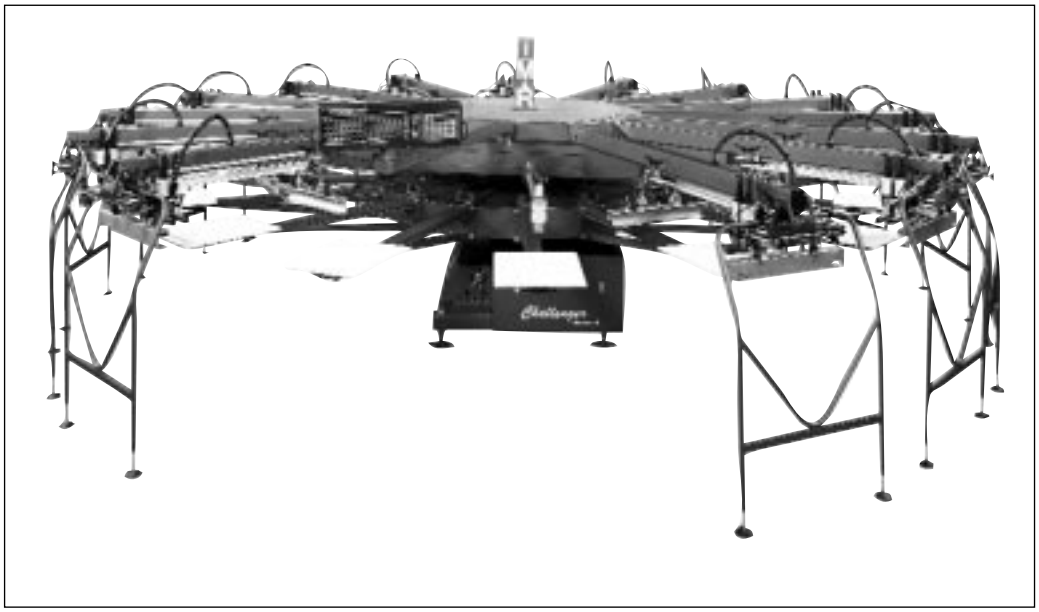


The M&R Challenger Series II

Revision No. 1 071499MS

M&R PRINTING EQUIPMENT, INC.
TOLL-FREE: 800-736-6431

Registration Numbers

MODEL #: _____

SERIAL #: _____

SCHEMATIC #: _____

MACHINE #: _____

DATE INSTALLED: _____

INSTALLED BY: _____

POSITION 1: _____

POSITION 2: _____

INTRODUCTION

Dear Valued Customer,

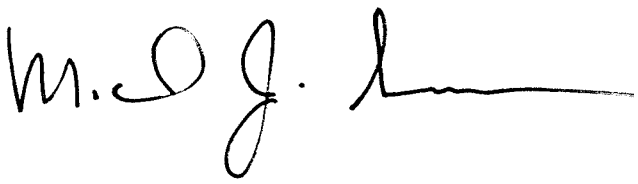
Thank You and Congratulations on the purchase of your new Challenger Series II Semi-Automatic Printing Press.

We believe that the Challenger Series II has been engineered to fulfill our "State-Of-The-Art" claim. Our goal from the start has been to realistically expand our customers' production horizons by applying tomorrow's technology today. This remains a firm commitment of management.

Since its introduction, the M&R Challenger Series II has permitted its owners to produce jobs in a cost-effective manner with unprecedented registration. This tradition of high-performance and cost-effective decorating of finished garments and piece goods is continued with the new M&R Challenger Series II. This press is setting new standards in textile decoration, and brings a dimension of production and cost efficiency never before available. It's the professionals' choice for multicolor textile printing.

Understanding the assembly, operation and maintenance of your Challenger Series II will ensure maximum production rates and a long productive life. The purpose of this manual is to help, guide, and inform your employees in the procedures required for operation and maintenance of your new press.

For information or technical support, call the Equipment Service Department at M&R Printing Equipment, Inc. (800) 736-6431 or our weekend/holiday 24-hour service hotline number at (630) 462-4715.
Again, thank you and congratulations.



Michael J. Sweers
Director of Technical Services
M&R Printing Equipment Inc.

Table of Contents

WARNING!

The product described in this publication may employ hazardous voltages or might create other conditions that could, through misuse, inattention, or lack of understanding, result in personal injury, or damage to the product or to other equipment. It is imperative, therefore, that personnel involved in the installation, maintenance, or use of this product understand the operation of the product and the contents of this publication.

This document is based on information available at the time of its publication. The information contained here in purports to be accurate,However, it may not cover all details or variations in hardware, software, features or specifications, nor to provide for every possible contingency in connection with installation, operation and maintenance. Features may be described herein which are not present in all variations of this product. M&R Printing Equipment, Inc. assumes no obligation of notice to holders of this document with respect to changes subsequently made.

M&R Printing Equipment, Inc. makes no representation or warranty, express or implied or statutory with respect to, and assumes no responsibility for the accuracy, or completeness, of the information contained herein. No warranties of merchantability or fitness for a particular purpose shall apply.

Chapter 1
Safety Precautions

FUNDAMENTAL SAFETY INSTRUCTIONS:

Please read all information regarding safety precautions as presented in the Operator's Manual.

The fundamental requirement to insure safe and trouble-free operation of this equipment is a thorough understanding of the safety information contained in this manual.

This manual includes important instructions to insure safe operation of this equipment.

This Operator's Manual, and especially the safety instructions as described therein, must be observed by everyone who will operate this equipment.

In addition to the safety instructions and regulations described in this manual, rules and regulations of the site location also must be carefully observed.

Obligation of the Equipment Operator -

The Equipment Operator Must Guarantee That Only Staff:

Who are acquainted with the fundamental regulations according to workers protection and accident prevention, are completely knowledgeable in the operation of the equipment.

Employees must have fully read the Safety Chapter and the Warning Instructions of this manual, and understand the instructions as they relate to operation of the equipment.

Equipment operators must be continually evaluated to assure that they fully understand the operation of this equipment.

Obligation of Personnel:

Every person that will be engaged in the operation of this equipment must comply with the following rules before operation of the equipment is to begin.

- Observe the fundamental regulations of worker's protection and accident prevention.

- Read the Safety Chapter and Warning Instructions of this Operator's Manual and confirm by signature that they understand the instructions as described in the manual.

Dangerous Situations During Operation of the Equipment:

The M&R Challenger Series II has been designed and constructed in accordance with safety standards as described by Nationally Recognized Testing Laboratories, such as Underwriters Laboratories in the United States, and CENELEC and the European Economic Community (CE) Standards and Directives. However, it is possible that dangerous conditions which can cause serious injury or loss of life for the user or third persons, or damage to the equipment or property could occur. This equipment must be used only for the defined purpose as described in the Operator's Manual, and must be maintained in perfect running condition in accordance with the described Safety Regulations. Conditions which may compromise operator safety must be identified and corrected immediately.

Defined Purpose:

The M&R Challenger Series II is specifically designed for screen printing on Textile products. Any other use of the equipment which does not meet the Defined Purpose as described abovewill invalidate warranty annd release M&R. In accordance with the Defined Purpose of this equipment, it is necessary to observe all instructions as outlined in the Operator's Manual and to perform the preventive maintenance procedures as described in the manual.

Guarantee and Liability:

In principle, our general terms of sale and delivery are valid and these are at the operators disposal. Guarantee and liability claims for persons or property damage are excluded if they originate for one or more of the following reasons:

A non-defined use of the equipment.
Improper installation or use of the equipment.
Operation of the equipment with knowledge of defective safety devices.
Non-Observance of instructions as described in the Operator's Manual for transportation, storage, installation, operation, maintenance, set-up and take-down of the equipment.
Modification of the equipment.
Failure to replace worn or defective parts of the equipment.
Defective repairs made to the equipment by anyone other than authorized M&R personnel.
Dangerous conditions which are a result of the improper use of the equipment.

Description of Safety Symbols and Instructions:

This symbol signifies or alerts the equipment operator of conditions or areas of the equipment which present imminent danger to the health of the equipment operator. **Non-observance of these instructions has serious health consequences, and can lead to serious injuries.**

DANGER

This symbol signifies a possible imminent danger for life and health of persons and equipment operators. **Non-observance of these instructions can have serious health consequences and can lead to serious injuries.**

WARNING

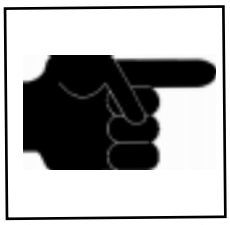
This symbol signifies a possible danger. **Non-observance of these instructions can lead to serious or damage to the equipment or property.**

CAUTION

This symbol gives important instructions for the proper use of the equipment. **Non-observance of these instructions can lead to equipment failure.**

IMPORTANT

This symbol is used to describe operating tips or especially useful information.**This information will enable the operator to use all equipment functions for optimal performance.**



OPERATING TIP

Organizational Measures:

Equipment operators are responsible to provide personal protection when operating this equipment. All safety devices must be checked each day before operation of the equipment can begin.

Safety Devices:

Before beginning operation of the equipment, all safety devices must be checked for proper operation.

Safety devices may only be removed after...

The equipment is shut down.
The electrical power has been disconnected from the equipment.
In case of delivery of partial components, the operator must install safety devices in accordance with regulations.

Exploratory Safety Measures:

The Operator's Manual must be kept on or near the equipment at all times.
All safety and danger notices must be kept in readable condition at all times.

Training of the Equipment Operator:

Only properly trained operators may run the equipment.
The competence of personnel who are to operate, maintain, set-up and shut down the equipment must be confirmed.
Unskilled staff may work with the equipment only when supervised by experienced equipment operators.

Equipment Control System:

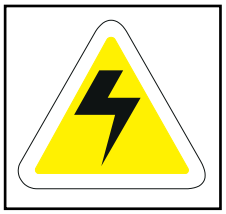
Never make any modifications to software.
Only experienced operators may actuate the control system.

Safety Measures During Normal Operation:

Operate the equipment only if all safety devices are fully operational.
Before starting the equipment, check to be sure no-one will be endangered by the operation of the equipment.
Check the equipment and safety devices at least once per shift for external or visible damage.

Danger by Electrical Energy:

Work on the electrical system must be carried out by qualified personnel only.
Check the electrical equipment regularly for any sign of defect or loose connections.
Electrical enclosures must be kept securely locked at all times. Only authorized personnel with a key are allowed access to electrical enclosures.


DANGER

Danger by Pneumatic Energy:

Only personnel with experience with pneumatic power systems may work with pneumatic components or assemblies.
Before starting any work on pneumatic components or assemblies, the compressed air supply must be completely drained from the equipment to prevent any operation of pneumatic controls or assemblies.
All pneumatic piping and/or hoses must be checked at regular intervals for signs of wear or failure.


DANGER

Maintenance & Trouble Shooting:

Preventive maintenance must be performed at regular intervals as described in the Operators Manual.
Equipment operator's must be informed before any preventive maintenance can be performed.
All power systems such as electrical, pneumatic, hydraulic or mechanical must be disconnected and locked out before preventive maintenance may begin.


WARNING

Structural Modification of the Equipment:

Modifications of equipment are specifically not allowed without written authorization from M&R Printing Equipment, Inc.

Cleaning of the Equipment:

Clean away all ink or other contaminants at the end of each day.

Equipment Noise:

Under normal operating conditions as described under Defined Purposethis equipment will not produce sound at harmful levels. Depending on local conditions, a higher continuous sound level may result that could lead to future hearing impairment. In this case, the operational staff must wear appropriate safety clothing or protection.

CAUTION

CAUTION: The information contained in this Operator's Manual has been provided to eliminate problems from occurring. Be sure to read through this Operator's Manual fully before operating your press.

There are numerous safety features utilized in the operation of this equipment. Please be sure you know the location of these safety devices and how they operate before attempting to operate this equipment.

SAFETY FEATURES -

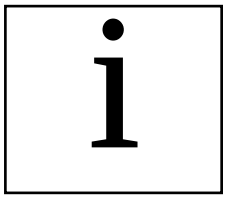
1. All equipment is provided with either a safety bar, foot switch or hand switch to stop the equipment. Please know the type on your equipment and its location before operating.

2. Safety guards have been provided to protect the operator from all moving parts. Please do not remove these Safety Guards any time the equipment is in operation.

3. This Operator's Manual includes information regarding the proper preventative maintenance procedures. Whenever personnel are performing preventative maintenance procedures, be sure that all electrical and pneumatic power is disconnected from the equipment, **and that disconnects are locked in the "OFF" position.**

OPERATOR SAFETY INSTRUCTIONS -

All industrial equipment, including screen printing equipment, requires a combination of high electrical, pneumatic, hydraulic or mechanical power for operation. In addition, automatic screen printing equipment, by its nature, exposes operators to parts and assemblies which operate at high speeds and contain numerous moving parts. As with all complex industrial equipment, care should be exercised to carefully observe proper operating procedures and safety precautions.



IMPORTANT

Every effort has been made to design and construct safe, dependable equipment, however, it is impossible to foresee all circumstances under which this equipment may be utilized, or to anticipate all possible combinations of factors which may cause a hazardous condition or situation. It is imperative that the equipment operator, as well as all other personnel engaged in any phase of the set-up, operation or preventative maintenance of this equipment consider safety first an important part of their job.

The following general safety considerations are offered as an aid to users of M&R Printing equipment to assist them in becoming safety conscious.

1. **READ THE OPERATOR'S MANUAL** before attempting to lift, move, operate or perform maintenance on any piece of machinery. Become intimately familiar with all equipment controls, their locations, their operations and their effect on equipment function. Keep this Operator's Manual in a clean location immediately adjacent to the equipment for a quick and handy reference.

2. **BEFORE ATTEMPTING TO START THE EQUIPMENT** inspect all areas around and adjacent to moving parts for possible obstructions: tools, rags, crating remnants etc. Be certain that all Safety Guards, covers, access doors etc., are properly installed prior to starting operation.

3. **PRACTICE GOOD HOUSEKEEPING:** Maintain an area adjacent to and NOT ON the equipment for tool and color storage. Clean up all spills and eliminate all potential trip points from the operating areas around the equipment to prevent slipping or falling into the working zone of the equipment. **Do not stand on equipment elements not intended for this purpose**. Maintain a maximum clear area around the equipment for unobstructed movement of the operator. Perform Preventative Maintenance at the intervals specified in this Operator's Manual.

4. **AVOID WEARING LOOSE CLOTHING** , long hair, neck ties etc., when operating this equipment as these can easily become entangled in moving parts. Safety shoes are likewise recommended. Avoid horseplay around the equipment.

5. **DO NOT ATTEMPT** to operate this equipment if you are sick, excessively fatigued or under the influence of alcohol or prescription drugs. Shut off the equipment immediately if any malfunction occurs or appears imminent. Report any unsafe equipment or condition promptly in order that correction can be made as soon as possible.

6. **ANY OTHER PERSONNEL** should stay well away from the equipment so as not to distract the operator or accidentally move a control element. Avoid talking to the operator while the equipment is in operation.

7. **WHEN CHANGING SET-UP,** performing maintenance work, cleaning the equipment etc., it is imperative that the main electrical and pneumatic power supplies be disconnected to avoid accidental operation and possible resultant injury. This is particularly important in the event more than one person is involved in such duties.

8. A **WRITTEN SAFETY PROGRAM** should be installed by all companies owning M&R equipment. This program should cover inspection, maintenance and safety training on the proper use of the machinery.

Chapter 2
Features & Specifications

STANDARD FEATURES

- Servo-driven index system
- Expanded 20" x 28" (50.8 cm x 71 cm) print area
- Test Print Feature
- Micro Processor Control with “plain language” operator interface
- Up Front Control Panel
- Reversible Carousel Rotation thru operator interface
- Single or Double Index of Carousel
- Single or Double Print Stroke
- Dwell Timer: Controls Cycle for Feeding and/or Flashing
- Emergency Stop Button
- Independent Head Start-Push Buttons: Single Print, Double Print, Front and rear Carriage Stop
- Adjustable Length Rear Screen Holders
- Adjustable Print Stroke Length – Rear
- Micro-Registration – Front
- Independent Squeegee and Flood Bar Speed Controls
- Adjustable Squeegee and Flood Bar Angles
- On-Board Self-Diagnostic Program
- Print Start/Print Finish Cycle
- Quick-Release Pallet System
- Positive Safety Cord System
- Production Unit Counter
- Two Year Limited Warranty on all Parts
- Rigid Steel and Aluminum Construction
- Low Profile Pallets

OPTIONAL FEATURES

- Pneumatic Screen Frame Clamps
- Pneumatic Squeegee/Flood Bar Clamps
- 3/16" (5 mm) Central Off-Contact Adjustment
- M&R “Tri-Loc” pre-registration system
- Rear Micro Registration
- Quartz Flash or (Automatic Omni Flash Cure–Automatically Retracts When Press is not in Operation)
- Youth Pallets (2 sizes Available)
- Oversize Pallets
- Front Adjustable Print Stroke Length
- Sleeve Pallets
- Patented No Shirt Detector (Patent No. 5,383,400)
- Management Production Software Package
- Modem connection for “On-Line” technical support
- Revolver and Patent #5,595,113

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SPECIFICATIONS

Electrical Requirements: 200/230 volts, 3 phase, 30 amps, 60 Hz. service required for press operation.

Air Requirements: (12 & 14-Color Standard Press Only)
A compressor with refrigerated dryer to remove condensation from air lines providing 86.5 scfm at 110 pounds per square inch. (See detail drawing of recommended hookup of compressor and dryer below.)

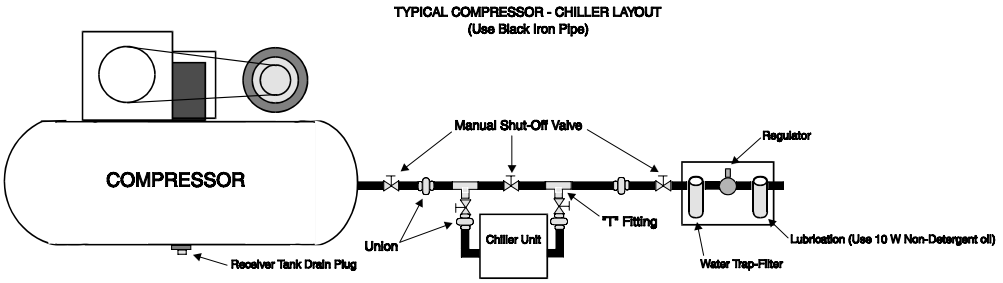


Figure 1 Typical Compressor - Chiller Layout

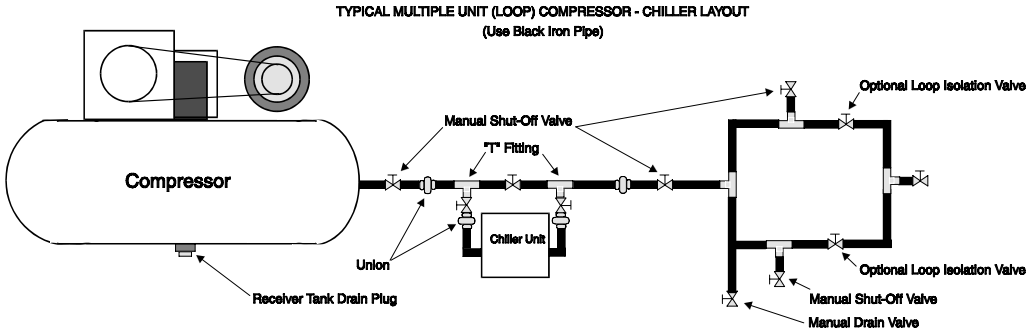


Figure 2 Typical Multiple Unit (Loop) Compressor - Chiller Layout

Model No.	12 Color	14 Color
Frame Size	26" x 43" x 1 3/4" - (66cm x 109cm x 4.4cm)	Adj. up to 26" x 43" x 1 3/4" - (66cm x 109cm x 4.4cm)
Print Size	20" x 28" - (50cm x 70cm)	20" x 28" - (50cm x 70cm)
Dimensions	Diameter 18' - (5.4m) Height 5'7" - (1.70m)	Diameter 19.5' - (6m) Height 5'7" - (1.70m)
Shipping Wt.	7500 lb. - (3409Kg)	8000 lb - (3636Kg)
Total Air Consumption (cfm)@100 P.S.I.	64 cfm	74 cfm
Model No.	12 Color	14 Color
No. of Stations	14	16
Volts	230	230
Phase	3 or Single	3 or Single
Current	3 Ph=22 amps/Single=34 amps	3 Ph=22 amps/Single=34 amps

CAUTION

NOTE: The electrical specifications indicated are based on mathematical calculations which assume ideal conditions exist for electrical supply line values, materials used in the installation of electrical service and site preparation. Although every effort has been made to provide accurate electrical specifications, M&R Printing Equipment, Inc. does not assume any liability for damages, whether consequential or incidental, that may result from the use of the indicated electrical specifications. M&R Printing Equipment encourages the use of a licensed electrician for the installation of electrical service to this equipment.

The equipment when installed must be electrically grounded in accordance with local codes or in the absence of local codes, with the National Electrical Code ANSI/NFPA 70 - Latest Edition.

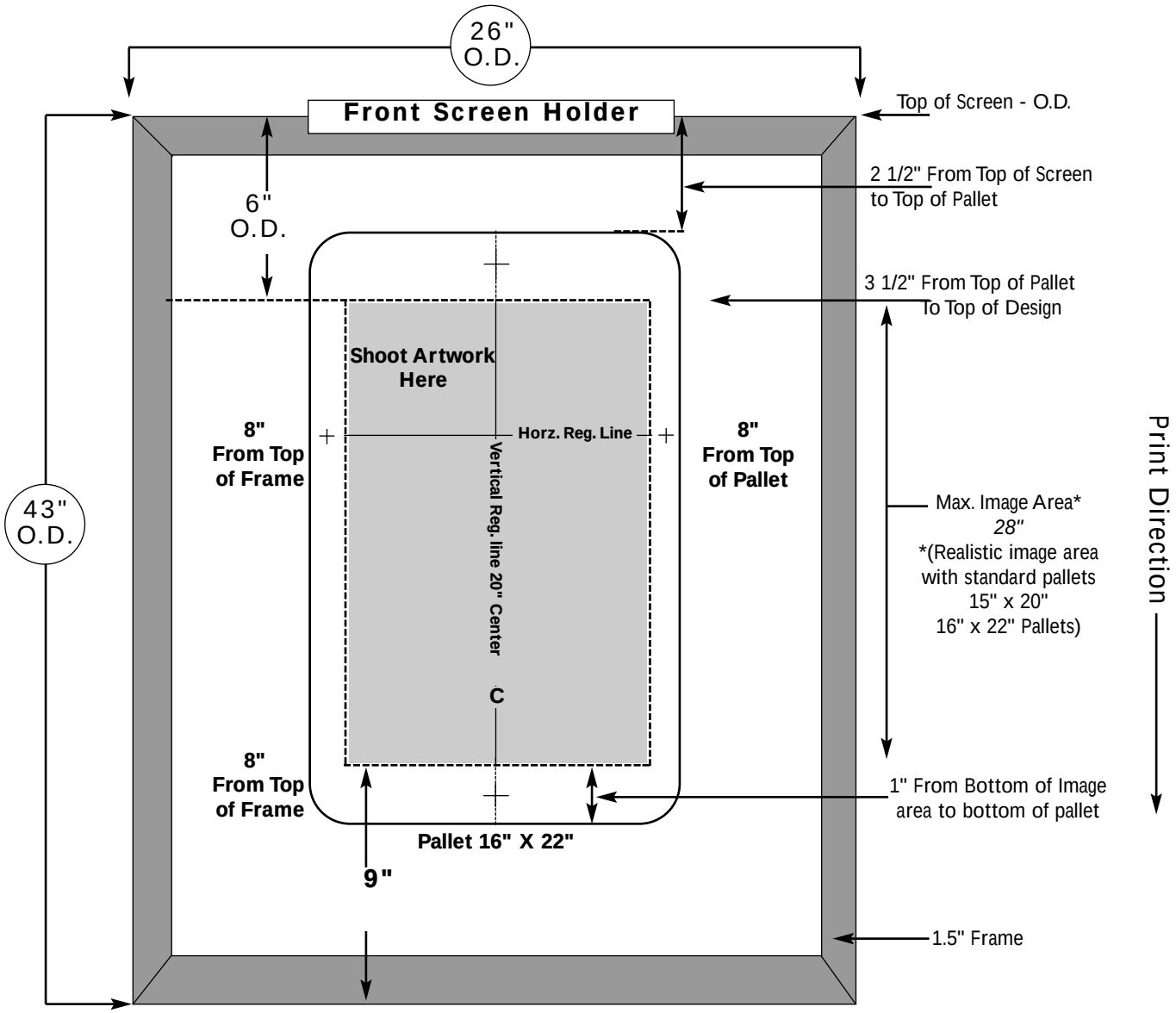
M&R Printing Equipment reserves the right to alter specifications in the manufacture of its products.

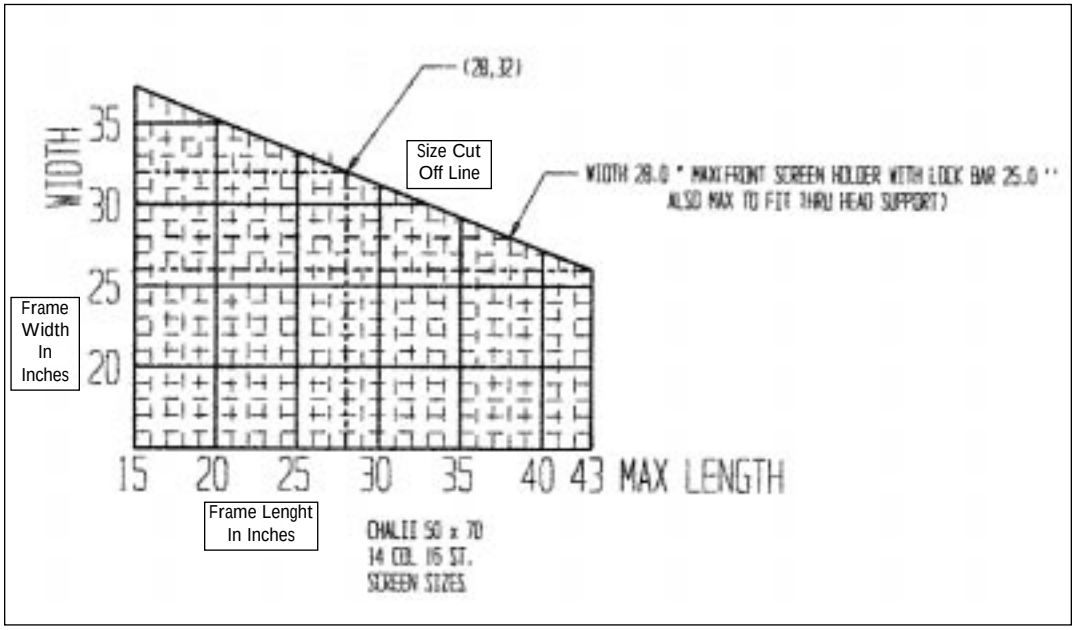
Chapter 3
Screen Frame Requirements

FRAME SIZE:

The maximum size frame that the standard press accommodates is 26" x 43"(66cm x 109cm) outside dimensions.

NOTE: **Special frame sizes are available. Consult with the factory on your requirements.**





Use this chart to determine whether your frame can be used on the press.

1. Locate where your frame's width falls along the left side of the chart.
2. Then find where the frame length falls along the bottom of the chart.

As long as these two dimensions come together withinthe chart, the frame will fit on the press.

Note: 26" wide by 43" long is the maxium screen size when every head is in use.

Chapter 4
Installation

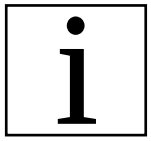
The Challenger Series II requires installation by a factory-trained service representative. The following conditions have to be met before a technician can be scheduled for your installation.

Pre-Technician Checklist for Challenger II Installation:

- Uncrate your Challenger II and check for any obvious damage.

- Using the Chart on page 22, determine the space requirements for your Challenger II. Position the base in the center of this area.
- Have the compressor and dryer operational. Use 3/4" black pipe from the compressor to press with a Shut-Off Valve provided at the press.
- Install a 200/230 Volt 30-Amp Electrical Service to the electrical power input terminal located on the indexer base assembly. Do not connect to press at this time.
- If optional flash cure is to be used, install the electrical service as indicated on the Manufacturer's Rating Plate at all the positions where it might be used (208/220 volts, single phase 30 Amp supply. Jumbo models require 220 Volts, single phase, 50 Amp service.) Refer to the Manufacturer's Rating Plate on each flash cure unit for specific electrical requirements.
- Provide one 16", squeegee blade ready to install at every station (size 1 7/8" x 3/8").
- A three-color minimum print job, with tight registration, should be ready to run. Screens should be prepared with a 6 1/2" well room (measured from the I.D.) at both the front and the rear. With a normal imprint area, the dimension is 8" from the frame's O.D.
- Provide adequate assistance (labor) for the M&R technician during the assembly.

NOTE: **Grease and oil are shipped with all new Challenger Series II presses.**



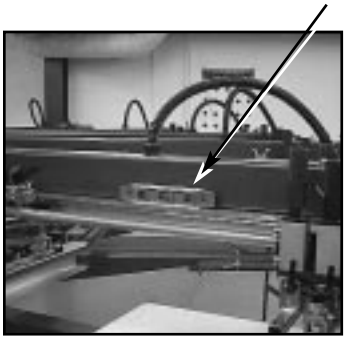


Fig. 1

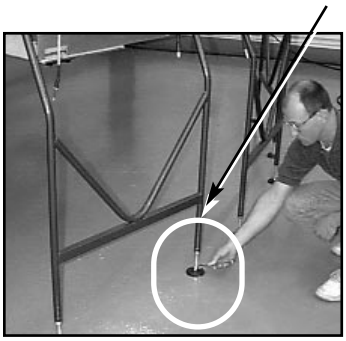


Fig. 2

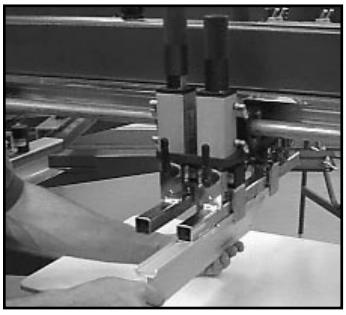


Fig. 3

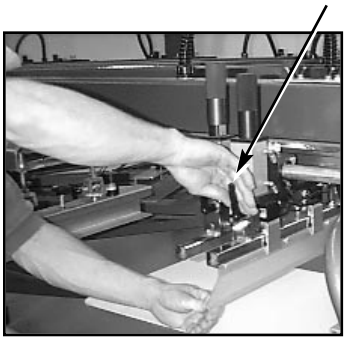


Fig. 4

- Provide and have available a grease gun with standard Zerk fitting and filled with white lithium grease. Have another grease gun filled with Synthetic Teflon Grease. One quart of 10W non-detergent oil also will be required.

After assembling, completing registration and checking general operation of the Challenger Series II, our service representative will assist in setting up a job for which you have screens prepared. He will supervise and instruct all designated personnel in the proper production procedures. This includes instructions on the correct usage of controls and preventive maintenance described in the following sections of this manual.

LEVELING THE PALLETS:

1. Make sure the press head being used to level the pallets is level by placing a small magnetic level (Torpedo Level) on the chrome plated plate (See Fig. 1). Adjust the feet on the head support to level the head, if necessary. (See Fig. 2).

NOTE:	**After the press has been installed by a factory trained technician, there is no need to further adjust the head supports.**

2. Mount the flood bar on the mounting bar flood position. (Mounting Bar with the extended chopper cylinders) (See Fig. 3).

3. Adjust the flood angle straight up and down. Loosen the two ratchet type knobs on both sides of the mounting bar. After adjusting, tighten the knobs (See Fig 4.)

4. Turn the flood pressure knobs clock-wise, to adjust flood bar all the way up. (See Fig. 5)

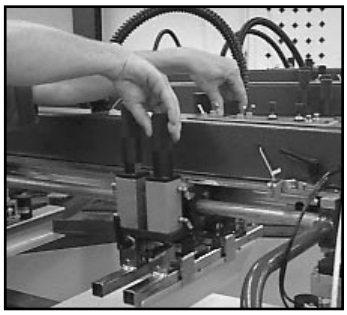


Fig. 5

5. Pull the head carriage all the way towards the front of the head and disconnect the 3/8" air line located on the front of the head (Tol-O-Matic Cylinder Fitting). Use a brass fitting union with plug, to plug the 3/8" air line (M&R Part #2003060-fitting union and Part # 2003042-plug). After doing this, unplug the air line located on the back of the head (Tol-O-Matic Brass Cylinder Fitting). Use a brass fitting union with plug , to plug the air line. This will allow you to move the head carriage back and forth by hand without resistance. (See Fig 6)

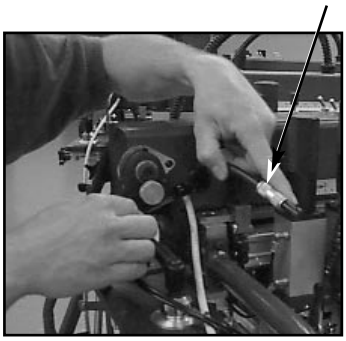


Fig. 6

NOTE: **Before you disconnect the 3/8" air line, be sure that the head carriage is in the full front position. To do this, put the head in the single stroke and front position (Front/Rear toggle switch), and press the green reset button. If, however, the head is in mid-stroke, removing the air line will put 110 psi, of force to the head and it will slam into position.**

6. Before raising the table into the registration forks, make sure that the nuts on the three adjustment points on the base pallet frame are slightly thighten towards the middle of the adjustment range. (See Fig 7)

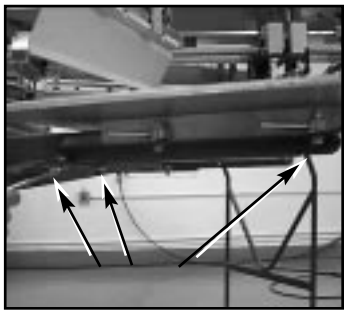


Fig. 7

7. Now go ahead and raise the first pallet into the head used for leveling the pallets. (See Fig. 8)

Fig.8

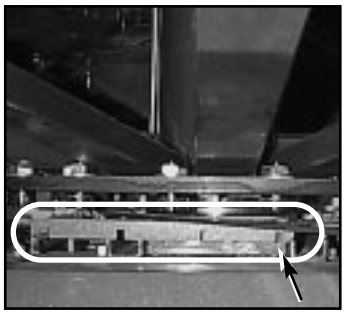


Fig. 9

NOTE: **If your machine has the "Central - Off Contact Lever", make sure it is set for the highest position, least amount of off-contact. (See Fig. 9)**

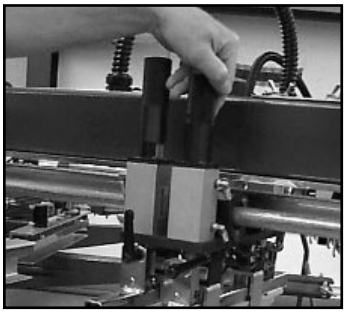


Fig.10

8. Now go ahead and move the head carriage towards the center so that it is located above the center of the pallet. Now adjust the flood pressure knobs counter-clockwise until the edge of the flood bar comes in contact with the surface of the Pallet. (See Fig. 10)

Fig.11

9. Bring pallet down by pressing the green reset button, now use your small magnetic level (Torpedo Level) and place it on the edge of the flood bar to make sure it is level. If it is not level, make the necessary adjustments to make it level. (See Fig 11)

10. Now bring the pallet back up and move the head back and forward, (by hand), and adjust the base pallet frame so that surface of the pallet is one business card (.010") from the edge of the flood bar, throughout the length of the print stroke of the head. (See Fig. 12 and 12 A)

11. Repeat Step #10 with all the remaining pallets.

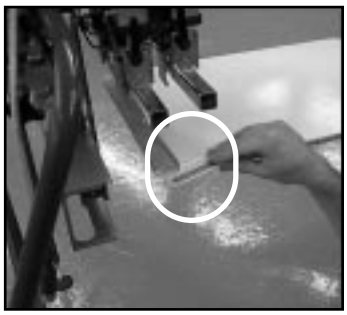


Fig.12

Fig.12 A

This Page For Notes:

Chapter 5
M&R Tri-Loc Pre-Registration System (Optional)

The M&R Tri-Loc Registration System is designed to aid in the set up and registration of screens on the M&R Challenger Series II press. The system as a whole is very simple. It starts by pre-registering screens on the exposure unit, then transferring those screens to the press, which is outfitted with a location fixture that duplicates the exposure system exactly. This stop location is accurately repeatable from print head to print head, giving the press operator a quick and exact locating point to set screens.

The process is divided into three areas as follows:

1. ART DEPT.: "Film and Pin Register"
2. SCREEN DEPT.: "Exposure Registration"
3. PRESS SET-UP: "On Press Registration"

As with any system of this type, it is important that everyone involved has a through understanding of how their participation affects the overall accuracy of the system. It is recommended that everyone involved read this manual in its entirety.

SYSTEM COMPONENTS:

Parts No.	Description
ADJEXREG - 23" x 25" -	EXPOSURE UNIT MASTER FRAME (Adjustable)
EXREG - 25" X 33" or 25" x 36" -	EXPOSURE UNIT MASTER FRAME (Non-Adjustable)
PALREG - CH/FORM -	ON-PRESS PALLET
TRI-LOC SHEET 8.5 -	PIN BAR
TRI-LOC SHEET 11.5 -	CARRIER SHEET (8.5" x 20")
TRI-LOC - PB -	CARRIER SHEET (11.5" x 20") (See fig. 1)

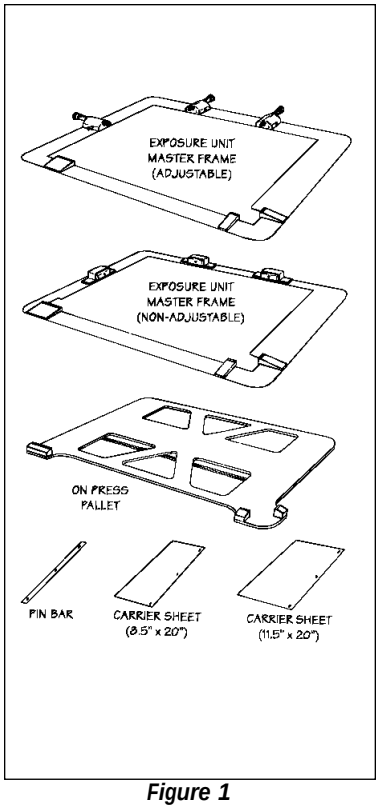


Figure 1

To better facilitate shops that have existing film/pin systems, the M&R Tri-Loc is supplied without a film register Pin Bar attached. Pin Bars and carrier sheets are available separately or in a start up kit available through M&R Sales and Service.

It is important to note that the greatest factor affecting quick set ups and on press registration is properly separated films that have been accurately registered to one another using some type of Pin Bar system. This pre-registration in the Art Dept. will have a direct effect on the overall accuracy of the system once the screens reach the press. Because the system begins in the Art Dept., you will need to set up a film/layout table in which to register your films to the Pin Bar. This layout

table must duplicate the image and Pin Bar location of that on the exposure unit Master Frame.

The following pages will detail the steps needed to set up a film/Pin system that will carry through from the Art Dept. to screen exposure, and ultimately to the on press unit.

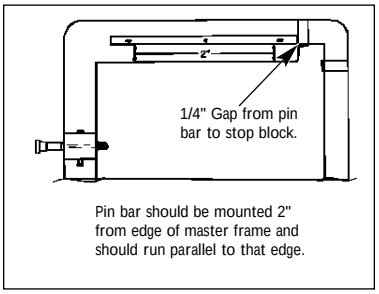


Figure 2

ART DEPT. SET-UP:

In order to set up a layout table for registering films, you must first attach one (1) Pin Bar to the exposure Unit Master Frame as a reference for your film positioning. The dimensions shown are for M&R supplied Pin Bars, but can be used as a guide if you are currently using pin registered films.((See Fig. 2)

NOTE: When mounting pin bars, clean the mounting surface thoroughly for proper tape adhesion.

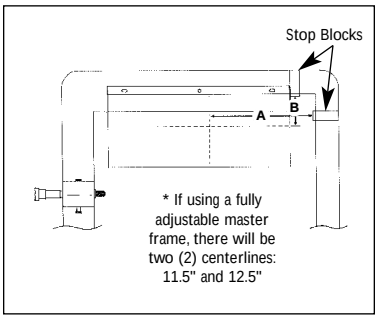


Figure 3

Once the Pin Bar has been attached to the Master Frame, place a punched film on the Pin Strip and measure over from the side stop block to find the image center. (See Fig. 3 dimension "A") and measure down from the top stop block to find image start location. (See Fig. 3 dimension "B")

NOTE: DIMENSION "A" = Half of frame width O.D.
Example:
23" wide = 11.5" - 25" wide = 12.5" - 26" wide = 13.0"

DIMENSION "B" = 6" for Challenger Series II, Formula 5090, Challenger Series II reverse print.
9" for Challenger Series II standard print and Formula 5070.

