# Workhorse Products, LLC

## Operation & Maintenance Manual
## Falcon "E" Series Printing Machine

**Dear Valued Customer,**

Congratulations on your purchase of a Falcon™. We're sure your new machine will bring you many years of successful prints.

In order for you to gain the most from your new machine, it will be important for you and your employees to fully understand the operation of The Falcon™. The operation of the machine includes the setup, the actual printing and teardown process, and normal maintenance.

Please use this manual to familiarize yourself and your employees with the proper operation and maintenance of your Falcon™. If, for any reason, you have questions regarding the operation or maintenance of the machine, please contact us – we're always ready, willing, and able to assist you.

We appreciate the confidence you have shown in our product and wish you every success in its use.

Regards,

Workhorse Products
3730 E. Southern Ave
Phoenix, Az 85040

| **Contact Information:** | **Ship To:** | **Mail To:** |
|---|---|---|
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## Please record your Machine Model and Serial Number here.

**Model #** _____
**Serial #** _____

## Please record your Flash Model and Serial Numbers here

**Model #** _____
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# Operation & Maintenance Manual – Table of Content

# Operation of Machine

The Falcon™ incorporates modern electronic technology with sophisticated servo indexing and an extremely precise registration system. The Falcon™ also provides smooth and efficient operation with excellent print quality and unsurpassed functionality.

It is important that the operation and maintenance of your new machine follow the guidelines specified in this manual. The guidelines are specific to the intended function of the machine (textile screen printing); any use, other than the intended function, will void your warranty and may result in personal injury. Compliance with the operation, maintenance and safety guidelines of the machine will ensure years of trouble-free printing.

## Before You Begin

Throughout this manual, references will be made to features, functions, and controls used in the day-to-day operation of the machine. To assist you in better understanding these items, below is a display of the control panel. In addition, a complete glossary is available to you at the end of the manual - see Appendix A.


## Safety Guidelines

The Falcon™ has been designed to give years of reliable service. It is essential that operators be alerted to the safe operation of this machine, and the practices to avoid what could

lead to serious injury. The following safety guidelines are necessary for the safe installation, operation, and maintenance of the machine.

Workhorse Products has set forth all efforts to design and manufacture safe and dependable machines. However, it is impossible to predict all situations and circumstances that may cause dangerous conditions; therefore, Workhorse Products requires all operators and maintenance personnel use every means possible to ensure the safe operation of the machine; which will, in turn ensure the safety of the personnel.

Following are the fundamental safety guidelines:

Installation:

- Adequate power supplies (electrical and pneumatic) should be installed and connected by certified technicians
- The machine should be located in an area with sufficient room to operate
- The machine should be secured to the floor

Operation:

- The area around the machine should be maintained in a clean and obstacle free condition
- The Falcon™ should only be operated according to the specifications of the machine
- The operator should make a visual inspection of the machine before operating
- Safety devices should be inspected daily
- If the machine does not appear to be functioning properly, immediately stop the operation and attend to all issues/concerns
- The machine should NEVER be operated unless all safety precautions and devices are in place
- Maintain a safe distance from all moving parts
- Loose clothing should not be worn while operating the machine
- Operators should wear any/all safety equipment necessary to operate the machine
- Maintain proper settings and adjustments for operation of machine
- NEVER attempt to enter in to or crawl under the machine while it is in operation
- Clear the machine of all garments, ink, and potential hazards at the end of the day
- Maintain a copy of the Operation & Maintenance Manual within reasonable distance to the machine

Maintenance:

- Equipment modifications are not allowed without the written consent from Workhorse Products
- All power supplies should be turned off while performing machine maintenance
- Maintenance of all power supplies (electrical and pneumatic) should be performed by certified technicians
- Only qualified personnel should perform machine maintenance
- Maintenance questions/issues/concerns should be directed to Workhorse Products.

