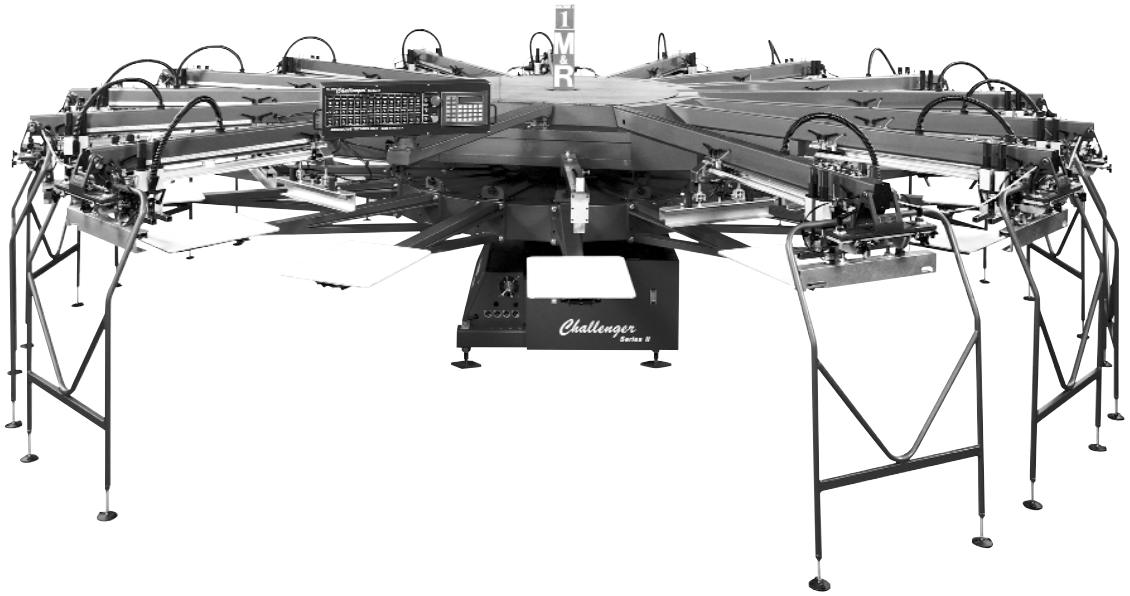
$45.00



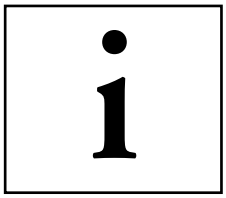
# The M&R

## Challenger II

mrprint.com

**M&R Printing Equipment, Inc.**
www.mrprint.com
Toll Free 1-800-736-6431
International +847-967-4461

050605MS
MAN-CH2



**IMPORTANT!**

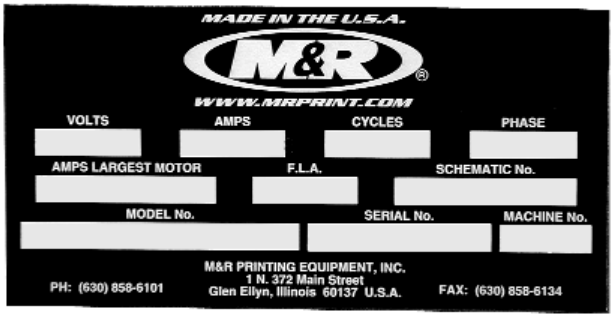
# IMPORTANT!

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.

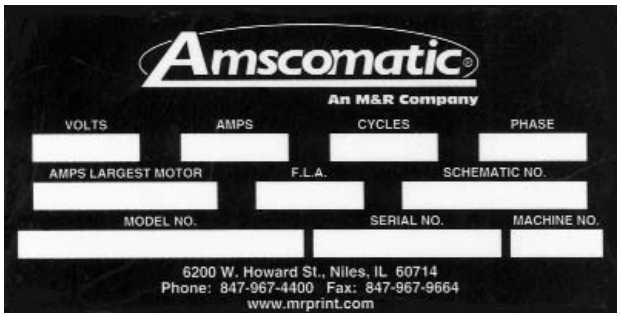
This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information contained herein does not purport to cover all details or variations in hardware, software, features or specifications, nor to provide for every possible contingency 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. and its subsidiaries, NuArc Company, Inc. and Amscomatic, Inc. assume no obligation of notice to holders of this document with respect to changes subsequently made.

M&R Printing Equipment, Inc. and its subsidiaries, NuArc Company, Inc. and Amscomatic, Inc. make no representation or warranty, expressed, implied or statutory with respect to, and assume no responsibility for the accuracy, completeness, sufficiency or usefulness of the information contained herein. No warranties of merchantability or fitness for purpose shall apply.

# Product Information








Each product manufactured by M&R Printing Equipment, Inc., or one of its subsidiaries, NuArc Company, Inc. or Amscomatic Inc. includes a metal manufactures rating plate permanently fixed to the product as shown above. The Manufacturers Rating Plate includes important information regarding the product, such as electrical power requirements, Model No., Serial No. and schematic number.

In the event that replacement parts are to be ordered for any M&R, NuArc or Amscomatic product, always supply the following information which can be found on the Manufacturers Rating Plate. This will help to ensure that you receive the correct replacement part you require.

Product Name: _____

Model No. _____

Serial No. _____

Schematic No. _____

Machine No. _____

*Date of Installation: _____

*Installed By: _____

* Optional information (not required)

# Introduction

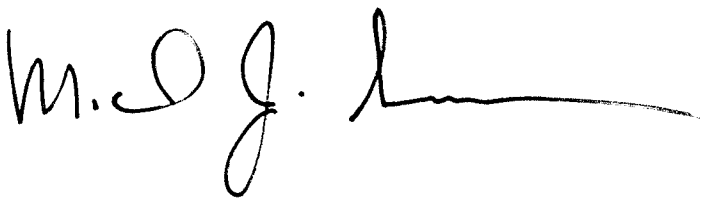
Valued Customer,

Thank you and congratulations on your purchase of your new M&R Challenger Series II semi-automatic Textile Screen Printing System.

A thorough understanding of the operation and maintenance of your new M&R Challenger Series II will insure maximum production rates and a long service life for your investment. This Operator's Manual is provided to help guide you, and your employees, in the proper procedures for set-up, operation and preventive maintenance of your new M&R Challenger Series II.

Should you have any questions regarding the operation or maintenance of your new M&R Challenger Series II, M&R's world wide Technical Service and Support Network is available to you during regular business hours (8:30am - 5:00pm C.S.T.) at 1 (800) 736-6431, International customers phone +847-967-4461 or, on week ends or holidays, call our 24 hour Emergency Service Hotline at 1 (630) 462-4715 for technical support 24 hours a day, seven days a week.

On behalf of all of us here at M&R, thank you for selecting M&R as your equipment supplier.



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

# Table of Contents

# Safety Precautions

## SAFETY PRECAUTIONS

### FUNDAMENTAL SAFETY INSTRUCTIONS:

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

The fundamental requirement to assure safe and trouble-free operation of this equipment, is a thorough understanding of the safety information contained in this Operator's Manual.

This Operator's Manual includes important instructions to assure safe operation of this equipment. This Operator's Manual, and especially the safety instructions as described there-in, must be observed by everyone who will operate this equipment. In addition to the safety instructions and regulations described in this Operator's Manual, rules and regulations of the equipment owners place of business must also be observed.

### Obligation of the Equipment Operator:

The equipment Operator is obliged to guarantee that only staff who are acquainted with the fundamental regulations according to workers protection and accident prevention, and, are completely knowledgeable in the operation of this equipment have fully read the Safety Chapter and the Warning Instructions of this manual, and understand the instructions as they relate to operation of this 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 before operation of the equipment is to begin.

1. Observe the fundamental regulations of worker's protection and accident prevention.
2. 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 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 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 to apply (print) screen printed textile inks on textile substrates. Any other use of the equipment which does not meet the Defined Purpose as described above is not permitted.

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 Operator's disposal. Guarantee and liability claims for persons or property damage are excluded if they originate for one or more of the following reasons.

1. A non-defined use of the equipment
2. Improper installation or use of the equipment
3. Operation of the equipment with defective safety devices
4. 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.
5. Modification of the equipment.
6. Failure to replace worn or defective parts of the equipment.
7. Defective repairs made to the equipment.
8. 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 highly dangerous injuries.**

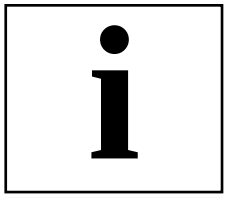
# Safety Precautions

**WARNING!**

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 highly dangerous injuries.**

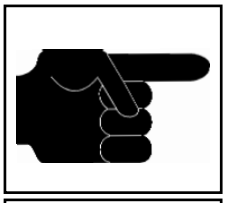
**CAUTION!**

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



**IMPORTANT!**

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



**OPERATING TIP!**

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.**

## 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 appliances must be checked for proper operation.
Safety devices may only be removed after.....

1. The equipment is shut down.
2. The electrical power has been dis-connected from the equipment.
3. 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 Equipment Operator's

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.

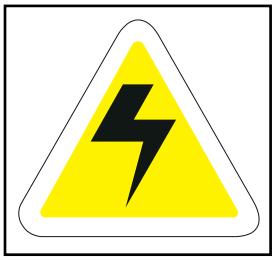
## Equipment Control System:

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:



**DANGER!**

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 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.**

# Safety Precautions

All pneumatic piping and/or hoses must be checked at regular intervals for signs of wear or failure.

### Maintenance & Trouble Shooting:

Preventive maintenance must be performed at regular intervals as described in the Operator's 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 dis-connected and locked out before preventive maintenance may begin.**

### Structural Modification of the Equipment:

Modifications of equipment are specifically not allowed with out written authorization from M&R Printing Equipment, Inc.

### Cleaning of the equipment:

Clean away all ink or other contaminant's at the end of each day.

### Equipment Noise:

Under normal operating conditions as described under Defined Purpose, this equipment will not produce sound above the level of 65 db. Depending on local conditions, a higher continuous sound level may result that could lead to hardness of hearing. In this case, the operational staff must wear appropriate safety clothing or protection.


**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, yellow safety cords, infrared safety beam, yellow floor mats or hand switch to stop the equipment. Please know the type on your equipment and its location and function before operating. **NEVER ATTEMPT TO BY-PASS OR DEFEAT ANY SAFETY DEVICE OR APPLIANCE. IN THE EVENT THAT ANY OR ALL SAFETY DEVICES ARE NOT OPERATING OR FUNCTIONING PROPERLY, DO NOT ATTEMPT TO OPERATE THIS EQUIPMENT!**

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. When ever 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.**

4. Never work on the table surface under the print stations unless the power **"ON/OFF"** switch is placed 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.

Although every effort has been made to design and construct safe, dependable equipment, 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 therefore 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 conscience.

**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 operation 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.

# Safety Precautions

**3. PRACTICE GOOD HOUSEKEEPING**: Maintain and area adjacent to **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. BY-STANDERS** 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 Printing Equipment. This program should cover inspection, maintenance and safety training on the proper use of the machinery.

**WARNING!**

**WARNING! DO NOT WORK WITHIN THE INDEX TABLE OPERATING AREA UNLESS ALL SAFETY PRECAUTIONS HAVE BEEN OBSERVED**!

# Specifications

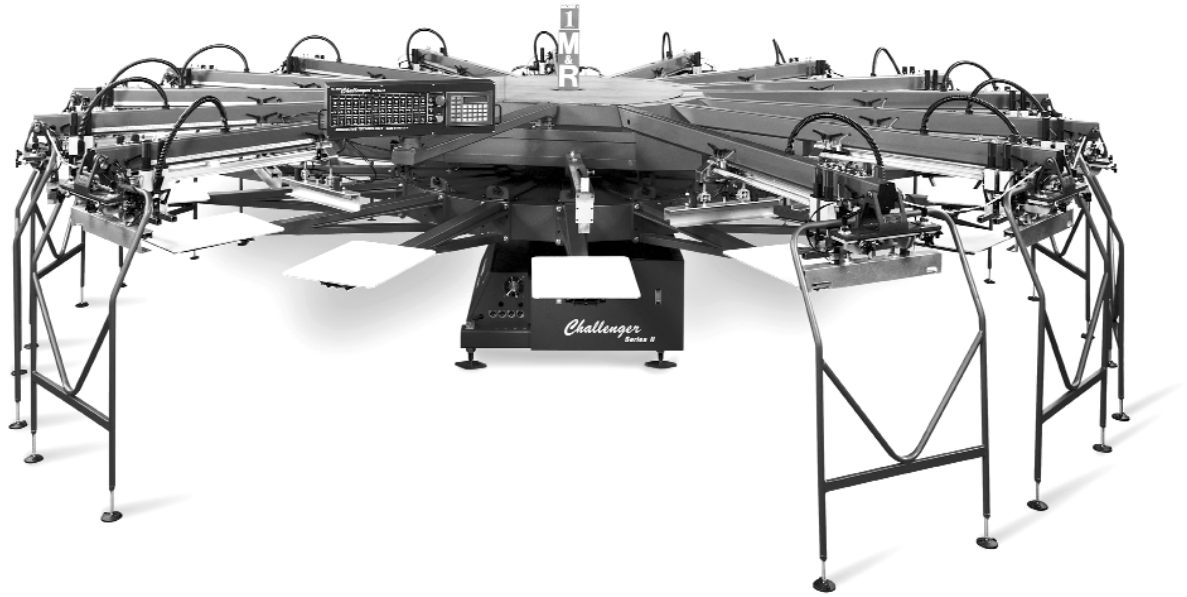

| SPECIFICATIONS CHALLENGER Series II (Pneumatic Models) | | | | |
|---|---|---|---|---|
| **MODEL No.** | **12 COLOR** | **14 COLOR** | **16 COLOR** | **18 COLOR** |
| **Maximum Image Size** | 20” x 28” (50 x 70 cm) | 20” x 28” (50 x 70 cm) | 20” x 28” (50 x 70 cm) | 20” x 28” (50 x 70 cm) |
| **Maximum Frame O.D.** | 26” x 43” (66 x 109 cm) | 26” x 43” (66 x 109 cm) | 26” x 43” (66 x 109 cm) | 26” x 43” (66 x 109 cm) |
| **Total Set-Up Diameter** | 18’ (5.49 m) | 19’ 6” (5.94 m) | 21’ (6.40 m) | 22.6’ (6.9 m) |
| **Compressed Air Req.** | 100 P.S.I. @ 62scfm | 100 P.S.I. @ 72 scfm | 100 P.S.I. @ 82 scfm | 100 P.S.I. @ 92 scfm |
| **Electrical Requirements** | 208/230 v, 3 ph, 17 Amps 50/60 Hz. | 208/230 v, 3 ph, 17 Amps 50/60 Hz. | 208/230 v, 3 ph, 17 Amps 50/60 Hz. | 208/230 v, 3 ph, 17 Amps 50/60 Hz. |
| **Shipping Weight** | 7600 lbs. (3447 kg) | 8100 lbs. (3674 kg) | 10110 lbs. (4586 kg) | 12110 lbs. (5493 kg) |
| **Standard Pallet Size** | 16” x 22” (40.6 x 55.8 cm) | 16” x 22” (40.6 x 55.8 cm) | 16” x 22” (40.6 x 55.8 cm) | 16” x 22” (40.6 x 55.8 cm) |

**IMPORTANT!**

*The electrical specifications indicated are based on mathematical calculations which assume ideal conditions exist for electrical supply line values, material 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, Inc.,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, Inc. reserves the right to alter specifications in the manufacture of its products.*

# Specifications




| SPECIFICATIONS CHALLENGER Series II (AC Models) | | | | |
|---|---|---|---|---|
| **MODEL No.** | **12 COLOR** | **14 COLOR** | **16 COLOR** | **18 COLOR** |
| **Maximum Image Size** | 20” x 28” (50 x 70 cm) | 20” x 28” (50 x 70 cm) | 20” x 28” (50 x 70 cm) | 20” x 28” (50 x 70 cm) |
| **Maximum Frame O.D.** | 26” x 43” (66 x 109 cm) | 26” x 43” (66 x 109 cm) | 26” x 43” (66 x 109 cm) | 26” x 43” (66 x 109 cm) |
| **Total Set-Up Diameter** | 18’ (5.49 m) | 19’ 6” (5.94 m) | 21’ (6.40 m) | 22.6’ (6.9 m) |
| **Compressed Air Req.** | 100 P.S.I. @ 21scfm | 100 P.S.I. @ 21 scfm | 100 P.S.I. @ 21 scfm | 100 P.S.I. @21 scfm |
| **Electrical Requirements** | 208/230 v, 3 ph, 37 Amps 50/60 Hz. | 208/230 v, 3 ph, 40 Amps 50/60 Hz. | 208/230 v, 3 ph, 44 Amps 50/60 Hz. | 208/230 v, 3 ph, 48 Amps 50/60 Hz. |
| **Shipping Weight** | 7600 lbs. (3447 kg) | 8100 lbs. (3674 kg) | 10110 lbs. (4586 kg) | 12110 lbs. (5493 kg) |
| **Standard Pallet Size** | 16” x 22” (40.6 x 55.8 cm) | 16” x 22” (40.6 x 55.8 cm) | 16” x 22” (40.6 x 55.8 cm) | 16” x 22” (40.6 x 55.8 cm) |

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# Specifications

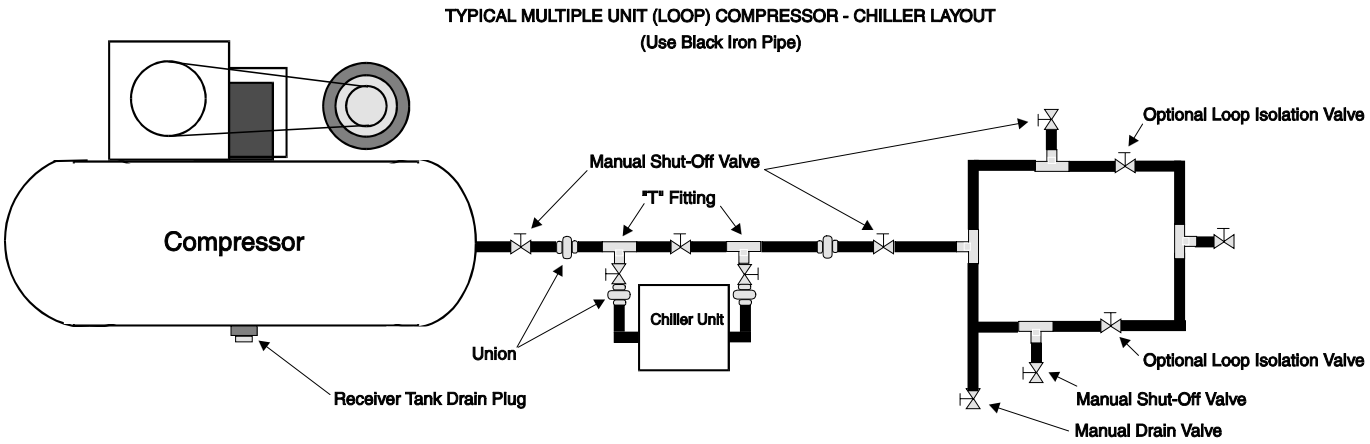



*Figure 2 Typical Multiple Unit (Loop) Compressor-Chiller Layout*

**CAUTION!**

A clean, moisture free compressed air supply is essential for the continued operation of the M&R Challenger Series II press. We strongly recommend that a refrigerated air chiller be installed in the compressed air supply line to the Challenger Series II press to prevent moisture damage to pneumatic seals, valves and air cylinders used in the operation of the print carriage (See diagram above). Failure to use a refrigerated compressed air chiller with this equipment may void the warranty for pneumatic components such as air cylinders, valves and seals.

# Specifications

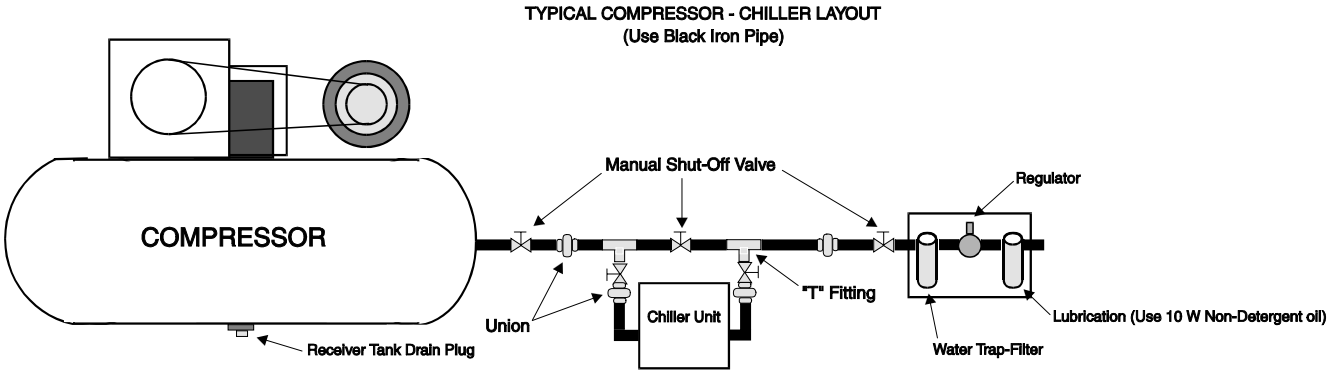
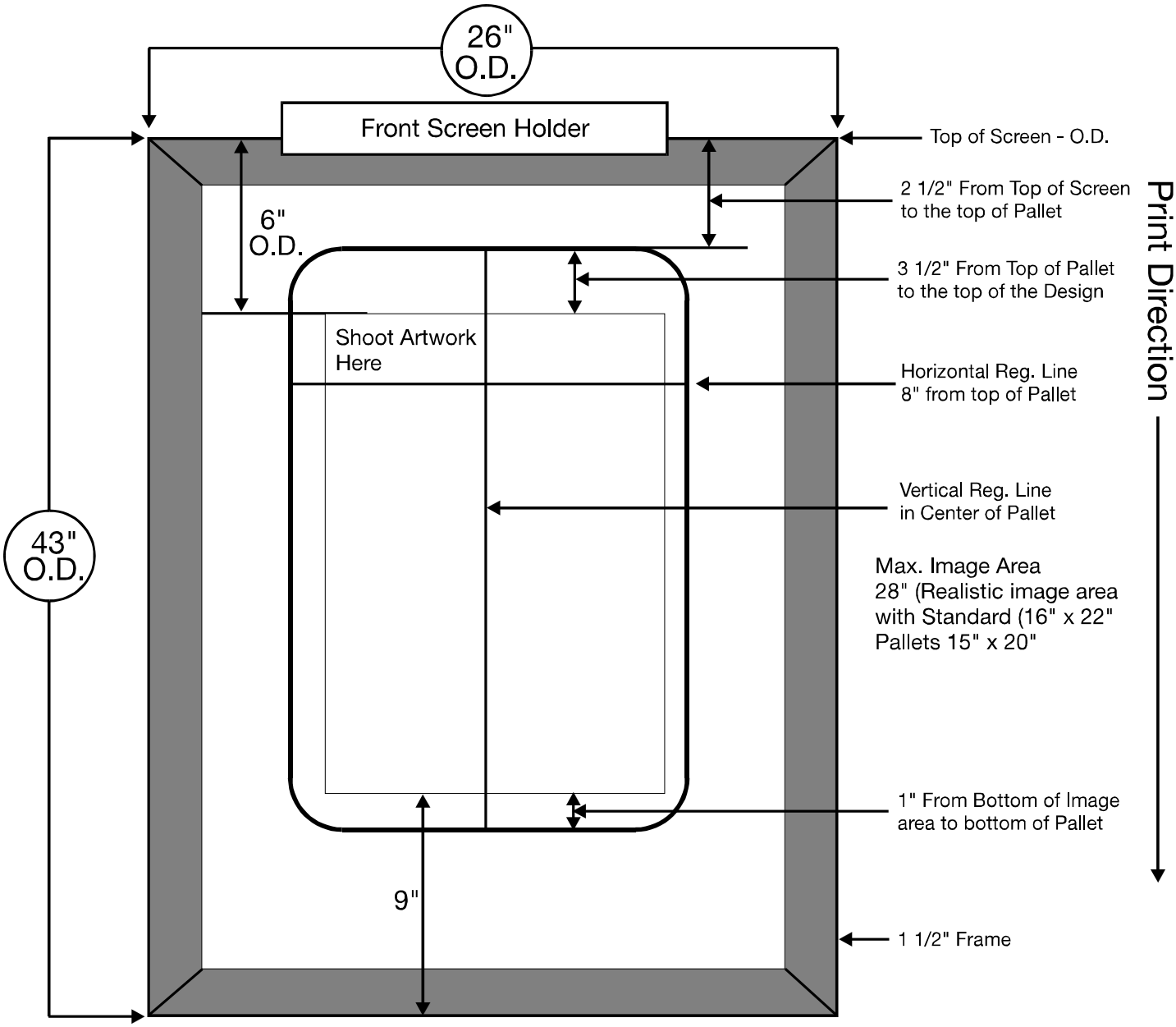



*Figure 1 Typical Compressor-Chiller Layout*

**CAUTION!**

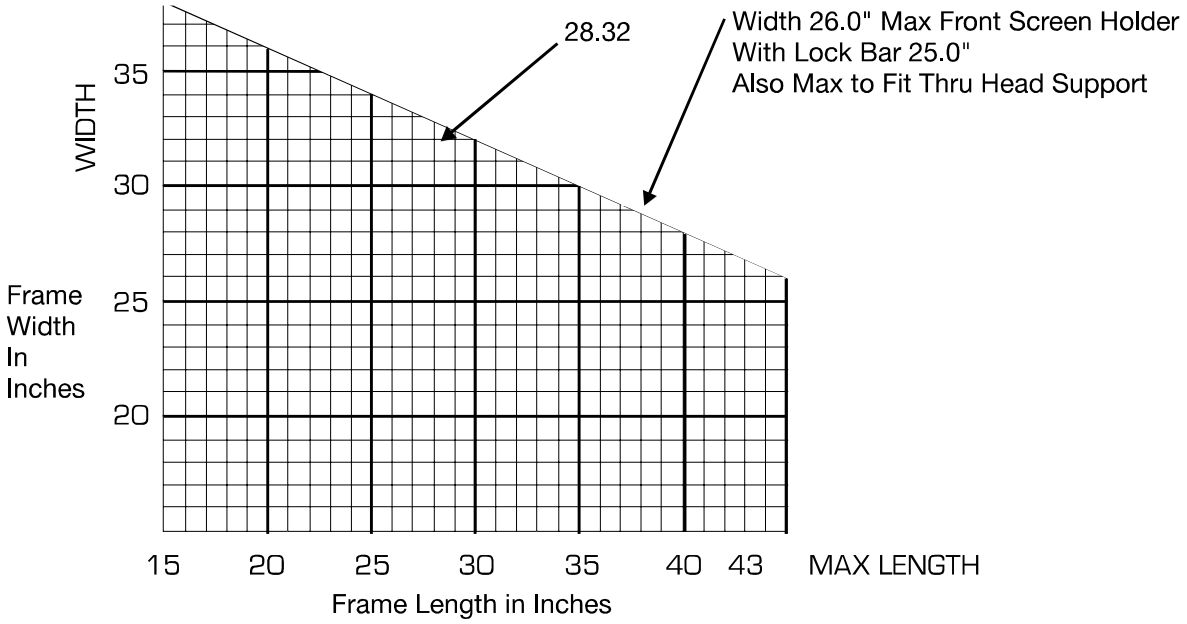
A clean, moisture free compressed air supply is essential for the continued operation of the M&R Challenger Series II press. We strongly recommend that a refrigerated air chiller be installed in the compressed air supply line to the Challenger Series II press to prevent moisture damage to pneumatic seals, valves and air cylinders used in the operation of the print carriage (See diagram above). Failure to use a refrigerated compressed air chiller with this equipment may void the warranty for pneumatic components such as air cylinders, valves and seals.

# Screen Frame & Image Size




**NOTE:** Although every effort has been made to provide accurate screen frame specifications, M&R Printing Equipment, Inc. does not assume any liability for damages, whether consequential or incidental that may result from the use or misuse of the indicated specifications. M&R Printing Equipment, Inc. reserves the right to alter specifications in the manufacture of its products.

# Screen Frame & Image Size




Use this chart to determine whether your existing screen frame can be used on the M&R Challenger Series II.
1. Locate where your frames width falls along the left side of the chart.
2. Now find where the frame length falls along the bottom of the chart.
As long as these two dimensions come together within the chart, the frame will fit on the press.

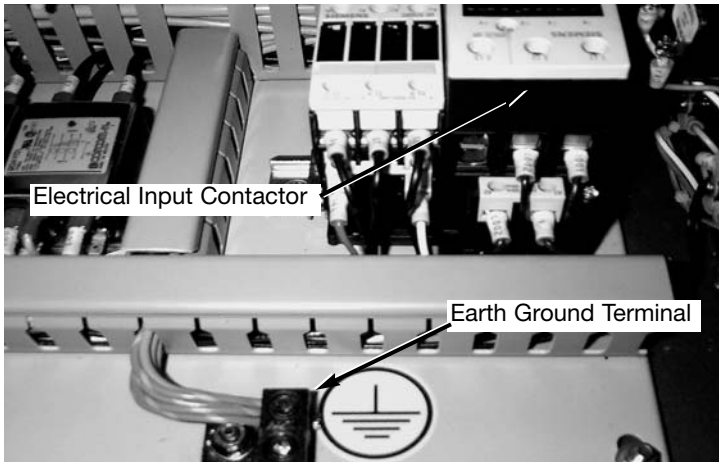
**NOTE! 26” wide by 43” long is the maximum screen size when every print station is in use.**

# Installation

The M&R Challenger Series II requires installation by an M&R factory-trained service representative. The following conditions must be addressed 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 5 or 6, determine the space requirements for your Challenger II. Position the base in the center of this area.
- Have the compressor and dryer (chiller unit) operational. Use 3/4" black pipe from the compressor to press with a Shut-Off Valve provided at the press.
- Refer to the Manufacturers Rating Plate mounted to the control panel. Install the required Electrical Service at the power input contactor located in the electrical enclosure on the indexer base assembly. **Do not connect to press at this time.** (See illustration below)




- 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. 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"). **Please note, squeegee blades are not provided with your press.**
- A three-color minimum print job, with tight registration, should be ready to run. Refer to page 11 & 12 for the required screen frame dimensions and image placement.
- Provide adequate assistance (labor) for the M&R technician during the assembly.

**IMPORTANT!**

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

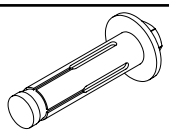
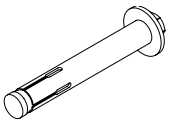
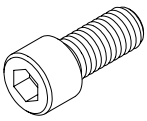
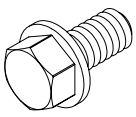
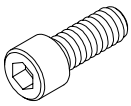
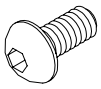
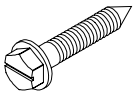
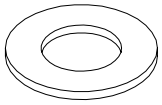
- Provide a grease gun with standard Zerk fitting. Fill the grease gun with white lithium grease. Have another grease gun filled with Synthetic Teflon Grease. One quart of 10W non-detergent oil also will be required.

After assembling, completing registration and checking general operation of the Challenger Series II, our Service Representative will assist your production staff 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.

NOTES:

# Installation Hardware

The hardware list shown below illustrates and describes all hardware required to assemble your Challenger Series II screen printing system. The quantity is indicated for each available model size. Although a Factory Trained M&R Service Representative will perform the original installation of this equipment, this hardware list can prove valuable should the equipment be relocated or dis-assembled for any reason. If any of the hardware listed below is not included with the equipment upon delivery, please contact our Customer Service Dept. at 1 (800) 736-6431 for assistance.

| Illustration | Part No. | Description | 12 Color | 14 Color | 16 Color | 18 Color |
|---|---|---|---|---|---|---|
|  | 3047001 | Sleeve Anchor<br>1/2” x 2-1/4” | 4 | 4 | 4 | 4 |
|  | 3047000 | Sleeve Anchor<br>5/16” x 2-1/2” | 26 | 30 | 34 | 38 |
|  | 3009013 | Socket Cap Screw<br>1/2” - 13 x 1-1/4” | 36 | 42 | 48 | 54 |
|  | 3003003 | Bolt FL Whiz Lok<br>1/2”-13 x 1” Long | 56 | 64 | 72 | 80 |
|  | 3009047 | Socket Cap Screw<br>1/4” - 20 x 1/2” Long | 48 | 56 | 64 | 72 |
|  | 3001013 | Button Socket Cap<br>10-24 x 1/2” Long | 42 | 51 | 60 | 69 |
|  | 3055003 | Self Drill (Sheet Metal Screw)<br>8 x 3/4” | 12 | 14 | 16 | 18 |
|  | 3022001 | Lock Washer<br>1/4” | 48 | 56 | 64 | 72 |
|  | 3021000 | SAE Washer 1/2”<br>Zinc Plated | 36 | 42 | 48 | 54 |

# General Setup & Registration

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

2. Once you determine print order, install all your screens in their print stations 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 add ink in your “trap” screen, making sure that all adjustments are secure, 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 index table and pallet with the image around, printed in step No. 3, to the remaining screens and register them visually. 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. Place a small amount of ink in the screen to start with. This way, if the color is incorrect, 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.

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 (adhesive) when making test prints for registration.

**IMPORTANT!**

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

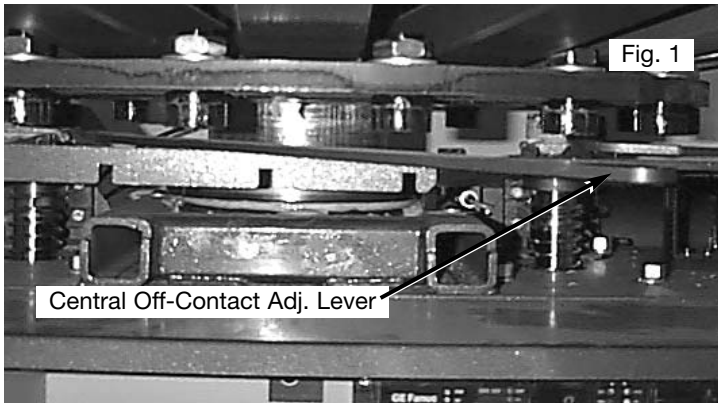
8. When using the micro register adjustments, be sure to back the adjustment knob off after you lock down the Kipp Elisa handles. This will take any side load or torque off of the adjuster so the next time you release the Kipp Elisa handle, the screen won’t shift.

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 clear of ink or pallet adhesive and well lubricated.

**CENTRAL OFF-CONTACT LEVER:**

The Central Off-Contact Lever provides a single point adjustment that allows the press Operator to change the off-contact dimension of all the screens with a simple adjustment of a lever. This eliminates the need to individually adjust off-contact for screens when printing different thickness garments. i.e. (T-shirts to sweat-shirts). (See Fig. 1)

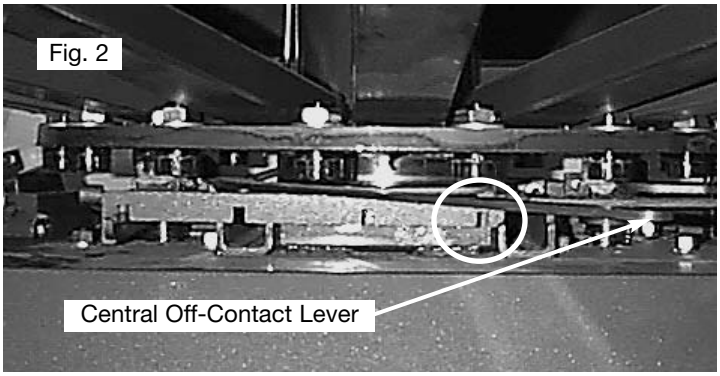



This convenient control lever allows the press Operator to adjust the off-contact setting for the press from a maximum of 3/16" (5mm) to the minimum setting. The adjustment is calibrated in three settings at 1/16" (1.5mm) increments.

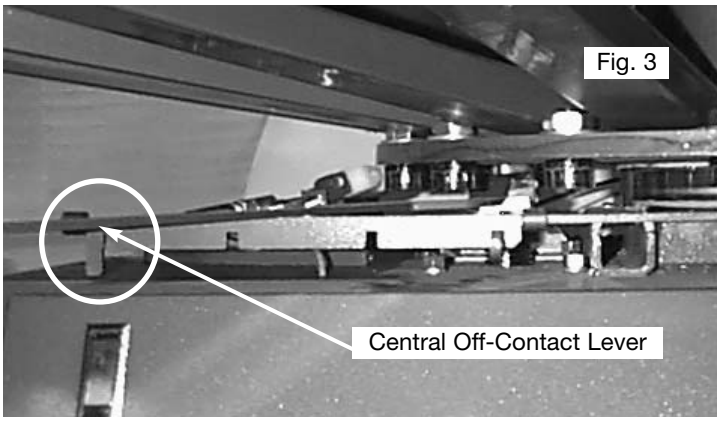
# General Setup & Registration

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

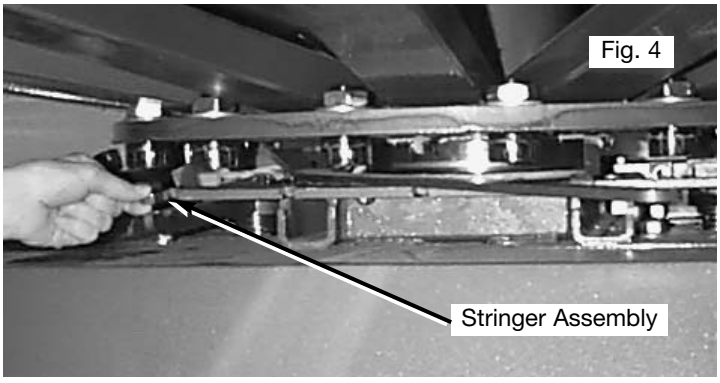
The central off-contact adjustment lever has four possible positions. When the lever is fully to the right hand side, the index table will be set for its highest position. This setting then allows for the minimum off-contact setting. (See Fig. 2)




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)

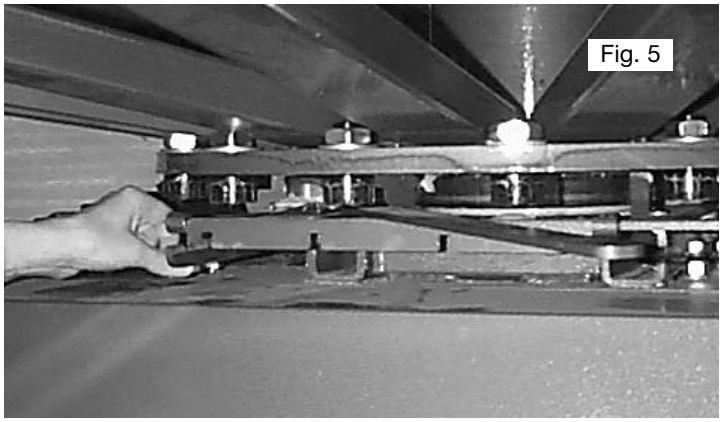



In order to adjust the lever, the index table should be in the lowered position. Taking your left hand and lifting up on the stringer, you can now manually move the lever to the desired position for the off-contact setting. (See Fig. 4)




Each setting is designed to change the off-contact setting by 1/16” (1.5mm).

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)




**IMPORTANT!**

**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.**

# Operator Controls

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 of 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"**. Release the Emergency Stop Button and press the green **"Reset"** button. The index fork (clevis) will cycle in and engage one of the index cam followers located on the bottom of the index table. Turn one print station 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 station 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 competitive semi-automatic textile press.

**Control Panel 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

**Print Station Control Switches:**
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. (See illustration on page 25)

**Independent Print Start Push Button:**
This push button permits manual cycling of a selected print station. Please note that the **"Single/Double"** toggle switch for the selected print station must be set to either **"Single"** or **"Double"** position in order for the print station 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. 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. (See illustration on page 25)

**Single/Double Selector Switch:**
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.

**NOTE: When this toggle switch is selected for the middle, or "OFF" position, the particular print station will not operate.** (See illustration on page 25)

# Operator Controls

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.

**Front/Rear Toggle Switch:**
This toggle switch permits the system operator to command the selected print station 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. (See illustration on page 27)

**Print Start/Print Finish Toggle Switch:**
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 stations. Placing this toggle switch in the **"Print Start"** position will automatically command each print station that is selected to **"ON"**, to print sequentially at the start of a print run. (See illustration on page 26)

**Test Print Toggle Switch:**
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 this toggle switch is placed in the **"ON"** position, the control system will automatically and sequentially command each print station which is selected to **"ON"**, to print one complete flood/print cycle. The result will be one printed garment at the end of the print sequence, ready for inspection. In this way, the press Operator is not required to manually turn **"ON"** and **"OFF"** individual print stations to print one sample garment. (See illustration on page 26)

**Operation Mode Toggle Switch:**
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 the **"Manual"** 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 print stations 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 34 of this manual.

**NOTE: When the Operation Mode toggle switch is selected to the middle or "OFF" position, the index system will NOT operate.**

**Emergency Stop Push Button:**
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 stations shutting down, the retraction of the index fork and shut down of all system operation. Once pushed "In," the Emergency Stop push button will remain locked in this position to prevent any further operation of the system. To start the system operation once again, turn the red mushroom shaped Emergency Stop Push Button clockwise one quarter turn, until it pops out then press the green "Reset" push button.


**WARNING! DO NOT ATTEMPT TO RESUME SYSTEM OPERATION UNTIL YOU HAVE IDENTIFIED AND CORRECTED THE CAUSE OF THE EMERGENCY STOP COMMAND. TEST ALL SAFETY DEVICES BEFORE RESUMING OPERATION.**

**Reset Push Button:**
The green colored **"Reset"** push button is provided to "reset" the control system logic in the event of a Emergency Stop command or activation of one of the safety devices. This push button also is used to lower the index table during set-up procedures.

**WARNING! IN THE EVENT OF AN EMERGENCY STOP OR SAFETY SYSTEM SHUT DOWN OF THE EQUIPMENT, DO NOT PRESS THE RESET PUSH BUTTON UNTIL YOU HAVE IDENTIFIED AND CORRECTED THE CAUSE OF THE EMERGENCY STOP OR SAFETY SHUT DOWN.**

# Operator Controls

**Independent Print Start Push Button:**
This push button permits manual cycling of a selected print station. Please note that the **"Single/Double"** toggle switch for the selected print station must be set to either **"Single"** or **"Double"** position in order for the print station 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. 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.

**Emergency Stop Push Button:**
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 stations shutting down, the retraction of the index fork and shut down of all system operation. Once pushed **"In"** the Emergency Stop push button will remain locked in this position to prevent any further operation of the system. To resume system operation once again, turn the red mushroom shaped Emergency Stop Push Button clockwise one quarter turn, until it pops out then press the green **"Reset"** push button.


**Single/Double Selector Switch:**
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.

**NOTE: When this toggle switch is selected for the middle, or "OFF" position, the particular print station will not operate.**

**Reset Push Button:**
The green colored **"Reset"** push button is provided to **"reset"** the control system logic in the event of a Emergency Stop command or activation of one of the safety devices. This push button also is used to lower the index table during set-up procedures.

# Operator Controls

**Test Print Toggle Switch:**
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 this toggle switch is placed in the **"ON"** position, the control system will automatically and sequentially command each print station which is selected to **"ON"**, to print one complete flood/print cycle. The result will be one printed garment at the end of the print sequence, ready for inspection. In this way, the press Operator is not required to manually turn **"ON"** and **"OFF"** individual print stations to print one sample garment.

**Print Start/Print Finish Toggle Switch:**
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 stations. Placing this toggle switch in the **"Print Start"** position will automatically command each print station that is selected to **"ON"**, to print sequentially at the start of a print run.


**Operation Mode Toggle Switch:**
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 the **"Manual"** 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 print stations 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 43 of this manual.

**NOTE: When the Operation Mode toggle switch is selected to the middle or "OFF" position, the index system will NOT operate.**

# Operator Controls

**Front/Rear Toggle Switch:**
This toggle switch permits the system operator to command the selected print station 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.


**E300 Operator Interface Instructions:**
The Operator Interface control panel 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. Refer to page 33 of this Manual for a detailed description of the operation and function of this control.

# Operator Controls

**Individual Print Station Controls:**
Each of the print stations used on the M&R Challenger Series II includes individual controls for adjustment of flood stroke speed, print stroke speed, independent print start, On/Off switches for pneumatic screen frame clamps and, if ordered as an option, squeegee/flood bar pneumatic clamps, and **"Reset"** push button.

**1. Squeegee/Flood Bar Pneumatic Locking Clamps (Optional):**
Located at the top of the print station control panel, these toggle switches are used to lock the squeegee and flood bar to their respective mounting bars. To lock the squeegee or flood bar to the print station carriage mounting bars, simply position the squeegee or flood bar on the mounting bar and place the toggle switch in the **"On"** lock position (up).

**2. Pneumatic Screen Frame Locks:**
Situated just below the pneumatic squeegee/flood bar locking clamps controls are the pneumatic screen frame locking clamp control switches. The toggle switch on the left activates the front screen frame clamps, while the right toggle switch activates the rear screen frame locking clamps. To lock the screen frame into the screen frame holder assembly, simply locate the screen frame in position and place the toggle switches in the "On" (up) position. The pneumatic cylinders (front & rear) will securely lock the screen frame into the screen holder assembly. To release the screen frame, simply move the toggle switches to the "Off" position and remove the screen frame from the holder assembly.

**3. Squeegee Speed Adjustment:**
The squeegee speed may be independently adjusted by use of this convenient control knob. To increase the squeegee speed, turn the control knob counterclockwise. To decrease the squeegee speed, turn the control knob clockwise.