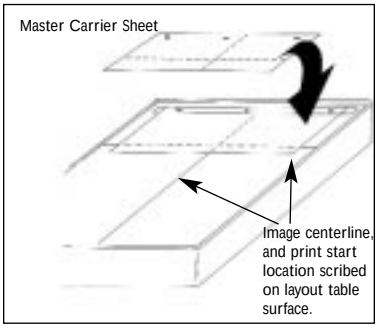


Figure 4

Scribe these lines on the film and this will become your Master Sheet for transferring dimensions to the layout table. Ideally, the layout table should be a backlit unit to better check actual film tolerances during the registration and paste up process. Although the type of table used may vary, it is important that the art table pin bar is positioned to match the vertical centerline and image start position of that on the Exposure Master Frame. (See Fig. 4)

If you are using a fully adjustable exposure frame, your layout table should have 2 center lines, one for the 23" wide frames, and one for the 25" wide frames. When pasting up films to carrier sheets it is important to use the centerline that corresponds with the frame size that will be used for that job. (ie: 23" frame = 11.5" centerline)

When pasting up films, the main or “trap color” should be positioned first and taped securely to the pin mounted carrier sheet.(See Fig. 5)

It is recommended to tape up one color at a time to cut down on the optical distortion that occurs when layering too many films together. The extra time and care taken at this point is critical to the overall accuracy on the press.

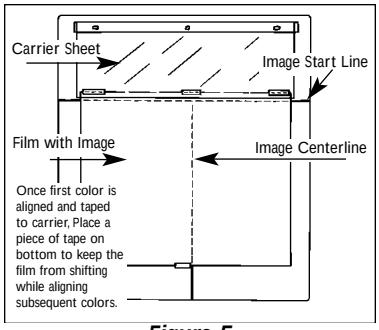


Figure 5

EXPOSURE UNIT SET-UP:

The exposure unit master frame is designed to be mounted directly to the exposure unit. This mounting can be permanent or removable. It is recommended however, that which ever exposure unit you elect to use with the Tri-Loc system, that this exposure unit be dedicated to the Tri-Loc system for all future set-ups. The master frame may be attached to the glass using a heavy grade tape such as duct tape. (See Fig. 6) Typical one up semi-permanent installation showing stop blocks towards the operator for ease of loading and confirming stop block contact. (See Fig. 6)

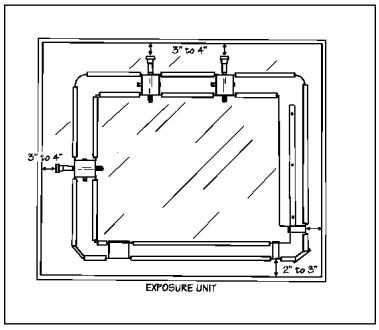


Figure 6

The master frame may also be mounted permanently to the exposure glass (See Fig. 7) using a heavy bond double sided tape (M&R Part No. 701600 / 2 Pcs. 3.75” x 14”) cut tape as shown below. The majority should be used under the working fixtures. (ie: Stop blocks and push pins). Thoroughly clean the master frame and glass for proper tape adhesion. Position master frame on the exposure unit leaving proper clearances (See Fig. 6) and mark the outer edges with masking tape for a reference. Once the tape backing is removed it is recommended to use two people to position it on the glass, as once the tape is down it is not easily removed.

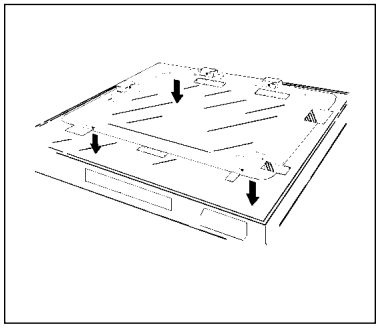


Figure 7

To expose a screen, position film and carrier sheet on pin-bar. Next, load screen into master frame by pushing against push pins and lowering front edge to rest against stop blocks. ***(Do not use excessive force to load a frame. If it does not fit, check frame tolerances)***.(See Fig. 8)

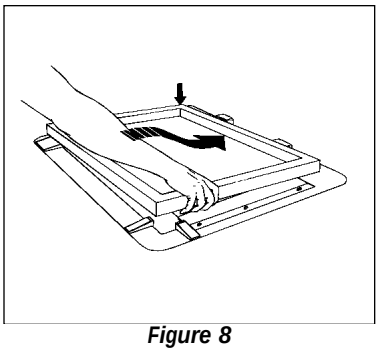


Figure 8

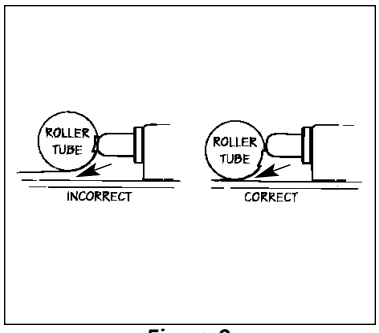


Figure 9

If using a roller type adjustable frame, be sure to check that the push pin is properly engaged and that the frame is flat on the glass before turning on the vacuum. (See Fig. 9)

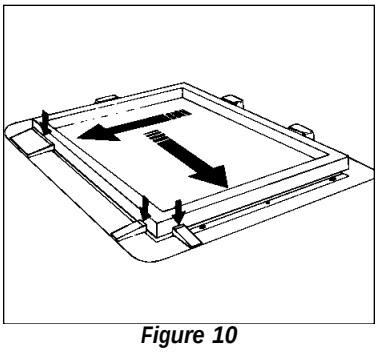


Figure 10

Once the frame is positioned, give it a slight push towards the stop blocks to confirm that you have contact against all three blocks. Activate the vacuum and expose the screen in the normal manner. (See Fig. 10)

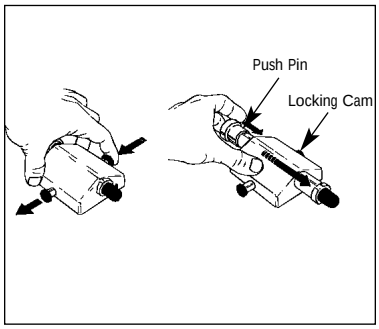


Figure 11

Adjustable master frames are equipped with push pins that adjust in half inch (1/2") increments to fit a variety of frames. Remember, frame width dictates image centerline. To adjust push pin, push locking cam to unlock position (See Fig. 11). Adjust push pin barrel to the desired position and push locking cam back to the locked position.

IMPORTANT

IMPORTANT: While prepping screens for the press, it is important *NOT* to tape over the corners that were in contact with the stop blocks. This will change the frame's outside dimension (O.D.) and affect its registration when it contacts the stop blocks on the press.

Since registration relies heavily on screen tension, it is important to use screens that are not only tensioned properly, but also consistently. A large variance of mesh tension from one screen to another within the same job *will* have an effect on up and down (North/South) registration.

If using two or more master frames on one exposure unit, it is recommended that each job be burned on the same master frame to reduce the number of variables that affect registration.

M&R PRESS SET-UP:

Press registration is achieved by simply locating the screens to the same three points that were used in the exposure unit. This is done via a Tri-Loc registration pallet which is positioned in place of a normal print pallet during set-up.

The positioning of the Tri-Loc pallet will be referred to as the “Prime Position”. This position will be different on every press due to the number of presses in the field.

The procedure for finding the “Prime Position” is a one time operation. The benefits derived from spending the time to properly set this position will become evident the first time the Tri-Loc system is put into use.

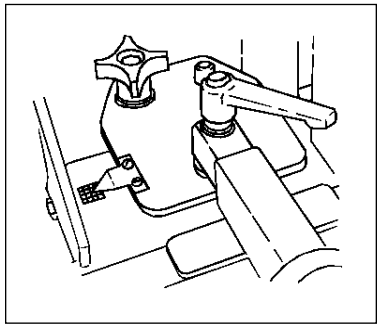


Figure 12A - Formula

PRESS SET-UP:

**** Challenger Series II***

NOTE: Before starting, it is important that pallet level and off-contact are set to specifications. If there is any question of calibration of your press, it should be corrected before you begin. You will realize more of the advantages the system has to offer if all printing parameters are correctly calibrated.

Once it is determined that the press is calibrated properly (i.e; Pallet Level and Off Contact), adjust the micros on each print head to their center position. (See Fig. 12A *Micros are zeroed when pointers are centered on the grid blocks*)

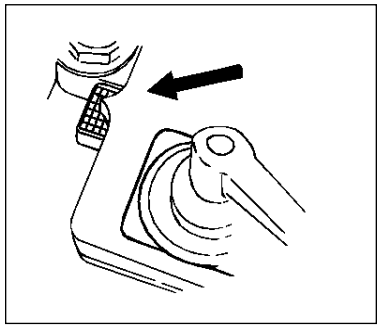


Figure 12B - Series II

Now you are ready to install the Tri-Loc pallet and mark the press for “Prime Position”.

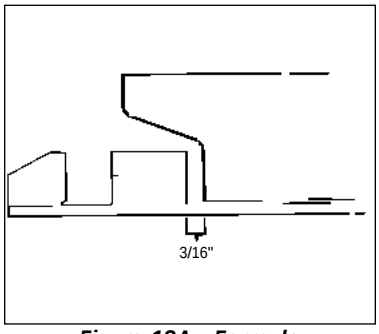


Figure 13A - Formula

Remove one print pallet and replace it with the Tri-Loc pallet. When installed, the M&R logo should be facing the operator and the registration stop blocks will be on the left side.

With the pallet still loose on the arm, manually index the Tri-Loc pallet under the first print head. Re-arm safety circuits and reset machine so that the lower carousel is locked in position with the pallet centered under the print head (Formulas = home position). Check clearance between right and left sides of front stop block and frame holder. This measurement will vary with size of Tri-Loc pallets but should be no less than 3/16". Use right to left micro to adjust if necessary. (See Fig 13A&B)

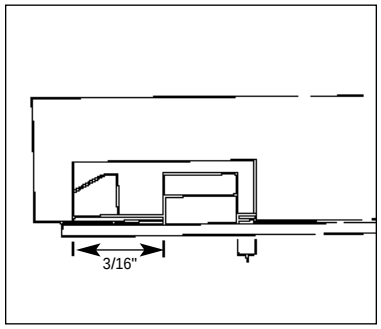


Figure 13B - Series II

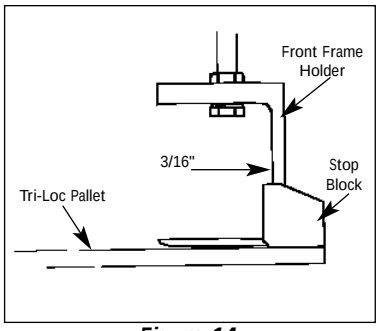


Figure 14

Having confirmed clearances, raise the carousel. Next slide the pallet so the front stop block is positioned (3/16") beyond the inside front edge of the front frame holder (See Fig. 14). Once the pallet is positioned properly, securely lock in place using cam locks.

With pallet locked in position, repeat procedure on print heads and confirm measurements. (See Fig.13 & 14)

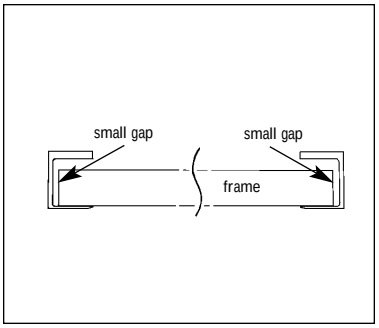


Figure 15

The end goal of positioning frame holders is to ensure they are not restricting the frame while in contact with the stop blocks. (See Fig.15)

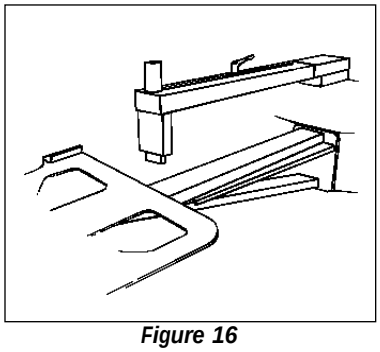


Figure 16

Having confirmed clearances you are now ready to mark the press for “Prime Position”. Series II presses simply set pallet locating arm to rear edge of Tri-Loc Pallet and record and post the measurement on the press. (See Fig. 16)

USING THE TRI-LOC:

Having marked the press with “Prime Position” setting, and adjusted the frame holders to their optimum position, you are now ready to set up a print run using the Tri-Loc pallet. Locate the print arm marked with “Prime Position” and replace print pallet with Tri-Loc registration pallet, setting back edge to mark on arm and securely fastening it in place.

Having loaded the press with screens burned in the Tri-Loc master frame (pages 33 & 34) rotate the Tri-Loc pallet under the first screen, visually confirm stop block to frame clearances and bring pallet into set up position. (See Fig. 17)

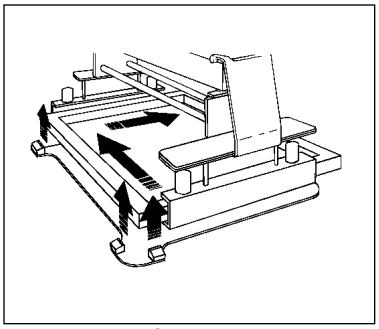


Figure 17

With pallet in position pull screen towards stop blocks. While applying light pressure hold the screen against all three stops and lock the frame in place. Visually confirm that frame holders are not interfering with the screens placement (See Fig. 18) after having confirmed clearances, lower carousel and repeat procedure on remaining screens.

NOTE: When manually indexing Tri-loc pallet, rotate the lower carousel by grabbing the pallet to either side of the registration pallet.

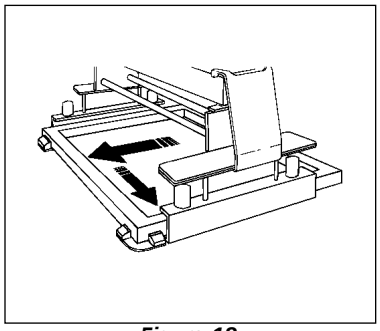


Figure 18

In house and field testing done with the Tri-Loc and other registration systems has proven machines equipped with rear micros can benefit from the addition of a rear micro lock. (See Fig. 19)

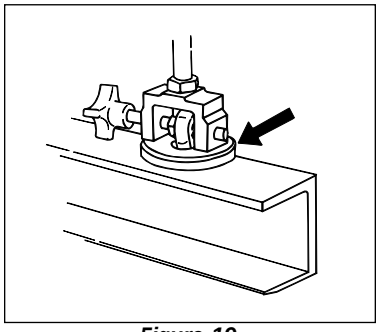


Figure 19

The rear micro lock holds the rear frame holder rigid during the initial engagement of the frame locks. This added rigidity improves accuracy regardless of what type registration system is being used. Although locked during set-up, it can be easily loosened if a micro adjustment is necessary.

M&R SCREEN PLACEMENT SYSTEM:

M&R's screen placement system has been designed to permit easy and accurate job set up. This system is also compatible for design layouts on machines of other manufacturers. Please take a few minutes to read the following procedure carefully:

1. Locate all pallets 2.75" (6.98cm) from inside of front screen holder. Care must be taken to assure that all pallets are positioned in exactly the same way for accurate location of the printed design as well as for consistent piece to piece decoration.

2. On pallet #1 mark a line at center 8", (20.3cm) the full length of the pallet. Now measure 3.25" (6.25 Standard Challengers) (24.1cm) from the front of the pallet and scribe a line the full width of the pallet. These lines become the center placement position of all designs and print work on your machine.

3. The most important step of this system follows. Have your art department standardize the location of all registration marks to the scribed lines 3.25" (6.25 Standard Challengers) (24.1cm) and 8" (20.3cm). After this has been accomplished, the press operator has only to line up the registration marks on the scribed lines for artwork placement, thereby eliminating costly time measuring position. By using this system, the normal design will be located 3.25" from the top of the pallet.

Understanding that set-up time lost counts against production, every minute saved is productive for you. This method should cut your set-up time considerably.

CAUTION: When handling printing pallets use extreme caution to prevent dropping them. Failure to do so could result in de-lamination to the pallets.

Chapter 6
General Setup & Registration

1. Before installing screens into the machine, check the recommended print order, consider the mesh count, type of ink, and area of ink deposit. Now is the time to catch problems, such as ink build-up and butt-to-butt registration blurring due to mesh count or ink type and improper screen tension. Experience is the best teacher for pre-press trouble shooting. It is better to eliminate problems before you start to print.

2. Once you determine print order, install all your screens in the machine and zero out the micros. Locate and align the “trap” screen or screen that has the main image to which all other colors register. When setting this screen, be sure to leave 3/8" (9mm) to l/2" (12mm) between the inside of the front screen holder and the frame. Leaving this gap will help you later as you align the rest of your screens because not all the screens are going to be in the exact location as the first one. This gap should give you enough room to align “MIS-EXPOSED” screens without running out of room in the frame holders.

3. Install the flood bar, squeegee and ink in your “trap” screen, making sure that everything is tight and then print it on a Pelon. Be sure you have the proper ink deposit and squeegee pressure before you register the rest of your screens to this image.

4. Rotate the table with the image around, printed in step No. 3, to remaining screens and register them by eye. You may find that registering your screen slightly above the trap print will help, due to mesh elongation during the print stroke. When locking down a registered screen, do not tighten down the rear hand knob because you are going to need to release the rear clamps later when doing any micro-registration unless you have the optional rear micro.

5. Install all squeegees and flood bars. Put a small amount of ink in the screen to start with. This way, if the color is wrong, clean-up won’t be much of a problem.

6. Walk around the press and print one screen at a time. Check the print for proper ink deposit, adjust print speed, squeegee angle and pressure accordingly.

IMPORTANT

7. Once you have your desired ink deposit on all screens, start to fine tune your registration. Remember to use the same pallet and plenty of spray tack when doing test prints for registration.

NOTE: When using the micro-registration, you must have the rear clamps released to let the screen move freely and to avoid side loading of the frame.

8. When using the micros, be sure to back the adjustment knob off after you lock down the Kipp Elisa handles. This will take any side load off of the adjuster so the next time you release the Kipp Elisa handle, the screen won't shift.

9. Once you have a good print and it's been approved, go back and add ink to your screens.

10. When finished with the job and during tear down, always clean the press and make sure to keep the carriage shafts clean and greased.

CENTRAL OFF-CONTACT LEVER:

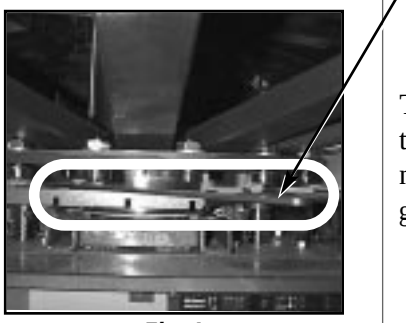


Fig. 1

The Central Off-Contact Lever is a mechanism that will allow the press operator to change the off-contact of all the screens with a simple click of a lever, thereby not having to adjust every single screen when changing to different thickness of garments. i.e. (T-shirts to sweat-shirts). (See Fig. 1)

The lever allows the press operator to change the off-contact of the machine by a maximum of 3/16" (5mm) difference form minimal off-contact to maximum off-contact. This difference takes place at 1/16" (1.5mm) increments.

The following is a step by step instruction of how to change the off -contact setting using the central-off-contact lever:

The lever has a total of four possible positions. When the lever is all the way towards the right hand side, that is the highest position of the table, therefore, giving you the least off-contact setting. (See Fig. 2)

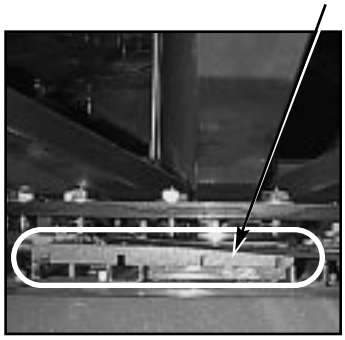


Fig. 2

When the lever is all the way towards the left hand side, which is the lowest position of the table, this gives you the most off-contact setting, which is 3/16" (5mm) added to your initial off-contact. (See Fig. 3)

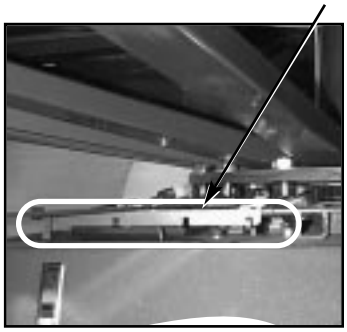


Fig. 3

In order to adjust the lever, the machine table should be in the down position. Taking your left hand and lifting up on the stringer, you can now move the lever to the desired position or off-contact you want to achieve the best performance for the thickness of garments. i.e. (T-shirts to sweat-shirts). (See Fig. 4)

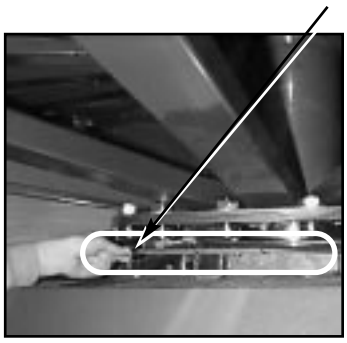


Fig. 4

After determining the proper off-contact setting lower the stringer to lock the setting in place. Now raise the table to check the off-contact between your screens and your garment. (See Fig. 5)

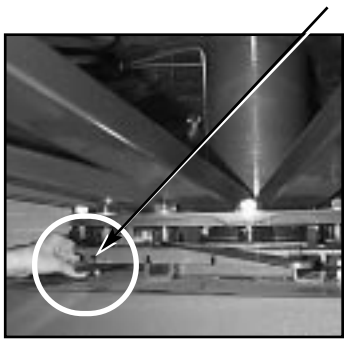


Fig. 5

NOTE: **You will have to adjust your squeegee pressure setting on each print head that you are using. However, the flood bar setting remains the same.**

This Page For Notes:

Chapter 7
Omni/Uni Flash Operation

AUTO FLASH MODE -

When using any head for Auto Flash Operation, the control panel switches for that particular head must be in the front stop position, and the head in the single position. More than one head can be activated for flash mode simply by positioning as above. Once placed in the auto flash mode, the heads will cycle in the auto flash mode and stay there as long as the indexer is running either manually or with the timer. When the indexer stops and the dwell time expires, the flash will return to a standby position (which will be away from the pallet). To return the heads to normal mode, simply flip the carriage stop switch to the rear stop position.

NOTE: All Challenger Series II systems can be retrofitted to accept the Omni Flash or Quartz Flash Unit.

*** *DISCLOSURE STATEMENT*: The following parts list may not all apply to your Omni Flash or Quartz Flash Unitp, check with the factory for further information.**

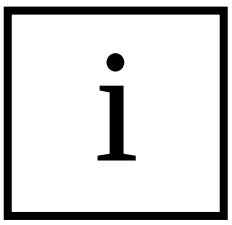
List of parts:

No. of Items:	Description of Item:
2	Cross Knob 1/2 - 20
4	Flat Washer 1/2"
2	Hex Nut 1/2" - 20
4	Flat Soc. Cap-Screw 10 - 24 x 3/8"
2	Bolt 3/8" - 16 x 1" lg.
2	Hex Nut 3/8" - 16
1	Clamp Bracket
1	Flat Mounting Bracket
1	Flash Adapter Series I to Series II
1	Flash Hanger
2	Squeegee Clamps (Manual)

MANUAL FLASH MODE -

To flash a sample manually or test print, proceed as follows:

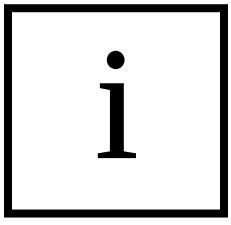
1. Position front-rear switch to “Rear” position on head with Omni Flash.
2. Position single-double switch to either “Single” or “Double” position.
3. Press the reset button and the Omni Flash will move into position over the pallet.
4. Return the single-double switch to the middle position and the front-rear switch to the front position.
5. Press any print button to raise the carousel to print position.
6. After flash time is completed, return the single-double switch to single position and press the reset button to remove the Omni Flash from over the pallet.



IMPORTANT

INSTRUCTIONS FOR OMNI/UNI FLASH INSTALLATION -

The following information describes the proper procedure for the installation of the M&R Omni/Uni Flash cure unit on M&R Challenger Series II textile screen printing systems.



IMPORTANT

NOTE: The M&R Omni/Uni Flash requires the installation of electrical power for operation. Please refer to the Manufacturer’s Rating Plate located on the side of the control panel enclosures for the proper electrical specifications to operate this equipment.
M&R Printing Equipment, Inc. encourages the use of a professionally licensed electrical contractor for the installation/connection of electrical power/service to this equipment.

1. After determining the location of the M&R Omni/Uni Flash Unit, usually print head number “2” will be in the print sequence, disengage the latch clamp located on the flip-up front screen frame holder assembly (See Fig. 1).

Fig. 1

2. Having loosened the latch clamp as described in number 1, lift the entire front screen frame holder assembly up into the fully raised, vertical position. The flip-up front screen frame holder assembly should lock into the fully raised position.(See Fig. 2) If the flip-up front screen frame holder assembly does not lock securely into position, check the lock assembly for proper operation or contact our Equipment Service Department at 1 (800) 483-8765 for further assistance .

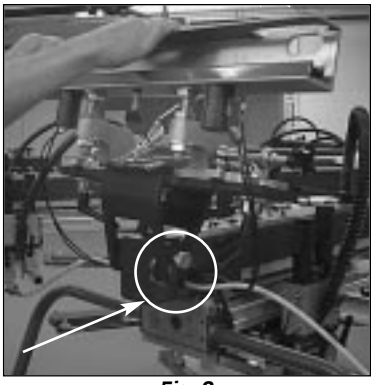


Fig. 2

WARNING: Do not operate the Omni/Uni Flash Unit if the flip-up front screen frame holder assembly does not lock securely into position (See Fig. 2).

3. Roll the M&R Omni/Uni Flash cure unit into position, in line with the selected print head (See Fig. 3).

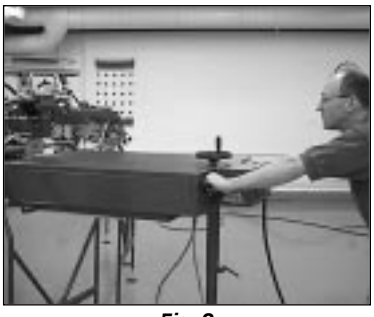


Fig. 3

Fig. 4

4. Using the round height adjustment handle located at the top rear of the M&R Omni/Uni Flash unit, adjust the height of the infra-red heating panel enclosure so that it is slightly above the front end plate. (Latch clamp assembly locking bracket.) (See Fig. 4 and 4A)

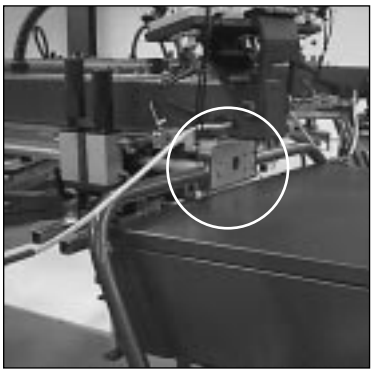


Fig. 4A

Make sure to loosen the ratchet knob, (Kipp Elisa Knob) that secures the two telescope tubes together, before making this adjustment.(See Fig. 5)

Fig. 5

5. Make sure the front mounting bar is straight (no angle) by loosening the two ratchet knobs (Kipp Elisa Knobs) and turning the mounting bar (See Fig. 6).

Fig. 6

6. Next adjust squeegee/and flood bar pressure adjustment knobs (turn clock-wise) until squeegee and flood bar is completely in the up position, (Squeegee and flood bar will not go through the chopping motion if print head is accidentally turned on as a print head, therefore, not damaging the radiant panel.) (See Fig. 7).

Fig. 7

7. Install the flash panel mounting bracket on the mounting bar and secure with the two squeegee clamps (manual) (See Fig. 8).

Fig. 8

The height of the heat panel may be adjusted by using the black plastic cross knobs, which are threaded onto the threaded support rod on top of the flash panel mounting bracket (See Fig. 9).

Fig. 9

Fig. 9A

8. To adjust the infra-red panel at the rear for proper level, adjust the black plastic cross knob located at the rear uni-strut support channel under the infra-red panel insulated cover guard (See Fig. 9A).

IMPORTANT

NOTE: Make sure all nuts are securely tightened to keep flash panel from shaking/vibrating during shuttling operation.

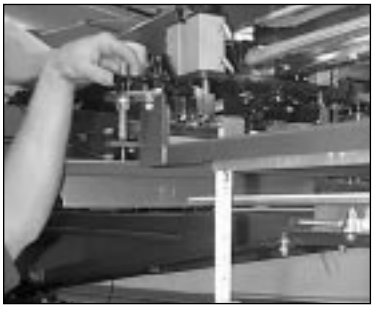


Fig. 10

9. Adjust both the front and rear threaded support rods so that the dimensions from the top of the printing pallet to the bottom of the infra-red heat panel is 3/4" (1.9cm) to 1 1/2" (3.8cm) at all four corners. Make this adjustment while the index table is in the fully raised position (See Fig. 10).

10. Set the inboard speed and the outboard speed of the infra-red heat panel by adjusting the Squeegee and Flood Bar speed controls located on the top of the print head (See Fig. 11).

Fig. 11

WARNING: Be careful not to adjust the inboard or outboard speed too fast. High speeds can lead to premature failure of the infra-red heat panel due to mechanical shock from higher inboard/outboard speed. Always adjust the inboard or outboard speed so the heat panel moves into and out of position smoothly without jerking motion or vibration.

11. Adjust the digital temperature control for optimum flash curing of garments. We suggest that you run some tests to determine the proper heat setting before beginning production. Proper cure temperature will be determined in large by the type and weight of the garment. In addition, the type of ink used also will have an effect on the proper cure temperature (Fig. 12).
100% cotton T-Shirt - Start at 800° F
100% cotton Sweat Shirt - Start at 850° F

Fig. 12

OPERATION OF THE TEMPERATURE CONTROLLER

1. Turn on the power to the Flash Cure unit.

2. Press the PV/SV key so the green L.E.D. lights beside the PV (Present Value) or SV (Set Value) symbol displays on the face of the controller.

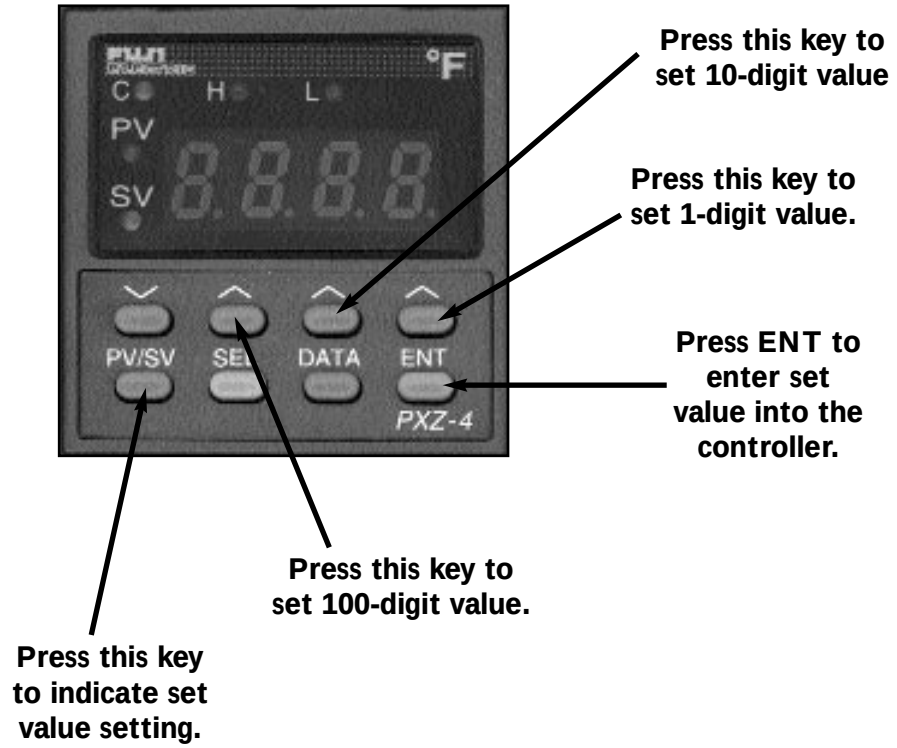
3. To set the desired process temperature, press the key under each individual numeric value.

> *Example:* To set for 250 degrees, push the 10-digit key one time. The 10-digit indication will flash. Push the 10-digit key 5 times to indicate 5. The display will read 0050. Now, press the 100-digit key. The 100-digit key will flash. Push the 100-digit key 2 times so the numeral 2 appears in the indicator. The indicator will now read 0250. Press the ENTER key. The display will stop flashing, and the set value of 250 degrees will be indicated.

4. To check the current process temperature, press the PV/SV key so the red L.E.D. lights beside the PV (Measured Value) lights up. The number displayed will be the current process temperature as measured by the thermocouple in the flash panel.

5. To lower the process temperature, press the PV/SV key so the green L.E.D. light beside the SV indicator comes on. Press the (Λ) key. Under each digit that you want to change, you will use the (V) key to decrease the number value on each digit to get the numbers to flash. Once the programmed temperature has been selected, press the enter key. The display will stop flashing. Now press the PV/SV key so the red L.E.D. light beside the PV is showing the temperature as measured by the thermocouple, in the flash panel (See Fig. 13).

Fig. 13



WARNING: The electrical power switch for the Challenger II must *NOT* be turned "OFF" before the flash cure panels have cooled down to 99° degrees F or lower.

This Page For Notes:

Chapter 8
Main Control Panel

The Challenger Series II is a blend of exciting technology that incorporates microprocessor controls and a unique servo driven index system that offer the ultimate in maximum production efficiency. The following is a description of a single cycle operation on your new press, followed by a description of all control functions.

CYCLE SEQUENCE -

Position the table so that the Index On Proximity Switch, located on the base of the machine, is on “Start Position.” Release the Emergency Stop Button and press on the green reset button. The index fork (clevis) will move in and engage one of the index cam followers located on the bottom of the index table. Turn one head switch on by placing the toggle switch to the single print position. Depress the mode switch to manual and release.
The press will perform the following functions:

- The index servo drive assembly will rotate the carousel until the next cam follower again activates the index on proximity switch.
- Simultaneously, the flood stroke of the print head is started and completed.
- Next, the carousel is lifted into the print position and activates the Table Proximity Switch; this starts the print stroke. At the same time, the index servo drive is returning to the start or standby position for the next cycle.
- At the completion of the print stroke, the carousel lowers with the cam follower settling into the index fork (clevis) ready for the next cycle.

The combination of full microprocessor controls—and the use of proximity switches to indicate the position of all components at any time—permits our engineers to provide you with a “plain language” self-diagnostic system unavailable on any semi-automatic textile press.

CONTROL PANEL SWITCHES AND FUNCTIONS -

The Main Control console for the M&R Challenger Series II contains all controls for operation of the entire system. The individual controls and their functions are described as follows.
* Main “ON/OFF” switch location. (See figure 1)

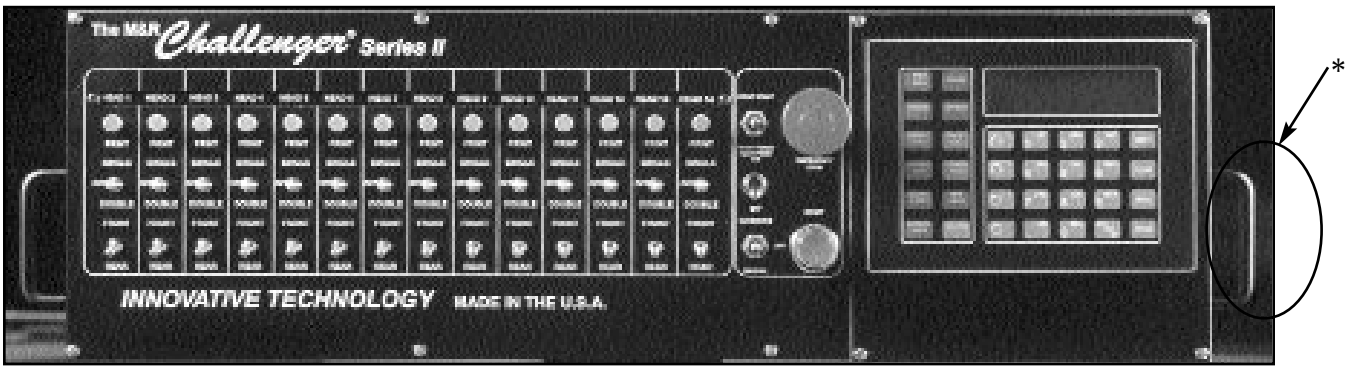


Fig. 1

Fig. 2

To the extreme left of the Main Control panel, the individual Print Head control switches and push buttons are located. These include “Independent Print,” “Single/Double” print stroke and “Front/Rear” print carriage stop.

- ***Independent Print:*** ***(Figure 2)***

  This push button permits manual cycling of a selected print head. Please note that the “Single/Double” toggle switch for the selected print head must be set to either “Single” or “Double” position in order for the print head to operate. When the “Single/Double” toggle switch is selected to “Single,” the print head will make one complete flood/print cycle. When the “Single/Double” toggle switch is selected for “Double,” the selected print head will make two (2) complete flood/print cycles.

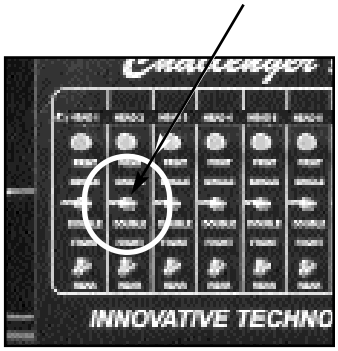


Fig. 3

The “Independent Print” push button is also used during screen frame setup to check registration etc. as follows:

During screen frame installation and setup, place the selected “Single/Double” toggle switches to the middle or “OFF” position. Then press the “Print” push button. The index carousel will raise so that screen registration or placement may be checked. To lower the index carousel, press the green “Reset” push button located at the right of the control panel under the “Emergency Stop” push button.

- ***Single/Double Toggle Switch:*** ***(Figure 3)***

  The “Single/Double” toggle switch commands the selected print head to print either one complete flood/print cycle or two (2) flood/print cycles. Generally, this switch is used when it is desired to deposit a thicker coating of ink, 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 “Double” print mode using these toggle switches.

IMPORTANT

NOTE: When this toggle switch is in the middle, or “OFF” position, the particular print head will not operate.

A small L.E.D. located in the tip of the toggle handle will illuminate confirming activation. When in the single position the L.E.D. will be **GREEN**. When in the double position the L.E.D. will be **ORANGE**.

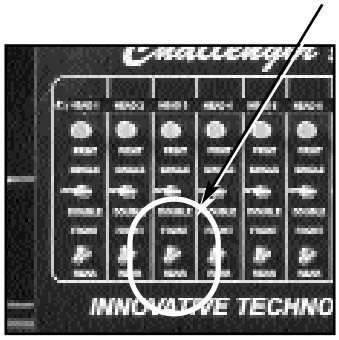


Fig. 4

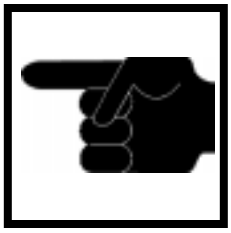
- ***Front/Rear Toggle Switch:*** ***(Figure 4)***

This toggle switch permits the system operator to command the selected print head to stop in either the “Front” or “Rear” position. Generally, 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 toggle switch is placed in the “Front” position, the print carriage will stop at the front (outside) of the screen frame with the image area flooded with ink. When placed in the “Rear” position, the print carriage will stop at the rear (inside) of the print head, and the image area will be clear of ink. A small, red L.E.D. located in the tip of the toggle handle will illuminate confirming that the switch is set for front stop.


Fig. 5

- ***Print Start/Print Finish Toggle Switch:*** ***(Figure 5)***

This toggle 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 heads. Placing this toggle switch in the “Print Start” position will automatically command each print head that is selected to “ON” to print sequentially at the start of a print run.



***EXAMPLE*:** As the operator loads a garment, the first print head will print. Then the second print head, and so on through each print head selected in the cycle, thus eliminating the need for the operator to stop and turn on each print head individually. When placed in the “Print Finish” position, the print heads will automatically and sequentially shut down after printing the last shirt loaded. Again, this eliminates the need for the press operator to turn “OFF” each individually selected print head in the print run.

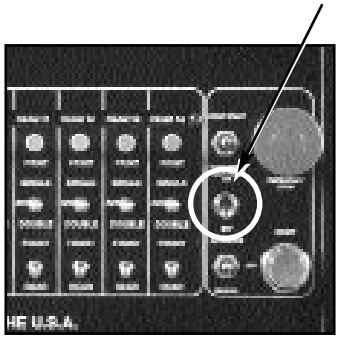


Fig. 6

- ***Test Print Toggle Switch:*** ***(Figure 6)***

This toggle switch is designed to aid the system operator when it

is desired to print only one garment to check for registration or image quality. When placed in the "ON" position, the system will automatically and sequentially print each selected print head one print cycle, then shut down each print head at the end of the print cycle. The result is one printed garment at the end of the print sequence without the need for the system operator to turn "ON" and "OFF" the print heads individually.

