

Diamondback™ L Fv3  
Part # MAN-DIAMONDBACKL  
\$95.00 USD



**The M&R Companies**  
M&R • NUARC • AMSCOMATIC

# ***Diamondback™ L***

V.070914

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# 1. Safety and Operational Guidelines

## DANGER



**This symbol identifies situations that endanger people, property, and/or equipment.** If such conditions exist, the equipment must be shut down and all energy sources (electrical, gas, and pneumatic) must be disconnected, purged, and locked out until the problem is resolved.

**Never attempt to bypass or defeat any safety device.** Do not attempt to operate the equipment if any safety device is not functioning properly, or if any doubt exists about proper operation of safety devices.

**The product described in this publication may operate at high speed and contain numerous moving parts.** It may employ natural gas or propane, mechanical or pneumatic forces, and/or hazardous voltages, and may create other conditions that could, through misuse, abuse, unauthorized alteration or retrofitting, inattention, or lack of understanding, result in injury, death, or damage to the product or to other equipment. In addition, improper operation may also depreciate the value of the machine and other assets of the owner, and impair the working efficiency of the machine.

### Energy Sources

M&R equipment may use one of more of the following energy sources:

- Compressed Air (Pneumatic Energy)
- Electricity
- Gas (Natural Gas or Propane)

Each form of energy presents its own unique hazards and requires appropriate precautions.

### Danger From Compressed Air (Pneumatic Energy)

Only qualified personnel should be allowed to work on pneumatic components or assemblies. Before work is started on pneumatic components or assemblies, equipment should be disconnected from the air supply and all pneumatic lines should be purged to prevent accidental operation of pneumatic assemblies. All pneumatic pipes and hoses should be checked frequently for damage and wear.

### Danger From Electrical Energy

Only qualified personnel should have access to electrical enclosures or work on electrical systems, and enclosures should be locked when not in use. Electrical equipment should be checked regularly.

### Danger From Gas (Natural Gas or Propane)

Only qualified personnel should be allowed to work on gas components or assemblies. Before work is started on gas components or assemblies, gas supply valve should be closed and locked. Gas pipes and equipment should be checked regularly.

## WARNING

Failure to follow safety and maintenance procedures or to take appropriate corrected action when required can result in severe or fatal personal injuries, property damage, and/or damage to the equipment.



## 1.1 Management Responsibilities

1. Ensure that this equipment is used only for the purposes set forth in the “Defined Purpose” section of this manual.
2. Ensure that all employees involved with the operation of this equipment or working near it read, understand, and act in accordance with the operational and safety standards set forth in this manual, including the Operator Responsibilities listed below.
3. Ensure that all recommended preventive maintenance is carried out according to M&R guidelines.
4. Should any problem arise which compromises the safe operation or normal functioning of this equipment, ensure that the equipment is immediately shut down, sources of power to the equipment are shut off and secured, and that personnel not trained to repair - and directly involved in repairing - the equipment are removed from the immediate area and not allowed to return until the equipment has been returned to a safe and fully-functional condition.
5. Provide, and compel use of, any personal protection devices that may be required for the safe operation of this equipment.
6. Make no modification to equipment or equipment software without written approval from M&R.
7. Provide - and support with written documentation - necessary employee training to ensure safe operation, including but not limited to instruction in:
  - a. the operation of this machine
  - b. the use of personal protection devices
  - c. preventive maintenance procedures

## 1.2 Operator Responsibilities

Note: 'Operator Responsibilities' pertain to all employees who work on or near the equipment; this includes, but is not limited to those who clean, maintain and repair the equipment as well as those who operate it. In general, all those who work on or near the equipment have a duty to use reasonable and ordinary care for their own safety when in the vicinity of the machine. Failure to use reasonable and ordinary care subjects people and property to serious personal injury and/or death and to destruction of personal and/or company property. M&R expressly disclaims any and all liability, whether in contract, tort or by statute, for damages, whether in the nature of personal injury/death and/or property damage, and whether direct, indirect, consequential or incidental, as a result of a failure to use reasonable and ordinary care.

1. Ensure that this equipment is used only for the purposes set forth in the "Defined Purpose" section of this manual.
2. Read, understand, and act in accordance with the safety and operational standards and guidelines set forth in this manual.
3. Install and maintain the equipment and safety devices in accordance with this manual; this includes checking the equipment and safety devices for external or visible damage at least once per shift, and making sure all safety and danger notices are in place and in readable condition.
4. Make no modification to equipment or equipment software without written approval from M&R.
5. Ensure that all other employees working on or near this equipment are knowledgeable in its safe operation, and closely supervise inexperienced employees; keep bystanders away from the equipment.
6. Make sure the area around the equipment is clear and free of obstructions, clean up spills immediately, and remove ink and other contaminants at the end of each shift.
7. Ensure that any and all safety guards (including but not limited to safety bar, foot switch, yellow cycle interruption cords, infrared safety beam or hand switches) provided with this equipment for the purpose of protecting personnel by automatically stopping the equipment are in place - and are not removed, disabled or rendered ineffective during operation.
8. Wear any personal protection devices required for the safe operation of this equipment.
9. Avoid wearing anything that could become entangled in moving parts; for example, but not by way of limitation, tie back, pin up, or cover long hair.
10. Do not attempt to operate this equipment if you are sick, fatigued, or under the influence of alcohol and/or drugs including, but not limited to, prescriptions and over-the-counter medications that warn against the operation of equipment.
11. Avoid standing on any part of the equipment not intended for that purpose.
12. Immediately shut down the equipment, disconnect and lock out all sources of power (electrical, gas, and/or pneumatic); and purge all lines under pressure if the equipment fails to be fully operational or if any safety device fails to operate properly, and ensure that the equipment stays offline until the safety device is again operational.
13. Perform - and document - preventive maintenance at intervals described in the Operator's Manual.
14. Keep this Operator's Manual in clean, easily readable condition near the equipment at all times so it can be quickly accessed by operators and maintenance personnel.



## 2. General Information

### **This Document**

This document is based on information available at the time of its publication. While every effort has been made to be accurate, the information contained herein does not purport to cover all details or variations in hardware, software, features, or specifications, or to provide for every possible contingency in connection with installation, operation and maintenance. Features may be described herein which are not present in all models of this product. M&R Printing Equipment, Inc. and its subsidiaries reserve the right to alter specifications in the manufacture of their products, and they assume no obligation of notice to holders of this document with respect to changes subsequently made.

M&R Printing Equipment, Inc. and its subsidiaries make no representation or warranty, expressed or implied, whether pursuant to statute or case law with respect thereto, and assume no responsibility for, the accuracy, completeness, sufficiency or usefulness of the information contained herein. No warranties of merchantability or fitness for a particular purpose shall apply.

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## 2.1 Service and Parts

### Manufacturer's Rating Plate

Most products manufactured by the M&R Companies have a metal manufacturer's rating plate. Below is a label imprinted with the information from your product's rating plate. Please be prepared to provide this information when calling. This helps us respond to your needs more quickly.

If this is a replacement manual, please record the information from your product's rating plate on the sample plate shown below.

VOLTS	PHASE	HERTZ	TOTAL F.L.A.	A.L.M.
SHORT CIRCUIT CURRENT RATING		AMPS LARGEST HEATER LOAD		
kA rms symmetrical	V maximum			
FACTORY	SCHEMATIC No.	MACHINE No.		
MODEL No.		SERIAL No.		
		M&R Printing Equipment, Inc. 1 N 372 Main Street Glen Ellyn, Illinois 60137 U.S.A.		M&R Part No. 7009187C - BLACK 7009187D - RED 7009187E - BLUE

<b>Date Installed</b>	
<b>Installed by</b>	
<b>Optional Features and Special Information</b>	

### Contacting M&R

If you need service or have questions about your equipment, call the appropriate number and ask for Technical Support. If you need parts, ask for the Parts Department.

<b>From the United States &amp; Canada</b> Monday-Friday between 8:30 AM and 5:00 PM Central Standard/Daylight Time	800-736-6431 Or 630-858-6101
<b>From all other countries</b> Monday-Friday between 14:30 and 23:00 Greenwich Mean Time (GMT)	+847-967-4461
<b>Outside Regular Hours</b>	<b>Call our Global Hotline:</b> +630-462-4715
<b>Visit <a href="http://www.mrprint.com">www.mrprint.com</a> for a list of global contacts</b>	<b><a href="http://www.mrprint.com">www.mrprint.com</a></b>



## 2.2 Defined Purpose

### **Textile Presses**

Textile Presses are designed to print textile inks on textile substrates, as more fully set forth in the manual specific to that product. Any other use of this equipment is not permitted.

### **Textile Dryers**

Textile Dryers are designed to cure/dry textile inks on textile substrates, as more fully set forth in the manual specific to that product. Any other use of this equipment is not permitted.

### **Graphic Presses**

Graphic Presses are designed to print graphic inks on rigid and semi-rigid flat substrates, as more fully set forth in the manual specific to that product. Any other use of this equipment is not permitted.

### **Graphic Dryers**

Graphic Dryers are designed to cure/dry graphic inks on rigid and semi-rigid flat substrates, as more fully set forth in the manual specific to that product. Any other use of this equipment is not permitted.

### **Exposure Equipment**

Exposure Equipment is designed to produce photographic printing plates and printing screens, as more fully set forth in the manual specific to that product. Any other use of this equipment is not permitted.

### **Folding and Packaging Equipment**

Folding and Packaging Equipment is designed to fold, transport, and package textile materials, as more fully set forth in the manual specific to that product. Any other use of this equipment is not permitted.

### **Ancillary Equipment**

Ancillary Equipment is designed to perform specific operations related to processing and handling of substrates, as more fully set forth in the manual specific to that product. Any other use of this equipment is not permitted.

### **Digital Equipment**

Digital Printers are designed to print water based inks on textile substrates and screens, as more fully set forth in the manual specific to that product. Any other use of this equipment is not permitted.

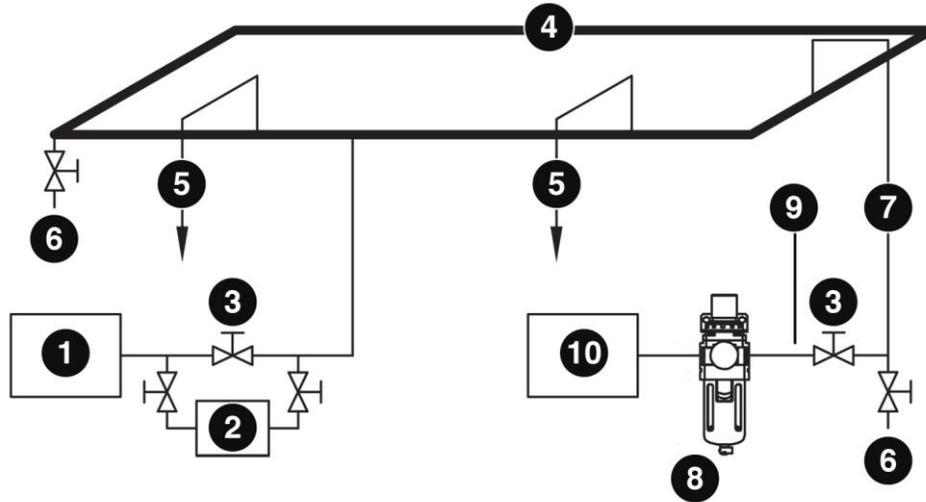
## 2.3 Warranty

### Limited Warranty

Your Warranty does not apply to damages sustained due to equipment misuse, whether intentional or negligent, and such misuse may void your warranty. Misuse includes - but is not limited to - the items listed below. In addition, M&R Printing Equipment, Inc. accepts no responsibility for personal injury or property damage caused by misuse.

1. Use of the equipment for any non-defined purpose
2. Improper installation or use of the equipment
3. Operation of the equipment with defective safety devices
4. Operation of the equipment with safety devices removed, disabled, not working in whole or in part or in any manner rendered ineffective for the purpose for which they were designed
5. Failure to comply with instructions for transportation, storage, installation, operation, maintenance, setup, and take-down of the equipment as described in the Operator's Manual
6. Unauthorized modification of the equipment or equipment software
7. Failure to replace worn or defective parts
8. Failure to use M&R supplied replacement and repair parts
9. Defective repairs made to the equipment
10. Dangerous conditions which result from improper use of the equipment

### 3. Compressed Air Supply



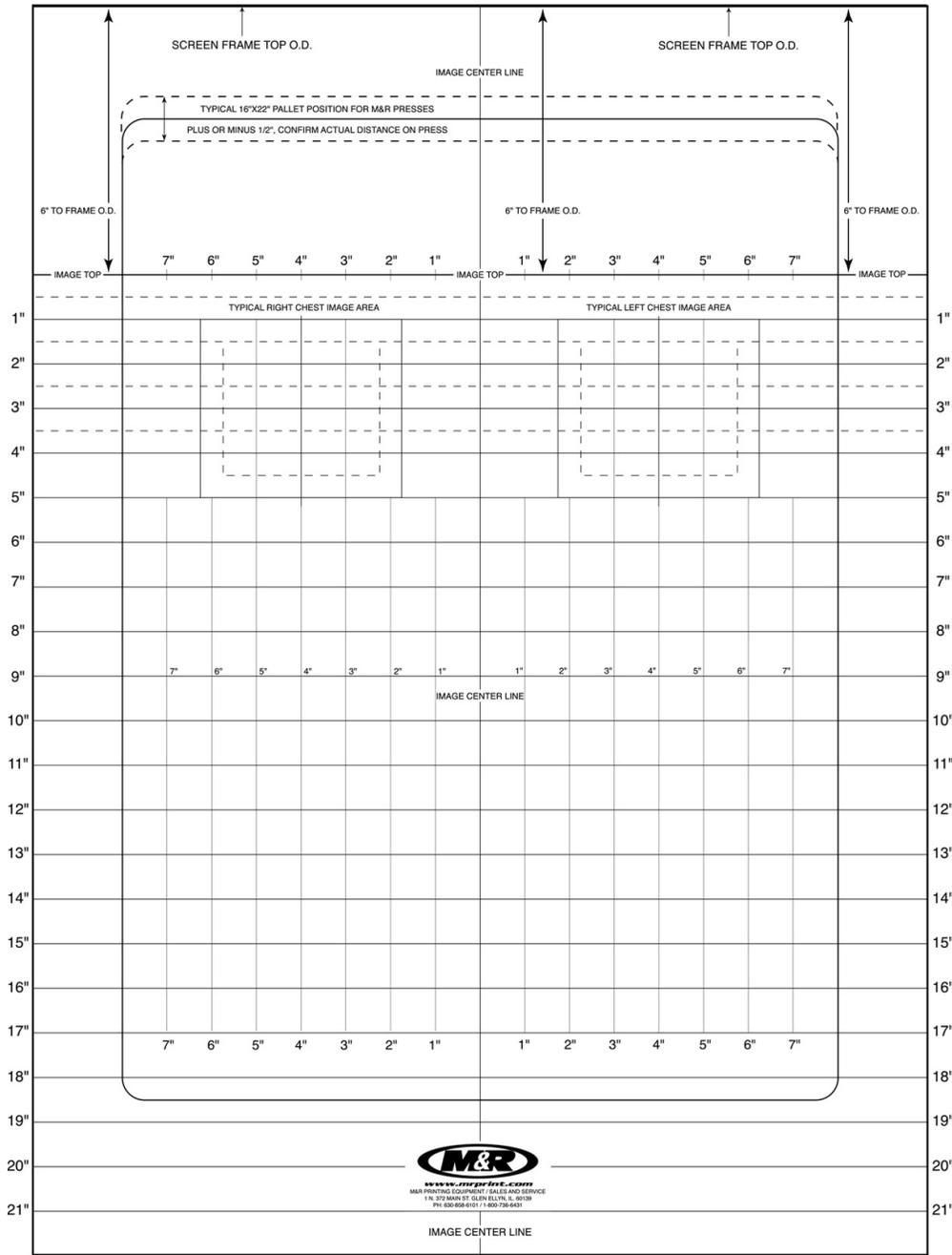
Description	
1	Compressor
2	Air Dryer Unit
3	Shut-Off Valve
4	Closed Loop
5	Supply Lines (Air Drops) to Other Equipment (If Required)
6	Drain with Shut-Off Valve
7	Supply Line (Air Drop) to Equipment (3/4" inside-diameter pipe required)
8	Filter/Regulator/Lubricator
9	Flexible Rubber Hose
10	Equipment

This illustrates a typical closed-loop compressed-air supply system. It is designed to deliver clean, moisture-free compressed air to pneumatic equipment. Air Dryers should be installed to help prevent moisture damage to pneumatic seals, valves, and air cylinders that could void equipment warranties.

Air generated by the compressor (1) contains oil and moisture. The air dryer (2) removes moisture as the air passes through it into the air supply system (4). Shutoff valves (3) should be installed at strategic locations to allow operators to isolate parts of the system for repair or maintenance without shutting down the entire system. A drain valve (6) should be installed at the lowest point in the loop to drain off accumulated oil and moisture. The system may include one or more feeder lines (5). To further reduce moisture and prevent other contaminants from entering pneumatic equipment, the feeder line should force air to travel upward, causing moisture and contaminants to collect on the inside of the pipe and flow downward toward the drain valve. The supply line should run horizontally to a position near the equipment before turning downward (these lines are known as 'air drops'). Before reaching the equipment, the rigid supply pipe (7) should terminate in a shutoff valve (3) connected to a 3/4" flexible rubber hose (9). The hose should be connected to the filter/regulator manifold (8) on the equipment. The regulator controls air pressure and the filter provides a final moisture-removal stage (10).

**Note:** System air requirements determine pipe sizes. Air systems should be designed and installed by licensed plumbing contractors.

# 4. Screen Placement Grid



M&R part # 7020004

Textile presses are shipped with a Screen Placement Grid as shown above. This is a useful tool for screen placement between the film positive and the screen.

## 5. Specifications

Specifications <sup>2</sup>	
	<b>Diamondback L 8/6</b>
<b>Air @ 6,9 bar (100 psi)</b>	566 l/min (20 cfm)
<b>Diameter</b>	259 cm (8' 6")
<b>Electrical Requirements <sup>1</sup></b>	110 V, 1 ph, 10 A, 50/60 Hz, 0.46 kW 208/230 V, 1 ph, 5 A, 50/60 Hz, .046 kW
<b>Maximum Frame Size</b>	51 x 61 x 4.5 cm (20" x 24 x 1.75")
<b>Maximum Image Area</b>	35 x 28 cm (14" x 11")
<b>Shipping Weight</b>	1295 kg (2850 lbs)
<b>Standard Pallet Size</b>	15 x 41 cm (6" x 16") 38 x 41 cm (15" x 16")
<b>Station/Colors</b>	8/6

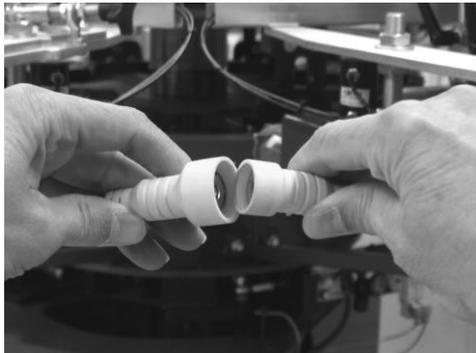
<sup>1</sup> If incoming voltage differs from the voltage(s) listed, calculate amperage accordingly. Other electrical configurations are available: Contact M&R for details.

<sup>2</sup> Confirm the latest specifications on our website, [www.mrprint.com](http://www.mrprint.com) .

## 6. Operation

### Cycle Interruption Cords

Yellow Cycle Interruption Cords are provided to restrict access into the index table operating area while the equipment is in operation. To disconnect, grasp each of the cords at the magnetic jack connection and pull apart.



## Emergency Stop Button

The red **EMERGENCY STOP** Button is provided to stop all operation of the equipment in an EMERGENCY situation. Push the button to activate.



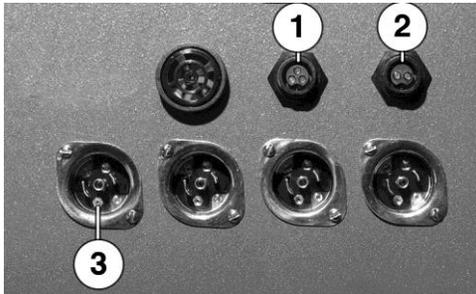
**WARNING:** Do NOT turn off electrical power until all Flash Cure Units have cooled down to 38 C (100 F) or lower.

## Accessory Sockets

Accessory Sockets are located on the lower electrical enclosure.

- (3-Pin) No Shirt Detector Cable (1)
- (2-pin) Foot Pedal Control Cable (2)
- Flash Cure Signal Cable (3)

Note: Socket location, number and type vary by options ordered and machine model.



## 6.1 Start Up

### ON/OFF Switch

The lockable **ON/OFF** switch (1) is located on the right side of the control panel.

**IMPORTANT:** When **ON/OFF** switch (1) is moved to the off position, it must remain in the off position for 10 seconds to allow the motor to reset or unit will not operate properly.



### Standard Print Cycle

Position the table so the index on proximity switch, located on the base of the machine, is on. Release the emergency stop button and press the **Reset** button. The fork moves forward and engages one of the bearings on the bottom of the index table. Using the **Operator Interface**, turn one print station **On**. Press the **Automatic/Manual** switch to **Manual** and release.

The press performs the following functions:

- The index drive assembly rotates the carousel until the next actuator activates the Index On proximity switch.
- Simultaneously, the flood stroke of the print station is started and completed.
- Carousel moves up to the print position and activates the table proximity switch; this starts the print stroke. At the same time, the index drive is returning to the start or standby position for the next cycle.
- At the completion of the print stroke, the carousel lowers, ready for the next cycle.

## 6.2 Control Panel



Number	Name	Function
1	<b>Operator Interface</b>	Used to display information regarding operational, programming, and system status messages. Refer to the Operator Interface section of this manual for a detailed description of the operation.
2	<b>Index On Indicator Light</b>	Red light illuminates when the index table is aligned with the index cam follower on the lower index plate. Apply sideways pressure to the pallet arm to make sure the index fork clevis has fully engaged the cam follower.
3	<b>Reset Button</b> 	The green <b>Reset</b> button resets the control system logic in the event of an emergency stop or activation of one of the cycle interruption cords. This button is also used to lower the index table during setup procedures.
4	<b>Emergency Stop Button</b> 	The red <b>Emergency Stop</b> button stops all operation. Press the button in until it remains depressed to activate. Turn the button clockwise until it pops out to deactivate.

