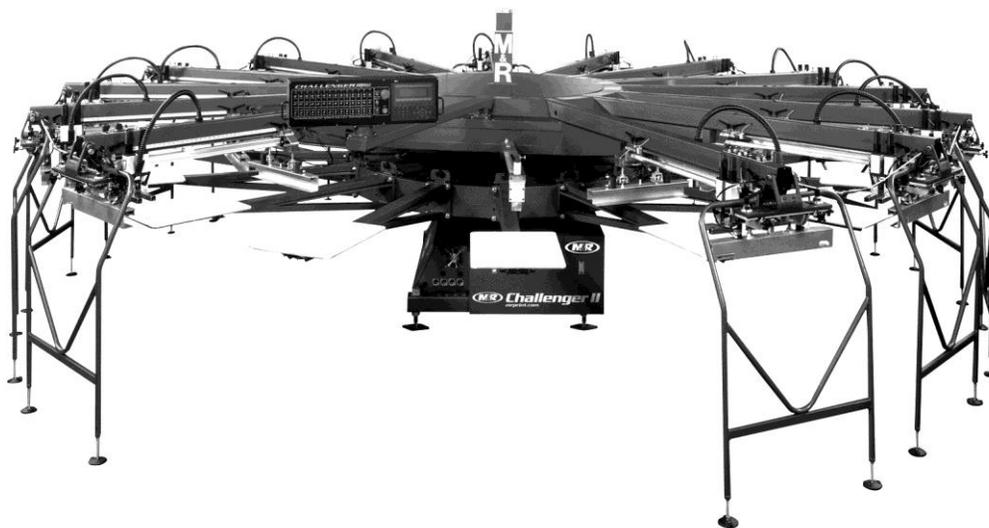


V.033114 Part # MAN-CHALLENGERII

Challenger II Jv1
\$95.00 USD

Challenger[®] II



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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 or 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.

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

- 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 is 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

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.

This is a publication of M&R Printing Equipment, Inc. and its subsidiaries. All information contained herein is derived in part from proprietary and patent data of M&R Printing Equipment, Inc., and may not be copied, electronically reproduced, or transmitted in any form without prior written permission, in each case made and provided.

2.1 Service and Parts

Manufacturer's Rating Plate

Most products manufactured by the M&R Companies carry a metal manufacturer's rating plate similar to the one shown below. Please use it to fill out the product information below, and be prepared to provide the identification information when calling. This helps us respond to your needs more quickly.

VOLTS	PHASE	HERTZ	TOTAL F.L.A.	A.L.M.
SHORT CIRCUIT CURRENT RATING kA rms symmetrical	CURRENT RATING V maximum	AMPS LARGEST HEATER	YEAR MFG.	
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				

Model No.	
Machine No.	
Serial No.	
Schematic No.	
Date Installed	
Installed by	
Optional Features and Special Information	

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.

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

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.

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. Product Specifications

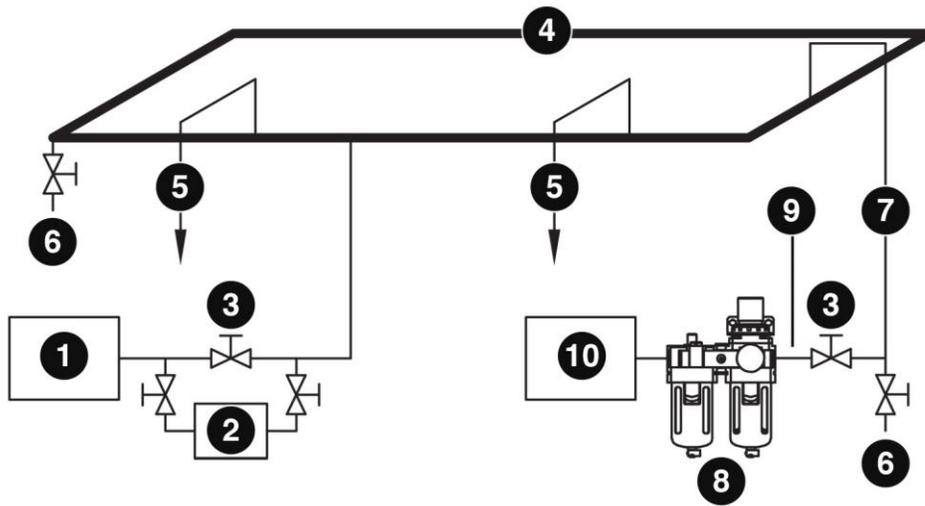
Specifications ³					
	Challenger II 12/10	Challenger II 14/12	Challenger II 16/14	Challenger II 18/16	Challenger II 20/18
Air @ 6.9 Bar (100 psi)	510 l/m (18 cfm)	595 l/m (21 cfm)			
Diameter	518 cm (17')	518 cm (17')	594 cm (19' 6")	640 cm (21')	683 cm (22' 6")
Electrical Requirements ¹	208/230 V, 3 ph, 34 A, 50/60 Hz, 7.5 kW 400 V, 3 ph, 21 A, 50/60 Hz, 7.5 kW	208/230 V, 3 ph, 39 A, 50/60 Hz, 8.2 kW 400 V, 3 ph, 23 A, 50/60 Hz, 8.2 kW	208/230 V, 3 ph, 42 A, 50/60 Hz, 8.9 kW 400 V, 3 ph, 23 A, 50/60 Hz, 8.9 kW	208/230 V, 3 ph, 45 A, 50/60 Hz, 9.6 kW 400 V, 3 ph, 32 A, 50/60 Hz, 9.6 kW	208/230 V, 3 ph, 48 A, 50/60 Hz, 10.4 kW 400 V, 3 ph, 34 A, 50/60 Hz, 10.4 kW
Maximum Frame Size	66 x 109 x 5 cm (26" x 43" x 2")	66 x 109 x 5 cm (26" x 43" x 2")	66 x 109 x 5 cm (26" x 43" x 2")	66 x 109 x 5 cm (26" x 43" x 2")	66 x 109 x 5 cm (26" x 43" x 2")
Maximum Frame Size (Alternating Printheads) ²	135 x 109 x 5 cm (53" x 43" x 2")	135 x 109 x 5 cm (53" x 43" x 2")	135 x 109 x 5 cm (53" x 43" x 2")	135 x 109 x 5 cm (53" x 43" x 2")	135 x 109 x 5 cm (53" x 43" x 2")
Maximum Image Area	50 x 70 cm (20" x 28")				
Maximum Image Area (Alternating Printheads) ²	109 x 71 cm (43" x 28")	109 x 91 cm (43" x 36")			
Shipping Weight	3221 kg (7100 lb)	3496 kg (7700 lb)	3791 kg (8350 lb)	4445 kg (9800 lb)	4989 kg (11000 lb)
Standard Pallet Size	41 x 56 cm (16" x 22")				
Stations/Colors	12/10	14/12	16/14	18/16	20/18

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

² When equipped with optional Transformer Printheads (excludes Challenger II 12/10 model).

³ Confirm the latest specifications on our website, www.mrprint.com.

4. Compressed Air Supply



Description	
1	Compressor
2	Chiller 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. Chillers should be installed to help prevent moisture damage to pneumatic seals, valves, and air cylinders that could void equipment warranties.

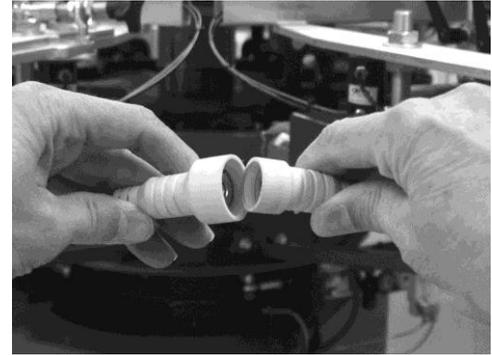
Air generated by the compressor (1) contains oil and moisture. The chiller (2) removes moisture as the air passes through it into the air supply system (4). Shutoff valves (3) should be installed at strategic locations to allow operators to isolate parts of the system for repair or maintenance without 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/lubricator manifold (8) on the equipment. The regulator controls air pressure, the filter provides a final moisture-removal stage, and the lubricator delivers a mist of special oil to lubricate all pneumatic components on the equipment (10).

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

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.



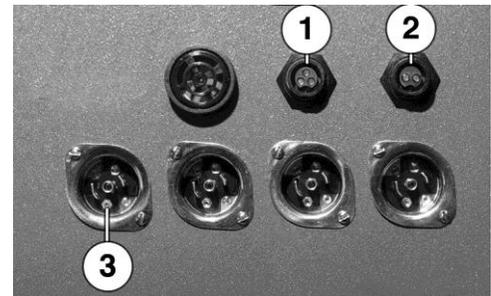
WARNING: Do NOT turn off electrical power until all Flash Cure Units have cooled down to 38 C (100 F) or lower.

Accessory Sockets

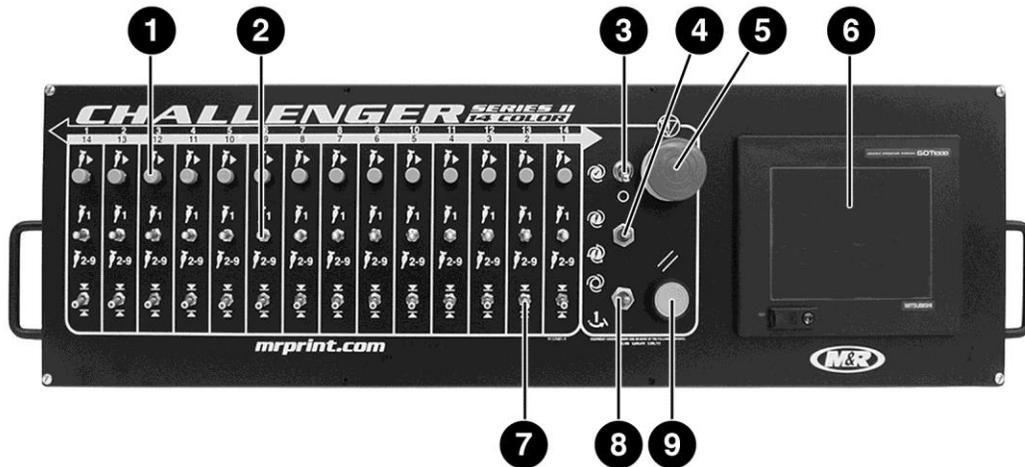
Accessory Sockets are located on the lower electrical enclosure.

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

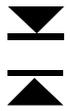
Note: Socket location, number and type vary by options ordered and machine model.



6.1 Main Control Panel



Number	Name	Function
1	<p>Print Button</p> 	<p>Permits manual cycling of an individual print station. The Print button is also used during screen frame setup to check registration. During setup, press the Print button. The index carousel moves up so that screen registration or placement may be checked. To lower the index carousel, press the Reset button (9).</p> <p>The Print button also functions in a Standard or Enhanced mode. These functions are explained in the Operator Interface Section of this manual.</p>
2	<p>Single/Multi Switch</p>  	<p>Commands the selected print station to print either one or up to nine complete flood/print cycles. This switch is used when a thicker coating of ink is required, such as in flash cure applications, or whenever increased ink opacity is desired. Each individual print head in the system may be set independently for either Single or Multi print stroke. (MULTI print is set in the OPTIONS screen on the Operator Interface.)</p> <p>Note: When this switch is selected for the middle, or Off position, the particular print station will not operate.</p>
3	<p>Test Print Switch</p>   	<p>Aids the operator when printing only one garment to check for registration or image quality. When placed in the On position, the control system will automatically and sequentially command each print station which is selected to On to print one complete flood/print cycle.</p>

Number	Name	Function
4	Print Start / Print Finish Switch 	<p>This switch is provided as a convenience when initially starting or finishing a print run. It is designed to eliminate the need to individually turn on or off print stations. Placing this switch in the Print Start position will automatically command each print station that is selected to On, to print sequentially at the start of a print run. Placing this switch in the Print Finish position will automatically command each print station that is selected to On, to shut-down sequentially at the completion of a print run.</p>
5	Emergency Stop Button 	<p>The red Emergency Stop button stops all operation.</p> <p>Press the button in until it remains depressed to activate. Turn the button clockwise until it pops out to deactivate.</p>
6	Operator Interface	<p>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.</p>
7	Front/Rear Switch 	<p>Commands the selected print station to stop in either the Front or Rear position. This switch is used whenever the operator desires to complete the print cycle with the screen frame flooded with ink to reduce the chance of ink drying in the image. When this switch is placed in the Front position, the print carriage stops at the front (outside) of the screen frame, with the image area flooded with ink. When placed in the Rear position, the print carriage stops at the rear (inside) of the print head, and the image area will be clear of ink. A red LED in the tip of the switch handle illuminates confirming that the switch is set for Front stop.</p> <p>Note: This feature will perform the exact opposite function if the press has been programmed to print from inside to outside.</p>
8	Automatic Manual Mode Switch 	<p>This switch has three positions; Automatic at the top position, Off at the middle position, and Manual at the lower position. This switch commands the system to operate in either Automatic or Manual mode of operation. To operate the index system one complete cycle, press the switch down to Manual. The index system will cycle one time, along with any print stations that are selected to On.</p> <p>Placing this switch in the Automatic position while the index table is in motion will command the index system to operate in the automatic mode. The dwell time for automatic operation is adjusted via the Operator Interface (6). Instructions on how to adjust the index dwell time are available in the Operator Interface Section of this manual.</p> <p>Note: When the switch is selected to the middle or Off position, the index system will not operate.</p>
9	Reset Button 	<p>The green Reset 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.</p>

6.1.1 Operator Interface

Operator Interface

The **Operator Interface** touch screen is used to access and adjust all functions of the press.

When electrical power is turned ON to the equipment, the **M&R** screen is displayed. In the lower right is the **Menu** button and in the lower left is the **INFO** button. The **INFO** menu contains information on how to contact M&R Printing Equipment and program information. Press the **Menu** button to display the **Menu** screen.



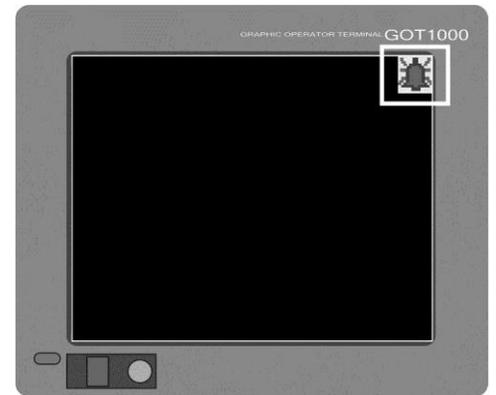
Menu Screen

The **Menu** screen is used to access all menus used to adjust press functions or to display diagnostic and test data. The **Menu** screen is also used to access the **Alarms** menu which displays the cause of alarm conditions.

If an **Alarm** condition is detected, a flashing alarm bell is displayed in the upper right corner of all display screens. Press the alarm bell and the screen displays the cause of the alarm or error.

The menus on the **Menu** screen are **Counters**, **Timers**, **Tests**, **MPR Data**, **Options**, **Alarms**, **Service**, **M&R** and **Menu**.

Press the **Menu** button to return to the **M&R** screen.



Languages

The **Operator Interface** may be set to multiple languages. To select a language, first push in the Emergency Stop button. Then, from the left of the main control panel, press and hold the first and sixth print buttons until the language screen is displayed. Press the button for the language you wish to use.



Counters

The counters menu is accessed by pressing the **Counters** button on the **Menu** screen. The counters menu contains six menus: **Shift**, **Job**, **Total**, **Preset**, **Remaining** and **Speed**.



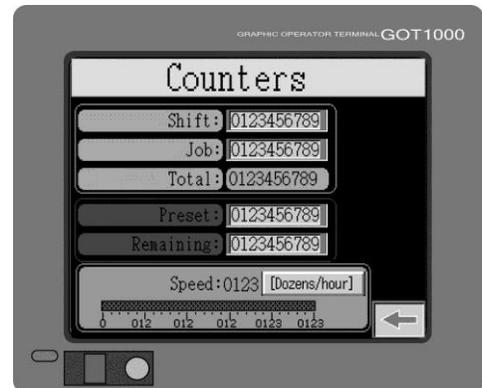
Shift Counter

Shift indicates the total number of press cycles during a given production shift. To reset the **Shift**, press the data entry cell to the right of **Shift**; a numeric keypad is displayed. Enter 0, then press **Enter**. **Shift** is reset to 0.



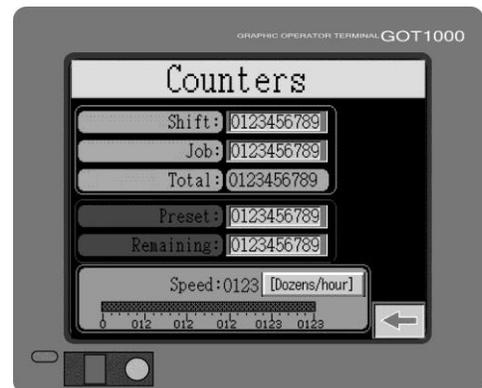
Job Counter

Job indicates the total number of index cycles for a given print job. To reset the **Job** press the data entry cell to the right of **Job**; a numeric keypad is displayed. Enter 0, then press **Enter**. **Job** is reset to 0.



Total Counter

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



Preset

The **Preset** counter is used to enter a number of print cycles for a given print job. For example, if a print job consists of printing 30 dozen (360) shirts, enter 360. You may enter up to a maximum of 32,767 print cycles into the **Preset** menu. The minimum is 0.

To enter a number of print cycles press the data entry cell to the right of **Preset**; a numeric keypad is displayed. Enter the number of print cycles and then press **Enter**.

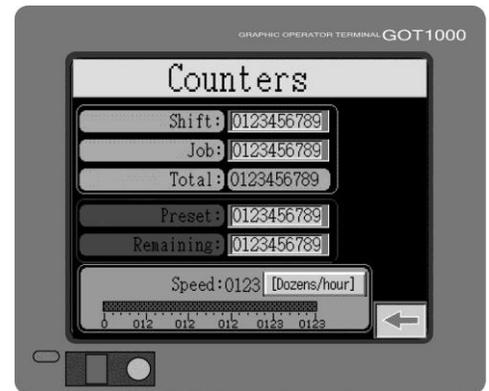


Remaining

The **Remaining** menu selection displays the number of print cycles which remain in the **Preset** menu. The **Remaining** menu functions as a count down display. To keep the **Remaining** count accurate, the **Remaining** indication can be accessed and changed in the event that 2 or 3 shirts are misprinted. To change the number of print cycles for the **Remaining** selection, touch the data entry cell to the right of **Remaining**; a numeric keypad is displayed. Enter the number of print cycles and then press **Enter**.

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. If you entered 360 print cycles in the **Preset** menu, when the **Remaining** menu display reaches the last shirt or print cycle, the press automatically enters the Print Finish mode and the audible signal sounds.

Note: Clear the Reset and Remaining indication when the print job is completed, or the PLC will respond as though you are printing the same number of garments on the next print job.



Speed

The **Speed** menu selection displays the current speed of the machine in dozens per hour. The speed may not be reset. A horizontal bar with graduated scale provides a visual indication of press speed. As the press progresses through the print run, the horizontal bar fills in from the left to the right. When you resume operation the current speed in dozens per hour is automatically displayed.

Press the **Dozens/hour** button to change to **Quantity/hour**.

This is a useful tool if you are printing the same job on a regular basis. With all parameters set and a good production speed has been achieved, you



can record the production levels and use this information to estimate future production times for this particular job.

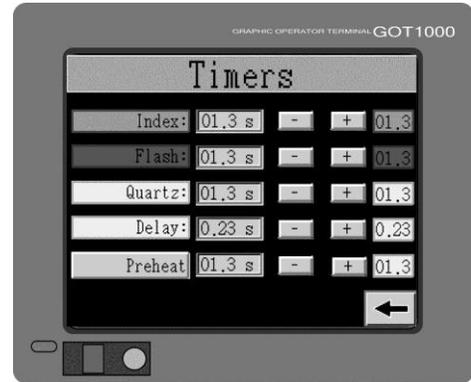
Press the **Back Arrow** to return to the **MENU** screen.

Timers Press the **Timers** button on the **Menu** screen. The Timers menu contains five menu items: **Index**, **Flash**, **Quartz**, **Delay** and **Preheat**.

Index **Index** dwell time is the time interval during automatic operation in which the system operator may load and/or unload garments. This time interval starts after the index table has reached the fully raised position at the conclusion of the index motion, and ends with the start of the index table start cycle.

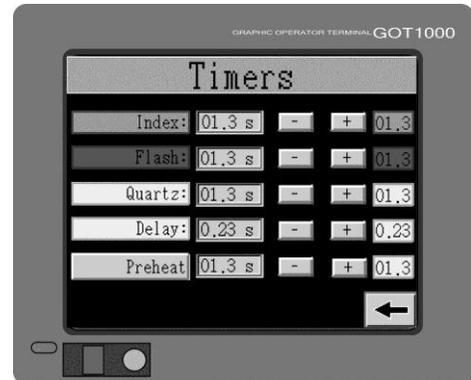
To quickly adjust the time in 0.5 second increments, press the **plus** or **minus** buttons.

To adjust the **Index** dwell time, press the data entry cell to the right of **Index**; a numeric keypad is displayed. Enter the dwell time in seconds and then press **Enter**. The maximum **Index** dwell time interval is 20 seconds and the minimum is 0 seconds.



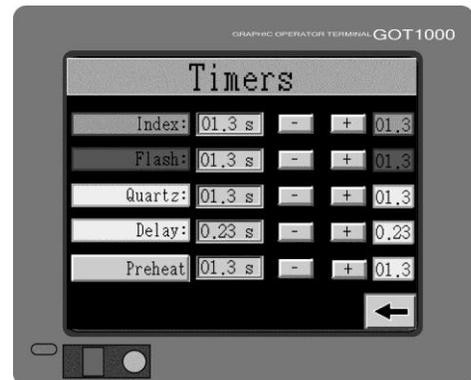
Flash **Flash** controls the dwell time of the index table in the raised position (Flash Cure position). To adjust the **Flash** dwell time press the data entry cell to the right of **Flash**; a numeric keypad is displayed. Enter the time in seconds and then press **Enter**. The maximum **Flash** dwell time is 20 seconds and the minimum is 0 seconds.

To quickly adjust the time in 0.5 second increments, press the **plus** or **minus** buttons.



Quartz **Quartz** controls the dwell time of the index table in the raised position (Flash Cure position). To adjust the **Quartz** dwell time press the data entry cell to the right of **Quartz**; a numeric keypad is displayed. Enter the time in seconds and then press **Enter**. The maximum **Quartz** time is 15 seconds and the minimum is 0 seconds.

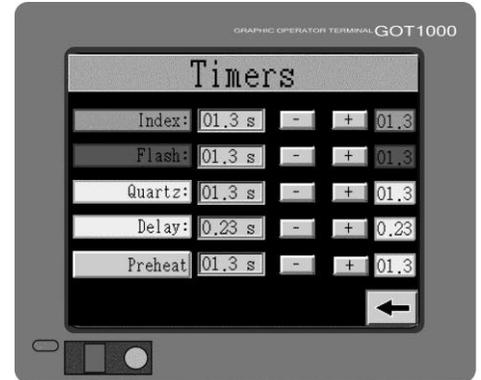
To quickly adjust the time in 0.5 second increments, **press** the **plus** or minus buttons.



Delay

Delay controls the dwell time of the quartz lamps as the index table starts its index motion. This additional delay time allows the quartz lamps to reach operating power and reduces overexposure of heat sensitive substrates. To adjust the **Delay**, press the data entry cell to the right of **Delay**; a numeric keypad is displayed. Enter the time in seconds and then press **Enter**. The maximum **Delay** time is 5 seconds and the minimum is 0 seconds.

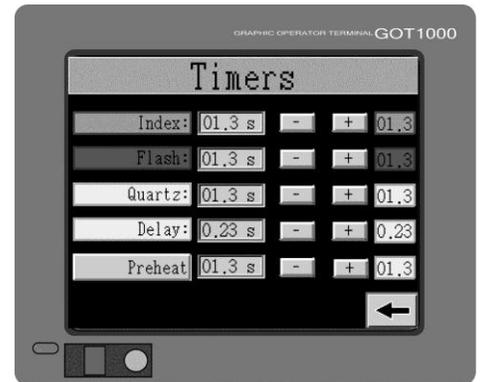
To quickly adjust the time in 0.5 second increments, press the **plus** or **minus** buttons.



Preheat

Preheat controls the preheat time interval for the Quartz Flash panels. Press the data entry cell to the right of **Preheat**; a numeric keypad is displayed. Enter the **Preheat** time in seconds and then press **Enter**. The maximum **Preheat** time is 15 seconds and the minimum is 0 seconds.

Note: Always use preheat before starting an automatic print cycle. This allows the quartz lamps sufficient time to achieve curing temperature and eliminates under cure and/or ink build-up on screens.



Options

From the **Menu** screen press the **Options** button. The **Options** menu is used to access the optional control features which may have been supplied with your press. The options listed are **Heads, Machine, Revolver, Servo, Megastamp, Flocker, Flashes** and **Glue**. To access any of these optional control features press the button for that specific control option.

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



Heads

Heads selects print heads to double print or multi-print up to a maximum of 9 prints. The **Heads** menu also includes menus used to control the optional M&R Ink Dip feature (U.S. Patent No. 5,649,479).

To access the **Heads** menu, press the **Heads** button in the **Options** menu.



Multi-Print

The first menu selection in the **Heads** menu is **Multi-Print**. **Multi-Print Up/Down** commands the print carousel to remain in the **Up** (print) position until all print strokes are completed. When selected to **Down**, the print carousel lowers to the index position when the last print head completes the print stroke for the first print. The index carousel then moves up for the start of the second print stroke.



Multi-Switch

The next menu selection in the **Heads** menu is **Multi Switch**. When the button displays **2** or **2-9**, the control system commands individual print stations to perform double or up to nine flood print strokes.

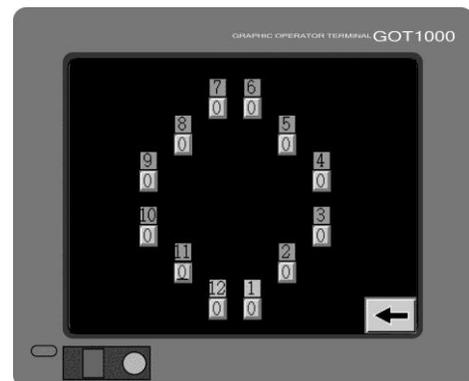
To select print stations for multi operation, press the button to the right of **Multi-Switch** until the button displays **2**. Now place the **Single/Multi** switch on the main control panel in the **Multi** position. The table below the **Multi-Switch** reflects your selection for two print strokes for the selected print heads by displaying the number **2**.



To select print stations for 2-9 print strokes, press the button to the right of **Multi-Switch** until the button displays **2-9**.

Note: The **Single/Multi** switch on the main control panel must be in the **Multi** position.

In the print head table below the **Multi-Switch** menu selection, press the data entry cell below the print head you want to select for **Multi** operation. A new screen is displayed which shows the print station position on the press. Now press the data entry cell for the print head to be selected for multiple print strokes; a numeric keypad is displayed. Press number keys (3 to 9) then press **Enter**. Your selection for print strokes is now displayed in the data entry cell. Press the **Back Arrow** to return to the **HEADS** screen. The table below the **Multi-Switch** reflects your selection for print strokes for that print head by displaying a number 3-9.



Inkdip Every
(US Patent No. 5,649,479)

The **Inkdip Every** control automatically scoops ink from the rear ink well area of the screen into the active image area of the screen. Press the data entry cell to the right of **Inkdip Every**; a numeric keypad is displayed. Enter the number of print cycles before the ink dip control feature activates and then press **Enter**.

If you enter the number 10, the **Inkdip Every** automatically retrieves ink from the ink well area of the screen after 10 print cycles have been completed. The maximum value is 999. If you enter 0, the **Inkdip Every** control will not operate.



Inkdip Time

Inkdip Time controls the distance that the print carriage moves back into the ink well area. The maximum time is 1.7 seconds and the minimum is 0.30 seconds. Press the data entry cell to the right of **Inkdip Time**; a numeric keypad is displayed. Enter the **Inkdip Time** in seconds and then press **Enter**.



Machine

To access the **Machine** menu, press the **Machine** button on the **Options** menu.



Head Setup

The first menu selection in the **Machine** menu is **Head Setup**. Each print station has a **PRINT** button located on both the main operator control panel and each individual print station control panel. The **PRINT** button may be set to operate in **Standard** or **Enhanced** mode using this menu selection.

Note: To use the **PRINT** button in **Standard** mode, first make sure all print stations are in the **OFF** position on the main control panel.

In the **Standard** mode, pressing the **PRINT** button moves the print carousel up to the print position and commands the print station to perform one complete flood/print cycle.



In the **Enhanced** mode, the print stations may be On or Off. Pressing the **PRINT** button momentarily on the main control panel or at any of the print station control panels commands the index carousel to move up to the upper (print) position. When the **PRINT** button is pressed and held for 2-3 seconds, the print station performs a complete print cycle, (flood, index table up, print, index table down). The **Enhanced** mode eliminates the need to turn Off print stations when performing set up operation. To select either **Standard** or **Enhanced** mode, press the button to the right of **Head Setup**. Each time you press the button, the selection changes between **Standard** and **Enhanced**.

Setup Mode

Each print station has a **PRINT** button located on both the main operator control panel and each individual print station control panel. The **PRINT** button is used to raise the print carousel during setup operations and to command individual print stations to perform one complete flood/print cycle.