The machine operator is responsible for compliance with all safety guidelines set forth as well as the use of general industry safety precautions. Person and property damage claims are disqualified if they initiate for any one or more of the following reasons:

- Operators failure to follow safety guidelines
- Modifications made to the machine
- Modifications made to the machine's software
- Use of the machine for something other than its intended function
- Inappropriate installation, operation, and maintenance of the machine
- Failure to repair and/or replace defective or worn parts

# Main Control Panel Operation


| | | |
|---|---|---|
| 1 | Emergency Stop | Used to disable the machine in the event of an emergency. |
| 2 | Print / Set-UP | These buttons used to manually cycle print heads or to select print head for set-up when in that mode. |
| 3 | Print Head On/Off | These switches determine whether a head will print during automatic or manual cycling. |
| 4 | Manual / Auto | Determines if machines will automatically advance after each cycle or if it will require operator input. |
| 5 | Start | Starts and indexing sequence. |
| 6 | Stop | Stops indexing sequence. |
| 7 | Test | Used for printing each print head once – typically for printing a proof or sample. |
| 8 | Rotation Direction | Determines whether machine will index clockwise or counter-clockwise. |
| 9 | Free Index | Used to remove the mechanical connection between the wheel and the index mechanism. |
| 10 | Reset | Used at initial power up to home servo and after a home configuration change. |

## Getting Started

The main ON/OFF switch is located on the right side of the Main Control Panel Box. By flipping the switch up, you are placing the machine in the ON position. Once the machine has been turned on, the E300 interface LCD screen will illuminate and begin its boot sequence.

After the E300 has completed its boot sequence, the "Main Menu Screen" will be displayed and the red EMERGENCY STOP button is now illuminated.


## Initiating the Machine

Push the red EMERGENCY STOP button which will allow it to come out to disengage. The yellow RESET button should illuminate indicating the machine is ready to begin the "Homing Sequence".

**WARNING** – if the yellow RESET button does ***not*** illuminate after the EMERGENCY STOP button has been disengaged, one or more of the yellow SAFETY CABLES are disconnected. Reconnect cables where applicable.

Press the illuminated yellow RESET button (once the RESET button is pressed, the EMERGENCY STOP and RESET buttons are no longer illuminated). The "Servo-Indexer Mechanism" will perform its "Homing Sequence". Allow 10 – 15 seconds for the mechanism to complete the

sequence. Once in position, the INDEXER will engage the WHEEL by activating the INDEXER CAPTURE FORK.

**WARNING** – if the pallets are not in position, the "Position Pallets Screen" will be displayed.


Rotate the pallets until the BLUE LIGHT in the center of the machine is illuminated. The center BLUE LIGHT indicates the machine is ready for the INDEXER to engage the WHEEL.

The machine is now "Live" and fully activated! The Falcon™ is ready to perform an index sequence.

While "Live", it is extremely important that no persons or objects interfere with the machines operation. Every precaution should be taken to avoid personal injury or damage to the machine. It is imperative for you and your employees to understand the importance of safety and to follow the safety guidelines established in this manual.

## Print Station Buttons

The PRINT/SETUP buttons have a dual purpose. Their primary purpose is to manually cycle (PRINT) the selected Print Station and the secondary purpose is for the SETUP of the selected Print Station.

By pressing the PRINT/SETUP button, the selected Print Station will flood, the Wheel will raise, the Chopper will chop, the Print Station will print, and the Wheel will lower. This entire process is a complete manual cycle of the Print Station.

**NOTE**: In automatic mode pressing the PRINT/SETUP button will stop the machine's operation.

## Toggle Switches

The ON/OFF Toggle switches are used to turn On or Off the selected Print Station. These switches can be turned On or Off during production.

**NOTE**: Whether the Print Station is On or Off, a manual cycle can be performed by pressing the desired PRINT/SETUP button.

## Start and Stop

Press the green START button to begin cycling the machine.

Press the red STOP button to end the cycling of the machine.

**NOTE**: Pressing any one of the PRINT/SETUP buttons this will perform the same function as pressing the red STOP button.

## Print Start and Print Finish

By pressing the PRINT START key (located on the E300 operator interface panel), the green LED (above the key) will illuminate. Once the green LED is illuminated, press the green START button. The machine will then sequentially activate the Print Stations. Only those Print Stations that are in the ON position will be sequentially activated.

After sequentially activating all of the Print Stations (in the ON position) and once the first loaded pallet reached the unload position, the LED will go off and the machine will continue to operate all enabled Print Stations.

By pressing the PRINT FINISH key (located on the E300 operator interface panel), the red LED (above the key) will illuminate. Once the red LED is illuminated, the machine will sequentially deactivate the Print Stations until the last loaded pallet reaches the unload position. The red LED will go off and the machine will stop.