5	<p><b>Print Start Switch</b></p>  <p><b>Print Finish Switch</b></p> 	Use when starting or finishing a print run to eliminate the need to individually turn print stations On or Off. Placing this switch in the <b>Print Start</b> position sets each print station in the <b>On</b> position to print sequentially at the start of a print run. When this switch is in the <b>Print Finish</b> position each print station in the <b>On</b> position will shut down sequentially at the end of a print run.
6	<p><b>Automatic Manual Switch</b></p>  	This switch has three positions: <b>Automatic</b> at the top position, <b>Off</b> at the middle position, and <b>Manual</b> at the lower position. To operate the index system one complete cycle, press the switch down to <b>Manual</b> . The switch does not stay in the Manual position, but returns to the middle or Off position when released. The index system will cycle one time, along with any print stations that are selected to <b>On</b> .  Placing this switch in the <b>Automatic</b> position while the index table is in motion commands the index system to operate in the Automatic mode. The Index time (dwell) for Automatic operation is adjusted via the Operator Interface.  <div style="background-color: #e0f0ff; padding: 5px;">                     Note: When the switch is moved to the middle or <b>Off</b> position, the index system will not operate.                 </div>

### 6.2.1 Operator Interface

The Operator Interface is used to access and adjust all functions of the press. When electrical power is turned on, the message screen displays the **MAIN** menu. The available menu selections are **Heads, Servo, Print Run, Revolver Mode, Tests, Production Data, Service Data, Date/Time** and **M&R Info**.

Displayed along the bottom of the message screen are **MAIN, COUNTER, TIMER, OPTION** and **ALARM**.

If the **ALARM** button is flashing, press the **ALARM** button to access the **ALARM** screen to view the alarms. To return to the **MAIN MENU**, press the **Back Arrow**.

If your equipment has the optional Password Protection programming installed and an alarm is displayed, press the **Time Out Password** button for instructions and contact M&R Printing Equipment, Inc. for a password.

When the **Revolver Mode** is selected all screens will display the word **Revolver** vertically on the left and right margins of each display screen.

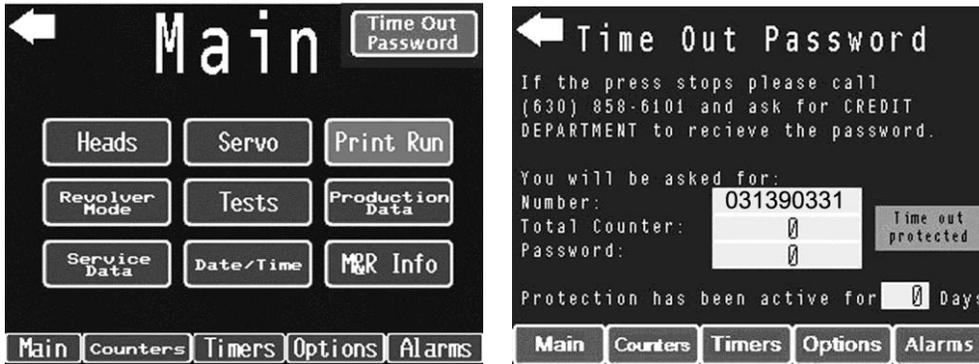
The previous screen is displayed by pressing the **Back Arrow** button. The current month, date, year and time is displayed at the top of the **MAIN** screen.



## Time Out Password

**IMPORTANT:** The Time Out alarm is displayed 3 days prior to the machine stopping. Record the **Serial Number** and **Total Counter** information and contact M&R Printing Equipment, Inc. for the password. Do **NOT** advance the machine even 1 index until the password is entered or the password will be invalid.

If the **Time Out Password** alarm is displayed, contact M&R Printing Equipment, Inc. and provide the Serial Number and Total Counter information requested on the **Time Out Password** screen to receive the password.



## Date & Time

The screen displays the date as Month, Day and Year and the time using a 24 hour clock where 13:00 hours are read as 1:00 PM.

To change the date, enter the numbers which represent the current Month. Example: 01 = January, 11 = November. Use the Up or Down arrow buttons to select the numerical value for the Month, Date and Year.

The time is displayed using a 24 hour clock. To change the time, enter the numbers which represent the current Hour. Example: 13 = 1 o'clock pm. 00 = minutes. The time would be read as 13:00 hours or 1:00 pm in the afternoon. Use the Up or Down arrow buttons to select the numerical value for the Hour and Minutes.



## Print Run

Select **Print Run** from the **Main** screen. Most functions including the stopwatch function can be accessed from this screen.



## Counters

Press the **Counters** button at the bottom of the screen. The **Counters** screen contains six menus: **Speed**, **Total**, **Job**, **Shift**, **Preset** and **Remaining**.

To change a selection to zero, press the **RST** button on the right.



### Speed

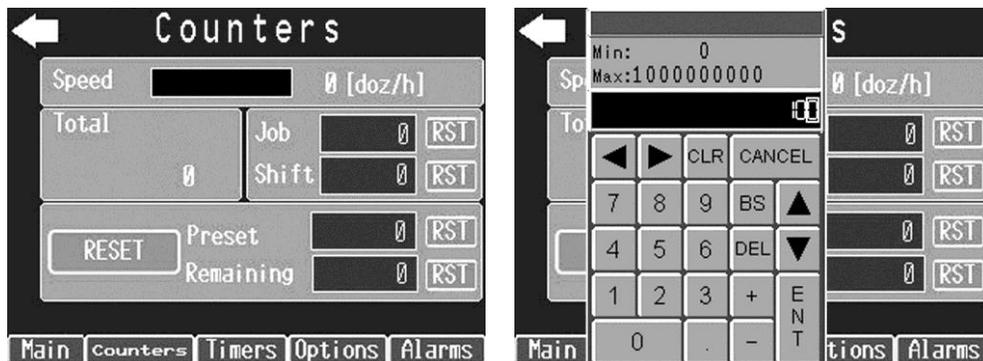
The **Speed** menu displays the current production speed of the equipment in dozens or pieces per hour and may not be reset. Press the **Dozens/hour** button to change to **Pieces/hour**.

### Total Counter

The Total Counter displays the total number of index cycles beginning from the initial date of installation of the unit in your production facility. The Total Counter is an indication of service life of the equipment and cannot be changed.

### Job

The **Job** counter displays the number of press cycles for the current print job. To reset the **Job** counter, press the data entry cell for **Job** counter. A numeric keypad is displayed. Press **0** and then press **ENT**. The **Job** counter resets to **0**. The upper area of the keypad displays the minimum and maximum range allowed for the specific menu selection.



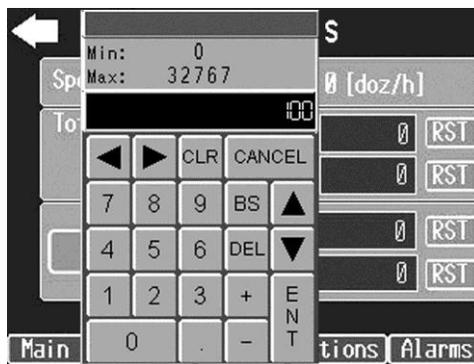
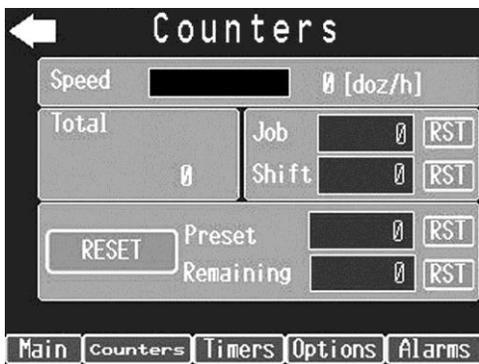
### Shift

The **Shift** counter displays the total press cycles for a particular shift. To reset the **Shift** counter, press the data entry cell for **Shift** counter. A numeric keypad is displayed. Press **0** and then press **ENT**. The **Shift** counter resets to **0**.

### Preset

The **Preset** menu selection is used to enter a number of print cycles for a given print job. For a print job of 30 dozen (360) shirts, enter **360**. You may enter up to a maximum of 32,767 print cycles into the **Preset** menu.

To enter a number of print cycles, press the data entry cell for **Preset**. A numeric keypad is displayed. Enter the number of print cycles and then press **ENT**.



**Remaining**

The **Remaining** menu displays the number of print cycles remaining in the **Preset** menu and functions as a countdown display. The **Remaining** selection can be changed in the event that 2 or 3 shirts are misprinted.

To add shirts to the **Remaining** count, press the data entry cell for **Remaining**. A numeric keypad is displayed. Press the keys for the number of shirts you wish to add and then press **ENT**. The **Remaining** display now indicates the new **Remaining** total.

The **Remaining** menu also automatically activates the **Print Finish** mode and sounds an audible signal when the last shirt in the count is loaded onto the press.



Press the **Back Arrow** button to return to the previous screen.

**Timers**

At the bottom of any message screen press the **Timers** button to view the **Timers** screen. The **Timers** menu includes menu selections for **Index Dwell Time**, **IR Flash Time**, **Quartz**, **Preheat** and **Delay**.

**Stopwatch**

A stopwatch function is built into the **Timers** screen and the **Print** screen. Press the Right Arrow to start the stopwatch. Press again to pause, continue or stop the stopwatch function.

To reset the **Stopwatch** to zero, press the double arrow button to the right of the **Stopwatch**.



### Index Dwell Time

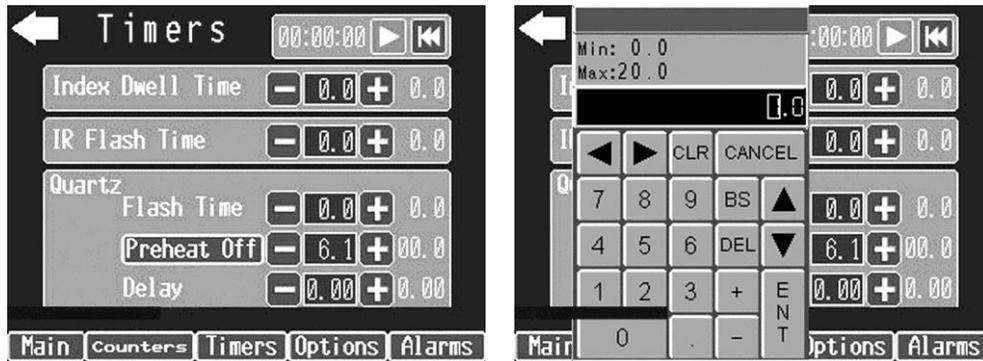
The **Index Dwell Time** is the time interval during automatic operation where the press operator may load and/or unload garments. This time interval starts when the index table reaches the fully raised position at the end of the index motion, and ends with the start of the index table start cycle. The maximum setting is 20 seconds.

To set the **Index Dwell Time**, press the data entry cell. A numeric keypad is displayed. Enter the **Index Dwell Time** (up to 20 seconds) and then press **ENT**.

Another way to set the **Index Dwell Time** is to press the minus (-) to decrease the **Index Dwell Time**, or press the plus (+) to increase the **Index Dwell Time**.

Note: The **Index Dwell Time** value decreases or increases by 0.5 second each time you press the - or + button.

The numeric indicator at the far right provides a visual display of the remaining **Index Dwell Time**.



### IR Flash Time

The **IR Flash Time** controls the dwell time of the index table in the raised or flash cure position.

To set the **IR Flash Time**, press the data entry cell. A numeric keypad is displayed. Press the number keys to enter the **IR Flash Time** and then press **ENT**.

Another way to set the **IR Flash Time** is to press the minus (-) to decrease the **IR Flash Time**, or press the plus (+) to increase the **IR Flash Time**.

Note: The **IR Flash Time** value decreases or increases by one tenth second (0.1) each time you press the - or + button.

When using a print carriage mounted IR flash cure unit, with the **IR Flash Time** set for 0, the flash panel will cycle in over the pallet and stay over the pallet (no in/out cycle). If the **IR Flash Time** is set for an equal or greater dwell time then the **Index On** or **Quartz** dwell timer, the flash panel will remain over the pallet (no in/out cycle). If the **IR Flash Time** is set for a dwell time greater than the print cycle timer, the index table will remain in the raised (print) position until the **IR Flash Time** concludes the dwell time cycle.

In the event that the **IR Flash Time** is set for less than the **Index On** timer or the **Quartz** timer, the flash panel will travel in over the pallet and then out to the standby position.



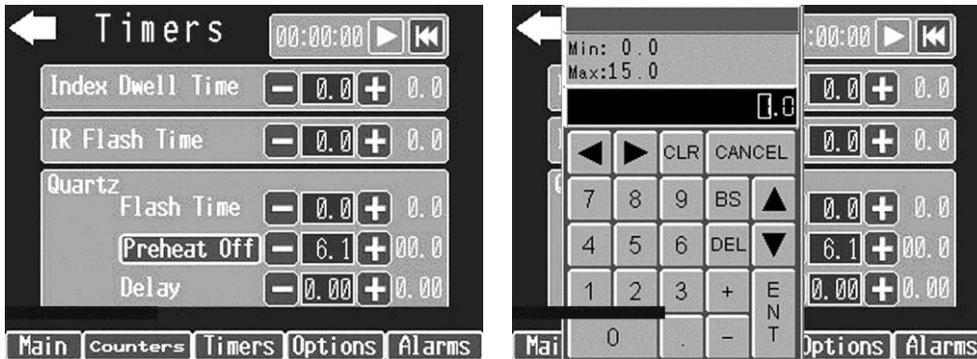
## Quartz Flash Time

The **Quartz Flash Time** controls the dwell time of the index table in the raised or flash cure position.

To set the **Quartz Flash Time**, press the data entry cell. A numeric keypad is displayed. Enter the **Quartz Flash Time** and then press **ENT**.

Another way to set the **Quartz Flash Time** is to press the minus (-) to decrease the **Quartz Flash Time**, or press the plus (+) to increase the **Quartz Flash Time**.

Note: The **Quartz Flash Time** value decreases or increases by one tenth (0.1) second each time you press the - or + button.



## Preheat Time

**Preheat** controls the preheat dwell time for the quartz flash panels.

To turn On the **Preheat** control, press the **Preheat** button. The indication will now display **On** and preheats for the set time.

To set the **Preheat** time, press the data entry cell. A numeric keypad is displayed. Enter the **Preheat** time and then press **ENT**.

Another way to set the **Preheat** time is to press the minus (-) to decrease the **Preheat** time, or press the plus (+) to increase the **Preheat** time.

Note: The **Preheat** dwell time value decreases or increases by 0.5 second each time you press the - or + button.



## Delay

The **Delay** menu controls the preheat time for M&R standard Quartz flash units. The minimum **Delay** time setting is 0 and the maximum is 5 seconds.

During normal operation, the quartz flash heating elements are energized as the pallets begin the index cycle. The index cycle time is used to preheat the heating elements before the index table begins its upward cycle.

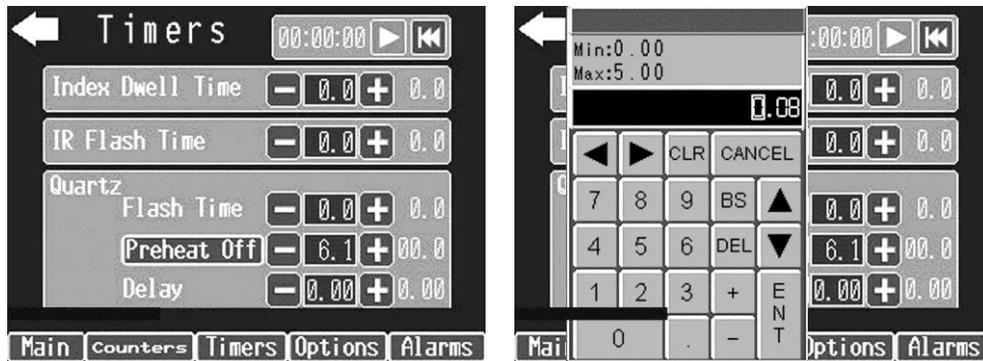
If the **Delay** time is set to 0, the quartz flash units will energize as soon as the index table begins its cycle. If set for 5 seconds the quartz heating elements will wait or delay for 5 seconds before energizing after the start of the index cycle.

Should the **Delay** time be set for a greater time value than the time it takes the index table and flood cycles to complete their cycles, the quartz heating elements will energize as the index table begins its upward cycle.

To set the **Delay** time, press the data entry cell. A numeric keypad is displayed. Enter the Delay time (up to 5 seconds) and then press **ENT**.

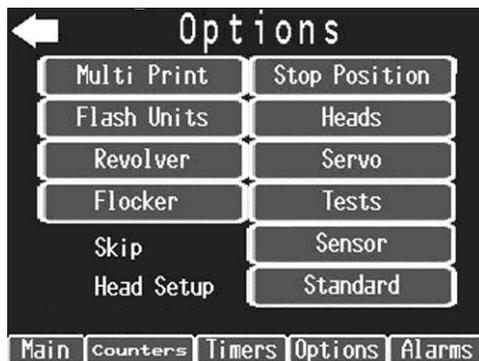
Another way to set the **Delay** time is to press the minus (-) to decrease the **Delay** time, or press the plus (+) to increase the **Delay** time.

Note: The **Delay** dwell time value decreases or increases by 0.5 second each time you press the - or + button.



### Options

At the bottom of any message screen, press the **OPTIONS** button to display the Options menu. The Options menu displays control features such as **Multi-Print**, **Stop Position**, **Flash Units**, **Heads**, **Revolver**, **Servo**, **Flocker**, **Tests**, **Skip**; **Foot Pedal/Sensor** and **Head Setup**; **Standard** or **Enhanced**.



### Multi Print

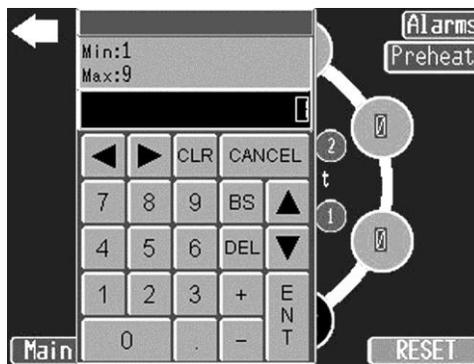
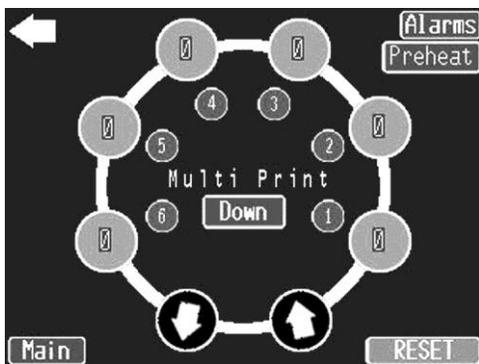
**Multi-Print** selects individual print stations to perform multiple flood and print strokes up to a maximum of 9. To use the **Multi Print** control, press the **Multi Print** button.

Note: In the illustration the print stations are arranged in a counterclockwise configuration. If you change the index rotation to clockwise, the print station layout will change to reflect the selected index rotation.

To select a print station for multiple print cycles press the square data entry cell for that print station. A numeric keypad is displayed. Select the number of print cycles (up to 9) and then press **ENT**. The number of print cycles is now displayed in the data entry cell.

The **Up/Down** indication at the middle of the display screen is used to command the print carousel to remain in the **Up** position until all print strokes are completed. When selected to **Down**, the print carousel will lower to the index position at the completion of each print stroke. To change the indication from **Up** to **Down**, press the **Up/Down** indicator. Each time you press the indication the display changes between from **Up** to **Down**.

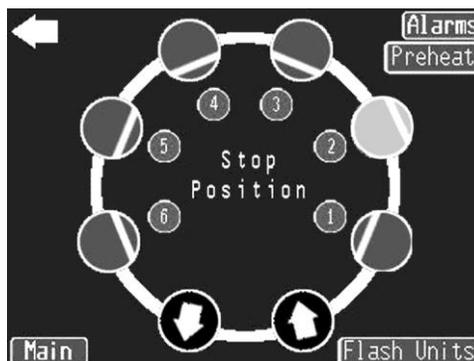
The **Reset** at the bottom right of the screen is used to reset all print heads to single cycle.



## Stop Position

**Stop Position** sets individual print stations to stop the print carriage at the front of the screen.

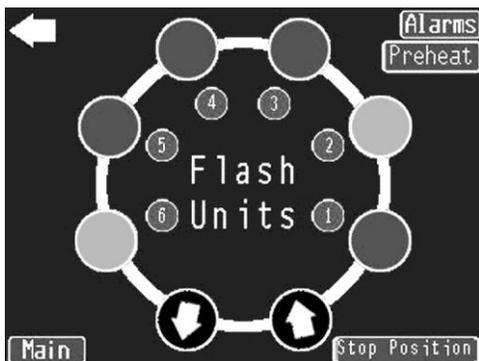
To select print stations for **Stop Position** operation, press the indicator representing the print station you wish to select for front stop. The indicator line moves to the outside or front of the circle for that head. Press the indication again and the indicator changes back to rear. The print carriage will then stop at the rear of the print station.



## Flash Units

**Flash Units** are used to select individual print stations to operate as **Flash** cure stations. To select print stations for flash unit operation press the indicator representing the print station selected to operate as a **Flash Unit**. The color changes from blue to orange.

In the illustration, print stations numbers 2 and 6 have been selected to operate in the **Flash Unit** mode. To return a print station to standard print operation, press the indicator once again and the print station will return to normal print operation.



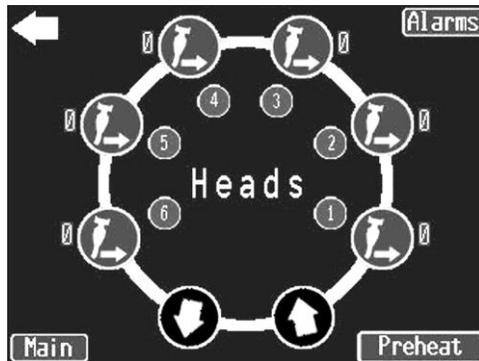
## Heads

**Heads** is used to activate a print station. To select a print station, press the **Heads** button on the **Options** menu. To activate a print station, press the head number button and the indication changes from red to green. The Print station will not operate during printing if **OFF** is selected.

Press the button next to the head number on the **Heads** screen. If selected to **ON**, the print station completes one flood/print cycle.

If selected to **OFF**, pressing the button moves the index carousel up so that screen registration or placement may be checked. Pressing the button again lowers the index carousel.

Note: To lower the index carousel at any time, press the **RESET** button on the control panel.