To turn on the **Setup Mode** menu selection, press the **OFF** button to the right to the right of **Setup Mode**. The indication changes to **ON**.



**Setup Mode ON
Print Station
(Single/Multi
Switch) OFF**

In this mode, pressing the **PRINT** button once commands the print table to lift. Pressing the **PRINT** button a second time commands the print carriage to chop down to the print position. Pressing the **PRINT** button a third time commands the index table to return to the down position and the print carriage to chop back up to the Flood position.



**Setup Mode ON
Print Station
(Single/Multi
Switch) ON**

In this mode, pressing the **PRINT** button results in one complete flood, table up, print and table down cycle. You must have the selected print station **Single/Multi** switch in the **Single** or **Multi** position on the main control panel.

**Skip Print –
(U.S. Patent No.
5,383,400)**

This control menu allows the system operator to select either **No T-Shirt Sensor** (No Shirt Detector (U.S. Patent No. 5,383,400) or **Foot Pedal/Push Button** to skip pallets which do not have a garment loaded on them. To change from **No T-Shirt Sensor** to **Foot Pedal/Push Button** press the button labeled **No T-Shirt Sensor**. The button displays **Foot Pedal/Push Button**. Each time you press the button it changes between **No T-Shirt Sensor** and **Foot Pedal/Push Button**.



Index

Index dwell time is the time interval during automatic operation in which the system operator may load and/or unload garments. This time interval starts after the index table has reached the fully raised position at the conclusion of the index motion, and ends with the start of the index table start cycle.

To adjust the **Index** dwell time, press the data entry cell to the right of **Index**; a numeric keypad is displayed. Enter the dwell time in seconds and then press **Enter**. The maximum **Index** dwell time is 20 seconds and the minimum is 0 seconds.



Revolver Sequencing Program
U.S. Patent No. 5,595,113

The M&R Revolver program is used to program selected print heads to either print or flash in multiple cycles with the use of only one flash cure unit.

To access the **Revolver** menu, press the **Revolver** button on the **Options** screen.



Revolver Mode On/Off

The button to the right of **Revolver Mode** displays either **On** or **Off**. To change between **On** and **Off** mode press the button. Press the button so **On** is displayed to program or operate in the **Revolver Mode**.



Enter Program

After programming the indexer and print heads, press the **Enter Program** button to store the program in the PLC memory.

Revolution

Revolution allows the selection of up to 10 different revolutions to be programmed for print, flash operation within the Revolver program. Press the data entry cell to the right of **Revolution**; a numeric keypad is displayed. Enter a number from 1 to 10 and then press **Enter**.

Pallet No.

The **Pallet No.** provides a visual indication of how many pallets are entered in the program sequence for each revolution of the indexer. The numerical indication counts down as the press progresses through the Revolver Program.



Print Head Program Indicators

Located just below the **Revolution** number menu item is a reference line listing each of the print heads. Below each of the numbers is a letter or number that indicates how the print head will perform in a given revolution in the Revolver Program.

The indicators used are **F** indicating the head will be used as a flash cure station, a dash (-) which indicates the print head is not used in this revolution or a number for single, double or multi-print.

Note: To program print heads for flash cure or single/double, multi-print operation you must refer to the instructions on how to program these functions.



Job No.

Job No. assigns a job number from 1 to 3 for a set of Revolver program parameters saved in the PLC memory. Press the data entry cell to the right of **Job No.**; a numeric keypad is displayed. Press the numbers, from 1 to 3, and then press **Enter**.

Job Clear

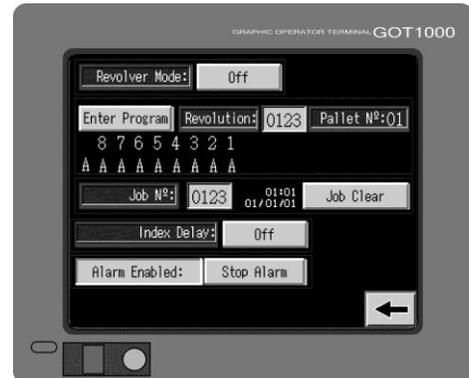
Job Clear clears all current Revolver program data for a saved Job No. from the PLC. To use it, press the **Job Clear** button when the **Job No.** to be cleared is displayed in the **Job No.** data entry cell.



Index Delay

The **Index Delay** is used the same way as the **Index** dwell timer described previously. To operate the **Index Delay**, press the **Off** button to the right of **Index Delay**. The indication will change to **On** and the **Index Delay** will be activated based on the Index Dwell Time as selected in the **Timers** menu.

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



Alarm Enabled **Alarm Enabled** provides the system operator with a way to either **enable** or **disable** the audible alarm signal which sounds just before the completion of a programmed Revolver print sequence. Press the button to change between **Alarm Enabled** and **Alarm Disabled**.

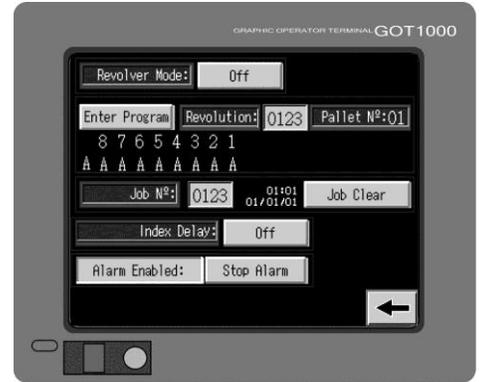
Stop Alarm The **Stop Alarm** button is used to silence the audible alarm signal that sounds just before the completion of a programmed Revolver print sequence. Press the **Stop Alarm** button to turn off the audible signal.

Index Servo Option To access the **Servo** menu press the **Servo** button on the **Options** menu.

The **Index Servo Option** menu includes four menu selections: **Rotation**, **Index**, **Servo Offset** and **Pallet Size**.

Rotation **Rotation** selects the index rotation direction; clockwise (**CW**) or counterclockwise (**CCW**). To select the index rotation, press the button to the right of **Rotation**. Each time you press the button, the indication changes between **CW** and **CCW**.

Index The number of index cycles may be selected to either **Single** index, or **Double** index. When **Single** is selected, the indexer performs one index cycle and all active print heads complete a flood/print cycle. When **Double** index is selected the indexer performs two complete index cycles and all active print heads complete a flood/print cycle. To select the **Single**, press the button to the right of **Index** until **1** is displayed. To select the **Double**, press the button until **2** is displayed.



Servo Offset

The **Servo Offset** sets the stopping position of the indexer servo drive as it aligns with the index registration forks. **Servo Offset** also adjusts the index stop after changing pallets to a smaller or larger size. Larger pallets increase the index load, while smaller lighter pallets decrease the index load. As a result, changing of printing pallets can have an effect on the stopping position and the efficient operation of the index servo drive.

The range of the setting is from -0.26” to +0.26”. To change the **Servo Offset** setting for either **End Position** or **Start Position** press the - button to decrease the setting or + button to increase the setting.



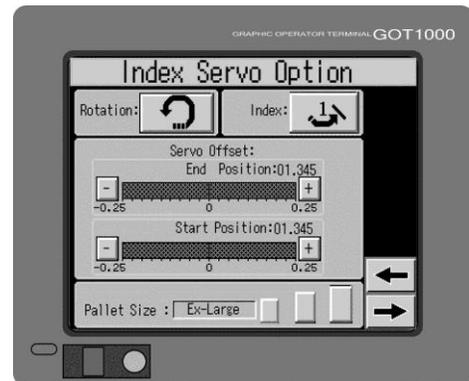
Pallet Size

The next menu selection is **Pallet Size: Small, Normal or Ex-Large**. To select a pallet size, press the button which represents the pallet size you require.

As you press the button, the pallet size is displayed.

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.

Press the **Forward Arrow** to access additional **Index Servo Options**.



Oiler

The press includes an automatic lubrication system for the servo index drive system.

Run Oiler Every

The lubrication system automatically dispenses lubricant to the servo index drive system based on the number of cycles entered. We recommend that the setting be adjusted for every 30 index cycles. Press the data entry cell to the right of **Run Oiler Every**; a numeric keypad is displayed. Enter a number from 1 to 99 and then press **Enter**.

Index

Index is a non-adjustable indicator of how many index cycles remain before automatic lubrication.

Manual Oiler

Manual Oiler button activates the lubricant pump resulting in the manual lubrication of the servo index drive system. To activate the **Manual Oiler**, press the button to the right of **Manual Oiler**. The button changes to **On**. After activation of the pump, the indication automatically changes back to **OFF**.



Low Oil Indexes

The oil level in the oil reservoir for the index servo drive system is monitored by a sensor which alerts the operator to insufficient oil for lubrication. The oil level may be monitored using the **Low Oil Indexes** menu selection.

Present

Present displays how many index cycles have occurred since the low oil sensor detected a low oil condition.

Total

Total displays how many total index cycles have occurred after a low oil condition since the press was first put into service.

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

Mega-Stamp

Mega-Stamp is the M&R optional foil application system used with the press.

To access the **Mega-Stamp** menu selection, press the **Mega-Stamp** button on the **Options** menu screen.

Mega-Stamp

The **Mega-Stamp** menu includes control menus used on both the M&R Mega-Stamp and the M&R Midas foil loading system. The four **Mega-Stamp** menu selections are displayed in red and the three Midas menus are displayed in yellow.

To activate or deactivate the **Mega-Stamp**, press the **Disabled** button to the right of **Mega-Stamp**. The indication changes to **Enabled** and the **Mega-Stamp** is activated. To deactivate the **Mega-Stamp**, press the button again.

Mega-Stamp Head Location

Head Location is used to select the print head in which the M&R **Mega-Stamp** will operate.

To use, press the data entry cell to the right of **Mega-Stamp**; a numeric keypad is displayed. Enter the print head location where the **Mega-Stamp** will be operating and then press **Enter**.



Mega-Stamp Down Time **Down Time** is used to select the amount of time that the **Mega-Stamp** heat platen is down in contact with the foil and garment. To adjust the **Down Time**, press the data entry cell to the right; a numeric keypad is displayed. Enter the down time and then press **Enter**. Your selection for the **Down Time** is displayed in the data entry cell.

Mega-Stamp Manual Test **Manual Test** is used to confirm communication between the press and the **Mega-Stamp** unit. To use, press the **OFF** button to the right of **Manual Test**. The **Mega-Stamp** heat platen cycles down and the button indicates **On**.

Midas Loader The **Midas Loader** menu selection is used to control the optional M&R Midas foil loader.

Midas-Loader Enabled Disabled To activate the Midas, press the **Disabled** button to the right of **MIDAS-LOADER**. The indication changes to **Enabled** and the Midas is activated. To deactivate the Midas, press the button again.

Midas Head Location **Head Location** is used to select the print head in which the M&R Midas will operate. To use, press the data entry cell to the right of **Head Location**; a numeric keypad is displayed. Enter the print head location where the Midas will be operating and then press **Enter**.

Midas Manual Test **Manual Test** is used to confirm the communication between the press and the Midas unit. Press the **OFF** button to the right of **Manual Test**. The Midas foil gripper cycles in/out and the button indicates **ON**.

Press the **Forward Arrow** to access the next Mega-Stamp menu screen.

Mega-Stamp/ Midas This screen visually confirms the operation of the switches used to control the **Mega-Stamp** and the **Midas**. The screen shows the input signals (green) and the output signals (red) and whether they are **ON** or **OFF**.

The first menu is **Both Safe**. This menu is displayed in green so it is an input signal. The illustration shows the input signal as **OFF**.



Mega-Stamp Down

The next menu is **Mega-Stamp Down**. The menu is displayed in red so it is an output signal. The illustration shows that the proximity switch which is used to confirm **Mega-Stamp Down** is currently **OFF**. When the proximity switch is actuated the indication will display **ON**.

Midas Table In Position

The next menu is **Midas Table In Position**. The menu is displayed in red so it is an output signal. The illustration shows that the proximity switch which is used to confirm **Midas Table In Position** is currently **OFF**. When the proximity switch is actuated the indication will display **ON**.

Midas Auto Cycle

The final menu is **Midas Auto Cycle**. The menu is displayed in red so it is an output signal. The illustration shows that the proximity switch which is used to confirm **Midas Auto Cycle** is currently **OFF**. When the proximity switch is actuated the indication will display **ON**.

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



Flocker

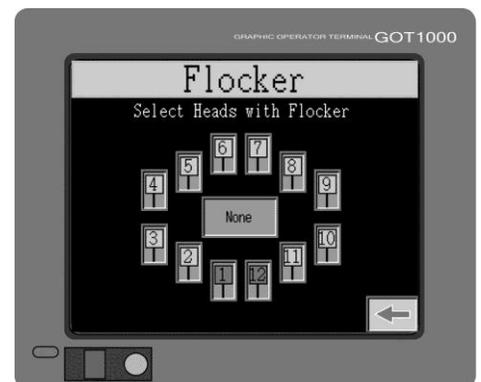
Flocker is used to select the print station location in which the M&R Flocker 2000 will operate.

To select, press the **Flocker** button on the **Options** screen.



Press the print station number to operate as a Flocker station. As you press the print station number, the indication changes to green and displays a vertical line for **On**. If you press the print station number again, the indication changes back to red and displays a zero for **Off**.

Press the **None** button and none of the print stations will operate as a Flocker station.



Flashes

Flashes is used to designate infrared flash position. To access the **Flashes** menu, press the **Flashes** button on the **Options** menu screen.

Flashes selects the print head location where a flash unit will operate in the print flash sequence.



Flash Location

To select a print head to operate as a flash cure station, first place the **FRONT/REAR** switch for that particular print head on the main control panel in the **FRONT** position. Press the **Enter** button. The indicator below the print head on the screen displays a letter **F** confirming that the print head will now operate as a flash cure station.



Flash Time

Infrared flash cure only. Flash Time controls the dwell time of the index table in the raised or flash cure position. To adjust the **Flash Time**, press the data entry cell to the right of **Flash Time**; a numeric keypad is displayed. Enter the dwell time in seconds and then press **Enter**. The maximum **Flash Time** is 20 seconds and the minimum is 0 seconds.

A graduated scale serves as a visual indicator for the balance of **Flash Time**. If the **Flash Time** is set for 20 seconds, the graduated scale displays a solid red line up to the 20 indicator. As the **Flash Time** counts down the red line retracts towards the zero indicator and the data entry cell displays the remaining **Flash Time**. When the **Flash Time** reaches zero, the Flash heating elements retract.



Quartz Time

Quartz controls the time the Quartz Flash heating elements are on. To adjust the **Quartz** dwell time, press the data entry cell to the right of **Quartz**; a numeric keypad is displayed. Enter the time in seconds and then press **Enter**. The maximum **Quartz Time** is 15 seconds and the minimum is 0 seconds.

A graduated scale provides a visual indicator of the balance of **Quartz Time**. If the **Quartz** time is set for 15 seconds, the graduated scale displays a solid green line up to the 15 indicator. As the **Quartz Time** counts down the green line retracts towards the zero indication and the data entry cell displays the remaining **Quartz Time**. When the **Quartz Time** reaches zero, the Quartz heating elements turn Off.



Quartz Location

To select a print head to operate as a quartz flash cure station, first place the **FRONT/REAR** switch for that particular print head on the main control panel in the **FRONT** position. Now press the **Enter** button to the right of **Quartz**.

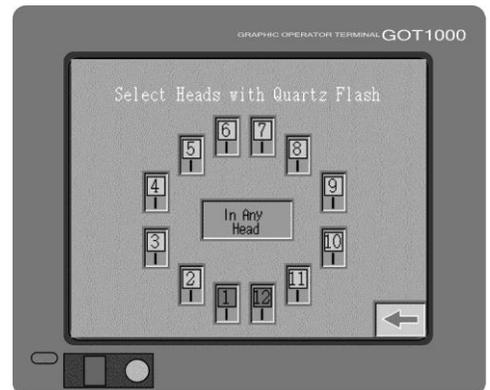


Press the print station number to operate as a quartz flash cure station. After you press the print station number the indication changes to green and displays a vertical line for **On**. If you press the print station number again, the indication changes back to red and displays a zero for **Off**.

To select any print station to operate as a Quartz Flash station, press the **In Any Head** button.

Press the **Back Arrow** button in the lower right corner to return to the previous screen. The gray indicator below the print head on the screen now displays a letter **Q** confirming that the print head will now operate as a quartz flash cure station.

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



Delay

The next menu selection in the **FLASHES** menu is **Delay**. The **Delay** menu is used to control the preheat time for the M&R standard Quartz flash units. During normal operation, the quartz flash heating elements are energized as the pallets begin their index cycle. This 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 heating elements will energize as soon as the index table begins its cycle. If set for 5.0 seconds, the quartz heating elements will wait (delay) for 5.0 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, the quartz heating elements will energize as the index table begins its upward cycle.

To adjust the **Delay** Time, press the data entry cell to the right of **Delay**; a numeric keypad is displayed. Enter the **Delay** Time in seconds and then press **Enter**. The maximum **Delay** Time is 5 seconds and the minimum is 0 seconds.

A button to the right of the **Delay** Time serves as a countdown indicator, displaying the remaining **Delay** time.



Preheat

This menu item is used to control the preheat time for the Quartz Flash panels used on your system. Press the data entry cell to the right of **Preheat**; a numeric keypad is displayed. Enter the **Preheat** time in seconds and then press **Enter**. The maximum **Preheat** time is 15 seconds, the minimum is 0 seconds.

A graduated scale provides a visual indicator of the balance of **Preheat Time**. If the **Preheat Time** is set for 15 seconds, the graduated scale will then display a solid green line up to the 15 indicator. As the **Preheat Time** counts down, the green line will retract towards the zero indication and the data entry cell will display the remaining **Preheat Time**.



WARNING: When using the Preheat function, be sure that the pallets are not located under the flash unit heating elements. The infrared heat produced during the preheat cycle can damage substrates and/or pallets.

Glue Applicator

The **Glue** menu is used to adjust the operation of the optional M&R Annamister Automatic Adhesive Application System. From the **Options** menu, press the **Glue** button.



Spray 1 Revolution (1)

Spray 1 Revolution permits the operator to apply adhesive to all pallets during one complete revolution of all pallets. To activate or deactivate this control feature, press the **Off** button to the right of **Spray 1 Revolution**. The button changes to **On**.

Spray Every (2)

Spray Every allows the operator to program the M&R Annamister to apply adhesive to the pallets based on the number of index revolutions. If the indication in the data entry cell is set to 0, the M&R Annamister system is deactivated.

If the indication is set to 1 the M&R Annamister applies adhesive to all pallets regardless of the cycle or revolution number. If the indication is set to 2, the M&R Annamister applies adhesive to all pallets on every other revolution. The maximum setting is 99. To enter a number for the revolutions for **Spray Every**, press the data entry cell to the



right of **Spray Every**; a numeric keypad is displayed. Enter the number from 1 to 99 and then press **Enter**. Your selection for **Spray Every** is now displayed in the data entry cell.

Front Delay (3) **Front Delay** permits the system operator to program a time delay interval, in hundreds of a second, before activation of the Annamister system. The maximum setting is 1 second and the minimum setting is 0.01 second. This setting will vary depending on the pallet size and press speed. However in most cases this setting will be less than 0.1 second.

To enter a number for the **Front Delay**, press the data entry cell to the right of **Front Delay**; a numeric keypad is displayed. Enter the number from 0.01 to 1 and then press **Enter**. Your selection for **Front Delay** is displayed in the data entry cell.

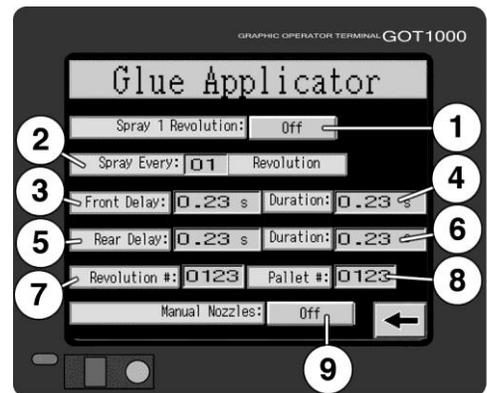
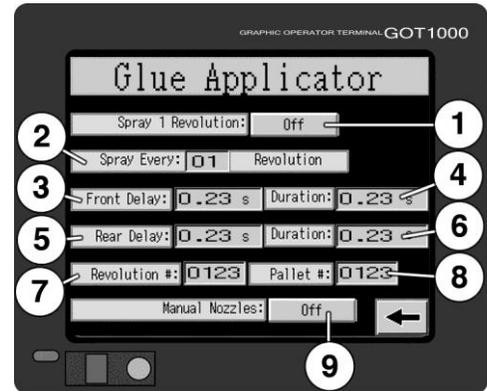
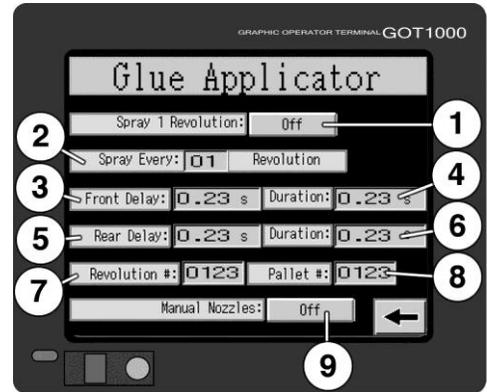
Front Duration (4) **Front Duration** permits the operator to program the time interval, in hundreds of a second, in which the M&R Annamister applies adhesive to the pallets. The minimum setting is 0 and the maximum setting is 1 second. This setting varies depending on the surface area (size) of the pallet and the press speed. In most cases the setting is set between 0.2 and 0.4 seconds.

To enter a number for the **Front Duration**, press the data entry cell to the right of **Front Duration**; a numeric keypad is displayed. Enter the number from 0.2 to 0.41 and then press **Enter**. Your selection for **Front Duration** is displayed in the data entry cell.

Rear Delay (5) **Rear Delay** operates in the same manner as described for **Front Delay**.

Rear Duration (6) The **Rear Duration** operates like the **Front Duration**.

Note: Rear Delay and Rear Duration will not be displayed if the Revolver Flash is activated in the Service Data menu. Contact M&R Technical Support for assistance in accessing these control menus.



Revolution # (7)

Revolution # gives the system operator a visual indication of the current revolutions remaining before the M&R Annamister automatically applies adhesive to the pallets, as determined by the setting in the **Spray Every** menu.

Pallet # (8)

Pallet # provides the number of remaining pallets before the M&R Annamister automatically applies adhesive.

Manual Nozzles (9)

Manual Nozzles permits manual operation of the Annamister’s spray gun assemblies to check if adhesive is available for operation, or for manual cleaning of the spray gun nozzle or fluid tips. To activate the **Manual Nozzles**, press the **Off** button to the right of **Manual Nozzles**. The button changes to **On**. Press the button again to turn the **Manual Nozzles Off**.

Press the **Back Arrow** to return to the **Options** menu.

Timeout Password

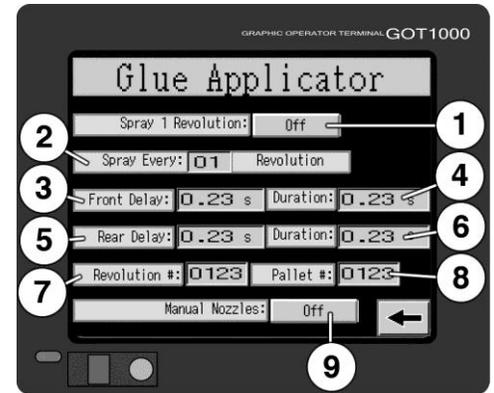
If your equipment has the optional Password Protection programming installed, follow the instructions on the screen and contact M&R Printing Equipment, Inc.

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

Tests

The Tests menu provides a diagnostic tool for troubleshooting and isolation of operational errors.

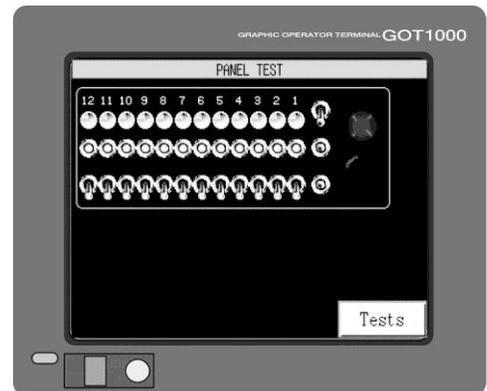
To access the **Tests** menu press the **Tests** button on the **Menu** screen.



Hardware Test The **HARDWARE TEST** screen includes the test menus: **PANEL TEST**, **PROX TEST**, **OTHER TESTS**, **INDEX MOTION**, **INDEX SERVO** and **INDEX SERVO HISTORY**.



Panel Test The **PANEL TEST** screen provides a visual indication of all the switches used on the main control panel. The indications confirm the correct operation and position of the particular switch or push button.

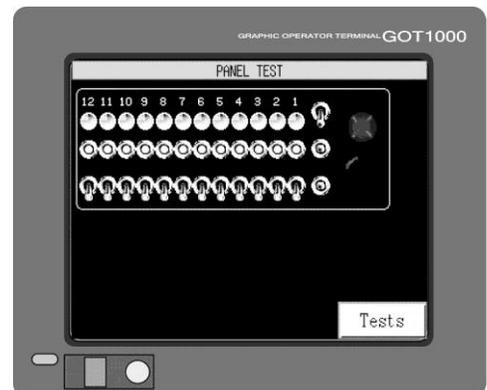


On the **PANEL TEST** screen the **PRINT** buttons are located under the print head number.

If you activate any of the **PRINT** buttons on the main control panel the gray color changes to blue, indicating that the print button is operating correctly.

The next row of switches is the **SINGLE/MULTI** switches on the main control panel.

The **SINGLE/MULTI** switches are shown in the middle or **OFF** position on the **PANEL TEST** screen. To test any of the switches, place the switch in the **SINGLE** position. The switch on the screen moves to the **SINGLE** position and the color changes to green. If you place the switch in the **MULTI** position the switch on the screen moves to the **MULTI** position and the switch color changes to orange.

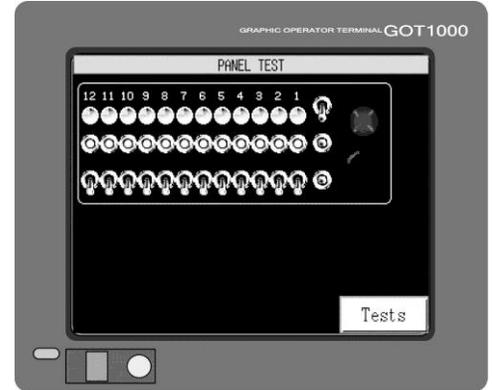


If you place the switch in either **SINGLE** or **MULTI** position and the switch does not change position as described, then the switch must be considered faulty and should be inspected or replaced.

Front/Rear Switches

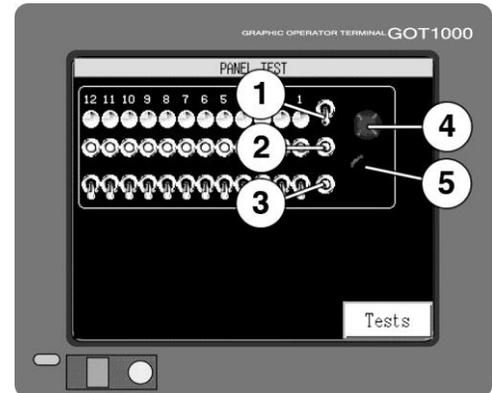
The next row of switches is the **FRONT/REAR** switches. The **FRONT/REAR** switches are shown in the **REAR** position on the **PANEL TEST** screen. To test any of the switches place the switch in the **FRONT** position. The switch on the screen moves to the **FRONT** position and the color changes to red. If you place the switch in the **REAR** position the switch on the screen moves to the **REAR** position and the color changes to gray.

If you place the switch in either **FRONT** or **REAR** position and the switch does not change positions as described, then the switch must be considered faulty and should be inspected or replaced.



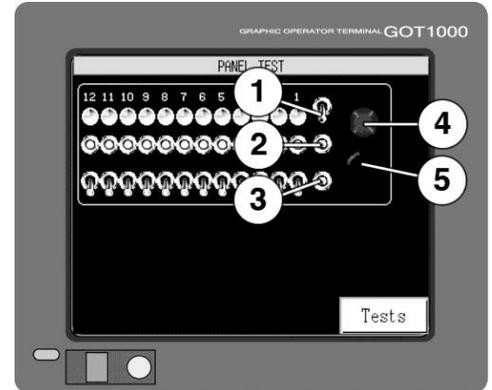
Test Print On/Off Switch (1)

The **TEST PRINT ON/OFF** switch is shown in the **OFF** position on the **PANEL TEST** screen. To test the switch, place the switch in the **TEST PRINT ON** position. The switch on the screen moves to the **TEST PRINT ON** position. If you place the switch in the **TEST PRINT OFF** position, the switch on the screen moves to the **TEST PRINT OFF** position. If you place the switch in either **TEST PRINT ON** or **TEST PRINT OFF** position and the switch does not change position as described, then the switch must be considered faulty and should be inspected or replaced.