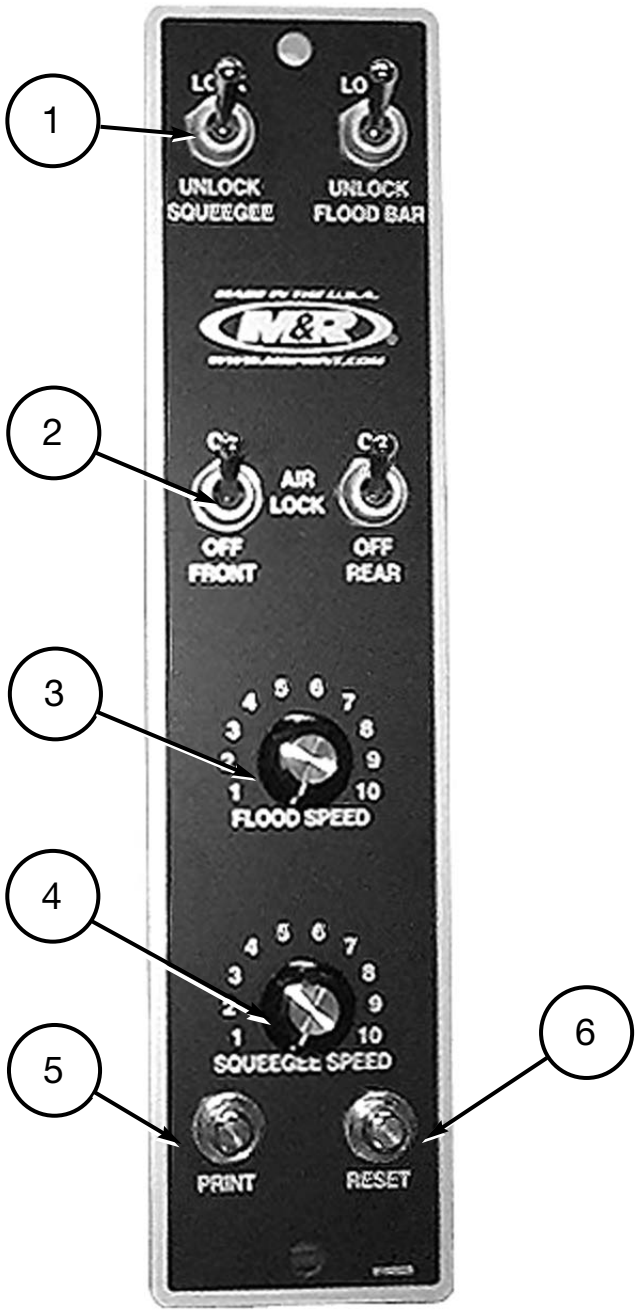
**4. Flood Bar Speed Adjustment:**
The flood bar speed may be independently adjusted by use of this convenient control knob. To increase the flood bar speed, turn the control knob counterclockwise. To decrease the flood bar speed, turn the control knob clockwise.

**5. Independent Print Push Button:**
As described in the Main Control Panel section, this push button is used to cycle the individual print station manually. The **"Print"** push button is also used during screen frame set-up to check for proper screen placement during registration adjustments. To operate, place the **"Single/Double"** toggle switch for the particular print station on the Main Control Panel in the middle, or **"Off"** position. Now press the **"Print"** push button on the print station control panel. The index table will raise so that screen placement and registration may be checked.

To lower the index table, press the green **"Reset"** push button (6) located just to the right of the **"Print"** push button on the Print Station control panel.

**IMPORTANT!**

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



# Operator Controls

**YELLOW CYCLE INTERRUPTION CORDS/BARRIER GATES:**

To prevent injury to operating personnel, yellow cycle interruption cords, or on some models, yellow barrier gates are provided to restrict access into the index table operating area while the equipment is in operation. The yellow cycle interruption cords are provided with magnetic connection jacks at the middle to facilitate entry into the index table operating area during screen set-up or preventive maintenance procedures. If you press has yellow cycle interruption cords, grasp each of the cords at the magnetic jack connections and pull firmly and gently apart. The magnetic connection jacks are separated easier by breaking apart in a downward motion, much like breaking a pencil or dowel rod. (See illustration below)

**IMPORTANT!**

**IMPORTANT!** DO NOT PULL ON THE YELLOW CYCLE INTERRUPTION CORD ITSELF. THIS PRACTICE WILL RESULT IN A LOOSE OR "OPEN" ELECTRICAL CONNECTION INTERNAL TO THE JACK AND EQUIPMENT OPERATION WILL NOT BE POSSIBLE.

**WARNING!**

**WARNING!** ALWAYS DISCONNECT THE YELLOW CYCLE INTERRUPTION CORDS AND PUSH "IN" THE RED EMERGENCY STOP PUSH BUTTON DURING SCREEN INSTALLATION, SCREEN SET-UP AND WHILE WORKING WITHIN THE INDEX TABLE OPERATING AREA. CLEARANCE BETWEEN PRINT STATIONS IS EXTREMELY LIMITED AND SERIOUS BODILY INJURY MAY RESULT! DO NOT STAND BETWEEN INDEX PALLET SUPPORT ARMS TO INSTALL SCREEN FRAMES, ADJUST SCREEN REGISTER OR PERFORM ANY OTHER OPERATIONAL ADJUSTMENTS WITH THE YELLOW CYCLE INTERRUPTION CORDS CONNECTED!

**WARNING!**

**WARNING!** NEVER ATTEMPT TO BY-PASS OR DEFEAT ANY CONTROL DEVICE OR APPLIANCE. CHECK TO BE SURE THAT ALL CONTROL DEVICES AND APPLIANCES ARE WORKING AND FUNCTIONING PROPERLY BEFORE BEGINNING ANY OPERATION OF THIS EQUIPMENT. SHOULD YOU DETERMINE THAT ANY CONTROL DEVICE OR APPLIANCE IS NOT OPERATING OR FUNCTIONING PROPERLY, DO NOT ATTEMPT TO OPERATE THIS EQUIPMENT. REPORT ANY FAILURE OF CONTROL DEVICES OR APPLIANCES TO YOUR SUPERVISOR SO THAT REPAIRS OR REPLACEMENT MAY BE MADE AS SOON AS POSSIBLE.

**YELLOW BARRIER GATES:** (Export Models)

Some models of the M&R Challenger Series II may be equipped with yellow barrier gates. These gates provide the same protection to the press Operator as the yellow cycle interruption cords by restricting access to the inner operating area of the index table.

To enter into the index table area, first press "In" the red Emergency Stop push button. Now simply apply pressure to the yellow barrier gate at the interlock connection point (usually the right side). As the gate disconnects and swings away from its locked position, an "open" circuit in the 24 volt barrier gate control circuit will result in the shut down of the entire control system. To resume operation of the system, return the barrier gate to the "operating" or closed position. Do not close the gate with undue or excessive force. Pull "out" or deactivate the red Emergency Stop push button. Now press the green "Reset" push button on the main control panel to reset the PLC's control logic, and resume print operations.

**WARNING!**

**WARNING!** ALWAYS DISCONNECT THE YELLOW BARRIER GATE AND PUSH "IN" THE RED EMERGENCY STOP PUSH BUTTON DURING SCREEN INSTALLATION, SCREEN SET-UP AND WHILE WORKING WITHIN THE INDEX TABLE OPERATING AREA. CLEARANCE BETWEEN PRINT STATIONS IS EXTREMELY LIMITED AND SERIOUS BODILY INJURY MAY RESULT!

# Operator Controls

**WARNING!**

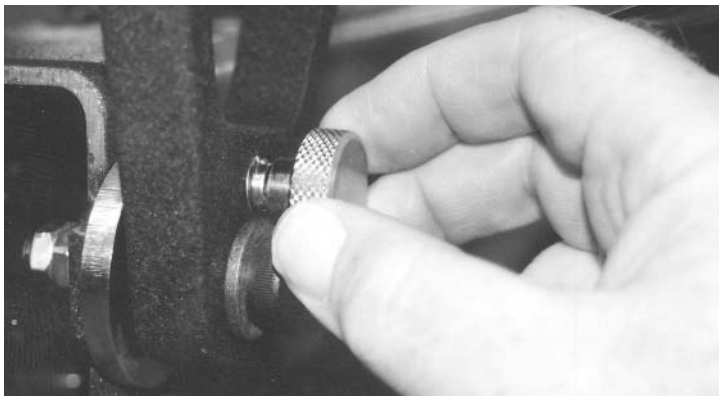
DO NOT STAND BETWEEN INDEX PALLET SUPPORT ARMS TO INSTALL SCREEN FRAMES, ADJUST SCREEN REGISTER OR PERFORM ANY OTHER OPERATIONAL ADJUSTMENTS WITH THE YELLOW BARRIER GATES CONNECTED!

**AC Print Station Drive Inverter -**
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. (See illustration below)

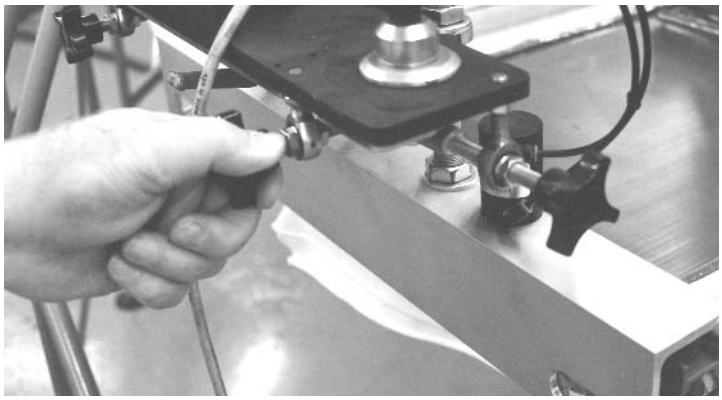

The L.E.D. display automatically changes to display either flood stroke or squeegee speed as the print station operates through the flood/print cycle.

**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 illustration top right)

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 illustration below)



Before securing the screen frame in the frame holders, be sure to set the micro registration adjustments for “Zero” or middle range. (See illustration below)



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.

# Operator Controls

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 previously.

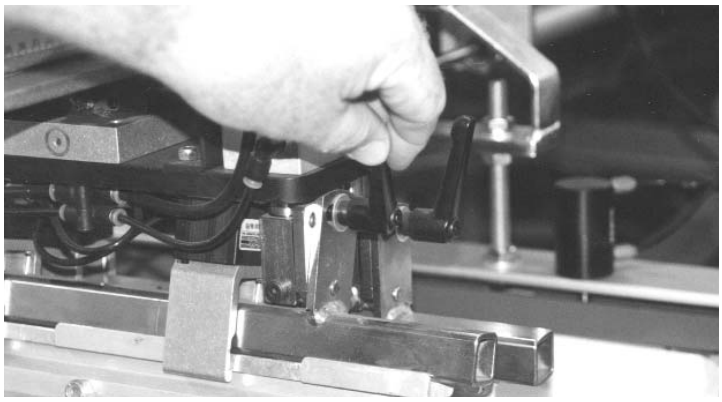
You are now ready to install the flood bar and the squeegee. The flood bar is installed on the rear (towards the center of the press) print carriage mounting bar. The squeegee is installed on the front (towards the outside diameter of the press).

**IMPORTANT!**

**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).

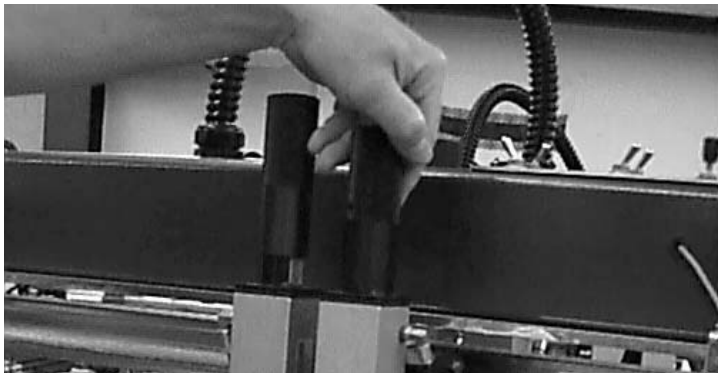
Align the notches on the flood bar and squeegee with the pneumatic squeegee/flood bar clamps, or with the manual mounting clamps provided. Raise the squeegee/flood bar into the clamp assembly and up against the chrome plated mounting bar and slide it either to the right or the left to center it on the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

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 illustration below)

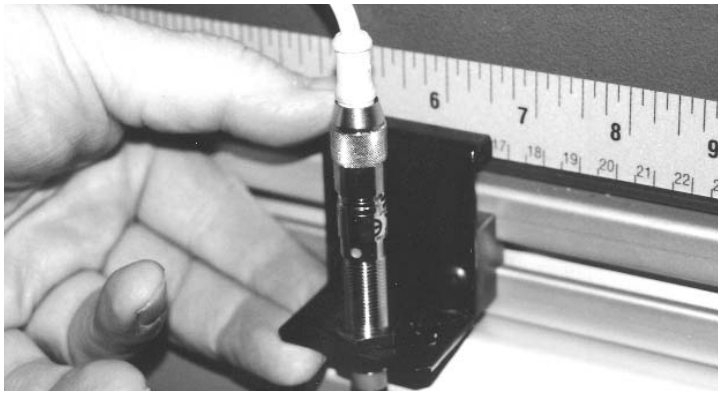


Adjust the flood bar pressure by use of the large black knurled knobs at the top of the print carriage assembly. The flood bar pressure should be adjusted so that there is only a slight pressure felt on the bottom of the screen mesh. To increase the flood bar pressure, turn the black knurled knobs counterclockwise. 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 illustration below)



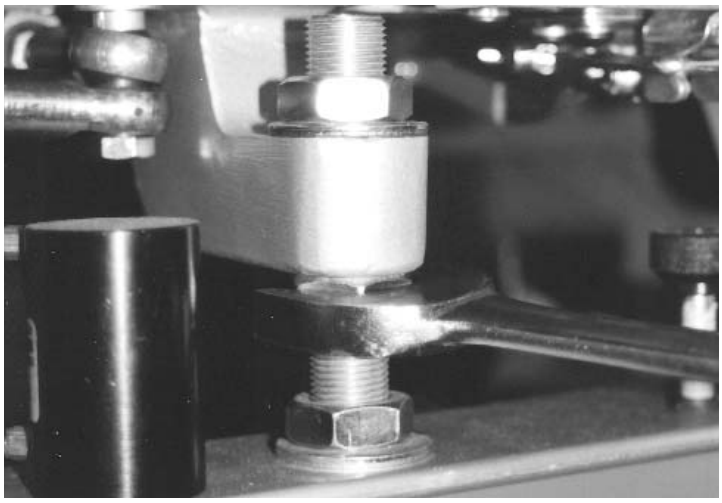
The M&R AC print stations feature solid state proximity sensors to facilitate the setting of print stroke length from the front and the rear of the screen. To adjust the print stroke length, simply grasp the sensor mounting bracket, and gently slide the proximity sensor to the desired position. Adjust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



# Operator Controls

**IMPORTANT!**

**NOTE:** DO NOT ADJUST THE SENSOR WHILE THE PRINT STATION IS IN OPERATION!



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 illustration below)


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 illustration top right)

# E 300 Operator Interface

**E 300 OPERATOR INTERFACE -**
The Operator Interface control panel is divided into 5 different control areas as follows. (See Figure 1 at the right)

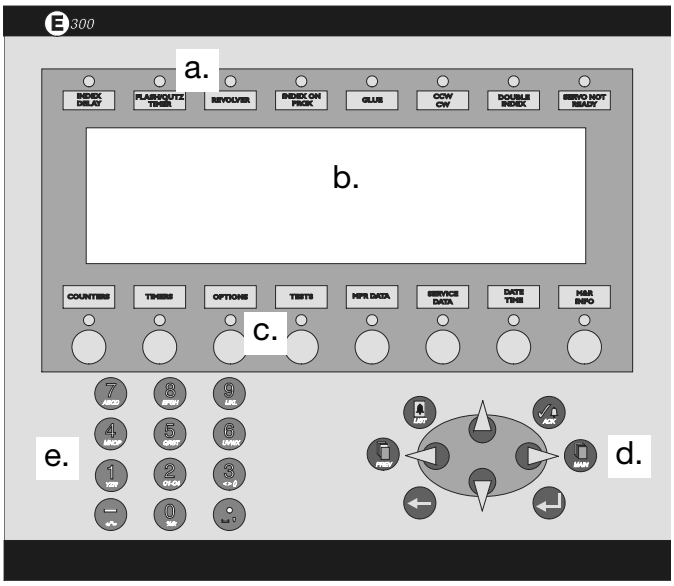



*Figure 1*

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/REVOLVER, INDEX ON PROX, GLUE, CCW/CW (Counterclockwise & Clockwise), DOUBLE INDEX and SERVO NOT READY.

**IMPORTANT!**

**NOTE:** If your press has been ordered with the "Revolver" print sequencing program, then the "QUARTZ TIMER" L.E.D. indicator will be replaced with "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 onboard 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 ALARM LIST.

# E 300 Operator Interface

**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. A red L.E.D. will be displayed when the system is operating in the "Revolver" print sequencing program.

**FLASH/QUARTZ TIMER -**
When the "Flash Timer" command is selected, this L.E.D. will display a green indication.

**REVOLVER/QUARTZ PREHEAT -**
This L.E.D. will display a green indication when the "Quartz Preheat" time interval is activated, or when the system is operating in the Revolver sequencing mode.

**INDEX ON PROX -**
This L.E.D. will display a green indication when the "Index ON" proximity switch which reads the carousel index cam followers 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 "OPTIONS" 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". (See Fig. 2 at the right)

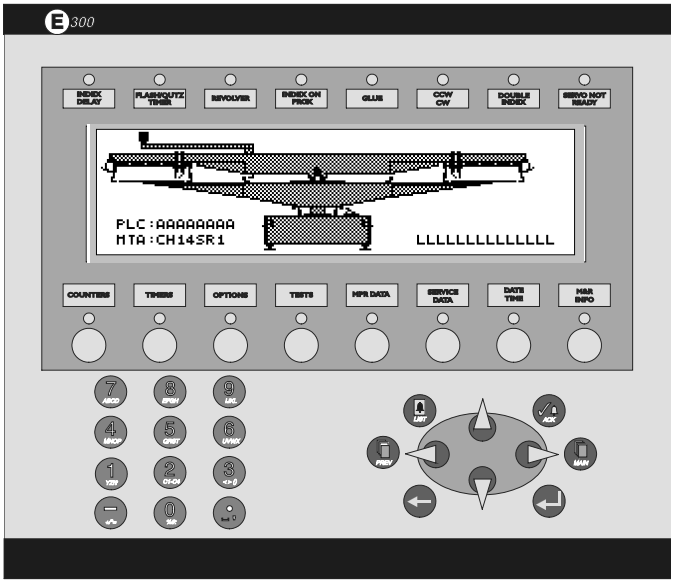



*Figure 2*

# E 300 Operator Interface

**OPERATIONAL CONTROL & STATUS KEYS -**

**MAIN SCREEN**
The first screen which is displayed is the MAIN SCREEN. The L.C.D window will display a graphic representation of the M&R Challenger Series II press. In the lower right corner of the L.C.D. window, the screen will display the program reference information for the program currently installed in the press. (See Figure 3 at the right)

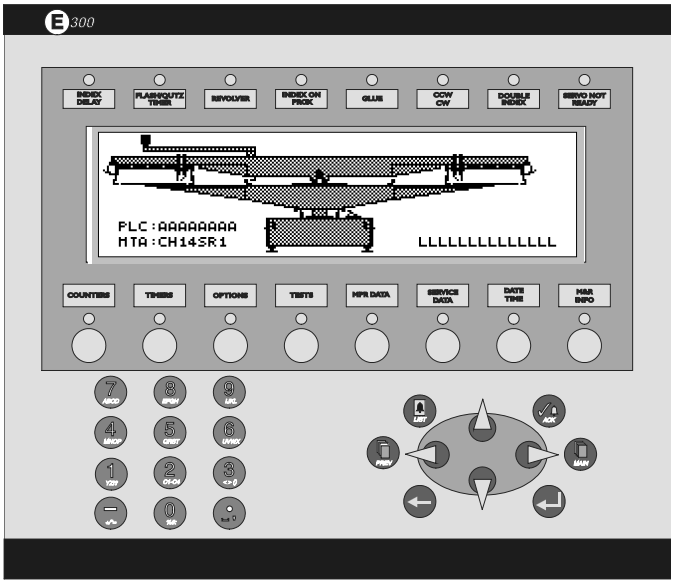



*Figure 3*

**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", "Set Counter", "Left Counter", "Total Counter" and "Speed. At the bottom of the screen is a graduated scale starting at "0" on the left and increasing to "120" on the right. This scale indicates the current production rate and is expressed in "Dozens per hour". As the press operates, you will note that the scale will gradually 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 Figure 4 at the right)

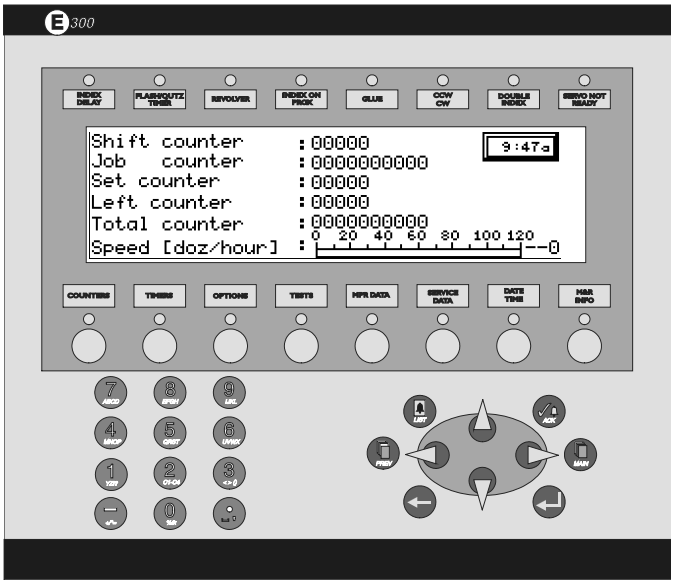



*Figure 4*

The "Shift Counter" displays the count for the production shift. The "Shift Counter" may be reset 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" is now reset to "0".

The "Job Counter" displays the current number of index cycles for a given print job. The "Job Counter" may be reset in the same manner as described above for "Shift Counter".

Set Counter
The next sub-menu selection is "Set Counter". The "Set Counter" sub-menu is used to enter a number of print cycles for a given print job into the PLC. For example, if a print job consists of printing 30 dozen shirts, you would enter 360, the total number of shirts in 30 dozen. You may enter up to a maximum of 32,767 print cycles into the "Set Counter" sub-menu. The minimum you may enter is "0".

To enter a number of print cycles, use the "ARROW DOWN" key to place the flashing frame on the numeric indication for "Set Counter" at the right of the message screen. Press the 3, 6, and 0 numerical keys to enter the number of print cycles (360 for example).

# E 300 Operator Interface

Now press the "Return/Enter" key to enter the number of print cycles into the PLC.

**Left Counter**
The next sub-menu selection is "Left Counter". The "Left Counter" sub-menu displays the number of print cycles which remain in the "Set Counter" sub-menu as you progress through the print job. In this manner the "Left Counter" sub-menu functions as a "count down" display. To enter a number of print cycles, use the "ARROW DOWN" key to place the flashing frame on the numeric indication for "Left Counter" at the right of the message screen. Press the 3, 6, and 0 numerical keys to enter the number of print cycles (360 for example). Now press the "Return/Enter" key to enter the number of print cycles into the PLC. The "Left Counter" indication can be accessed and changed if for instance in the event that 2 or 3 shirts are misprinted, you can add these shirts back into the "Left Counter" indication to keep the remaining count current. (See Fig. 5 at the right)

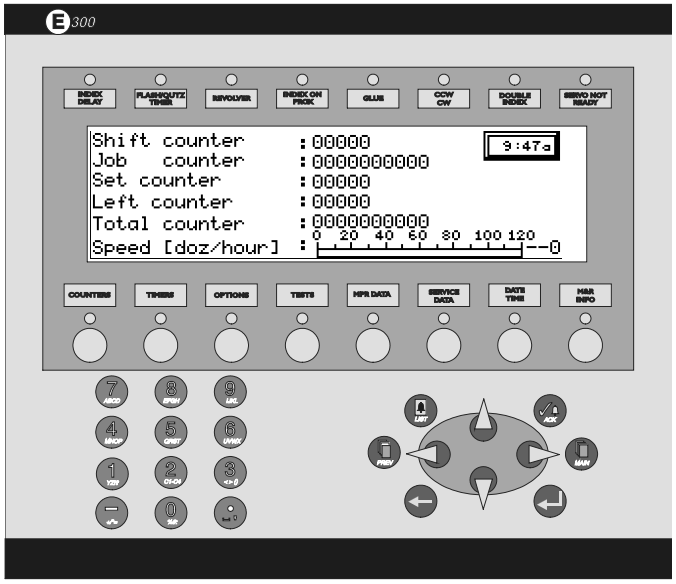



*Figure 5*

The "Left Counter" sub-menu also automatically activates the "Print Finish" mode and sounds an audible signal when the last shirt in the count is loaded onto the press. For example, if you entered 360 print cycles in the "Set Counter" menu, when the "Left Counter" menu display reaches the last shirt or print cycle, the press will automatically enter the "Print Finish" mode and the audible signal will sound.

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". 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 Figure 6 at the right)

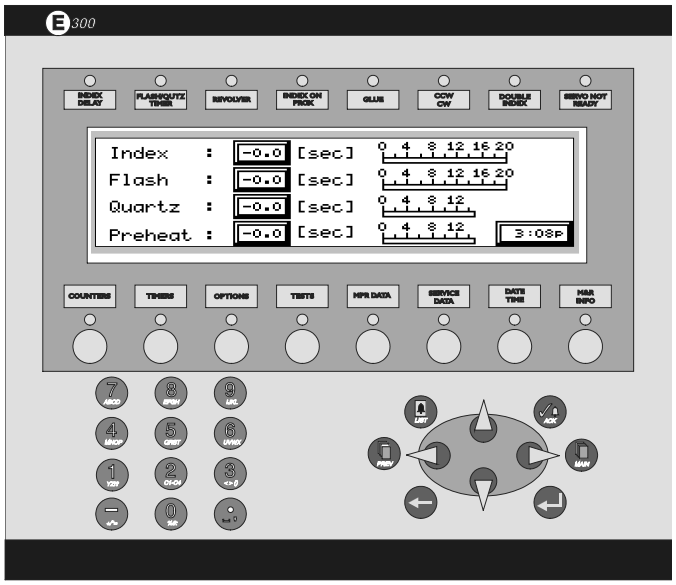



*Figure 6*

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 interval during automatic operation in which the system operator may load and/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 operator's requirements as follows.

# E 300 Operator Interface

The flashing frame should be located on the Index Dwell Time indication already. If it is not, use the “Arrow” keys to place it on the indication. 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. (See Figure 7 at the right)

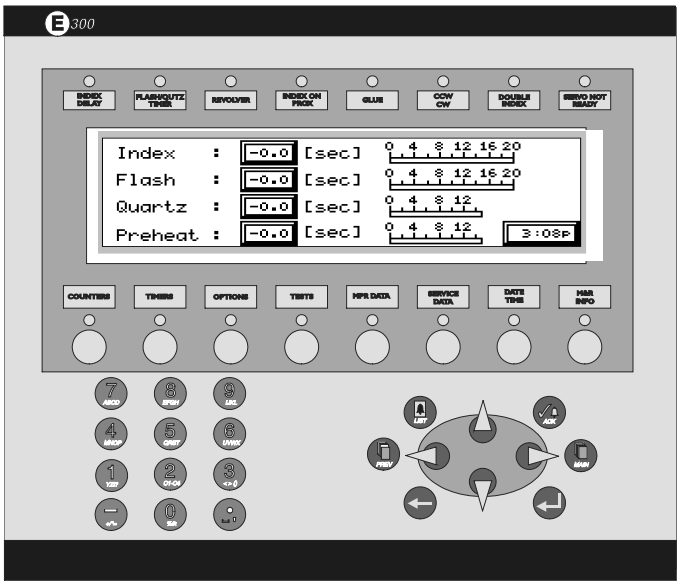



*Figure 7*

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 described above, enter the desired amount of flash dwell time using the numerical keys. 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. Please be aware that whenever a dwell time value of "0" has been selected for the "INDEX" or "FLASH DWELL TIMER", the flash cure units 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". 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 whenever 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 item provides this functionality. 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 it's 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.

**OPTIONS -**

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 ten sub-menu items, "Revolver Mode", "Flash", "Double Switch", "Head Setup", "Setup Mode", "Double

# E 300 Operator Interface

Print Up/Down", "Skip T-Shirt/Sensor", "InkDip Every", "Glue Applicator" and ">Servo Index Options".

**M&R REVOLVER SEQUENCING PROGRAM (Optional)**
(U.S. Patent No. 5,595,113)
The first sub-menu item is "Revolver mode".

**IMPORTANT!**

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", "Pallet No.:", "Job No.", "Job Clear" and "Alarm Enabled ON/OFF". 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". (See Figure 8 and 9 at the right)

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 the "TIMERS" menu 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 signal which indicates the approaching end of a programmed print sequence in the Revolver mode of operation. (See Figure 9 at the right)

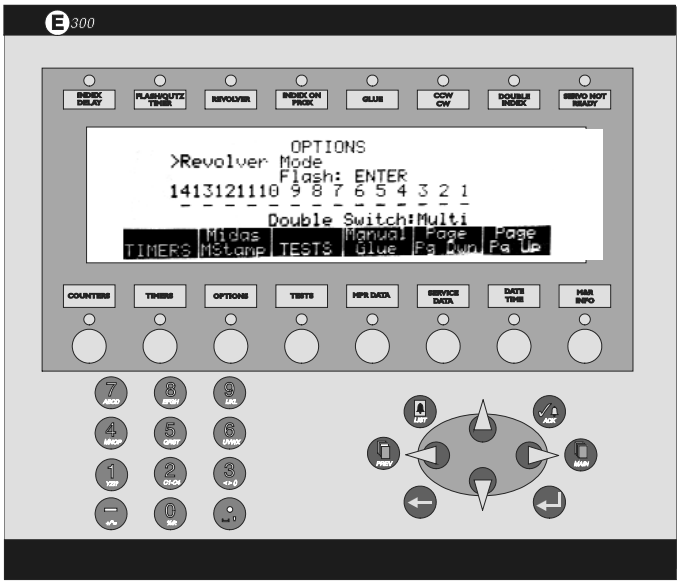



*Figure 8*

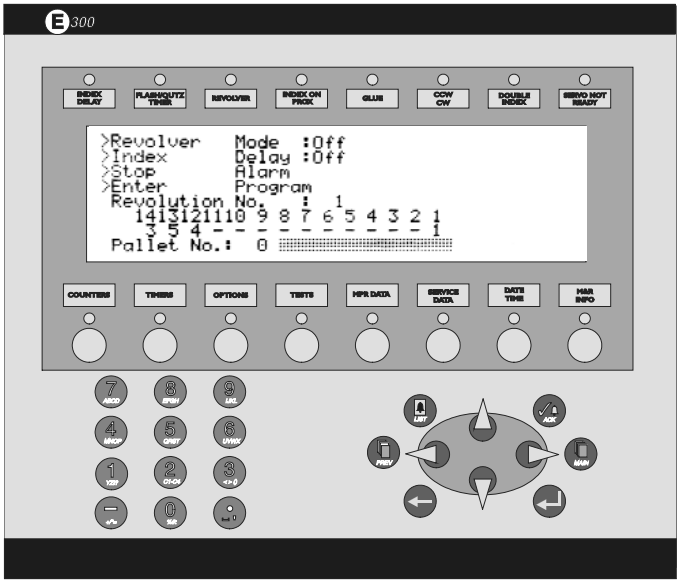



*Figure 9*

# E 300 Operator Interface

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/Multi" (remember, flashes units 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. "1" indicates a print station is printing in "Single" mode. "2-9" indicates the print station is printing in "Double/Multi" mode. "F" indicates that the print station 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 (count down) 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. (See illustration Figure 10 at the right)

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 signal which sounds just before the completion of a programmed print sequence. To turn the alarm signal "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.

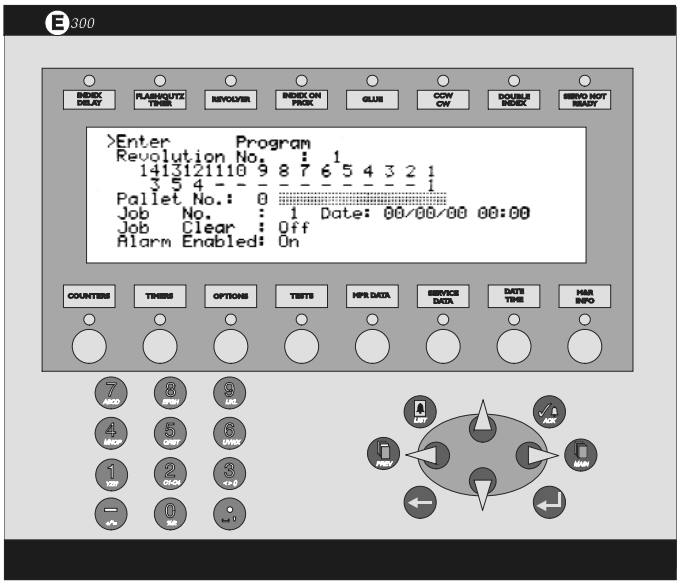



*Figure 10*

# E 300 Operator Interface

**Flash:**
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 frame 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 Fig. 11 at the right)

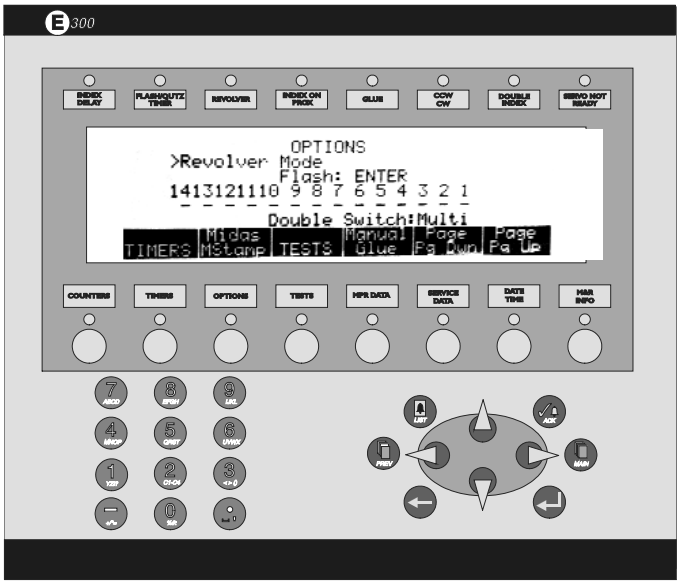



*Figure 11*

**Double Switch -**
The third sub-menu selection in the "Options" menu is "Double Switch". Double Switch is used to command individual print stations to perform multiple flood and print strokes, up to a maximum of 9. To select print stations for "Double Switch" operation, use the "ARROW RIGHT" key to place the flashing frame on the "Double/Multi" icon at the right of the message screen, then press the "RETURN/ENTER" key. Each time you press the "RETURN/ENTER" key, the icon indication will toggle from "Double" to "Multi" and vice versa. (See Fig. 13 at the right)

The L.C.D. message screen will display the "Multi-Print" menu screen. The next line displays the print stations from left to right as 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, and 1. The last line displays a numeric indicator under each print station number which indicates if the print station is operating in "normal" (1) single stroke mode or in "Double" mode (2 print strokes) or "Multi" mode (3 through 9 print strokes).

In figure 12 at the right all print stations have been set to "Double" mode and will print 2 flood/print cycles. To select print stations for "Multi-Print" operation, use the "ARROW" keys to place the flashing cursor on the number indication which represents the print station. Now press the appropriate number key (3 through 9) to enter the number of print cycles for that print station.

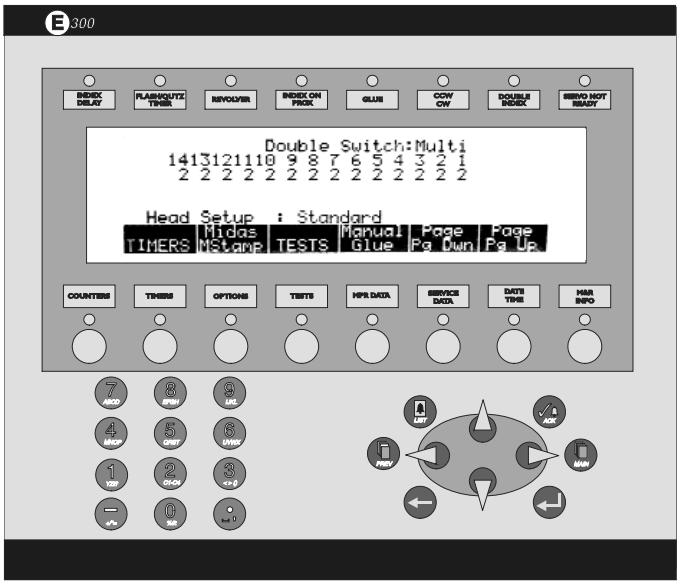



*Figure 12*

# E 300 Operator Interface

Now press the "RETURN/ENTER" key. The number indication for the print cycles will change indicating the selected print station will now perform multiple flood/print strokes in the "Multi-Print" mode. To return a print station to standard (single) print operation, locate the flashing cursor on the number indicator under the print station and press the number "1" key. Press the "RETURN/ENTER" key. The print station will now return to standard, single print stroke operation.

**Head Setup:**
Each print station is provided with a independent print push button located on both the main operator control panel and each individual print station control panel. The independent print push button is used to raise the print carousel during set-up operations and to command individual print stations to perform one complete flood/print cycle. You will note that the "Head Setup" includes a "Standard/Enhanced" indication at the right of the message screen. To select either "Standard" or "Enhanced" mode, use the "Arrow" keys to place the flashing cursor on the "Standard" or "Enhanced" indication. Now press the "RETURN/ENTER" key. Each time you press the "RETURN/ENTER" key, the indication will toggle from "Standard" to "Enhanced" and vice versa. (See Fig. 13 at the right)

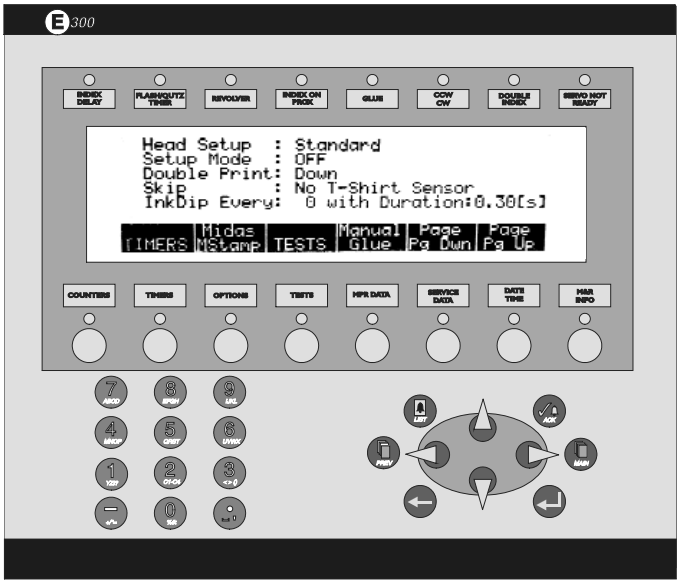



*Figure 13*

In the "Standard" mode, pressing the "Print" push button will command the index table to raise and the selected print station to perform one complete flood/print cycle. You must have the selected print station "On/Off" switch in the "On" position on the main control panel.

In the "Standard" mode with the print stations "On/Off" switch in the "Off" position, pressing the "Print" push button one time will command the index table to raise to the print position. Pressing the "Print" push button for a second time will cause the index table to go down.

In the "Enhanced" mode with the print stations "On/Off" switch in the "On" position, tapping the "Print" push button momentarily will command the index table to raise and remain in the raised position. Tapping the "Print" push button once again will command the index table to lower to the index position once again. Pressing the "Print" push button and holding it in will command the index table to raise and the selected print stations to perform one complete flood/print cycle.

In the "Enhanced" mode with the print stations "On/Off" switch in the "Off" position, pressing the "Print" push button momentarily will command the index table to raise and remain in the raised position.

# E 300 Operator Interface

Pressing the "Print" push button once again will command the squeegee in the selected print station to chop down to the print position.

This allows the press Operator to easily check and adjust squeegee pressure prior to printing. Pressing the "Print" push button a third time will cause the squeegee to chop back to the raised position and the index table to drop down to the index position once again.

**Setup Mode: On/Off:**
As discussed previously, each print station is provided with a independent print push button located on both the main operator control panel and each individual print station control panel. The independent print push button is used to raise the print carousel during set-up operations and to command individual print stations to perform one complete flood/print cycle.

**Setup Mode On Print Station Off -**
In this mode, pressing the "Print" push button once will command the print table to raise. Pressing the “Print” push button a second time will command the print carriage to chop to the "Print" position. Pressing the "Print” push button a third time will command the index table to return to the down position and the print carriage to chop back to the “Flood” position.

**Setup Mode On  Print Station On-**
In this mode, pressing the "Print" push button will result in one complete flood, table up, print and table down cycle.
You must have the selected print station "On/Off" toggle switch in the "On" position on the main control panel.

**Double Print: Up/Down:**
The next menu selection in the "Options" menu is "Double Print Up/Down". This menu selection is used to command the index table to remain in the "Up" position during a double print or multi print stroke cycle of any print station. In this way, the additional time it takes for the index table to drop and rise between print stroke cycles is eliminated. When this menu selection is selected to "Down", the index table will operate in the standard mode during double or multi print operation, where the index table lowers between print strokes. (See Fig. 14 at the right)

To access the "Double Print Up/Down" menu, use the "Arrow" keys to place the flashing frame on the small indicator at the right "Down/Up" displayed on the screen. Now press the "RETURN/ENTER" key. Each time you press the "RETURN/ENTER" key the indication it will toggle from "Up" to "Down".

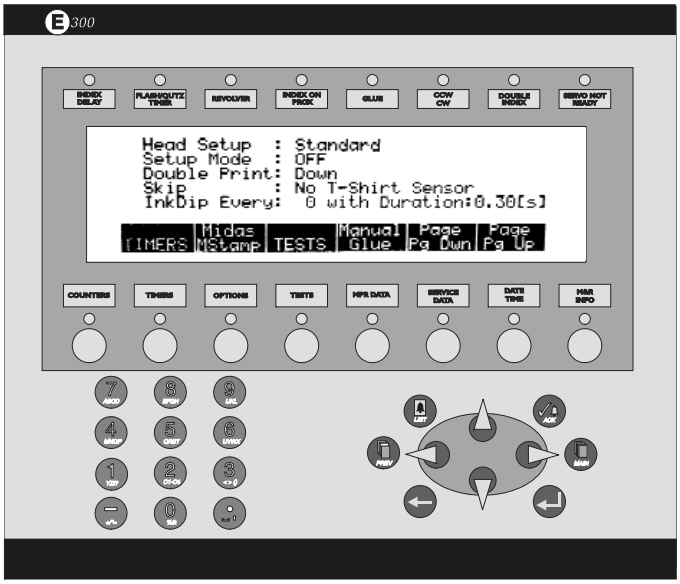



*Figure 14*

# E 300 Operator Interface

**Skip: No T-Shirt/Sensor:** (US Patent No. 5,383,400)
The next menu selection under "OPTIONS" is "Skip" sensor. This menu item is used to activate the "NO SHIRT DETECTOR" option. Activation of the "NO SHIRT DETECTOR" option may be accomplished in two ways.

First if you wish to command the system to dis-regard printing on a particular pallet for what ever reason, you may depress the Foot Pedal as that pallet begins its index cycle.

The second method is to allow the control system to automatically determine the pallet to be dis-regarded by use of the "NO SHIRT DETECTOR" sensor mounted to a portable floor stand. To activate the Foot Pedal, use the "Arrow" keys to place the flashing frame on the small box to the right of the word "Skip". Now press the "RETURN/ENTER" key. The indication will change from "Sensor" to "F. Pedal". To change the indicator back to "Sensor", press the "RETURN/ENTER" key once again.

**InkDip Every:** (US Patent No. 5,649,479)
The next sub-menu selection under the "OPTION" menu is "Ink Dip Every". This control feature eliminates the need for the press Operator to manually scoop ink from the rear ink well area of the screen, into the active image area of the screen. The "Ink Dip Every" feature does this for you automatically. Use the "ARROW" keys to locate the flashing frame at the left of the first menu selection under "Ink Dip Every". Now press the "ARROW RIGHT" key to locate the flashing cursor on the value at the right which indicates the frequency the InkDip activates. Using the numerical keys, enter the desired number of print cycles before the ink dip control feature activates. Now press "RETURN/ENTER" key. For instance, if you enter the number "10" into the value, then the "Ink Dip Every" feature will automatically retrieve ink from the ink well area of the screen after 10 print cycles have been completed. You may enter a value up to a maximum of "999". If you enter the value "0", the "Ink Dip Every" control feature will not operate. (See Fig. 15 at the right)

**Duration**:
Duration is used to control the distance that the print carriage moves back into the ink well area. The maximum time allowed is 0.70 seconds. The minimum setting is 0.30 seconds. To adjust the duration, press the "Arrow" keys so the the flashing frame is placed on time indication for duration at the right of the screen. Use the numerical keys to enter the desired time in seconds for the InkDip duration, then press the "RETURN/ENTER" key. Your selection for InkDip duration is now displayed in the time indication.