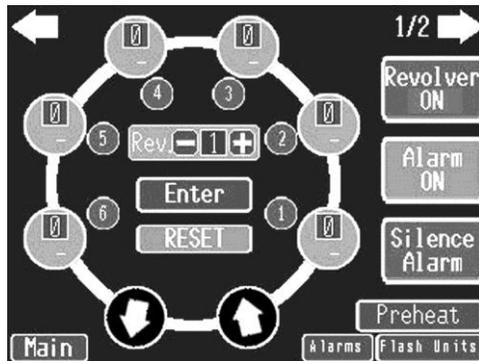


### Revolver Sequencing Program

The next menu selection under Options is **Revolver**. The M&R Revolver is used to program selected print stations to either print or flash in multiple cycles when using single or multiple flash cure units.

Note: The Revolver Program operates only with certain M&R Flash cure units.

To activate the **Revolver** mode press the **Revolver On/Off** button. Press the indicator again to turn the **Revolver** mode **Off**.



### Revolution Number

**Rev.** is used to select the number of the revolution to be programmed. Press the plus (+) to increase the **Rev.** Press the minus (-) to decrease the **Rev.**

Note: In the illustration the print stations are arranged in a counterclockwise configuration. If you change the index rotation to clockwise, the print station layout changes to reflect the selected index rotation.

The print station indicators display the current program status for each of the print heads used in the revolution.

For example the number **2** shown for print station No. 1 indicates that this print station is programmed to perform 2 print strokes in the program cycle. Orange for print station No. 2 indicates that this print station will be used as a **Flash** cure station in the program cycle.

### Multi Print

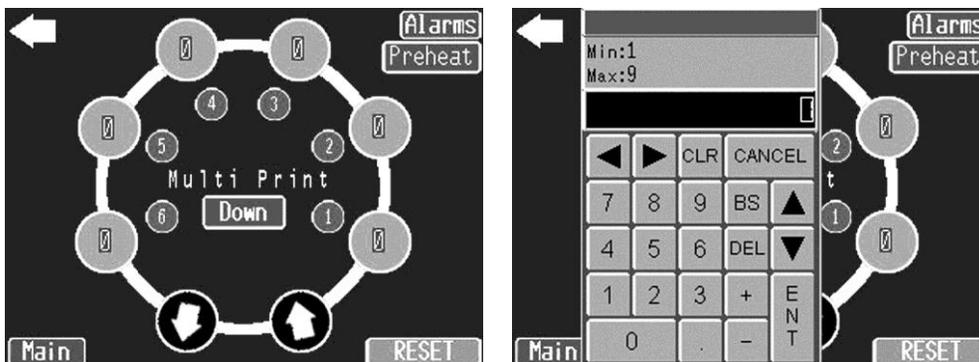
**Multi Print** selects individual print stations to perform multiple flood and print strokes up to a maximum of 9.

Starting in the lower left corner and moving upward each print station is indicated by number along with an indication for the number of print cycles selected.

Note: In the illustration the print stations are arranged in a counterclockwise configuration. If you change the index rotation to clockwise, the print station layout changes to reflect the selected index rotation.

To select a print station for multiple print cycles press the square data entry cell for that print station number. A numeric keypad is displayed. Select the number of print cycles (up to 9) and then press **ENT**. The number of print cycles is now displayed.

Note: Set the **Up/Down** position in the **Options/Multi Print** menu.



### Alarm On/Disabled

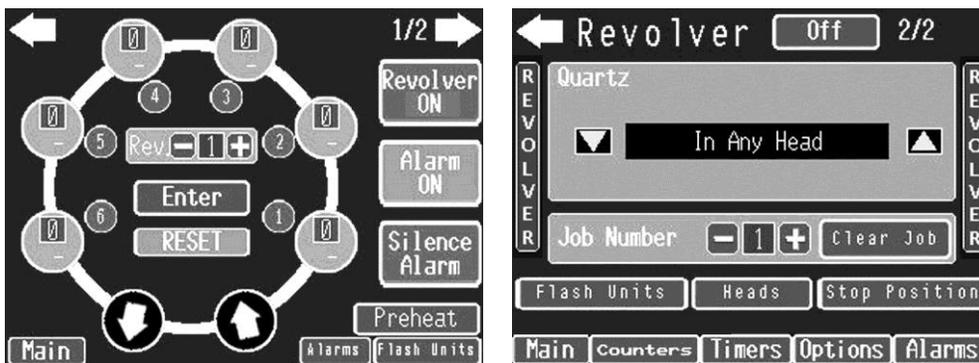
The **Alarm On/Disabled** button is used to activate the audible alarm signal that sounds just before the completion of a programmed Revolver print sequence. Press the **Alarm On/Disabled** button once again to turn off the audible signal.

### Silence Alarm

The **Silence Alarm** button is used to silence the audible alarm signal that sounds just before the completion of a programmed Revolver print sequence. Press the **Silence Alarm** button to turn off the audible signal.

**Preheat** and **Flash Units** can also be accessed from the first Revolver screen.

Press the **Forward Arrow** to access the second Revolver screen.



### Quartz

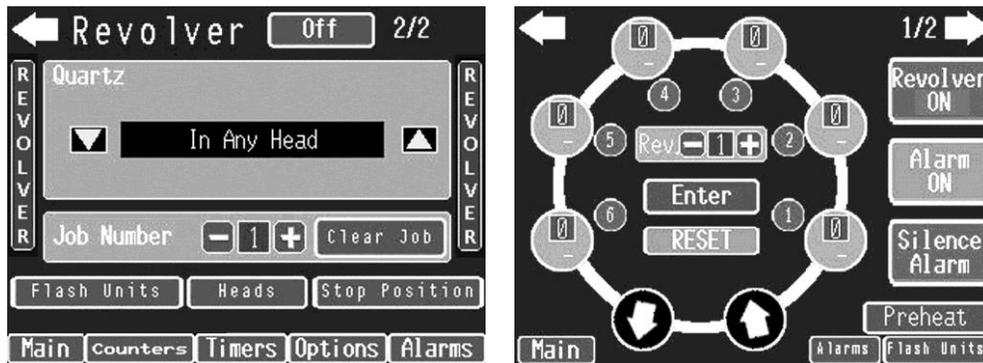
Select the print stations to operate as Quartz Flash stations by pressing the up or down arrows to view the list of available selections. Possible selections include **In Any Head**, **Head # 1**, **Head # 2**, **Head # 3**, **Head # 4**, **Head # 5**, **Head # 6**, **Head # 7** and **Unload Station**.

Press on the print station number to confirm your selection. To select a print head to operate as a quartz flash station, go to the **Stop Position** screen and select that particular print head to **Front** position.

### Job No.

The **Job No.** indicates the current job being programmed. Press the plus (+) to increase the Job No. Press the minus (-) to decrease the Job No. Press **Clear Job** to clear a previous job.

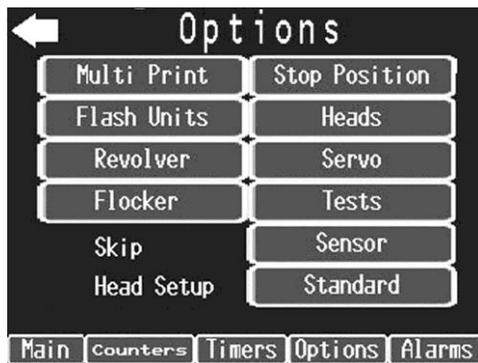
**Flash Units**, **Heads** and **Stop Position** can also be accessed from the second Revolver screen. Press the **Back Arrow** to return to the first Revolver screen.



### Skip Sensor

**Skip** allows the system operator to select either the optional floor mounted **Sensor** or **Foot Pedal** to skip pallets that do not have a garment loaded. If equipped with the **Sensor** option, press the button to the right of **Skip** to change between **Foot Pedal** and **Sensor**.

Note: To use the **Foot Pedal** to skip printing on a particular pallet, depress the **Foot Pedal** as that pallet begins its index cycle.



## Head Setup

**Head Setup** can be selected for either **Standard** or **Enhanced**. Each print station has an independent print button located on both the main operator control panel and the individual print station control panel. Select either **Standard** or **Enhanced** on the main operator control panel. Each time you press the button, it changes between **Standard** to **Enhanced**.

Note: **Enhanced** mode only changes the function of the **Print** button at the **print station**, not on the **operator control panel**.

### Standard Mode

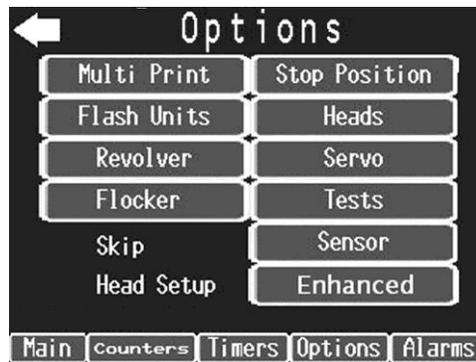
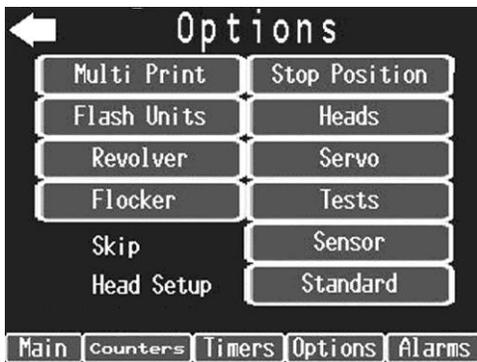
**Selected print station On.** At the **print station** or **operator control panel**, press the **Print** button. The index table moves up and the selected print station cycles through one complete flood/print sequence.

**Selected print station Off.** At the **operator control panel**, press the **Print** button and the index table moves up to the print position. Pressing the button again lowers the index carousel. At the **print station**, press the **Print** button and the index table moves up to the print position. Press the **Print** button a second time and the squeegee assembly moves down, allowing the operator to check and adjust squeegee pressure prior to printing. Press the **Print** button for a third time to raise the squeegee and lower the index table.

### Enhanced Mode

**Selected print station On.** At the operator control panel, press the **Print** button and the selected print station cycles through one complete flood/print sequence. At the print station, press the **Print** button and the index table moves up to the print position. Press the **Print** button a second time and the squeegee assembly moves down, allowing the operator to check and adjust squeegee pressure prior to printing. Press the **Print** button for a third time to raise the squeegee and lower the index table. Press and hold the Print button and the selected print station cycles through one complete flood/print sequence.

**Selected print station Off.** At the **operator control panel**, press the **Print** button and the index table moves up to the print position. Pressing the button again lowers the index carousel. At the **print station**, press the **Print** button and the index table moves up to the print position. Press the **Print** button a second time and the squeegee assembly moves down, allowing the operator to check and adjust squeegee pressure prior to printing. Press the **Print** button for a third time to raise the squeegee and lower the index table.

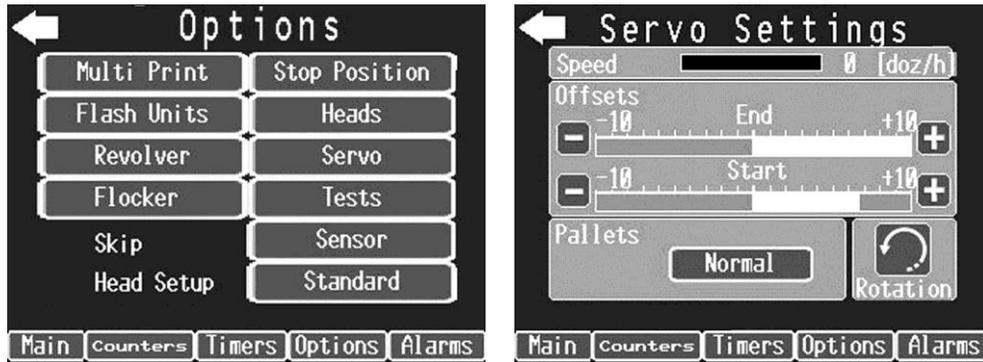


## Servo

To access the **Servo** menu press the **Servo** button.

### Servo Offsets

**Servo Offsets** is used to adjust the start and stop position of the index servo drive for optimum performance. Each parameter includes a minus (decrease) button and a plus (increase) button used to adjust the **Servo Offset** settings. A graphic gauge indicates the amount of the setting.



### Pallets

The **Pallets** menu is used when changing pallet sizes to set the servo index drive for the size and weight (load) of the pallets to be used in a print run.

To select the pallet size, press the button indicating **Normal** or **Large**. The pallet size indication changes between **Normal** and **Large** each time you press the button. Use **Normal** when using small or medium pallets. Use **Large** when using large pallets.

**IMPORTANT:** Selecting an incorrect pallet size may result in damage to the machine. Damaged caused by such misuse will not be covered under the Limited Warranty.

### Rotation

Rotation is used to select the direction of the index carousel, either clockwise (**CW**) or counterclockwise (**CCW**). Press the button to select the rotation direction. Each time you press the button the indication changes between **CW** and **CCW**.

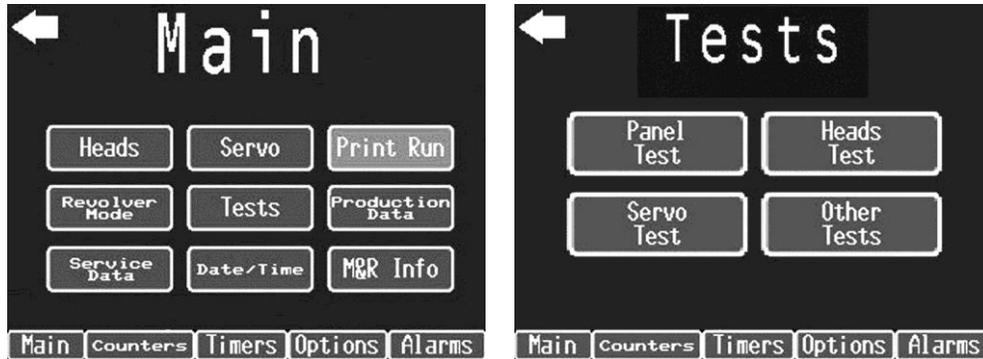
Note: When changing the index rotation to clockwise or counterclockwise, the print station layout in the Flash, Front, Revolver and Panel Test screens will change to reflect the selected index rotation.





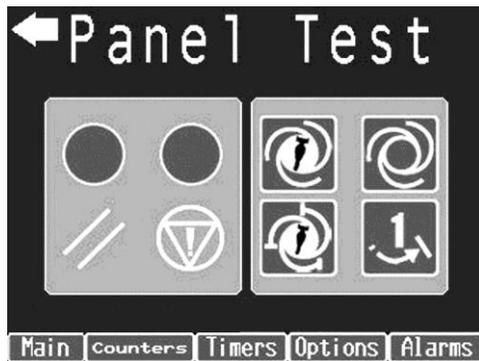
## Tests

Press the **TESTS** button on the **MAIN** screen to access the **TESTS** screen. The **Tests** menu displays the function of each control switch, proximity switch and safety device used in the control system. The **Tests** menu includes **Panel Test**, **Heads Test**, **Servo Test** and **Other Tests**.



### Panel Test

The **Panel Test** screen displays buttons for all the switches and push buttons used on the main control panel. To test a switch, place the switch in the **On** position on the main control panel. When activated the indicator on the menu screen for that switch changes color. This confirms the operation of that switch. When you place the switch in the **Off** position the indicator for that switch color returns. All remaining switches and push buttons are tested in the same manner.



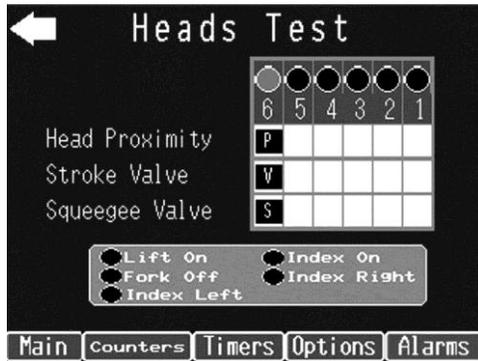
**Heads Test**

The **Heads Test** menu is used like the **Panel Test** menu. Press the **Heads Test** button on the **Tests** menu screen to display the **Heads Test**.

The **Heads Test** menu screen displays indicators for the front and rear proximity switches used on the print heads. As the print heads operate through a flood/print cycle the indicators changes from Head Proximity (**P**) to Stroke Valve (**V**) to Squeegee Valve (**S**) confirming the valve operation.

The **Lift On** indicator functions in the same way. When the index table is in the raised position the indicator will be black (**On**). When the index table is in the lowered position the indication will be green (**Off**).

Other proximity switches are **Lift On**, **Fork Off**, **Index Left**, **Index On** and **Index Right**. To test these switches turn on the index system and operate it through a manual cycle. As the press progresses through the cycle, each of the proximity switches displays black confirming its operation. As the press continues through the cycle, the proceeding switch will return to green and the next switch will change to black.

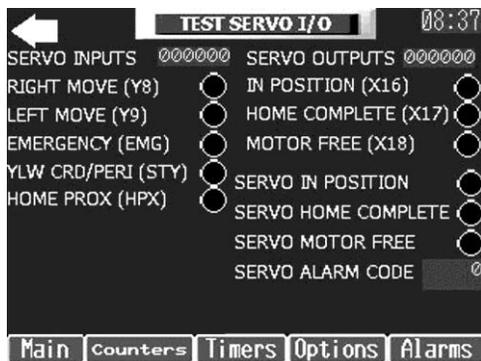


**Servo Test**

Press the **Servo Test** button on the **Tests** menu screen to display the **Servo Test** screen. The **Test Servo I/O** menu screen displays indicators which are used to determine the Servo drive's operation.

To use these indicators turn on the index system and allow it to operate through four or five cycles. As the index system progresses through the cycle the indications display black if any alarms are detected or as the Servo drive reaches the designated position in the index cycle.

Should one of the switches fail to change to black it would indicate that that switch may need adjustment or replacement.



### Other Tests

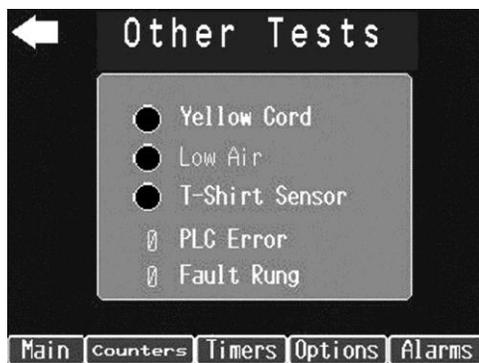
Press the **Other Tests** button on the **Tests** menu screen to display the **Other Tests** menu screen.

The **Other Tests** menu screen displays four control elements which may be tested. These are **Yellow Cord**, **Low Air**, **Emergency Relay**, **T-Shirt Sensor** and **PLC Error**. To test these controls turn On the index system and operate it through a manual cycle. As the press progresses through the cycle each of the control elements can be tested to confirm their operation.

To test the **Yellow Cord**, disconnect a pair of yellow cords between print stations. The indication for **Yellow Cord** changes to black confirming the open circuit in the control system. Reconnect the yellow cords. The **Yellow Cord** indication now changes back to green confirming that the control circuit is now closed. Disconnect the next set of yellow cords to check their operation. Do this for all remaining yellow cords between print stations.

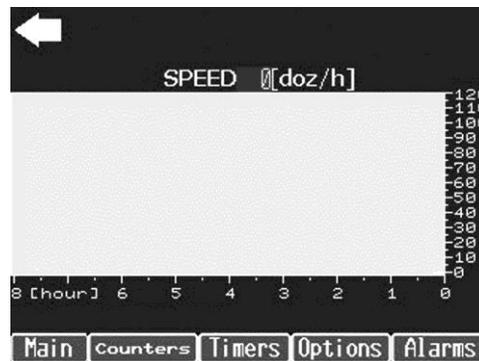
The **T-Shirt Sensor** may be tested by activating the **T-Shirt Sensor**. The indication for **T-Shirt Sensor** will now change to black.

**PLC Error** and **Fault Rung** are used to display any error codes detected by the PLC.



### Production Data

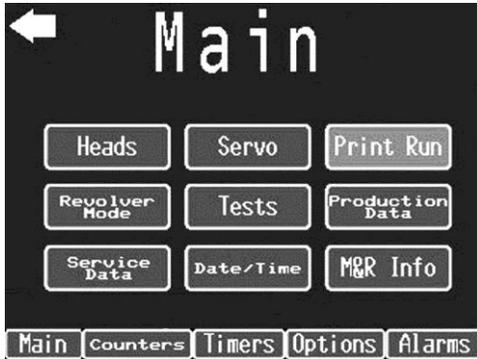
To select **Production Data** press **Production Data** on the **MAIN** screen.



## Service Data

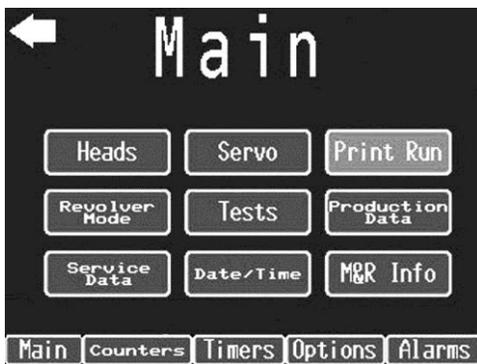
The **Service Data** screen is intended for use by M&R Authorized Service Personnel only and requires the use of a password for access.

**DO NOT ATTEMPT TO ACCESS THE SERVICE DATA MENU!**



## M&R Info

Press the **M&R Info** button on the **MAIN** screen. The **M&R Info** screen contains information on how to contact M&R Printing Equipment and program information.



## 6.2.2 Revolver Sequencing Program Overview

Textile Screen Printers may have print requirements beyond the capabilities of their equipment. However, the flexibility and versatility of the screen printing process allows experimentation with such variables as color sequence, ink deposit and flash cure utilization. The M&R Revolver Sequencing Program was designed to maximize the capabilities of your equipment while minimizing production costs. The M&R Revolver Sequencing Program expands the print and flash capability of a smaller color press to allow multiple flash cure cycles without losing the color print capability.

To explain how the M&R Revolver can expand your production capabilities, we offer the following production scenario.

Note: When programming revolutions, select to **On** only the heads that you want to print or flash. When you are finished programming all of the revolutions, make sure all of the heads that you are using are turned **On**.