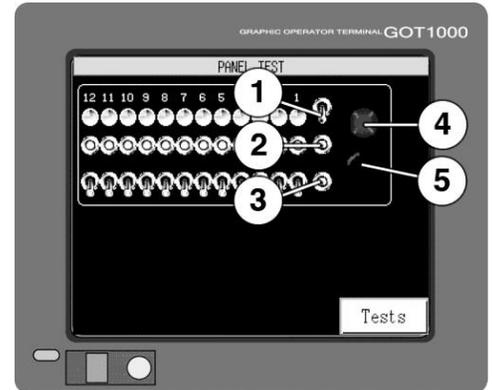
Print Start/Print Finish Switch (2)

The **PRINT START/PRINT FINISH** switch is shown in the middle or **OFF** position on the **PANEL TEST** screen. To test the switch, place the switch in the **PRINT START** position. The switch on the screen moves to the **PRINT START** position. If you place the switch in the **PRINT FINISH** position, the switch on the screen moves to the **PRINT FINISH** position. If you place the switch in either **PRINT START** or **PRINT FINISH** position and the switch does not change position on the screen, then the switch must be considered faulty and should be inspected or replaced.



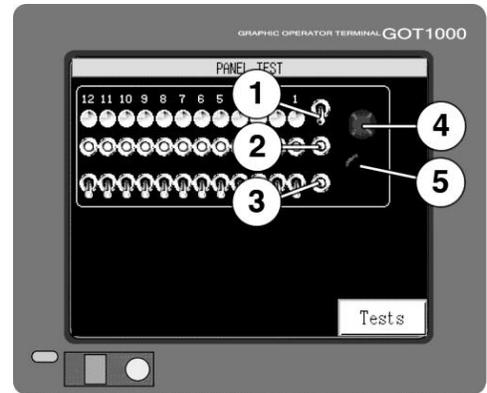
Automatic/Manual Switch (3)

The **AUTOMATIC/MANUAL** mode switch is shown in the middle or **OFF** position on the **PANEL TEST** screen. To test the switch, place the switch in the **AUTOMATIC** position. The switch on the screen moves to the **Automatic** position. If you place the switch in the **MANUAL** position the switch on the screen moves to the **MANUAL** position. If you place the switch in either **AUTOMATIC** or **MANUAL** position and the switch does not change position as described, then the switch must be considered faulty and should be inspected or replaced.



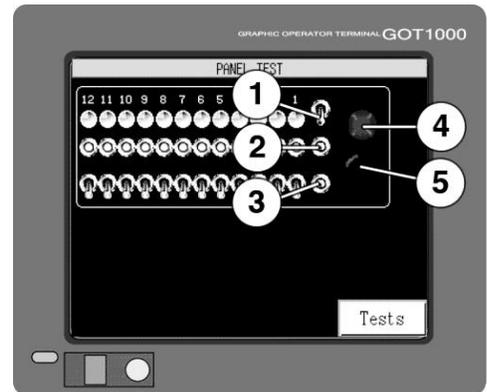
Emergency Stop Button (4)

The **EMERGENCY STOP** button is shown in the activated or in position on the **PANEL TEST** screen. To test, turn the **EMERGENCY STOP** button to the right. The button increases in diameter confirming its deactivation. If you push the button in, the **EMERGENCY STOP** button switch decreases in diameter on the screen confirming its operation. If you push in or pull out the **EMERGENCY STOP** button on the main control panel and the **EMERGENCY STOP** button on the screen does not change in size, then the **EMERGENCY STOP** button must be considered faulty and should be inspected or replaced.



Reset Button (5)

The **RESET** button is shown in the deactivated position on the **PANEL TEST** screen. To test, push the **RESET** button in. The button as seen on the **PANEL TEST** screen decreases in diameter confirming its activation. If you push in the green **RESET** button on the main control panel and the **RESET** button on the screen does not perform as described, then the **RESET** button must be considered faulty and should be inspected or replaced.



Press the **TESTS** button to return to the **TESTS** menu screen.

Proximity Test

The next menu selection in the **HARDWARE TEST** screen is **PROX. TEST**.

To access the **PROX. TEST** menu press the **PROX. TEST** button on the **HARDWARE TEST** menu screen.



The **PROX. TEST** screen provides a visual indication of all the proximity switches used to control the index and print heads. The indication is used to confirm the operation of the particular proximity switch.

**Heads Front
Heads Rear**

Across the top of the **PROXIMITY TEST** screen are the **Heads Front** and **Heads Rear** indicators. Push in the **EMERGENCY STOP** button.

The **Heads Front** and **Heads Rear** indicators perform as follows. When a print carriage reaches the front proximity switch, the indicator below the print head will change to a red indicator. If the indicator fails to change to a red indication, this would indicate that the proximity switch should be considered faulty and must be inspected and/or replaced.



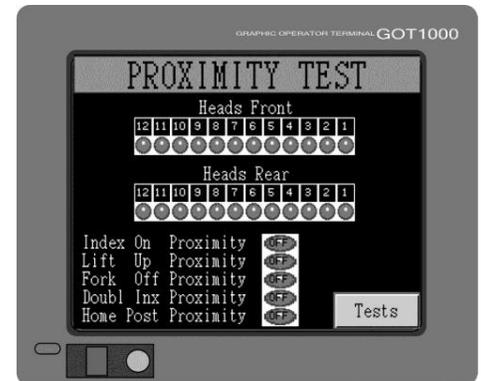
The same procedure is used to check the **Heads Rear** indicators.

Index On Proximity

The **Index On** proximity switch is mounted to the indexer base and is positioned so that it reads the cam follower bearings on the carousel plate as the indexer revolves. When this proximity switch is actuated, the control system then raises the index carousel up into the registration forks and print position.

When the print heads all complete their flood/print strokes, the index carousel lowers and this proximity switch again reads the cam follower on the carousel plate.

When the **Index On** proximity switch reads the cam follower, the indicator at the right changes to red. This confirms the correct operation of the **Index On** proximity switch. If the indicator does not change to red when this proximity switch is reading the carousel plate cam follower, then the operation of the proximity switch and/or the switch cables may be faulty. Inspect and/or replace the proximity switch and/or cables to correct the problem.

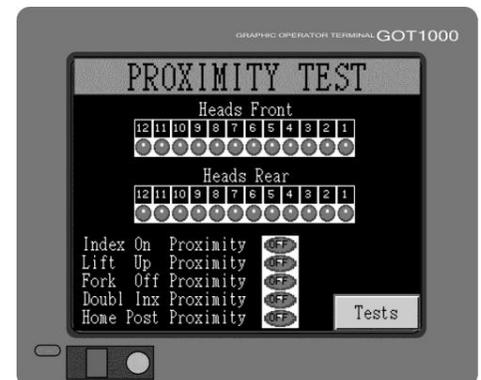


Lift Up Proximity Switch

The **Lift Up** proximity switch is mounted to the upper indexer print head support and is positioned so that it reads the index carousel registration cam follower bearings as they engage in the registration fork. When this proximity switch is actuated, the control system then signals the print heads to begin the print stroke.

When the **Lift Up** proximity switch reads the cam follower, the indicator changes to red. This confirms the operation of the **Lift Up** proximity switch.

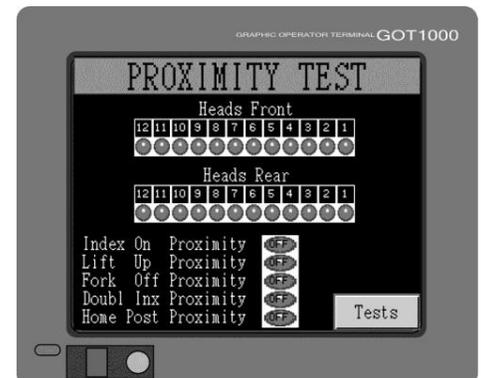
If the indicator does not change to red when this proximity switch is reading the registration cam follower, then the operation of the proximity switch and/or the cables may be faulty. Inspect and/or replace the proximity switch and/or cables to correct the problem.



Fork Off Proximity Switch

The **Fork Off** proximity switch is mounted to the index drive engagement fork assembly and is positioned so that it reads the index fork clevis when the index engagement fork is retracted.

When the **Fork Off** proximity switch reads the fork clevis, the indicator changes to red. This confirms the operation of the **Fork Off** proximity switch. If the indicator does not change to red when this proximity switch is reading the fork clevis, then the operation of the proximity switch and/or the cables may be faulty. Inspect and/or replace the proximity switch and/or cables to correct the problem.

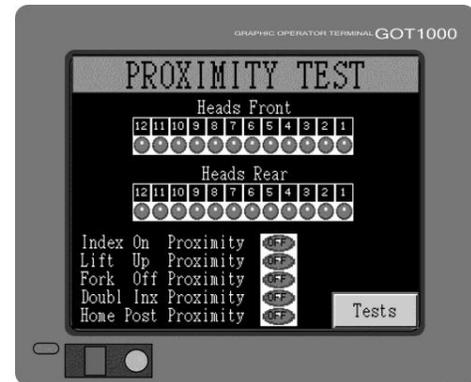


Double Index Fork Proximity Switch

The **Double Index Fork** Proximity switch is mounted to the index base near the load and unload stations and is positioned so that it reads the double index fork when the double index fork is retracted.

When the **Double Index** proximity switch reads the double index fork, the indicator changes to red. This confirms the operation of the **Double Index** proximity switch.

If the indicator does not change to red when this proximity switch is reading the **Double Index** fork, then the operation of the proximity switch and/or the cables may be faulty. Inspect and/or replace the proximity switch and/or cables to correct the problem.

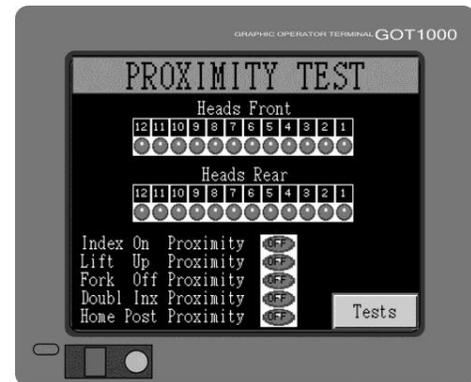


Home Post Proximity Switch

The **Home Post** proximity switch is used during the initial installation and setup of your press, or when ever the servo drive assembly or components have been replaced. This proximity switch is not used during normal operation. The switch is located on the left side of the index drive assembly.

When the **Home Post** proximity switch reads the index drive assembly, the indicator changes to red. This confirms the correct operation of the **Home Post** proximity switch.

If the indicator does not change to red when this proximity switch is reading the Index drive assembly, then the operation of the proximity switch and/or the cables may be faulty. Inspect and/or replace the proximity switch and/or cables to correct the problem.



Other Tests

To access the **OTHER TESTS** press the **OTHER TESTS** button on the **HARDWARE TEST** menu screen.

The **OTHER TESTS** menu displays control elements such as **Emergency Relay**, **T-Shirt Sensor**, **Air Pressure** and **HEAD PRINT BUTTONS**. To the right of the control elements are indicators which display either **OFF** or **ON**. As each of the control elements is activated the indicator to the right displays an **ON** indication. This confirms the operation of the control element.



For example, if you disconnect the Yellow Cycle Interruption cords, the indicator to the right of Yellow Cord displays an **OFF** indication.

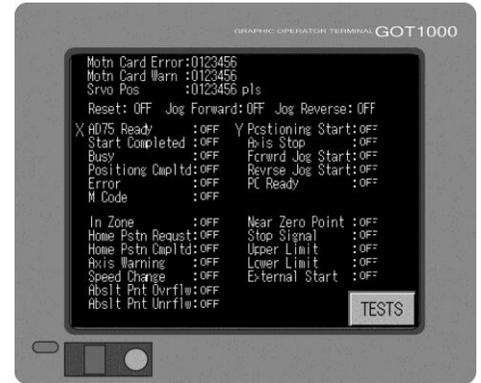
Press the **Tests** button to return to the

HARDWARE TEST menu.

Index Motion Information

To access the **INDEX MOTION** screen, press the **INDEX MOTION** button on the **HARDWARE TEST** screen.

As the servo drive operates, it maintains communication with the **PLC**. The motion card sends and receives signals from the servo drive that constantly monitors the position and speed of the servo drive. These signals and control parameters are displayed on the **INDEX MOTION** screen as a visual indication of the servo drive performance.



Index Servo Information

To access the **INDEX SERVO** screen, press the **INDEX SERVO** button on the **HARDWARE TEST** screen.

As the servo drive operates the **INDEX SERVO** screen displays information on the speed, position and mechanical loads seen by the servo drive.



Index Servo History

To access the **INDEX SERVO HISTORY** screen, press the **INDEX SERVO HISTORY** button on the **HARDWARE TEST** screen.

This menu selection displays historical data for the motion card. This information is for the use of M&R Technical Representatives only and should not be accessed or used by operators unless instructed by M&R Technical Service personnel.

Press the **Back Arrow** to return to the **HARDWARE TEST** screen.

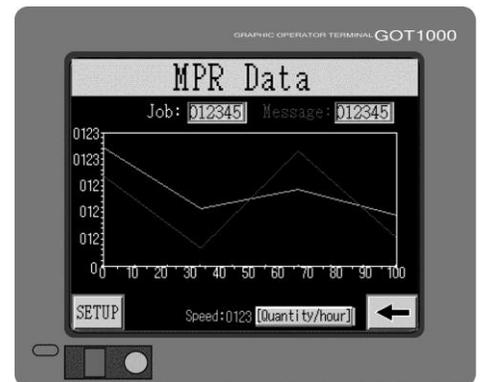


MPR Data

To select **MPR Data** press the **MPR Data** button on the **MENU** screen.

The optional **MPR Data** menu item is designed for use with the M&R Management Production Report software package. A detailed logging builds a database, which may be used for cost analysis, job tracking, production volume reporting, press utilization and down time analysis.

The **MPR Data** report filters, compiles and formats this data for output to any compatible computer. Please refer to the instructions supplied with your **MPR Data** software package.



Alarms

To access the **Alarms** screen, press the **Alarms** button on the **Menu** screen.

If an alarm condition is detected from the previous production run or production day, the **Alarm** indication (alarm bell) appears in the upper right corner of the display window. This condition alerts the operator that an **Alarm** condition exists, and that operation of the system is not possible.

To determine the cause of the **Alarm** condition press the **Alarms** button or the alarm bell and the **Alarms** screen will direct you to the area in the system where the **Alarm** condition exists. For example, if the red Emergency Stop button has been activated, or left in the **ON** position at the conclusion of the previous production shift, the **Alarms** screen alerts the system operator by displaying **Emergency panel**.

Deactivate the Emergency Stop button and press the green **RESET** push button to resume operation and clear the **Alarms** message.

Press the **Back Arrow** to return to the previous screen. Should there be any additional alarm conditions, these will also be displayed on the **Alarms** 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!**

The **Service Data** screen is also used to access the **Date/Time, Clean, Video and Utility** screens.



Date/Time

To set the time and date, press the **Date/Time** button at the bottom of the **Service Data** screen. This will display the **Date/Time** screen.

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

To change, press the month, day or year on the screen; a numeric keypad displays. The date in the illustration indicates March 18, 2008 at 4:16 PM in the afternoon. To change the date, enter the numbers which represent the current Month. Example: 01 = January, 11 = November. When you have finished entering each number for the current Month, Date, Year etc., press **Enter**.

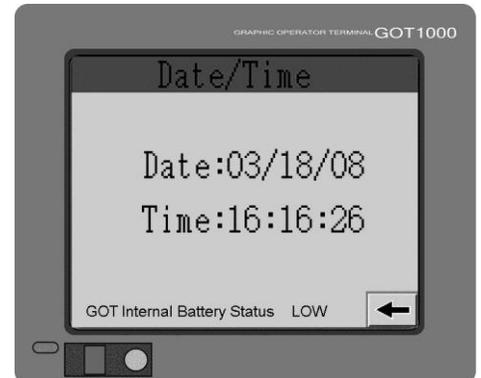
The time is displayed using a 24 hour clock. The time in the illustration is 04:16:26 PM. To enter a time of eight o'clock in the evening you would first press the number 2, then the number 0 representing 20:00 hours on a 24 hour clock or 08:00 PM.

When you have finished entering each number, press **Enter**.



GOT Battery Voltage

At the bottom of the date and time screen is the **GOT** (Graphic Operator Terminal) internal battery voltage status indicator. When the battery requires changing the **LOW** indication is displayed. The life expectancy of the battery is approximately three years.



Clean Screen

If the screen surface should require cleaning, use the **Clean** menu in the **Service Data** screen.

Press the **Clean** button. This will display the screen used to clean the screen surface. Use a clean, lint free wiper or paper towel lightly moistened with clear clean water and gently wipe the surface of the screen.

Note: Do not use solvents such as acetone, MEK or mineral spirits to clean the screen surface. These solvents will attack the surface of the screen leaving a dull finish making the display difficult to read.



When you are finished cleaning the screen surface, press the top corner buttons simultaneously. This will return you to the **Service Data** screen.



Video Contrast The **Video** menu is used to adjust the brightness and the contrast of the display screen. To access the **Video** menu press the **Video** button on the **Service Data** menu screen.

Note: This screen requires a password. Contact M&R Technical Support for assistance to change contrast.

The next screen displays the brightness setting at the top of the screen and the contrast setting below. To increase the brightness setting, press the **+** button. Each time you press the **+** button the brightness of the display screen increases. To decrease the brightness setting, press the **-** button. To adjust the contrast, proceed as described for the brightness setting.



A graduated scale is displayed at the bottom of the screen and may also be used to set the brightness and contrast of the display screen. Press the shaded cell in the graduated scale which most approximates the brightness and contrast setting you require. When you are finished, press the **OK** button.

Press the **X** in the upper right corner of the screen to return to the **Service Data** screen.

Utility The **Utility** screen is intended for M&R Service Personnel only and requires a Password for access. **DO NOT ATTEMPT TO ACCESS THE UTILITY SCREEN.**



**M&R
Information**

To access the **M&R Information** menu, press the **M&R** button on the **Menu** screen.

The **M&R Information** screen contains information on how to contact M&R Printing Equipment and program information.

Press the **Back Arrow** to return to the **M&R** screen.



Step 2

Now go to **OPTIONS** and press **REVOLVER** (4).



The button (5) to the right of **Revolver Mode** displays either **On** or **Off**. To change between **On** and **Off** mode press the button. Press the button until **On** displays to program or operate in the **Revolver Mode**.



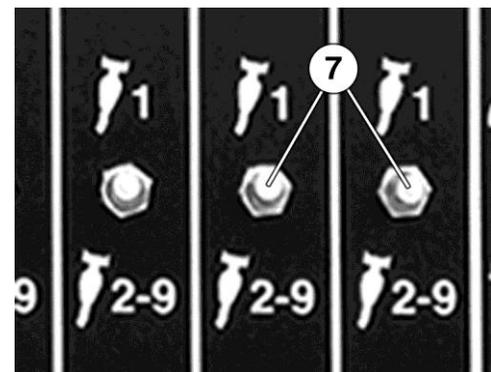
Step 3

Select **Revolution No. 1**. Press the data entry cell (6) to the right of **Revolution**; a numeric keypad displays. Enter the number **1** and press **Enter**.

Under **Revolution No. 1** select head No.1 and head No.2 (flash station) to **On** (7).



Place the **Single/Multi** switch (7) for heads No. 1 and No. 2 in the **Single** position.



Press **Enter Program** (8). The indicator below print head No. 1 displays a **1** and below print head No. 2 the screen displays the letter **F** confirming that the print head will now operate as a flash cure station.

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

Your program selections now appear on the **Revolver** menu.



Step 4

Select **Revolution No. 2**. Press the data entry cell (6) to the right of **Revolution**; a numeric keypad displays. Enter the number **2** and press **Enter**.



Step 5

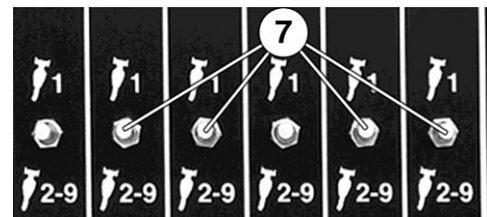
Under **Revolution No. 2** select heads 1, 2, 4 and 5 to **On**.

Place the **Single/Multi** switch (7) for heads 1, 2, 4 and 5 in the **Single** position.

Press **Enter Program** (8). The indicator below heads 1, 4 and 5 displays a **1**. Below head 2, the screen displays the letter **F** confirming that the print head will operate as a flash cure station.

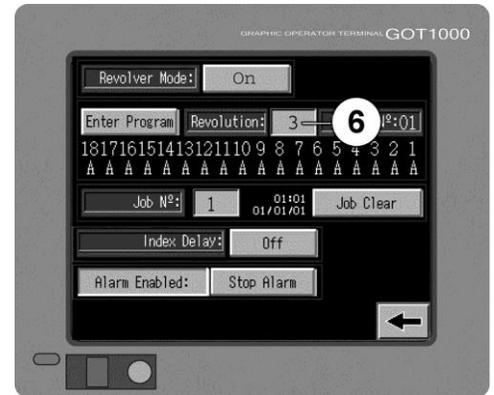
Turn heads 1, 2, 4 and 5 **Off**.

Your program selections now appear on the **Revolver** menu.



Step 6

Select **Revolution No. 3**. Press the data entry cell (6) to the right of **Revolution**; a numeric keypad displays. Enter the number **3** and press **Enter**.



Step 7

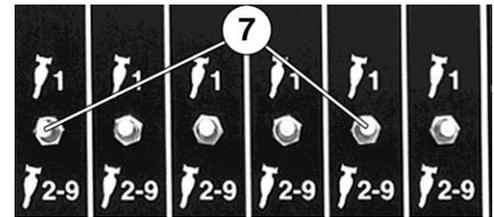
Under **Revolution No. 3** select heads 2 and 6 to **On** (7).

Place the **Single/Multi** switch (7) for heads 2 and 6 in the **Single** position.

Press **Enter Program** (8). The indicator below head 6 displays a **1**. Below head 2 the screen displays the letter **F** confirming that the print head will operate as a flash cure station.

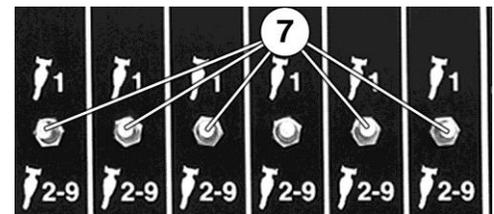
Turn heads 2 and 6 **Off**.

Your program selections now appear on the **Revolver** menu.



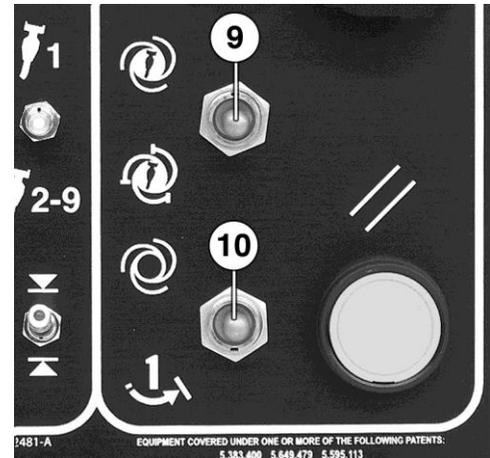
Step 8

Make sure all of the heads that you will be using are in the **On** position (7) and your flash unit is turned **On**.



You are now ready to print.

Place the **Automatic/Manual** switch (10) in the **Automatic** position. Activate the **Print Start** switch (9) to begin the Revolver sequence.

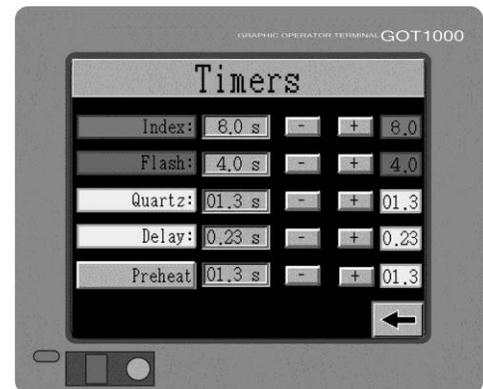
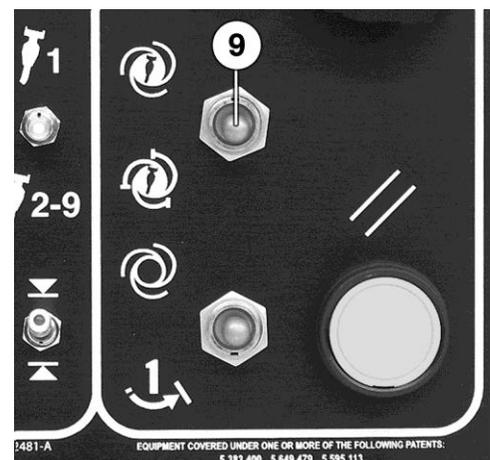


To continue printing: When you hear the audible alarm near the end of the last revolution push the **Print Start** switch (9). Also make sure the **Index Delay** setting under **Timers** is set to a long enough time for you to unload/load the shirts.

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.

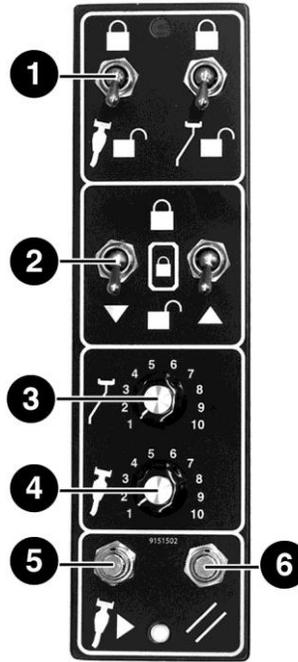
The press will then switch to the **Flash Only** time of 4 seconds for all of the revolutions you have programmed. As the press approaches the end of the last revolution and the audible alarm sounds. Press **Print Start**. The press returns to the **Flash** and **Index** time combination to give the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

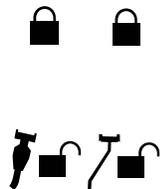
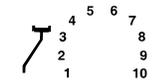
The last shirt/pallet will stop at the load station.

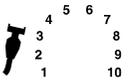


6.2 Print Station

6.2.1 Print Station Control Panel



Number	Name	Function
1	<p>Squeegee/ Floodbar Lock/Unlock</p> 	<p>Locks the squeegee/floodbar to its mounting bar. To lock the squeegee/floodbar to the print station carriage mounting bar, position the squeegee/floodbar on the mounting bar and place the switch in the Lock position.</p>
2	<p>Frame Lock On/Off (Optional)</p> 	<p>The Frame Lock On/Off switches lock the screen frame in the screen clamps. The switch on the left activates the front screen frame locking clamps and the right switch activates the rear screen frame locking clamps. To lock the screen frame into the screen frame holder, locate the screen frame in position and place the switches in the On position. To release the screen frame, move the switches to the Off position and remove the screen frame from the screen frame holders.</p>
3	<p>Flood Speed</p> 	<p>The Flood Speed knob controls the floodbar speed.</p> <p>Turn the knob clockwise to increase speed. Turn the knob counterclockwise to decrease speed.</p>

Number	Name	Function
4	<p>Squeegee Speed</p> 	<p>The Squeegee Speed knob controls the squeegee speed.</p> <p>Turn the knob clockwise to increase speed. Turn the knob counterclockwise to decrease speed.</p>
5	<p>Print Button</p> 	<p>Cycles the individual print station manually. The Print button is also used during screen frame setup to check registration. To operate, place the Single/Double switch for the particular print station on the Main Control Panel in the middle or OFF position. Press the Print button. The index carousel moves up so that screen registration or placement may be checked.</p> <p>The Print button also functions in a Standard or Enhanced mode. These functions are explained in the Operator Interface Section of this manual.</p>
6	<p>Reset Button</p> 	<p>To lower the index table, press the Reset button.</p>

6.2.2 Install Pallets and Screen Frames

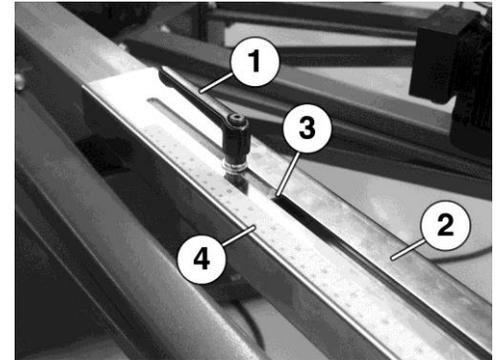


Install Pallets

WARNING: Before entering between print heads, always push in Emergency Stop button and disconnect Cycle Interruption Cords. Refer to the beginning of this section for detailed information.

Loosen the handle (1) on the top of the Pallet Locator (2). Using the edge of the Pallet Locator Mounting Arm as reference (3), slide the Pallet Locator (2) to the required position on the scale (4).

Example: If the pallet size is 22", align the edge of the Pallet Locator Mounting Arm (3) with 22" on the scale (4).



Set the Pallet Locking Handles as shown. Slide the square end of the Pallet onto the Pallet Support Arm.



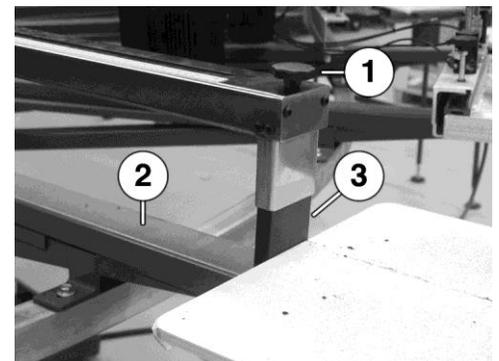
With all print head switches on the Main Control Panel in the **OFF** position, press the **PRINT** button to raise the Index Table.

Position the Pallet Locator Stop (3) to approximately 1/8" above the Pallet Support Arm (2). Turn the knob (1) on the Pallet Locator counterclockwise to **lower** or clockwise to **raise** the Pallet Locator Stop (3).