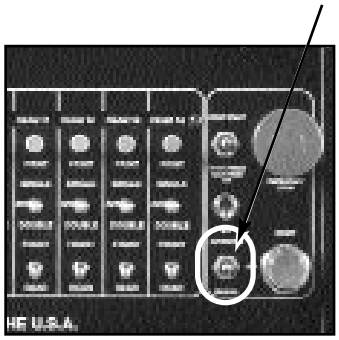


Fig. 7

- ***Operation Mode Toggle Switch:*** ***(Manual/Automatic toggle switch) (Figure 7)***

This toggle switch has three positions: "Automatic" at the top position; "Stop" 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 toggle switch down to "Manual." You will note that the toggle switch does not "latch" in this position, but returns via a spring-loaded action to the middle or "OFF" position when released. The index system will cycle one time, along with any selected print heads that are selected to "ON." Placing this toggle 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 L.C.D. operator interface control panel to the extreme right of the Main Control panel. Instructions on how to adjust the index dwell time are available on page 63 of this manual.

WARNING

NOTE: **When the operation mode toggle switch is placed in the middle or "OFF" position, the index system will not operate.**

Fig. 8

- ***Emergency Stop Push Button:*** ***(Figure 8)***

This large, red mushroom-shaped *push button is designed to stop the system operation only in an emergency situation.* **DO NOT USE THIS PUSH BUTTON TO STOP SYSTEM OPERATION UNDER NORMAL OPERATING CONDITIONS.**

To stop the system in an Emergency situation, press the red mushroom-shaped button "In." This will result in all print heads shutting down, the retraction of the index fork and shut down of all system operation. Once pushed "In," the

"Emergency" push button will remain locked in this position to prevent any further operation of the system. To start system operation once again, pull the red mushroom-shaped "Emergency" Stop push button "Out," then press the green "Reset" push button.

WARNING: Do not attempt to restart the system until you have identified and resolved the reason for the emergency stop event. Test all safety devices before resuming operation!

- ***Reset Push Button:*** ***(Figure 9)***

The green-colored "Reset" push button is provided to reset the control system logic in the event of a Emergency or Safety shut down of the system. This push button also is used to lower the index carousel during set-up of screen frames etc. (Refer to "Independent Print" push button information on page 54).

WARNING: In the event of an emergency or safety system shut down, do not press the "Reset" button until you have identified and resolved the reason for the emergency or safety shut down.

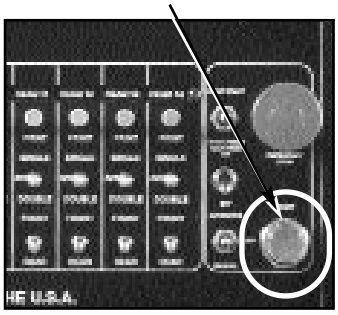


Fig. 9

INDIVIDUAL PRINT HEAD CONTROLS -

Each of the print heads on the M&R Challenger Series II system includes individual controls for adjustment of flood stroke speed, print stroke speed, independent print start, On/OFF switches for pneumatic screen frame clamps and squeegee/flood bar clamps, if ordered, and Reset push button (See Fig. 10).

The following describes the function for each of these controls:

1. ***Squeegee//Flood Bar Pneumatic Lock Clamps (Optional):***

These toggle switches are used to lock the squeegee and flood bar pneumatically to their respective mounting bars. Placing the switch in the "ON" position will lock the squeegee or flood bar to the mounting bar, while placing the switch in the "OFF" position will release the squeegee or flood bar from the mounting bar.

Fig. 10

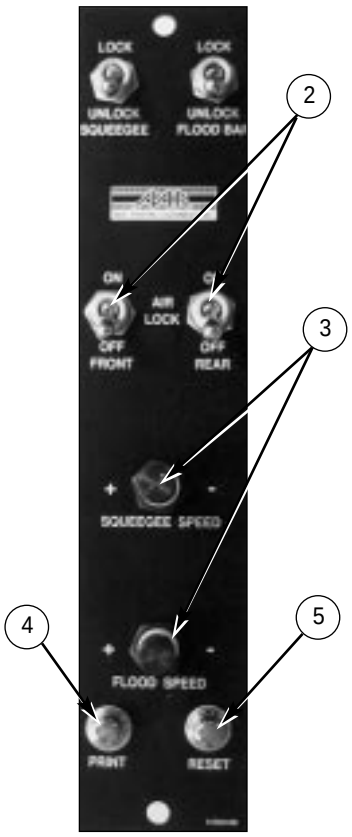


Fig. 11

2. ***Pneumatic Screen Fame Locks:*** ***(Figure 11)***

(Pneumatic Screen Clamps): These toggle switches are used to pneumatically lock the screen frame into the print head in the front and the rear. To lock the screen frame, simply place the toggle switch in the "ON" position. When the toggle switch is in the "OFF" position, the pneumatic clamps will release and the screen can then be removed from the print head.

3. ***Flood/Squeegee Speed:***

The Flood/Squeegee speed adjustments located in the lower middle section of the print head control panel provide a means of controlling flood and print stroke speed. To adjust the speed, turn the control knob clockwise to decrease speed, and counterclockwise to increase speed.

4. ***Independent Print Push Button:***

As described under the Main Control Panel section previously, this push button is used to cycle the individual print head manually. (See Page 54)

The "Print" push button also is used during screen frame set-up to check for proper screen placement during registration procedures. To operate, place the "Single/Double" toggle switch for the particular print head in the middle or "OFF" position, then press the "Print" push button on the print head. The index carousel will raise so screen registration or placement may be checked. To lower the index carousel, press the "Reset" button located to the right of the "Print" push button.

IMPORTANT

NOTE: The "Single/Double" toggle switch on the Main Control panel must be selected for either "Single" or "Double" in order for the print head to operate.

5. ***Reset Push Button:***

As described in the Independent Push Button section, the "Reset" push button is used during setup procedures to lower the index carousel. The "Reset" push button also acts in the same manner as the green "Reset" push button on the Main Control Panel. (See Page 57)

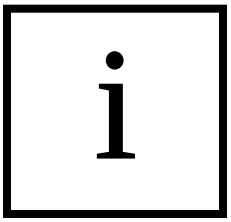
YELLOW SAFETY CORDS - *(Figure 12 and 13)*

Yellow Safety Cords are provided to restrict access into the indexer operating area when the equipment is in operation. The Yellow Safety Cords are located between all print heads with the exception of the last and first print heads, the load and unload station. The Yellow Safety Cords are provided with jack connections at the middle to facilitate entry into the indexer operating area during screen setup or preventive maintenance procedures. To gain access into the indexer operating area, grasp each of the jack connections firmly and gently pull apart.

Fig. 12 - (Proper way)

Fig. 13 - (Improper way)

IMPORTANT: Do not pull on the yellow safety cord itself. This practice will result in a loose electrical connection internal to the jack and equipment operation will not be possible.



IMPORTANT

This Page For Notes:

Chapter 6a
Optional AC Print Head Operation

AC PRINT HEADS-

The M&R Challenger Series II is offered with optional AC drive print stations. The optional AC drive print stations feature precise and repeatable control of both flood and print stroke speeds, produces “glass smooth” flood and squeegee strokes and virtually eliminates print carriage “chatter” and vibration through the use of a dependable timing belt drive system. The M&R Challenger Series II AC drive print stations are simple to operate and maintain. The following information will describe the operation, set-up and preventive maintenance procedures.

Operation -

The M&R Challenger Series II AC drive print heads include controls for the adjustment of both flood and squeegee stroke speeds, independent print start push button, reset push button, ON/OFF toggle switches for activation of the front and rear pneumatic screen frame holder clamps and ON/OFF toggle switches for activation of the pneumatic flood bar and squeegee mounting clamps. All of these controls operate in the same manner as described on pages 57 through 58 of this Operator’s Manual. The exception being the flood and squeegee speed adjustments which are adjusted by means of two potentiometers in place of the flow control adjustment knobs used on the conventional print station control panel. (See Fig. 1 at right)

Fig. 1

Adjusting the flood bar or squeegee speed control in a clockwise direction will result in a faster stroke speed. Adjusting the control in a counterclockwise direction will decrease the flood or squeegee speed. While adjusting either the flood bar or squeegee stroke speed, observe the L.E.D. digital readout on the power drive inverter located at the rear right hand side of the print head. This L.E.D. indicator provides a visual reference of flood/squeegee speed and is invaluable when you need to set precise flood or squeegee speeds. The L.E.D. display (See Fig. 1a) automatically changes to display either flood stroke or squeegee speed as the print station operates through the flood/print cycle.

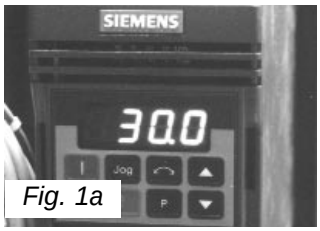


Fig. 1a

Set-Up -

To facilitate the installation of screen frames, and/or flash cure units, the M&R AC drive print stations feature “Flip Up Front Frame Holder” assemblies which conveniently pivot up and out of the way. To move the front frame holder assembly to the “load” position, simply unlatch the front frame holder lock handle at the front middle of the print head. The locking handle is identified by the red plastic grip on the locking handle. To unlatch, push the handle lever “DOWN”. Be sure that the “U” shaped locking bracket is clear of the latch, then move the front frame holder assembly up 180 degrees to the lock position. A spring loaded locking pin will automatically secure the front frame holder assembly in place during screen frame or flash unit installation. You may now load the screen frame into the rear screen frame holder assembly. (See Fig. 2)

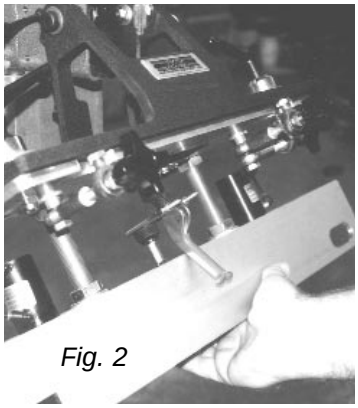


Fig. 2

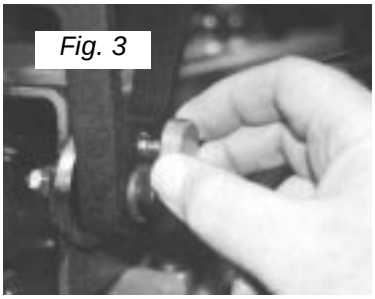


Fig. 3

Now pull “OUT” the small knurled knob located at the upper right side of the “Flip Up Front Screen Frame Holder” assembly. This will release the locking pin mechanism, allowing the front screen frame holder assembly to swing down into normal print position. Locate the “U” shaped locking bracket into the lock mechanism and pull up on the red locking lever to secure the front frame holder assembly back in place. (See Fig. 3)

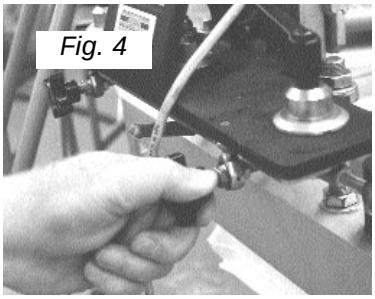


Fig. 4

Before securing the screen frame in the frame holders, be sure to set the micro registration adjustments for “Zero” or middle range. (See Fig. 4) In addition, be sure to allow 3/8” (9mm) to 1/2” (12mm) gap between the inside of the front screen frame holder and the screen frame. This clearance will prove helpful later in the set-up process as you align screen frames which may have a slightly mis-aligned image. When the screen frames are properly loaded into the front and rear screen frame holders, lock the screen frame into position using the pneumatic screen frame clamp toggle switches (Air Locks) located on the small control panel on top of the print station assembly. Install all remaining screen frames as outlined above.

You are now ready to install the flood bar and the squeegee. The flood bar is installed on the rear (towards the center of the press) print carriage mounting bar. The squeegee is installed on the front (towards the outside diameter of the press). NOTE: On presses ordered with outside to inside diameter print stroke, the flood bar and squeegee mount in an opposite manner, squeegee at the rear (towards the center of the indexer) and flood bar in the front (towards the outside diameter of the press).

Align the notches on the flood bar and squeegee with the pneumatic squeegee/flood bar clamps, or with the manual mounting clamps provided. Raise the squeegee/flood bar into the clamp assembly and up against the chrome plated mounting bar and slide it either to the right or the left to center it on the mounting bar. Once centered, lock the squeegee/flood bar in place using the pneumatic clamps or manual clamps as provided.

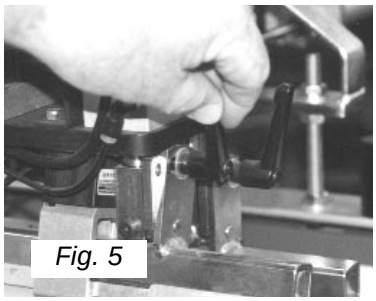


Fig. 5

Both the flood bar and the squeegee are provided with an angle adjustment. If the angle is set to a greater degree, the squeegee will deposit more ink during the print stroke. Decreasing the angle will result is less ink deposit. The same holds true for the angle of the flood bar as well. Set the angle for the squeegee and flood bar to middle range (an approx. 30-40 degree angle). (See Fig. 5)

Adjust the flood bar pressure by use of the large black knurled knobs at the top of the print carriage assembly. The flood bar pressure should be adjusted so that there is only a slight pressure felt on the bottom of the screen mesh. To increase the flood bar pressure, turn the black knurled knobs counterclockwise. To decrease the pressure, turn the black knurled knobs clockwise. With the flood bar installed, you are now ready to install the squeegees.

Squeegee installation is performed in the same manner as described previously for the flood bar, raise, align and lock. Adjustment of the squeegee pressure is as follows:
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 small reference scale on the air cylinder. To increase the squeegee pressure, turn the black knurled knobs counterclockwise. To decrease the pressure, turn the black knurled knobs clockwise. (See Figure 6)

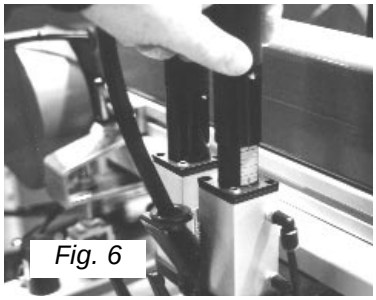


Fig. 6

The M&R AC print stations feature solid state proximity sensors to facilitate the setting of print stroke length from the front and the rear of the screen. To adjust the print stroke length, simply grasp the sensor mounting bracket, and gently slide the proximity sensor to the desired position. Adjust the sensor so that the flood bar and squeegee just clear the image area of the screen. (See Fig. 7)

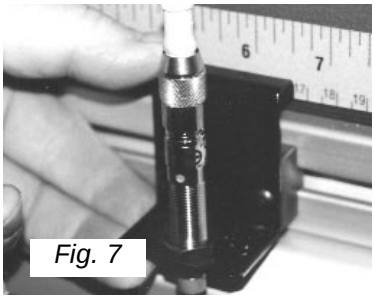


Fig. 7

IMPORTANT!

NOTE: DO NOT ADJUST THE SENSOR WHILE THE PRINT HEAD IS OPERATING!

The squeegee and flood bar speeds may be independently adjusted to suit a wide range of print applications or requirements. The speed adjustment knobs are located on the top print station control panel. Simply adjust the control knob for either the flood bar speed, or the squeegee speed, clockwise to increase the speed, or counterclockwise to decrease the speed. A convenient L.E.D. digital speed indicator is located on the power inverter assembly at the right rear of the print station chassis. Use this indicator as a handy visual reference whenever the need for reproducing precise flood/print stroke speeds is required. (See Fig. 8)

Fig. 8

The AC drive print stations include an adjustment for setting of the off-contact distance. Off-contact is defined as the dimension between the bottom of the screen fabric and the top surface of the substrate. Generally when printing textiles, the off-contact distance is set for 1/16". The adjustment may be set by use of the threaded shafts with lock nuts located on the front and rear screen frame holder assembly. Using a 1-1/8" open end wrench, loosen the lower locking nut on the threaded shaft. Turning the top locking nut counterclockwise will decrease the off-contact distance, while turning the top locking nut clockwise will increase the off-contact distance. Remember to tighten the bottom and top locking nuts when you are satisfied with the off-contact distance. Adjustment of the rear screen holder off-contact will require the use of a 3/4" open end wrench (See Fig. 9)

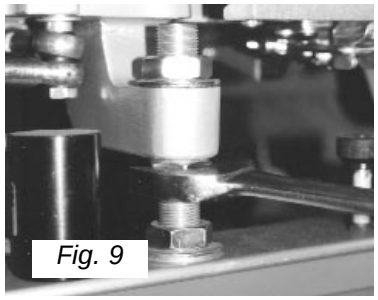


Fig. 9

Preventive Maintenance Procedures -
The benefits of a regularly scheduled preventive maintenance program can never be over-estimated. Equipment which is properly maintained operates more efficiently, extends service life and reduces operating costs.

The following information is provided for the preventive maintenance of your M&R Challenger Series II AC drive print stations.

Every Day -
1. Check and clean away as needed any lint, ink or spray tac which may have accumulated on the print carriage or screen frame holder assemblies.

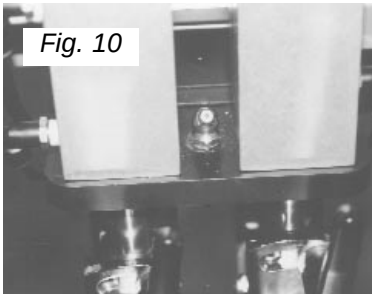


Fig. 10

Every Week -
1. Using the Zerk grease fitting provided, lubricate the print carriage linear bearing using white lithium grease (M&R Part No. 7018017). (See Fig. 10)

2. Clean away any lint or dirt which may have accumulated on the drive motor ventilation cover, motor housing and heat disapating fins.

Every Month -
1. Using a small paint brush, apply white lithium grease (M&R Part No. 7018017) to the threaded shafts on the micro-register adjustment knobs.

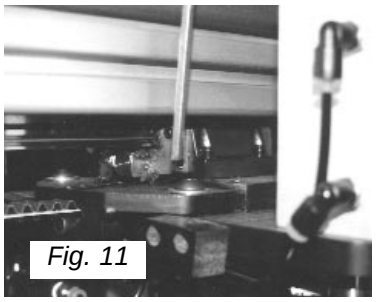


Fig. 11

Every Six Months -
1. Check and adjust as required the timing belt drive tension. To adjust timing belt tension, proceed as follows.
a. Using a 1/8” allen wrench, remove both left and right dust cover shields by loosening the three 10-24 x 3/8” buttonhead allen screws.
b. Using a 3/16” allen wrench, loosen the two 5/16” - 18 x 3/4” button head allen screws on the tension bracket assembly. (See Fig. 11)
c. Adjust the 1/4” -20 x 1-1/4” allen head cap screw in clockwise direction to increase the tension on the timing belt. Generally, this will only be a slight adjustment, perhaps 1/4 to 1/2 turn of the screw. (See Fig. 12)
d. Re-tighten the 5/16” - 18 x 3/4” button head allen screws.
e. Re-install both the right and left dust covers using the 10-24 x 3/8” button head allen screws.

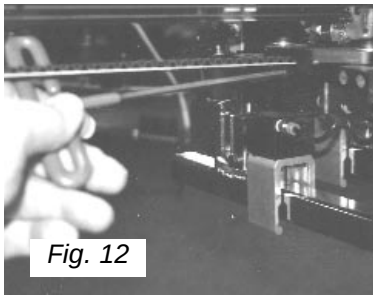


Fig. 12

Chapter 9
Operator Interface Control

The M&R Challenger Series II features a new easy-to-use operator interface with "Plain language" programming. Control parameters such as Counters, Dwell Time, Index Speed and Index Rotation are just a few of the control functions which may be accessed, adjusted or monitored. The operator interface also includes a complete self-diagnostic program which monitors and displays the operational integrity of all system controls and functions. This self diagnostic program makes trouble shooting, as well as monitoring of system functions easy and immediately available to the system operator. (See fig. 1A, 1B)

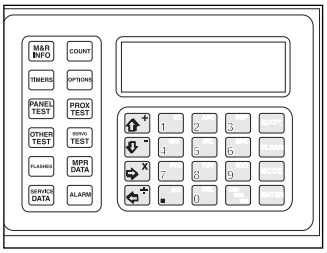


Fig. 1A (Without Revolver)

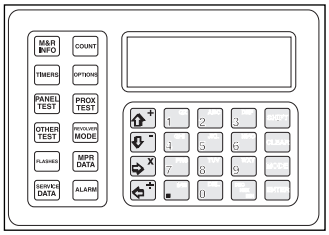


Fig. 1B (With Revolver)

The following information is provided to help guide you through the various menus and sub-menus which are used to operate the system. Should you have any questions regarding the operation or use of the operator interface, do not hesitate to call our Customer Service, or Equipment Service departments toll free at 1 (800) 483-8765. During weekends or holidays, you may reach our Technical Support group at our 24 hour Emergency Service Hotline at 1 (630) 462-4715.

The operator interface control panel is divided into four basic areas. Running vertically along the left side of the of the Operator Interface Control Panel are 12 function keys. Starting from the top down, and running left to right, these are labeled M&R Info, Count, Timers, Options, Panel Test, Prox Test, Other Test, Revolver Mode, Flashes, MPR Data, Service Data and Alarm. Located to the right of the function keys and just below the LCD display window are the Arrow Up/Down and Left/Right keys.

To the right of the Arrow keys you will find the numerical keys which are used to program values into the control system. To the right of the numerical keys are the programming keys, Shift, Clear, Mode and Enter. Each of these controls will be described in the following text. These keys are used to change control values and parameters in primary and sub-menu selections.

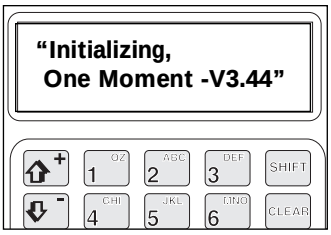


Fig. 2

Initial Power Up -

Upon initial power up of the system, you will see displayed in the L.C.D. window "**Initializing, One Moment - V3.44**". Displayed in the L.C.D. Window. (See fig. 2)

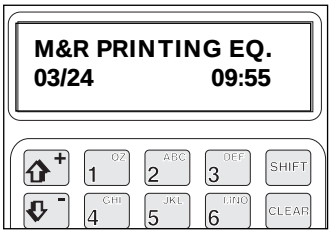


Fig. 3

By pressing the M&R info button the next display to appear will be "**M&R Printing Eq.**" With the date and time displayed immediately below. Both the date and time are expressed numerically. Example: March 25th will be displayed as "**03/25**", while the time will be displayed as **09:55**, or 9:55 in the morning. (See fig. 3)

To change the displayed time and date, you proceed as follows:

Press both "SHIFT" and "ENTER" at the same time. The display will read "**Adjust Display**" and "**Set Clock**". You may adjust the contrast of the L.C.D. display by pressing the "ENTER" key when the flashing arrow is to the left of "Adjust Display" in the L.C.D. window. To increase or decrease the contrast, press the arrow up or arrow down keys, then press "ENTER".

To adjust the date and time, press the "SHIFT" and "ENTER" keys once again. Now press the arrow down key so that the flashing arrow is placed to the left of "**Set Clock**", then press "ENTER". The display will read the current date and time as programmed into the control memory. To change the date press the "RIGHT ARROW" key. This action will cause the month to flash. Press the "ARROW UP/DOWN" keys until the desired month is displayed. Using the "ARROW RIGHT" key, select the day of the month. You will know that the day of the month is selected when the display starts to flash. Now, using the "ARROW UP/DOWN" keys, as described previously for month, select the desired numerical day of the month. To select the current year, press the "ARROW RIGHT" key to select the year, then as before, use the "ARROW UP/DOWN" keys to select the desired year.

To set the time, use the "ARROW RIGHT" and "ARROW UP/DOWN" keys as described for the date above, and make your selections for hour and minute. The seconds display will automatically count the seconds of time. Now press the "ENTER" key. Your selections for Date and Time are now stored in the PLC memory.

M&R Information -

Located in the upper left corner of the L.C.D. control panel is the "M&R INFO" key. Press this key to view information about M&R, such as street address, phone and fax numbers, and our 24 hour Emergency Hotline number for technical service and support.

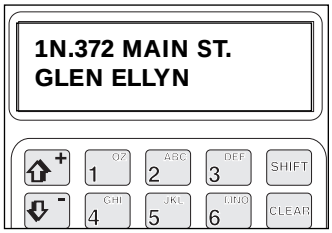


Fig. 4

To view this information, press "M&R INFO". The display will read "**M&R Printing Eq.**" At the top with the date and time displayed immediately below. Press the "ARROW DOWN" key to view our address, phone, fax and emergency Hotline numbers. Continuing to press the "ARROW DOWN" key will bring you into the next menu, which is "COUNT", or you can press the "COUNT" key located to the right of the "M&R INFO" key to access the "COUNT" menu item. (See fig. 4)

Count -

The “COUNT” menu item contains three sub-menu items, “Daily Counter”, Total Counter and press Speed in dozens per hour. Pressing the “COUNT” key will display “**Daily Cntr**” and “**Total Cntr**” at the top of the L.C.D. window. (See fig. 5)

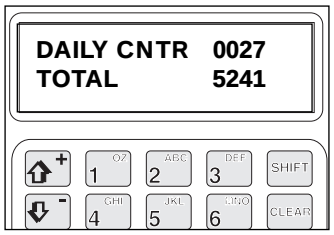


Fig. 5

The “Daily Cntr” indicates the total number of index cycles for a given print job or production shift. The “Daily” counter may be re-set using the arrow keys, the numerical keys and the “ENTER” key as follows.
First, press the “RIGHT ARROW” key. The display for “Daily Cntr” will start to flash, confirming its selection. To reset the “Daily Cntr”, press the “0” key on the numerical keypad, then press “ENTER”. The display for “daily Cntr” will reset to “0”.

The “Total” counter displays the total number of press cycles beginning from the initial date of installation of the equipment in your production facility. The numerical value for the “Total” counter cannot be changed or adjusted in any way. It merely serves as a reference for the system’s operational history.

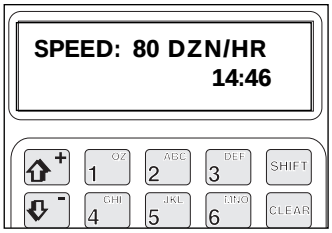


Fig. 6

To access “Speed” use the “ARROW DOWN” key to scroll down to “Speed” in the L.C.D. window. The current speed will be expressed in dozens per hour at the extreme right of the L.C.D. display window. The speed is provided as an indication of production speed, and may not be reset. When you resume operation the current speed in dozens per hour will automatically be displayed.(See fig. 6)

Timers -

The “TIMERS” menu contains three sub-menus which are, “Index”, “Flash” and Qrtz”. You may access each of these sub-menu areas by using the “ARROW DOWN” key to scroll down through the L.C.D. display. (See fig. 7)

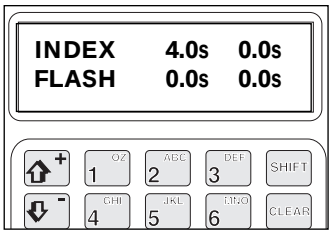


Fig. 7

Index Dwell Time: is used to control the dwell time when operating the system in the automatic mode. Dwell time is defined as the time during automatic operation in which the system operator may load or unload garments. The dwell time is adjustable and may be re-adjusted to suit the system operator’s requirements as follows. Press the “ARROW RIGHT” key. The numerical value for dwell time to the right of “Index” will start to flash, confirming its selection. Now, simply press the numerical keys to select the desired amount of Index Dwell Time. Please note, the maximum amount of Index Dwell Time is 20 seconds, while the minimum is zero seconds. Now, press the “ENTER” key. Your selection is now programmed into the PLC memory.

Flash Dwell Time: is used to control the Dwell time of the table in the up position when it comes to flashing garments with a radiant panel unit (Omni/Uni Flash). To reset the "Flash" dwell time, continue pressing the "ARROW RIGHT" key. The numerical value for "Flash" will start to flash confirming its selection. Now, as with "Index" time above, press the desired amount of flash dwell time. As with "Index" dwell time above, the maximum dwell time allowed is 20 seconds. Now press the "ENTER" key and your selection will be saved in the PLC memory.

Quartz Dwell Time: is used to control the Dwell time of the table in the up position when it comes to flashing garments with a Quartz unit. To adjust the "Qrtz" dwell time, you proceed in the same manner as previously described for Index Dwell Time and Flash Dwell Time above, press the "RIGHT ARROW" key until the numerical value for "Qrtz" time starts to flash, confirming its selection. Now enter the numerical value using the number keys, maximum 15.0 seconds, and press the "ENTER" key. Your selection is now programmed into the PLC memory. (See fig. 8)

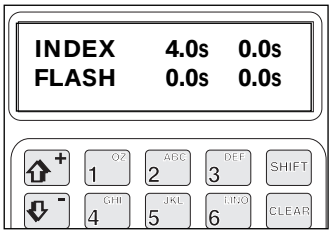


Fig. 8

Options -

The "OPTIONS" menu selection contains three sub-menu items, "Pallet Sizes", "Multi Index" and "Rotation".

The M&R Challenger Series II utilizes a sophisticated Servo Index Drive system which can be precisely tuned for optimum performance under a wide range of operating conditions.

The "Pallet Sizes": provides the system operator with a unique adjustment which contributes to increased Servo Index Drive performance by allowing the system to be programmed for particular pallet sizes and corresponding weights or mechanical load. (See fig. 9)

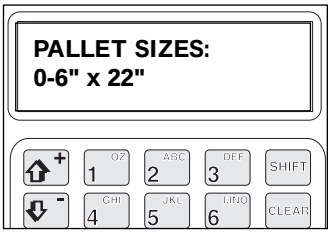


Fig. 9

To access the "Pallet Sizes" menu, press the "ARROW DOWN" key until the "**Pallet Sizes**" menu is displayed. Scrolling down through the menu will display the five various pallet sizes, "0-6"x22" **HC**, 1- 16"x22" **HC**, 2- 16"x22" **AL**, 3- 22"x24" **AL** and 4- 24"x36" **AL**. The construction characteristics of each pallet size is also displayed as either **HC** for Honeycomb construction, or **AL** for Aluminum construction.

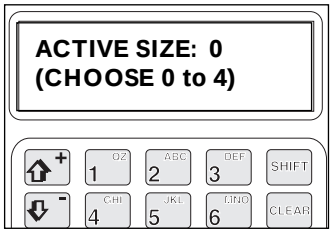


Fig. 10

To select one of the five available pallet sizes, press the "ARROW DOWN" key until "**Active Size:**" appears in the L.C.D. display window. Now press the "ARROW RIGHT" key. The numerical value for ***"Active Size"*** will start to flash, confirming its selection. Now press the corresponding number key to select a pallet size, for example, pressing the number 3 will select the 22"x24" **AL** pallet size. Then press the "ENTER" key. Your pallet size selection is now saved in the PLC memory. (See fig. 10)

Multi Index: Will allow the press operator to run the machine either in the single or double index mode. (See fig. 11)

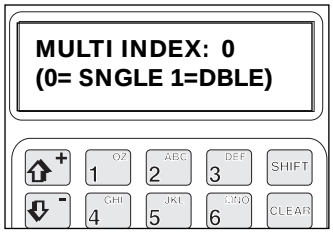


Fig. 11

The next sub-menu item is "Multi Index". To select "Multi Index" press the "ARROW DOWN" key until "**Multi Index**" is displayed in the L.C.D. window. (See fig. 11)

You will note that immediately below "Multi Index" is displayed "**0=Single 1=Double**". To select single Index, press the "ARROW RIGHT" key until the numerical value to the right of "Multi Index" starts to flash. Now press the "0" number key, then press the "ENTER" key. The "0" appears to the right of "Multi Index" confirming your selection. If double index operation is desired, press the "1" key, then press "ENTER".

Rotation: Will allow the press operator to determine the indexer rotation of the machine, it can be either ccw or cw. (See fig. 12)

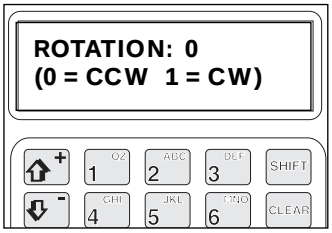


Fig. 12

The next sub-menu is "Rotation". Press the "ARROW DOWN" key until "**Rotation**" appears in the L.C.D. display window. This menu item allows the system operator to command the indexer to run in either the clockwise or counterclockwise direction of travel. To select the desired direction of rotation, press the "ARROW RIGHT" key until the number indicator to the right of "Rotation" begins to flash. Now press either "0" for Counterclockwise rotation or "1" for clockwise rotation, then press the "ENTER" key. Your selection for index rotation is now saved in the PLC memory.

Panel Test -

The "Panel Test" menu contains 10 sub-menu items. Emergency Stop; Reset; Manual Auto; Print Start; Print Finish; Test Print; Head 1 thru 14, Print; Head 1 thru 14, Single/Double Print and Heads 1 thru 14, Front/Rear Stop. This menu item gives the press operator a visual indication of the condition of each switch located on the Main Control panel by simply scrolling down through the listings using the "ARROW DOWN" key. If the numeral "1" appears to the right of the particular switch it means the switch is set for the "ON" position.

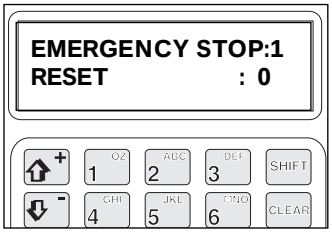


Fig. 13

The exception to this is the Emergency Stop Push button. If a "**1**" appears next to Emergency Stop, this indicates that the **Emergency Stop is "OFF"**. This feature is very useful for checking the continuity (electrical contact integrity) of all control panel switches. (See fig. 13)

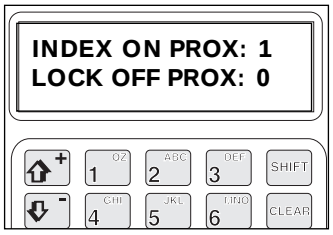


Fig. 14

Prox Test -

The “Prox Test” menu contains five sub-menu items, “Index On Prox”, “Lock Off Prox”, “DBL Index Prox”, “Lift Up Prox” and “Heads 1 thru 14 Front/Rear Prox”. This menu item is used in the same manner as the ”Panel Test” menu item described previously. (See fig. 14) The system operator may use this menu to obtain a visual indication of the continuity of each of the switches located on the print heads and indexer base. The display reads the same as the “Panel Test” menu above in that the numeral “1” to the right of a particular switch indicates that the switch is currently “ON”. When a “0” appears next to a particular switch, it indicates that the switch is currently “OFF”. Use the “ARROW DOWN” key to scroll down through the listing to check each switch.

Again, this feature is an excellent diagnostic tool for trouble shooting individual electrical components as well as system operation.

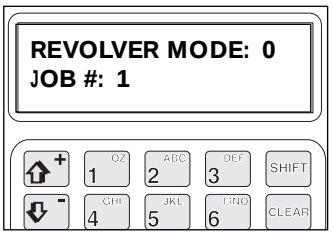


Fig. 15

Revolver Mode -

Press the “Revolver Mode” key located to the right of the “Others Test” key on the L.C.D. control panel. The L.C.D. display will read “**Revolver mode: 0**” with “Job #:1” directly below. (See fig. 15)

Be advised that when you order the “Revolver” sequencing program option, the L.C.D. control keypad includes a different layout. Specifically, in order to include a key for the “Revolver” program, we have eliminated the “Servo Test” key and combined the “Servo Test” menu item within the “Others Test” menu item, described below. The “Servo Test” menu item is the first menu item displayed when you select “Others Test”.

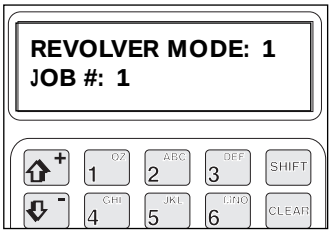


Fig. 16

To select the Revolver mode of operation, press the “Right Arrow” key until the “0” starts to flash. Then press “1” and then press “Enter”. The display will change to “**Revolver Mode:1**”. (See fig. 16)

The M&R Challenger Series II can store up to 3 different Revolver programs in the PLC memory. To select an earlier saved program, press the “Left Arrow” key. When the job number starts to flash, enter the desired job number from 1 to 3 and press the “Enter” key. Please note, you cannot change the program while the press is operating.

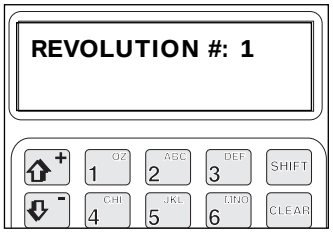


Fig. 17

To change a Revolver program, press the “Arrow Down” key until you see “**Revolution #:1**” in the L.C.D. display window. (See fig. 17) Below this will be “Reset:0 Enter:0” If the first revolution is not the part of the program you wish to change, enter the revolution number you wish to change. Next, set the toggle switches on each individual print head to either “Single” , “Double” or “Off”. Print

heads which are to be used as flash cure stations should be set to the "Off" position with the "Front/Rear" toggle switch set to "Front". You must also program these print heads as flash cure heads in the "Flashes" menu after programming them in the "Revolver" program menu. After you have set the switches as described above, change the "Enter: 0" to "Enter:1" and press the "Enter" key. The revolver program will save the new print head settings in the PLC memory.

Should you want to change the entire program, you must first erase it as follows. First change "**Rest:0**" to "**Rest:1**", then press the "Enter" key. You can now enter a new program as described previously.

The M&R Challenger Series II allows you to view the Revolver program as it is programmed in the system. To view the current program sequence, enter the "Revolution #" you wish to view, then press the "Arrow Down" key. The display will indicate the active print heads for the selected cycle of the program. For example: "**F-S—D—-FD-FS**" indicates that the first print head is programmed for flash cure operation. (See fig. 18) The second print head is programmed to be inactive in the cycle, while the third print head is programmed for Single print operation in the cycle. In this manner, print heads can be easily viewed to determine their programming within the print sequence. "S" = Print head executes "Single" print stroke;"D" = Print head executes "Double" print stroke; "F" = Print head operates as a "Flash cure" station and "-" = Print head is inactive in the print cycle.

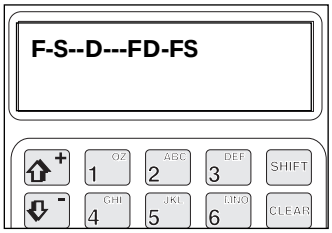


Fig. 18

As the press is running, you can view the L.C.D. control panel to see the actual cycle as it happens.

Before you begin working in the Revolver mode, you must first turn "On" all the active print heads and program the flash cure stations in the "Flashes" menu. In the last half of the last print cycle, you will hear the audible alarm. This signals the end of the program sequence. If you would like to repeat the same program sequence again, press the "Print Start" switch while the alarm is sounding and the audible alarm will stop.

When the first pallet arrives at the load station, the "Index Delay" starts automatically. The "Index Delay" can be set or reset at any time by setting "Timer:1". (See fig. 19)

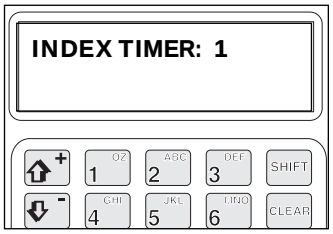


Fig. 19

If you do not want to repeat the program sequence and would like to stop the audible alarm, set the indication to "**Alarm:1**". (See fig. 20) If you don't do this, the audible alarm will keep sounding until the last pallet arrives at the load station. If you are using an old program, remember to program your flash cure units to match the program you want to run. (See page 68, "How to Program the Flash Heads".)

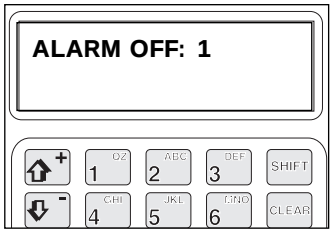


Fig. 20

Other Test -

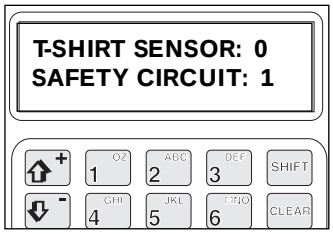


Fig. 21

The "OTHER TEST" menu item contains five sub-menu items which are "Servo Test", "T-shirt Sensor", "Safety Circuit". (See fig. 21)

The "SERVO TEST" menu item contains six sub-menu items. "APM STATUS", "AXIS ENABLED", "POSITION VALID", "DRIVE ENABLED", "IN ZONE" and "HOME PROX". This menu item gives the system operator a visual indication of the current status of the Servo Drive system. "APM Status" refers to an on-board self checking test for the Servo Drive system, and is not adjustable by the system operator in any way. To the right of the "APM Status" is an error code number. Should the self check feature detect an error in the system, it will display a code number in this area which will direct service personnel to the area of concern. *For example:* if "**00B2**" is displayed, this means that the Servo Drive System is not currently being detected.

"**Axis Enabled**" refers to and is indicated for either "ON" when a "**1**" is displayed to the right of "Axis Enabled" or "OFF" when a "**0**" is displayed. The same indications ("0" or "1" "OFF" or "ON") apply for "**Position Valid**", "**Drive Enabled**", "**In Zone**" and "**Home Prox**". The exception being that when the servo drive system is in operation, the "Drive Enabled" indication will toggle from "0" to "1" as the system is turned "On" or "Off".

