER:** Always turn power off and mechanically lock out electrical panel before working on Concrete Product Machine. Always follow the safety tips listed in the Safety section of this manual. During the course of the following procedure, you will be asked to periodically turn power off and lock out machine. It is important you do so for your safety and the safety of personnel working on the ULTRAPAC II !

⚠	**WARNING:** No one should be standing next to machine when running machine to “first stop”. Feed box coming forward is dangerous and could lead to serious injuries!

5.3.5 Run machine to “third stop”. (Stripper head frame and pallet receiver frame all the way down).

5.3.6 Turn clutch to "JOG" until stripper head is high enough above mold to insert blockings inside mold.

5.3.7 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

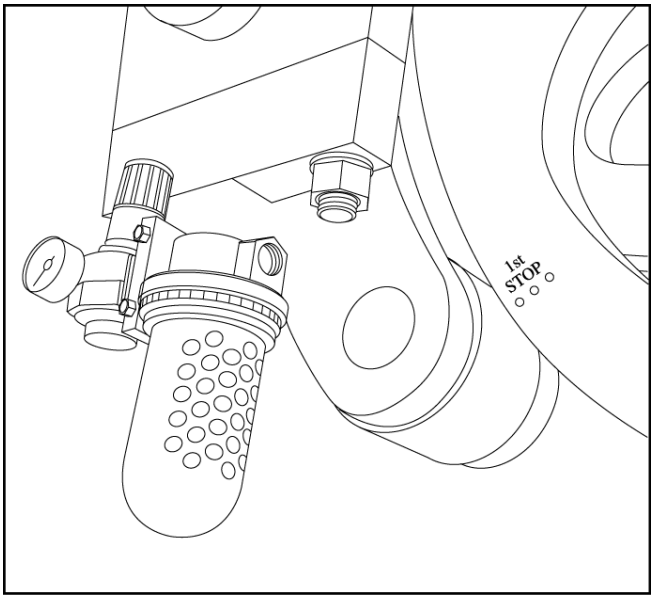


Figure 5.1 *“FIRST STOP”*
(R.H. SIDE OF MACHINE)

5.3.8 Put 2 X 4’s wooden blockings in mold as shown in figure 5.2.Use two pieces of 2" x 4" x 8" wood blocking, and one piece of 2” x 4" x 7-1/2” to assure a space between stripper head plate and mold top plate. Use the 8" blockings in the rear corners and the 7-1/2” blocking in the front center to clear bolt holes in the stripper head top plate.

5.3.9 Make sure no one is standing on or near machine and turn power back on. Hit MCR reset button. **Do not** start main drive motor.

5.3.10 Jog machine until stripper head frame is resting on 2 X 4's blockings. Weight of stripper head will turn machine in reverse.

5.3.11 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

5.3.12 Remove bolts holding the head assembly (figure 5.3).

5.3.13 Make sure no one is standing on or near machine and turn power back on. Hit MCR reset button.

5.3.14 Jog machine to bring stripper head high enough to connect safety chain (figure 5.4).

5.3.15 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

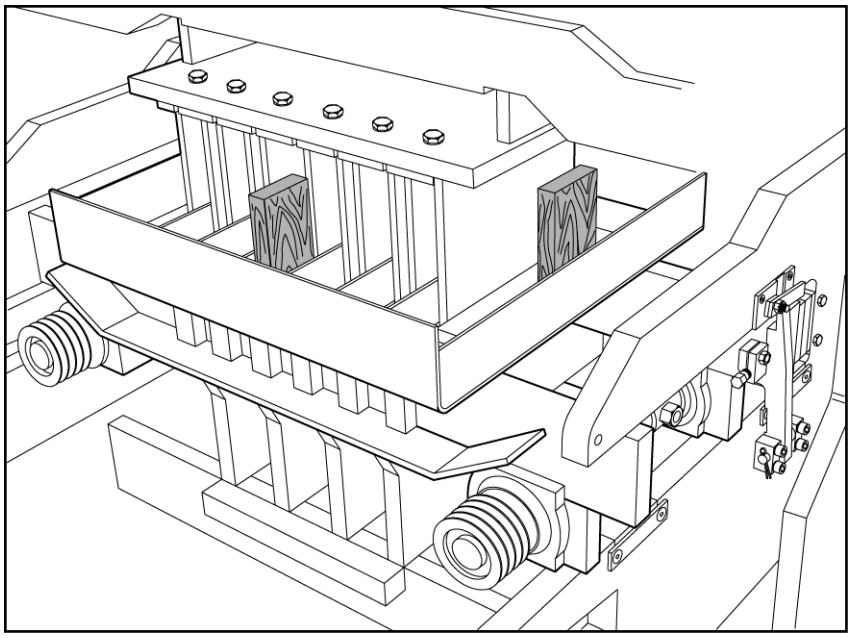


Figure 5.2 *WOODEN BLOCKINGS IN MOLD*

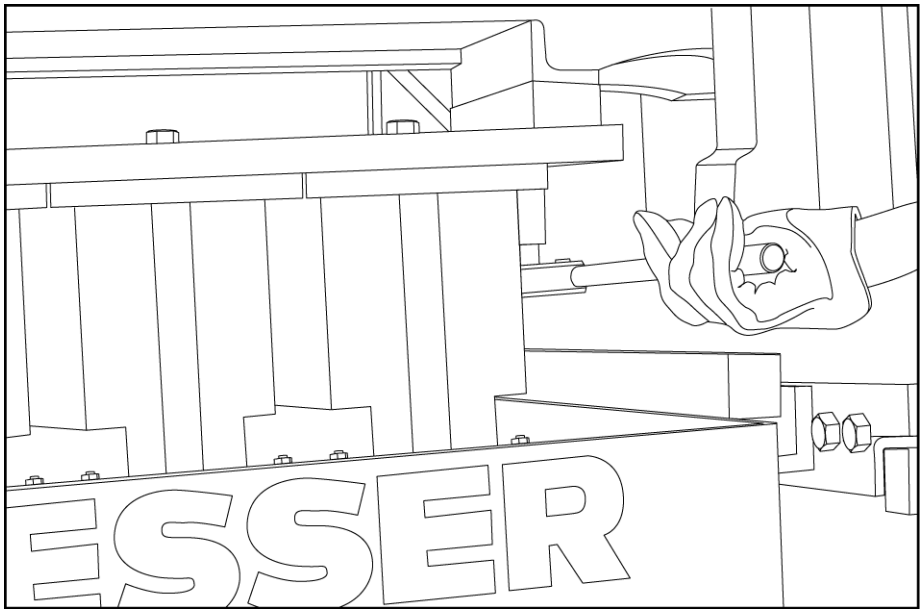


Figure 5.3 *REMOVING BOLTS FROM BOLT STRIPPER HEAD PLATE*

5.3.16 Hook safety chain as shown in figure 5.4.

5.3.17 Make sure no one is standing on or near machine and turn power back on. Hit MCR reset button. **Do not** start main drive motor.

5.3.18 Jog clutch until stripper head comes down and is supported by safety chain.

5.3.19 Keep jogging until pallet receiver is at lowest position.

5.3.20 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

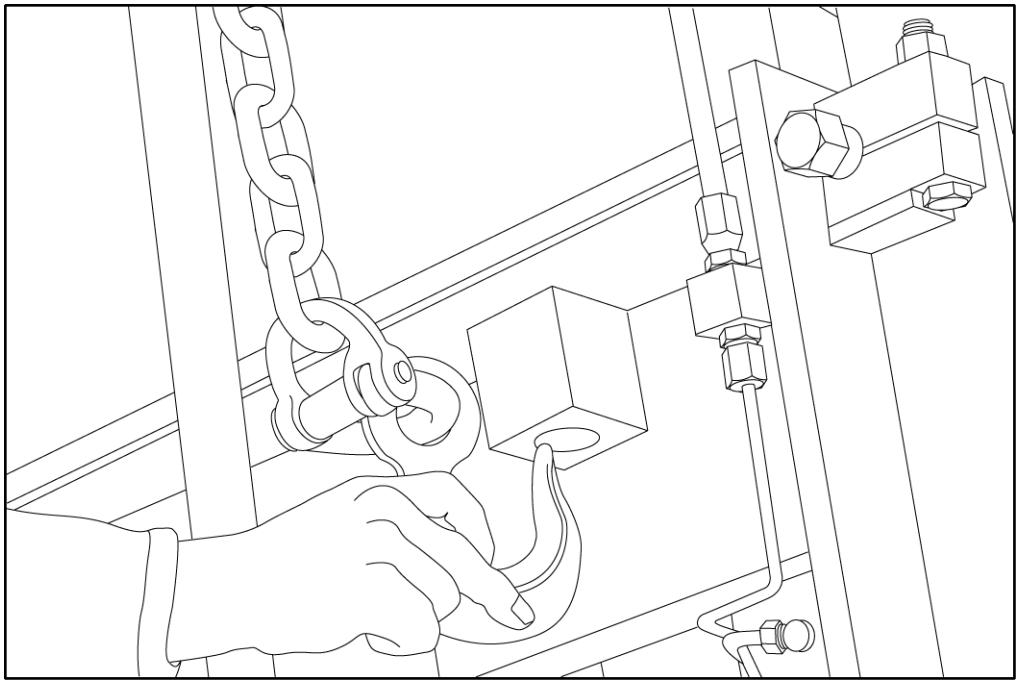


Figure 5.4 *ATTACHING STRIPPER HEAD FRAME WITH SAFETY CHAIN*

5.3.21 Disconnect vibrator shaft hose from dump valve and cap (on Smartpac vibration system only).

5.3.22 Lift up vibrator guards.

5.3.23 Raise both vibrator motors with screw jacks (C) (see figure 5.5).

5.3.24 Remove V-belts from vibrating motor sheaves to vibrating shaft sheaves.

5.3.25 Open mold locks (left and right) as shown in figure 5.6.

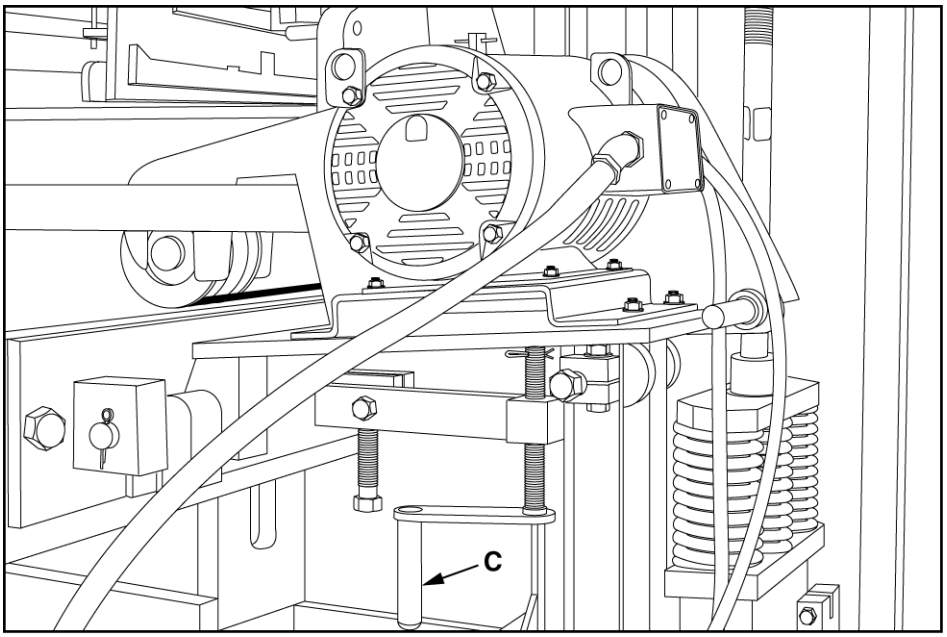


Figure 5.5 *RAISING THE VIBRATOR MOTORS WITH SCREW JACK (C)*

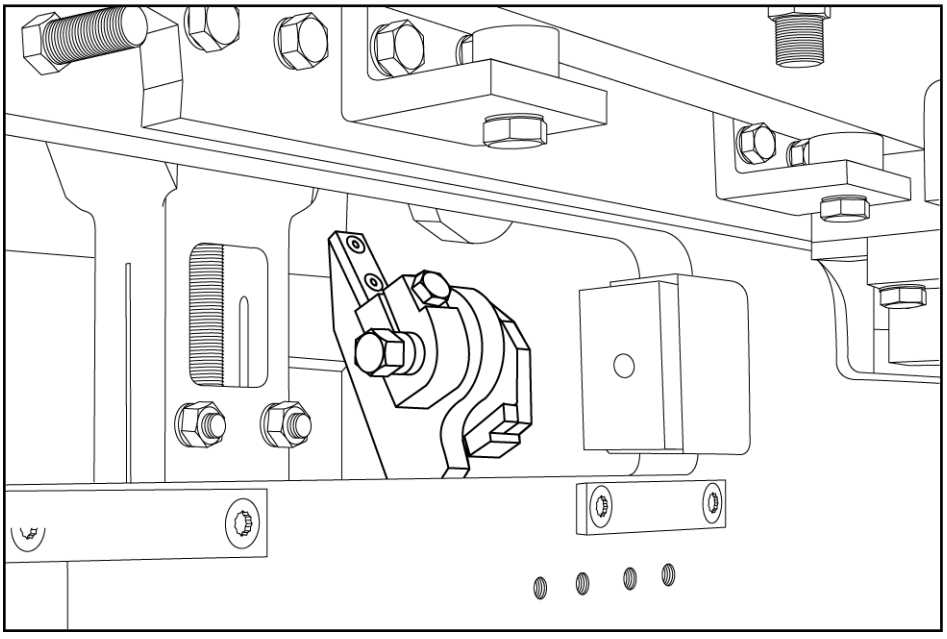


Figure 5.6 *MOLD LOCKS IN OPEN POSITION (LEFT LOCK SHOWN)*

5.3.26 If your machine is equipped with a Mold Insertion Device, push carriages under shaft assembly of mold. Then raise carriage to carry position using the hand control. Figure 5.7 shows the Mold Insertion Device in its lower position.

5.3.27 Pull mold forward.

5.3.28 Chain mold as shown in figure 5.8.

5.3.29 Remove mold. We recommend the use of an overhead crane.

	**CAUTION:** Molds are heavy pieces of equipment. Handle with extreme care.

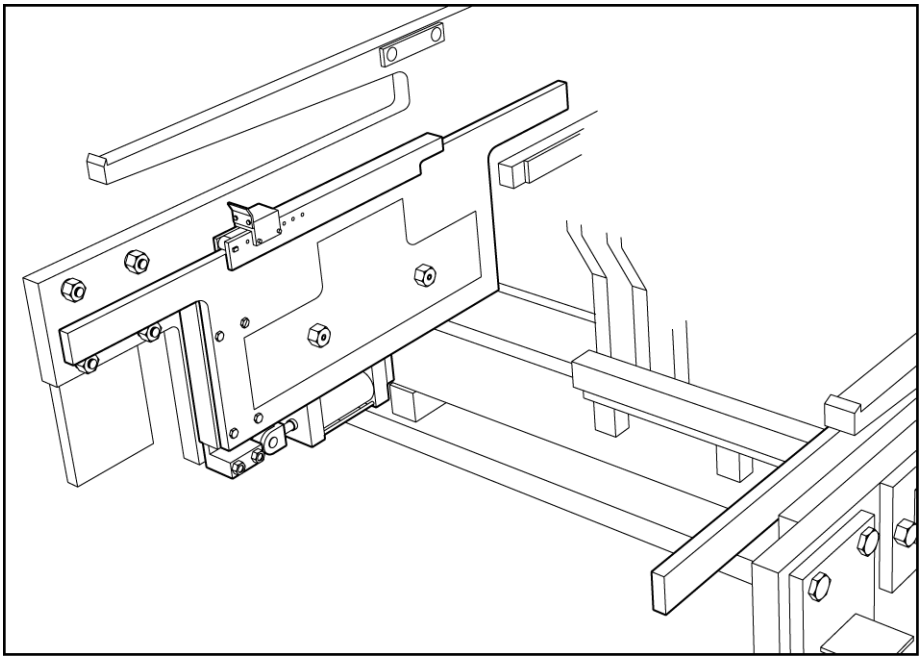


Figure 5.7 *MOLD INSERTION DEVICE IN LOWER POSITION*
THIS FIGURE HAS BEEN SIMPLIFIED FOR ILLUSTRATION PURPOSES

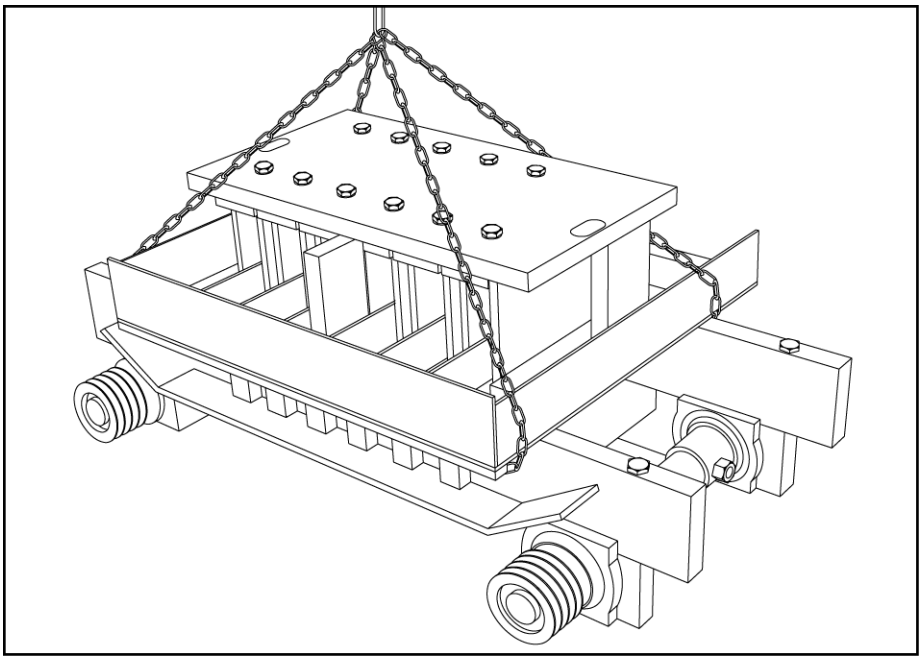


Figure 5.8 *MOLD IS CHAINED, READY TO BE TAKEN OUT OF MACHINE*

5.4 INSTALLING THE MOLD.

⚠	**DANGER: Always** turn power off and mechanically lock out electrical panel before working on Concrete Product Machine. **Always** follow the safety tips listed in the Safety section of this manual (see section 1). During the course of the following procedure, you will be asked to periodically turn power off and lock out machine. It is important you do so for your safety and the safety of personnel working on the ULTRAPAC II !

A. Preparing the machine for the mold.

5.4.1 Starting with machine in a stripped through position, both the pallet receiver frame and the stripper head frame are all the way down. Mold locks are in closed position and latched.

5.4.2 Jog the machine until the stripper head is high enough to hook up safety chain but before the feedbox starts forward (figure 5.9).

5.4.3 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

5.4.4 Hook safety chain to stripper head frame (see figure 5.9).

⚠	**DANGER: Do not** go on with this procedure without hooking safety chain to stripper head frame!

5.4.5 Make sure no one is standing on or near machine and turn power back on. Hit MCR reset button. **Do not** start main drive motor

5.4.6 Jog the machine to lower the stripper head so it hooks on the safety chain. The pallet receiver will lower. When it is low enough to allow easy mold change without interference with pallet receiver, that is sufficient.

5.4.7 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

NOTE: Sometimes the main drive pulley (ref. page 2.5) may have to be manually rotated clockwise to allow the pallet receiver to lower. To do so, the motor should be stopped and the clutch on.

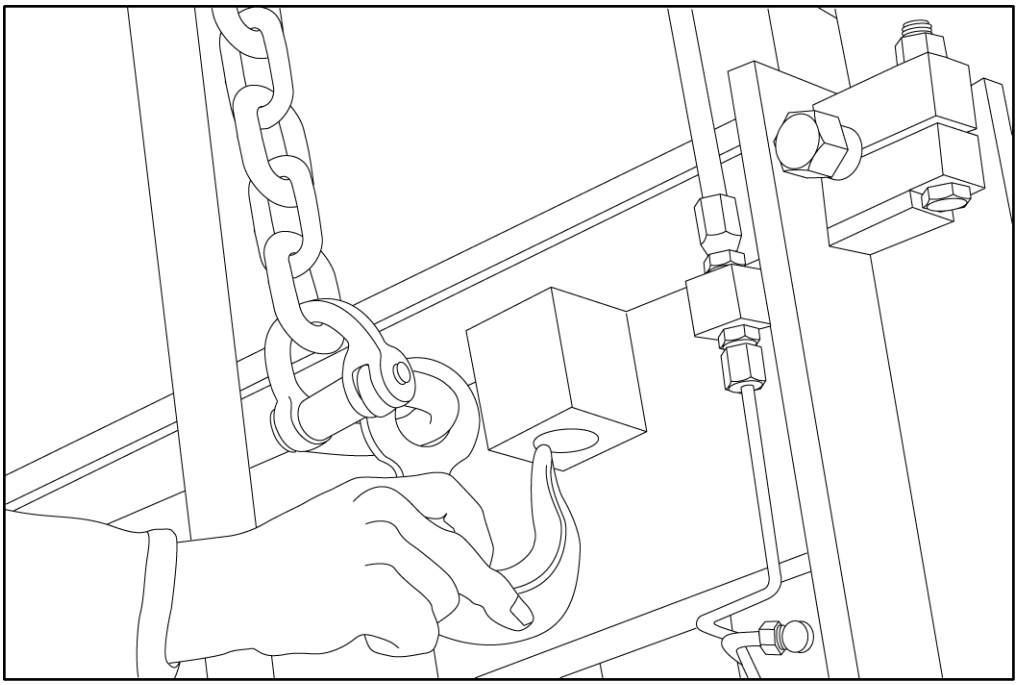


Figure 5.9 *ATTACHING STRIPPER HEAD FRAME WITH SAFETY CHAIN*

5.4.8 Open mold locks as shown in figure 5.10 below (one on each side).

5.4.9 Place stripper head down in mold using two pieces of 2" x 4" x 8" wood blocking, and one piece of 2” x 4" x 7-1/2” to assure a space between stripper head plate and mold top plate. Use the 8" blockings in the rear corners and the 7-1/2” blocking in the front center to clear bolt holes in the stripper head top plate (see figure 5.11).

NOTE: Make sure the cutoff bar and the agitator grid have been removed before putting a mold in the machine!

CAUTION: Stripper heads are heavy pieces of equipment. Handle with extreme care.

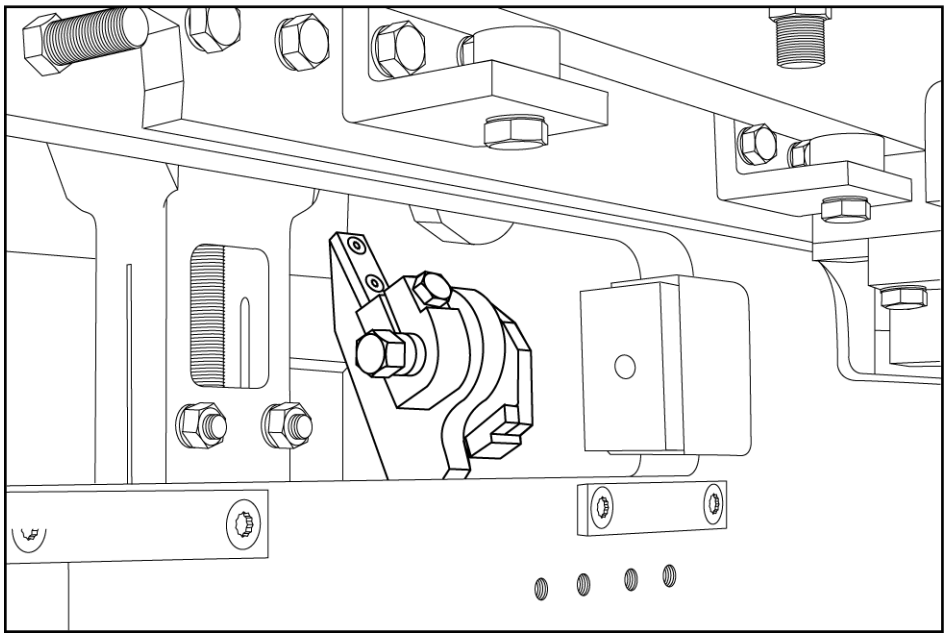


Figure 5.10 *MOLD LOCKS IN OPEN POSITION (LEFT LOCK SHOWN)*

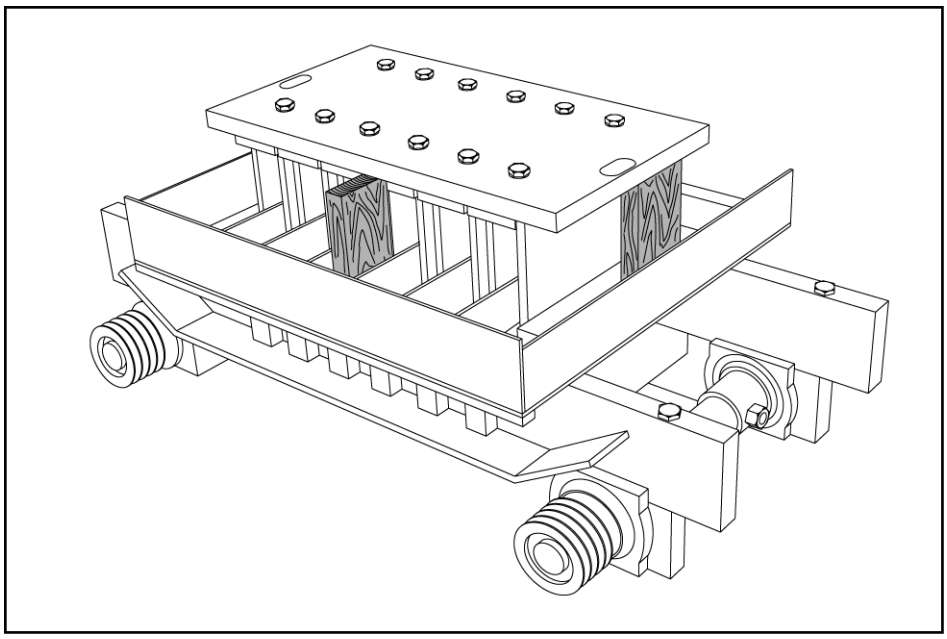


Figure 5.11 *STRIPPER HEAD POSITIONED IN MOLD*

5.4.10 Chain mold with stripper head as shown in figure 5.12 below. The weight of a complete mold is approximately between 3500 lbs [1600 Kg] and 4000 lbs [1800 Kg]. We recommend the use of an overhead crane.

Mold is now ready to be placed in machine.

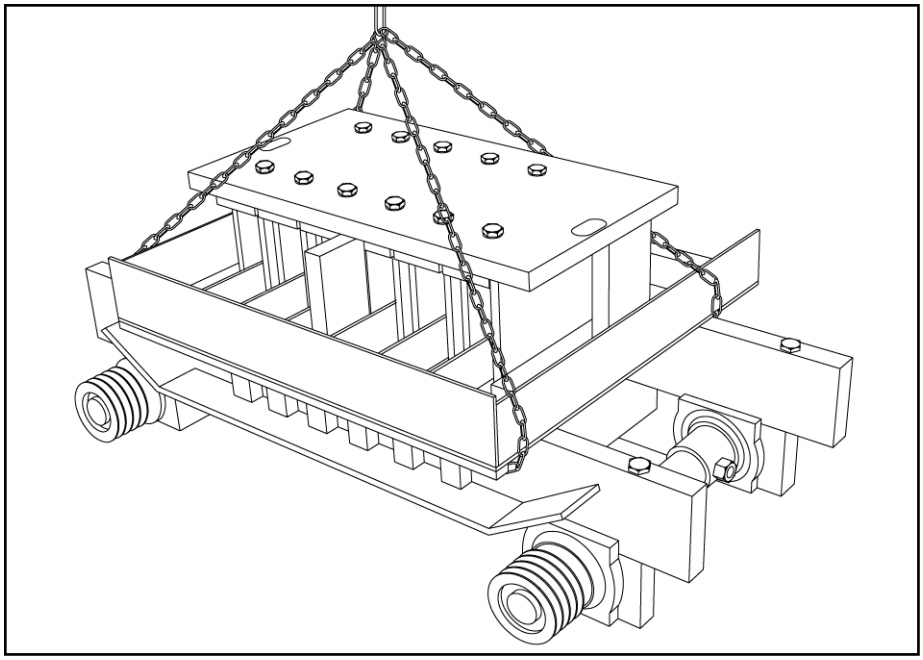


Figure 5.12 *MOLD IS CHAINED, READY TO BE PLACED IN MACHINE*

B. Placing mold and stripper head in machine without the use of the optional Mold insertion device.

5.4.11 Place mold and stripper head in machine (see figure 5.13), back against mold throat liners (E) (see figure 5.13b).

5.4.12 Close mold locks (A) and latch (B) (see figure 5.13b).

5.4.13 Loosen the clamp bolt (C) (see figure 5.13b).

5.4.14 Tighten the bolt (D) hand tight and then back off 1/4 of a turn (see figure 5.13b).

5.4.15 Tighten the clamp bolt (C) (see figure 5.13b).

Figure 5.13b *SECURING THE MOLD*

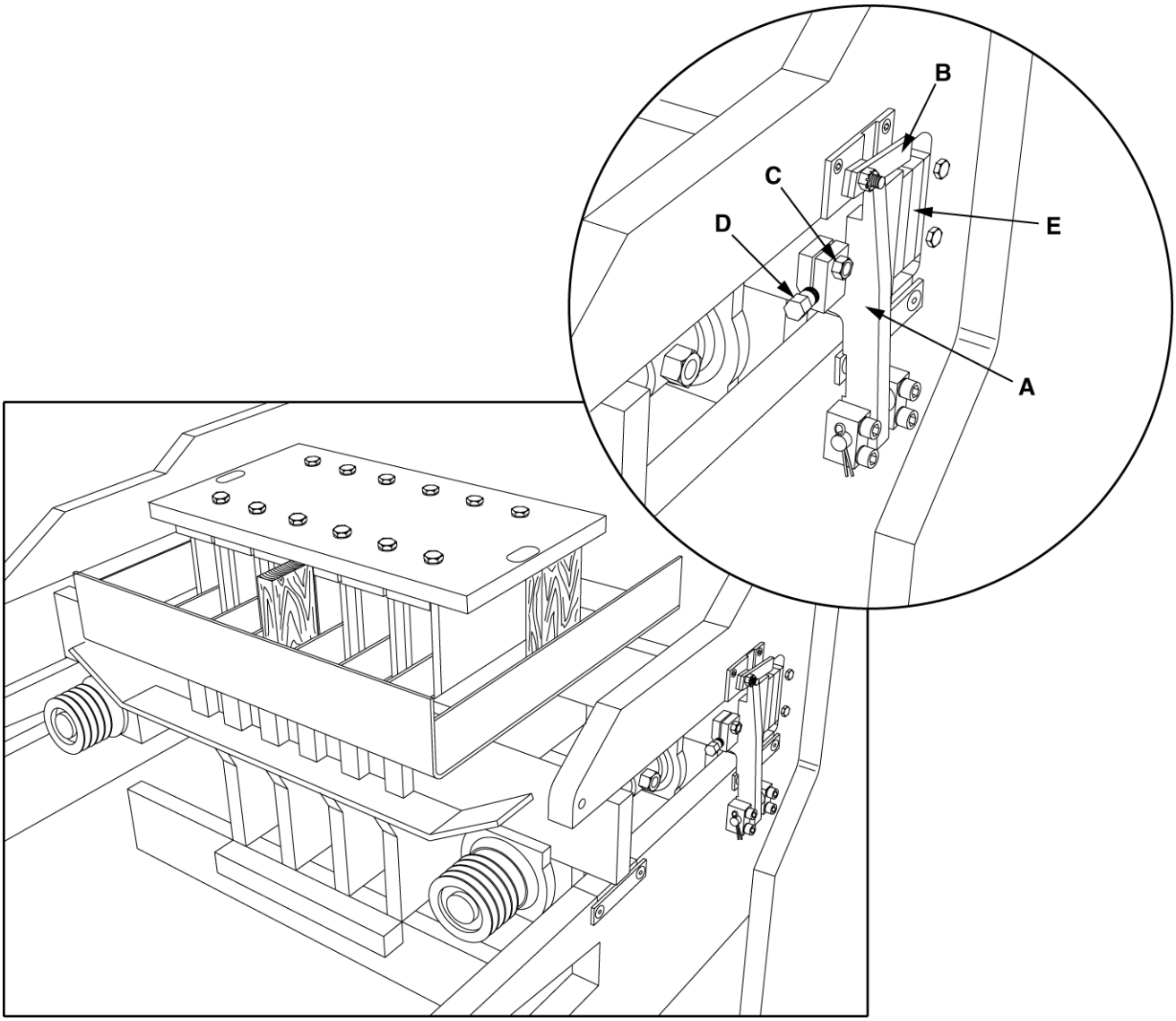


Figure 5.13 *PLACING MOLD AND STRIPPER HEAD IN MACHINE*
NOTE: THIS FIGURE HAS BEEN SIMPLIFIED FOR ILLUSTRATION

5.4.16 Raise both vibrator motors with screw jacks (C) (see figure 5.14). Screw vibrators jacks up and place V-belts from vibrating motor sheaves to vibrating shaft sheaves. On a standard vibration system, you must install 4 belts on each side. On a Smartpac system, you must install 2 belts on each side.

5.4.17 Lower right hand vibrator motor, then left hand vibrator motor to tighten belts. Make sure sheaves are aligned. Lower jack screws to cotter pins.

5.4.18 Make sure no one is standing on or near machine and turn power back on. Hit MCR reset button and start main drive motor.

5.4.19 Jog machine to raise the stripper head frame just high enough to disconnect safety chain.

5.4.20 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, lock out machine.

5.4.21 Disconnect safety chain, and hang it on chain hook.

⚠	**WARNING:** Do not raise the stripper head frame too high; otherwise the feedbox will come forward resulting in crush hazard!

5.4.22 Turn power back on. **Do not** start main drive motor. Turn clutch switch to the “Jog” position and push the “Jog” button to allow the stripper head frame to lower to the top of stripper head plate.

5.4.23 Bolt stripper head plate to stripper head frame. **Do not tighten bolts completely.** Tighten until head plate contacts the stripper head frame (see figure 5.15).

5.4.24 Place a good pallet on the pallet receiver rubbers.

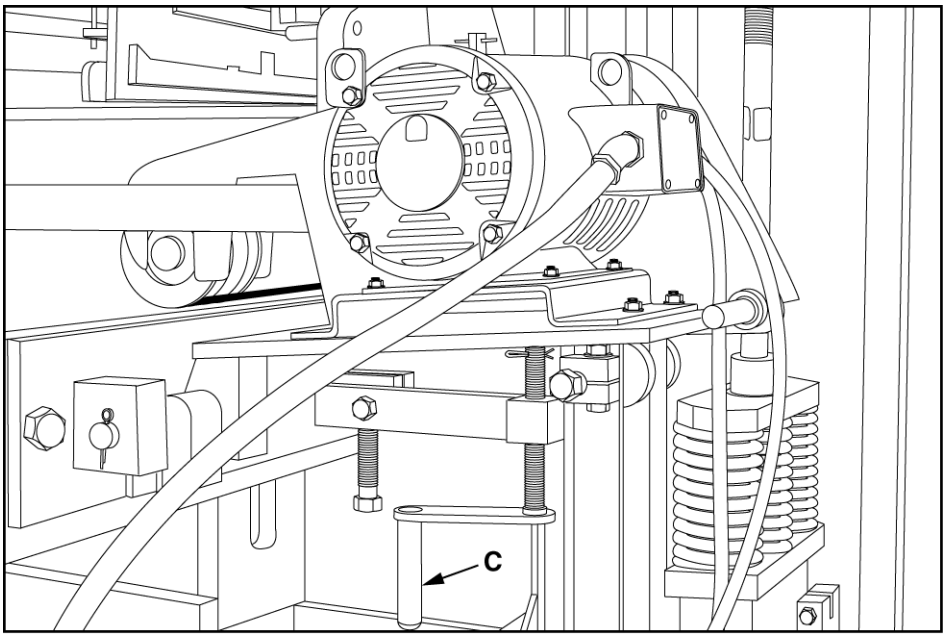


Figure 5.14 *RAISING THE VIBRATOR MOTORS WITH SCREW JACK (C)*

5.4.25 Start main drive motor. Jog machine to raise stripper head just high enough to remove 2"x4" blocking from under stripper head plate.

5.4.26 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, lock out machine.

5.4.27 Remove the rear blocks first, then remove the front block.

5.4.28 Make sure no one is standing on or near machine and turn power back on. Hit MCR reset button.

5.4.29 Cycle machine to “first stop” position (feedbox all the way to the front), turn clutch switch off and stop drive motor. At this point the mold and pallet should be on the pallet receiver rubbers (see figure 5.16).

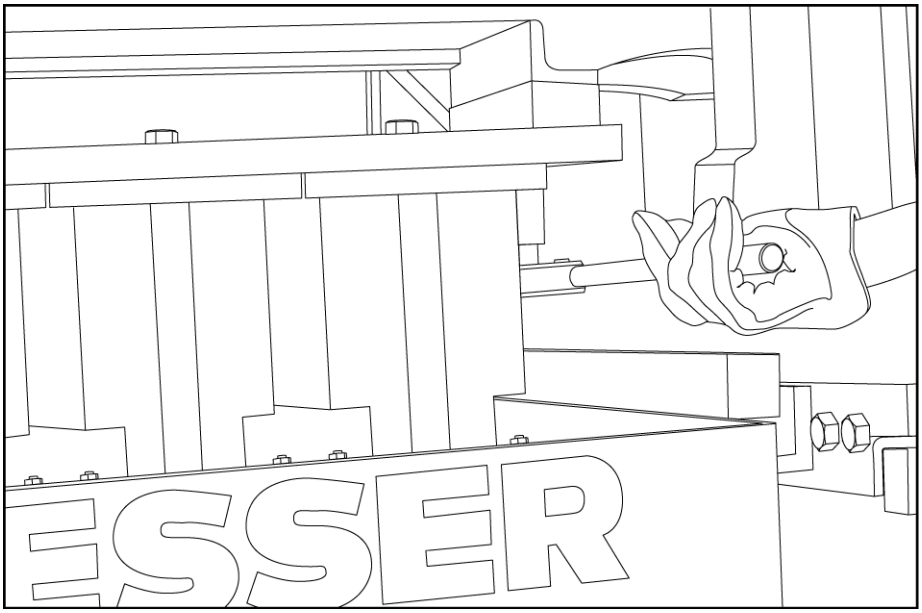


Figure 5.15 *BOLT STRIPPER HEAD PLATE TO STRIPPER HEAD FRAME*

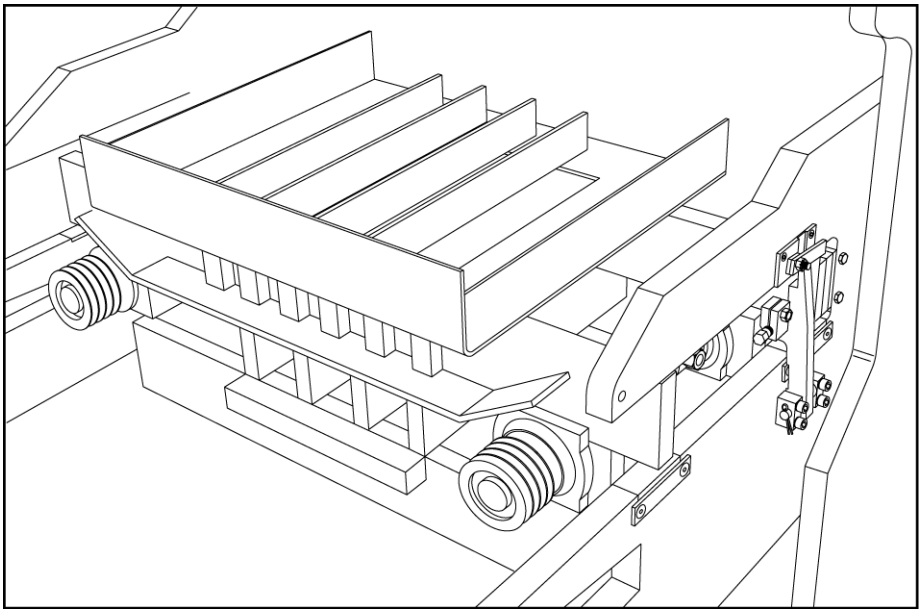


Figure 5.16 *MOLD RESTING ON THE PALLET RECEIVER*

5.5 ADJUSTING THE MOLD

A. Leveling the mold.

5.5.1 Run machine to “first stop” (feedbox all the way forward) (see figure 5.1).

5.5.2 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, lock out machine.

5.5.3 Check level of mold from side to side and from front to back until bottoms of mold side bars are approximately 5/8” [16mm] above mold throat plates at all four check points (see figure 5.17).

5.5.4 If the dimension on each side is not approximately 5/8" [16mm], adjustment must be made using the pallet receiver link rods (B) (see figure 5.18, next page), after loosening nut (A) (see figure 5.18).

5.5.5 Turn power back on and vibrate mold.

5.5.6 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

5.5.7 Check level of mold from side to side and from front to back until bottoms of mold side bars are 5/8” [16mm] above mold throat plates at all four check points (see figure 5.17).

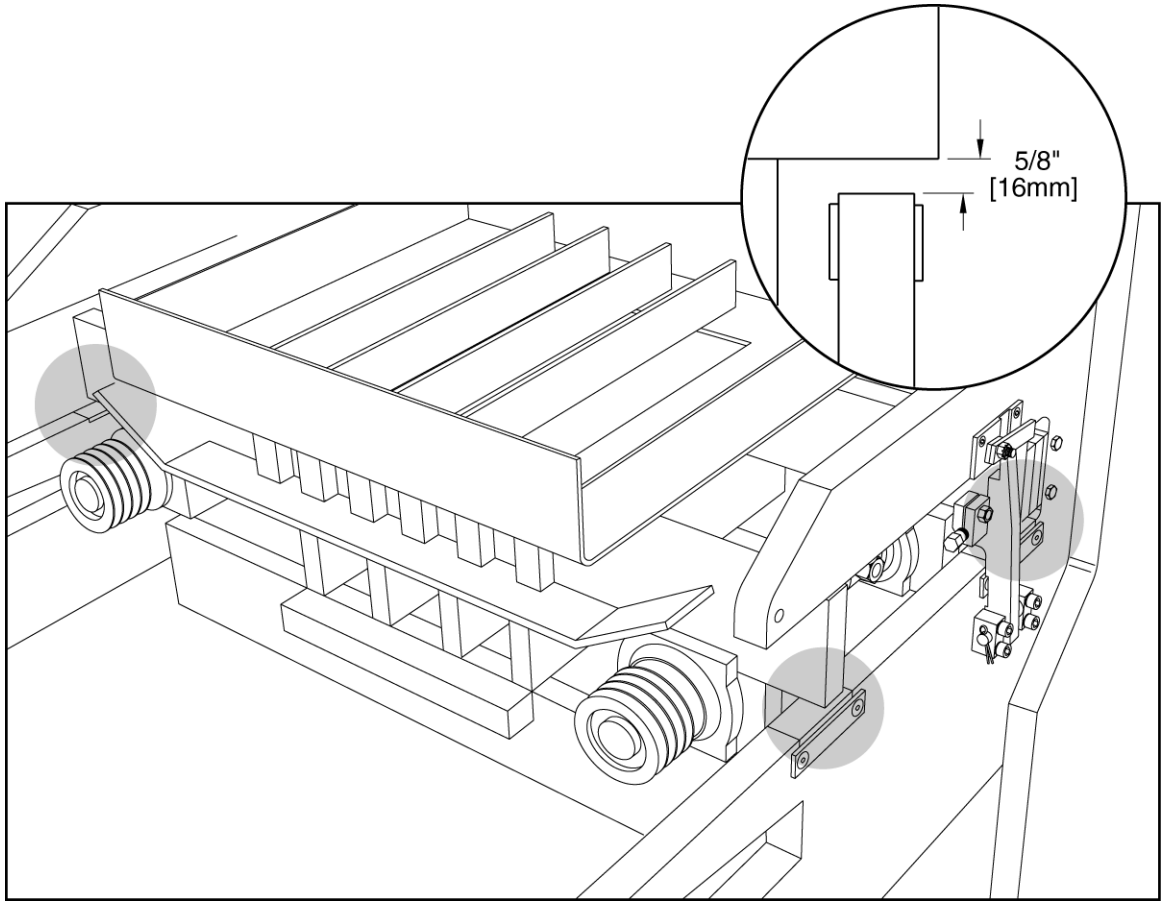


Figure 5.17 *SIDE TO SIDE DIMENSION (3 OF THE 4 CHECK POINTS SHOWN)*

5.5.8 If the dimension on each side is not 5/8" [16mm], adjustment must be made using the pallet receiver link rods (B) (see figure 5.18), after loosening nut (A) (see figure 5.18).

5.5.9 Turn power back on and vibrate mold again.

5.5.10 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

5.5.11 Recheck level of mold and adjust following steps 5.5.3 to 5.5.5 until mold is perfectly levelled. Tighten nut (A) (see figure 5.18).

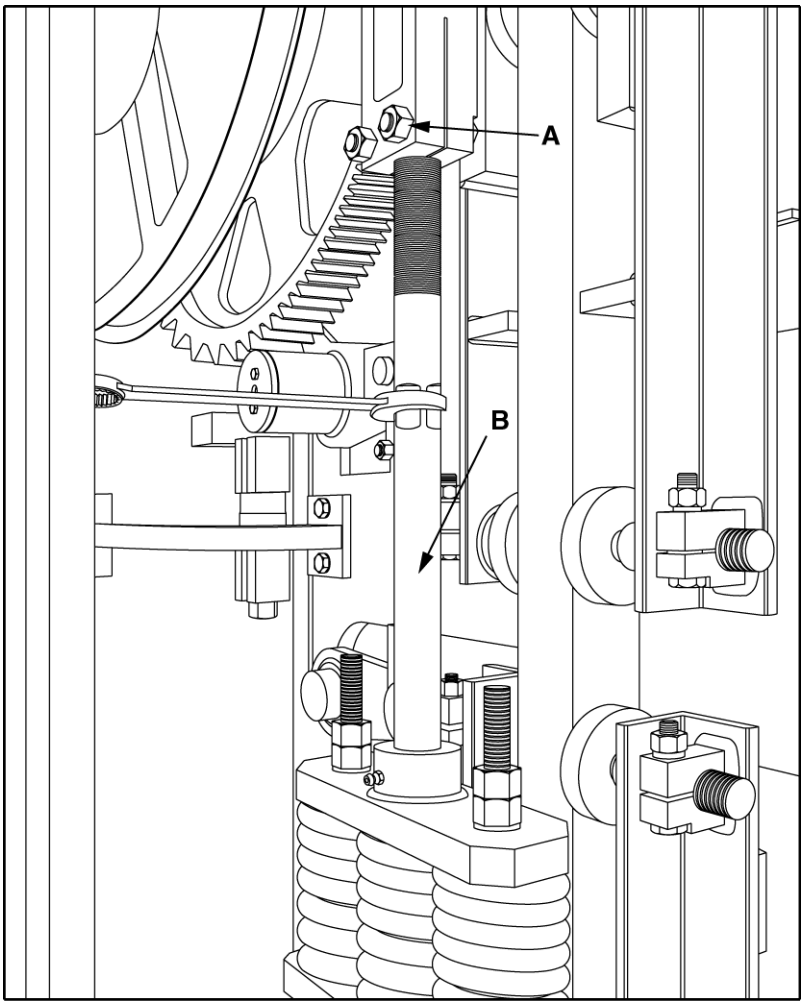


Figure 5.18 *PALLET RECEIVER LINK ROD (LEFT SIDE SHOWN)*

5.5.12 If the dimension in front and back is not 5/8" [16mm], carry out adjustment by first checking clearance of bottom guide liners on both sides of the machine. If clearance is off, tighten front screw hand tight and then back off 1/4 of a turn balancing out both guide liner adjusting screws. These screws are located at the bottom of the pallet receiver frame at the slide shaft on both sides of the machine.

a. To make the following adjustments (see figure 5.19):
   1. Loosen the nut (A).
   2. Adjust the guide liner (B) as desired.
   3. Tighten the nut (A).

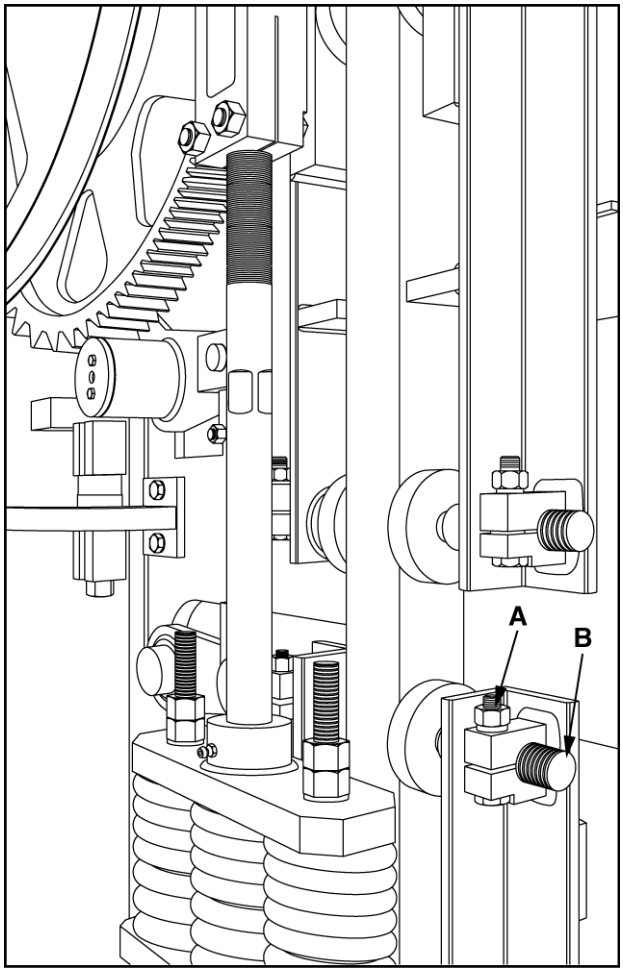


Figure 5.19 *UPPER GUIDE LINER ADJUSTMENT SCREW*

5.5.13 Make adjustments on right hand side by backing one guide liner away from slide shaft and tightening the other against the slide shaft. To raise the front, loosen the front and tighten the back. To raise the back, loose the back and tighten the front. See figure 5.20 below.

5.5.14 After 5/8" [16mm] adjustment is obtained, go back to the left hand side of the machine and retighten loosened guideliner adjusting screws. Then back rear screw 1/4 of a turn so this guide liner will move freely.

5.5.15 Vibrate between each adjustment. Turn clutch off and power off before checking dimensions and/or making adjustments.

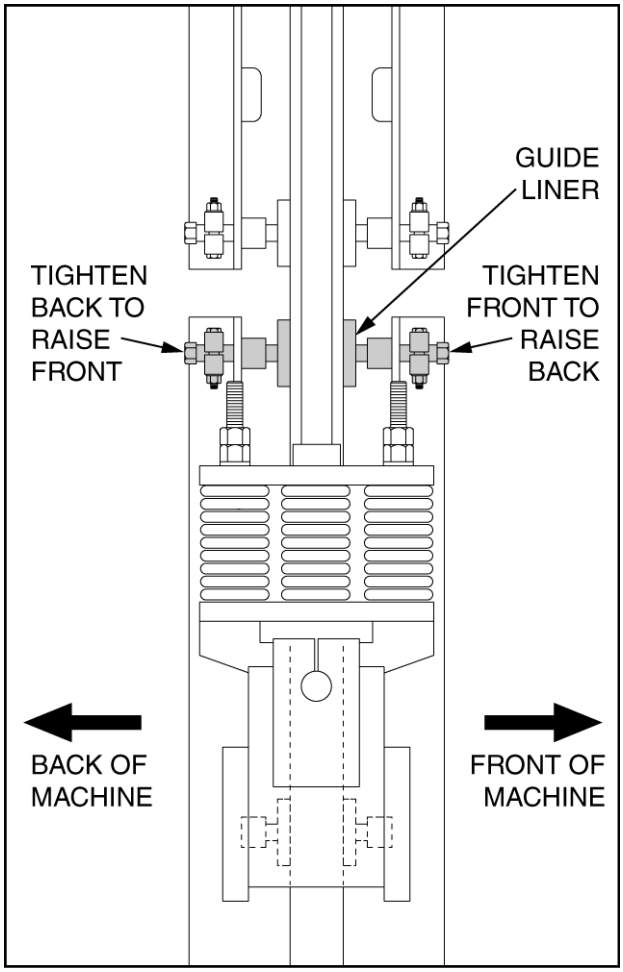


Figure 5.20 *PALLET RECEIVER FRAME ADJUSTMENT*

B. Mold lateral adjustment.

NOTE: The mold and pallet are supported by the pallet receiver frame.

5.5.16 Vibrate mold.

5.5.17 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, lock out machine.

5.5.18 Check for centered position in machine. Mold is centered when mold side bars are approximately 1” [25.4mm] between vibrator bearing blocks and the inside of mold throat plates (see figures 5.21 and 5.22).

NOTE: The 1” [25.4mm] wide gooseneck pry bar (part #61397) works nicely for mold centering.

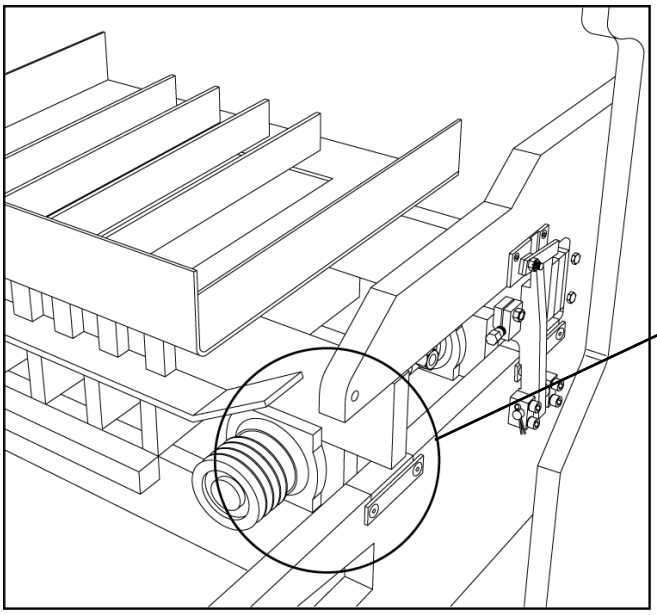


Figure 5.21 *CENTERING THE MOLD*
NOTE: *THIS FIGURE HAS BEEN SIMPLIFIED FOR ILLUSTRATION PURPOSES*

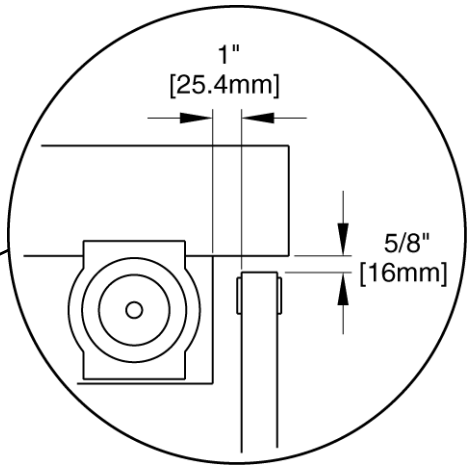


Figure 5.22 *USING THE 1" [25.4MM] DIMENSION TO CENTER THE MOLD*

5.5.19 Loosen clamp bolt (A) (see figure 5.23).

5.5.20 Turn adjusting screw (B) up until it contacts under side of right hand vibrating motor support plate (see figure 5.23). The adjusting screw (B) is located under the right vibrating motor.

5.5.21 Turn power back on. Hit MCR reset button.

5.5.22 Vibrate mold.

5.5.23 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, lock out machine.

5.5.24 Recheck 1” dimension. During vibration, if mold works off center to the right, turn adjusting screw (B) up (see figure 5.23) which will move the vibrating motor up. If molds works off center to the left, turn adjusting screw (B) down (see figure 5.23).

NOTE: Make sure base is not on the jacking screw (C) when adjusting vibrating motor height (see figure 5.23).

5.5.25 Repeat step 5.5.24 if necessary, until mold automatically remains centered. No adjustment is required on left hand vibrating motor. Equal belt tension is automatically maintained.

5.5.26 Tighten clamp bolt (A).

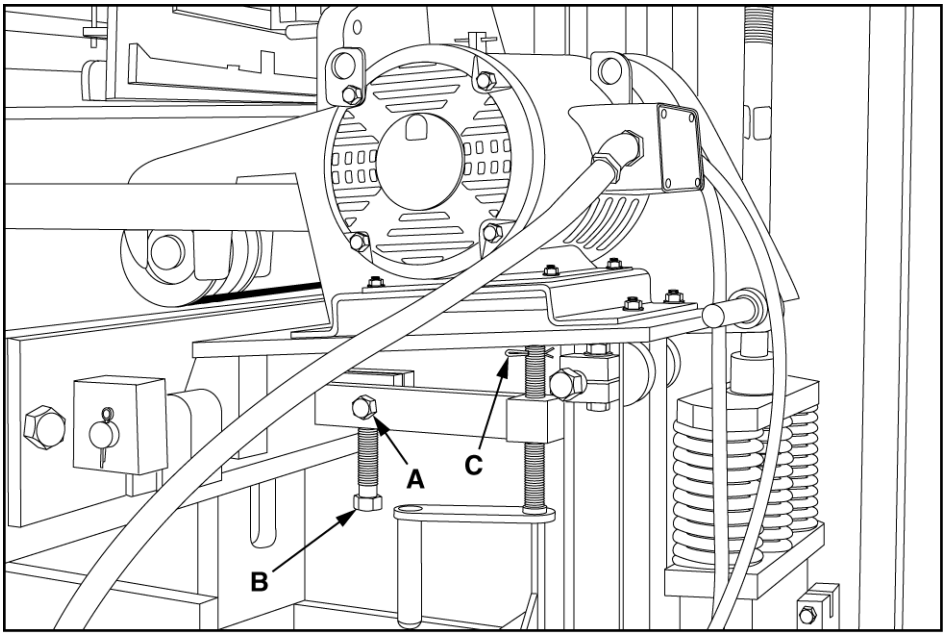


Figure 5.23 *VIBRATING MOTOR HEIGHT ADJUSTMENT SCREW (B)*

5.6 APRON PLATE ADJUSTMENT

WARNING: The following procedure must be done with power off and machine locked-out!

5.6.1 Adjust so the apron plate is 1/8" [3mm] above the mold top plate (figure 5.25) with the machine at “first stop”.

NOTE: 1/8" [3mm] is a good reference provided the feedbox does not contact the mold during vibration.

5.6.2 Check to see that there is approximately 1/32" [0.8mm] clearance between the apron plate and the back of the mold top plate (see figure 5.24 and 5.25).