### Job 1 / Revolutions 3 / Flash in Head 2

Revolution No. 1 (P) Head 1 (F) Head 2

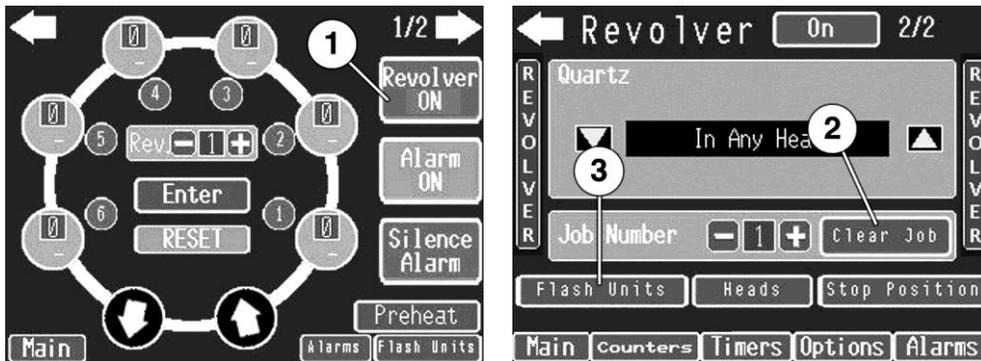
Revolution No. 2 (P) Head 1 (F) Head 2 (P) Head 4 (P) Head 5

Revolution No. 3 (F) Head 2 (P) Head 6

1. Go to **Main/Revolver Mode** or **Options/Revolver** and press the **Revolver Off** button (1) to turn the **Revolver On**.

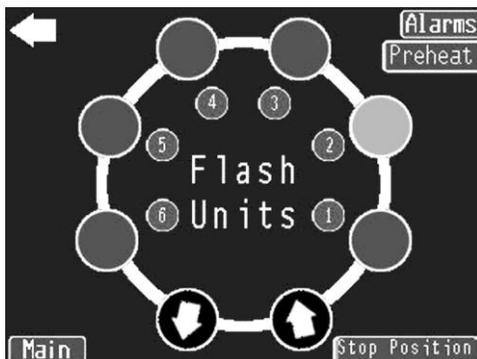
To clear a previous job, press the **Arrow Right** button at the top right corner of the screen to display the next Revolver screen.

Press the **Clear Job** button (2) to clear the Job Number. Press the **Flash Units** button (3).



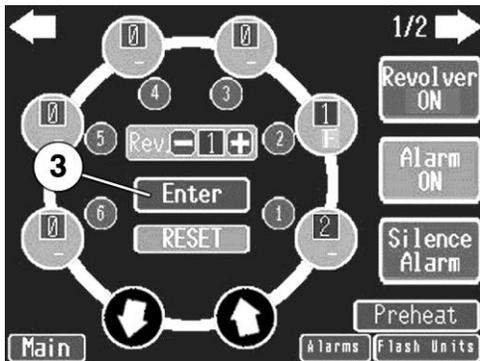
2. Program print head number 2 to operate as the flash cure station. To select print station 2 for flash unit operation press the indicator on the screen representing print station 2. The indication changes from blue to orange. To return a print station to standard print operation, press the indicator once again and the print station returns to normal print operation.

Press the **Back Arrow** to return to the previous screen.



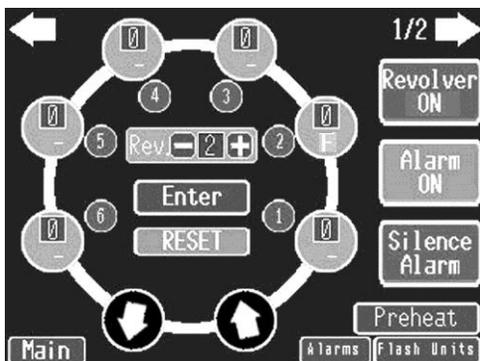
- Under Rev. 1, press the head number and select head No.1 and head No.2 (flash station) to On and then press the **Enter** button (3).

Turn head No. 1 and head No. 2 Off.



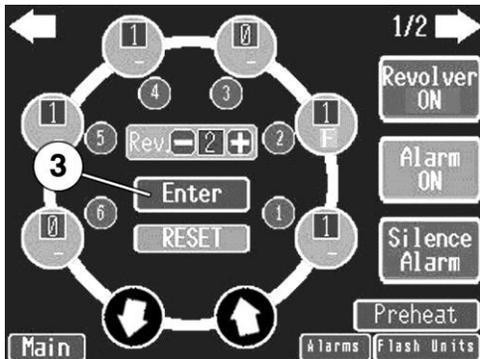
- Change the **Rev.** to 2. Press the plus (+) to the right of **Rev.** until a 2 displayed.

Note: In the illustration the print stations are arranged in a counterclockwise configuration. If you change the index rotation to clockwise, the print station layout will change to reflect the selected index rotation.

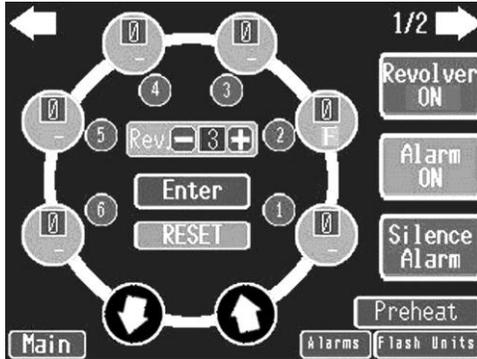


- Under Rev. 2, press the head number and select heads number 1,2,4,5 to On and then press the **Enter** button (3).

Turn heads number 1, 2, 4 and 5 Off.

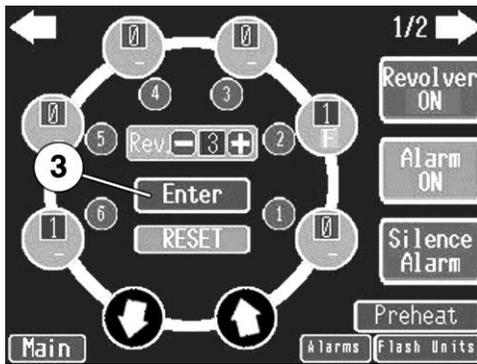


- Change the **Rev.** to 3. Press the plus (+) to the right of **Rev.** until a 3 is displayed.



- Under **Rev. 3**, press the head number and select heads number 2 and 6 to **On** and then press the **Enter** button (3).

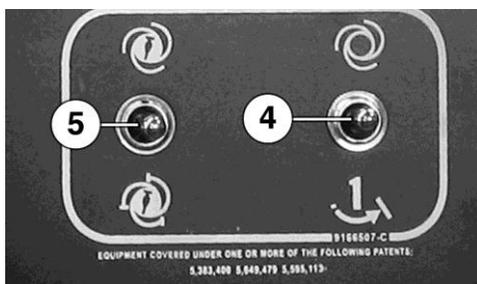
Turn heads number 2 and 6 Off.



- Make sure all of the heads that you will be using; heads 1, 2, 4, 5 and 6 are **On** and your flash unit is turned **On**.

You are ready to print.

Place the **Automatic/Manual** switch (4) in the **Automatic** position. Activate the **Print Start** switch (5) to begin the Revolver sequence.



**To continue printing:** When you hear the audible alarm near the end of the last revolution push the **Print Start** switch (5). Also make sure the **Index Delay** setting under **Timers** is set to a long enough time for you to unload/load the shirts.

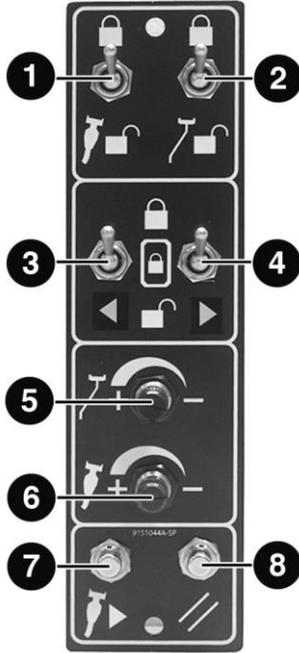
Example: If you have the **Flash Time** set for 4 seconds and the **Index Dwell Time** set for 8 seconds, when you **Print Start** the press, the pallets will remain up for 4 seconds, the flash will come out and the tables will drop and wait an additional 4 seconds before indexing until you have all of the pallets loaded.

The press will then switch to the **Flash Only** time of 4 seconds for the balance of the revolutions you have programmed. As the press approaches the end of the last revolution and the audible alarm sounds, press **Print Start** (5). The press returns to the **Flash** and **Index** time combination to give the operator time to unload and load the garments.

The last shirt/pallet will stop at the load station.

## 6.3 Print Station

### 6.3.1 Print Station Control Panel



Number	Name	Function
1	<b>Squeegee Lock/Unlock</b>  	The <b>Squeegee Lock/Unlock</b> switch locks the squeegee to the mounting bar. To lock the squeegee, position the squeegee on the mounting bar and put the <b>Squeegee Lock/Unlock</b> switch in the <b>Lock</b> position. To release the squeegee, move the switch to the <b>Unlock</b> position.
2	<b>Floodbar Lock/Unlock</b>  	The <b>Floodbar Lock/Unlock</b> switch locks the floodbar to the mounting bar. To lock the floodbar, position the floodbar on the mounting bar and put the <b>Floodbar Lock/Unlock</b> switch in the <b>Lock</b> position. To release the floodbar, move the switch to the <b>Unlock</b> position.
3, 4	<b>Frame Lock On/Off</b>  	The <b>Frame Lock On/Off</b> switches lock the screen frame in the screen clamps. The switch on the left (3) activates the left screen frame locking clamps, and the right switch (4) activates the right screen frame locking clamps. To lock the screen frame into the screen clamp, locate the screen frame in position and place the <b>Frame Lock On/Off</b> switches in the <b>On</b> position. To release the screen frame, move the switches to the <b>Off</b> position and remove the screen frame from the screen clamps.

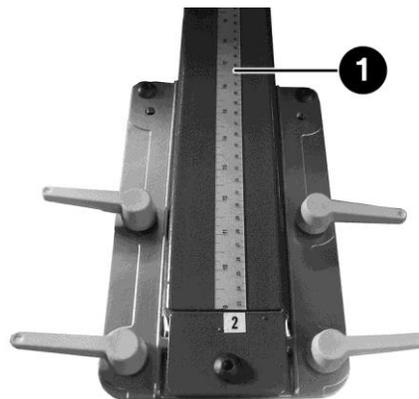
5	<b>Flood Speed</b> 	The <b>Flood Speed</b> knob controls the floodbar speed. To <b>increase</b> speed, turn the control knob counterclockwise. To <b>decrease</b> speed, turn the control knob clockwise.
6	<b>Squeegee Speed</b> 	The <b>Squeegee Speed</b> knob controls the squeegee speed. To <b>increase</b> speed, turn the control knob counterclockwise. To <b>decrease</b> speed, turn the control knob clockwise.
7	<b>Print Button</b> 	Cycles the individual print station manually. The <b>Print</b> button is also used during screen frame setup to check registration. Press the <b>Print</b> button. The index carousel moves up so that screen registration or placement may be checked.
8	<b>Reset Button</b> 	To lower the index table, press the <b>Reset</b> button.

### 6.3.2 Install Pallets and Screen Frames



**WARNING:** Before entering between print heads, always push in Emergency Stop button and activate Cycle Interruption Cords.

1. Set the pallet cam lock handles as shown. Slide the square end of the pallet onto the Pallet Support Arm.
2. Use the scale (1) on the Pallet Support Arm to position pallets.

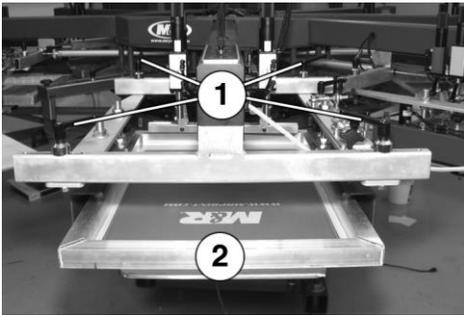


3. Turn the pallet locking handles towards the center of the press to lock the pallet in place.  
Repeat steps 1-4 to install the remaining pallets.



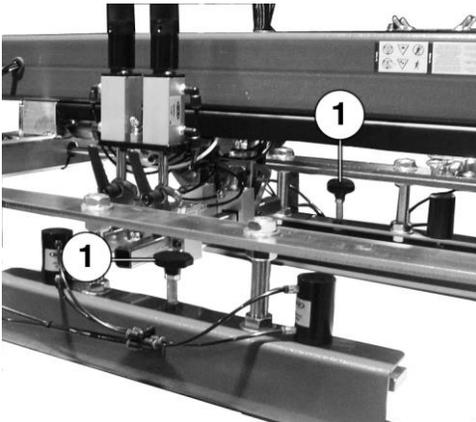
## Install Screen Frames

4. To install a screen frame, adjust the width of the Side Screen Clamps to accommodate the screen by turning the handles (1) counterclockwise to loosen the clamps. If necessary, pull up on the handle to reposition. Position the screen frame (2) in the Side Screen Clamps.



5. Put the **Frame Lock** switches on the print head control panel in the **On** position to lock the screen frame into the Side Screen Clamps. The pneumatic cylinders hold the screen frame in place.

To unlock the screen frame, loosen the manual screen clamps (1) if necessary and move the **Frame Lock** switches to the **Off** position and remove the screen frame from the Side Screen Clamps.



### 6.3.3 Central Off-Contact Lever



**WARNING:** Before entering between print heads, always push in Emergency Stop button and disconnect Cycle Interruption Cords.

#### Central Off-Contact Lever

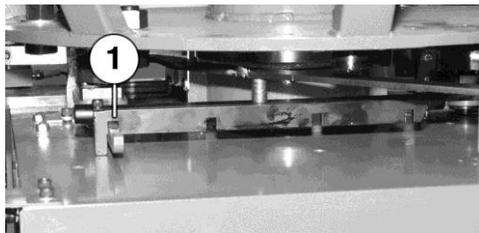
The Central Off-Contact Lever provides a single point to change the off-contact dimension of all the screens with a simple adjustment of a lever. This eliminates the need to individually adjust off-contact for screens when printing different thickness garments. The adjustment is calibrated in four settings of 1/16" (1.5 mm) increments.

#### Setting and Locking the Off-Contact Lever

To adjust the lever the index table must be in the down position. Lift up the stringer (1). Move the lever to the required position for the off-contact setting.

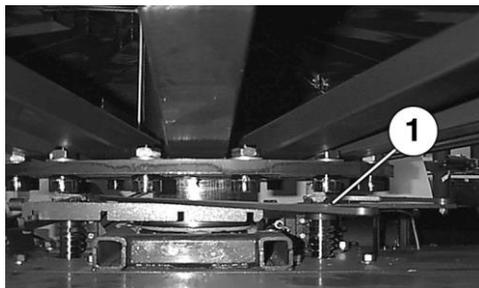
After adjusting the off-contact setting, lower the stringer (1) to lock the setting. Raise the index table to check the off-contact.

Note: You will have to adjust the squeegee pressure setting on each print head that you are using. However, the floodbar setting remains the same.



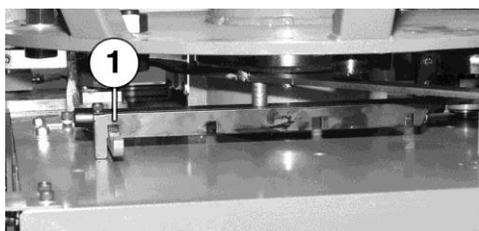
#### Minimum Off-Contact Setting

The central off-contact lever has four positions. When the lever is moved fully to the right (1), the index table is set at its highest position. This is the minimum off-contact setting.



#### Maximum Off-Contact Setting

When the lever is moved fully to the left (1), the index table is at the lowest position. This setting gives you the most off-contact setting, which is 3/16" (5 mm) added to your initial off-contact.



### 6.3.4 Squeegee/Floodbar

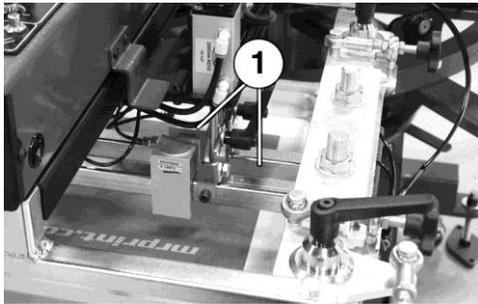


**WARNING:** Before entering between print heads, always push in Emergency Stop button and activate Cycle Interruption Cords.

#### Install Squeegee/Floodbar

Install the squeegee and floodbar on the mounting bars using the pneumatic clamps. The floodbar (1) is mounted to the rear mounting bar and the squeegee is mounted to the front mounting bar. Install the floodbar first by positioning the floodbar with the angle on the floodbar facing towards the front of the press. Center the floodbar on the mounting bar and raise the floodbar up so that the “U” shaped top of the floodbar engages the mounting bar. Engage the clamps using the switches on the print station control panel.

The squeegee is installed in the same manner as described for the floodbar (1).

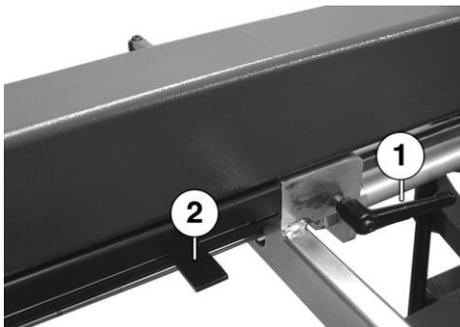


#### Rear Print Carriage Stop Position



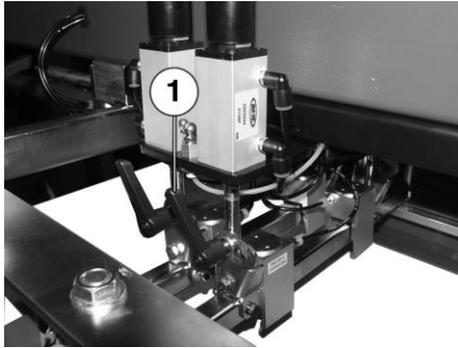
**WARNING:** Before entering between print heads, always push in Emergency Stop button and activate Cycle Interruption Cords.

Position the Rear Carriage Stop to cover the image area. Turn the handle (1) counterclockwise to loosen the clamp. If necessary, pull up on the handle to reposition. Move the proximity switch stop actuator (2) left or right to the required position. Turn the handle (1) clockwise to tighten.



### Squeegee/Floodbar Angle Adjustment

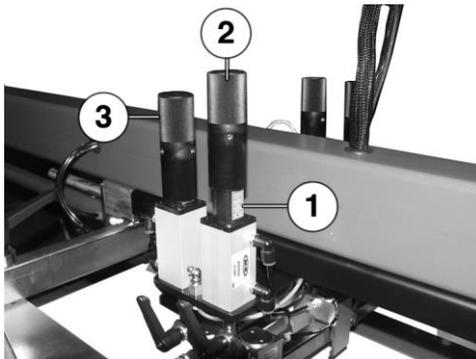
Loosen the handle (1). Pivot the squeegee/floodbar to an approximate 15-20 degree angle. A reference scale is stamped into the angle bracket for ease of adjustment. Tighten the handle.



### Squeegee/Floodbar Pressure Adjustment

A properly adjusted squeegee should exhibit a slight bend, producing a light resistance as you manually push the print carriage towards the rear of the screen. Note the pressure reading for the squeegee bar on the reference scale (1) on the air cylinder. Turn the knobs (2) counterclockwise to increase pressure. Turn the knobs clockwise to decrease pressure.

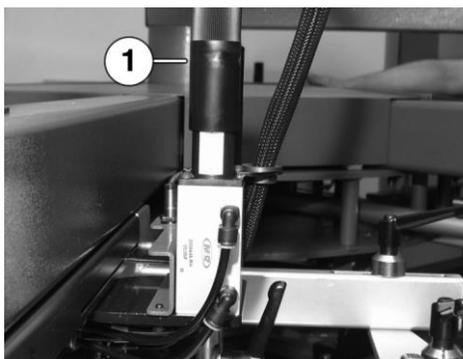
A properly adjusted floodbar should exhibit a slight pressure felt on the bottom of the screen mesh. Turn the knobs (3) counterclockwise to increase pressure. Turn the knobs clockwise to decrease pressure.



### Squeegee Pressure Regulator

The Squeegee Pressure Regulator equalizes pressure across the length of the squeegee. To use, raise the squeegee pressure adjustment knobs (1) to maximum pressure on both the right and left sides of the print carriage by turning the knob counterclockwise.

Adjust the Squeegee Pressure Regulator by pulling out the adjustment knob to unlock the adjustment. Turn the adjustment knob clockwise to **increase** pressure. Turn the adjustment knob counterclockwise to **decrease** pressure. A setting of 35-40 psi is sufficient for most printing requirements.



## 6.3.5 Print Head Adjustments



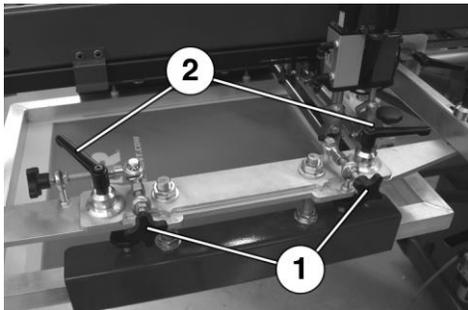
**WARNING:** Before entering between print heads, always push in Emergency Stop button and activate Cycle Interruption Cords.

### Print Head Micro-Register

1. Put the switch for the left screen frame clamps on the print head control panel in the Off position or loosen the left manual screen clamps. This allows the screen frame to move freely during micro-register adjustments.

Check the micro-register adjustment knobs (1) to verify they are not binding. The knobs should have slight play ( $1/32$ " ) in both the clockwise and counterclockwise directions.

Loosen both the right and left micro-register locking handles (2).

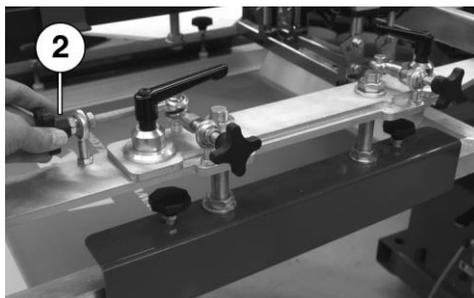
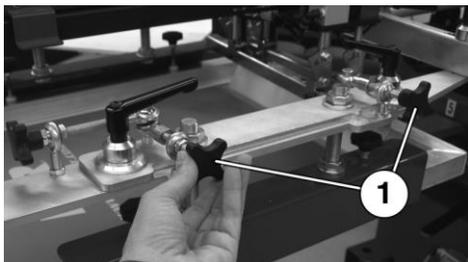


2. The two micro-register knobs (1) at the right-hand side of the print head are used to move the screen frame from left to right. The micro-register knob (2) on the front of the screen holder assembly is used to move the screen frame from the front to the rear.

The micro-register adjustments allow for movement of  $1/4$ " from the zero or center position for an overall range of  $1/2$ " right to left and front to rear.

After completing the micro-register adjustments, verify the adjustment knobs still have the  $1/32$ " play in both the clockwise and counterclockwise directions. Tighten the micro-register locking handles securely.

Tighten the left manual screen clamps or put the switch for the left screen frame clamps on the print head control panel in the On position.