The ***"T-shirt Sensor"*** menu item performs the same diagnostic test as described in "Panel Test and Prox Test previously. For example: If the T-Shirt sensor detects no T-Shirts on the pallet a "**1**" will appear to the right of "**T-Shirt Sensor**" indicating that no T-shirt was placed on the pallet.

The ***"Safety Circuit"*** menu item performs the same diagnostic tests as described in "Panel Test" and "Prox Test" above. For example, if the Safety Circuit, which consists of the Yellow Safety Cords located between print heads is disconnected for any reason, then a "**0**" will appear to the right of "**Safety Circuit**" indicating the safety circuit is open.

Flashes -

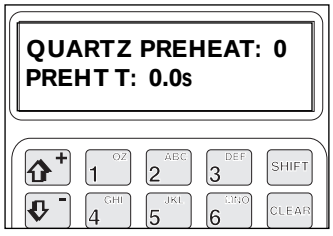


Fig. 22

The "FLASHES" menu item contains three sub-menu items which are "Quartz Preheat", "Preht T" and "Radiant Flash".

"Quartz Preheat": This sub-menu will allow the operator to preheat all the Quartz Flash-cure units from the main control panel. When a "**0**" is displayed, it means the "Quartz Preheat" is "Off". When an "**1**" is displayed the "Quartz Preheat" is "On". (See fig. 22)

"Preht T" or ***Preheat Timer sub-menu***. This control is adjustable and may be set for a maximum preheat time of 15 seconds. To set this control, press the "ARROW RIGHT" key until the time value starts to flash. Then enter the desired preheat time, maximum 15 minutes, then press the "ENTER" key. Your selection for preheat time is now saved in the PLC memory.

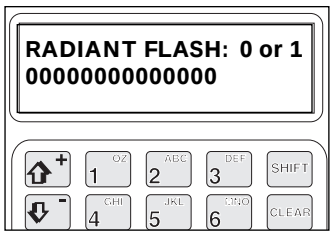


Fig. 23

"Radiant flash" is the last sub-menu item in this menu. This menu item gives the operator a visual display of the current condition of print heads in the system which are programmed for Radiant Flash operation. (See fig. 23) To use this control, simply press the "ARROW RIGHT" key until the indicator starts to flash, then press the number "1" and then press "ENTER". The display will now indicate which of the print head toggle switches are set or programmed for Radiant Flash operation by displaying a "**1**" in the corresponding location in the display.

For example: The following would indicate that print heads number 2, 4 and 6 are programmed for Radiant Flash operation in a 14 color system. 01010100000000. (See fig. 24)

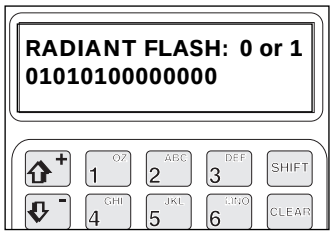


Fig. 24

NOTE: For the original machines with machine numbers 25 or below the position of toggle switches for flash mode are as follows:
- Single/Double switch in the off position.
- Front/Rear switch in the front position.

NOTE: For current machines with machine numbers 26 or above, the position of toggle switches for flash mode are as follows:
- Single/double switch in the single position.
- Front/Rear switch in the front position.

To activate the head as a flash, you must place "Single/Double" switch in the "Single" position. If the head is in the off position, the head is still programmed as a flash head, but not active.

To de-activate the head from the flash mode, move the front/rear toggle switch to the rear position. This will clear the flash mode for that particular head.

MPR Data -

The optional MPR Data menu item is designed for use with M&R's exclusive Management Production Report software package. A detailed logging builds a data base, which may be used for cost analysis, job tracking, production volume reporting, press utilization and down time analysis. The MPR Data report filter, compiles and formats this data for output to any Intel-based computer running Windows 95.

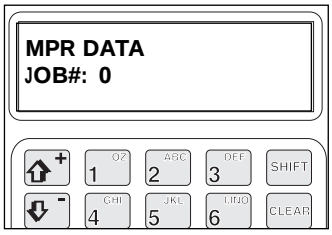


Fig. 25A

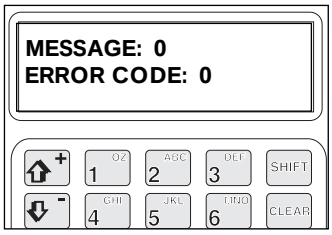


Fig. 25B

Fig. 26

Fig. 27

MPR Data contains three sub-menu items which are “Job No.”, “Message” and “Error Code”. (See fig. 25A & 25B)

The “Message Code” is a code number which describes a reason for which down time occurred during a shift. You may for instance, select code 1 for set-up time, or code 20 for lunch or dinner breaks.

To use the “MPR Data” menu, press the “MPR Data” key. The display will read “**MPR Data**”. Now press the “ARROW RIGHT” key. The numerical value will start to flash. Now press the desired Job No., then press the “ENTER” key. Press the “ARROW DOWN” key to display both “Message” and “**Error Code**”. Based on your pre-determined Message and Error code listing, enter the corresponding code number, then press the “ENTER” key. Your selections are now saved in the PLC memory.

Service Data -

The Service Data menu item is intended for use by factory authorized M&R Service Representatives only. Do not attempt to access this menu item. (See fig. 26)

Alarms -

The final menu item is the “ALARMS” menu. This menu is used to alert the system operator that an “ALARM” condition exists. Additionally, pressing the “ALARMS” key will give the system operator a visual list of the cause of the “ALARM” condition. (See fig. 27) In this manner, the alarm condition may be readily identified and resolved and system operation may begin or continue.

Some of the typical “ALARM” conditions which may be listed are:

“Emergency”
“Safety Cords Disconnected”
“Index Proximity Off”

As the alarm condition is identified, and resolved, the indication will be automatically deleted from the “Alarm” listing.

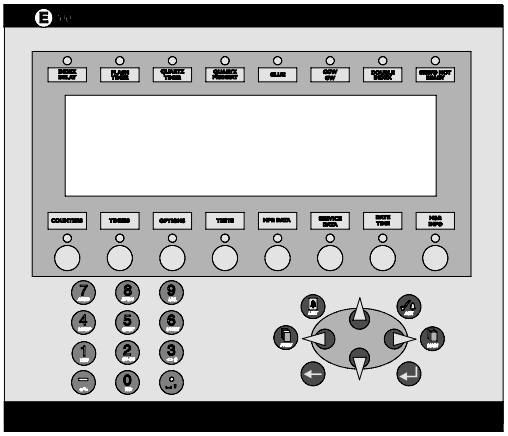
Challenger Series II E300 Operator Interface Instructions:

The Operator Interface control panel used in the manufacture of the M&R Challenger Series II Textile Screen Printing System incorporates an L.C.D. (Liquid Crystal Diode) type alpha/numeric display for providing information regarding operational, programming and system status messages in real time.

The Operator Interface control panel is divided into 5 different control areas as follows. (See illustration at right)

a. Along the top width of the control are status L.E.D. indicators each of which can display either a green or red indication based on the various operational parameters listed below each individual indicator. The operational parameters, listed form left to right are - **INDEX DELAY, FLASH TIMER, QUARTZ TIMER, QUARTZ PREHEAT, GLUE, CCW/CW** (Counterclockwise & Clockwise)**, DOUBLE INDEX and SERVO NOT READY.**

NOTE: If your press has been ordered with the "Revolver" print sequencing program, then the "QUARTZ PREHEAT" L.E.D. indicator will be changed to "REVOLVER".

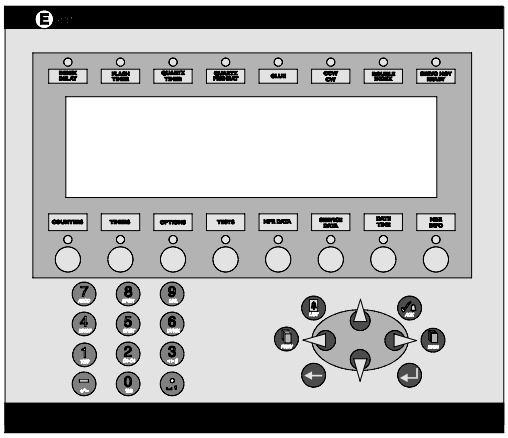


b. Directly below the L.E.D. indicators is the L.C.D. display window. Information regarding operation, programming and system status are displayed here.

c. Directly below the L.C.D. display window are the individual Status and Program control buttons with L.E.D. indicators. These control buttons are used to program the on-board PLC for various requirements, and to access system status, useful for trouble shooting procedures. Listed from left to right they are - **COUNTERS, TIMERS, OPTIONS, TESTS, MPR DATA, SERVICE DATA, DATE/TIME** and **M&R INFO**.

d. Located at the bottom left of the control is the alpha numeric keypad used to input information for various programming parameters.

e. To the lower right of the control panel is the programming function buttons. Starting at the 12 O'clock position and moving clockwise they are - **ARROW UP, ACKNOWLEDGE, ARROW RIGHT, MAIN, ENTER, ARROW DOWN, BACK SPACE, ARROW LEFT, PREVIEW** and **LIST**.



The following information provides a detailed description of all controls and indicators on the Operator Interface. (See illustration at left)

L.E.D. STATUS INDICATOR LIGHTS -

INDEX DELAY -

This indicator light displays a green L.E.D. when the system is operating with the "Index Delay" command. It will display a red L.E.D. when the system is operating in the **"REVOLVER"** print sequencing program.

FLASH TIMER -

When the **"Flash Timer"** command is operational, this L.E.D. will display a green indication.

QUARTZ TIMER -

This L.E.D. will display a green indication when the **"Quartz Timer"** is activated in the production cycle.

QUARTZ PREHEAT -

This L.E.D. will display a green indication when the **"Quartz Preheat"** time interval is activated.

GLUE -

This indicator will display a green L.E.D. when ever the optional M&R Annamister spray guns are activated.

CCW/CW -

This L.E.D. will display a green indication when the indexer rotation is selected for counterclockwise **(CCW)** operation. When selected for clockwise **(CW)** operation, the L.E.D. will display a red indication.

DOUBLE INDEX -

When ever the system Operator selects the index system to operate in the **"DOUBLE INDEX"** mode of operation in the **"OPTION"** menu, this L.E.D. will display a green indication.

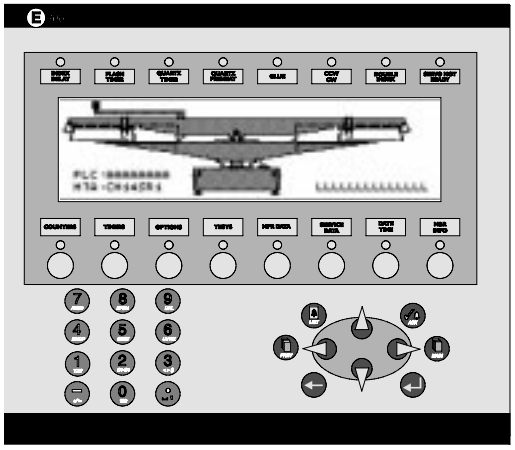
SERVO NOT READY -

When ever this indicator displays a red L.E.D. indication, it means that the indexer servo drive system is not operating. This L.E.D. will also illuminate for a few seconds after the **"EMERGENCY STOP"** push button has been activated, or when ever the **"POWER ON"** switch is turned **"ON"**.

OPERATIONAL CONTROL & STATUS KEYS -

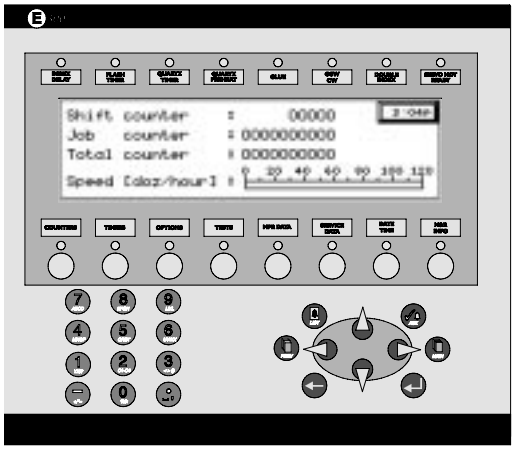
MAIN SCREEN

The first screen which is displayed in the **MAIN SCREEN**. The L.C.D window will display a graphic representation of the M&R Challenger Series II press. In the lower left corner of the L.C.D. window, the screen will display the program reference information for the program currently installed in the press. (See illustration at right)



COUNTERS -

The first command key on the left is **"COUNTERS"**. To access **"COUNTERS"**, press the button under **"COUNTERS"** one time. The **"COUNTERS"** information menu is displayed in the L.C.D. window, and the green L.E.D. indicator above the **"COUNTERS"** button illuminates.
The L.C.D. window displays **"Shift Counter"**, **"Job Counter"** and **"Total Counter"**. Immediately below is a graduated scale starting at **"0"** on the left and increasing to **"120"** on the right. This scale indicates the current production rate in **"Dozens per hour"**. As the press operates, you will note that the scale will fill in from the left to the right to indicate the current production speed. Lastly, in the upper right corner of the screen, the current time of day is displayed. (See illustration at right)

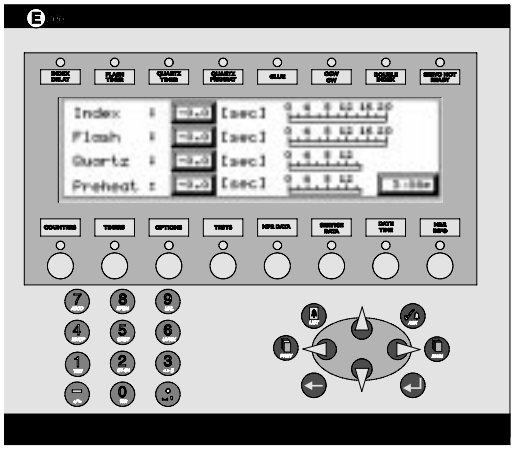


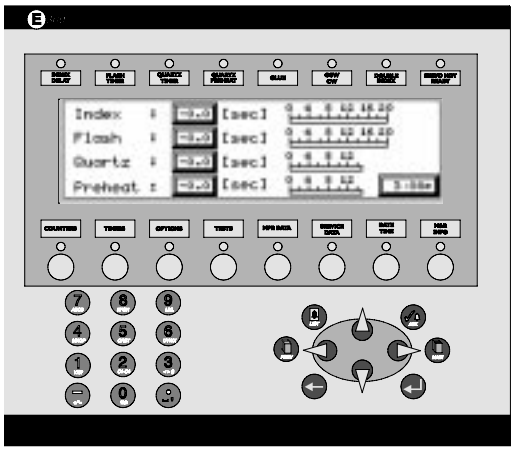
The **"Shift Counter"** displays the production shift. The **"Shift Counter"** may be re-set using the arrow keys, the numerical keys and the **"ENTER"** key as follows.
First, press the **"RIGHT ARROW"** key. The numerical display for **"Shift Counter"** will start to flash, confirming its selection. To reset the **"Shift Counter"**, press the **"0"** key on the numerical keypad, then press the **"ENTER"** key. The display for **"Shift Counter"** will reset to **"0"**.

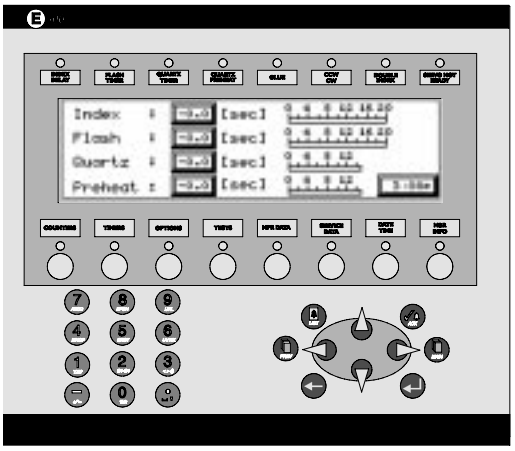
The **"Job Counter"** displays the current number of index cycles for a given print job.
The **"Total Counter"** displays the total number of press cycles beginning from the initial date of installation of the equipment in your production facility. The numerical value for the **"Total Counter"** cannot be changed or adjusted in any way. It merely serves as a reference for the systems operational history.

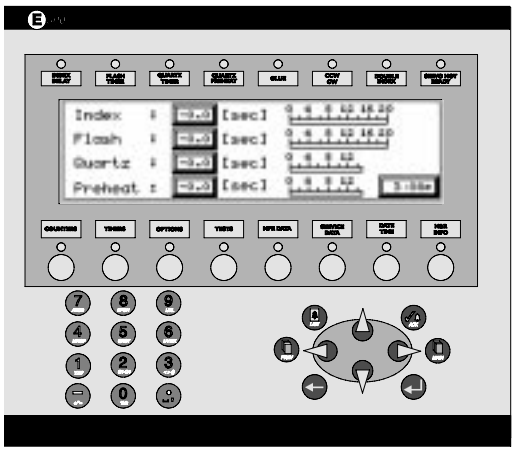
TIMERS -

The **"TIMERS"** menu contains four sub-menu items which are, **"Index", "Flash", Quartz"** and **"Preheat"**. (See illustration at right)
You may access each of these sub-menu areas by using the **"ARROW DOWN"** key to scroll down through the L.C.D. display.









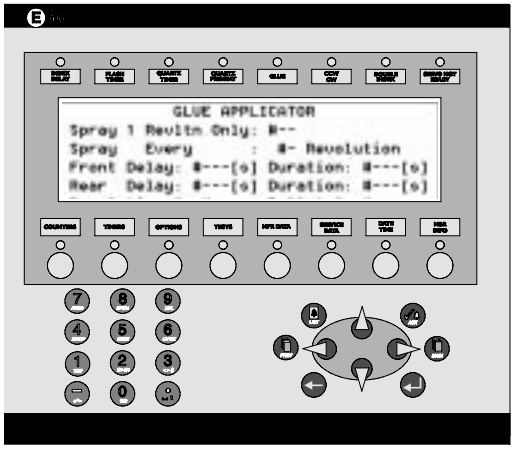
Index Dwell Time is used to control the dwell time when operating the system in the automatic mode. Dwell time is defined as the time during automatic operation in which the system operator may load or unload garments. The dwell time starts at the completion of the index cycle. The dwell time is adjustable from a minimum of **"0"** seconds, to a maximum of **"20"** seconds and may be adjusted to suit the system operators requirements as follows.
Press the **"ARROW RIGHT"** key. The numerical value for dwell time to the right of "Index" will start to flash, confirming its selection. Now, simply press the numerical keys to select the desired amount of Index Dwell Time. Now, press the **"ENTER"** key. Your selection is now programmed into the PLC memory. (See illustrations at left)

To reset the **"Flash"** dwell time, press the **"ARROW DOWN"** key. The numerical value for **"Flash"** will start to flash confirming its selection. Now, as with **"Index"** time above, press the desired amount of flash dwell time. As with **"Index"** dwell time above, the maximum dwell time allowed is **"20"** seconds and the minimum is **"0"**. Now press the **"ENTER"** key and your selection will be saved in the PLC memory. When ever a "0" has been selected for the **"INDEX"** or **"FLASH DWELL TIMER",** the flash heating panel will not cycle in or out of position over the printing pallets.

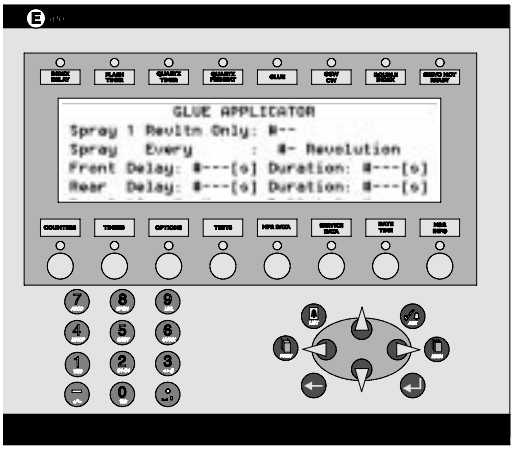
To adjust the **"Quartz"** dwell time, you proceed in the same manner as previously described for Index Dwell Time and Flash Dwell Time above.
Press the **"ARROW DOWN"** key until the numerical value for **"Quartz"**. Time starts to flash, confirming its selection. Now enter the numerical value using the number keys, maximum **"15.0"** seconds, minimum is **"0"** seconds and press the **"ENTER"** key. Your selection is now programmed into the PLC memory.

When first starting production with the optional Quartz Flash unit or when ever the Quartz Flash unit has been inoperative for 10 minutes or longer, a dwell time is required to allow the quartz heating elements to achieve proper operating temperature. The **"Preheat"** menu items provides the system Operator with a convenient means to adjust the required preheat dwell time.
To adjust the "Preheat" dwell time, press the **"ARROW DOWN"** key so that the numeric indication for "Preheat" flashes. Now using the numerical keys, enter the desired preheat dwell time from a minimum of **"1"** to a maximum of **"15"** seconds. Then press the **"ENTER"** key. The "Preheat" dwell time is now saved in the PLC memory. To command the Quartz Flash unit to begin its preheat cycle, press the **"ARROW LEFT"** key so the word "Preheat" flashes, then press the **"ENTER"** key. "Preheat" will change to **"ON"** for the selected time of the preheat cycle, and the **"Preheat"** L.E.D. will flash.

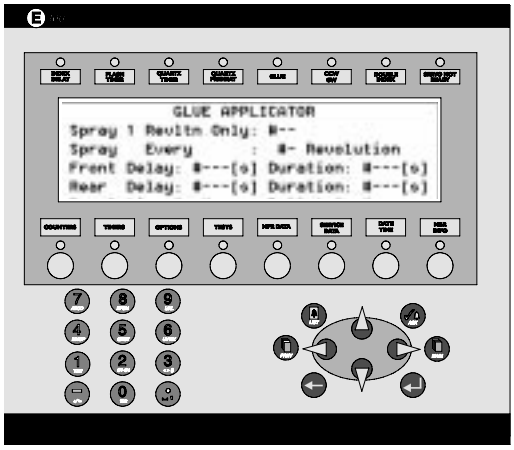
The next menu item is **"OPTIONS"**. To access the **"OPTIONS"** menu item, press the **"OPTIONS"** key located to the right of the **"TIMERS"** key. The **"OPTIONS"** menu contains nine sub-menu items, **"GLUE APPLICATOR", "FLASH", "ROTATION", "INDEX", "SKIP", "REVOLVER", "SERVO OFFSET", "PALLET SIZE"** and **"OILER"**. **NOTE: The sub-menu item for "REVOLVER" appears only on presses equipped with the "REVOLVER" program option.**
The **"GLUE APPLICATOR"** sub-menu provides control adjustments for the optional M&R Annamister Automatic Adhesive Application system. The available parameters are **"Spray 1 Revltn Only:"** ,**"Spray Every: Revolution" "Front Delay", "Front Duration", Rear Delay", "Rear Duration", "Revolution #:"** and **"Pallet #:"**. (See illustration at right)



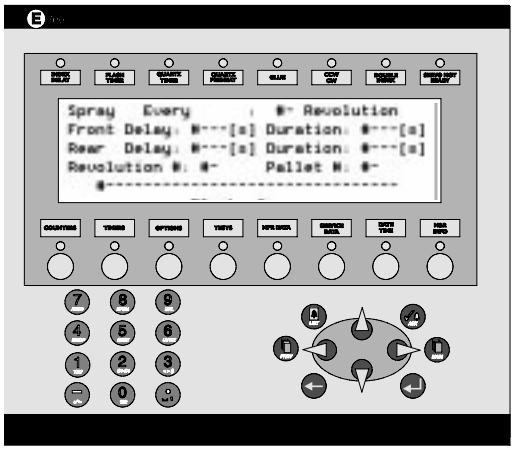
To access the first menu item, **"Spray 1 Revltn Only"** press the **"ARROW DOWN"** key one time. Now press the **"ARROW RIGHT"** key one time. The flashing cursor will now be positioned at the **"ON/OFF"** indication. To activate **"Spray 1 Revltn Only"** press the **"ENTER"** key one time. The indication will now display **"ON"**. When **"Spray 1 Revltn Only"** is **"ON"**, the M&R Annamister will dispense adhesive on each pallet for one revolution only. A revolution is defined as one complete cycle of all printing pallets. This control provides a convenient manner in which to automatically apply adhesive to all printing pallets at the beginning of a print run.



Press the **"ARROW DOWN"** key one time, then press the **"ARROW RIGHT"** key one time to access the **"Spray Every Revolution"** sub-menu item. The **"Spray Every Revolution"** menu item permits the system Operator to program the M&R Annamister to apply adhesive to the printing pallets based on the number of revolutions of the press.
Remember that a revolution is defined as one complete cycle of all printing pallets. The value may be set for a minimum of **"0"**, or a maximum of **"99"**. As an example, if the indication is set for **"5"**, then the M&R Annamister system will automatically apply adhesive to all printing pallets every fifth revolution of the index system. To change the indication, use the numerical keys to enter the desired number of revolutions, then press the **"ENTER"** key one time. Your selection is now saved in the PLC memory.

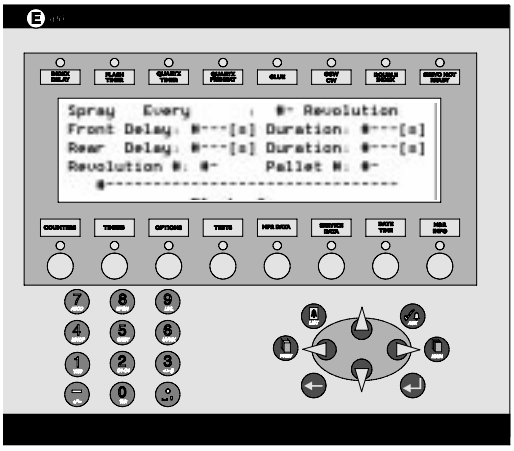


Press the **"ARROW DOWN"** key one time, then press the **"ARROW RIGHT"** key one time to access the next sub-menu item, **"Front Delay"**. This sub-menu item permits the system Operator to program a start delay time for the front air valve which operates the two front spray guns. This adjustment is provided to precisely set the spray gun trigger cycle to the speed of the indexer when operating the press in the automatic mode. The adjustment has a range of between **"0.01"** second and **"2"** seconds delay time.



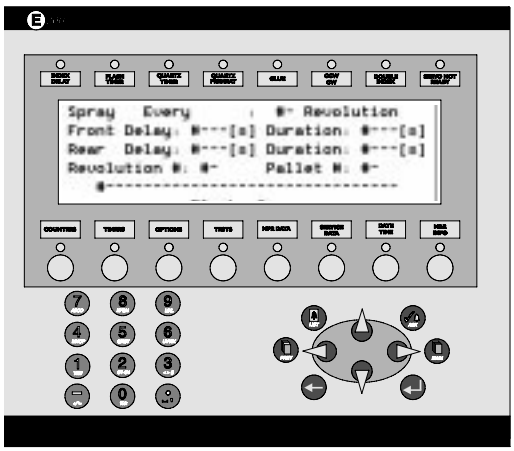
To adjust the **"Front Delay"** time, enter the desired time interval using the numerical keys, then press the **"ENTER"** key one time. Your selection is now saved in the PLC memory.

Press the **"RIGHT ARROW"** key one time to access the **"Front Duration"** dwell time. This sub-menu item permits the adjustment of the time duration in which the front air valve which operates the front spray gun is activated. This adjustment, like the **"Front Delay"** adjustment described above, permits the system Operator to precisely set the two front spray guns to synchronize with the current index speed. The adjustment has a range of **"0.00"** seconds to **"2"** seconds. Use the numerical keys to enter the desired time value, then press the **"ENTER"** key one time. Your selection is now saved in the PLC memory.



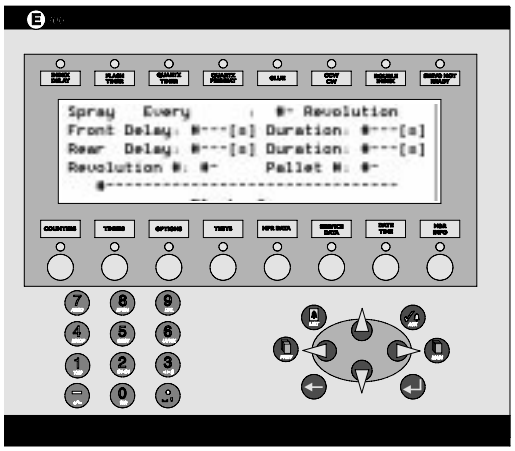
The next sub-menu item is **"Rear Delay"**. This sub-menu item permits the system Operator to program a start delay time for the one rear air valve which operates the rear spray gun. As with **"Front Delay"** described previously, this adjustment is provided to precisely set the spray gun trigger cycle to the speed of the indexer when operating the press in the automatic mode. The adjustment has a range of **"0.01"** second to **"2"** seconds delay time. To adjust the **"Rear Delay"** time, press the **"RIGHT ARROW"** key so that the flashing cursor is located under the current indication. Now using the numerical keys, enter the desired delay time, then press the **"ENTER"** key. Your selection is now saved in the PLC memory.

The next sub-menu item is **"Rear Duration"**. This sub-menu item permits the adjustment of the time duration in which the rear air valve which operates the rear spray gun is activated. This adjustment, like the **"Rear Delay"** adjustment described above, permits the system Operator to precisely set the one rear spray gun to synchronize with the current index speed. The adjustment has a range of **"0.00"** second to **"2"** seconds.
To adjust the **"Rear Duration"** time, press the **"RIGHT ARROW"** key so that the flashing cursor is located under the current indication. Now using the numerical keys, enter the desired delay time, then press the **"ENTER"** key. Your selection is now saved in the PLC memory.

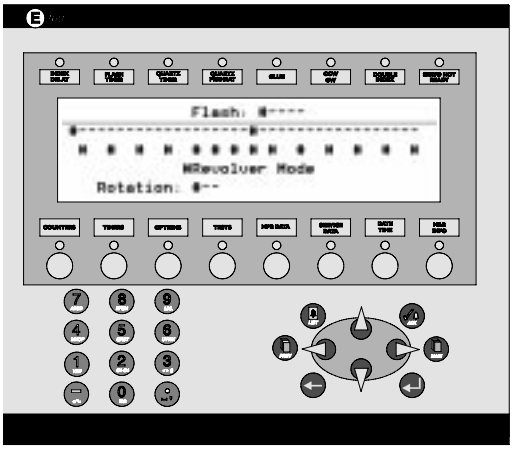


The next sub-menu item is **"Revolution #"**. This menu item is used to provide the system Operator with a visual indication of the current number of revolutions remaining before the M&R Annamister automatically applies adhesive to the printing pallets as determined by the Operator's selection in the **"Spray Every..."** sub-menu item as described previously. The indication displayed shows a countdown of remaining revolutions. For example, if the selection for **"Spray Every..."** was **"20"**. Then the indication will begin at **"20"** and countdown to **"0"** at which time the M&R Annamister system will begin applying adhesive to the printing pallets.

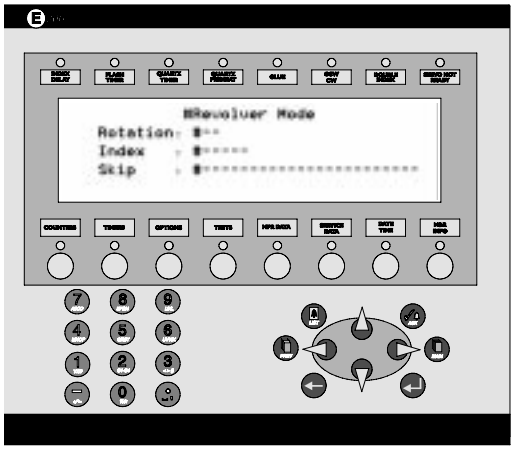
The next sub-menu item is **"Pallet #"**. This menu item is provided as an indication of how many pallets remain until the end of the current revolution. (See illustration at right)
You will note that across the bottom of the display screen is a dark bar with **"TIMERS","NOZZLE","TESTS","MPR","Pg Dwn"** and **"Pg Up"**. Except for **"NOZZLE"** and **"Pg Dwn"** and **"Pg Up"** these functions work as explained previously. **"NOZZLE"** is used to manually activate the M&R Annamister spray guns. Simply press the button below **"NOZZLE"** which normally would be **"OPTIONS"**, and the spray guns will dispense adhesive for as long as you hold the button **"IN"**. Additionally, the green L.E.D. above the **"GLUE"** indicator at the top of the control panel will also illuminate. Press the buttons below **"Pg Dwn"** or **"Pg Up"** to scroll down through the menu item.

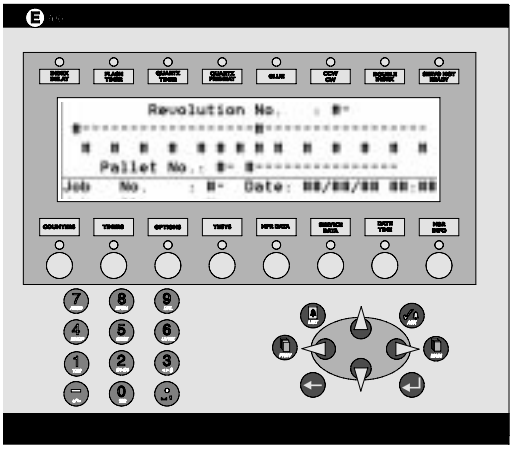


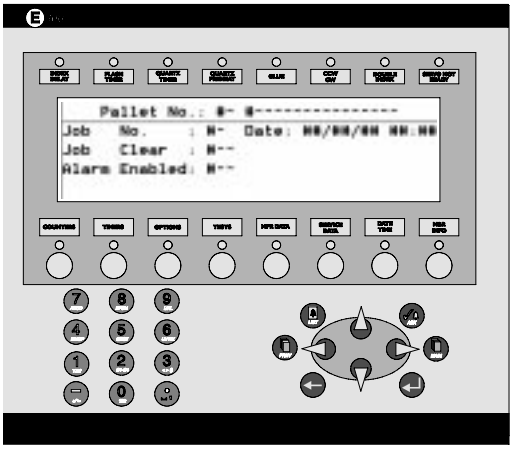
The next menu item in the **"OPTIONS"** menu is **"FLASH"**. This menu item provides a visual indication which alerts the system Operator as to which print heads are currently selected for **"Flash Cure"** operation. Print heads are displayed from the left to the right of the display screen starting with the highest number print head. Displayed below each print head you will note either a **"-"** indicating that print head is currently selected for print operation, or the letter **"F"** indicating that the print head is selected for flash cure operation. To change the indication from flash to print operation and back again, use the **"FRONT/REAR"** stop toggle switches located on the Main control console to select the desired operation of that particular print head. To select the print head for flash cure operation, place the toggle switch in the **"FRONT"** stop position, then, using the **"ARROW"** keys, place the flashing cursor under the letter **"E"** in the word **"ENTER"** to the right of the word **"FLASH"**, and press the **"ENTER"** key. In addition, the **"SINGLE/DOUBLE"** toggle switch must also be selected, or the print head will not operate in either print or flash operation. (See illustration at right)



The next sub-menu item is **"Revolver mode"**. **NOTE: The "REVOLVER" option only appears on presses equipped with the "REVOLVER" program option.** To access the Revolver mode of operation, press the **"ARROW DOWN"** key one time, then press the **"ARROW RIGHT"** key so that the flashing cursor is located under the **">"** to the left of the letter **"R"** in **"Revolver Mode"**, then press the **"ENTER"** key one time. The **"Revolver Mode"** display screen contains **"Revolver Mode ON/OFF"**, **"Index Delay", "Stop Alarm", "Enter Program", "Revolution Number"**, and **"Pallet No.:"**.
When you first enter into this message screen, you will note that the flashing cursor automatically locates beneath the letter **"R"** on the word **"Revolver"** in **"Revolver Mode"**. To activate the revolver mode simply press the **"ENTER"** key one time. The **"ON/OFF"** indication will now change to **"ON"**.







Pressing the **"ENTER"** key once again will change the indication to **"OFF"**. Press the **"ARROW DOWN"** key one time, then press the **"ARROW RIGHT"** key. The flashing cursor is now located under the letter **"I"** in the word **"INDEX"**. Press the **"ENTER"** key one time. You will be presented with a **"WAIT"** indication, after which the current index dwell time as programmed under **"TIMERS"** will be activated. The **"INDEX DELAY"** L.E.D. will display a red indication when the timer is inactive, and a green indication when the **"INDEX DELAY"** is activated.

Press the **"ARROW DOWN"** key one time, then press the **"ARROW RIGHT"** key one time to access the **"Stop Alarm"** menu item. When the flashing cursor is located under the letter **"S"** in the word **"STOP"**, press the **"ENTER"** key one time. You will see the **"WAIT"** message appear in the message window.
This control feature allows the system Operator to over ride the audible alarm which indicates the approaching end of a programmed print sequence in the Revolver mode of operation.

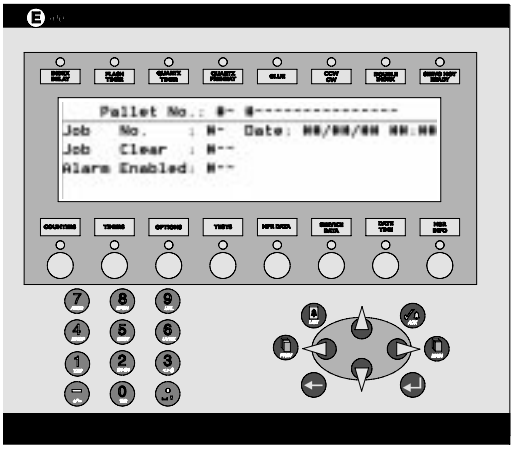
Press the **"ARROW DOWN"** key one time, then press the **"ARROW RIGHT"** key one time to access the **"Enter Program"** menu item. This control function is used to enter print sequences for the Revolver program mode of operation. When the flashing cursor is located under the letter **"E"** in the word **"ENTER"**, press the **"ENTER"** key one time. You will see the **"WAIT"** message appear in the message window, after which your pre-selected program information will be saved in the PLC memory.

The next menu item is **"Revolution No."** Press the **"ARROW DOWN"** key one time, then press the **"ARROW RIGHT"** key one time. This control function allows the selection of up to 10 different revolutions to be programmed for print, flash operation in the revolver program. Enter a number from 1 to 10, then set the active heads to either **"Single"** or **"Double"** (remember, flashs must be programmed before you enter the **"Revolver"** screen, then press the **"ENTER"** key one time. Your **"Revolver"** program will be displayed on the screen. **"S"** indicates head printing in **"Single"** mode. **"D"** indicates head is printing in **"Double"** mode. **"F"** indicates that the print head is operating in the **"Flash"** mode.

The **"Pallet No."** indication provides a visual indication of how many pallets are entered in the program sequence for each revolution of the indexer. The numerical indication will change as the press continues through its operation.

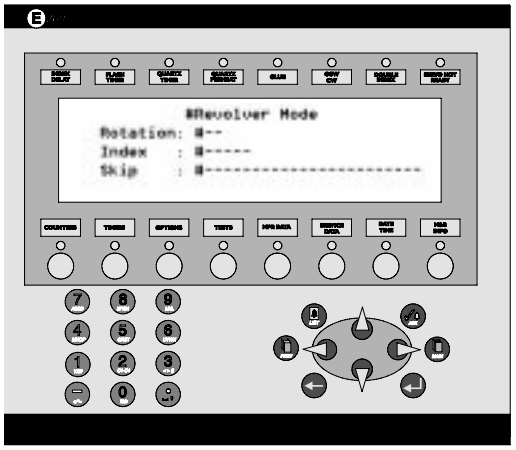
The next menu item is **"Job No."**. **"Job No."** is used to enter a job number from 1 to 3 which is saved in the PLC memory. Simply press the numeric key from 1 to 3, then press the **"ENTER"** key.

The next menu item is **"Job Clear"**. This menu item is used to clear all currently active Revolver program data from the PLC. To use it, press the **"ARROW DOWN"** key once, then press the **"ARROW RIGHT"** key one time. Now press the **"ENTER"** key. The indication will toggle from **"ON"** to **"OFF"**.
When the indication reads **"ON"**, then all Revolver program data as entered by the Operator will be cleared from the PLC memory.

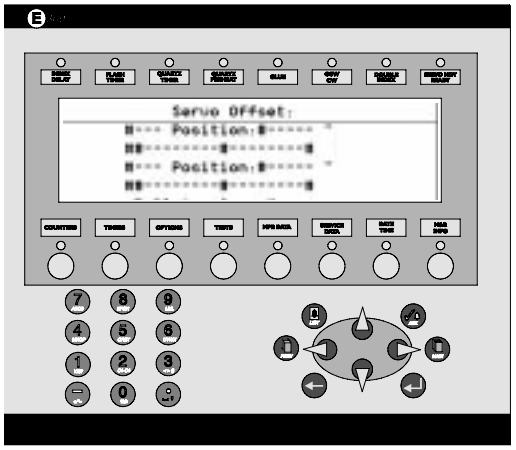


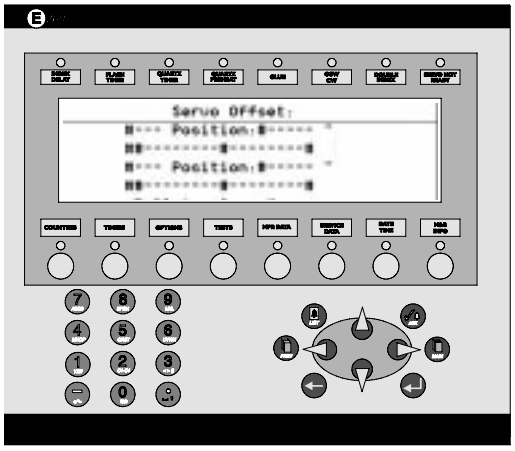
The next menu item is **"Alarm Enabled"**. This menu item provides the system Operator with a way to either enable or disable the audible alarm which sounds just before the completion of a programmed print sequence. To turn the alarm **"OFF"**, press the **"ENTER"** key when the flashing cursor is located under the letter **"O"** in the **"ON"** indication. To turn the alarm back **"ON"**, press the **"ENTER"** key once again, and the alarm will turn back on. Press the **"PREV"** button to return to the previous screen.