5.6.3 If necessary, adjust apron plate. Loosen bolts and move forward or back (see figure 5.26).

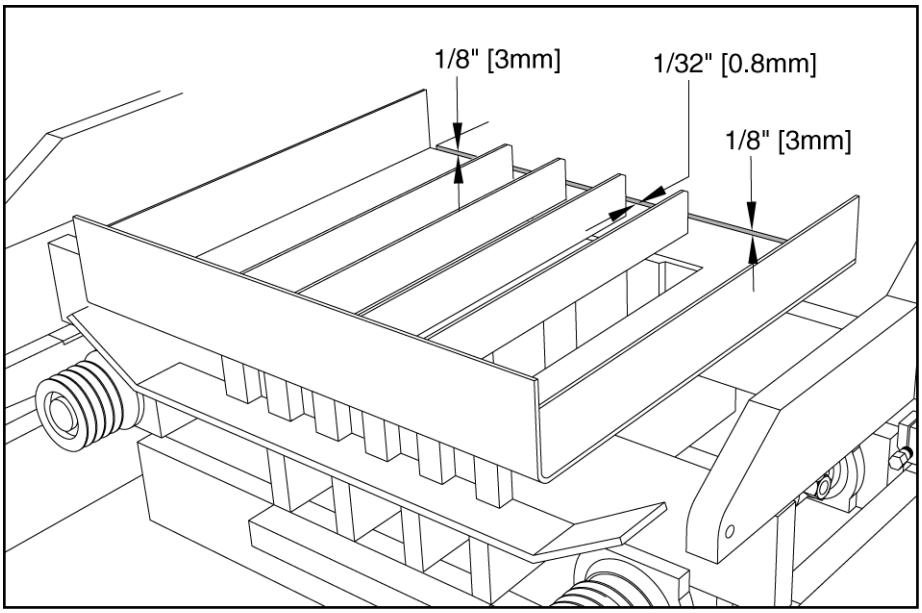


Figure 5.24 *APRON PLATE CLEARANCE*

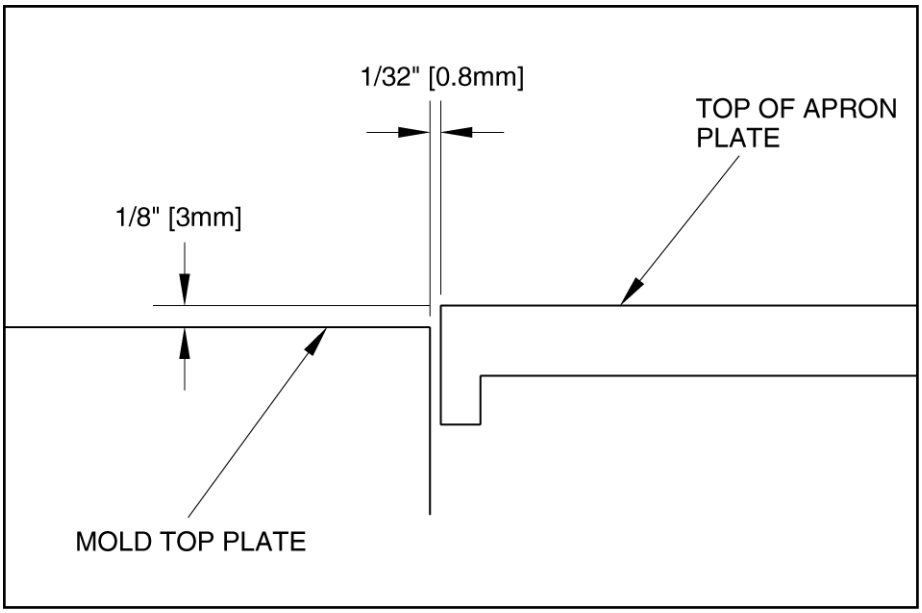


Figure 5.25 *APRON PLATE CLEARANCE*

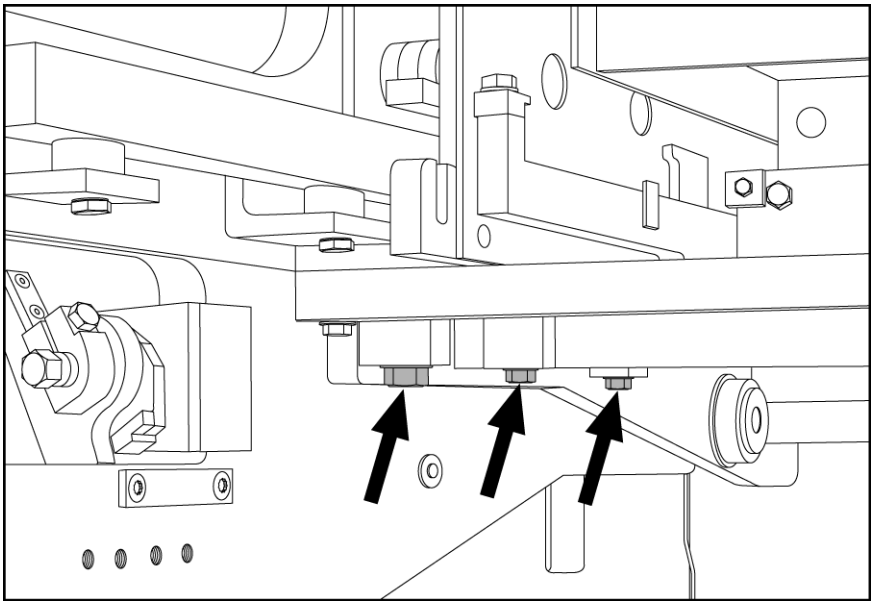


Figure 5.26 *APRON PLATE ADJUSTMENT (FORWARD TO BACK)*

5.6.4 Run machine to “first stop” (feed box all the way forward). See figure 5.1.

5.6.5 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, lock out machine.

5.6.6 Measure from bottom of shoe to top of mold end liners (see figure 5.27). Add dimension “C” to this measurement (dimension “C” is the amount of compression. For detailed explanations, see section 5.8).

5.6.7 Loosen nuts (A) and set height pins (B) to be this far away – the final result of the measurement in 5.5.6 – from lower height stops (figure 5.28).

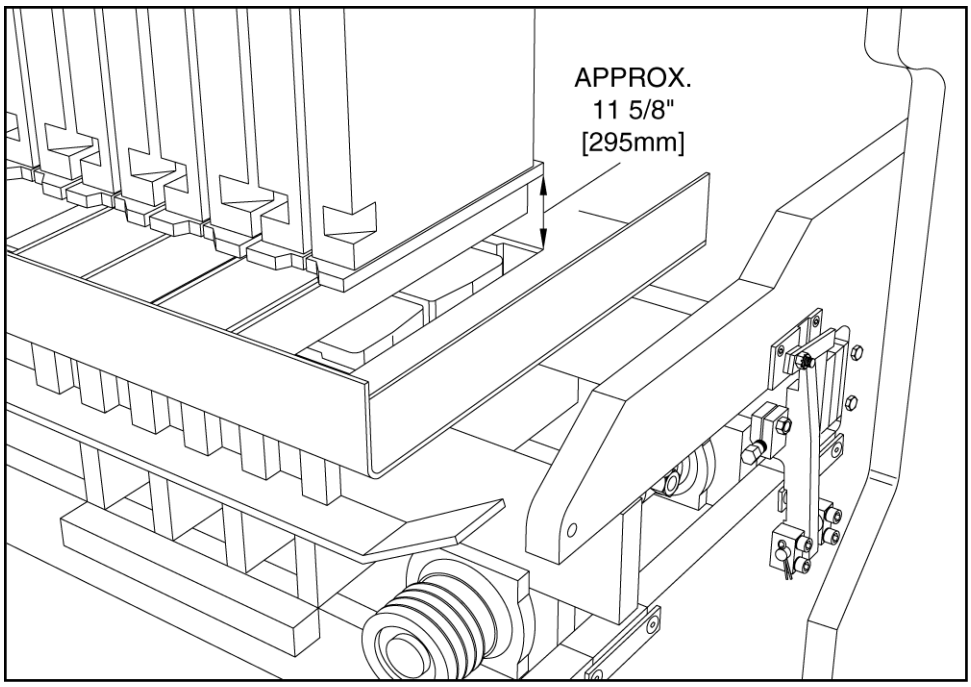


Figure 5.27 *SHOES 4" [102MM] ABOVE MOLD*

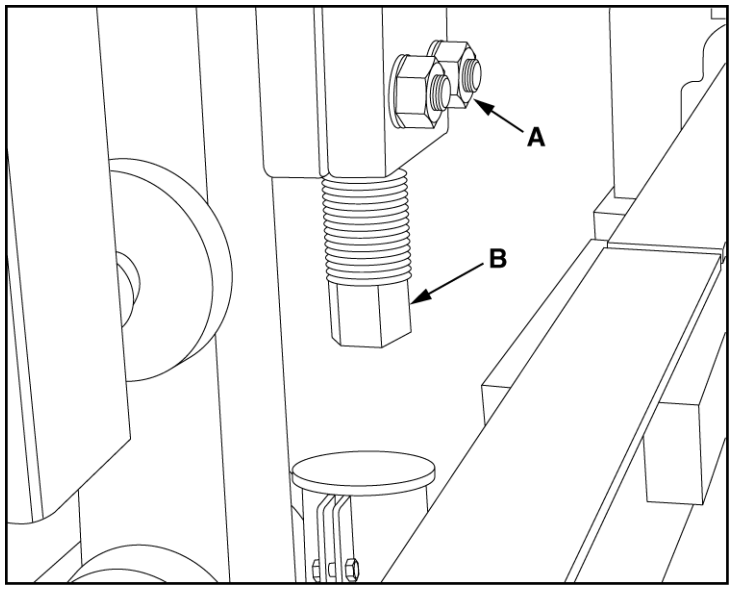


Figure 5.28 *HEIGHT PINS ADJUSTMENT (LEFT SIDE SHOWN)*

5.7 ADJUSTING STRIPPER HEAD

5.7.1 Run machine to “first stop” (feed box all the way forward). See figure 5.1.

5.7.2 To determine if the head is level with mold (left to right and front to back), measure how far the bottom of the stripper shoes are above the mold end liners at all 4 corners (A, B, C and D) (see figure 5.30).

5.7.3 If the head is not levelled side to side (A to B) (see figure 5.30), adjust the left hand stripper head adjusting link (see figure 5.29).

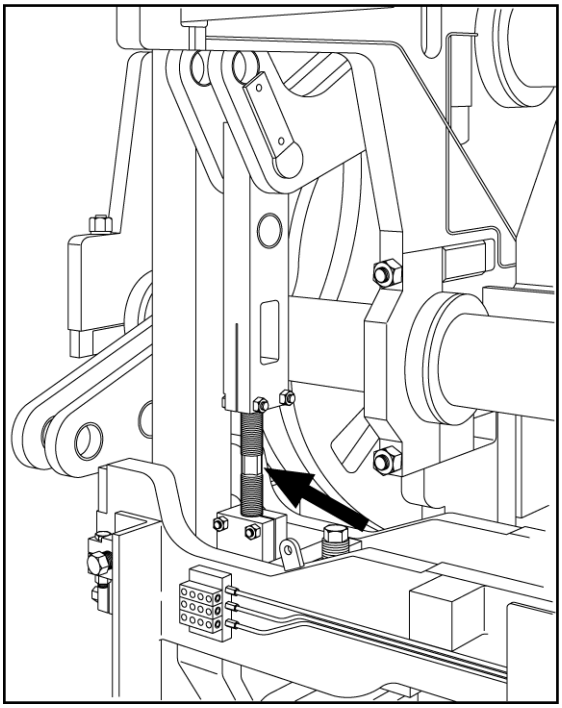


Figure 5.29 *L.H. STRIPPER HEAD LINK*

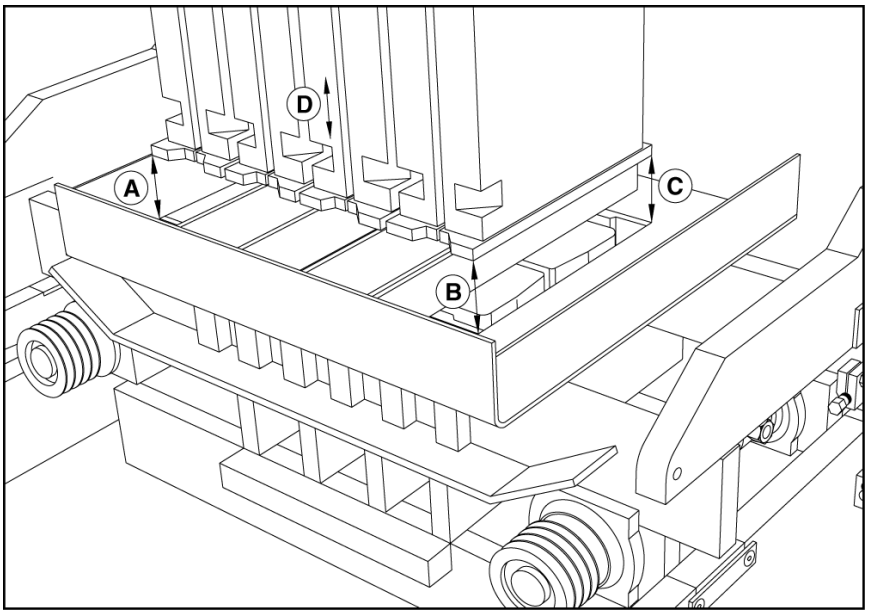


Figure 5.30 *STRIPPER SHOES POSITION*

5.7.4 If the stripper head is not level (B to C) (see figure 5.30) with the mold from front to back, back out both lower guide liner adjusting screws on the stripper head frame at the slide shaft on the left hand side of machine (see figure 5.31). Loosen nut (A) and adjust with bolt (B).

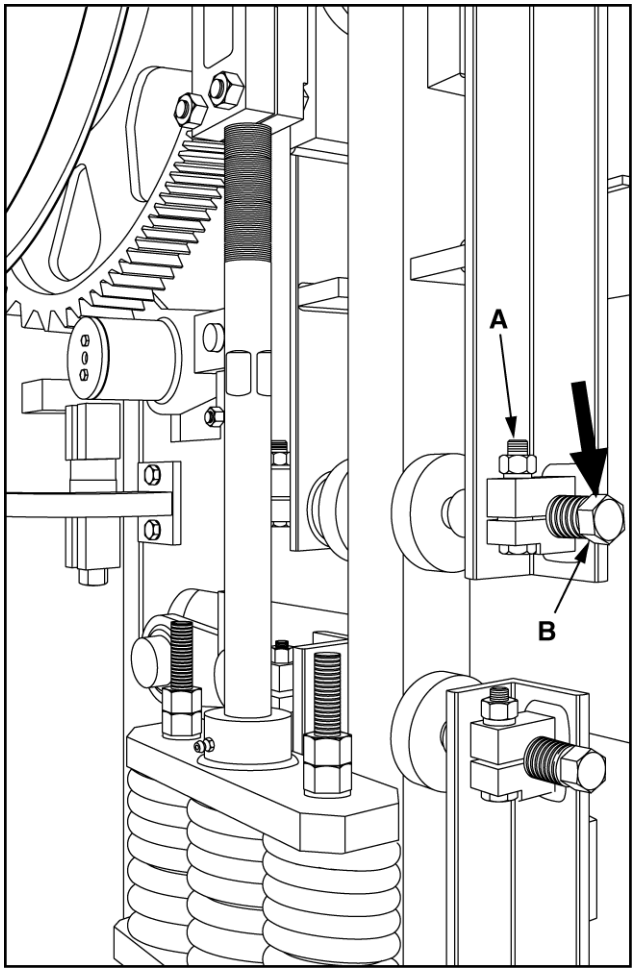


Figure 5.31 *LOWER GUIDE LINER ADJUSTMENT SCREW*

5.7.5 Make adjustment on the right hand side by backing one lower stripper head guide liner away from the slide shaft and tightening the other against the slide shaft. To raise the front, loosen rear and tighten front. To raise the back, loosen the front and tighten the rear (see figure 5.32).

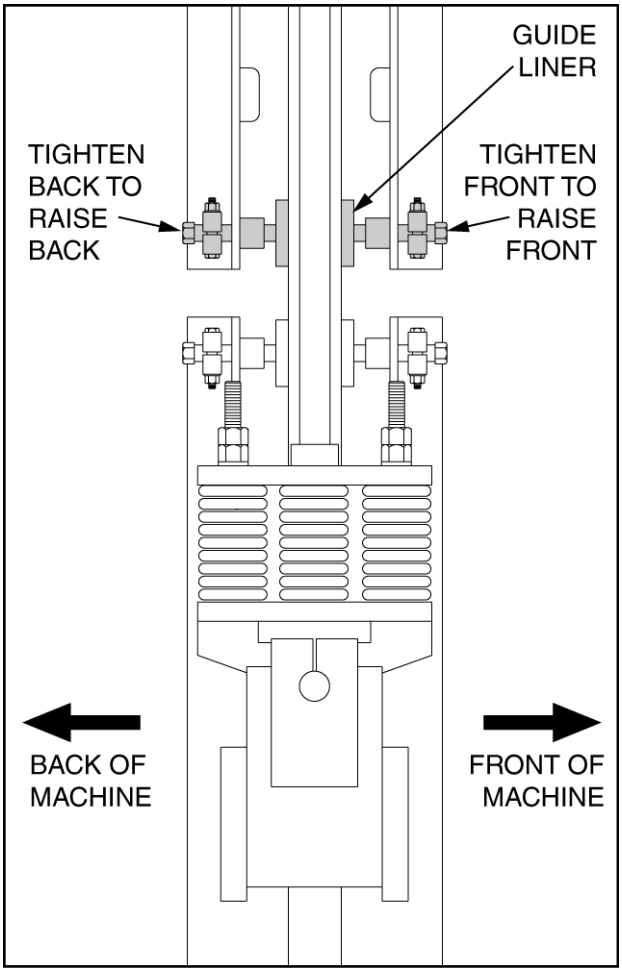


Figure 5.32 *STRIPPER HEAD FRAME ADJUSTMENT*

5.7.6 After head is level with mold, tighten both adjustment screws against the slide shaft on the left hand side (see figure 5.31). Then loosen the front adjustment screws 1/4 of a turn and tighten clamp bolts.

5.7.7 Turn power back on. Hit MCR reset button.

5.7.8 Turn height pins OFF. Jog machine to “second stop” (Ref. section 7.3). Stripper shoes should be in mold and height pins should touch.

5.7.9 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, lock out machine.

5.7.10 Adjust bottom of shock absorbers to pads to dimension of unit height plus 3/4" [19mm].

5.7.11 Put in agitator grid and cut-off bar, and check feedbox alignment. There should be a minimum clearance of 1/4" [6mm] between the wiper assembly and the stripper shoe as shown in figure 5.33.

NOTE: For units higher than 3 5/8”, clearance with stripper head plate must also be maintained.

5.7.12 If adjustment is necessary, adjust the feedbox linkages (see figure 5.34).

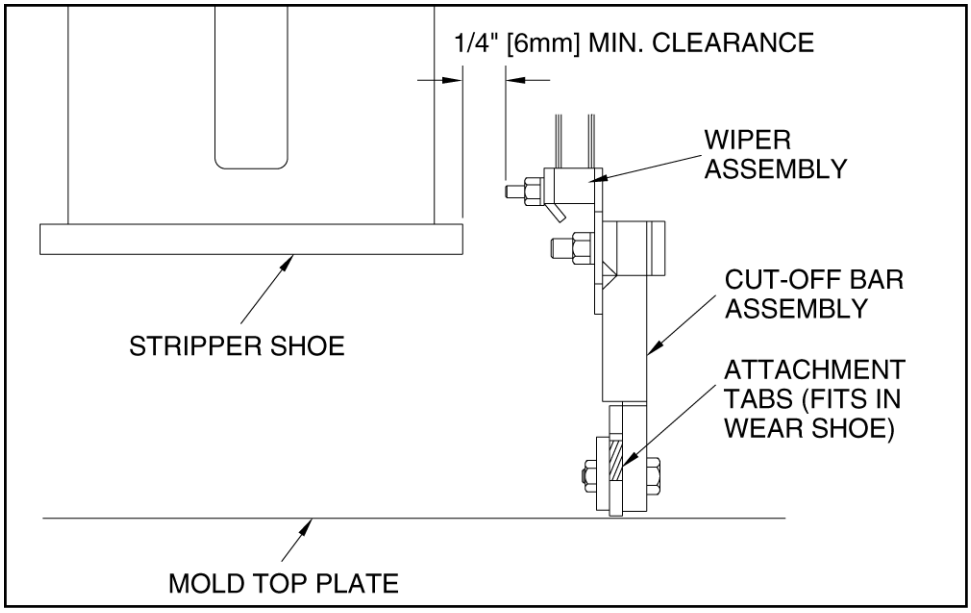


Figure 5.33 *FEEDBOX ADJUSTMENT*

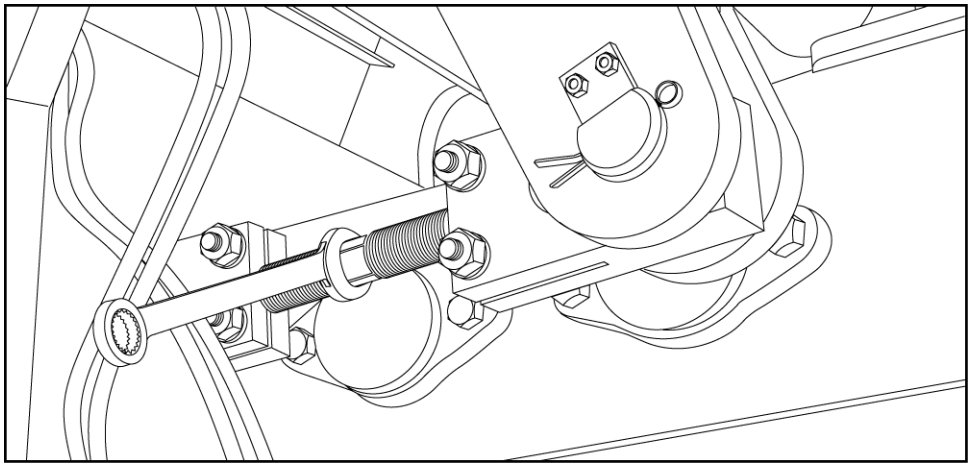


Figure 5.34 *FEEDBOX LINKAGE*

5.7.13 Turn power back on. Hit MCR reset button.

5.7.14 Make sure that machine is at “second stop” (Ref. section 7.3).

5.7.15 Shut off clutch.

5.7.16 Turn vibrator switch to "hand" position for 5 seconds.

⚠	**WARNING:** Make sure **guards** are **in place** over vibrator belts!

5.7.17 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

5.7.18 Tighten the head bolts (figure 5.35).

5.7.19 Turn height pins ON.

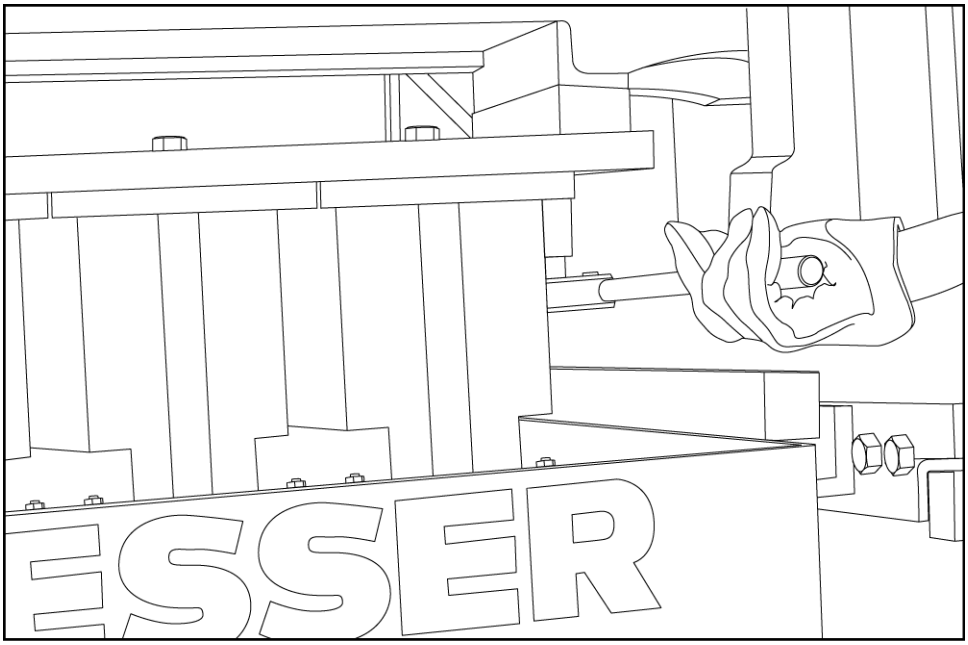


Figure 5.35 *TIGHTENING THE HEAD BOLTS*

5.8 COMPRESSION CALCULATION

5.8.1 To correctly evaluate the amount of compression needed from the stripper head to make units of the desired height, the operator must use the following equation:

SAL = UH – MH + ST

In this equation, UH represents Unit Height, MH is Mold Height and SST is Stripper Shoes Thickness. The result, SAL, is the height of the stripper Shoes Above end Liners.

Figure 5.36 will help you visualize the equation. Letters A, B and D represents respectively unit height, mold height and stripper shoes thickness.

Letter E is the height of the stripper shoes above end liners (letter C is the **amount of compression**).

EX:
Suppose the operator wants to make 7 5/8" [194mm] high units in a 8 1/4" [209mm] high mold with stripper shoes of 1 1/2" [38mm] thickness. The operator gets a result of 7/8" [23mm] for the height of stripper shoes above end liners:

7 5/8" – 8 1/4" + 1 1/2" = 7/8"

Or, in millimeters:

194mm – 209mm + 38mm = 23mm

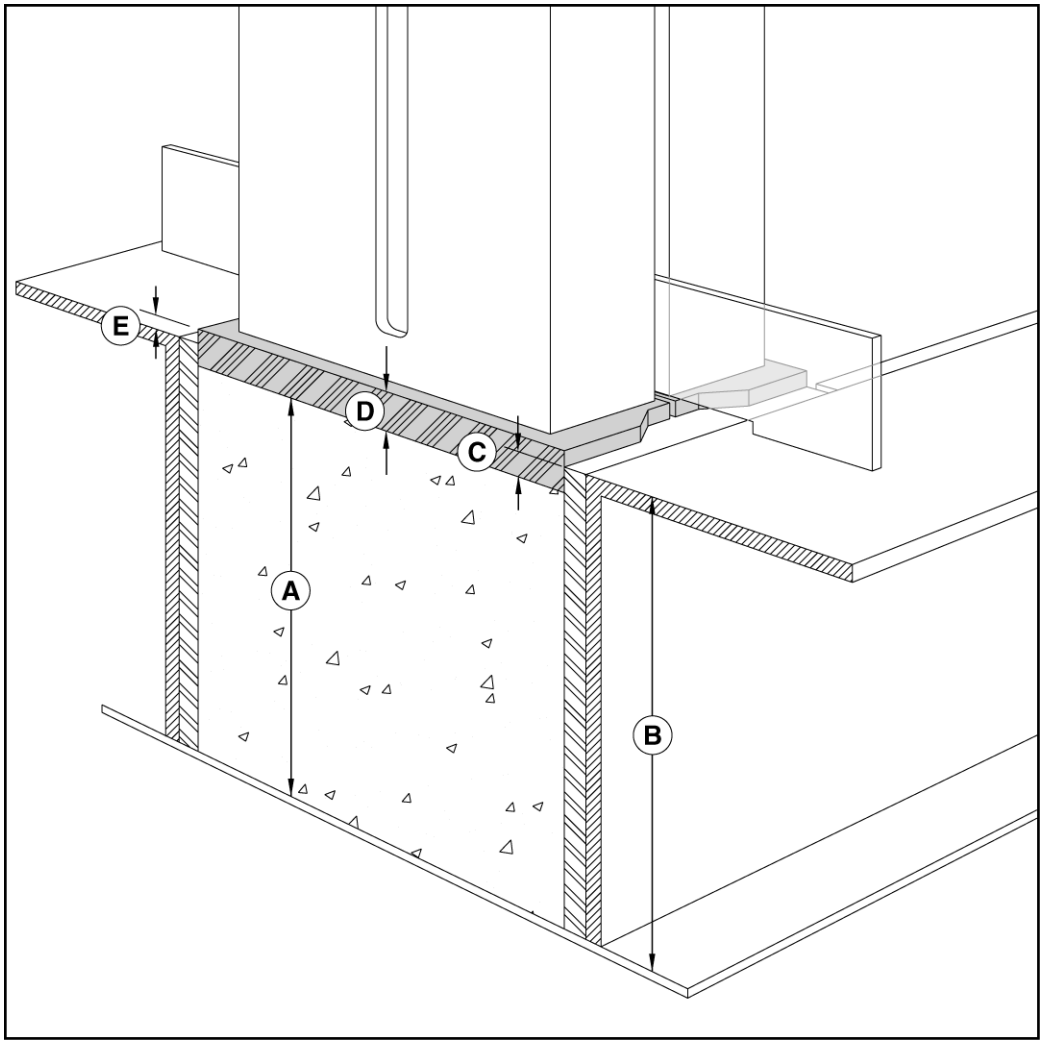


Figure 5.36 *MOLD AND STRIPPER HEAD DIMENSIONS FOR HEIGHT PINS ADJUSTMENTS*

5.9 SPRING OPENING ADJUSTMENT

5.9.1 Turn height control “ON”, jog the machine until the bottom of the mold side bars set down on the machine side frame.

5.9.2 The spring opening should be between 1/32” [0.8mm] and 1/16” [1.6mm] maximum (see figure 5.37). This is all that is required to make most units on an ULTRAPAC II.

5.9.3 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, lock out machine.

5.9.4 If adjustment is needed, adjust the right hand stripper head adjusting link (clockwise for more, counterclockwise for less); keep an accurate count of how many flats you turn the right hand link (see figure 5.38).

5.9.5 Turn power back on. Hit MCR reset button.

5.9.6 In order to keep stripper head frame level, turn the left hand stripper head link in the same direction. Also turn it the same number of flats as was used to turn the right hand link.

NOTE: Spring opening may differ on each side.

5.9.7 Jog the machine to the stripped-through position. At this point, the stripper shoes should protrude through the mold by 1/8” [3mm] to 1/4” [6mm].

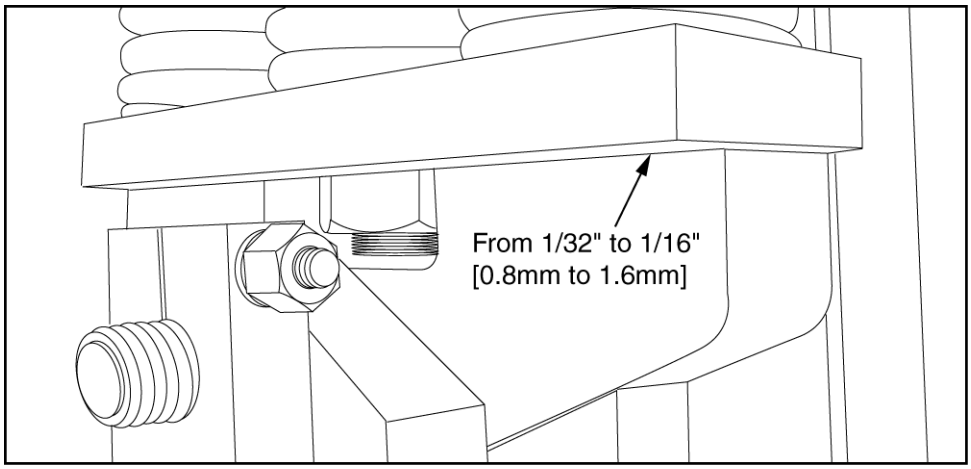


Figure 5.37 *SPRING OPENING*

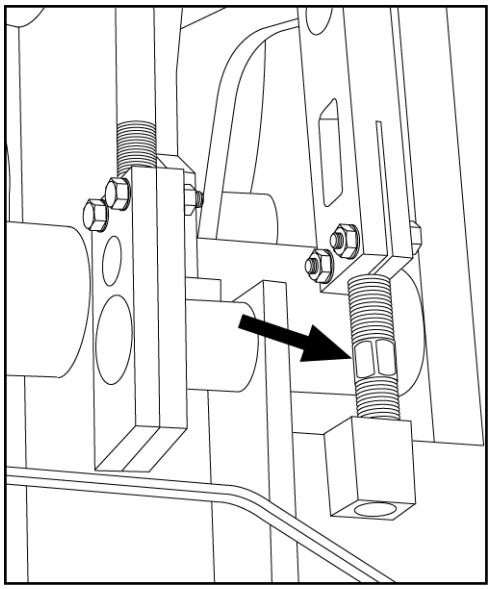


Figure 5.38 *STRIPPER HEAD LINK (RIGHT SHOWN)*

5.9.8 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out machine**.

5.9.9 If adjustment is needed, adjust the shock absorbers. Record the adjustment made for future calibration.

5.9.10 Start machine and run machine to second stop, when height pins first meet.

5.9.11 Shut off clutch and turn power off. Wait until motor has stopped completely. Also, **lock out** machine.

5.9.12 The machine is ready to run; final adjustment may be needed when production is started. The shock absorbers should be adjusted so they take equal load on each side (see figure 5.39).

	**WARNING:** All safety guards must be in place when the ULTRAPAC II is running.

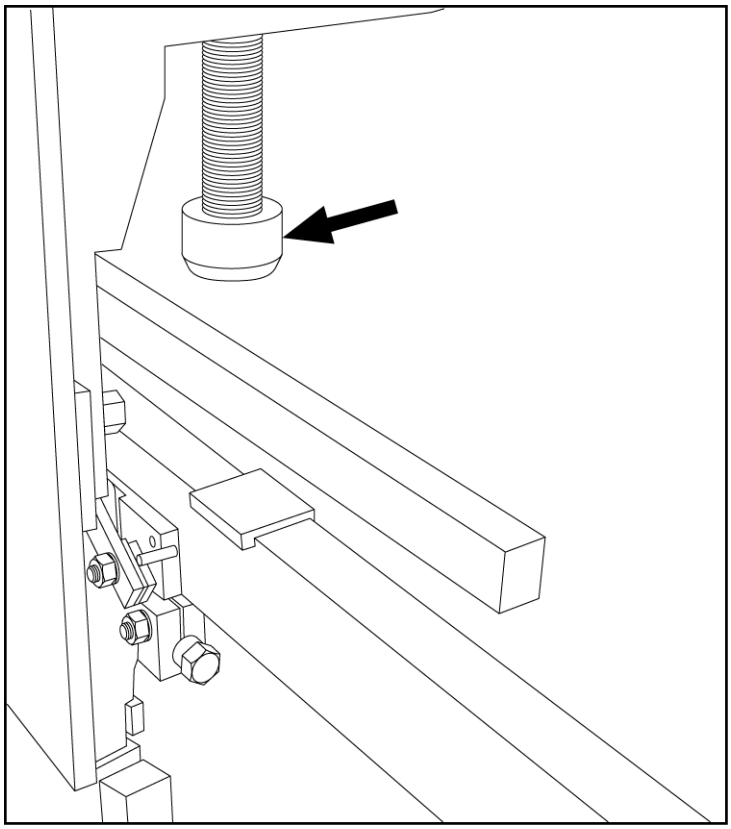


Figure 5.39 *SHOCK ABSORBERS*

SECTION 6
TIMING THE PALLET FEEDER

It is important that the pallet feeder be well synchronized with the rest of the machine. This adjustment must be done before the machine is run for the first time and each time a mold change is done.

6.1 INITIAL CONDITIONS

6.1.1 No mold or head in machine.

6.1.2 Inner frame adjusted for height (see section 4).

6.1.3 Pallet receiver stroke set for mold (see section 4).

6.1.4 Machine has no excessive wear or damage.

6.1.5 Front delivery conveyor 34 13/16" [884mm] above top of machine base (see section 4).

6.1.6 Make sure the pallet feeder drive chain and lug chains (see figure 6.1 and 6.2) are well adjusted. To adjust those chains, follow the procedure presented on the next two pages.

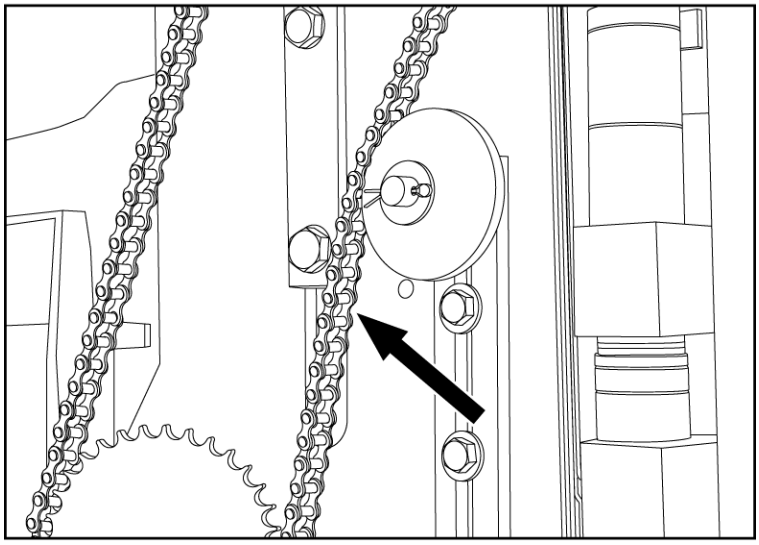


Figure 6.1 *PALLET FEEDER DRIVE CHAIN*

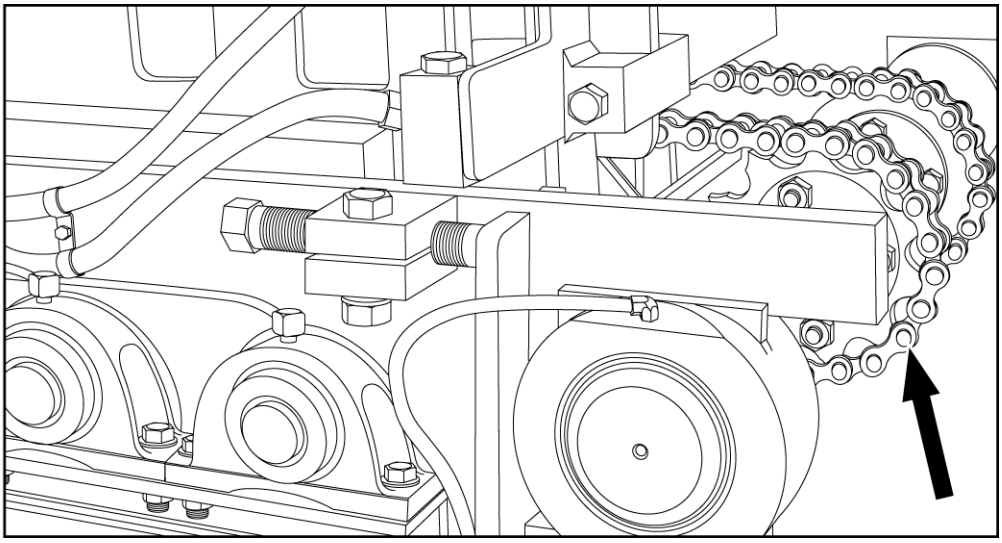


Figure 6.2 *PALLET FEEDER LUG CHAINS*

A. Pallet feeder drive chain adjustment

Check pallet feeder drive chain tension on right hand side of machine. Tension chain until it cannot be moved back and forth by hand more than 1/4" [6MM]; recheck periodically (see figure 6.3).

⚠	**WARNING:** The following procedure must be done with power off and machine locked-out!

To adjust the pallet feeder drive chain tension, follow this procedure:

1. Loosen the fixing bolts (A).
2. Move the tensioner (B) up or down as required.
3. Tighten the fixing bolts (A).

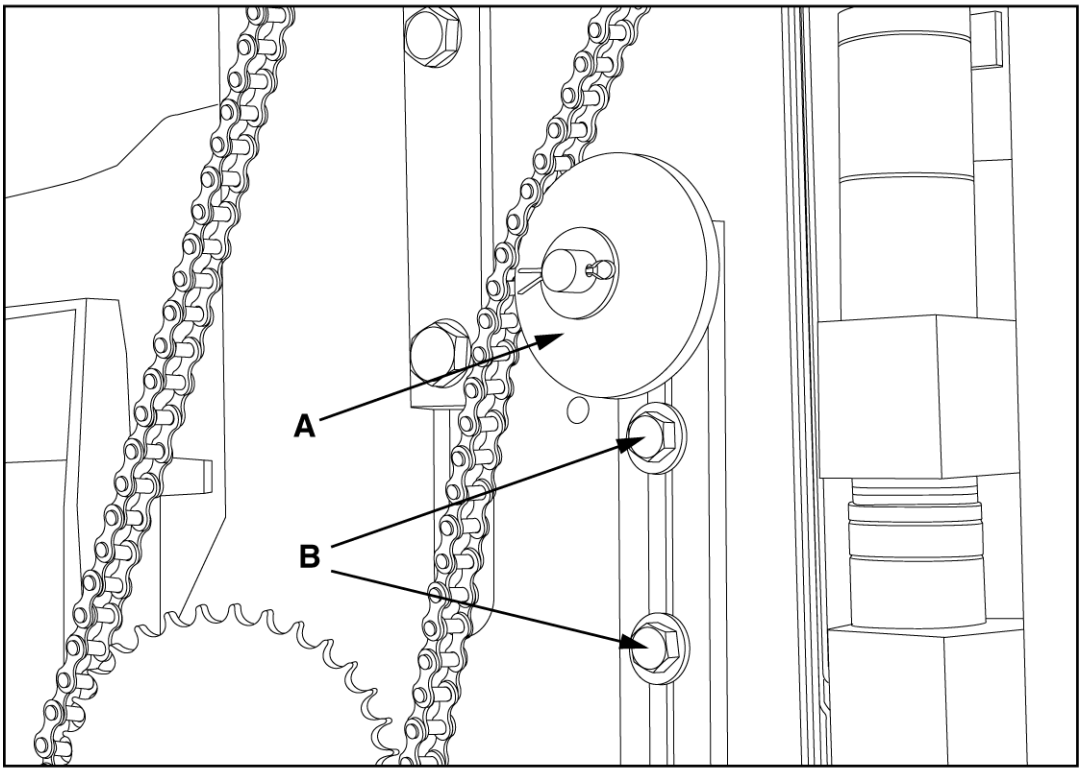


Figure 6.3 *PALLET FEEDER DRIVE CHAIN ADJUSTMENT*

B. PALLET FEEDER LUG CHAINS ADJUSTMENT

Check tension of pallet feeder lug chains. Adjust tension at rear end of pallet feeder. Bottom strand of each chain sags down in center by approximately 1/2" to 3/4" [13mm to 19mm]; recheck periodically.

⚠	**WARNING:** The following procedure must be done with power off and machine locked-out!

To adjust the pallet feeder drive chain tension, follow this procedure (see figure 6.4 and 6.5):

4. Loosen the clamp bolts (A) on the inside and on the outside of the machine.
5. Adjust the tension with the tensioning screw (B).
6. Tighten the clamp bolts (A).

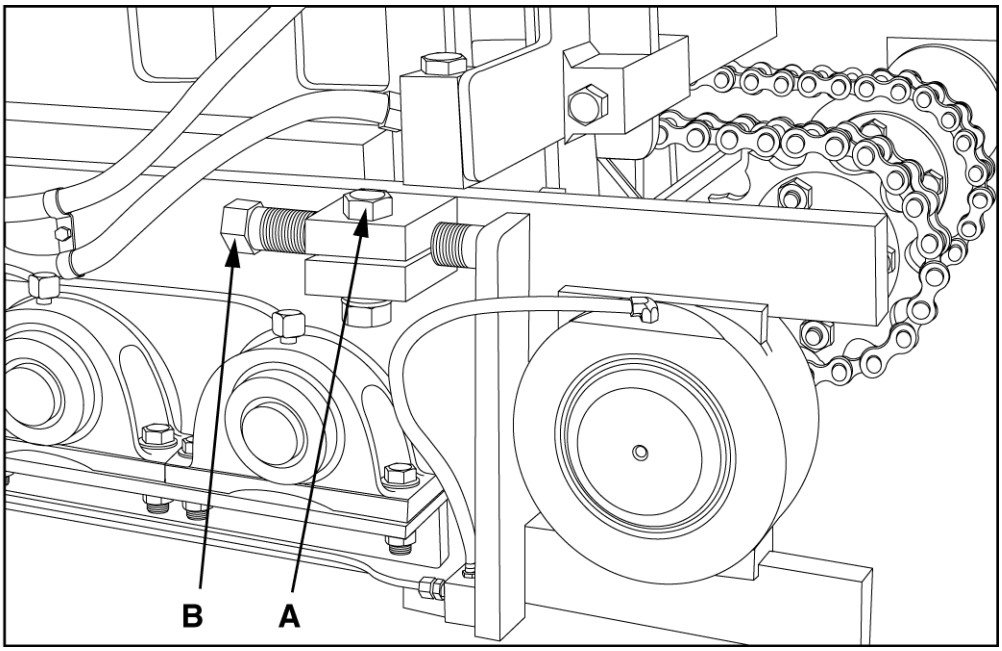


Figure 6.4 *PALLET FEEDER CHAIN TENSIONING (LEFT OUTSIDE VIEW)*

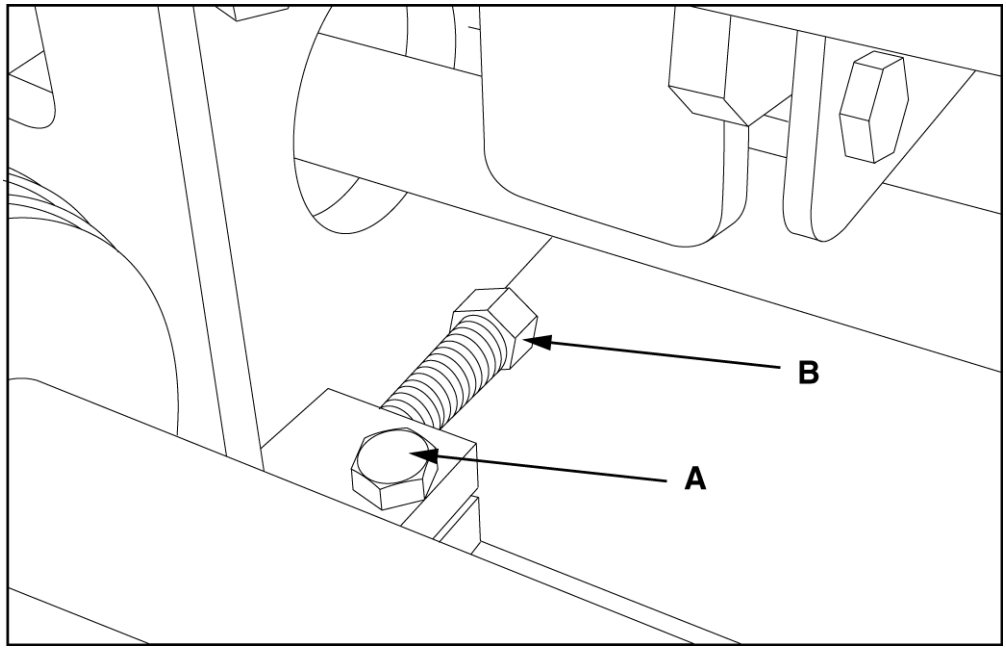


Figure 6.5 *PALLET FEEDER CHAIN TENSIONING (LEFT INSIDE VIEW)*

6.2 TIMING THE PALLET FEEDER

6.2.1 Run machine to align punch marks on pallet raising cam (innermost cam on left side of machine) with center of roller that it contacts (see figure 6.6).

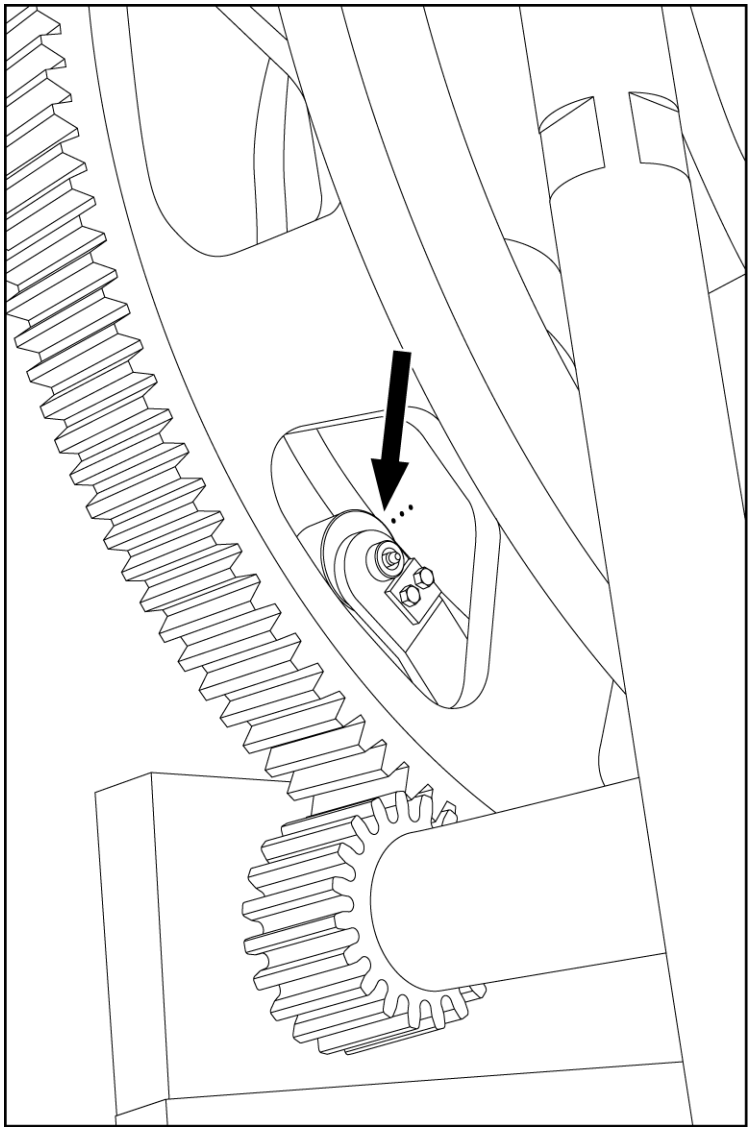


Figure 6.6 *PALLET RAISING CAM*

6.2.2 Use the two push buttons on valve (figure 6.7) to jog block delivery bar motor until block delivery bars are full forward (see figure 6.8), both link pins and gear box shaft are in line. Top button(A) jogs bars forward and bottom button(B) will jog bars backward.

⚠	**CAUTION:** Figure below is shown with guard removed and is for illustration purposes only. **Never** operate machine without the guards. Machine should be locked and tagged!

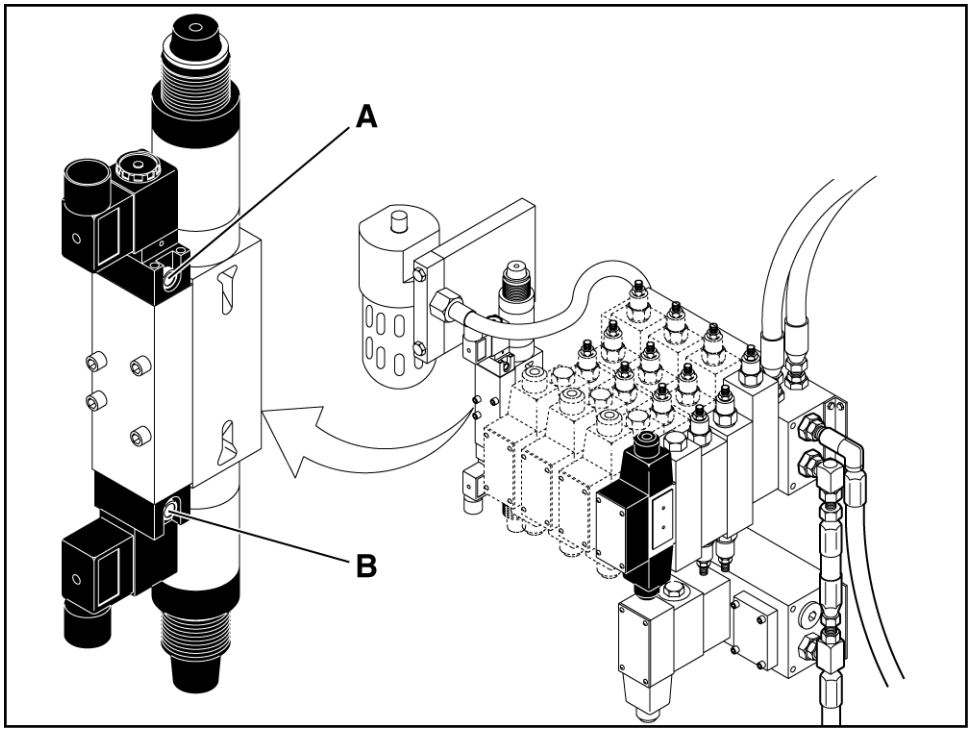


Figure 6.7 *POSITIONING BLOCK MOVING BARS*

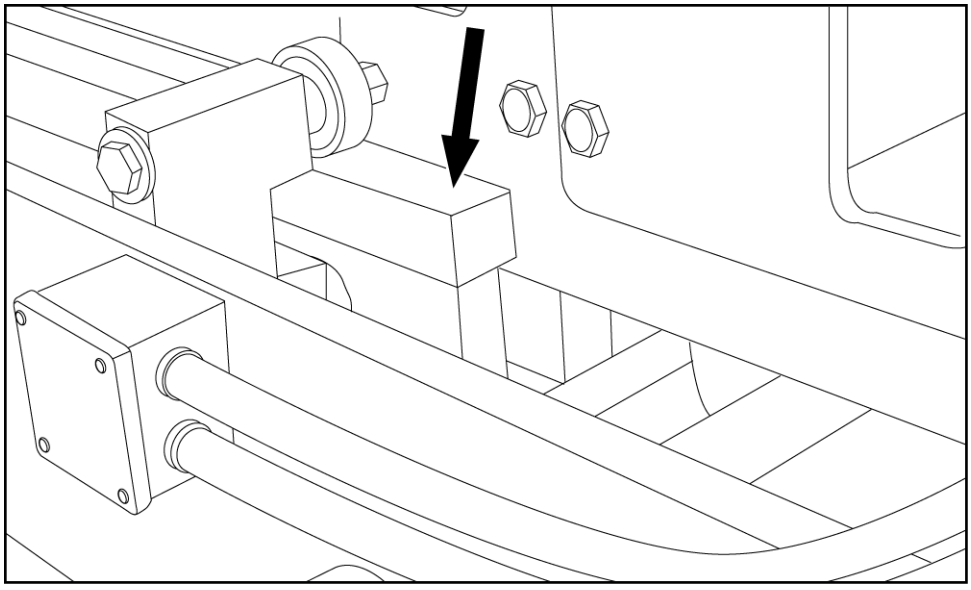


Figure 6.8 *EXTREME FORWARD POSITION OF BLOCK MOVING BARS*

6.2.3 Adjust pallet cradles to be centered with pallet receiver rubbers (see figure 6.9).

6.2.4 Set actuator on block delivery drive cam to trip LS-7 (see figure 6.10).

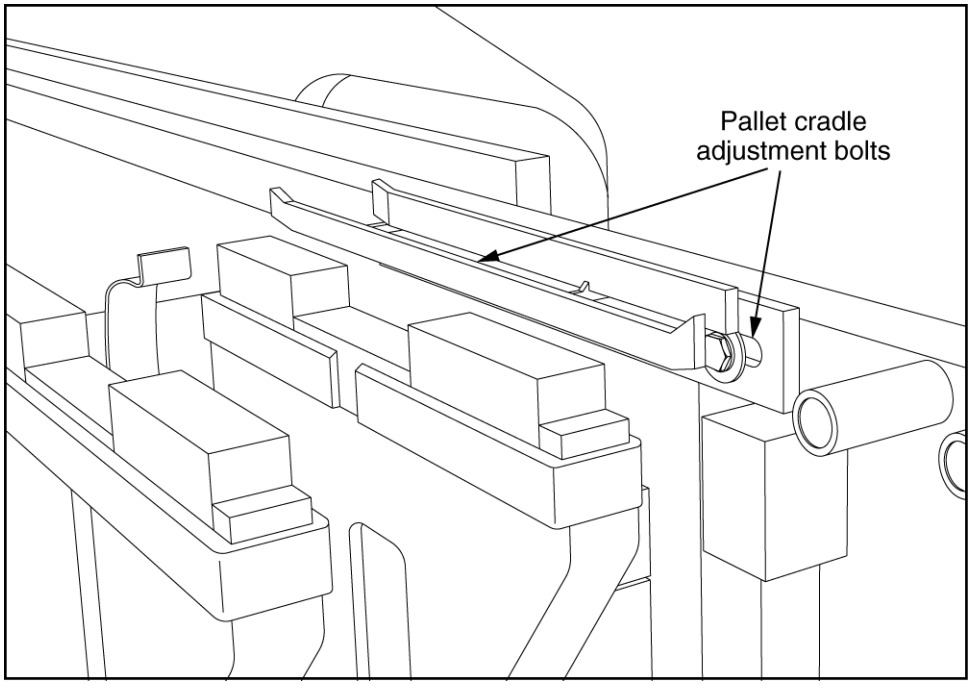


Figure 6.9 *ADJUSTING THE PALLET CRADLE*

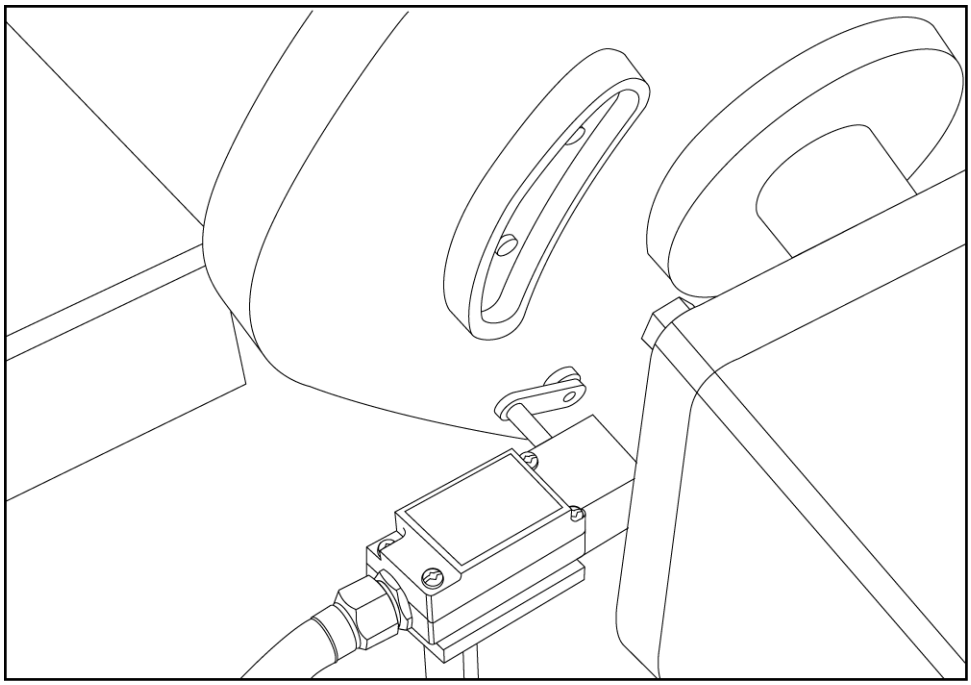


Figure 6.10 *LIMIT SWITCH LS-7*

6.2.5 Use the two push buttons on valve (figure 6.7) to jog block delivery bar motor until arms are fully back (see figure 6.11). In this position, the pins in the link will be aligned with the gearbox shaft.