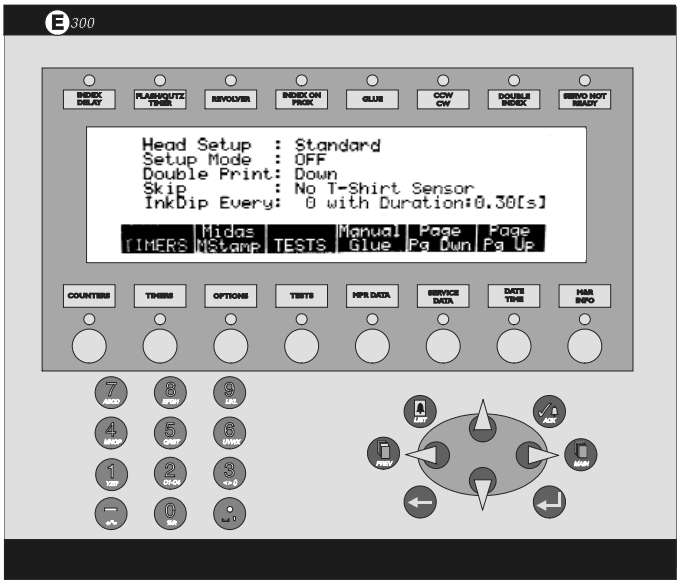



*Figure 15*

# E 300 Operator Interface

**Glue Applicator:**
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 #:".

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. (See Fig. 16 at the right)

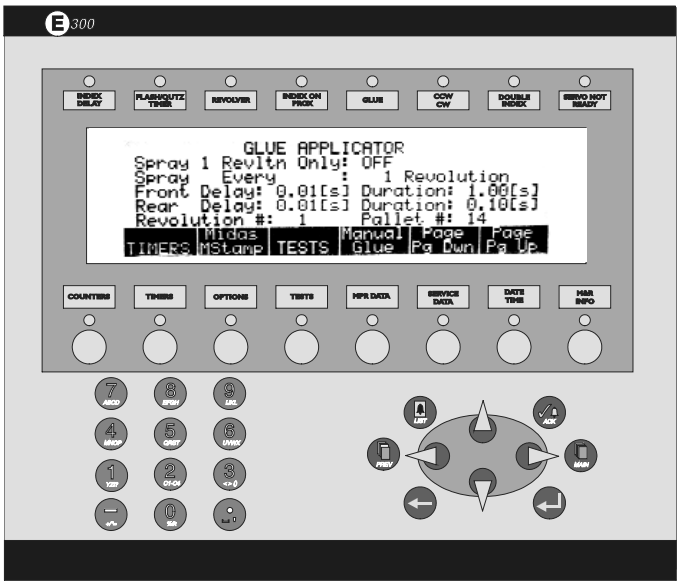



*Figure 16*

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 all pallets 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.

# E 300 Operator Interface

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. (See Figure 17 at the right)

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 previously, permits the system Operator to precisely set the one rear spray gun to synchronize with the current index speed.

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. (See Figure 17 at the right)

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.

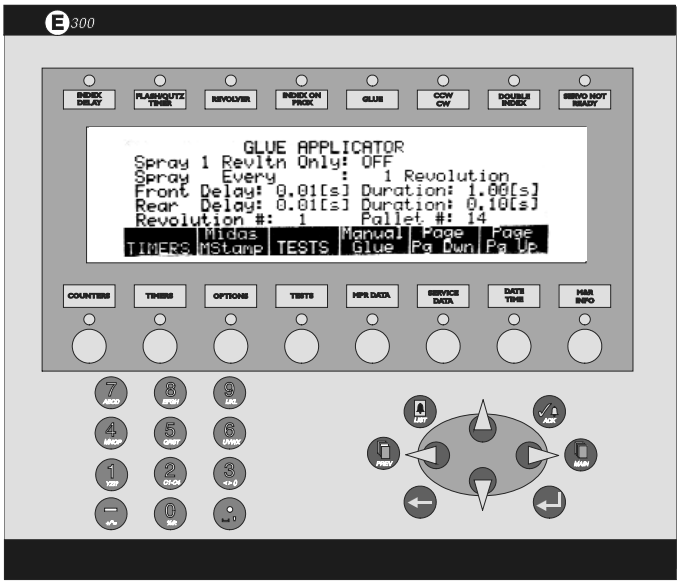



*Figure 17*

# E 300 Operator Interface

You will note that across the bottom of the display screen is a dark bar with **“TIMERS”, “Midas/MStamp”, “TESTS”, “MPR”, “Manual Glue”, “Pg Dwn”** and **“Pg Up”**. Except for **“Midas/MStamp”** and **“Pg Dwn”** and **“Pg Up”** these functions work as explained previously. **“Midas/MStamp”** is used to manually activate the M&R Midas or Mega Stamp foil application system. Simply press the button below **“Midas/MStamp”** which normally would be **“OPTIONS”**, to display the Midas/MStamp menu selection. (See Fig. 18 at the right)

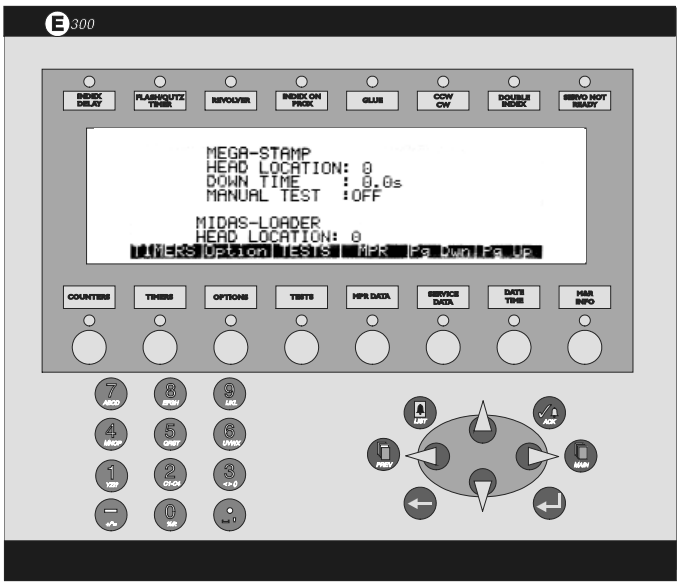



*Figure 18*

The first menu selection for the Mega-Stamp is “Head Location”. This menu selection is used to enter the print station number where the Mega-Stamp unit is located. To enter the print station location, use the “Arrow” keys to place the flashing frame on the indication at the right. Then press the number key or keys which represent the print station location. Now press the “Enter” key.

The next menu selection is “Down Time”. The “Down Time” is used to enter the time which the Mega-Stamp is in the down position applying force to the foil application on the pallet. The maximum down time which may be entered is 10 seconds. The minimum down time is 1 second. Use the “Arrow” keys to place the flashing frame on the indication at the right. Then press the number key or keys which represent the desired down time. Now press the “Enter” key.

The next menu selection is “Manual Test”. Manual Test is used to manually test the operation of the Mega-Stamp unit. Use the “Arrow” keys to place the flashing frame on the “Off” indication at the right. Now press the “Enter” key. The indication will change to “On” and the Mega-Stamp will perform one cycle. Each time you press the “Enter” key, the Mega-Stamp will perform one manual cycle.

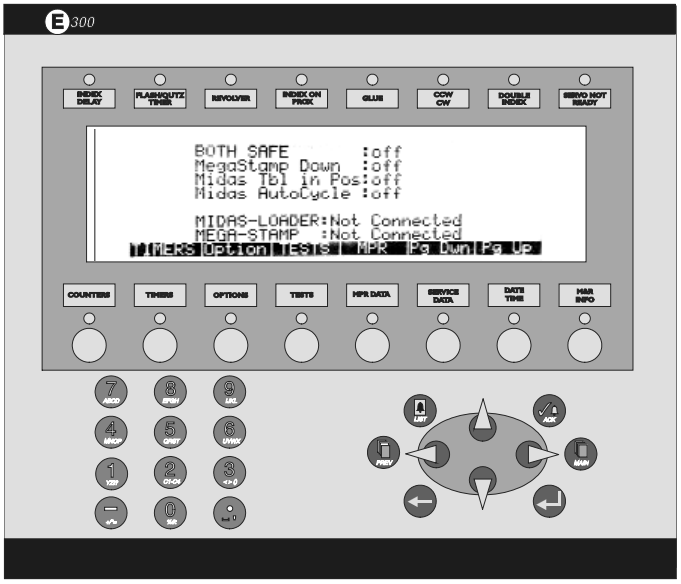



*Figure 19*

**Midas Loader -**
The first menu selection for the Midas Loader is “Head Location”. This menu selection is used to enter the print station number where the Midas Loader unit is located. To enter the print station location, use the “Arrow” keys to place the flashing frame on the indication at the right. Then press the number key or keys which represent the print station location. Now press the “Enter” key.

The next four menu selections are “Both Safe”, “Megastamp Down”, “Midas Tbl in Pos” and “Midas AutoCycle”. These menu selections are used to display the current status of the input and output signals form the MegaStamp and the Midas units. These selections are used as indicators only and are not adjustable in any manner.

# E 300 Operator Interface

Midas Loader" and "Mega-Stamp Connected/Not Connected" are used to activate these options in the PLC program. To turn these options "On", use the "Arrow" keys to place the flashing cursor on the "Connected/Not Connected" indication at the right of the screen. Now press the "Enter" key. Each time you press the "Enter" key the indication will toggle back and forth from "Connected" to "Not Connected".

**Servo Index Options -**
The final menu selection in the Options menu is "Index Servo Options". This menu selection is used to adjust the operation of the index servo drive system. (See Fig. 20 at the right)

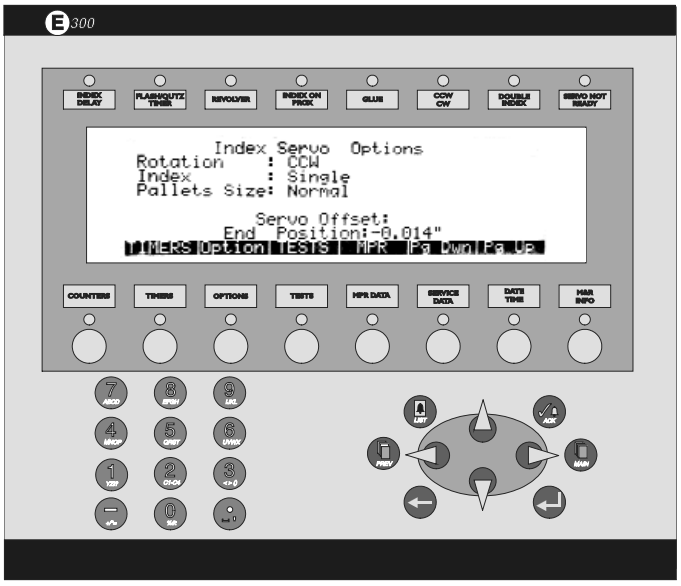



*Figure 20*

The first menu selection is "Rotation". With this menu selection you can select either clockwise or counter-clockwise index table rotation. Use the "Arrow" keys to place the flashing frame on the "CCW/CW" indication at the right. Now press the "Enter" key. Each time you press the "Enter" key, the indication will toggle from "CCW" to "CW".

The next menu selection is used to set the servo index drive to operate in either "Single" or "Double" index mode. Use the "Arrow" keys to place the flashing frame on the "Single/Double" indication at the right. Now press the "Enter" key. Each time you press the "Enter" key, the indication will toggle from "Single" to "Double".

The next menu selection is "Pallet Size". Use the arrow keys to place the flashing frame on the indication at the right. Now press the "Enter" key. Each time you press the "Enter" key, the indication will toggle from "Small" to "Normal" or "Large".

**Servo Offset:**
Scrolling down further in the Servo Index Options 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. This control is provided to adjust index stop after changing pallets to a smaller or larger size. Larger pallets increase the mechanical load as seen by the indexer, while smaller lighter pallets decrease the index load. As a result, changing of printing pallets can have an impact 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. (See Fig. 21 at the right)


*Figure 21*

# E 300 Operator Interface

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.

Press the buttons below **“Pg Dwn”** or **“Pg Up”** to scroll down through the menu item.

**OILER -**
The next sub-menu item is “OILER”. This sub menu item makes the periodic lubrication of the index drive assembly 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 drive assembly 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. (See Fig. 22 at the right)

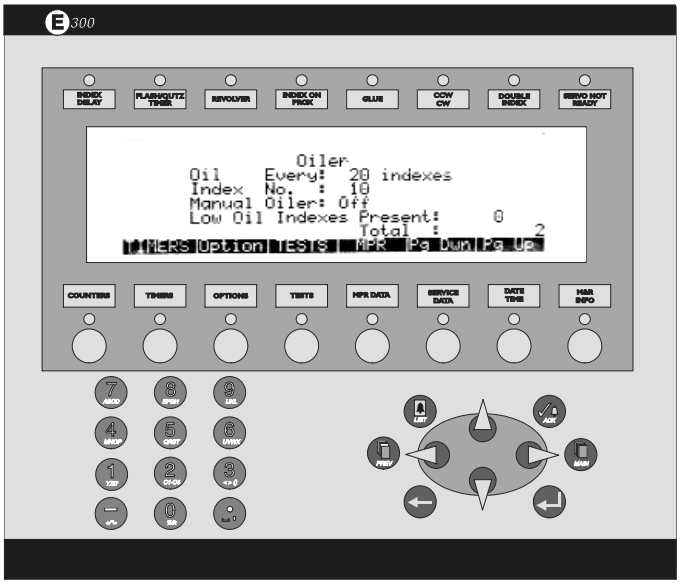



*Figure 22*

“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 six sub-menu selections which are "Panel Test", "Proximity's Test", "Motion Card Test", "Servo Drive Test", "Servo Motion Card History" and "Others" tests. The "TESTS" menu provides 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 button switches used in the operation of the M&R Challenger Series II system. (See Fig. 23 at the right)

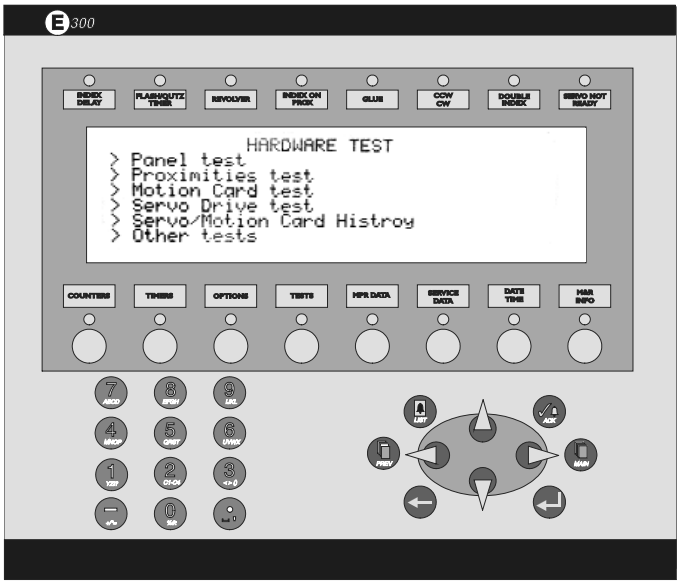



*Figure 23*

**PANEL TEST** To access the "Panel Test" sub-menu, press the arrow keys 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.

# E 300 Operator Interface

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. (See Fig. 24 at the right))

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 an indication fail to respond, then investigation of the operation of that particular proximity switch is indicated. (See Figure 25 at the right)

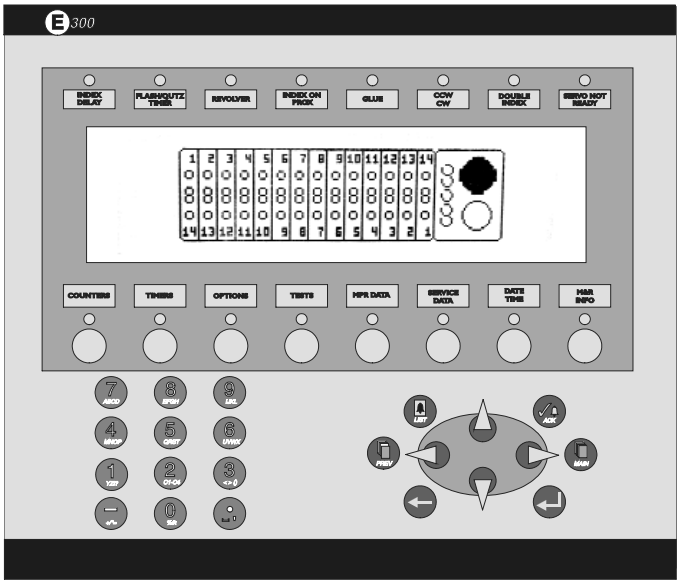



*Figure 24*

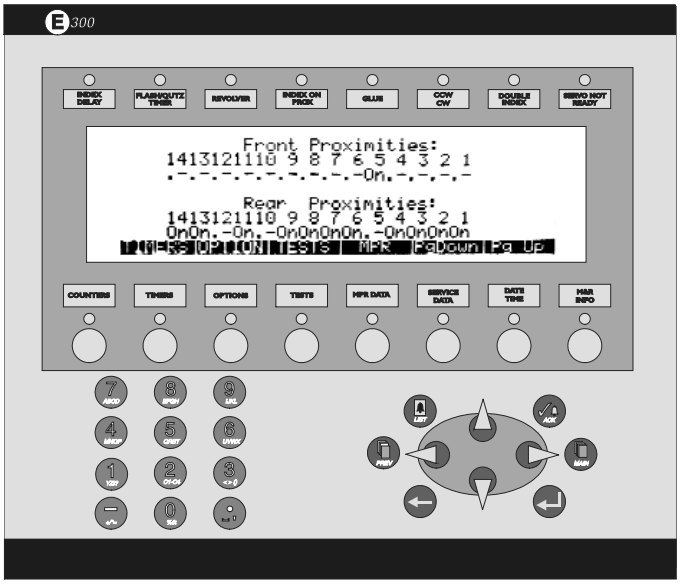



*Figure 25*

**"MOTION CARD ERROR"** again performs in the same diagnostic manner as described previously 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.

**"SERVO DRIVE TEST"** also performs in the same diagnostic manner as described above for "Panel Test" and "Proximities Test", with 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.

**SERVO MOTION CARD HISTORY**

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

# E 300 Operator Interface

**OTHER TESTS**
This menu selection is used to display the current operational status of other control features which may be utilized on the equipment. These control features include Print head push buttons, Yellow cycle interruption cords, no t-shirt sensor, Foot Pedal, Air Pressure Switch and PLC Errors.

**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 submenu 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.

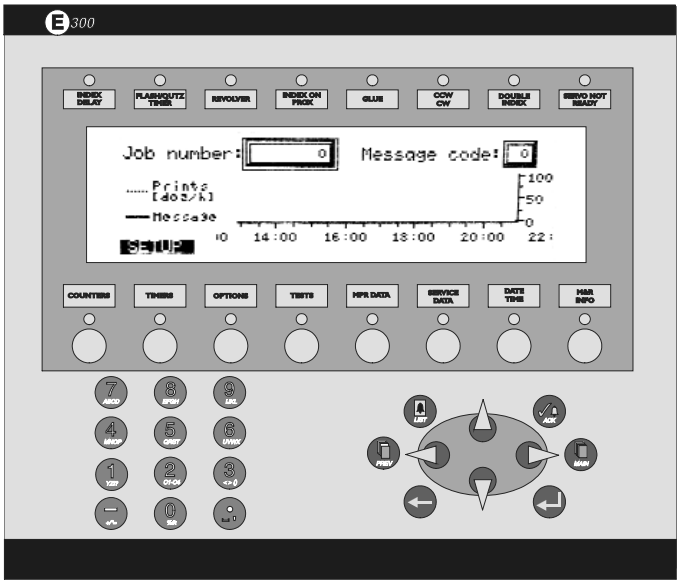



*Figure 26*

The display will read "Job number" and "Message Code". (See Figure 26 at the right) 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.

**DATE/TIME**
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. (See Fig. 27 at the right)

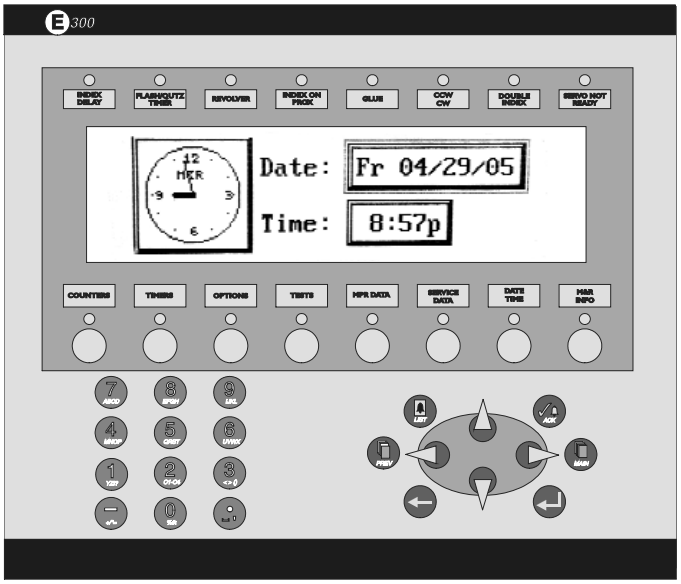



*Figure 27*

# E 300 Operator Interface

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.

**M&R INFO -**
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. (See Fig. 28 at the right)

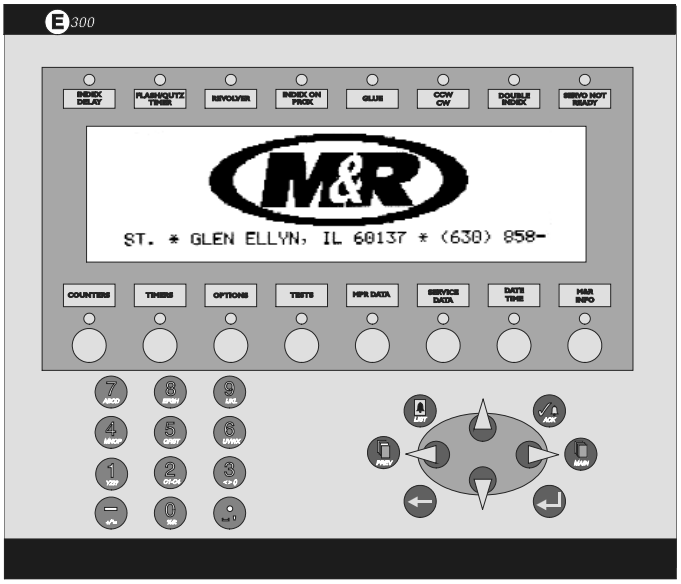



*Figure 28*

# E 300 Operator Interface

**MAIN MENU SCREEN**
PLC Identity No.
Program Version No.
MTA No.

**COUNTERS**
Shift Counter
Job Counter
Set Counter
Left Counter
Total Counter
Speed (Doz/hour)

**TIMERS**
Index
Flash
Quartz Delay
>Preheat

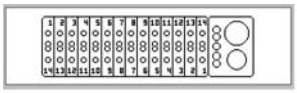
**OPTIONS**
>Revolver Mode
Flash: ENTER
18171615141312111098765432 1
- - - - - - - - - - - - - - - - -
Double Switch: Multi
18171615141312111098765432 1
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Head Setup: Standard/Enhanced
Setup Mode: On/Off
Double Print: Down/Up
Skip: No T-Shirt Sensor/Foot Pedal
Ink Dip Every: Duration
GLUE APPLICATOR
Spray 1 Revln Only: OFF
Spray Every: 0 Revolution
Front Delay: 0.01 [s] Duration: 0.00 [s]
Rear Delay: 0.01 [s] Duration: 0.00 [s]
Revolution #: 0 Pallet #: 0
Servo Offset:
End Position: 0.000”
Strt Position: 0.000”
Oiler
Oil Every: 20 indexes
Index No.: 0
Manual Oiler: OFF
Low Oil Indexes Present:
Total

**HARDWARE TEST**
>Panel Test
>Proximities Test
>Motion Card Test
>Servo Drive Test
>Servo/Motion CArd History
>Other Tests

**REVOLVER MODE**
>Revolver Mode: OFF
>Index Delay: OFF
>Wait
>Enter Program
Revolution No.:
18171615141312111098765432 1

Pallet No.: 0
Job No.: Date: 00/00/00 00:00
Job Clear: OFF
Alarm Enabled: OFF

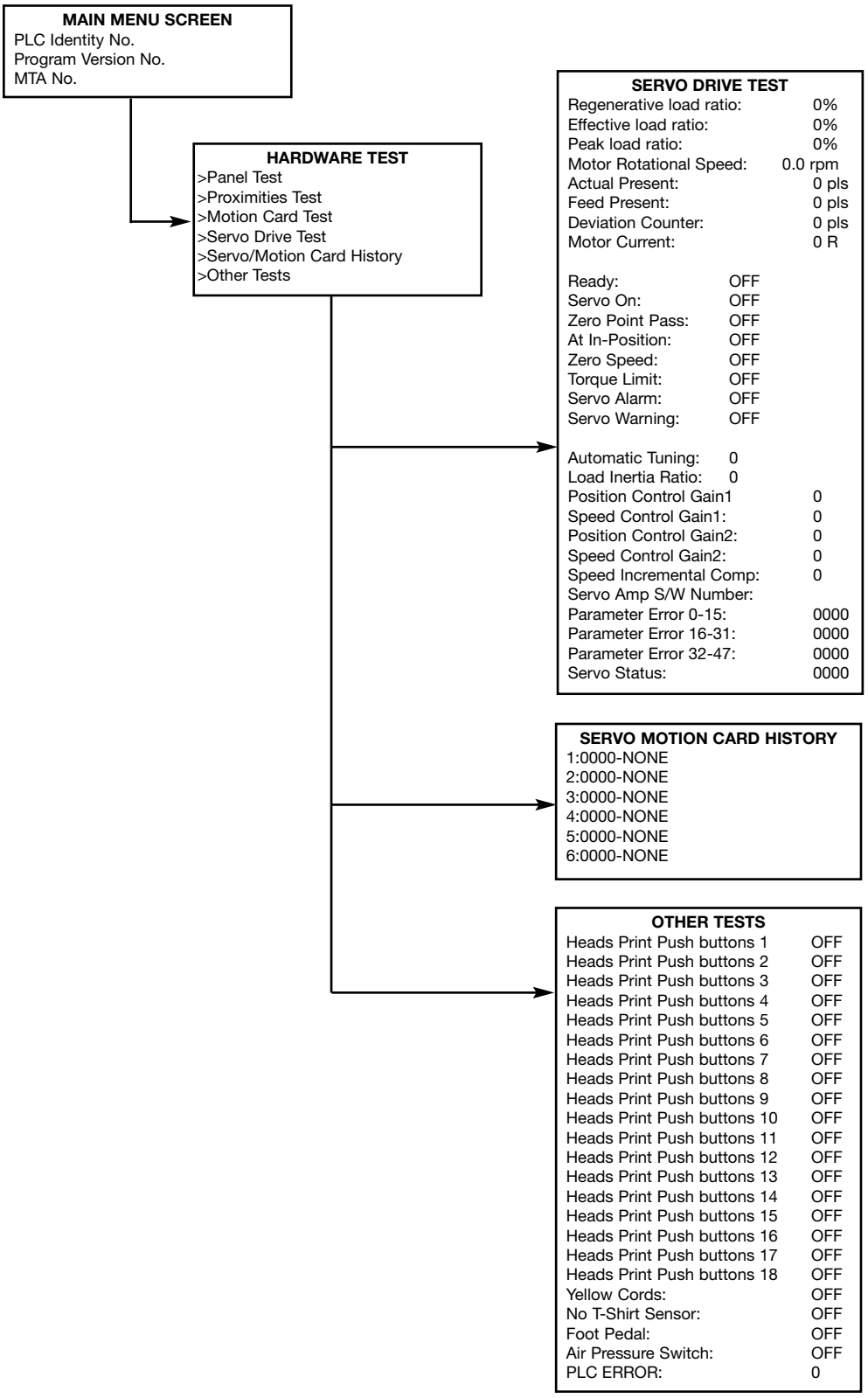
**PANEL TEST**



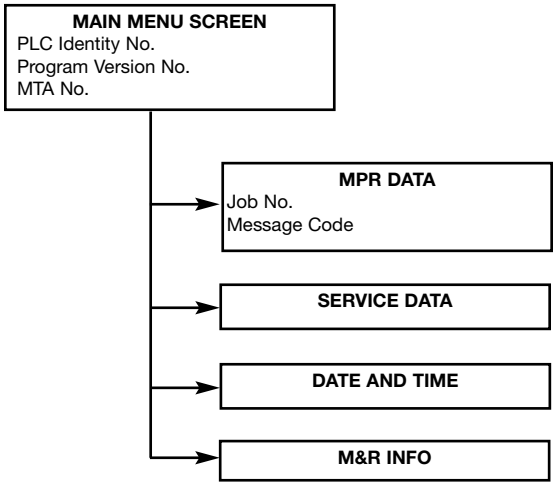
**PROXIMITIES TEST**
Front Proximities:
18171615141312111098765432 1
- - - - - - - - - - - - - - - - -
Rear Proximities:
18171615141312111098765432 1
- - - - - - - - - - - - - - - - -
Index On Prox: OFF
Lock Off Prox: OFF
Lift Up Prox: OFF
Double Index Prox: OFF
Home Postn Prox: OFF

**MOTION CARD TEST**
Motion Card Error: 0
Motion Card Warning:0
Reset: OFF
Servo Position: 0
Jog Forward: Off Jog Reverse: Off
X AD75 Ready: 0
Start Completed: OFF
Busy: OFF
Positioning Cmpltd: OFF
Error: OFF
M Code: OFF
Y Positioning Start: OFF
Axis Stop: OFF
Forward Jog Start: OFF
Reverse Jog Start: OFF
PC Ready: OFF
Drive Unit Ready: OFF
Zero Point Signl: OFF
In Positn Signl: OFF
Near Zero Point: OFF
Stop Signal: OFF
Upper Limit: OFF
Lower Limit: OFF
External Start: OFF
Speed/Position: SPD
In Zone: OFF
Home Pstn Request: OFF
Home Pstn Cmpltd: OFF
Axis Warning: OFF
Speed Change: OFF
Abslt Pnt Ovrflw: OFF
Abslt Pnt Unrflw: OFF
SERVO DRIVE MANUAL OPERATION

# E 300 Operator Interface



# E 300 Operator Interface



**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. A properly managed preventive maintenance program will minimize downtime and its attendant costs before they occur, allowing you to be your most productive.

Important factors to be considered when planning a preventive maintenance program include the proper selection, handling and application of lubricants, spare replacement parts and the general cleaning and appearance of the equipment. Equally important is the creation of a preventive maintenance history for each piece of equipment in your shop. Documentation of preventive maintenance procedures performed on your equipment can prove invaluable for future reference.

The following information is provided for the preventive maintenance of your new M&R Challenger II Textile Screen Printing System.

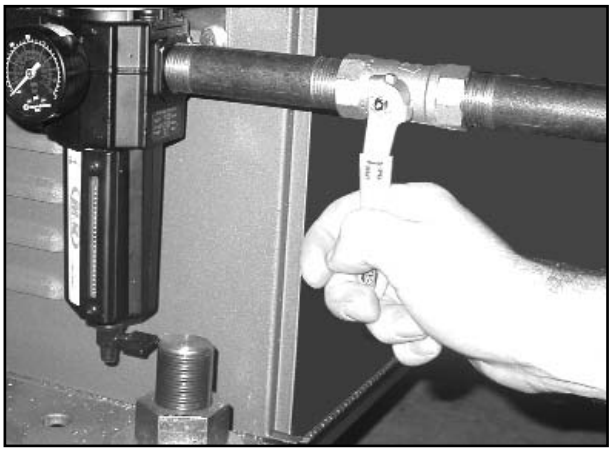
**Lock Out/Tag Out Procedures -**
**OSHA standard 1910.147, Control of Hazardous Energy or Lock out/Tag out**, covers the servicing and maintenance of machines and equipment in which the unexpected energization or start up of the machines or equipment, or release of stored energy could cause injury to employees. This standard applies to the control of energy during servicing and/or maintenance of machines and equipment outside of normal operations. Maintenance of machines during normal operations is covered by this standard if and only if an employee is required to bypass or remove a guard or other safety device or is required to place any part of his or her body into an area on a machine where work is actually performed upon the processing material.

Before performing preventive maintenance procedures on equipment, always do the following.

1. Disconnect, lock out and tag the electrical service to the equipment. The tag should indicate that the lock and the tag may only be removed by the person who placed it there. (See top illustration at the right)

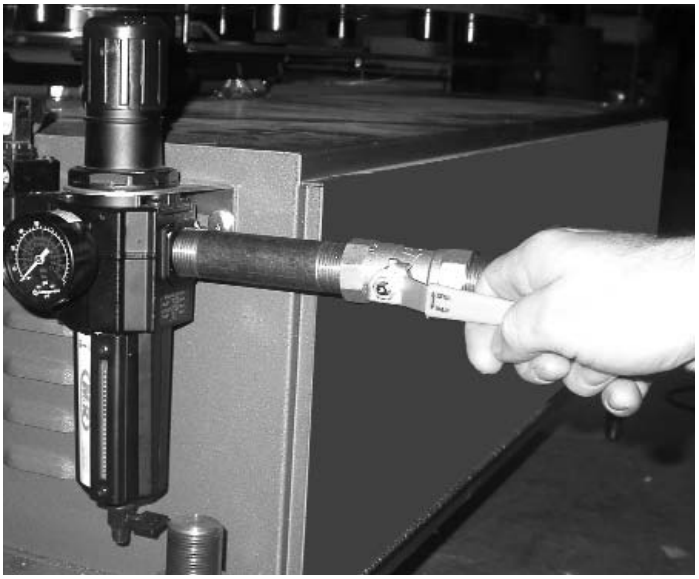
2. Disconnect the compressed air supply from the equipment. In Fig. 2 at the right, the manual shut off valve is shown in the “Closed” position. (See middle illustration at the right)

3. Open the small pet cock valve located on the bottom of the moisture trap reservoir to evacuate any residual air which might still be in the system. (See bottom illustration at the right)

4. When preventive maintenance procedures are completed, open the manual shut off valve to restore compressed air to the equipment. The manual shut off valve is in the “Open” position as shown in Fig. 4 at the right. (See top illustration at the right)

5. Remove lock out and tag and restore electrical power to the equipment. The lock and tag should only be removed by the person who placed it.



The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Check and clean away as needed any lint, ink or spray adhesive which may have accumulated on the print carriage assembly.

## Frequency Interval

**Every Day**

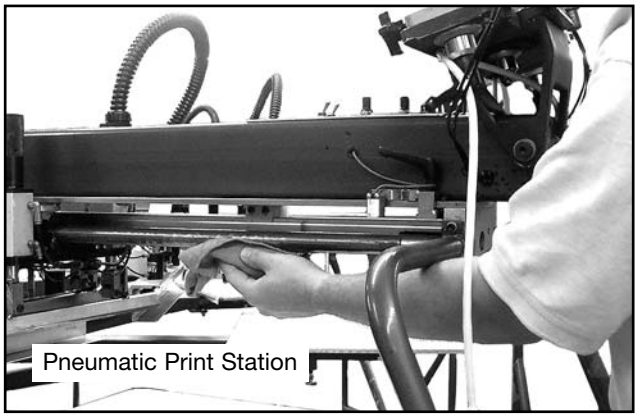
## Procedure Information

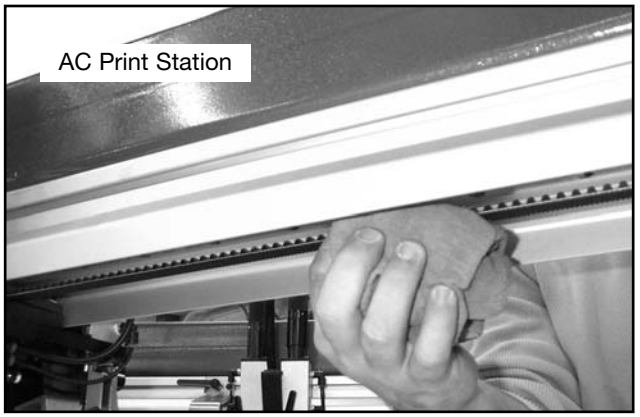
**Tools required:** None


**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

1. Using a clean cloth moistened with 10 wt. non-detergent oil, clean away any accumulation of ink, lint, dirt or spray adhesive from the print carriage guide shafts, chopper linkage assembly, adjustment knobs, squeegee/flood bar angle brackets and miscellaneous hardware. (Refer to the illustrations of pneumatic and AC print stations at right)
After cleaning, lubricate all assemblies as required.

2. Open manual shut-off valve for compressed air supply to the equipment. The manual shut-off valve is open when the handle is aligned with the incoming compressed air supply line pipe or hose. (See illustration at right)


Pneumatic Print Station


AC Print Station

# PREVENTIVE MAINTENANCE PROCEDURE

## CHALLENGER Series II  Bulletin No. **EL1**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Check and clean as required the lower electrical component enclosure air vents and circulation fan of any accumulation of lint or dirt.

## Frequency Interval

**Daily**

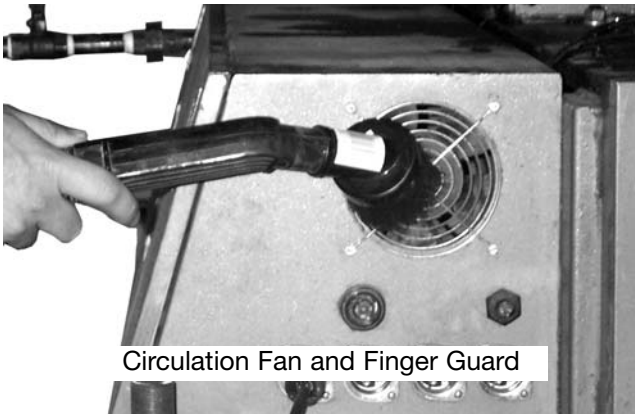
## Procedure Information

**Tools Required:**

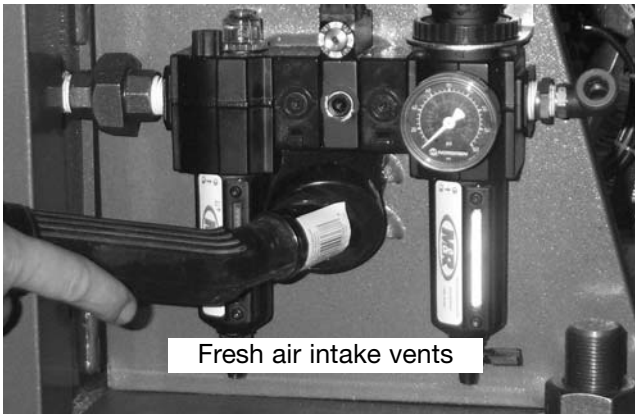
Shop Style Vacuum Cleaner
Soft brush vacuum attachment


**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

1. If the equipment is to be operated in an environment which is exposed to excessive accumulations of lint or air borne garment fibers, we suggest the use of a shop style vacuum cleaner. Use a soft brush attachment and carefully vacuum the area around the fresh air intake vents and the circulation fan and finger guard assembly. (See illustrations at right)



Circulation Fan and Finger Guard



Fresh air intake vents

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Check moisture trap and drain as needed. In normal operation, you should never notice any accumulation of water in the moisture trap. If water is discovered, you should inspect the air compressor receiver tank and air refrigeration unit for proper operation. Clean, filtered regulated air only must be supplied to the equipment.

## Frequency Interval

**Daily**

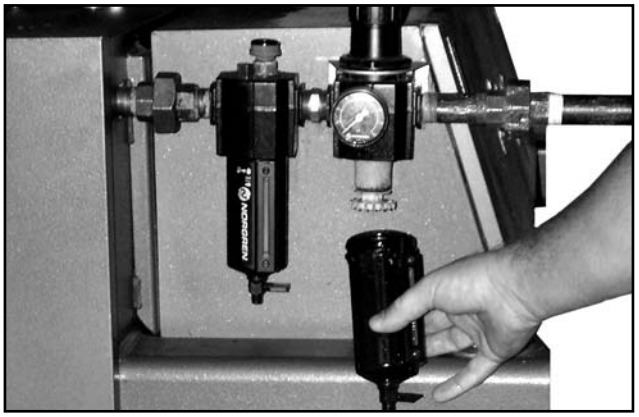
## Procedure Information

**Tools Required:**
None required

**CAUTION!**

**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

1. Remove moisture trap reservoir by pushing up while turning the reservoir bowl 1/4 turn to the left, then pull straight down. Inspect the inside of the reservoir for indications of standing water or excessive moisture. If water or excessive moisture is discovered in the reservoir, clean water/moisture from reservoir and inspect the compressed air supply lines to the equipment. Also inspect the refrigerated air line chiller and air compressor for proper operation. If water and moisture are not detected in the reservoir, replace the moisture trap reservoir by reversing removal procedure described above. Reservoir should lock and “seat” when properly installed. (Refer to the illustration at the right)



## Maintenance Point

Lubricate indexer assembly bearing using Permatex Super Lube with Teflon. (M&R Part No. 7018031)

## Frequency Interval

**Every Day**

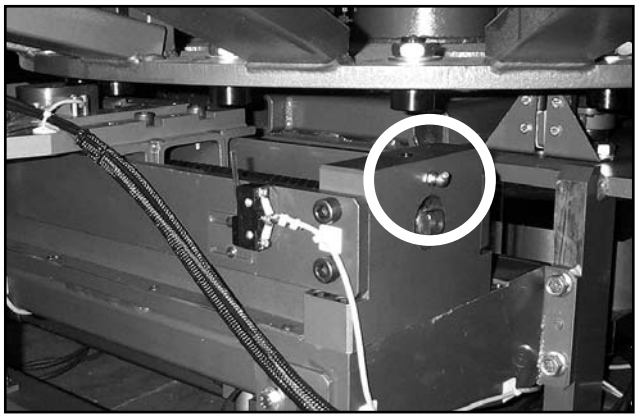
## Procedure Information

**Tools required:** 1 - Permatex Super Lube M&R Part No. 7018031
1 - Standard pump action grease gun.

**CAUTION!**

**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

1. Using the grease gun, apply Super Lube with Teflon grease to the index drive assembly bearing. Two to three pumps of the grease gun should be all that is required. (See illustration at right)



The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Check (Vactra) oil level and inspect index drive screw lubrication system for proper operation.

## Frequency Interval

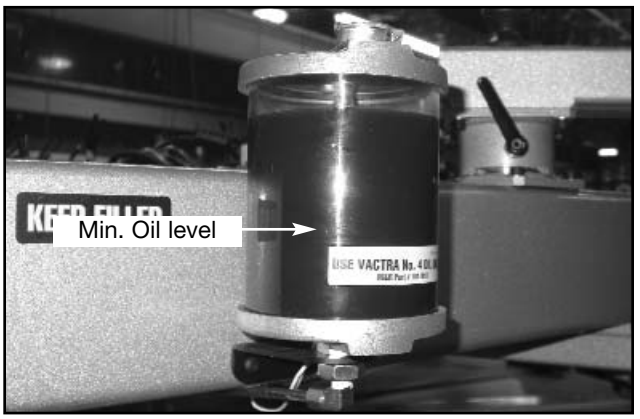
**Every Day**

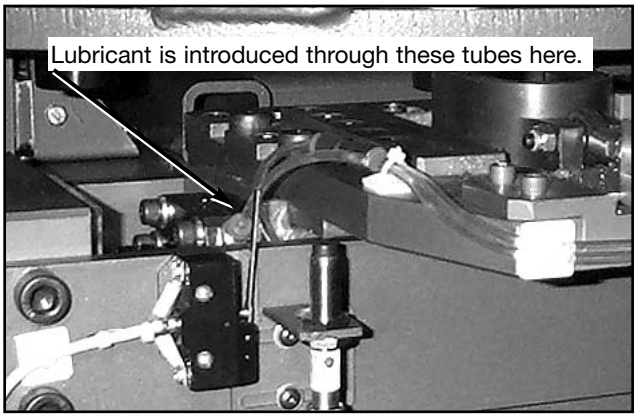
## Procedure Information

**Tools required:** 1 - M&R Part No. 7017018 Vactra Oil


**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

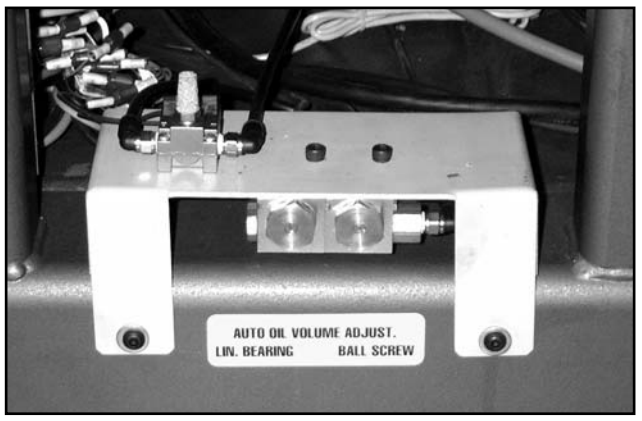
1. The reservoir for the Vactra oil is located on the upper portion of the indexer assembly between the unload and load stations. The lubricant is supplied to the index drive screw assembly by pneumatic pressurized feed through a small tube from the reservoir to the index screw drive assembly. The oil level in the reservoir must be maintained at the level indicated by the oil lever label on the side of the reservoir. To add oil, simply remove the black plastic cover at the top of the reservoir, after bleeding off residual air in the press manifold as described in step No.3, and add oil directly into the reservoir. Fill to the indicated level on the label mounted to the side of the reservoir. (See illustration at right)



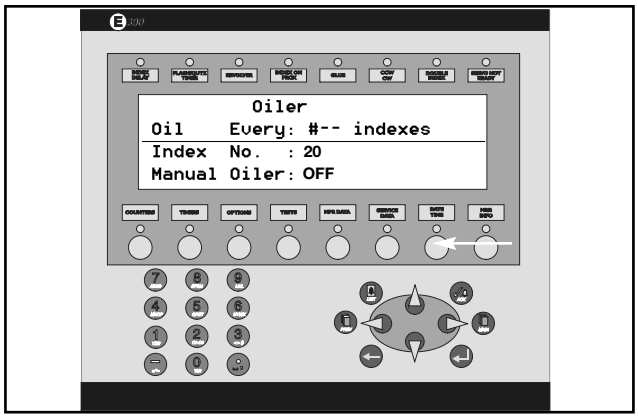

2. Inspect the screw drive assembly to be sure lubricating oil is reaching the screw drive assembly. The screw drive assembly is directly lubricated by a metered application of Vactra oil onto screw drive component surfaces at pre-determined intervals. Run-off lubricant is collected in a reservoir mounted to the bottom of the indexer chassis. **This run-off lubricant should never be re-cycled back into the system**, but should be disposed of according to local codes and regulations. Check the level in the collection reservoir and dispose of used lubricant as necessary.

3. The amount of oil which is introduced to both the linear bearing assembly and the ball screw assembly is pre-set at the factory. In the event that this adjustment should be changed or mis-adjusted for any reason, it may be reset as follows. Using a small screw driver, turn the small metering screw located in the center of the adjustment all the way “in” (clockwise). Now turn the metering screw 4 full turns counterclockwise. When adjusted properly the metering screw will be flush with the outer hex nut on the adjustment. Both adjustments are set in the same manner.