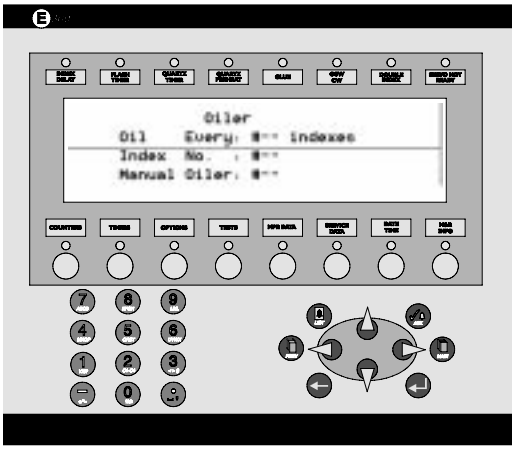
Below **"Revolver Mode"** you will find **"Rotation" CCW/CW"**. This menu item permits the system Operator to select either counterclockwise rotation of the index carousel, or clockwise rotation of the index carousel. To change the indication, use the **"ARROW"** keys to place the flashing cursor under the **"CCW"** or **"CW"** indication, press the **"ENTER"** key, then press the "Reset" push button. When the indication is selected for CCW, counterclockwise rotation, the green L.E.D. at the top of the control panel will illuminate. When CW clockwise rotation is selected, the L.E.D. displays a red indication.

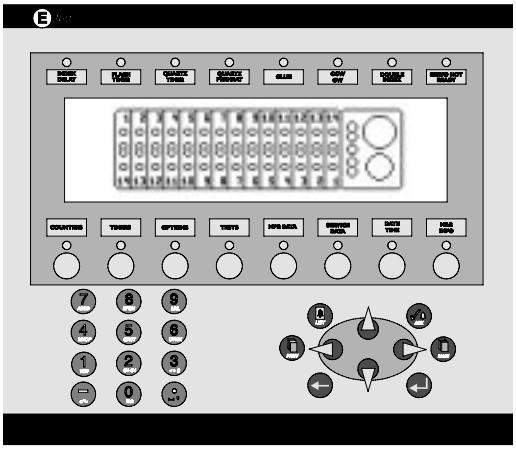


The next sub-menu item is **"INDEX SINGLE/DOUBLE"**. This menu item provides the system Operator with a means to select either **"SINGLE"** index operation, or **"DOUBLE"** index rotation. To select **"SINGLE"** index rotation, use the arrow keys to place the flashing cursor under the letter **"D"** in the word **"DOUBLE"**, then press the **"ENTER"** key one time.
The next menu item is **"SKIP"**. This menu item permits selection of either **"No T-Shirt Sensor"** or **"FOOT PEDAL/PUSH BUTTON"** operation. To select either function, use the arrow keys to place the flashing cursor on either the letter **"N"** in **"NO"**, or the letter **"F"** in the word **"FOOT"** and press the **"ENTER"** key.
Scrolling down further in this menu will reveal the word **"Servo Offset"** and below this **"End Position"** and **"Start position"**. These controls are used to program the stopping position of the indexer servo drive system for the most optimum locking of the carousel into the locking forks on the indexer. This control is provided to adjust index stop after changing pallets to a smaller or larger size. Larger pallets increase the index load, while smaller lighter pallet decrease the index load. As a result, changing of printing pallets can have an effect on the stopping position, and ultimately, the smooth operation of the index servo drive system.









The range of setting is from **-0.25"** to **+ 0.25"**. To change the setting for either **"Strt"** or **"End"**, use the arrow keys to place the flashing cursor on either the **"-"** sign, or the **"+"** sign. Now press the **"ENTER"** key and hold it down until the desired numerical value, either plus or minus is displayed. Then release the **"ENTER"** key. Your selection is now programmed into the Servo Drive Offset.

The next sub-menu item is **"Pallet Size"**. Use the arrow keys to select either **"Small"**, **"Normal"** or **"Large"**, then press the **"ENTER"** key.

OILER -

The next sub-menu item is **"OILER"**. This sub menu item makes the periodic lubrication of the index system convenient and effortless. The first parameter **"OIL EVERY __ INDEXES"** allows the system Operator to enter a number from **"0"** up to **"999"**. The index lubrication system will now dispense oil to the indexer every so many cycles based on the value entered. For example, if you enter the number 80, which is the value selected at the factory, the lubrication system will automatically dispense oil to lubricate the indexer every 80 cycles. To change the value, use the **"ARROW "** keys to place the flashing cursor on the value, then use the numerical keys to select the value, then press the **"ENTER"** key.
"INDEX No." is used as a visual indicator to advise the system Operator how many index cycles remain before automatic lubrication will take place. **"MANUAL OILER"** permits the lubrication of the index system manually. To activate the **"MANUAL OILER"**, use the **"ARROW"** keys to place the flashing cursor on the **"ON/OFF"** indication, and press the **"ENTER"** key. This action will activate the lubricant pump resulting in the manual lubrication of the index system.

TESTS -

The next menu item is the **"TEST"** menu item. In the **"TESTS"** menu item there are three sub-menu items which are **"Panel Test", "Proximity's Test"** and **"Servo Drive Test"**.
The **"TESTS"** menu contains an on-board self diagnostic program which gives the system Operator a visual indication of the operational integrity of all the proximity switches, toggle switches and push buttons used in the operation of the M&R Challenger Series II system. The sub-menus are **"Panel Test", "Proximities Test"** and **"Servo Drive Test"**. To access the **"Panel Test"** sub-menu, press the arrow key to place the flashing cursor on the small arrow to the left of the words **"Panel Test",** then press the **"Enter"** key. The L.C.D. display window will now display a graphic representation of the Main Control console. (See illustration at left) As you select either **"ON"** or **"OFF"** the various switches and push buttons used to control the system, the particular switch or push button will become

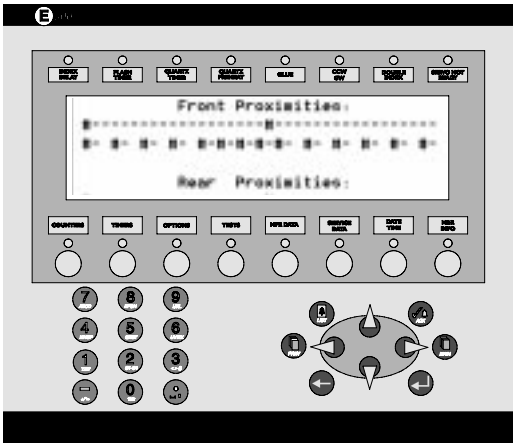
highlighted on the graphic representation of the control panel, indicating that it is working properly.

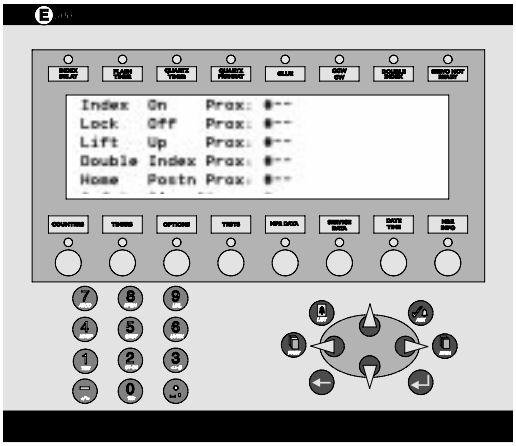
Should the indication on the graphic representation of the control panel fail to respond, then the particular switch in question must be examined for a possible defect in operation, or possible replacement. **We strongly recommend that when performing tests on the Main Control Panel, that the "EMERGENCY STOP" push button be activated (Pushed IN).**

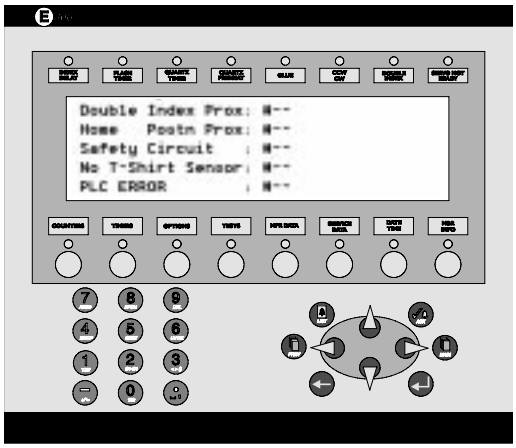
"PROXIMITIES TEST" may be accessed in the same manner as described above for **"Panel Test"**. The **"Proximities Test"** menu performs the same diagnostic function as described for **"Panel Test"** above. The display screen will list every proximity switch used in the operation of the system. As each individual switch is activated, the corresponding indication on the display screen will confirm its operational integrity. Should a indication fail to respond, then investigation of the operation of that particular proximity switch is indicated.

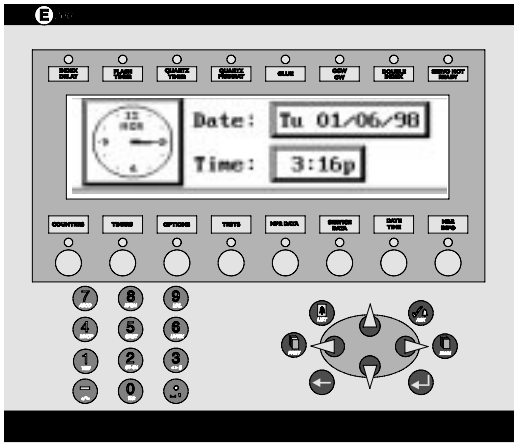
"SERVO DRIVE TEST" again performs in the same diagnostic manner as described above for **"Panel Test"** and **"Proximities Test"**, the exception being that as the servo drive system utilizes a number of various components for operation, the listing of operational components is further expanded to include these items.
Use the **"ARROW DOWN"** key to scroll through the component list to examine each parameter.

MPR DATA -
The optional MPR Data menu item is designed for use with M&R's exclusive Management Production Report software package. A detailed logging builds a data base, 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.
MPR Data contains three sub-menu items which are **"Job No.", "Message",** and **"Production Speed Trend"**.
The **"Message Code"** is a code number which describes a reason for which down time occurred during a shift. You may for instance, select code 1 for set-up time, or code 20 for lunch or dinner breaks.
To use the **"MPR Data"** menu, press the **"MPR Data"** key. The display will read **"Job number"** and **"Message Code"**. As you access the **"MPR DATA"** menu, the numerical value for ""Job number" will automatically start to flash. Now, using the numerical keys, enter the desired Job No., then press the **"ENTER"** key.
Press the **"ARROW RIGHT"** key to access the **"Message code"**









indication. Based on your pre-determined Message and Error code listing, enter the corresponding code number, then press the **"ENTER"** key. Your selections are now saved in the PLC memory.

The next menu item is **"SERVICE DATA"**. This menu item is used by **M&R Technical Support Personnel ONLY** and cannot be accessed by the system Operator. This menu item creates and stores in the PLC memory a complete operational history of the system.

The next menu item is **"DATE/TIME"**. In this menu item you may adjust the on-board clock and calendar for the proper display. The date is displayed as day of the week, month of the year, date and year. To adjust the date, press the numerical keys for the month. For example, for January 12, 1998, first press the **"0"** key, then press the **"1"** key. The display will change to **"01"** for the month indication. For the date press first the **"1"** key, then press the **"2"** key. The display will read **"12"** for the date indication. To enter the current year, press the **"9"** key, then press the **"8"** key. Now press the **"ENTER"** key. The day of the week will automatically be displayed based on the information entered for month, date and year.

To change the time of day, press the **"ARROW DOWN"** key. The frame around the time of day display will start to flash confirming its selection. Use the numerical keys to enter the current hour and minutes of the day, then press the **"ENTER"** key. Upon pressing the **"ENTER"** key, you will be prompted to select either **"AM"** or **"PM"**. Use the **"ARROW UP"** or **"ARROW DOWN"** keys to select either **"AM"** or **"PM**, then press the **"ENTER"** key once again. Your selection for the date and time of day are now saved in the PLC memory.

The last menu item is **"M&R INFO"** located under the L.C.D. window at the extreme left of the control panel. This menu item provides information on how to contact M&R Printing Equipment, Inc. It lists our phone number, Fax number and address.

Chapter 10
Preventive Maintenance Schedule

This maintenance schedule is based on an 8-hour day production shift. In cases where the equipment is to be operated on a 2 or 3 shift schedule (16 hours or 24 hours), then the schedule outlined below must be revised to meet the increased demands placed upon the equipment.

Daily -

D1. Check the electrical control enclosure vents and cooling fan and finger guard for build up of lint. The electrical control enclosure is located on the lower section of the indexer (See Fig.1).

D2. Clean away any ink or spray tack which may have contaminated any mechanical control surfaces. This is especially true for each print head assembly (See Fig.2A & 2B).

D3. Using Permatex Super Lube with Teflon, (M&R Part No. 7018031) grease the zerk grease fittings on the indexer base assembly. Keep a separate grease gun supplied with Permatex Super Lube with Teflon for lubrication of the index assembly bearings only. (See Fig.3)

D4. Check water trap, air filter and drain as needed. In normal operation, you should never note any accumulation of water in the water trap. If water is noted in the water trap, then a check of the refrigerated air unit is required(Chiller). (See Fig.4)

Twice A Week -

B1. Using white lithium grease, grease the zerk fittings located on the index ring. (See Fig.9 on page 73)

B2. Check oiler and add 10W non-detergent as needed. Oil should be added whenever the level shows a half full indication. (Oiler should be set to give one (1) drop every eight cycles with all systems operational). (See Fig.4)

Instructions for adding oil, and adjusting rate of lubrication:

BA. Disconnect compressed air supply from the system and bleed off any remaining compressed air which may be present in the system by opening the drain valve located on the water trap. After bleeding excess air, close the drain valve and tighten securely. (See Fig 4)

Fig. 1

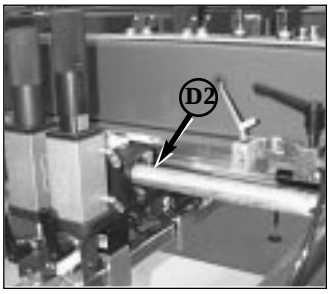


Fig. 2A

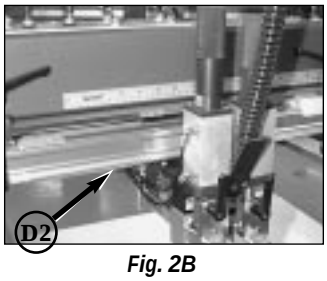


Fig. 2B

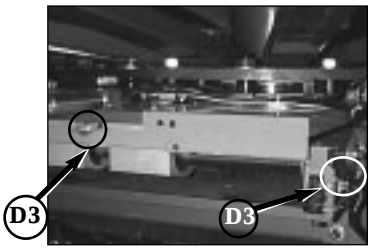


Fig. 3

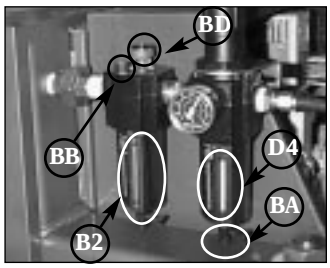


Fig. 4

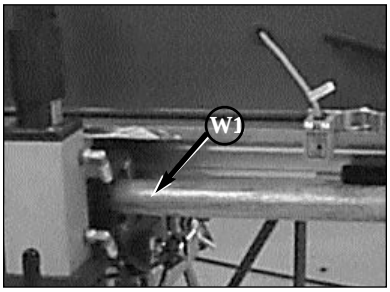


Fig. 5

BB. Remove the air line lubricator fill cap and add 10 weight non-detergent oil into the reservoir until it is three quarters full. Replace the lubricator fill cap. (See Fig.4)

BC. Re-connect the compressed air supply to the system.

BD. Start the index system and observe the rate of lubrication at the sight dome on top of the air line lubrication assembly. The rate of lubrication should be one drop of oil for every eight (8) complete index cycles with all the print heads operational. If this is not the case, adjust the RED Knob, located above the sight dome until the rate is one drop of oil for every eight cycles with all systems operational. Clockwise adjustment of the knob will decrease the rate of lubrication, while counterclockwise will increase the rate of lubrication. (See Fig.4)

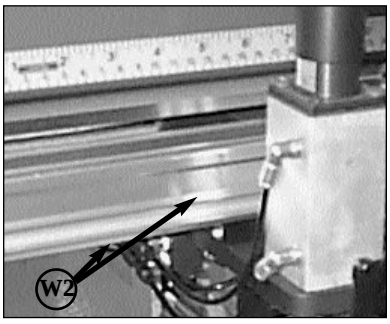


Fig. 6

Weekly -

W1. Clean and lubricate carriage shafts with white lithium grease. Grease may be applied with a small paint brush especially for this purpose. (See Fig.5)

Fig. 7

W2. Clean and lightly oil outside of Tol-O-Matic Band Cylinders print carriage stroke cylinders with 10 weight non-detergent oil.(See Fig.6)

W3. Grease Timken bearing and lower carousel plate with white lithium grease at the point where the index table lift cylinder pistons make contact with the plate. You may use a small paint brush to apply the grease. (See Fig.7)

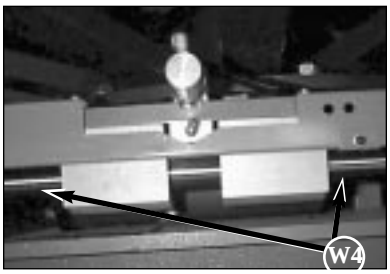


Fig. 8

W4. Apply 10 WD-Non detergent oil with a sponge brush to the index assembly carriage shafts. (See Fig.8)

Monthly -

M1. Clean inside “U” of index registration forks, and outer face of index registration cam follower, bearings and forks, then apply white Lithium grease.(See Fig.9)

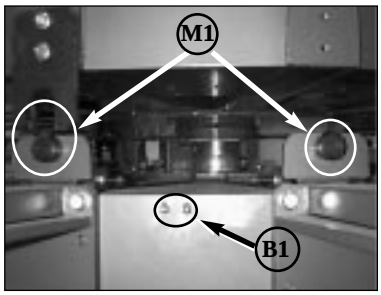


Fig.9

M2. Clean the bearing faces of all index cam followers and apply white Lithium grease. (See Fig.10)

M3. Clean the inside of the index capture fork (clevis) and also the guide way and apply white Lithium grease. (See Fig.10)

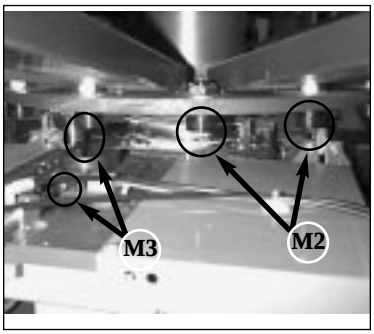


Fig. 10

M4. Drain water from the compressor tank and press manifold located on the bottom of the index chassis base. Be sure that the compressed air supply to the equipment is disconnected and any excess air in the system has been bled off before you loosen the manifold plug. (See Fig.11) Bled air as explained in step B-A Page 71.

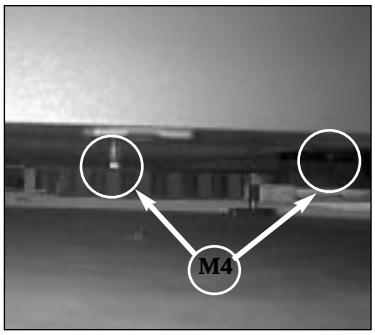


Fig. 11

3 Months -

3M1. Using a brush, apply a thin coating of white lithium grease to micro registration threaded shafts. (See Fig.12)

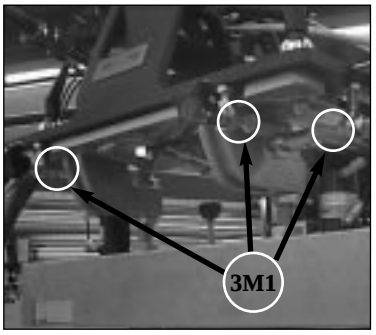


Fig. 12

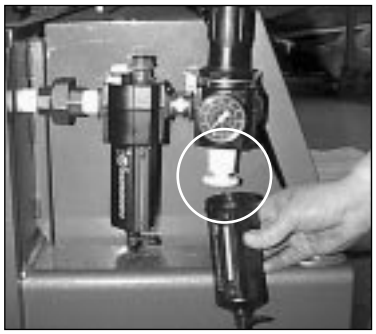


Fig. 13

6 - Months

Replace Air filter in main regulator with (M&R's Part # 2019025). (See Fig.13)

NOTE: Before replacing air filter, follow the instruction on page 71 Section BA, "Draining the Air Out of the Machine".

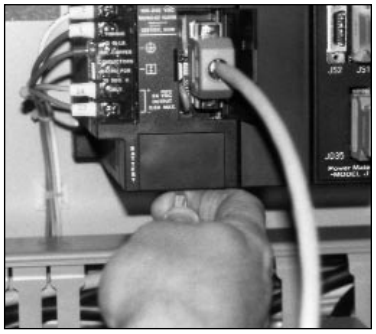


Fig. 14

3 Years -

NOTE: Battery contained in Micro-Processor must be replaced every 3 years. (See Fig. 14)

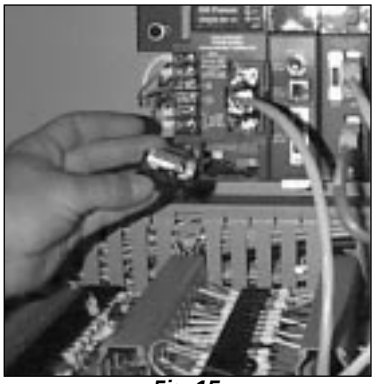


Fig. 15

CHALLENGER SERIES II BATTERY REPLACEMENT

Instructions for the Fanuc PLC Unit.:

The service life of the battery is three years. When the battery is nearly discharged, the ALARM indicator blinks. If this happens, replace the battery with a new one within a week. (M&R Part No. 1017075A) The date by which the first battery must be replaced is written on the side panel of the PLC. (See Fig.15)

For example: *if it says FIRST REPLACEMENT 97/12, that means you should replace the battery no later than December 1997.*

CAUTION

CAUTION: The new battery must be connected within five minutes of removing the old one to preserve the data in the PLC.

To replace the battery, follow these steps:

1. **DO NOT** turn power **OFF** to the machine. (If the power is not on, turn it on.)

2. Detach the cover of the battery compartment of the RAM unit. (See Fig.16)

Fig. 16

3. Remove the old battery from the clip on the cover, then disconnect the battery by pulling on the connector. (You will see the red L.E.D. next to the battery on the CPU light up.)

4. Install the new battery together with the connector.(See Fig. 17) (The Red L.E.D next to battery will turn off.)

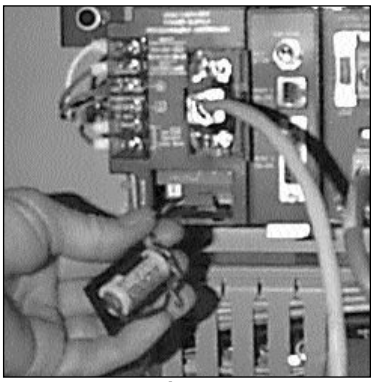


Fig. 17

5. Attach or close the cover of the battery compartment.

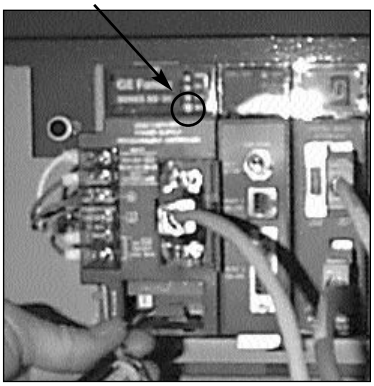


Fig. 18

NOTE: If the battery light stays on after connecting the new battery, re-connect the old battery. (New battery either has no charge or has a bad connector). (See Fig. 18)

Battery replacement instructions for Fanuc Servo Amplifier Unit:
The battery in the Fanuc Servo Amplifier unit also must be replaced at the same time of replacement for the Fanuc PLC unit described previously.
The following steps will guide you in the proper replacement procedure:
Battery for Fanuc Servo Amplifier Unit (M&R Parts # 1017275)

CAUTION

1. You ***MUST*** leave the power on to the machine.

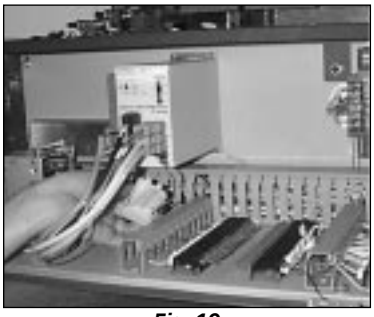


Fig. 19

2. Now, disconnect the old battery from the Servo Amplifier unit and remove it from the underside of the housing (See Fig.19). You will see “Servo Drive Error” message on the interface Panel.

Fig. 20

3. Reconnect the new battery to the Servo Amplifier (See Fig. 20)

4. Press the green reset button at the main control panel and the “Servo Drive Error” will erase from the interface panel.

IMPORTANT

NOTE: If the “Servo Drive Error” does not clear from the interface panel after pressing the green reset button, re-connect the used battery, *(The new battery either has no charge or a bad connector).*

Chapter 11
Recommended Lubricants

Lubricants that you should keep on hand.

		(M&R Part No.)
1 Quart	10WD non-detergent oil.	7017000
1 Tube	White Lithium Grease	7018017
1 Tube	Permatex Super Lube with Teflon	7018031

This Page For Notes:

Chapter 12
Recommended Tools

BASIC TOOL LIST

1. Combination Wrench Set (in Inches)
   1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8
2. Allen Wrench Set (in Inches)
   1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 3/16, 7/32, 1/4, 5/16
3. Allen Wrench Metric Set
   1.5mm, 2mm, 2.5mm 3mm, 4mm, 5mm
4. 12" Adjustable Wrench
5. 6" Clamp
6. Locking Pliers “Vise Grip”
7. 12" Pipe Wrench Aluminum
8. Electrical Pliers
9. Claw Hammer 13" or longer
10. Rubber Mallet
11. Hack Saw
12. 1/2" Drive Racket
13. 1/2" Drive Socket Set
    3/8, 7/16, 1/2, 9/16, 5/8, 1/16, 3/4, 15/16, 1 5/16
14. Needle Nose Pliers
15. Measuring Tape
16. Rat (Round) Tail File
17. 5/16" Nut Drive
18. Screw Starter/Magnet
19. Utility Knife
20. Phillips Screw Driver 7" Long
21. Flat Head Screw Driver 7" Long
22. Flash Light
23. Wire Stripper/Crimper
24. 9" Torpedo Level/with Magnetic Strip
25. Small Phillips Screw Driver
26. Small Flat Head Screw Driver
27. Flat File Coarse and Fine
28. Snap Ring Pliers Int/Ext Rings
29. Multimeter (Multi-Tester)

This Page For Notes:

Chapter 13
Trouble Shooting

PROBLEM 1: No power to control panel. Nothing works.

PROBABLE CAUSE:	SOLUTION:
1. On-Off Switch located on the control Panel box is off.	1. Check the on-off switch and be sure it is in the "on" position.
2. Circuit breaker has tripped or fuse has blown. (Breaker Panel or Disconnect Box).	2. Check for 220 Volts, three phase at the machine's terminal block. Reset the circuit breaker or replace the fuses as needed.
3. Control power 2 1/4 Amp fuse has blown or Control power. 1 Amp fuse has blown.	3. Remove 2 1/4 Amp fuse from the control box and check with tester. Replace if blown. Fuse holder will have wire #1 and #17 attached to it. After replacing fuse, and turning power back on to the machine, check for 110 vac across wire #1 and wire #2 with volt meter. Remove 1 Amp fuse from the control box and check with tester. Replace if blown. Fuse holder will have wire #1 and #19 attached to it.
4. A short circuit exists in the 24 volt DC power circuit of the press.	4. Check for 24 vdc across wire #3 and #4 with a volt meter. If no voltage is present check 1 amp fuse, (fuse holder will have wire #4 and #20). Pull fuse out of fuse holder and check with tester.
5. A print head proximity switch may be damaged or inoperative. (Short Circuit across wire #3. and #4).	5. Check for any physical damage done to any proximity switch on the Print Heads and replace if necessary. Also check for any kind of pinch marks on proximity cables.

PROBLEM 2: Power is indicated to controls, but nothing works.

PROBABLE CAUSE:	SOLUTION:
1. There is not enough air pressure to the machine (100 lbs. minimum per square inch).	1. Be sure that the compressor has been turned on and the shut-off valve is open. Adjust the main air regulator to at least 100 lbs. minimum per square inch.
2. Carousel arms are not located in correct position.	2. Manually move table into lock position. This starts indexer again and the index clevis will lock into place.

3. Open Safety cord between print heads. ("Alarm" will appear in L.C.D. Display)	3. Check to make sure all the safety cords are properly plugged in. Clean any ink that could have accumulated on safety cord connectors.
4. Index "ON" proximity is damaged or mis-adjusted.	4. Check to see if the L.E.D. indicator light comes on the proximity switch. (Index on proximity). When the index cam follower is in front of the switch you should see the L.E.D. indicator come on . If it does not, adjust the proximity switch with two 11/16" open-end wrenches until the L.E.D light comes on. (See page 108)
5. A short circuit exists in the 24 Volt D.C. power circuit of the press.	5. Check 1 Amp fuse with multi-tester. (Fuse holder will have Wire #4 and #20). Check for 24 vdc with volt meter across wires #3 and #4 in control box.
6. A print head proximity switch may be damaged or inoperative (Short Circuit across wire #3 and #4).	6. Check for any physical damage done to any of the proximity switches and their cable on all the print heads and replace if necessary. Also check for any kind of pinch marks on Proximity cables.

PROBLEM 3: During set-up a print head start button is pushed but the carousel does not rise to the print position.

PROBABLE CAUSE:	**SOLUTION:**
1. One or more print heads are turned on either single or double print position.	1. Check each individual head switch and be sure that all switches are in the off position on the control panel.
2. Emergency stop switch has been pushed and locked in. (L.C.D. display will read "Emergency Stop")	2. To correct, pull out the red "EMERGENCY" button and push the green "RESET" button to clear the alarm.
3. Not enough air pressure to the machine (100 pounds per square inch minimum).	3. Be sure that the compressor has been turned on, and that the shut-off valve is opened. Adjust the main air regulator to at least 100 pounds per square inch minimum.

4. Lift valve solenoid coil on Mac valve is defective.	4. Remove the base cover next to the indexer and manually activate the valve by pushing on the white over-ride button. If indexer goes up and down the valve is fine. Locate wires #2 and #96 and carefully check wires from control box. With a volt meter, they should read 110 volts AC. If voltage is present, replace valve solenoid. If voltage is not present, trace for broken wires or loose connectors (The test should be taken after pressing on the head start button).

PROBLEM 4: Indexer does not rise all the way up into print position.

PROBABLE CAUSE:	**SOLUTION:**
1. Air cushions on lift cylinders are out of adjustment.	1. To adjust the cylinder cushions, remove the base covers and locate the Allen Head Screws on the top of both lift cylinders. Insert Allen Wrench and turn both screws counter clockwise 1/4 turn or less to solve the problem.
2. Off-contact is set too low, or either the screen frame or holders are hitting the pallets when the index table raises.	2. The off-contact must be re-adjusted. The frame should be adjusted so that there is at least 1/16" off-contact between the frame and material being printed. (On models equipped with the Central Off-Contact Lever, set lever for desired off-contact distance.)

PROBLEM 5: The indexer lifts and lowers either too slow or too fast.

PROBABLE CAUSE:	**SOLUTION:**
1. Mis-adjustment of the lift cylinder flow-control valves.	1. Remove the base cover and locate the lift cylinder MAC Valve. The left flow control valve controls the lifting of the indexer, the right controls the lowering. To increase the speed, turn the knob counter-clockwise. To slow the action, turn knobs clock-wise.(See Page 110)
2. Inadequate air pressure or restricted compressed air supply to the equipment.	2. Check to make sure you are getting 110 PSI to the machine by looking at the main regulator (See Page 71, Fig. 4). As you run the machine you should not see a pressure drop any greater than 5 PSI. If you do, check your compressed air system for restrictions.

PROBLEM 6: Indexer shudders or is very noisy when going up or down.

PROBABLE CAUSE:
1. The main shaft bearings need lubrication. There is improper maintenance being performed. Lubricate the main index shaft with white lithium grease.

SOLUTION:
1. The two Zerk grease fittings (See Page 73,Fig 9) should be greased at least twice weekly. Use grease gun filled with white lithium grease. Pump the handle until you see a small amount of grease above the hub to the indexer. You will also see grease come out of the bottom, from the bottom brass bearing next to the Timken Bearing.

PROBLEM 7: Heads finish the print cycle but the indexer does not go down.

PROBABLE CAUSE:
1. Check the L.C.D. display "ALARM" will be displayed indicating that one of the print proximity switches of the heads being used is not operating correctly or not on.

SOLUTION:
1. After determining which proximity switch is not operating properly, check to see if you can get the proximity to operate properly by triggering the proximity with a piece of metal. If proximity indicator light comes on, adjust proximity clearance between prox tip and the flag on the print head carriage.

PROBLEM 8: Air and power are OK, but indexer does not move.

PROBABLE CAUSE:
1. Emergency switch is pushed in and locked. (L.C.D. display will read "EMERGENCY STOP")

2. Safety cord is pulled apart or the wire is broken. (L.C.D. display will read "ALARM")

3. Index drive assembly is out of position.

4. Carousel is located in wrong position.

SOLUTION:
1. To correct, pull out the red "EMERGENCY" button and push the green "RESET" button to clear the alarm.

2. Check all safety cords at plugs with Ohm Meter for broken wires and replace or repair. Also clean any ink, that could have accumulated on safety cord connectors.

3. Push reset button for the servo motor to return to the start position. Press the reset button for one second.

4. Manually move indexer to a lock position. (Pallets should aligned with the print heads.) Then push reset button so that index fork (Clevis) engages index cam follower.

5. Index “ON” proximity switch is damaged or mis-adjusted.	5. Check to see if the L.E.D. indicator light comes on the proximity switch (Index on proximity). When the index cam follower is in front of the switch you should see the L.E.D. indicator come on. If it does not, adjust the proximity switch with two 11/16" open-end wrenches until the L.E.D. light comes on. (See Page 108)

PROBLEM 9: Indexer rotates but the table assembly does not lift into print position.

PROBABLE CAUSE:	**SOLUTION:**
1. Index “ON” proximity switch is damaged or mis-adjusted.	1. Check to see if the L.E.D. indicator light comes on the proximity switch (Index on Proximity). When the index cam follower is in front of the switch, you should see the L.E.D. indicator come on. When the index cam follower is not in front of the proximity switch, you should not see the L.E.D. indicator come on. If switch does not operate as explained previously, but stays on all the time, you must replace the proximity switch with a new one (See page 108).
2. Lift valve solenoid coil on mac valve is defective.	2. Remove the base cover next to the indexer and manually activate the valve by pushing in the white over-ride button. If the indexer goes up and down the valve is operational. Locate wires #2 and #96 and carefully check wires from control box. Using a volt-meter, check between wires #2 and #96 to see if it reads 110 volts AC. If voltage is present, replace valve solenoid. If voltage is NOT present, check for broken wires or loose connectors. (This test should be taken after machine has finished rotating (indexing)).

PROBLEM 10: In the automatic mode the press cycles a few times and then stops.

PROBABLE CAUSE:	SOLUTION:
1. The center proximity switch is loose or not making contact.	1. Push the emergency stop button. Check to see if the proximity switch mounted to the underside of the print head support arm is loose. Before tightening adjust so that the proximity switch tip is approximately 1/8" away from the indexer registration bracket when the carousel is in the upper (lifted) position. The L.E.D. light on the proximity switch will be on when the switch is properly adjusted.
2. Safety cord has broken or has a loose wire connection. (L.C.D. display will read “ALARM”)	2. Check all safety cords at plugs with an OHM Meter for broken wires, and replace or repair. Clean any ink that has accumulated on safety cord connectors.

PROBLEM 11: Indexer rises and head starts to print but does not complete its stroke.

PROBABLE CAUSE:	SOLUTION:
1. Head flow control valve is incorrectly adjusted (closed).	1. Turn the knob on the flow control valve that is farthest away from you counter-clockwise to increase air-flow to the stroke cylinder. (See page 57, Fig. 10)
2. Center table proximity switch not giving signal.	2. Proximity switch is loose and needs to be adjusted as explained previously. (Problem 10)
3. Solenoid valve is sticking or there is an air leak.	3. Remove covers from top of carousel and check for air leaks. Press on the white button on the end of the head valves to be sure that they are free and that nothing mechanical has stopped the head from moving. In addition, any dirt that might be blocking the spool slides can be forced through the valve (See Page 97 and 99).

PROBLEM 12: The indexer over-travels and is so rough that it clanks or the machine moves.

PROBABLE CAUSE:
1. Operator has changed to different size pallets and did not make adjustments to the "Pallet sizes".

SOLUTION:
1. Reset "Pallet Sizes" adjustment located in the "OPTIONS" menu of the Operator Interface Control Panel. (See page 64)

PROBLEM 13: The print head goes through the flood motion and print motion, but the flood bar and squeegee do not go through the change over.

PROBABLE CAUSE:
1. Solenoid Mac valve for the chopper cylinders has gone bad.

SOLUTION:
1. With the power turned off to the machine, manually activate the Mac Valve for the chopper cylinders. If the action takes place, the valve is good.

You must now check the solenoid for the condition of the coil with an OHM Meter. If the coil reads open, replace with new one (See Page 97 and 99).

ALARM LIST FOR THE CHALLENGER SERIES II WITH THE MITSUBISHI PLC AND SERVO DRIVE, AND THEIR DEFINITIONS.

EMERGENCY-PANEL. – This alarm will appear if the Emergency stop push button on the control panel is pushed "IN". In order to clear the alarm, first the push button must be pulled "OUT" and then the Green reset push button must be pressed momentarily to clear the alarm.

SAFETY CIRCUIT. – This alarm will appear if one or more of the yellow safety cords, which are located on the print heads is not properly connected. In order to clear the alarm, first you must make sure that all the yellow safety cords are properly connected and then press on the Green reset push button momentarily to clear the alarm.

TIMERS NOT SET. - This alarm will appear after the registers in the plc program have been cleared or set to zero, in order to clear this alarm the values to the registers in the plc must be entered into the program (please contact the Technical Service Department for the proper values)

RESET ERROR. – This alarm will appear if the Reset input signal is being sent to the plc, and the signal has not discontinued after 10 sec of receiving it. This error will appear after 10 sec of receiving a constant signal from any reset push button (shorted switch) on the machine

AIR PRESSURE. – This alarm will appear if the incoming air pressure to the machine has dropped below 75 psig. In order for the alarm to clear, air pressure must reach a minimum of 100 psig. Check at the incoming regulator to confirm that the air pressure to the machine is proper.

LIFT PROX ERROR. – This alarm will appear if the signal from the lift prox (table prox) is either staying on all the time or the signal is not being sent to the plc, after the table has raised into the registration forks.

INDEX ON PROX ERROR. – This alarm will appear if the signal from the index on prox is either staying on at all the time or the signal is not being sent to the plc, after the table has been aligned with the print heads or after the table has rotated (index).

SERVO FWD TIME OUT. - This alarm will appear after the servo drive not being able to send or not sending feed back information to the plc about its movement. After the plc gives a output to the servo drive to move, it will wait 6 seconds for this feed back information. If it is not received, the alarm will appear.

LOCK OFF PROX ERR. – This alarm will appear if the signal from the lock off prox (fork prox) is either staying on all the time or the signal is not being sent to the plc. After the index clevis is pulled away from the index cam follower bearings (table is in the free wheel mode)

DBL INDX PROX ERR. – This alarm will appear if the signal from the double index prox, is either staying on all the time or the signal is not sent to the plc, after the double index nylon fork has pulled away from the index cam follower bearing.

SERVO RVR TIME OUT. -This alarm will appear should the servo drive fail to send, or not send feed back information to the plc about its movement in the reverse motion. After the plc gives a output to the servo drive to move, it will wait 4 seconds for this feed back information, if it is not received. the alarm will appear.

SERVO NOT HOME. - This alarm will appear if the servo index drive system is not at the starting position after pressing on the green reset button, the alarm will appear after 5 seconds of the index drive not reaching the starting position.