6.2.6 Adjust block fingers to center them with the pallet receiver rubbers (see figure 6.12).

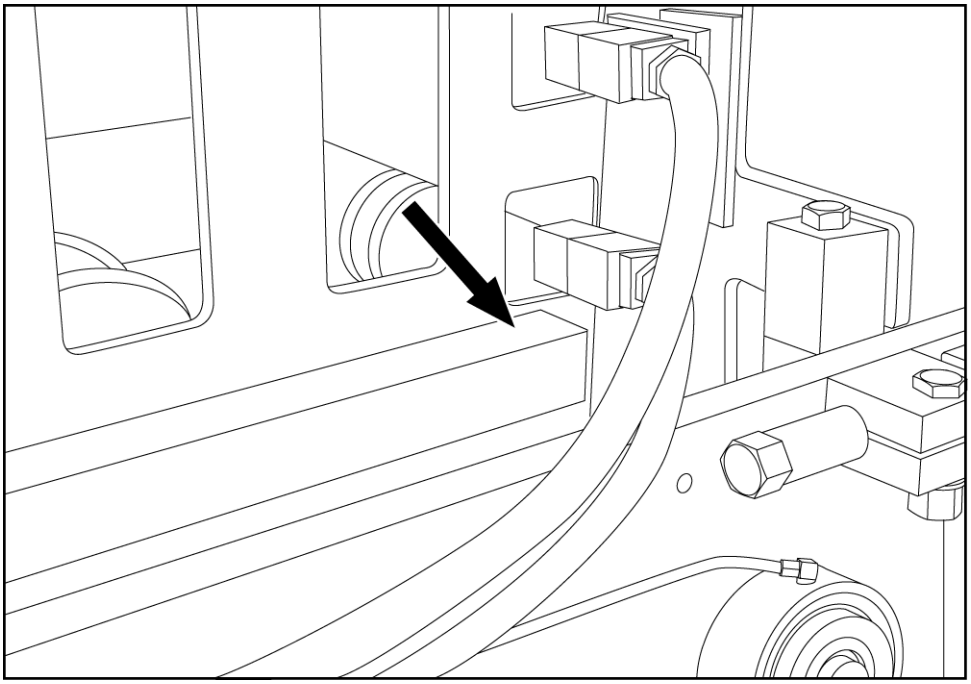


Figure 6.11 *EXTREME BACK POSITION OF BLOCK MOVING BARS*

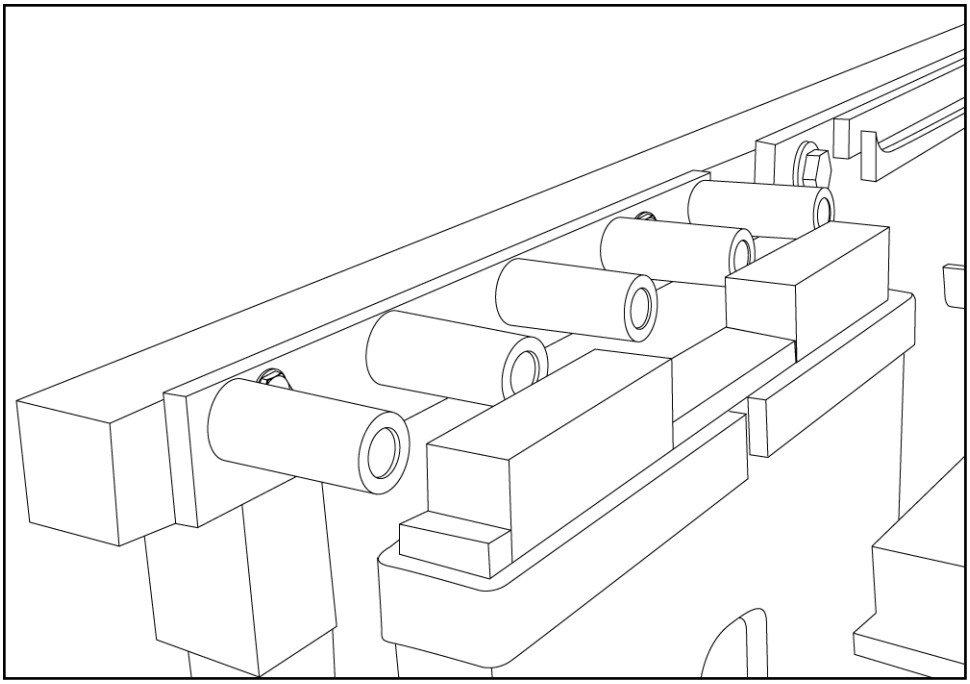


Figure 6.12 *ADJUSTING THE BLOCK MOVING BAR FINGERS*

6.2.7 Locate top of pallet spring stops even with top of pallet resting on the chains (see figure 6.13).

NOTE: Pallet cradle is at same height as lug chain.

6.2.8 Move spring stop assembly so springs are 1/4" [6.5mm] to 1/2" [13mm] in front of a pallet centered in pallet cradles. Also, top of spring should be flush with top of pallet. (see figure 6.14 and 6.15).

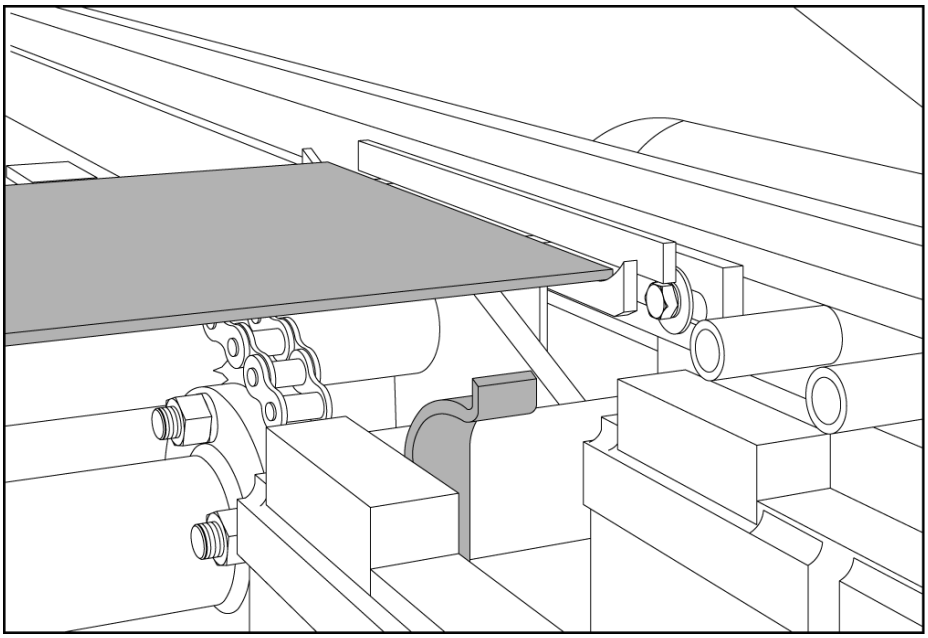


Figure 6.13 *PALLET PICK-UP POINT*

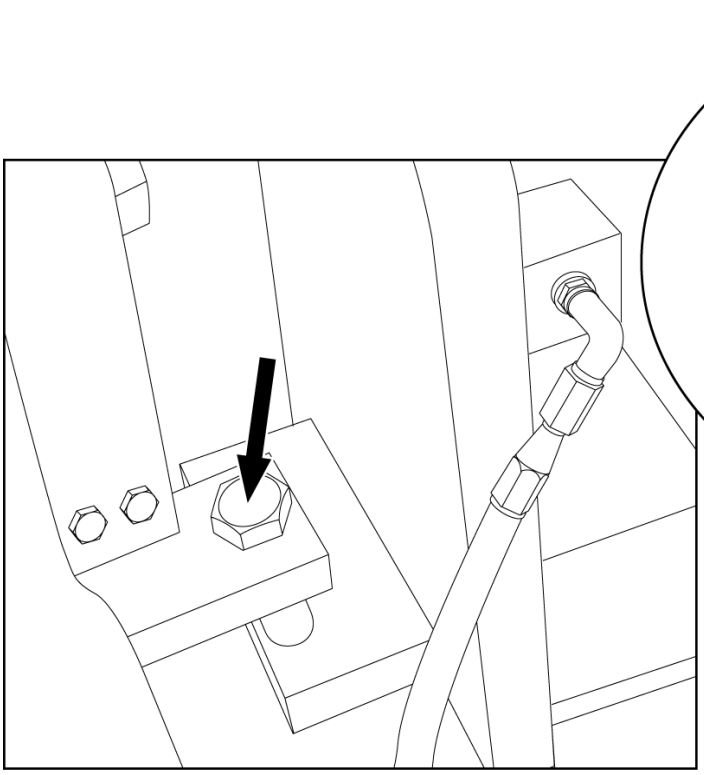


Figure 6.14 *SPRING STOP ADJUSTMENT BOLTS*

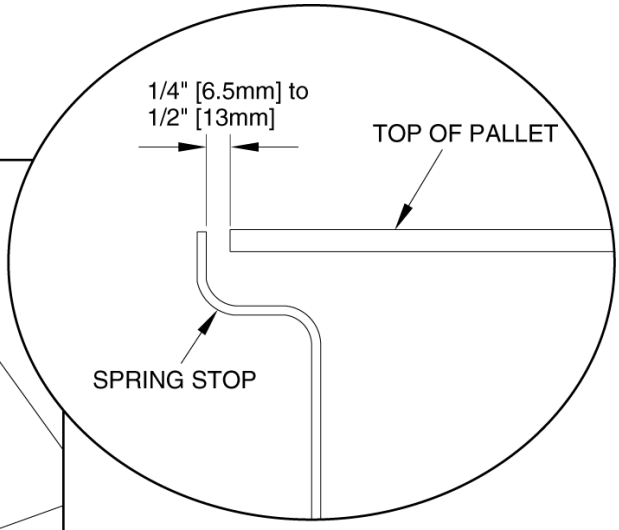


Figure 6.15 *SPRING STOP ADJUSTMENT*

6.2.9 Adjust pallet chain lugs to be even with back of pallet (see figure 6.16) by removing shear bolt and shaft (6.17). Use wrench to adjust lug chain (6.18). Place shear bolt assembly in holes that align and tighten.

6.2.10 Adjust the actuator for LS-6 to trip the switch by 2" [51mm] (see figure 6.19).

⚠	**CAUTION:** Figure below is shown with guard removed and is for illustration purposes only. Never operate machine without the guards! Machine should be locked and tagged.

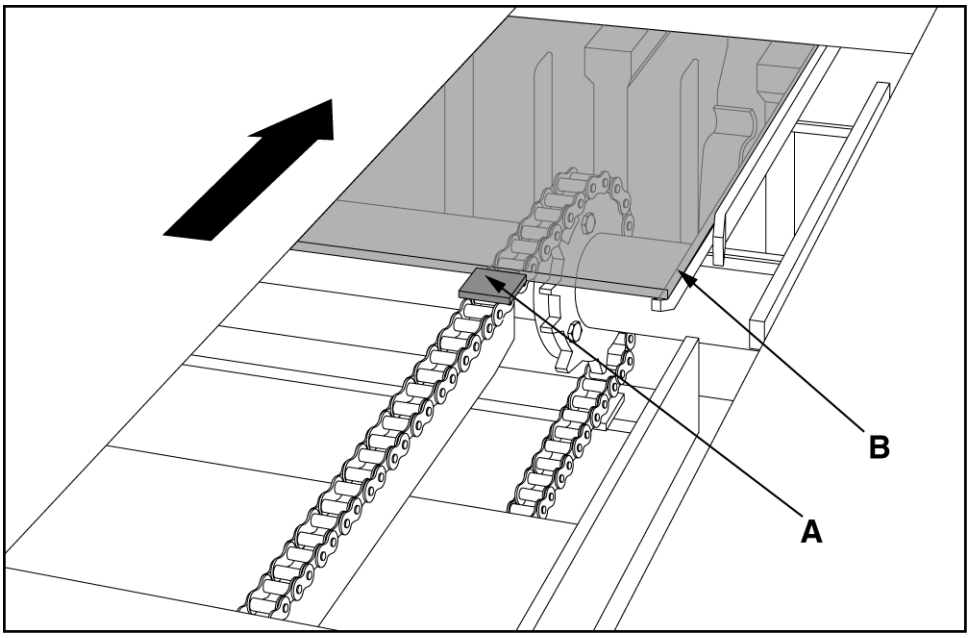


Figure 6.16 *LUG (A) SHOULD BE CONTACTING PALLET WHEN IN CRADLE (B)*

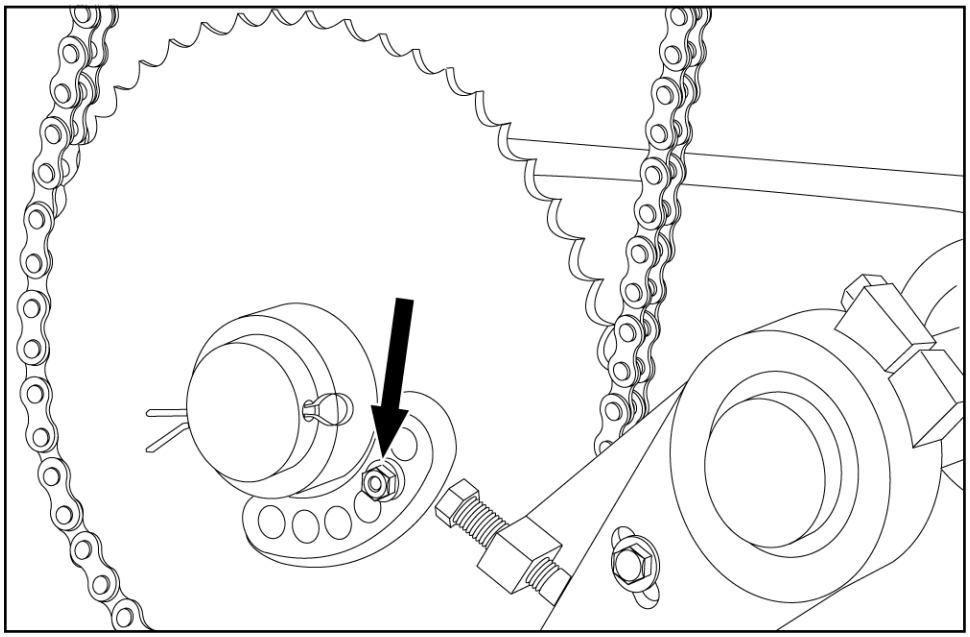


Figure 6.17 *REMOVING THE SHEAR BOLT*

⚠	**CAUTION:** Figures below are shown with guard removed and are for illustration purposes only. Never operate machine without the guards. Machine should be locked and tagged.

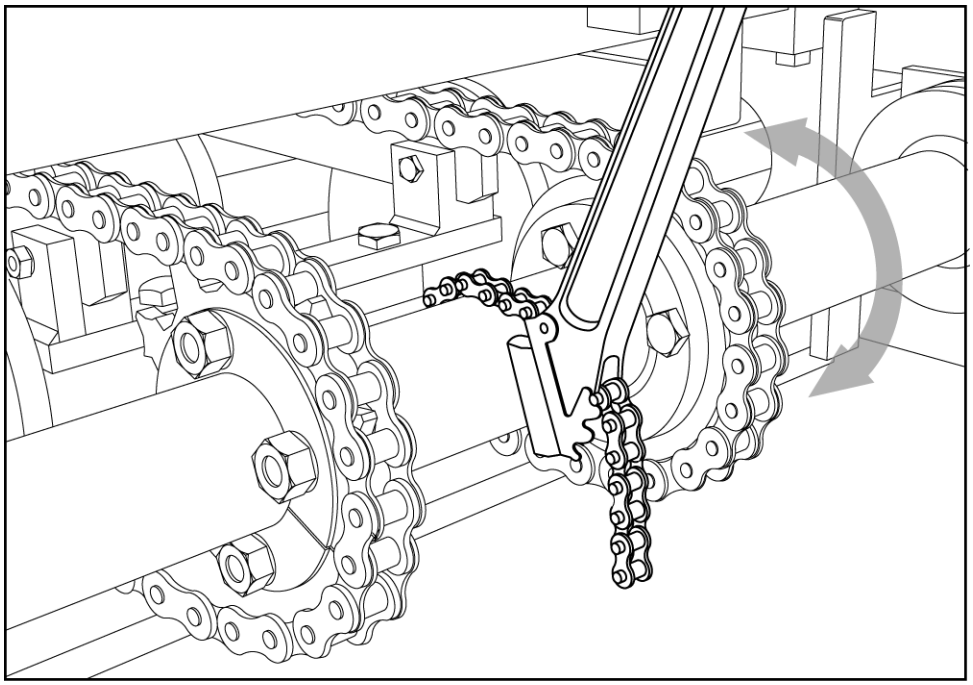


Figure 6.18 *USING PIPE WRENCH TO ADJUST LUG CHAIN*

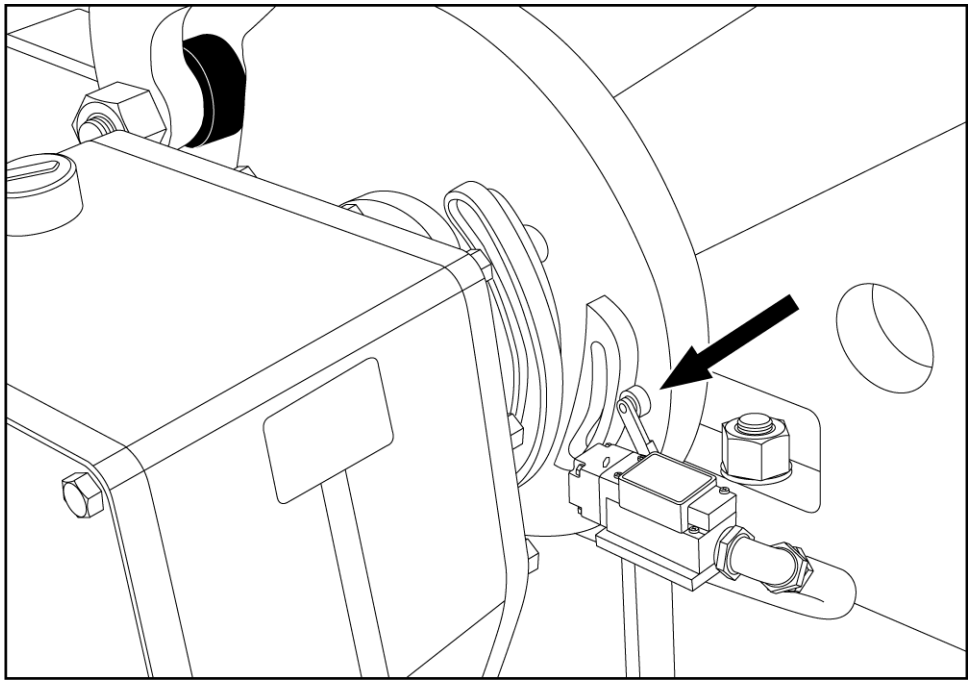


Figure 6.19 *LIMIT SWITCH ACTUATOR*

6.2.11 Run machine until pallet receiver frame is all the way down; roller is in lowest part of pallet receiver cam.

6.2.12 Place pallet on fingers and adjust block raising link on left side of machine (see figure 6.20) to obtain 31 1/2" [800mm] from top of base plate to bottom of pallet. Make sure there is 1/4" [6mm] of clearance between bottom of pallet and pallet receiver rubbers (see figure 6.21).

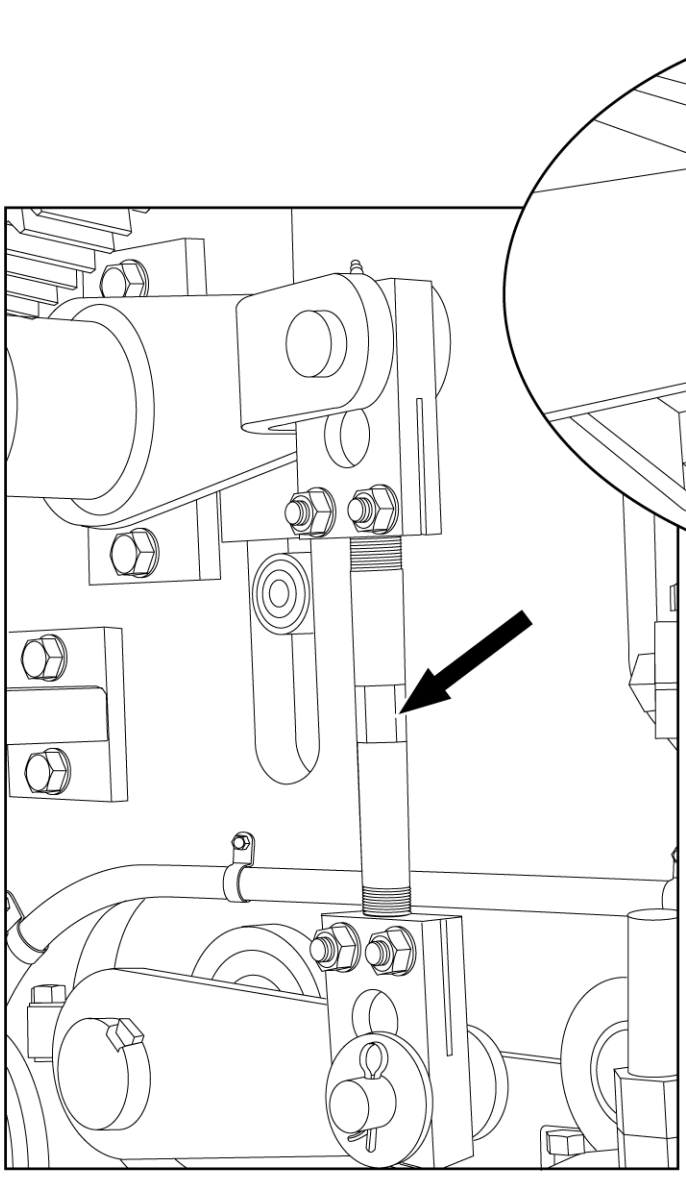


Figure 6.20 *PALLET RAISING LINK*

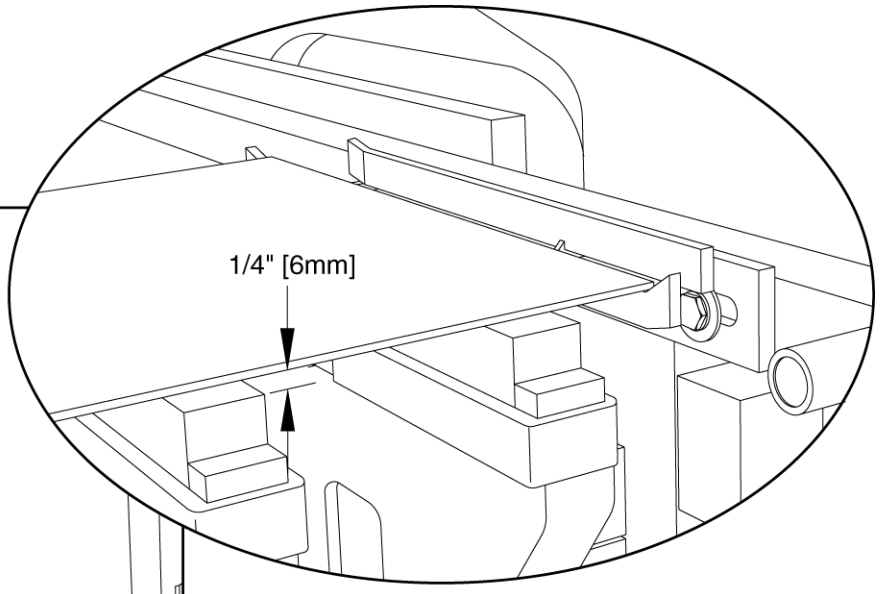


Figure 6.21 *PALLET CLEARANCE*

6.2.13 Rotate block delivery drive CCW until punch marks on high part of cam align with the center of the roller (A) (see figure 6.22).

6.2.14 Loosen the clamp bolt (B) and adjust the jack screw (C) on the right hand side of machine, until a piece of paper can just be slid between the cam and roller. Tighten clamp bolt (B).

6.2.15 Run machine and, at the moment where the pallet is beginning to be lifted off the chain, make sure the pallet is centered on the cradle. If pallet is not in center of cradle, adjust chains (refer to 6.2.8). When delivery arms come all the way back (see figure 6.11), drive link to cam must be in line with gear box shaft; if not, adjust actuator for LS-6 (see figure 6.19).

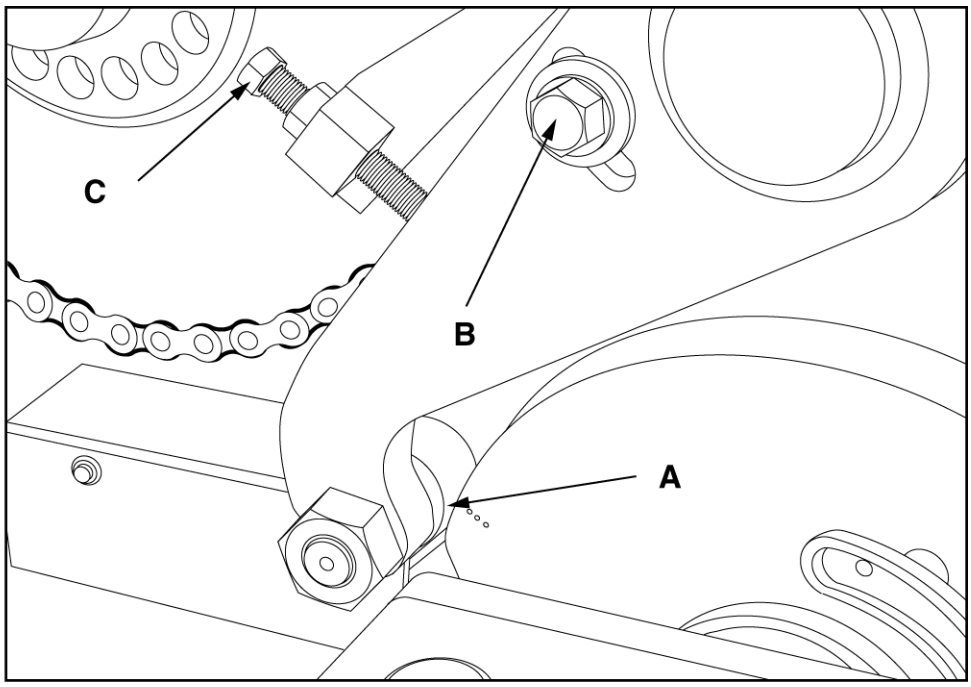


Figure 6.22 *BLOCK LOWERING ARM ADJUSTMENT*

6.2.16 Adjust speed of block delivery using the graphic control station as explained below. The actuators for limit switches LS6 (6.2.10) and LS7 (6.2.4) may have to be adjusted.

a. From the Machine Run Screen, press the **F1** key.

The screen below will be displayed.

b. Press the **F14** key to decrease block moving bar speed.

c. Press the **F15** key to increase block moving bar speed.

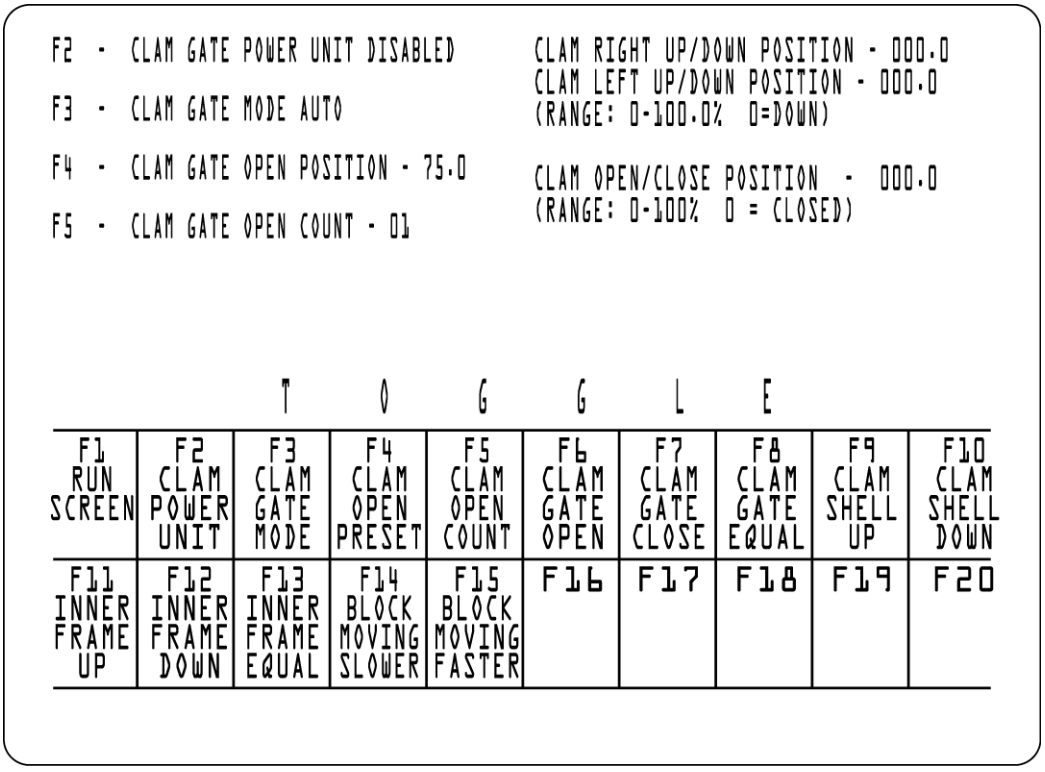


Figure 6.23 *THE HAND & MACHINE SET-UP SCREEN*

SECTION 7
ROTARY SENSOR SETTING

The rotary sensor setting should be done each time the rotary sensor has been removed or disconnected. It should also be done after a "rotary sensor is out of sync." fault has appear on the screen.

1. As an initial condition, cycle the machine to the "first stop" position "First stop" is obtained when the punch marks on the cam are in line with the roller.(see figure 7.2). In this position, the feedbox should be all the way forward and the roller should be centered on the first stop mark of the pallet receiver cam. At this point, the "Rotary sensor value" should be indicating 1000 on the rotary sensor adjustment screen (see figure 7.1, for more details see section 10.4). To reach this screen, press "F2" from the main menu.
2. If the rotary sensor value shown in the screen is not 1000, loosen rotary sensor coupler (A) (as shown in figure 7.3) and make adjustment. To adjust, turn rotary sensor coupler until 1000 is reached. Use the screen to monitor the rotary sensor. Make sure you tighten rotary sensor coupler before resuming adjustment.
3. Run the machine to "second stop" position which is controlled by the rotary sensor. The roller should be centered with the "second stop" marks on the pallet receiver cam. "Second stop" is the point where the stripper head shaft roller just falls off the high lobe of the stripper head raising cam. The stripper head raising cam is the second cam from the outside on the right side of the machine (see figure 7.4). The "rotary sensor value" should be indicating 1800 at this point.

NOTE: As the machine ran from first stop to second stop, the value must count in a positive direction (meaning from 1000 to 1800 in 10 increments). If the value is not incrementing in a positive direction, rotate the screw on the back of the rotary sensor to opposite position.

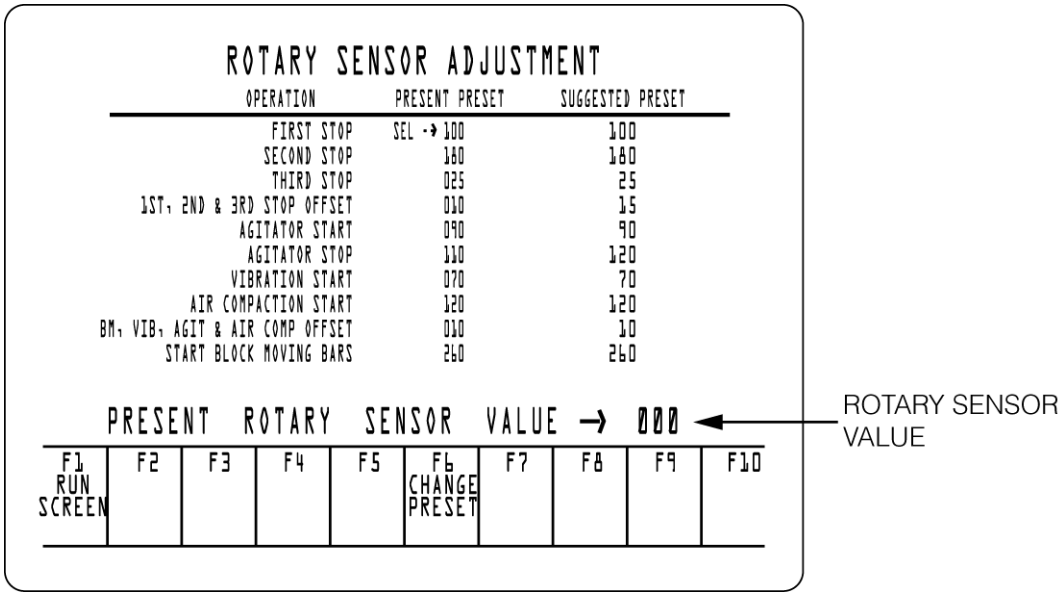


Figure 7.1 *ROTARY SENSOR ADJUSTMENT SCREEN*

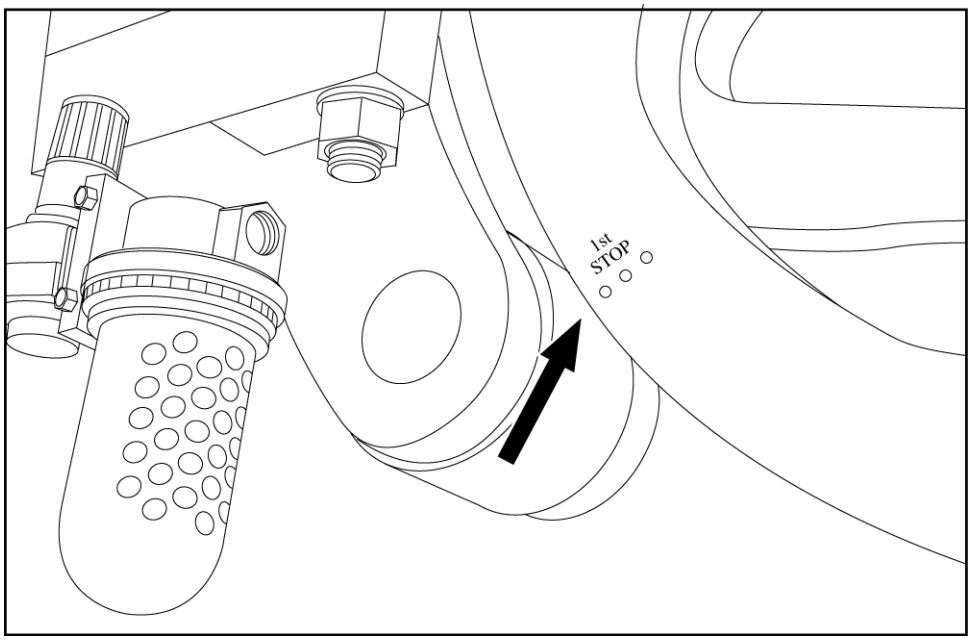


Figure 7.2 *"FIRST STOP" (R.H. SIDE OF MACHINE)*

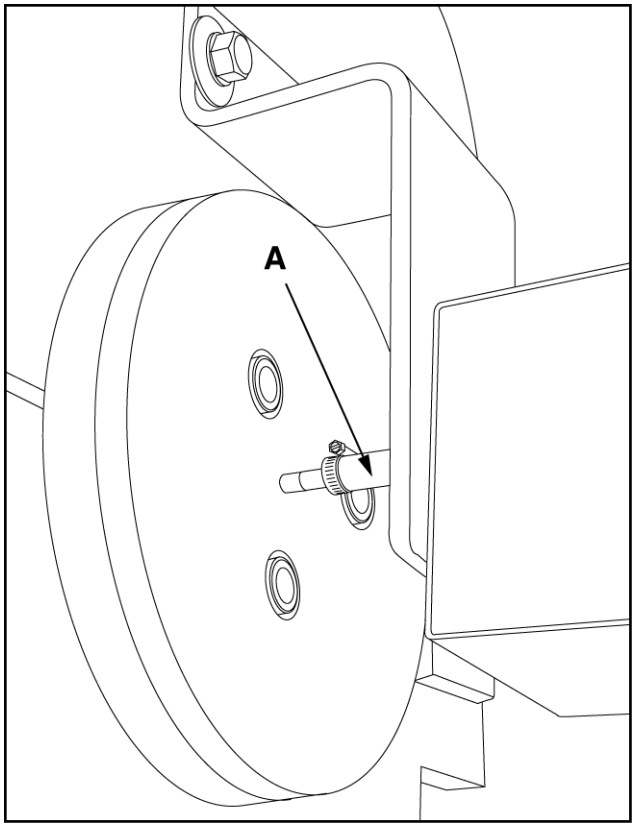


Figure 7.3 *ROTARY SENSOR COUPLER ADJUSTMENT*

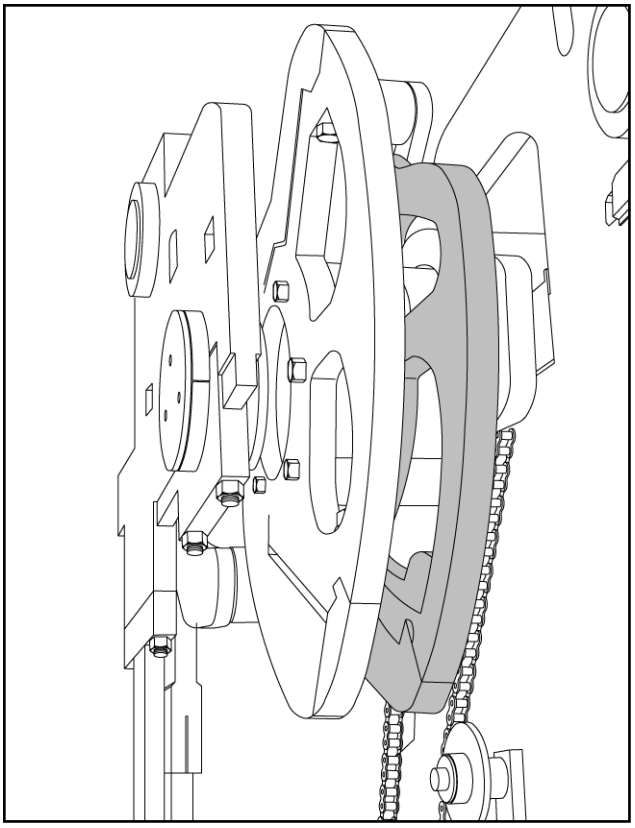


Figure 7.4 *STRIPPER HEAD RAISING CAM*

SECTION 8
OPERATING THE MACHINE

8.1 OPERATING THE ULTRAPAC II

This section will guide you, the operator, through the actual operation of the ULTRAPAC II. First, read the sequence of the machine in order to have a good understanding of how the machine works and how you can make adjustments to produce perfect concrete blocks or pavers. Of course, the machine has to be setup before it can be operated properly. Adjustments on the pallet feeder, on machine timing and on adjustments for specific molds have to be made prior to the sequence outlined in this section.

8.2 HOW A CONCRETE PRODUCT MACHINE WORKS

The ULTRAPAC II is a four-at-a-time block machine rated at up to 2,160 blocks per hour. A concrete unit is made when concrete is fed into a mold and is then vibrated and compacted. Once it has been compacted, it is stripped out of the mold and delivered onto a conveyor. Many types of molds can be fitted on the machine to obtain a wide variety of products.

Refer to section 2 “MACHINE DESCRIPTION" to learn about the names and locations of the machine’s components.

All of the machine’s movements are controlled by cams located on a main shaft. As the cams turn with the main shaft, they activate rollers which are connected to link rods which in turn are connected to the components. These components either go forward and back or up and down. One cam brings a component forward (or up) and another brings it back (or down). The main shaft is powered by a motor and a clutch. The motor runs all the time. It is the clutch that will stop and start all machine movements. The only operation not activated by the main cam is the block delivery arm which feeds empty pallets to the mold and pallet with blocks to the exit conveyor. This component is powered by a motor and is independent because it sometimes has to keep running while the rest of the machine is stopped.

The pallet has to be lifted at one point in the process; a cam does that. A stripper head frame is also connected to two different cams to move it up and down. A stripper head, which is part of the mold, has to be installed on the stripper head frame. This stripper head will press on top of the units to compact them. A pallet receiver frame is located below the stripper head. This component holds the pallet and the mold in place during the concrete unit forming process (stripper head is pressing and the mold is vibrating).

The pallet receiver is connected by links to a cam on the main shaft to move up and move down through gravity. The last two cams will bring a feed box forward and back. This feed box pushes the material (concrete) to the mold. Concrete will fall into the feedbox through a hopper located on top of the machine. An agitator grid placed in the feedbox will agitate the material as it falls in the mold for better distribution of the concrete. The Agitator is powered by a motor located on the feedbox.

Finally, one motor on each side of the machine vibrate the mold. The vibration occurs when the concrete is fed in by the feedbox and when the units are being compressed by the stripper head. Vibration only lasts a few seconds but it is crucial to making concrete units.

8.3 MACHINE SEQUENCE OF OPERATION:

1. Machine cycle begins with feedbox ready to start forward when main drive clutch solenoid is energized.
2. With feedbox on its way forward, vibrators and agitators begin functioning.
3. Feedbox completes its forward stroke and stops over mold. At this point, the machine stops (at the position called "FIRST STOP").

   While in "first stop", the following occurs:

   - Feed timer is turned ON
   - Feed timer times out, which re-starts machine.
4. Feedbox returns to home position, at which time-

   - Agitator turns OFF
     (At this time, machine keeps cycling)
5. Stripper head drops onto concrete in mold. At this point, machine stops (this position is "SECOND STOP").

   While at "second stop", the following occurs:

   - Height pin control circuit is turned ON
   - Finish timer starts and autofeed control circuit is enabled.
   - When height pins meet, finish indicator stops and delay timer begins. At this point, the Cutoff bar or feed time is adjusted, if necessary (actual finish time was not equal to desired finish time).
   - Delay timer times out which:
   - Starts the strip delay timer - Turns off vibrators
   - Strip delay timer times out which-.
   - Turns ON main drive
6. Machine strips units from the mold. If a fault occurs, machine stops. If no fault occurs, pallet moving bars pick up empty incoming pallet from pallet feeder conveyor. Pallet with block is deposited on block moving support fingers while:

   - Stripper head is raising
   - Block moving bars travel to their most forward position.
   - If limit switch LS-7 is tripped before rotary sensor reaches “third stop” position (approximately 25o), NO "THIRD STOP".
   - If rotary sensor reaches “third stop” position before LS-7 is tripped, main drive stops until LS-7 is tripped, this is the "THIRD STOP" position.
7. Block moving bars lower and return to extreme rear position.

   - LS-6 tripped which-stops Block moving bars.

Machine cycle is complete; a new one begins.

8.4 MACHINE SEQUENCE AND THE ROTARY SENSOR

The figure below represents the machine sequences in accordance with the rotary sensor values (in degrees). It will help you understand better how the machine cycle works and how to adjust parameters such as feed time, finish time, delay time and strip delay time which are crucial in making good quality concrete products.

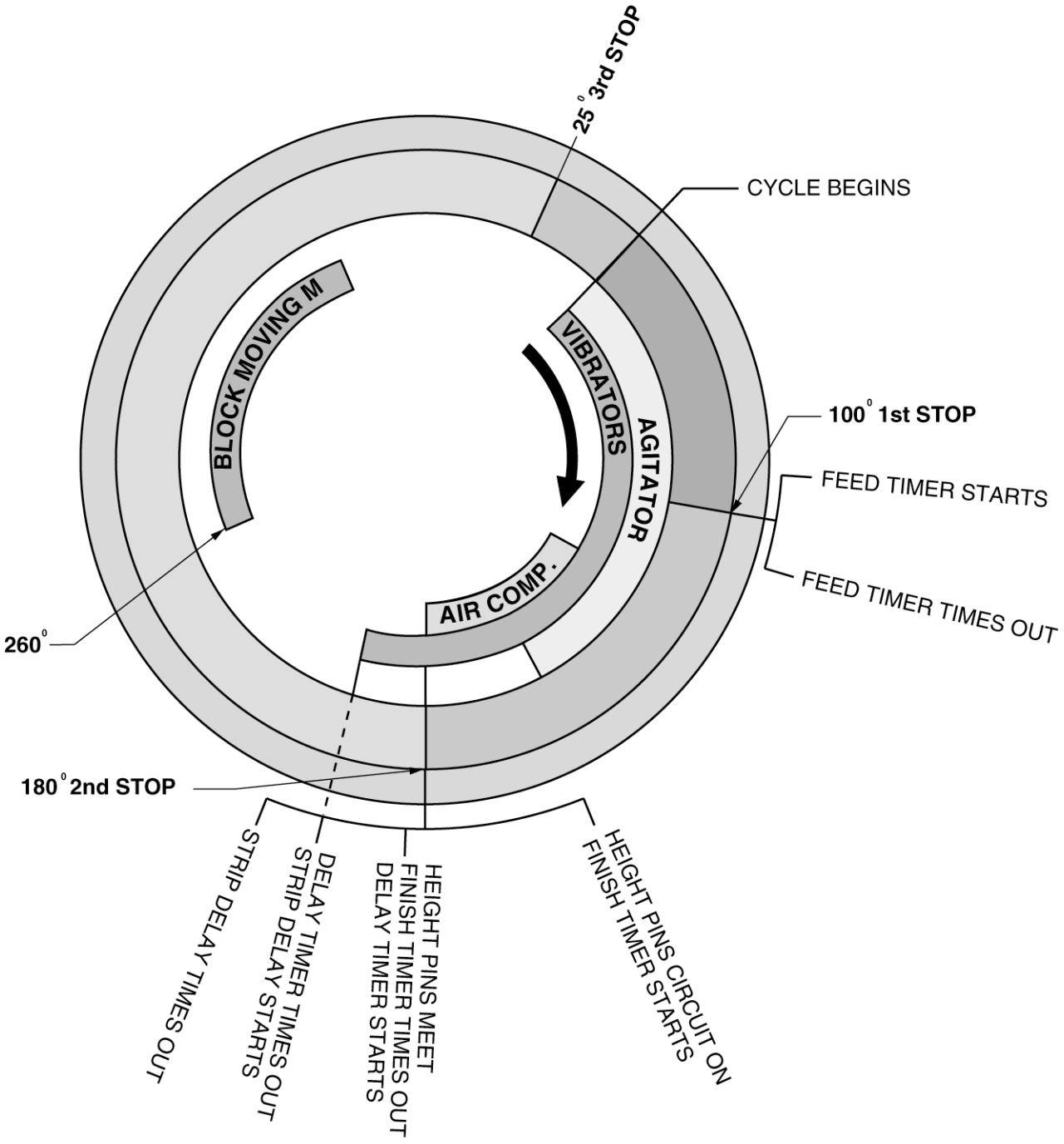


Figure 8.1 *MACHINE SEQUENCE CYCLE*

8.5 INITIAL STARTING POSITION

Make sure all the following are set properly.

1. Make sure “EMERGENCY STOP” button is pulled out.
2. Make sure “CLUTCH” switch is “OFF”.
3. Make sure “VIBRATOR” switch is “OFF”.
4. Press and release “MCR RESET” push button. Machine will start.
5. Press and release “VIBRATOR START” push button. The vibrators will start.
6. Press F1 from the run screen and verify all selections are correct:
   - Height pins are [enabled].
   - Agitator is [ON].
   - Air compaction is [ON].
   - Slump mode is [OFF].
   - Aux. feed box oscil. is [OFF].
   - Feed time adjust is [OFF].
   - Cutoff is in [AUTO].
   - Auto height pin by pass is [DISABLE].
   - Aux. feed box is in [HAND].
7. Main drive mode is in single speed.
8. Aux. FB cutoff.
9. Table vibration is on [MAN]. (optional)
10. Head vibration is on [MAN]. (optional)
11. Air bag is [OFF]. (optional)
12. Impactors are [OFF]. (optional)
13. Clam gate power unit is [UNABLE].
14. Clam gate mode is on [AUTO]. (optional)
15. Clam gate open position to 75%. (optional)
16. Clam gate open count to 01. (optional)

NOTE: Enabling these items may not be required for all products.

The machine will sound an alarm for 7 seconds and begin cycling.

To stop the machine, set the clutch switch to “OFF” or push in the “EMERGENCY STOP” button.

8.6 PROCEDURES TO RUN MACHINE FOR FIRST TIME OR WHEN NEW MOLD HAS BEEN INSTALLED

Make sure pre-run procedures have been done and initial start-up position is obtained before going through these adjustments.

First, the operator has to decide of the quality of concrete units he wants to produce.

The quality depends on two (2) factors:

- the mix.
- the machine adjustments.

The machine adjustments for making units are done by adjusting the forming time and the autofeed adjustment. The forming time includes the feed time, the finish time and the delay time. The following is a description of these parameters on the machine which will help you understand how to adjust the machine.

NOTE: These explanations are better covered in section 9: Hand & Machine Interface.

FEED TIME:

Amount of time the feed box is stopped over the mold. This will control the amount of material (concrete) placed in the mold.

FINISH TIME:

Preset time that you will expect desired finish time, from the moment stripper head shoes hit material to when height pins meet each other. Machine will adjust the finish time by adjusting the autofeed mechanism or the feed time (the operator has to select which one he prefers the machine to change. See section 9.3: "Hand & Machine Set-up".

DELAY TIME:

The time of vibration after height pins meet.

STRIP DELAY TIME:

Time from the moment vibration stops to when units are stripped out of the mold. Note that the strip delay does not influence the quality of the units. The strip delay will simply slow down the process.

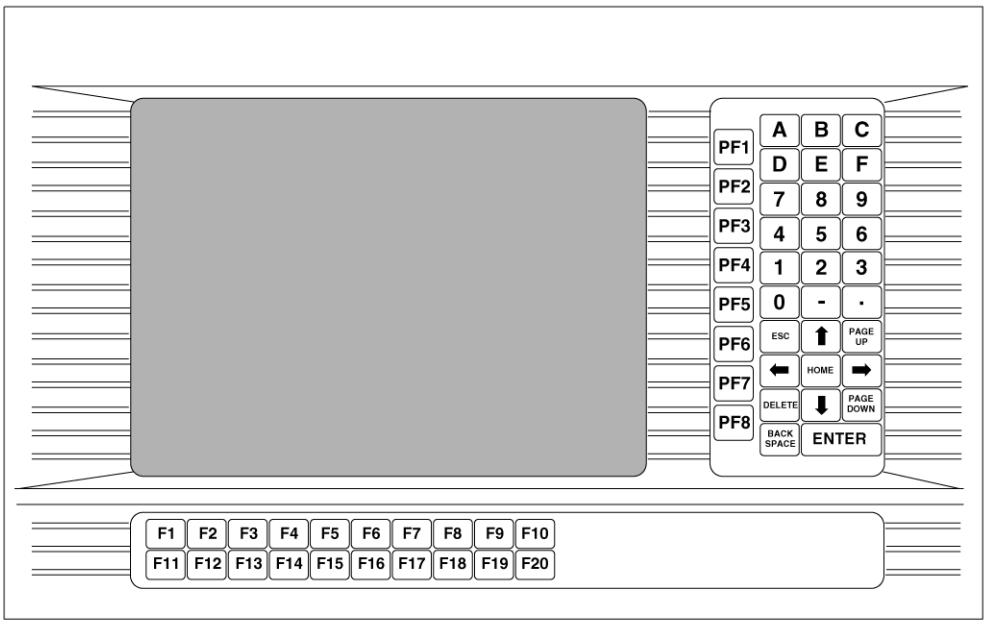
1. Adjust parameter for feed time to approximately 1 1/2 seconds.
2. Adjust parameter for finish time to approximately 1 1/2 seconds.
3. Adjust parameter for delay time to approximately 1 1/2 seconds.
4. Set "Cutoff" to "MAN" position.
5. Adjust it to 1/2" [13mm].
6. Start making units (start machine) (see section 8.5).
7. Check units coming out. Check for cracks, dimensions and density.
8. If units are not perfect, modify finish time until units are perfect. To modify finish time, refer to section 9.5: "Timer adjustment".
9. If units continue being cracked, check delay time; it is probably not sufficient. Too much material introduced in the mold can also cause the cracks.
10. If the units are still not perfect, see section 10: "Troubleshooting" for more details.
11. Set the Cutoff bar to "auto". See section 9.3: "Hand & Machine Set-up".

NOTE: We strongly suggest you use the Cutoff bar auto. correction for most units. It will allow you to produce consistent products. The use of Cutoff bar auto. correction is not recommended for low height units.

SECTION 9
GRAPHIC CONTROL STATION

9.0 GRAPHIC CONTROL STATION

NOTE: In this section, the term "SLC" will be used in reference of the "small logic controller"



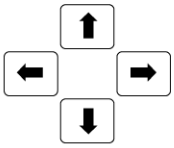
F1 To F10 — Use these keys to select a menu.

F11 To F20 — These keys are not in use.

PF1 — This key is used to confirm certain parameter change.

A To F — These keys are used to enter a name or parameters.

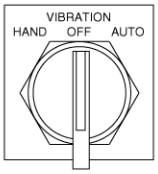
0 To 9 — These keys are used to enter a name or parameters.



These keys are used to move cursor up and down and left to right.

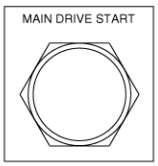
DELETE — This key allows the operator to erase a parameter.

This key is used to accept a parameter after it has been typed in.

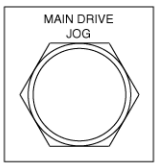


HAND mode: vibration will start whenever switch is set to this position.
AUTO mode: vibration will occur during the appropriate time during the operation of machine.

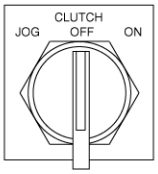
Start vibrating motors but not the vibration itself.
To start actual vibration, use the "hand-off-auto" button.



Starts the main drive, but not the machine operation (clutch).

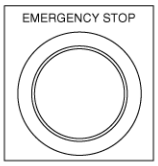


Jogs the machine only when the clutch selector switch is set to "Jog".



To start automatic operation.
At "Off", it stop the auto operation.
At "Jog", the machine can be jogged with the "Main drive jog" button.

OPTIONAL



Used to remove or install the mold with the stripper head.
Lock and unlock.
Raise and lower.

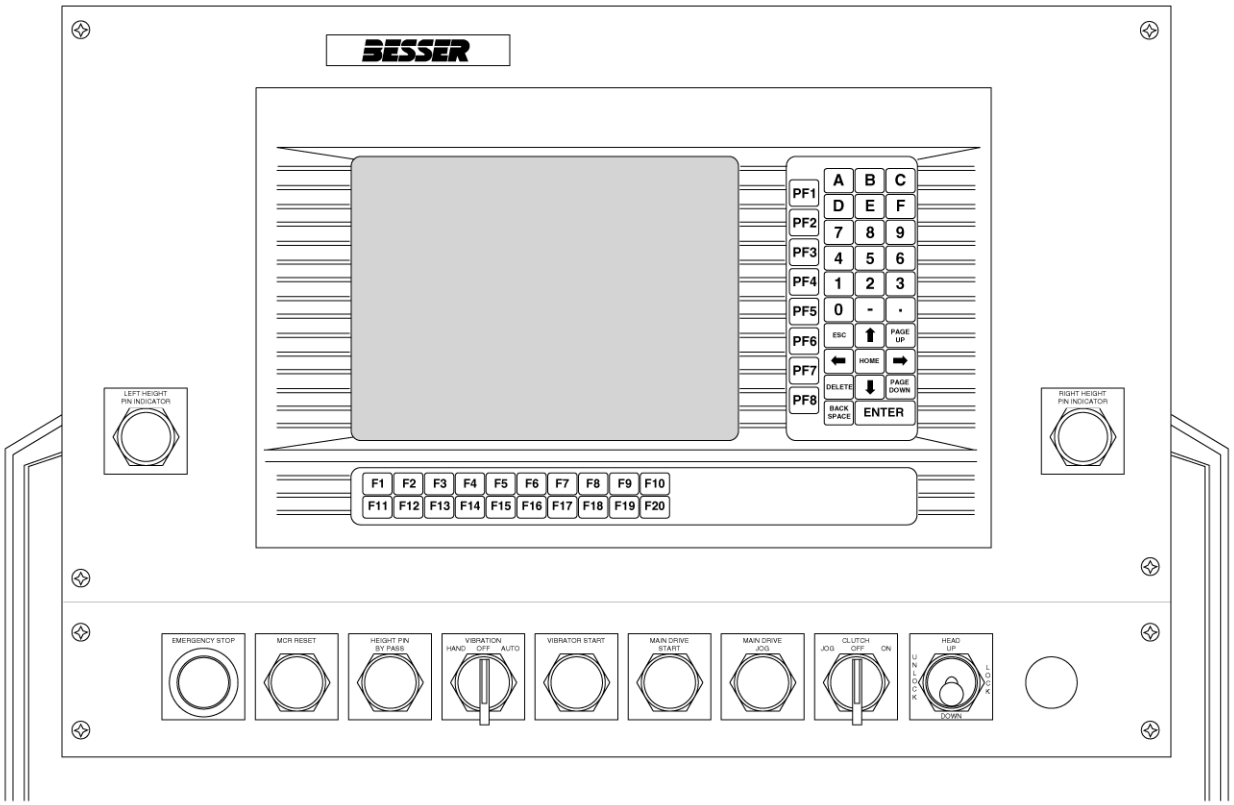
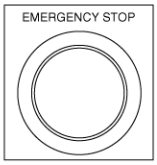
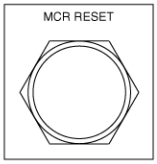


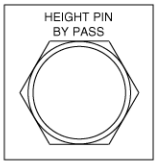
Figure 9.1 *GRAPHIC CONTROL STATION*



Emergency stop,complete shut off of machine.
Needs to be pulled out to start the machine.

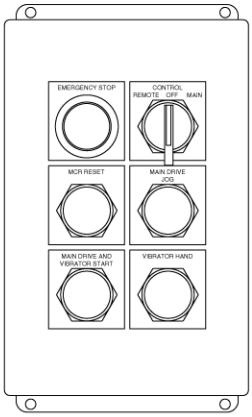


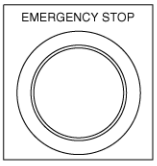
Master control delay reset.
Enables the machine to function (emergency button has to be pull out first).



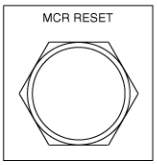
This will override the height pins (simulate the meeting of height pins).

Remote Control Station (Optional).

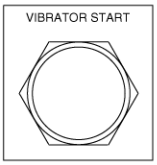




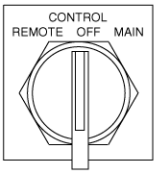
Emergency stop,complete shut off of machine.
Needs to be pulled out to start the machine.



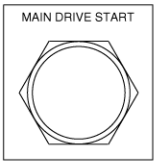
Master control delay reset.
Enables the machine to function (emergency button has to be pull out first).



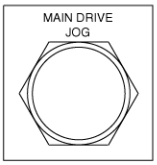
Vibrator hand. The vibration starts only when the “control” selector switch is set to “remote”.



REMOTE mode: Remote panel will control machine.
MAIN mode: Main panel will control machine.

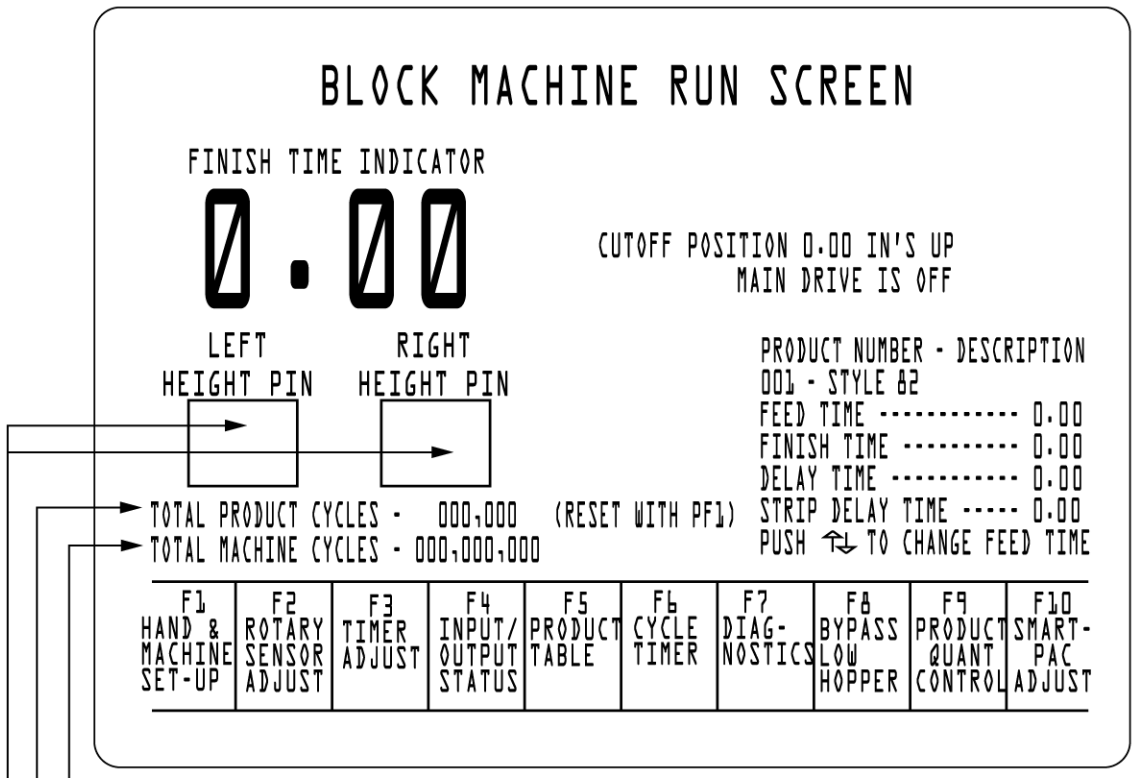


Starts the main drive and vibrator motors, but not the machine operation (clutch).