Slide the Pallet up on the Pallet Support Arm (2) so that it just touches the Pallet Locator Stop (3).

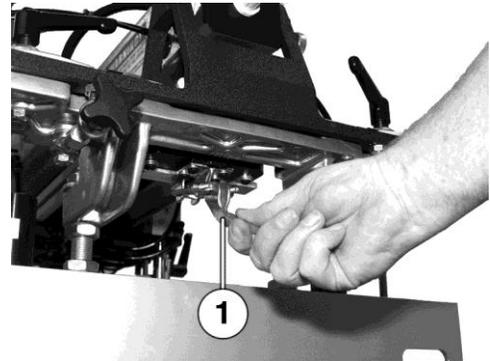
Turn the Pallet Locking Handles towards the center of the press to lock the Pallet in place.

Install remaining Pallets.

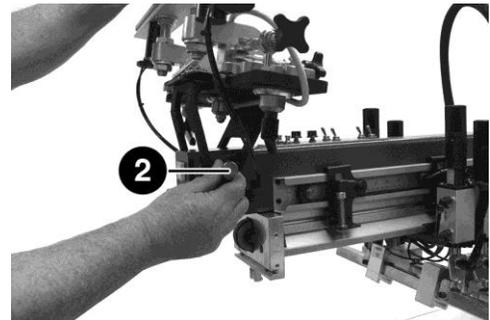


Install Screen Frames

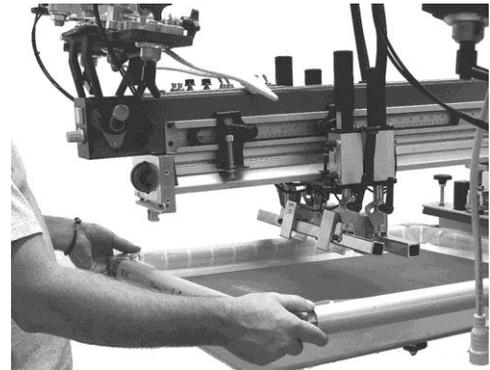
For easy installation of screen frames, and/or flash cure units, the M&R print stations feature a Flip Up Front Frame Holder which pivots up and out of the way. To move the front frame holder up to the load position, unlatch the front frame holder lock handle (1). To unlatch, push the locking handle lever down.



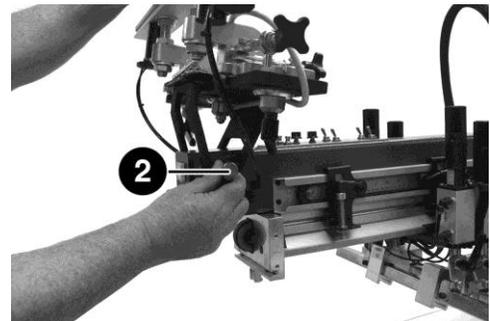
Move the front frame holder up to the lock position. A spring loaded locking pin (2) automatically secures the front frame holder in place during screen frame or flash unit installation.



Install screen frame in the rear screen frame holder. Place the **REAR FRAME LOCK** switch on the print head control panel in the **ON** position. The pneumatic cylinders lock the screen frame into the screen frame holder. To release the screen frame, move the switch to the **OFF** position and remove the screen frame from the screen frame holder.

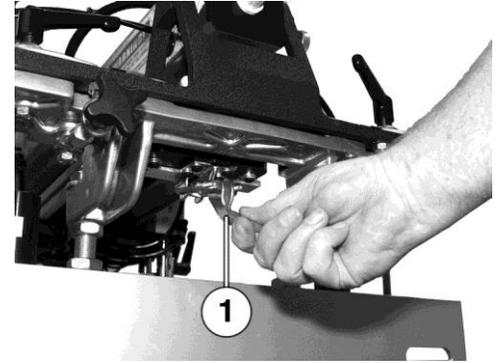


Pull out the locking pin knob (2). Move the front screen frame holder to down into the print position.



Pull up on the red locking lever (1) to secure the front frame holder.

Place the **FRONT FRAME LOCK** switch on the print head control panel in the **ON** position.



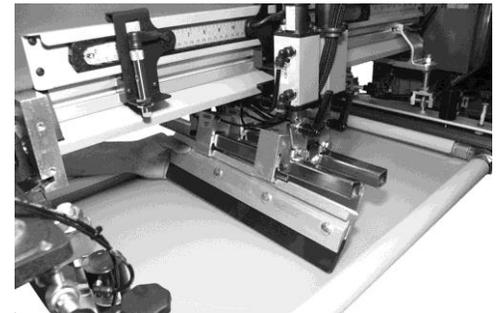
6.2.3 Squeegee/Floodbar



Install Squeegee/Floodbar

WARNING: Before entering between print heads, always push in Emergency Stop button and disconnect Cycle Interruption Cords. Refer to the beginning of this section for detailed information.

The squeegee and floodbar are installed on their individual mounting bars using pneumatic clamps. The floodbar 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 lift the floodbar up so that the “U” shaped top of the floodbar engages the mounting bar. Center the floodbar and engage the pneumatic clamps using the switches located on the print station control panel.



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

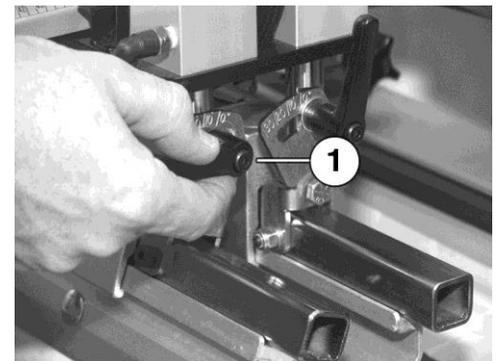


Squeegee/Floodbar Angle Adjustment

WARNING: Before entering between print heads, always push in Emergency Stop button and disconnect Cycle Interruption Cords. Refer to the beginning of this section for detailed information.

Both the floodbar and the squeegee are provided with an angle adjustment. The greater the angle, the more ink the squeegee deposits during the print stroke. Decreasing the angle reduces the ink deposit. The same is true for the angle of the floodbar. A 15-20 degree angle for the squeegee and floodbar is a good starting point. A reference scale is stamped into the angle bracket for ease of adjustment.

To adjust the angle of the floodbar or squeegee, loosen the lock handle (1) on the angle brackets. Position the floodbar and/or squeegee to the desired angle and tighten the lock handles.

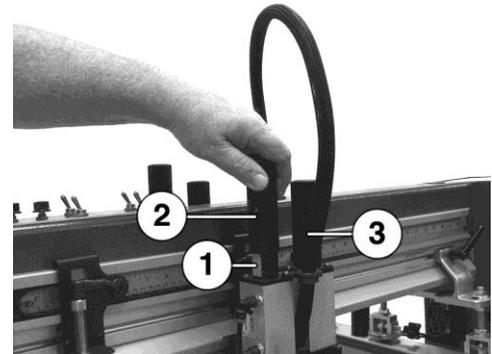




WARNING: Before entering between print heads, always push in Emergency Stop button and disconnect Cycle Interruption Cords. Refer to the beginning of this section for detailed information.

**Squeegee/
Floodbar
Pressure
Adjustments**

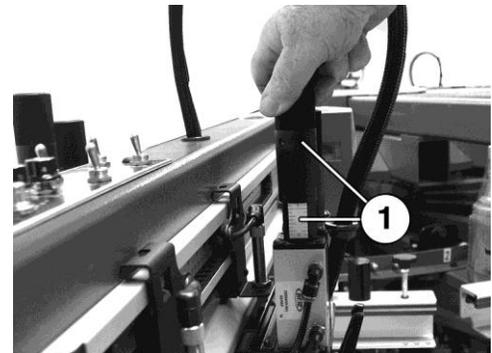
Adjust the floodbar pressure using the knobs at the top of the print carriage assembly. The floodbar pressure should be adjusted so that there is only a slight pressure felt on the bottom of the screen mesh. Turn the knobs (3) counterclockwise to **increase** the floodbar pressure. Turn the knobs clockwise to **decrease** the pressure.



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. You can note the pressure reading on the reference scale (1) on the air cylinder. Turn the knobs (2) counterclockwise to **increase** the pressure. Turn the knobs clockwise to **decrease** the pressure.

**Squeegee
Pressure
Equalizer**

The squeegee pressure equalizer adjustment uses pneumatic energy to maintain equal pressure across the length of the squeegee. To use, first raise the squeegee pressure adjustment knobs (1) to maximum pressure on both the right and left sides of the print carriage by turning the knobs counterclockwise.



To adjust the Squeegee Pressure Equalizer, pull out the adjustment knob to unlock the adjustment. Now turn the adjustment knob clockwise or to the right to increase the pressure, or counterclockwise or to the left to decrease the pressure. A setting of 35-40 psi is sufficient for most printing requirements.



6.2.4 Print Head Adjustments



Print Head Micro Register

WARNING: Before entering between print heads, always push in Emergency Stop button and disconnect Cycle Interruption Cords. Refer to the beginning of this section for detailed information.

Place the switch for the rear screen frame clamps on the print head control panel in the **OFF** position. This allows the screen frame to move freely during micro-register adjustments.

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

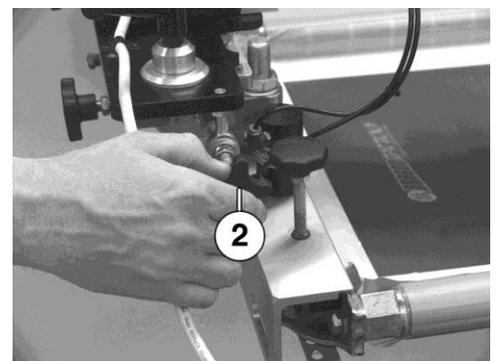
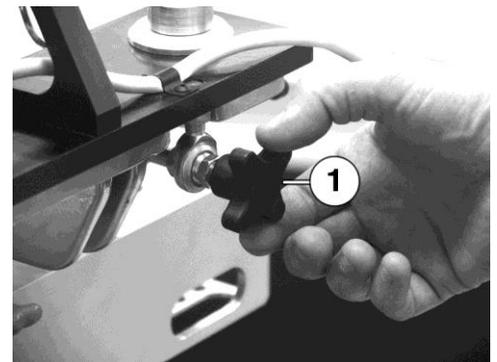
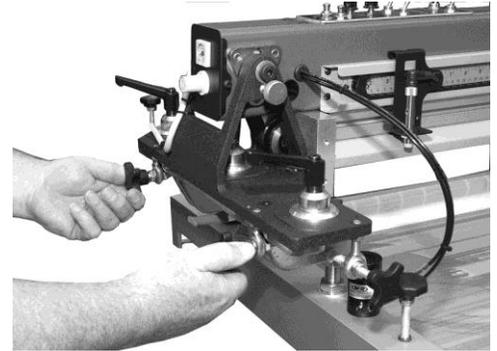
Unlock both the right and the left micro-register locking handles.

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

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.

When you have completed the micro-register adjustments, check to be sure the adjustment knobs still have the $1/32$ " play in both the clockwise and counter clockwise directions. Now lock the micro-register locking handles securely.

Place the switch for the rear screen frame clamps on the print head control panel in the **ON** position.



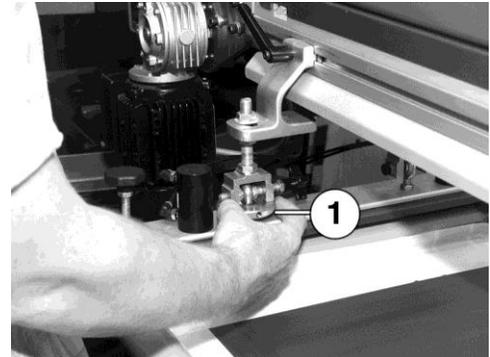


WARNING: Before entering between print heads, always push in Emergency Stop button and disconnect Cycle Interruption Cords. Refer to the beginning of this section for detailed information.

Rear Micro Register Adjustment

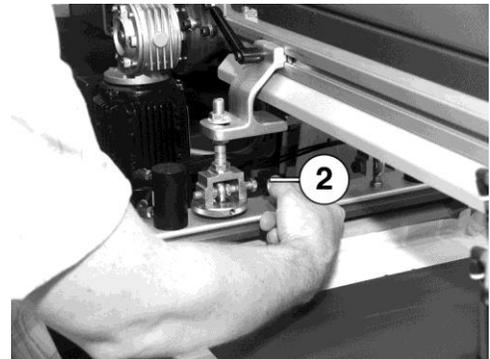
The rear micro-register adjustment allows movement of the screen frame from the left to the right.

To adjust, loosen the knurled locking knob (1) at the bottom of the adjustment to allow movement of the screen frame.



Adjust the cross knob (2) at the right side of the adjustment to make registration corrections.

After adjusting, lock the knurled knob (1).



WARNING: Before entering between print heads, always push in Emergency Stop button and disconnect Cycle Interruption Cords. Refer to the beginning of this section for detailed information.

Front and Rear Print Stroke Length Adjustment

To adjust the print stroke length, grasp the sensor mounting bracket and slide the proximity sensor to the required position.

Adjust the sensor so that the floodbar and squeegee just clear the image area of the screen.

Note: Do not adjust the sensor while the Print Station is in operation.



6.2.5 Central Off-Contact Lever



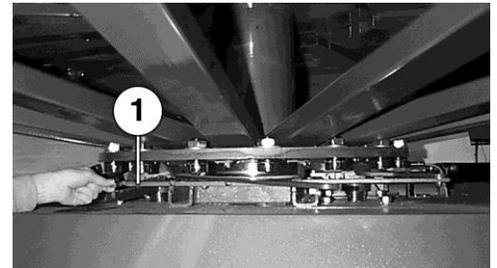
WARNING: Before entering between print heads, always push in Emergency Stop button and disconnect Cycle Interruption Cords. Refer to the beginning of this section for detailed information.

Central Off-Contact Lever

The Central Off-Contact Lever provides a single point to change the off-contact dimension of all the screens with the 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 1/16" (1.5 mm) increments.

Setting the Off-Contact Lever

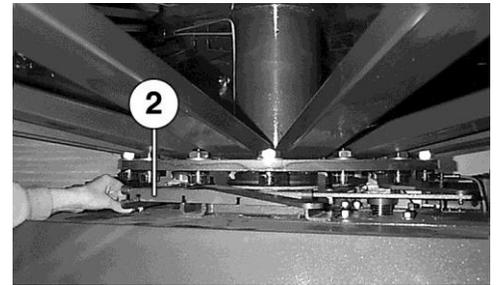
To adjust the lever the index table must be in the down position. Lift up the stringer (1). Move the lever to the required position for the off-contact setting.



Locking the Off-Contact Setting

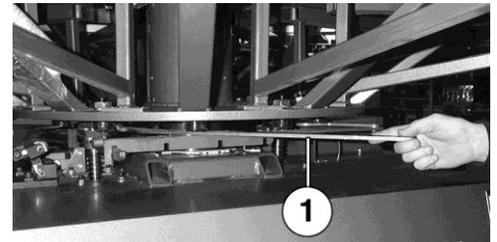
After adjusting the off-contact setting, lower the stringer (2) to lock the setting. Raise the index table to check the off-contact.

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.



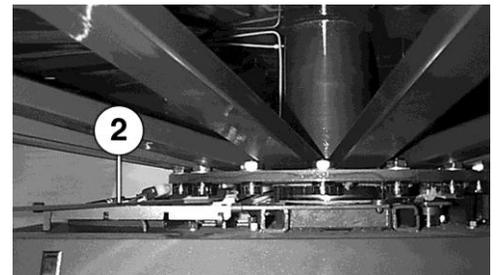
Minimum Off-Contact Setting

The Central Off-Contact Lever has four possible positions. With the lever moved all the way to the right (1), the index table is set at its highest position for the minimum off-contact setting.



Maximum Off-Contact Setting

When the lever is moved all the way to the left (2), the index table is set at the lowest position. This setting gives the most off-contact setting, which is 3/16" (5 mm) added to the initial off-contact.



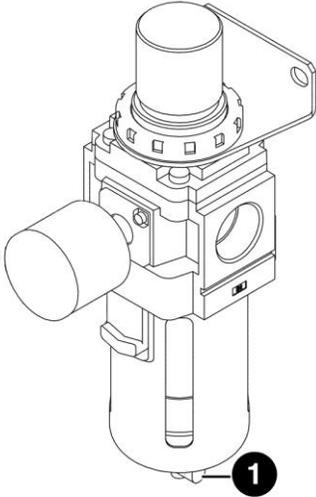
7. Scheduled Maintenance

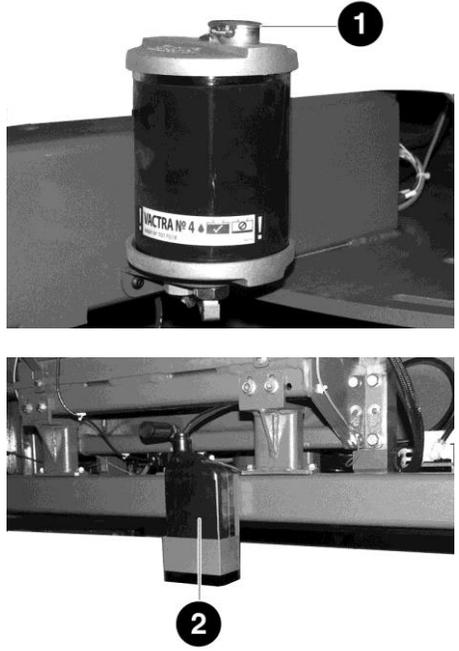
Benefits Properly maintained equipment operates more efficiently, reduces operating costs, and lasts longer. A properly managed preventive maintenance program can minimize downtime.

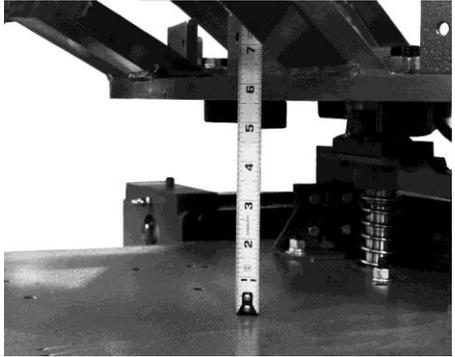
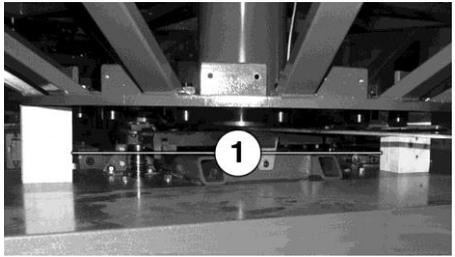
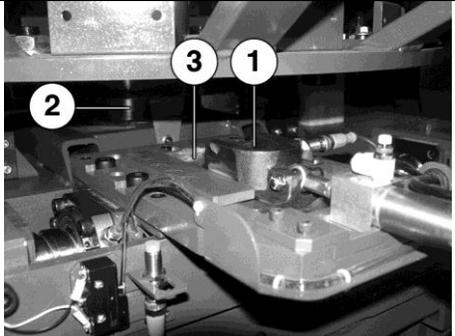
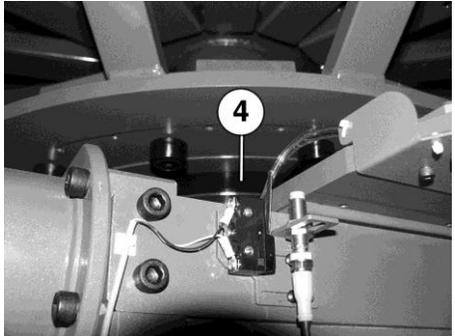
Preparation An effective preventive maintenance program includes:

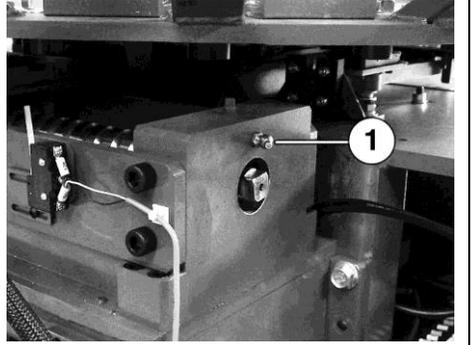
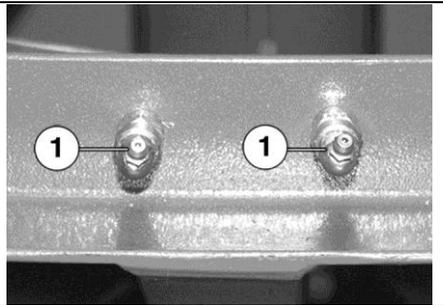
- proper selection, handling, and application of lubricants
- stocking high-quality replacement parts
- general cleaning and appearance of equipment
- creation of a preventive maintenance history for each piece of equipment

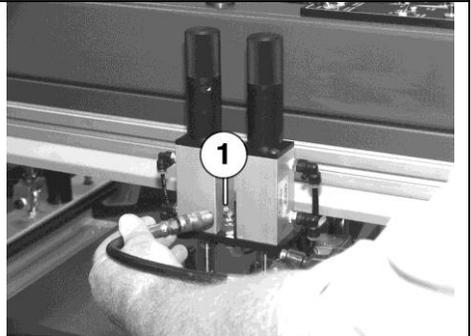
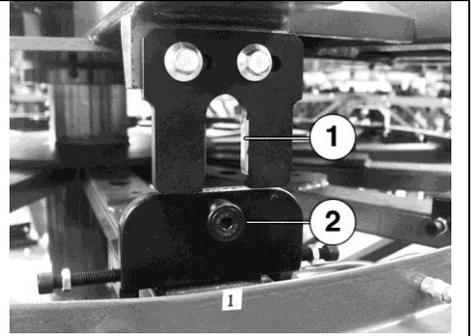
Preventive maintenance documentation can be an invaluable resource.

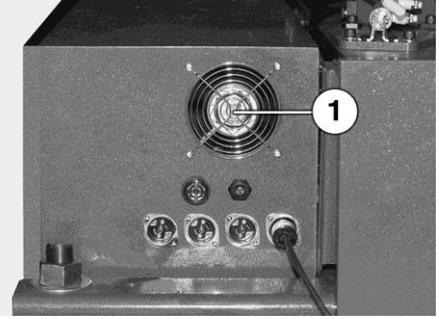
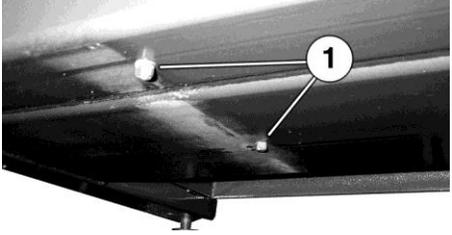
Frequency	Maintenance	
	WARNING: To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to the equipment.	
Daily	<p>Check and Clean Print Carriage Assembly</p> <p>Items required: 1 - Towel</p> <p>Use a towel to clean ink, lint, dirt or spray adhesive from the print carriage guide shafts, chopper linkage assembly, adjustment knobs, Squeegee/Floodbar angle brackets and all other hardware.</p>	
	<p>Drain Air Filter Moisture Trap</p> <p>Press and hold the orange button (1) on the bottom of the filter until no moisture is present in the air.</p> <p>Note: If water or excessive moisture is in the reservoir, remove water/moisture from reservoir and inspect the chiller and compressor for proper operation.</p> <p>IMPORTANT: Oil-less valves are used on this equipment, do NOT lubricate the air.</p>	

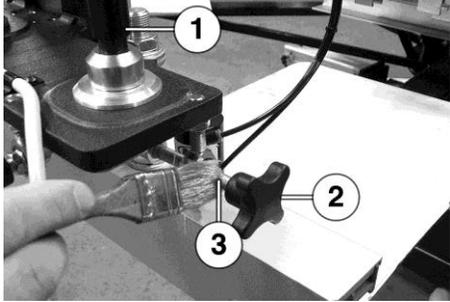
Frequency	Maintenance	
Daily (Cont.)	<p>Check Index Drive Lubricator Oil Level</p> <p>Items required: 1 - Vactra No. 4 Oil (M&R Part No. 7017018)</p> <p>IMPORTANT: Under normal operating conditions, the oil level in the reservoir should gradually decrease over time. If the oil level does not decrease, contact the M&R service department.</p> <ol style="list-style-type: none">1. Visually inspect oil level. To add oil to the reservoir, flip open the cap (1) and fill.2. Empty the oil collection bottle (2) and dispose of used oil according to local recycling practices.	

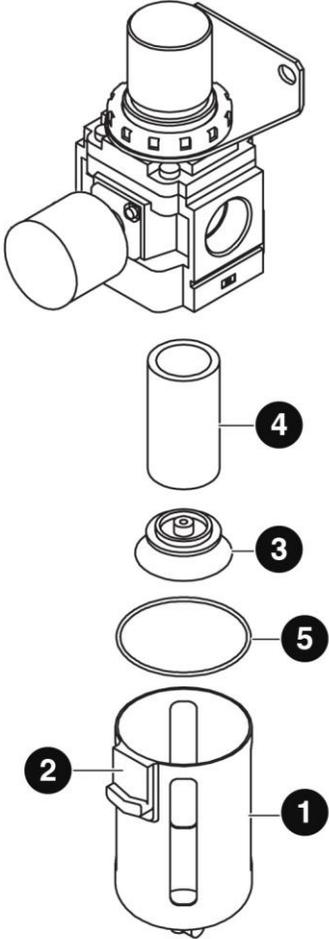
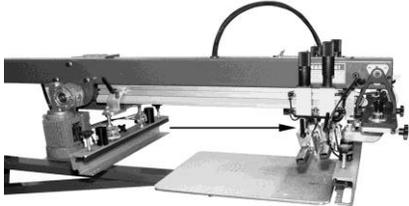
Frequency	Maintenance	
	<p>WARNING: To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to the equipment.</p>	
<p>Weekly</p>	<p>Lubricate Index Clevis Fork, Clevis Plate and Lower Carousel Plate</p> <p>Items required: 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</p> <p>IMPORTANT: This procedure requires electrical power and compressed air to be connected to the press.</p> <ol style="list-style-type: none"> 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). <p>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.</p>	 
	<ol style="list-style-type: none"> 3. Use a towel to remove the old grease from the inside surface of the Index Clevis (1), Index Cam Follower Bearings (2), and Clevis Plate (3). 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 (4). <p>IMPORTANT: If this step is not performed as specified, the Index Pusher Pads may score a groove into the surface of the carousel plate.</p> <ol style="list-style-type: none"> 5. Remove wooden blocks. 	 