MOTION CARD ALARM. - This alarm will appear if there is an error with the motion card of the plc, either communication between the absolute encoder or servo amplifier has been lost, or the motion card has a internal circuit failure.

SRVO AMPLIFIER ALARM. - This alarm will appear if there is an error on the servo amplifier, you must check the read-out on the face of the servo amplifier to see which code is given, this way the source of the problem can be determined.

MOTION CARD NOT READY. - This alarm will appear if the motion card detects a failure within the servo drive system, be it a positioning problem or a hardware problem etc.

HOME POSITION LOST. - This alarm will appear if the reference position (home position) of the servo drive has been lost. In order to clear the alarm, the green reset button must be pressed and the servo drive will search for the home prox. Switch, this way determining the reference position (home position).

HOME RETURN ON. - This alarm will appear if the servo drive is going through its homing mode, the servo index drive (servo motor) will move at a very low speed while searching for the home prox, after the servo finishes the homing mode the alarm will disappear.

H 1 FRONT PROX ERR. THRU H 14 FRONT PROX ERR– This alarm will appear if the signal from the front prox is either on at all times or the signal is not being sent to the plc, after the print head carriage has reached the front position (outside) of the print head.

H 1 REAR PROX ERR THRU H 14 REAR PROX ERR.- This alarm will appear if the signal from the rear prox is either on at all times or the signal is not being sent to the plc, after the print head carriage has reached the rear position (in side) of the print head.

FLASH 1 TO FAST THRU FLASH TO .- This alarm will appear if either the inboard or outboard speed of the head used as a flash head (infra-red only) is set too fast. The maximum speed of travel should not be faster then 1 sec from the outside position of the head to the inside position of the head and vise-versa.

BATTERY LOW PLC. - This alarm will appear if the lithium battery in the CPU for the plc, runs low on voltage or if it is disconnected. If the alarm (battery low plc) appears, do not turn the power off to the machine or the plc will loose it's program. The battery in the plc must be connected or replaced if the voltage is low, after doing so the alarm will disappear.

SERVO NOT READY. - This alarm will appear if power is turned off to the machine and then turned on again, the alarm will clear it self within the next 4 seconds. Additionally, this alarm will appear if the emergency stop is pushed in or if either one of the two limit switches is triggered.

ABS COMMUNICATION. - This alarm will appear after 4 attempts by the servo amplifier and the plc to establish communication, if no communication is established the alarm will appear.

FORWARD LIMIT. - This alarm will appear if the limit switch which is placed away from the servo motor is tripped by the servo index drive assembly, in order to clear the alarm the limit switch must be reset by moving the Servo index drive assembly away from the limit switch.

REVERSE LIMIT. - This alarm will appear if the limit switch which is placed next to the Servo drive motor is tripped by the servo index drive assembly, in order to clear the alarm the limit switch must be reset by moving the Servo index drive assembly away from the limit switch.

FLASHES NOT SET - This alarm will appear if the flashes programmed in the MTA E-300 do not match the flashes programmed in the Revolver mode set-up screen. This alarm will only appear if the machine is placed in the Revolver mode.

SYSTEM ERROR - COMM ERROR.- This alarm will appear if the communication between the CPU and the E-300 interface panel is lost or interrupted. The 25 pin connector behind the E-300 interface panel or the 25 pin connector which is connected to the CPU has come loose. If both 25 pin connectors are properly connected there might be an “Open circuit” in one of the communication wires inside the cable connecting the CPU with the E-300 interface panel.

NOTES:

Chapter 14
Spare Parts

CHALLENGER II Spare Parts List

(Spare parts that should be kept on hand)

NAME		QTY	PARTS #
Valves:			
Stroke		2	2010034
Chopper		2	2011000
Cylinders:			
Airlocks		2	2009023
Airclamps		2	2009118
Chopper		2	9150003
Stroke		1	2009303
Clevis		1	8080252A
Cam Follower Bearing		4	3023064
Fuses:			
FLNR	20 Amp	1	1004002
FLNR	5 Amp	1	1004049
FLNR	2.25 Amp	1	1004080
FLNR	.5 Amp	1	1004021
FLNR	1 Amp	1	1004022
NLN	1 Amp	1	1004060
Safety Cords:			
		2	8080160
Air Tubing:			
	3/8"	300"	2001002
	1/4"	300"	2001000
	5/32"	300"	2001001
Electrical Switches:			
Push Button		2	1010006
Toggle on-off-on		2	1017157
Toggle on-off		2	1017158
Two Pole		2	1010011
With level Seal		2	1010007

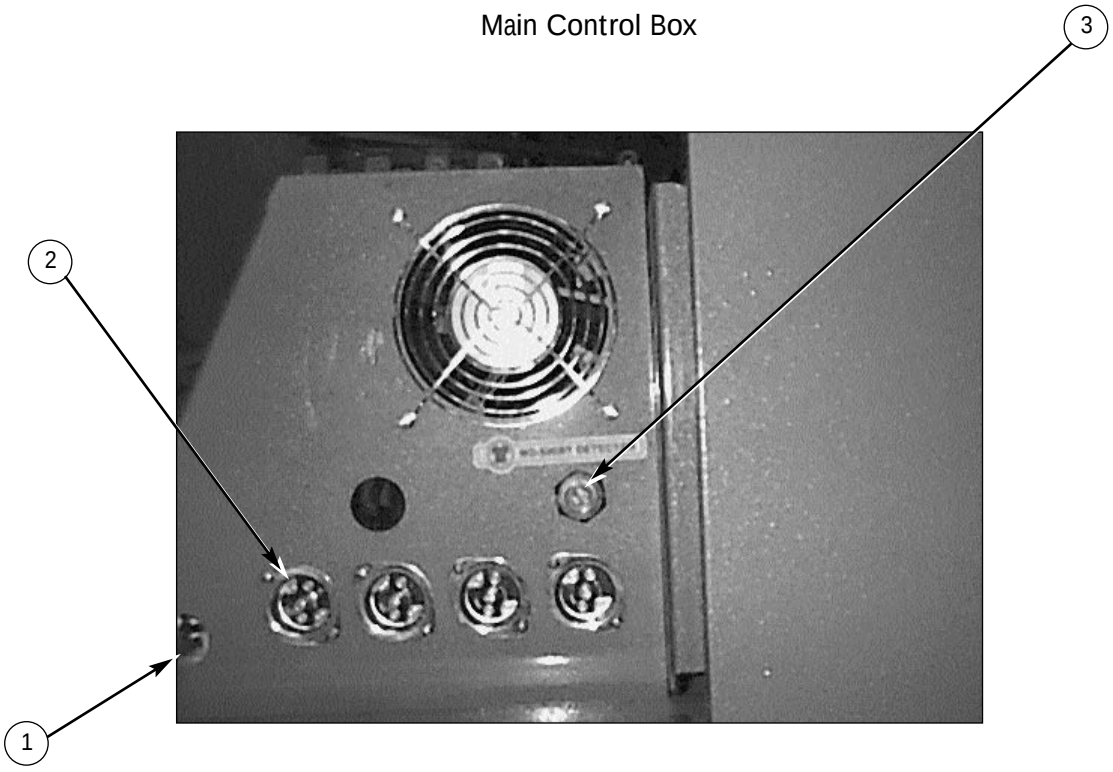
CHALLENGER II Spare Parts List (continued)

(Spare parts that should be kept on hand)

NAME		QTY	PARTS #
Proximity Switches:			
Square		2	1010005
Round	3 wire	2	1010012
Round	4 wire	1	1010082
Flow Control:			
Flow Control		2	2018001
Kipp Elisa Knobs:			
Female Handle		2	3032001
Male Knob	10/32	2	3032000
Male Knob	5/16	2	3032002

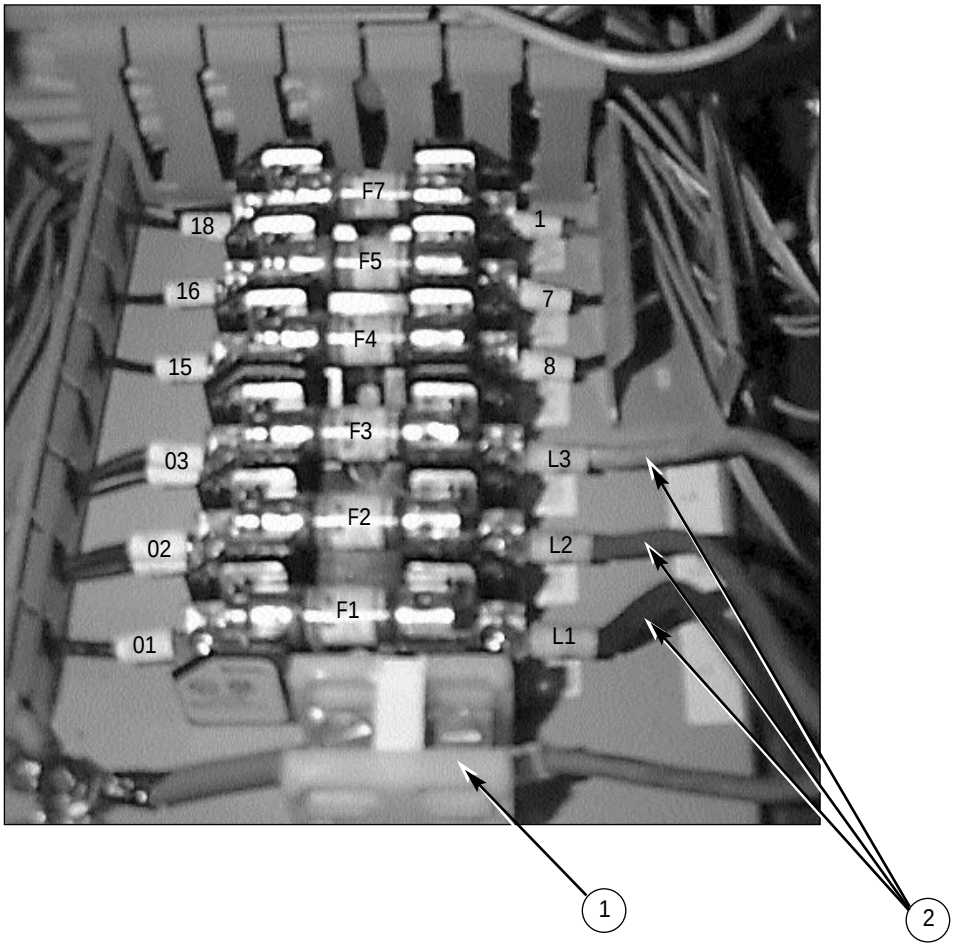
Chapter 15
Replacement Parts

Main Control Box



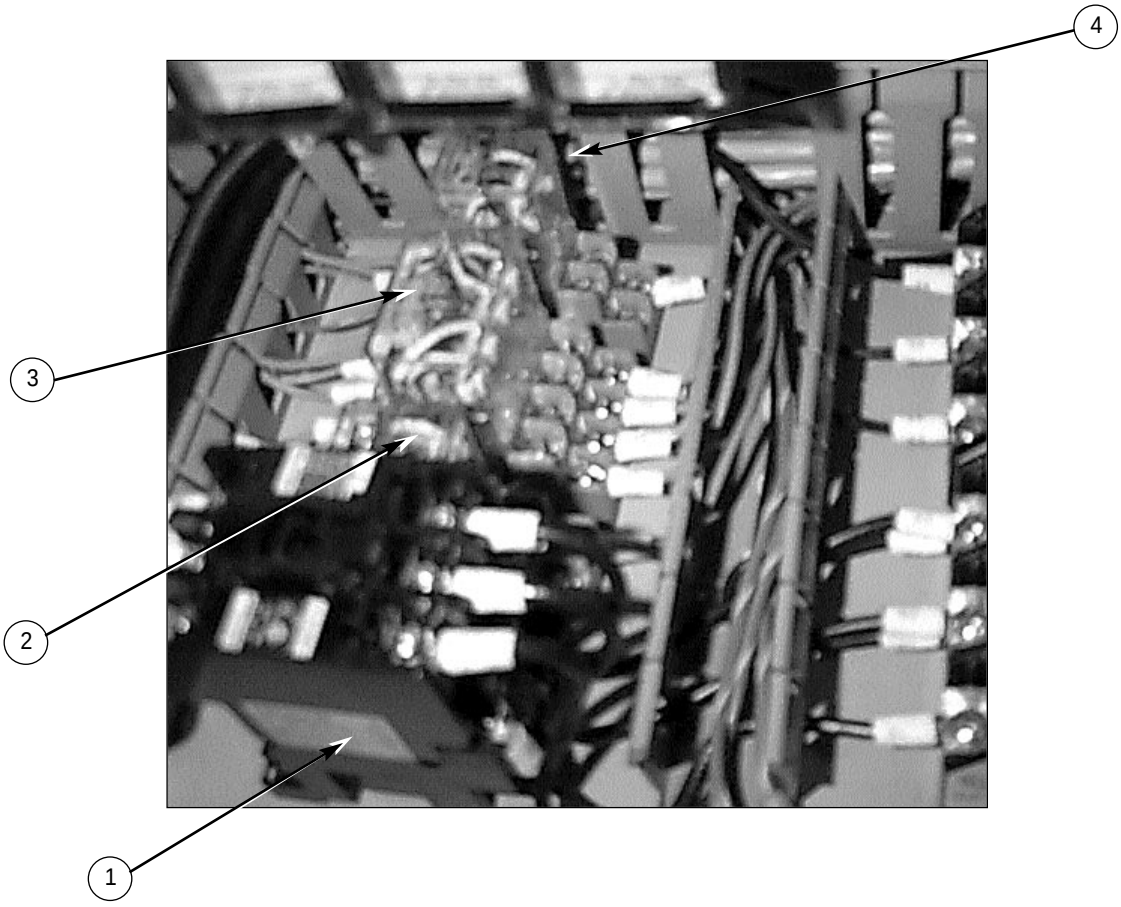
	Part Name	Part Number
1	Electric Power - 220 Vac	Ref. Only
2	3 Way Locking Receptacle 15 Amp	1020292
3	Connector Multi-Con-X Panel 3S	1020035

Main Control Box (Continued.)



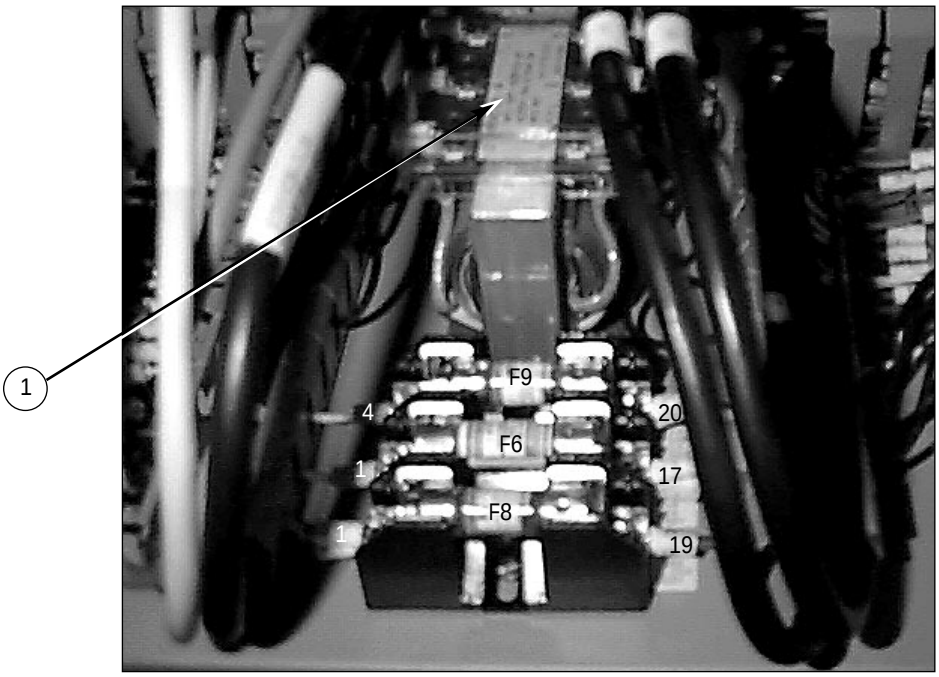
Part Name		Part Number
F1	Fuse - 20 Amp, 250V - Time Delay	1004002A
F2	Fuse - 20 Amp, 250V - Time Delay	1004002A
F3	Fuse - 20 Amp, 250V - Time Delay	1004002A
F4	Fuse - 5 Amp, 250V - Slow-Blow	1004049
F5	Fuse - 5 Amp, 250V - Slow-Blow	1004049
F7	Fuse - 1/2 Amp, 250V - Slow-Blow	1004021
1	Ground Terminal Block	1033001
2	Power - Hook-up	Ref. Only

Main Control Box (Continued.)



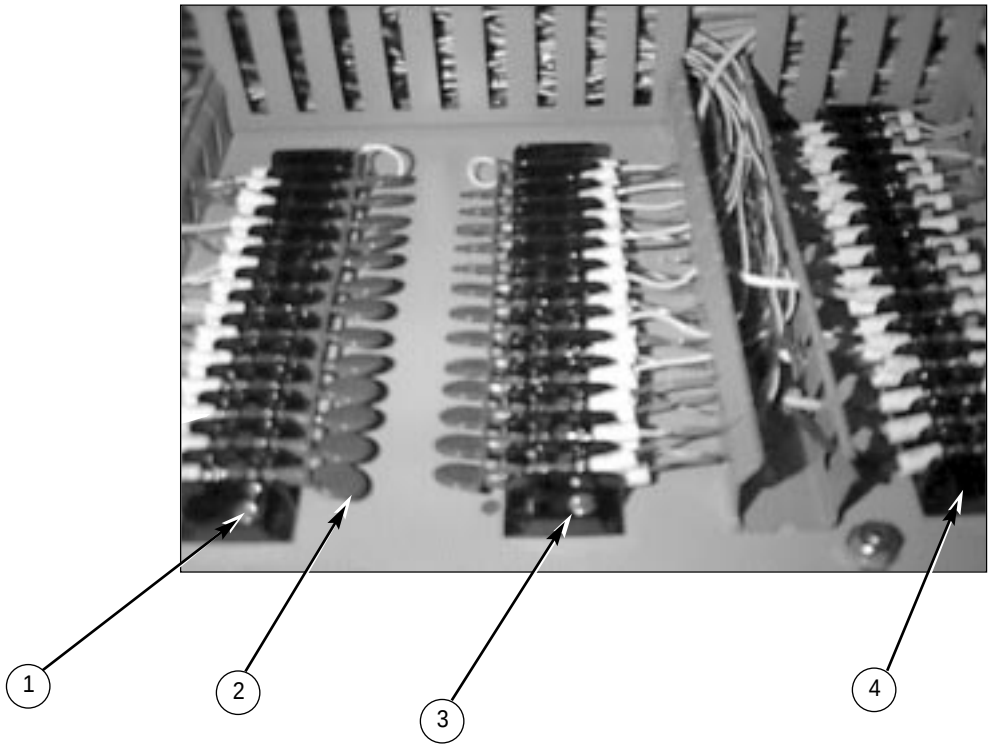
	Part Name	Part Number
1	Magnetic Contactor - 30A, 5HP	1011096
2	Idec Relay 2 Pole, 120V (Safety Relay)	1011005
3	Idec Relay 4 Pole, 120V (Quartz Relay)	1011021
4	Idec Relay 2 Pole, 24V (Dbl. Index Lock Relay)	1011017

Main Control Box (Continued.)



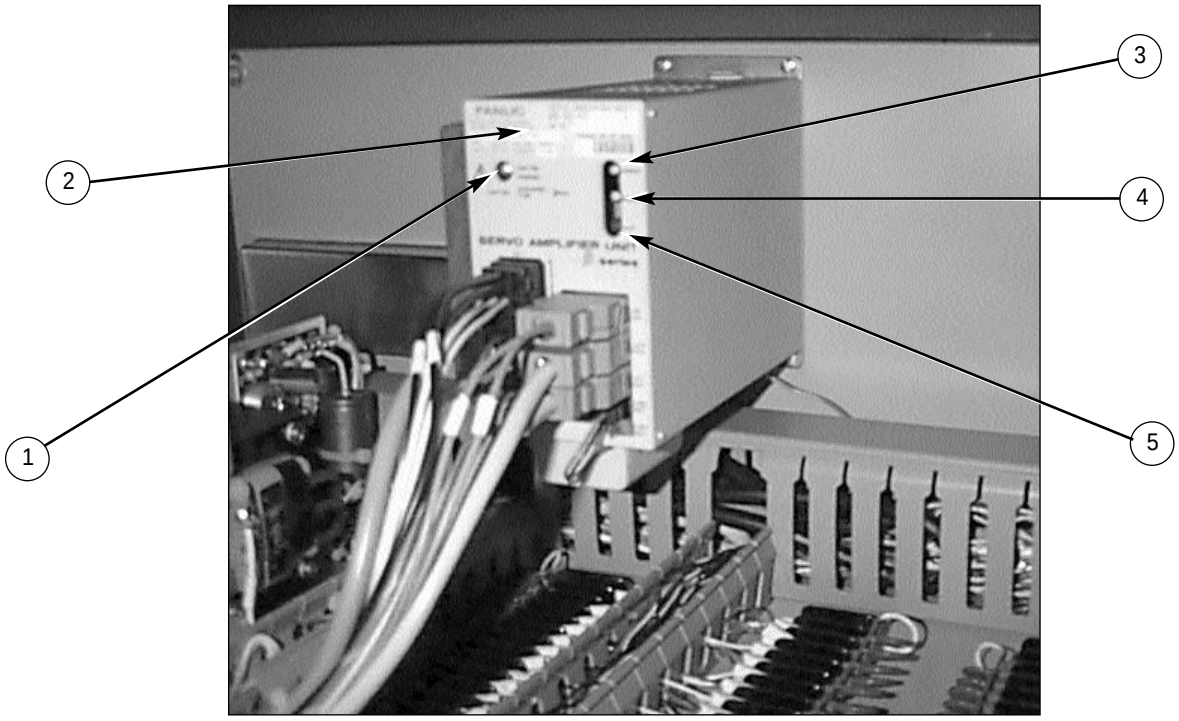
Part Name		Part Number
F8	Fuse 1 Amp, 250V, - Non-1	1004061
F6	Fuse 2 1/4 Amp, 250V - Slow-Blow	1004080
F9	Fuse 1 Amp, 250V - Slow-Blow	1004022
1	Line Filter 5.4W, GE Fanuc	1017268

Main Control Box (Continued.)



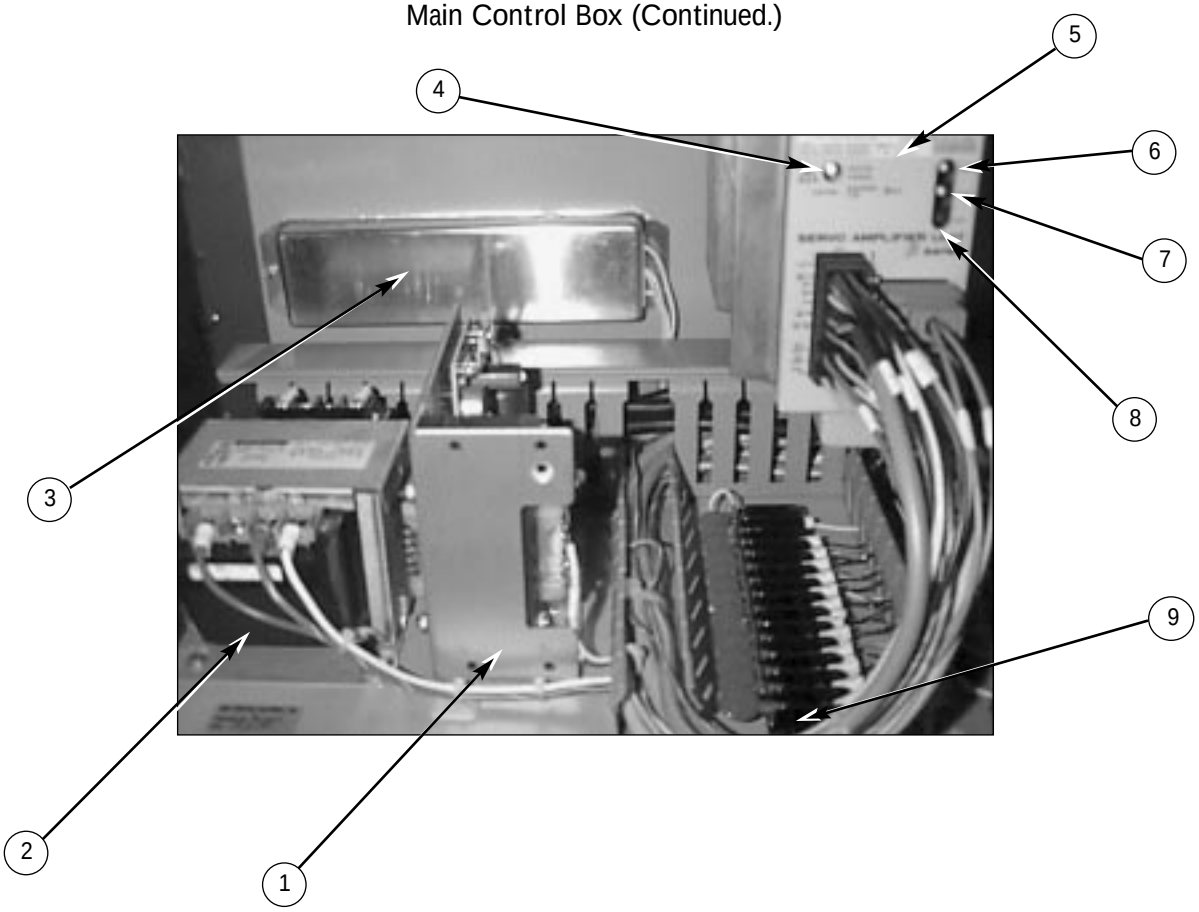
	Part Name	Part Number
1	Terminal Block Cinch 16 Term. (Wires #96 thru #110)	1003016
2	Varistor - 175 VDC	1023000
3	Terminal Block Cinch 16 Term. (Wires #109 thru #125)	1003016
4	Terminal Block Cinch 16 Term. (Wires #4, #3, #2 #1, #5 and #02)	1003016

Main Control Box (Continued.)



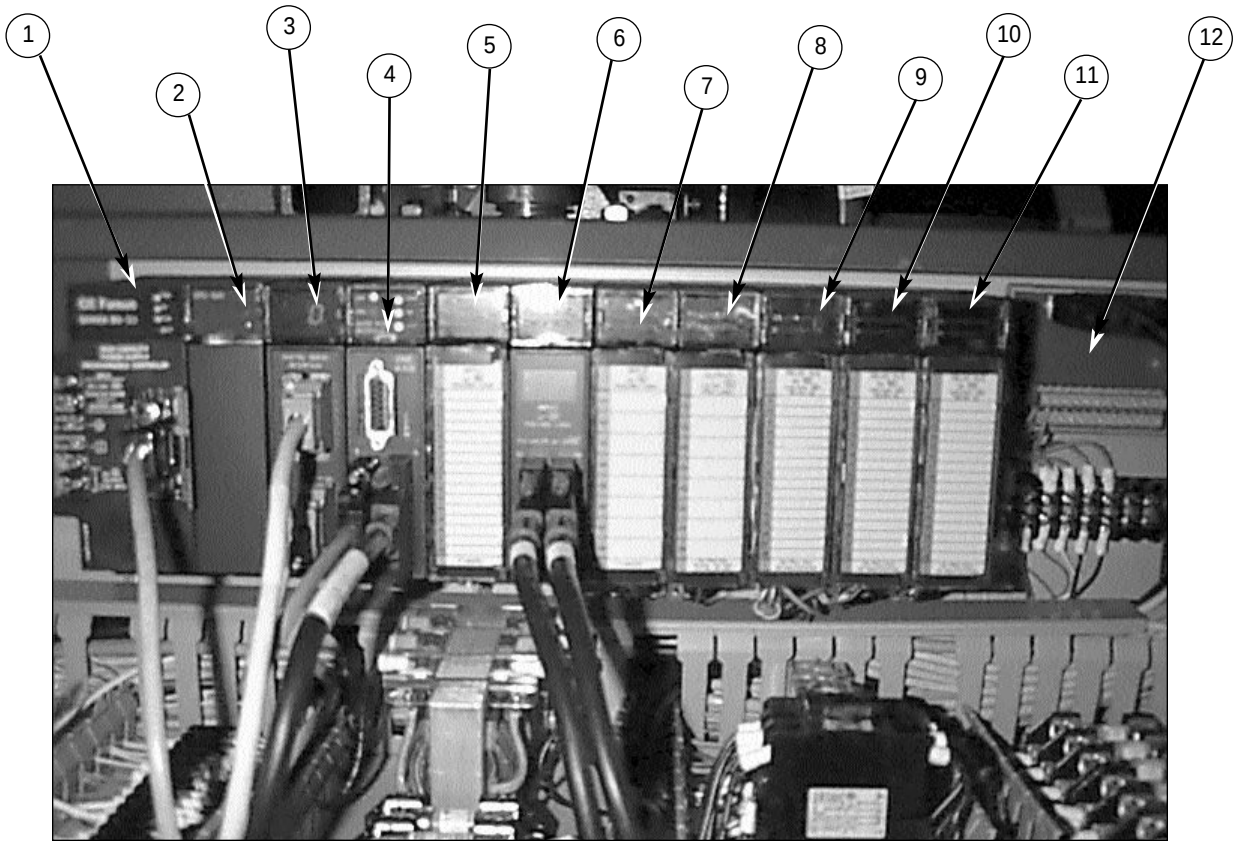
	Part Name	Part Number
1	3 Phase Power Indicator Light	Ref. Only
2	GE Fanuc Servo Pkg. AC12/2000	1017263
3	Green 24 VDC Power Indicator Light	Ref. Only
4	Green Ready Indicator Light	Ref. Only
5	Red Alarm Indicator Light	Ref. Only

Main Control Box (Continued.)



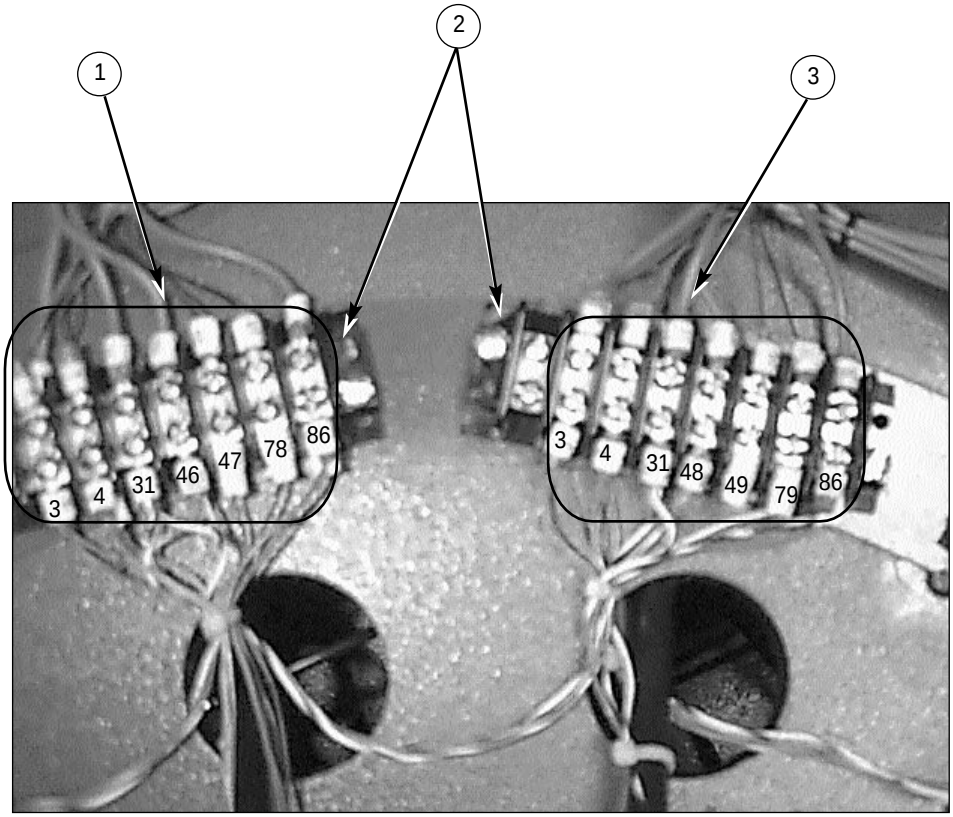
	Part Name	Part Number
1	Power Supply DC - 24V, 2.4 Amp	1024016A
2	Transformer Machine Tool 250 V	1019005
3	Discharge Register	1017252
4	3 Phase Power Indicator Light	Ref. Only
5	GE Fanuc Servo Pkg AC - 12/2000	1017263
6	Green 24 V DC Power Indicator Light	Ref. Only
7	Green Ready Indicator Light	Ref. Only
8	Red Alarm Indicator Light	Ref. Only
9	Terminal Block Cinch 16 Term. (Wires #93A thru #141)	1003016

Main Control Box (Continued.)



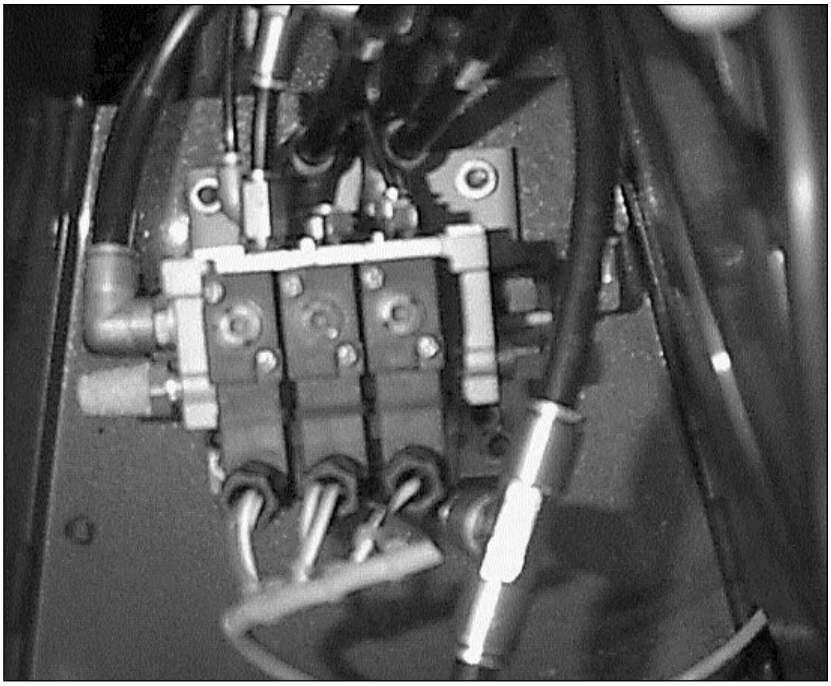
	Part Name	Part Number
1	GE Power Supply - 120/240 VAC	1017246
2	CPU Module 340 - 32k Words	1017269
3	GE Fanuc Power Mate J Digital Servo Interface	1017248
4	Axis Pos. Module	1017248
5	Input module 16 Pt. - 24V, (Con. Wire #4)	1017148
6	GE 24V Input Module Neg/Pos	1017244
7	GE 24V Input 8 pt. Neg/Pos, (Con. Wire #3)	1017260
8	GE 24V Output 8 pt., (Con. Wire #3)	1017261
9	Output Relay Module (2A)16Pt., (Con. Wire #1)	1017182
10	Output Relay Module (2A)16Pt., (Con. Wire #1)	1017182
11	Output Relay Module (2A)16Pt., (Con. Wire #1)	1017182
12	Fanuc Servo Terminal Block	1017276

Top Carousel Replacement Parts



	Part Name	Part Number
1	Terminal Wire Spade #6 - Red	1003008
2	Terminal Block Cinch 8 Term. Heads #1 thru #14	1003003
3	Terminal Wire Spade #6 - Blue	1003009

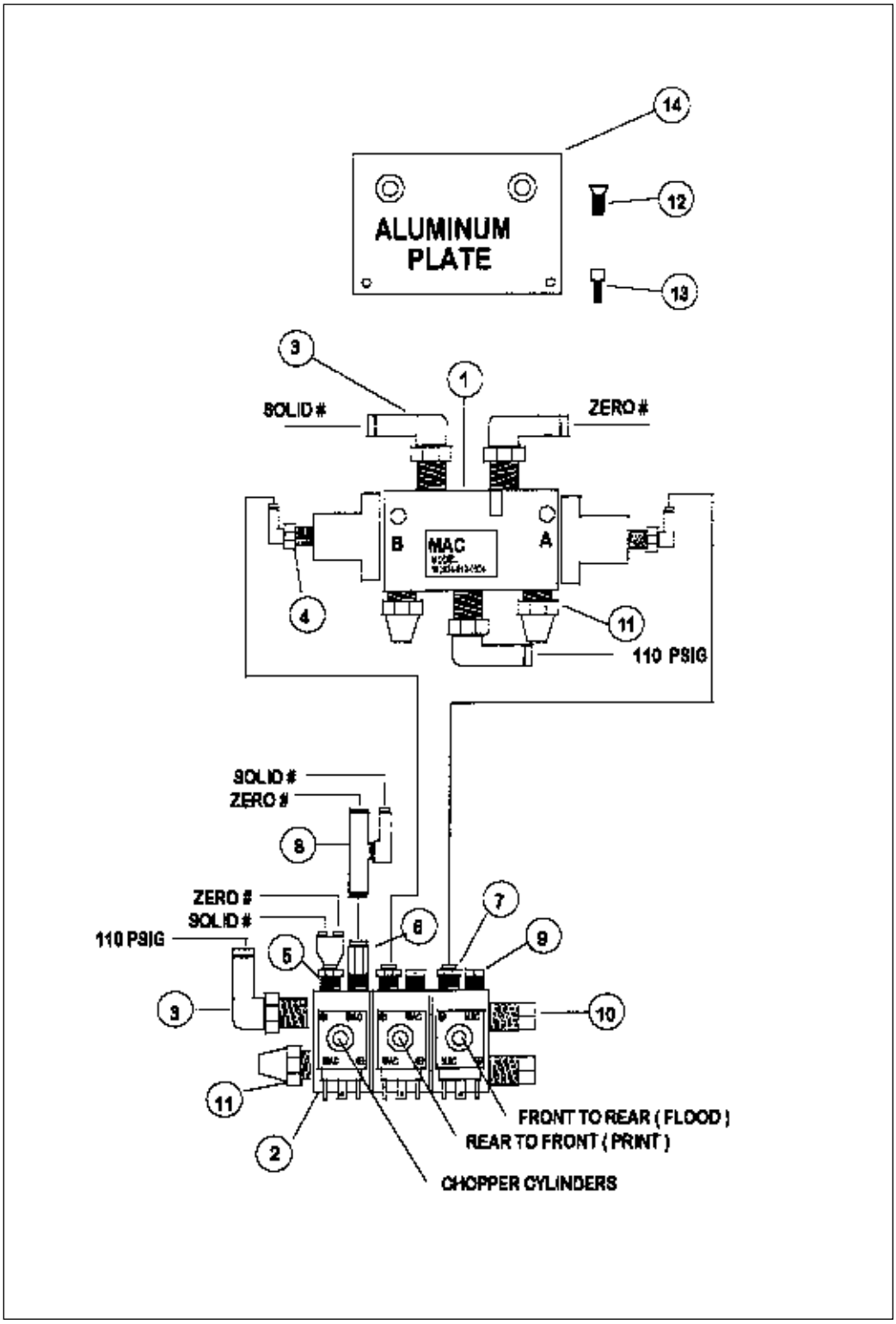
Top Carousel (Continued.)
Mac Block Assembly for Print Head (Stroke and Chopper)



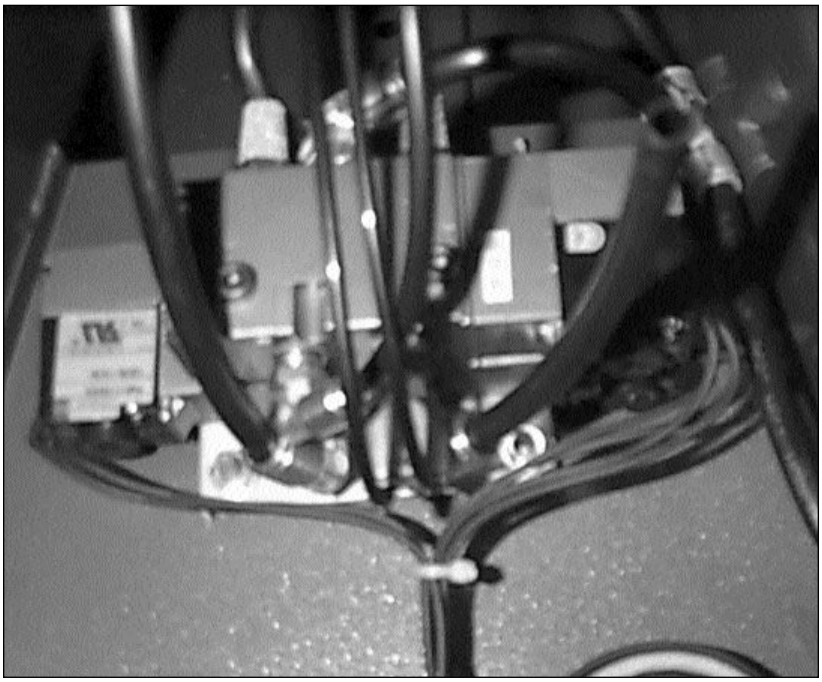
* See Page 101 exploded illustration for part number.