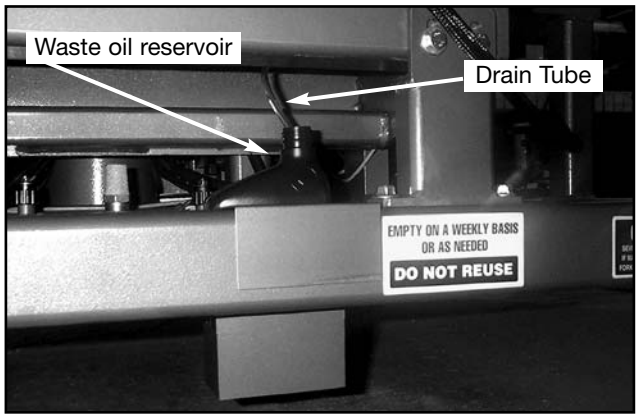
## Procedure Information (Cont.)

4. The frequency of lubrication may be adjusted through the use of the E 300 Operator Interface on the main control panel. Press the **"OPTIONS"** key. Now use the **"ARROW DOWN"** key to scroll down through the sub-menus to select **"OILER"**. Now press the **"ENTER"** key. The first sub-menu, **"OIL EVERY _ INDEXES"** is used to enter a value from **"0"** to **"999"**. For example, if you enter the number **"20"**, which is the value pre-set at the factory, the lubrication system will automatically dispense oil to lubricate the screw drive assembly every 20 index 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 **"ENTER"**.




The next sub-menu **"INDEX No."** is provided as a visual indicator to advise the Operator of how many index cycles remain before automatic lubrication of the screw drive takes place.

**"MANUAL OILER"** permits the lubrication of the screw drive assembly manually. To use the **"MANUAL OILER"** use the **"ARROW"** keys to place the flashing cursor on the **"ON/OFF"** indication, then press the **"ENTER"** key. This will activate the lubricant pump resulting one application of lubricant to the index screw drive assembly.




5. Check the level of the waste oil in the waste oil collection reservoir. Dispose of the waste oil as required by local code or regulations. Replace waste oil collection reservoir in holder on lower index chassis. Be sure the drain tube is inserted in the waste oil collection reservoir.

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Check air line lubricator/moisture trap assembly oil level. Add 10 wt. non-detergent oil as needed. Oil should be added whenever the graduated sight glass indicator displays a half full indication.

## Frequency Interval

**Two Times a Week**

## Procedure Information

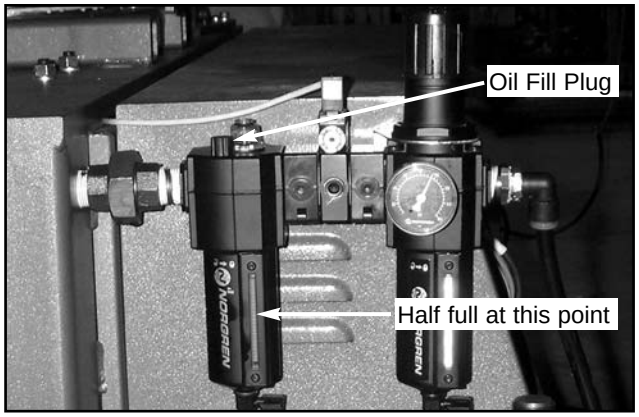
**Tools required:** 1 - Standard blade screw driver
1 - Non-detergent oil (M&R Part No. 7017000)

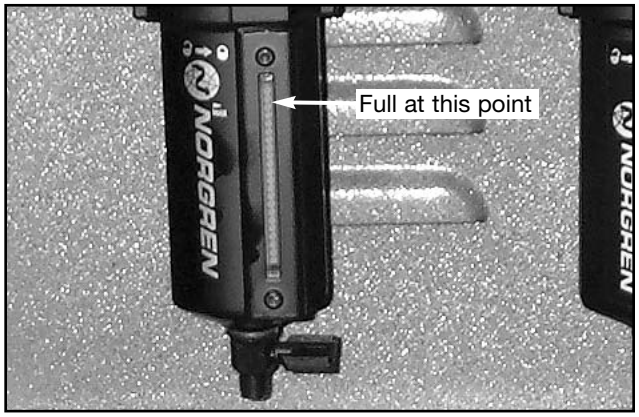
**CAUTION!**

**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

1. Check the current oil level on the glass indicator. If the oil level indicated is less than half full, you will need to add oil.

2. To add oil, use the standard blade screw driver to remove the fill plug at the top of the lubricator assembly. Add 10 wt. non-detergent oil (M&R Part No. 7017000) as needed to bring oil to proper level. The glass indicator will indicate full when the oil level is approximately 1/8" from the top of the glass indicator. Replace the oil fill plug and tighten securely. **NEVER OVERFILL THE LUBRICATOR RESERVOIR!**



# PREVENTIVE MAINTENANCE PROCEDURE

## CHALLENGER Series II  Bulletin No. **IX5**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

The air line lubricator automatically dispenses 10 wt. non-detergent oil into the compressed air used to operate the system. This oil is carried via the air lines to all air cylinders, valves and seals for the purpose of lubrication. The system will operate at peak performance when the oil rate is set to one drop dispensed for every 2 complete press cycles with all print stations and indexer operational.

## Frequency Interval

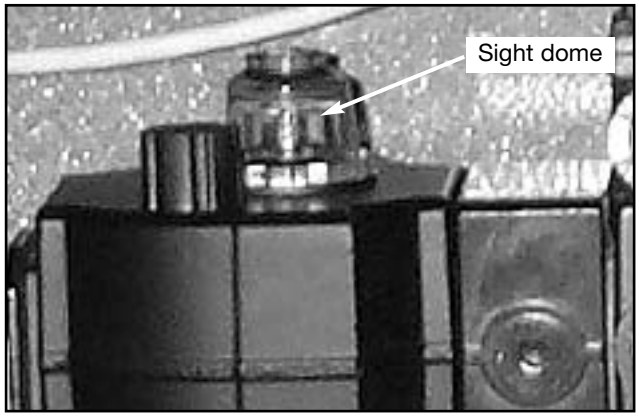
**As Required**

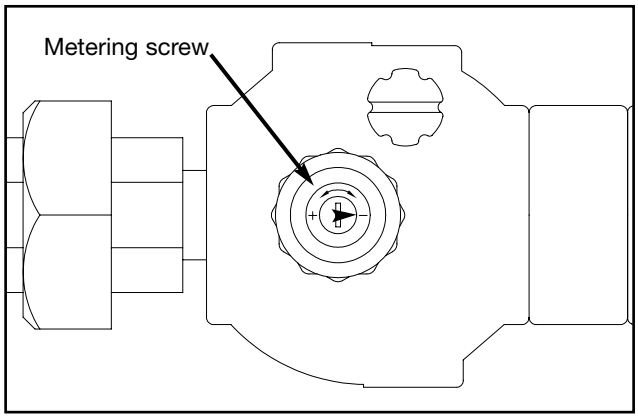
## Procedure Information

**Tools required:** 1 - Standard blade screw driver (small)

1. Turn “ON” all print stations. Start the press and allow the press to run with all print stations and index system operational for 5-10 minutes. After the press has run for 5-10 minutes, observe the oil flow rate at the sight dome on top of the air line lubricator assembly. A proper rate of flow will be 1 drop of oil for every 2 complete press cycles.

2. Should the oil flow rate require adjustment, use the small standard blade screw driver and adjust the small red colored metering screw on top of the sight dome for the proper rate of 1 drop for every 2 complete press cycles. Turn the metering screw clockwise to decrease the oil flow rate. Turn the metering screw counterclockwise to increase the oil flow rate. (See top view illustration at right)




**WARNING!**

**WARNING! THE INDEX SYSTEM WILL BE OPERATIONAL DURING THIS ADJUSTMENT. <u>DO NOT PERFORM THIS ADJUSTMENT BY YOURSELF!</u> ALWAYS WORK WITH AN ASSISTANT WHO CAN SHUT THE EQUIPMENT DOWN IN THE EVENT OF AN EMERGENCY SITUATION. ADJUST THE DWELL TIME CONTROL IN THE E 300 OPERATOR INTERFACE SO THAT YOU HAVE PLENTY OF TIME TO MAKE ADJUSTMENTS TO THE METERING SCREW BEFORE THE INDEX TABLE BEGINS ANOTHER CYCLE.**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Lubricate the center index shaft bearings using white lithium grease M&R Part No. 7018017.

## Frequency Interval

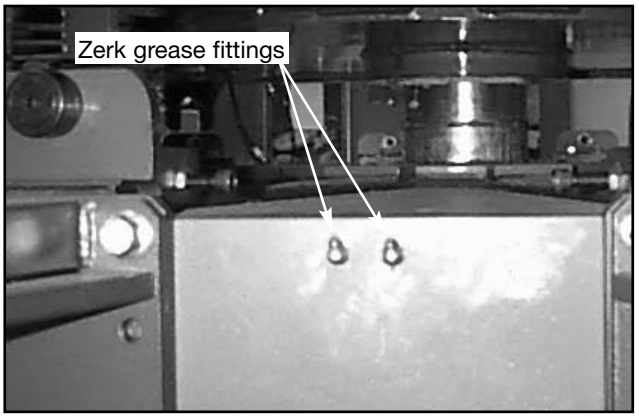
**Every 16 hours of operation**

## Procedure Information

**Tools required:** 1 - M&R Part No. 7018017 White Lithium Grease
1 - Standard pump action grease gun


**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

1. Apply white lithium grease until you notice the grease breaking between the bearing race and the center shaft. Two or three pumps of the grease gun should be all that is required for proper lubrication of the index bearings.



# PREVENTIVE MAINTENANCE PROCEDURE

## CHALLENGER Series II  Bulletin No. **PH2**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point (Pneumatic)

Clean away old lubricant and apply a fresh coat of 1/3 white lithium grease (M&R Part No. 7018017) and 2/3 non-detergent oil (M&R Part No. 7017000) to the print carriage guide shafts on each print station.

## Frequency Interval

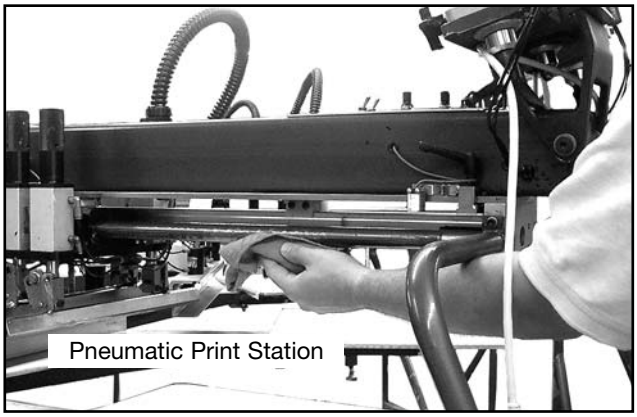
**Weekly**

## Procedure Information

**Tools required:** 1 - M&R Part No. 7018017 White Lithium Grease
1 - M&R Part No. 7017000 10 wt. non-deter gent oil

**CAUTION!**

**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.


Pneumatic Print Station

**Pneumatic Print Stations Only**

4. Using a suitable wiper or cloth shop towel, remove old grease from the print carriage guide shafts on each print station. Using a small painters brush, apply a blend of 1/3 white lithium grease with 2/3 10 wt. non-detergent oil along the length of each guide shaft. Only a small amount of lubricant is required. Excessive lubricant will only serve to attract lint and other air borne contaminant's to the guide shaft surfaces.

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point (AC Drive Print Stations Only)

Lubricate the print carriage assembly linear bearing using Permatex Super lube with Teflon (M&R Part No. 7018031)

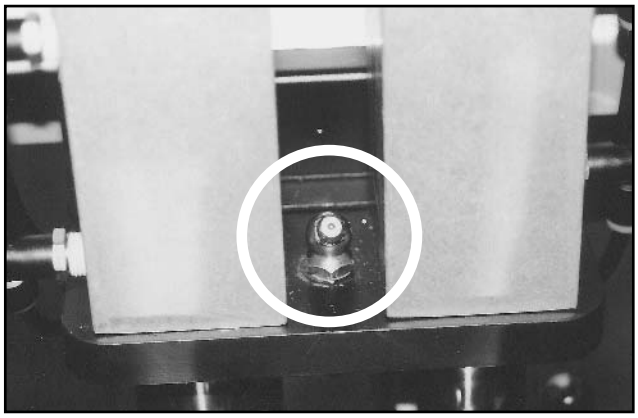
## Frequency Interval

**Weekly**

## Procedure Information

**Tools required:** 1 - M&R Part No. 7018031 Permatex Super Lube
1 - Standard pump action grease gun


**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.



1. Using a standard pump action grease gun, apply 3 or 4 applications of Permatex Super Lube to the zerk grease fitting located between the print carriage squeegee and flood pressure air cylinders.

# PREVENTIVE MAINTENANCE PROCEDURE

## CHALLENGER Series II  Bulletin No. **IX7**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Lubricate the lower carousel plate with white lithium grease (M&R Part No. 7018017) at the point where the index table lift cylinder pistons make contact with the plate. You may use a small painters brush to apply the grease.

## Frequency Interval

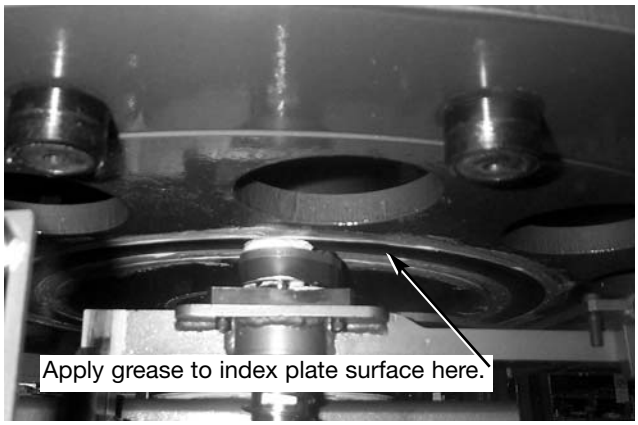
**Weekly**

## Procedure Information

**Tools required:** 1 - M&R Part No. 7018017 White Lithium Grease
1 - Small Painter's Brush

**CAUTION!**

**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.




1. Using a suitable wiper or cloth shop towel, clean away the old grease from the bottom surface of the lower carousel plate. Use a small painters brush to apply white lithium grease around the bottom of the lower carousel plate where the index lift pistons make contact with the plate. Only a small amount of grease is required. Excessive application of grease will only serve to attract lint and other air borne contaminant's to the index plate surface.

**IMPORTANT! IF THIS MAINTENANCE PROCEDURE IS NOT PERFORMED ON A REGULAR BASIS AS LISTED, THE TABLE LIFT CYLINDER PISTONS WILL SCORE A GROVE INTO THE SURFACE OF THE CAROUSEL PLATE CAUSING SEVERE AND PERMANENT DAMAGE!**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Clean away old grease, dirt or lint and apply a fresh coat of 10 wt. non-detergent oil (M&R Part No. 7017000) to the print carriage stroke cylinder (Tol-O-Matic band cylinder) on each print station.

## Frequency Interval

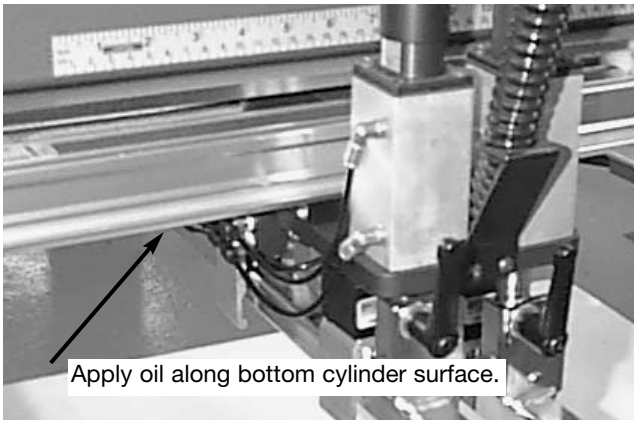
**Weekly**

## Procedure Information

**Tools required:** 1 - M&R Part No. 7017000 10 Wt. non-detergent oil
1 - Cloth wiper (shop towel)


**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

1. Using a suitable wiper of cloth shop towel remove the old oil from the outside surface of the print carriage stroke cylinder on each print station. Using a cloth wiper, apply 10 wt. non-detergent oil along the length of each stroke cylinder. Only a small amount of oil is required. Excessive application of oil will only serve to attract lint and other air borne contaminant's to the stroke cylinder surface.



# PREVENTIVE MAINTENANCE PROCEDURE

## CHALLENGER Series II  Bulletin No. **PH5**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Clean away old grease dirt or lint and apply a fresh coat of white lithium grease (M&R Part No. 7018017) to the inside "U" shaped index drive capture fork.

## Frequency Interval

**Monthly**

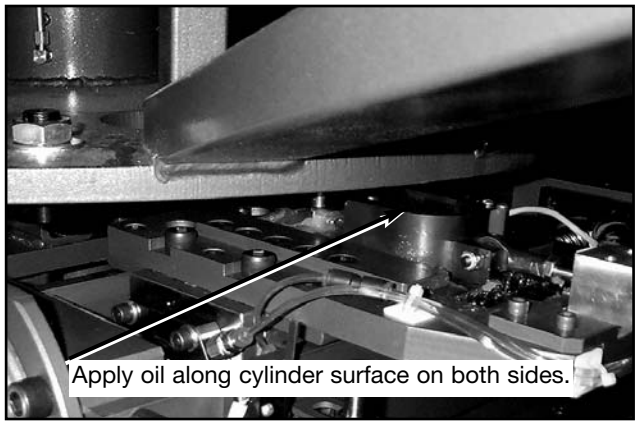
## Procedure Information

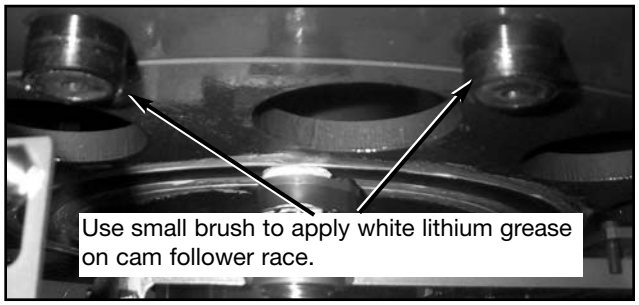
**Tools required:** 1 - M&R Part No. 7018017 White Lithium Grease
1 - Small Painter's Brush

**CAUTION!**

**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

1. Using a suitable wiper of cloth shop towel remove the old grease from the inside surface of the "U" shaped index capture fork clevis and outside race of the index cam follower bearings. Using a small painter brush, apply white lithium grease to the inside "U" of the capture fork clevis and the outside race of the index cam follower bearings. Only a small amount of grease is required. Excessive application of grease will only serve to attract lint and other air borne contaminant's to the capture fork clevis and cam follower bearing race surface.



The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Clean away old grease from the inside of the "U" shaped registration forks and each of the registration cam follower bearings on the index table. Use a small painters brush to apply a fresh coat of white lithium grease (M&R Part No. 7018017) to the inside of the "U" shaped registration forks and around the outer race of each registration cam follower bearing.

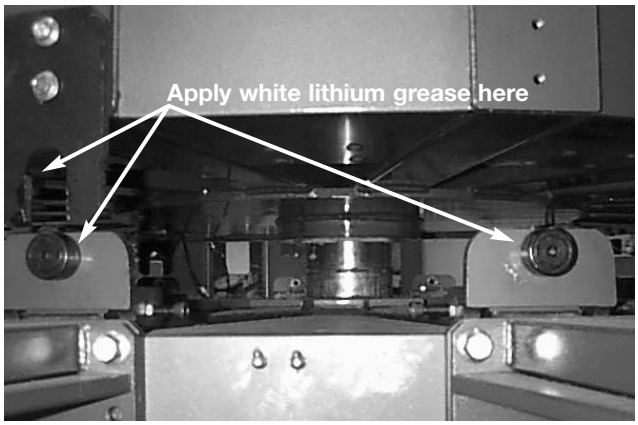
## Frequency Interval

**Monthly**

## Procedure Information

**Tools required:** 1 - M&R Part No. 7018017 White Lithium Grease
1 - Small Painter's Brush


**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.




1. Using a suitable wiper or cloth rag, remove old grease from the inside "U" surface of the registration forks and outside race of the registration cam follower bearings. Using a small painters brush, apply white lithium grease to the inside "U" of the registration forks and outside race of the registration cam follower bearings. Do not apply too much grease. Only a small amount will be required. Excessive application of grease will only serve to attract lint and other air borne contaminant's to the surfaces.

# PREVENTIVE MAINTENANCE PROCEDURE

## CHALLENGER Series II  Bulletin No. **PH6**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Lubricate the micro-registration threaded adjustment shafts on each print stations front and rear screen frame holder assembly.

## Frequency Interval

**Every Three Months**

## Procedure Information

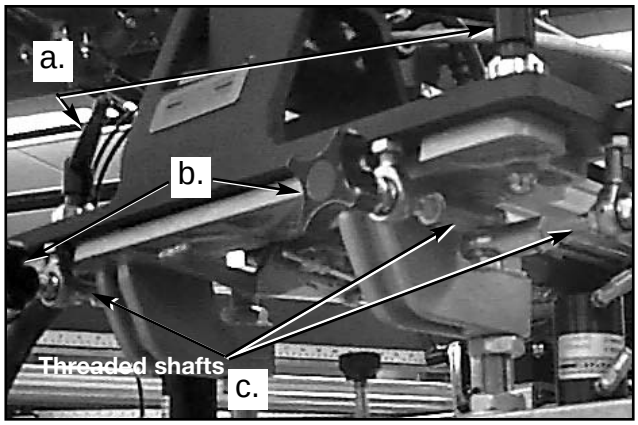
**Tools required:** 1 - M&R Part No. 7018017 White Lithium Grease
1 - 1 small painters brush

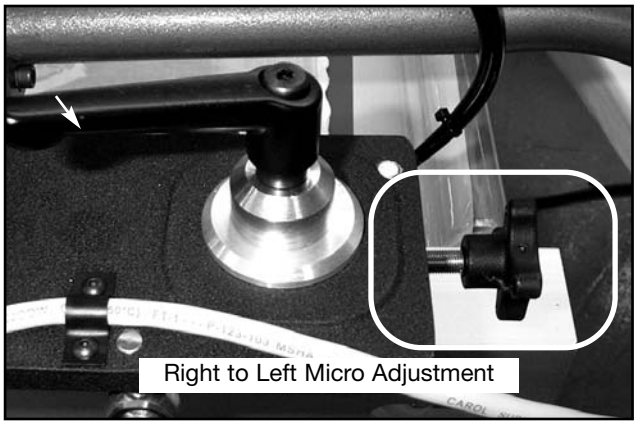
**CAUTION!**

**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

1. Use a suitable wiper or cloth shop towel to remove any old grease or dirt which may have accumulated on the threaded shaft surfaces.

2. First, release the micro-registration locking knobs (a) by turning counterclockwise. Back out the micro-registration adjustments (b) fully by turning the adjustment knob counterclockwise. Now, apply a coat of grease to the threads of the micro register knobs. Turn the micro-registration adjustment knobs (b) clockwise until the micro adjustment reference pointer registers in the center of the micro-registration reference grid. Lock the micro-registration lock knobs by turning clockwise. Using a small painters brush, apply white lithium grease along the entire threaded shaft (c) for each micro-registration adjustment on each print station. Do not apply excessive amounts of grease to the threaded shaft. Only a small amount is required.(See illustration at right)



Right to Left Micro Adjustment

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Drain accumulated water and moisture from your compressor receiver tank and the press air manifold located on the bottom of the indexer chassis.

## Frequency Interval

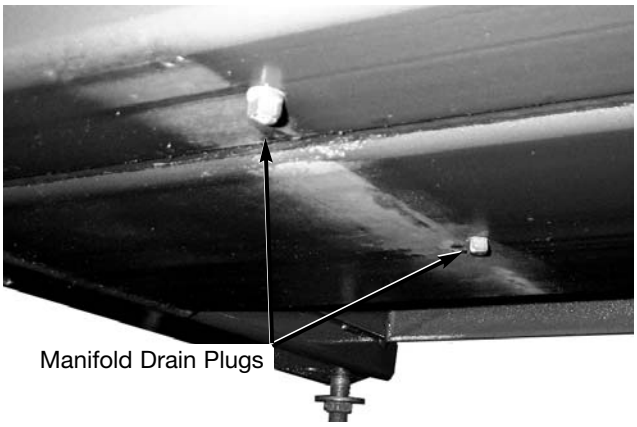
**Monthly**

## Procedure Information

**Tools required:** 1 - 7/16” Box end 12 point wrench
1 - 3/8” open end wrench

**CAUTION!**

**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.



Manifold Drain Plugs

1. Using the wrench, remove the press manifold drain plug on the bottom of the indexer chassis and alternate manifold by turning counterclockwise. Allow any accumulated water and moisture to discharge from the manifold.If moisture is discovered in the press manifold, check your compressor and/or refrigerated air chiller unit.

2. Replace the manifold drain plug and tighten securely. **DO NOT OVER TIGHTEN!**

# PREVENTIVE MAINTENANCE PROCEDURE

## CHALLENGER Series II  Bulletin No. **IX10**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

Replace air filter element in air line moisture trap assembly.

## Frequency Interval

**Every Six Months**

## Procedure Information

**Tools required:** 1 - Filter element (M&R Part No. 2019047)
Shop towels

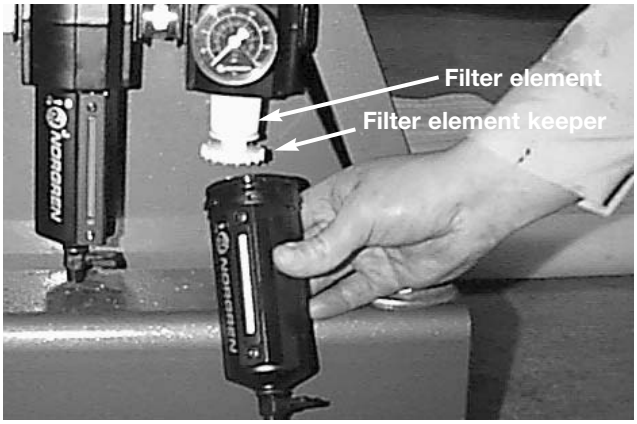
**CAUTION!**

**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.

1. Remove moisture trap reservoir assembly by pushing up while turning the reservoir 1/4 turn to the right (clockwise).

2. Remove the filter element keeper by turning to the left (counterclockwise).

3. Install new filter element and element keeper. Replace reservoir assembly. (Refer to the illustration at right)



The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point (AC Print Stations Only)

Check and adjust as required, the print carriage timing belt tension on each of the print stations.

## Frequency Interval

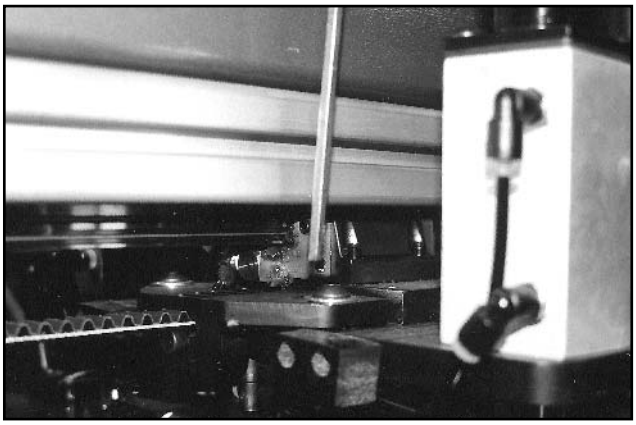
**Every Six Months**

## Procedure Information

**Tools required:** 1 - 1/8” Allen wrench
1 - 3/16” Allen wrench

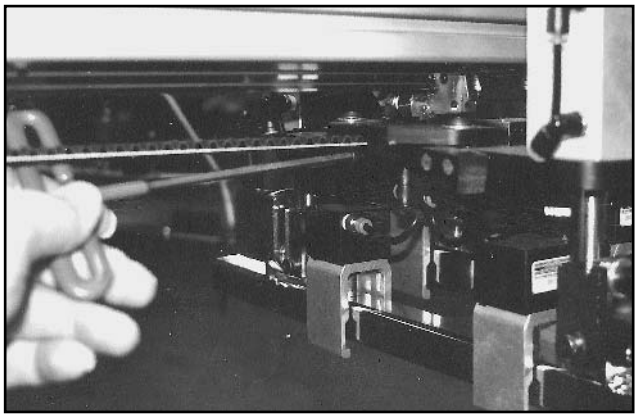
**CAUTION!**

**CAUTION!** To prevent possible injury to personnel and/or damage to the equipment, lock out and tag the electrical service and compressed air supply to this equipment. Refer to pages 55 and 56 of this manual for information regarding lock out/tag out procedures.



1. Using a 1/8” allen wrench, remove both the left and right dust covers by loosening the three 10-24 X 3/8” button head allen screws.

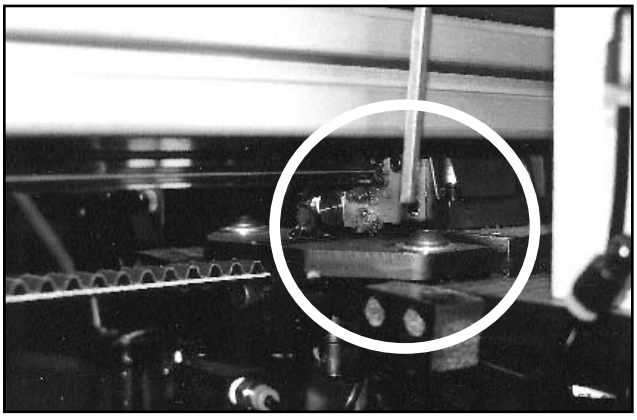
2. Using a 3/16” allen wrench, loosen the two 5/16”-18 X 3/4” button head allen screws on the tension bracket assembly. (See illustration at right)



3. Adjust the 1/4”-20 X 1-1/4” allen head cap screw in a 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 illustration at right)

4. Re-tighten the 5/16”-18 X 3/4” button head allen screws.

5. Re-install both the right and left dust covers using the 10-24 X 3/8” button head allen screws.



# PREVENTIVE MAINTENANCE PROCEDURE

## CHALLENGER Series II  Bulletin No. **EL3**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

The service life of the battery in the Mitshubishi PLC unit is three years. When the battery is nearly discharged the "ALARM" indicator on the PLC will begin to flash. When this happens, replace the battery (M&R Part No. 1017147) with in a week.

## Frequency Interval

**Every Three Years**

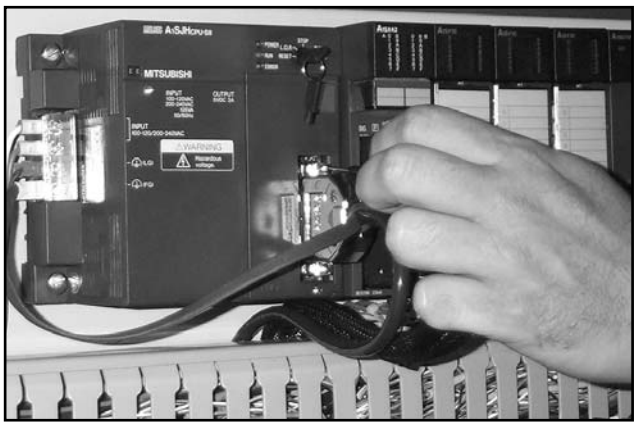
## Procedure Information

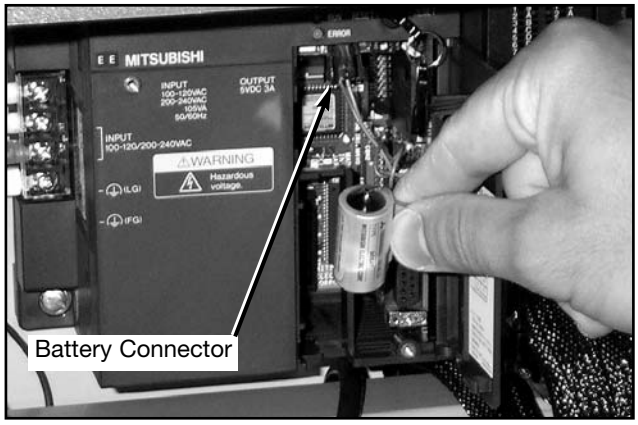
**Tools required:** 1 - Replacement battery M&R Part No. 1017147
1 - Small phillips screw driver

1. DO NOT turn "OFF" the electrical power to the equipment. If the electrical power is not "ON", turn it "ON".

2. Open the access door on the lower electrical component cabinet mounted to the indexer chassis.

3. Remove the communication cable from the CPU unit using the small phillips screw driver. Open the access door on the CPU unit to expose the battery and battery connector.

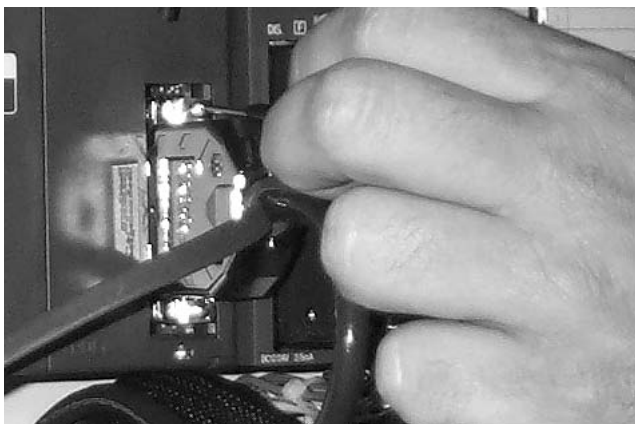



4. Remove the old battery from the holder on the access door, then disconnect the battery by gently squeezing while pulling down on the connector.

5. Install the new battery together with the connector. Replace the battery in the holder on the access door and close the access door.

6. Install the communication cable using the small phillips screw driver.



**WARNING!**

**WARNING! THE NEW BATTERY MUST BE INSTALLED WITH IN FIVE (5) MINUTES OF REMOVAL OF THE OLD BATTERY. THIS WILL ENSURE THE PRESERVATION OF DATA IN THE PLC MEMORY.**

The frequency of the following preventive maintenance procedure is based on a 8 hour daily production shift or 40 hour work week.

## Maintenance Point

The service life of the battery in the Mitshubishi Servo Amplifier Unit is three years. Replace the battery (M&R Part No. 1017147).

## Frequency Interval

**Every Three Years**

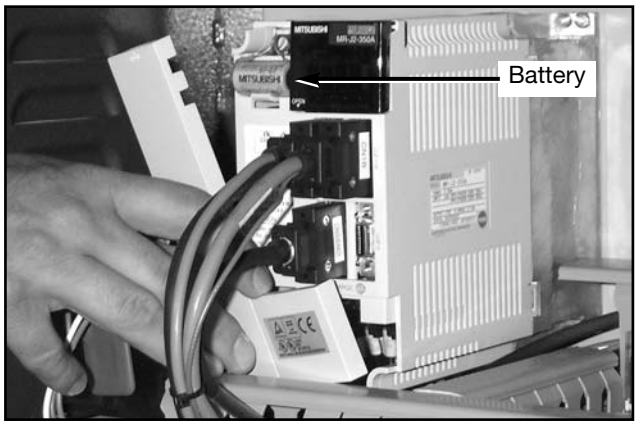
## Procedure Information

**Tools Required:** None

1. DO NOT turn “OFF” the electrical power to the equipment. If the electrical power is not “ON”, turn it “ON”.

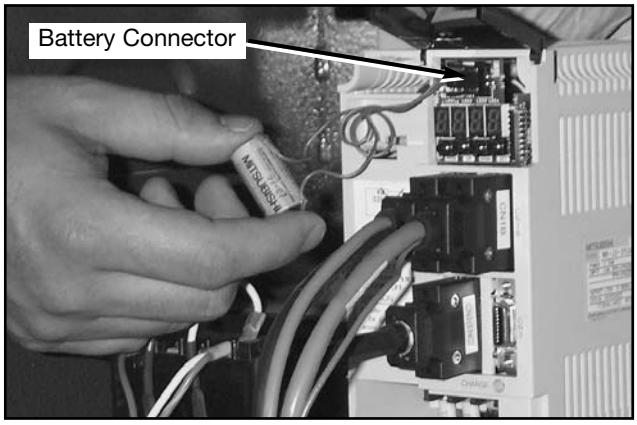
2. Open the access door on the lower electrical component cabinet mounted to the indexer chassis.

3. Open the access panel to the battery compartment on the left side of the Servo Amplifier Unit to expose the battery.



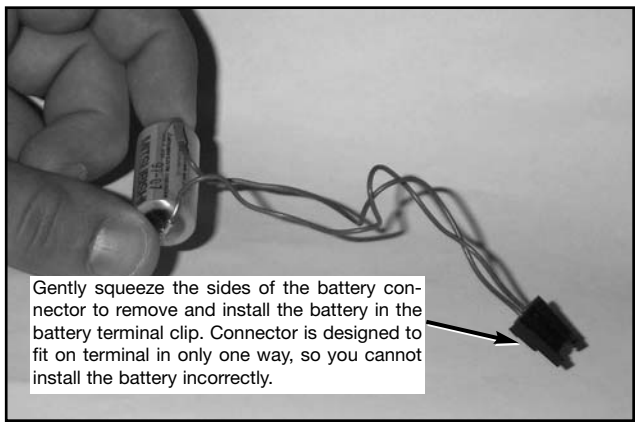

4. Flip up the plastic L.E.D. cover assembly on the right of the battery to expose the battery connector. Remove the old battery from the holder, then disconnect the battery by gently squeezing while pulling down on the connector.

5. Install the new battery together with the connector. Replace the battery in the holder and close the plastic L.E.D. cover.




**WARNING!**

**WARNING! THE NEW BATTERY MUST BE INSTALLED WITH IN FIVE (5) MINUTES OF REMOVAL OF THE OLD BATTERY. THIS WILL ENSURE THE PRESERVATION OF DATA IN THE SERVO AMPLIFIER MEMORY.**



# PREVENTIVE MAINTENANCE LOG

## CHALLENGER Series II

The benefits of a regularly scheduled preventive maintenance program can never be over-estimated. Equipment which is properly maintained operates more efficiently, prolongs service life and reduces operating costs. A properly managed preventive maintenance program will minimize downtime and its attendant costs before they occur. Documentation of preventive maintenance procedures performed on your equipment can prove an invaluable reference in the future. The space below provides a convenient means of recording the preventive maintenance procedure described in the Preventive Maintenance section of this manual. **PLEASE MAKE COPIES OF THIS ORIGINAL FOR YOUR USE.**

| Equipment Serial No. | Machine No. |
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| Date | Procedure Code No. | Completed By |
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**INSTRUCTIONS:** Fill in the equipment serial number and machine number. Fill in the date on which the maintenance procedure was performed. Enter the maintenance procedure code number found in the upper right corner of the particular maintenance procedure, Example: IX2 and enter the name of the person who performed the maintenance procedure. Make copies of this original for your use.

# Leveling the Pallets

**LEVELING THE PALLETS:**

1. Make sure the print station being used to level the pallets is level by placing a small magnetic level (Torpedo Level) on the chrome plated plate (See Fig. 1).

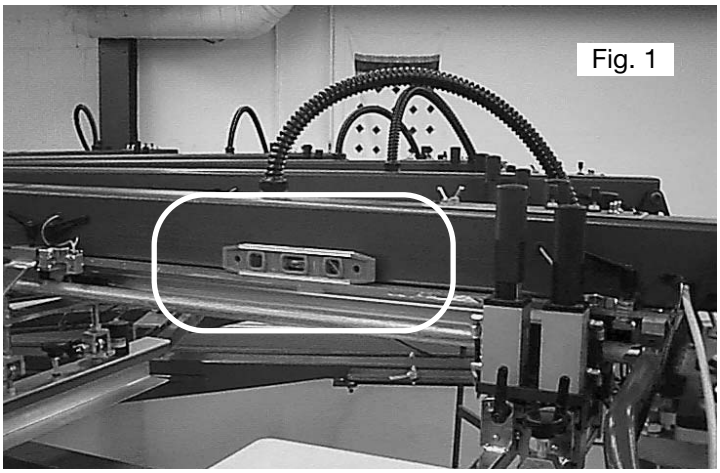


Fig. 1

Adjust the leveling pads on the head support to level the head if necessary. (See Fig. 2)

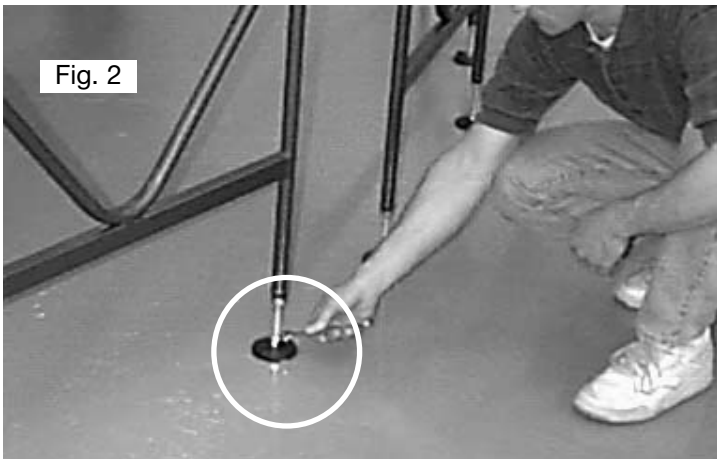


Fig. 2

**IMPORTANT!**

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

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

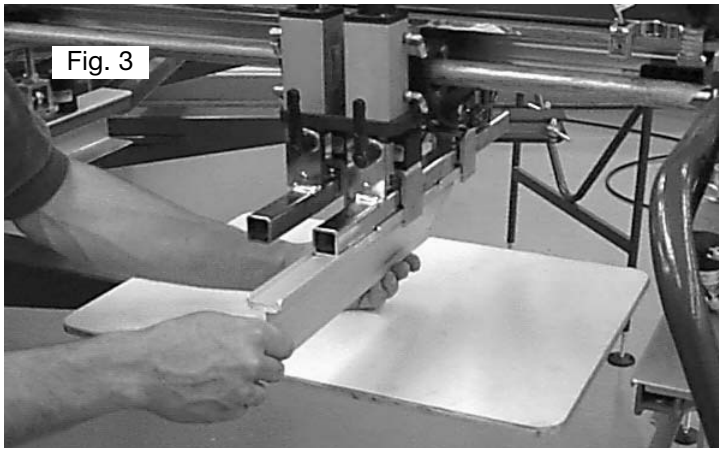


Fig. 3

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

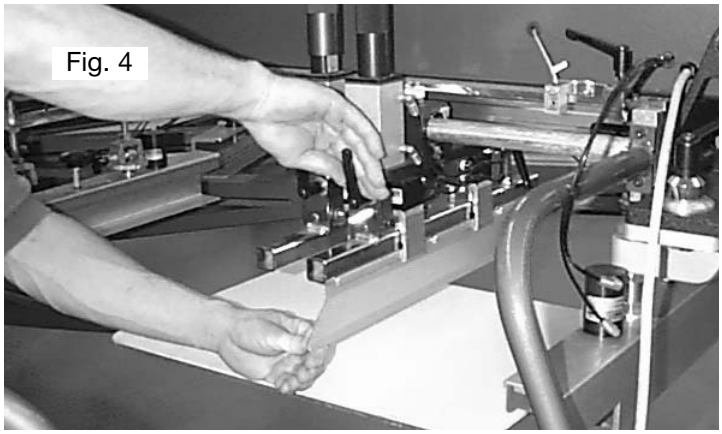


Fig. 4

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

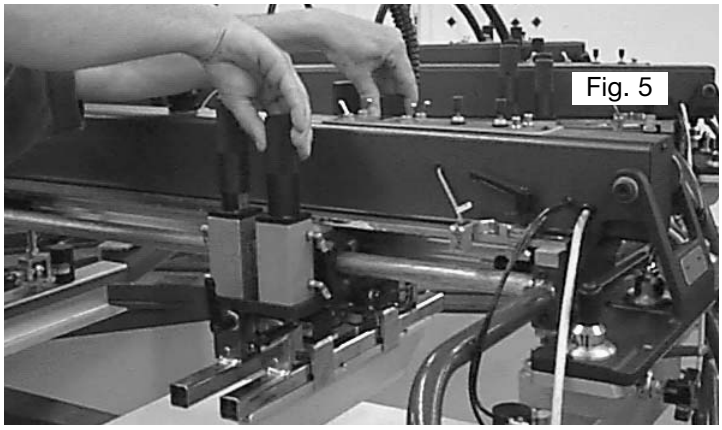
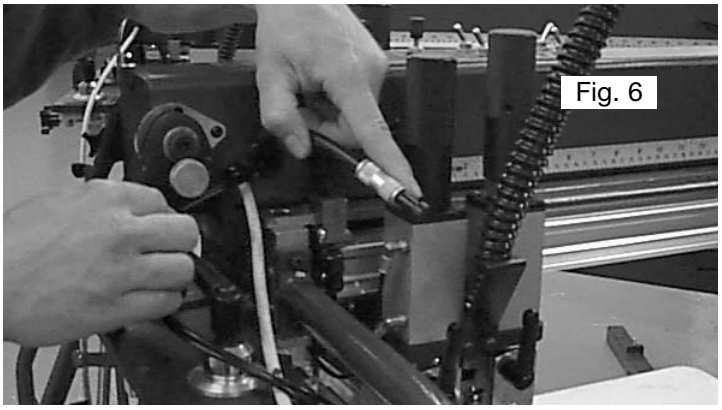


Fig. 5

5. Pull the print carriage all the way towards the front of the print 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).