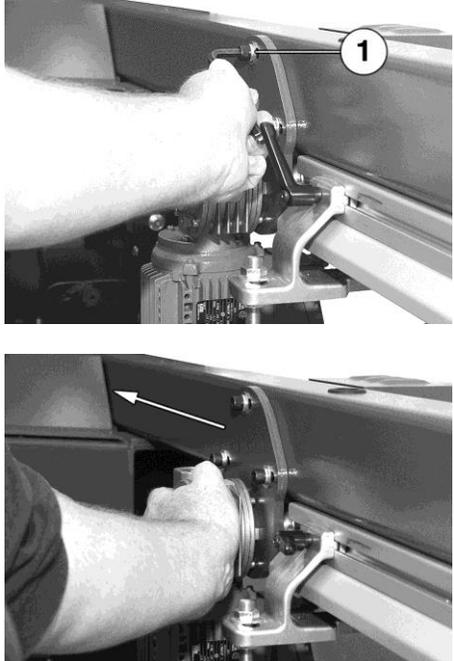
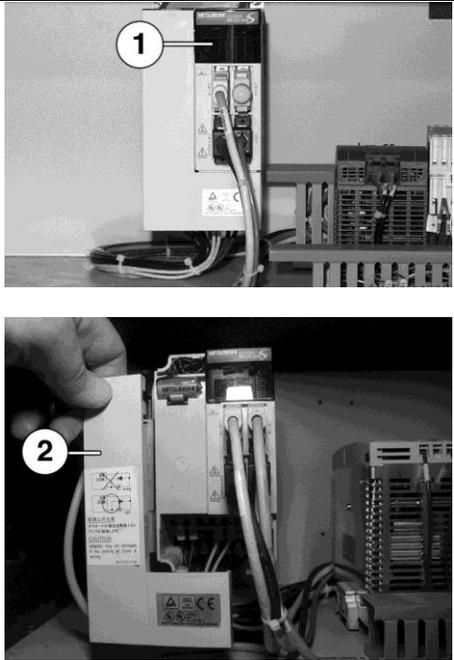
Frequency	Maintenance	
Weekly (Cont.)	<p>Lubricate Index Needle Bearing</p> <p>Items required: 1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034) 1 - Standard Pump Action Grease Gun</p> <p>Using a standard pump action grease gun, slowly apply 1 pump of grease to the grease fitting (1).</p>	
	<p>Lubricate Center Shaft Bushings</p> <p>Items required: 1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034) 1 - Standard Pump Action Grease Gun</p> <p>Apply grease to the grease fittings (1) until you notice the grease breaking between the bearing race and the center shaft.</p>	

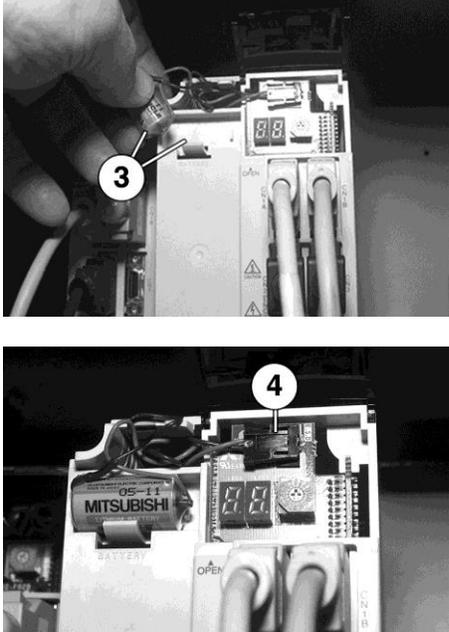
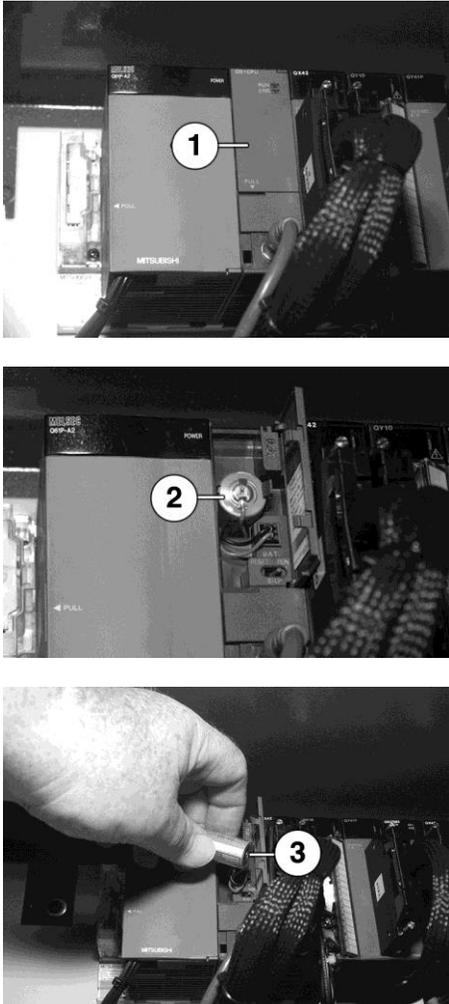
Frequency	Maintenance	
	<p>WARNING: To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to the equipment.</p>	
Every Two Weeks	<p>Lubricate Print Carriage Assembly Linear Bearing</p> <p>Items required: 1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034) 1 - Standard Pump Action Grease Gun</p> <p>Using a standard pump action grease gun, slowly apply 1 pump of grease to the grease fitting (1).</p>	
	<p>Lubricate Registration Cam Follower Bearings and Forks</p> <p>Items required: 1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034) 1 - Small Brush 1 - Towel</p> <p>Use a towel to remove old grease from the inside surface of the Registration Forks (1) and Registration Cam Follower Bearings (2). Use a small brush to apply a thin coat of new grease to these areas.</p>	

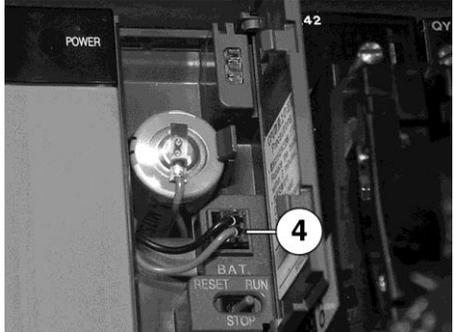
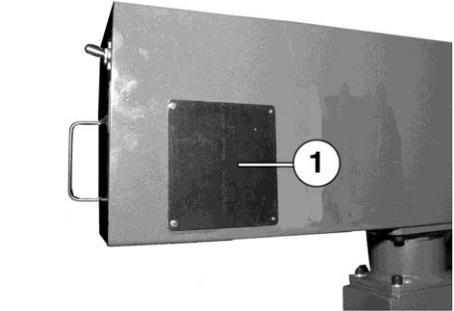
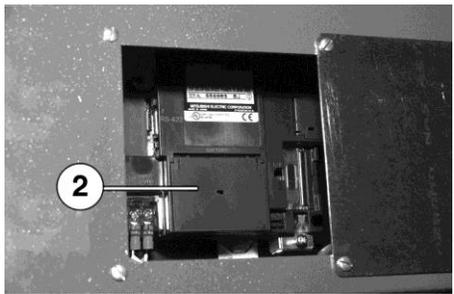
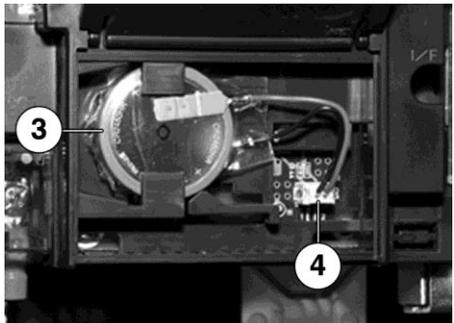
Frequency	Maintenance	
	<p>WARNING: To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to the equipment.</p>	
<p>Monthly</p>	<p>Clean Circulation Fan and Air Vents</p> <p>Items required: 1 - Vacuum</p> <p>Vacuum the area around the fresh air intake vent, circulation fan and finger guard assembly (1).</p>	
	<p>Drain Water From Air Manifolds</p> <p>Items required: 1 – 7/16” Open End Wrench 1 – 3/8” Open End Wrench</p> <ol style="list-style-type: none"> 1. Remove the manifold drain plugs (1) on the bottom of the indexer chassis to drain any water that may have accumulated. <p>Note: Plugs may show a small amount of oil. No oil or excessive oil indicates oil line lubricator is not operating correctly and must be adjusted.</p> <ol style="list-style-type: none"> 2. Replace the manifold drain plugs and tighten. DO NOT OVER TIGHTEN! 	

Frequency	Maintenance	
	<p>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.</p>	
<p>Every Three Months</p>	<p>Lubricate Micro-Registration Threaded Shafts</p> <ul style="list-style-type: none"> 1 - Permatex Super Lube with Teflon Grease (M&R Part No. 7018034) 1 - Small Brush 1 – Towel <ol style="list-style-type: none"> 1. Use a towel to remove old grease from the threaded shaft surfaces. 2. Loosen micro-registration knobs (1). 3. Turn adjustment knob (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 knob (2) to original position. 6. Tighten micro-registration knob (1). 7. Repeat procedure for each print head. 	

Frequency	Maintenance	
<p>Every Three Months (Cont.)</p>	<p>Replace Air Filter Element and Reservoir Seal</p> <p>Items required: 1 - Filter Element (M&R Part No. 2019114-A) 1 - Bowl Seal (M&R Part No. 2020091-1) 1 - 10 wt. Non-Detergent Oil (M&R Part No. 7017000)</p> <ol style="list-style-type: none"> 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 the Moisture Trap (1) by pushing up and turning 1/8 of a turn counterclockwise. Pull the Reservoirs 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. <p>Note: The level sight glass should be facing towards the front of the assembly.</p>	
	<p>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.</p>	
<p>Every Six Months</p>	<p>Check Print Carriage Drive Belt Tension</p> <p>Items required: 1 – 3/8” Hex Wrench</p> <p>Note: Manually move the Print Carriage all the way towards the front of the print station.</p> <ol style="list-style-type: none"> 1. Check drive belt for proper tension. The belt should be straight and taught. 2. If adjustment is needed, use a 3/8” Hex Wrench to loosen the three socket cap screws (1) 2 full turns. 3. To increase drive belt tension, manually move the Print Carriage Drive Assembly towards the rear of the print station 	

	<p>as shown.</p> <p>IMPORTANT: Do not use pry bars or other tools as levers to move the Print Carriage Drive Assembly.</p> <p>4. While holding the Print Carriage Drive Assembly in position, tighten the three socket cap screws (1).</p>	
<p>Frequency</p>	<p>Maintenance</p>	
	<p>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.</p>	
<p>Every Three Years</p>	<p>Replace Servo Amplifier Batteries</p> <p>1 - Servo Battery (M&R Part No. 1017147)</p> <p>IMPORTANT: This procedure requires electrical power to be connected to the press.</p> <p>IMPORTANT: The new batteries must be installed within five minutes of removal of the old battery. This will ensure the preservation of program data in the Servo Amplifier memory.</p> <ol style="list-style-type: none"> 1. Open the access door on the lower electrical enclosure mounted to the indexer chassis. 2. Locate both Servo Amplifier units (1 & 2) mounted to the rear wall. Remove the access cover on the Servo Amplifier (2) and flip up the LED cover assembly on Servo Amplifier (1) to expose the battery connector. 	

Frequency	Maintenance	
<p>Every Three Years (Cont.)</p>	<p>3. Remove the old battery (3) from the holder, then, disconnect the battery by squeezing while pulling on the connector (4).</p> <p>4. Install replacement battery.</p>	
	<p>Replace PLC Battery</p> <p>Items required: 1 - PLC Battery (M&R Part No. 1017515)</p> <p>IMPORTANT: This procedure requires electrical power to be connected to the press.</p> <p>IMPORTANT: The new battery must be installed within five minutes of removal of the old battery. This will ensure the preservation of program data in the PLC memory.</p> <ol style="list-style-type: none"> 1. Open the access door on the lower electrical enclosure mounted to the indexer chassis. 2. Locate the PLC module (1) mounted to the rear upright wall inside the enclosure. Swing open the access cover on the PLC module to expose the battery (2). 3. Remove the old battery (3) from the holder, then, disconnect the battery by squeezing while pulling on the connector (4). 	

Frequency	Maintenance	
<p>Every Three Years (Cont.)</p>	<p>4. Install replacement battery.</p>	
	<p>Replace Operator Interface Battery</p> <p>Items required: 1 – Battery (M&R Part No. 1017786) 1 - Blade Screwdriver</p> <p>Note: Replace battery when the LOW battery indicator is displayed.</p> <p>IMPORTANT: The new battery must be installed within twenty seconds of removal of the old battery. This will ensure the preservation of program data in memory.</p> <ol style="list-style-type: none"> Using a screwdriver, open the access door (1) on the rear of the main control panel. Locate the battery compartment door (2) at the bottom of the graphic operator terminal. Swing the door up from the bottom to open and expose the battery. Remove the battery (3) from the holder, then disconnect the battery by squeezing while pulling on the connector (4) Install replacement battery. 	  

7.1 Scheduled Maintenance Log

Maintenance Procedure	Daily	Weekly	Every 2 Weeks	Monthly	Every 3 Months	Every 6 Months	Yearly	Every 3 Years	Date performed/ Initials
Check and Clean Print Carriage Assembly	X								
Drain Air Filter Moisture Trap	X								
Lubricate Index Clevis Fork, Clevis Plate and Lower Carousel Plate		X							
Lubricate Index Needle Bearing		X							
Lubricate Center Shaft Bushings		X							
Lubricate Print Carriage Assembly Linear Bearing			X						
Lubricate Registration Cam Follower Bearings and Forks			X						
Clean Circulation Fan and Air Vents				X					
Drain Water From Air Manifolds				X					
Lubricate Micro-Registration Threaded Shafts					X				
Replace Air Filter Element and Reservoir Seal					X				
Check Print Carriage Drive Belt Tension						X			
Replace Servo Amplifier Batteries								X	
Replace PLC Battery								X	
Replace Operator Interface Battery								X	

8. 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.

VOLTS	PHASE	HERTZ 50Hz	TOTAL F.L.A.	A.L.M.
SHORT CIRCUIT CURRENT RATING		AMPS LARGEST HEATER LOAD		
kA rms symmetrical	V maximum			
FACTORY	SCHMATIC 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				

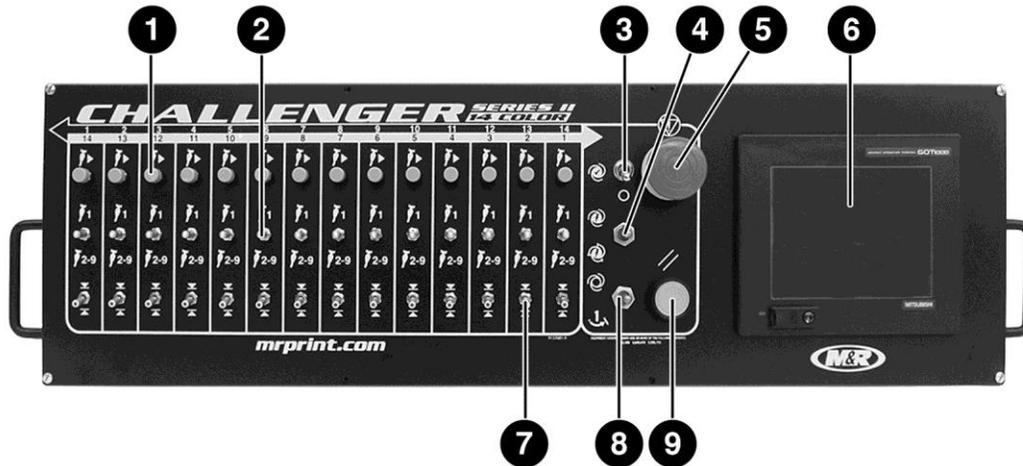


DANGER: Operating this equipment with incorrect electrical parts can result in severe or fatal personal injuries and/or property damage.

Schematic Diagrams for Electrical Parts

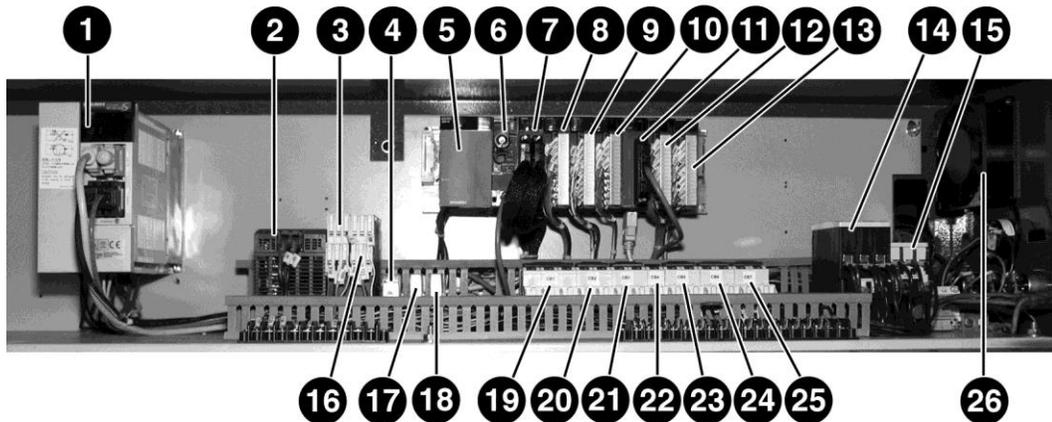
M&R uses the ‘just-in-time’ approach to printing manuals, so the electrical parts and part numbers shown in this section should be accurate. However, since schematic diagrams are model -specific, they remain the most accurate source of electrical part numbers. Cross-reference the part numbers in this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

Control Panel (UL & CE)



	Control Panel (UL & CE) Part Name	Part Numbers
		All Models
1	Push Button Switch	1017159
2	Switch (Single/Multi)	1017157
3	Switch (Test Print)	1010011
4	Switch (Print Start/Print Finish)	1010007A
5	Emergency Stop Push Button (must also order 1010040B)	1010040
6	Operator Interface	1017717
	Replacement Battery (Not Shown)	1017786
7	Switch (Front/Rear)	1017158
8	Switch (Automatic/Manual)	1010007A
9	Push Button (Reset)	1010001A

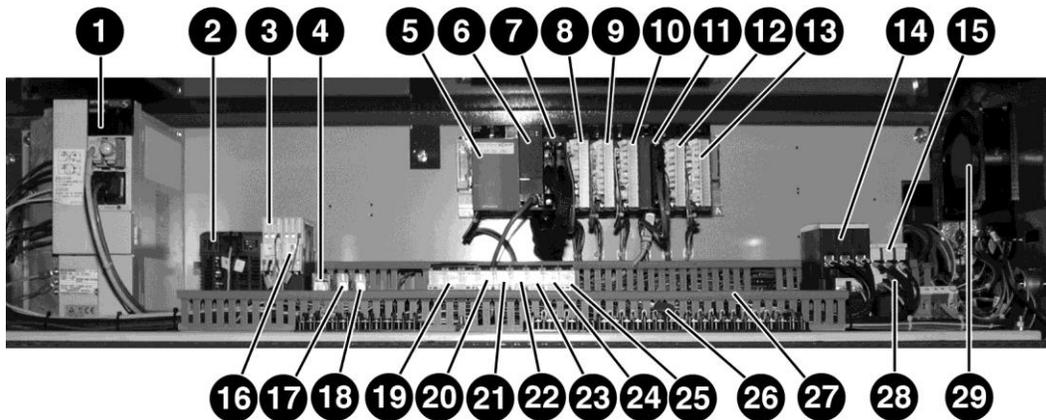
Electrical Cabinet (UL)



	Electrical Cabinet (UL) Part Name	Part Numbers				
		12/10	14/12	16/14	18/16	20/18
1	Servo Amplifier	1017483	1017483	1017483	1017483	1017483
	Replacement Battery	1017147	1017147	1017147	1017147	1017147
2	Power Supply	1024131	1024131	1024131	1024131	1024131
3	Safety Relay (K2)	1017422	1017422	1017422	1017422	1017422
4	Relay 4 Pole 24 VDC (K1)	1011033	1011033	1011033	1011033	1011033
5	Power Supply	1017476	1017476	1017476	1017476	1017476
6	PLC	1017502	1017502	1017502	1017502	1017502
	Replacement Battery PLC	1017515	1017515	1017515	1017515	1017515
7	Input Module	1017501	1017501	1017501	1017501	1017501
8	Output Module	1017478	1017478	1017478	1017478	1017478
9	Output Module	1017478	1017478	1017478	1017478	1017478
10	Output Module	1017478	1017478	1017478	1017478	1017478
11	Positioning Module	1017503	1017503	1017503	1017503	1017503
12	Output Module	—	1017478	1017478	1017477	1017477
13	Mixed I/O Module	1017787	1017787	1017787	1017529	1017529
14	Contactors (C1)	1011306	1011306	1011306	1011306	1011306
15	Contactors (C2)	1011302	1011302	1011302	1011302	1011302
16	Safety Relay (K3)	1017422	1017422	1017422	1017422	1017422
17	Relay 2 Pole 24 VDC (K4)	1010204	1010204	1010204	1011033	1011033
18	Relay 2 Pole 24 VDC (K5)	1010204	1010204	1010204	1010204	1010204
19	Circuit Breaker 3 Pole - 25 A (CB1)	1006518	1006518	1006518	1006518	1006518
20	Circuit Breaker 2 Pole - 3 A (CB2)	1006447	1006447	1006447	1006447	1006447
21	Circuit Breaker 2 Pole - 0.5 A (CB3)	1006458	1006458	1006458	1006458	1006458
22	Circuit Breaker 1 Pole - 8 A (CB4)	1006475	1006475	1006475	1006475	1006475
23	Circuit Breaker 2 Pole - 15 A (CB5)	1006471	—	—	1006539	—
	Circuit Breaker 2 Pole - 25 A (CB5)	—	1006539	1006539	—	1006540
24	Circuit Breaker 2 Pole - 15 A (CB6)	1006471	—	—	1006539	—
	Circuit Breaker 2 Pole - 25 A (CB6)	—	1006539	1006539	—	1006540
25	Circuit Breaker 2 Pole - 20 A (CB7)	1006457	1006457	1006457	1006540	1006540
26	Vent Fan	1009004	1009004	1009004	1009004	1009004

Note: 208-230V 3Ph. 60Hz. shown. Refer to **Schematic Diagrams for Electrical Parts** at the beginning of this section before placing a parts order.

Electrical Cabinet (CE)

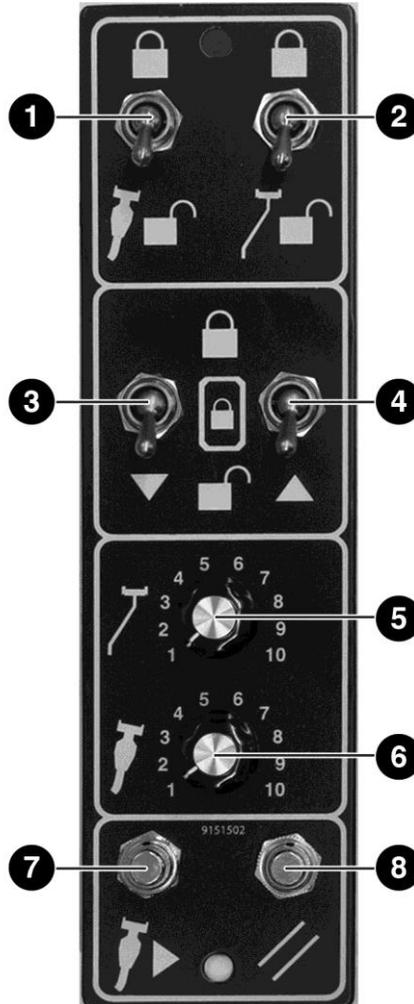


	Electrical Cabinet (CE) Part Name	Part Numbers				
		12/10	14/12	16/14	18/16	20/18
1	Servo Amplifier	1017595	1017595	1017595	1017595	1017595
	Replacement Battery	1017147	1017147	1017147	1017147	1017147
2	Power Supply	1024131	1024131	1024131	1024131	1024131
3	Safety Relay (K2)	1017422	1017422	1017422	1017422	1017422
4	Relay 4 Pole 24 VDC (K1)	1011033	1011033	1011033	1011033	1011033
5	Power Supply	1017476	1017476	1017476	1017476	1017476
6	PLC	1017502	1017502	1017502	1017502	1017502
	Replacement Battery for PLC	1017515	1017515	1017515	1017515	1017515
7	Input Module	1017501	1017501	1017501	1017501	1017501
8	Output Module	1017478	1017478	1017478	1017478	1017478
9	Output Module	1017478	1017478	1017478	1017478	1017478
10	Output Module	1017478	1017478	1017478	1017478	1017478
11	Positioning Module	1017503	1017503	1017503	1017503	1017503
12	Mixed I/O	1017787	1017787	1017787	1017477	1017477
13	Output Module	—	1017478	1017478	1017529	1017529
14	Contactors (C1)	1011306	1011306	1011306	1011306	1011306
15	Contactors (C2)	1011302	1011302	1011302	1011302	1011302
16	Safety Relay (K3)	1017422	1017422	1017422	1017422	1017422
17	Relay 2 Pole 24 VDC (K4)	1010204	1010204	1010204	1010204	1010204
18	Relay 2 Pole 24 VDC (K5)	1010204	1010204	1010204	1010204	1010204
	Circuit Breaker 3 Pole - 16 A (CB1)	1006549	1006549	1006549	—	—
19	Circuit Breaker 3 Pole - 25 A (CB1)	—	—	—	1006518	1006518
20	Circuit Breaker 1 Pole - 3 A (CB2)	1006442	1006442	1006442	1006442	1006442
21	Circuit Breaker 1 Pole - 0.5 A (CB3)	1006439	1006439	1006439	1006439	1006439
22	Circuit Breaker 1 Pole - 8 A (CB4)	1006475	1006475	1006475	1006475	1006475
23	Circuit Breaker 1 Pole - 15 A (CB5)	1006552	—	—	—	—
	Circuit Breaker 1 Pole - 20 A (CB5)	—	1006568	—	—	—
	Circuit Breaker 1 Pole - 25 A (CB5)	—	—	1006590	1006590	1006590
24	Circuit Breaker 1 Pole - 15 A (CB6)	1006552	—	—	—	—
	Circuit Breaker 1 Pole - 20 A (CB6)	—	1006568	—	—	—
	Circuit Breaker 1 Pole - 25 A (CB6)	—	—	1006590	1006590	1006590
25	Circuit Breaker 1 Pole - 15 A (CB7)	1006552	—	—	—	—
	Circuit Breaker 1 Pole - 20 A (CB7)	—	1006568	1006568	—	—
	Circuit Breaker 1 Pole - 25 A (CB7)	—	—	—	1006590	1006590

26	Varistor	1023009	1023009	1023009	1023009	1023009
27	Line Filter	1036020A	1036020A	1036020A	1036020A	1036020A
28	Varistor	1023001	1023001	1023001	1023001	1023001
29	Vent Fan	1009004	1009004	1009004	1009004	1009004

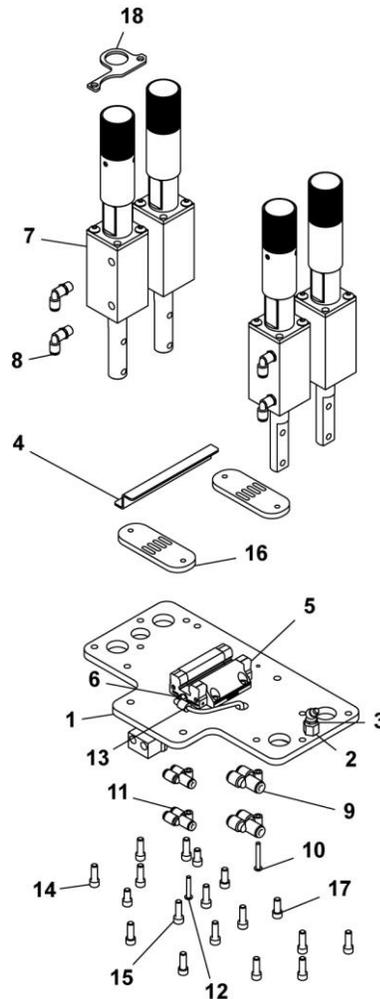
Note: 380-415V 3Ph. 50Hz. shown. Refer to **Schematic Diagrams for Electrical Parts** at the beginning of this section before placing a parts order.