Jogs the machine only when the “control” selector switch is set to "remote".

9.1 BLOCK MACHINE RUN SCREEN



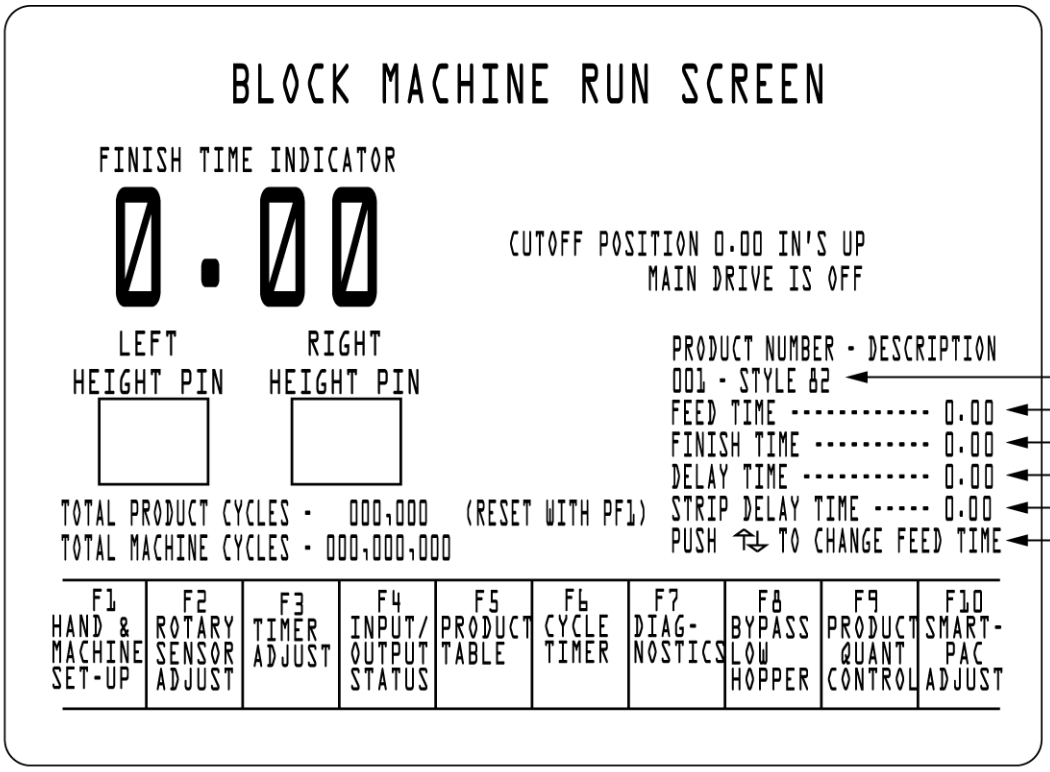
Red box will appear when height pins have made contact.

Note: Use blue light indicators on both sides of display screen to monitor height pins. They are more accurate than the one on the display screen,

Number of cycles run by the machine since the last product change or since last reset.

Note: Machine will ignore cycle counts when vibrators are turned off (dry cycles are not counted).

Life time cycle counts (cannot be reset).



Product number 1 to 100 - Product description: 20 character field.

FEED TIME
Amount of time the feed box is stopped over the mold. This will control the amount of material (concrete) placed in the mold.

FINISH TIME
Preset time that you will expect desired finish time, from the moment stripper head shoes hit material to when height pins meet each other. Machine will adjust the finish time by adjusting the Cutoff bar or the feed time (the operator to select which one he prefers the machine to change with (uses F1, F7 or F8).

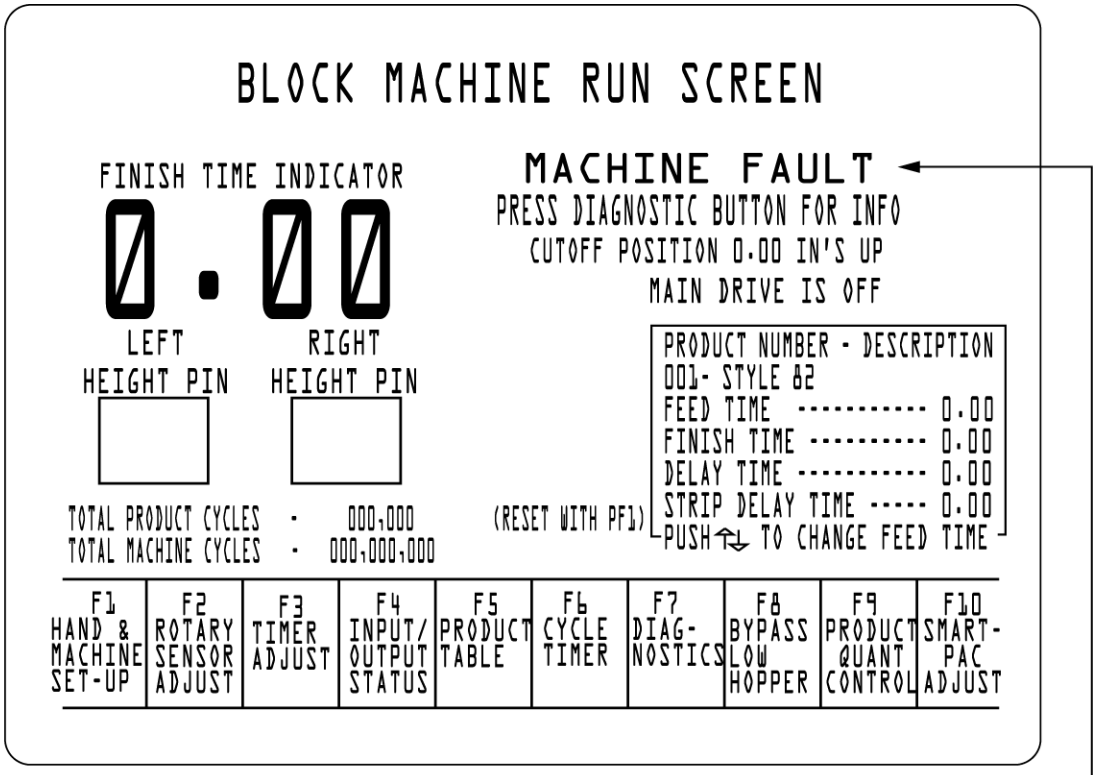
DELAY TIME
The time of vibration after height pins meet (F3 timer 2)

STRIP DELAY TIME
Time from the moment vibration stops to when units are stripped out of the mold.(F3 timer 3)

Use arrows to modify feed time by 0.1 second increments.

9.2 FAULT MESSAGE ON BLOCK MACHINE RUN SCREEN

This screen will be displayed every time a fault occurs.



When this message appears, follow this procedure:

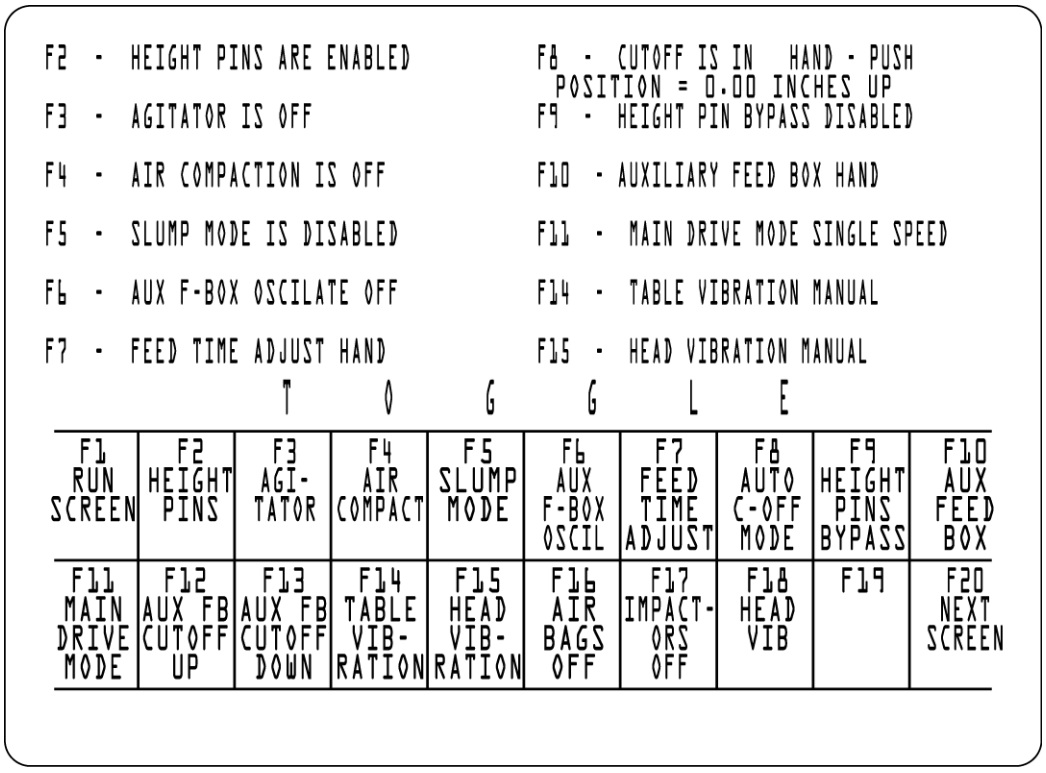
1. Press F7 to inquire about the fault.
2. Correct the fault (see Trouble Shooting section 10.1.1).
3. Turn the clutch selector switch to "OFF".
4. Press the F9 key to clear the fault.
5. Turn clutch switch "ON"

The machine will sound an alarm and restart.

9.3 HAND & MACHINE SET UP F1

This screen allows the operator to turn some of the machine's components ON and OFF.

To access this screen from the **RUN SCREEN**, press **F1**.



F2: Normally enabled. The machine will not continue beyond point where height pins meet. It can be useful for single cycle runs.

F3: Turns the agitator ON or OFF .

F4: Turns the air compaction cylinders ON or OFF

F5: If enabled, machine only needs 1 height pin to meet in order to continue cycle.

F6: OPTIONAL: If turned on, the aux. feedbox will oscillate while over the mold.

F7: If enabled, the feed time will be automatically adjusted, otherwise, no adjustment will be made by the machine. The feed time adjustment will be made with 0.1 sec increments. If you wish to change this increment, change value of register of N7:35 (see section 10.9, data table display "F7"). Here, the normal value is equivalent to 0.1 seconds. When this is in AUTO, cutoff will switch to the MANUAL mode (F8).

F8: Turns the cutoff in AUTO or MANUAL mode.

ref. timer 8 = manual adjustment increment (time of travel)

ref. timer 10 = automatic adjustment increment (time of travel)

F9: If enabled, a timer will control the finish time (refer to timer 49)

F10: Toggles the Auxiliary feedbox from AUTO to HAND (manual). Press key to change.

F11: Controls speed of main drive.
Single speed: machine runs same speed as full cycle.
Dual speed: machine runs at different speed at different parts of cycle.

F12 & F13: Manually operate Aux. cutoff bar. Press key to move.

F14: Toggles optional Table vibration between Manual, Single and Dual. Press key to change.

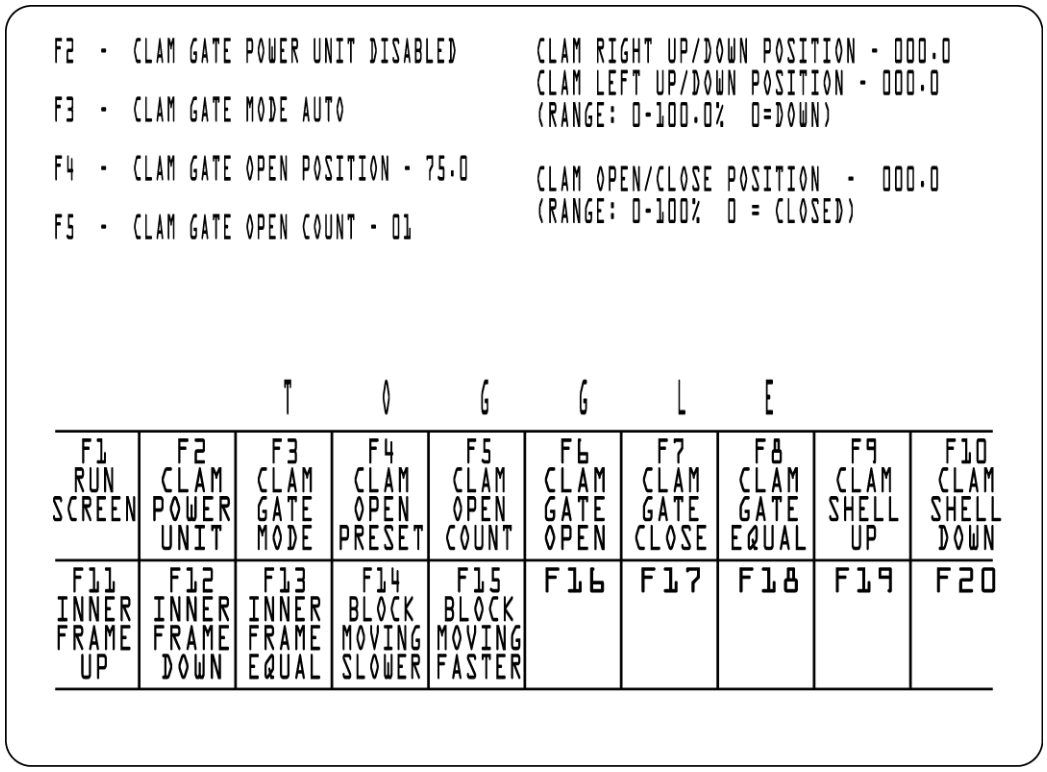
F15: Toggles optional Head vibration between Manual and Auto. Press key to change.

F16: Use this key to manually operate the optional Table vibration then use F17 to vibrate.

F17: Press this key to turn Impactors ON and OFF.

F18: Press this key to turn Head vibration ON.

F20: Press this key to access 2nd set of functions. The screen will display the following showed below.



F2: If enabled, pump will start when machine starts.

F3: HAND or AUTO (clam gate mode): When in AUTO, F6 to F10 are not applicable. When in MANUAL, F4 and F5 not applicable.

F4: Clam gate open position. 0 to 99.9%.
0 is completely close.
99.9 is completely open.

F5: Clam open count. How many times the machine will cycle before the clam opens. Preset of 1 means clam opens on each cycle.

F6: Press key to open clam gate. Will work only if F3 is in MANUAL.

F7: Press key to close clam gate. Will work only if F3 is in MANUAL.

F8: Will equalize both cylinders on clam gate. Will work only if F3 is in MANUAL.

F9: Press key to raise clam shell. Will work only if F3 is in MANUAL.

F10: Press key to lower clam shell. Will work only if F3 is in MANUAL.

F11: Press key to raise inner frame.

F12: Press key to lower inner frame.

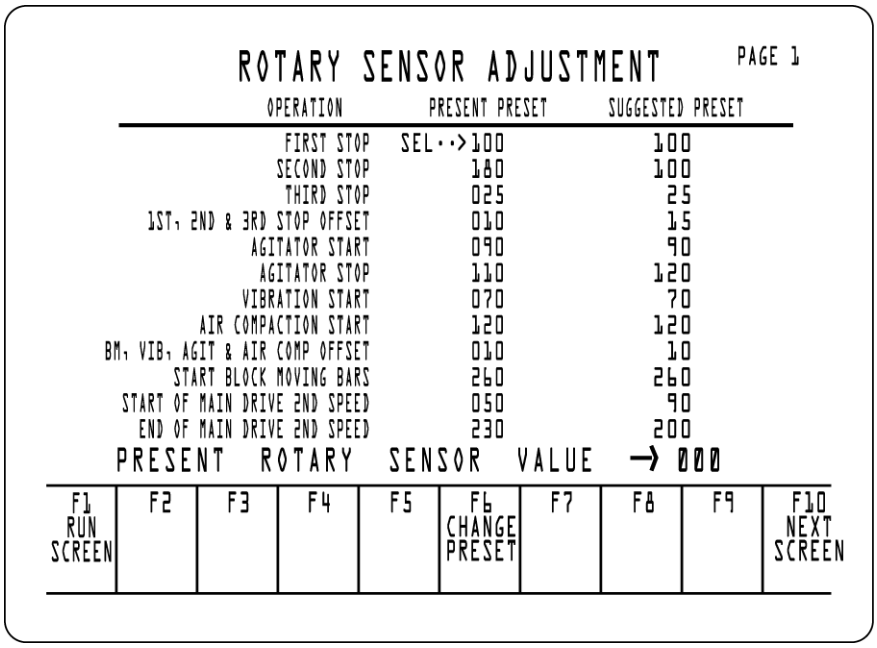
F13: Press key to equalize inner frame (will level both cylinders).

F14: Press key to decrease block moving bar speed.

F15: Press key increase block moving bar speed.

9.4 ROTARY SENSOR ADJUSTMENT F2

This screen allows the user to change the preset values of the rotary sensor. The rotary sensor is located at the end of the main shaft. Its purpose is to synchronize the machine and all its components. This screen also allows the user to acknowledge the present rotary sensor value. To access this screen from the **RUN SCREEN**, press **F2**.



First stop:
Should occur when indicating 1000.

Second stop:
Should occur when indicating 1800.

Third stop:
Should occur when indicating 250.

1st, 2nd & 3rd stop offset:
Window for stop position. (accuracy)
Ex.: If offset is 10°, 1st stop can be between 90° and 100°. This value (10) will be subtracted from the stop value (100) to give range of operation to the rotary sensor to determine a stop.

Agitator start:
The location on the rotary sensor where the agitator is turned ON.

Agitator stop:
The location on the rotary sensor where the agitator is turned OFF.

Vibration start:
The location on the rotary sensor where the vibrators start (no stop location)(stop is controlled by a delay time).

Air compaction start:
The location on the rotary sensor where the air compaction starts (no stop location) (stop when height pins meet).

BM, VIB, AGIT & Air comp offset:
Window for these components. (accuracy)
Ex.: If offset is 10°, BM bars can be between 250° and 260°. This value (10) will be subtracted from the value (250) to give range of operation to the rotary sensor to determine a stop.

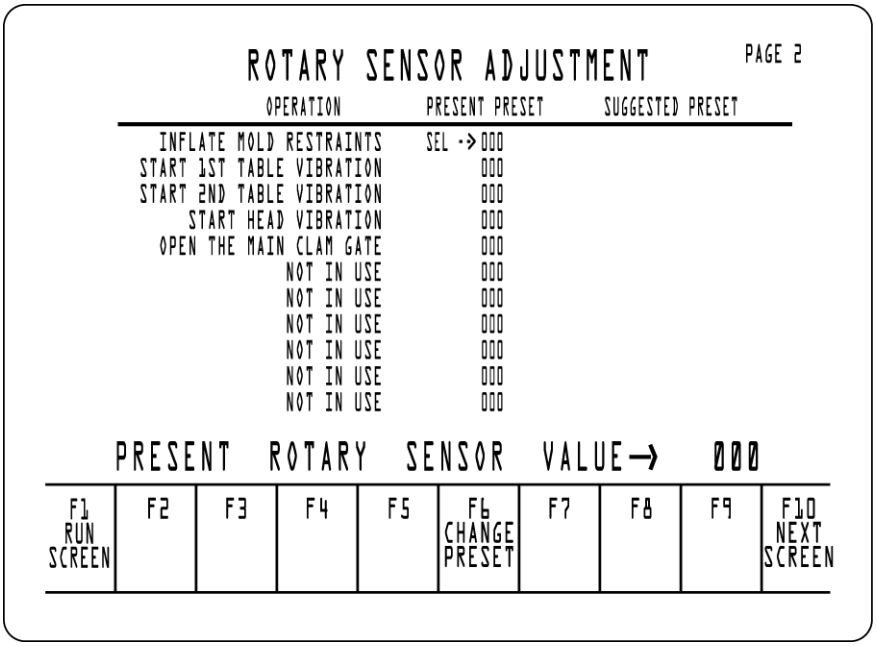
Start block moving bars:
The location on the rotary sensor where the block moving bars start.

Start (end) of main drive 2nd speed:
By running machine manually, set to desired position where you wish speed change. Check sensor value and enter here. Only Applicable if DUAL speed is selected (Hand & Machine Set-up - F11).

F6
Press this key to change any of the preset values. Use arrows to select. Use numbers to changes values. Use ”enter” to accept changes.

PRESENT ROTARY SENSOR VALUE: 000
It will indicate the rotary sensor location at present time.

Press the **F10** key access 2nd “Rotary sensor adjustment” screen.



NOTE: the following settings are found on optional devices only.

Inflate mold restraints: (Optional table vibration) Inflates a set of air bags which hold the mold in position. Need to turn on before table vibration.

Start 1st table vibration: The location on the rotary sensor where table vibration starts for the first time.

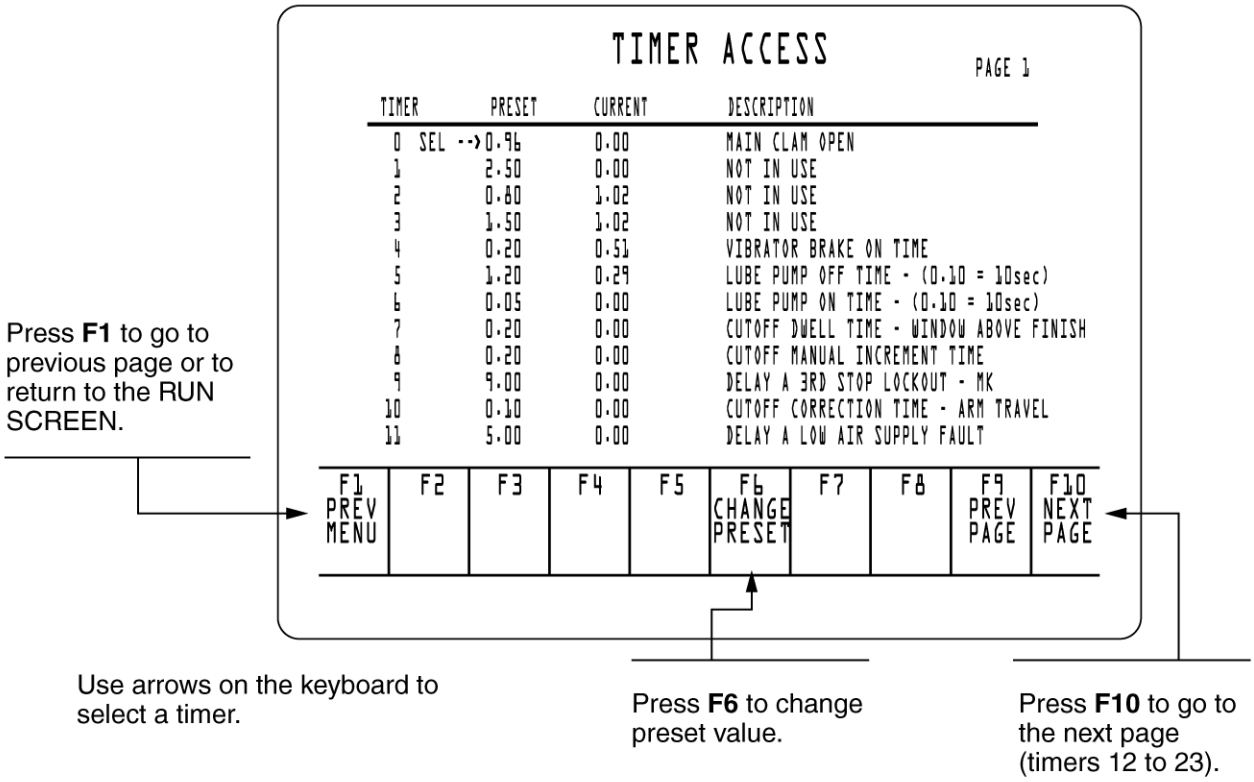
Start 2nd table vibration: The location on the rotary sensor where table vibration starts for the second time.

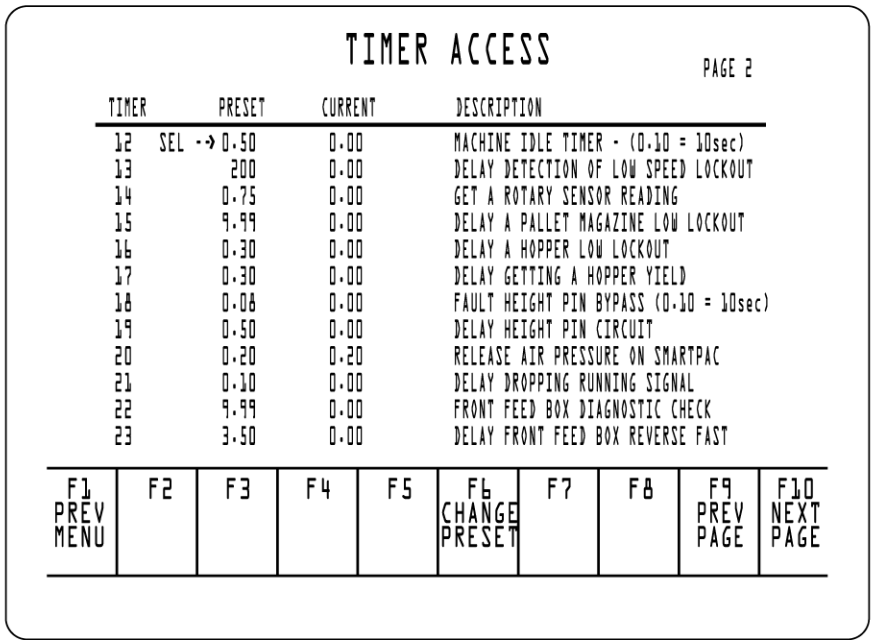
Start head vibration: The location on the rotary sensor where the head vibration starts.

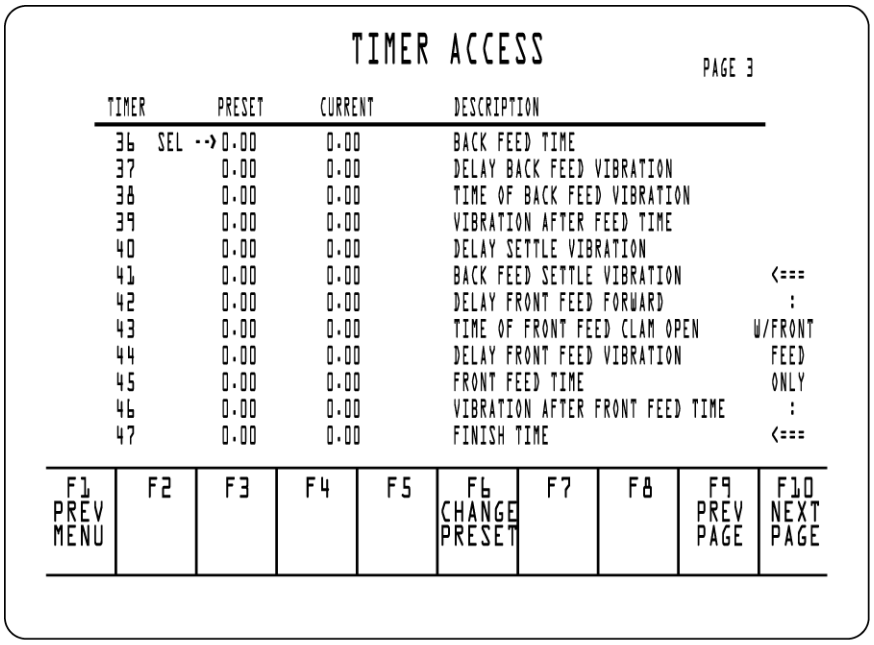
Open the main clam gate: The location on the rotary sensor where the clam gate opens.

9.5 TIMER ADJUSTMENT F3

These two screens allow the operator to visualize and to change preset timer values. There are 24 timers (0 to 23) which are accessible through these screens. Additional timers are accessible through the DATA TABLE DISPLAY (F7 then F4). See appendix "A" for all timer addresses and descriptions. Each timer has a specific function related to the machine's overall performance. The timers and their functions are listed on the next page. Timers 0 to 3 are the most used timers; they control functions which are directly related to production. To access this screen from the **RUN SCREEN**, press **F3**.





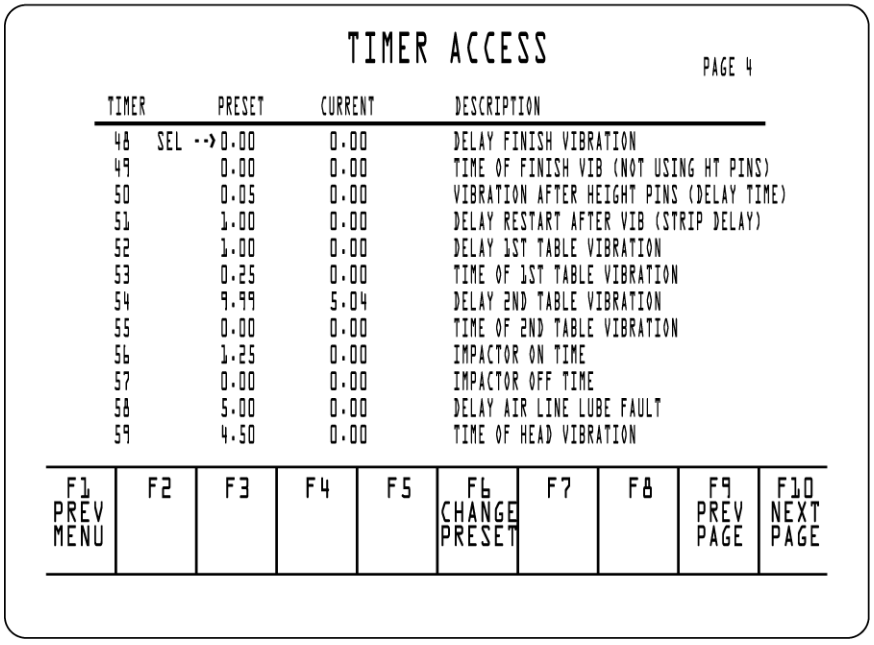


TIMER ACCESS

PAGE 3

TIMER		PRESET	CURRENT	DESCRIPTION	
36	SEL -->	0.00	0.00	BACK FEED TIME	
37		0.00	0.00	DELAY BACK FEED VIBRATION	
38		0.00	0.00	TIME OF BACK FEED VIBRATION	
39		0.00	0.00	VIBRATION AFTER FEED TIME	
40		0.00	0.00	DELAY SETTLE VIBRATION	
41		0.00	0.00	BACK FEED SETTLE VIBRATION	<===
42		0.00	0.00	DELAY FRONT FEED FORWARD	:
43		0.00	0.00	TIME OF FRONT FEED CLAM OPEN	W/FRONT
44		0.00	0.00	DELAY FRONT FEED VIBRATION	FEED
45		0.00	0.00	FRONT FEED TIME	ONLY
46		0.00	0.00	VIBRATION AFTER FRONT FEED TIME	:
47		0.00	0.00	FINISH TIME	<===

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
PREV MENU					CHANGE PRESET			PREV PAGE	NEXT PAGE



TIMER ACCESS

PAGE 4

TIMER		PRESET	CURRENT	DESCRIPTION
48	SEL -->	0.00	0.00	DELAY FINISH VIBRATION
49		0.00	0.00	TIME OF FINISH VIB (NOT USING HT PINS)
50		0.05	0.00	VIBRATION AFTER HEIGHT PINS (DELAY TIME)
51		1.00	0.00	DELAY RESTART AFTER VIB (STRIP DELAY)
52		1.00	0.00	DELAY 1ST TABLE VIBRATION
53		0.25	0.00	TIME OF 1ST TABLE VIBRATION
54		9.99	5.04	DELAY 2ND TABLE VIBRATION
55		0.00	0.00	TIME OF 2ND TABLE VIBRATION
56		1.25	0.00	IMPACTOR ON TIME
57		0.00	0.00	IMPACTOR OFF TIME
58		5.00	0.00	DELAY AIR LINE LUBE FAULT
59		4.50	0.00	TIME OF HEAD VIBRATION

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
PREV MENU					CHANGE PRESET			PREV PAGE	NEXT PAGE

TIMER FUNCTION

0. MAIN CLAM OPEN TIME. How much the operator needs the clam to be open. (this will control the amount of material in the feedbox).

4. VIBRATOR BRAKE ON TIME. The amount of time the vibrator brake is energized. Note: If your machine is equipped with Smartpac, timer 4 is **not** used.

5. LUBE PUMP OFF TIME. This is the time (over a period of 1 minute) that the lubrication pump is OFF. (IMPORTANT: 0.01 = 1 second) **NOTE:** This is the timer that should be used to adjust lubrication time.

6. LUBE PUMP ON TIME. This is the time (over a period of 1 minute) that the lubrication pump is ON. (IMPORTANT: 0.01 = 1 second) **NOTE:** Use timer 5 above to adjust lubrication time. Timer 5 + timer 6 = total cycle time of lubrication pump.

7. CUTOFF DWELL TIME. If the finish time is greater than this amount, the autofeed will not adjust the finish time.
   Ex.: Finish time = 1 second
   Timer 7 = 0.40 second
   If finish time is between 1 sec. and 1.4 sec., the autofeed will not adjust finish time.
   If finish time is 1.50 sec., autofeed mechanism or feed time will be incremented down.
   If finish time is 0.9 sec., autofeed mechanism or feed time will be incremented up.
   NOTE: See section 9.3: “Hand & machine setup” - F7 and F8.

8. CUTOFF MANUAL INCREMENT TIME. The amount of autofeed correction in manual mode. **NOTE:** This is necessary to manually increase or decrease the amount of travel done by the autofeed mechanism each time you manually operate it. This timer is related to the ruler on top of the autofeed mechanism.

9. DELAY A 3RD STOP LOCKOUT. After the product is stripped out of the mold, it is possible that a third stop is necessary. The third stop may be required for slow product delivery. The delay you will be presetting here will be considered acceptable. Above this time (9 seconds), the computer will show a fault signal.

10. CUTOFF CORRECTION TIME - ARM TRAVEL - Same as timer 8 but with the automatic mode on.

11. DELAY A LOW AIR SUPPLY FAULT. Won't stop the machine in case of small air pressure fluctuation. If the air pressure fluctuation lasts longer than this preset time, the machine will stop and the display will show a fault.

12. MACHINE IDLE TIMER. If your machine is part of a plant integration, this timer will be used. No fault condition created.

13. DELAY DETECTION OF LOW SPEED LOCKOUT. In case of mechanical jam or underspeed condition, the machine will stop after this delay.

14. GET A ROTARY SENSOR READING. This timer is preset and should not be adjusted by the operator.

15. DELAY A PALLET MAGAZINE LOW LOCKOUT. The amount of acceptable time the magazine is low on pallets before a fault is actuated.

TIMER FUNCTION

16. DELAY A HOPPER LOW LOCKOUT. The amount of acceptable time the hopper is low on material before a fault is actuated.

17. DELAY GETTING A HOPPER YIELD. Used in plan integration.

18. NOT IN USE.

19. DELAY HEIGHT PIN CIRCUIT. Amount of time before height pin circuit are enabled. Used to ignore pin bounce on low height products.

20. RELEASE AIR PRESSURE ON SMARTPAC. Time to release air pressure on Smartpac once desired amplitude has been reached.

21. DELAY DROPPING RUNNING SIGNAL. If machine is not cycling for a certain period of time, RUN SIGNAL is dropped. Machine may have to be restarted.

22. FRONT FEED BOX DIAGNOSTIC CHECK. If front feed box does not move during that period, fault will occur.

23. DELAY FRONT FEED BOX REVERSE FAST. When front feed box is coming back, it will start slow, wait for this delay then accelerates.

24 to 35. From the timer screen, use the data table screen to access these times (see section 9.9.3)

36. BACK FEED BOX. Refer to timer 0.

37. DELAY BACK FEED VIBRATION. Refer to timer 20.

38. TIME OF BACK FEED VIBRATION. Amount of time of vibration at first stop.

39. VIBRATION AFTER FEED TIME. Amount of time of vibration after feed time.

40. DELAY SETTLE VIBRATION. Vibration after main feed box goes back and before front feedbox comes in.

41. BACK FEED SETTLE VIBRATION. How long settle vibration goes on.

42. DELAY FRONT FEED FORWARD. Delay how long front feed box comes forward after settle vibration.

43. TIME OF FRONT FEED CLAM OPEN. Amount of time you allow clam to stay open.

44. DELAY FRONT FEED VIBRATION. Delay when front feed box is forward and when vibrating is starting.

45. FRONT FEED TIME. Amount of time the feed box is stopped over the mold. This time controls the amount of concrete placed in the mold.

46. VIBRATION AFTER FRONT FEED TIME. Amount of time of vibration after feed time.

47. **FINISH TIME**. Preset time that you will expect desired finish time. Finish time is from the moment stripper head shoes hit material to when height pins meet. Machine will adjust the finish time by adjusting either the autofeed mechanism or the feed time.

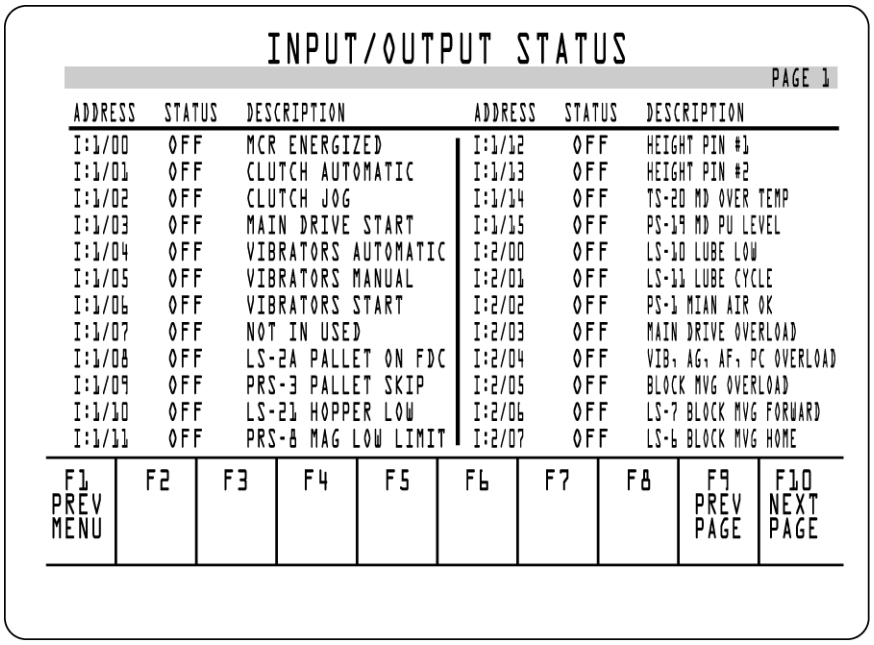
TIMER FUNCTION

47. **FINISH TIME**. Preset time that you will expect desired finish time. Finish time is from the stripper head shoes hit material to when height pins meet. Machine will adjust the finish time by adjusting either the autofeed mechanism or the feed time.
48. DELAY FINISH VIBRATION. Delay after 2nd stop before it begins finish vibration.
49. Used if height pins are not used. Used in conjunction with height pin bypass.
50. **DELAY TIME.** Amount of time of vibration after height pins meet.
51. **STRIP DELAY TIME.** Delay between time when vibration stops and when units are stripped out of the mold.
52. Delays how long 1st vibration occurs after rotary sensor position has been reached.
53. Duration of optional table vibration.
54. Delay start of 2nd table vibration.
55. Time of 2nd table vibration
56. ON and OFF of optional table vibration (pulse vibration). Note: for continuous table vibration set impactor ON time greater than table vibration ON time.
57. Impactor off time (used only when pulsing the impactors).
58. Won't stop the machine in case of a short airlub fault signal. If fault lasts longer than preset time, machine will stop.
59. Duration of optional head vibration.

9.6 INPUT / OUTPUT STATUS F4

These screens represent the status of all electrical components on the block machine. They can be used to isolate one component on the machine or to locate an electrical fault on one of the components.

To access this screen from the **RUN SCREEN**, press **F4**.

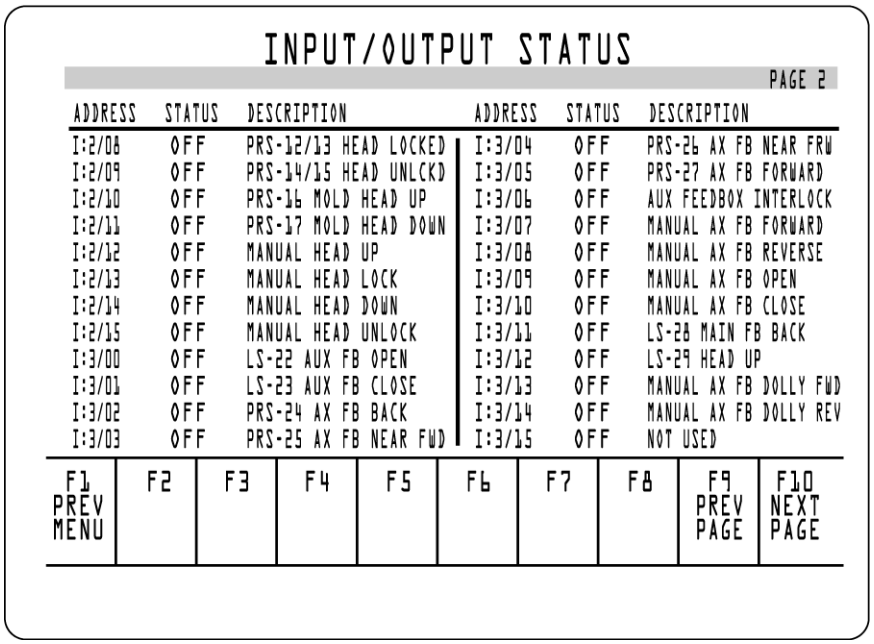


INPUT/OUTPUT STATUS

PAGE 1

ADDRESS	STATUS	DESCRIPTION	ADDRESS	STATUS	DESCRIPTION
I:1/00	OFF	MCR ENERGIZED	I:1/12	OFF	HEIGHT PIN #1
I:1/01	OFF	CLUTCH AUTOMATIC	I:1/13	OFF	HEIGHT PIN #2
I:1/02	OFF	CLUTCH JOG	I:1/14	OFF	TS-20 MD OVER TEMP
I:1/03	OFF	MAIN DRIVE START	I:1/15	OFF	PS-19 MD PU LEVEL
I:1/04	OFF	VIBRATORS AUTOMATIC	I:2/00	OFF	LS-10 LUBE LOW
I:1/05	OFF	VIBRATORS MANUAL	I:2/01	OFF	LS-11 LUBE CYCLE
I:1/06	OFF	VIBRATORS START	I:2/02	OFF	PS-1 MIAN AIR OK
I:1/07	OFF	NOT IN USED	I:2/03	OFF	MAIN DRIVE OVERLOAD
I:1/08	OFF	LS-2A PALLET ON FDC	I:2/04	OFF	VIB, AG, AF, PC OVERLOAD
I:1/09	OFF	PRS-3 PALLET SKIP	I:2/05	OFF	BLOCK MVG OVERLOAD
I:1/10	OFF	LS-21 HOPPER LOW	I:2/06	OFF	LS-7 BLOCK MVG FORWARD
I:1/11	OFF	PRS-8 MAG LOW LIMIT	I:2/07	OFF	LS-6 BLOCK MVG HOME

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
PREV MENU								PREV PAGE	NEXT PAGE

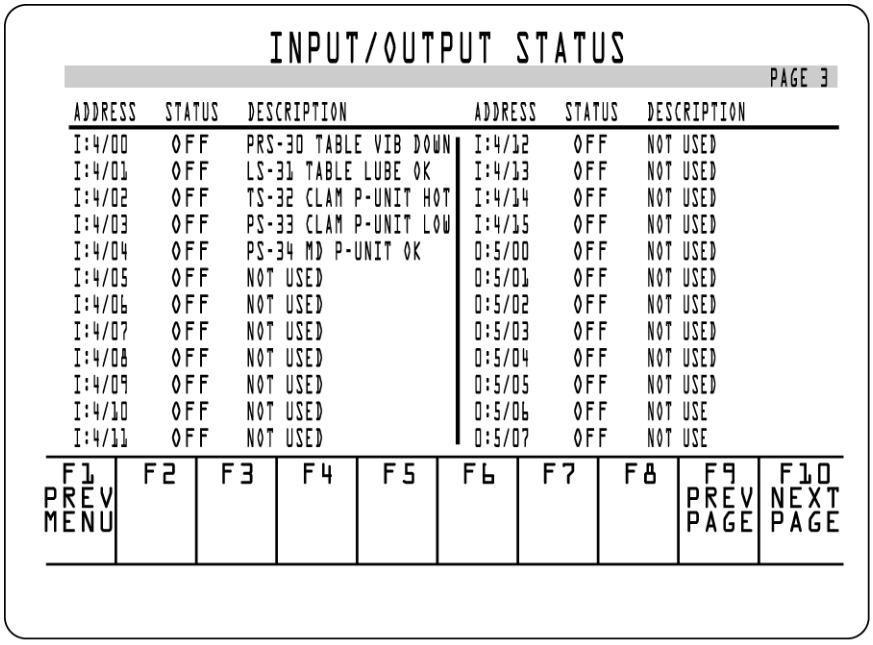


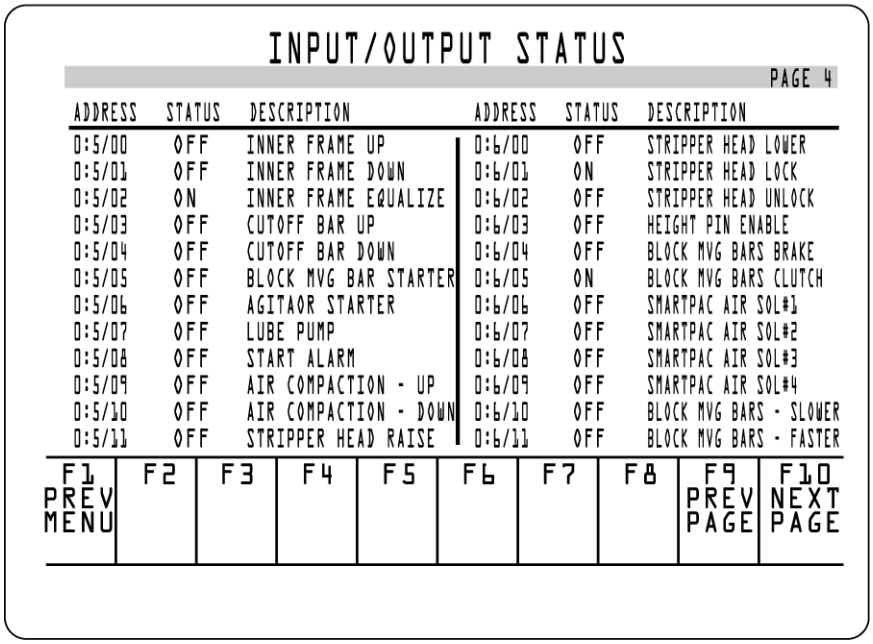
INPUT/OUTPUT STATUS

PAGE 2

ADDRESS	STATUS	DESCRIPTION	ADDRESS	STATUS	DESCRIPTION
I:2/08	OFF	PRS-12/13 HEAD LOCKED	I:3/04	OFF	PRS-26 AX FB NEAR FRW
I:2/09	OFF	PRS-14/15 HEAD UNLCKD	I:3/05	OFF	PRS-27 AX FB FORWARD
I:2/10	OFF	PRS-16 MOLD HEAD UP	I:3/06	OFF	AUX FEEDBOX INTERLOCK
I:2/11	OFF	PRS-17 MOLD HEAD DOWN	I:3/07	OFF	MANUAL AX FB FORWARD
I:2/12	OFF	MANUAL HEAD UP	I:3/08	OFF	MANUAL AX FB REVERSE
I:2/13	OFF	MANUAL HEAD LOCK	I:3/09	OFF	MANUAL AX FB OPEN
I:2/14	OFF	MANUAL HEAD DOWN	I:3/10	OFF	MANUAL AX FB CLOSE
I:2/15	OFF	MANUAL HEAD UNLOCK	I:3/11	OFF	LS-28 MAIN FB BACK
I:3/00	OFF	LS-22 AUX FB OPEN	I:3/12	OFF	LS-29 HEAD UP
I:3/01	OFF	LS-23 AUX FB CLOSE	I:3/13	OFF	MANUAL AX FB DOLLY FWD
I:3/02	OFF	PRS-24 AX FB BACK	I:3/14	OFF	MANUAL AX FB DOLLY REV
I:3/03	OFF	PRS-25 AX FB NEAR FWD	I:3/15	OFF	NOT USED

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
PREV MENU								PREV PAGE	NEXT PAGE


INPUT/OUTPUT STATUS
PAGE 3
ADDRESS STATUS DESCRIPTION ADDRESS STATUS DESCRIPTION
I:4/00 OFF PRS-30 TABLE VIB DOWN I:4/12 OFF NOT USED
I:4/01 OFF LS-31 TABLE LUBE OK I:4/13 OFF NOT USED
I:4/02 OFF TS-32 CLAM P-UNIT HOT I:4/14 OFF NOT USED
I:4/03 OFF PS-33 CLAM P-UNIT LOW I:4/15 OFF NOT USED
I:4/04 OFF PS-34 MD P-UNIT OK O:5/00 OFF NOT USED
I:4/05 OFF NOT USED O:5/01 OFF NOT USED
I:4/06 OFF NOT USED O:5/02 OFF NOT USED
I:4/07 OFF NOT USED O:5/03 OFF NOT USED
I:4/08 OFF NOT USED O:5/04 OFF NOT USED
I:4/09 OFF NOT USED O:5/05 OFF NOT USED
I:4/10 OFF NOT USED O:5/06 OFF NOT USE
I:4/11 OFF NOT USED O:5/07 OFF NOT USE
F1 PREV MENU
F2
F3
F4
F5
F6
F7
F8
F9 PREV PAGE
F10 NEXT PAGE


INPUT/OUTPUT STATUS
PAGE 4
ADDRESS STATUS DESCRIPTION ADDRESS STATUS DESCRIPTION
O:5/00 OFF INNER FRAME UP O:6/00 OFF STRIPPER HEAD LOWER
O:5/01 OFF INNER FRAME DOWN O:6/01 ON STRIPPER HEAD LOCK
O:5/02 ON INNER FRAME EQUALIZE O:6/02 OFF STRIPPER HEAD UNLOCK
O:5/03 OFF CUTOFF BAR UP O:6/03 OFF HEIGHT PIN ENABLE
O:5/04 OFF CUTOFF BAR DOWN O:6/04 OFF BLOCK MVG BARS BRAKE
O:5/05 OFF BLOCK MVG BAR STARTER O:6/05 ON BLOCK MVG BARS CLUTCH
O:5/06 OFF AGITAOR STARTER O:6/06 OFF SMARTPAC AIR SOL#1
O:5/07 OFF LUBE PUMP O:6/07 OFF SMARTPAC AIR SOL#2
O:5/08 OFF START ALARM O:6/08 OFF SMARTPAC AIR SOL#3
O:5/09 OFF AIR COMPACTION - UP O:6/09 OFF SMARTPAC AIR SOL#4
O:5/10 OFF AIR COMPACTION - DOWN O:6/10 OFF BLOCK MVG BARS - SLOWER
O:5/11 OFF STRIPPER HEAD RAISE O:6/11 OFF BLOCK MVG BARS - FASTER
F1 PREV MENU
F2
F3
F4
F5
F6
F7
F8
F9 PREV PAGE
F10 NEXT PAGE

INPUT/OUTPUT STATUS

PAGE 5

ADDRESS	STATUS	DESCRIPTION	ADDRESS	STATUS	DESCRIPTION
O:7/00	OFF	CLAM SHELL POWER UNIT	O:8/00	OFF	AUX FB CLAM OPEN
O:7/01	OFF	CLAM SHELL RIGHT UP	O:8/01	OFF	AUX FB CLAM CLOSE
O:7/02	ON	CLAM SHELL LEFT UP	O:8/02	OFF	AUX FB FWD SLOW
O:7/03	OFF	CLAM SHELL RIGHT DOWN	O:8/03	ON	AUX FB FWD FAST
O:7/04	OFF	CLAM SHELL LEFT DOWN	O:8/04	ON	AUX FB REV SLOW
O:7/05	OFF	CLAM GATE OPEN	O:8/05	OFF	AUX FB REV SLOW
O:7/06	OFF	CLAM GATE CLOSE	O:8/06	OFF	AUX FB DOLLY FWD
O:7/07	OFF	CLAM GATE EQUALIZE	O:8/07	ON	AUX FB DOLLY REV
O:7/08	OFF	MAIN DRIVE CLUTCH	O:8/08	OFF	MOLD RESTRAINT
O:7/09	OFF	HYDRO DRIVE REVERSE	O:8/09	OFF	SMARTPAC START CMD
O:7/10	OFF	HYDRO DRIVE HIGH PSI	O:8/10	OFF	TABLE VIBRATORS
O:7/11	OFF	HYDRO DRIVE BRAKE	O:8/11	OFF	HEAD VIBRATORS

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
PREV MENU								PREV PAGE	NEXT PAGE

INPUT/OUTPUT STATUS

PAGE 6

ADDRESS	STATUS	DESCRIPTION	ADDRESS	STATUS	DESCRIPTION
O:9/00	ON	MAIN DRIVE CONTACTOR	I:10/00	OFF	NOT USED
O:9/01	OFF	VIBRATOR CONTACTOR	I:10/01	OFF	NOT USED
O:9/02	OFF	MAIN DRIVE START CMD	I:10/02	OFF	NOT USED
O:9/03	ON	MAIN DRIVE SPEED SW-1	I:10/03	OFF	NOT USED
O:9/04	ON	MAIN DRIVE SPEED SW-2	I:10/04	OFF	NOT USED
O:9/05	ON	NOT USED	I:10/05	OFF	NOT USED
O:9/06	ON	NOT USED	I:10/06	OFF	NOT USED
O:9/07	OFF	NOT USED	I:10/07	OFF	NOT USED
O:9/08	OFF	NOT USED	I:10/08	OFF	NOT USED
O:9/09	OFF	NOT USED	I:10/09	OFF	NOT USED
O:9/10	OFF	NOT USED	I:10/10	OFF	NOT USED
O:9/11	OFF	NOT USED	I:10/11	OFF	NOT USED

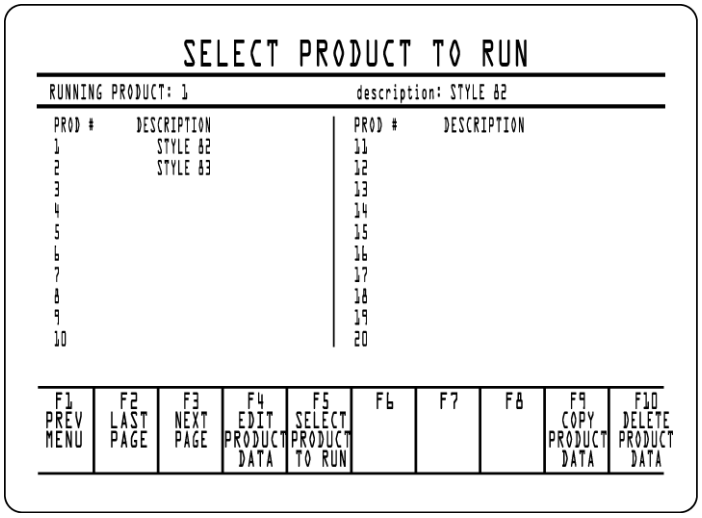
F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
PREV MENU								PREV PAGE	NEXT PAGE

9.7 SELECT PRODUCT F5

This menu allows you to store and retrieve preset recipes which include Feed time, Finish time, Delay time, and Strip delay time. There are 20 products on each of the 14 pages for a maximum of 280 product numbers. To access this menu from the **RUN SCREEN**, press **F5**. To return to the **RUN SCREEN**, press **F1**

With this menu, you may:

- Enter into the SLC memory a name for different products.
- Enter preset recipes for each of those products.
- Modify any preset recipe for any product.



F1 Return to RUN SCREEN.

F2 LAST page. Go to last page.

F3 NEXT PAGE. Go to next page (products 21 to 40)

F4 EDIT PRODUCT DATA. Will allow user to build new recipe or edit existing ones.

F5 SELECT PRODUCT TO RUN. Allows user to select particular recipe to run.

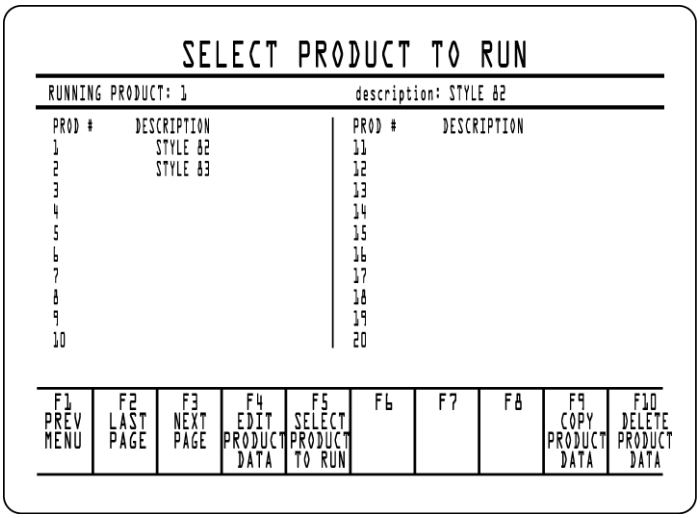
F9 COPY PRODUCT DATA. Allows user to copy a recipe from one product to another.

F10 DELETE PRODUCT DATA. Allows user to delete particular product.

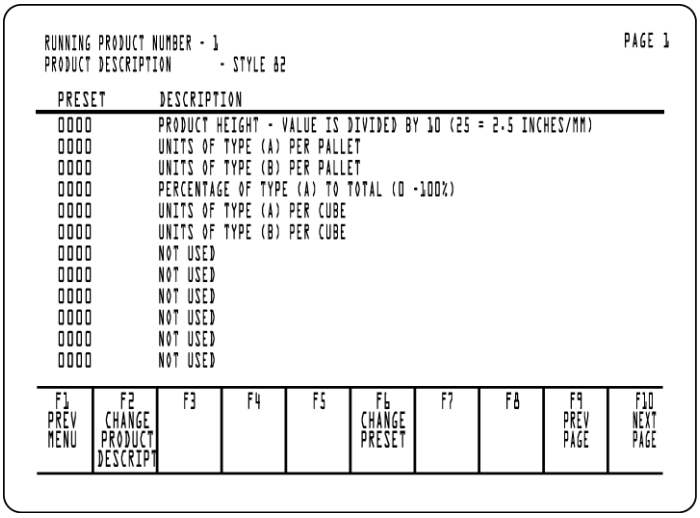
9.7.1 To Edit Product Data (F4):

NOTE: The following procedure shows how to store information into the SLC memory. The SLC will not use the recipe until it has been LOADED as shown.