	Part Name	Part Number
1	Mac Pilot Pressure Valve	2012046
2	Squeegee Valve Blk 3 Col	2012018
3	Fitting Male SWIV ELB 1/4 NPT	2003013
4	Fitting Male SWIV ELB 1/8 NPT	2003004
5	Fitting Male “Y” 1/8 NPT	2003034
6	Fitting Male Conn. 1/4" Tube	2003001
7	Fitting Male Conn. 5/32" Tube	2003000
8	Head Connecting Fitting Ch	8090063
9	Plug Square Head Block 1/8	2006002
10	Plug Square Head Block 1/4	2006000
11	Muffler 1/4	2014000
12	Flat Soc Cap SC 1/4-20 x 2"	3010063
13	Button Soc Cap 1/4-24 x 3/4"	3001002
14	Squeegee Valve Mount Plate C	9150066

Top Carousel (Continued.)
Mac Block Assembly for Print Head (Stroke and Chopper)



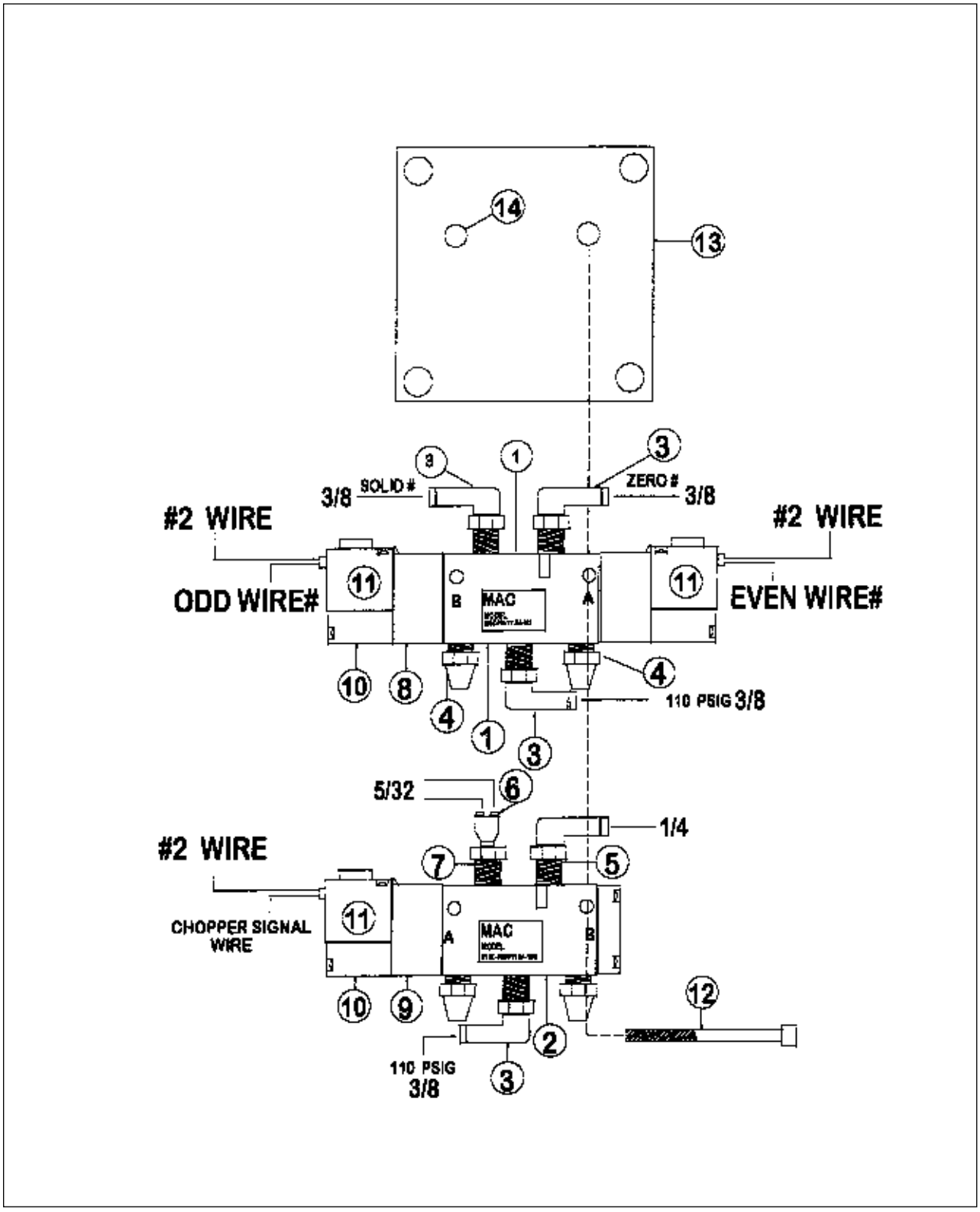
Top Carousel (Continued.)
Mac Block Assembly for Print Head (Stroke and Chopper)



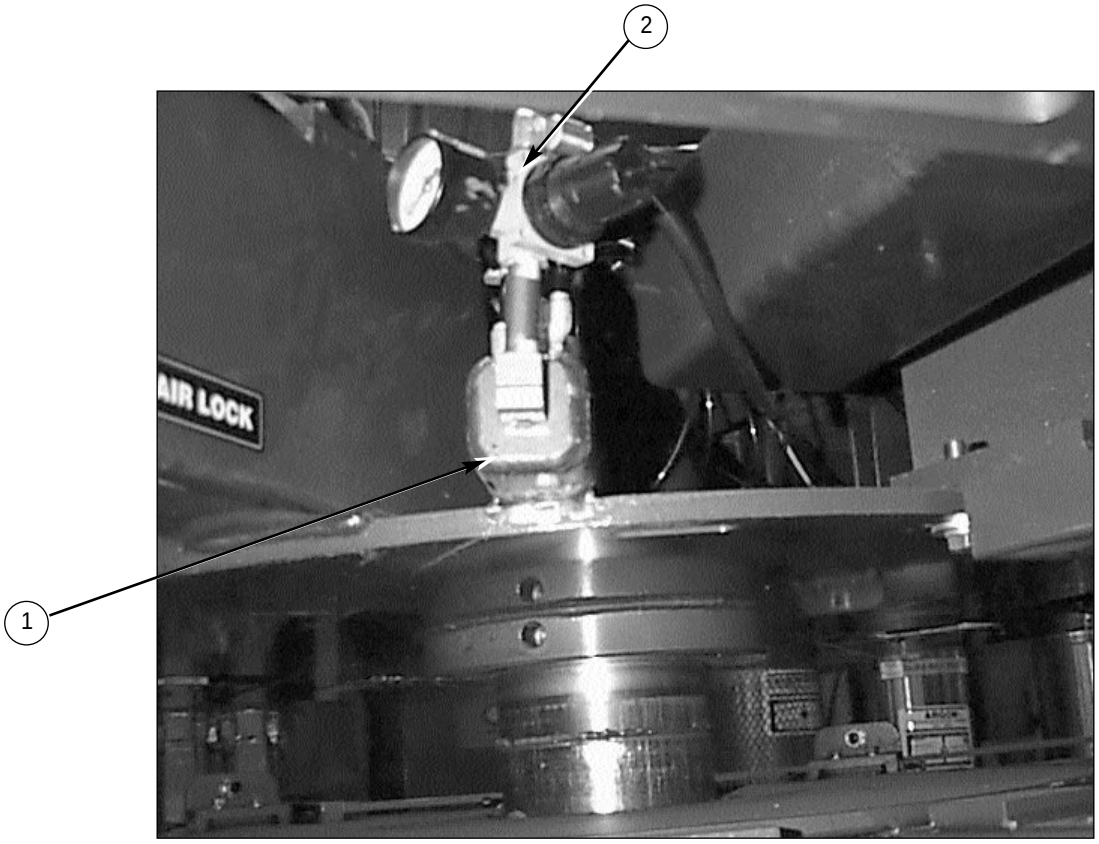
* See Page 103 exploded illustration for part number.

	Part Name	Part Number
1	Mac Double Solenoid Valve	2010034
2	Fork Valve Challenger	2011000
3	Fitting Male SWIV ELB 1/4" NPT	2003013
4	Muffler 1/4"	2014000
5	Fitting Male SWIV ELB 1/4" NPT	2003014
6	Fitting Male "Y" 1/8" NPT	2003034
7	Reducing Bushing Blk 1/4 - 1/8"	2004001
8	Piston Adapter for Mac Col Sta.	2017002
9	Piston Adapter for Indexer	2017000
10	Piston Old Style 800 Series PME-1	2017013
11	Solenoid Old Style 800 Series	2017012
12	Round HD Mach SC 1/4-20 x 3" Lg.	3005002
13	Stroke Valve Mount Plate CH 11	9150065
14	Fin Hex Nut ZP 1/4" - 20	3013003

Top Carousel (Continued.)
Mac Block Assembly for Print Head (Stroke and Chopper)



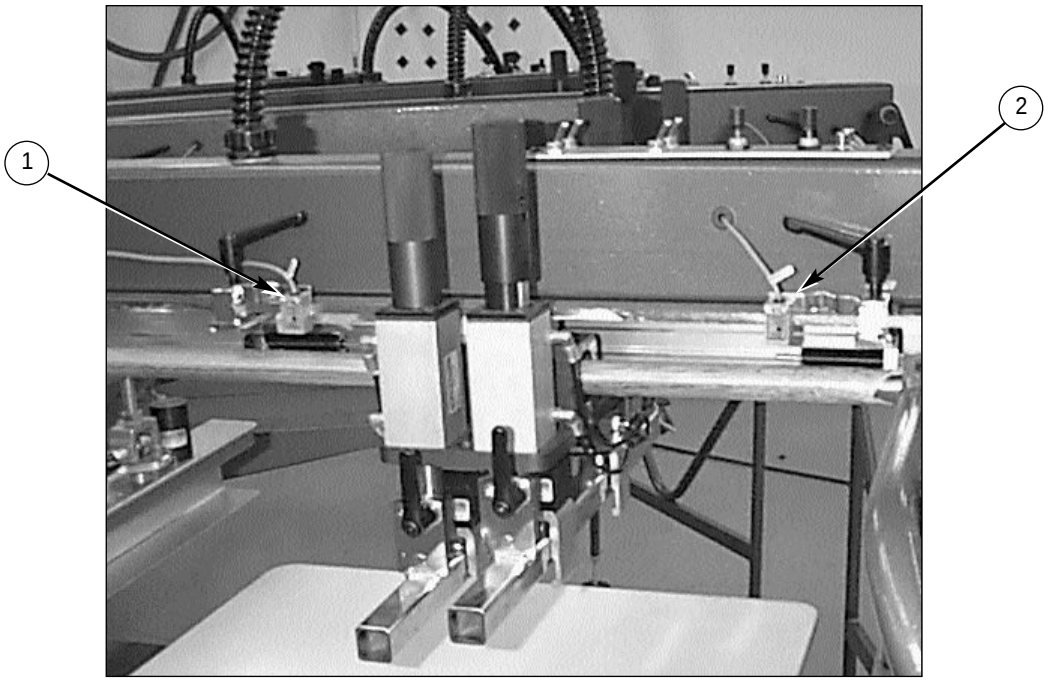
Air-Lock Pressure Regulator



Part Name		Part Number
1	Air Lock Manifold	9140237A
2	Regulator with Gauge Assembly	2019000

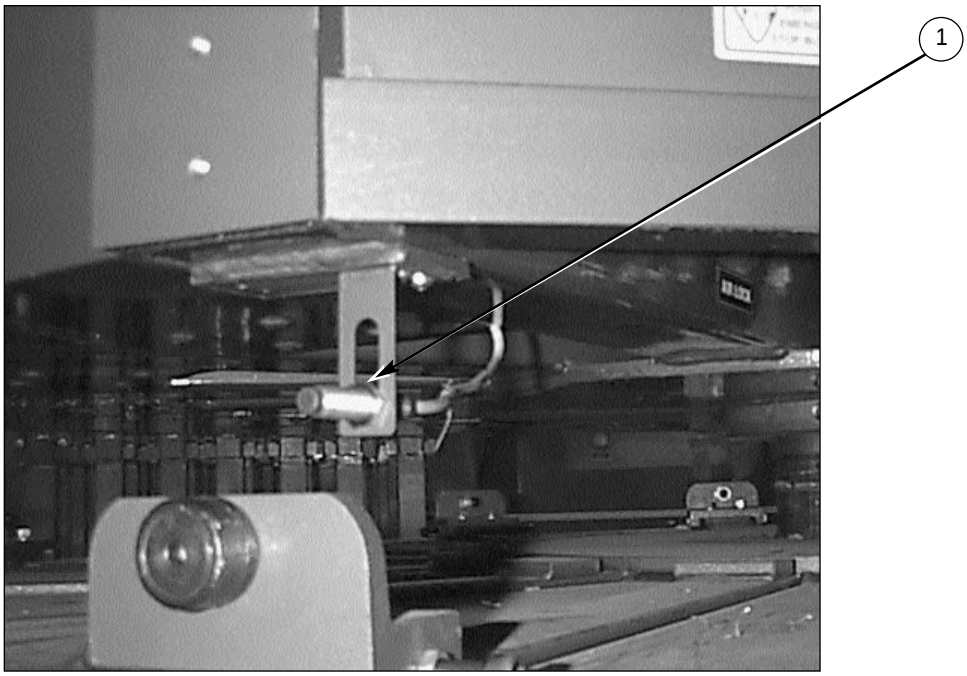
This Page For Notes:

Proximity Switch Location



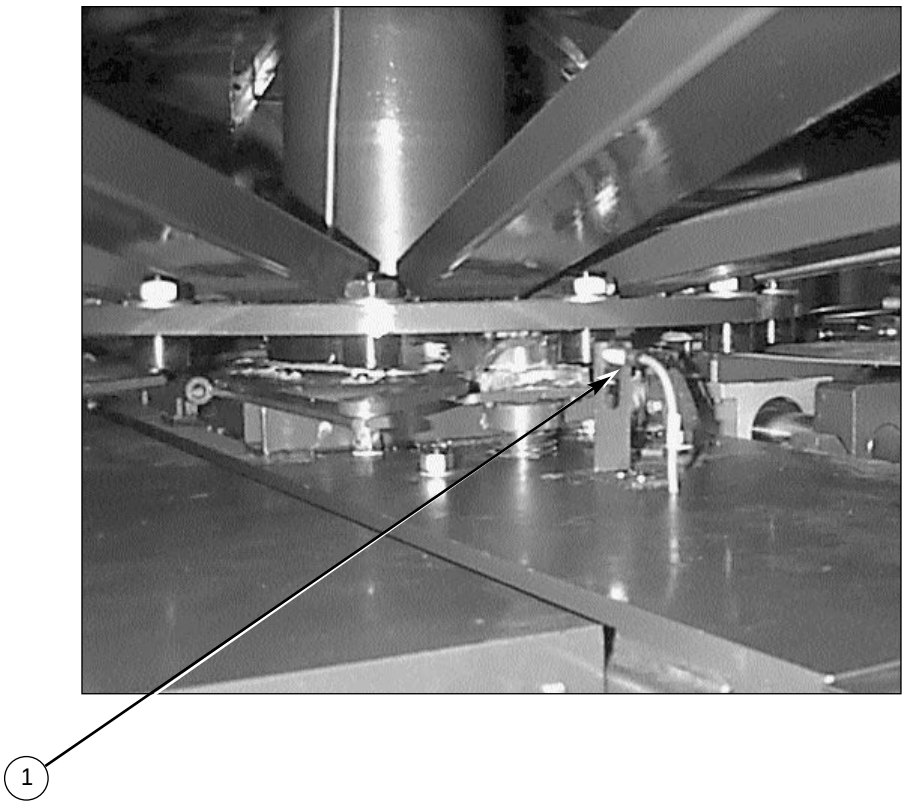
	Part Name	Part Number
1	Head Rear Proximity Switch (Square)	1010005
2	Head Front Proximity Switch (Square)	1010005

Proximity Switch Location



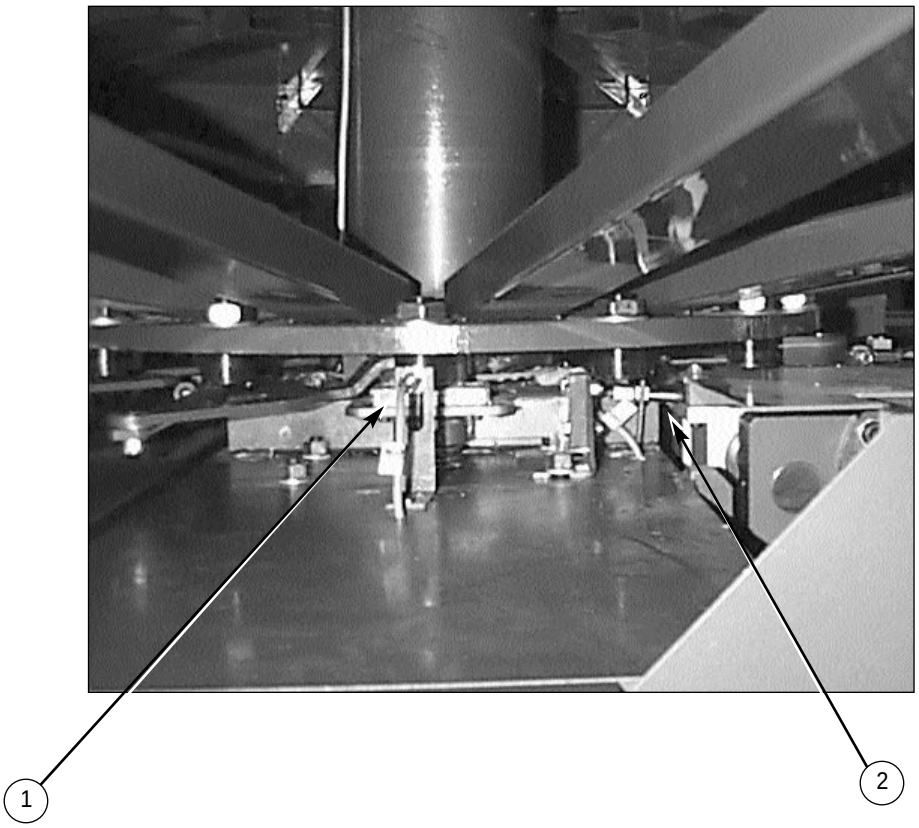
	Part Name	Part Number
1	Lift on Prox.Table Proximity Switch (Round)	1010012

Proximity Switch Location



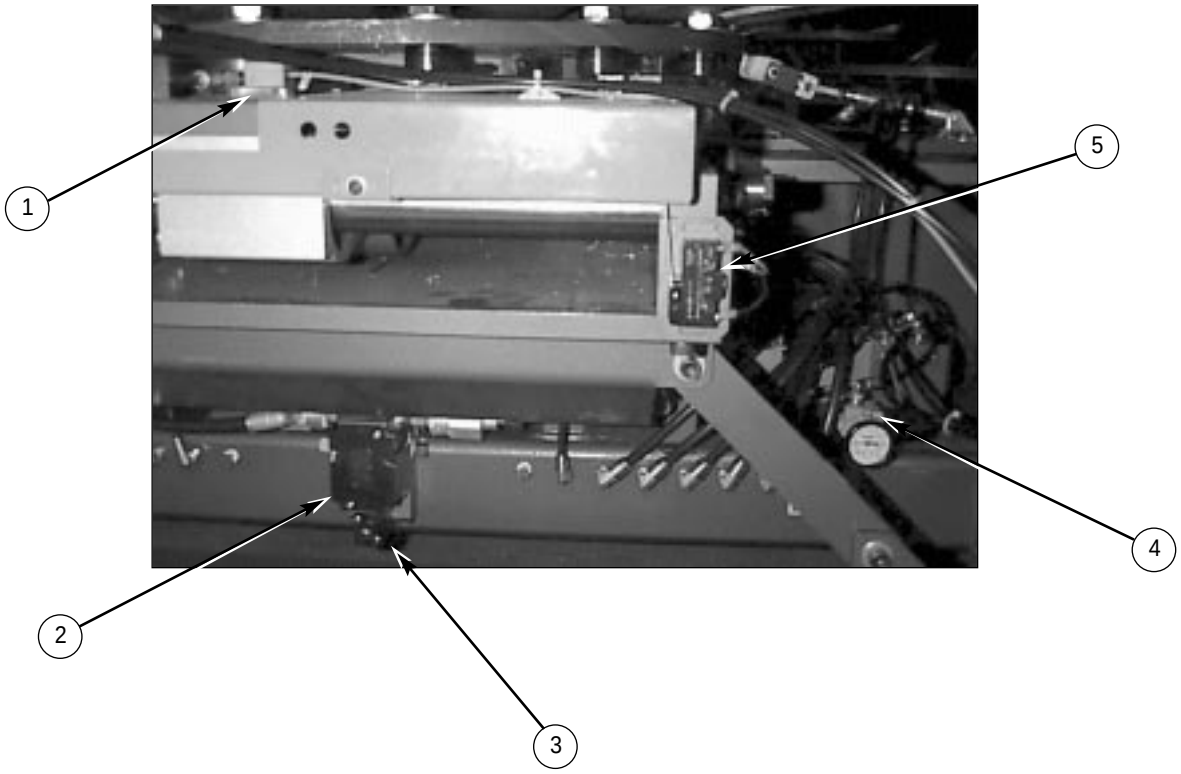
Part Name	Part Number
Index on Proximity Switch (Round)	1010012

Proximity Switch Location



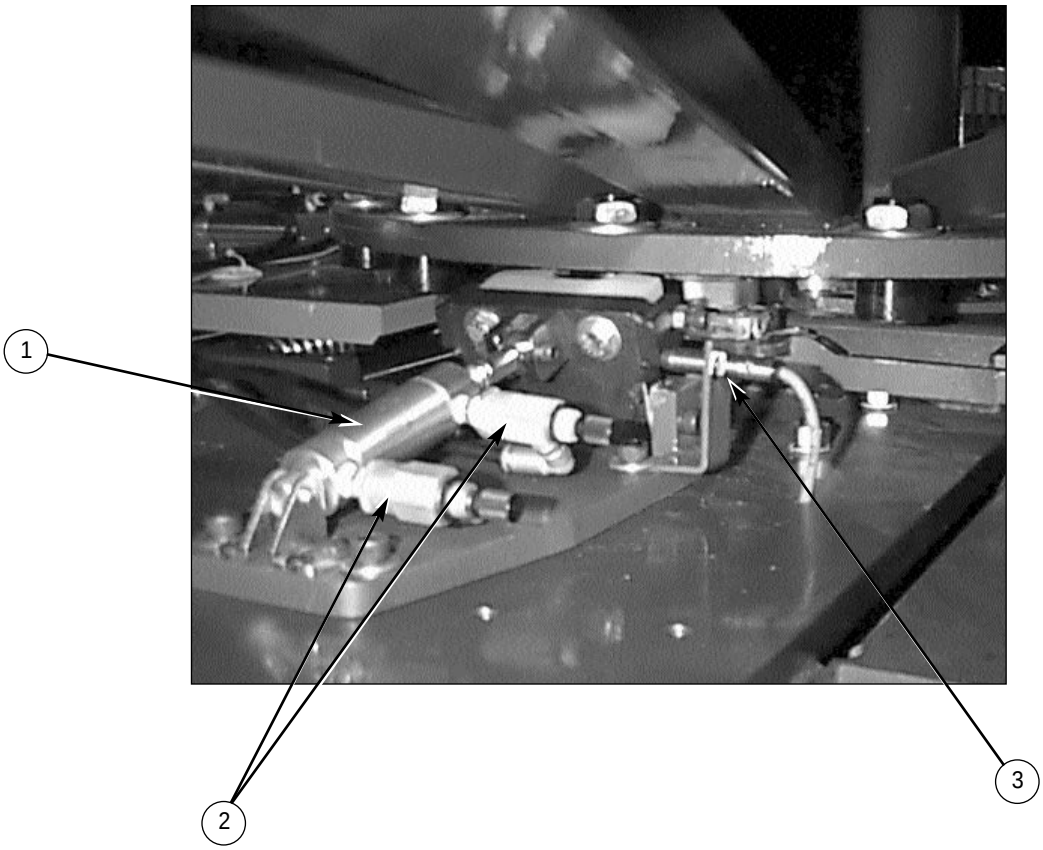
	Part Name	Part Number
1	Index on Proximity Switch (Round)	1010012
2	Home Proximity Switch (Round - 4 wire)	1010082

Proximity Switch Location



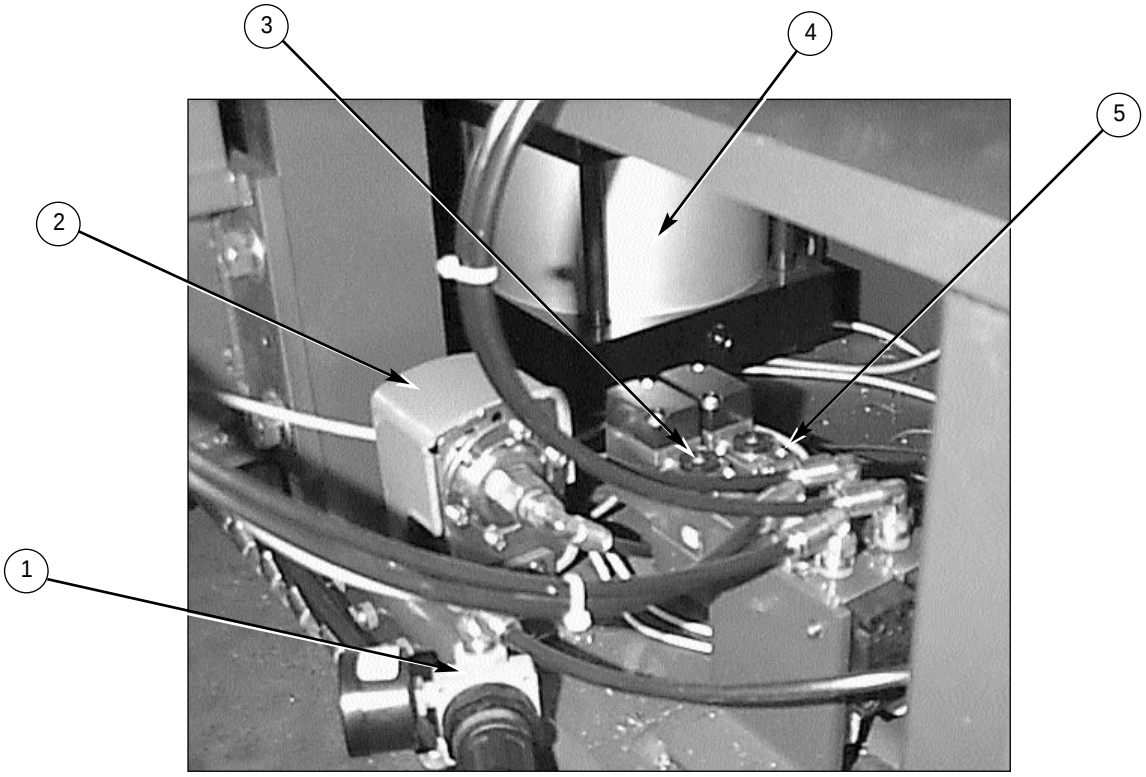
	Part Name	Part Number
1	Fork Proximity Switch (Square)	1010005
2	Lift Valve	2011001
3	Manual Over-ride Button Lift Valve	Ref. Only
4	Regulator w/Gauge Assem.1/4"(Capture Fork (Clevis))	2019000
5	Over Travel Limit Switch (Right)	1020242

Proximity Switch Location



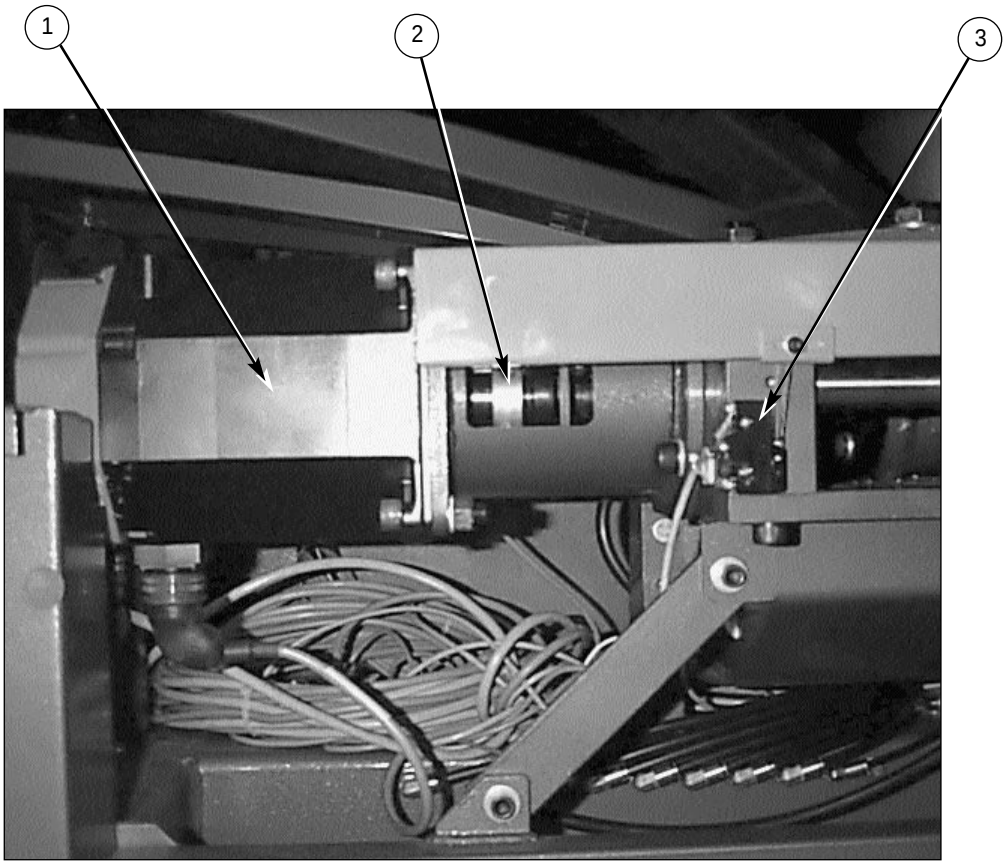
	Part Name	Part Number
1	Double Action Cylinder 1 1/16" x 1	2009031
2	Flow Control Valve 1/8"	2008001
3	Double Index Lock Prox.	1010012

Fork Regulator Location



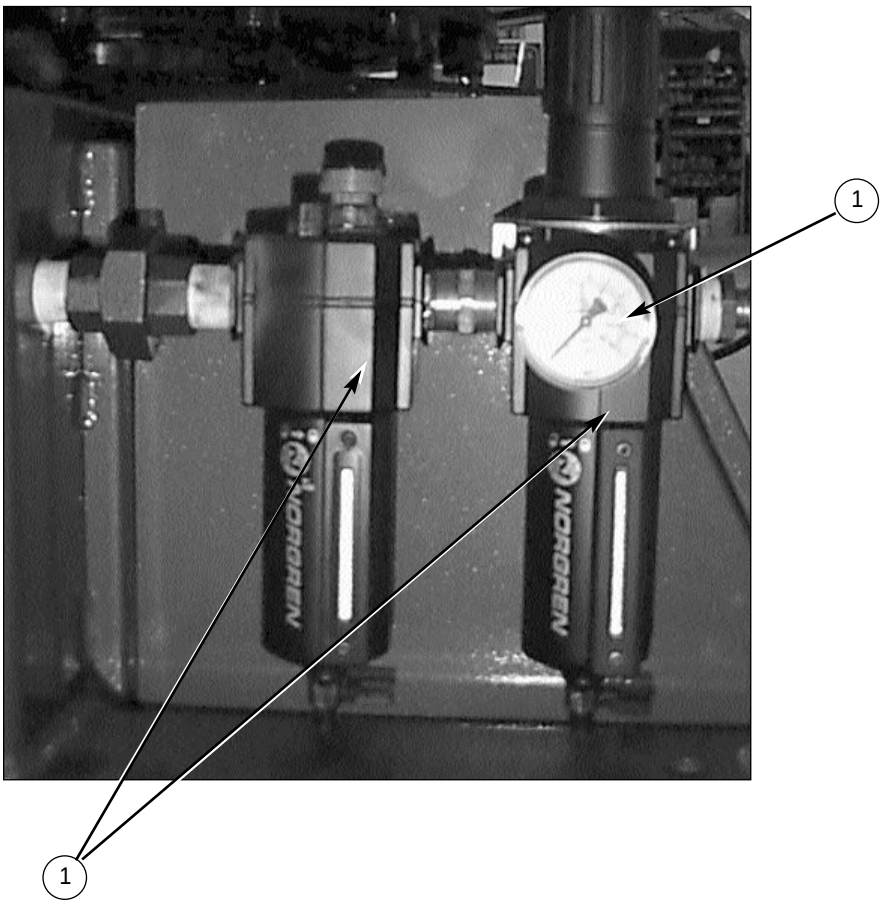
	Part Name	Part Number
1	Regulator w/Gauge Assembly 1/4"	2019000
2	Pressure Switch	1010137
3	Fork Valve/Fork Valve Challenger	2011000
4	Lift Cylinder 6" Bore x 2" Stroke	2009302
5	Double Index Valve/Fork Valve Challenger	2011000

Servo Motor Location



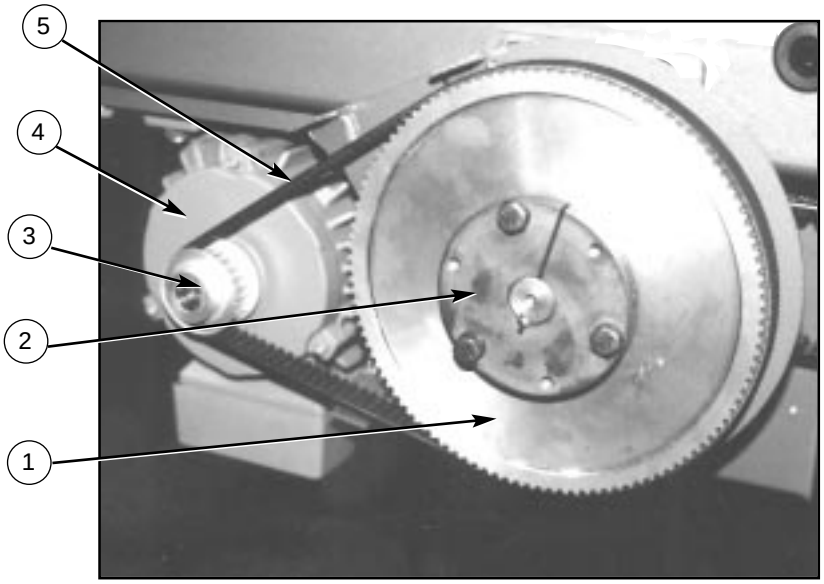
	Part Name	Part Number
1	GE Fanuc Servo Motor AC12/2000	1017263A
2	Motor Coupling CD - 6A37-AC	2007069
3	Over Travel Limit Switch	1020242

Main Regulator



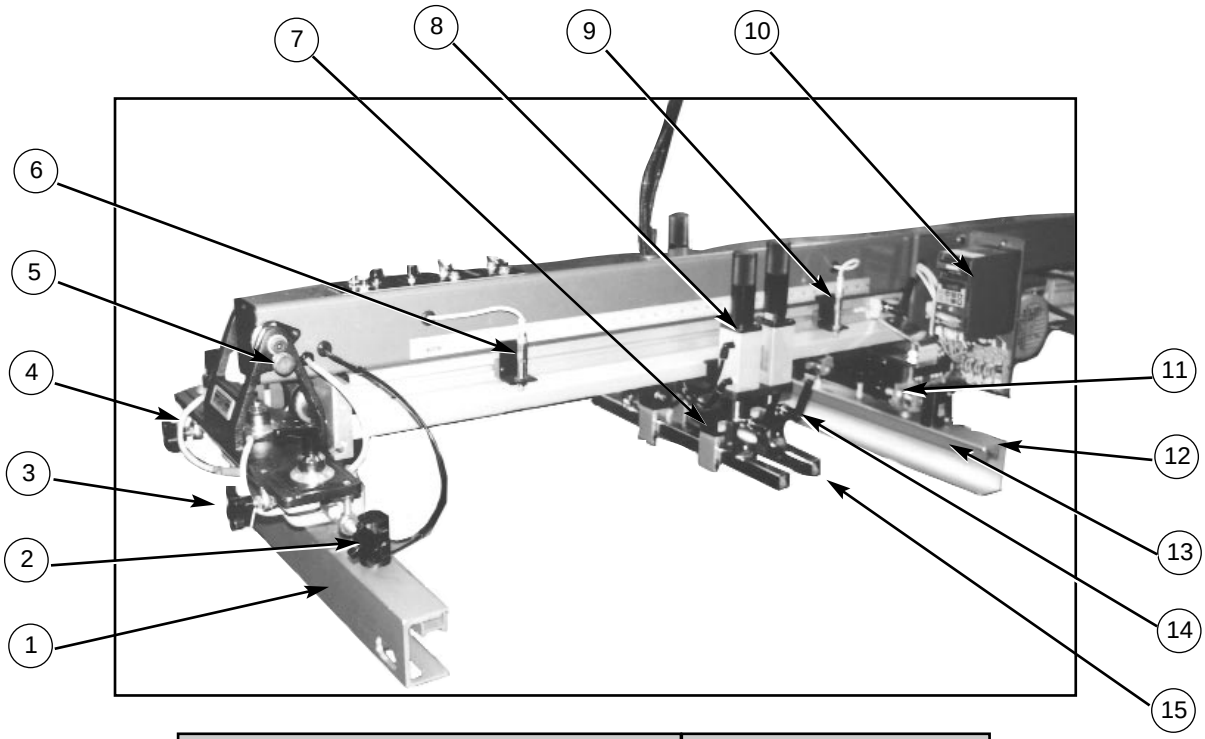
	Part Name	Part Number
1	Filter Reg. Lube Comb. 3/4"	2020003
2	Wilkerson Gauge for R16-03	2019003

AC Drive Print Station



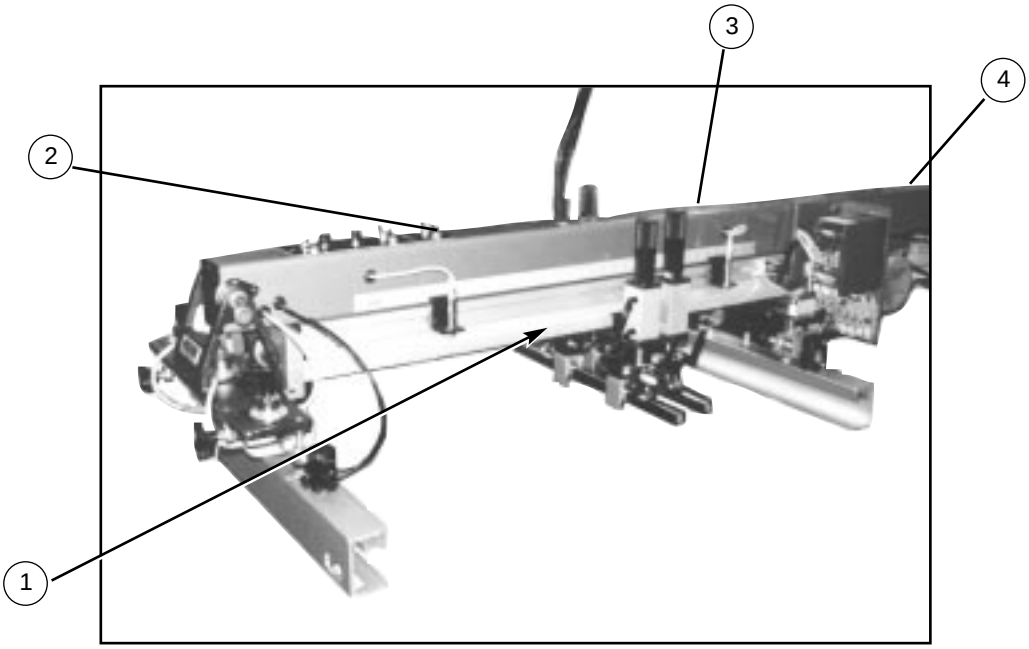
	Part Name	Part Number
1	Sprocket 5mm Pitch	3041270A
2	Bushing 3/4” Bore	2004032
3	Sprocket 25 Teeth	3041175
4	Drive Motor 1/2 H.P. 3 Phase	1008218
5	Drive Belt	3040261
6	Cover Assembly (Not shown)	9150932