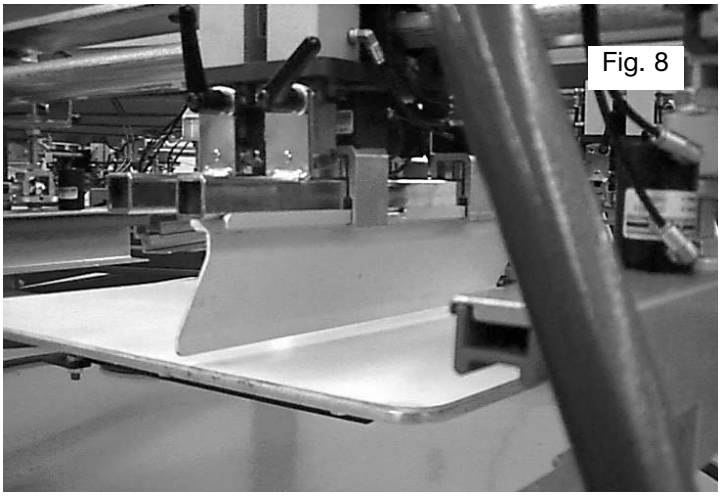
# Leveling the Pallets

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)

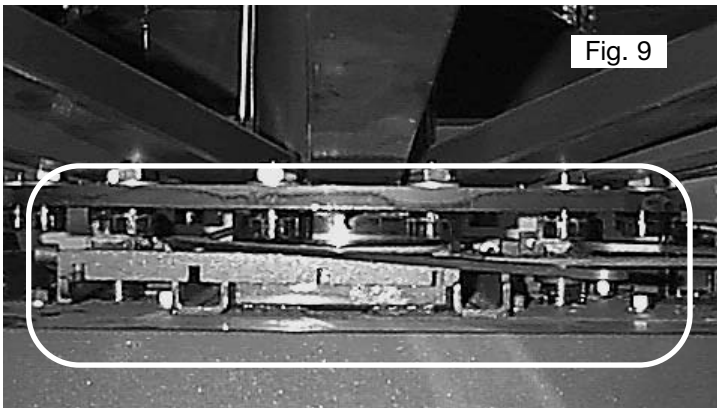



6. Before raising the table into the registration forks, make sure that the nuts on the three adjustment points on the base pallet frame are slightly tightened towards the middle of the adjustment range. (See Fig 7)

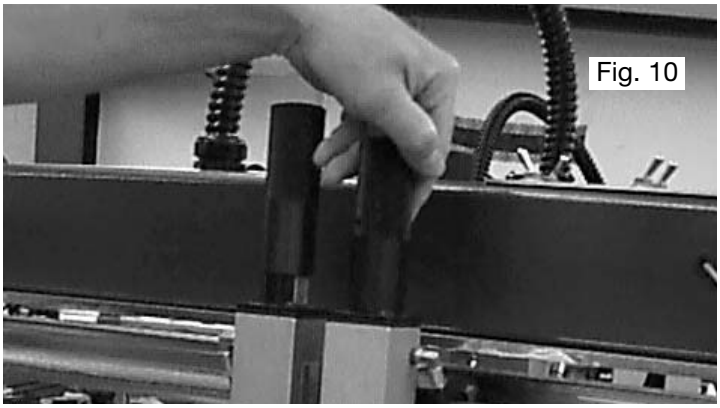

7. Now go ahead and raise the first pallet into the head used for leveling the pallets. (See Fig. 8)



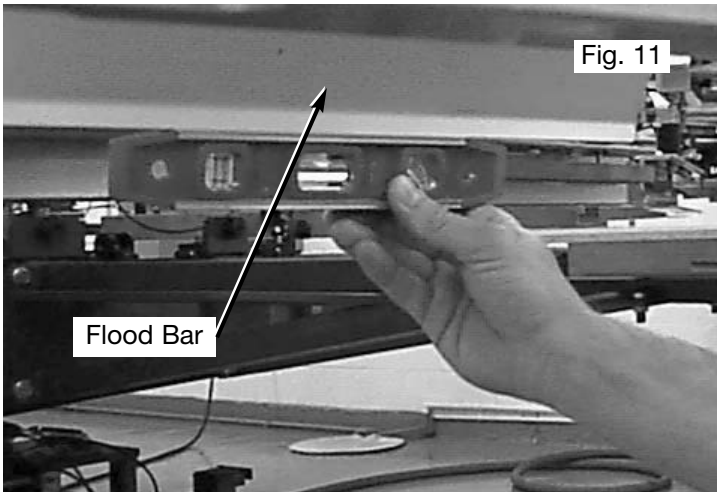

**NOTE:** If your machine has the "Central - Off Contact Lever", make sure it is set for the highest position, least amount of off-contact. (See Fig. 9)




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)




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)



# Leveling the Pallets

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)

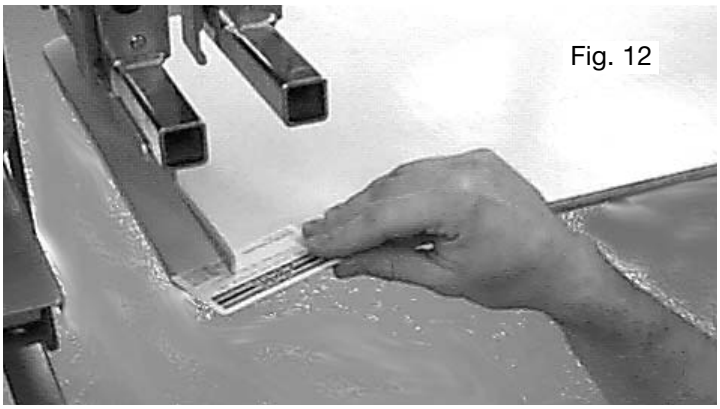


Fig. 12

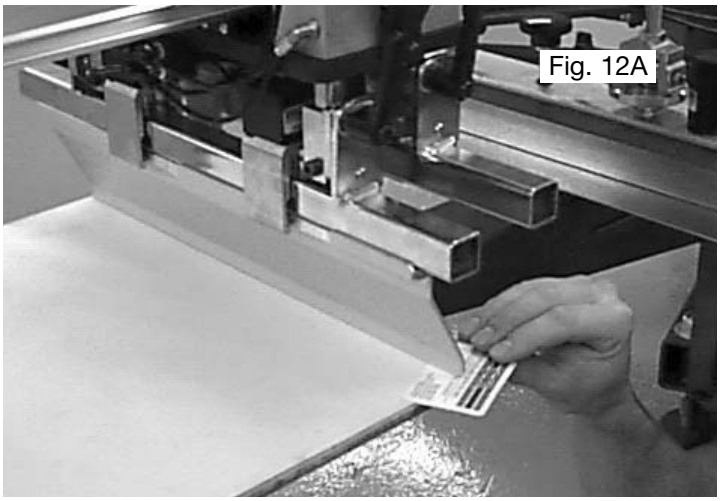


Fig. 12A

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

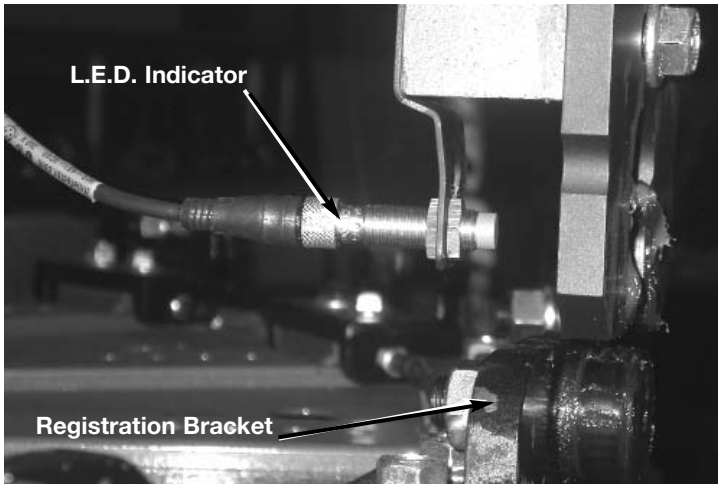
NOTES:

# Leveling the Pallets

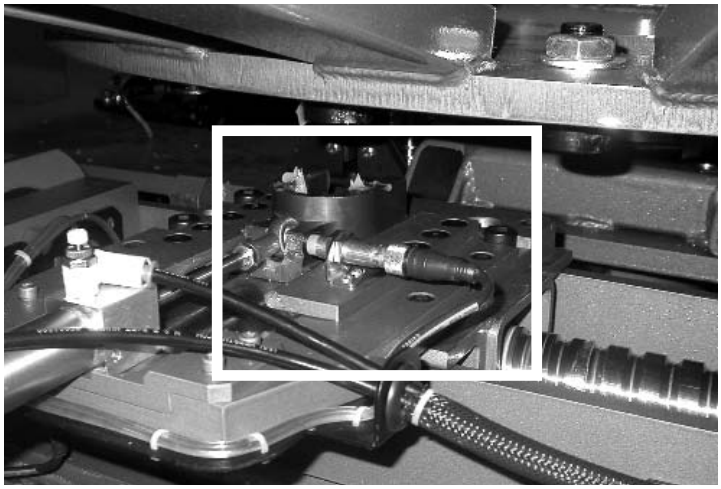
NOTES:

# Proximity Switch Location & Function

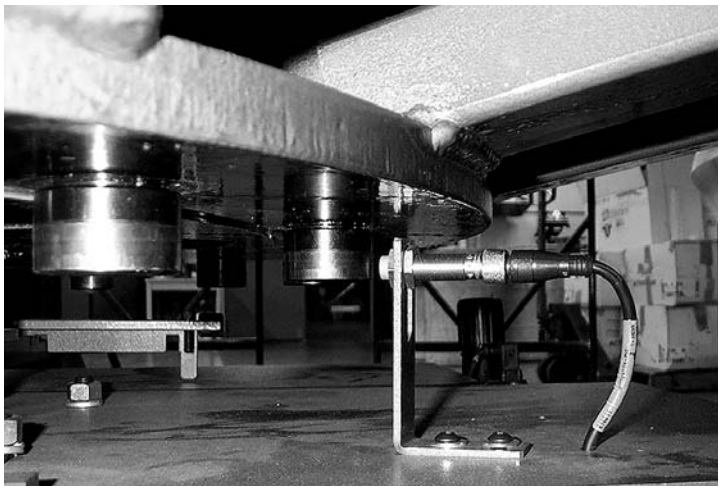
**INDEX TABLE UP PROXIMITY SWITCH - (Lift "ON" Prox)**
This proximity switch is mounted to a bracket located in the middle area of the indexer assembly. The function of this proximity switch is to signal the PLC that the index table has reached its fully raised, or print position. A small L.E.D. on the side of the proximity switch illuminates whenever the proximity switch senses the proximity of the registration mounting bracket as the index table raises. (See illustration at left)




**FORK OFF PROXIMITY SWITCH -**
This round shaped proximity switch, referred to as the "Fork Proximity Switch" is used to signal the PLC when the index capture fork clevis is dis-engaged from the index table. A small L.E.D. on the switch illuminates confirming the switch operation and the fork clevis position. The switch is mounted to the index clevis assembly. (See illustration at right)

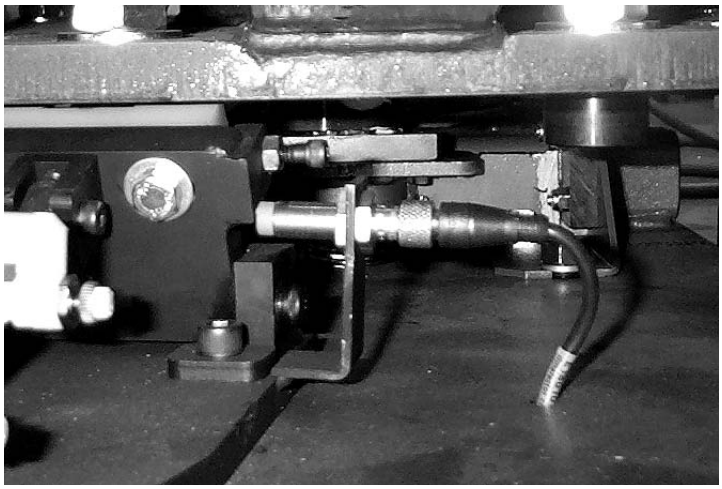


**INDEX "ON" PROXIMITY SWITCH -**
This proximity switch is referred to as the "Index ON" proximity switch. The function of this proximity switch is to signal the PLC that the index table is aligned with the print stations by sensing the index cam follower bearing mounted to the bottom of the index carousel plate. In addition, this proximity switch also provides a signal which tells the PLC that the index table has reached its fully lowered position. A small L.E.D. on the side of the proximity switch will illuminate when the switch senses the index cam follower bearing. (See illustrations at right)



# Proximity Switch Location & Function

**DOUBLE INDEX PROXIMITY SWITCH -**
The function of this proximity switch is to signal the PLC that the double index fork is “dis-engaged” from the index table. A small L.E.D. on the switch illuminates confirming switch operation and the position of the double index fork. This switch is mounted on the double index fork assembly located near the load and unload stations. (See illustrations at right)

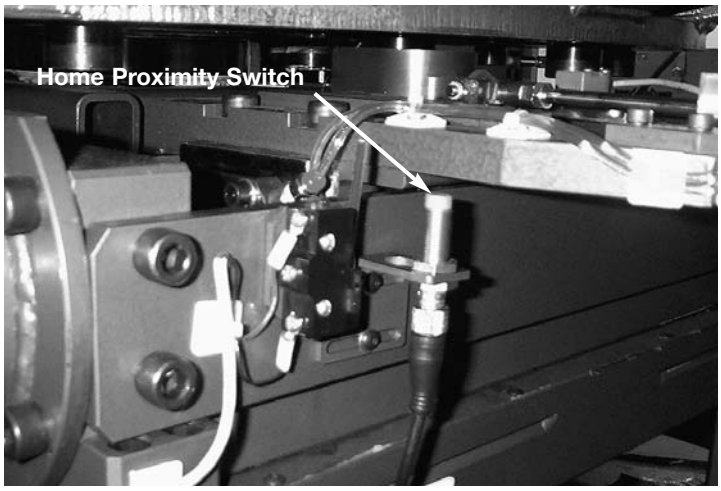


**FRONT PROX - (On AC Print Station)**
The function of this proximity switch is to signal the PLC that the print station carriage is at the front of the print head. In this position, the print carriage assembly is closer to the outside diameter of the press.

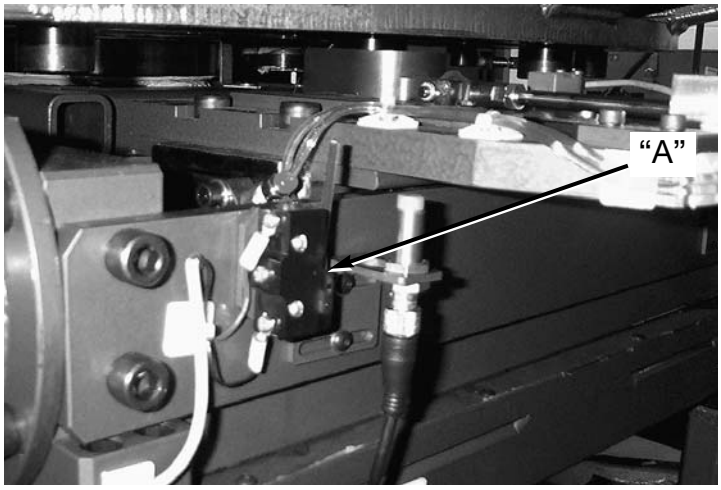
**REAR PROX - (On AC Print Station)**
The function of this proximity switch is to signal the PLC that the print station carriage is at the rear of the print head. In this position, the print carriage assembly is closer to the center diameter of the press.

# Proximity Switch Location & Function

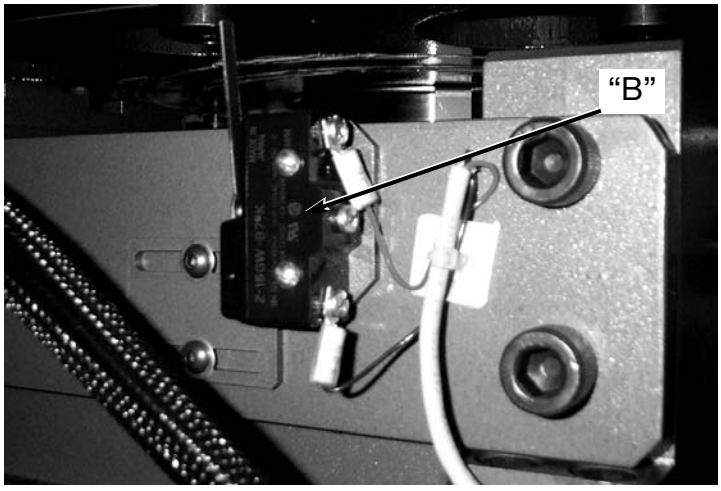
**HOME PROXIMITY SWITCH -**
This proximity switch is used during the initial installation and set-up of your M&R Challenger Series II press. The Home proximity switch is used in conjunction with the Index Servo Drive to “teach” the servo drive where the optimum starting reference point for the index drive assembly is located. The Home proximity switch is used only for the initial installation of the system, or when ever the servo drive assembly or its components have been replaced. This proximity switch is not actively used during normal operation. The switch is located on the left side of the index drive assembly. (See illustration at left)




**LOWER LIMIT/REVERSE SNAP ACTION SWITCH -**
This snap action style switch, (“A” in illustration at right) sends a signal to the PLC should the index drive assembly over run its travel range during the return (towards servo motor) cycle. (See illustration at left)

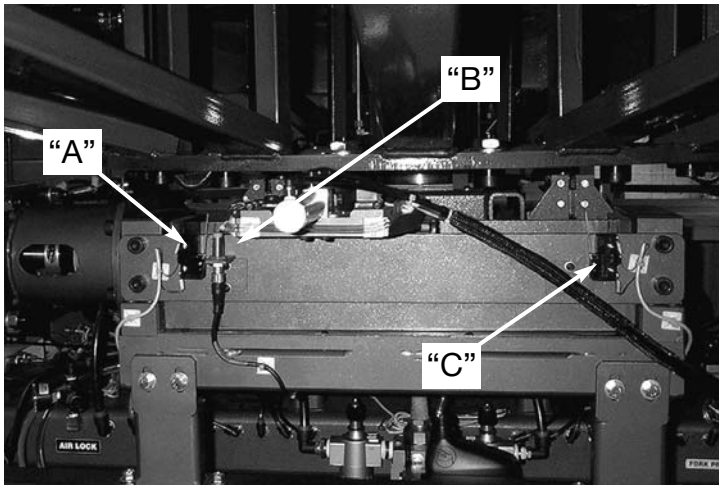



**UPPER LIMIT/FORWARD SNAP ACTION SWITCH -**
This snap action style switch (“B” in illustration at left) sends a signal to the PLC should the index drive assembly over run its travel range during the forward/index (away from the servo motor) cycle. (See illustration at left)



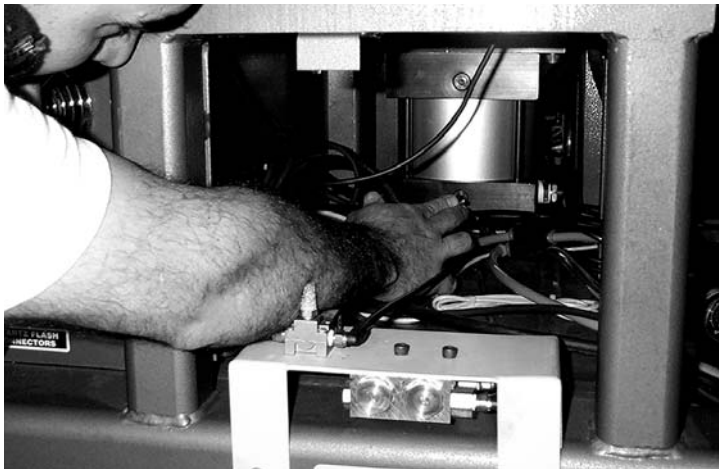
# Proximity Switch Location & Function

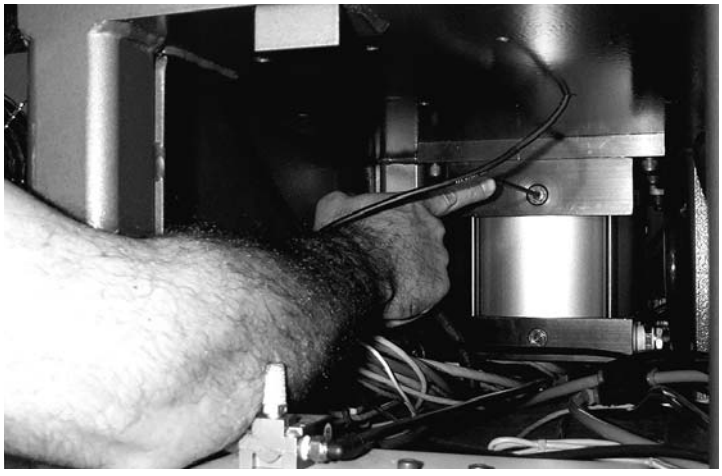
**INDEX DRIVE PROXIMITY SWITCHES -**
Lower Limit/Reverse Snap Action Switch (“A”)
Home Position Proximity Switch (“B”)
Upper Limit/Forward Snap Action Switch (“C”)




# Index Lift Cylinder Cushion Adjustments

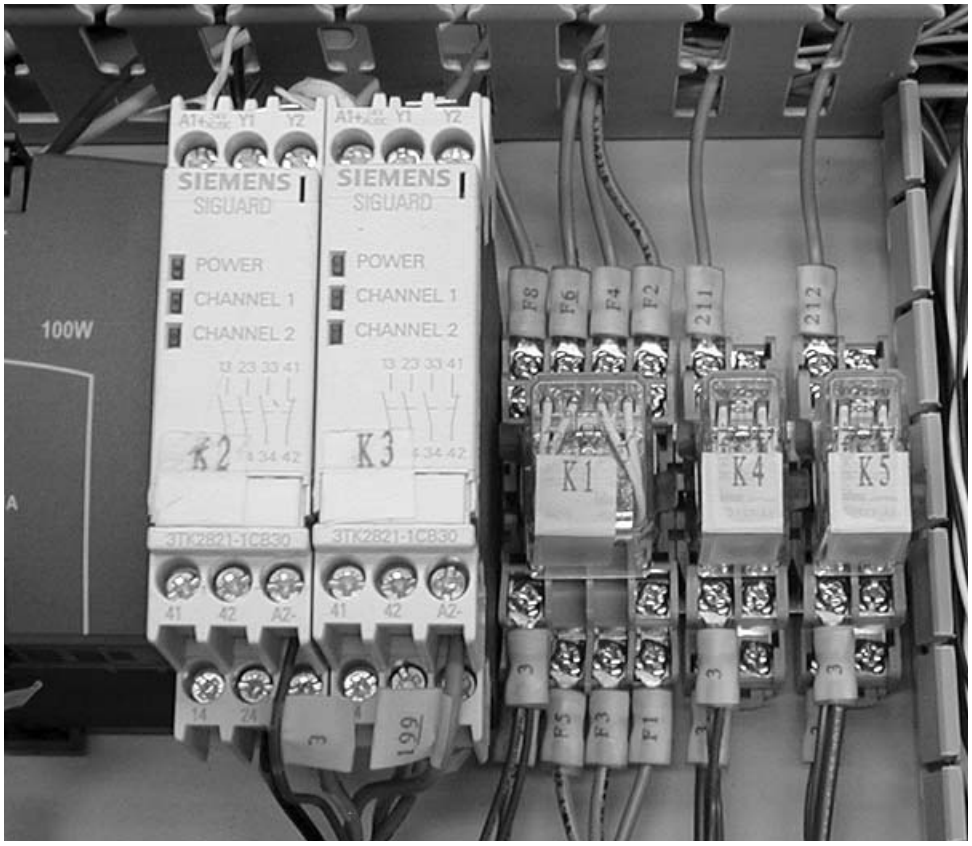
Adjustments for the deceleration or cushioning of the index table lift/lower cycle are provided on both of the index lift air cylinders. There are two cushion adjustment screws on each lift cylinder. The adjustment screw located on the bottom is used for the retraction (lowering) of the cylinder piston, while the adjustment on the top is used for the extension (raising) of the cylinder piston. On some models the adjustment is made using a small blade screw driver, on other models the adjustment is made using a 5/32” allen wrench. Be aware, these adjustments are very slight, perhaps only 1/8 turn to achieve the desired result. Turning the adjustment screw in a clockwise direction will increase the cushion effect while turning the adjustment screw in a counterclockwise direction will decrease the cushion. (See illustrations at the right)





# Idec Relay Identification

## Idec Relay Location & Function




**K2 (Emergency Relay)** - This relay is used to confirm the closure of the red emergency stop push button located on the Operator's control panel. If this relay does not energize, it is an indication that the red emergency stop push button has been activated (pushed "IN").

**K3 (Safety Relay)** - This relay is used to confirm the closure of the yellow safety cord circuit. If this relay does not energize, it is an indication that one or more yellow safety cords have not been connected.

**K1 (Quartz Lamps Relay)** - This relay is used to signal the optional Quartz Lamp Flash Cure Units to cycle up to the pre-selected output power setting for flashing of garments.

**K4 (Servo Alarm Relay)** - This relay is used to monitor the Servo Amplifier Unit. Should a Servo Alarm condition occur, this relay will drop out resulting in a shut down of the index Servo Drive unit.

**K5 (Ink Dip Relay)** - This relay is used to activate the optional "Ink Dip" control feature.

# Idec Relay Identification

NOTES:

# E 300 Alarm Message Listing

## 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.

# E 300 Alarm Message Listing

**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 14** .- 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.

# Troubleshooting Procedure

The following information is provided as a guide for troubleshooting in the event a problem may occur during the operation of your M&R Challenger Series II press. Should you have any questions regarding the installation, operation or preventive maintenance procedures for this equipment, we strongly encourage you to contact our Equipment Service Department at 1 (630) 858-6101 during normal business hours, or our 24 hour Emergency Service hotline at 1 (630) 462-4715 in the evening, week ends or holidays.

It is further recommended that persons using this troubleshooting guide have a working knowledge of electrical power and control systems, and in addition are thoroughly familiar with the operation and adjustment of the components and control devices used on this equipment before attempting to replace or adjust components of this equipment.

**IMPORTANT!** Experience has shown that many problems can be Operator induced. It is important to check that the main electrical power lines to the equipment are **"ON"**, and that the manual power **"ON/OFF"** switch is **"ON".**

| PROBLEM | PROBABLE CAUSE/SOLUTION |
|---|---|
| No power to main control panel. Neither print stations or index system operate. | 1. "ON/OFF" toggle switch located on the side of the control panel box is in the "OFF" position. Check the "ON/OFF" toggle switch and be sure it is selected for the "ON" position.<br><br>2. The circuit breaker for the incoming electrical power to the equipment has tripped. Check for the proper incoming electrical power at the incoming power terminal block on the equipment. Reset the circuit breaker as necessary.<br><br>3. The control power 3 amp circuit breaker has tripped. The circuit breaker will have wires #6 and #7 attached to it. After replacing fuse, and turning power back on to the machine, check for 230 vac across wire # 13 and wire #14 with a volt meter.<br><br>4. A short circuit exists in the 24 volt DC power circuit of the press. Check for 24 VDC across wires #3 and #4 with a volt meter. If no voltage is present check 3 amp circuit breaker, The circuit breaker will have wires #13 and #14.<br><br>5. A print station proximity switch may be damaged or inoperative. Check for any dam age (Ex: pinch points on proximity switch wires and/or cables) to print station proximity switches and replace as necessary. |
| Electrical power is indicated to controls, but nothing operates. | 1. There may be insufficient air pressure to the equipment (100 lbs. minimum per square inch). Check to be sure that your compressor is turned "ON" and the shut-off valve is open. Adjust the main air regulator to at least 100 lbs. minimum per square inch.<br><br>2. Carousel arms are not located in the correct position. Manually move the index table into the lock position, the index clevis will lock into place.<br><br>3. One of the yellow cycle interruption cords between print stations is disconnected. Check to be sure all yellow cycle interruption cords are properly connected. Clean away ant ink that may have accumulated on the cord surface. |

# Troubleshooting Procedure

| PROBLEM | PROBABLE CAUSE/SOLUTION |
|---|---|
| (Cont.)<br>Electrical power is indicated to controls, but nothing operates. | 4. Index "ON" proximity switch has failed or is mis-adjusted. Check to see if the small L.E.D. on the side of the proximity switch illuminates when the index cam follower locates in front of the switch. If the L.E.D. does not illuminate, adjust the switch using two 11/16" open-end wrenches until the L.E.D. illuminates.<br><br>5. A short circuit exists in the 24 VDC power supply on the press. Check the 3 amp circuit breaker to see if it has tripped. The circuit breaker will have wires #13 and #14 on it. Check for 24 volts DC with a volt meter across wires #13 and #14 in control box.<br><br>6. A print station proximity switch may have failed or may be shorted. Check for any physical damage done to any of the proximity switches and their cable on the print stations and replace as needed. Also look for any indication that the switch wire or control cables may have been pinched in any way. |
| During the set-up procedure a print station start push button is activated, however the carousel does not lift to the print position. | 1. One or more print stations are selected for either "SINGLE" or "DOUBLE" print open ation. Check to be sure all print station stroke switches are selected to the "OFF" position.<br><br>2. The Emergency Stop push button has been activated. Pull "out" the red Emergency Stop push button, and press the green "Reset" push button to resume operation.<br><br>3. There may be insufficient air pressure to the equipment (100 lbs. minimum per square inch). Check to be sure that your compressor is turned "ON" and the shut-off valve is open. Adjust the main air regulator to at least 100 lbs. minimum per square inch.<br><br>4. The lift valve solenoid coil on the Mac valve may have failed. Remove the base access cover on the indexer and manually activate the valve by pushing the white over-ride/test button. If the indexer goes up and down the valve is fine. Locate wires #2 and #Y42 and inspect the wires from the control box. Using a volt meter, they should read 230 volts AC. If voltage is present, trace for broken or open/loose connections. The test should be taken after pressing the print station start button. |
| The indexer does not raise fully into the print position. | 1. The air cushion adjustments on the lift cylinders are mis-adjusted. To adjust the cylinder cushions, remove the index base access covers and locate the allen screws on the top of both lift cylinders. Insert Allen Wrench and turn both screws counterclockwise 1/4 turn or less to adjust the cushion.<br><br>2. The off-contact is set too low, or one or more screen frame holders may be striking the pallets when the index table rises. Re-adjust the off-contact setting. The screen frame should be adjusted so that there is at least 1/16" off-contact between the frame and the material being printed. (On models equipped with the central off-contact lever, set the lever for the required off-contact distance.) |
| The index table lifts and lowers too fast or too slow. | 1. The lift cylinder flow-controls may be mis-adjusted. Remove the index base access 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 counterclockwise. To slow the movement, turn the control knob clockwise.<br><br>2. The air pressure to the equipment is insufficient. Check to be sure you are getting 110 PSI to the equipment by checking the air regulator. As you operate the equipment you should not see a pressure drop any greater than 5 PSI. If you do, check your compressed air supply for restrictions or blockages. |

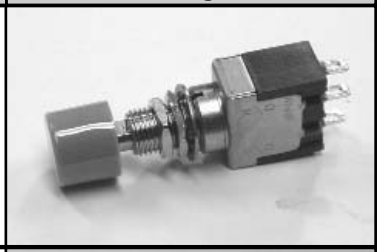
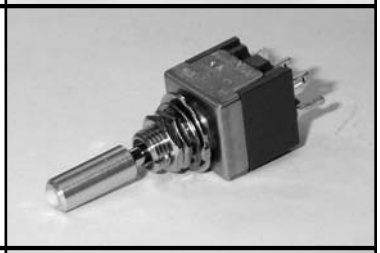
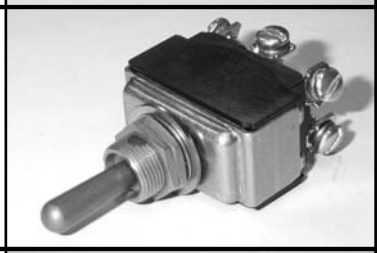
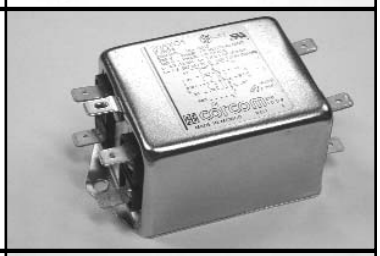
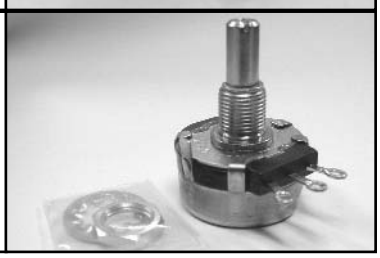
# Troubleshooting Procedure

| PROBLEM | PROBABLE CAUSE/SOLUTION |
|---|---|
| Indexer shudders or is excessively noisy when cycling up or down. | 1. The main index shaft bearings require lubrication. Lubricate the index shaft bearing with white lithium grease. There are two zerk grease fittings provided on the center index shaft for this purpose. |
| The print station complete the print cycle, however the index table does not lower. | 1. One or more of the proximity switches on print stations is defective or mis-adjusted. Once it has been determined which proximity switch or switches are at fault, check the switch to see if it will operate using a piece of metal to trigger the switch. If the L.E.D. illuminates on the side of the proximity switch, adjust the distance between the proximity switch tip and the actuator flag on the print carriage assembly for consistent operation. |
| The electrical and pneumatic power supplies to the equipment are connected, but the index table does not operate. | 1. The Emergency Stop push button has been activated. Pull “out” the red Emergency Stop push button, and press the green “Reset” push button to resume operation.<br>2. One of the yellow cycle interruption cords between print stations is disconnected. Check to be sure all yellow cycle interruption cords are properly connected. Clean away any ink that may have accumulated on the cycle interruption cord surface.<br>3. The indexer drive assembly is out of position. Push the “Reset” button for the servo motor to return to the “Start” position. Press the “Reset” button for one second.<br>4. The carousel is located in the wrong position. Carousel arms are not located in the correct position. Manually move the index table into the lock position, the index clevis will lock into place.<br>5. Index “ON” proximity switch is damaged or mis-adjusted. Check to see if the L.E.D. indicator light on the side of the proximity switch illuminates when the index cam follower locates in front of the switch. If it does not adjust the proximity switch with two 11/16” open-end wrenches until the L.E.D. illuminates. |
| The index table rotates, however the table assembly does not lift into print position. | 1. Index “ON” proximity switch is damaged or mis-adjusted. Check to see if the L.E.D. indicator light on the side of the proximity switch illuminates when the index cam follower locates in front of the switch. When the index cam follower is not not in front of the proximity switch, you should not see the L.E.D. indicator illuminate If the L.E.D. stays on constantly, replace the index ON proximity switch.<br>2. Lift valve solenoid coil on Mac valve is defective. The lift valve solenoid coil on the Mac valve may have failed. Remove the base access cover on the indexer and manually activate the valve by pushing the white over-ride/test button. If the indexer goes up and down the valve is fine. Locate wires #2 and #Y42 and inspect the wires from the control box. Using a volt meter, they should read 230 volts AC. If voltage is present, replace the solenoid. If voltage is not present check for broken or open/loose connections. The test should be taken after the press has finished rotating (indexing). |

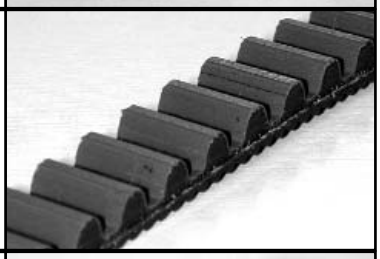
# Troubleshooting Procedure

| PROBLEM | PROBABLE CAUSE/SOLUTION |
|---|---|
| In the automatic mode the press cycles a few times and then stops. | 1.The center proximity switch is loose or not making contact. Push the Emergency stop push button. Check to see if the proximity switch mounted to the underside of the print station 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 position. The L.E.D. light on the proximity switch will be on when the switch is properly adjusted.<br><br>2. Safety cord has broken or has a loose wire connection. Check all safety cords at plugs with a continuity tester for "Open" or broken conductors. Replace the safety cord as necessary. |
| The indexer raises and the print stations start to print but do not complete the print stroke. | 1. A print station flow control valve is mis-adjusted. Turn the knob on the flow control that is farthest away from you counterclockwise to increase air flow to the stroke cylinder.<br><br>2. Center table proximity switch not giving signal. The proximity switch may be loose requiring adjustment. Push the Emergency stop push button. Check to see if the proximity switch mounted to the underside of the print station 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 position. The L.E.D. light on the proximity switch will be on when the switch is properly adjusted.<br><br>3. Solenoid valve is sticking or there is an air leak in the system. Remove the access covers from the top of the carousel and check for any air leaks. Press on the white test button on the end of the print station valves to be sure that they are free and that nothing mechanical has stopped the print station from moving. This action will also serve to clear any dirt or lint that might be blocking the spool slide, to be forced through the valve. |
| The indexer over-travels and is so rough that it clanks or the machine moves. | 1. If the pallet sizes have been changed, the difference in the mechanical load on the indexer can result in excessive vibration during indexer operation. Adjust the "Pallet Sizes" control in the "OPTIONS" menu of the Operator Interface control panel. |
| The print station goes through the flood cycle and print cycle, however the flood bar and squeegee do not go through the change over. | 1. Solenoid Mac valve for the chopper cylinders has failed. With the power turned "OFF" to the equipment, manual activate the Mac valve for the chopper cylinders. If the action takes place, the valve is operating fine.<br><br>You must now check the solenoid for the condition of the coil with an Ohm meter or continuity tester. If the coil is "open" replace with a new coil. |

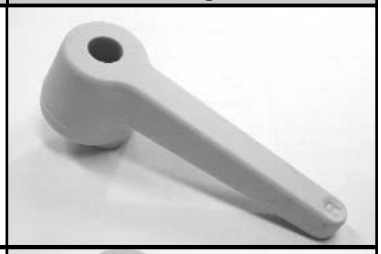
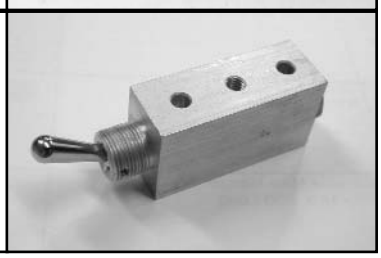
# Recommended Spare Parts

| Part No. | Qty. | Description | Image |
|---|---|---|---|
| 1017159 | 2 | Push Button Switch (Print) |  |
| 1017157 | 2 | Toggle Switch On/Off<br>LED Green/Yellow |  |
| 1010007 | 2 | Toggle Switch with Lever Seal<br>Double Pole |  |
| 1036020A | 1 | Line Filter<br>20AY01  20 Amp<br>Used on Export Models Only |  |
| 3033006 | 2 | Knob 1/4” Insert with Set Screw |  |
| 1029020 | 2 | Potentiometer 5K Ohm  2 Watt |  |

# Recommended Spare Parts

| Part No. | Qty. | Description | Image |
|---|---|---|---|
| 2003031 | 2 | Fitting Male Swivel Elbow 10-32 |  |
| 8090056 | 2 | Micro Side Adjusting Screw |  |
| 3041184 | 76 inches | 8mm Poly Chain Belt 12mm Wide |  |
| 9150940 | 2 | Bumper .625 OD X .75” Long |  |
| 3032009 | 2 | Kipp Elisa Male Handle<br>5/16 - 18 X .59 long |  |
| 3032045 | 2 | Kipp elisa Male Handle<br>5/16 - 18 X .980 Long |  |

# Recommended Spare Parts

| Part No. | Qty. | Description | Image |
|---|---|---|---|
| 9050153A | 2 | Right Locking Cam No Tools Pallet |  |
| 9050154 | 2 | Left Locking Cam No Tools Pallet |  |
| 2003023 | 2 | Fitting Male Conn 10-32 NPT |  |
| 2009023B | 2 | Double Acting Air Cylinder<br>1” Bore 1-1/2” Stroke |  |
| 1017158 | 2 | Toggle Switch Off/On<br>LED Red |  |
| 2018011 | 2 | Air Switch 4 Way<br>10-32 Ports |  |

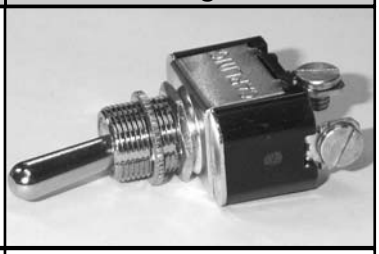
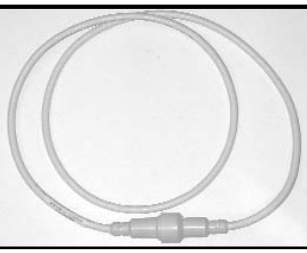
# Recommended Spare Parts

| Part No. | Qty. | Description | Image |
|---|---|---|---|
| 8010003 | 2 | Screen Holder Screw Assembly |  |
| 8090057 | 2 | Micro X Y Adjusting Screw |  |
| 3034002 | 2 | Female Rod End 3/8-24 |  |
| 9150069 | 2 | Rear Micro Mounting Rod End |  |
| 8010005 | 2 | Cup Washer |  |
| 3032001 | 2 | Kipp Elisa Handle |  |

# Recommended Spare Parts

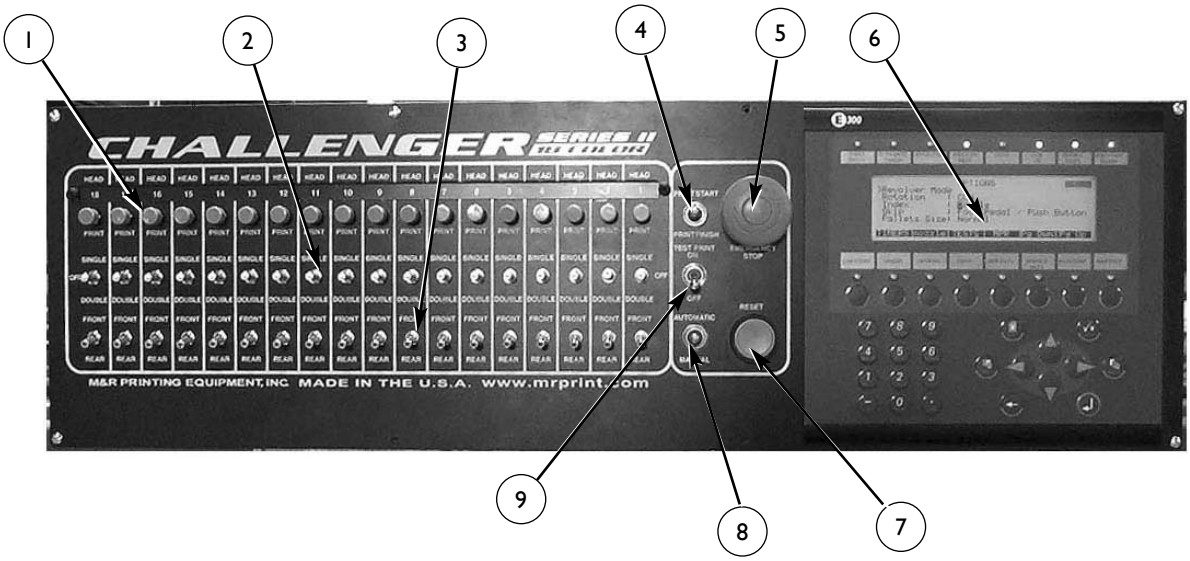
| Part No. | Qty. | Description | Image |
|---|---|---|---|
| 2001080 | 10 ft. | Tubing Nylon 1/4” OD Red |  |
| 2001000 | 30 ft. | Tubing Polyurethane 1/4” Black |  |
| 2001001 | 30 ft. | Tubing Nylon 5/32” Black |  |
| 7017000 | 1 | 10 wt. Non-Detergent Oil |  |
| 7018031 | 1 | Super Lube Grease |  |
| 1010040 | 1 | Emergency Stop Push Button |  |

# Recommended Spare Parts

| Part No. | Qty. | Description | Image |
|---|---|---|---|
| 1010011 | 1 | Toggle Switch |  |
| 1009004 | 1 | Vent Fan |  |
| 1010001A | 1 | Reset Push Button<br>ABW210-G |  |
| 1010082D | 2 | Round Proximity Switch<br>**NOTE:** Requires separate cable Part No. 1010224 shown below. |  |
| 1010224 | 2 | Round Proximity Switch Cable 5 meter |  |
| 1018033 | 2 | Cycle Interruption Cord 54”<br>Double Ended |  |

# Replacement Parts

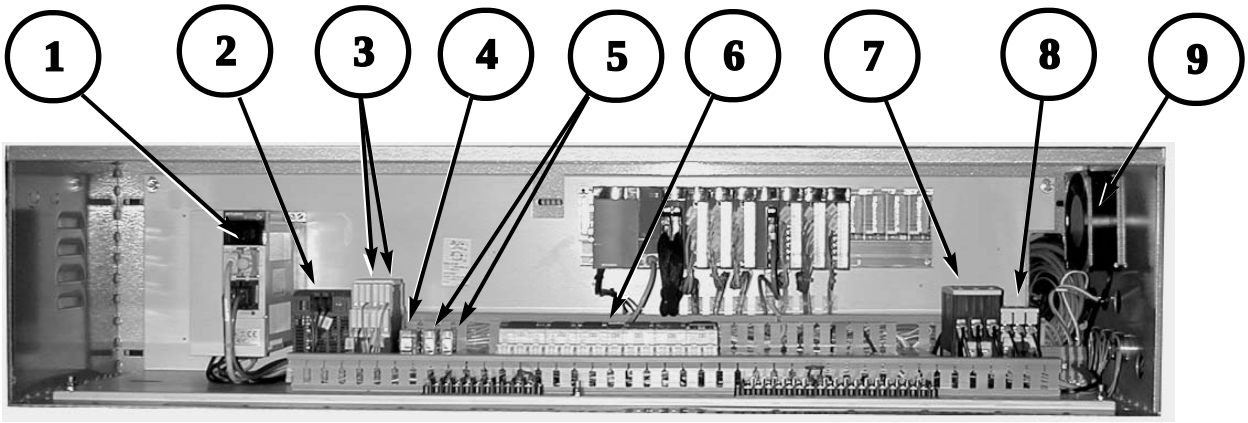
Operator Control Console




| | Part Description | Part Number |
|---|---|---|
| 1 | Push Button Switch | 1017159 |
| 2 | Toggle Switch. | 1017157 |
| 3 | Toggle Switch | 1017158 |
| 4 | Toggle Switch | 1010007 |
| 5 | Emergency Stop Push Button | 1010040 |
| 6 | E-300 Operator Interface | 1017295 |
| 7 | Reset Push Button | 1010001 |
| 8 | Toggle Switch | 1010007 |
| 9 | Toggle Switch | 1010011 |