## 7. Scheduled Maintenance

### Benefits

Properly maintained equipment operates more efficiently, reduces operating costs, and lasts longer. A properly managed preventive maintenance program can minimize downtime.

### Preparation

- An effective preventive maintenance program includes:
- proper selection, handling, and application of lubricants
- stocking high-quality replacement parts
- general cleaning and appearance of equipment
- creation of a preventive maintenance history for each piece of equipment

Preventive maintenance documentation can be an invaluable resource. This schedule is based on a 40 hour work week.

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### Daily



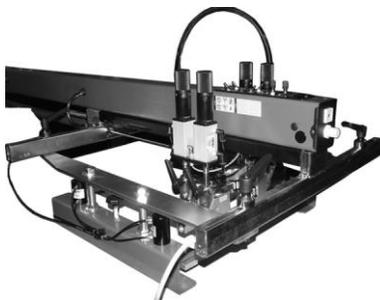
**WARNING:** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to the equipment.

### Check and Clean Print Carriage Assembly

#### Items Required:

1 - Towel

Use a towel to clean ink, lint, dirt or spray adhesive from the print carriage cylinder rod, chopper linkage assembly, adjustment knobs, squeegee/floodbar angle brackets and all other hardware.



## Clean Servo and Motor Fan

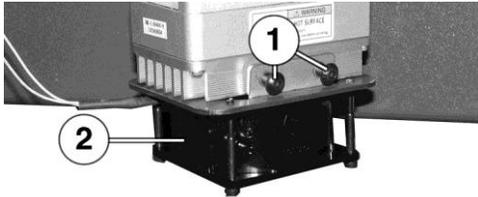
### Items Required:

1 – 5/32-inch Hex Head Wrench

1 - Vacuum

**Important:** If the alarm 'Motor Temperature Warning. Clean Fan' is displayed, the fan must be cleaned immediately or the press may stop running.

Loosen screws (1) and lower fan assembly (2) away from motor heat sink. Clean any dust or lint from fan. Reattach fan assembly (2) to motor heat sink. Tighten screws (1).

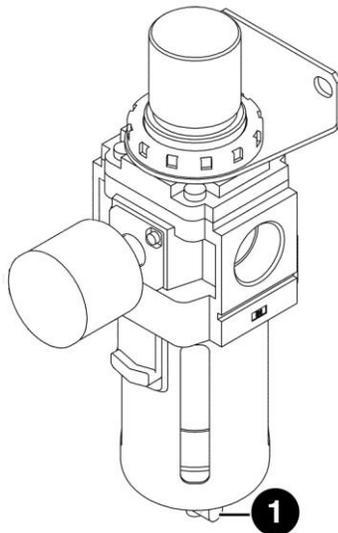


## Drain Air Filter Moisture Trap

Press and hold the orange button (1) on the bottom of the filter until no moisture is present in the air.

Note: If water or excessive moisture is in the reservoir, remove water/moisture from reservoir and inspect the chiller and compressor for proper operation.

**IMPORTANT:** Oil-less valves are used on this equipment, do NOT lubricate the air.



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## Weekly



**WARNING:** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to the equipment.

### Lubricate Stroke Cylinder Rod

#### Items required:

- 1 - Towel
- 1 - 10 wt. Non-Detergent Oil (M&R Part No. 7017000)

**Note:** Manually move the Print Carriage all the way towards the front of the print station.

Use a towel to clean the stroke cylinder rod. Use a clean towel to apply 10 wt. Non-Detergent Oil to the stroke cylinder rod. Only a small amount of oil is needed.



## Lubricate Index Clevis Fork, Clevis Plate and Lower Carousel Plate

### Items required:

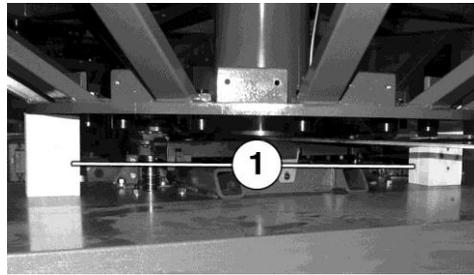
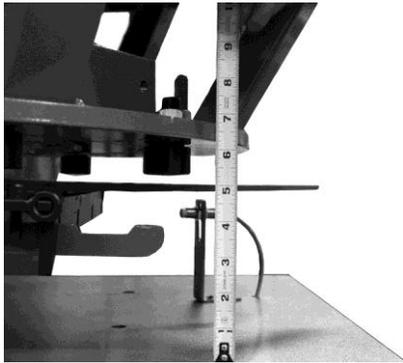
- 2 - 4" X 4" Wooden Blocks
- 1 - Tape Measure
- 1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034)
- 1 - Small Brush
- 1 -Towel

**IMPORTANT:** This procedure requires electrical power and compressed air to be connected to the press.

1. With the carousel in the **UP** position, measure the distance between the bottom carousel plate and the chassis top plate as shown. Cut 2 pieces of 4" X 4" wood slightly smaller than the measured distance.
2. Place the wooden blocks on either side of the carousel center shaft as shown (1).



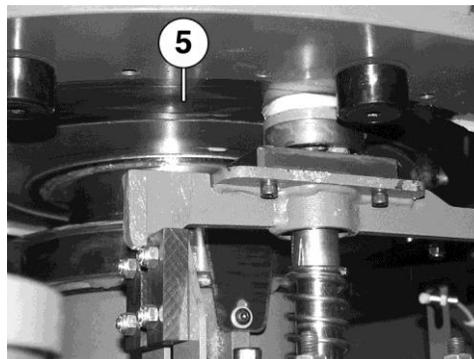
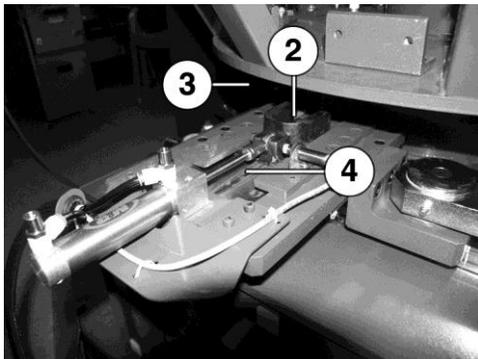
**WARNING:** Do not continue until the blocking procedure, outlined in the previous steps, has been performed. Failure to do so could result in severe or fatal personal injuries.



3. Use a towel to clean away the old grease from the inside surface of the Index Clevis (2), Index Cam Follower Bearings (3), and Clevis Plate (4). Use a small brush to apply a thin coat of new grease to these areas.
4. Use a towel to remove old grease from the bottom surface of the lower carousel plate. Apply a thin coat of grease to the bottom of the lower carousel plate where the Index Pusher Pads make contact (5).

**IMPORTANT:** If this step is not performed as specified, the Index Pusher Pads may score a groove into the surface of the carousel plate.

5. Remove wooden blocks.



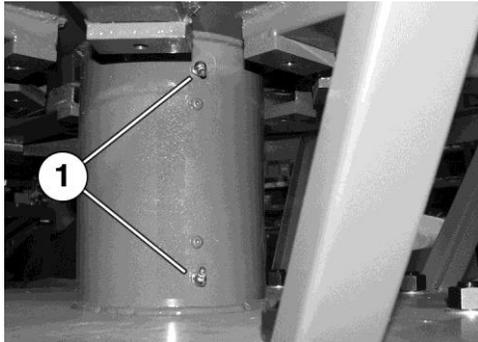
### Lubricate Center Shaft Bushings

**Items required:**

1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034)

1 - Standard Pump Action Grease Gun

Apply grease to the grease fittings (1) until you notice the grease breaking between the bearing race and the center shaft.



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### Every Two Weeks



**WARNING:** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to the equipment.

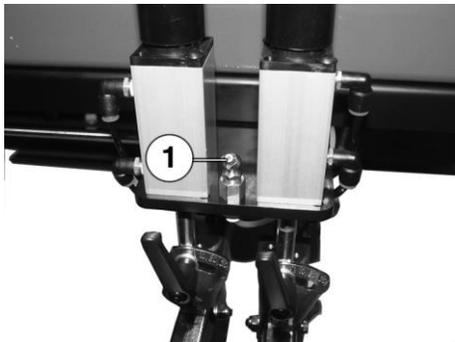
### Lubricate Print Carriage Assembly Linear Bearing

**Items required:**

1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034)

1 - Standard Pump Action Grease Gun

Using a standard pump action grease gun, slowly apply 1 pump of grease to the grease fitting (1).



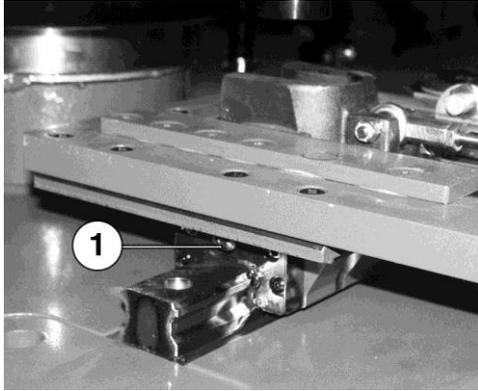
## Lubricate Index Drive Assembly Bearing

### Items required:

1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034)

1 - Standard Pump Action Grease Gun

Using a standard pump action grease gun, slowly apply 1 pump of grease to the grease fitting (1).



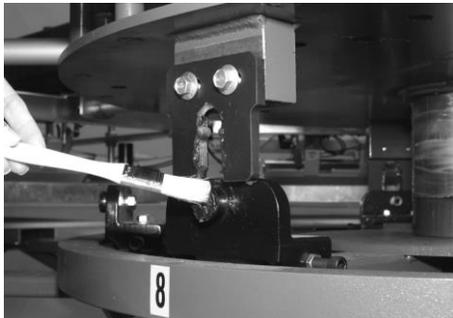
## Lubricate Registration Forks and Cam Follower Bearings

### Items required:

1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034)

1 - Small Brush

1. Use a towel to remove old grease from the inside “U” surface of the registration forks and outside race of the registration cam follower bearings.
2. Use a small brush to apply grease to the inside “U” of the registration forks and outside race of the registration cam follower bearings. Only a small amount is required.



### Lubricate Index Crank Arm

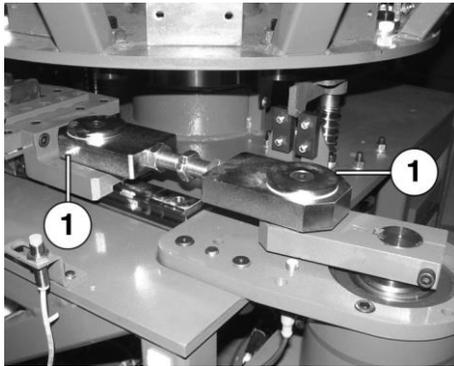
#### Items required:

1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034)

1 - Standard pump action grease gun

1 - 5/16" hex wrench

1. Remove the index drive cover.
2. Using a standard pump action grease gun, slowly apply 1 pump of grease to the grease fittings (1).
3. Reinstall the index drive cover.



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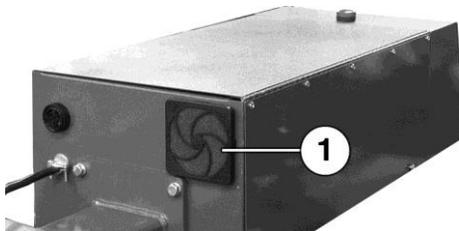
## Monthly



**WARNING:** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to the equipment.

### Clean Fan Filter Screen

Remove the frames and screens (1). Check and clean the filter screen. Reinstall the filter screen and frame (1).



### Clean Control Panel Air Vents

#### Items required:

1 - Vacuum

Vacuum the area around the fresh air intake vents under the control panel (1).



## Drain Water from Air Manifold

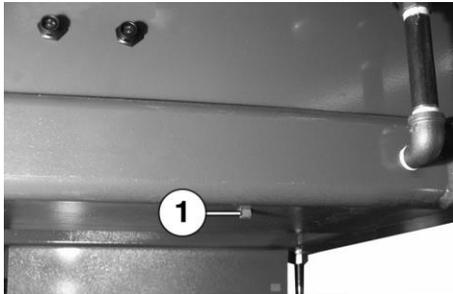
### Items required:

1 - 7/16" open end wrench



**WARNING:** Before removing drain plug (1), press and hold the orange button on the bottom of the filter to bleed off any residual air which may remain in the system.

1. Remove the manifold drain plug (1) on the bottom of the indexer chassis to drain any water that may have accumulated.
2. Replace the manifold drain plug and tighten. **DO NOT OVER TIGHTEN!**



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## Every 3 Months



**WARNING:** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to the equipment.

### Lubricate Micro-Registration Threaded Shafts

#### Items required:

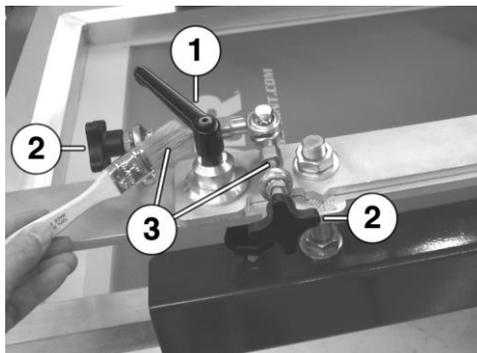
1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034)

1 - Small Brush

1 - Towel

1. Use a towel to remove old grease from the threaded shaft surfaces.
2. Loosen micro-registration knobs (1).
3. Turn adjustment knobs (2) counterclockwise as far as possible.
4. Use a small brush to apply a thin coat of grease to the exposed threads (3).
5. Return adjustment knobs (2) to the original position.
6. Tighten micro-registration knob (1).

Repeat procedure for each print head.



**Replace Air Filter Element and Reservoir Seal****Items required:**

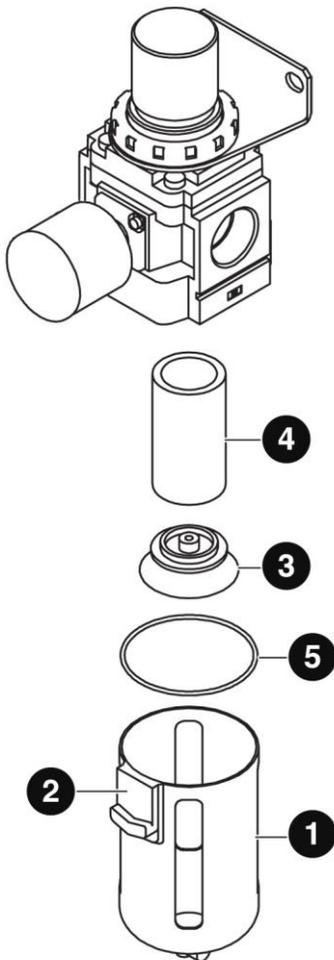
1 - Filter Element (M&amp;R Part No. 2019114-A)

1 - Bowl Seal (M&amp;R Part No. 2020091-1)

1 - 10 wt. Non-Detergent Oil (M&amp;R Part No. 7017000)

1. Press and hold the orange button on the bottom of the filter to bleed off any residual air which may remain in the system.
2. Remove Moisture Trap Reservoir (1) by pulling down the black locking latch (2) and turn 1/8 of a turn counterclockwise. Align the single line on the upper assembly with the double line on the reservoir and pull straight down and away from the Filter/Regulator Assembly.
3. Remove Bowl Seal (5) from Reservoir and replace with new Seal. Lightly lubricate the outside surface of the new seal with 10 wt. Non-Detergent Oil.
4. Remove the Baffle (3) by turning to the left (counterclockwise).
5. Install new Filter Element (4) and replace Baffle (3). Replace Reservoir (1). Firmly push Reservoir up into the Filter/Regulator Assembly and turn 1/8 turn to lock into place.

Note: The level sight glass should be facing towards the front of the assembly.





## 7.1 Scheduled Maintenance Log

Maintenance Procedure	Daily	Weekly	Every 2 Weeks	Monthly	Every 3 Months	Yearly	Every 3 Years	Date performed/ Initials
Check and Clean Print Carriage Assembly	X							
Clean Servo and Fan Motor	X							
Drain Air Filter Moisture Trap	X							
Lubricate Stroke Cylinder Rod		X						
Lubricate Index Clevis Fork, Clevis Plate and <b>Lower Carousel Plate</b>		X						
Lubricate Center Shaft Bushings		X						
Lubricate Print Carriage Assembly Linear Bearing			X					
Lubricate Index Drive Assembly Bearing			X					
Lubricate Registration Forks and Cam Follower Bearings			X					
Lubricate Index Crank Arm			X					
Clean Control Panel Fan and Air Vents				X				
Drain Water from Air Manifolds				X				
Lubricate Micro-Registration Threaded Shafts					X			
Replace Air Filter Element and Reservoir Seals					X			

# 8. Troubleshooting

## General Guide

The following information is provided as a guide for troubleshooting. If you have any questions regarding the installation, operation, or preventive maintenance procedures for this equipment, contact The M&R Companies Service Department. Anyone using this troubleshooting guide should have a working knowledge of electrical power and the control systems on this equipment.

## Schematic

Electrical schematics are located in the back of this manual.

**IMPORTANT:** This unit must receive adequate electrical power to perform properly. Make sure the electrical power lines to the equipment are on.

Problem	Probable Causes	Solution
No power to main control panel. The print stations or index system does not operate.	On/Off switch located on the side of the control panel is in the Off position.	Check the On/Off switch and make sure it is selected for the On position.
	The circuit breaker for the incoming electrical power to the equipment has tripped or opened.	Check for the proper incoming electrical power at the incoming power terminal block on the equipment. Reset the circuit breaker as necessary.
	The control circuit breaker (CB1) has tripped.	The circuit breaker has wires #6 and #7 or N attached to it. Before restoring the circuit breaker to the on position, carefully check the equipment for any indications of “binding” mechanical assemblies, or evidence of electrical or mechanical overloads. Do not attempt to restore electrical power to the equipment until you have determined the cause of the circuit breaker trip or failure. After restoring circuit breaker to on, check for 220 VAC across wire #1 and wire #2 or N with a voltmeter. If 220 volts AC is not indicated on the voltmeter, replace the circuit breaker.
	A short circuit exists in the 24 volt DC power supply circuit of the press.	Check for 24 VDC across wires #24N and #24V with a voltmeter. If no voltage is present check for 220 VAC across wires #13 and #14 on the 24 Volt DC Power Supply. If 220 VAC is indicated, replace the 24 Volt DC Power Supply. If 220 volts is not indicated, check for open wires to the 24 Volt DC Power Supply or check circuit breaker CB2.
	A print station proximity switch may be damaged or inoperative.	Check for any damage (pinch points on proximity switch wires and/or cables) to print station proximity switches and replace as necessary.



<b>Problem</b>	<b>Probable Causes</b>	<b>Solution</b>
Electrical power is indicated to controls, but nothing operates.	There may be insufficient air pressure to the equipment (100 lbs. minimum per square inch).	Verify the compressor is turned on and the shut-off valve is open. Adjust the main air regulator to at least 100 lbs. minimum per square inch.
During the setup procedure a print station button is activated, however the carousel does not move up to the print position.	One or more print stations are selected for On.	Verify all print stations are selected to the Off position.
	The Emergency Stop button has been activated.	Pull out the red Emergency Stop button and press the green Reset button to resume operation.
	There may be insufficient air pressure to the equipment (100 lbs. minimum per square inch).	Verify the compressor is turned on and the shut-off valve is open. Adjust the main air regulator to at least 100 lbs. minimum per square inch.
	The lift valve solenoid coil may have failed.	Remove the base access cover on the indexer and manually activate the valve by pushing the override/test button. If the indexer goes up and down the valve is fine. Locate wires #Y7 and #24V and inspect the wires from the control box. Using a volt meter, they should read 24 volts DC. If voltage is not present, trace for broken wires or open/loose connections.
The indexer does not move up into the print position.	The off-contact is set too low, or one or more Screen Clamps may be striking the pallets when the index table moves up.	Readjust the off-contact setting. The screen frame should be adjusted so that there is at least 1/16" off-contact between the frame and the material being printed.
Indexer shudders or is excessively noisy when cycling up or down.	The main index shaft bearings require lubrication.	Lubricate the index shaft bushing with Permatex Super Lube with Teflon grease.
The print station completes the print cycle; however the index table does not lower.	One or more of the proximity switches on print stations is defective or misadjusted.	Once it has been determined which proximity switch or switches are at fault, check the switch to see if it will operate using a piece of metal to trigger the switch. If the LED on the side of the proximity switch illuminates, adjust the distance between the proximity switch tip and the actuator flag on the print carriage assembly for consistent operation.

Problem	Probable Causes	Solution
<p>The electrical and pneumatic power to the equipment is connected, but the index table does not operate.</p>	<p>The Emergency Stop button has been activated.</p>	<p>Pull out the red Emergency Stop button and press the green Reset button to resume operation.</p>
	<p>One of the yellow cycle interruption cords between print stations is disconnected.</p>	<p>Verify all yellow cycle interruption cords are properly connected. Clean away any ink that may have accumulated on the cord surface.</p>
	<p>The carousel is located in the wrong position.</p>	<p>Carousel arms are not located in the correct position. Manually move the index table to align a cam follower bearing with a registration fork; the index clevis locks into place.</p>
	<p>Index ON proximity switch is damaged or misadjusted.</p>	<p>Check to see if the LED indicator light on the proximity switch illuminates when the index cam follower locates under the registration fork. If it does not, adjust the proximity switch with two 11/16" open-end wrenches until the LED illuminates.</p>
<p>The index table rotates, however the table assembly does not lift into print position.</p>	<p>Index ON proximity switch is damaged or misadjusted.</p>	<p>Check to see if the LED indicator light on the proximity switch illuminates when the index cam follower locates in front of the switch. When the index cam follower is not in front of the proximity switch, you should not see the LED indicator illuminate. If the LED stays on constantly, replace the Index On proximity switch.</p>
	<p>Lift valve solenoid coil is defective. The lift valve solenoid coil on the valve may have failed.</p>	<p>Remove the base access cover on the indexer and manually activate the valve by pushing the override/test button on the valve body. If the indexer cycles up and down, the valve is fine. Locate wires #Y7 and #24V on the valve body, and inspect the wires from the control box to the valve. Using a volt meter, they should read 24 volts DC. If DC voltage is present, replace the solenoid on the valve. If voltage is not present check for broken or open/loose connections on the wires from the control box to the valve body. The test should be taken after the press has finished rotating (indexing).</p>
<p>In the automatic mode, the press cycles a few times and then stops.</p>	<p>A yellow cycle interruption cord has broken or has a loose wire connection.</p>	<p>Check all cycle interruption cords at plugs with a continuity tester for open or broken wires. Replace the cycle interruption cord as necessary.</p>



Problem	Probable Causes	Solution
<p>The indexer moves up and the print stations start to print but do not complete the print stroke.</p>	<p>A print station flow control (Squeegee/Flood Speed) valve is misadjusted.</p>	<p>Increase the squeegee speed on the print station control.</p>
	<p>Solenoid valve is sticking or there is an air leak in the system.</p>	<p>Remove the access covers from the top of the carousel and check for any air leaks. Press on the test button on the end of the print station valves to be sure that they are free and that nothing mechanical has stopped the print station from moving. This action will force any dirt or lint that might be blocking the spool slide through the valve.</p>
<p>The print station goes through the flood cycle and print cycle, however the floodbar and squeegee do not go through the change over.</p>	<p>Solenoid valve for the chopper cylinders has failed.</p>	<p>With the power to the equipment turned off, manually activate the valve for the chopper cylinders by pressing the test button on the valve body. If the action takes place, the valve is operating correctly.</p>
	<p>The solenoid coil which controls the air valve for the print station in question may have failed.</p>	<p>To check the solenoid, use an Ohmmeter. Disconnect the wires to the solenoid of the valve in question to isolate it from the circuit. Take an Ohm reading across the solenoid terminals on the valve. If you read continuity across the solenoid terminals, the solenoid is operating correctly. If you do not observe a reading, the solenoid coil is "open" and must be replaced.</p>

# 9. Replacement Parts

## CE vs. UL Models

All equipment containing electrical components is designed to comply with either Conformance European (CE) or Underwriters Laboratories (UL) standards, and each type of equipment has a different parts list. CE equipment runs at 50 Hz; UL equipment runs at 60 Hz. Electrical specifications, including Hertz, can be found on the Manufacturer's Rating Plate similar to the one shown below.