Print Station Control Panel (UL & CE)



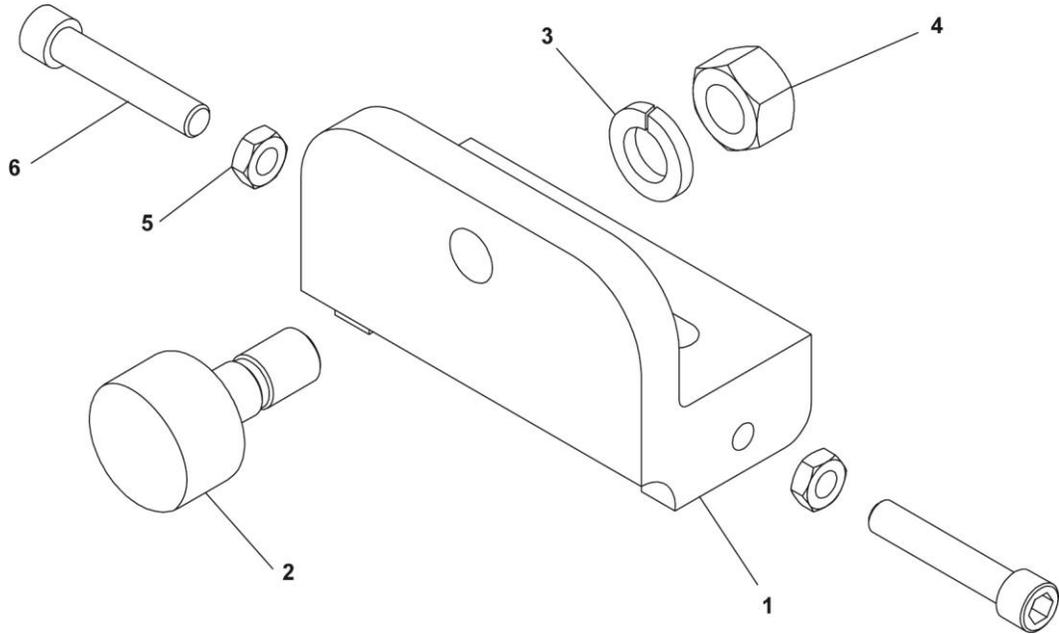
	Print Station Control Panel (UL & CE) Part Name	Part Numbers All Models
1	Air Switch 4-Way	2018011
2	Air Switch 4-Way	2018011
3	Air Switch 4-Way	2018011
4	Air Switch 4-Way	2018011
5	Potentiometer 5K Ohm	1029020
	Adjustment Knob	3033006
6	Potentiometer 5K Ohm	1029020
	Adjustment Knob	3033006
7	Push Button Switch	1010006
8	Push Button Switch	1010006

Carriage Assembly (UL & CE)



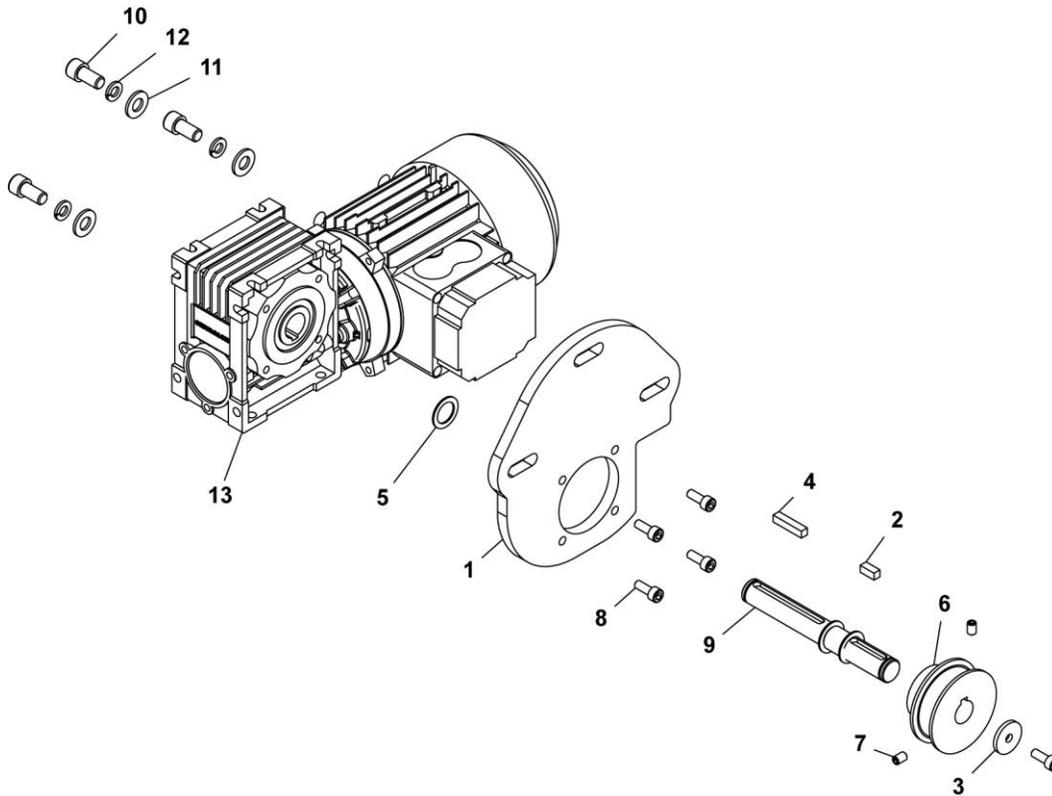
	Carriage Assembly (UL & CE) Part Name	Part Numbers All Models
1	Carriage Plate	9157902
2	Bulkhead Fitting 5/32OD X 1/8 NPT	2003239
3	Fitting Grease 1/8 NPT 45 DEG	2003032
4	Head Proximity Flag	9157934
5	Linear Bearing Carriage	3030113
6	Grease Nipple M6 X 4.5 mm	2005129
7	Air Cylinder Assembly	2009475
8	Fitting Male Swivel Elbow 1/8 NPT	2003004
9	Fitting Y Connector 1/4" Hose	2003086
10	Button Socket Cap Screw 8-32 X 1-1/4"	3001071
11	Fitting "Y" 5/32" Tube w/Hole	2003024
12	Button Socket Cap Screw 8-32 X 1"	3001024
13	Tubing Polyurethane 5/32" OD	2001077
14	Socket Cap Screw 1/4-20 X 3/4"	3009022
15	Socket Cap Screw M6 X 20mm	3009117
16	Belt Lock	9157908
17	Socket Cap Screw 1/4-20 X 5/8"	3009047
18	Flexible Cable Bracket	9151111

Bearing Casting Assembly (UL & CE)



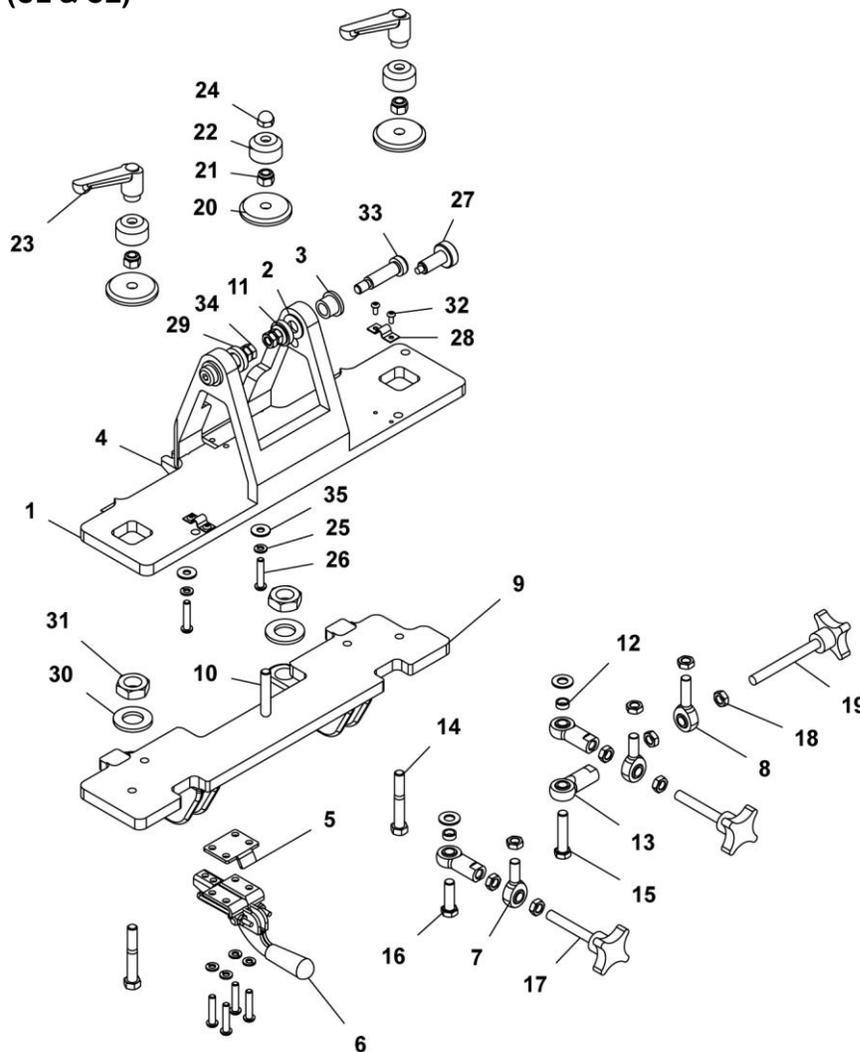
	Bearing Casting Assembly (UL & CE) Part Name	Part Numbers All Models
1	Register Bearing Bracket	8362408
2	Cam Follower	3023012A
3	Split Lock Washer ZP 5/8"	3022005
4	Fin Hex Nut ZP 5/8-18	3013016
5	Fin Hex Jam Nut ZP 3/8-16	3013014
6	Socket Cap Screw 3/8-16 X 2"	3009002

Carriage Drive Assembly (UL & CE)



	Carriage Drive Assembly (UL & CE) Part Name	Part Numbers All Models
1	Gear Motor Mounting Bracket	9157917-A
2	Keystock 6mm X 6mm X 0.55"	9165543-A
3	Pulley Shaft Washer 1" OD	9165502
4	Keystock 6mm X 6mm X 1.125"	9165544
5	External Retaining Ring 18mm Shaft	3024072
6	Timing Belt Pulley, 8mm Belt	3041604
7	Socket Set Screw 1/4-20 X 3/8"	3007003
8	Socket Head Cap Screw M6 X 1 X 16mm	3011075
9	Pulley Shaft	9165515
10	Socket Cap Screw 3/8-16 X 3/4"	3009074
11	Flat Washer 3/8"	3020010
12	Split Lock Washer ZP 5/16"	3022003
13	Gearmotor	3027302

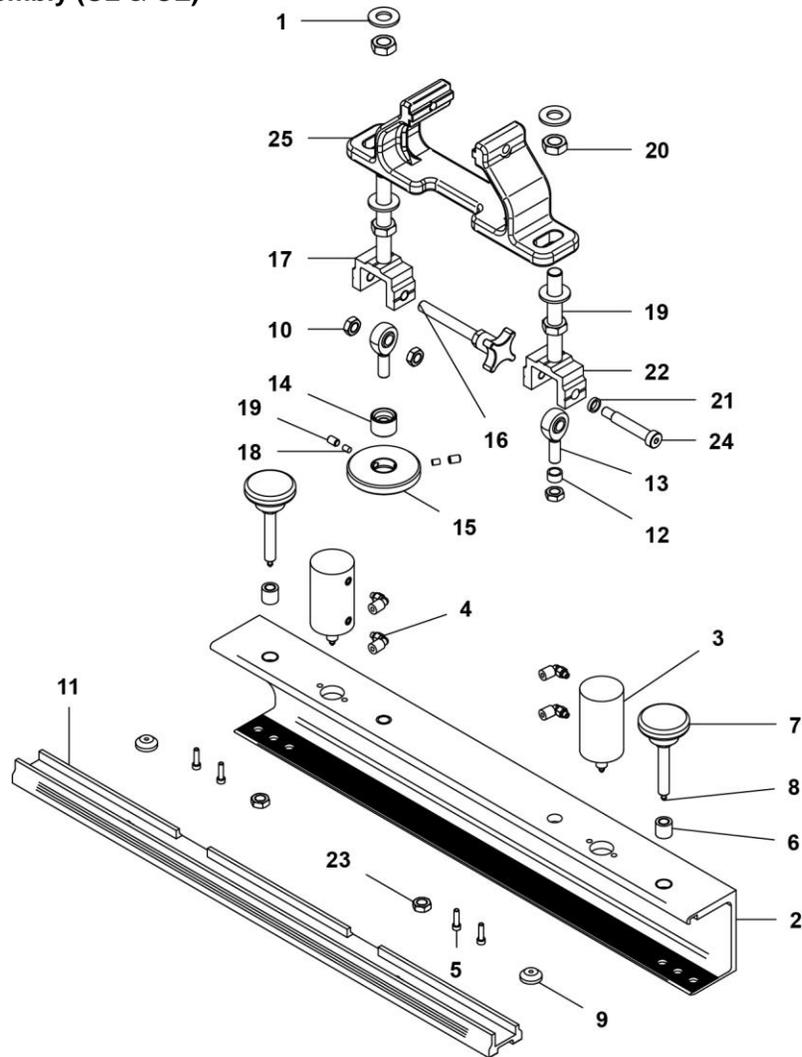
Front Micro Assembly (UL & CE)



	Front Micro Assembly (UL & CE) Part Name	Part Numbers All Models
1	Top Micro Casting	9150061
2	Plastic Washer	9165542
3	Flanged Bronze Bearing 1/2" X 3/4" X 5/8"	3023025
4	Micro Positioning Plate	9150014
5	Lock Clamp Spacer Plate	9150017
6	Clamp	3033087
7	Rear Micro Mounting Rod End	9150069
8	Male Rod End 3/8-24	3034003
9	Bottom Micro Casting	9150063
10	Threaded Rod 3/8-16 X 2.5"	9150005-34
11	Wrought Flat Washer 3/8" ZP	3020010
12	Front Micro Bushing .5" OD X .19	9150145
13	Female Rod End 3/8-24	3034002
14	Hex Head Bolt 3/8-16 X 2-1/2"	3008006
15	Hex Cap Screw 3/8-24 X 1-3/4"	3054032

16	Hex Cap Screw 3/8-24 X 1-1/4"	3054031
17	Micro X - Y Adjustment Screw	8090057
18	Finish Hex Jam Nut 3/8-24	3013015
19	Micro Side Adjustment Screw	8090056
20	Micro Lock Washer 2" OD	8080132
21	Elastic Stop Nut ZP 3/8-16	3012003
22	Top Lock Washer	9150016
23	Female Handle	3032001
24	Acorn Hex Nut 3/8-16	3013139
25	Split Lock Washer ZP 1/4"	3022001
26	Button Socket Cap Screw 1/4-20 X 1-1/4"	3001043
27	Retractable Spring Plunger	3033090
28	Safety Cable Clip	9150128
29	Spacer 1" OD	9165538
30	SAE Washer 3/4" ZP	3021005
31	Finish Hex Jam Nut ZP 3/4-16	3013031
32	Micro Target-Black On Yellow	5020169
33	Shoulder Bolt 1/2"D X 1-1/2"	3006048
34	Hex Jam Nut 3/8"	3013014
35	SAE Washer 1/4"	3021015

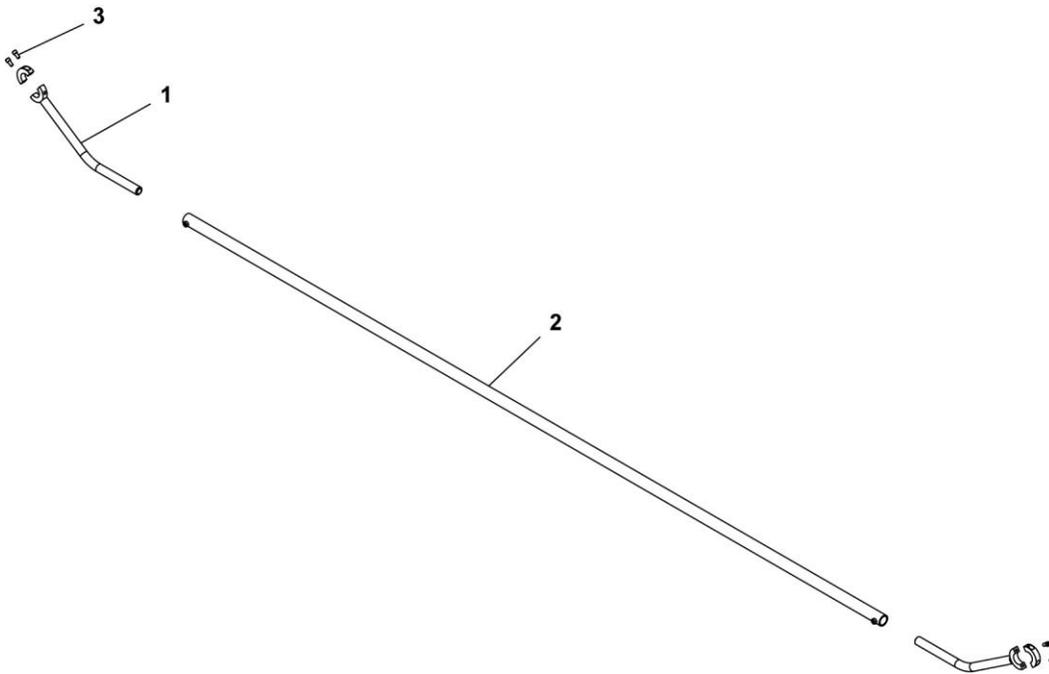
Rear Screen Holder Assembly (UL & CE)



	Rear Screen Holder Assembly (UL & CE) Part Name	Part Numbers All Models
1	SAE Washer ZP 1/2"	3021000
2	Rear Screen Holder	9159053
3	Double Acting Air Cylinder	2009023B
4	Fitting Male Swivel Elbow 10-32	2003031
5	Socket Cap Screw 8-32 X 5/8"	3009051
6	Keylocking Insert 3/8-16	3013106
7	Plastic Knob Round 3/8-16	3033001
8	Screen Holder Stud 3/8-16 X 3.125"	9162029
9	Cup Washer	8010005
10	Finish Hex Jam Nut ZP 3/8-16	3013014
11	Screen Frame Locking Bar	9150103
12	Rear Micro Bushing	9150101
13	Rear Micro Mounting Rod End	9150069
14	Rear Micro Locking Bolt	9150081
15	Rear Micro Locking Nut	9150082

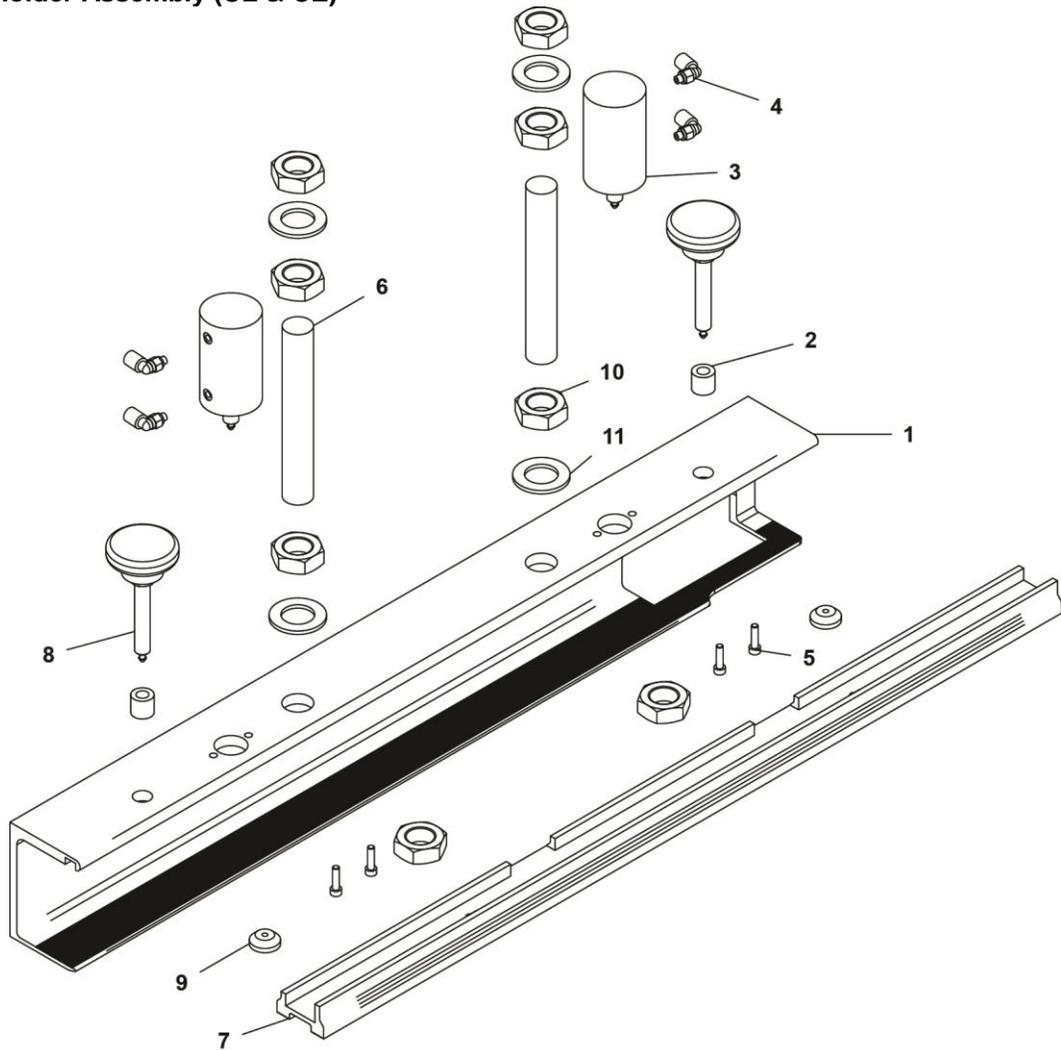
16	Threaded Rod 3/8-16 X 3.5"	8090143-1
17	Right Hand Rear Micro Clevis 1/2-20	9362062
18	Knob Bracket Insert 3/16"	9362111
19	Socket Set Screw 1/4-20 X 3/8"	3007003
20	Hex Jam Nut 1/2-20	3013023
21	Shoulder Screw Spacer	9362579
22	Left Hand Rear Micro Clevis	9362061
23	Finish Hex Jam Nut ZP 3/8-24	3013015
24	Shoulder Bolt 3/8 X 1-3/4"	3006008
25	Rear Screen Holder Casting	9150967

Safety Bar Assembly (UL & CE)



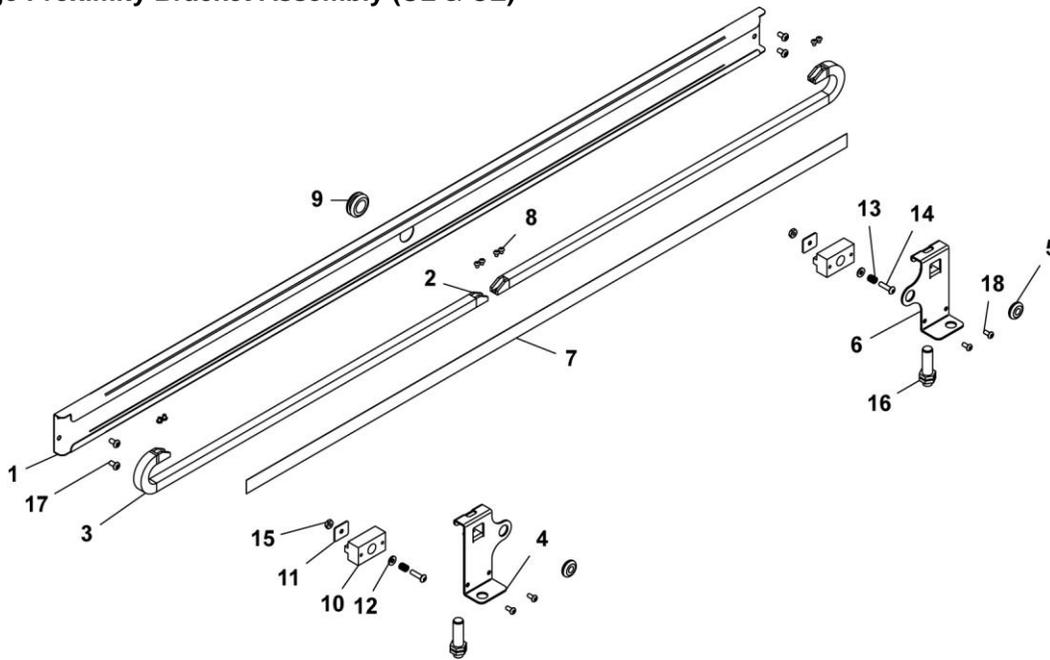
	Safety Bar Assembly (UL & CE) Part Name	Part Numbers				
		12/10	14/12	16/14	18/16	20/18
1	Safety Bar Mounting Bracket	9150132	9150132	9150132	9150132	9150132
2	Safety Bar Tube	9150131	9150859	9150131	9150131	9130088
3	Socket Cap Screw 1/4-20 X 1/2"	3009019	3009019	3009019	3009019	3009019

Front Screen Holder Assembly (UL & CE)



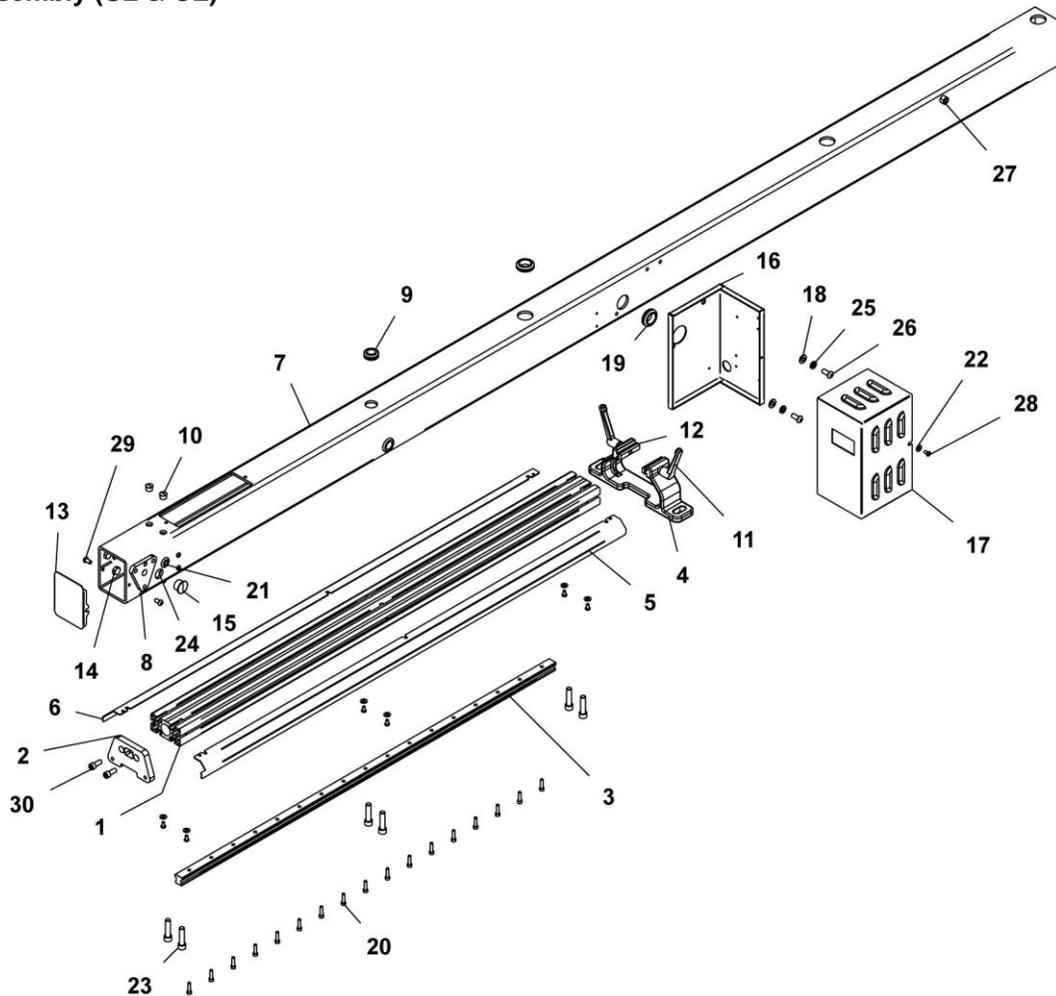
	Front Screen Holder Assembly (UL & CE) Part Name	Part Numbers All Models
1	Front Screen Holder	9159051-A
2	Key Locking Insert 3/8-16	3013106
3	Double Acting Air Cylinder	2009023B
4	Fitting Male Swivel Elbow 10-32	2003031
5	Socket Cap Screw 8-32 X 5/8"	3009051
6	Threaded Rod 3/4-16 X 5"	9150005-15
7	Screen Frame Locking Bar	9150111
8	Screen Holder Stud 3/8-16 X 3.125"	9162029
9	Cup Washer	8010005
10	Hex Jam Nut 3/4-16	3013031
11	SAE Washer 3/4"	3021005

Carriage Proximity Bracket Assembly (UL & CE)



	Carriage Proximity Bracket Assembly (UL & CE) Part Name	Part Numbers All Models
1	Energy Chain Guide	9157991
2	Energy Chain Mounting Bracket	1017430
3	Snap-Open Energy Chain	1017431-2
4	Head Stroke Proximity Mounting Bracket	9155692
5	Rubber Grommet 13/16" OD	7001108
6	Rear Head Proximity Mounting Bracket	9155693
7	Head Stroke Scale	9153717
8	Button Socket Cap Screw 6-32 X 3/16"	3001112
9	Rubber Grommet 1-1/8" OD	7001016
10	Proximity Slide	9150925
11	Proximity Slide End Plate	9150926
12	SAE Washer ZP #8	3021001
13	Safety Lock Spring	9051503
14	Button Socket Cap Screw 10-24 X 3/4"	3001002
15	Hex Nut ZP 10-24	3013019
16	Proximity Switch	1010082D
17	Button Socket Cap Screw 10-24 X 3/8"	3001003
18	Button Socket Cap Screw 8-32 X 3/8"	3001031

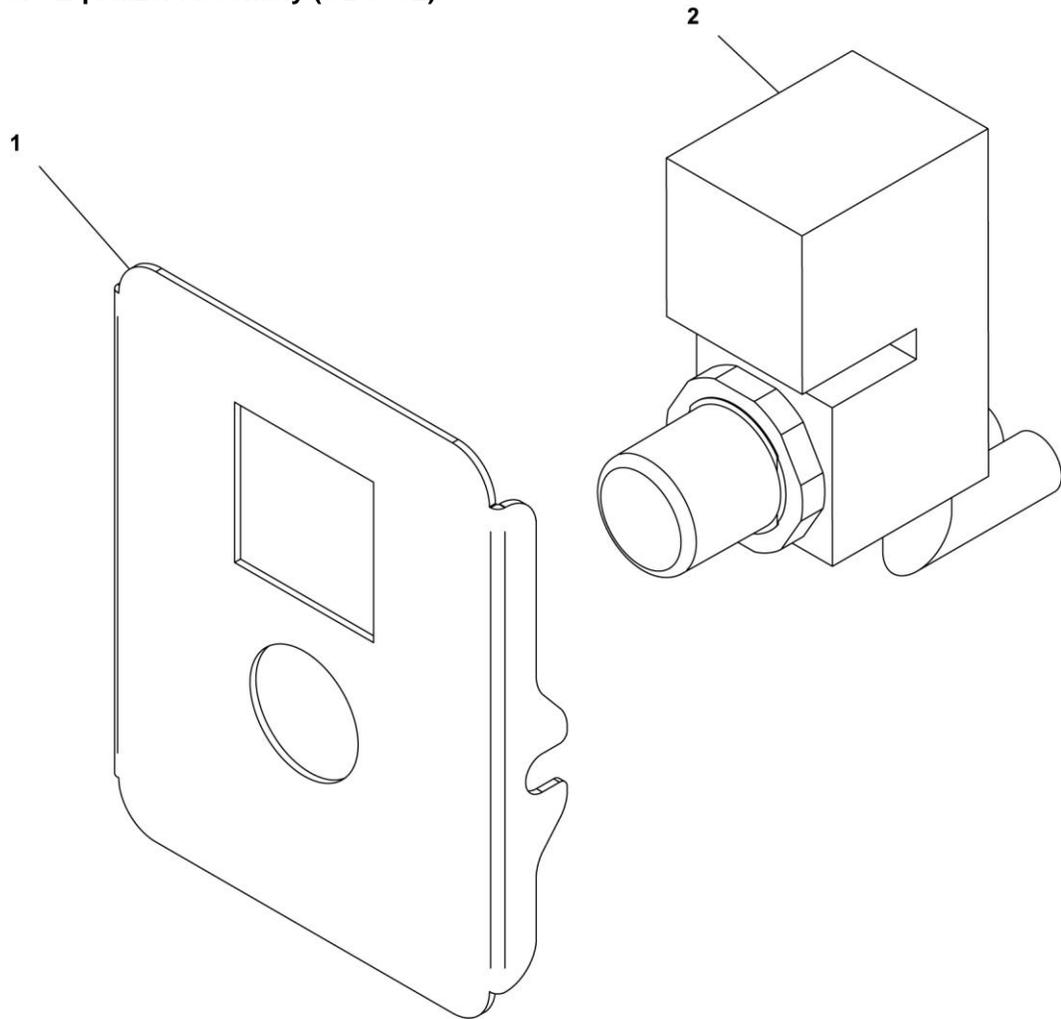
Head Tube Assembly (UL & CE)