**NOTE**: The PRINT FINISH button can be pressed again (the red LED will go out) to reactivate the print process of the next pallet in the load position.

## Test Mode

When the TEST button is pressed, a solid green light will illuminate on the Operator Interface above the Test LED. Once the green START button is pressed, the solid green light will change to blinking (indicating the test is in process) and the machine will index the pallet from the load position until it reaches the unload position. This will activate each head in the ON position.

**NOTE**: Any/all Print Stations in the ON mode will print. However, if the Print Station is OFF, the station will not print, machine will lower the Wheel, and then advance to the next Print Station. This process will continue until the machine finds the next Print Station in the ON mode.

Test mode will continue it's process of indexing the pallet and raising the wheel until the STOP button is pressed. To continue the current Test mode, simply press the START button. To exit Test mode, press the TEST button twice.

## Auto or Manual Mode

When the selector switch is set to AUTO and the green START button is pressed, the indexing sequence will initiate. The indexing sequence includes: index, flood, wheel up, print, and wheel down. This indexing sequence will continue until the STOP button is pressed.

When the selector switch is set to MANUAL and the green START button is pressed, the FOOT PEDAL will initiate each indexing sequence. Each time the FOOT PEDAL is pressed, the machine will begin the indexing sequence. In order to continue the indexing sequence, the FOOT PEDAL needs to be pressed again. The indexing sequence will not continue unless the FOOT PEDAL is pressed.

## Rotation Right/Left

When the selector switch is set to ROTATION RIGHT, the machine will index in a counterclockwise direction.

When the selector switch is set to ROTATION LEFT, the machine will index in a clockwise direction.

**WARNING**: If the need arises to change the rotation of the machine change the selector switch, press the RESET button, and the machine will adjust the position of the servo mechanism accordingly.

## Free Index

Press the FREE INDEX button to disengage the Indexer from the Wheel. The Indexer will disengage from the Wheel by deactivating the "Indexer Capture Fork". Once the Indexer is disengaged, the blue FREE INDEX button will illuminate.

Free Index will allow the pallets to be manually indexed from "Print Station" to "Print Station".

In order to operate the machine, the "Indexer Capture Fork" must be engaged. To engage the Indexer Capture Fork rotate the pallets until the BLUE LIGHT in the center of the machine illuminates. Once the pallets are in position, press the blue FREE INDEX button to engage the Indexer to the Wheel, by activating the "Indexer Capture Fork".

The "Indexer Capture Fork" will **NOT** engage the "Wheel" if:

- ✓ One of the yellow SAFETY CABLES is disconnected
- ✓ The EMERGENCY STOP button is illuminated
- ✓ The BLUE LIGHT in the center of the machine is not illuminated

## Special Function - Machine Adjustment

There is a special function built into the machine's software to anticipate human error. Should the green START button be pressed, the machine will determine if adjustment to any of its mechanisms is required to begin cycling the machine. The "Machine Adjustment Needed" screen (on the E300 operator interface) will display:


Press the ENTER key (E300 operator interface) to accept the change. The machine will begin to adjust and the "Machine Adjustment in Process" screen will display:


Once the machine has completed the adjustment, the "Machine Adjustment Complete" screen will display. Press the ENTER button (E300 operator interface) to continue. The machine is now ready to begin normal printing.

**NOTE**: Once the machine has completed all its adjustments, it will be necessary for the operator to press the green START button to begin cycling the machine.

# E300 Operator Interface Control Functions


## Interface Keys

### *Cursor Keys*

There are four orange CURSOR keys available to move the cursor Up ↑, Down ↓, Right →, and Left ← on the LCD Screen.

### *Enter Key*

The ENTER key is used to accept changes within the E300 operator interface. The ↵ symbol on the interface represents the ENTER key.

### *PREV Key*

The PREV key is used to return to the Previous Screen on the operation interface.

### *MAIN Key*

The MAIN key is used to display the "Main Menu Screen" on the operator interface.


### *LIST Key*

The LIST key is located between the Up ↑ and Left ← keys and is used to display the "Alarm List Screen" on the operator interface.