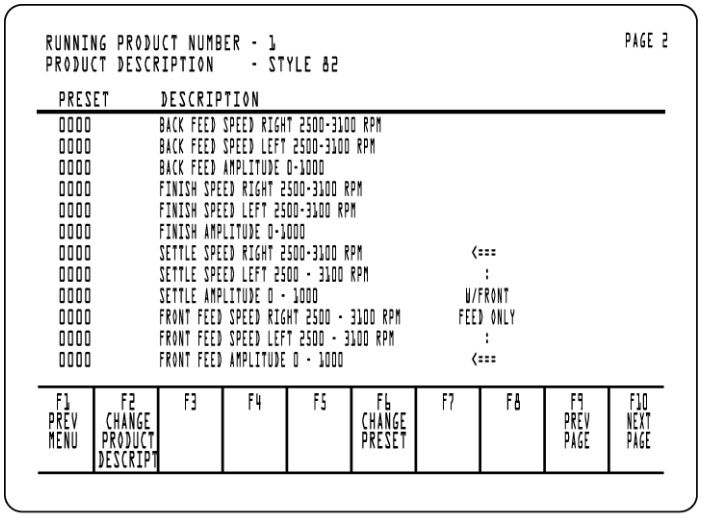
1. From the RUN SCREEN, press the **F5** key.
2. From the SELECT PRODUCT TO RUN screen, press F5 (SELECT PRODUCT TO RUN).
3. Enter running product number (if you have never entered a product number into memory, enter 1.



4. Press the **F4** key (EDIT PRODUCT DATA).
   The display will read:



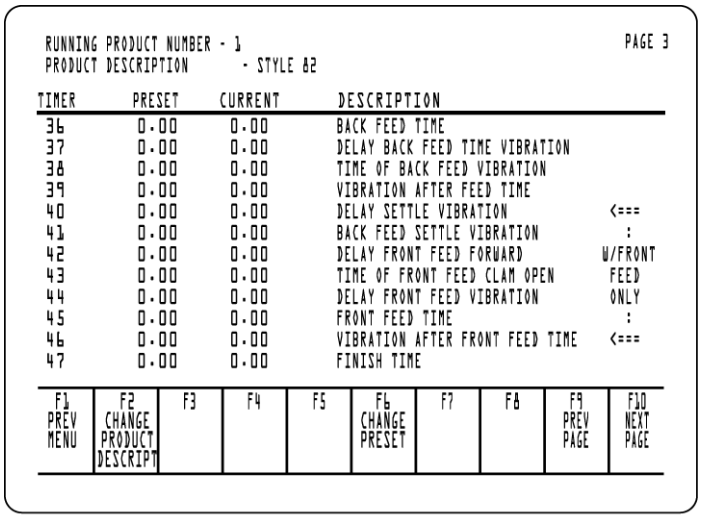
5. Use arrows to select data to change then press F6 to enter new preset. Use F9 and F10 keys to go from page to page.



RUNNING PRODUCT NUMBER - 1 PAGE 2
PRODUCT DESCRIPTION - STYLE 82

PRESET	DESCRIPTION	
0000	BACK FEED SPEED RIGHT 2500-3100 RPM	
0000	BACK FEED SPEED LEFT 2500-3100 RPM	
0000	BACK FEED AMPLITUDE 0-1000	
0000	FINISH SPEED RIGHT 2500-3100 RPM	
0000	FINISH SPEED LEFT 2500-3100 RPM	
0000	FINISH AMPLITUDE 0-1000	
0000	SETTLE SPEED RIGHT 2500-3100 RPM	<===
0000	SETTLE SPEED LEFT 2500 - 3100 RPM	:
0000	SETTLE AMPLITUDE 0 - 1000	W/FRONT
0000	FRONT FEED SPEED RIGHT 2500 - 3100 RPM	FEED ONLY
0000	FRONT FEED SPEED LEFT 2500 - 3100 RPM	:
0000	FRONT FEED AMPLITUDE 0 - 1000	<===

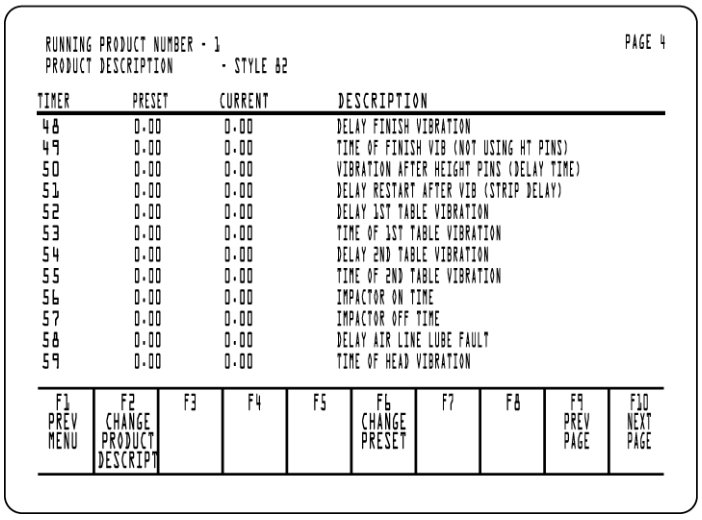
F1 PREV MENU	F2 CHANGE PRODUCT DESCRIPT	F3	F4	F5	F6 CHANGE PRESET	F7	F8	F9 PREV PAGE	F10 NEXT PAGE



RUNNING PRODUCT NUMBER - 1 PAGE 3
PRODUCT DESCRIPTION - STYLE 82

TIMER	PRESET	CURRENT	DESCRIPTION	
36	0.00	0.00	BACK FEED TIME	
37	0.00	0.00	DELAY BACK FEED TIME VIBRATION	
38	0.00	0.00	TIME OF BACK FEED VIBRATION	
39	0.00	0.00	VIBRATION AFTER FEED TIME	
40	0.00	0.00	DELAY SETTLE VIBRATION	<===
41	0.00	0.00	BACK FEED SETTLE VIBRATION	:
42	0.00	0.00	DELAY FRONT FEED FORWARD	W/FRONT
43	0.00	0.00	TIME OF FRONT FEED CLAM OPEN	FEED
44	0.00	0.00	DELAY FRONT FEED VIBRATION	ONLY
45	0.00	0.00	FRONT FEED TIME	:
46	0.00	0.00	VIBRATION AFTER FRONT FEED TIME	<===
47	0.00	0.00	FINISH TIME	

F1 PREV MENU	F2 CHANGE PRODUCT DESCRIPT	F3	F4	F5	F6 CHANGE PRESET	F7	F8	F9 PREV PAGE	F10 NEXT PAGE



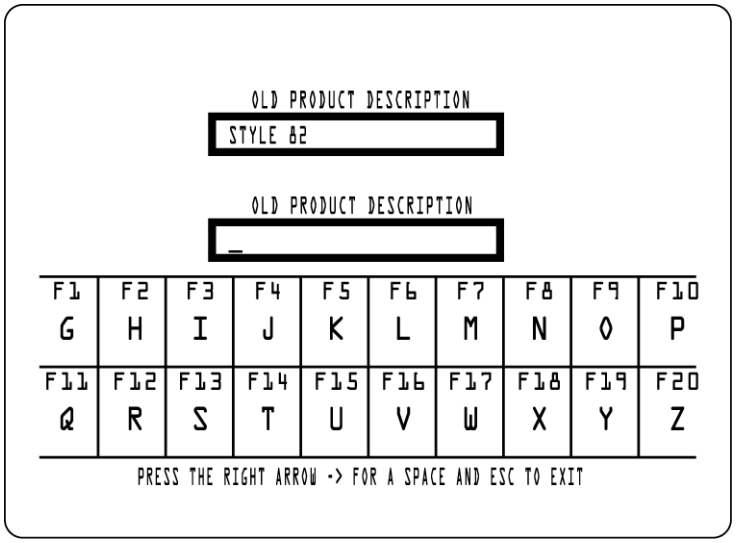
RUNNING PRODUCT NUMBER - 1 PAGE 4
PRODUCT DESCRIPTION - STYLE 82

TIMER	PRESET	CURRENT	DESCRIPTION
48	0.00	0.00	DELAY FINISH VIBRATION
49	0.00	0.00	TIME OF FINISH VIB (NOT USING HT PINS)
50	0.00	0.00	VIBRATION AFTER HEIGHT PINS (DELAY TIME)
51	0.00	0.00	DELAY RESTART AFTER VIB (STRIP DELAY)
52	0.00	0.00	DELAY 1ST TABLE VIBRATION
53	0.00	0.00	TIME OF 1ST TABLE VIBRATION
54	0.00	0.00	DELAY 2ND TABLE VIBRATION
55	0.00	0.00	TIME OF 2ND TABLE VIBRATION
56	0.00	0.00	IMPACTOR ON TIME
57	0.00	0.00	IMPACTOR OFF TIME
58	0.00	0.00	DELAY AIR LINE LUBE FAULT
59	0.00	0.00	TIME OF HEAD VIBRATION

F1 PREV MENU	F2 CHANGE PRODUCT DESCRIPT	F3	F4	F5	F6 CHANGE PRESET	F7	F8	F9 PREV PAGE	F10 NEXT PAGE

9.7.2 To Change a Product Description:

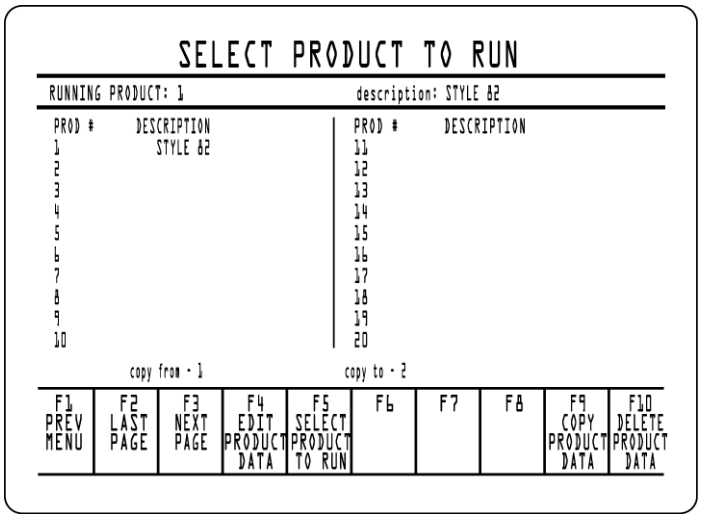
1. From the RUN SCREEN, press the **F5** key.
2. From the SELECT PRODUCT TO RUN screen, press **F5** (SELECT PRODUCT TO RUN).
3. Enter running product number (if you have never enter a product number into memory, enter 1.
4. Press the **F4** key (EDIT PRODUCT DATA).
5. Press the **F2** key (CHANGE PRODUCT DESCRIPT).
   The display will read:



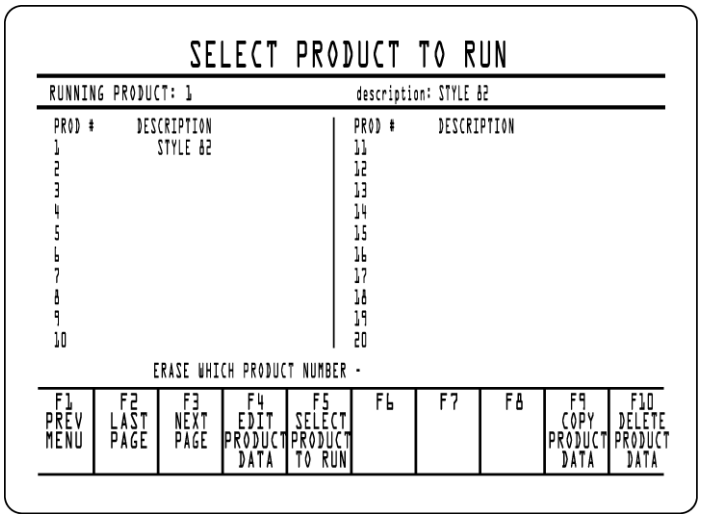
6. Enter new product description for running product. Use keys A to F on the right hand side of the Graphic Control Station and keys F1 to F20 located below the screen. Use right arrow for space and ESC key to exit this menu.

9.7.3 To Copy or Delete Product Parameters:

1. From the RUN SCREEN, press the **F5** key.
2. From the SELECT PRODUCT TO RUN screen, press **F9** (COPY PRODUCT DATA). The display will read:



3. Enter product number from which parameters have to be copied from.
4. Enter product number where parameters have to be copied to.
5. To delete product number and parameters, press the **F10** key. The display will read:



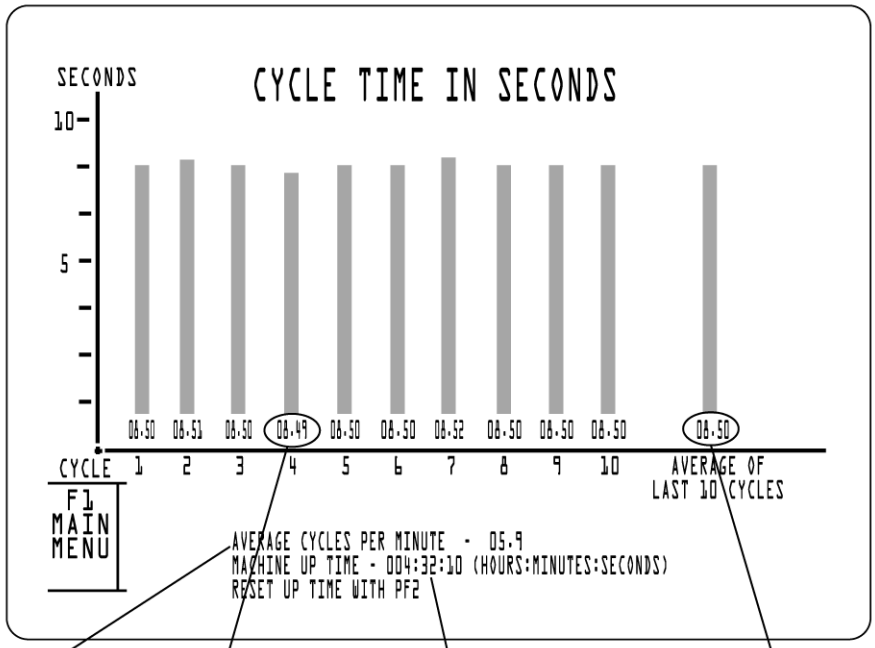
6. Enter product number to delete.

9.8 CYCLE TIMER F6

This menu allows the operator to monitor each machine cycle through a graph. It will indicate the time it took to do each cycle and also it will show the average time for the last 10 cycles.

To access this screen from the **RUN SCREEN**, press **F6**. To return to the **RUN SCREEN**, press **F1.**

The display will read:



Average cycles per minute

Average time it takes the machine to complete one average cycle (based on the last 10 cycles)

Time it takes the machine to complete one full cycle. Example here: 8.49 seconds

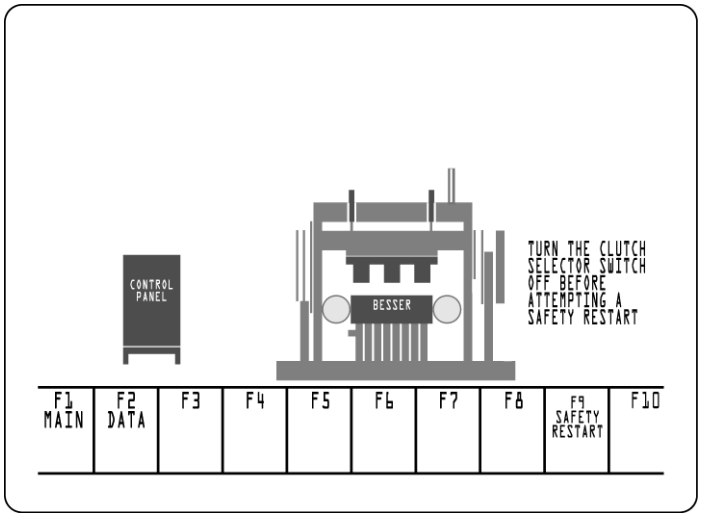
Total amount of time the machine has been running. Can be reset by using the PF2 key.

9.9 DIAGNOSTICS F7

This menu allows the operator to monitor the machine once a fault condition has occurred.

To access this screen from the **RUN SCREEN**, press **F7**. To return to the **RUN SCREEN,** press **F1**.

The display will read:

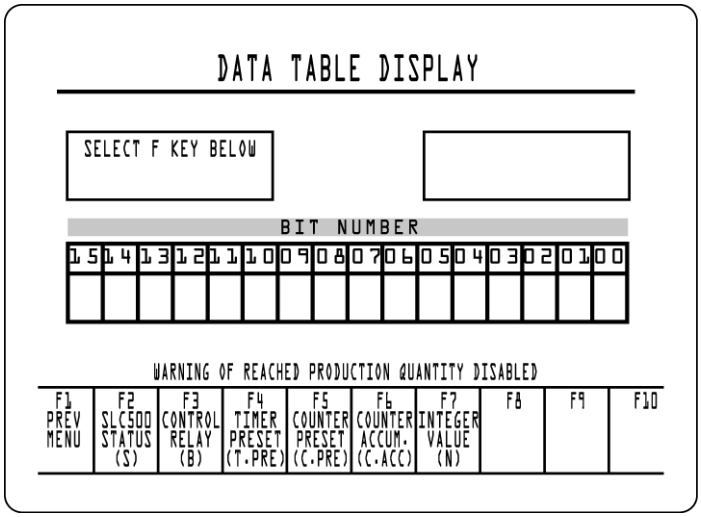


This screen will show a diagram of the machine and indicate where the fault is located.

From this screen, you can access the Data table. The Data table enables the operator to monitor or change parameters concerning: Control relays, Timer and Counter presets as well as Integer value.

To access the Data table, press the **F2** key.

The display will read:



From this screen, the operator has access to 6 different menus. See next pages for description of these menus.

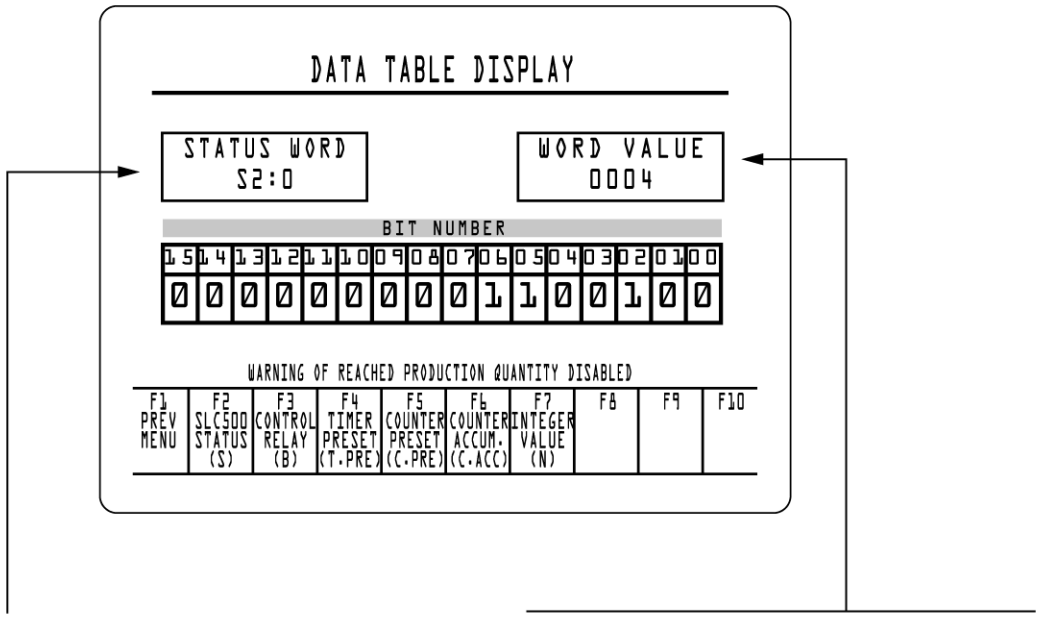
To change or monitor any of the parameters, press any of the keys between F2 and F7.

9.9.1 To Monitor a SLC500 Status (F2):

From the DATA TABLE DISPLAY SCREEN,

1. Press the **F2** key.

The display will read:



2. Enter a status word here then press ENTER. A word is an address to a memory location fora timer, a counter, an integer value or a control relay. Refer to appendix A for address location.

The SLC shows here the word preset value.

To change a preset value:

3. Press the A and then the B key.

4. Enter new value.

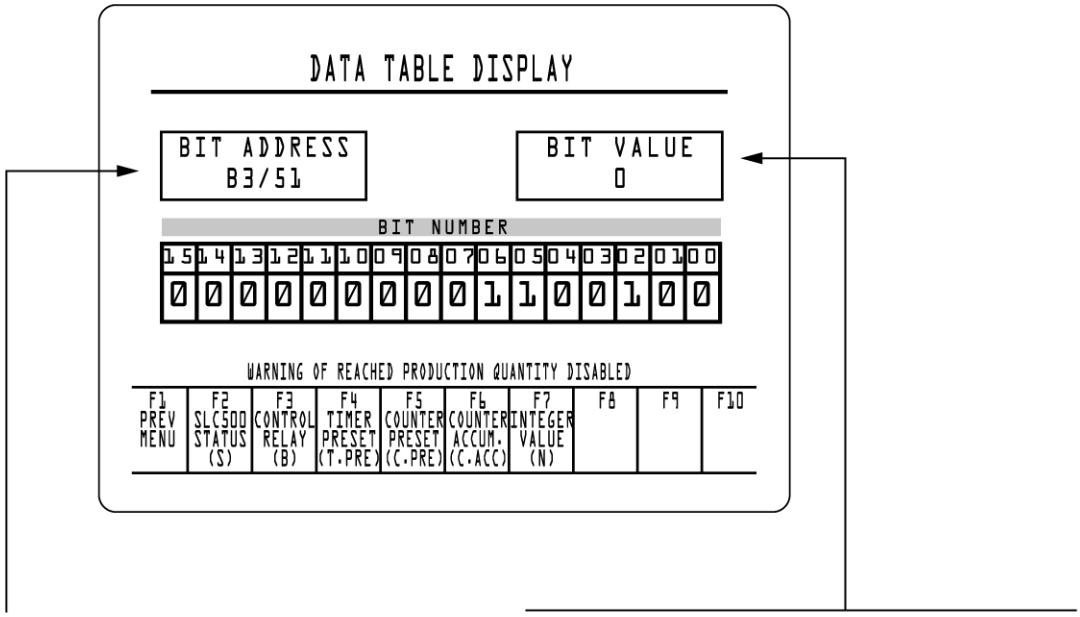
5. Press ENTER.

9.9.2 To Monitor a Control Relay (F3):

From the DATA TABLE DISPLAY SCREEN,

1. Press the **F3** key.

The display will read:



2. Enter a control relay bit address here then press ENTER. Refer to the logic diagram in appendix A for proper address location.

The SLC shows here the word preset value.
The SLC shows here bit value for this address.
0 = OFF
1 = ON

To change a preset value:

3. Press the A and then the B key.

4. Enter new value.

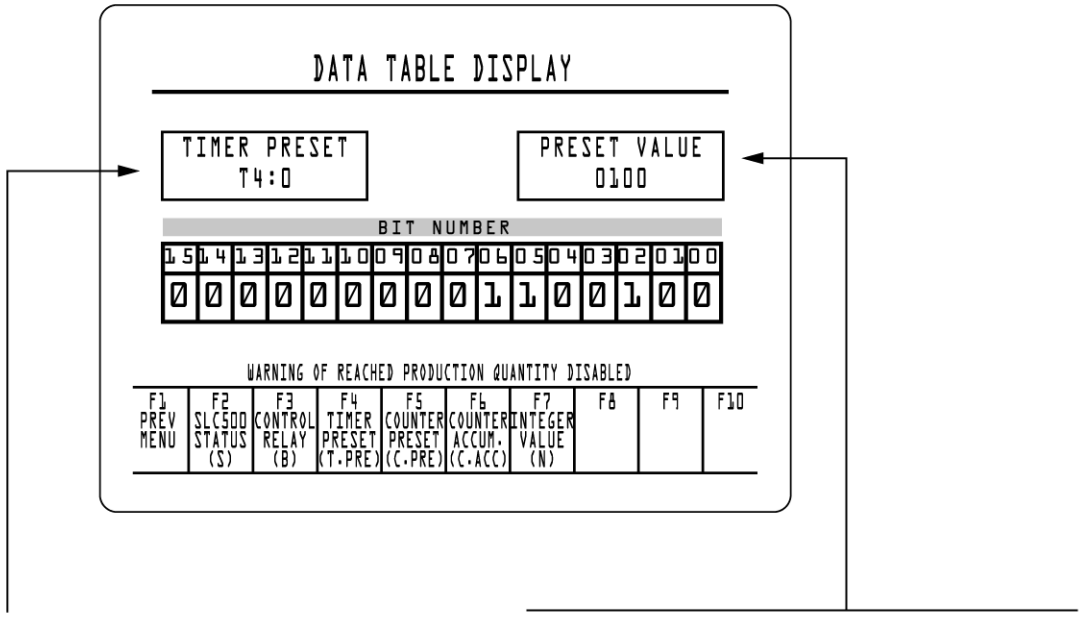
5. Press ENTER.

9.9.3 To Monitor or Change a Timer Preset (F4):

From the DATA TABLE DISPLAY SCREEN,

1. Press the **F4** key.

The display will read:



2. Enter a Timer address here then press ENTER. (Example here is 0)Refer to appendix A for proper address location and description.

The SLC shows here the preset value for this timer. NOTE: A time base should be taken into account when establishing true time value.

To change a preset value:

3. Press the A and then the B key.

4. Enter new value.

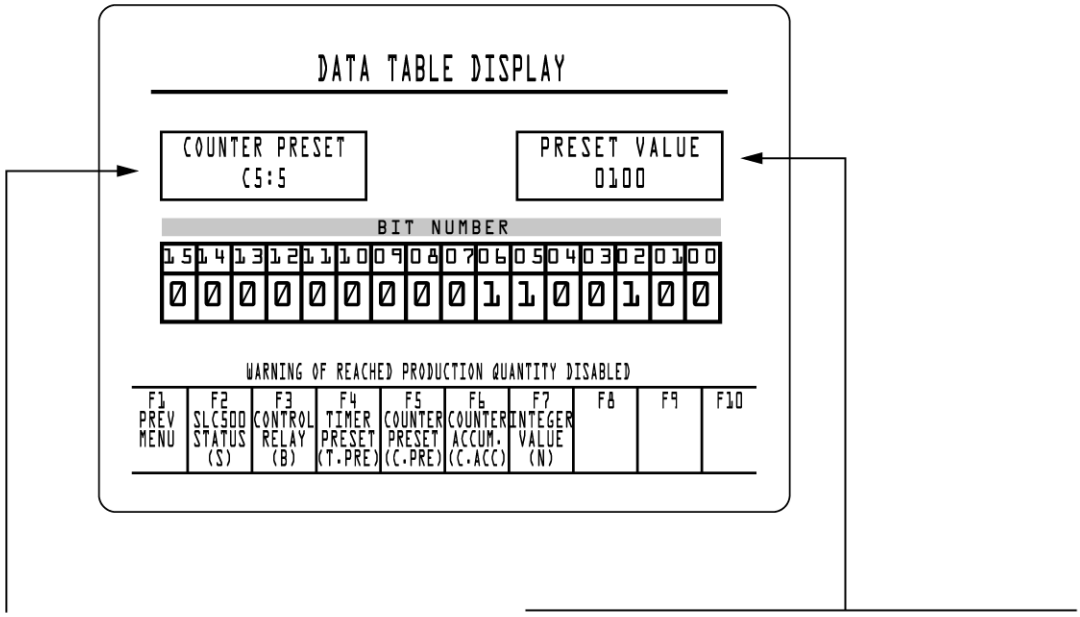
5. Press ENTER.

9.9.4 To Monitor or Change a Counter Preset (F5):

From the DATA TABLE DISPLAY SCREEN,

1. Press the **F5** key.

The display will read:



2. Enter a Counter address here then press ENTER. (example here is 5) Refer to appendix A for proper address location and description.

The SLC shows here the preset value for this counter. NOTE: A time base should be taken into account when establishing true time value.

To change a preset value:

3. Press the A and then the B key.

4. Enter new value.

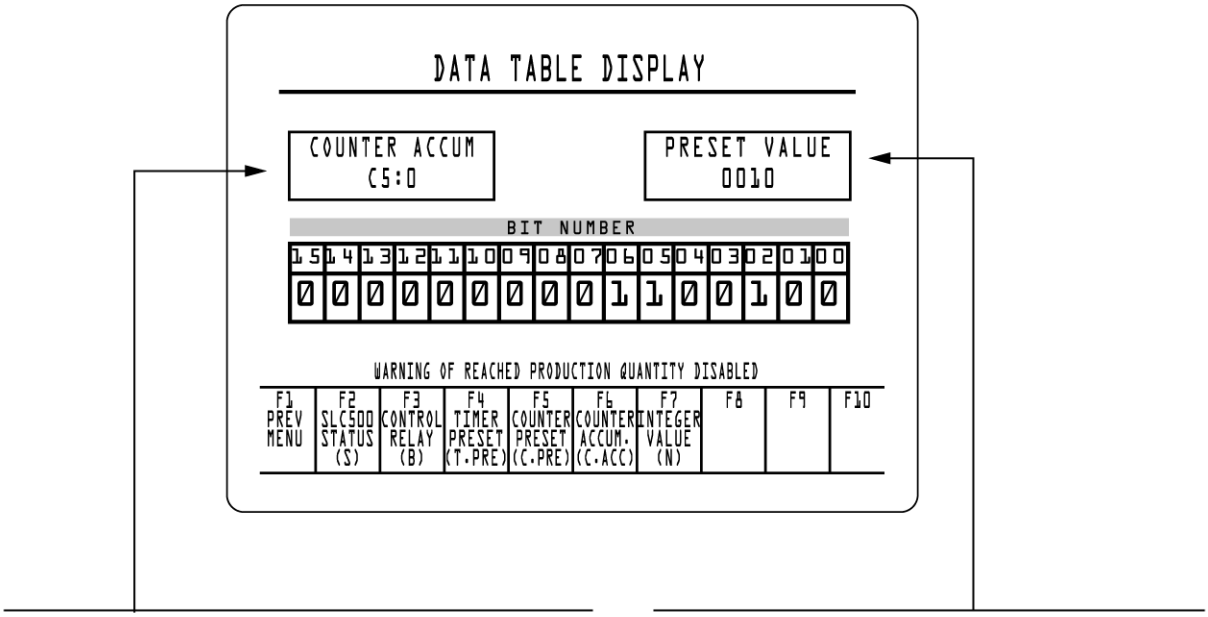
5. Press ENTER.

9.9.5 To Change the Accumulated Value of a Counter (F6):

From the DATA TABLE DISPLAY SCREEN,

1. Press the **F6** key.

The display will read:



To change the accumulated value of a counter:

2. Press the A and then the B key.

3. Enter new value.

4. Press ENTER.

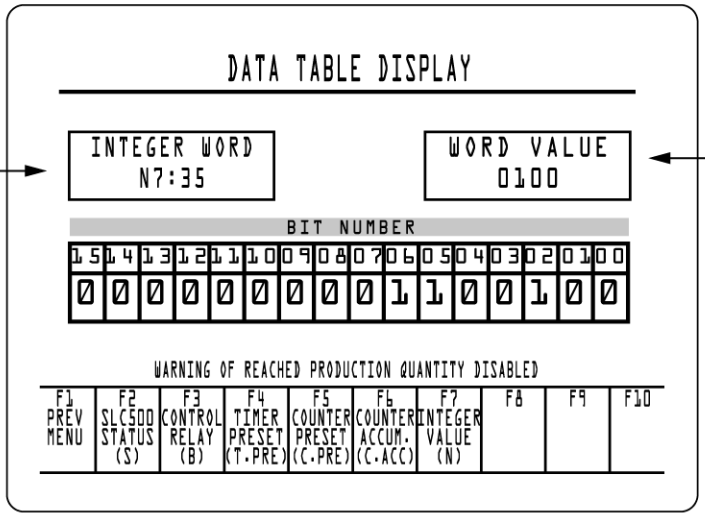
The SLC shows here.the preset value for this counter. NOTE: A time base should be taken into account when establishing true time value.

9.9.6 To Monitor or Change a Integer Word Value (F7):

From the DATA TABLE DISPLAY SCREEN,

1. Press the **F7** key.

The display will read:



2. Enter a Integer word address here then press ENTER.(example here is 7)

3. Enter a word value then press ENTER (example here is 35)

   Refer to the logic diagram in appendix A for proper address location and description.

The SLC shows here the word value for this Integer.

To change a preset value:

4. Press the A and then the B key.

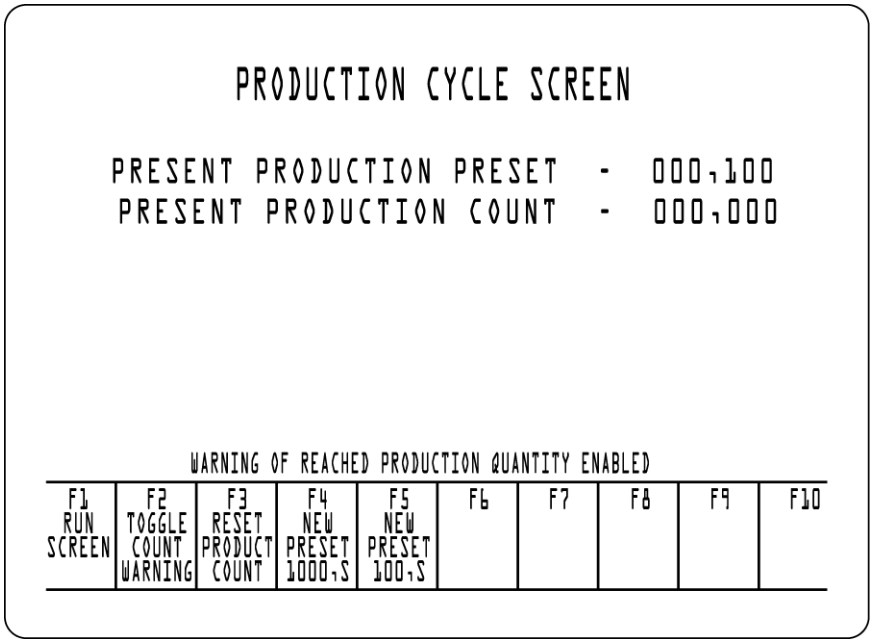
5. Enter new value.

6. Press ENTER.

9.10 PRODUCT QUANTITY CONTROL F9

This menu allows the operator to enter a desired preset production count and to set the count warning.

To access this screen from the **RUN SCREEN**, press **F9**.



9.10.1 To Have the Production Count Warning Show:

Press the F2 key to toggle between Disabling and Enabling the production count warning.

9.10.2 To Reset the Production Count:

Press the F3 key and the production count will be reset.

9.10.3 To Set a New Production Count Warning:

1. Press the F4 key to set new preset in the thousands.
2. Enter a new present production preset (1=1000 / 999 = 999,000)
3. Press ENTER.
4. Press the F5 key to set new preset in the hundreds.
5. Enter a new present production preset (1=1 / 999 = 999)
6. Press ENTER.

When the machine cycle count will have reached this preset value, a warning will show on the screen if you have enabled this warning.

This warning is shown on the next page.

Once this warning has occurred, press any key to return to the RUN SCREEN.

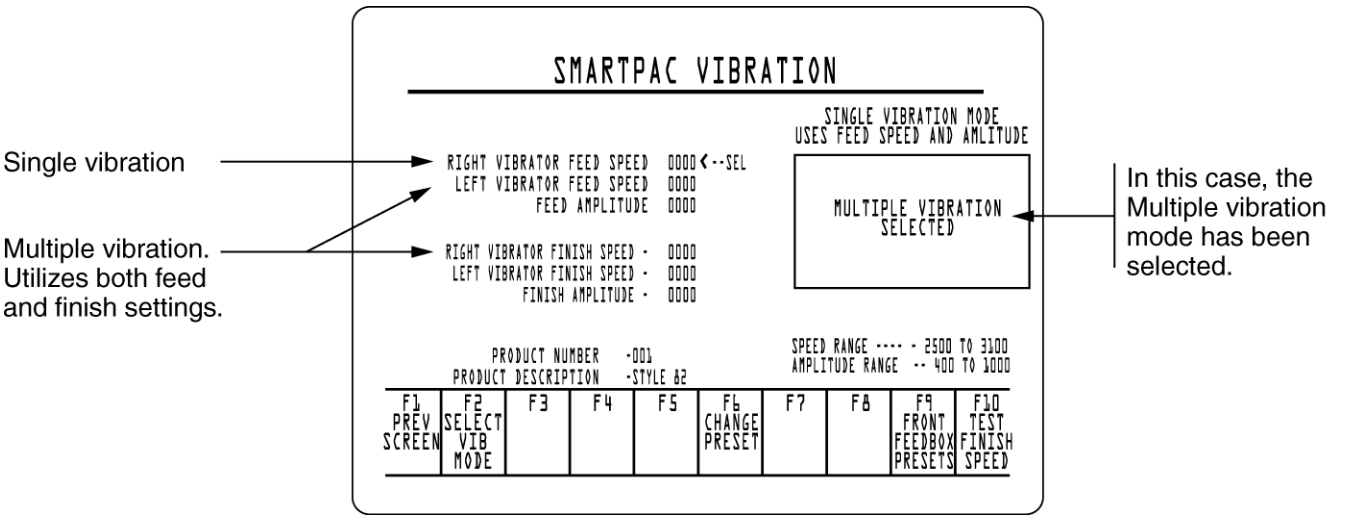
NOTE: This will automatically reset the production count to 0.


PRODUCT
QUANTITY REACHED
PRESS ANY KEY

9.11 SMARTPAC ADJUSTMENT F10

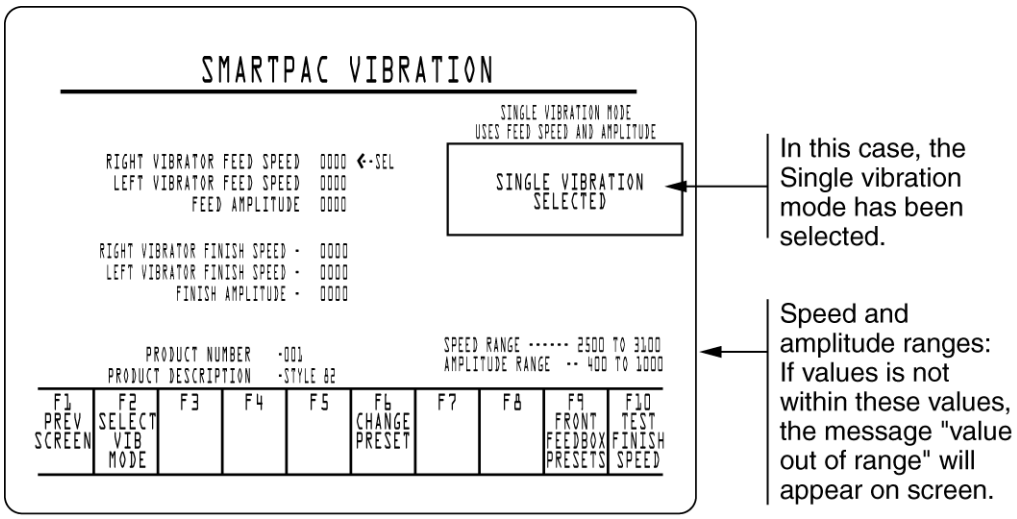
This menu allows the operator to enter desired vibrator speed and amplitude for the SMARTPAC vibrating system. The operator can also access some other data such as speed and amplitude range.

To access this screen from the **RUN SCREEN**, press **F10**. (SMARTPAC VIBRATION)



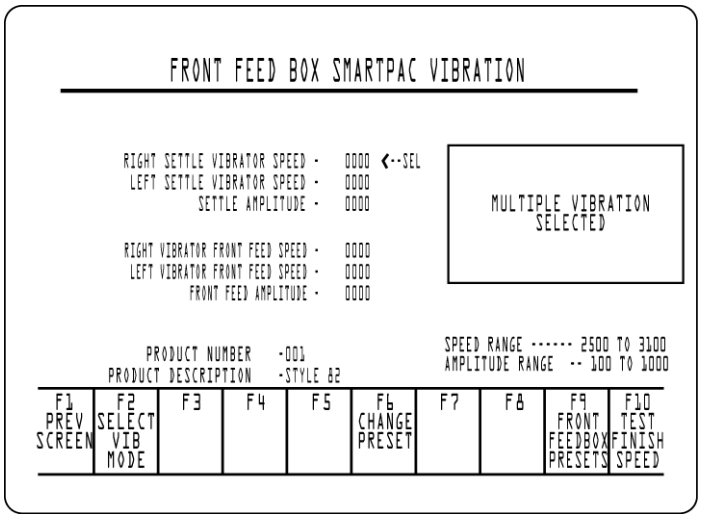
9.11.1 To Change Vibration Preset Values:

1. Press the **F2** key to select a vibration mode. The screen below shows an example where the operator has selected the Single vibration mode. If you press the **F2** key one more time, you will select the Multiple vibration mode has shown below.
   The display will read:



2. Use the arrows to select which one of the parameters you wish to modify.
3. Press the **F6** key.
4. Change the parameter (use any number key) then press **ENTER**.
5. Press the **F9** key to access the front feed box vibration.

The display will read:



SECTION 10
TROUBLESHOOTING

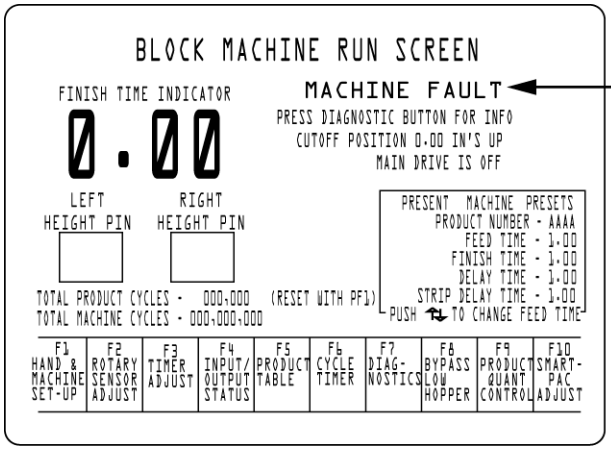
THIS SECTION WILL HELP YOU SOLVE TWO KINDS OF PROBLEMS:

1. **Problems with machine. Those problems are diagnosed by the Small Logic Controller (see section 9) and will show up on the screen as outlined in section 10.1 below.**
2. **Problems with the concrete units. Those problems are diagnosed by looking at the concrete units as outlined in section 10.2.**

10.1 SMALL LOGIC CONTROLLER FAULTS.

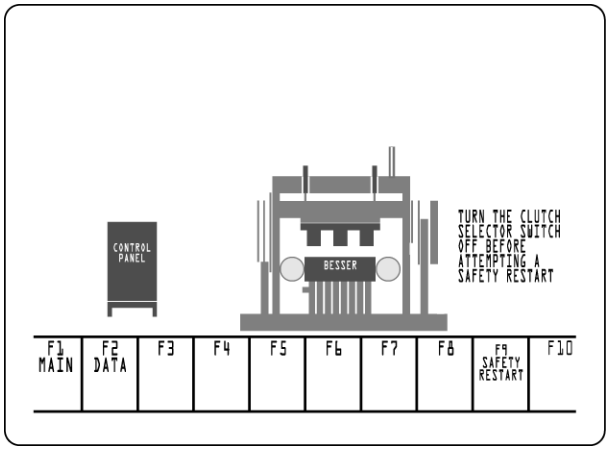
10.1.1 When a mechanical fault occurs, the machine stops and the fault shows on the screen. When this happens:

1. The display on your Graphic Control Unit will read:



Screen indicates that there is a fault in the machine.

2. Press F7 to inquire about the fault (diagnostic).
   The display will read:



This screen shows a diagram of the machine and indicates where the fault is located.

3. Correct the fault.
   Once the fault has been corrected:
4. Turn the clutch selector switch to "OFF".
5. Press the F9 key.
6. Turn clutch switch "ON".
   The machine will sound an alarm and restart.

10.1.2 List of Concrete Products Machine Faults

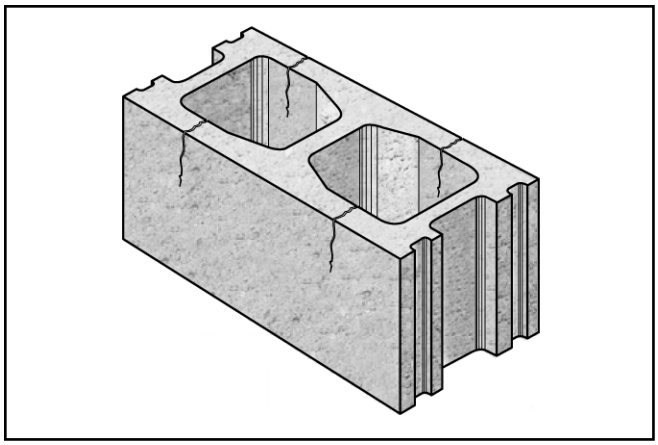
1. THE VIBRATOR, AGITATOR, AUTOFEED OR PALLET CLEANER MCP OR OVERLOAD IS TRIPPED.
   The vibrator, agitator, autofeed or pallet cleaner motor circuit protector (MCP) or overload is tripped. This error may indicate:
   - Motor is not rotating freely. Verify motor rotation.
   - Motor has an electrical short in its winding. Check resistance of winding.
   - Wiring to the motor is shorted. Verify continuity of wiring to motor.
2. THE MAIN DRIVE MCP OR OVERLOAD IS TRIPPED.
   The main drive motor circuit protector (MCP) or overload is tripped. This error may indicate:
   - Motor is not rotating freely. Verify motor rotation.
   - Motor has an electrical short in its winding. Check resistance of winding.
   - Wiring to the motor is shorted. Verify continuity of wiring to motor.
3. THE BLOCK MOVING BAR DRIVE MCP OR OVERLOAD IS TRIPPED.
   The block moving bar motor circuit protector (MCP) or overload is tripped. This error may indicate:
   - Motor is not rotating freely. Verify motor rotation.
   - Motor has an electrical short in its winding. Check resistance of winding.
   - Wiring to the motor is shorted. Verify continuity of wiring to motor.
4. THE SYSTEMS AIR PRESSURE IS LOW.
   The system air pressure switch PS-13 indicates low pressure.
   - Insure the air compressor is working properly.
   - Check for proper connection of air lines.
5. THE LUBE RESERVOIR IS LOW.
   The lube level switch LS-11 indicate that the grease reservoir is low.
   - Refill grease reservoir as required (see section 11).

6. MACHINE ROTATION IS UNDER SPEED.
   This condition can be caused by a motor or clutch deficiency. An object jammed in the machine can also cause this fault. If pallet jams the machine, the shear bolt on the timing sprocket will break to avoid further damage to the machine.
7. ROTARY SENSOR IS OUT OF SYNC.
   The rotary sensor coupling has slipped. Adjust the rotary sensor to 100 degrees at 1st stop and tighten coupling clamps.
8. THE MATERIAL HOPPER IS LOW.
   The material hopper is low of material and will not allow the machine to operate until additional concrete is delivered to the hopper. This condition may be bypassed by use of the "F8" key on the Run screen.
9. THE MAIN DRIVE BESCODYNE IS OVER NORMAL TEMPERATURE.
   The temperature sensor on the main drive bescodyne has tripped.
   - Check oil level of bescodyne drive to insure it is properly filled.
   - Replace oil as required (see section 11).
10. A VIBRATOR BESCODYNE IS OVER NORMAL TEMPERATURE.
    The temperature sensor on the main drive bescodyne has tripped.
    - Check oil level of bescodyne drive to insure it is properly filled.
    - Replace oil as required (see section 11).
11. THE HEAD IS NOT PROPERLY CLAMPED (only on machine with Mold Head Clamp Device).
    The mold head clamp device is not in the "UP" and "LOCKED" position.
    - Insure sensor head "UP" sensor (PRS-16) is tripped. If it has not, raise head with use of the graphic display station.
    - Insure sensor head "LOCK" sensors (PRS-12 and PRS-13) are tripped. If not, lock the head with use of the graphic display station.
12. THE PALLET MAGAZINE IS LOW.
    The pallet magazine is low. The concrete units machine will not operate until pallets are provided to the magazine.
13. A PALLET SKIP ERROR HAS OCCURRED.
    A pallet was not present on the Pallet Skip switch PRS-3 when the height pins met.
    - Check to insure pallets are moving freely through machine.

14. A PALLET HAS BEEN ON LS-2A TOO LONG.
    A pallet is stopped over LS-2A on the front delivery conveyor too long.
    - Check to insure the front delivery conveyor is running, if not restart conveyor.
    - Check to insure pallets are moving freely on the front delivery conveyor
    - Check to insure enough time is on T4 : 27 (timebase = 1.0 seconds)
15. THE MACHINE IS AT THIRD STOP TOO LONG. MAY HAVE MISSED LS-7.
    The machine is waiting at third stop too long and waiting for the block moving bars to travel forward.
16. THE MACHINE HAS CYCLED TOO MANY TIMES WITHOUT A LUBE CYCLE.
    The lube cycle switch LS-11 has not toggled on or off within a preset amount of machine cycles (Counter C5:0).
    - Check for blocked grease lines.
    - Check to insure the lube pump is working properly.
    - Increase lube pump cycle rate by decreasing the preset of lube pump timer (T4:5).
17. AIR OPERATING EQUIPMENT DOES NOT WORK PROPERLY.
    - Check air filters, they might be clogged.
    - Clean unit and replace filter element.

10.2 SOLUTIONS TO CORRECT DEFORMED AND CRACKED BLOCKS

10.2.1 Cracked Face Shells



a. Check mold to stripper head alignment (section 5).

b. Check to see if core assembly is bent or twisted due to over tightening.

c. Check mix (moisture content). An inconsistent moisture content in your mix may result in inconsistent concrete product quality. The use of a computerized moisture control unit in you mixer is recommended to improved product quality and consistency.

d. Check pallet receiver guides on slide shaft (section 5).

e. Increase delay time (section 9).

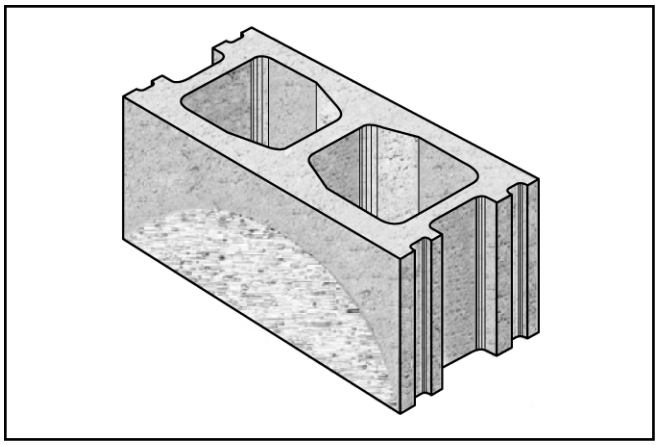
f. Check shock absorbers.

g. Check pallet receiver rubbers.

h. Check admix.

i. Check amount of material being left in mold after feedbox goes back.

10.2.2 Half-Moon on Face Shell



a. Check for loose division plates.

b. Check pallet receiver rubbers.

c. Check that pallet is moving on the conveyor.

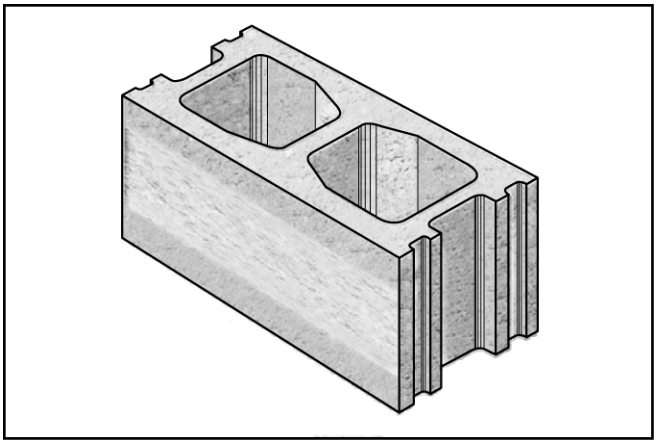
d. Check vibrator bearings.

e. Check pallet receiver rubbers (hardness).

f. Check mold assembly.

g. Check amount of admix in concrete.

10.2.3 Lamination on Face Shell and Horizontal Cracking



a. Check vibrator shaft speeds for R.P.M. (they should turn within 2 R.P.M. of each other - adjust with screw.

b. Check for metal to metal contact during vibration (mold vibrating against machine mold throat).

c. Check back apron plate alignment to mold (section 5).

d. Check that Feedbox is not vibrating on mold.

e. Check vibrator bearings.

f. Check delay time (decrease or increase). (section 9)

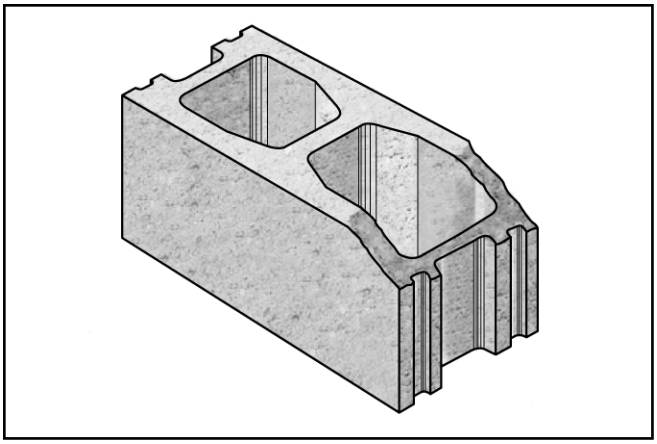
g. Check mix design.

h. Check for loose division plates.

i. Check for lack of proper admix.

j. Check slide shaft pucks (section 5).

10.2.4 Front of Block Not Filled



a. Check hopper gate setting.

b. Check feedbox travel forward.

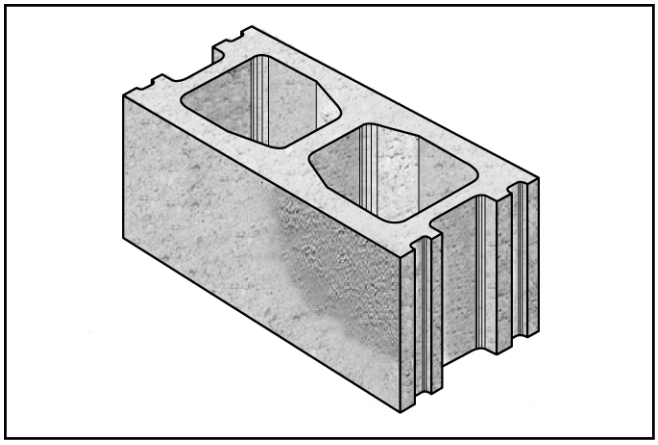
c. Check agitator.

d. Check for chunks in feedbox.

e. Mix may be too wet.

f. Check feed time. Increase if necessary. (section 8 and 9)

10.2.5 Area of Face Shell Too Coarse



a. Check machine hopper for build up.

b. Make sure vibrator sheaves are properly aligned.

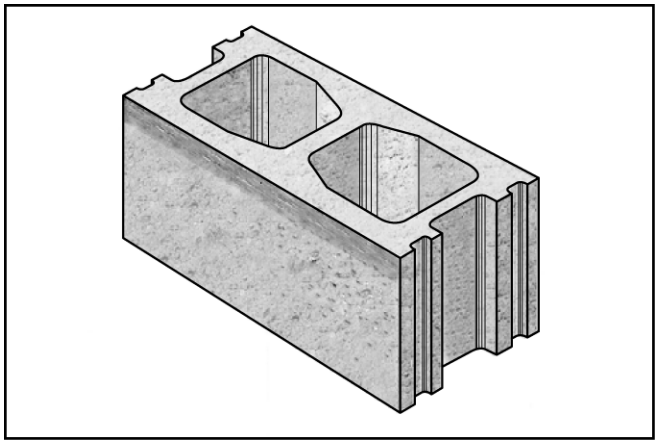
c. Check vibrator weights for proper balance (equal length of clamping bolts and equal weight of nuts).

d. Check for loose mold parts.

e. Check for material segregation.

f. Check vibrator shaft speed.

10.2.6 Smooth Top Edge on Face Shell



a. Check for division plate wear.

b. Make sure stripper shoes protrude through bottom of mold at completion of stripping.

c. Check stripper head alignment. (section 5)

d. Check for loose stripper shoes.

e. Check pallet receiver frame for level. (section 5)

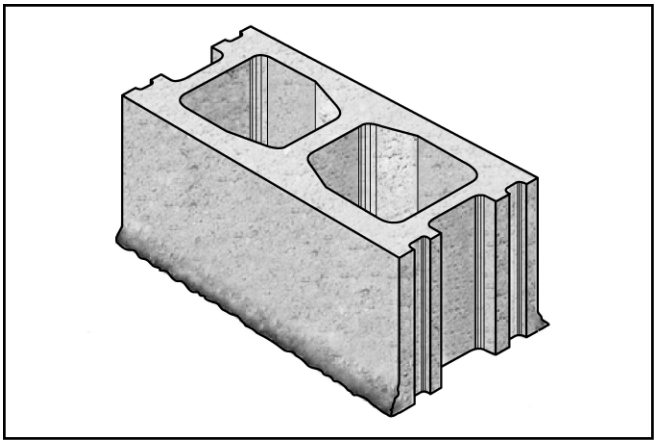
f. Check moisture content of mix.

g. Check finish times. (sections 8 and 9)

h. Check feed time. Decrease if necessary. (sections 8 and 9)

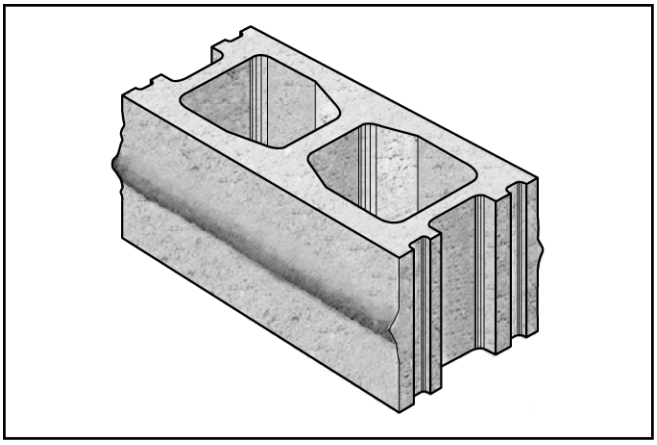
i. Check autofeed mechanism. Lower if necessary.

10.2.7 Bottom Edge Crushed



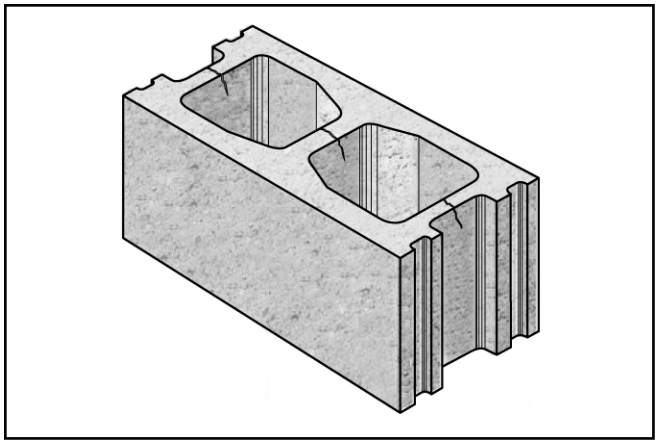
a. Check spring opening. (section 5)
b. Check delay time. (section 8 and 9)
c. Check stripper head alignment. (section 5)
d. Check pallet receiver rubbers.
e. Check for build up on bottom of mold.
f. Check for build up on pallets.
g. Check for spillage on pallet.
h. Check rubbers on cutoff bars.
i. Check the mix (can be too dry).
j. Check the air compaction setting (too much force).
k. Make sure pallet is against bottom of mold.