Note: You must verify whether your equipment is 50 Hz (CE) or 60 Hz (UL) and order parts accordingly.



**DANGER:** Operating this equipment with incorrect electrical parts can result in severe or fatal personal injuries and/or property damage.

## Schematic Diagrams for Electrical Parts

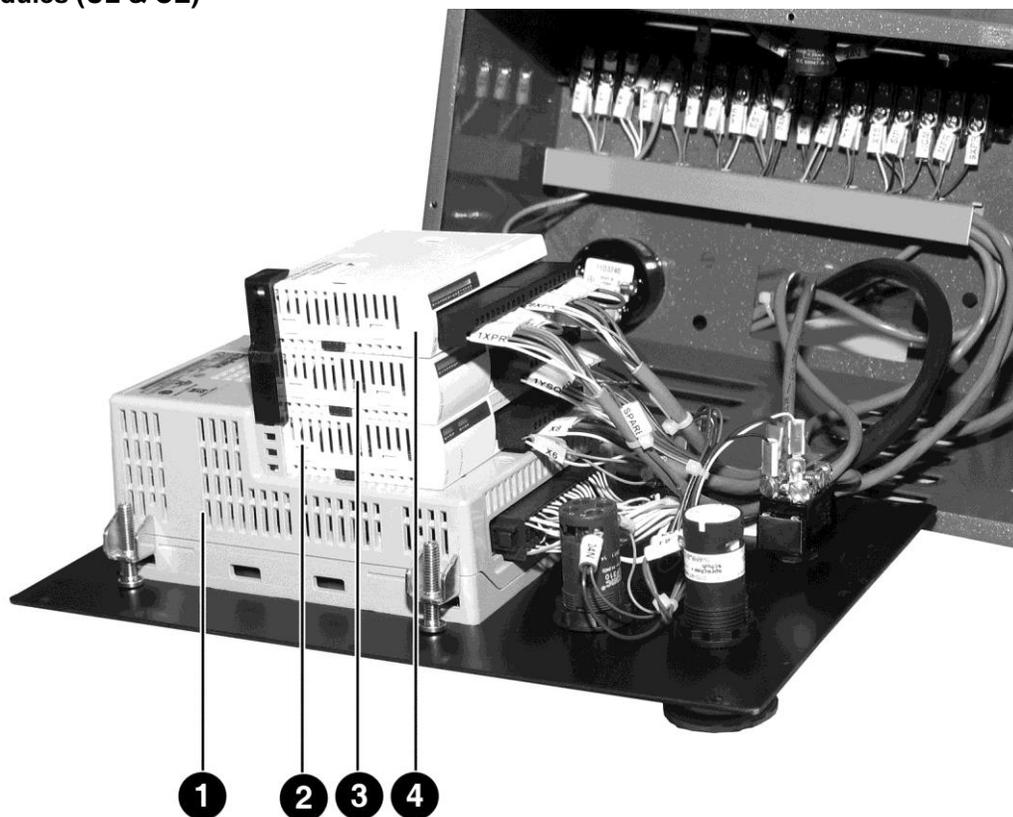
M&R uses the 'just-in-time' approach to printing manuals, so the electrical parts and part numbers shown in this section should be accurate. However, since schematic diagrams are unit-specific, they remain the most accurate source of electrical part numbers. Cross-reference the part numbers in this manual with the part numbers in the schematic diagrams in the back of this manual before placing an order.

**Control Panel (UL & CE)**

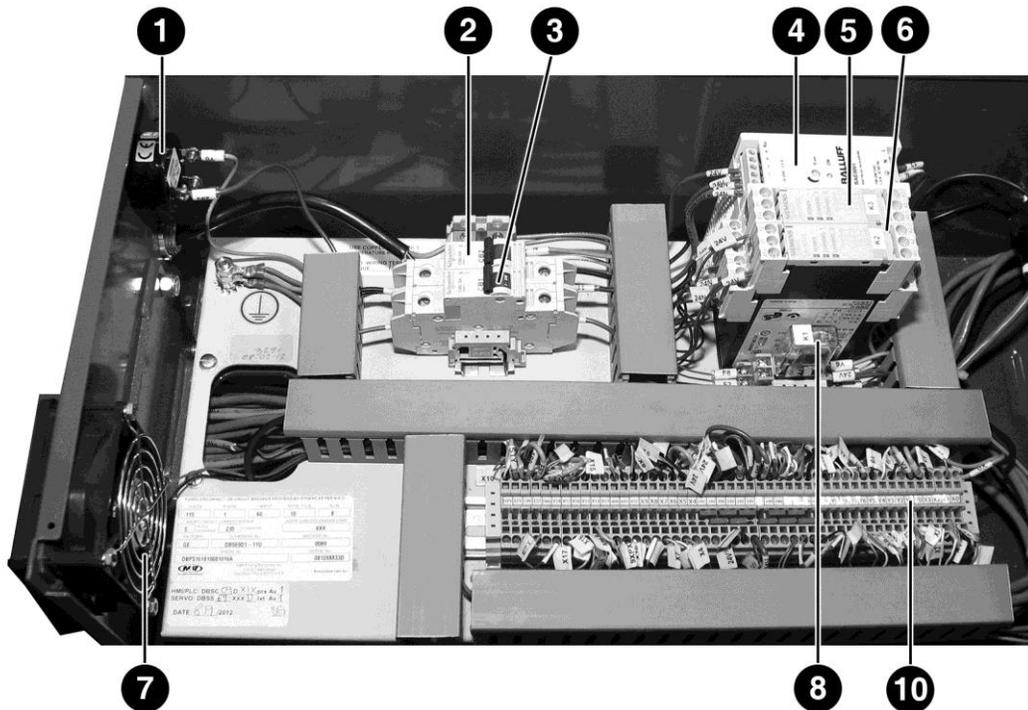


	<b>Control Panel (UL &amp; CE) Part Name</b>	<b>Part Numbers All Models</b>
1	Touch Screen	1017995
2	Red Pilot Lamp	1010405
3	Reset Button	1010401
4	Emergency Stop	1010400
5	Switch Double Pole	1010007A
6	Disconnect Switch 25A	1010462

## HMI Modules (UL & CE)



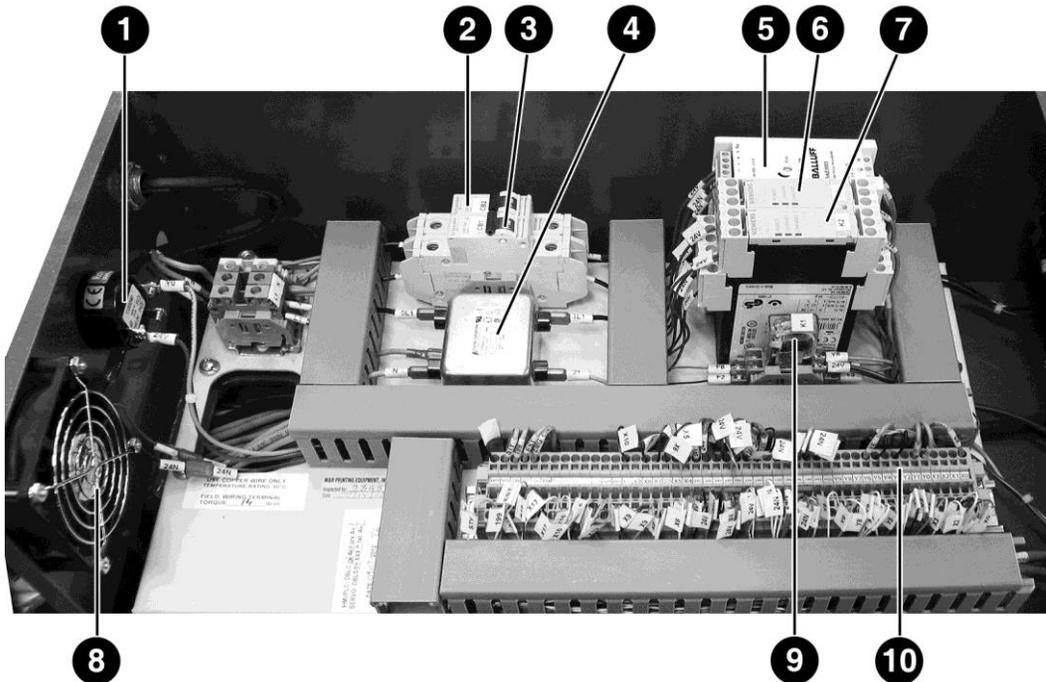
	HMI Modules (UL & CE) Part Name	Part Numbers All Models
1	HMI Touch Screen	1017995
2	Extension I/O Module	1038212
3	Extension Output Module	1017942
4	Extension Input Module	1017940

**Electrical (UL)**


Note: 115V 1Ph. 60Hz. shown. Refer to **Schematic Diagrams for Electrical Parts** before placing a parts order.

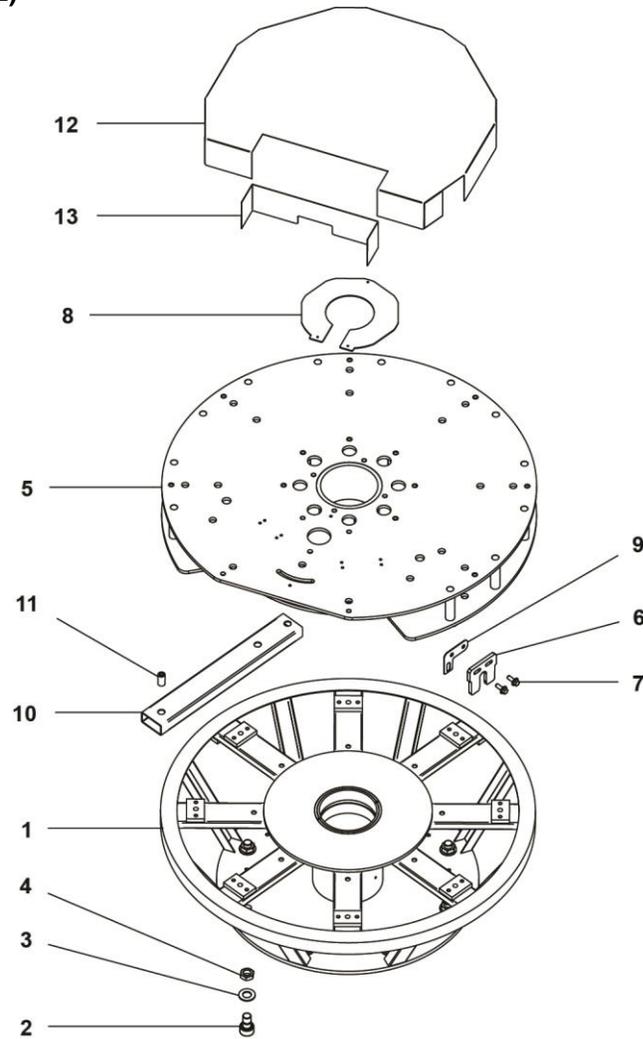
	<b>Electrical (UL) Part Name</b>	<b>Part Numbers All Models</b>
1	Sonalert Sensor	1024004C
2	Circuit Breaker 1 Pole 8A (CB2)	1006475
	Circuit Breaker 2 Pole 8A (CB2) 208/230V 1 Ph	1006522
3	Circuit Breaker 1 Pole 3A (CB1)	1006442
	Circuit Breaker 2 Pole 3A (CB1) 208/230V 1 Ph	1006447
4	Power Supply 24 VDC	1024124
5	Emergency Relay K3	1017422
6	Safety Relay K2	1017422
7	Fan 24 VDC 42 cfm	1009103
8	Relay 2 Pole K1	1010204
9	Terminal Block	1003183

## Electrical (CE)



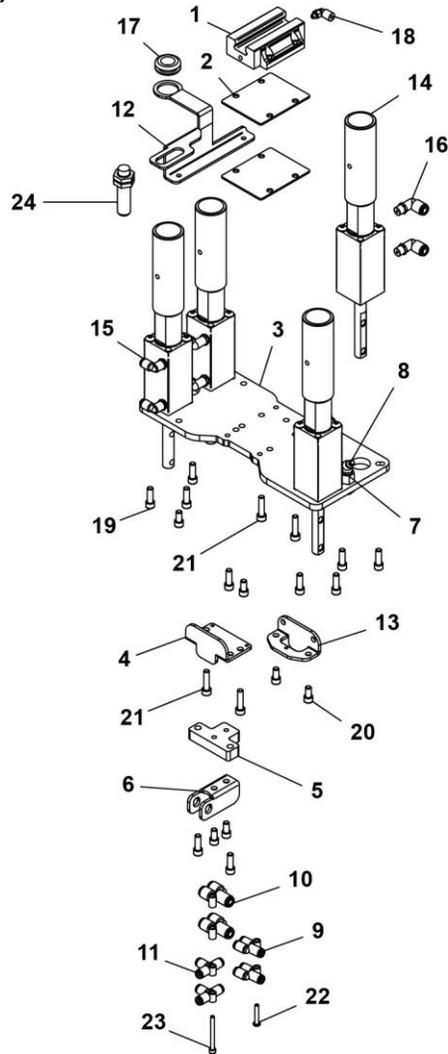
Note: 230V 1Ph. 50Hz. shown. Refer to **Schematic Diagrams for Electrical Parts** before placing a parts order.

	<b>Electrical (CE) Part Name</b>	<b>Part Numbers All Models</b>
1	Sonalert Sensor	1024004C
2	Circuit Breaker 1 Pole 8A (CB2)	1006475
3	Circuit Breaker 1 Pole 3A (CB1)	1006442
4	Line Filter	1036020D
5	Power Supply 24 VDC	1024124
6	Emergency Relay K3	1017422
7	Safety Relay K2	1017422
8	Fan 24 VDC 42 cfm	1009103
9	Relay 2 Pole K1	1010204
10	Terminal Block	1003183

**Carousel Assembly (UL & CE)**


	<b>Carousel Assembly (UL &amp; CE) Part Name</b>	<b>Part Number All Models</b>
1	Lower Carousel Machine	9162120
2	Cam Follower	3023012
3	Wrought Flat Washer 7/8"	3020009
4	Finished Hex Jam Nut 7/8-14	3013000
5	Upper Carousel Weldment	9162070
6	Registration Fork	9151077-A
7	Whiz Lock Bolt 3/8-16 X 1"	3003000
8	Electric Mounting Plate	9168131
9	Lift Proximity Bracket	9162101
10	Pallet Stop Arm Tube	9162103
11	Welding Nut 3/8-16 X 1.5"	9162105
12	Upper Cover Skin	9470527-A
13	Top Cover Front Wall	9470528

## Carriage Assembly (UL & CE)

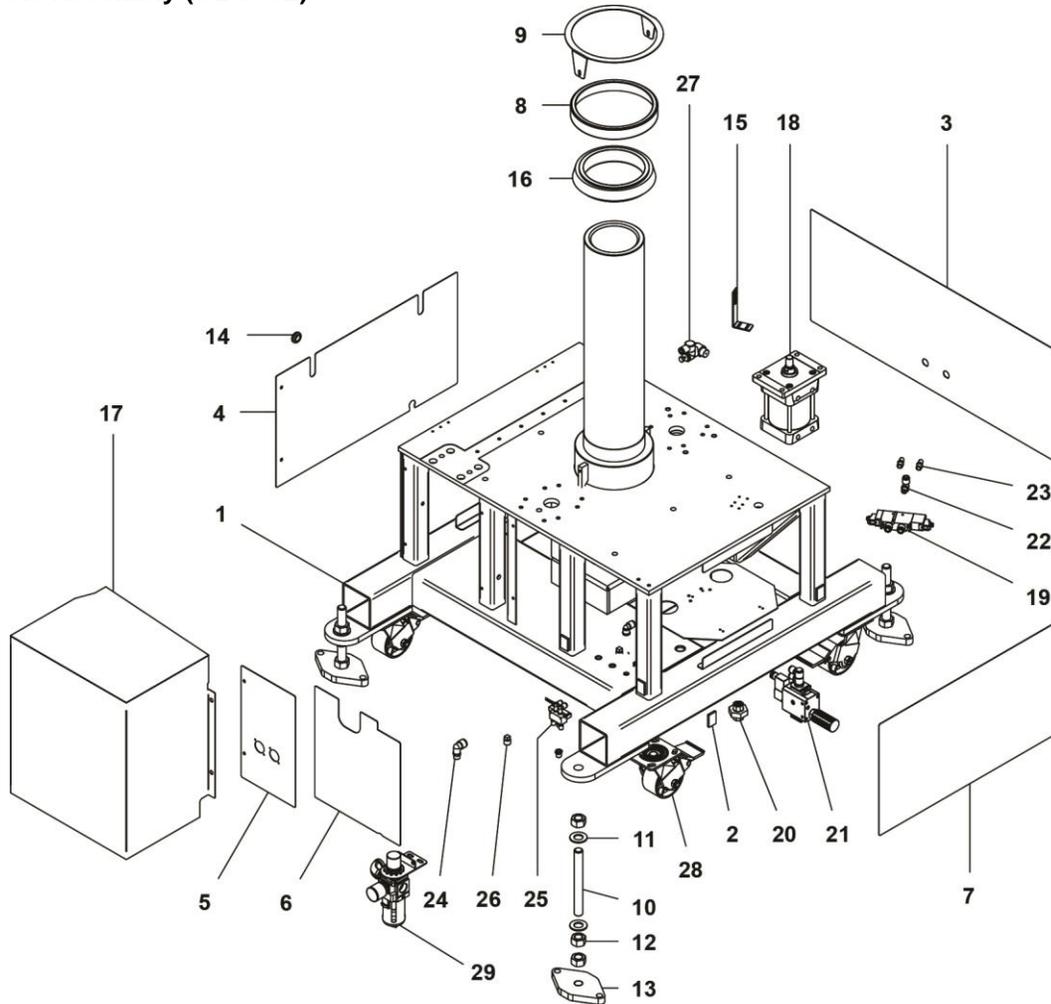


	Carriage Assembly (UL & CE) Part Name	Part Numbers All Models
1	Linear Bearing Carriage	3030113
2	Carriage Spacer	9165522
3	Carriage Plate	9167196
4	Rear Bumper Bracket	9162188
5	Spacer	9162187
6	Clevis Channel	9162186
7	Bulkhead Fitting	2003239
8	Fitting Grease 1/8" NPT 45 Degree	2003032
9	Fitting "Y" 5/32" Tube W/Hole	2003024
10	Fitting Y Connector 1/4" Hose	2003086
11	Fitting Union Tee 5/32" Tube	2003021
12	Proximity Mounting Bracket	9167132
13	Front Bumper Bracket	9162189
14	Flood Bar Air Cylinder 1-1/8" Bore	2009544



15	Fitting Male Swivel Elbow 1/8" NPT	2003004
16	Fitting Male Elbow 1/8" NPT	2003005
17	Grommet Rubber 1-1/8" OD X 5/8"	7001016
18	Elbow One Touch Fitting 4 mm OD	2005129
19	Socket Cap Screw 1/4-20 X 3/4"	3009022
20	Socket Cap Screw 1/4-20 X 1/2"	3009019
21	Socket Cap Screw M6 X 25 mm	3009173
22	Button Socket Cap Screw 8-32 X 1-1/4"	3001071
23	Socket Cap Screw 8-32 X 1-3/4"	3009250
24	Head Number Proximity Switch	1010307

## Chassis Assembly (UL & CE)

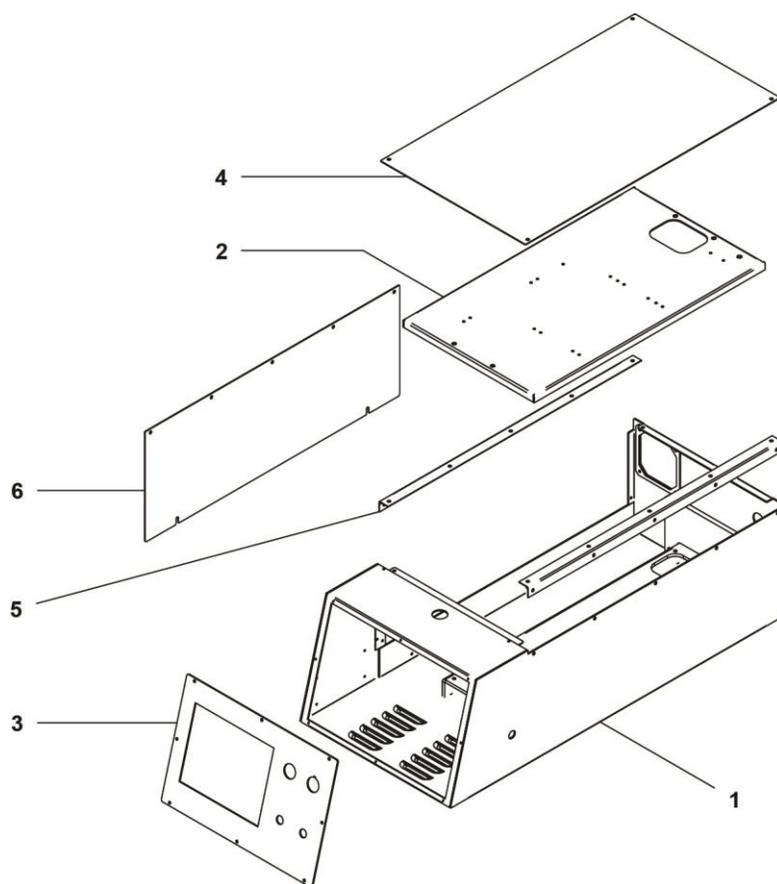


	Chassis Assembly (UL & CE) Part Name	Part Numbers All Models
1	Base Weldment	9470521
2	Dual Lock	9MC7016012-1
3	Front Base Cover	9168382
4	Right Base Cover	9162166
5	Rear Left Base Cover	9168326
6	Rear Right Base Cover	9168368-A
7	Left Base Cover	9168369
8	Bearing Cup	9150125
9	Bearing Holder Ring 10"	9162135
10	Leveling Bolt	9470224
11	Wrought Flat Washer 7/8"	3020009
12	Finished Hex Nut 7/8-14	3013030
13	Leveling Bolt Base	9470223
14	Grommet Rubber 7/8 OD X 1/8"	7001000
15	Index On Proximity Mounting Bracket	9162161
16	Bearing Cone	3023001