# Replacement Parts

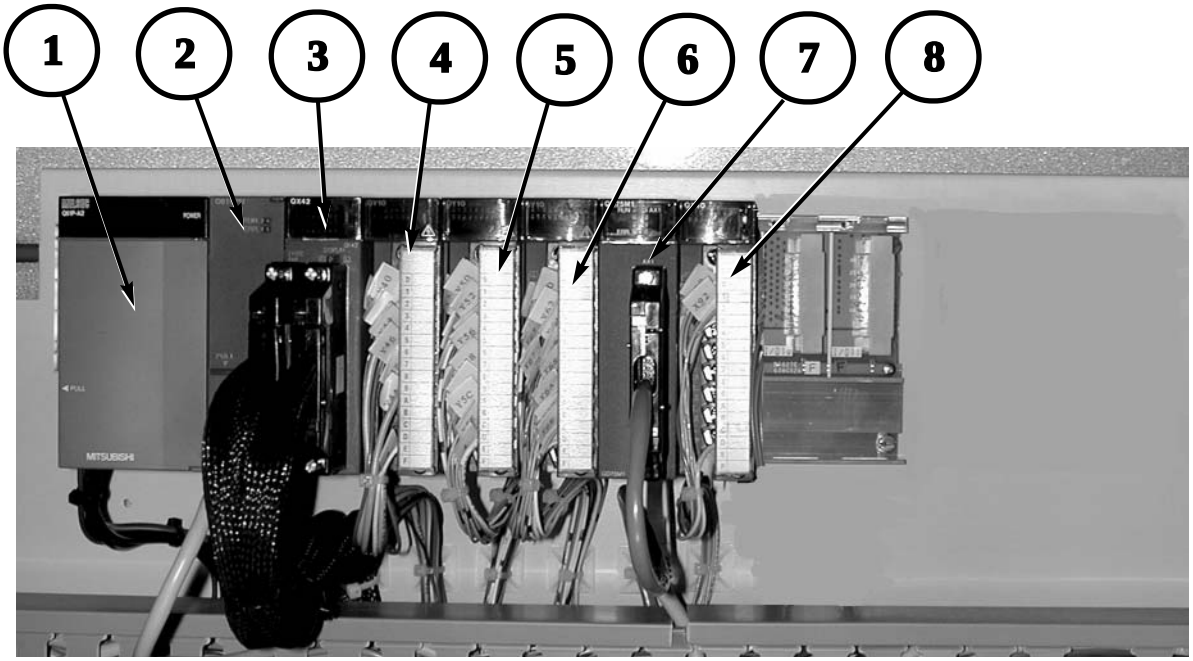
Lower Index Electrical Cabinet




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Index Servo Amplifier | 1017483 |
| 2 | Power Supply | 1024125 |
| 3 | Emergency & Safety Relays (K2 and K3) | 1017422 |
| 4 | Quartz Lamp On Relay (K3) | 1011033 |
| 5 | Servo Alarm & Ink Dip Relay (K4 & K5) | 1010204 |
| 6 | Circuit Breakers (See Pages 108 - 111) | |
| 7 | Contactor (C1) | 1011516 |
| 8 | Contactor (C2) | 1011518 |
| 9 | Vent Fan | 1009004 |

# Replacement Parts

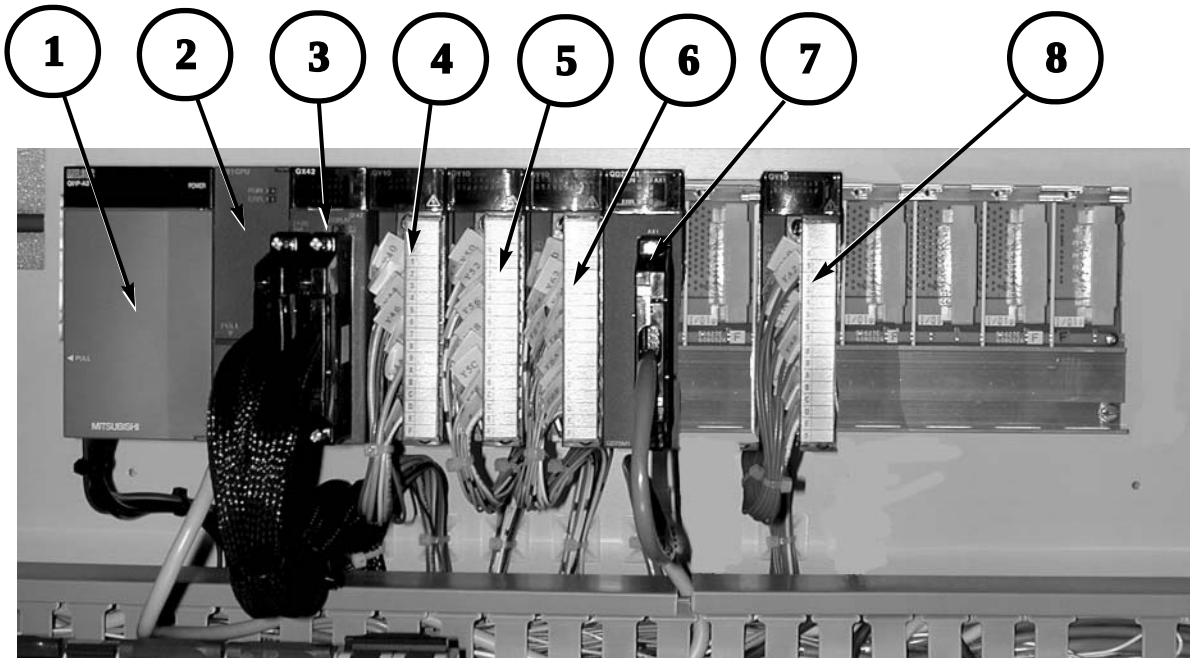
## PLC Rack 12 and 14 Color




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Power Supply | 1017476 |
| 2 | Central Processing Unit (CPU) | 1017502 |
| 3 | QX42 Input Module | 1017501 |
| 4 | QY10 Output Module | 1017478 |
| 5 | QY10 Output Module | 1017478 |
| 6 | QY10 Output Module | 1017478 |
| 7 | QO75M1 Position Module | 1017503 |
| 8 | QX40 Input Module | 1017477 |

# Replacement Parts

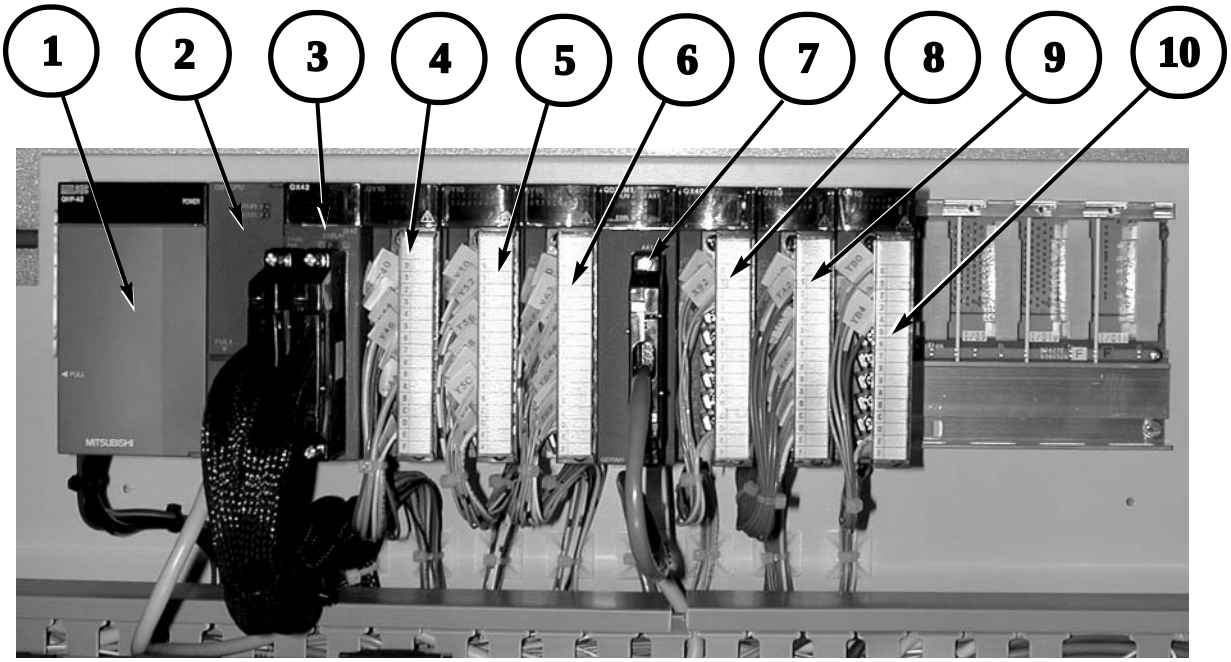
PLC Rack 16 Color




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Power Supply | 1017476 |
| 2 | Central Processing Unit (CPU) | 1017502 |
| 3 | QX42 Input Module | 1017501 |
| 4 | QY10 Output Module | 1017478 |
| 5 | QY10 Output Module | 1017478 |
| 6 | QY10 Output Module | 1017478 |
| 7 | QO75M1 Position Module | 1017503 |
| 8 | QX40 Input Module | 1017477 |

# Replacement Parts

## PLC Rack 18 Color




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Power Supply | 1017476 |
| 2 | Central Processing Unit (CPU) | 1017502 |
| 3 | QX42 Input Module | 1017501 |
| 4 | QY10 Output Module | 1017478 |
| 5 | QY10 Output Module | 1017478 |
| 6 | QY10 Output Module | 1017478 |
| 7 | QO75M1 Position Module | 1017503 |
| 8 | QX40 Input Module | 1017477 |
| 9 | QY10 Output Module | 1017478 |
| 10 | QY10 Output Module | 1017478 |

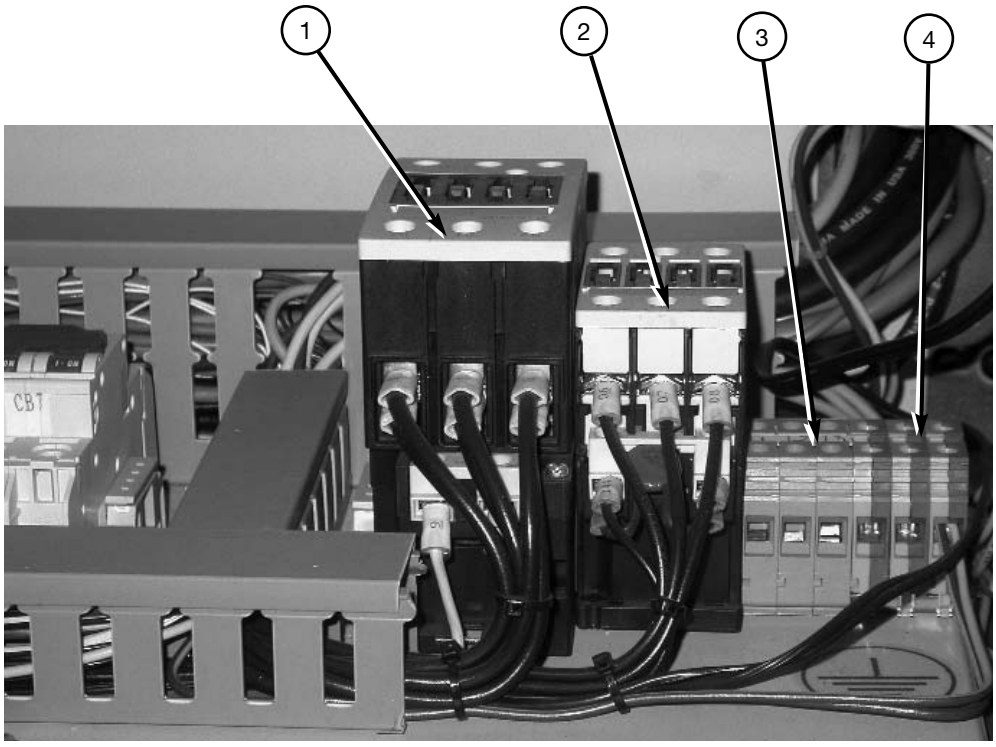
# Replacement Parts

## Line Filters


| | Part Name | Part Number |
|---|---|---|
| 1 | AC Line Filter | 1036020A |

# Replacement Parts

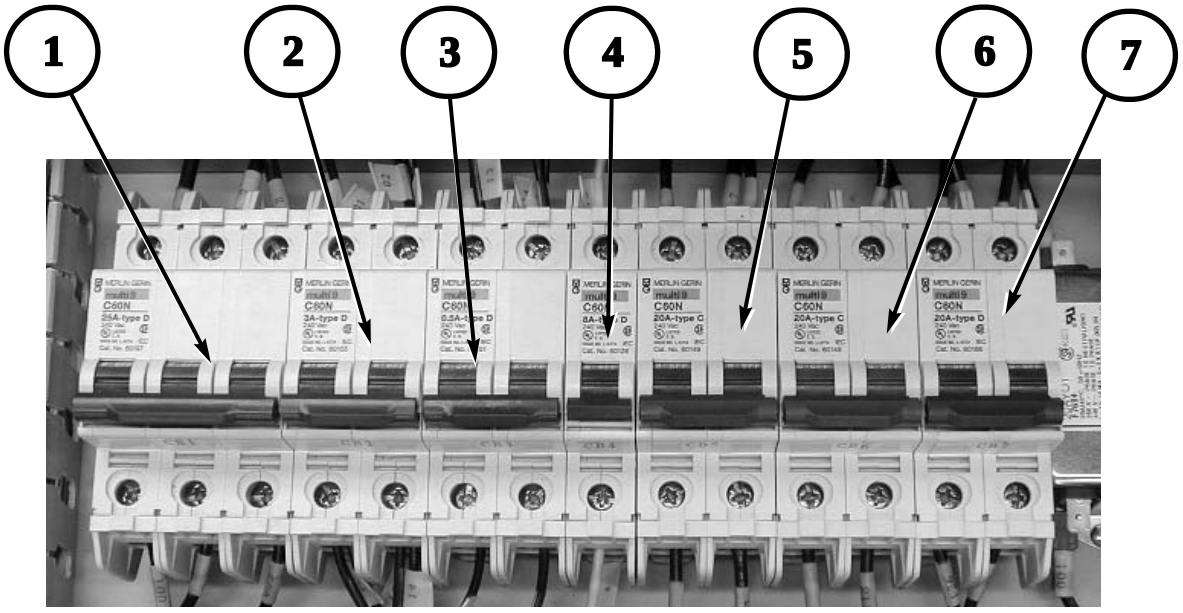
## Indexer Electrical Enclosure




| | Part Name | Part Number |
|---|---|---|
| 1 | Contactor 3RT1035 230 Volt Models | 1011516 |
| 1 | Contactor 3RT1026 380 Volt Models | 1011518 |
| 2 | Contactor | 1011518 |
| 3 | Terminal Block | 1035001 |
| 4 | Terminal Block (Ground) | 1035005 |

# Replacement Parts

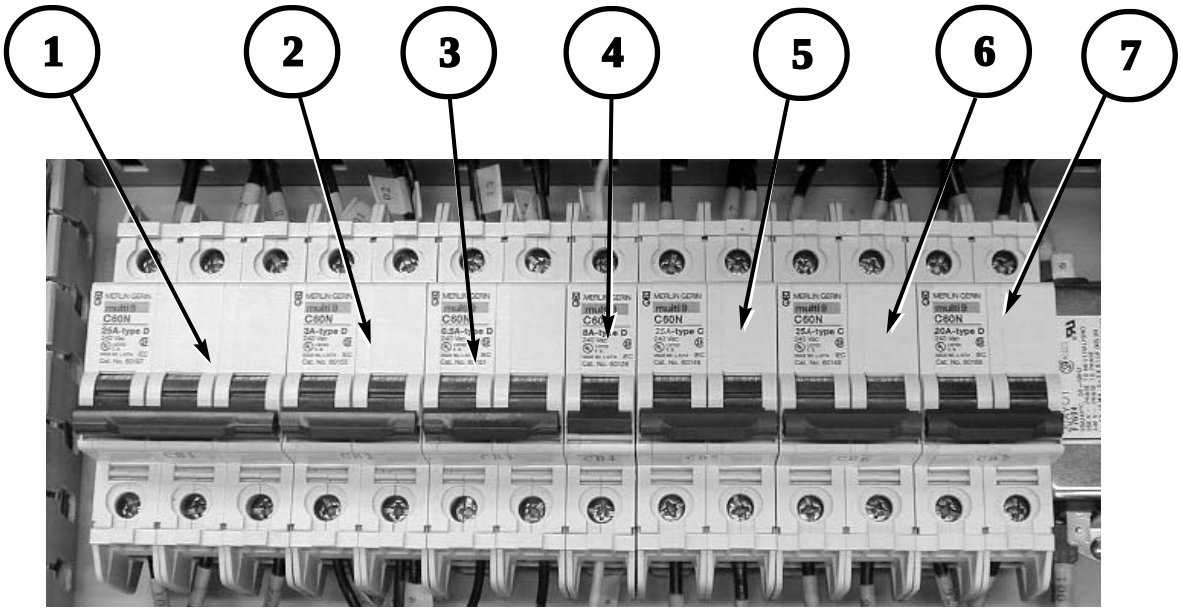
12 Color Circuit Breakers




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Circuit Breaker 3 Pole 25 Amp CB1 | 1006518 |
| 2 | Circuit Breaker 2 Pole 3 Amp CB2 | 1006447 |
| 3 | Circuit Breaker 2 Pole 0.5 Amp CB3 | 1006458 |
| 4 | Circuit Breaker 1 Pole 8 Amp CB4 | 1006475 |
| 5 | Circuit Breaker 2 Pole 20 Amp CB5 | 1006457 |
| 6 | Circuit Breaker 2 Pole 20 Amp CB6 | 1006457 |
| 7 | Circuit Breaker 2 Pole 20 Amp CB7 | 1006457 |

# Replacement Parts

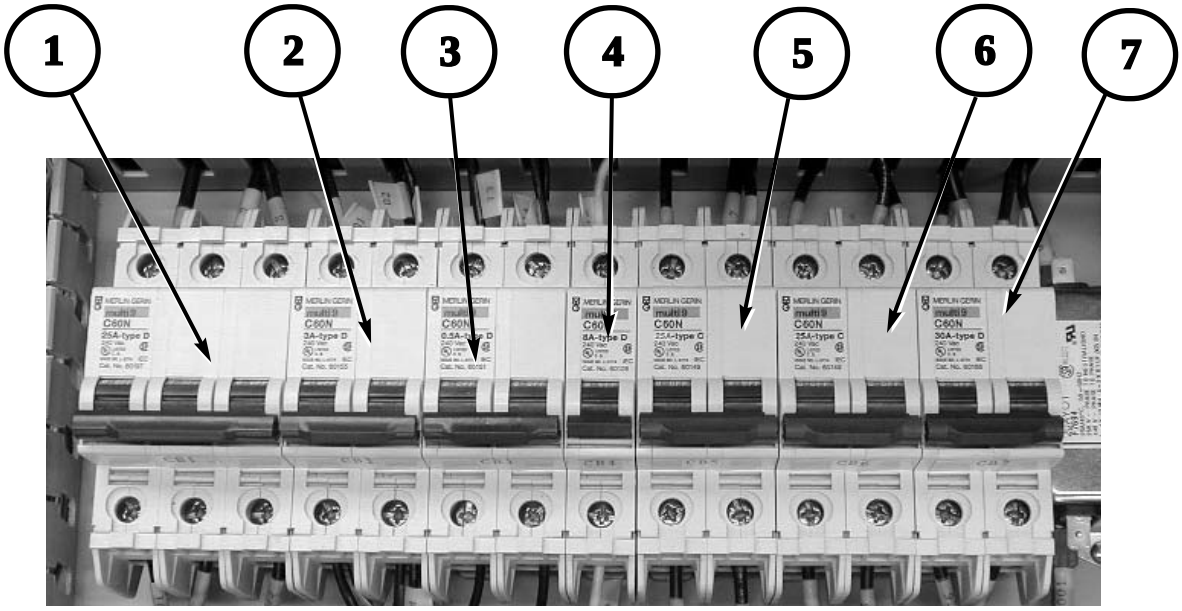
## 14 Color Circuit Breakers




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Circuit Breaker 3 Pole 25 Amp CB1 | 1006518 |
| 2 | Circuit Breaker 2 Pole 3 Amp CB2 | 1006447 |
| 3 | Circuit Breaker 2 Pole 0.5 Amp CB3 | 1006458 |
| 4 | Circuit Breaker 1 Pole 8 Amp CB4 | 1006475 |
| 5 | Circuit Breaker 2 Pole 25 Amp CB5 | 1006539 |
| 6 | Circuit Breaker 2 Pole 25 Amp CB6 | 1006539 |
| 7 | Circuit Breaker 2 Pole 20 Amp CB7 | 1006457 |

# Replacement Parts

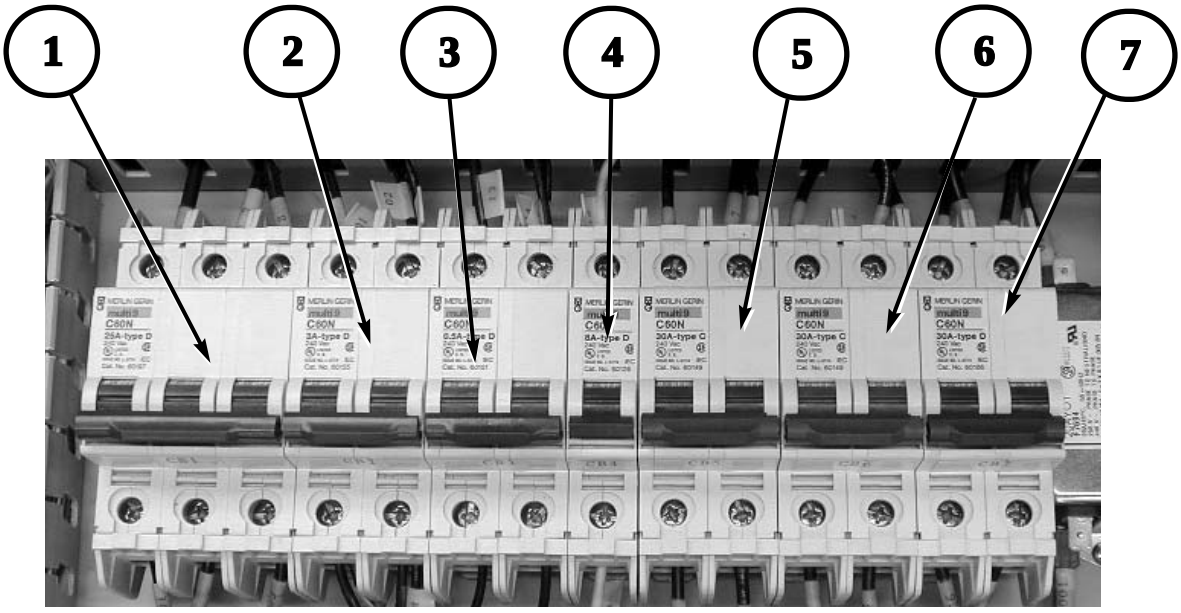
16 Color Circuit Breakers




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Circuit Breaker 3 Pole 25 Amp CB1 | 1006518 |
| 2 | Circuit Breaker 2 Pole 3 Amp CB2 | 1006447 |
| 3 | Circuit Breaker 2 Pole 0.5 Amp CB3 | 1006458 |
| 4 | Circuit Breaker 1 Pole 8 Amp CB4 | 1006475 |
| 5 | Circuit Breaker 2 Pole 25 Amp CB5 | 1006539 |
| 6 | Circuit Breaker 2 Pole 25 Amp CB6 | 1006539 |
| 7 | Circuit Breaker 2 Pole 30 Amp CB7 | 1006540 |

# Replacement Parts

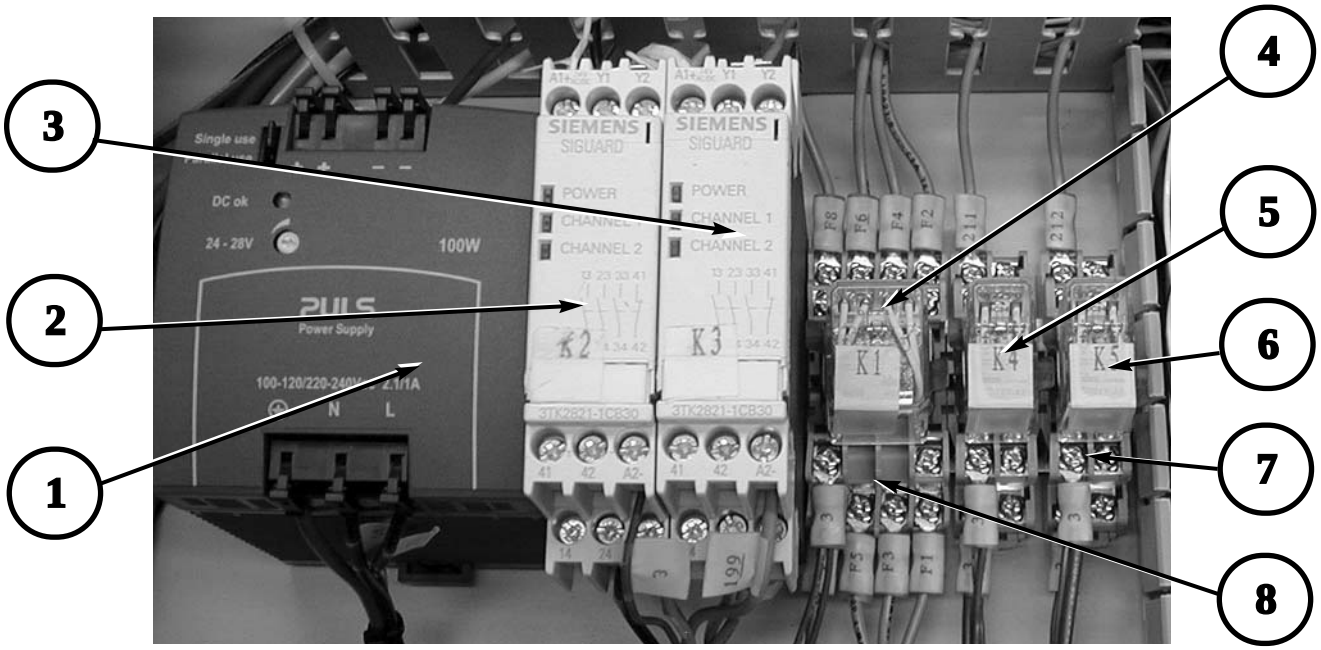
## 18 Color Circuit Breakers




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Circuit Breaker 3 Pole 25 Amp CB1 | 1006518 |
| 2 | Circuit Breaker 2 Pole 3 Amp CB2 | 1006447 |
| 3 | Circuit Breaker 2 Pole 0.5 Amp CB3 | 1006458 |
| 4 | Circuit Breaker 1 Pole 8 Amp CB4 | 1006475 |
| 5 | Circuit Breaker 2 Pole 30 Amp CB5 | 1006540 |
| 6 | Circuit Breaker 2 Pole 30 Amp CB6 | 1006540 |
| 7 | Circuit Breaker 2 Pole 30 Amp CB7 | 1006540 |

# Replacement Parts

## Power Supply & Relays




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Power Supply | 1024059 |
| 2 | Emergency Relay (K2) | 1017422 |
| 3 | Safety Relay (K3) | 1017422 |
| 4 | Quartz Lamps On Relay (K1) | 1011033 |
| 5 | Servo Alarm Relay (K4) | 1010204 |
| 6 | Ink Dip Relay (K5) | 1010204 |
| 7 | Relay Socket 2 Pole | 1010206 |
| 8 | Relay Socket 4 Pole | 1011022 |

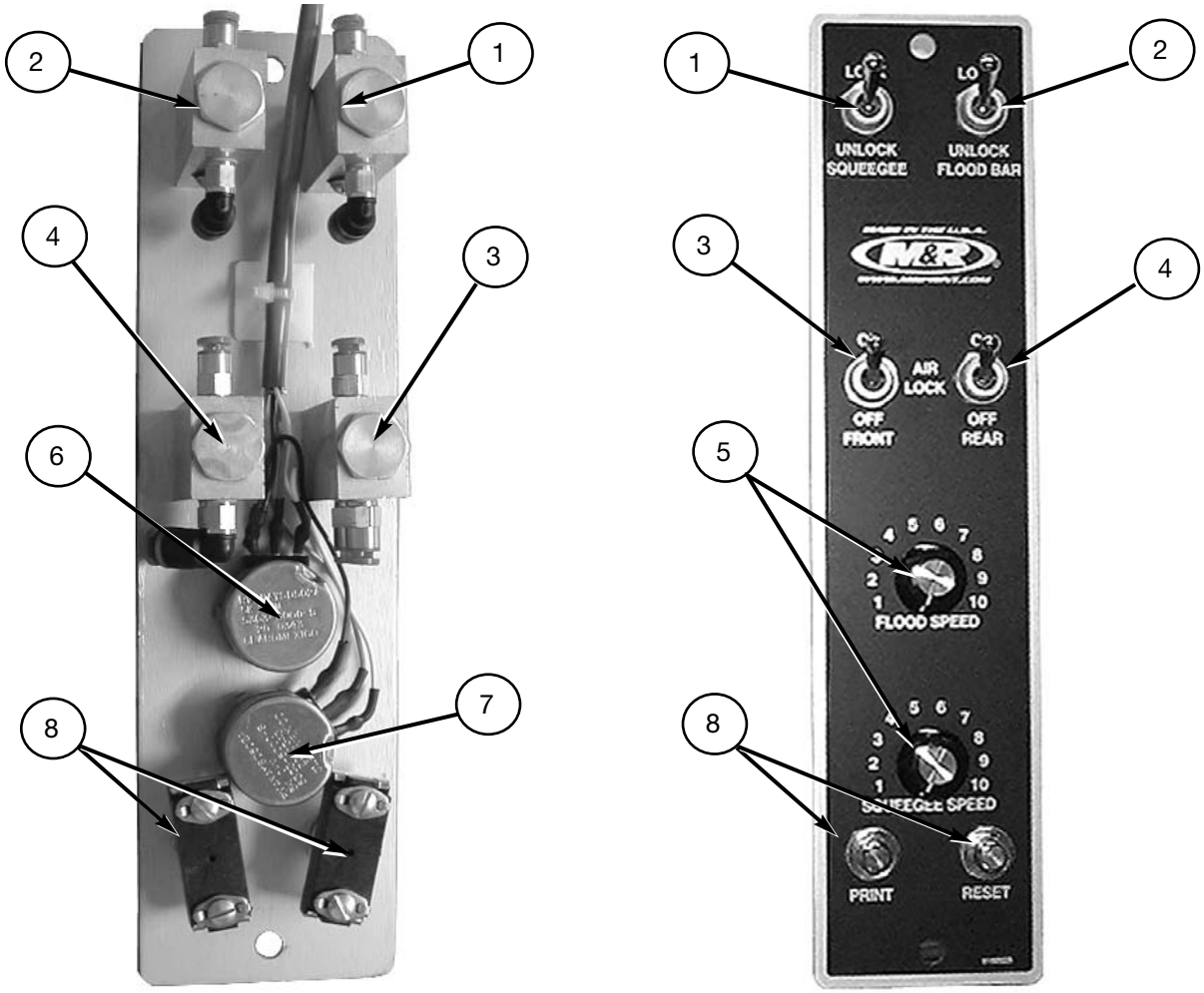
# Replacement Parts

## Accessory Plugs


| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | 3 Way Locking Receptical | 1020292 |
| 2 | Connector Multi-Conn 3S | 1020035 |
| 3 | Vent Fan | 1009004 |
| 4 | Connector Multi-Conn 2S | 1020039 |

# Replacement Parts

**AC Print Station Control Panel**




| Part Description | | Part Number |
|---|---|---|
| 1 | Air Lock Valve for Squeegee/Fld Bar | 8090066 |
| 2 | Air Lock Valve for Squeegee/Fld Bar | 8090066 |
| 3 | Air Lock Valve with Straight Fitting | 8090060 |
| 4 | Air Lock Valve with 90 Fitting | 8090059 |
| 5 | Adjustment Knob | 3033006 |
| 6 | Potentiometer 5K Ohm | 1029020 |
| 7 | Potentiometer 5K Ohm | 1029020 |
| 8 | Push Button | 1010006 |

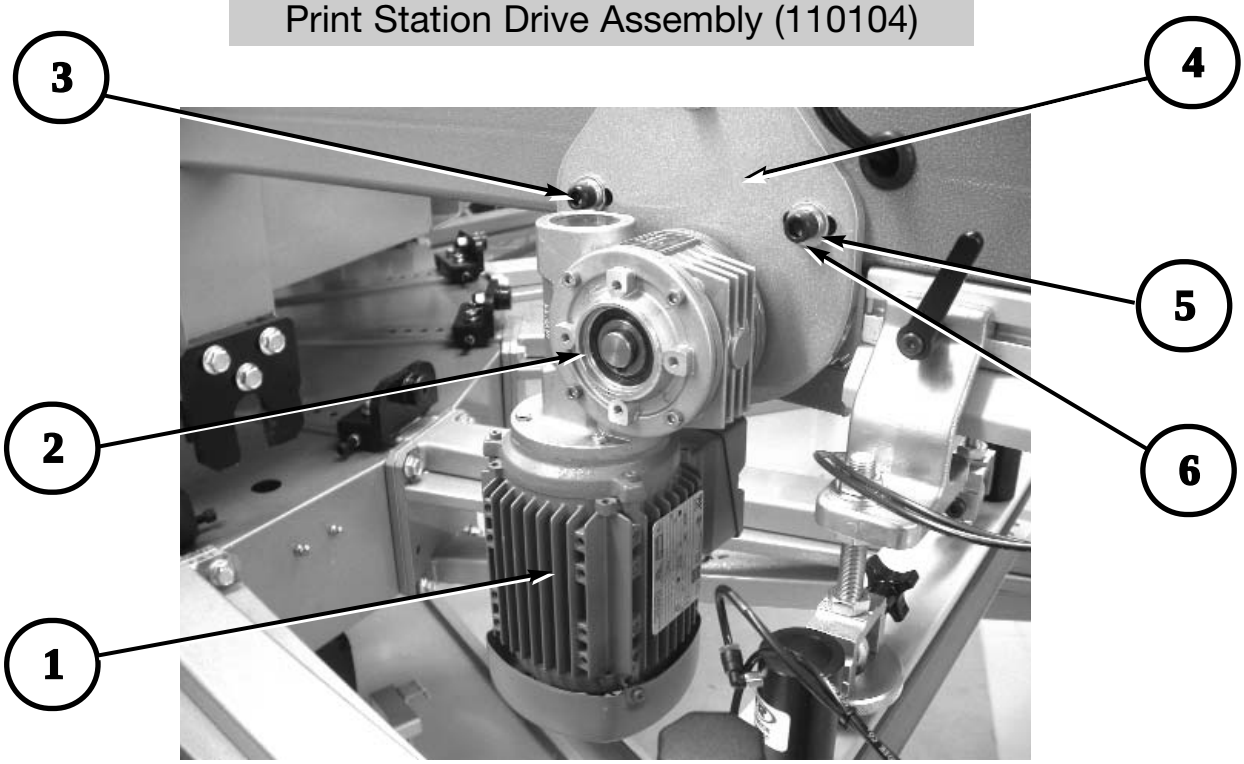
# Replacement Parts

## Servo Index Drive Lubrication Assembly


| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Auto Lubricator Reservoir with Bracket | 9130061 |
| 2 | Auto Oiler Volume Control Injector Pump | 2007084 |

# Replacement Parts

Print Station Drive Assembly (110104)




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Motor | 1008463 |
| 2 | Gear Reducer | 3027280 |
| 3 | Socket Hex Screw | 3009074 |
| 4 | Mounting Plate | 9157197 |
| 5 | Washer | 3022002 |
| 6 | Loc Washer | 3022003 |

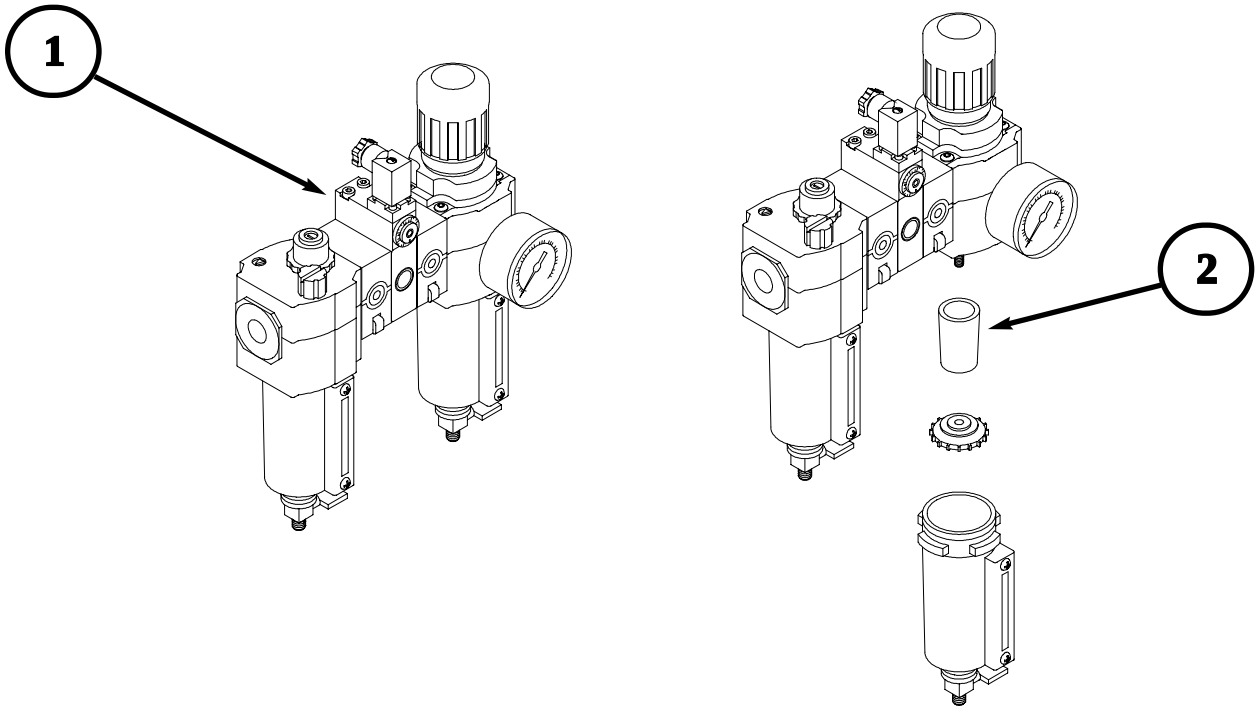
# Replacement Parts

## Print Station Inverter Unit


| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Inverter Unit | 1008476 |

# Replacement Parts

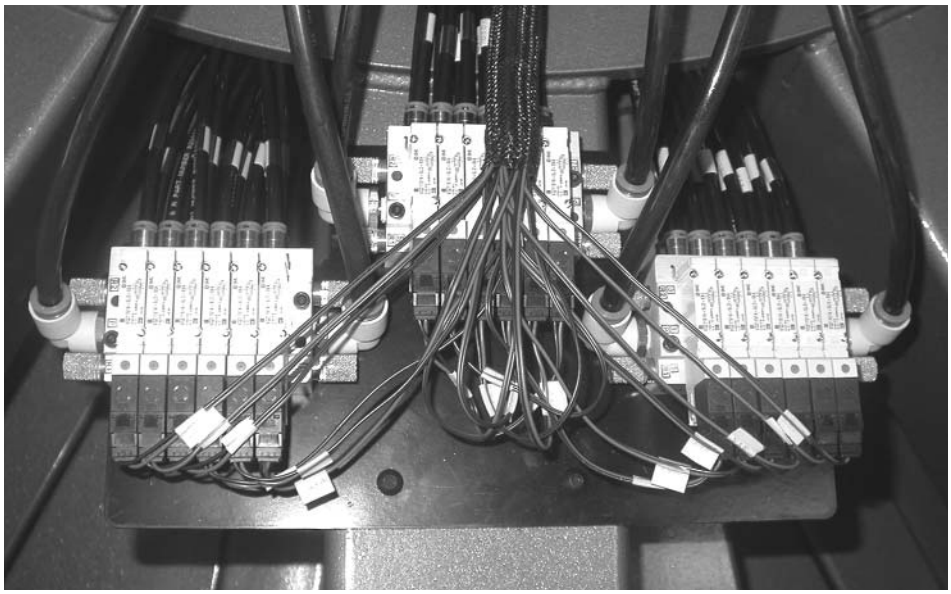
Regulator, Lubricator Moisture Trap Assembly




| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | Regulator, Filter Lubricator Combination | 2020029 |
| 2 | 5 Micron Air Filter | 2019047 |

# Replacement Parts

## Chopper Cylinder Air Valves

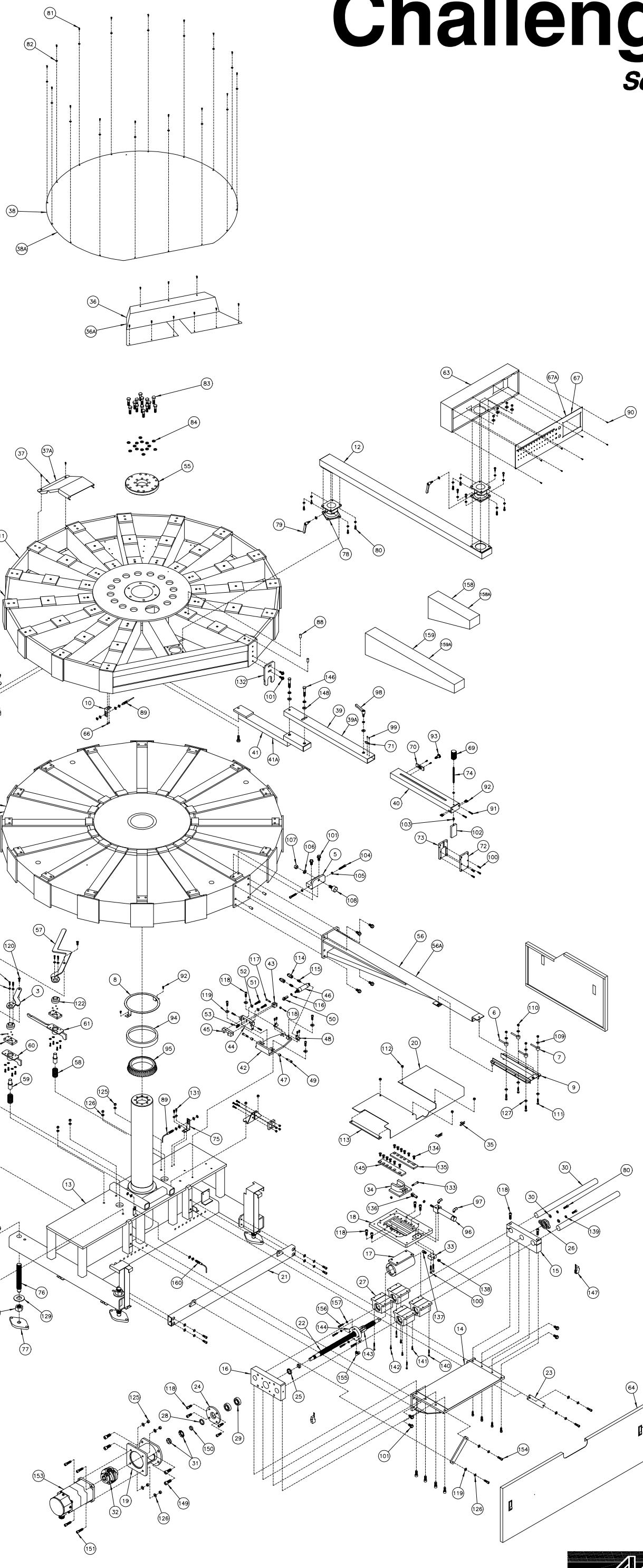


| Reference No. | Description | M&R Part No. |
|---|---|---|
| 1 | 12 Color Valve Block | 2010049A |
| 2 | 14 Color Valve Block | 2010048A |
| 3 | 10 Color Valve Block | 2010050A |
| 4 | 16 Color Valve Block | 2011014 |
| 5 | 18 Color Valve Block | 2011019 |
| 6 | Individual Valve Assembly | 2010061 |