10.2.8 Block Crushed During Stripping



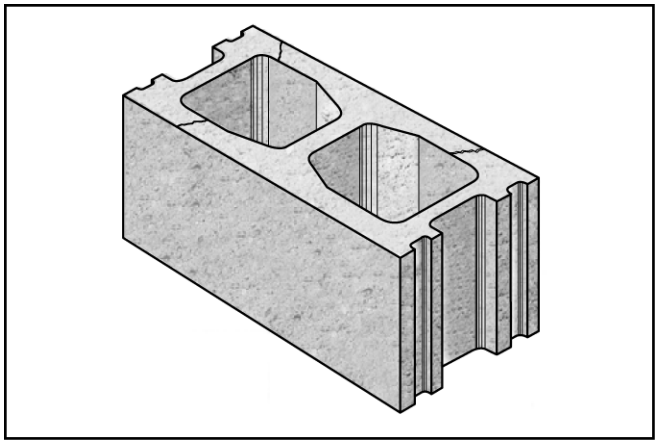
a. Increase strip delay time. (section 9)
b. Check spring opening. (section 5)
c. Check moisture content of concrete.
d. Check for excess feed. Decrease feed time and lower autofeed if necessary.
e. Check vibrator brakes.
f. Check pallet delivery and timing.
g. Check air compaction setting.

10.2.9 Core Bar Crack



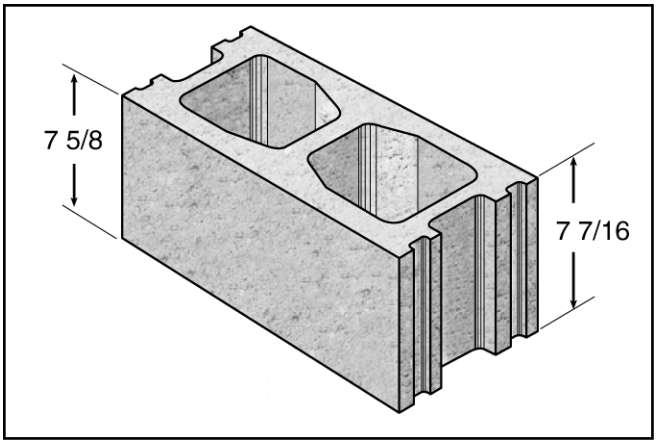
a. Check vibrator brake settings.
b. Check vibrators shaft speeds.
c. Check for loose cores.
d. Check vibrator sheave alignment.
e. Check pallet guides. Rear guides may have a groove worn so pallets stick during stripping operation (this may not apply to V4).
f. Check feed and finish time (it may need more).
g. Check for material build-up on core bars or core assemblies.
h. Check mix (it can be too dry).

10.2.10 Cracking at Pallet Side



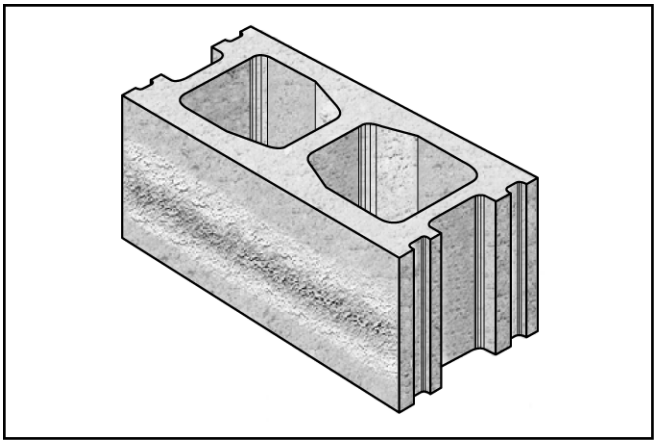
a. Check for loose core assembly.
b. Check for bent core assembly.
c. Check pallet receiver frame for level.
d. Check pallet receiver rubbers. Pallet may be moving during finish time (it may require pallet snubbers).
e. Check pallet guides.
f. Check core bars for material build-up.
g. Check for thick and thin pallets.
h. Check vibrator brakes (may be slipping).
i. Check for material between pallet and pallet receiver rubbers.
j. Pallet receiver and stripper head alignments.

10.2.11 Block Height Not Correct Front To Rear



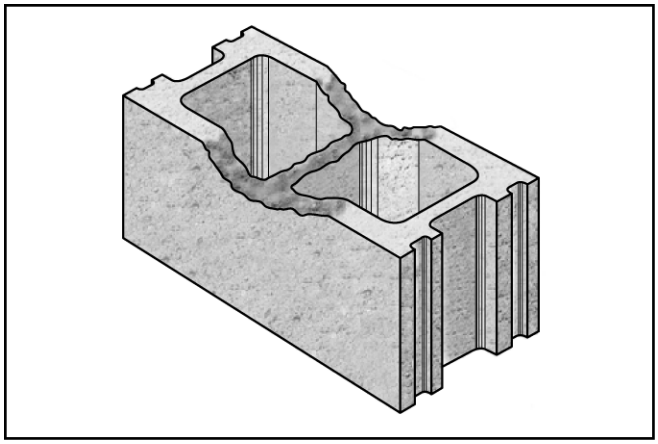
a. Check pallet receiver frame for level (see section 5.4)
b. Check stripper head frame in relation to pallet receiver frame alignment.
c. Check stripper head for level.
d. Check mold for 5/8" dimension off mold throat.
e. Check for loose stripper shoe or plunger.
f. Check agitator grid (see section x.x).
g. Check delay time.

10.2.12 Coarse Texture in Middle of Block Face



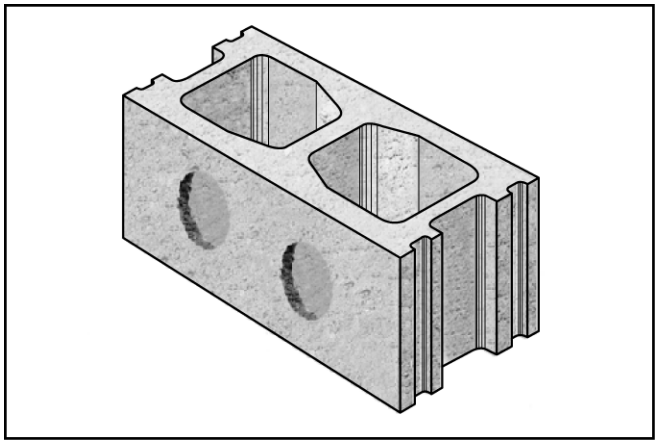
a. Check vibrator shaft speeds.
b. Check material for coarse aggregate.
c. Check (generally increase) feed time setting.
d. Check material, could be too wet.
e. Check autofeed, make sure it's turned on.
f. Check for material segregation.
g. Check vibrator motor rotation.
h. Material segregation in machine hopper.

10.2.13 Block Not Filled Properly



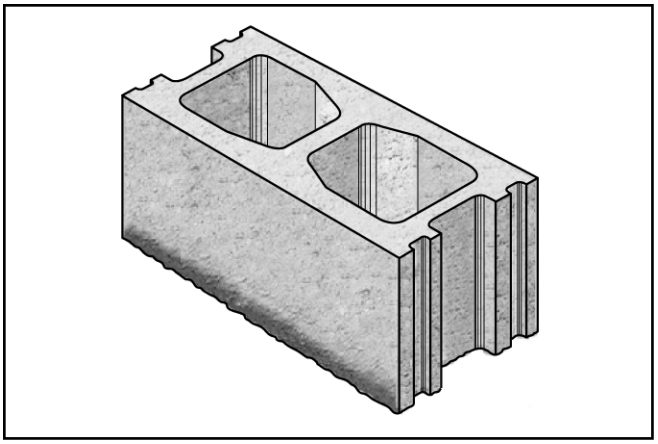
a. Check agitator grid for build up.
b. Check agitator grid to make sure it is turned on.
c. Material too wet and there may be moisture variations.
d. Check that autofeed is on automatic.
e. Check hopper gate setting.
f. Check if there are chunks in feedbox.
g. Check feed time.

10.2.14 Face Shells Sucked in at Completion of Stripping



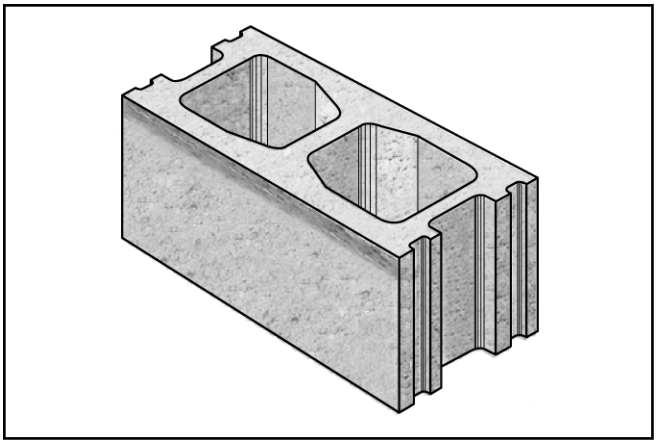
a. Check core vents, may be plugged.
b. Material too wet, moisture content variation.
c. Check for worn division plates.
d. Check for loose core assembly.
e. Check stripping speed.
f. Check admix.
g. Check for frozen aggregate.
h. Check core valve springs.

10.2.15 Coarseness on Bottom of Block Leaving a Bad Edge



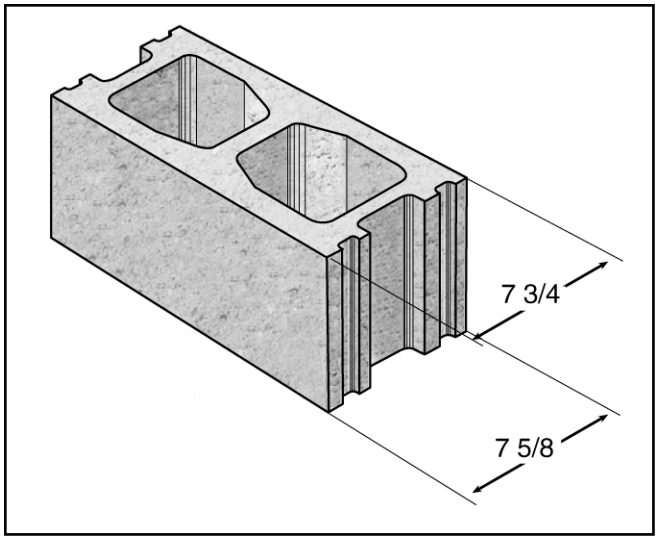
a. Check pallet receiver rubbers.
b. Check if pallet moves during vibration.
c. Check vibrator weights, may have to change to larger or smaller vibrator weights.
d. Check mold for loose parts.
e. Check stripper head alignment.
f. Check for material segregation.
g. Check for build up on pallets or mold.
h. Check for core spillage on pallet.
i. Check moisture content of mix. It may be to dry.
j. Check vibrator shaft rotation.
k. Make sure pallet is against bottom of mold.

10.2.16 Hairline Cracking and Pulling at Top of Block on Completion of Stripping



a. Check spring opening to assure height pins stay together during strip.
b. Check to make sure stripper shoe protrudes through bottom of mold at completion of strip.
c. Check adjustment for stripping.
d. Check division plates for wear.
e. Check for loose stripper shoes.
f. Check moisture content of mix. It may be too wet.

10.2.17 Block Wider at Top Than at Bottom



NOTE: There are no visible cracks on the blocks.

a. Check block handling during movement to curing kilns.

b. Check block delivery on machine.

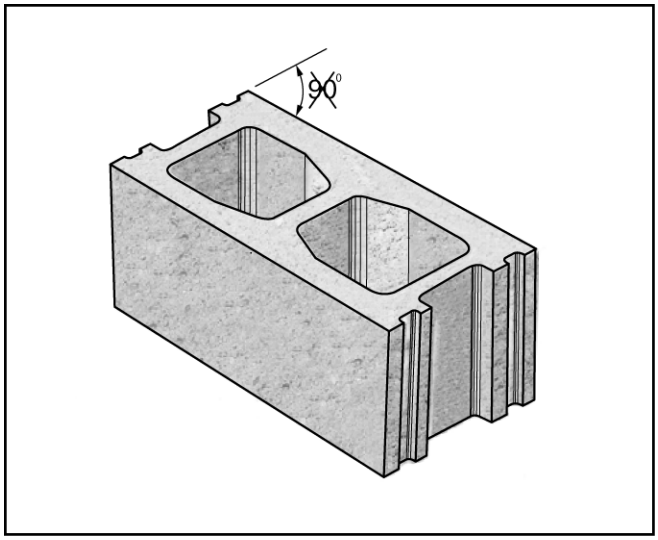
c. Check stripping adjustment.

d. Check mold assembly for wear.

e. Check curing cycle (preset & steam conditions).

f. Check admix.

10.2.18 Block Out of Square (Not 90° on Each Corner)



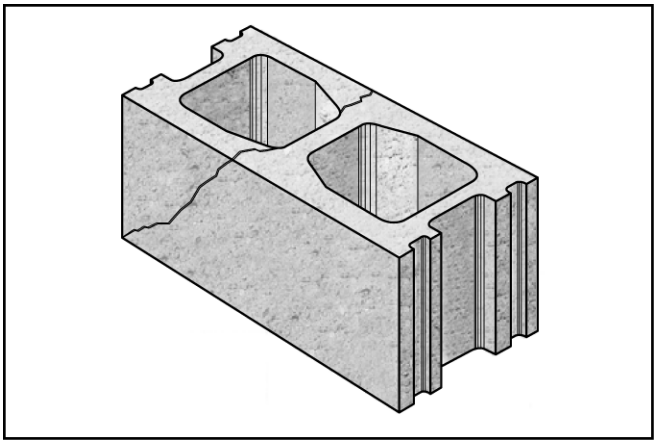
a. Check mold assembly for wear.

b. Check all mold parts for excessive wear.

c. Check block delivery on machine.

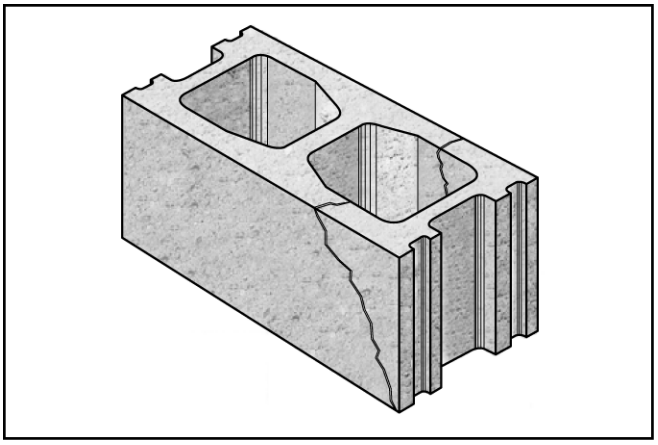
d. Check curing cycle (preset, steam, etc.).

10.2.19 Diagonal Crack at Rear of Block



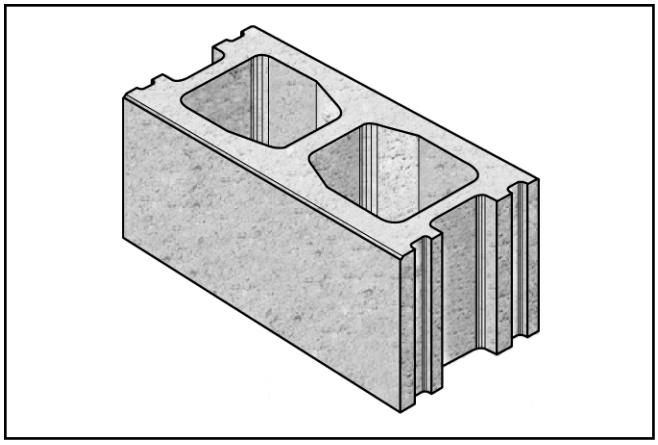
a. Pallet setting on block moving bars may be too late.
b. Check fork lift bumping rack on Besser-Matic.
c. Check if pallet is setting down evenly on front delivery conveyor.
d. Check for loose core.
e. Check of loose plunger.
f. Check mix design.
g. Check vibrator weights.

10.2.20 Diagonal Crack at Front of Block



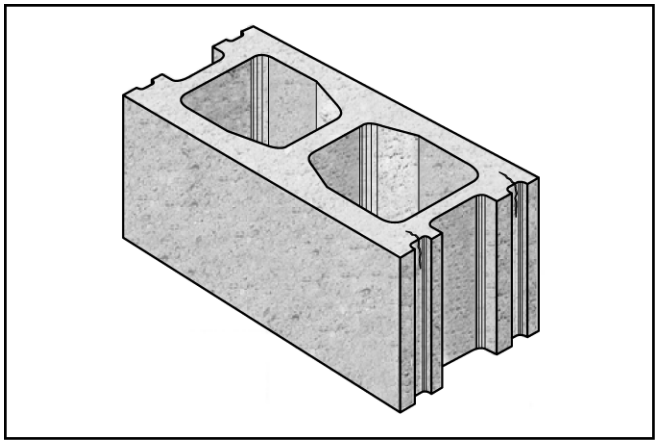
a. Check if pallet hit stop on front delivery too hard.
b. Check fork lift bumping rack on Besser-matic.
c. Check if pallet is not setting down evenly on front delivery conveyor.
d. Check for loose core.
e. Check for loose plunger.
f. Check mix design.
g. Check for wrong vibrator weights.

10.2.21 Feather-Edge at Top of Unit



a. Check alignment of stripper shoes.
b. Check for worn plungers and mold parts.
c. Check Mix design and mixing procedure.
d. Check stripping adjustment.
e. Check for mold shifting.
f. Check for loose mold parts.
g. Check stripper head alignment.
h. Check vibration.
i. Check vibrator motor brake adjustments.
j. Check admixture in batch.

10.2.22 Crack in Mortar Groove



a. Check vibrator brakes.
b. Check for loose end liner.
c. Check for worn end liner.
d. Pallet snubbers may be necessary.
e. Check vibrator shaft speeds.
f. Check for loose mold parts.
g. Check stripping adjustment.
h. Check moisture content of mix.
i. Check mix design.

SECTION 11
MAINTENANCE

11.1 PREVENTIVE MAINTENANCE

Correct maintenance is largely a matter of good judgment on the part of the operator in charge. The ULTRAPAC II, like any other machine, will do the work required just as long as it is properly cared for. A good preventive maintenance program based on the recommendations below will extend the machine's life at a high level of performance.

Check the following procedures ***daily* and ***every time*** a product or mold change is done.**

Component	Ref.[1]	Check For	Tolerance[2]	Action	Hours[3]
Upper and lower height stops	5.22	Loose clamp / wear	see torque chart	repair	400
Lower height stops wire	5.22	Loose / broken	0	repair/replace	400
Spring link assembly Spring opening	5.33	Gap as mold touches throat	1/16" [1.5mm]	adjust	400
Pallet receiver rubbers	4.14	All rubbers same height	max:015" [.38mm]	replace	400
Mold	5.9	Centered (after vibration)	± .030" [.76mm]	adjust	400
Mold locks and liner	5.2	Wear	0 to .125" [3mm]	replace	1000
Mold lock liner	5.2	Clearance	.020" ± .030" [.51mm ± .76mm]	adjust	1000
Apron plate	5.17	Clearance to mold	.030" ± .010" [.76mm ± .25mm]	adjust	Every mold change
Apron plate	5.17	Height above mold	.125" ± .010" [3mm ± .25mm]	adjust	Every mold change
Pallet receiver frame - guide liners	5.16	Clearance	.020" ± .005" [.51mm ± .13mm]	adjust	Every week
Stripper head frame - guide liners	5.28	Clearance	.020" ± .005" [.51mm ± .13mm]	adjust	Every week
Air filter	na	Dirty or clogged filter	na	check[4]	Every week

Table 11.1 *PREVENTIVE MAINTENANCE TABLE*

[1] The "REF." column refers you to the figure in this manual where the component is illustrated and where adjustment instructions is given.

[2] If TOLERANCE is not respected, proceed to ACTION.

[3] Hours of operation.

[4] Check if filters are drained properly as required (dependent on air supply).

11.2 SERVICE AND REPAIRS

11.2.1 Drive Motor (not illustrated)

Component	Check For	Action	Hours
Mounting bolts	Recommended torque	torque	installation
Bearings	.002 [.05mm] radial move	repair / replace	4000
Lubrication		lubricate	2000
Sheave	Wear - Match with gauge #112541	replace	400
Belts	Surface contamination, wear, cuts, cracks. Match with gauge #112541	replace	400

Table 11.2

11.2.2 Bescodyne Clutch/Brake Unit (figure 11.1)

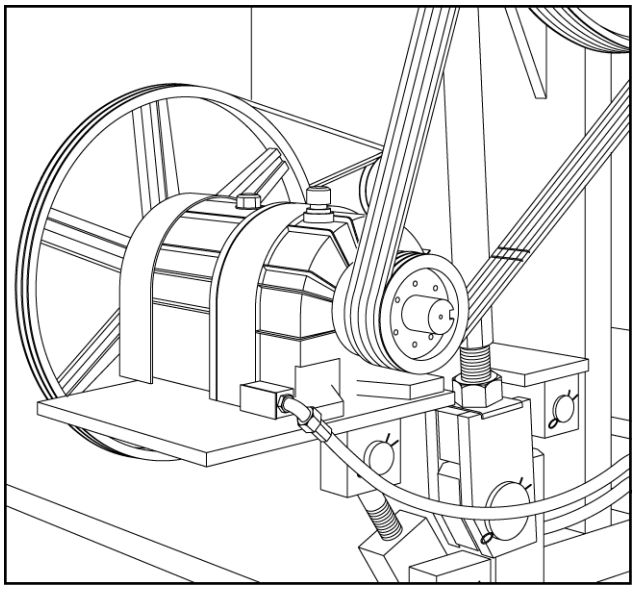


Figure 11.1

Component	Check For	Action	Hours
Input sheave #112339F2280	Match with gauge #112541	torque	installation
Output sheave #112339F6080	Match with gauge #112541	repair / replace	4000
Lubrication	Oil - 10 quarts	check level	weekly
	Oil - Use Mobil Automatic Transmission Fluid ATF-210 (Type “F”) or equivalent	change	3 weeks
Disc	Centered (after vibration)	replace	400
Belts	Surface contamination, wear, cuts, cracks Match with gauge #112541	replace	400

Table 11.3

C. Checking the Oil Level

Every week or until experience dictates otherwise, check the oil level. Always check the oil level with the drive at room temperature and while it is not running.

The drive has an oil sight gauge located at the output end of the drive. The oil level is to be at the center of the gauge.

D. Changing the Oil

IMPORTANT: Open the disconnects to the drive motors before attempting to change the oil.

Every three months, completely drain the oil from the drive using the drain plugs provided. If the oil sight gauge is dirty, it should be removed and cleaned.

Reinstall the drain plugs and refill the drive to the center of the sight gauge with fresh oil.

NOTE: Do not overfill the drive unit. Excess oil will cause the unit to overheat.

E. Type of Oil

Use only Mobil Automatic Transmission Fluid ATF-21 0 (type “F’) or Mobil Multi-purpose Automatic Transmission Fluid for most drives. Other fluids may be specified for special applications. Always use the type of fluid specified on the Name Plate.

F. Cleaning and Inspection

Clean metal parts in a suitable solvent and dry in a stream of low pressure compressed air. The Clutch and Brake Drive Plates can be cleaned in solvent, but **DO NOT** clean the Clutch and Brake Friction Discs in solvent. Use only a clean, dry and lint-free rag to clean these Friction Discs. (Solvent will damage the resilient paper-based friction material used on the Friction Discs). Keep the Drive Plates and Friction Discs in the same order as they were removed. After cleaning, inspect parts for cracks, distortion, scoring, nicks, burrs or other damage would affect serviceability. Pay particular attention to the following:

- Check the disc wear surfaces for scoring, galling or evidence of uneven wear.
- Check the clutch and brake plates for scoring or galling. Make sure they are flat. If a perceptible ridge is worn in any of the drive plates, replace all of the drive plates and friction discs as a complete set.
- Carefully check the piston and bore surfaces for nicks, scratches, scoring or other damage which would affect operation or cause leakage.
- Pay particular attention to Wear Sleeve (#250), Mating Ring (#4) and shafts in the area of rotary seals. Check for nicks or scratches which would cause leakage. Replace any damaged parts.
- It is not necessary to remove the ball bearings to check their operation. Slowly rotate the free race of each bearing by hand checking to see if it turns freely without rough or flat spots.

G. Repair and Replacement

A fine stone or crocus cloth may be used to remove minor surface defects from parts as long as the operating or sealing action of the part is not affected. The use of coarser abrasive or other machining methods should not be attempted. Otherwise, damaged parts should be replaced.

Replacement is recommended also for the following, as applicable:

- Replace all O-Rings, Liners, Gaskets and Oil Seals removed during the course of disassembly.
- Replace Clutch or Brake Discs and Drive Plates as complete sets only.

H. Belts (ref. table 11.3)

Check wear and tension on input and output belts as described in table 11.3 (see figure 11.4 and 11.5).

NOTE: Refer to Bescodyne® catalogue #502-03/20-001 for more complete instructions on this unit.

I. Procedure for Checking Brake and Clutch Stacks for Wear.

An easy procedure has been established to visually check the brake and clutch stacks for wear to determine whether or not they need to be replaced.

Two “stack wear” grooves (A) have been machined in the input shaft (B) lugs to facilitate this visual check (see figure 11.2)

⚠	**CAUTION:** Disconnect and lock-out all electrical power to the drive motor. This step must be taken to avoid any possibility of personal injury or damage to the drive unit.

1. Remove the inspection pipe plug from the top of the input housing.

A.) CLUTCH STACK WEAR

2. Apply air pressure to the clutch port.
3. Using a flashlight, observe the clutch stack (C) through the inspection port (see figure 11.2).

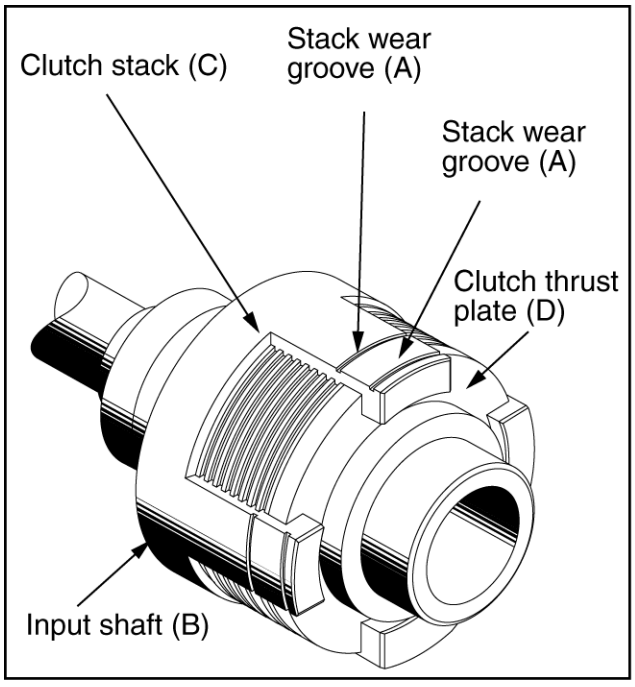


Figure 11.2 *STACK WEAR GROOVES*

If the rear surface of the clutch thrust plate (D) has moved up to or past the “stack wear” groove (A), the clutch stack needs to be replaced (see figure 11.2).

4. Exhaust the air pressure from the clutch port.

B.) BRAKE STACK WEAR

5. Apply air pressure to the brake port.
6. Using a flashlight, observe the clutch stack through the inspection port (A) (see figure 11.3).

   If the rear surface of the Thrust place (E) has moved up to or past the “stack wear” groove #1, the brake stack is worn and needs to be replaced.

NOTE: Both the brake stack and the clutch stack can individually be checked for wear. If either stack is worn and needs to be replaced, both stacks should be replaced as a complete set. Refer to service manual and repair parts for clutch/brake drives (502-03/20-001) Besser catalog No. 437629F001, section 7 - disassembly and section 9 reassembly for brake and clutch stack replacement.

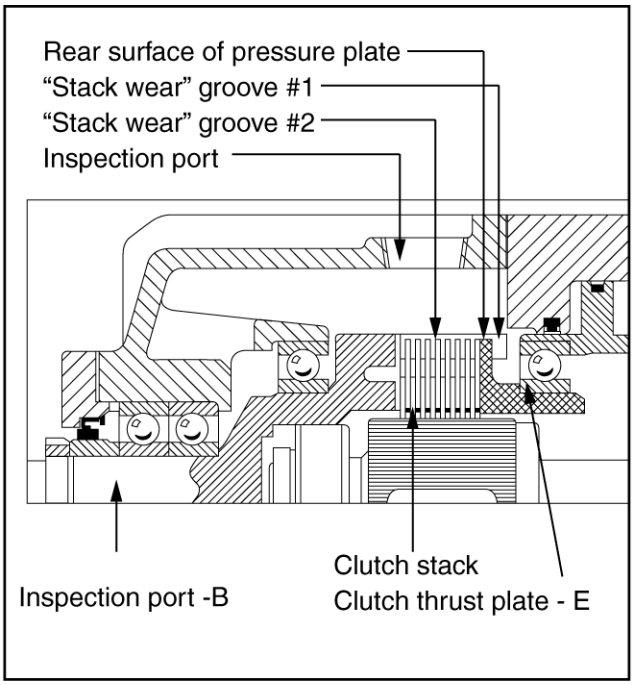


Figure 11.3 *BRAKE AND CLUTCH STACKS FOR WEAR*

J. Bescodyne Units Service Tips

- KNOW THE AIR PRESSURES
  Don't guess, be positive. Use 70 psi (4.8 bar) for Clutch. Use 50 to 55 psi (3.4 to 3.8 bar) for Brake.
- BRAKES
  Brakes are spring-boosted, so less air pressure is required.
- GAUGES AND REGULATORS
  Use glycerine-filled gauges; they are accurate and last longer.
- ULTRAPAC USES TWO DIFFERENT UNITS
  5S and 10S units use entirely different friction lining. Radically higher pressures will cause premature wear. Integrally piloted valve will not shift at pressures below 40 psi (2.8 bar) and must be converted to externally piloted. For a conversion, consult a Besser representative or refer to Besser Service Bulletin No. 91 -1.
- EXCEEDING 80 psi (5.5 bar)
  Exceeding this pressure on the clutch for any length of time can result in early failure of thrust bearings.
- AIR LINE LUBRICATION
  Use an air line lubricator only when a lubricator has been used previously. A small trace of oil in the air valve and piston of the Bescodyne can extend life. Use the same ATF oil in the lubricator as used in the Bescodyne. When adjusting the lubricator, follow the adjustment procedures as outlined by the manufacturer.
- CLEANER AIR
  Always invest in good quality air filters, regulators and lubricators. The result of using air filters, regulators and rubricators is clean air that is free of moisture and contaminants.
- V-BELTS
  While it is necessary to maintain enough belt tension to drive the block machine, overtightening of V-belts on the output end of the Bescodyne drive could cause fatigue breakage of the spliced output shaft. When the 4 or 5 groove output sheave becomes worn, it is tempting to over-tighten the belt to prevent slipping. When slippage occurs, replace the output sheave.
- CHANGING OIL
  Besser recommends changing the oil in Bescodynes drives every three months. Use a Multi-Purpose ATF 210 Automatic Transmission Fluid.

NOTE: Do Not Overfill. Refer to Besser Service Bulletin No. 93-4, for additional information.

NOTE: DO NOT FLUSH with any solvents; we recommend to simply change the oil.

- EXCESSIVE HEAT
  Excessive heat can be a real enemy! Keep fans intact and fan shroud in place.

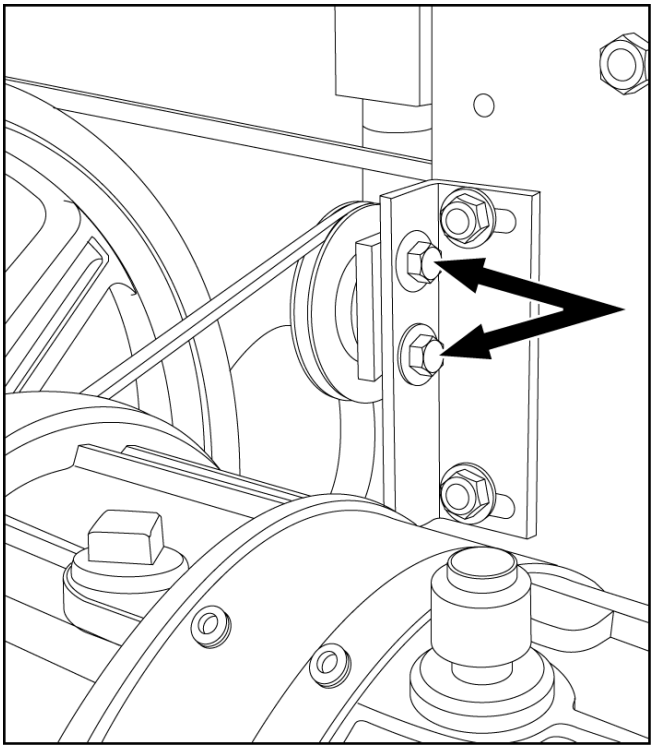


Figure 11.4 *INPUT PULLEY BELT TENSION*

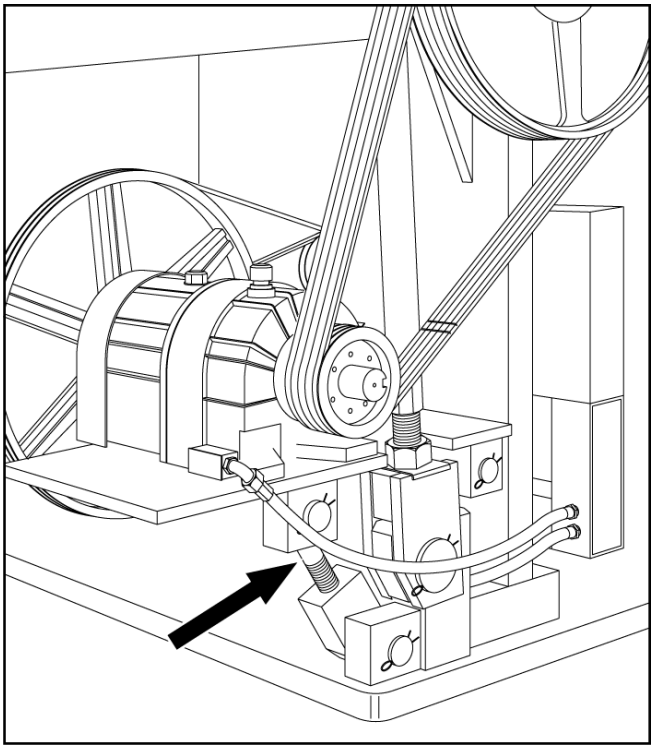


Figure 11.5 *OUTPUT PULLEY BELT TENSION*

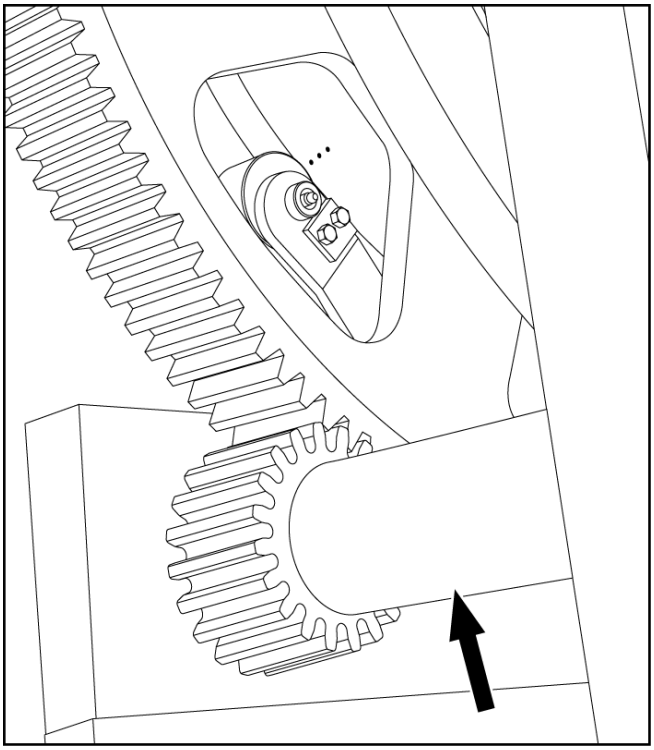


Figure 11.6 *PINION SHAFT*

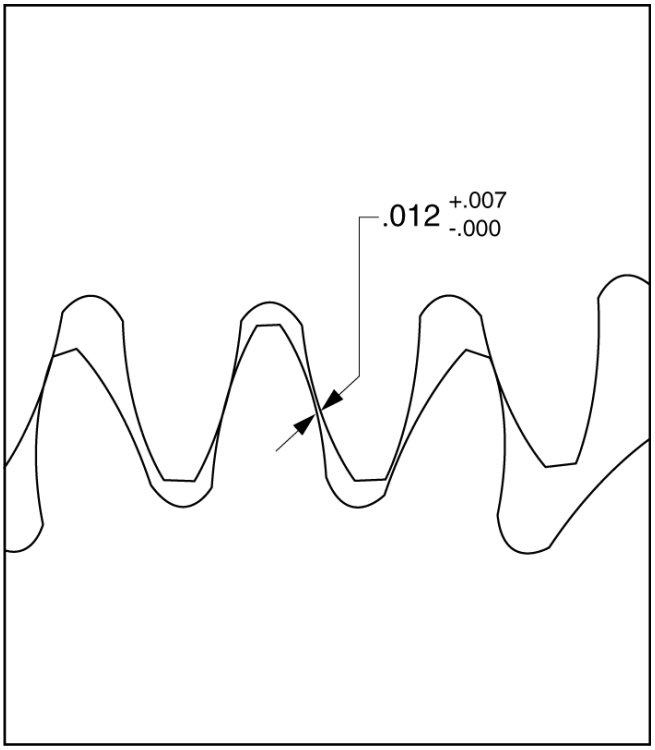


Figure 11.7 *GEAR TOOTH GAP*

11.2.3 Replacing Pinion Shaft

Before replacing pinion shaft, make sure machine is in safe position. Stripper head frame and pallet receiver frame must be down. Also, make sure there is no tension on the pinion gear.

1. Remove pinion shaft assembly from machine and transfer parts to be rebuilt to new shaft.
2. Reinstall rebuilt assembly and adjust so teeth have equal pressure across width and a clearance of .012” to .019” (.3mm to .5mm).

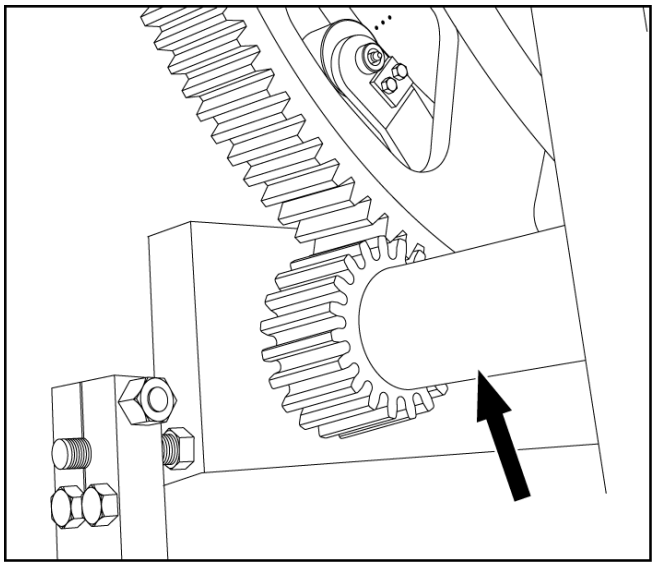


Figure 11.8 *PINION SHAFT*

11.2.4 Turning Bull Gear

The bull gear must be turned in order to extend its life span. Turn bull bear when .020” (.5mm) clearance develops between pinion and bull gear teeth.

Before turning bull gear, make sure machine is in its safe position. Stripper head frame and pallet receiver frame must be down.

1. Unbolt bull gear from hub (bolt A in figure 11.9).
2. and turn pinion shaft to turn bull gear 900.
3. Finally, rebolt to hub.

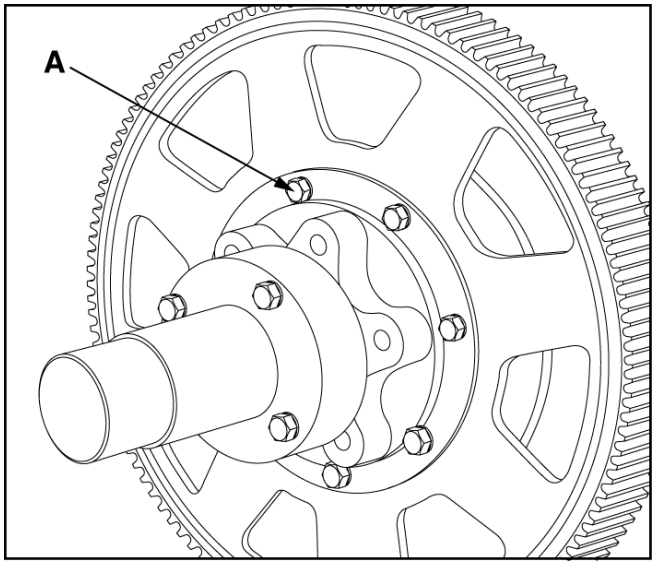


Figure 11.9 *BULL GEAR*

11.2.5 Pinion Shaft (figure 11.6 and 11.7)

Component	Check For	Action	Hours
Sheave P/N 112339F6280	Wear - Match with gauge #112541	replace	400
Bearings	.005” [.127mm] radial move	replace	2000
Pinion	Alignment, wear and clearance	0.012” to 0.019” between teeth	
Taper lock-tight			
Lubrication	Automatic	-	-

Table 11.4

11.2.6 Cam Shaft (not illustrated)

Component	Check For	Action	Hours
Bull gear	Alignment, wear and tightness	adjust	Installation
Bearings	Clearance, seals	repair / replace	2000
Lubrication	Automatic	-	-
Cam assemblies			

Table 11.5

11.2.7 Feed, Stripper Head and Pallet Receiver Shafts & Links

Component	Check For	Action	Hours
Bearings	Wear. .030” [.76mm] clearance	replace	1000
Rollers	Wear. .010” [.25mm] clearance	replace	1000
Bushings	Wear. .030” [.76mm] between feeler gauge pin and bushing	replace	1000
Pins	Wear. .010” [.25mm]	replace	1000
Links	Link ends tightness (see torque chart)	replace	400
Link bearings	Wear. .030” [.76mm] clearance	replace	1000
Link pins	Wear. .010” [.25mm] clearance	replace	1000

Table 11.6

11.2.8 Feedbox

Component	Check For	Action	Hours
Agitator motor	Lubrication (see manufac.'s manual)	lubricate	4000
Agitator sheave	Worn (match with gauge #112541)	repair / replace	400
Agitator belts	Wear and tension (match with gauge #112541)	check level	400
Agitator bearings	Wear	replace	400
Agitator nylons	Worn. .030" [.76mm] clearance	replace	400
Agitator rollers	Worn. .010" [.25mm] clearance	replace	400
Agitator bars	Worn more than 1/2" [13mm] in dia.	replace	400
Back bar and guide	Bent or worn more than .030" [.76mm]	clean & replace	Daily
Liners	Bent or worn more than .060" [1.5mm]	replace	Daily
Loose back bar	Bent or worn more than .100" [2.5mm]	replace	Daily
Hopper	Bent or worn more than .100" [2.5mm]	replace	Daily
Gate	Bent or worn more than .100" [2.5mm]	replace	Daily
Baffle	Bent or worn more than .100" [2.5mm]	replace	Daily
Apron plate	Worn more than .125" [3mm]	replace	Daily
Wear shoes	Worn more than .125" [3mm]	replace	Daily
Rollers	Worn more than .010" [.25mm]	replace	100
Bushings	Worn more than .030" [.76mm]	replace	100
Pins	Worn more than .010" [.25mm]	replace	100
Back top plate	Worn more than .100" [2.5mm]	replace	100
Feedbox track	Worn more than .060" [1.5mm]	replace	400

Table 11.7

11.2.9 Pallet & Block Delivery

Component	Check For	Action	Hours
Pallet conveyor chain	3% elongation and sloppy rollers	Adjust	1000
Pallet conveyor shafts	-	-	-
Pallet conveyor bearings	.020" [0.5mm] radial movement	replace	1000
Pallet conveyor sprockets	No longer smooth when engages chain	replace	1000
Pallet conveyor trunion shaft bearings	.020" [0.5mm] radial movement	replace	1000
Pallet conveyor chain track	1/8" [3mm] wear or can no longer adjust	replace	1000
Pallet lugs	Won't consistently push pallets	replace	1000

Table 11.8

11.2.10 Pallet & Block Moving Bars

Component	Check For	Action	Hours
Linkage bearings	.010” [0.25mm] radial movement	replace	1000
Slides	Can no longer adjust	replace	1000
Guide rollers	won’t turn or .010” [0.25mm] radial movement	replace	1000
Pallet cradle	Bent or broken	replace	1000
Block fingers	Worn more than 1/16” [1.6mm]	replace	1000

Table 11.9

11.2.11 Pallet & Block Support Shaft

Component	Check For	Action	Hours
Linkage bearings	.030” [0.76mm] radial movement	replace	1000
Bearings	.030” [0.76mm] radial movement	replace	1000
Cam rollers	won’t turn or .005” [0.13mm] radial movement	replace	1000

Table 11.10

11.2.12 Pallet & Block Drive

Component	Check For	Action	Hours
Shaft bearings	005” [0.13mm] radial movement	replace	1000
Link bearings	005” [0.13mm] radial movement	replace	1000
Cam	Surface rough or penned	replace	1000
Gearbox	(see manufac.’s manual)		
Beier variator	(see manufac.’s manual)		
Motor	(see manufac.’s manual)		4000
Clutch/brake unit	(see manufac.’s manual)		1000

Table 11.11

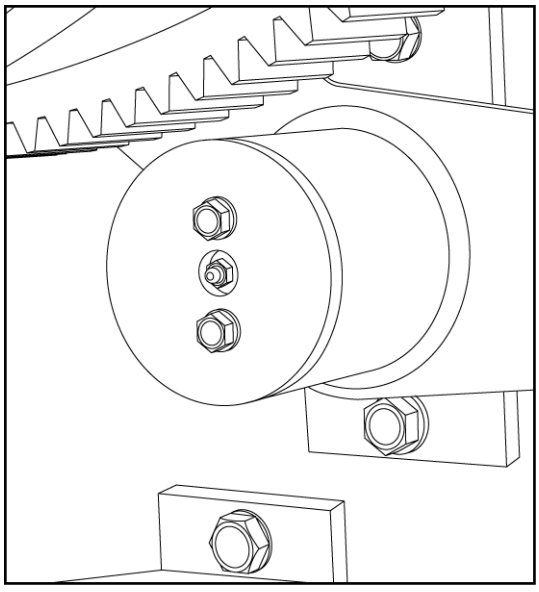


Figure 11.10

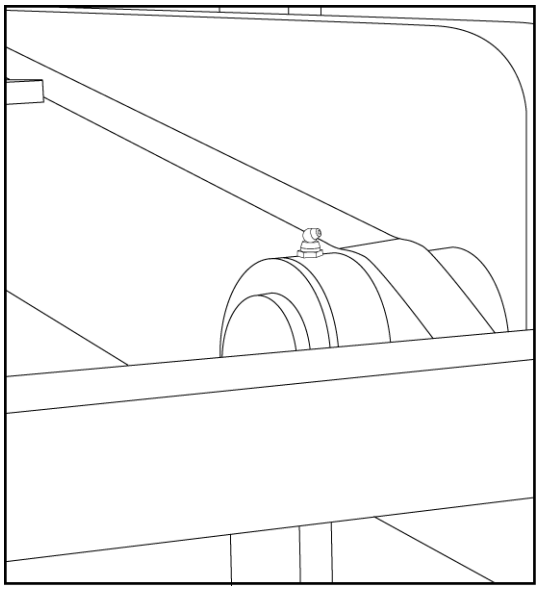


Figure 11.11

11.2.13 Tools

Tool	Part #
Belt & sheave gauge	#112541
Posydine stock gauge (inside unit)	
Belt tension gauge	#106666
Bearing feeler gauge - .015” [0.38mm]	#94133
Pry bar (Goose neck) (Mold centering)	#61397
Multiple lockout device	#111140
Padlock	#111139

Table 11.12

11.2.14 Bolt Torque Chart

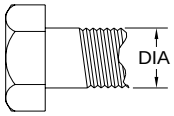
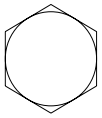
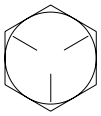
Threaded Diameter 	S.A.E. Grade 2 	S.A.E. Grade 5 
1/4 inch	60 – 80 lb. inch	100 – 120 lb. inch
3/8 inch	20 – 30 lb. foot	30 – 40 lb. foot
1/2 inch	40 – 60 lb. foot	65 – 85 lb. foot
5/8 inch	90 – 110 lb. foot	140 – 160 lb. foot
3/4 inch	145 – 165 lb. foot	250 – 270 lb. foot
7/8 inch	165 – 185 lb. foot	420 – 440 lb. foot
1 inch	230 – 250 lb. foot	640 – 660 lb. foot
1 1/4 inch	500 – 520 lb. foot	1200 – 1250 lb. foot
1 1/2 inch	600 – 620 lb. foot	1400 – 1500 lb. foot

Table 11.13

11.3 TRABON PUMP MAINTENANCE

The adjustments covered in this section are:

1. PUMP IN-FEED PRESSURE.
2. THE SOLENOID FLOW ADJUSTMENT controls the speed the air piston shifts.
3. THE PUMP PISTON STROKE determines how much grease is pumped each stroke.
4. LUBRICATION RATE ADJUSTMENT Adjusted through the Graphic Control Station. Refer to section 9.5: “TIMER ADJUSTMENT” - F3 -Timers 5 and 6.
5. FILLING THE GREASE PUMP.

For more complete instructions on the TRABON PUMP, refer to “Trabon Pump Owner’s Service Manual #437629F913”.

⚠	**WARNING:** Be very careful while adjusting or troubleshooting the lube system that the machine is not turning, and the main drive motor is off.

11.3.1 Trabon In-Feed Pressure Adjustment

The Trabon pneumatic pump has a air-to-lube ratio of 30 to 1. The Trabon in-feed air pressure on many Besser Vibrapacs is supplied from the Bescodyne main drive brake air regulator. In this case when the brake regulator adjustment is changed, it also affects the Trabon pump. The Trabon pump pressure ideally should be 60-80 psi [4.1-5.5 bar], which can develop at least 1800 psi [124 bar] pumping pressure.

NOTE: It may be advantageous to connect your Trabon pump to the Bescodyne main drive clutch rather than to the brake. The clutch air pressure adjustment is higher than the brake. Starting in 1991, Besser block machines have a separate air regulator supplied to the Trabon pumps. The plastic air solenoids on double acting pumps may not operate with less than 70 PSI [4.8 bar].

11.3.2 Trabon Piston Stroke Adjustment

AL-5M Pump stroke adjustment for Besser block machines:

On AL-5M pumps, we recommended in the past a setting of .020 which would be 20 thousandths cubic inches of grease per stroke or.328 cubic centimeters. .020 is the middle of 3 calibration marks.

On the right side of the pump, remove the calibrated silver cap. Put the open end of the cap up against the locknut. The stroke is how far the screw sticks out and matches the calibrations on the cap. To adjust the stroke, loosen the lock nut on the adjustment screw. Turn the screw inward or clockwise to reduce the stroke. Turn the screw outward or counterclockwise to increase the stroke. The lock nut has to be retightened and the cap placed up against it again to recheck the settings after you change them. After final adjustment, tighten lock nut, then tighten silver cap onto the adjustment screw.

L-25M Pump stroke adjustment:
On AL-25M pumps used on block machines, set the pump stroke on the mark between the 30 line and the .075 line. This will be a setting of approximately.052 cubic inches which is equal to .853 cubic centimeters. The method of adjustment is described and shown in the Pump owner’s manual on page 4-2 and 4-3.

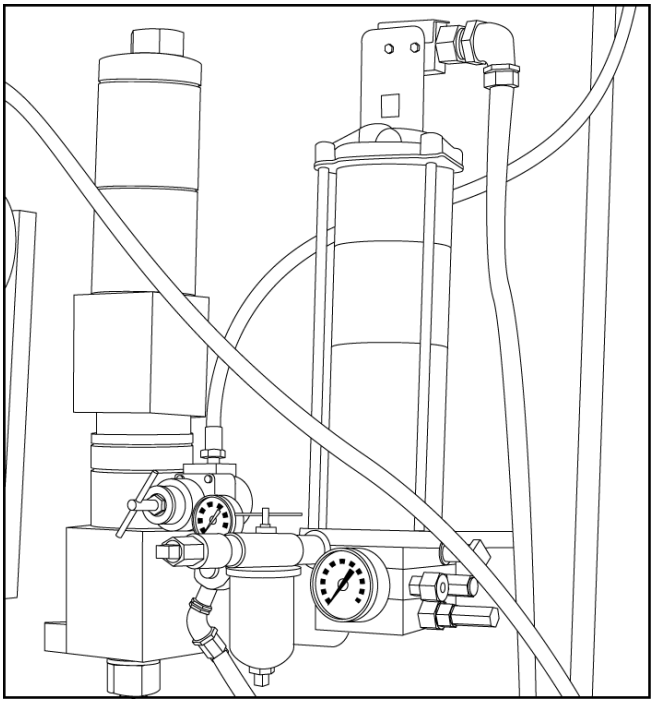


Figure 11.12 *THE TRABON LUBE PUMP*

AL-25M Pump stroke adjustment for Besser slump mixers:
Set the stroke adjustment for .030 cubic inches, .492 cubic centimeters for AL-5M and AL-25M pumps.

11.3.3 Trabon Solenoid Flow Control Adjustment for ALS Pumps

The solenoid flow adjustment controls the speed at which the Trabon air piston shifts. The solenoid flow controls should be adjusted to get a gentle but positive shift of the piston without slamming.

Single acting ALS pumps have one flow adjustment which controls the in-feed air into the SA port. Depending on the air plumbing, you may have to use an offset screwdriver to adjust the flow control.

Turn the solenoid adjusting screw clockwise all the way in. Back the adjusting screw out 1/16 to 1/4 turn. Press the manual shifting override button on the air solenoid.

You should be able to hear the air piston shifting and the exhaust air exiting the DA port. Adjust the solenoid as slow as possible while still getting a positive shift of the piston. If you place your hand on the air cylinder of the Trabon pump, you should also be able to feel it shifting.

11.3.4 Trabon Solenoid Flow Control Adjustment for ALJ Pumps

On the double-acting pumps when the solenoid flow controls are adjusted, the exhaust air flow is also adjusted. When the Trabon air piston shifts forward, air flows in the SA port and out the DA port. So, to adjust the speed of the piston shift forward, turn the front or right hand flow control which adjusts the air coming out of the DA port. Loosen the lock nuts and turn both screws all the way clockwise to shut off the flow. Start by backing both screws out 1/2 turn and testing the pump shift with the plastic manual override button. The reverse speed is controlled by air for the most part, but the return spring will also be helping. The reverse speed is controlled by the exhaust air coming out of the SA port which is the back or left hand flow control. Set both flow control adjustments to obtain a positive shift without a hard, slamming action. When adjustments are completed, tighten the lock nuts so the adjustment screws cannot move out of adjustment.

11.3.5 Filling the Grease Pump

Grease To Use:
We recommend Lithium based E.P.-1 grease, such as Shell Alvania E.P. No. 1, or Mobilux E.P. No. 1. In colder climates and/or in colder months, Shell Alvania E.P. No. 0, Mobilux E.P. No. 0, or grease with equivalent specifications may be used.

Filling the Pump:
The Trabon Pump, on the average, should be filled with grease after 35 hours of operation. It is best if the pump never runs out of grease because excessive air can be introduced into the system. Before filling the pump, turn the filter handle a few times to clean it. Attach a filling pump hose to the fill stud quick disconnect located just ahead of the filter.

	**WARNING:** If a high pressure supply pump is used to fill the Trabon grease reservoirs, wear safety glasses. Pressure could build up high enough to fracture the reservoir and send particles flying.

NOTE: If air does get into the automatic greasing system, refer to the proper sections:

1. To bleed air from the Reservoir, refer to Section 1 in Pump owner's manual.
2. To bleed air from the Pump, refer to Section 6 in Pump owner's manual,
3. To bleed air from the Feeder Blocks and Grease Lines, refer to Section 9 in Pump owner's manual.

Operate the filler pump at a steady speed to allow air-free filling of the reservoir. Filling the pump too fast may form air pockets. Also to avoid inducing air into the pump, make sure there is enough grease in the supply source to fill the reservoir without disconnecting and reconnecting the filler hose. While filling the pump, watch the grease level rise. Stop adding grease when the level reaches the air bleed hole.

NOTE: Never fill over the air bleed hole; this will cause a vapor lock in the system. The air bleed hole is found about 2/3, the way up the plastic reservoir on the right. When filling is complete, turn the supply source off and disconnect supply line from the fill stud. Install the plastic dust cap over the fill stud to keep dirt out of the lube system.

11.4 BEARING MAINTENANCE

11.4.1 Remember These Do's and Don'ts

When handling bearings:

DO:

1. Remove all outside dirt from housing before exposing bearing.
2. Treat a used bearing as carefully as you would a new one.
3. Work with clean tools in clean surroundings.
4. Handle with clean, dry hands, or preferably with clean canvas gloves.
5. Use clean solvents and flushing oils.
6. Lay bearings out on clean paper.
7. Protect disassembled bearings from rust and dirt.
8. Use clean lint-free cloths or rags to wipe bearings.
9. Keep bearings wrapped in oil proof paper when not in use.
10. Clean inside of housing before replacing bearing.

DON'T:

1. Don't work in dirty surroundings.
2. Don't use dirty, brittle or chipped tools.
3. Don't use wooden pallets or work on wooden bench tops.
4. Don't handle with dirty, moist hands.
5. Don't use gasoline containing tetraethyl lead, as they may be injurious to health.
6. Don't spin unclean bearings.
7. Don't spin bearings with compressed air.
8. Don't use cotton waste or dirty cloths to wipe bearings.
9. Don't expose bearings to rust or dirt.
10. Don't nick or scratch bearing surface faces.

11.4.2 Lubrication Tips

Lubrication is essential for the proper operation of bearings. Grease and oil are both used over a considerable range of speeds and operating temperatures. The choice of the type of lubricant should be made only after careful consideration of the several factors involved.

1. Keep lubricants clean. Dirt causes most bearing failures, and one easy way for it to get to bearings is to be put there in the grease. Keep covers tight on all grease cans. Use only clean dishes and clean spatulas with grease. Keep grease stored away from all dust, dirt, and metal chips,
2. Standardize your greasing procedures. Make sure all maintenance personnel understand proper greasing methods. Do not let inexperienced personnel take over greasing; it is too important. Establish precise instructions regarding cleaning of greasing equipment, grease fittings, grease cups (before refilling them). Oil cups and grease fittings can be marked with colored paints to systemize your relubrication.
3. Relubricate on schedule. Do not wait for trouble to signal the need for additional lubrication. Relubrication schedules should be posted on machines.
4. Use only high grade grease in bearings. Low grade grease is a false economy. Its use usually results in shortened bearing life. Also, try to use the grease recommended by the machine manufacturer.
5. Over-greasing is bad, It causes churning of the lubricant and subsequent over-heating. If bearing runs hot after relubrication, open the drain plug and let some of the grease run out while the bearing is operating. Never fill end-bells more than one third full when re-greasing.
6. Never start a new machine until the bearings have been lubricated according to directions.

11.4.3 Watch Out for Dirt

The most important precaution to be observed in handling or using bearings is to keep them clean. Dirt is the greatest enemy of bearings. It causes wear, destroys their accuracy, and shortens their life. To the bearing user, metal chips, grit, abrasive, dust, etc., are all DIRT. Avoid them.