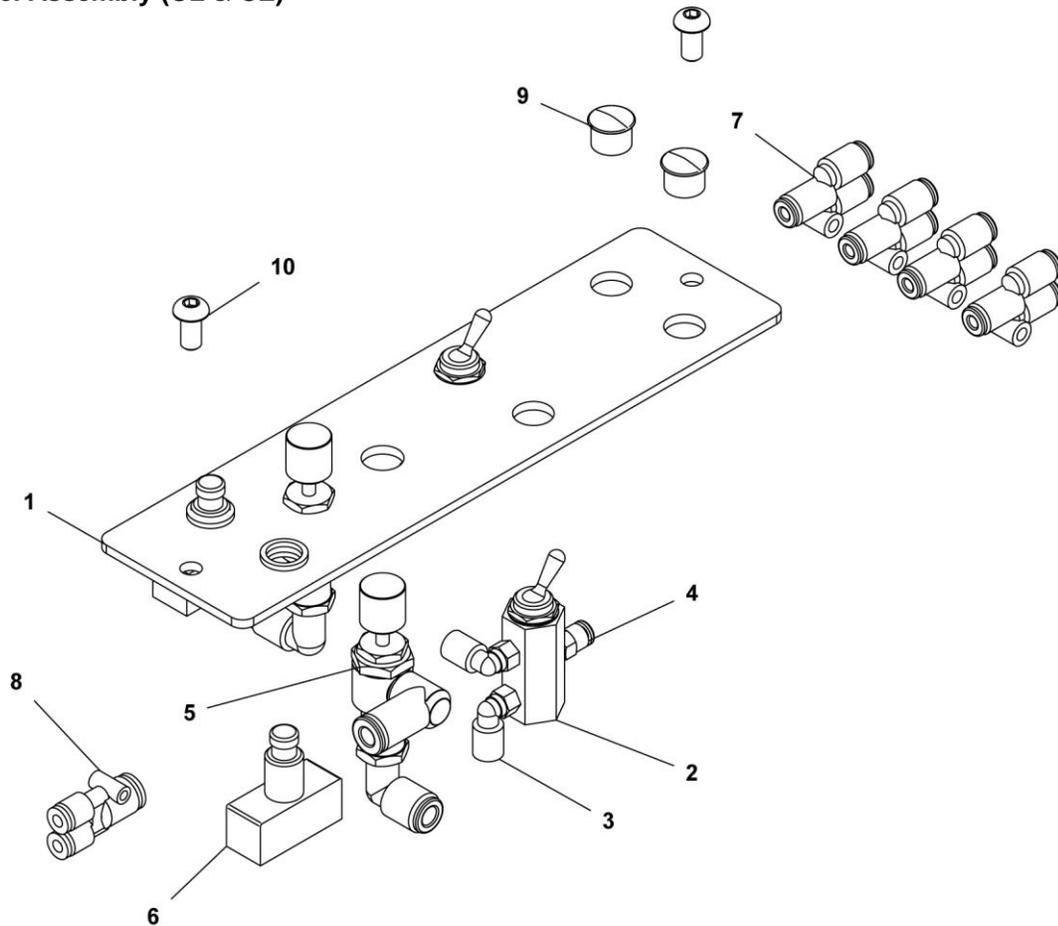


17	6E & 8E Crank Cover Weldment	9166237
18	Lift Cylinder 4" Bore 2" Stroke	2009304
19	Exhaust Center Valve	2018212
20	Union Black 1/2"	2013000
21	1/2" NPT Soft Start Valve Assembly	2018144
22	Fitting Male Swivel Elbow 1/4" NPT	2003013
23	Muffler 1/4"	2014000
24	Fitting Male Elbow 3/8" NPT	2003006
25	1 Station Valve Manifold Assembly	2019092-C
26	Plug Square Head Black 3/8 NPT	2006001
27	1/2 NPT Dual Speed Controller	2020309
28	Swivel Caster 4" X 2" X 5-5/8"	3037005-A
29	Filter Regulator 3/4"	2020091-AA
	Replacement Filter	2019114-A

**Electrical Box Assembly (UL & CE)**

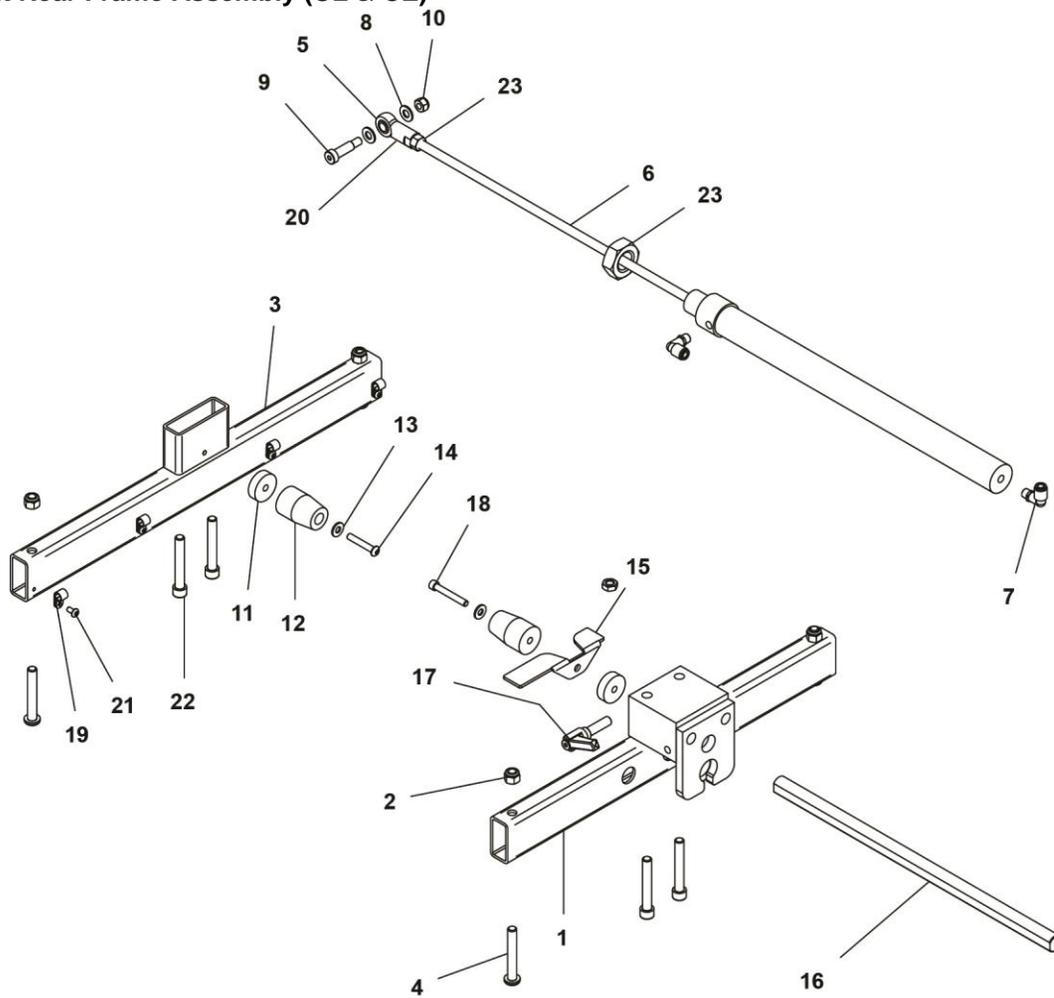


	<b>Electrical Box Assembly (UL &amp; CE) Part Name</b>	<b>Part Numbers All Models</b>
1	Electrical Box Body	9168222-A
2	Upper Box Sub Panel	9168221
3	Control Panel	9470361-A
4	Upper Box Horizontal Cover	9168234
5	Upper Box Cover Hinge	9168228
6	Upper Box Vertical Cover	9168236

**Control Panel Assembly (UL & CE)**


	<b>Control Panel Assembly (UL &amp; CE) Part Name</b>	<b>Part Numbers All Models</b>
1	Printed Head Control Plate	9151044-A-SP
2	Air Switch 4 Way Ports	2018011
3	Fitting Male Swivel Elbow	8000059
4	Fitting Male Connector	2003023
5	Panel Mount Flow Control 1/4"	2018121
6	Switch Push Button	1010006
7	Fitting "Y" 5/32" Tube w/Hole	2003024
8	Fitting Union "Y" 1/4" To 5/32"	2003181
9	Dome Plug 1/2" Hole	1018009
10	Button Socket Cap Screw 1/4-20 X 1/2"	3001005

**Front Rear Frame Assembly (UL & CE)**

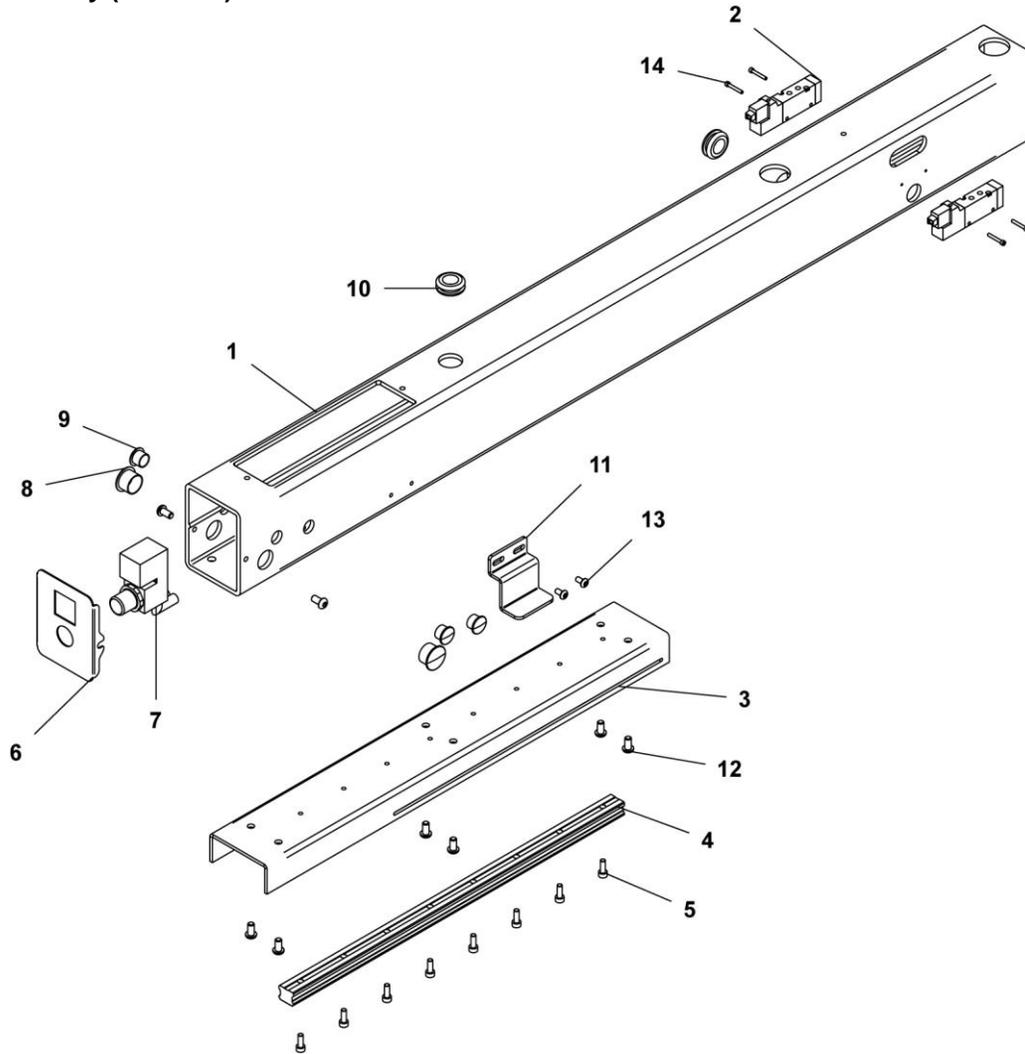


	<b>Front Rear Frame Assembly (UL &amp; CE) Part Name</b>	<b>Part Number All Models</b>
1	Sub Frame Rear Beam	9470145-A
2	Elastic Stop Nut 3/8-16	3012003
3	Sub Frame Front Beam	9470140-A
4	Button Socket Head Cap Screw 3/8-16 X 2-1/2"	3001206
5	Female Rod End 3/8-24	3034002
6	Cylinder 1-1/8" Bore 14" Stroke 3/8" Rod	2009582
7	Fitting Male Elbow 1/8" NPT	2003005
8	Wrought Flat Washer 5/16"	3020007
9	Shoulder Bolt 3/8" X 1"	3006044
10	Elastic Stop Nut 5/16-18	3012001
11	Head Stroke Front Bumper Washer	9167218
12	Polyurethane Bumper-Molded	9161013-1
13	Wrought Flat Washer 1/4"	3020005
14	Button Socket Cap Screw 1/4-20 X 1-1/2"	3001057
15	Proximity Flag-Rear	9167105

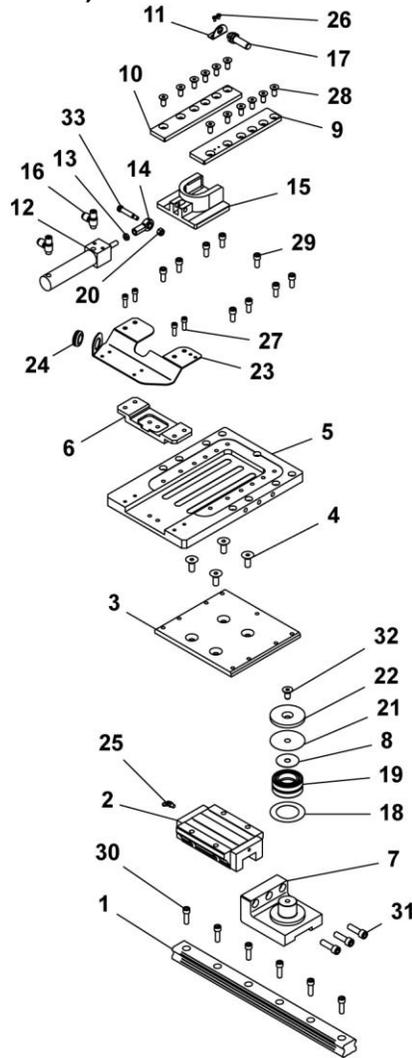


16	Tag Bumper Rod	9470114
17	Adjustable Lever 3/8-16 X 1.26"	3032075
18	Socket Cap Screw 1/4-20 X 1-3/4"	3009020
19	Nylon Loop Strap (Off-White)	1003208
20	Finish Hex Nut ZP 3/8-24	3013008
21	Button Socket Cap Screw 10-24 X 3/8"	3001003
22	Socket Cap Screw 3/8-16 X 2 1/2"	3009139
23	Finished Hex Jam Nut ZP 1-14	3013013

## Head Tube Assembly (UL & CE)

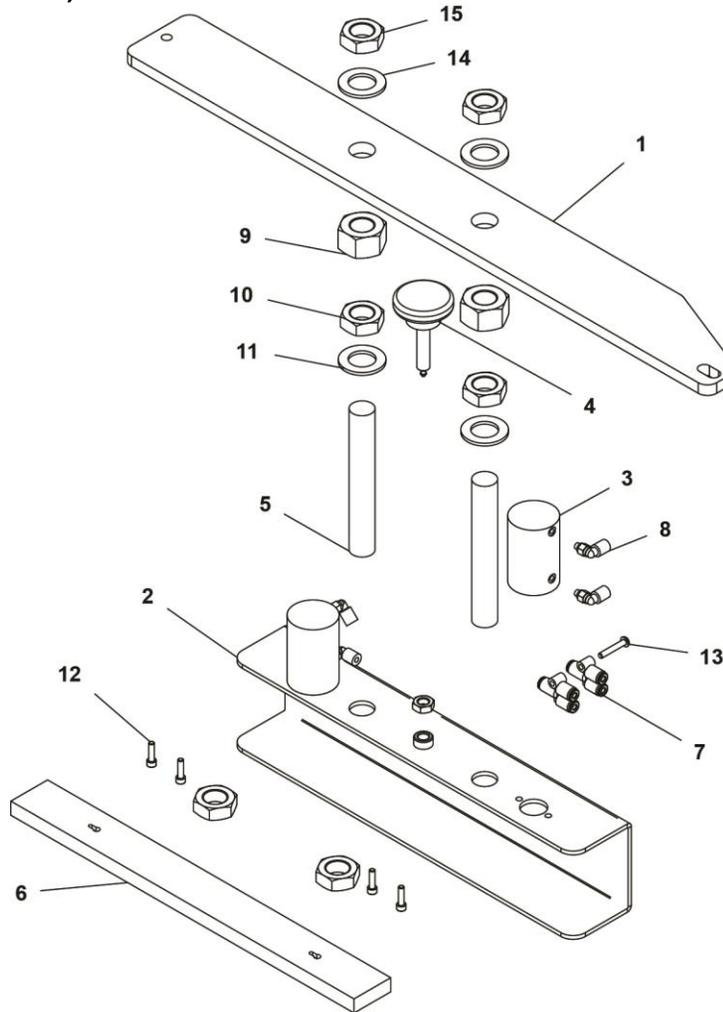


	Head Tube Assembly (UL & CE) Part Name	Part Numbers All Models
1	Head Tube	9470111
2	2 Position Valve Body Ported	2010133-C
3	Head Channel	9470112
4	Linear Rail 460 mm	3030244
5	Socket Cap Screw M5 X 14 mm	3009303
6	AC Print Head Cover 4"	9165547-A
7	Pressure Regulator With Gauge	2019132
8	Round Snap in Plug 13/16" Hole Diameter	7025023
9	Snap In Plug 9/16" Hole Size	7025007
10	Grommet Rubber 1-1/8" OD X 5/8"	7001016
11	Proximity Flag 2.218" X 2"	9167129
12	Button Socket Cap Screw 1/4-20 X 1/2"	3001005
13	Button Socket Cap Screw 10-24 X 3/8"	3001003
14	Socket Cap Screw M4-40 X 3/4"	3009119

**Servo Index Clevis Plate Assembly (UL & CE)**


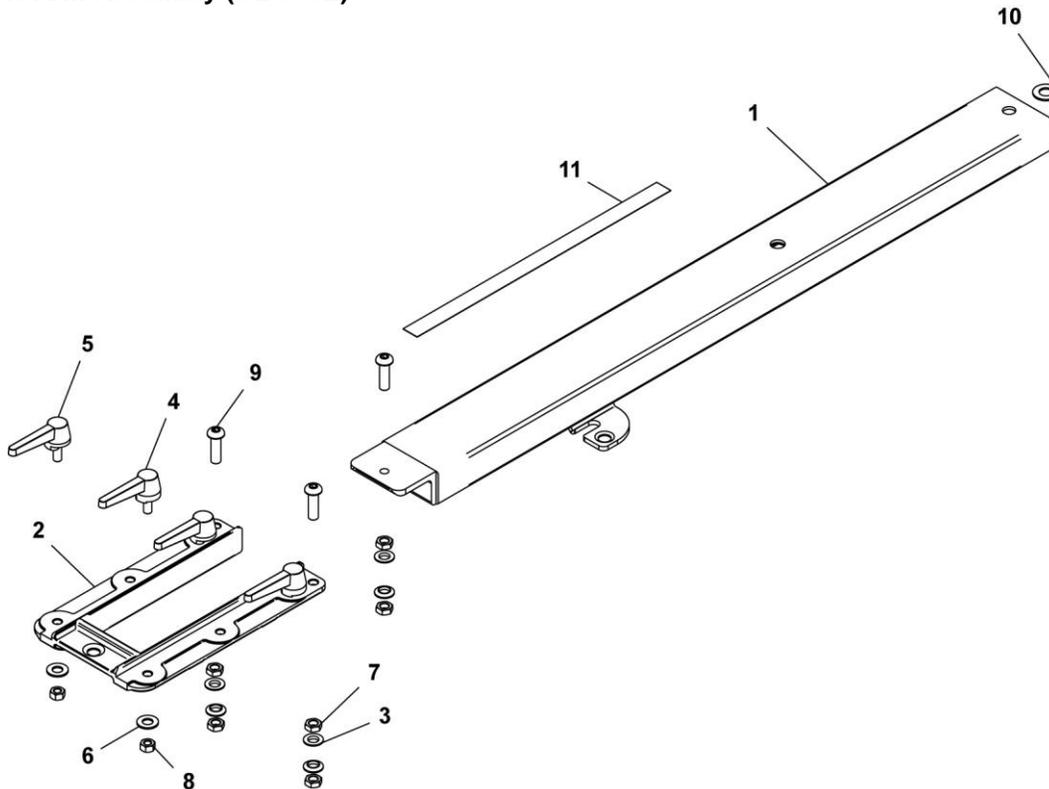
	<b>Servo Index Clevis Plate Assembly (UL &amp; CE) Part Name</b>	<b>Part Numbers All Models</b>
1	Linear Way Slide Rail	3030194
2	Linear Way Block	3030193
3	Index Mounting Plate Spacer 7"	9155046
4	Flat Socket Cap Screw M10 X 25 mm	3001094
5	Index Mounting Plate	9162250
6	Clevis Lock 2" X 6"	9151006
7	Carriage Clevis Base	9162248
8	Washer 1.625" OD X 0.406" ID	9162239
9	Right Side Index Clevis Guide	9151019-R
10	Left Side Index Clevis Guide	9151019-L
11	Proximity Bracket All Index	9154184
12	Fork Clevis Cylinder	2009178
13	Finish Hex Jam Nut 1/4-20	3013114
14	Female Rod End 5/16-24	3034011