# Replacement Parts

# Challenger

***Series II***



# Replacement Parts

## 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 |

# Replacement Parts

## 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 |

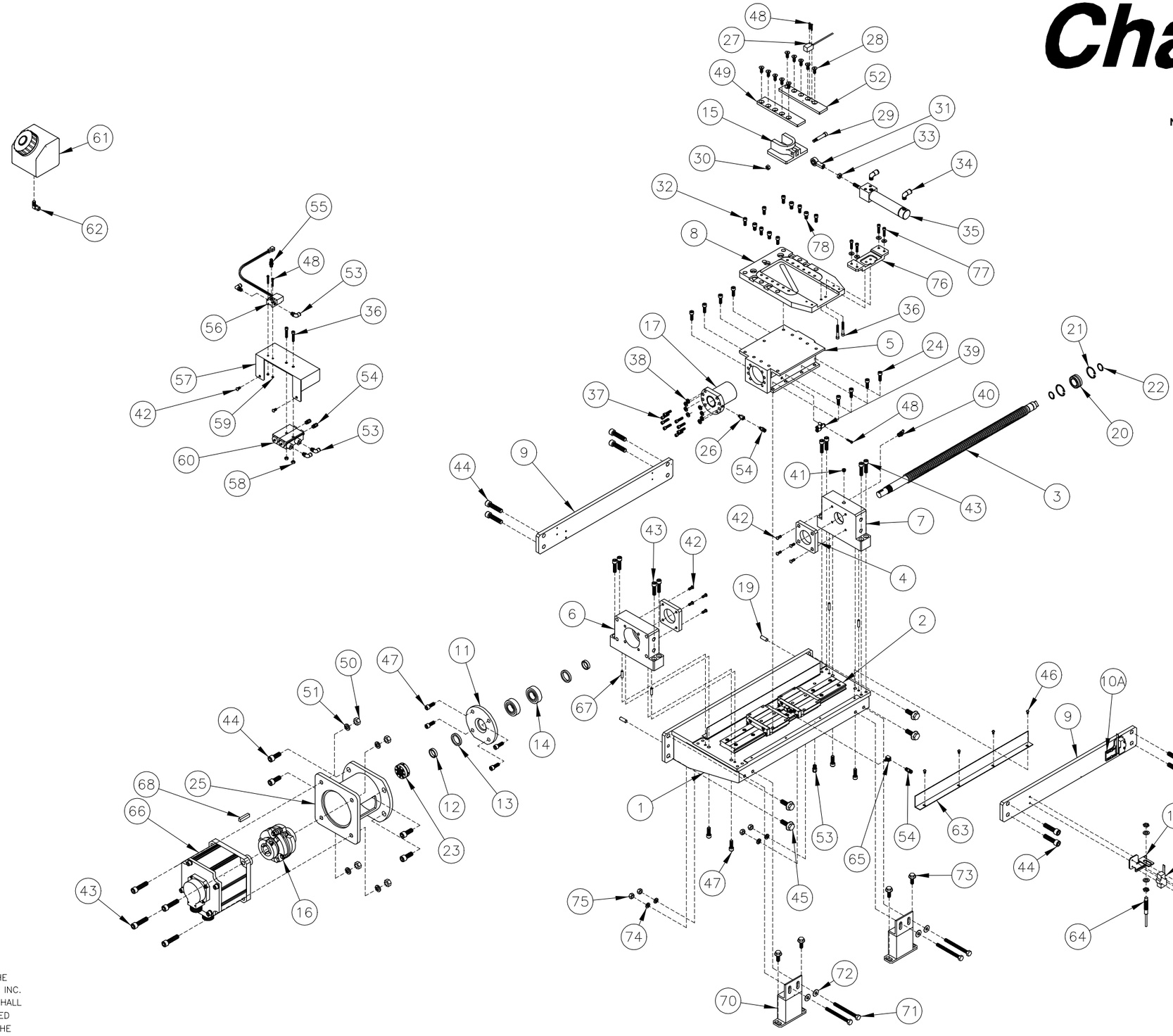
# Replacement Parts

## 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 |

# Challenger
## Series II

**NEW BALL SCREW INDEX DRIVE ASSEMBLY**
**(Revised 12/27/00)**



| 34 | FITTING, MALE ELBOW 1/8 NPT | 2003005 |
|---|---|---|
| 33 | HEX JAM NUT 5/16"–24 | 3013032 |
| 32 | SOCKET CAP SCREW 5/16"–18 X 3/4" | 3009005 |
| 31 | FEMALE ROD END 5/16"–24 | 3034011 |
| 30 | ELASTIC STOP NUT 1/4"–20 | 3012000 |
| 29 | SHOULDER BOLT 5/16" X 1 1/4" | 3006015 |
| 28 | FLAT SOCKET CAP SCREW 5/16"–18 X 3/4" | 3010008 |
| 27 | SQUARE PROX. | 1010005 |
| 26 | LUBE ADAPTOR | 2007088 |
| 25 | MOTOR MOUNTING BRACKET | 9150076 |
| 24 | SOCKET CAP SCREW M8 X 25mm | 3009162 |
| 23 | LOCKING NUT | 3013143 |
| 22 | EXTERNAL RETAINING RING | 3024046 |
| 21 | INTERNAL RETAINING RING | 3024047 |
| 20 | NEEDLE ROLLER BEARING | 3023460 |
| 19 | DOWEL PIN ø3/8" X 1" | 3014040 |
| 18 | SNAP ACTION SWITCH | 1020242 |
| 17 | BALL SCREW NUT | 3063023A |
| 16 | MOTOR COUPLING | 2007069 |
| 15 | INDEX CLEVIS | 8121252C |
| 14 | SINGLE ROW ANG. CONTACT BALL BEARING | 3023089 |
| 13 | OIL SEAL | 3023088 |
| 12 | DISTANCE BUSHING | 9105258 |
| 11 | BEARING FLANGE | 9105252 |
| 10A | HOME PROX. MOUNTING BRACKET, RIGHT | 9150429 |
| 10 | HOME PROX. MOUNTING BRACKET | 9150439 |
| 9 | REINFORCEMENT PLATE | 9150437 |
| 8 | INDEX MOUNT PLATE | 9152084 |
| 7 | BEARING BLOCK, RIGHT | 9150434 |
| 6 | BEARING BLOCK, LEFT | 9150433 |
| 5 | BALL SCREW NUT HOUSING | 9150432 |
| 4 | BALL SCREW BUMPER | 9150424 |
| 3 | BALL SCREW SHAFT | 9150436 |
| 2 | LINEAR SLIDE (2 BLOCKS) | 3030085 |
| 1 | BALL SCREW DRIVE BASE | 9150431 |

| ITEM NO. | DESCRIPTION | PART NO. |
|---|---|---|

CHALLENGER SERIES II NEW BALL SCREW INDEX DRIVE

| 69 | BUTTON SOCKET CAP SCREW 10-24 X 1/2" | 3001013 |
|---|---|---|
| 68 | KEY STOCK 10 X 8mm | 6201033 |
| 67 | DOWEL PIN | 3014001 |
| 66 | SERVO MOTOR | 1008215 |
| 65 | FITTING, ELBOW 1/8 NPT | 2005104 |
| 64 | PROX. SWITCH, ROUND | 1010012 |
| 63 | OIL SPLASH SHIELD | 9150407 |
| 62 | ELBOW, COMPRESSION 1/4 X 1/8 | 2002007 |
| 61 | OIL RESERVIOR | 2007085 |
| 60 | AIR TWO INJECTOR PUMP | 2007084 |
| 59 | ELASTIC STOP NUT 6-32 | 3012007 |
| 58 | ELASTIC STOP NUT 1/4"-20 | 3012000 |
| 57 | OIL SYSTEM SUB PANEL | 9150452 |
| 56 | MAC VALVE, 3-WAY | 2012050 |
| 55 | MUFFLER, 1/8" | 2014002 |
| 54 | FITTING, MALE CONNECTOR 1/8 NPT | 2003000 |
| 53 | FITTING, MALE SWIVEL ELBOW 1/8 NPT | 2003010 |
| 52 | CLEVIS GUIDE, RIGHT | 8121254 |
| 51 | SPLIT LOCK WASHER 3/8" | 3022002 |
| 50 | HEX NUT 3/8"-16 | 3013007 |
| 49 | CLEVIS GUIDE, LEFT | 8121255 |
| 48 | ROUND HEAD MACHINE SCREW 6-32 X 7/8" | 3005008 |
| 47 | SOCKET CAP SCREW 3/8"-16 X 1" | 3009000 |
| 46 | BUTTON SOCKET CAP SCREW 10-24 X 3/8" | 3001003 |
| 45 | BOLT, WHIZ LOCK 1/2"-13 X 1" | 3003003 |
| 44 | SOCKET CAP SCREW 1/2"-13 X 1 1/4" | 3009013 |
| 43 | SOCKET CAP SCREW 3/8"-16 X 1 1/2" | 3009001 |
| 42 | BUTTON SOCKET CAP SCREW 1/4"-20 X 1/2" | 3001005 |
| 41 | PLUG 1/8 NPT | 2006002 |
| 40 | FITTING, GREASE 1/8 NPT 45° | 2003032 |
| 39 | FITTING "Y' 5/32 TUBE | 2003024 |
| 38 | SPLIT LOCK WASHER 5/16" | 3022003 |
| 37 | SOCKET CAP SCREW 5/16"-18 X 1" | 3009003 |
| 36 | SOCKET CAP SCREW 1/4"-20 X 1 1/2" | 3009017 |
| 35 | FORK CLEVIS CYLINDER | 2009016 |
| ITEM NO. | DESCRIPTION | PART NO. |
| CHALLENGER SERIES II NEW BALL SCREW INDEX DRIVE | | |

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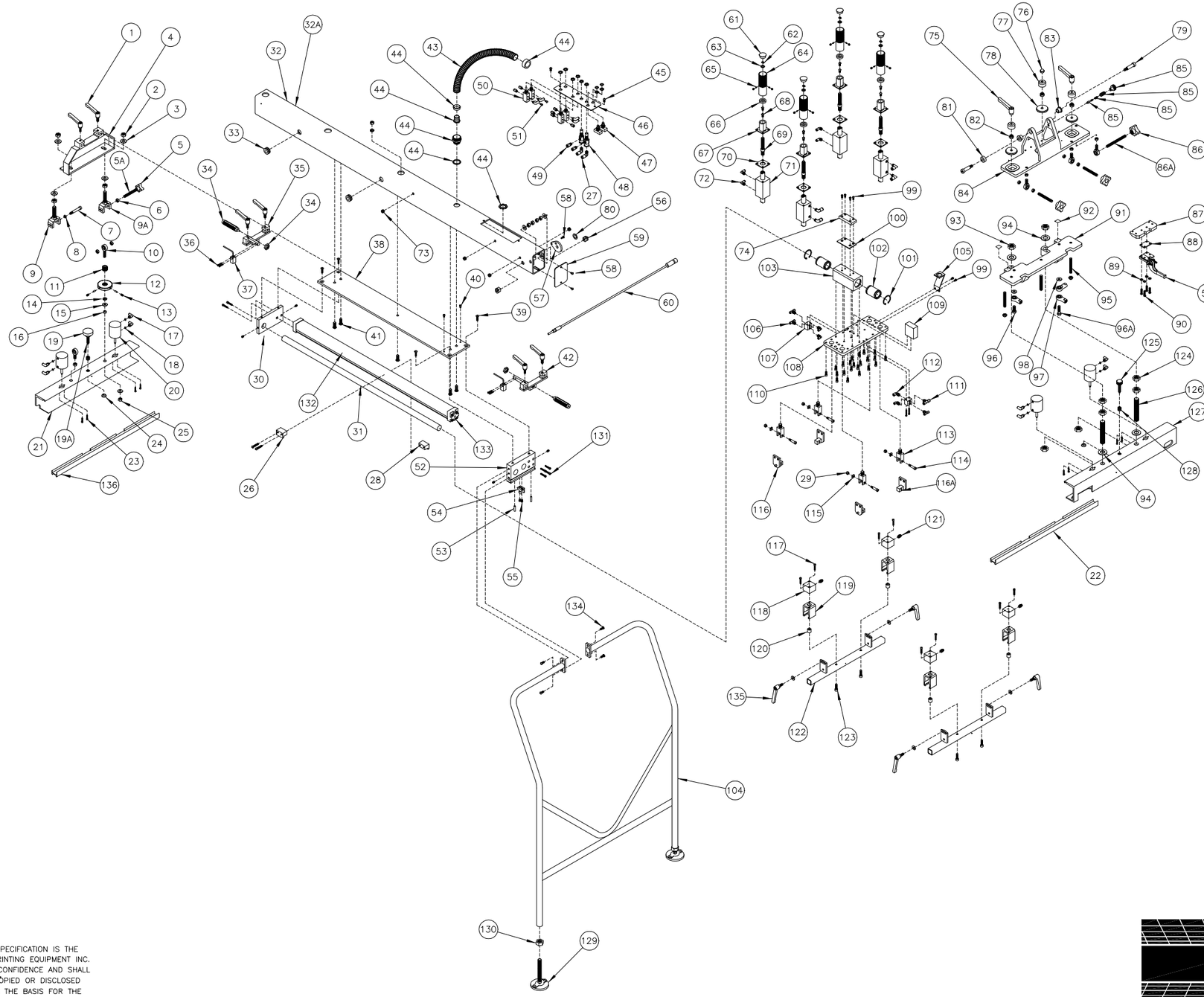
| 78 | SOCKET CAP SCREW 1/2"–13 X 3/4" | 3009200 |
| 77 | SOCKET CAP SCREW 1/4"–20 X 3/4" | 3009022 |
| 76 | CLEVIS LOCK | 9151006 |
| 75 | FIN. HEX NUT ZP 3/8"–16 | 3013007 |
| 74 | SPLIT LOCK WASHER ZP 3/8" | 3022002 |
| 73 | BOLT, FLAT WHIZ LOCK 3/8"–16 X 3/4" | 3003002 |
| 72 | WROUGHT FLAT WASHER ZP 3/8" | 3020010 |
| 71 | TAP BOLT 3/8"–16 X 4" | 3054019 |
| 70 | INDEXER SUPPORT | 9150438 |
| ITEM NO. | DESCRIPTION | PART NO. |
| CHALLENGER SERIES II NEW BALL SCREW INDEX DRIVE | | |

# Challenger

***Series II***



# Replacement Parts

## 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 |

# Replacement Parts

## 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 |

# Replacement Parts

## 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 Clamp | 9260992 |
| 120 | Air Lock Spacer .56" Lg. | 9260991 |
| 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 |

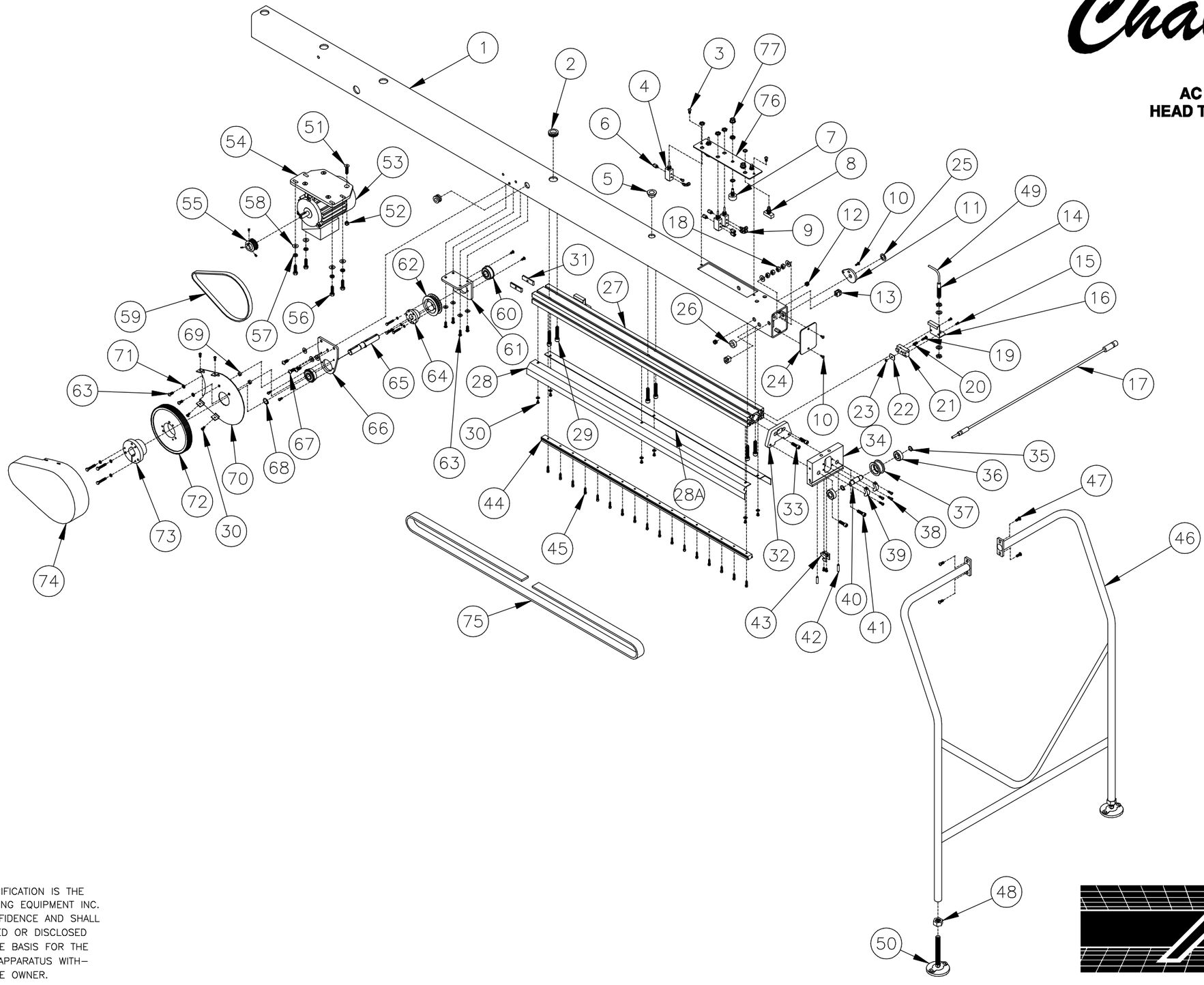
# Replacement Parts

## 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 |

# Challenger Series II

**AC PRINT HEAD**
**HEAD TUBE ASSEMBLY**



| 34 | FRONT END PLATE | 9150909 |
|---|---|---|
| 33 | SOCKET CAP SCREW 5/16"–18 X 3/4" | 3009005 |
| 32 | FRONT SPACER | 9150906 |
| 31 | REAR SCREEN HOLDER NUT | 9150944 |
| 30 | BUTTON SOCKET SCREW 10–24 X 1/4" | 3001021 |
| 29 | SOCKET CAP SCREW 3/8"–16 X 1 3/4" | 3009023 |
| 28A | HEAD COVER R.H. | 9150956 |
| 28 | HEAD COVER L.H. | 9150957 |
| 27 | SUPPORT BEAM | 9150904 |
| 26 | MICRO SHOULDER BOLT SPACER | 9150045 |
| 25 | FLAT NYLON WASHER 1/2" | 3020001 |
| 24 | PRINT HEAD FRONT COVER | 9150044 |
| 23 | HEX NUT ZP 10–24 | 3013019 |
| 22 | PROXIMITY SLIDE END PLATE | 9150926 |
| 21 | PROXIMITY SLIDE | 9150925 |
| 20 | SAFETY LOCK SPRING | 9051503 |
| 19 | BUTTON SOCKET CAP SCREW 10–24 X 3/4" | 3001002 |
| 18 | FIN. HEX JAM NUT ZP 3/8"–16 | 3013014 |
| 17 | SAFETY CORD | 8080160 |
| 16 | PROX. MOUNTING BRACKET | 9150927 |
| 15 | BUTTON SOCKET CAP SCREW 8–32 X 3/8" | 3001031 |
| 14 | PROXIMITY SWITCH, ROUND | 1010223 |
| 13 | STRAIN RELIEF BUSHING | 7006000 |
| 12 | GROMMET, RUBBER 5/16" I.D. | 7001101 |
| 11 | MICRO FLIP LOCK PLATE | 9150086 |
| 10 | BUTTON SOCKET CAP SCREW 10–24 X 1/2" | 3001013 |
| 9 | FITTING, MALE SWIVEL ELBOW 10–32 | 2003031 |
| 8 | SWITCH, PUSH BUTTON | 1010006 |
| 7 | POTENTIOMETER | 1029020 |
| 6 | FITTING, MALE CONNECTOR 10–32 NPT | 2003023 |
| 5 | CARRIAGE AIR CABLE BUSHING | 9151113 |
| 4 | AIR SWITCH, 4 WAY | 2018011 |
| 3 | BUTTON SOCKET CAP SCREW 1/4"–20 X 1/2" | 3001005 |
| 2 | GROMMET, RUBBER | 7001028 |
| 1 | HEAD TUBE | 9150929 |
| ITEM NO. | DESCRIPTION | PART NO. |

CHALLENGER SERIES II HEAD TUBE ASSEMBLY

| 69 | FRONT MICRO BUSHING | 9150145 |
|---|---|---|
| 68 | EXTERNAL RETAINING RING 3/4" | 3024038 |
| 67 | BUTTON SOCKET CAP SCREW 5/16"–18 X 3/4" | 3001046 |
| 66 | BEARING MOUNTING BRACKET – MOTOR SIDE | 9150919 |
| 65 | DRIVE SHAFT | 9150918 |
| 64 | BUSHING, 3/4" BORE | 3041010B |
| 63 | BUTTON SOCKET CAP SCREW 1/4"–20 X 5/8" | 3001010 |
| 62 | POLY CHAIN SPROCKET 25 TEETH | 3041175 |
| 61 | BEARING MOUNTING BRACKET | 9150920 |
| 60 | RADIAL BALL BEARING | 3023466 |
| 59 | BELT, 5mm PITCH 15mm WIDE | 3040261 |
| 58 | WROUGHT FLAT WASHER 5/16" ZP | 3020007 |
| 57 | SPLIT LOCK WASHER ZP 5/16" | 3022003 |
| 56 | HEX HEAD BOLT 5/16"–18 X 1" | 3008010 |
| 55 | MOTOR SPROCKET | 9150942 |
| 54 | MOTOR MOUNTING FLAT | 9150917 |
| 53 | A.C. MOTOR 1/2 HP. | 1008218 |
| 52 | ELASTIC STOP NUT ZP 5/16"–18 | 3012001 |
| 51 | FLAT SOCKET CAP SCREW 5/16"–18 X 1" | 3010014 |
| 50 | LEVELING FOOT VALVE GUIDE 5/8" | 3037001 |
| 49 | PROX. SWITCH ROUND CABLE | 1010224 |
| 48 | FIN. HEX NUT ZP 5/8"–11 | 3013016 |
| 47 | SOCKET CAP SCREW 1/4"–20 X 5/8" | 3009047 |
| 46 | HEAD SUPPORT FRAME | 9150085 |
| 45 | SOCKET CAP SCREW M5 X 16mm | 3009166 |
| 44 | LINEAR MOTION RAIL 1000mm | 3030087 |
| 43 | DE–STA–CO CLAMP | 3033087 |
| 42 | DOWEL PIN 1/4" X 1" | 3014001 |
| 41 | SOCKET CAP SCREW 5/16"–18 X 1" | 3009003 |
| 40 | IDLER ROLLER SHAFT | 9150908 |
| 39 | IDLER SHAFT CLAMP | 9150939 |
| 38 | SOCKET CAP SCREW 10–24 X 1/2" | 3009024 |
| 37 | IDLER ROLLER | 9150907 |
| 36 | BALL BEARING, BOSTON | 3023097 |
| 35 | EXTERNAL RETAINING RING 5/8" | 3024041 |
| ITEM NO. | DESCRIPTION | PART NO. |
| CHALLENGER SERIES II HEAD TUBE ASSEMBLY | | |

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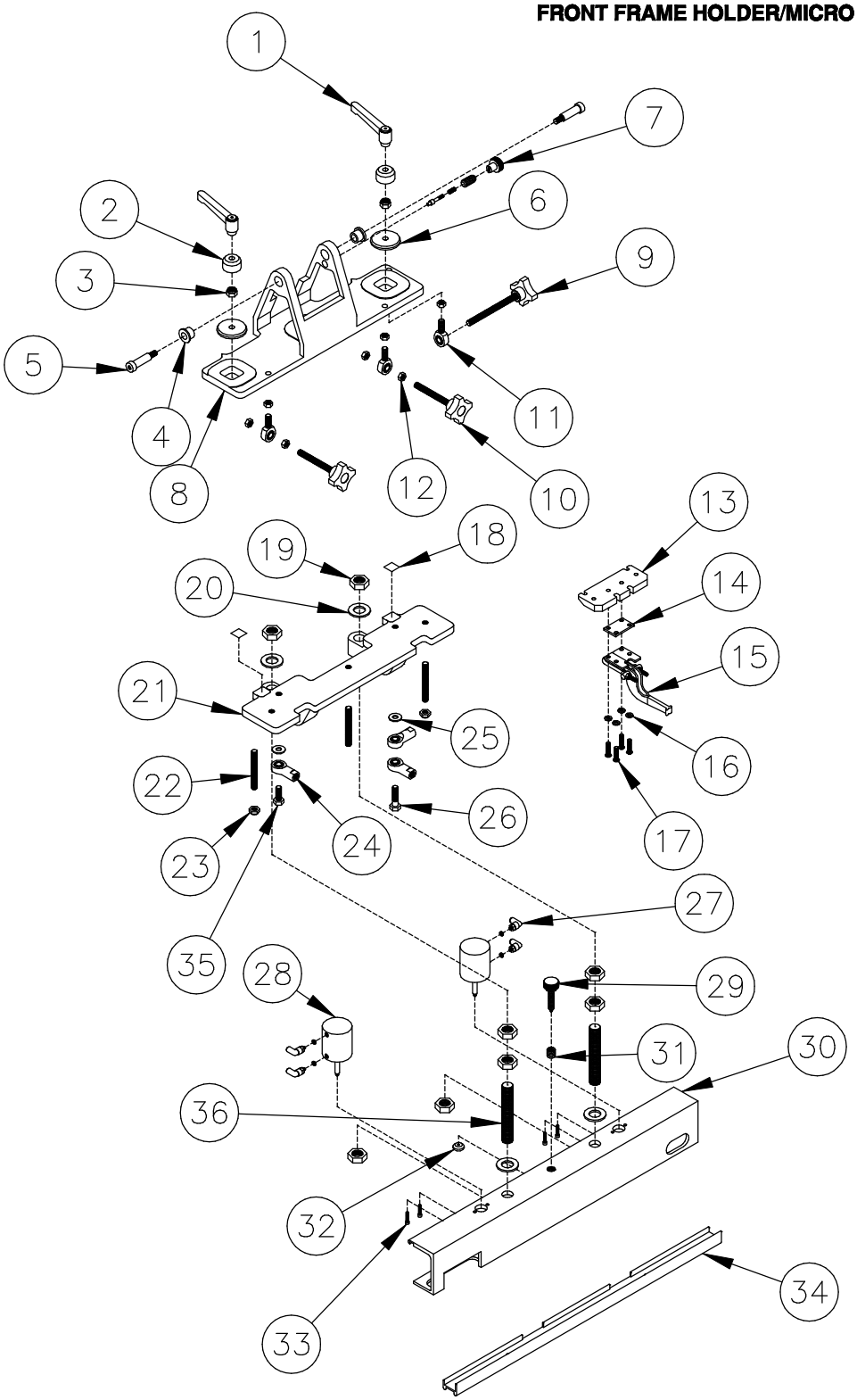
| 77 | KNOB | 3033006 |
| 76 | HEAD CONTROL PLATE | 9150928 |
| 75 | 8mm POLY CHAIN BELT 12mm WIDE 98.25" LG. | 3041184 |
| 74 | TRANSMISSION COVER | 9150932 |
| 73 | BUSHING 3/4" | 2004032 |
| 72 | HTD SPROCKET 5mm PITCH | 3041270A |
| 71 | SAE WASHER ZP 1/4" | 3021015 |
| 70 | TRANSMISSION COVER BASE | 9150930 |
| ITEM NO. | DESCRIPTION | PART NO. |

CHALLENGER SERIES II HEAD TUBE ASSEMBLY

# Challenger Series II

## AC PRINT HEAD
## FRONT FRAME HOLDER/MICRO ASSEMBLY

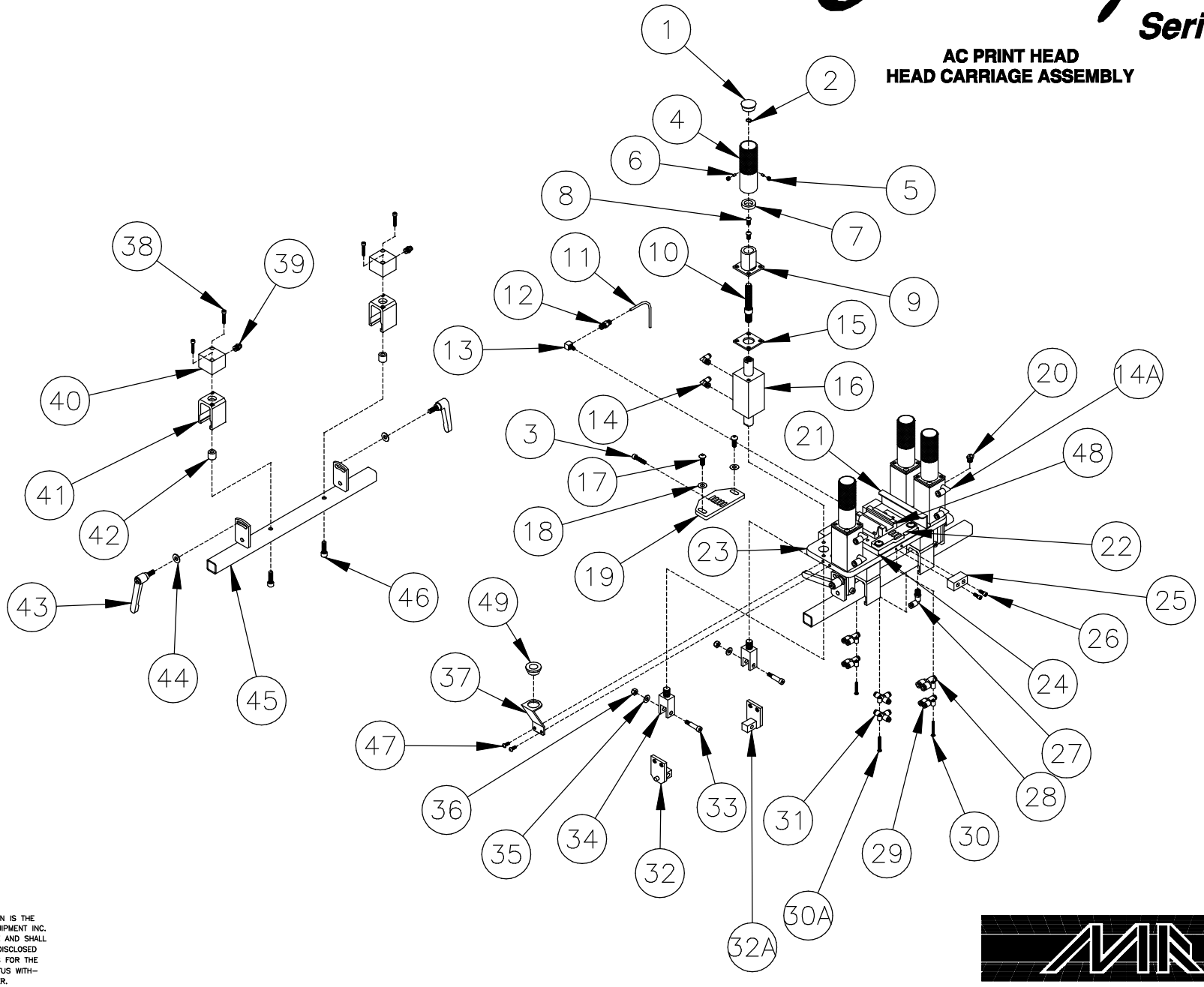


| 36 | THREADED ROD 3/4"–16 X 4.75" | 9150005–15 |
|---|---|---|
| 35 | HEX CAP SCREW 3/8"–24 X 1 1/4" | 3054031 |
| 34 | SCREEN FRAME LOCKING BAR | 9150095 |
| 33 | SOCKET CAP SCREW 8–32 X 3/4" | 3009032 |
| 32 | CUP WASHER | 8010005 |
| 31 | KEY LOCKING INSERT | 3013106 |
| 30 | FRONT AIR LOCK SCREEN HOLDER | 9150083 |
| 29 | FRONT SCREEN HOLDER KNOB | 9362098 |
| 28 | CYLINDER, AIR LOCK | 2009023 |
| 27 | FITTING, MALE ELBOW 1/8 NPT | 2003005 |
| 26 | HEX CAP SCREW 3/8"–24 X 1 3/4" | 3054032 |
| 25 | SAE WASHER 3/8" | 3021013 |
| 24 | FEMALE ROD END 3/8"–24 | 3034002 |
| 23 | ACORN HEX NUT 3/8"–16 | 3013139 |
| 22 | THREADED ROD PLAIN 3/8"–16 X 3" | 9150005–25 |
| 21 | BOTTOM MICRO CASTING | 9150064 |
| 20 | SAE WASHER 3/4" Z | 3021005 |
| 19 | FIN HEX JAM NUT 3/4"–16 | 3013031 |
| 18 | REGISTRATION GRID LABEL | 5020154 |
| 17 | BUTTON SOCKET CAP SCREW 1/4"–20 X 1" | 3001004 |
| 16 | SPLIT LOCK WASHER ZP 1/4" | 3022001 |
| 15 | DE–STA–CO CLAMP | 3033087 |
| 14 | LOCK CLAMP SPACER PLATE | 9150017 |
| 13 | MICRO POSITIONING PLATE | 9150014 |
| 12 | FIN HEX JAM NUT 3/8"–24 | 3013015 |
| 11 | MALE ROD END 3/8"–24 | 3034003 |
| 10 | MICRO X–Y ADJUSTING SCREW | 8090057 |
| 9 | MICRO SIDE ADJUSTING SCREW | 8090056 |
| 8 | TOP MICRO CASTING | 9150062 |
| 7 | RETRACTABLE SPRING PLUNGER | 3033090 |
| 6 | MICRO LOCK WASHER | 8080132 |
| 5 | SHOULDER BOLT 1/2" X 1 1/2" | 3006048 |
| 4 | FL BR BEAR 1/2" X 3/4" X 5/8" | 3023025 |
| 3 | ELASTIC STOP NUT ZP 3/8"–16 | 3012003 |
| 2 | TOP LOCK WASHER | 9150016 |
| 1 | KIPP ELISA FEMALE HANDLE | 3032001 |
| ITEM NO. | DESCRIPTION | PART NO. |

CHALLENGER SERIES II FRONT FRAME HOLDER/MICRO ASSEMBLY

# Challenger Series II

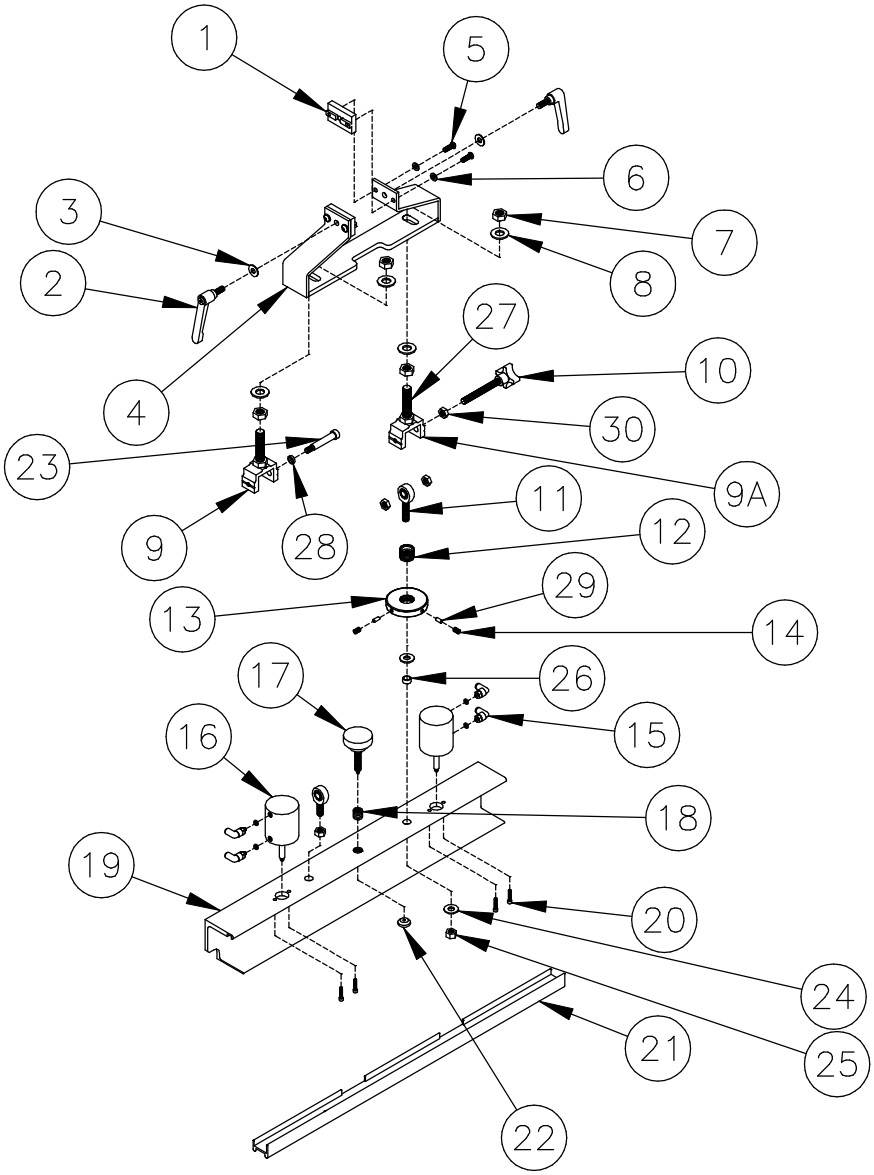
## AC PRINT HEAD
## HEAD CARRIAGE ASSEMBLY



| 49 | CARRIAGE AIR CABLE BUSHING | 9151113 |
|---|---|---|
| 48 | LINEAR CARRIAGE BEARING | 3030088 |
| 47 | BUTTON SOCKET CAP SCREW 10-24 X 1/2" | 3001013 |
| 46 | SOCKET CAP SCREW 5/16"-24 X 1" | 3009085 |
| 45 | SQUEEGEE MOUNTING BAR | 9362169 |
| 44 | WROUGHT FLAT WASHER ZP 5/16" | 3020007 |
| 43 | KIPP ELISA MALE HANDLE 5/16"-18 | 3032009 |
| 42 | AIR LOCK SPACER | 9151047 |
| 41 | SQUEEGEE/FLOOD BAR AIR CLAMP | 9151048 |
| 40 | CUSTOM SQUARE CYLINDER | 2009118 |
| 39 | FITTING, MALE CONNECTOR 5/32" TUBE | 2003142 |
| 38 | SOCKET CAP SCREW 10-32 X 1" | 3009082 |
| 37 | FLEXIBLE CABLE BRACKET | 9151111 |
| 36 | ELASTIC STOP NUT ZP 1/4"-20 | 3012000 |
| 35 | SAE WASHER ZP 1/4" | 3021015 |
| 34 | CYLINDER PIVOT BRACKET W/ROD | 8090145 |
| 33 | SHOULDER BOLT 5/16" X 1" | 3006014 |
| 32A | RIGHT HAND PIVOT SHAFT | 9362114 |
| 32 | LEFT HAND PIVOT SHAFT | 9362113 |
| 31 | FITTING, UNION TEE 5/32" TUBE | 2003021 |
| 30A | BUTTON SOCKET CAP SCREW 8-32 X 1" | 3001024 |
| 30 | BUTTON SOCKET CAP SCREW 8-32 X 1 1/4" | 3001071 |
| 29 | FITTING, Y CONNECTOR, 5/32" TUBE | 2003024 |
| 28 | FITTING, Y CONNECTOR, 1/4" TUBE | 2003086 |
| 27 | FITTING MALE SWIVEL ELBOW 1/8 NPT 5/32" TUBE | 2003004 |
| 26 | SOCKET CAP SCREW 10-24 X 5/8" | 3009045 |
| 25 | CARRIAGE STOP | 9150940 |
| 24 | BEARING SPACER | 9150903 |
| 23 | CARRIAGE PLATE | 9150902 |
| 22 | BELT, FRONT LOCK | 9150914 |
| 21 | PROXIMITY ACTIVATOR | 9150934 |
| 20 | FITTING, GREASE 1/8 NPT 45° | 2003032 |
| 19 | BELT TENSION LOCK | 9150911 |
| 18 | WROUGHT FLAT WASHER 5/16" ZP | 3020007 |
| 17 | BUTTON SOCKET CAP SCREW 5/16"-18 X 3/4" | 3001046 |
| 16 | CYLINDER, 1 1/4" BORE 1 1/2" STROKE | 2009299 |
| 15 | CARRIAGE AIR CABLE BUSHING | 9151113 |
| 14A | FITTING, MALE ELBOW 1/8 NPT 1/4" TUBE | 2003005 |
| 14 | FITTING, MALE ELBOW 1/8 NPT 5/32" TUBE | 2003017 |
| 13 | FITTING, ELBOW 1/8 NPT M6 X .75 | 2005104 |
| 12 | FITTING, MALE CONNECTOR 1/8 NPT 5/32" TUBE | 2003000 |
| 11 | TUBING, POLYURETHANE 5/32" | 2001077 |
| 10 | STROKE ADJUSTMENT SCREW | 9150037 |
| 9 | STROKE ADJUSTMENT GUIDE | 9150036 |
| 8 | BUTTON SOCKET CAP SCREW 1/4"-20 X 1/2" | 3001005 |
| 7 | STROKE ADJUSTMENT SPACER | 9150039 |
| 6 | TEFLON TFE ROD 3/16" | 7013052 |
| 5 | SOCKET SET SCREW 1/4"-20 X 3/16" | 3007012 |
| 4 | STROKE ADJUSTMENT KNOB | 9150035 |
| 3 | SOCKET CAP SCREW 1/4"-20 X 1 1/4" | 3009018 |
| 2 | EXTERNAL RETAINING RING | 3024019 |
| 1 | SNAP IN PLUG | 7025004 |
| ITEM NO. | DESCRIPTION | PART NO. |
| CHALLENGER SERIES II HEAD CARRIAGE ASSEMBLY | | |

# Challenger Series II

**AC PRINT HEAD**
**REAR FRAME HOLDER/MICRO ASSEMBLY**



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|---|---|---|
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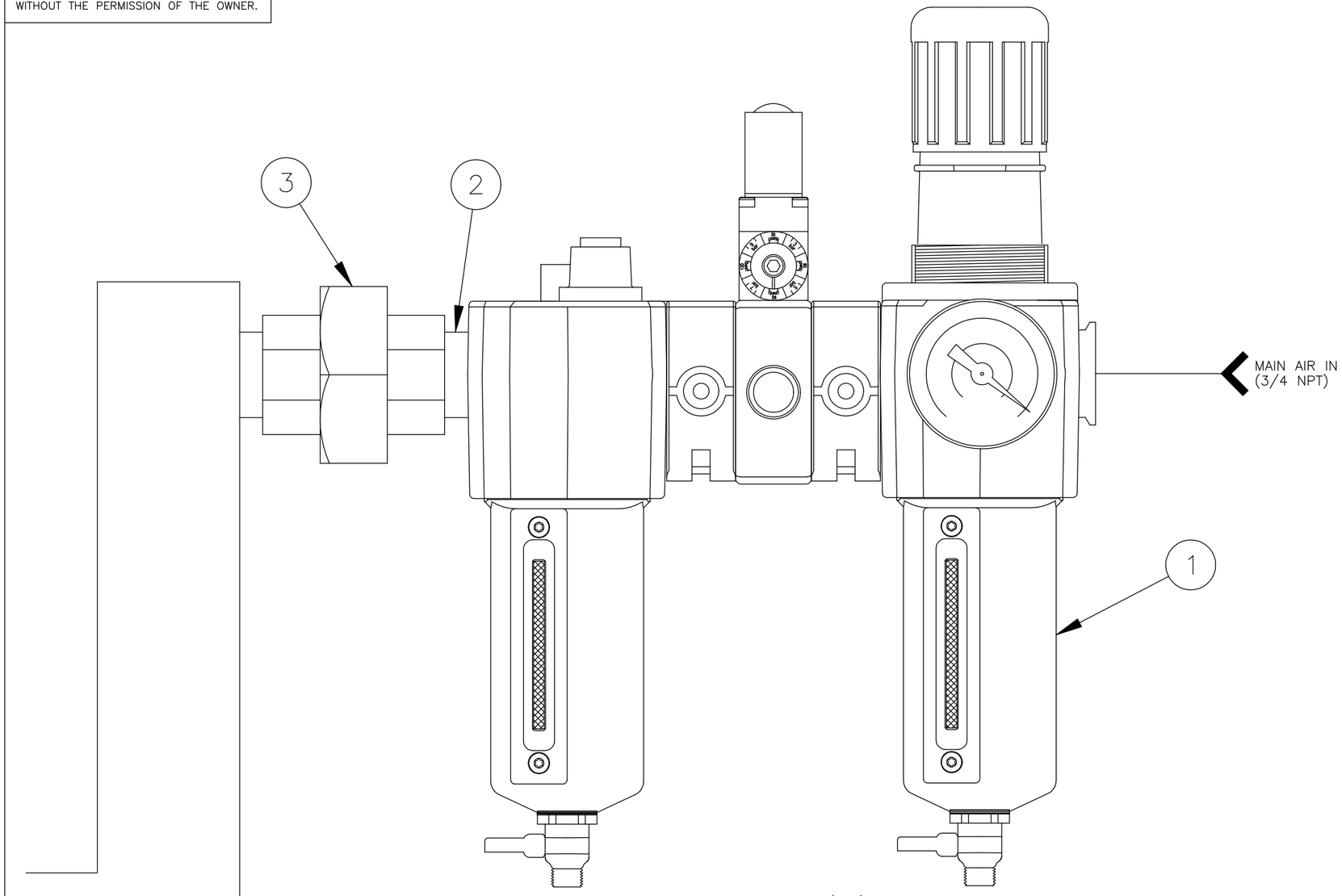
| | | |
| 30 | FIN HEX JAM NUT ZP 3/8"–16 | 3013014 |
| 29 | TEFLON TFE ROD ø3/16" | 7013052 |
| 28 | SHOULDER SCREW SPACER | 9362579 |
| 27 | 1/2"–20 THREADED ROD 3.5" LG. | 8050107 |
| 26 | REAR MICRO BUSHING | 9150101 |
| 25 | FIN HEX JAM NUT ZP 3/8"–24 | 3013015 |
| 24 | WROUGHT FLAT WASHER 3/8" ZP | 3020010 |
| 23 | SHOULDER BOLT 3/8' X 1 3/4" | 3006008 |
| 22 | CUP WASHER | 8010005 |
| 21 | SCREEN FRAME LOCKING BAR | 9150102 |
| 20 | SOCKET CAP SCREW 8/32 X 3/4" | 3009032 |
| 19 | REAR SCREEN HOLDER | 9150084 |
| 18 | KEYLOCKING INSERT | 3013106 |
| 17 | SCREEN HOLDER SCREW | 8010003 |
| 16 | CYLINDER, AIR LOCK | 2009023 |
| 15 | FITTING, MALE SWIVEL ELBOW 10–32 | 2003031 |
| 14 | SOCKET SET SCREW 1/4"–20 X 3/16" | 3007012 |
| 13 | REAR MICRO LOCK NUT | 9150082 |
| 12 | REAR MICRO LOCK BOLT | 9150081 |
| 11 | MALE ROD END 3/8"–24 | 3034003 |
| 10 | REAR MICRO SCREW ASSEMBLY | 8090143 |
| 9A | RIGHT REAR MICRO CLEVIS | 9362062 |
| 9 | LEFT REAR MICRO CLEVIS | 9362061 |
| 8 | WROUGHT FLAT WASHER 1/2" ZP | 3020004 |
| 7 | FIN HEX JAM NUT ZP 1/2"–20 | 3013023 |
| 6 | SPLIT LOCK WASHER ZP 1/4" | 3022001 |
| 5 | BUTTON SOCKET CAP SCREW 1/4"–20 X 5/8" | 3001010 |
| 4 | REAR SCREEN HOLDER | 9150945 |
| 3 | WROUGHT FLAT WASHER 5/16" ZP | 3020007 |
| 2 | KIPP ELISA MALE HANDLE 5/16"–18 | 3032045 |
| 1 | REAR SCREEN HOLDER GUIDE | 9150943 |
| | | |
| ITEM NO. | DESCRIPTION | PART NO. |
| CHALLENGER SERIES II REAR FRAME HOLDER/MICRO ASSEMBLY | | |




| NO. | DESCRIPTION | PART NO. |
|---|---|---|
| 3 | UNION, BLACK 3/4 NPT | 2013001 |
| 2 | NIPPLE, BLACK 3/4 CLOSE NPT | 2005019 |
| 1 | FILTER REGULATOR LUBRICATOR | 2020029 |

DESCRIPTION: PNEUMATIC LAYOUT
CHALLENGER SERIES II
MAIN REGULATOR

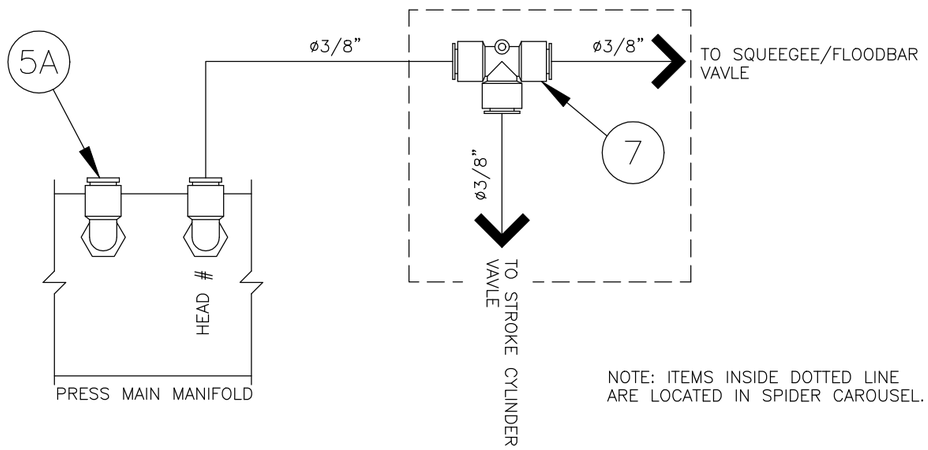
FILE NAME: CH2_P_MR.DWG

DRAWN BY: FJL | DATE: 9/14/00 | SHEET: 1 OF 9

NOTE: DRAWING NOT TO SCALE

M&R PRINTING EQUIPMENT, INC.
TECHNICAL SERVICES DEPARTMENT
1N. 372 MAIN STREET
GLEN ELLYN, ILLINOIS 60137


## PNEUMATIC HEAD




NOTE: ITEMS INSIDE DOTTED LINE ARE LOCATED IN SPIDER CAROUSEL.