11.4.4 Preventive Maintenance

Have a perfectly clean work bench on which to place bearings before and after cleaning. Place the bearing in a degreaser or in a container of appropriate solvent such as standard solvent, kerosene, methyl-chloroform, or similar solvents. “Swirl” the bearing around in the cleaning solvent allowing it to wash through the bearing, carrying away any grit particles and dissolving all oil or grease. Finally, slowly revolve the inner ring so the cleaning solvent reaches all parts of the bearing. Do not allow the bearing to rest on the bottom of the container. Cleaning of a bearing interior around the balls or rollers is often done with a normal paint brush. This is a satisfactory practice although care should be taken to use a good quality brush which does not lose its bristles, and that none of the bristles become lodged between the balls or rollers and separators or rings. A piece of bristle can be as harmful as a steel chip.

ONCE IN, DIRT IS HARD TO GET OUT - A clean bearing placed on a dusty bench always becomes contaminated. Dirt, once entrenched in the separator, is exceedingly difficult to remove. Make cleanliness your first rule for working with bearings.

Bearings with closures on both sides should not be cleaned by dipping, spraying and the like, which would wash out the grease. The outer surfaces of such bearings may be carefully wiped with a lint-free cloth and light oil or solvent, after which they can be lightly coated with a protective lubricant, and wrapped to protect against dirt and corrosion.

Throughout the cleaning process, and especially where a bearing has been solvent cleaned, remember that corrosion can be caused by perspiration from hands.

So if a bearing has been solvent cleaned, wipe it carefully before applying a protective oil coat.

USE AIR WITH CAUTION - Never use unfiltered air. Make sure all traces of water and dirt in the air line are trapped out. Dirty air can blow dust into the bearing ruining careful cleaning work. Never allow the air blast to spin a bearing. If you must use air, hold bearing and hose carefully.

11.4.5 Relubricate After Cleaning

Always re-lubricate bearings immediately after they have been cleaned. Immerse in light clean oil and rotate the inner ring very slowly until all the solvent has been removed. Oil has a tendency to slip away from metal surfaces already wet with solvents, leaving the bearing surfaces unprotected and in danger of rust and corrosion.

11.4.6 Rewrap After Cleaning

Immediately after re-lubricating the bearing, wrap well in clean polyethylene or oiled paper. Replace in its box, making sure that inside of box is also clean. Reseal the box. A good shop practice is to write on the sealing tape the date of cleaning, the type of lubricant, and the name of the person cleaning the bearing.

11.4.7 Bearing Removal

Bearings may have to be removed as part of an overhaul program to service another part, or to replace the bearing. In any case, even if the bearing is an obvious failure, it should be removed with care to avoid damage to the shaft, housing or other machine parts and to avoid obliterating the cause of failure.

As mentioned before, at least one of the bearing rings is press fitted sometimes to a very tight fit. At this point, we are concerned largely with the proper handling of press fitted parts.

The first basic principle is that no press fit should be broken unless it is essential to the job being done, Many roller bearings are separable and when it is certain the bearing itself has not been damaged, it is best to leave the press fitted member in place. In addition to the time and trouble involved, removal may cause damage to the bearing seat. However, if any failure is evident, the entire bearing should be replaced. The second basic principle is that, in removing a ring, the driving force be directed through the inner or outer ring which is being removed, and not be transmitted through the balls, rollers, separators, closures and the like.

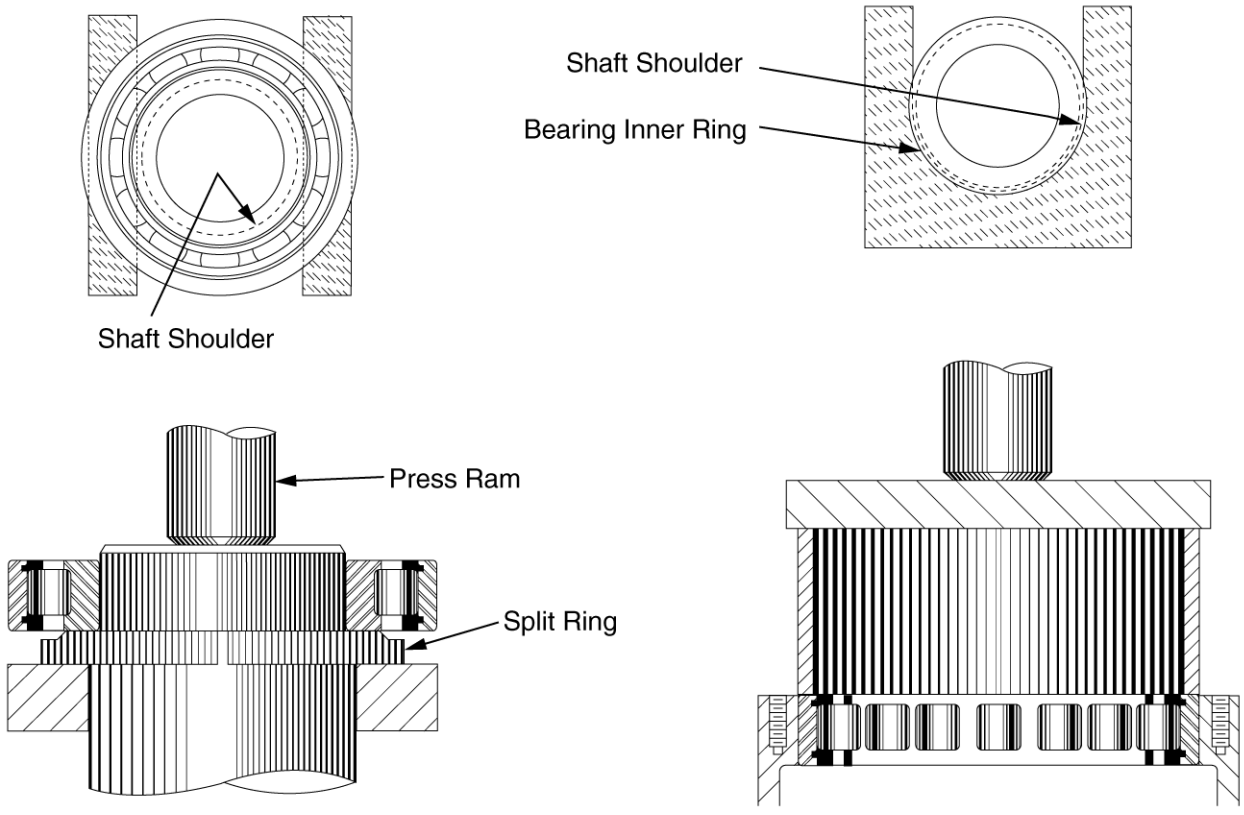


Figure 11.13 *BEARINGS*

The familiar arbor press is a very good machine for removing (or installing) bearings. if action is rapid, smooth and positive. In addition, it can supply a greater force than most other means. Further, it is a useful shop accessory for many other types of work. Unfortunately, space restrictions prevent its use in many jobs.

The arbor press requires various fixtures as an aid to removing or installing bearings. Although some of these aids are not inexpensive to make, their use is justified by the saving in time and by the freedom from damage to the equipment under repair. This is especially true if the job is a repetitive one.

The best fixture for pressing off inner rings from a shaft is a split ring with the outer area relieved. For most roller bearings, flat bars or U-shaped washers as shown here are quite satisfactory. They are not recommended for ball bearings since the outer ring or the closure may project beyond the inner ring face a small amount, A possible solution to this problem is to insert a small piece of shim stock about 0.01“ [0.25mm] thick between the fixture and the inner ring face. Also, an interference condition can be checked by oscillating the outer ring while applying a little pressure.

The arbor press can also be used to remove outer rings from housings in those cases where the housing can be handled in the arbor press and where a portion of the outer ring is exposed. In the event the entire outer ring is exposed, a section of tubing capped by a flat bar can be used as illustrated. In other cases, where there is axial space restriction, a fiat bar can sometimes be inserted to bear against the face.

Next to the arbor press, the puller is the best removal tool and is often necessary because of size and space restrictions in the arbor press. Pullers are made in different configurations and sizes and with accessories to make them adaptable to various jobs. Larger sizes are available with a hydraulic piston and hand pump.

As with the arbor press, the pressure must be applied directly through the press fitted member. In addition, where screw adjustments to the arms are made, care should be taken to pull the press fitted part off straight and true. It is advisable to use a piece of soft metal in the shaft center to prevent scoring due to the pressure of the puller screws.

The least desirable method is removal of inner and outer rings by driving with a hammer. Where machine shop facilities are available, it may be worth the effort to build a simple puller adapted to the job, especially if it is repetitive.

The use of a hammer and drift directly in the ring is very bad practice. An auxiliary fixture as shown here should be used.

Large roller bearing inner rings are particularly difficult to remove by any of the methods given here. Usually, these rings are separable and it is necessary to destroy them by heating or splitting. No specific instructions can be given here except that ail attempts should be made to prevent damage to the shaft.

11.4.8 Identification Damage and Failure on Bearings

INSPECTION:
When a machine or other piece of equipment is down for repair, the objective of the maintenance personnel is to repair it and get it going as soon as possible. However, some knowledge of bearing failure and damage identification is required to determine:

1. Whether the bearing is suitable for further service.
2. If there is some underlying cause for failure so that corrective measures can be applied before installing a new bearing. Here are some inspection tips and techniques to be used before or during machine dismantling Before removing or replacing a “noisy” bearing, try to determine if the bearing is the cause. To start with, a common complaint is that the bearing is “noisy”. This is a natural reaction of machine users to unusual noise emanating from a machine. Generally, a noisy bearing produces a continuous whine. A pulsating noise is usually the result of a malfunction of some other part. It must be remembered too that all ball and roller bearings have some noise level. Bearings in good condition tend to produce a pleasant sound compared to a harsh sound from one that is not functioning properly. Another point to remember is that a noisy machine is not always a sign of imminent bearing failure, but may indicate the need for lubrication.

   On dismantling a machine, it is often possible to make pertinent examination of the bearing without removing it from the shaft or housing

This is especially true with separable roller bearings, including single row tapered bearings. In such cases, major damage or failure can readily be noted. Ball bearings, being non separable, present considerably more difficulty, especially those with seats or shields.

In all cases, if failure or damage is not obvious, look for these signs :

1. A loose fit of the rotating ring. This is probably a signal that the ring has rotated and that wear has taken place. Where the ring is not loose by normal feel but there are rust-like loose particles around the fit area, check carefully for wear.
2. Indents, flaking or heavy rust on the operating surfaces. In many cases, these conditions result from metal particles thrown off by failure of an adjacent gear, or the like.
3. Undue looseness in a radial bearing. In most cases, radial shake, which can be felt by hand, is an indication that undue wear has taken place. Another sign of wear is a gritty feel of the lubricant adjacent to the bearing. In connection with the noise problem discussed earlier, keep in mind that excessive bearing wear can be a cause of noise by allowing the rotating member to move due to unbalance or other forces.
4. Missing balls or rollers. If one or more balls or rollers fall out of a separator, sufficient wear to the separator may have occurred to indicate the need for bearing replacement.
5. Rough rotation or “sticking” of the bearing when rotated by hand. This test requires considerable judgment and experience. In the case of “open” bearings, the bearing should be cleaned and lightly oiled before testing. A good practice is to clean it again using a strong solvent like varnish remover, then oil and retest. If the roughness or sticking persists, discard the bearing. Ball bearings with closures cannot, of course, be washed and oiled. These can be given the hand rotation test, repeatedly rotating and oscillating while applying a little axial pressure in one direction and then the other.

We do not recommend rotating bearings by power to check the noise characteristics. Besides the obvious danger of damage, this test requires great experience to determine if the bearing is faulty. As pointed out before, all bearings have some sound level.

If a part adjacent to the bearing has failed, it is good practice to replace the bearing even though it is not obviously damaged. It is also good practice to replace a bearing which has seen considerable service. The good judgment of the maintenance person is required here to determine a balance between the cost and difficulty of replacement vs. the possibility of a subsequent breakdown.

11.4.9 Types of Bearing Damage

Here are photographs and a description of the more common types of bearing damage. Many of these type of damage, especially in ball bearings, cannot readily be seen without dismantling the bearing. Hence, this identification is of benefit in cases of chronic failure, where a specific cause is sought. These types of failure are grouped as those caused by:

- Installation
- Operating conditions
- Normal fatigue

11.4.10 Installation Damage

BALL RING BRINELL:This type of brinelling on the shoulders is caused by excessive thrust which pushes the balls up on the pathway and creates a triangular shaped dent or “Brinell” spot at the junction of pathway and shoulder.

11.5 SMARTPAC MAINTENANCE AND CARE

1. Store in clean dry area.
2. Lubricate bearings before storing.
3. Keep quick disconnects clean and capped.
4. For extended storage, spray rust preventive in tube hole & seals.
5. Handle units with care; do not hit or pry the weights.
6. Mount to good mold side bars and make sure bearing housings are seated directly to bar and vibrator bolts are properly torqued. DO NOT force by hitting the bearing housing with a hammer.
7. Lift unit by the shaft, not by bearing housing as this can damage the seals.
8. Clean quick disconnects before engaging.
9. Replace “O” ring in quick disconnects at least every month or when they become worn or damaged.
10. Never operate system pressure above 80 psi (5.5 bar).
11. Use only new clean fluid when filling the system. Contamination will cause erratic operation.
12. Do not disassemble unit.
13. To prevent crimping of seals, Besser recommends the sheaves be tightened to 8 lbs ft. (12 N.M.) of torque. Tightening over 18 lbs ft.(27 N.M.) will cause rotary union to bind, reducing its life.
14. Never put undue pressure on rotary union fittings or connection hose.
15. Lubricate vibrator bearing every 8 hours with 1 oz [30 ml]. of clean high temperature synthetic grease #114135.
16. Always have guards in place when operating vibrator motors.
17. Keep system in top condition by replacing any worn belts, sheaves, etc...

11.6 SLC CONTROLLER MAINTENANCE

11.6.1 Preventive Maintenance

The printed circuit boards of the controller must be protected from dirt, oil, moisture and other airborne contaminants. In order to protect these boards, the controller must be installed in an enclosure suited to the environment. The interior of the enclosure should be kept clean and the enclosure door should be kept closed whenever possible.

Regularly inspect your terminal connections for tightness. Loose connections may cause improper functioning of the controller or damage the components of the system.

CAUTION: To ensure personal safety and to guard against damaging equipment, inspect connections with incoming power OFF.

The National Fire Protection Association (NFPA) gives recommendations for electrical equipment maintenance. Refer to article 70B of the NFPA for general requirements regarding safety related work practices.

11.6.2 Troubleshooting

When troubleshooting, pay careful attention to these general warnings:

CAUTION: Have all personnel remain clear of the controller and equipment when power is applied. The problem may be intermittent and sudden.

Unexpected machine motion could result in injury. Have someone ready to operate an Emergency Stop switch in case it becomes necessary to shut off power to the controller equipment. Also, see NFPA 70E Part II for additional guidelines for safety related work practices.

Never reach into a machine to actuate a switch since unexpected machine motion can occur and cause injury. Use a wooden stick. A metal rod could damage the machine and/or conduct current to the person holding it.

Remove all electrical power at the main power disconnect switches before checking electrical connections or inputs/outputs causing machine motion.

The SLC controller will give you reliable service. If a problem should occur, the first step in the troubleshooting procedure is to identify the problem and its source. Do this by observing your machine or process and by monitoring the diagnostic LED indicators on the CPU, Power Supply and I/O modules. By doing this, the source of a problem can generally be narrowed down to the processor, wiring, or the input/output devices.

To assist you in identifying the source of the controller's operation problem, we have included some troubleshooting considerations including status indication, trouble description, probable causes and recommended action.

11.6.3 Diagnostic Checks

A. Battery

The SLC Controller has power supplied by a lithium battery. The battery is located in the power supply inside the control panel. Replace the battery if the low battery signal activates. See figure 11.14 (page 11-21).

B. Fuses

A burned-out fuse may cause the power supply indicator light to illuminate in controller. Check the two fuses, located behind the lithium battery. The battery is located in the SLC-500 control panel. Replace burned-out fuses with new fuses. See figure 11.14 (page 11-21).

C. Circuit Breakers

A tripped circuit breaker may result for no apparent reason. Check the circuit breakers, located in the SLC control panel, and reset any tripped circuit breakers. See figure 11.14 (page 11-21).

D. Memory Loss

When the power to the panel goes off due to a power surge, drop or a dead battery, a memory loss may result. The CPU fault light will illuminate to indicate problem. To restore the memory, turn the panel power OFF. Insert EPROM into the inside of the processor. Restore the power. The SLC-500 will automatically read the EPROM into its RAM and go into RUN mode. The CPU light will illuminate to indicate a successful transfer. Turn the power OFF. Remove the EPROM from the unit.

11.6.4 Using the Troubleshooting Considerations Table Guide

To receive the maximum benefit of this Table Guide, we recommend the following steps in using its information:

1. Identify your Power Supply and CPU LED status indicators.
2. Match your controller's status LED indicators with the status LED indicators located in the first column in the Troubleshooting Considerations Table.
3. Once the LED status indicators are matched to the appropriate table, simply move across the table identifying trouble Description and Probable Causes.
4. Then follow the Recommended Action steps for each probable cause until the cause is identified.
5. If Recommended Actions do not identify the cause of trouble, contact your local Allen-Bradley Sales Office.

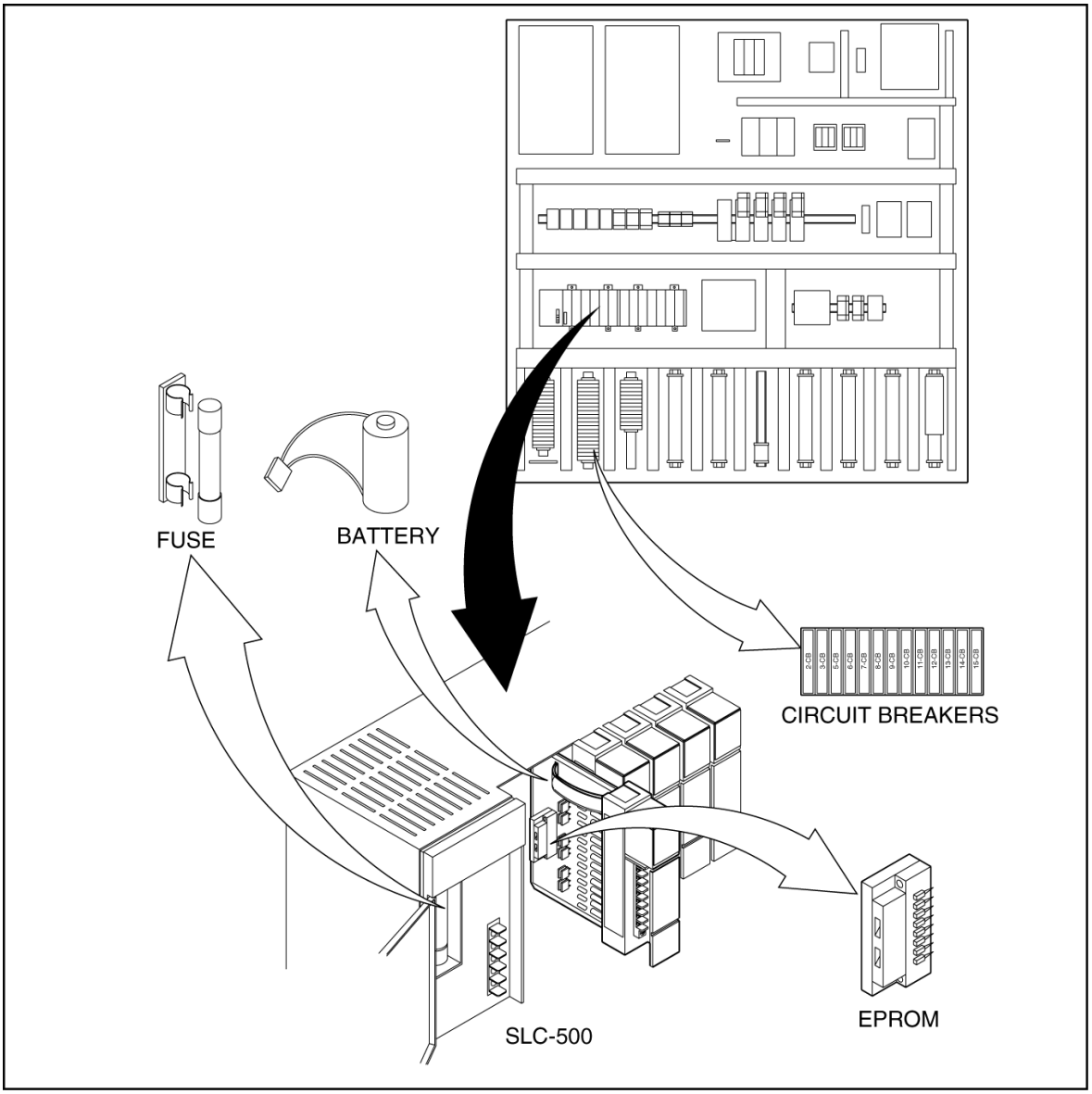


Figure 11.14 *SLC CONTROLLER BATTERY, FUSES, EPROM AND CIRCUIT BREAKERS*

11.6.5 Troubleshooting Table Guide

Refer to the following log to determine the status of the LED indicators:

- ☐ Indicates that LED is OFF
- ■ Indicates that LED is ILLUMINATED
- ▒ Indicates that LED is FLASHING

TROUBLESHOOTING CONSIDERATION			
STATUS INDICATORS	**DESCRIPTION**	**PROBABLE CAUSES**	**RECOMMENDED ACTION**
☐ POWER[1] ☐ PC RUN ☐ CPU FAULT ☐ FORCED I/O ☐ BATTERY LOW [1] On modular SLC configuration systems, you will find the POWER LED indicator on the rack mounted power supply of each rack.	Inadequate System Power	No line power	1. Verify proper line voltage and connections on the power supply. 2. Verify proper 115/230 Volt power supply jumper placement. Refer to Page 8-5 of the SLC manual for placing the jumper.
		Power supply fuse	1. Check for proper power supply connections. Replace fuse. 2. If fuse blows again, replace power supply. Refer to page 8-5 of the SLC manual for fuse location and replacement procedures.
		Power supply overloaded	1. Remove line power to power supply. Remove several output modules from the rack. Reapply power. 2. If condition reoccurs, re-calculate module configuration power required and verify proper power supply selection. **NOTE:** This problem can occur intermittently if power supply is slightly overloaded. Refer to page 6-2 of the SLC manual for power supply specifications.
		Defective power supply	1. Recheck other probable causes. 2. Monitor line power to rack power supply for possible transient or shorting problem identification. Replace power supply

Refer to the following log to determine the status of the LED indicators:

- Indicates that LED is OFF
- Indicates that LED is ILLUMINATED
- Indicates that LED is FLASHING

TROUBLESHOOTING CONSIDERATION			
STATUS INDICATORS	**DESCRIPTION**	**PROBABLE CAUSES**	**RECOMMENDED ACTION**
POWER[1] PC RUN CPU FAULT FORCED I/O BATTERY LOW [1] On modular SLC configuration systems, you will find the POWER LED indicator on the rack mounted power supply of each rack.	Processor not in RUN mode	User or user program logic selected mode	1. Verify selected processor mode. 2. If in program/test modes attempt RUN mode entry. 3. Check user program logic for suspend instructions if in suspend mode. Refer to either the Hand-Held terminal programming manual - Publication 1747 - 809 or the Advanced programming software manual - Publication 1747-801.
		Line power out of operating range	1. Check proper 115/230 Volt power supply jumper placement. Refer to page 8-5 of the SLC manual for placing the jumper. 2. Monitor for proper line voltage at power supply connections.
		Improper seating of power supply and/or CPU in the rack	1. Remove power and inspect the power supply rack connections and the CPU rack connections. 2. Re-install the devices and re-apply power. **IMPORTANT** - The CPU will only operate in SLOT 0 rack #1. Refer to page 8-5 of the SLC manual for power supply installation and page 8-6 of the SLC manual for CPU installation.
		Defective CPU, power supply or rack	1. Attempt RUN mode selection using a programming device in existing rack. 2. Place CPU in another rack not in the existing system. Apply power, reconfigure and attempt RUN mode selection. If unsuccessful, replace CPU. 3. Try existing power supply in test rack. If unsuccessful, replace power supply. If RUN mode is allowed, replace the existing rack.

Refer to the following log to determine the status of the LED indicators:

- Indicates that LED is OFF
- Indicates that LED is ILLUMINATED
- Indicates that LED is FLASHING

TROUBLESHOOTING CONSIDERATION			
STATUS INDICATORS	**DESCRIPTION**	**PROBABLE CAUSES**	**RECOMMENDED ACTION**
POWER[1] PC RUN CPU FAULT FORCED I/O BATTERY LOW	System inoperable no major CPU fault detected	User program logic error	1. Monitor logic in RUN mode and verify desired I/O status. 2. Check for minor CPU faults. Refer to Hand-Held programming manual - publication #1747-809 or Advanced programming software manual - publication #1747-801.
		Defective I/O Devices or I/O wiring	1. Test inputs and outputs according to start-up procedures covered in chapter 9 of the SLC manual.
POWER[1] PC RUN CPU FAULT FORCED I/O BATTERY LOW	CPU fault	CPU memory error	1. Cycle power.
		Fault memory module	1. Remove power and then remove the memory module from the CPU. 2. Re-install the CPU and cycle power. **Note**: If steady CPU FAULT LED changes to flashing, replace the existing memory module with a replacement module. Refer to chapter 3 of the SLC manual for removing and installing memory modules.
		Faulty CPU/power supply	1. Place the CPU in another rack not in the existing system and cycle power. Note: If steady CPU FAULT LED reappears, replace the CPU. 2. If CPU FAULT LED clears, monitor line power to power supply in existing system. 3. Replace existing system power supply if line power checks OK. Refer to page 8-5 of the SLC manual for power supply installation.

[1] On modular SLC configuration systems, you will find the POWER LED indicator on the rack mounted power supply of each rack.

Refer to the following log to determine the status of the LED indicators:

- Indicates that LED is OFF
- Indicates that LED is ILLUMINATED
- Indicates that LED is FLASHING

TROUBLESHOOTING CONSIDERATION			
STATUS INDICATORS	**DESCRIPTION**	**PROBABLE CAUSES**	**RECOMMENDED ACTION**
POWER[1] PC RUN CPU FAULT FORCED I/O BATTERY LOW [1] On modular SLC configuration systems, you will find the POWER LED indicator on the rack mounted power supply of each rack.	CPU major error	Initial CPU factory power-up condition. Hardware/software major fault detected. **Note**: erratic repetitive power cycling can cause a CPU major hardware fault.	1. Refer to chapter 9 of the SLC manual and follow the start-up procedures. 1. Monitor status file word S2:6 for major error code. 2. Refer to either the Hand-Held terminal programming manual - Publication 1747 - 809 or the Advanced programming software manual - Publication 1747-801 for major / minor fault identification. 3. Remove hardware / software condition causing fault. 4. Clear status file S2:1/13 major error halted bit. 5. Clear status file S2:5 minor error bits, if set. 6. Clear status file S2:6 major error code (optional) 7. Attempt a CPU RUN mode entry. If unsuccessful, repeat recommended action steps above.

Refer to the following log to determine the status of the LED indicators:

- Indicates that LED is OFF
- Indicates that LED is ILLUMINATED
- Indicates that LED is FLASHING

TROUBLESHOOTING CONSIDERATION			
STATUS INDICATORS	**DESCRIPTION**	**PROBABLE CAUSES**	**RECOMMENDED ACTION**
POWER[1] PC RUN CPU FAULT FORCED I/O BATTERY LOW	System does not operate per ladder logic.	User forced I/O disabling operation	1. Monitor program file on-line and identify forced I/O. 2. Disable appropriate forces and test system conditions again. Refer to either the Hand-Held terminal programming manual - Publication 1747 - 809 or the Advanced programming software manual - Publication 1747-801.
POWER[1] PC RUN CPU FAULT FORCED I/O BATTERY LOW	System does not operate per programmed forces.	Forces user programmed are not enabled.	1. Monitor program file on-line and identify programmed forces. 2. Enable appropriate forces and test system conditions again. Once forces are enabled FORCED I/O LED should be steady. Refer to either the Hand-Held terminal programming manual - Publication 1747 - 809 or the Advanced programming software manual - Publication 1747-801.
POWER[1] PC RUN CPU FAULT FORCED I/O BATTERY LOW	CPU major error with low or NO battery back-up	Loss of RAM memory during power down period	1. Replace the battery. 2. Refer to CPU major error recommended action steps. Refer to either the Hand-Held terminal programming manual - Publication 1747 - 809 or the Advanced programming software manual - Publication 1747-801.

[1] On modular SLC configuration systems, you will find the POWER LED indicator on the rack mounted power supply of each rack.
[2] Regardless of any other LED status indicator conditions, always replace the battery when the BATTERY LOW LED indicator is illuminated if RAM battery back-up is desired.

11.7 BLOCK MOVING DRIVE MAINTENANCE

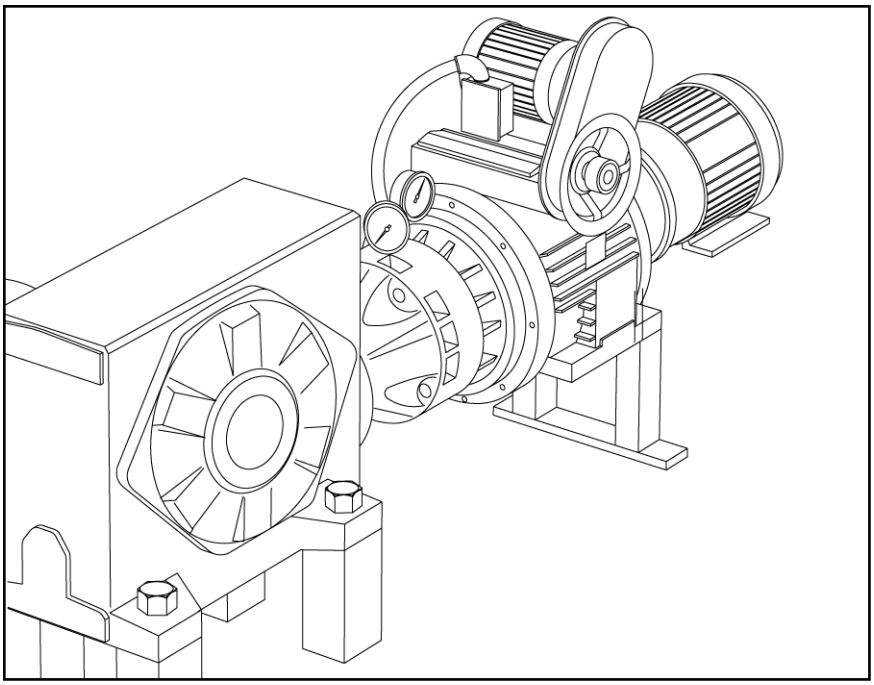


Figure 11.15 *BLOCK MOVING DRIVE*

The block moving drive is the independant drive (on the R.H. side of your Ultrapac II) which powers the block moving mechanism. As with all other components of the machine, the block moving drive requires regular maintenance and service to insure a continuous and smooth working.

This sub-section will review maintenance and service procedures for the three parts of the block moving mechanism: the reducer (see figure 11.16), the variator (see figure 11.17) and the clutch/brake unit (see figure 11.18).

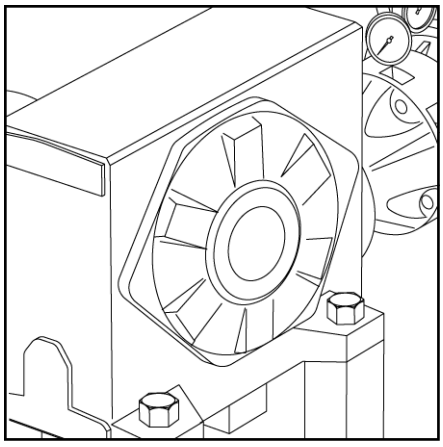


Figure 11.16 *REDUCER*

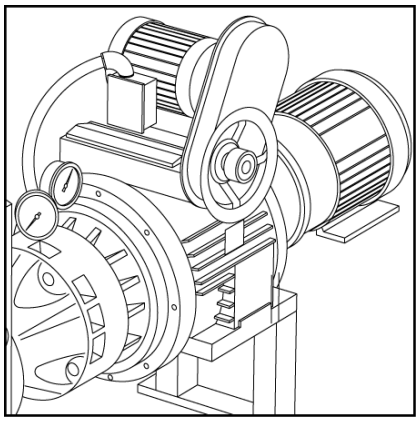


Figure 11.17 *VARIATOR*

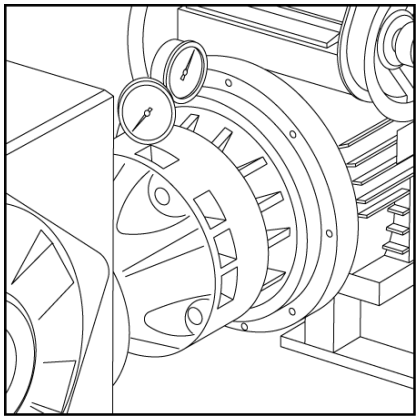


Figure 11.18 *CLUTCH/BRAKE UNIT*

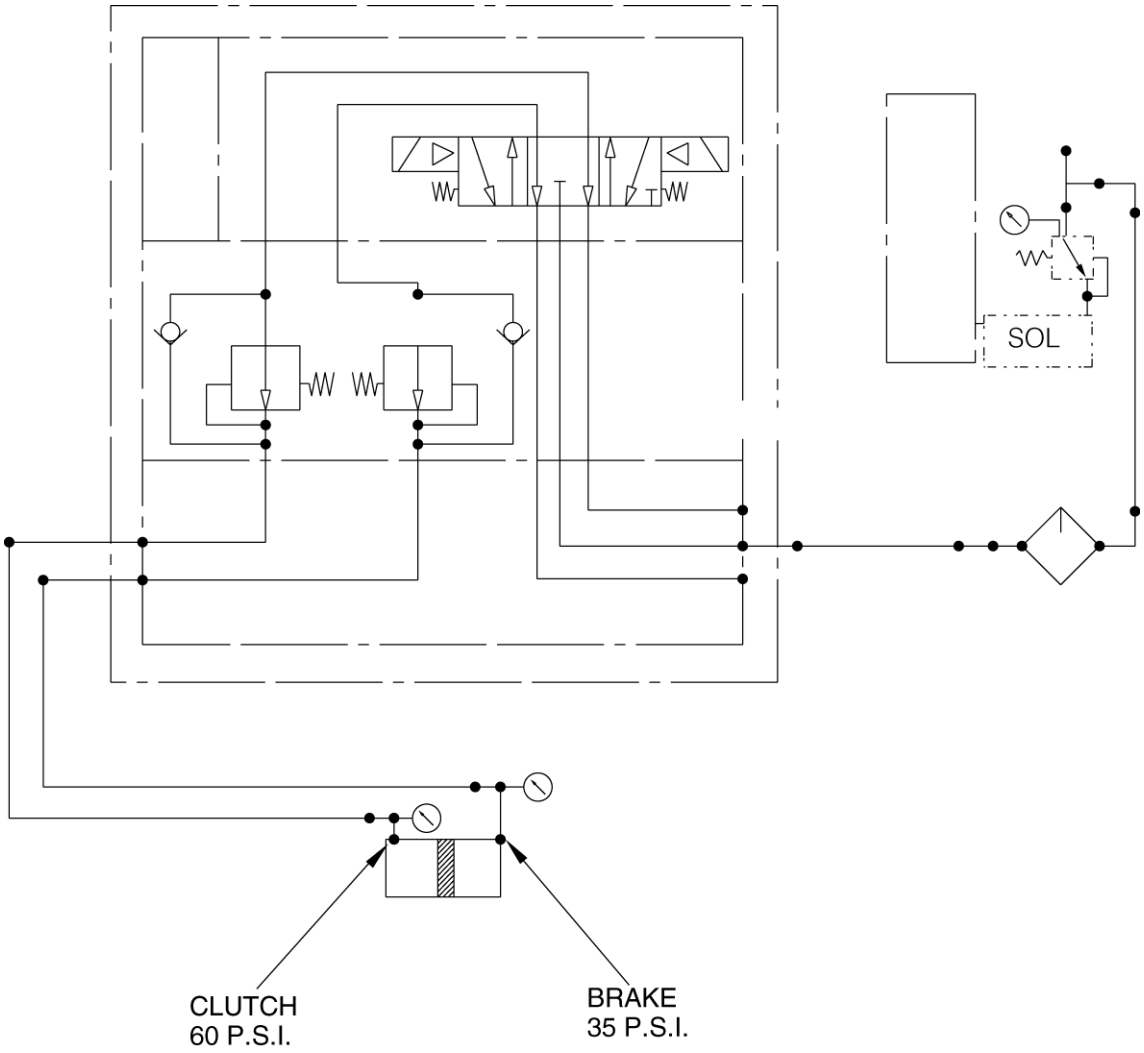


Figure 11.19 *BLOCK MOVING DRIVE PNEUMATIC DIAGRAM*

CAUTION: Before doing any kind of maintenance or service operation, shut **all power off** and **lock out** machine. Always follow the lockout procedure listed in the **Safety** section of this manual!

11.7.1 Reducer Maintenance

The reducer must be lubricated and greased at some predetermined intervals.

When changing oil, choose your oil according to the oil grade table (see table 11.14). The new oil must also have the required viscosity according to temperature conditions (see table 11.15).

A. Oil Filling

Fill reducer with 0.8 gallons of oil. Check the oil level plug position to fill the exact amount of oil.

B. Oil Draining

Drain oil while unit is still warm. To facilitate oil draining, remove filler plug.

C. Ventilation

To prevent pressure build-up, a breather plug is fitted on top of the housing. Take care and check regularly that this breather does not become clogged.

D. Oil Change

- The first oil change has to be made after 800 hours of operation. You can reuse the removed oil after filtering (use a 40µm filter).
- Subsequently, the next oil changes have to be made every 8000 hours of operation or every two years max.

E. Output Shaft Distance

You must adjust the output shaft distance, called “distance X” (see figure 11.20), of the reducer before starting it. Adjust the output shaft to have a distance "X" of 4.133" [105mm].

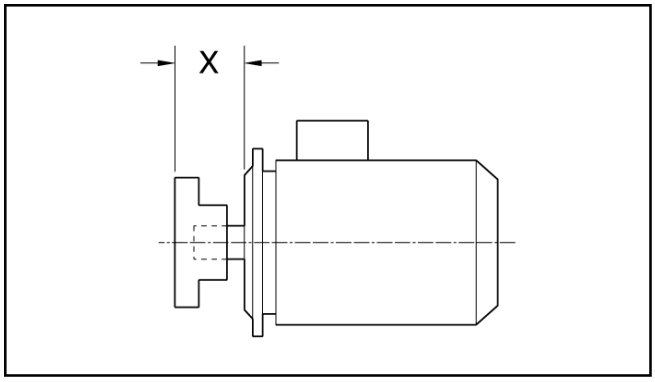


Figure 11.20 *DISTANCE “X”*

Aral	BP	Castrol	Chevron	Elf	Esso	Exxon	Fina	Gulf*	Mobil	QS	Shell	Sunoco	Texaco	Total	Winter-shall
Degol BG 220	Energol GR-XP 220	Alpha SP 220	Spartan EP 220	Reduct-elf SP 220	Spartan EP 220	Spartan EP 220	Giran 220	EP lubric. HD 220	Mobil Gear 630	Goya 220	Omala 220	Sunep 1060 ISO 220	Meropa 220	Caner EP 220	Ersolan 220
*Gulf Ultima 220 for Canada															

Table 11.14 *OIL GRADE (EP GEAR OIL)*

AMBIENT TEMPERATURE							
+150F	+600F	-100C	+150C	+320F	+1050F	00C	400C
ISO VG 100 (AGMA 3EP)				ISO VG 220 (AGMA 5EP)			

Table 11.15 *OIL VISCOSITY*

⚠	**CAUTION:** Before doing any kind of maintenance or service operation, shut **all power off** and **lock out** machine. Always follow the lockout procedure listed in the **Safety** section of this manual!

11.7.2 Clutch/Brake Unit Maintenance

The Power Flo model CAB-CC is a pneumatic brake such that when air pressure is applied to the clutch port or to the brake port, the double acting piston will move to engage the clutch and release the brake or move to engage the brake and release the clutch, respectively. This model is made with a female nema C-face mounting on the clutch side and a male nema C-face on the brake side.

The clutch/brake requires filtered and lubricated air pressure. Also, the following items have a limited life and may eventually need replacing:

Friction discs
O-rings
Bearings

Note that the maximum case temperature of the clutch/brake unit should be 1800F (820C).

For more information on your clutch/brake unit and to know how to assemble and disassemble the unit to replace these parts, please refer to the manufacturer's manual. To obtain a repair kit, spanner or fitting for the unit, contact the manufacturer as indicated on the manual.

11.7.3 Variator Maintenance

The SM- Beier variator unit of the block moving mechanism must be regularly lubricated and checked for worn-out parts. For more detailed information on the variator, please refer to the manufacturer's manual.

A. Oil Level

Oil level must be carefully watched as frequently as possible. Keeping the oil at the required level is very important. The appropriate oil level is:

Upper Red Mark : when not in operation

Lower Red Mark : during operation

Make a daily inspection of the oil level.

B. Oil Change

Suggested interval for oil change for NA type Beier variators is 500 hours after initial operation and every 2,500 hours thereafter. This is the recommendation for normal operation. Of course, oil should be changed more frequently whenever deterioration is detected, since deterioration occurs in different operation hours subject to brand of oil, conditions of loading and surroundings.

C. Oil Selection

The most important factor for the lubricant for the variator is its viscosity. When there are seasonal ambient temperature changes, change oil periodically to meet the viscosity requirement due to the respective ambient temperature. Recommended oils to be used with Beier variators are listed in table 11.16.

NOTE: For the maintenance, it is recommended that the maintenance records be attached to the drive. Keep record of (1) Date of last oil change, (2) Brand of oil supplied, (3) Name of personnel who did it, etc.

Recommended oils for use in NA Type variators - USE NO SUBSTITUTES
WARNING : DO NOT USE OILS CONTAINING E.P. ADDITIVES - OR AUTOMOBILE OILS

	Ambient Temperature F° (C°)				
Manufacturer	14° to 32° (-10° to 0°)		32° to 95° (0° to 35°)		95° to 122° (35° to 50°)
Gulf Oil Corp.	Harmony 46AW	Harmony 68AW	Harmony 100AW	Harmony 150AW	Harmony 220
Exxon Co.	Nuto H46	Nuto H68	Terrestic 100	Terrestic 150	Terrestic 220
Mobil Oil Corp.	Mobil DTE 25	Mobil DTE 26	Mobil DTE Hvy	Mobil DTE Extra Heavy	Mobil DTE BB
Shell Oil Co.	Tellus 46	Tellus 68	Tellus 100	n.a	n.a
Texaco Inc.	Rando 46	Rando 68	Regal R10100	Regal R&O 150	Regal R&O 220

Table 11.16 *OIL GRADE AND VISCOSITY - NA TYPES*

D. Check Points

During daily oil level inspection, give care to the following abnormalities that may be the first signs of some faults/failures occuring in the drive.

- **Excessive temperature rise**
  Feel or measure temperature on the casing. Allowable temperature rise measured on the surface of the casing is 860F to 1050F over the ambient temperature. Excessive temperature rise can be attributed to various hidden causes. Please refer to Variator troubleshooting on page 11-32 for details.
- **Abnormal sound**
  Abnormal sound is the sign of damage or failure of components and it varies with the kind of component damage. Please refer to Variator troubleshooting on page 11-32 for details.
- **Oil leakage**
  Oil leakage arises from various causes such as worn oil seal, loose housing fit, excessive oil, faulty gasket, etc. Since oil leakage causes other troubles, it must be quickly taken care of.
- **Other abnormal performance**
  In addition to the above signs, several other abnormal performances may be found during operation though they may occur infrequently. They are increase of power consumption, vibration, fluctuating output speed, inability or difficulty of change speed, etc. Please refer to Variator troubleshooting on page 11-32 for details.

E. Maintenance Overhaul

- **Overhauling period**
  After two years of continuous operation, an entire maintenance overhaul is recommended. This include disassembly of the variator and inspection of the wear on components. Please refer to the manufacturer's manual for details.
- **Recommended replacement parts**
  The main components, which yield to wear during operation, are **cone discs, flange discs, spline shafts, gears, bearings and oil seals**. Please refer to the manufacturer's manual for details.
- **Warning signals for replacement**
  During overhaul, examine the following components carefully and replace them when the components show symptoms mentioned below in table 11.17.

Component	Symptoms
Cone Discs	Breakage Discolor due to seizure Wear (reaching 20 microns) Flaw Pitting/Spalling Galling
Flange Discs	Wear of rim Pitting/Spalling/ Galling Discolor due to seizure **NOTE**: Slight pitting, spalling, flaw or burr can be corrected by an oil grind lapping stone.
Bearings	Wear Fatigue Discolor Broken Retainer
Spine shafts Input Shaft with Spline	Discolor due to seizure Fatigue of Key and Keyseat Fatigue on spline (if wear exceeds 0.1mm in depth on spline, replace)
Oil seal	Wear Loss of elasticity
Gears	Pitting Spalling Discolor due to seizure Flaw
Casing & Cover	Frequent speed change causes wear in the hubs on the casing and cover which supports swing shaft Creep due to wear exceeding 0.1mm requires replacementy

Table 11.17 *OIL QUANTITY*

F. Variator Troubleshooting

This is a list of problems that can occur on the variator and their possible solutions.

1. TEMPERATURE IS RISING

   Temperature on the casing is exceeding 1050F (400C) over ambient temperature. This may indicate:

   - Heat generation due to a shortage of oil or deterioration. Replenish or change oil.
   - Over-slippage due to overload. Measure input power of motor at the lowest speed and remove the causes for overload.
   - Wear of disc. Resistance can be felt in manual speed change operation. Replace worn discs.
   - Broken component or faulty assembly. Usually attended by abnormal sound. Disassemble and inspect the drive.
   - Other than the above, lack of oil on the lip(s) of oil seal causes temperature rise on the oil seal. Lubricate lip of oil seal.

2. ABNORMAL SOUND

   The variator is making strange and unusual noises:

   - If it is a rolling noise, that may indicate broken discs or bearings. Replace discs or bearings.
   - If it is a high cyclic metallic sound, that may indicate damage to the gears. Correct or replace gears according to the extent of damage.
   - If it is a grinding noise, that may indicate a rotating component in contact with unrelated parts due to faulty assembly.
   - If it is a rattling noise, that may indicate loose fit of coupling, fan, etc. due to worn key. Inspect the keys and replace if required.
   - If it is a squeaking noise, that may indicate poor lubrication on the lip of oil seal. Lubricate seal.
   - If it is a sliding noise, that may indicate excessive corrosion on discs and bearings. Corrosion tends to occur when oil deteriorates during long periods of no operation without appropriate care. Overhaul is required.
   - If it is a sound difference at certain speeds during speed change operation, that may indicate excessive wear on a certain range of cone disc due to operation at one set speed. Occurs with resistance for speed change operation. Operate drive at other speeds or replace discs.
   - If it is a sound difference according to load condition, there is usually no trouble. Meshing sound of gears varies subject to load intensity. Care should be taken that no overload is applied to the drive.

3. INCREASE OF INPUT POWER

   If you notice an increase of input power, that may indicate:

   - Sudden increase at certain speed during speed change due to excessive wear at a certain range of cone discs. Select other speed for operation or replace discs.
   - Higher viscosity of oil or more oil than required. Replace oil or reduce oil to the proper level.
   - Rotating component in contact with unrelated parts. Occurs with noise. Reassemble properly.
   - Overload. Disengage with load and measure the no load input power.

4. VIBRATION

   Abnormal vibration of the variator may indicate:

   - Weak foundation or loose mounting. Reinforce the foundation and tighten the bolts.
   - Misalignment. Correct misalignment.

- Loose fitting or broken coupling, sheave or fan. Replace key or coupling, sheave or fan itself.
- Pulsation of belt or chain. Determine the cause of pulsation.
- Resonance caused by the vibration of other element. Reduce or isolate the vibration of other element.

5. FLUCTUATION OF SPEED

   A fluctuation of speed of the variator may indicate:

   - Overload or lack of capacity. Detect the cause for overload.
   - Wear of rim on flange disc. Replace disc.
   - Movement of shifting screw by vibration. Lock the handwheel.

6. OIL LEAKAGE

   If you notice oil leaking from the variator, that may indicate:

   - Fatigue or wear of oil seal. Replace oil seal.
   - Oil is overfilled. Reduce oil to appropriate level.
   - Improper fitting or housing, cover, etc. Check fit and fasteners.
   - Oil return hole clogged. Clear the hole.

7. INABILITY OR DIFFICULTY OF SPEED CHANGE OPERATION

   An inability or difficulty for speed change operation on the variator may indicate:

   - Broken disc (impossible to keep running). Replace discs.
   - Fatigue of splined shaft or input shaft, where cone disc slides. Correct or replace subject to the extent of fatigue.
   - Disengagement of disc meshing. This tends to occur when severe peak load is applied under extreme high speed running. Reassembly is required.
   - Shifting nut is locked at extreme low or high speed. Release shifting nut.

11.8 HYDRAULIC POWER UNIT MAINTENANCE

Oil in hydraulic systems performs the dual function of lubrication and transmission of power. It constitutes a vital factor in a hydraulic system and its careful selection should be made with the assistance of a reputable supplier. The proper selection of oil assures satisfactory life and operation of the system components – with particular emphasis on hydraulic pumps and motors.

Two very important factors to be remembered in the selection of hydraulic fluids are:

1. The oil must have rust and oxidation inhibition for satisfactory system operation, and
2. The oil must have proper viscosity to maintain adequate sealing and lubricating quality at the expected operating temperatures.

11.8.1 Recommended Fluids for Hydraulic Power Units

Petroleum base and most phosphate ester fluids, water glycols and emulsions with water content not exceeding 40%.

11.8.2 Fluid Operating Temperature & Viscosity

Fluid temperatures up to 1600F (710C) will not appreciably affect pump performance. However, from a safety standpoint, temperatures above 1300F (650C) are not recommended. The oil temperature indicator is on side of unit (see figure 11.21 on next page). Specified operating viscosities (see table 11.18) must be allowed for optimum life and performance. For continuous operating temperatures above 1400F (600C), consult fluid manufacturer for correct fluid at elevated temperatures. Look at table 11.19 for appropriate fluid temperatures.

CONDITION	VISCOSITY
At start-up	Maximum : 1000 SUS
At operating temperature	Acceptable : 80-400 SUS
Nominal	Recommended : 100-250 SUS ISO Grade 46 or 32

Table 11.18 *OIL VISCOSITIES*

FLUID TYPE	FLUID TEMPERATURE (pump inlet)
Petroleum	Recommended max.: 1300F (590C)
Water-based	Recommended max.: 1200F (550C)
Synthetic	Recommended max.: 1300F (590C)

Table 11.19 *FLUID TEMPERATURES*

11.8.3 Oil Level

Oil level should be checked at every start-up and after 8 hours of continuous operation. You may have to increase checks frequency if there are some leaks. The oil level gauge is on side of unit (see figure 11.21 on next page).

11.8.4 Oil Change

Oil change intervals are variable, and depend on the kind and brand of oil being used. Consult with your oil manufacturer for exact oil change intervals.

11.8.5 Oil Filtration

Of major importance to long and trouble-free component and fluid life is fluid cleanliness. Fluids filtered at nominal 10 micron filtration is the most inexpensive insurance possible for continuous trouble-free operation. Look at table 11.20 for more details.

FILTRATION	TYPE OF FILTER
Suction	Petroleum fluids 100 mesh screen Water-based fluids 60 mesh screen Phosphate esters 60 mesh screen
Return	ISO 18/15 (25 micron) to 1000 PSI ISO 16/13 (10 micron) to 2000 PSI

Table 11.20 *OIL FILTRATION*

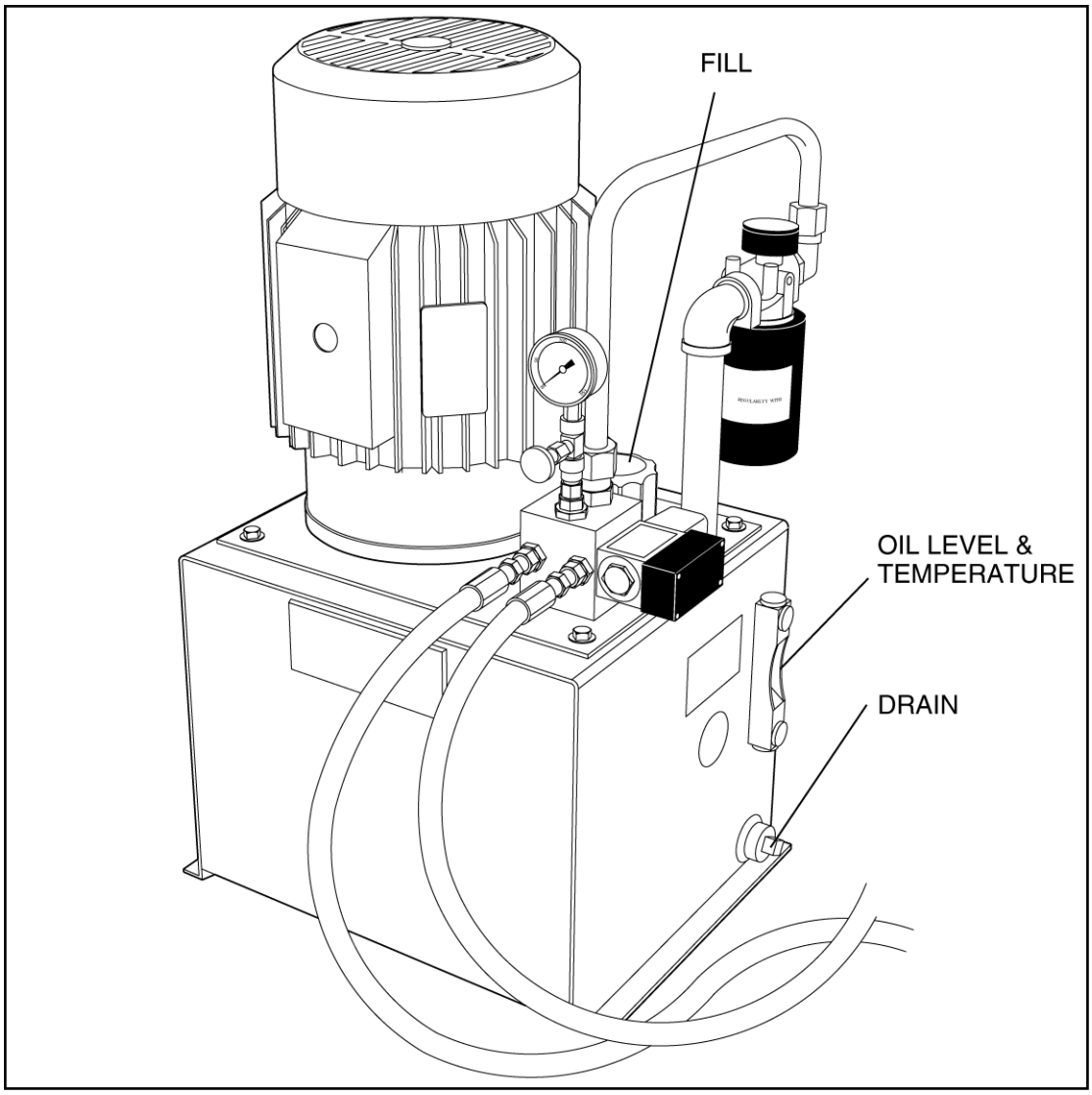


Figure 11.21 *THE HYDRAULIC POWER UNIT*

SECTION 12
VIBRATION SYSTEM

This section will show you Smartpac vibration system. With this option, an electric motor (see figure 12.1) are turning all the time and a cam activated by air change position to start and stop vibration.

THEORY OF OPERATION

Concrete and mold combinations each have unique vibratory characteristics. Each has an optimum amplitude and frequency for filling and consolidating. Concrete units can be made to the highest quality in the shortest time by matching the optimum frequency and amplitude for feed and for finish.

12.1 AMPLITUDE

Limits have been preset for both low and high speed of the motors to prevent operation outside optimum parameters. Amplitude is adjustable from 0 to 100% of 9000 - 13,000 or 15,000 lb. depending on the model of concrete products machine and which shaft assemblies are used. Amplitude should not be set below 30% as vibration will not synchronize and will be erratic.

12.2 SYSTEM INSTALLATION

12.2.1 Installation of the system can be made on machines with mold locks or pin guidance.

12.2.2 Make mechanical and electrical changes according to drawing supplied by BESSER and check that all parts are aligned properly.

12.2.3 Attach correct length shafts to the mold you want to run.

12.2.4 Make sure the right hand shaft is on right side and the left one is on left side.

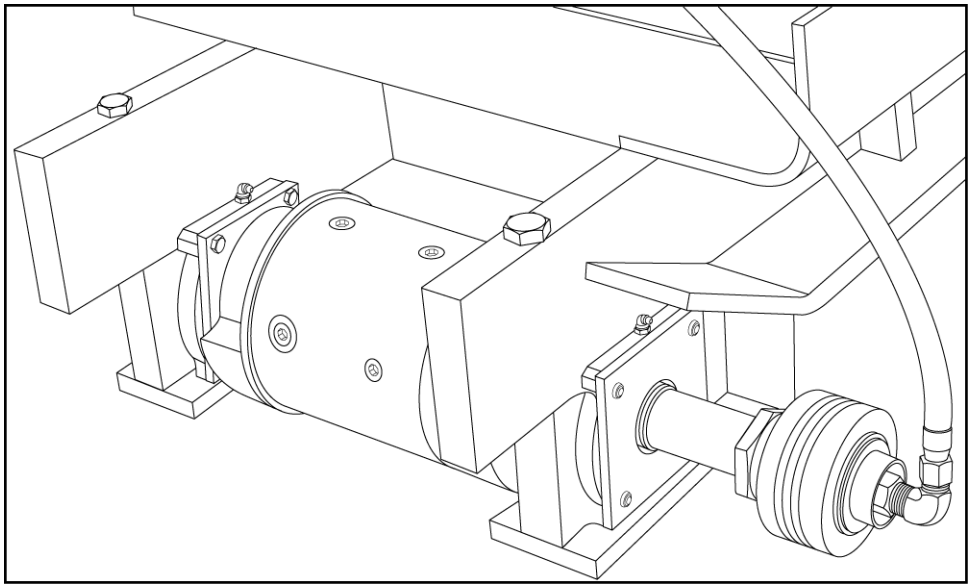


Figure 12.1 *SMARTPAC*

12.2.5 Disconnect lower hoses from “V” fitting on dump valve assemblies and fill with ATF fluid.

12.2.6 Make sure all air is removed from the hoses.

12.2.7 Fill control unit tank with ATF fluid. Keep tank 3/4 full during setup and operation.

12.2.8 Connect 80 psi. 5 CFM air supply to control unit.

12.2.9 Set air pressure for rod end of cylinder to 60 PSI and Cap End of cylinder to 30 PSI (see figure 12.2).

12.2.10 Operate air valve to extend rod of air cylinder. Install mold with SmartPac vibrator shafts and attach hoses to dump valve assemblies.

12.2.11 Retract air cylinder, wait 2 seconds, then extend rod, repeat process until both vibrators shift 90 degrees

NOTE: when rod is retracted. If vibrators don’t shift fully, refill bottom hoses on dump valves.

12.2.12 When rod is extended, both weights return to balanced position.

NOTE: DO NOT run system if vibrators or control unit are not functioning properly.

12.3 VIBRATOR FREQUENCY

To set frequency of vibrator:

12.3.1 Stop machine with feed drawer over the mold.

12.3.2 Start vibrator motors with vibration off.

NOTE: Check that the top belts are both going towards the center of the machine.

12.3.3 Bring up the SmartPac screen on the monitor and set the speed of shafts to 2900 RPM. Note: Check the speed with a strobe light or photo tachometer,

12.3.4 Adjust one motor so it runs exactly the same speed as the other. Registers N10:30 and N10:31 may be used to adjust motor speeds.

NOTE: On non AFC units, adjust frequency drive to match shaft speeds.