	Head Tube Assembly (UL & CE) Part Name	Part Numbers				
		10/12	14/12	16/14	18/16	20/18
1	Support Beam Extrusion	9157904	9157904	9157904	9157904	9157904
2	Front Spacer	9150906	9150906	9150906	9150906	9150906
3	Linear Rail	3030114	3030114	3030114	3030114	3030114
4	Rear Screen Holder Casting	9150967	9150967	9150967	9150967	9150967
5	Head Cover Right Hand	9157956	9157956	9157956	9157956	9157956
6	Head Cover Left Hand	9157957	9157957	9157957	9157957	9157957
7	Head Tube	9153702-A	9150970-B	9157929-A	9150529-B	9130002-B
8	Micro Lock Plate 2.63" X 3"	9165512	9165512	9165512	9165512	9165512
9	Rubber Grommet 1-1/8" OD	7001016	7001016	7001016	7001016	7001016
10	Dome Plug 1/2" Hole	1018009	1018009	1018009	1018009	1018009
11	Male Handle-Metal	3032045	3032045	3032045	3032045	3032045
12	Rear Screen Holder T-Nut	9150944	9150944	9150944	9150944	9150944
13	Front Cover Plate	9165539	9165539	9165539	9165539	9165539
14	Hex Head Bolt 3/8-16 X 1/2"	3008149	3008149	3008149	3008149	3008149

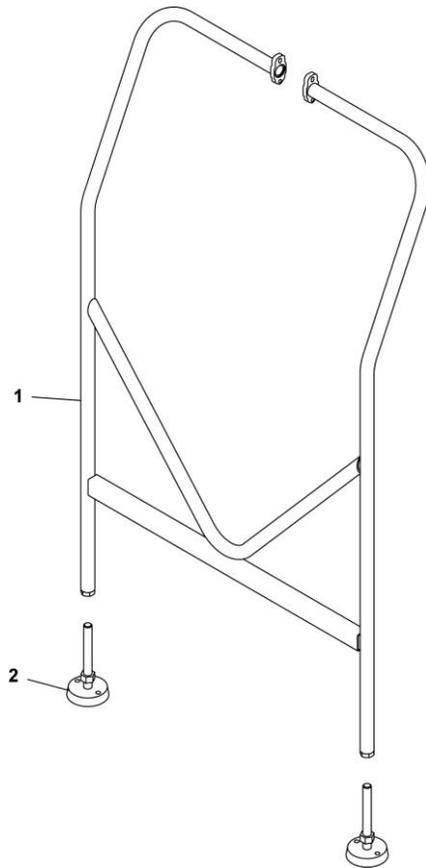
15	Snap In Plug 13/16" Hole Diameter	7025023	7025023	7025023	7025023	7025023
16	AC Head Control Box	9163081-B	9163081-B	9163081-B	9163081-B	9163081-B
17	Head Control Box Cover	9163074-A	9163074-A	9163074-A	9163074-A	9163074-A
18	SAE Washer 5/16"	3021023	3021023	3021023	3021023	3021023
19	Rubber Grommet 1-3/8" OD	7001028	7001028	7001028	7001028	7001028
20	Socket Cap Screw M5 X 20 mm	3009171	3009171	3009171	3009171	3009171
21	Rubber Grommet 13/16" OD	7001101	7001101	7001101	7001101	7001101
22	SAE Washer #10	3021029	3021029	3021029	3021029	3021029
23	Socket Cap Screw 3/8-16 X 1-1/2"	3009001	3009001	3009001	3009001	3009001
24	Button Socket Cap 3/8-16 X 3/4"	3001025	3001025	3001025	3001025	3001025
25	Split Lock Washer ZP 5/16"	3022003	3022003	3022003	3022003	3022003
26	Button Socket Cap 5/16-18 X 3/4"	3001046	3001046	3001046	3001046	3001046
27	Socket Cap Screw 3/8-16 X 5/8"	3009039	3009039	3009039	3009039	3009039
28	Button Socket Cap Screw 10-24 X 3/8"	3001003	3001003	3001003	3001003	3001003
29	Button Socket Cap Screw 1/4-20 X 1/2"	3001005	3001005	3001005	3001005	3001005
30	Socket Cap Screw 5/16-18 X 3/4"	3009005	3009005	3009005	3009005	3009005

Optional Pressure Equalizer Assembly (UL & CE)



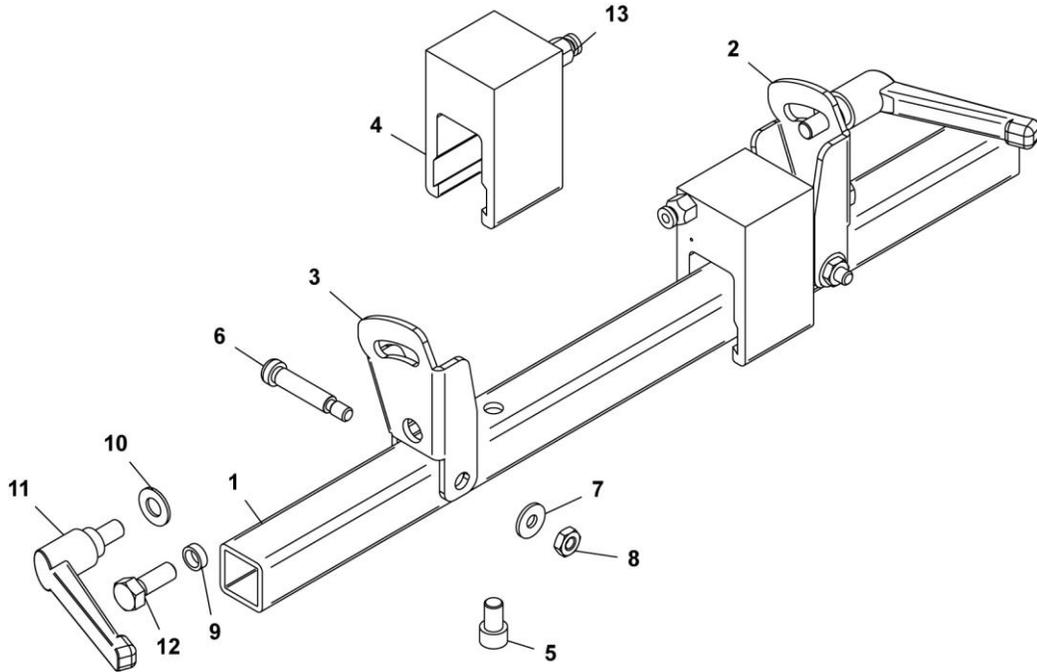
	Optional Pressure Equalizer Assembly (UL & CE) Part Name	Part Numbers All Models
1	Print Head Cover	9165547-A
2	Pressure Regulator With Gauge	2019132

Head Support Assembly (UL & CE)



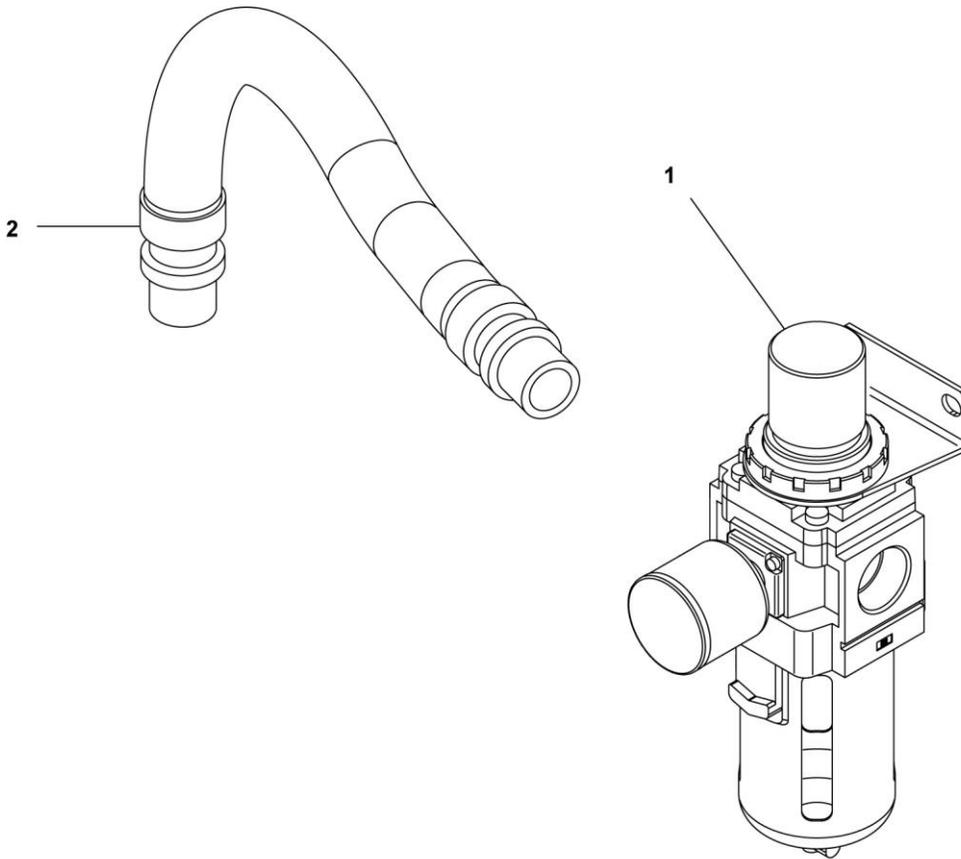
	Head Support Assembly (UL & CE) Part Name	Part Numbers All Models
1	Head Support Frame	9132296
2	Leveling Foot	3037001

Pneumatic Squeegee Floodbar Assembly (UL & CE)



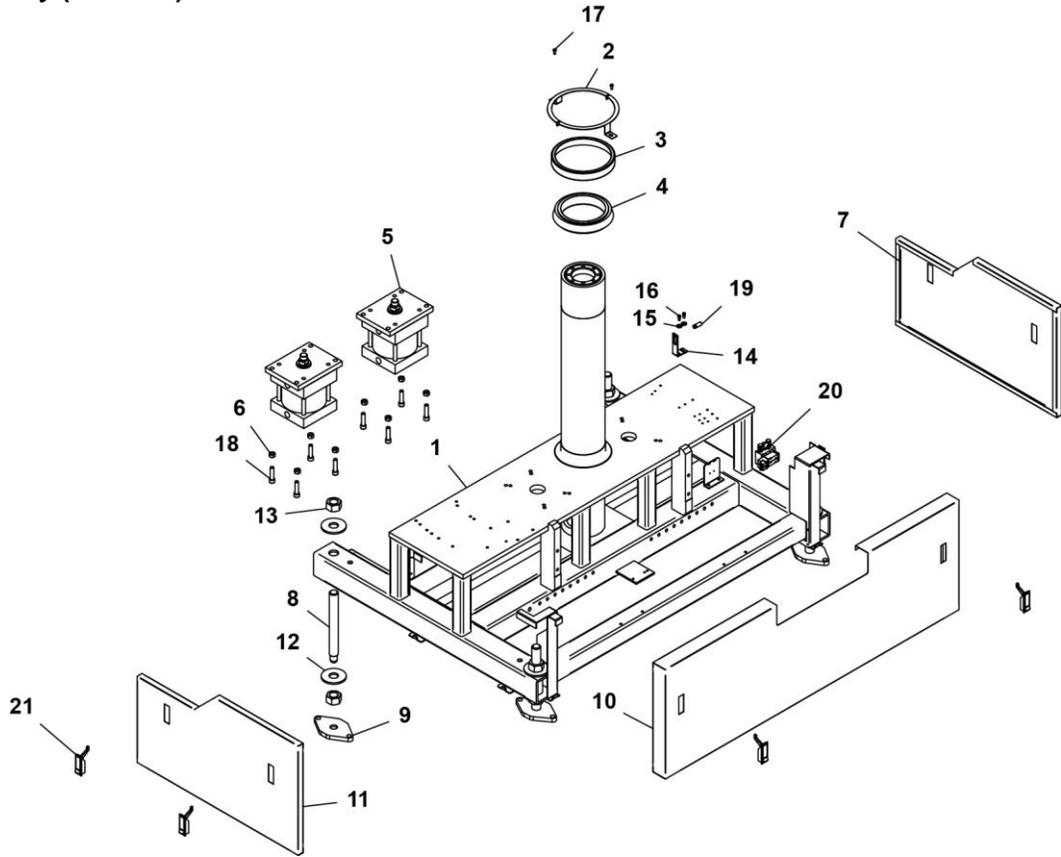
	Optional Pneumatic Squeegee Floodbar Assembly (UL & CE) Part Name	Part Numbers All Models
1	Squeegee\Floodbar Mounting Tube	9165526
2	Squeegee\Floodbar Holder, Left	9165525
3	Squeegee\Floodbar Holder, Right	9165524
4	Squeegee\Floodbar Air Clamp Cylinder	9162041
5	Socket Cap Screw 5/16-24 X 1/2"	3009133
6	Shoulder Bolt 5/16" X 1-1/4"	3006015
7	SAE Washer #12	3021036
8	Elastic Stop Nut ZP 1/4-20	3012000
9	Spacer	9165529
10	SAE Washer 5/16"	3021023
11	Male Handle 5/16-18	3032009
12	Hex Head Bolt 5/16-18 X 5/8"	3008113
13	U Clamp Cylinder Fitting	2003319

Filter Regulator Assembly (UL & CE)



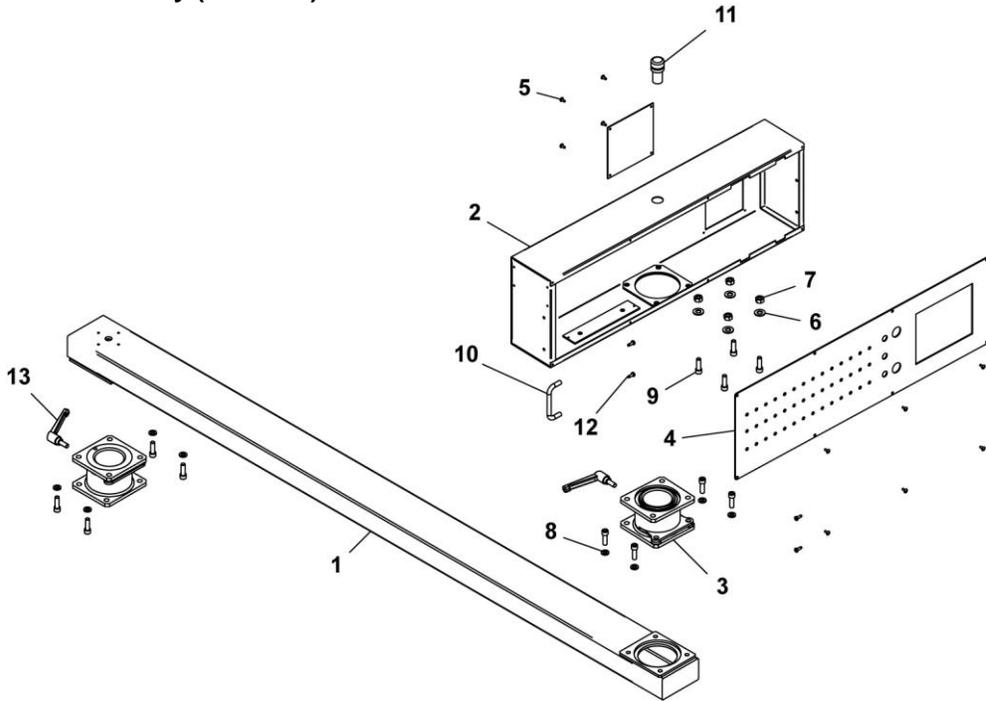
	Filter Regulator Assembly (UL & CE) Part Name	Part Numbers All Models
1	Filter Regulator Lubricator 3/4"	2020091-AA
	Replacement Filter (Not Shown)	2019114-A
2	Hose 3/4" I.D.	3058043-A

Chassis Assembly (UL & CE)



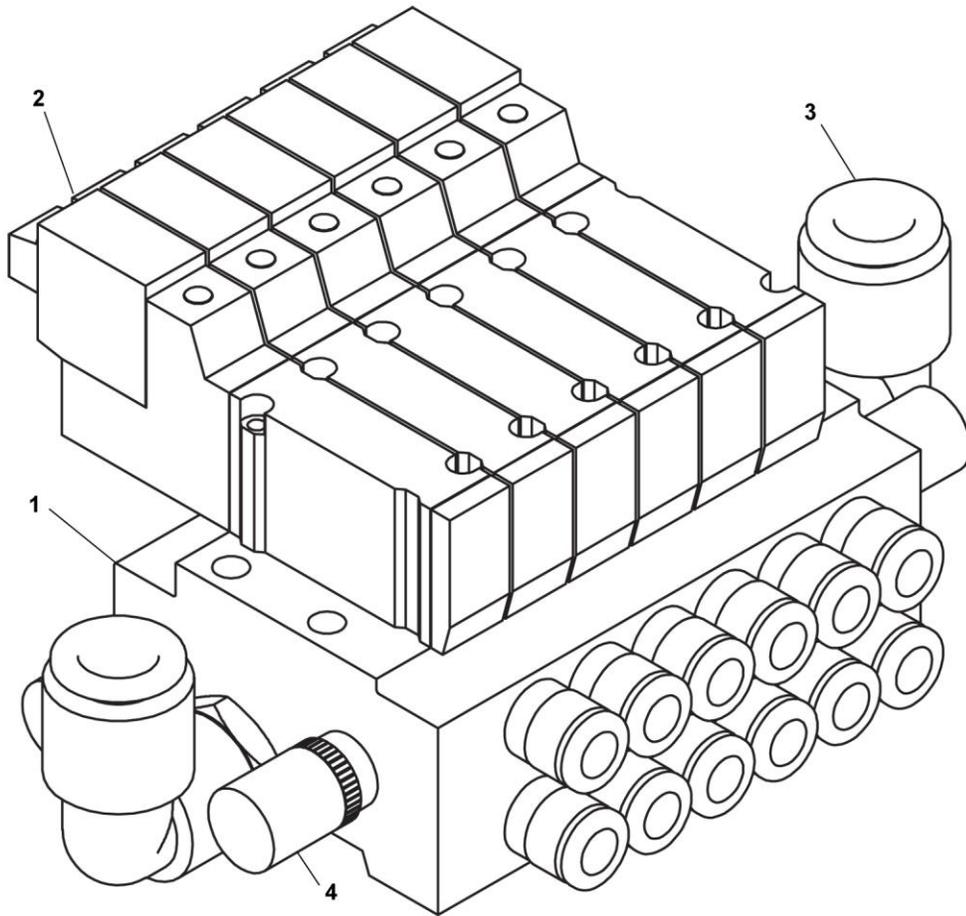
	Chassis Assembly (UL & CE) Part Name	Part Numbers All Models
1	Sub Base	9150426
2	Bearing Header Ring	9150124
3	Bearing Cup	9150125
4	Bearing Cone	3023001
5	Lift Cylinder	2009302C
6	Finish Hex Nut 1/2-13	3013027
7	Base Side Cover	9150376-R
8	Leveling Bolt	9370109
9	Leveling Bolt Base	9362221
10	Servo Drive Cover	9150375-1
11	Base Side Cover	9150376-L
12	Wrought Flat Washer 1-1/4" ID	3020034
13	Finished Hex Nut 1-1/4"	3013052
14	Proximity Mounting Bracket	9151157B
15	SAE Washer 1/4"	3021015
16	Socket Cap Screw 1/4-20 X 1/2"	3009019
17	Button Socket Cap Screw 1/4-20 X 5/8"	3001010
18	Socket Cap Screw 1/2-13 X 2"	3009015
19	Round Proximity Switch	1010223
20	2 Station Valve Manifold Assembly	2010076-C
21	Latch Clamp	3060000

Main Control Panel Assembly (UL & CE)



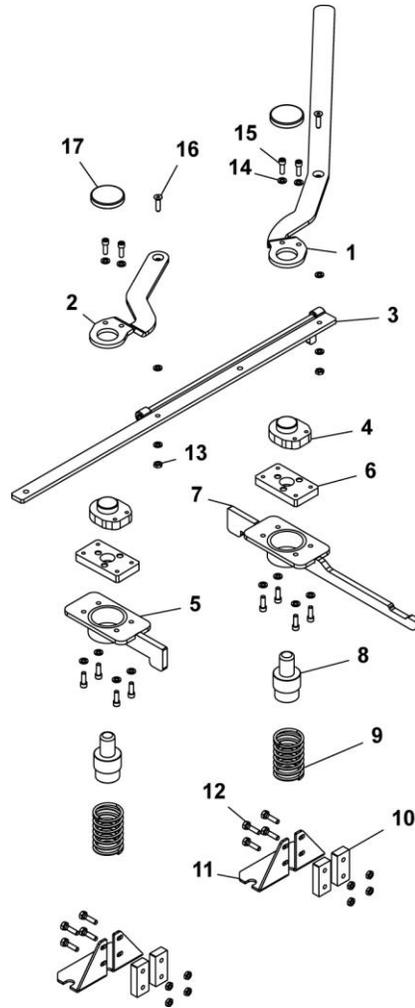
	Main Control Panel Assembly (UL & CE) Part Name	Part Numbers				
		12/10	14/12	16/14	18/16	20/18
1	Control Box Arm Weldment	9153706	9150385	9150385	9150585	9150036
2	Control Box Weldment	9150381	9150381	9150381	9150381	9150381
3	Control Box Hanger	9150460	9150460	9150460	9150460	9150460
4	Control Panel	9153009-B	9132881-A	9132681-A	9132481-A	9132281-A
5	Pan Head Machine Screw 6-32 X 3/8"	3004001	3004001	3004001	3004001	3004001
6	Wrought Flat Washer 5/16" ZP	3020007	3020007	3020007	3020007	3020007
7	Finish Hex Nut 5/16-18	3013015	3013015	3013015	3013015	3013015
8	Split Lock Washer ZP 5/16"	3022003	3022003	3022003	3022003	3022003
9	Socket Cap Screw 5/16-18 X 1"	3009003	3009003	3009003	3009003	3009003
10	Pull Handle Round	3033046	3033046	3033046	3033046	3033046
11	Red Pilot Light	1010405	1010405	1010405	1010405	1010405
12	Pan Head Machine Screw 8-32 X 1/2"	3004014	3004014	3004014	3004014	3004014
13	Handle	3032002	3032002	3032002	3032002	3032002

Chopper Valve Assembly (UL & CE)



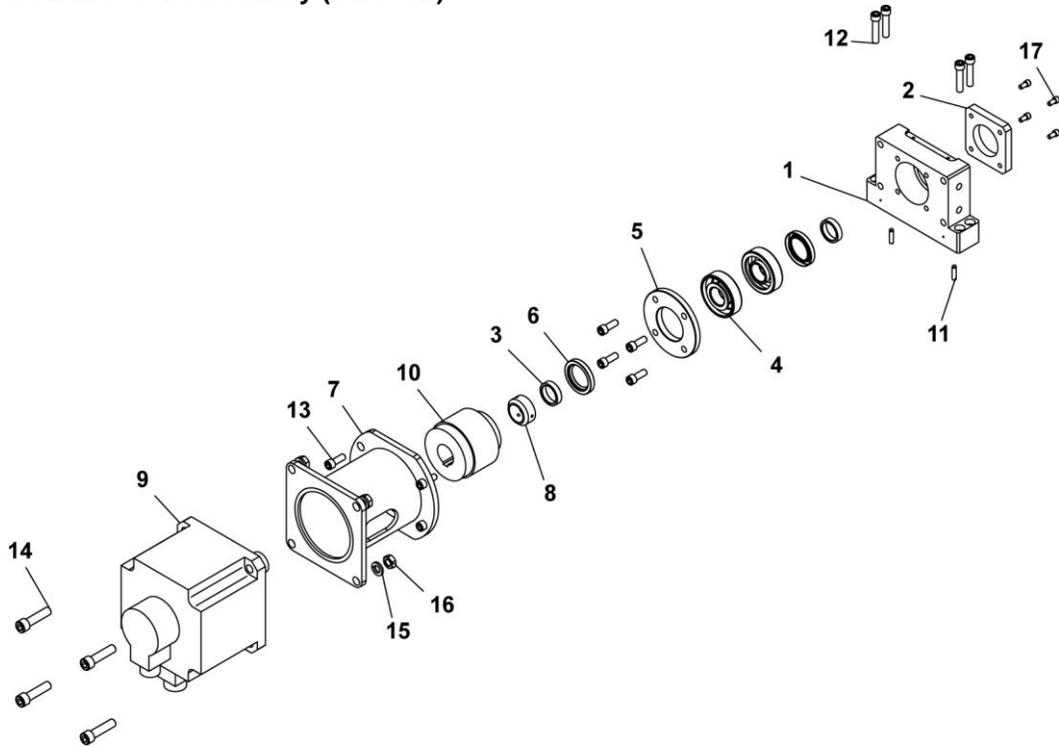
	Chopper Valve Assembly (UL & CE) Part Name	Part Numbers				
		12/10	14/12	16/14	18/16	20/18
1	Valve Assembly (Complete)	2010050C	2010049C	2010048C	2011014C	2011019
2	Solenoid Valve	2010093	2010093	2010093	2010093	2010093
3	Fitting Male Elbow 1/8 NPT, 3/8" Tube	2003146	2003146	2003146	2003146	2003146
4	Muffler 1/8"	2014002	2014002	2014002	2014002	2014002

Off-Contact Assembly (UL & CE)



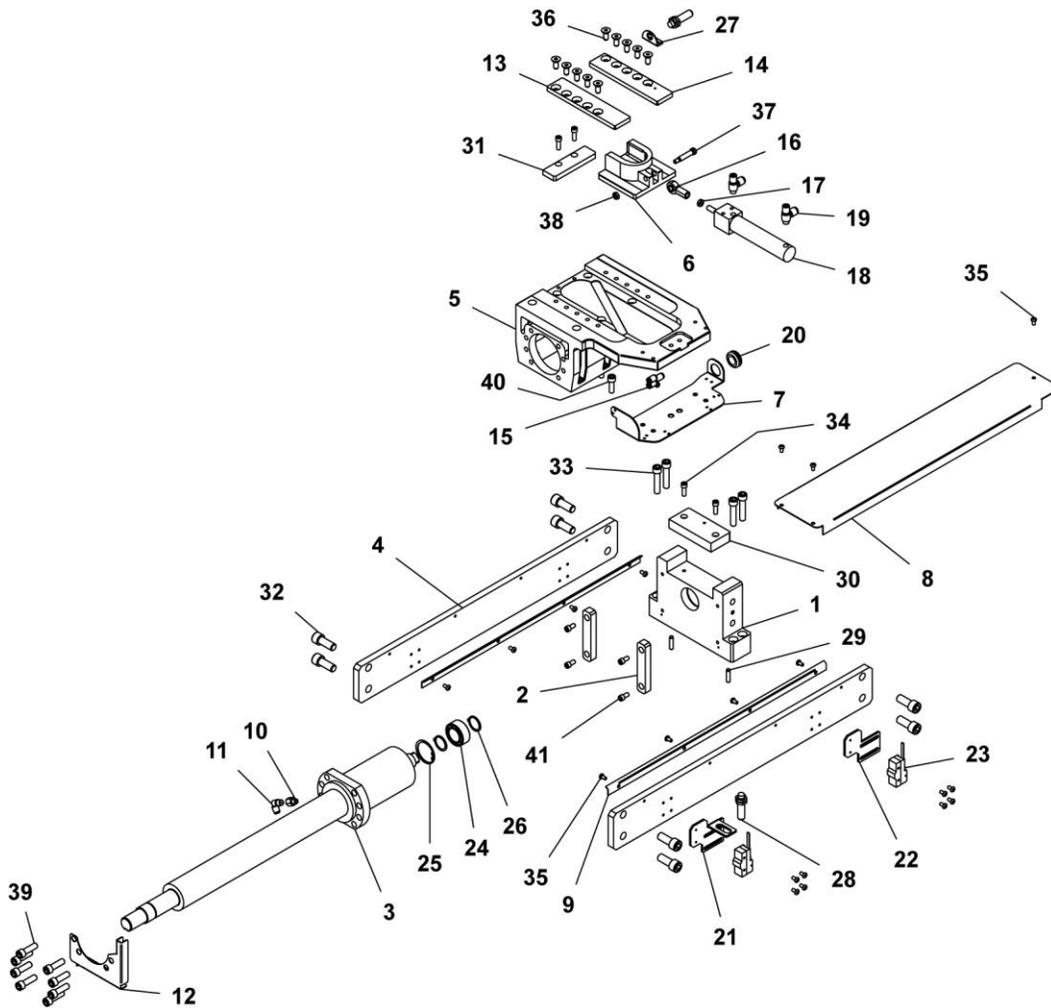
	Off-Contact Assembly (UL & CE) Part Name	Part Numbers All Models
1	Selector Lever	9150358
2	Off-Contact Parallel Lever	8080236
3	Off-Contact Stringer	8080238
4	Off-Contact Regulator	8051244-A
5	Off-Contact Down Plate	9150363
6	Off-Contact Down Plate #1	8051232
7	Off-Contact Lock	9150364
8	Lift Cylinder Extension	9150362
9	Lift Compression Spring	9150361
10	Off-Contact Slides	8051242
11	Spacer Bracket	9150366
12	Hex Head Bolt 1/4-20 X 1"	3008001
13	Elastic Stop Nut ZP 1/4-20	3012000
14	Flat Washer 1/4" ZP	3020005
15	Socket Cap Screw 1/4-20 X 3/4"	3009022
16	Flat Socket Flat Cap Screw 1/4-20 X 1"	3010005
17	Off-Contact Bronze Pusher	8051239