NOTE: DRAWING NOT TO SCALE

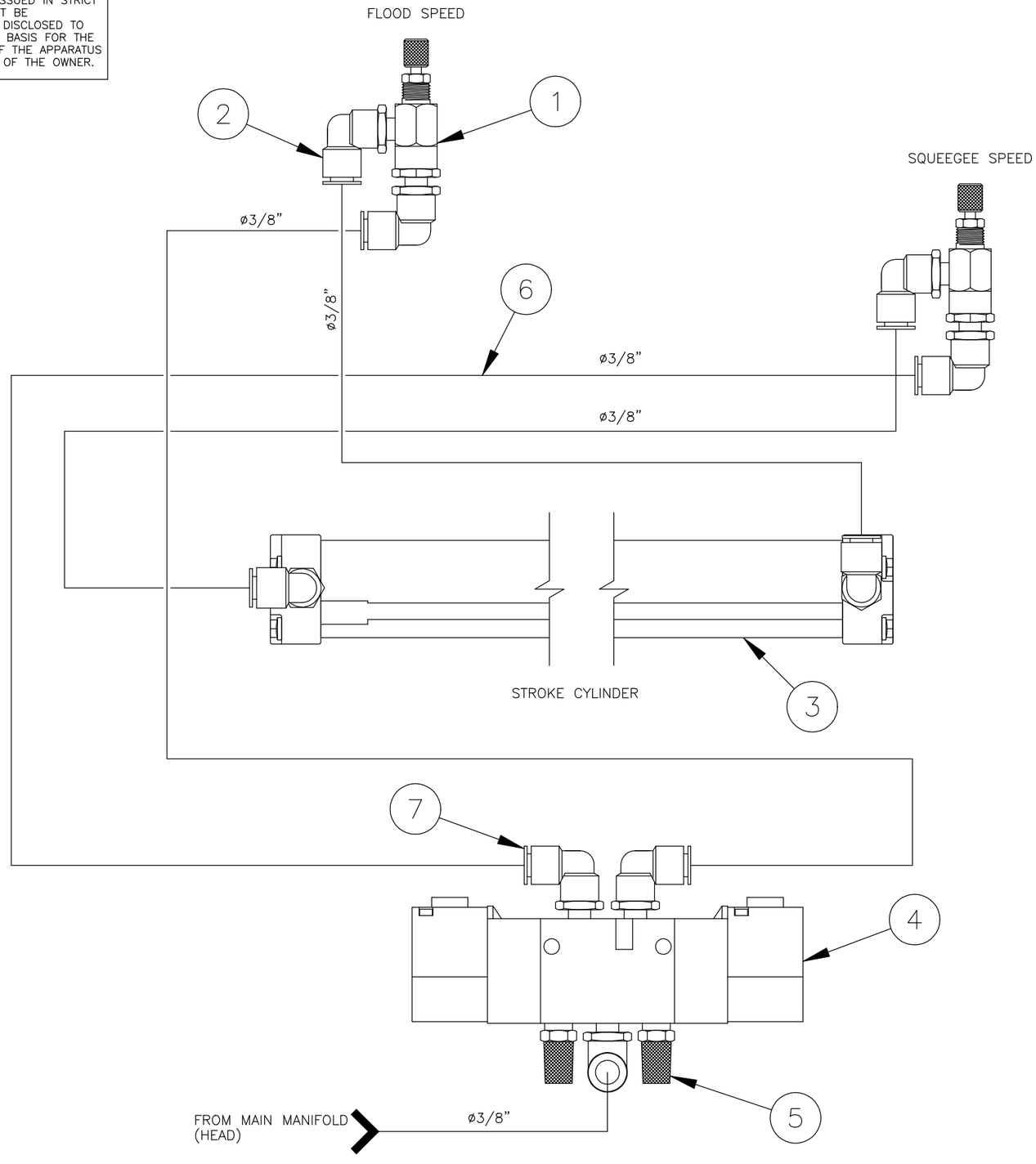
| NO. | DESCRIPTION | PART NO. |
|---|---|---|
| 7 | FITTING, UNION TEE ø3/8" TUBE | 2003036 |
| 6 | FITTING, 'Y" CONNECTOR ø1/4" TUBE | 2003086 |
| 5A | FITTING, MALE ELBOW 1/4 NPT ø3/8" TUBE (PNEUMATIC) | 2003013 |
| 5 | FITTING, MALE ELBOW 1/4 NPT ø1/4" TUBE (AC) | 2003014 |
| 4 | FITTING, MALE ELBOW 1/4 NPT ø3/8" TUBE | 2003013 |
| 3 | FITTING, MALE ELBOW 3/8 NPT ø1/2" TUBE | 2003008 |
| 2 | ELBOW, BRASS 1/4 NPT | 2002001 |
| 1 | REGULATOR W/GUAGE ASSEMBLY | 2019000 |

DESCRIPTION: PNEUMATIC LAYOUT
CHALLENGER SERIES II
MAIN MANIFOLD

FILE NAME: CH2_P_MMAN.DWG

DRAWN BY: FJL | DATE: 9/14/00 | SHEET: 2 OF 9

M&R PRINTING EQUIPMENT, INC.
TECHNICAL SERVICES DEPARTMENT
1N. 372 MAIN STREET
GLEN ELLYN, ILLINOIS 60137




NOTE: DRAWING NOT TO SCALE

| NO. | DESCRIPTION | PART NO. |
|---|---|---|
| 7 | FITTING, MALE ELBOW 1/4 NPT ø3/8" TUBE | 2003105 |
| 6 | TUBING, NYLON ø3/8" BLACK | 2001002 |
| 5 | MUFFLER, 1/4 NPT | 2014000 |
| 4 | DOUBLE SOLENOID VALVE | 2010034 |
| 3 | STROKE CYLINDER 1" BORE 31" STROKE | 2009303 |
| 2 | FITTING, MALE ELBOW 1/8 NPT ø3/8" TUBE | 2003146 |
| 1 | VALVE, FLOW CONTROL 1/8 NPT | 2018001 |

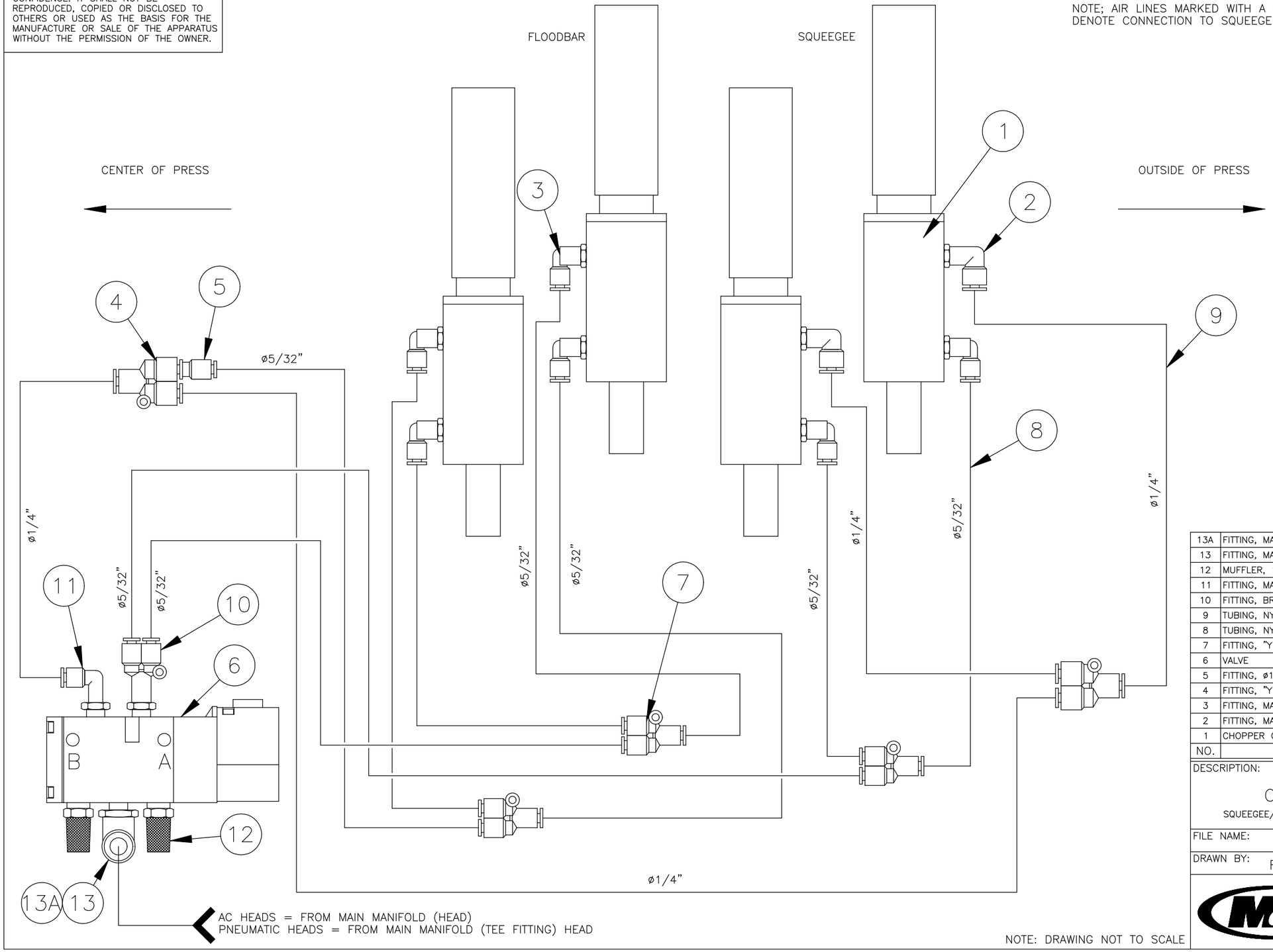
DESCRIPTION:
# PNEUMATIC LAYOUT
# CHALLENGER SERIES II
# STROKE CYLINDER (PNEUMATIC HEADS)

FILE NAME: CH2_P_SC.DWG

DRAWN BY: FJL | DATE: 9/14/00 | SHEET: 3 OF 9

M&R PRINTING EQUIPMENT, INC.
TECHNICAL SERVICES DEPARTMENT
1N. 372 MAIN STREET
GLEN ELLYN, ILLINOIS 60137

NOTE; AIR LINES MARKED WITH A YELLOW BAND DENOTE CONNECTION TO SQUEEGEE CYLINDERS.




NOTE: DRAWING NOT TO SCALE

| NO. | DESCRIPTION | PART NO. |
|---|---|---|
| 13A | FITTING, MALE ELBOW 1/4 NPT ø3/8" TUBE (PNEU) | 2003013 |
| 13 | FITTING, MALE ELBOW 1/4 NPT ø1/4" TUBE (A/C) | 2003014 |
| 12 | MUFFLER, 1/4 NPT | 2014000 |
| 11 | FITTING, MALE ELBOW 1/4 NPT ø1/4" TUBE | 2003014 |
| 10 | FITTING, BRANCH "Y" 1/4 NPT ø5/32" TUBE | 2003175 |
| 9 | TUBING, NYLON ø1/4" BLACK | 2001000 |
| 8 | TUBING, NYLON ø5/32" BLACK | 2001001 |
| 7 | FITTING, "Y" CONNECTOR ø5/32" TUBE | 2003024 |
| 6 | VALVE | 2010009 |
| 5 | FITTING, ø1/4" – ø5/32" REDUCER | 2003162 |
| 4 | FITTING, "Y" CONNECTOR ø1/4" TUBE | 2003086 |
| 3 | FITTING, MALE ELBOW 1/8 NPT ø5/32" TUBE | 2003004 |
| 2 | FITTING, MALE ELBOW 1/8 NPT ø1/4" TUBE | 2003005 |
| 1 | CHOPPER CYLINDER | 2009299 |

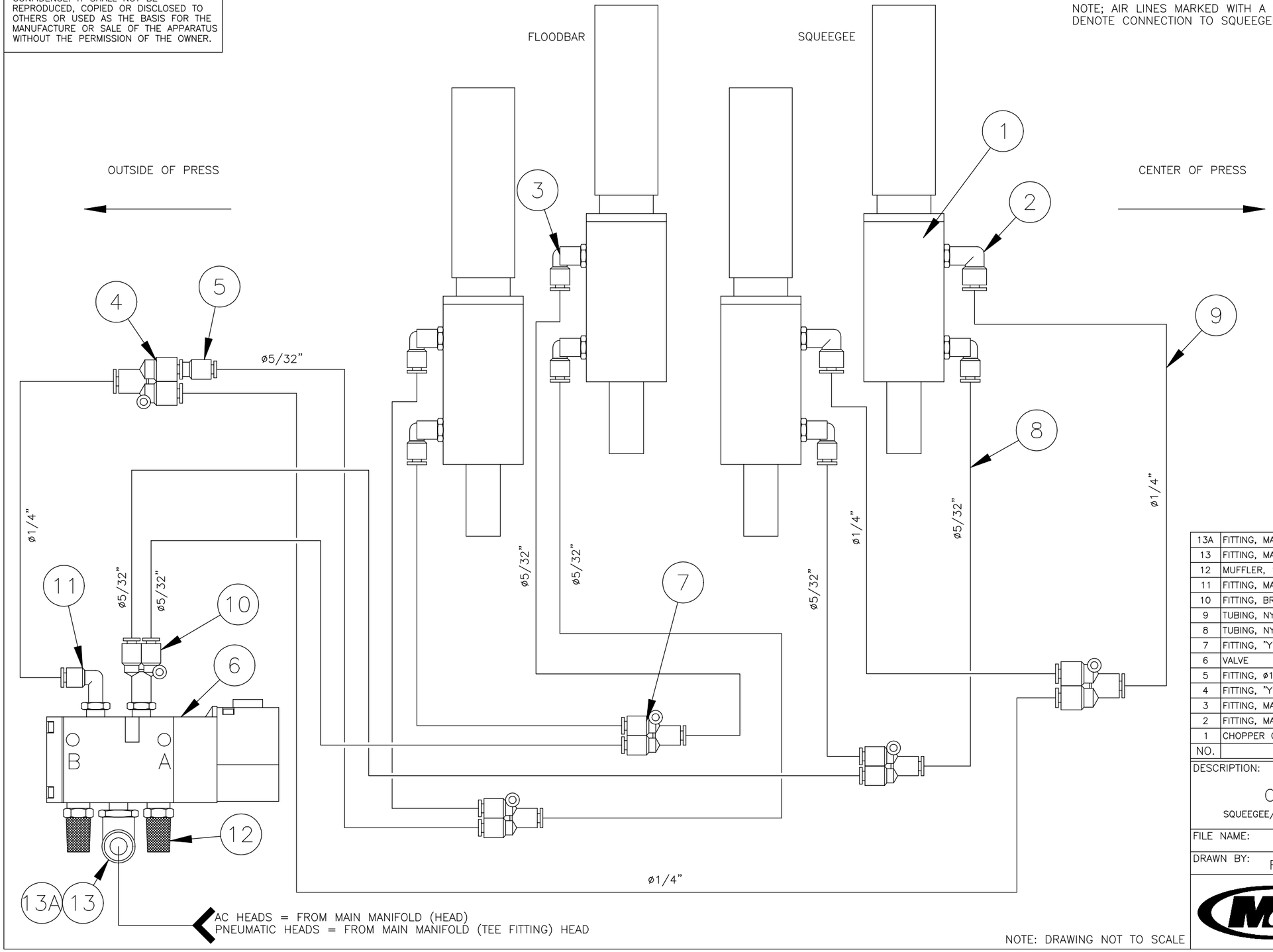
DESCRIPTION:
# PNEUMATIC LAYOUT
# CHALLENGER SERIES II
SQUEEGEE/FLOODBAR CYLINDERS (FLOOD OUT/SQUEEGEE IN)

FILE NAME: CH2_P_SQFBC

DRAWN BY: FJL | DATE: 9/14/00 | SHEET: 4 OF 9

M&R PRINTING EQUIPMENT, INC.
TECHNICAL SERVICES DEPARTMENT
1N. 372 MAIN STREET
GLEN ELLYN, ILLINOIS 60137

NOTE; AIR LINES MARKED WITH A YELLOW BAND DENOTE CONNECTION TO SQUEEGEE CYLINDERS.




AC HEADS = FROM MAIN MANIFOLD (HEAD)
PNEUMATIC HEADS = FROM MAIN MANIFOLD (TEE FITTING) HEAD

NOTE: DRAWING NOT TO SCALE

| NO. | DESCRIPTION | PART NO. |
|---|---|---|
| 13A | FITTING, MALE ELBOW 1/4 NPT ø3/8" TUBE (PNEU) | 2003013 |
| 13 | FITTING, MALE ELBOW 1/4 NPT ø1/4" TUBE (A/C) | 2003014 |
| 12 | MUFFLER, 1/4 NPT | 2014000 |
| 11 | FITTING, MALE ELBOW 1/4 NPT ø1/4" TUBE | 2003014 |
| 10 | FITTING, BRANCH "Y" 1/4 NPT ø5/32" TUBE | 2003175 |
| 9 | TUBING, NYLON ø1/4" BLACK | 2001000 |
| 8 | TUBING, NYLON ø5/32" BLACK | 2001001 |
| 7 | FITTING, "Y" CONNECTOR ø5/32" TUBE | 2003024 |
| 6 | VALVE | 2010009 |
| 5 | FITTING, ø1/4" – ø5/32" REDUCER | 2003162 |
| 4 | FITTING, "Y" CONNECTOR ø1/4" TUBE | 2003086 |
| 3 | FITTING, MALE ELBOW 1/8 NPT ø5/32" TUBE | 2003004 |
| 2 | FITTING, MALE ELBOW 1/8 NPT ø1/4" TUBE | 2003005 |
| 1 | CHOPPER CYLINDER | 2009299 |

DESCRIPTION:
# PNEUMATIC LAYOUT
# CHALLENGER SERIES II
SQUEEGEE/FLOODBAR CYLINDERS (FLOOD IN/SQUEEGEE OUT)

FILE NAME: CH2_P_SQFBC2.DWG

DRAWN BY: FJL | DATE: 9/14/00 | SHEET: 5 OF 9

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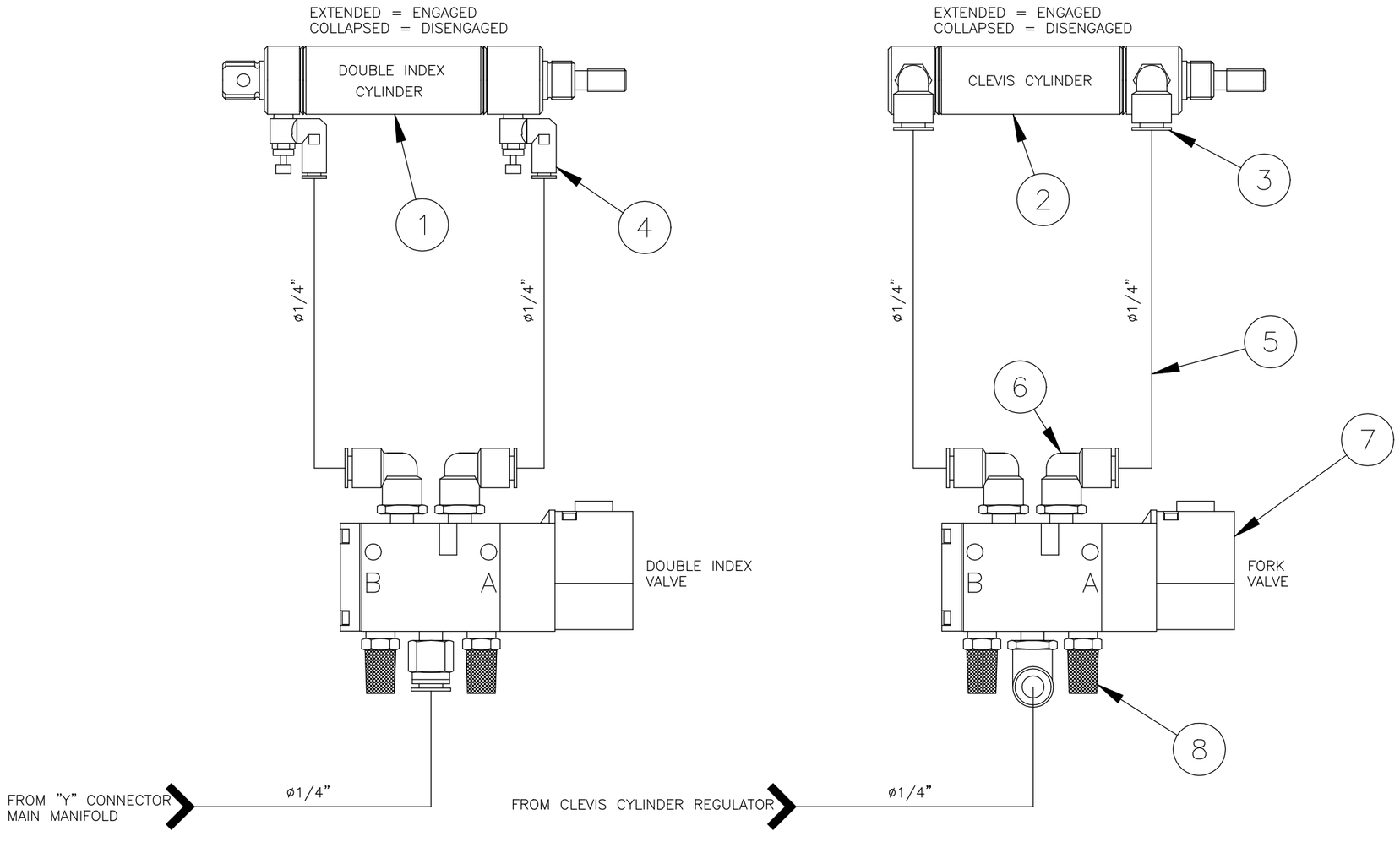


| NO. | DESCRIPTION | PART NO. |
|---|---|---|
| 8 | MUFFLER, 1/4 NPT | 2014000 |
| 7 | VALVE | 2010009 |
| 6 | FITTING, MALE ELBOW 1/4 NPT ø1/4" TUBE | 2003014 |
| 5 | TUBING, NYLON ø1/4" BLACK | 2001000 |
| 4 | FLOW CONTROL 1/4 | 2018079 |
| 3 | FITTING, MALE ELBOW 1/8 NPT ø1/4" TUBE | 2003005 |
| 2 | CYLINDER | 2009016 |
| 1 | CYLINDER | 2009031 |

DESCRIPTION: PNEUMATIC LAYOUT
CHALLENGER SERIES II
CAPTURE FORK CLEVIS/DOUBLE INDEX

FILE NAME: CH2_P_FCDI.DWG

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NOTE: DRAWING NOT TO SCALE

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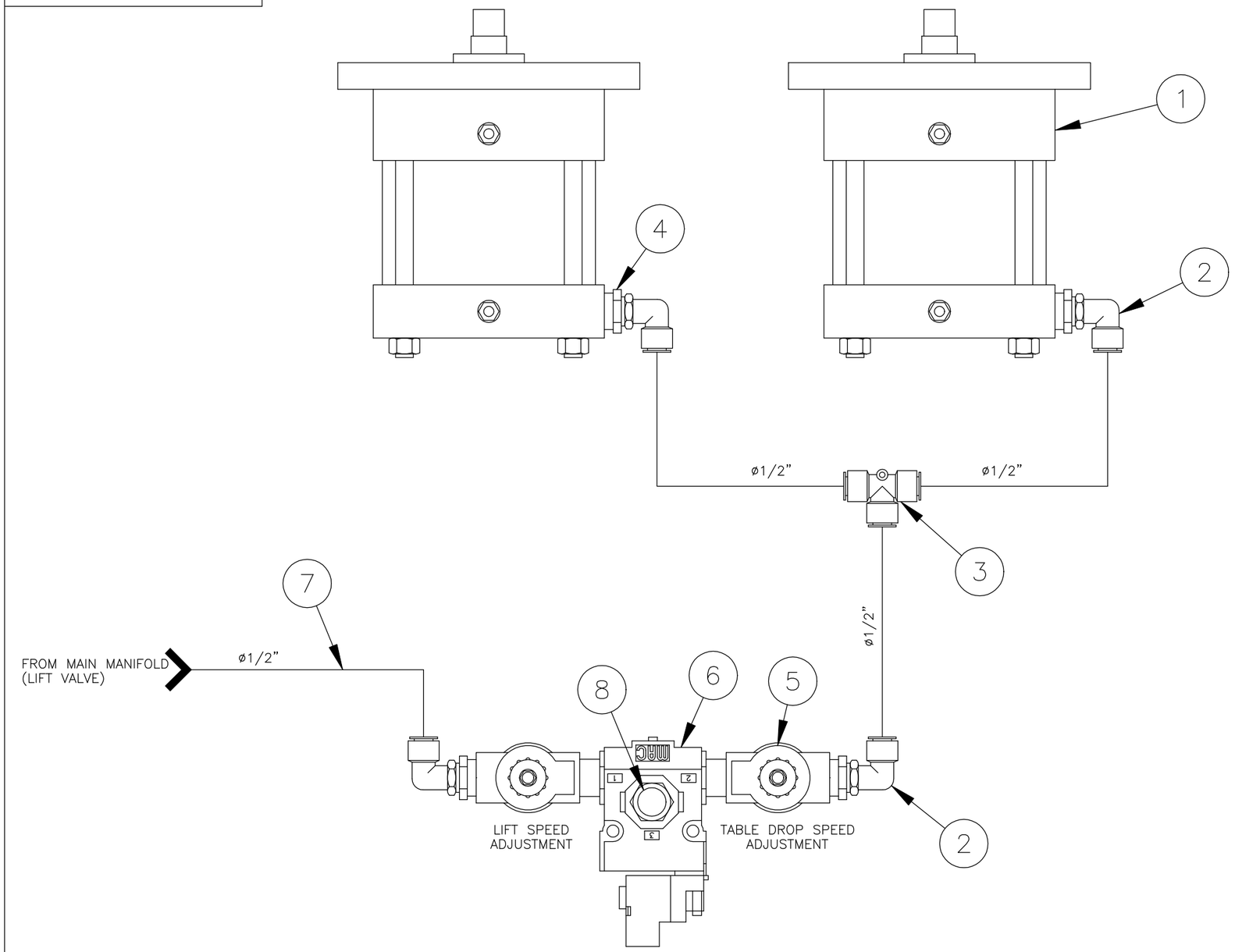


| NO. | DESCRIPTION | PART NO. |
|---|---|---|
| 8 | MUFFLER, 3/4 NPT | 2014008 |
| 7 | TUBING, NYLON ø1/2" | 2001003 |
| 6 | VALVE, 3–WAY NORMAL CLOSED | 2017145 |
| 5 | VALVE, FLOW CONTROL | 2018000 |
| 4 | REDUCING BUSHING 3/4 NPT – 1/2 NPT | 2004038 |
| 3 | FITTING, UNION TEE ø1/2" TUBE | 2003101 |
| 2 | FITTING, MALE ELBOW 1/2 NPT ø1/2" TUBE | 2003051 |
| 1 | LIFT CYLINDER | 2009302 |

DESCRIPTION: PNEUMATIC LAYOUT
CHALLENGER SERIES II
LIFT CYLINDER

FILE NAME: CH2_P_LC.DWG

DRAWN BY: FJL | DATE: 9/14/00 | SHEET: 7 OF 9

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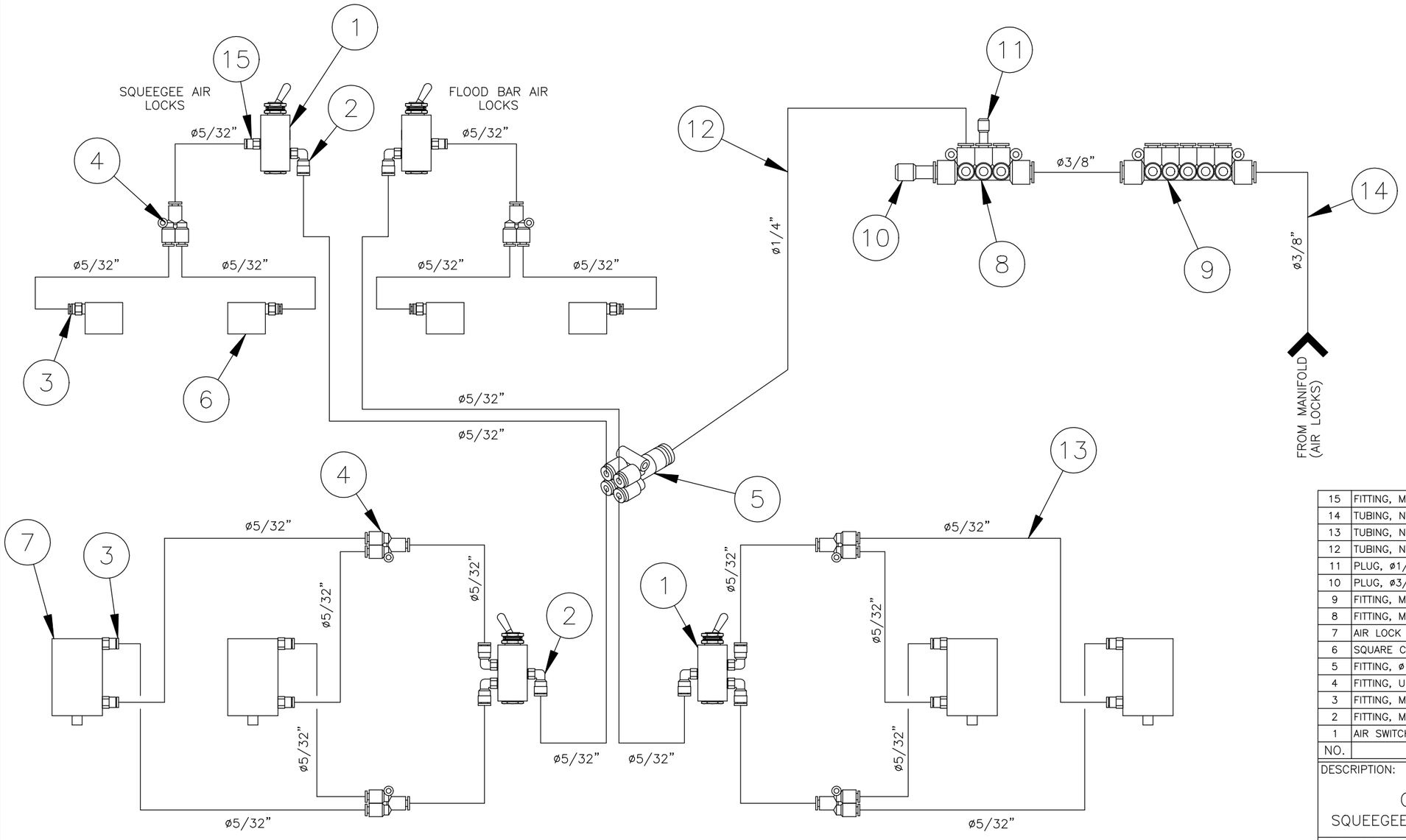


NOTE: DRAWING NOT TO SCALE

| NO. | DESCRIPTION | PART NO. |
|---|---|---|
| 15 | FITTING, MALE CONNECTOR 10–32 X ø5/32" TUBE | 2003023 |
| 14 | TUBING, NYLON ø3/8" BLACK | 2001002 |
| 13 | TUBING, NYLON ø5/32" BLACK | 2001001 |
| 12 | TUBING, NYLON ø1/4" RED | 2001080 |
| 11 | PLUG, ø1/4" | 2003027 |
| 10 | PLUG, ø3/8" | 2003042 |
| 9 | FITTING, MANIFOLD (10)ø1/4" (2)ø3/8" | 2003182 |
| 8 | FITTING, MANIFOLD (6)ø1/4" (2)ø3/8" | 2003161 |
| 7 | AIR LOCK CYLINDER | 2009023 |
| 6 | SQUARE CYLINDER | 2009118 |
| 5 | FITTING, ø1/4" IN, (4)ø5/32" OUT | 2003163 |
| 4 | FITTING, UNION TEE ø5/32" TUBE | 2003021 |
| 3 | FITTING, MALE CONNECTOR 1/8 NPT ø5/32" TUBE | 2003000 |
| 2 | FITTING, MALE ELBOW 10–32 X ø5/32" TUBE | 2003031 |
| 1 | AIR SWITCH 4–WAY 10–32 PORTS | 2018011 |

DESCRIPTION:
# PNEUMATIC LAYOUT
## CHALLENGER SERIES II
## SQUEEGEE/FLOODBAR LOCKS, SCREEN CLAMPS

FILE NAME: CH2_P_SFBL.DWG

DRAWN BY: FJL | DATE: 9/14/00 | SHEET: 8 OF 9

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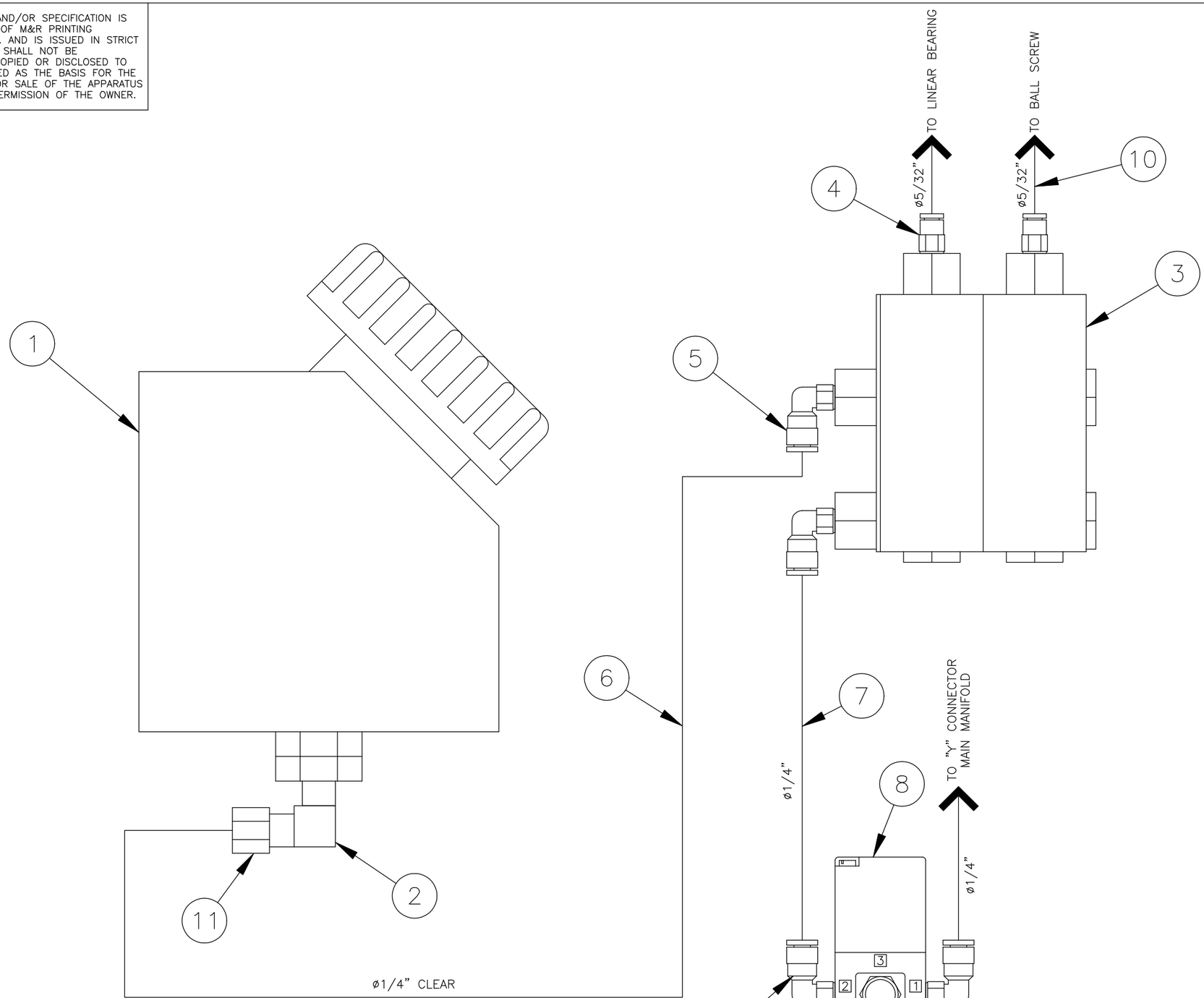


NOTE: DRAWING NOT TO SCALE

| NO. | DESCRIPTION | PART NO. |
|---|---|---|
| 9 | MUFFLER, 1/8 NPT | 2014002 |
| 8 | VALVE, 3-WAY NORMAL CLOSED | 2012050 |
| 7 | TUBING, NYLON ø1/4" BLACK | 2001000 |
| 6 | TUBING, POLYURETHANE CLEAR | 2001078 |
| 5 | FITTING, MALE ELBOW 1/8 NPT ø1/4" TUBE | 2003005 |
| 4 | FITTING, MALE CONNECTOR 1/8 NPT ø1/4" TUBE | 2003001 |
| 3 | AIR-TWO INJECTOR PUMP | 2007084 |
| 2 | ELBOW, BRASS 1/8-1/4 | 2002007 |
| 1 | RESERVOIR | 2007085 |

DESCRIPTION: PNEUMATIC LAYOUT
CHALLENGER SERIES II
AUTOMATIC OIL SYSTEM

FILE NAME: CH2_P_OS.DWG

DRAWN BY: FJL | DATE: 9/14/00 | SHEET: 9 OF 9

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# 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 adjust speed, height, distance and etc.

**adjustment knob -** A knob/handle provided with threads which is used to make changes to speed, height, distance etc.

**air dryer** - A device utilized to eliminate the moisture and condensate which is a by product of the act of compressing free air, also referred to as "Refrigerated Chiller".

**Allen Head Screw -** A machine screw with a head which requires an Allen Wrench for turning of the screw body. Allen head screws are used with or without a nut to mount or fasten two or more component assemblies together.

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

**art table pin bar** A flat metal strip with 3 machined dowel pins, which is located at the top of the art table, used to secure pre-punched plastic carrier sheets for the placement of film positives or art-work.

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

**butt-to-butt registration** The alignment of two or more colors in the printed image in such a manner which results in no overlapping of one color to another.

**cam follower** A roller type bearing with a threaded shaft, which will be used to secure the bearing to a mechanical assembly. Cam followers are used on the carousel table for locking of the carousel table during the printing cycle. Cam followers are also used on the index plate for rotation of the index table.

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

**carousel plate** The lower machined 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, such as print head carriage or index drive carriage assemblies.

**carrier sheet** A Piece of film or acetate that has been pre-punched with holes that correspond to the pins on the pin bar.

**chopper cylinder** The pneumatic double acting cylinders used to make the flood bar and squeegee raise or lower.

**compressor** The apparatus 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 specific operating temperatures.

**cross knobs** A knob/handle which has four points of leverage in the form of a cross.

**cure temperature** The temperature at which a liquid compound (ink) will change its chemical composition making it solid. (Plastisol Fusion)

**cycle sequences** A series of events or operations which must take place in a specific order to complete a work operation.

**digital temperature control** A device which uses electronic circuits to maintain a given temperature within a specific area.

**drain valve** A valve used to drain/release a substance out of a container.

**dwell timer** A 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 station (or print stations) will operate as a flash cure station.

**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) machined dowel pins used to secure pre-punched plastic carrier sheets for the placing of film positives or 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** A metal blade with a specific contour used to spread the ink across the image area in a 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 and support structure of the screen fabric or mesh.

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

**front/rear toggle switch** An electrical switch device used to determine if the print carriage will stop in the front or rear position of the print station at the completion of the print stroke operation.

**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 carriage will stop towards the outside of the machine.

**fuse holder** The device for securing a fuse in place in an electrical circuit, which will have provision for electrical connection to a circuit.

**head/print carriage** The assembly to which the flood bar and squeegee are mounted.

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

**improper screen tension** The absence of sufficient force used to produce elongation or extension of the screen fabric or mesh secured to a screen.

**inboard speed** The speed at which the print 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 consisting of printing pallets with supoort arms to which garments are placed.

**index cam follower** A roller type bearing employed in the index drive mechanisim.

**index delay** The interval of time that the machine will wait before initiation of the next operating or index cycle.

**index fork (clevis)** A machined metal "U" shaped fixture designed to engage 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 detects the location of the carousel by sensing the proximity of 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** A device which draws the attention of the Operator to a specific control area, alerting the Operator to the current condition of a control element.

**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 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** A machined cam milled in such a fashion as to lock two mechanical surfaces against one another when turned in a specific direction. Locking cams are used to secure printing pallets to the index support arm assemblies.

**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 compressed air encounters, located on the bottom of the machine.

**manufacturer's rating plate** The plate on which a manufacture will state the power requirements and serial and model numbers of 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, expressed in nanometers.

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

**micro registration** The incremental adjustment or placement of a screen.

**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 bottom of the screen fabric and the top surface of the substrate that is to be printed.

**off-contact lever** A mechanism designed to allow the adjustment of the off-contact of all screens at a single point.

**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. The LCD control panel provides this interface.

**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 print carriage moves from the center of the machine towards the outside.

**pallet** The flat surface on which the substrate is placed to be imprinted.

**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 dowel "Pins", manufactured under high tolerances so that there is zero play between the pins and the corresponding pre-punched acetate carrier sheet.

**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 equipment to repeat print location and alignment from color to color and pallet to pallet. Press registration is an extremely fine adjustment which sets the distance between the center of pallet arms to a tolerance of plus or minus .001".

**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 complete an electrical circuit by the presence of metal within a specific distance (proximity) from the sensor portion of the switch.

**push pin** A spring loaded pin.

**PV/SV key** The control element on the temperature controller that changes the temperature display indication, either PV (pre-set value) or SV (set value).

**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 printed image is reproduced on the substrate exactly as it appears on the original artwork.

**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** A cylindrical shaped control element internal to an air valve which incorporates fixed rubber "O" rings along its length designed to either block off, or open drilled air ports in the air valve body, depending on its position within the valve body.

**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 print 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. Sometimes referred to as “Butt Registration”.

**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 or vertically.

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

Neither are 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. Conveyor transport belts are subject to normal wear and tear. These belts may be replaced subject to M&R Printing Equipment, Inc. inspection. If replacement is deemed necessary by M&R, the belt will be replaced at no prorate during the first year and a graduated prorate during the second year of the warranty. 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.**
**6200 W. Howard Street**
**Niles, Illinois 60714-3400 U.S.A.**

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 which 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.

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