12.4 AMPLITUDE ADJUSTMENTS

Amplitude adjustments are made with vibrator motors stopped and large cylinder rod fully extended. Adjust the transducer to read zero by monitoring register #N10:21 (see section 9.9.6).

12.5 TRANSDUCER ADJUSTMENT

To adjust transducer (see figure 12.2):

12.5.1 Loosen mounting (A) then move transducer (B) to get zero in register. Retighten screw.

12.5.2 Retract rod on air cylinder (C) by manually activating valve. The reading should go to between 900 and 1000 and both weights should be shifted 90 degrees.

12.5.3 Extend rod and recheck zero.

12.5.4 Enter 0 into register #N10:26.

12.5.5 Set amplitude on the SmartPac screen to 500 and with vibrator motors off, turn vibrator switch to “hand”.

12.5.6 Check register #N10:21 reading and subtract 500, enter this into register #N l0:26 on SLC500. This is your Offset to compensate for delays in the system. This will have to be updated from time to time.

12.5.7 Operate vibration "hand" and check register N10:21 reading, it should be close to 500. The weights should be shifting about half way.

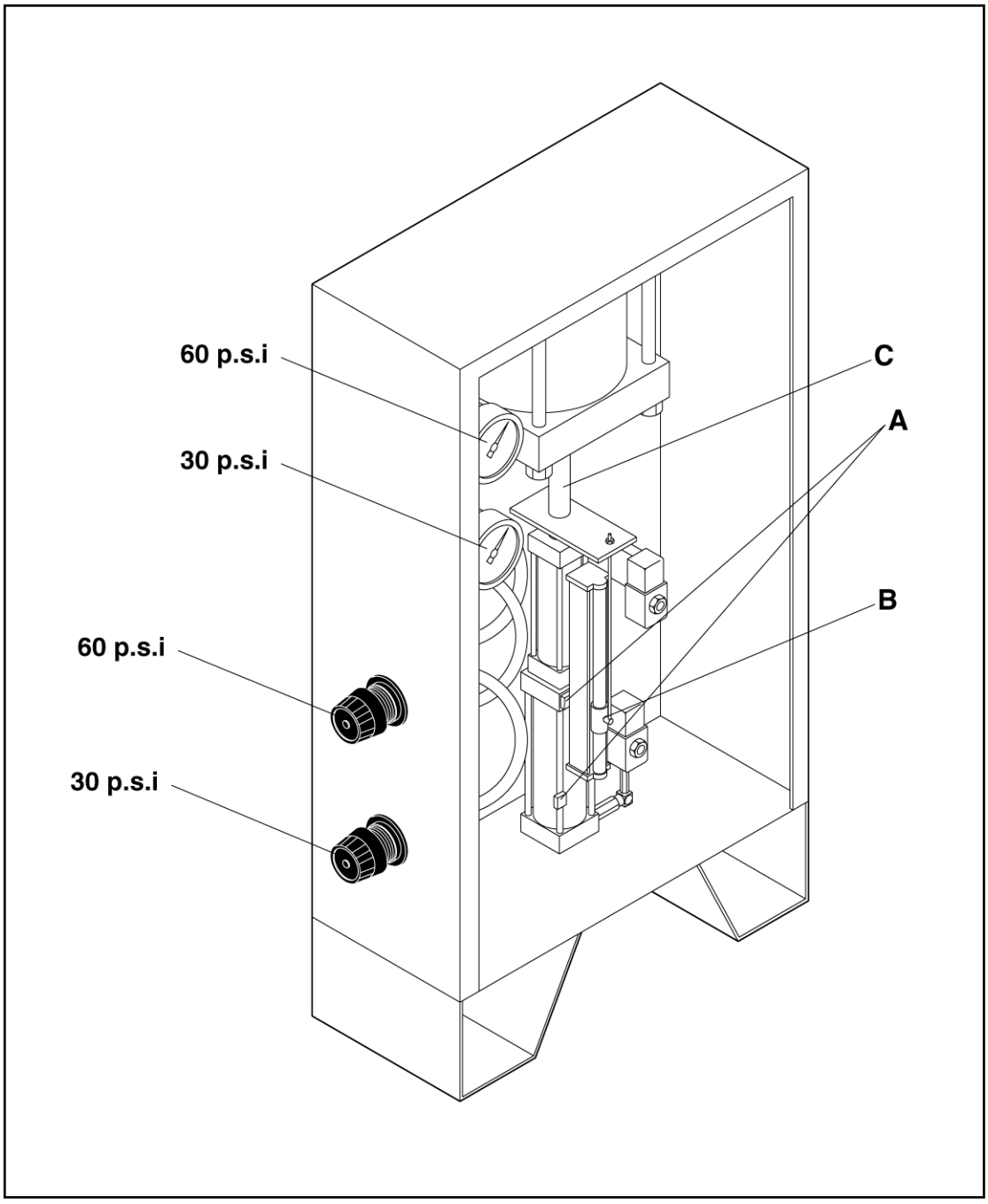


Figure 12.2 *SMARTPAC PANEL*

SECTION 13
CLAM SHELL GATE OPTION

The clam shell gate is a device designed to deliver material into the feedbox with precision. Its opening and closing action will enable the operator to set cement delivery rate which best suits the units being made.

13.1 OPERATION

The Clam shell gate can be operated either automatically or manually. All operations on this device are done on the Graphic Control Station. It is possible to set the open position of the gate (0 to 99%) and to set how many times the machine will cycle before the clam opens. Both these features are applicable in Auto mode only. It is also possible to operate clam shell gate in manual. Refer to section 9.3 of this manual for all operation instructions.

13.2 MAINTENANCE

Replace bearing (items 1 to 6) yearly.

Inspect all other gate parts for wear yearly and replace as needed.

Check cylinder seals for wear and replace them as needed.

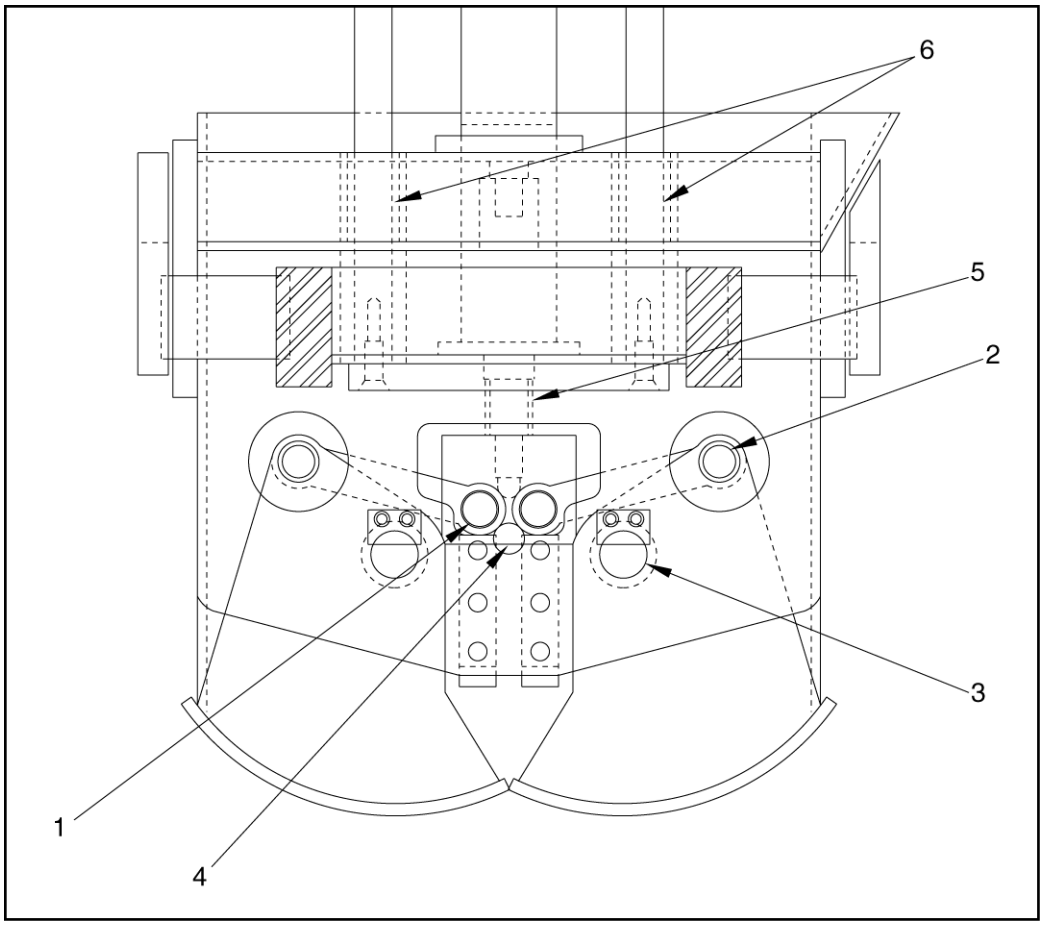


Figure 13.1 *CLAM SHELL GATE (SIDE VIEW)*

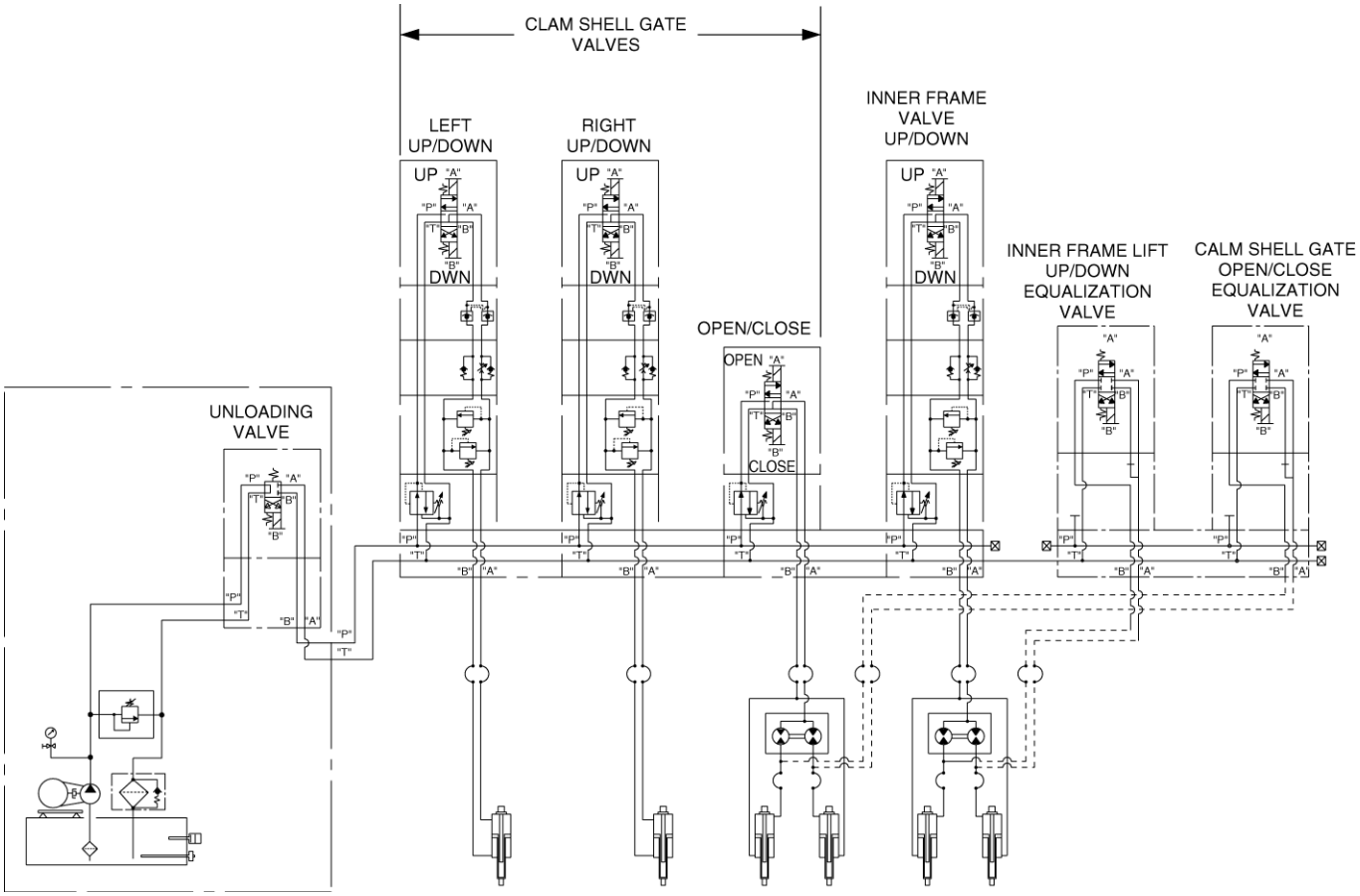


Figure 13.2 *CLAM SHELL GATE HYDRAULIC DIAGRAM*

SECTION 14
HEAD VIBRATION OPTION

The head vibration is a system designed to add vibration to the standard mold vibration in order to better compact material and thus increase product quality.

14.1 OPERATION

The head vibration is done through two electrical vibrators (item A, part #114073). At full thrust (3600 RPM), these devices will develop 3500 lbs of pressure [1588 Kg] each. They are wired for 460 volts.

NOTE: Isolators (item B) can be removed for increased trowling effect. (30% more horizontal vibration).

The head vibration utilizes shorter plungers than standard. The head vibration comes with 9 inches of blocking and the length that the plungers were shortened from standard length are subtracted from 9 inches, giving the effective blocking on the stripper head plate. Head vibration can be utilized for product heights up to 4 3/4" [120mm]. For more information on head blocking, consult section 5 of this manual.

The head vibration can be turned ON and OFF using the Graphic Control Station. Refer to section 9.3 of this manual for operation instructions (F18 key). A timer (timer 59) will control the time of head vibration. Refer to section 9.5 of this manual for more information on timer adjustment.

14.2 MAINTENANCE

The head vibration utilizes two electrical vibrators (part #114073). These devices must be periodically lubricated as follows:

Lubricate every two weeks for continuous duty or every 400 to 500 operating hours. The amount of lubricant should be 2.5 to 3 grams (two pumps with standard grease gun). DO NOT OVERGREASE! Two much grease will allow grease to leak into the stator blue side of the vibrator. By removing the end cover and inspecting around the seal, you will determine if unit has been excessively overgreased. If excessive, the unit should be taken apart and cleaned.

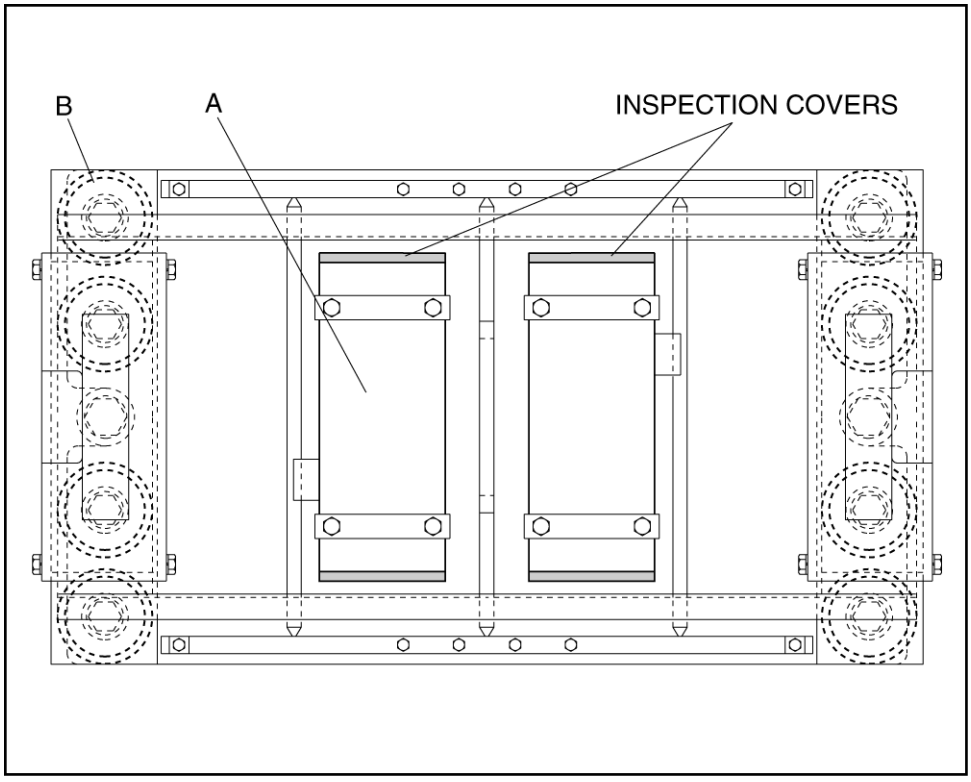


Figure 14.1 *HEAD VIBRATION SYSTEM*

RECOMMENDED LUBRICANT:

Always use high temperature synthetic grease Royal Purple #114135.

14.3 TROUBLESHOOTING

If vibrator does not start, it might be due to:

- short in lines;
- burned out overload protection;
- short in winding (check with ohmmeter).

NOTE: Overload protection shuts off vibrators.

Vibrator overloaded (possible causes):

- bad bearings;
- bolts holding vibrator are loose;
- fatigue cracks in structure;
- structure to be vibrated too weak, reinforce structure by welding on additional stiffeners.
- excessive ambient heat.
- one phase open, check power source and wiring.

SECTION 15
TABLE VIBRATION OPTION

The table vibration is a system designed to complement standard mold vibration. Table vibration is typically used for feeding low height (50-60 mm) slab molds.

15.1 OPERATION

The table vibration option is typically used for low height slab production for feed vibration only. The table vibration (part #468305) is accomplished with two air impactors. Air pressure should be set at a minimum of 45 psi and a maximum of 80 psi. During operation, compressed air is alternately directed from one end of the piston to the other through a series of internal ports. The action of the piston in a pneumatic piston vibrator generates high amplitude vibration. An auxiliary top (part #464582) should be installed to make standard units (60 mm higher).

The table vibration can be operated in manual and single mode for feed vibration through the Graphic Control Station by using an encoder and timer setting. Refer to section 9.3 of this manual for operation instructions. A timer (timer 53) will control the duration of table vibration. Refer to section 9.5 of this manual for more information on timer adjustment.

15.2 MAINTENANCE

The table vibration is done through two air impactors (part #114073). These devices must be cared for as follows:

15.2.1 Check for ruptured gasket on impactor cap.

15.2.2 Use Rock Drill EP 300 lubricant or equivalent for lubrication, which is specified from list provided, including weight. Drip rate should be 3 drip/second.

15.2.3 A warning on screen will appear when lubricator is empty.

15.2.4 Temperature of vibrator housing should be kept between –50°F and 75°F [-460C and 240C].

15.2.5 Change impactors when:

- experiencing low amplitude vibration;
- experiencing questionable amplitude vibration.

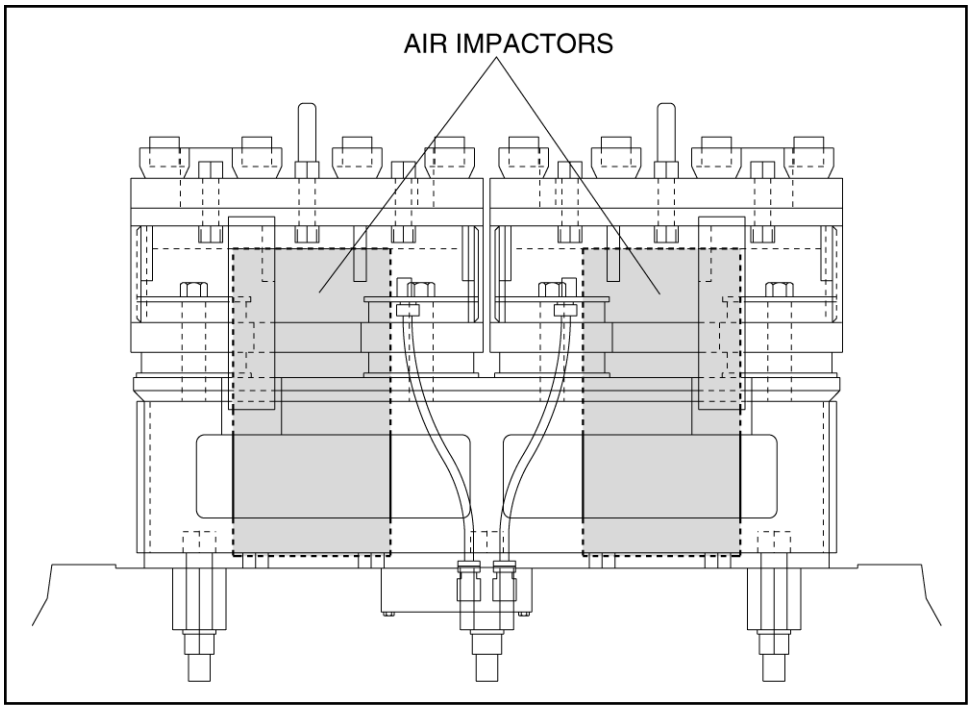


Figure 15.1 *TABLE VIBRATION SYSTEM*

SECTION 16
HEAD CLAMP OPTION

The Head clamp is a device designed to hold the stripper head in place in the machine. It replaces the standard mold locks. It is a more efficient and safer way of locking the stripper head in place.

16.1 OPERATION

The head clamp is operated by 4 air cylinders. 2 cylinders are used to raise and lower the stripper head, 2 others are used to lock and unlock the stripper head in place within the stripper head frame.

The head clamp is operated through a 4-position joystick on the main panel (see section 9.2)

16.2 MAINTENANCE

It is important to check and adjust spring tensions on the lock mechanism of the head clamp at monthly intervals. It is also necessary to replace Duralon bearings (#18, figure 16.2) when they reach 0.007" [0.18mm] wear, which represents approximately 2,000 hours of work.

16.2.1 Procedures to check spring tension (refer to figures 16.1 and 16.2):

a. Stripper head plate should be in place;

b. Raise up stripper head plate;

c. Measure top of plate (37) to top of shoulder bolt (38). See dimension 2 on figure 16.2.

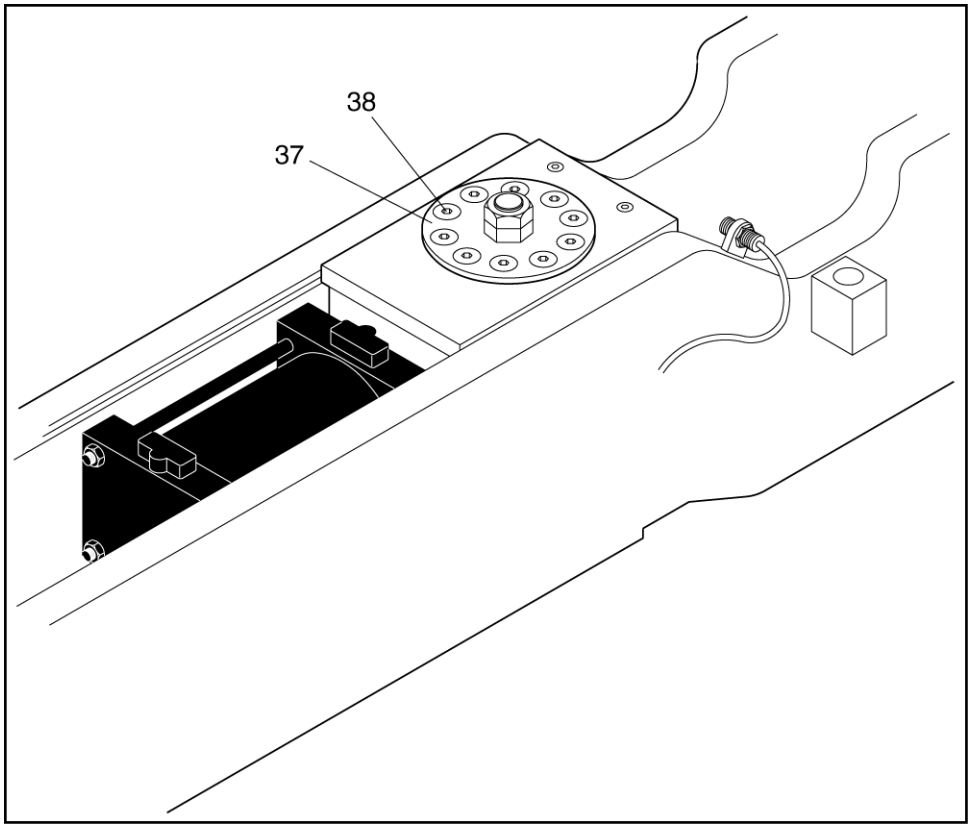


Figure 16.1 *HEAD CLAMP*

d. Lock clamp;

e. Measure distance from top of plate (#37) toshoulder bolt (#38). See dimension 1 in figure 16.2. Use depth micrometer for measurements. Shoulder bolt motion should be 0.035” [8.89mm] to 0.062” [15.75mm].

f. If shoulder bolt motion is greater than 0.062” [15.75mm]; loosen flanged nut accordingly. Reassemble and recheck bolt motion.

NOTE: 1/8 turn of the flanged nut is equal to 0.01” [0.25mm] nut travel on threaded rod.

g. If shoulder bolt motion is less than 0.035” [8.89mm]; follow procedures h. to k.:

h. Retighten fasteners.

NOTE: Detail #26 should be in up position, but not locking or holding up on adapter/stripper head plate assembly.

i. Check if details 18, 9 and 57 are shimmed properly – there should be a clearance of 0.001" [0.02mm] between mating parts. If not, change bearings (#57) and shim bearings to a 0.001" [0.025mm] clearance between mating parts.

j. Tighten flanged nut (#55).

NOTE: Shoulder bolt must not contact flanged nut when springs are compressed.

k. If flanged nut cannot be tighten enough, shim #23 with #49 and/or #50. Do not use more than 0.129" [3.28mm] of shim per side.

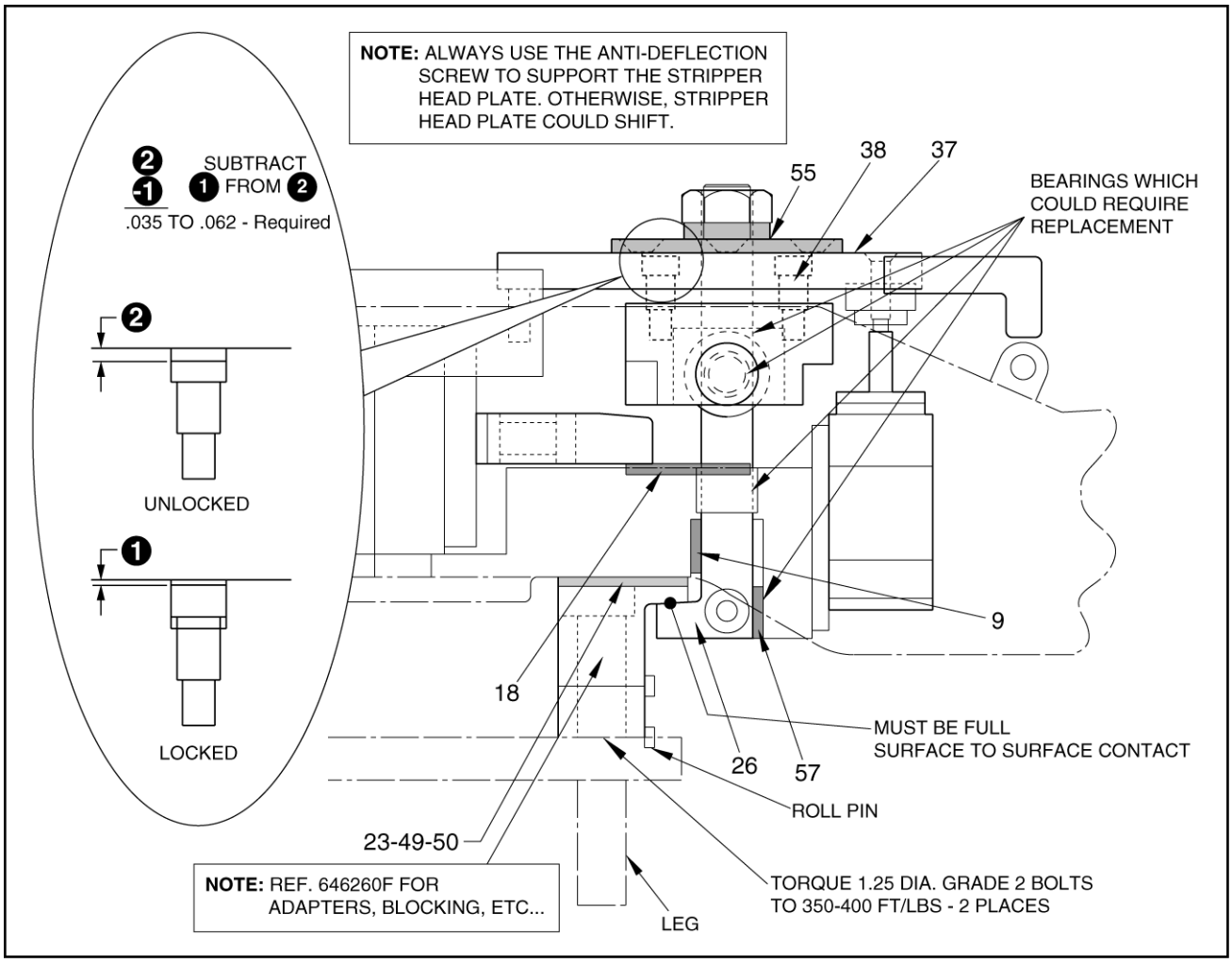


Figure 16.2 *HEAD CLAMP (DRAWING #455724 – USE WITH DRAWING #455725)*

16.3 PROCEDURE FOR SHIMMING SPRINGS AT ASSEMBLY REBUILD

NOTE: Use a micrometer for measurements.

1. Measure spring (32) & washers (31) shown in figure 16.4 (SPR).

NOTE: Do not compress springs!

2. Measure upper pocket (up) (figure 16.3).
3. Measure lower pocket (down) (figure 16.3).
4. Assemble spreader (37) and bracket (33) with shoulder bolt (38).
5. Measure gap (figure 16.3).
6. Add: (up) + (down) + gap = total
7. Calculate spring compression:
   SPR - total = comp.
8. Calculate shim thickness required for 0.110” [2.79mm] initial spring compression:
   total + 0.110” [2.79mm] - SPR = shim.
9. Add shim of a thickness corresponding to your result of step 8 between bracket (33) & washer (31).
10. Repeat 1 thru 10 for opposite side.

EX:

UPPER POCKET =	0.203"	5.156mm
LOWER POCKET =	+0.537"	+13.640mm
GAP =	+0.423"	+10.744mm
TOTAL 1=	1.163"	29.540mm
TOTAL 1=	1.163"	20.540mm
PRE-LOAD =	+0.110"	+ 2.794mm
TOTAL 2 =	1.273"	32.334mm
TOTAL 2 =	1.273"	32.334mm
SPR =	- 1.210"	- 30.734mm
SHIM =	0.063"	1.600mm

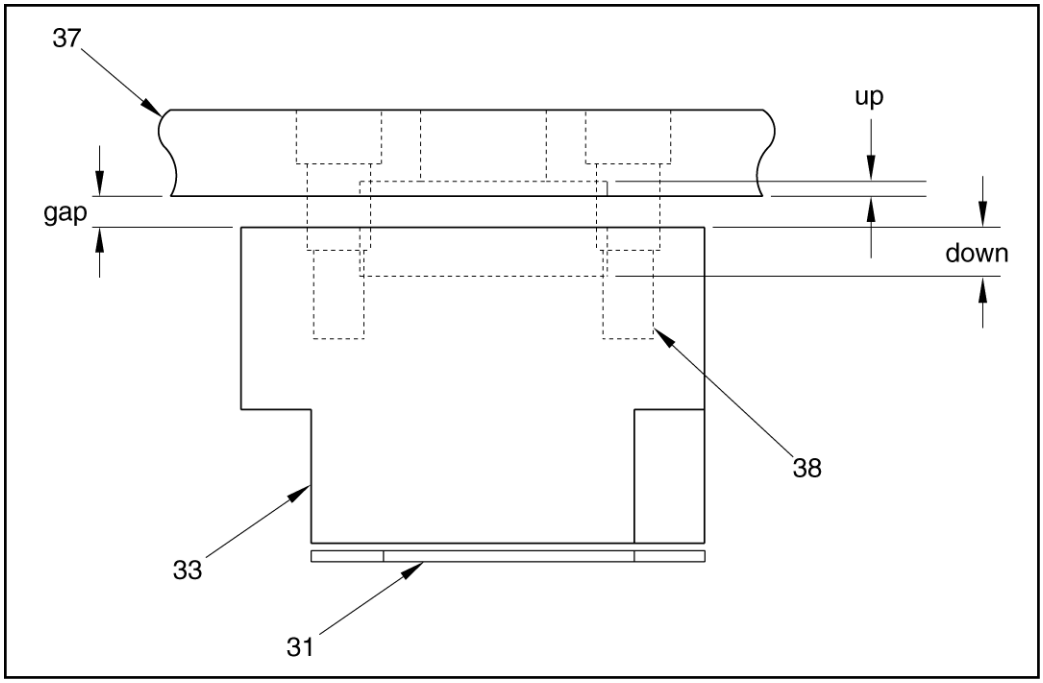


Figure 16.3 *ROLLER/SPRING BRACKET*

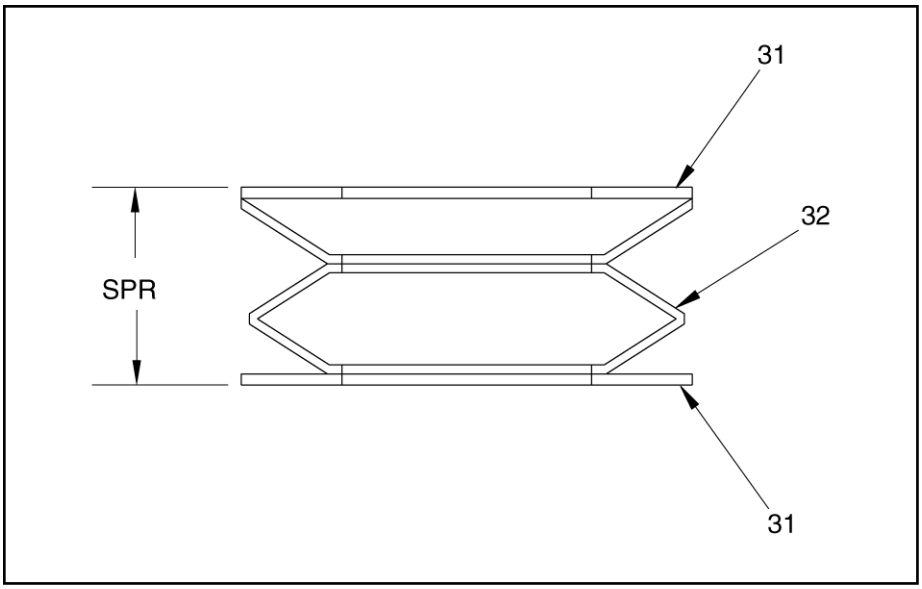


Figure 16.4 *SPRING ASSEMBLY*

16.4 HEAD CLAMP AIR SYSTEM ADJUSTMENT

The head clamp air system is fed with air from an air amplifier (see figure 16.5). Air pressure on raise/lower cylinder in the head clamp air system must be adjusted each time a new mold is installed on the stripper head frame. To adjust the air pressure, follow this procedure:

1. Clear machine area of all personnel.
2. Adjust tank air pressure at 200 PSI max. This is done by setting the input regulator to approx. 50 PSI and adjusting air amplifiers (with the adjusting knobs). Refer to figure 16.5.
3. Adjust air pressure coming out from the air tank to 150 PSI (see figure 16.5).
4. Adjust air pressure coming out from the "lock/unlock" control valve at 140 PSI.
5. Set the air pressure coming out from the "raise/lower" control valve to zero.
6. Now, slowly increase the air pressure coming out from the "raise/lower" control valve until the stripper head frame begins to lift up. Add 5 more PSI and then stop increasing the air pressure. Air pressure for the "raise/lower" control valve is now correctly set.

NOTE: Since molds have generally different weights, different air pressures must be set for the stripper head clamp to be able to lift different stripper head assemblies and allow the vibration to center the stripper head assembly in the mold.

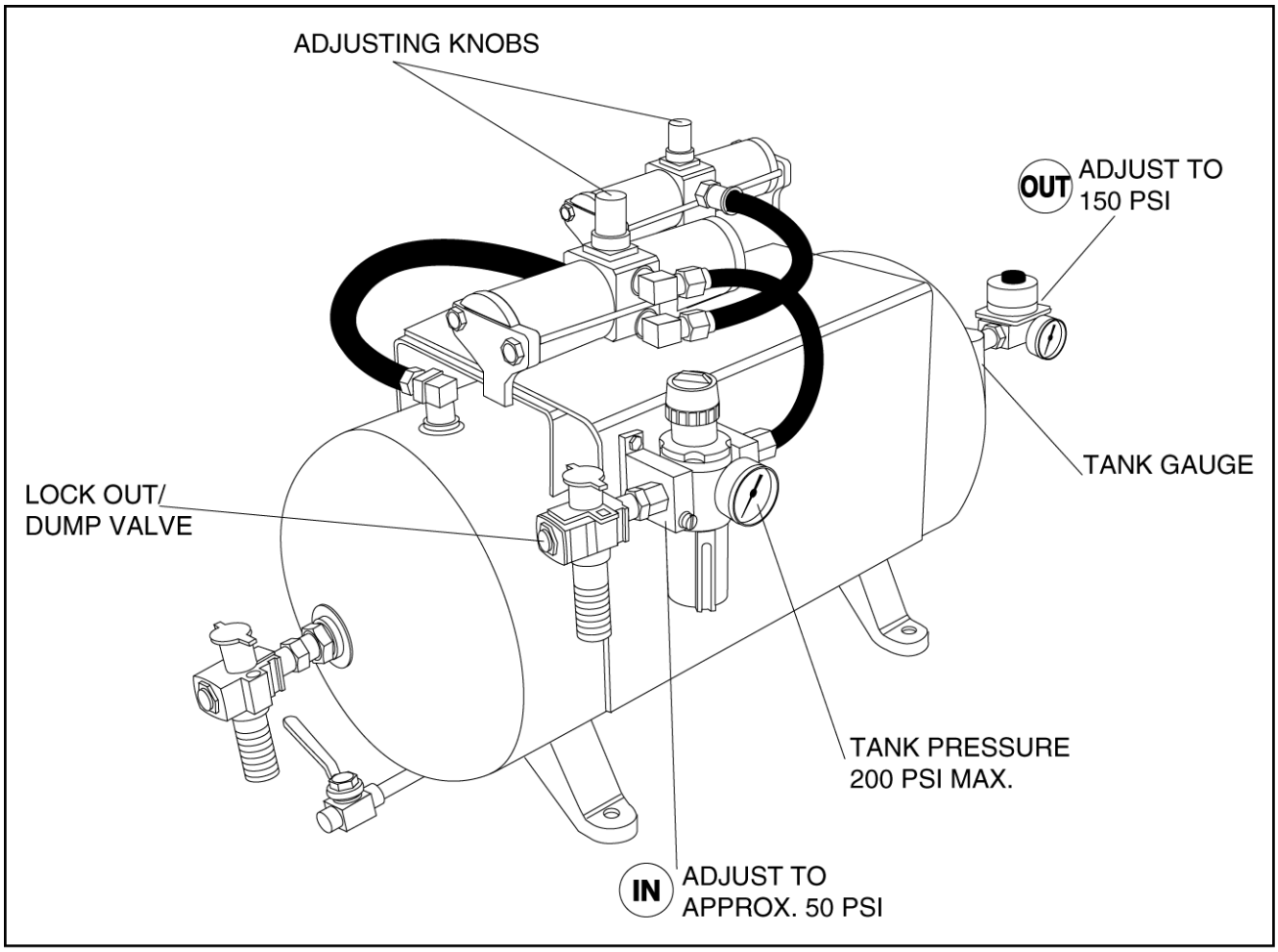


Figure 16.5 *AMPLIFIER AIR CONNECTIONS*

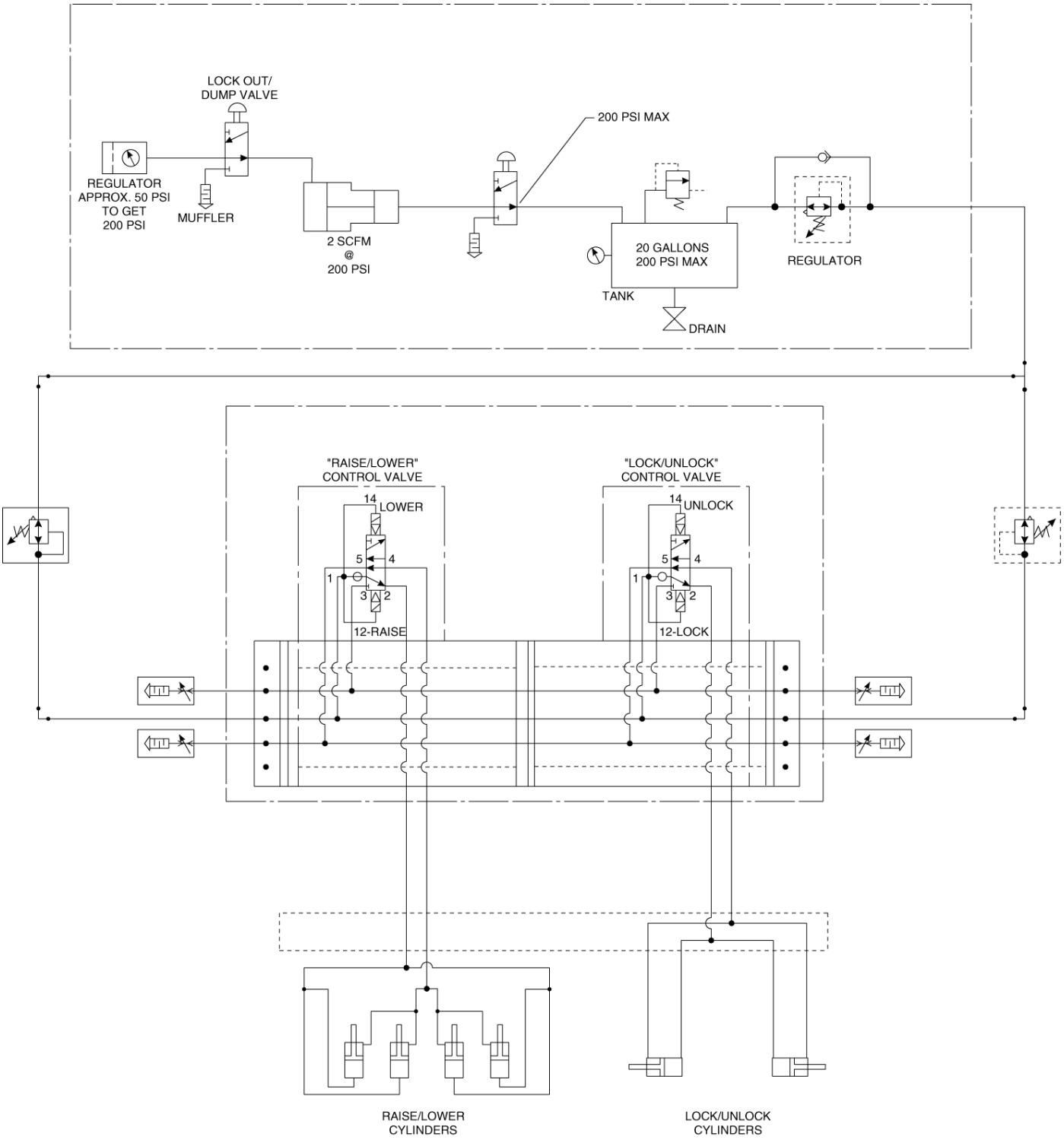


Figure 16.6 *HEAD CLAMP PNEUMATIC DIAGRAM*

SECTION 17
FREQUENCY DRIVE OPTION

The frequency drive option enables the operator to adjust main drive speed and/or Smartpac motor speed.

17.1 DISPLAY PANEL KEY DESCRIPTIONS

ESC

Escape

When pressed, the ESCape key will cause the programming system to go back one level in the menu tree.

SEL

Select

Pressing the SELect key alternately causes the top or bottom line of the display to become active. The flashing first character indicates which line is active.

Increment/Decrement

These keys are used to increment and decrement a value or scroll through different groups or parameters.

Enter

When pressed, a group or a parameter will be selected or a parameter value will be entered into the memory. After a parameter has been entered into memory, the top line of the display will automatically become active, allowing another parameter (or group) to be chosen.

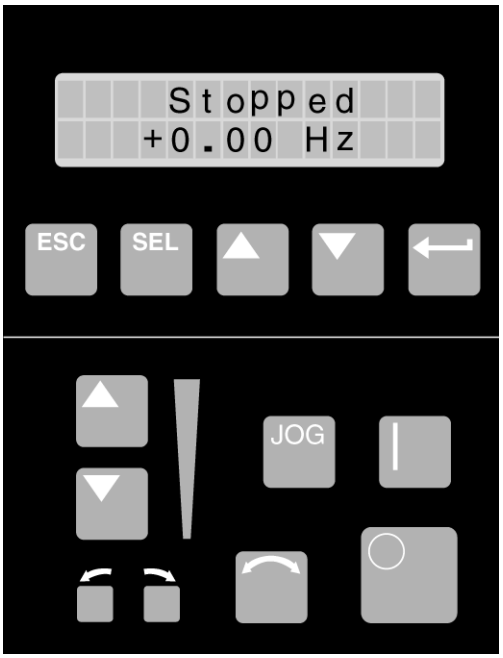


Figure 17.1 *DISPLAY PANEL*

17.2 OPERATION

EX: To change a preset input mode value on the main drive or Smartpac, follow the stepsbelow:

1. The status display must read “Stopped + 0.00 Hz” (see figure 17.1).
2. Press the ESC key.
   Status display reads “Choose Mode”.
3. Press the ▲ or ▼ key.
   Keep pressing until you reach “Program”.
4. Press the ↵ key.
5. Press the ▲ or ▼ key.
   Keep pressing until you reach “Setup”.
6. Press the ↵ key.
7. Press the ▲ or ▼ key.
   Keep pressing until you reach “Input Mode 2”.
8. Press the SEL key.
   You can now change the numerical value with the help of the ▲ ▼ keys. Select the desired value.
9. Press ↵
   The change is recorded. To come back to step 1 (initial position), press ESC until "Stopped + 0.00 Hz" appears on display.

NOTE: Other parameters that can be changed in the Setup menu includes “Freq Select”, “Accel Time”, “Decel Time” and “Minimum Freq”. When in “Setup” mode, press increment/decrement keys to choose another one of these parameters.

Also, if you choose “Frequency Set” instead of “Setup” in step 5, you can establish preset frequencies: “Preset Freq 1” and “Preset Freq 2”. Follow the same steps to change preset frequencies.

17.3 LIST OF FREQUENCY PRESET VALUES FOR MAIN DRIVE

SET-UP

Input mode:	**2**
Freq. Select:	**1**
Accel time 1:	**2**
Decel time 1:	**3**
Minimum Freq.:	**40**
Maximum Freq:	**60**
Motor NP RPM:	(set to motor name plate data)
Motor NP Hertz:	(set to motor name plate data)
Motor NP Volts:	(set to motor name plate data)
Motor NP Amps:	(set to motor name plate data)

FREQUENCY SET

Preset Freq 1:	**40**
Preset Freq 2:	**60**

MOTOR CONTROL

Base Voltage:	(set to motor name plate data)
Base Frequency:	(set to motor name plate data)
Maximum Voltage:	(set to motor name plate data)

17.4 LIST OF FREQUENCY PRESET VALUES FOR SMARTPAC

SET-UP

Input mode:	**2**
Freq. Select:	**4-20 mA**
Accel time 1:	**3**
Decel time 1:	**4**
Minimum Freq.:	**50**
Maximum Freq:	**69**
Stop Select 1:	**COAST**
Motor NP RPM:	(set to motor name plate data)
Motor NP Hertz:	(set to motor name plate data)
Motor NP Volts:	(set to motor name plate data)
Motor NP Amps:	(set to motor name plate data)

MOTOR CONTROL

Base Voltage:	(set to motor name plate data)
Base Frequency:	(set to motor name plate data)
Maximum Voltage:	(set to motor name plate data)

APPENDIX A
COUNTERS, INTEGER WORDS AND TIMERS

THE FOLLOWING IS A DESCRIPTION AND A PRESET VALUE FOR ALL SLC'S COUNTERS, INTEGER WORDS AND TIMERS. THEY CAN BE USED TO SOLVE AN ELECTRICAL PROBLEM ON THE ULTRAPAC II.

Counter	Preset Value	Actual Value (Customer)	Description
0	100		Amount of machine cycle before a "lube cycle" fault will occur. This counter is reset by LS-II changing state.
1	1000		Cycle count -Hundreds -Non resettable
2	1000		Cycle count -Thousands -Non resettable
3	1000		Cycle count -Millions -Non resettable
4	1000		Cycle count -Hundreds -Resettable
5	1000		Cycle count -Thousands -Resettable
6			
7	9999		Hopper yield cycle count.
8	9999		Cycle count -Hundreds -Production quantity
9	1000		Cycle count -Thousands -Production quantity
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Interger Word	Preset Value	Actual Value (Customer)	Description
N7:21	120		Low limit position for the "rotary sensor out of synchronization" Fault circuit.
N7:22	240		High limit position for the "rotary sensor out of synchronization" Fault circuit **Note**:The rotary sensor out of synchronization check is done when the height •pins meet. (180 degrees).
N7:30	5		Release the block moving bars 5 degrees before the motor starts.•
N7:35	1		Amount of time added or subtracted from the feed timer preset T4:0 when "autofeed time adjust" is enabled on the "hand & machine set-up" screen. (time base = 0.01) Example: 1 = 0.01 second increment
N7:62	50		Minimum time for the "auto feedtime adjust" circuit (50 = 0.50 seconds).•
N7:63	500		Maximum time for the "auto feed time adjustment" (circuit 500 = 5.00 seconds).
N7:70	10		Feed time increment amount while using the arrow keys on the display unit - 10 = 0.10 seconds.
N7:75	240		Fault shutdown position low limit.
N7:76	250		Fault shutdown position high limit. The machine will fault out between these two rotary sensor positions for faults as described in sections 10.
N7:77	10		Time the vibration will stop before the end of feedtime. Used during dual vibration mode only. (time base - 0.01) Example: 10 = 0.10 seconds
N7:82	285		Rotary sensor position where the block moving bars start and main drive stops while jogging the machine.
N10:21	0-1000		Actual smartpac amplitude position.
N10:26	100		Smartpac amplitude offset. This value is subtracted from the desired amplitude (400-1000).
N10:40	4096		Smartpac right shaft speed offset. Adjust this value to match the displayed speed to measured speed.
N10:41	4096		Smartpac left shaft speed offset. Adjust this value to match the displayed speed to measured speed.

NOTE: All timers are accessible, through the data table. Timers 0 to 59 are also accessible through the timer screen F3.

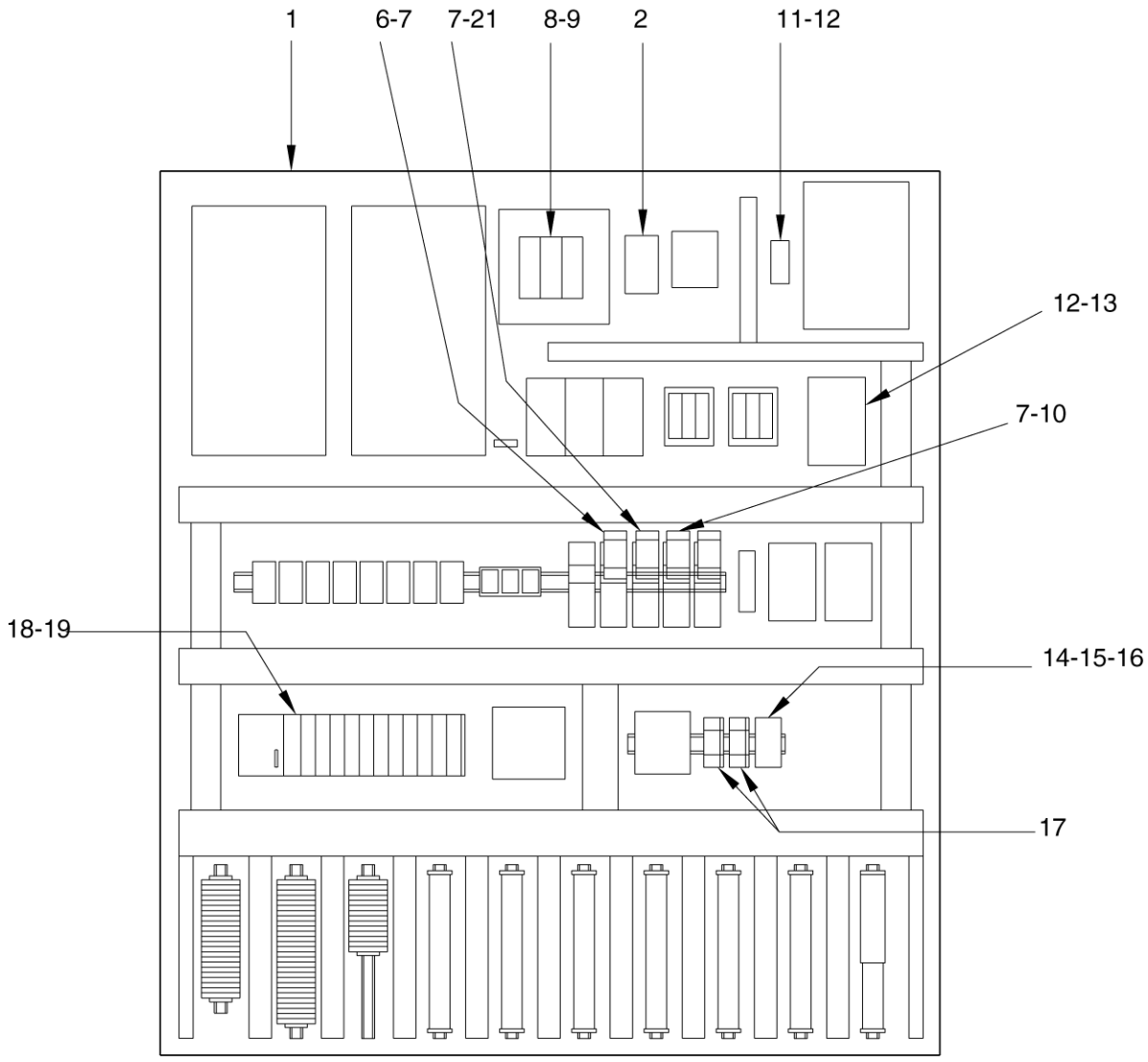
Timer	Preset Value	Time Base	Actual Value (Seconds)	Description
61	5	0.01	0.05	Delay before front feed box rev fast
62	999	0.01	9.99	Release Sol #1
63	-	-	-	-
64	100	0.01	1.00	Delay Cutoff bar motion detection
65	50	0.01	0.50	Allowable cutoff bar movement
66	50	0.01	0.50	Allowable cutoff bar movement
67	-	-	-	-
68	-	-	-	-
69	-	-	-	-
70	100	0.01	1.00	Clam gate Power unit oil is low
71	100	0.01	1.00	Clam gate open/close equalize time
72	5	0.01	0.05	Clam open/close time
73	60	1.0	60	Elapsed second indicator

APPENDIX B
ELECTRICAL DIAGRAMS

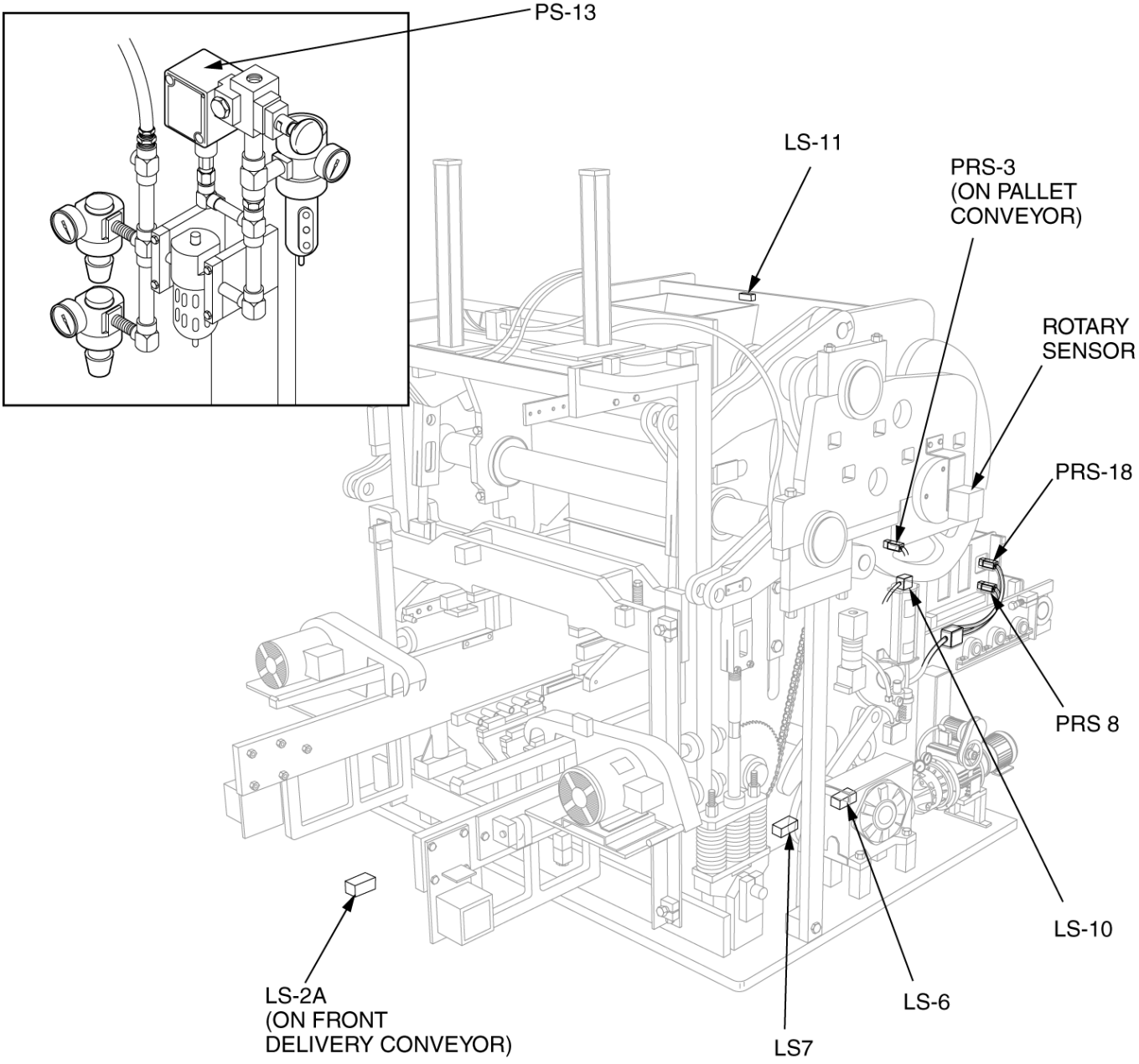
Because of different voltages, models and customer's control preferences, we have not included the electrical wiring diagrams , list of materials and electrical information in this manual.

The electrical wiring diagrams of your machine and other electrical information are supplied with your equipment, depending of the type of controls and electrical system.

APPENDIX C
ELECTRICAL PANEL (REF.)



APPENDIX D
LIMIT SWITCH LOCATIONS



LS-2A will prevent start of machine after 2nd stop if front conveyor is not clear.
PRS-3: a pallet in position.
LS-5: Autofeed over travel safety.
LS-6: Block moving bars home allows start after 2nd stop.
LS-7: Block moving bars forward.
LS-10: Lube reservoir low.
LS-11: Lube cycle switch.
PS-13: Air pressure low (Located on opposite side of machine).
PRS-8: Pallet magazine low limit.
PRS-18: Pallet magazine high limit (interlock to Bessermatic loader / unloader).