### *✓ACK Key*

When the "Alarm List Screen" is displayed, the ✓ACK key located to the right of the list key is used to "Acknowledge" an alarm has occurred. When the ✓ACK key is pressed, the highlighted alarm is cleared and removed from the list. If the alarm has not been resolved, the alarm will remain in the "Alarm List Screen".

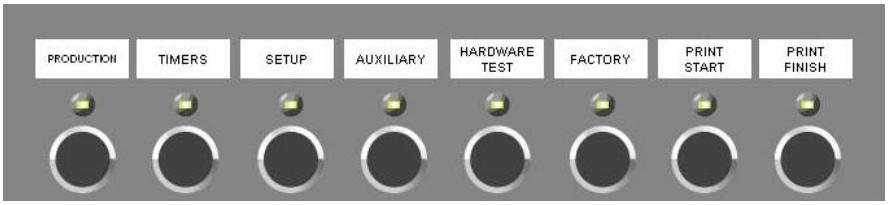
### *BACK Key*

The BACK key is used to delete characters left of the cursor. The ← symbol on the interface represents the BACK key. This key in only used when dealing with text on the main menu screen, it should not be used during the operation of the machine.

# E300 Operator Interface Function Keys

## Function Keys

There are eight function keys on the E300 panel. The first six – Production, Timers, Setup, Auxiliary, Hardware Test, and Factory control the "Primary Operation Menu Screens". The last two – Print START and Print FINISH were previously reviewed (see Print Start and Print Finish in the Main Control Panel Operation section).




### *Production*

By pressing the Production key, the LED above the button will illuminate green and the Production Screen will be displayed. The Production Screen is used to monitor the production of the machine.


Within this screen, the operator can:

- Define the quantity of the job (i.e. how many shirts do you want to print)
- Update the quantity of successful pieces for the specific job
- Change the option of pieces printed to pieces remaining (or vice versa), by placing the cursor on the word "Printed" (on the pieces printed line) and pressing the ENTER key. This will recalculate the number of pieces remaining for the specific job
- Reset the pieces per shift (print-o-meter) and reset the pieces per day (print-o-meter)

- View the production rate of the machine in dozens per hour
- View the total quantity of prints registered (print-odometer) on the machine to date
- View the Pallets in Process Screen by placing the cursor on the word "Shirts" (on the quantity for job line) and pressing the ENTER key

### *Timers*

By pressing the Timers key, the LED above the button will illuminate green and the Timers Screen will be displayed. The Timers Screen is used to define the time parameters set for the Flash Unit, which can be used during the machine operation.


Within this screen the operator can:

- Set Machine Delay (dwell after index)
- Set Flash Cure settings
  - Quartz
  - IR/Manual
- Set Manual/Pause Mode (disable foot pedal)
- Set Safety Mat (clear time) timers
- Set foot pedal safety timers

Depending on the type of flash unit (Quartz or IR) there are different sets of parameter definitions within the settings for the Flash Cure.

- The Quartz flash allows for the following parameters: pre-heat, global time, max time, cooled time, and quartz mode.
- The IR flash allows for the following parameters: global time and max time.

In addition, the "Flashes" submenu option allows the operator to view all the flashes currently connected to the machine and change flash times specific to their corresponding printhead.


## *Setup*

By pressing the Setup key, the LED above the button will illuminate green and the Setup Screen will be displayed. The Setup Screen is used to define the parameters required for the operation of the machine.

Within this screen the operator can:

- Define the Foot Pedal setup (skip shirt or pause)
- Define the Pallet Size (extra small, small, medium, large, extra large)
- Define the Safety Mat (disabled, enabled)
- Define Multiple Stroke (wheel position during flood (up/down), stroke will start/stop together)
- Define Factory Default Settings (reset the machine back to it's original factory settings)
- Define All Heads as One Stroke (resets all printheads to one stroke per head)
- Define the Flood/Flash (with index, after index, after table up)
- Define the Ink Type (plastisol or waterbase)
- Define the Print Direction (rear or front)
- Define the Double Index (every head, every other head)

By pressing one of the Printhead 'Print/Set up" buttons, the parameters for that specific head will be displayed


## *Auxiliary*

The Auxiliary button is not used currently. This function is reserved for future enhancements to the program.

## *Hardware Test*

By pressing the Hardware Test key, the LED above the button will illuminate green and the Hardware Test Screen will be displayed. The Hardware Test Screen is used to validate the functions of the machine.