AC Drive Print Station



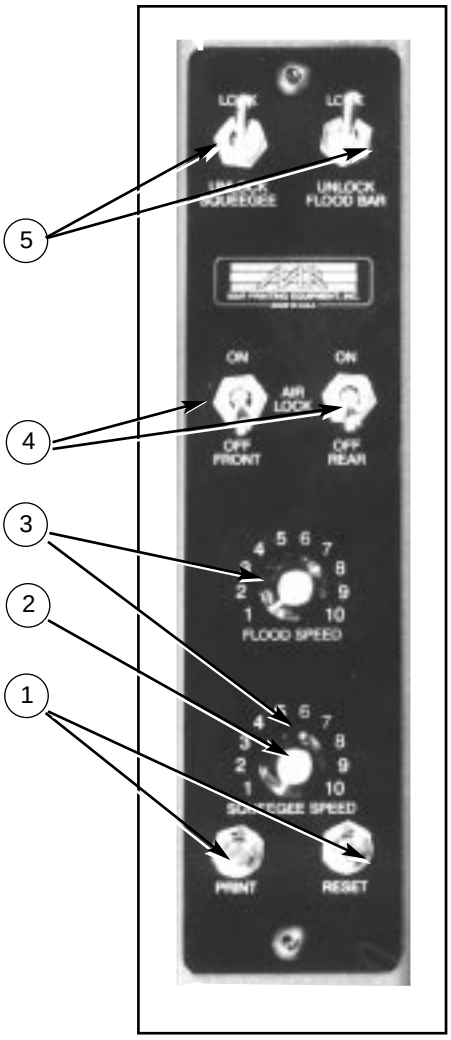
	Part Name	Part Number
1	Front Screen Frame Holder	9150083
2	Air Cylinder	2009023
3	Small Cross Knob	3033002
4	Safety Cord	8080160
5	Retractable Spring Plunger	3033090
6	Proximity Switch	1010082D
7	Air Cylinder Square	8050197
8	Air Cylinder	2009299
9	Proximity Switch Mtg Bracket	9150927
10	AC Drive 1/2 H.P.	1008220
11	Right Rear Micro Assembly	8050146
12	Rear Screen Frame Holder	9150084
13	Screen Frame Locking Bar	9150095
14	Kipp Elisa Male Handle	3032009
15	Squeegee Mtg. Bar	9362169

AC Drive Print Station

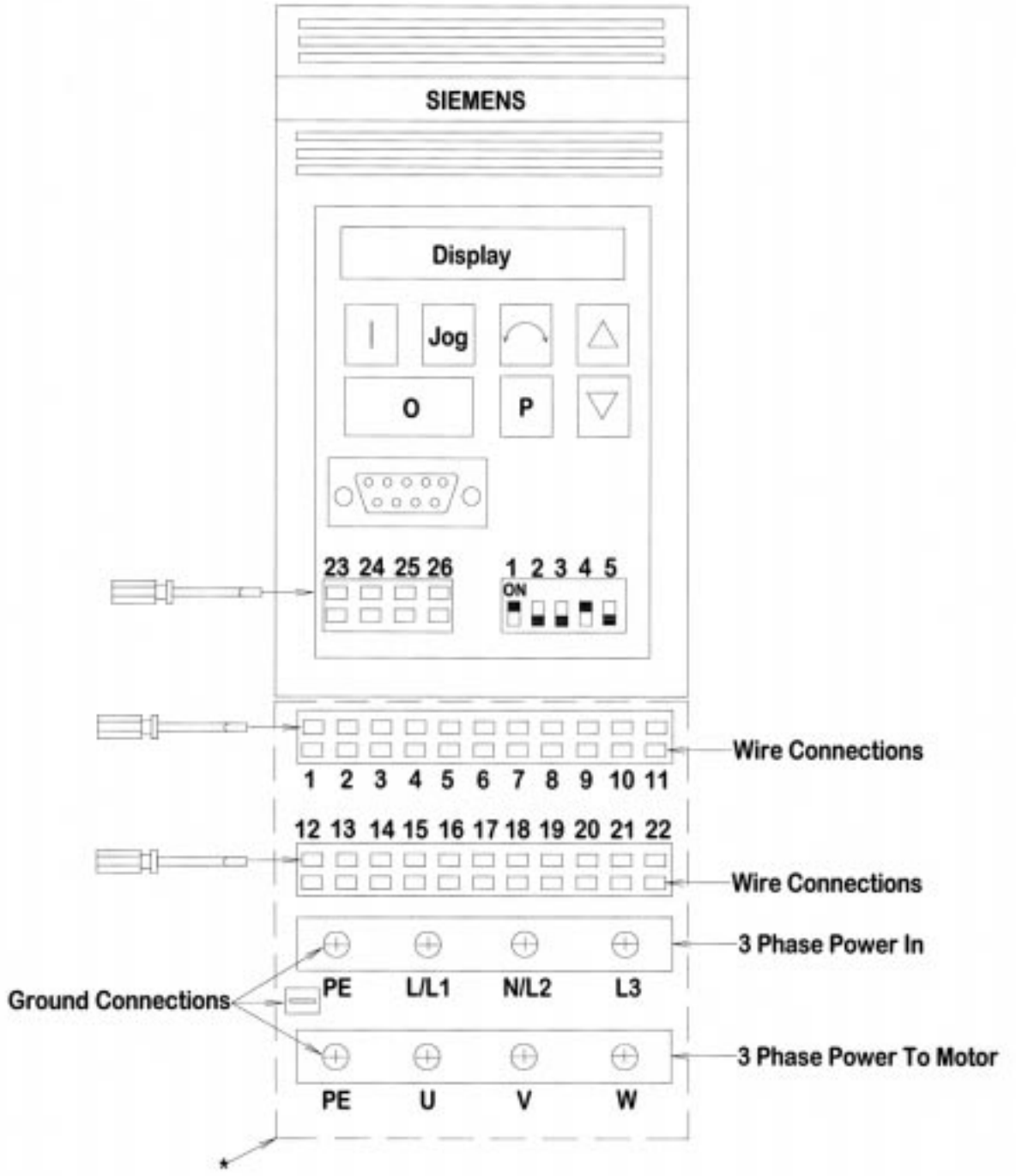


	Part Name	Part Number
1	Right Head Dust Cover	9150956
2	Left Head Dust Cover (Not	9150957
3	Left Rear Micro Assy. (Not	8050147
4	Poly Chain Drive Belt (Not	3041184

AC Drive Print Station



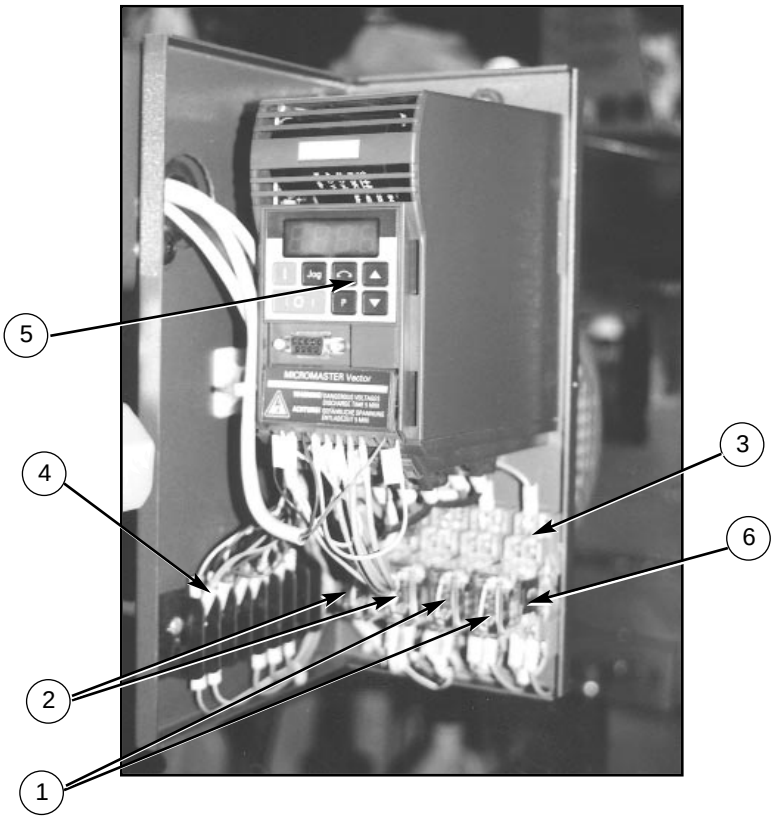
Part Name		Part Number
1	Push Button	1010006
2	Adjustment Knob	3033006
3	Potentiometer 5k Ohm 2 Watts	1029020
4	Air Switch 4 Way	2018011
5	Air Switch 4 Way	2018011



* Note: All wire connection are made at the bottom of the frequency drive (items in dotted box)

FREQUENCY DRIVE USED ON GTII AND CHII AC DRIVE SIEMENS 1/2HP	
DATE: April-01-98	DWN BY FJGO
M & R PART# 1008220	

AC Drive Print Station



	Part Name	Part Number
1	Idec Miniature Relay 24vdc	1010204
2	Idec Miniature Relay 120vac	1010205
3	Idec Miniature Relay Socket	1010206
4	Terminal Block 8 Positions	1003003
5	AC Drive 1/2 H.P.	1008220
6	Idec Relay Hold Down Spring	1011028

This Page For Notes:

Base Assembly

Ref. No.	Description	M&R Part Number
1	Lift Cylinder 6" Bore 2" Stoke	2009302
2	Off-Contact Down Plate #1	8051232
3	Off-Contact Parallel Lever	8080236
4	Off-Contact Stringer	8080238
5	Registration Bearing Bracket	8362408
6	Left Locking Cam	9050154
7	Right Locking Cam	9050153A
8	Bearing Holder Ring 15.761"	9150127
9	Pallet Base Machined 15" Lg.	9150335
10	Lift Proximity Mounting Bracket	9150046
11	Upper Carousel (14 Color)	9150050
11A	Upper Carousel (12 Color)	9150840
12	Control Box Arm	9150385
13	Base Weldment 58" Lg.	9150350
14	Screw Index Base Weldment	9150071
15	Guide Shaft Spacer 12.25" Lg.	9150072
16	Screw Bearing Block 12.25" Lg.	9150073
17	Screw Ball Nut Housing 11.25 Lg.	9150074
18	Indexer Mounting Plate 14.25	9150075
19	Motor Mounting Bracket 6.25" Lg.	9150076
20	Indexer Cover 30.25" LG.	9150077
21	Index Support Tube 49.5" Lg.	9150078
22	Ball Bearing Screw 28.88" Lg.	9150079
23	Indexer Support Bar 8.61" Lg.	9150091
24	Bearing Flange - Dia. 4.49"	9105252
25	Distance Bushing - Dia. 1.5"	9105258
26	Std. Duty NYLA-K Flange Unit	3023052
27	Closed Pillow Block - Dia. 1 1/2"	3023087
28	Oil Seal	3023088
29	Single Row Angular Contact Ball Bearing	3023089
30	Class “L” Shaft - Dia. 1 1/2" x 24 1/4" Lg.	3030028
31	Lock Nut with Lock Washer	3013010
32	1" Coupler	2007069
33	2 Way Conn. Manifold	9151147
34	Index Clevis	8080252A
35	Ball Screw Limit Switch Accuator 1.5" Lg.	9150152
36	Center Cover (12 Color)	9150849
36A	Center Cover (14 Color)	9150097
37	Small Top Cover (12 Color)	9150844
37A	Small Top Cover (14 Color)	9150098
38	Top Cover (12 Color)	9150847
38A	Top Cover (14 Color)	9150099
39	Pallet Registration Bar (12 Color)	9150857
39A	Pallet Registration Bar (14 Color)	9150137
40	Pallet Stop Channel	9150136

Base Assembly

Ref. No.	Description	M&R Part Number
41	Z-Bar Mounting Bracket (12 Color)	9150858
41A	Z-Bar Mounting Bracket (14 Color)	9150138
42	Double Index Base	9151141
43	Double Index Cylinder Bracket	9151144
44	Nylon Fork Bracket	9151145
45	Double Index Nylon Fork	9150151
46	Double Act. Cylinder	2009031
47	Bronze Flange Bushing	3023170
48	Bimba Pivot Bracket Right & Left	2009232
49	Shoulder Bolt 3/8" x 1 1/4"	3006007
50	Female Rod End 5/16" - 24	3034001
51	Hex Head Bolt 3/8" - 16 x 1 1/2"	3020010
52	Wrought Flat Washer 3/8"	3008005
53	Socket Cap Screw 10 - 24 x3/4"	3009052
54	Hex Head Bolt 1/4" - 20 x 1"	3008001
55	Head Lock Plate - Dia. 9.5"	9150318
56	Spider Arm Extension (12 Color)	9150819
56A	Spider Arm Extension (14 Color)	9150330
57	Off Contact Selector Lever	9150358
58	Lift Compression Spring	9150361
59	Cylinder Extension	9150362
60	Off Contact Regulator Down Plate	9150363
61	Lock, Off Contact	9150364
62	Spacer Bracket	9150366
63	Control Box	9150381
64	Drive Cover	9150375
65	Base, Side Cover 31.8" Lg. (Right & Left)	9150376
66	Button Socket Cap Screw 10 - 24 x 3/8"	3001003
67	Control Panel (12 Color)	9150869
67A	Control Panel (14 Color)	9150398
68	Lower Carousel (12 Color)	9150869
68A	Lower Carousel (14 Color)	9150320
69	Pallet Stop Knob	9151133
70	Stop, Mtg. Flat 1" x 2.5"	9151135
71	Pallet Stop Pointer	9151131
72	Pallet Stop Front Guide	9151137
73	Pallet Stop Rear Guide	9151138
74	Pallet Stop Threaded Rod	9151139
75	Proximity Mtg. Bracket 3.44" x 2.13"	9151157
76	Leveling Bolt	9362220
77	Leveling Bolt Base	9362221
78	Rear Hanger	9362940
79	Kipp Elisa Male Knob 5/16" - 18	3032002
80	3/8" - 16 x 1" Socket Cap Screw	3009003

Base Assembly

Ref. No.	Description	M&R Part Number
81	Button Socket Cap Screw 10 - 24 x 1/2"	3001013
82	Machine Screw Washer ZP #10	3021008
83	Hex Head Bolt 1/2" - 13 x 2"	3008135
84	Split Lock Washer ZP 1/2"	3022000
85	Cam Follower w/Heavy Stud .875"	3023012
86	Fin. Hex Jam Nut ZP 7/8" - 14	3013000
87	Sae Washer 7/8" Z	3021004
88	Dowel Pin - Dia. 1/2" x 1" Lg.	3014005
89	Switch Proximity, Round	1010012
90	Pan Head Machine Screw 6 - 32 x 3/8" Lg.	3004001
91	Button Socket Cap Screw 1/4" - 20 x 1 1/2"	3001057
92	Button Socket Cap Screw 1/4" - 20 x 5/8"	3001010
93	Knurled Handle Spring Plunger	3033089
94	Timken Bearing Cup 8.875 Bore	3023000
95	Timken Bearing Cone 6.25" Bore	3023001
96	Fork Clevis Cylinder 1 1/16" x 3'	2009016
97	Fitting Male Elbow 1/8" NPT	2003005
98	Plastic Adj. Handle, Male 3/8" - 16	3033033
99	Round Head Machine Screw 6 - 32 x 3/8"	3005007
100	Socket Cap Screw 1/4" - 20 x 3/4"	3009022
101	Bolt Fl Whiz-Lock 1/2" - 13 x 1"	3003003
102	Pallet Stop 3.875" x 2" x .5"	9151136
103	Bolt Compression Spring	8080411
104	F.T. Socket Cap Screw 3/8" - 16 x 2	3054003
105	Fin. Hex Jam Nut ZP 3/8" - 16	3013014
106	Split Lock Washer ZP 7/16"	3022004
107	Fin. Hex Nut ZP 7/16" - 20	3013012
108	Cam Follower CF - 1-1/2 - SB	3023012A
109	Wrought Flat Washer 1/4" ZP	3020005
110	Elastic Stop Nut ZP 5/16" - 18	3012001
111	Hex Head Bolt 5/16" - 18 x 1 1/2"	3008011
112	Elasstic Stop Nut ZP 10 - 24	3012002
113	Distance Plate 14.5" Lg.	9150092
114	Valve Flow Control 3/8" NPT	2018000
115	Nipple Hex Brass 3/8"	2005009
116	Fin Hex Jam Nut 5/16" - 24	3013032
117	Shoulder Bolt 5/16" - 1”	3006014
118	Socket Cap Screw 3/8" - 16 x 1"	3009000
119	Wrought Flat Washer ZP 3/8"	3020010
120	Flat Socket Cap Screw 1/4" - 20 x 1”	3010005
121	Steel Ball Bearing - Dia. 3/8"	3023104
122	Off-Contact Regulator	8051244
123	Elastic Stop Nut ZP 1/4" - 20	3012000
124	Socket Cap Screw 3/8" - 16 x 2"	3009002

Base Assembly

Ref. No.	Description	M&R Part Number
125	Fin. Hex Nut ZP 3/8" - 16	3013007
126	Split Lock Washer ZP 3/8"	3022002
127	Wrought Flat Washer 5/16" ZP	3020007
128	Off-Contact Slides	8051242
129	Wrought Flat Washer 1 1/4" ZP	3020034
130	Fin. Hex Nut 1 1/4" - 12 GR8	3013052
131	Socket Cap Screw 1/4' - 20 x 1/2"	3009019
132	Registration Fork 7" Lg.	9150307
133	Shoulder Bolt 5/16" x 1 1/4"	3006015
134	Flat Socket Cap Screw 5/16" - 18 x 3/4	3010008
135	Clevis Guide Right	8121254
136	Female Rod End 5/16 - 24	3034001
137	Brass Comp. Male 1/4" x 1/8"	2002019
138	Fitting, Grease 1/8" NPT 45°	2003032
139	Split Lock Washer ZP 5/16"	3022003
140	Socket Cap Screw 10 - 24 x 1 1/2"	3009021
141	Socket Cap Screw 10 - 24 x 1 3/4"	3009010
142	Socket Cap Screw 10 - 24 x 5/8"	3009045
143	Ball Screw Nut	3063014A
144	Ball Screw Flange	3063014B
145	Clevis Guide Left	8121255
146	Hex Head Bolt 1/2" - 13 x 2 3/4"	3008021
147	Snap Action Switch	1020244
148	Wrought Flat Washer 1/2" ZP	3020004
149	Socket Cap Screw 1/2" - 13 x 1 1/4	3009013
150	Distance Bushing - Dia. 1 1/2" CH10J	9105258
151	Socket Cap Screw 3/8" - 16 x 1 1/2"	3009001
152	Adjustable Trigger Lock	3060000
153	Servo Motor	1017263A
154	Socket Cap Screw 3/8" - 16 x 1 1/4"	3009037
155	Elbow Brass Compression 14" x 1/8"	2002007
156	Socket Cap Screw 1/4" - 20 x 1 1/4"	3009018
157	Split Lock Washer ZP 1/4"	3022001
158	Fork Head Support Bracket (14 Color)	9150121
159	Head Support Fork Station (12 Color)	9150854
159A	Rear Head Support Bracket (14 Color)	9150120
160	Rear Head Support 16.82" (12 Color)	9150855
160A	Proximity Round 4 Wire	1010082

This Page For Notes:

Print Head Assembly

Ref. No.	Description	M&R Part Number
1	Kipp Elisa Male Knob 5/16" - 18	3032002
2	Fin. Hex Jam Nut ZP 1/2" - 20	3013023
3	Wrought Flat Washer 1/2" ZP	3020004
4	Rear Screen Holder Bracket	9150029
5	Knob, Small Cross 3/8" -16	3033002
5A	Threaded Rod 3/8" - 16 X 4" Lg.	9150080-4
6	Fin. Hex Jam Nut ZP 3/8" - 16	3013014
7	Shoulder Bolt 3/8" x 1 3/4" Lg.	3006008
8	Shoulder Screw Spacer .13" Lg.	9362579
9	Left Rear Micro Clevis	9362061
9A	Right Rear Micro Clevis	9362062
10	Male Rod End 3/8" - 24	3034003
11	Rear Micro Lock Bolt .625" Lg.	9150081
12	Rear Micro Lock Nut 2.5" O.D.	9150082
13	Socket Set Screw 1/4" - 20 x 3/16"	3007012
14	Split Lock Washer ZP 3/8"	3022002
15	Wrought Flat Washer 5/16" ZP	3020007
16	Rear Micro Bushing .187"Lg.	9150101
17	Fitting Male Swivel Elbow 10 - 32	2003031
18	O-Ring (007B46A)	2003030
19	Knob, Round 3/8" - 16	3033001
19A	Screw Stud 3/8" - 16	8010013
20	Cylinder Air Lock 3/4" Bore 1 1/2" Stroke	2009023
21	Rear Screen Holder	9150084
22	Screen Frame Locking Bar	9150095
23	Socket Cap Screw 8 - 32 x 3/4"	3009032
24	Cup Washer	8010005
25	Fin. Hex Jam Nut ZP 3/8" - 24	3013015
26	Left Tool-O-Matic Support 1.5"	9150033
27	Fitting, Male Elbow 1/8" NPT	2003005
28	Right Tool-O-Matic Support 1.5"	9150032
29	Elastic Stop Nut ZP 1/4" - 20	3012000
30	Rear End Plate 5.875" Lg.	9150022
31	Class Shaft “L” Rail Dia. 1" x 43" Lg.	3030007
32	Head Tube 90.28" Lg. (12 Color)	9150821
32A	Head Tube 99.08" Lg. (14 Color)	9150042
33	Grommet, Rubber 7/8" I.D. x 1 3/8" O.D.	7001028
34	SMC Shock 3/4" - 16	3025002
35	Rear Stroke Adjustment Bracket	9150041
36	Round Head Machine Screw 6 - 32 x 7/8" Lg.	3005008
37	Switch Balluff Square Proximity	1010005
38	Carriage Support Plate	9150023
39	Flat Socket Cap Screw 5/16" - 18 x 3/4"	3010008
40	Socket Cap Screw 10 -24 x 3/8"	3009011

Print Head Assembly

Ref. No.	Description	M&R Part Number
41	Button Socket Cap Screw 3/8" - 16 x 1" Lg.	3001006
42	Front Stroke Adjustment Bracket	9150040
43	Flexible Conduit 3/4"	1001054
44	Flexible Conduit Fitting 3/4"	1001054A
45	Button Socket Cap Screw 1/4" -20 x 1/2"	3001005
46	Print Head Control Plate	9150043
47	Switch, Push Button	1010006
48	Valve, Flow Control 1/8" NPT	2018001
49	Fitting, Male Connector 1/8" NPT	2003001
50	Air Switch, 4 Way 10 -32 Ports	2018011
51	Button Socket Cap Screw 10 - 32 x 7/16	3001058
52	Front End Plate 5.875" Lg.	9150021
53	Dowel Pin Dia. 1/4" x 1" Lg.	3014001
54	DE-STA-CO ClAmp	3033087
55	Button Socket Cap Screw 1/4" - 20 x 1/2"	3001005
56	Strain Relief Bushing SRR -20	7006000
57	Micro Flip Lock Plate 2.13" Lg.	9150086
58	Button Socket Cap Screw 10- 24 x 1/2"	3001013
59	Print Head Front Cover 4" Lg.	9150044
60	Safety Cord 52" Lg.	8080160
61	Snap in Plug 1"	7025004
62	External Retaining Ring	3024019
63	Machine Screw Washer #24	3021031
64	Stroke Adjustment Knob 4.16"	9150035
65	Knob Brake Insert 3/16" Lg.	9362111
66	Stroke Adjustment Spacer	9150039
67	Stroke Adjustment Guide 1.69"	9150036
68	Button Socket Cap Screw 1/4" - 20 x 5/8" Lg.	3001010
69	Stroke Adjustment Screw 3.5"	9150037
70	Stroke Guide Spacer 1.75" Lg.	9150038
71	Cylinder 1 1/4" Bore x 1 1/2" Stroke	2009299
72	Fitting, Male Elbow 1/8" NPT	2003017
73	Grommet, Rubber 3/8" x 1/8"	7001001
74	Shaft Support Slide 3" Lg.	9150026
75	Kipp Elisa Female Handle 3/8" - 16	3032001
76	Acorn Hex Nut 3/8" - 16	3013139
77	Top Lock Washer .75" Lg.	9150016
78	Micro Lock Washer	8080132
79	Shoulder Bolt 1/2" x 1 1/2" Lg.	3006048
80	Flat Nylon Washer 1/2"	3020001
81	Micro Shoulder Bolt Spacer	9150045
82	Elastic Stop Nut ZP 3/8" - 16	3012003
83	Fl Br. Bearing 1/2" x 3/4" x 5/8"	3020325
84	Top Micro Casting	9150062
85	Retractable Spring Plunger 1/2" - 13	3033090

Print Head Assembly

Ref. No.	Description	M&R Part Number
86	Knob, Lg. Cross 3/8" - 24	3033000
86A	Threaded Rod ZP 3/8" - 24 x 3.5	9150005 -14
87	Micro Positioning Plate 5" Lg.	9150014
88	Lock ClAmp Spacer Plate 1.75" Lg.	9150017
89	Split Lock Washer ZP 1/4"	3022001
90	Button Socket Cap Screw 1/4" - 20 x 1"	3001004
91	Bottom Micro Casting	9150064
92	Registration Grid Label	5020154
93	Fin. Hex Jam Nut ZP 3/4" - 16	3013031
94	SAE Washer 3/4" Z	3021005
95	Threaded Rod Plain 3/8" - 16 x 3"	9150005-25
96	Hex Cap Screw 3/8 - 24 x 1 1/4"	3054031
96A	Hex Cap Screw 3/8 - 24 x 1 3/4"	3054032
97	Female Rod End 3/8" - 24	3034002
98	SAE Washer 3/8"	3021013
99	Button Socket Cap Screw 10 - 24 x 1/2"	3001013
100	Stroke Proximity Flag 2.25" x 3"	9150028
101	Internal Retaining Ring Dia. 1 9/16" Shaft	3024000
102	Linear Ball Bearing Fl - 16	3023007
103	Bearing Housing Block 5" Lg.	9150027
104	Head Support Frame 45.68" Lg.	9150085
105	Flexible Cable Bracket	9151111
106	Fitt. Male Branch Tee Dia. 5/32" Tube	2003147
107	Carriage Air Connector 1" Lg.	9150018
108	Carriage Plate 11.25" Lg.	9150034
109	Shock Stop Block 2" Lg.	9150025
110	Socket Cap Screw 1/4" - 20 x 3/4"	3009022
111	Fitt. Male Branch Tee 1/4" Tube	2003148
112	Fitting Male Elbow 1/4" Tube	2003145
113	Cylinder Pivot Bracket 1.75" Lg.	9260108
114	Shoulder Bolt 5/16" x 1" lg.	3006014
115	SAE Washer ZP 1/4"	3021015
116	Left Hand Pivot Shaft	9362113
116A	Right Hand Pivot Shaft	9362114
117	Socket Cap Screw 10 - 32 x 1"	3009082
118	Custom Square Cylinder	2009118
119	Squeegee/Flood Bar Air Clamp	9151048
120	Air Lock Spacer.	9151047
121	Fitting, Male Connector Dia. 5/32" Tube	2003142
122	Squeegee Mounting Bar 18" Lg.	9362169
123	Hex Head Bolt 5/16" - 18 x 3/4" Lg.	3008015
124	Fin. Hex Jam Nut ZP 3/4" - 16	3013031
125	Front Screen Holder Knob	9362098
126	Threaded Rod 3/4" - 16 x 4.75" Lg.	9150005-15
127	Front Air Lock Screen Holder	9150083

Print Head Assembly

Ref. No.	Description	M&R Part Number
128	Keylocking Insert 3/8" 16	3013106
129	Leveling Foot Valve Guide 5/8"	3037001
130	Fin. Hex Nut ZP 5/8" - 18	3013016
131	Socket Cap Screw 10 - 24 x 7/8"	3009134
132	Tool-O-Matic 1" Bore 31" Stroke	2009303
133	Cylinder Mounting Bracket 2"	9150024
134	Socket Cap Screw 1/4" - 20 x 5/8"	3009047
135	Kipp Elisa Male Handle 5/16" - 18	3032009
136	Screen Frame Locking Bar 25" Lg.	9150102

LIMITED WARRANTY

Textile printing equipment manufactured by M&R Printing Equipment, Inc. (M&R) is warranted against defects in workmanship and materials provided that it is properly maintained and operated under normal use for a period of one year from the date of shipment.

Damage that occurs in transit is not covered under this warranty. Any damage that occurs in transit is the responsibility of the freight carrier.

Neither parts subject to normal wear and tear, nor expendable parts such as motor brushes, filters, lamps and fuses covered by this warranty, nor do we warrant failure of parts or components resulting from misuse or lack of normal maintenance. M&R is not responsible for the removal or installation of a defective part or its replacement part, nor for any related or unrelated costs incurred with respect thereto. All labor, travel and sustenance charges for service technicians are the customers' responsibility. Any part determined to be defective in material or workmanship within the warranty period will be repaired or replaced if deemed necessary and at our discretion without charge when returned FREIGHT PREPAID to:

M&R PRINTING EQUIPMENT, INC.
1 N. 372 MAIN STREET
GLEN ELLYN, ILLINOIS 60137-3576

Customers must secure written authorization or authorization number from our Customer Service Department prior to making any return of defective parts.

A clean, moisture-free air supply must be installed onto pneumatically operated equipment. Failure to install a clean moisture-free air supply to this equipment may result in premature failure of pneumatic components, such as air cylinders, seals and valves. Any pneumatic component or assembly that is determined to have failed due to the customers' failure to provide a clean moisture-free air supply to the equipment will not be covered under this warranty.

Limitation of Remedies and Liability:

The remedies provided herein are Buyer's sole and exclusive remedies. In no event shall M&R be liable for direct, indirect, special, incidental or consequential damages (including loss of profits) whether based on contract, tort or any other legal theory.

Limitation of Warranty:

The foregoing warranty shall not apply to defects resulting from: Improper or inadequate maintenance by Buyer; Buyer supplied equipment or interfacing; Unauthorized modification or misuse; Operation outside of the environmental specifications for the product; or improper site preparation and maintenance. Warranty is not applicable unless equipment is installed by M&R Service Technician or M&R Certified Service Technician. This warranty applies to the original equipment purchaser only and is not transferable.

THE WARRANTY SET FORTH ABOVE IS EXCLUSIVE AND NO OTHER WARRANTY, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED. M&R SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

PREVENTIVE MAINTENANCE LOG

FILL IN APPROPRIATE DATES FOR EACH MONTH

After completing each maintenance procedure write in the procedure number in the calendar above.

MONTH/YEAR_____

PLEASE MAKE COPIES FROM THIS ORIGINAL FOR YOUR USE.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

Daily

1. Clean cooling fans, vents and filters.
2. Check mechanical control surfaces and print head assembly for ink or spray tack.
3. Lubricate index bearings.
4. Check water trap, air filter and drain.

Bi-Weekly

5. Grease Zerk fittings on index ring.
6. Check main oiler.

Weekly

7. Clean and lube carriage shafts.
8. Clean and oil print carriage stroke cylinder surface.
9. Grease lower carousel plate.

Monthly

10. Clean and grease the inside and outer face of the registration cam follower, bearings and forks.
11. Clean and grease the index capture fork and guide way.
12. Drain manifold.

3 Months

13. Grease micro registration threaded shafts.

6 Months

14. Replace air filter.

3 Years

15. Replace battery in Micro-Processor and Fanuc Servo Amplifier Unit.

This Page For Notes:

Revisions

This Page For Notes:

Glossary:

active size The speed at which the servo index drive will make the machine carousel turn, determined by the pallet size selected.

adjuster The mechanism used to change, so as to match speed, height, distance and etc.

adjustment knob The knob provided with threads which will be used to make a change to speed, height, distance and etc.

air dryer The device utilized to eliminate all the moisture trapped in the compressed air-delivered to a pneumatic machine, also known as “Chiller”.

Allen Head Screw A metal pin with a head that will take a Allen Wrench on one end and screw thread on the other, used with a nut to fasten two or more bored or threaded parts.

APM status The current condition of the amplifier circuit used to provide electrical power to the servo motor.

area of ink deposit The surface on which it is desired to print.

art table pin bar A flat metal strip with 3 pins, which will be at the top of the art table, used to secure plastic sheets for the placing of art-work.

base pallet frame The assembly on which the pallet gets attached to the pallet support arm.

butt-to-butt registration The alignment of two or more color screens in which the artwork is placed next to each other without overlapping.

cam follower A bearing with a threaded shaft, which will be used to secure the bearing to a mechanical assembly.

carousel The rotating part on the machine, to which the pallets are attached. (Also referred to as the “Table”)

carousel plate The lower plate that makes up the carousel, which rides on the center bearing, known as the “Timken bearing”.

carriage shafts The cylindrical rods used to guide and support a mechanical assembly.

carriage sheet A Piece of film or acetate that has been punched with holes that corresponds to the pins on the pin bar.

chopper cylinder The pneumatic double acting cylinders used to make the flood bar and squeegee go up or down.

compressor The machine used to compress free air into a holding tank.

control element The device in an electrical circuit or system that maintains a given valve.

control box The enclosure in which you will find most of the electrical and electronic elements of the machine.

cooling fan The blower used to move air across a control box to keep electrical and electronic elements within a working temperature.

cross knobs The knob which has four points of leverage in the form of a cross.

cure temperature The temperature at which a substance (ink) will change its chemical composition making it more stable. (Plastisol Fusion)

cycle sequences The different steps that must take place in order to reach the starting point again.

digital temperature control The device which uses electronic circuits to maintain a given temperature.

drain valve The valve used to drain a substance out of a container.

dwell timer The device used to delay the time in which the different steps of a sequence take place.

exposure unit master frame The assembly used to secure the screen during the exposure time.

flash mode The condition in which a print head (or print heads) will operate as a flash head.

flash panel The infra-red panel, powered by electricity, used to create heat to cure inks on a garment.

film register pin bar A flat metal strip with three (3) pins used to secure plastic sheets for the placing of art work.

flip-up front screen holder The "C" shaped channel attached to a mechanism with a pivot point that will allow the operator to swing the holder upward.

flood bar The long spatula used to spread the ink across the screen.

flow control valve The valve used to control the flow rate of a fluid (compressed air), which will increase or decrease the displacement speed of a pneumatic cylinder.

frame A structure composed of parts fitted and joined together which will serve as the perimeter of a screen.

frame holder assembly The mechanism used to secure a screen onto the print head of the machine.

front/rear toggle switch The electrical device used to determine if a print head will park in the front or rear position.

front screen holder The “C” shaped channel used to clamp the screen once placed in the print head.

front stop The position at which the print head will stop towards the outside of the machine.

fuse holder The device for holding a fuse in place, which will have electrical connection point.

head carriage The mechanism which will drag the flood bar and squeegee through the print stroke.

imprint area The surface on which it is desired to print.

improper screen tension The lack or improper force tending to produce elongation or extension on the mesh of a screen.

inboard speed The speed at which the head carriage moves from the outside of the machine towards the center.

indexer The mechanism used to make the carousel rotate one station over.

indexer base The bottom structure of the machine, which is part of the carousel of the machine.

index cam follower The bearing used as a pivot point to make the carousel rotate one station over.

index delay The amount of time that the machine will wait before starting another index of the carousel.

index fork (clevis) The “U” shaped device used to engage around the index cam-follower bearings.

independent print The activation of a single print head so that it performs a print cycle.

index on proximity switch The sensor which picks up the location of the carousel by detecting the index cam-follower bearings.

index table The rotating part on the machine, to which the pallets are attached to. (Also referred to as the “carousel”).

indicator One that indicates or is used to monitor the condition of a system.

infra-red heat panel A flat rectangular piece forming a part of a surface powered by electricity, used to create heat to cure inks on a garment.

ink build-up The accumulation of several layers of ink on the bottom surface of a screen or the printing surface.

ink deposit The amount of ink left on the printing surface after the print head has finish a print cycle.

latch clamp The mechanical device used to join the front screen holder assembly against the head front end plate.

L.C.D. The liquid crystal display.

locking cam An eccentric mounted on a rotating shaft which will be used to clamp two components together.

main image The defining color of a design. (In some cases one or more colors/films may be needed to create a defining complete image.)

main regulator The first air pressure regulator which the incoming air encounters, located on the bottom of the machine.

manufacturer's rating plate The plate on which a manufacture will state the different power specification needed by a machine.

mesh count The number of openings per linear unit of measurement, either per inch or per centimeter, of a screen printing fabric.

mesh tension The force tending to produce elongation or extension at which the screen printing fabric (mesh) is exposed to.

message code The systematically arranged and comprehensive collection of rules to convey a message.

micro registration The adjustment of the placement of a screen, which takes place in very small increments.

no shirt detector The photo eye sensor that will allow the machine to determine if there was no T-shirt place at the load station after the machine has gone through an index cycle.

O.D. The outside dimension.

off-contact The preset distance between the screen and the substrates that is to be printed.

off-contact lever The mechanism that will allow the press operator to change the off-contact of all the screens with a simple click of a lever.

Ohm Meter The testing device used to check the resistance across an electrical conductor.

oiler The device used to supply a mist of oil to the compressed air utilized by the machine.

operator interface The circuit that permits communication between a central processing unit and the operator of the machine.

operation mode toggle switch The electrical device used to command the machine to start an index cycle.

optical distortion The effect of viewing layered films at differing perspectives.

outboard speed The speed at which the head carriage moves from the center of the machine towards the outside.

pallet The flat surface on which the T-shirt is placed to be printed.

Pelon A material used to sample prints during set-up and registration of the press.

pin bars A flat piece of stainless steel containing small “Pins”, manufactured under high tolerances so that there is zero play between pins and corresponding punched acetate.

PLC memory The program within the programmable logic controller.

press head The mechanism used on the machine to push the ink through the screen.

press registration The capability of the machine to repeat the same location of a pallet.

press manifold The holding tank under the machine, which will store compressed air, available for the machine to use.

prime position The ideal location of placement of different components so that maximum adjustment can be achieved.

print finish The function of the machine that will allow the press operator to sequentially shut off the print heads as the last garment gets printed.

print speed The speed at which the squeegee travels across the screen.

print start The function of the machine that will allow the press operator to sequentially turn on the print heads, as the first garment gets printed.

print station master frame The mechanical structure which forms the perimeter of the printing head of a machine.

proximity switch The solid-state switch that will be triggered by the presence of a piece of metal with in proximity of it.

push pin A spring loaded pin.

PV/SV key The bottom on the temperature controller that will allow you to change between the screen display, either PV or SV.

ram The random access memory.

ratchet knob The knob which has a ratchet mechanism that will allow you to change the position of the lever for better leverage.

rear frame holder The “C” shaped channel used to clamp the rear of the screen once placed in the print head.

rear micro lock The locking mechanism that will not allow the rear micro adjustment to shift once an adjustment is made.

rear stop The position at which the print head will stop towards the inside of the machine.

registration The proper alignment of all the screens so that the image printed on the garment appears as desired.

reset button The electrical switch used to re-initiate the PLC after a halt has occurred.

revolver mode The section of the program of the machine that allows the PLC to accept up to 10 different print sequences.

screen exposure The action of allowing the screen with emulsion to get exposed to light.

scribe The action of drawing a very thin line.

servo amplifier unit The electro-electronic device which will provide the servo motor with electrical power.

servo index drive The mechanism used to make the carousel turn, which will be driven by a servo motor.

shut off valve The device that regulates or blocks the flow of gases, liquids or loose materials through structures, such as piping or passage ways.

sight dome The transparent hemispherical structure that will allow you to see the oil rate of an oiler.

side load The pressure of tension left on the micro-assembly after an adjustment took place.

solenoid An electro-magnet consisting of a coil with a movable core, which is used to activate the valves used in the machine.

spray tack The aerosol substance used to create stickiness on the surface of a pallet.

spool The cylindrical object which has rubber coated ridges, which is located at the center of a pneumatic valve.

squeegee angle The position at which the squeegee blade comes in contact with the screen.

squeegee blade The flat thin structural member made of a rubber-like material, used to push the ink through the screen.

squeegee pressure The amount of force placed on the squeegee blade to push ink though the screen.

stop blocks A solid piece of metal having one or more flat sides, which will be used to determine the placement of the screen.

stop block contact The coming together or touching of the screen frame corner with the stop block.

stroke cylinder The pneumatic cylinder used to carry the head carriage through the flood and print motion.

SV (set value) The value at which you desire the unit should reach.

tear down The action of taking squeegee, flood bar and screen off a print head or print heads.

terminal block The connecting device at which the end of a electrical wire gets attached to.

threaded rod The cylindrical rod that has been threaded throughout its length.

tight registration The scenario at which two colors printed on a garment come so close that they almost touch, but without leaving a gap between them.

Timken bearing The tapered roller bearing on which the carousel rotates.

torpedo level An instrument consisting of an encased liquid-filled tube containing an air bubble used for leveling a surface horizontally.

trap color The color which is used to fill up the gaps left by the previous colors printed on a garment.

trap screen The screen used to print the trap color on a garment.

trip points Any object placed, secured, or bolted to the floor that may cause someone to trip.

uni-strut support channel The “U” shaped channel on which the rear of the radiant panel frame gets its support.

water trap The device on the machine that will collect a very small amount of the moisture traveling with the compressed air. This is just a warning device.

Zerk fitting The device that will provide a place to connect the grease gun.

zero out the micros ***The action of placing the micro registration assembly in the middle position so that there is equal adjustment in either direction.***

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