15	Index Clevis	8121252C
16	Universal Flow Control	2018079
17	Proximity Switch Round	1010293
18	Bottom Washer	9162237
19	Needle Bearing	3023506
20	Elastic Stop Nut 1/4-20	3012000
21	Top Washer	9162238
22	Pivot Shaft Washer	9162256
23	Clevis Cable Support	9162236
24	Grommet Rubber 7/8" OD X 1/8"	7001000
25	Grease Fitting 67.5 Degree Angle	2003292
26	Pan Head Machine Screw 6-32 X 1/4"	3004003
27	Socket Cap Screw 1/4-20 X 3/4"	3009022
28	Flat Socket Cap Screw 5/16-18 X 3/4"	3010008
29	Socket Cap Screw 5/16-18 X 3/4"	3009005
30	Socket Cap Screw 5/16-18 X 1"	3009003
31	Socket Cap Screw 3/8-16 X 1-1/4"	3009030
32	Flat Socket Cap Screw 3/8-16 X 3/4"	3010013
33	Shoulder Bolt 5/16"X 1-1/4" Long	3006015

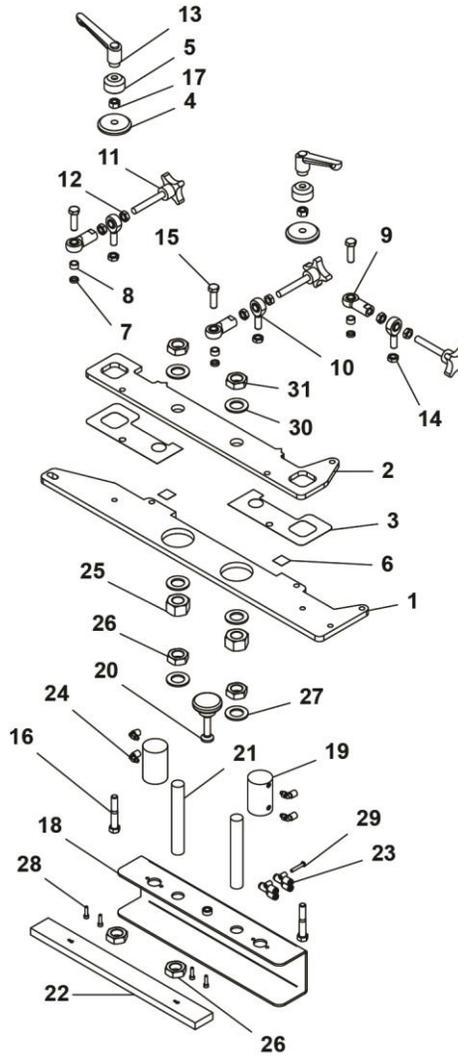
**Left Micro Assembly (UL & CE)**


	<b>Left Micro Assembly (UL &amp; CE) Part Name</b>	<b>Part Number All Models</b>
1	Tag Micro Plate	9470131
2	Screen Holder	9470126
3	Double Acting Air Cylinder	2009023C
4	Screen Holder Screw Assembly	8010003
5	Threaded Rod 3/4-16 5"	9150005-15
6	Tag Screen Frame Locking Bar	9470128
7	Fitting "Y" 5/32" Tube W/Hole	2003024
8	Fitting Male Swivel Elbow 10-32	2003031
9	Finish Hex Nuts 3/4-16	3013096
10	Finish Hex Jam Nut 3/4"-16	3013031
11	SAE Washer 3/4"	3021005
12	Socket Cap Screw 8-32 X 5/8"	3009051
13	Button Socket Cap Screw 8-32 X 1"	3001024
14	SAE Washer 3/4"	3021005
15	Finish Hex Jam Nut 3/4"-16	3013031

## Pallet Support Arm Assembly (UL & CE)



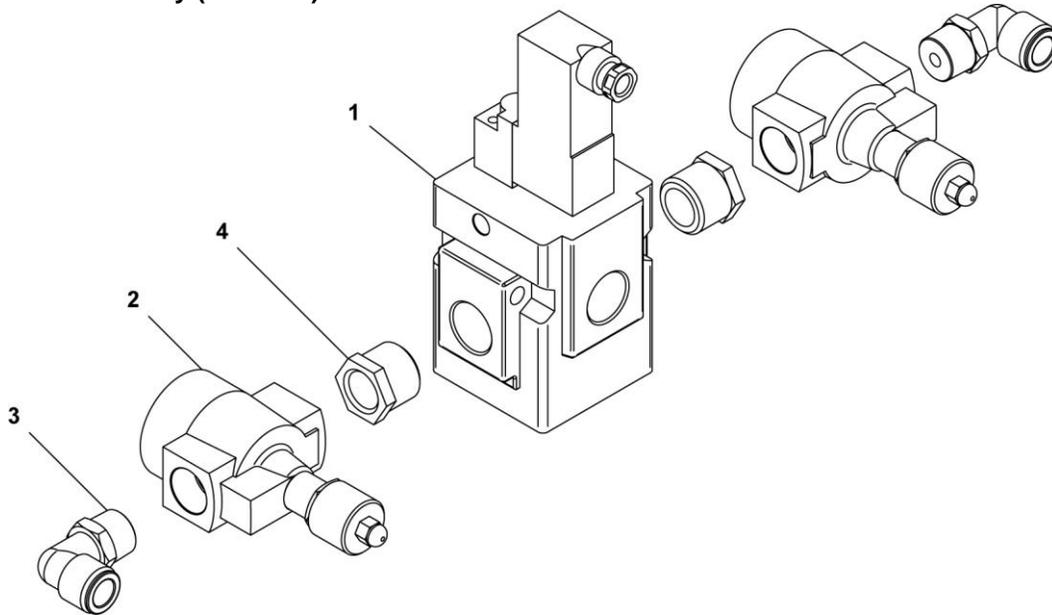
	<b>Pallet Support Arm Assembly (UL &amp; CE) Part Name</b>	<b>Part Numbers All Models</b>
1	Spider Arm Weldment	9470235-A
2	Pallet Support Bracket	9151064
3	Spherical Washer	9102153
4	Right Locking Cam	9050153-C
5	Left Locking Cam	9050154-C
6	Wrought Flat Washer 5/16" ZP	3020007
7	Finish Hex Jam Nut 3/8-24	3013015
8	Elastic Stop Nut ZP 5/16-18	3012001
9	Button Socket Cap Screw 3/8-24X 1-1/2"	3001078
10	Flat Washer 1/2" ZP	3020004
11	Pallet Stop Scale	9470234

**Right Micro Assembly (UL & CE)**


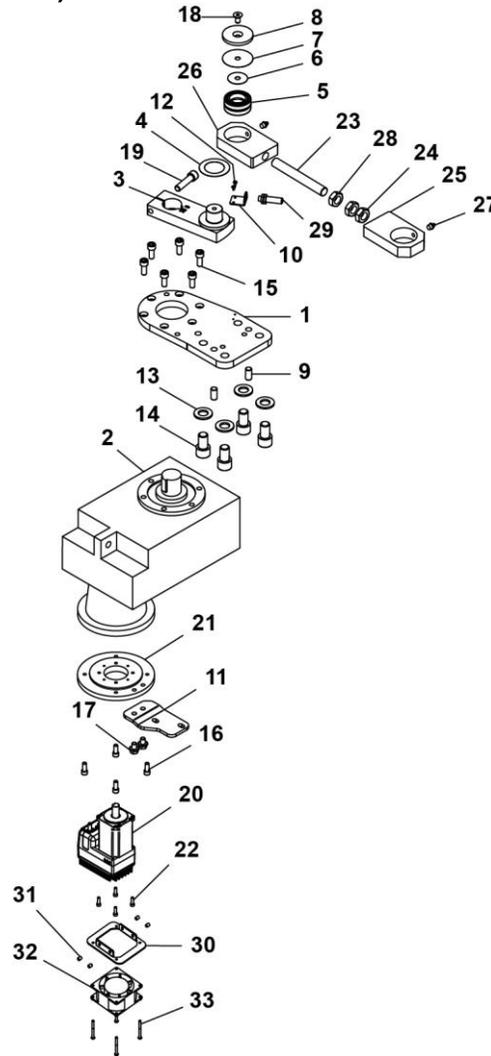
	<b>Right Micro Assembly (UL &amp; CE) Part Name</b>	<b>Part Number All Models</b>
1	Tag Micro Plate Bottom	9470123
2	Tag Micro Plate Top	9470124
3	Anti - Friction Tape	9167134-A
4	Micro Lock Washer 2" OD	8080132
5	Top Lock Washer	9150016
6	Micro Target-Black on Yellow	5020169
7	Shoulder Screw Spacer	9362579
8	Rear Micro Bushing	9150101
9	Female Rod End 3/8-24	3034002
10	Rear Micro Mounting Rod End	9150069
11	Micro X - Y Adjustable Screw 3/5"	8090057
12	Finish Hex Jam Nut 3/8-24	3013015
13	Female Handle 3/8-16 Tap	3032001
14	Finish Hex Jam Nut 3/8-24	3013015

15	Hex Cap Screw 3/8-24 X 1-1/4"	3054031
16	Hex Head Bolt 3/8-16 X 2-1/4"	3008311
17	Elastic Stop Nut ZP 3/8-16	3012003
18	Screen Holder	9470126
19	Double Acting Air Cylinder	2009023C
20	Screen Holder Screw Assembly	8010003
21	Threaded Rod 3/4-16 5"	9150005-15
22	Tag Screen Frame Locking Bar	9470128
23	Fitting "Y" 5/32" Tube W/Hole	2003024
24	Fitting Male Swivel Elbow 10-32	2003031
25	Finish Hex Nuts 3/4-16	3013096
26	Finish Hex Jam Nut 3/4"-16	3013031
27	SAE Washer 3/4"	3021005
28	Socket Cap Screw 8-32 X 5/8"	3009051
29	Button Socket Cap Screw 8-32 X 1"	3001024
30	SAE Washer 3/4"	3021005
31	Finish Hex Jam Nut 3/4"-16	3013031

**Pneumatic Valve Assembly (UL & CE)**

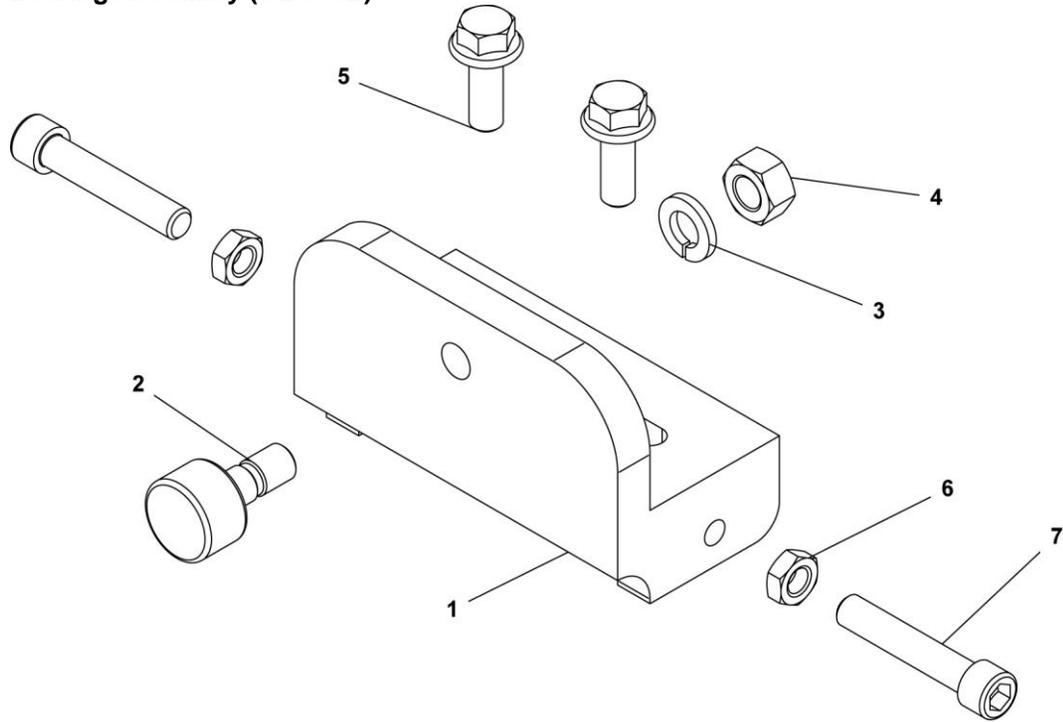


	<b>Pneumatic Valve Assembly (UL &amp; CE) Part Name</b>	<b>Part Numbers All Models</b>
1	Lift Valve 3 Port	2011021
2	In-Line Flow Control 1/2" NPT	2018152
3	Fitting Male Swivel Elbow	2003051
4	Reducing Bushing Black 3/4-1/2	2004038

**Servo Index Lower Assembly (UL & CE)**


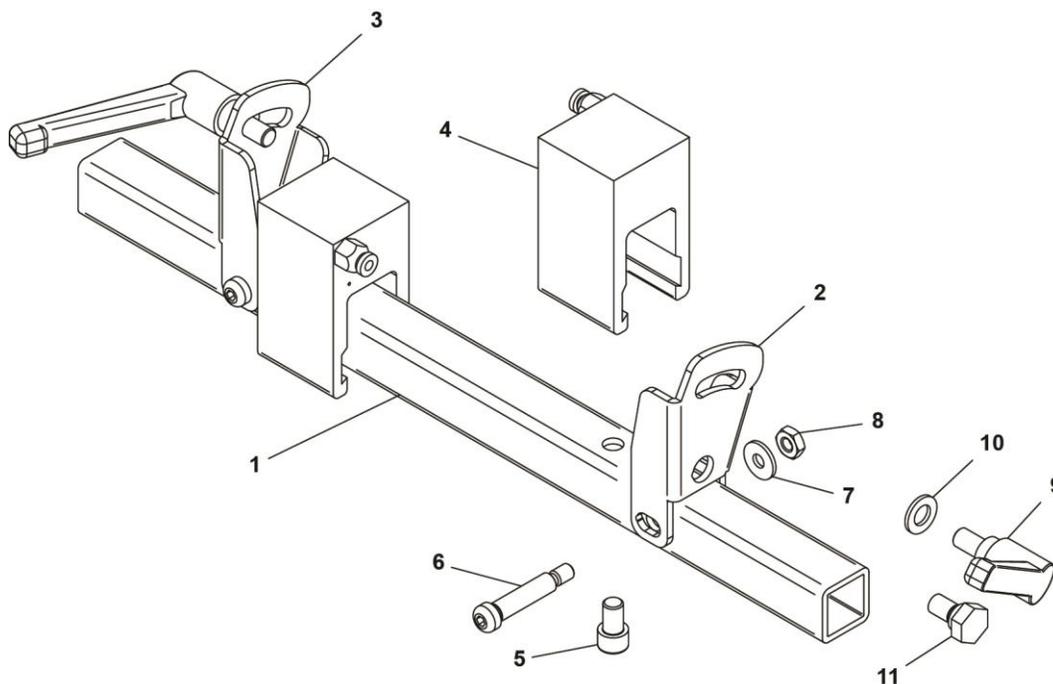
	<b>Servo Index Lower Assembly (UL &amp; CE) Part Name</b>	<b>Part Number All Models</b>
1	Reducer Mounting Plate	9165486
2	Servo Gearbox	9165488
3	Crank 10 Deg.	9166384-A
4	Bottom Washer 2.5"OD X 1.625"ID	9162237
5	Needle Bearing 1.312" X 2.1875"	3023506
6	Washer 1.625"OD X .406"ID	9162239
7	Top Washer 2.5"OD X .406"ID.	9162238
8	Pivot Shaft Washer 2.5"OD	9162256
9	Dowel Pin 1/2" X 1"	3014005
10	Proximity Bracket	9166676
11	Gearbox Low Mount Bracket	9166497
12	Pan Head Machine Screw 6-32 X 1/4"	3004003
13	SAE Washer 3/4"	3021005
14	Socket Cap Screw 3/4-10 X 1-1/4"	3009136

15	Socket Cap Screw M10 X 25mm	3009203
16	Socket Cap Screw 5/16-18 X 3/4"	3009005
17	Flange Hex Bolt 3/8-16 X 1/2"	3003001
18	Flat Socket Cap Screw 3/8-16 X 3/4	3010013
19	Socket Cap Screw 1/2-13 X 2"	3009015
20	Integrated Servo 400W	1017963
21	Motor Adapter	9165491
22	Socket Cap Screw 10-24 X 5/8"	3009045
23	Turnbuckle Rod	9162244
24	Thin Hex Nut 3/4-16	3012041
25	Reducer Crank Bearing Housing	9162252
26	Bearing Housing	9162251
27	Grease Fitting 1/8 NPT Straight	2003275
28	Finished Hex Jam Nut 3/4-16	3013031
29	Proximity Switch Round	1010293
30	Blower Holder	9472371
31	Socket Set Screw 1/4-20 X 3/8"	3007110
32	AC Axial Compact Fan	1009085
	AC Compact Fan Power Cable (Not Shown)	1009008
33	Round Head Machine Screw 8-32 X 2"	3055041

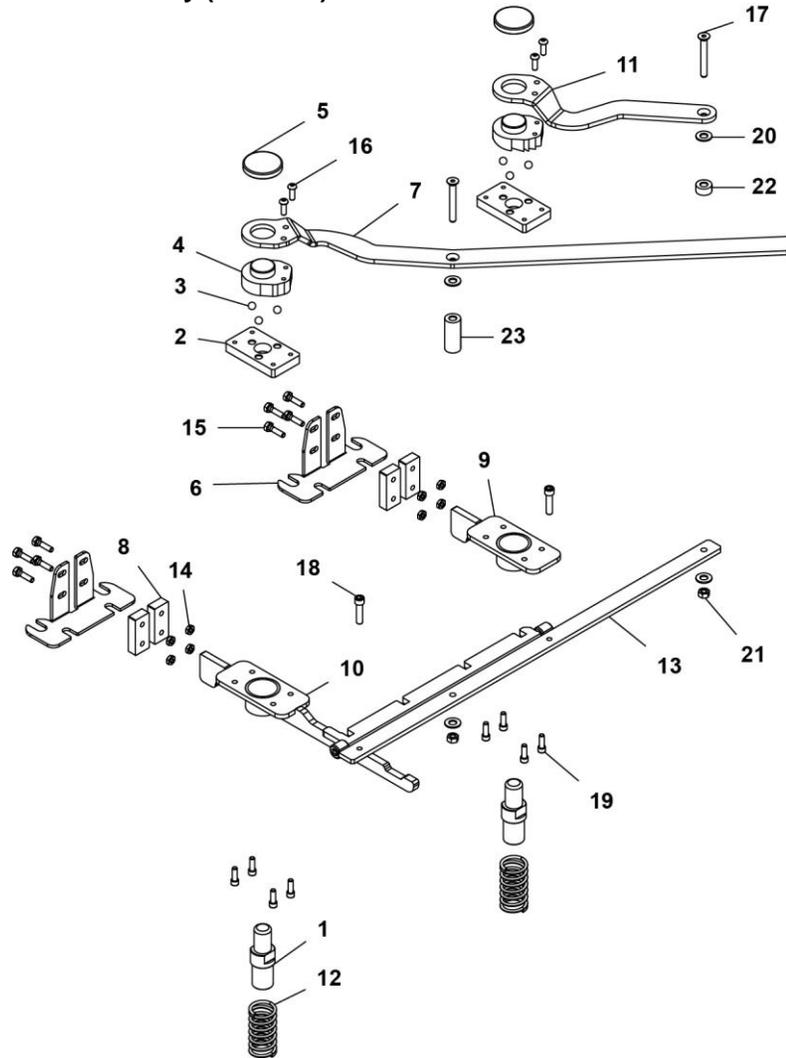
**Registration Bearing Assembly (UL & CE)**


	<b>Registration Bearing Assembly (UL &amp; CE) Part Name</b>	<b>Part Numbers All Models</b>
1	Bearing Casting	8080408
2	Cam Follower	3023010
3	Split Lock Washer 7/16"	3022004
4	Finish Hex Nut 7/16"-20	3013012
5	Bolt Flange Whiz Lock 3/8"-16 X 1"	3003000
6	Hex Jam Nut 3/8"	3013014
7	Full Thread Socket Head Cap Screw 3/8-16 X 2"	3009073

## SQ/FB Mounting Pneumatic Assembly (UL & CE)



	<b>SQ/FB Mounting Pneumatic Assembly (UL &amp; CE) Part Name</b>	<b>Part Number All Models</b>
1	SQ/FB Mounting Bar	9167136
2	Left Side SQ/FB Holder	9165525
3	Right Side SQ/FB Holder	9165524
4	SQ/FB Air Clamp Cylinder Assembly	9162041
5	Full Thread Socket Cap Screw 5/16-24 X 1/2"	3009133
6	Shoulder Bolt 5/16"X 1-1/4" Long	3006015
7	SAE Washer #12	3021036
8	Elastic Stop Nut ZP 1/4-20	3012000
9	Male Handle	3032009
10	SAE Washer 5/16"	3021023
11	Square Pivot Bolt	9162193

**Central Off Contract Assembly (UL & CE)**


	<b>Central Off Contract Assembly (UL &amp; CE) Part Name</b>	<b>Part Numbers All Models</b>
1	Cylinder Extension	9470271
2	Off-Contact Down Plate#1	8051232
3	Ball 3/8" Dia. Steel	3023104
4	Off-Contact Regulator	9470272
5	Off-Contact Bronze Pusher	8051239
6	Off-Contact Spacer Bracket	9162271
7	Selector Lever 27"	9150358-A
8	Off-Contact Slides	8051242
9	Down Plate 5"	8080233
10	Down Plate 15.31"	8080243
11	Off-Contact Lever	8080236
12	Lift Compression Spring	9080215
13	Off-Contact Stringer	8080238
14	Elastic Stop Nut ZP 1/4-20	3012000

15	Hex Head Bolt 1/4-20 X 1"	3008001
16	Button Socket Cap Screw 1/4-20X 3/4"	3001001
17	Flat Socket Cap Screw 5/16-18 X 1"	3010077
18	Socket Cap Screw 5/16-18 X 1-1/4"	3009008
19	Socket Cap Screw 1/4-20 X 3/4"	3009022
20	Wrought Flat Washer 5/16" ZP	3020007
21	Elastic Stop Nut ZP 5/16-18	3012001
22	Distance Bushing 3/16"	9473057
23	Distance Bushing 1-1/32"	9473059