Front Drive Motor Ball Screw Assembly (UL & CE)



	Front Drive Motor Ball Screw Assembly (UL & CE) Part Name	Part Numbers All Models
1	Left Hand, Bearing Block	9131376
2	Ball Screw Bumper	9150424
3	Distance Bushing	9105258
4	Single Row Angular Contact	3023089
5	Bearing Flange	9105252
6	Oil Seal	3023088
7	Motor Mounting Bracket	9150076
8	Locking Nut M30 X 1.5	3013143
9	Servo Motor	1008422
10	Motor Coupling	2007069
11	Dowel Pin 1/4" X 1"	3014001
12	Socket Cap Screw 3/8-16 X 1-3/4"	3009023
13	Socket Cap Screw 3/8-16 X 1"	3009000
14	Socket Cap Screw 1/2-13 X 2"	3009015
15	Split Lock Washer 1/2"	3022000
16	Elastic Stop Nut 1/2-13	3012014
17	Socket Cap Screw 1/4-20 X 1/2"	3009019

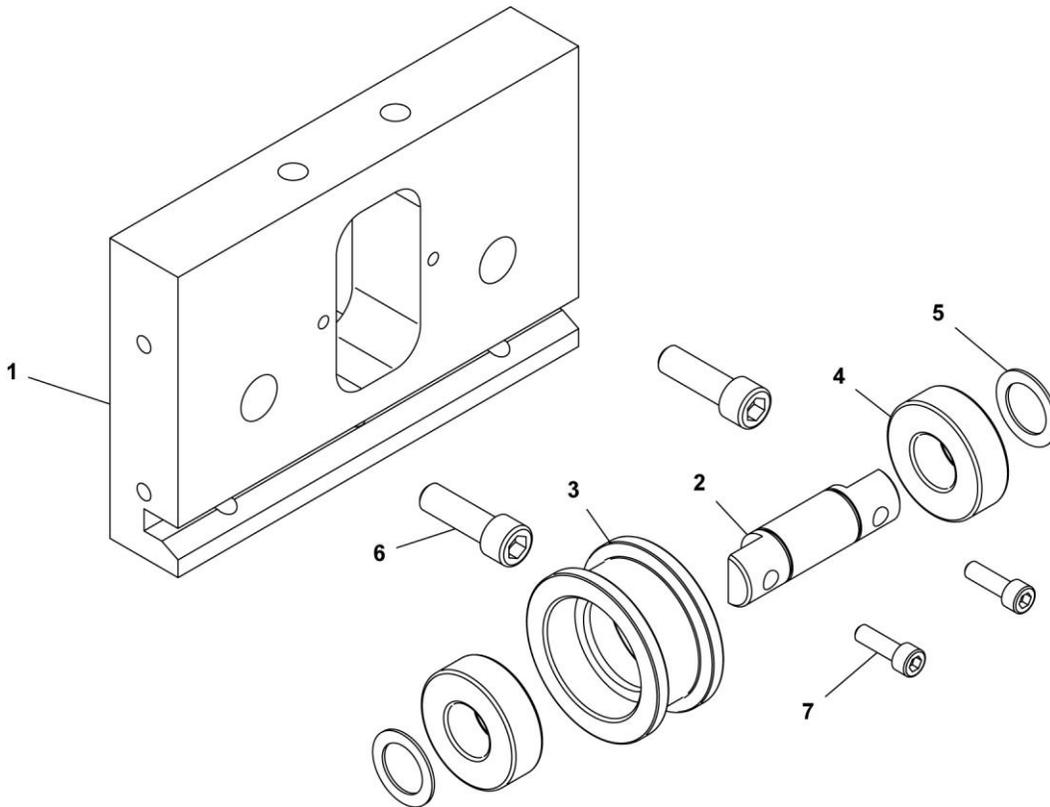
Back Drive Motor Ball Screw Assembly (UL & CE)



	Back Drive Motor Ball Screw Assembly (UL & CE) Part Name	Part Numbers All Models
1	Right Side Bearing Block	9131377-A
2	Ball Screw Bumper	9131384
3	Ball Screw Shaft	9150441
4	Reinforcement Plate	9131374
5	Indexer Nut Housing-Finish	9131365
6	Index Clevis	8121252C
7	Oil Tube Support	9152078
8	Ball Screw Cover	9131378-A
9	Oil Shield Angle	9131379-A
10	Lube Adapter M8 X 1/8" NPT	2007088
11	Fitting Male Swivel Elbow 1/8" NPT	2003004
12	Oil Tube Shield	9131389
13	Clevis Guide Left	8080255B
14	Clevis Guide Right	8080254B
15	Fitting "Y" 5/32" Tube W/Hole	2003024
16	Female Rod End 5/16-24	3034011

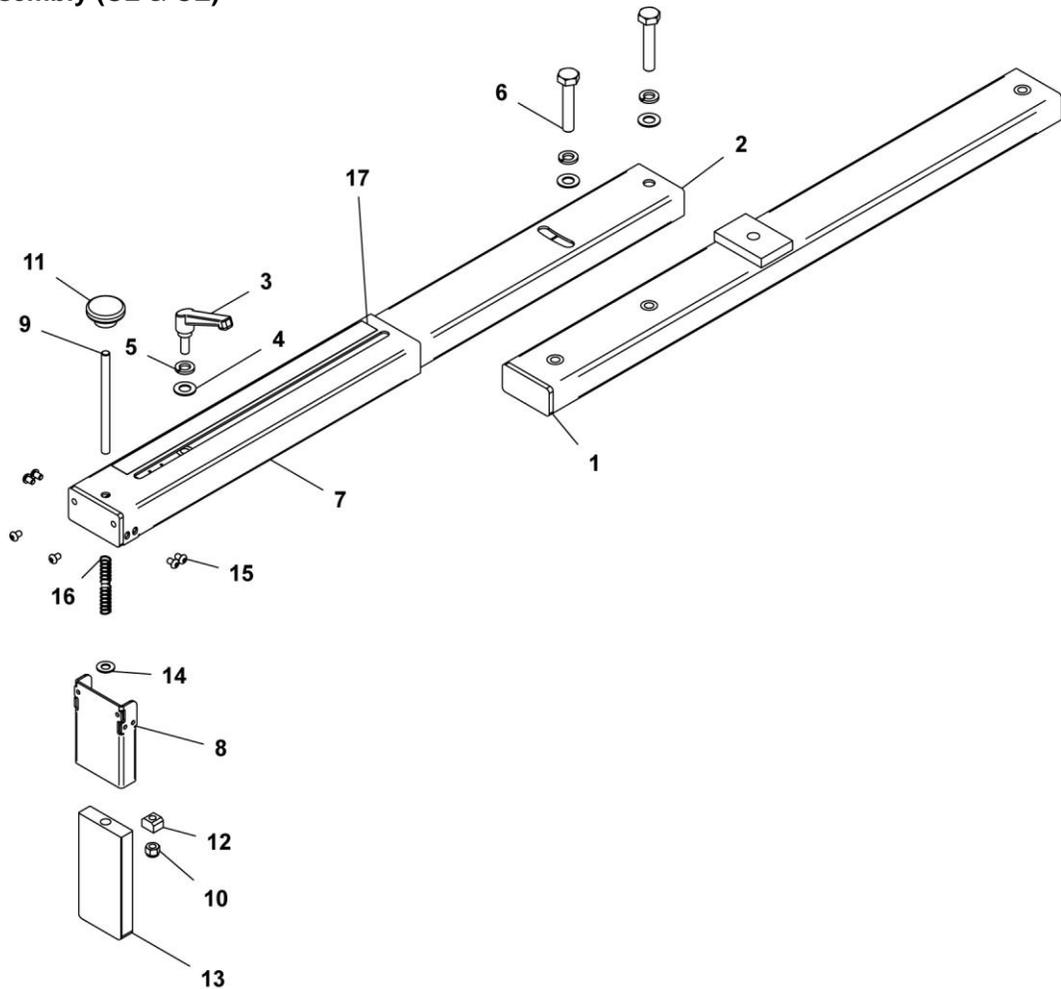
17	Finish Hex Jam Nut 1/4-20	3013114
18	Fork Clevis Cylinder 1-1/16" X 3"	2009016
19	Universal Flow Control 1/4"	2018079
20	Grommet Rubber 1-1/8" OD X 5/8"	7001016
21	Home Proximity Mounting Bracket	9131382
22	Home Proximity Mounting Bracket	9150429
23	Snap Action Switch Roller Type	1020242
24	Needle Roller Bearing	3023460
25	Internal Retaining Ring 42mm	3024047
26	External Retaining Ring 25mm	3024046
27	Proximity Bracket All Index	9154184
28	Round Proximity	1010223
29	Dowel Pin 1/4" X 1"	3014001
30	Cover Mounting Bracket	9131383
31	Clevis Bumper	9131387
32	Socket Cap Screw 1/2-13 X 1-1/4"	3009013
33	Socket Cap Screw 3/8-16 X 1-3/4"	3009023
34	Socket Cap Screw 1/4-20 X 3/4"	3009022
35	Button Socket Cap Screw 10-24 X 3/8"	3001003
36	Flat Socket Cap Screw 5/16-18 X 3/4"	3010008
37	Shoulder Bolt 5/16"X 1-1/4"Long	3006015
38	Elastic Stop Nut ZP 1/4-20	3012000
39	Socket Cap Screw 3/8-16 X 1-1/4"	3009030
40	Socket Cap Screw M8 X 25mm	3009162
41	Socket Cap Screw 1/4-20 X 1/2"	3009019

Carriage Drive Idler Pulley Assembly (UL & CE)



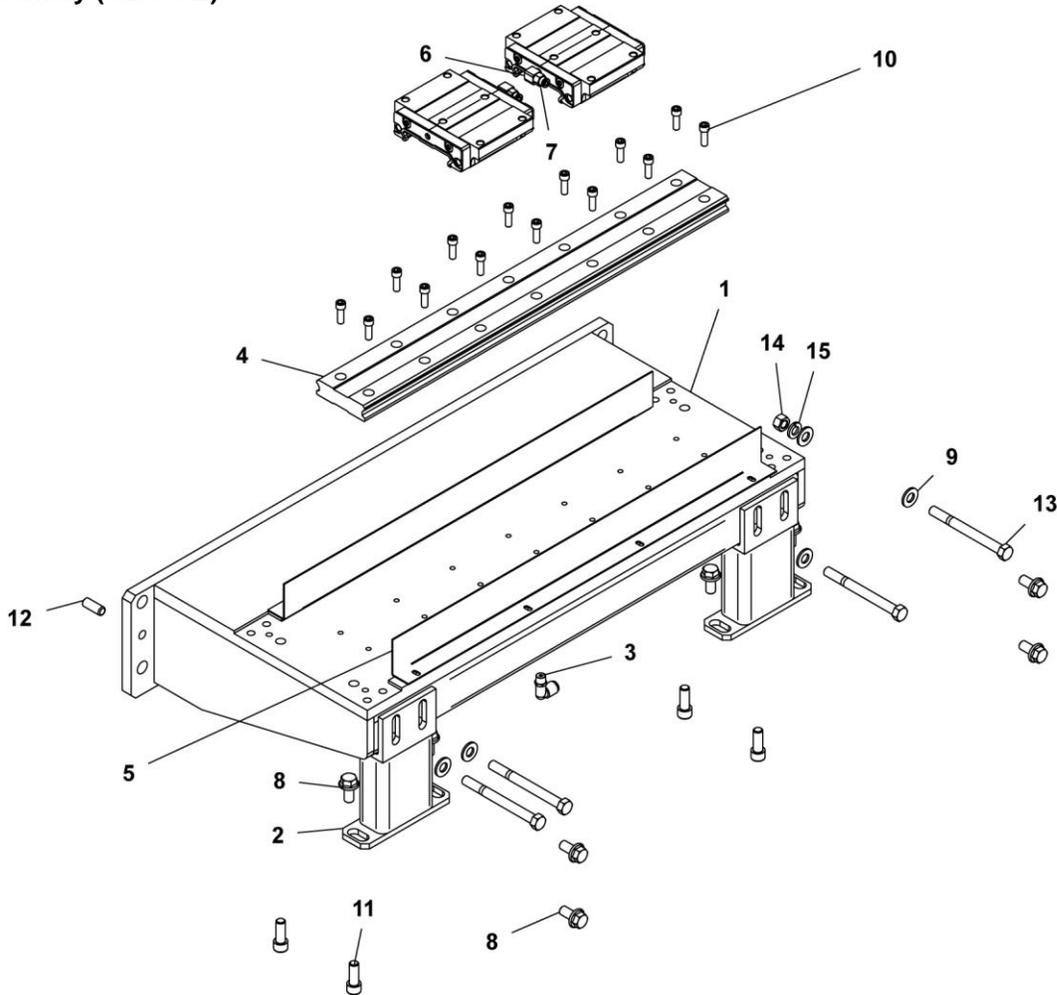
	Carriage Drive Idler Pulley Assembly (UL & CE)	Part Numbers
	Part Name	All Models
1	Front End Plate	9157909
2	Idler Roller Shaft	9165532
3	Idler Roller	9150907
4	Bearing	3023097
5	External Retaining Ring	3024041
6	Socket Cap Screw 5/16-18 X 1"	3009003
7	Socket Cap Screw 10-24 X 5/8"	3009045

Pallet Stop Assembly (UL & CE)



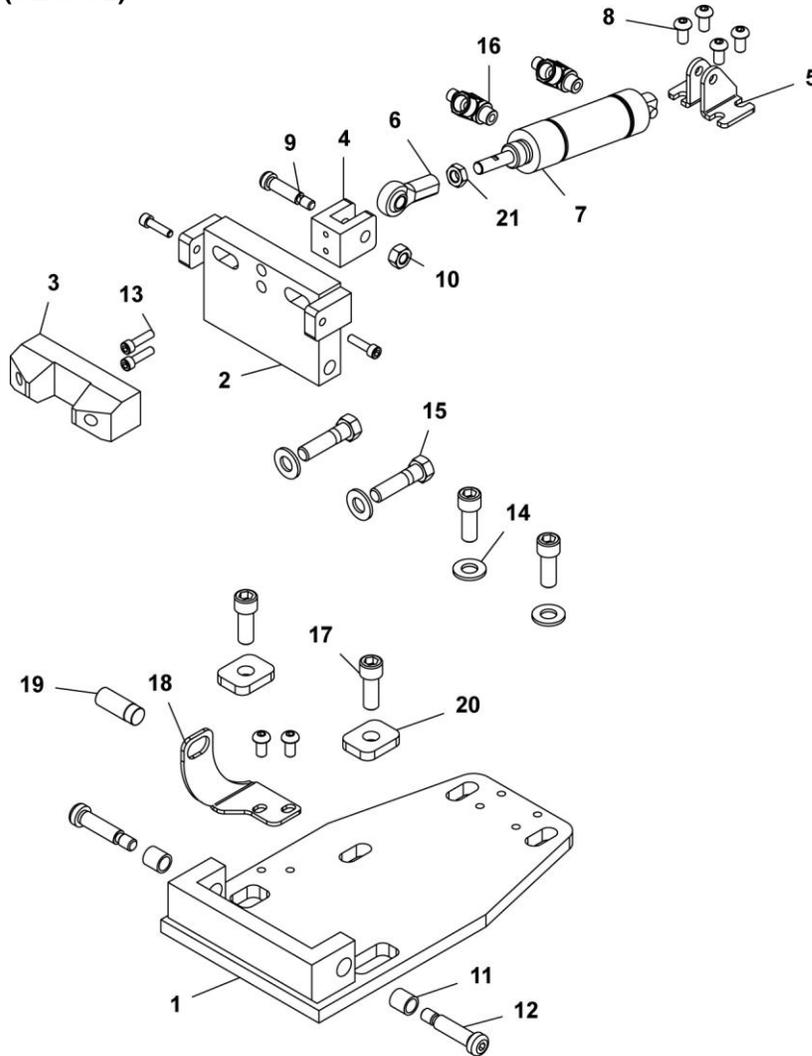
	Pallet Stop Assembly (UL & CE) Part Name	Part Numbers				
		10/12	14/12	16/14	18/16	20/18
1	Pallet Stop Mounting Bracket	9153039-A	9150858-A	9150138-A	9150538-A	9130050
2	Pallet Stop Mounting Bar	9153707	9150857-B	9150137-A	9150137-A	9172473
3	Plastic Adjustment Handle Male	3033033	3033033	3033033	3033033	3033033
4	Flat Washer 3/8" ZP	3021013	3021013	3021013	3021013	3021013
5	Split Lock Washer 3/8"	3022002	3022002	3022002	3022002	3022002
6	Heavy Hex Bolt 1/2-13 X 2-3/4"	3008021	3008021	3008021	3008021	3008021
7	Pallet Stop C-Channel Assembly	9153312	9150824	9150119-A	9150536-A	9154347
8	Pallet Stop Guide	9162354	9162354	9162354	9162354	9162354
9	Pallet Stop Lift Screw	9167509	9167509	9167509	9167509	9167509
10	Elastic Stop Nut 3/8-16	3012003	3012003	3012003	3012003	3012003
11	Plastic Knob Round 3/8-16	3033001	3033001	3033001	3033001	3033001
12	Plastic Nut	9162371	9162371	9162371	9162371	9162371
13	Pallet Stop	9154636	9154636	9154636	9154636	9154636
14	SAE Washer 3/8"	3021013	3021013	3021013	3021013	3021013
15	Button Socket Cap Screw 1/4"-20 X 3/8"	3001009	3001009	3001009	3001009	3001009
16	Compression Spring	3043111	3043111	3043111	3043111	3043111
17	Scale	7024019	7024019	7024019	7024019	7024019

Index Base Assembly (UL & CE)



	Index Base Assembly (UL & CE) Part Name	Part Numbers All Models
1	Ball Screw Drive Base Weldment	9150431
2	Indexer Support	9150438
3	Fitting Male Elbow 3/8"	2003002
4	Linear Way Slide With 2 Blocks	3030085
5	Oil Splash Shield	9150407
6	Fitting, Elbow 1/8 NPT M6 X.75	2005104
7	Fitting Male Connector 1/8"	2003000
8	Hex Lock Bolt 3/8-16 X 3/4"	3003002
9	Flat Washer 3/8"	3020010
10	Socket Cap Screw 1/4-20 X 3/4"	3009022
11	Socket Cap Screw 3/8-16 X 1"	3009000
12	Dowel Pin 3/8" X 1"	3014040
13	Hex Head Bolt 3/8-16 X 4"	3008029
14	Finish Hex Nut 3/8-16	3013007
15	Split Lock Washer 3/8"	3022002

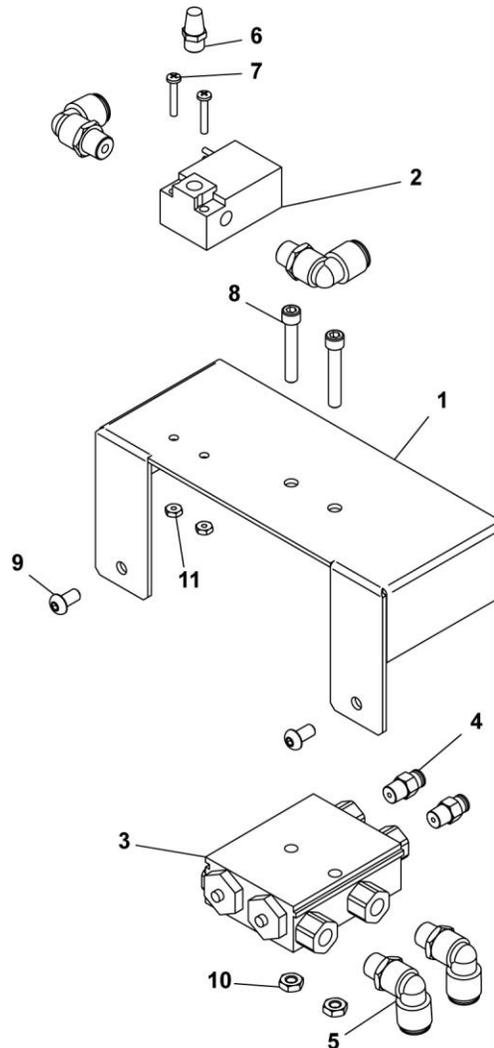
Double Index Assembly (UL & CE)



	Double Index Assembly (UL & CE) Part Name	Part Numbers All Models
1	Double Index Base Weldment	9151141
2	Double Index Fork Bracket	9151145
3	Double Index Nylon Fork	9150151
4	Double Index Cylinder Bracket	9151144
5	Pivot Bracket	2009232
6	Female Rod End 5/16-24	3034001
7	Double Acting Cylinder	2009031
8	Button Socket Cap Screw 1/4-20 X 1/2"	3001005
9	Socket Cap Shoulder Screw 5/16 X 1"	3006014
10	Elastic Stop Nut ZP 5/16-18	3012001
11	Cylinder Bronze Bearing 3/8" X 1/2" X 1/2"	3023170
12	Socket Cap Shoulder Screw 3/8 X 1-1/4"	3006007
13	Socket Cap Screw 10-24 X 3/4"	3009052
14	Flat Washer 3/8"	3020010
15	Hex Head Bolt 3/8-16 X 1-1/2"	3008005
16	Universal Flow Control 1/4"	2018079

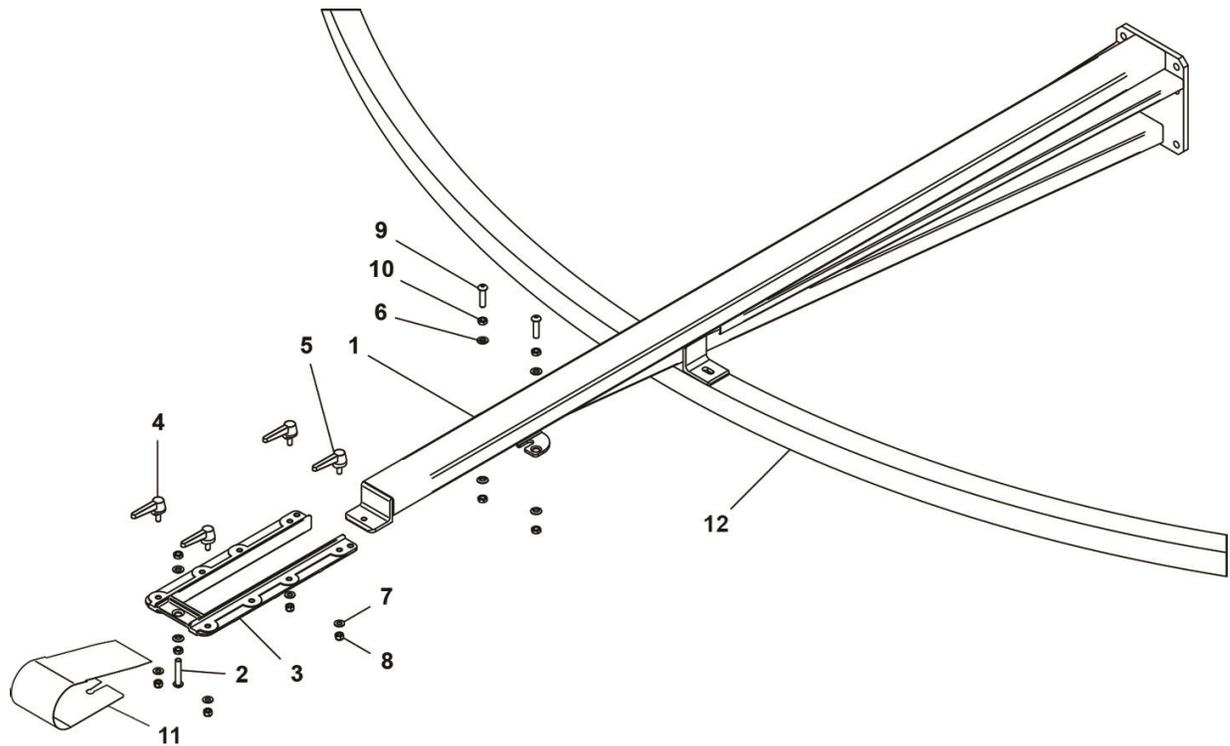
17	Socket Cap Screw 3/8-16 X 1"	3009000
18	Double Index Proximity Mounting Bracket	9150153
19	Round Proximity Switch M12 X 1"	1010223
20	Washer	9151167
21	Hex Nut ZP 5/16-24	3013032

Oil Panel Assembly (UL & CE)



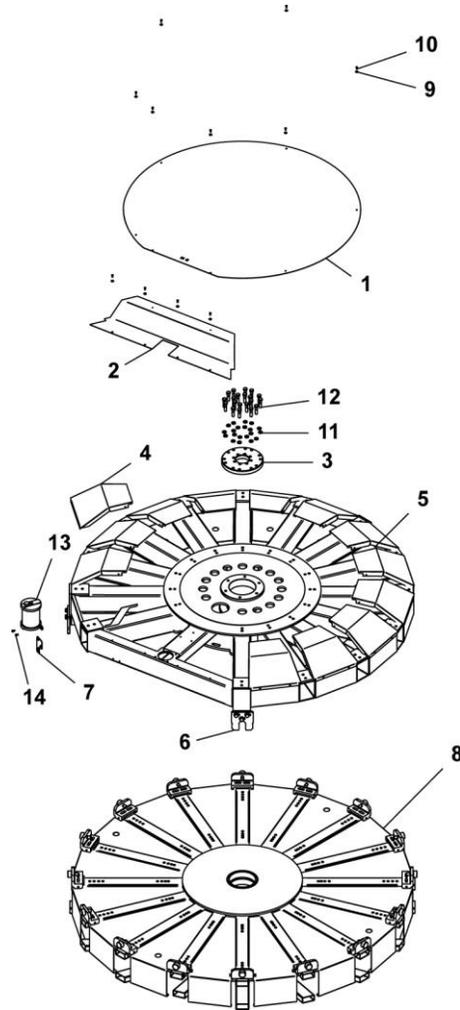
	Oil Panel Assembly (UL & CE) Part Name	Part Numbers All Models
1	Oil System Sub-Panel	9150452
2	Valve 24 VDC	2012055
3	Air Two-Injector Pump	2007084
4	Fitting Male Connector 1/8"	2003000
5	Fitting Male Swivel Elbow 1/4"	2003013
6	Muffler 1/8"	2014002
7	Round Head Machine Screw 6-32 X 7/8"	3005008
8	Socket Cap Screw 1/4-20 X 1-1/2"	3009017
9	Button Socket Cap Screw 1/4-20 X 1/2"	3001005
10	Elastic Stop Nut ZP 1/4-20	3012000
11	Elastic Stop Nut 1/4-20	3012007

Spider Arm Assembly (UL & CE)



	Spider Arm Assembly (UL & CE) Part Name	Part Numbers				
		12/10	14/12	16/14	18/16	20/18
1	Spider Arm Weldment	9153705	9150813	9151917	9153370	9172371
2	Button Socket Cap Screw 3/8-24 X 2"	3001210	3001210	3001210	3001210	3001210
3	Pallet Support Bracket	9150301	9150301	9150301	9150301	9150301
4	Left Locking Cam 3.01"	9050154-C	9050154-C	9050154-C	9050154-C	9050154-C
5	Right Locking Cam 3.01"	9050153-C	9050153-C	9050153-C	9050153-C	9050153-C
6	Spherical Washer .422" X .75"	9102153	9102153	9102153	9102153	9102153
7	Wrought Flat Washer 5/16"	3020007	3020007	3020007	3020007	3020007
8	Elastic Stop Nut 5/16-18	3012001	3012001	3012001	3012001	3012001
9	Button Socket Cap Screw 3/8-24 X 1-1/2"	3001078	3001078	3001078	3001078	3001078
10	Finished Hex Jam Nut 3/8-24	3013015	3013015	3013015	3013015	3013015
11	Front Spider Arm Cover	9PL0082	9PL0082	9PL0082	9PL0082	9PL0082
12	Spider Arm Ring	—	—	—	9153309	9369301

Carousel Assembly (UL & CE)



Carousel Assembly (UL & CE) Part Name		Part Numbers				
		12/10	14/12	16/14	18/16	2018
1	Top Cover	9153037-A	9150847-A	9150099-A	9150599-A	9130042
2	Center Top Cover	9153036-A	9150849-A	9150097-A	9150597-A	9130039
3	Head Lock Plate	9150318	9150318	9150318	9150318	9150318
4	Head Cover	9153035-A	9150844-A	9150098-A	9150535-A	9130041
5	Upper Carousel	9153150	9150680	9150660	9150670	9130020
6	Registration Fork	9152069-A	9152069-A	9152069-A	9152069-A	9152069-A
7	Lift Proximity Bracket	9130043	9130043	9130043	9130043	9130043
8	Lower Carousel	9153110	9150861	9150420	9150520	9130010
9	Machine Screw Washer ZP #10	3021008	3021008	3021008	3021008	3021008
10	Button Socket Cap Screw 10-24 X 1/2"	3001013	3001013	3001013	3001013	3001013
11	Split Lock Washer 1/2"	3022000	3022000	3022000	3022000	3022000
12	Hex Bolt 1/2-13 X 2"	3008135	3008135	3008135	3008135	3008135
13	Oil Reservoir W/Bracket Assembly	9130061	9130061	9130061	9130061	9130061
14	Button Socket Cap Screw 1/4-28 X 1/2"	3001083	3001083	3001083	3001083	3001083