The options available to the operator are:

- Sensor Test
- Panel Test
- Manual Test

Sensor Test:


This function indicates the sensors that are triggered throughout the machine. FWD SEN, REV SEN, and QRTZ PLUG (indicating the Forward (FWD), Reverse (REV), and Quartz Flash (QRTZ)) mark the sensors. The grid displayed within this function is based on the number of printheads on the machine; therefore, each printhead will show a FWD, REV, and QRTZ.

In addition to the sensors mentioned above there are several indicators for the Servo sensors as well. They are: Limit (both right and left), Low Air, Home, Servo In Position, Servo Ready, MCR1 X0, MCR2 X11, Low Lube, Wheel Sensors (Up/Down), Pin Disengaged, Safety Mat (X13, X14), and Safety Bars (Left/Right). The MCR1 X0 and MCR2 X11 are controlled by relays in the

base of the machine. They can be accessed by moving the cursor to the word 'NEXT' and pressing the 'ENTER' key.

Panel Test:


This function allows the operator to validate the Print, On/Off, Drive Fault, Manual, Auto, Stop, Start, Test, Left Rotation, Right Rotation, Free Index, Wheel Up/Down, Reset, and Foot Pedal functions. The operation of these functions (with the exception of the Drive Fault) is previously explained, in detail, in the Main Control Panel Operation section of this manual.

The Drive Fault function allows the operator to see what faults, if any, are present in the Inverter. When a fault occurs, the inverter cuts off its output and displays the fault status. The last 5 faults are stored with the operation status at the instance of the fault. A complete list of faults is available in Appendix C.

Manual Test:

This function allows the operator to Raise and Lower pallets, Engage or Disengage the Indexer, Energize or De-Energize the Lubricator, activate the Stroke, and activate the Chopper.

Raise and Lower pallets: the display indicates the current position of the pallet (Down/Up). The pallet position can be altered by pushing the ENTER button.

Engage or Disengage the Indexer: the display indicates the current position of the Indexer (Out/In). The Indexer position can be altered by pushing the ENTER button.

Energize or De-Energize the Lubricator: the display indicates the lubricator is Off. Once the ENTER key is pressed, the display will indicate On (for approximately one second) and will then immediately go back to the Off position.

Stroke: the display indicates the current position of the Stroke (Rear/Front). The Stroke position can be altered by pushing the ENTER button.

Chopper: the display indicates the current position of the Chopper (Flood/Squeegee). The Chopper position can be altered by pushing the ENTER button.

**WARNING**: The Indexer can be controlled/moved (left or right) by pressing ENTER on the Index Control function (this function is located at the bottom of the Warning message). Once ENTER is pressed, the option of Left and Right will appear, choose the direction you want to move the Indexer and press ENTER. To cancel out of the Indexer Control function press PREV.

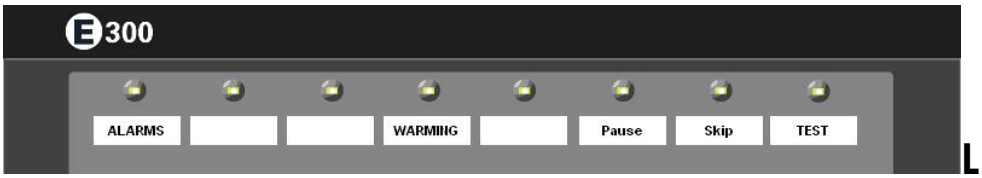
### *Factory*

By pressing the Factory key, the LED above the button will illuminate green and the Factory Screen will not be displayed without the correct password. The Factory Screen is used to define the operational settings of the machine.


**NOTE**: All functions within the Factory screen are password protected and should only be accessed by authorized service personnel or by direction of Workhorse Products.

Should assistance be required, please call Workhorse Products.

# E300 Operator Interface LEDs




## LEDs

The LEDs (light emitting diode) are the lights at the top of the Operator Interface.

### *Alarm*

When normal operation of the machine ceases, the Alarm light will blink red. This indicates some type of malfunction of the machine's standard operation. There are 46 different alarm notifications, each of which should be acknowledged/resolved without delay. A complete list of alarms is available at the end of the manual in Appendix B.

Follow the steps below to remove (acknowledge) an alarm:

1. Press the LIST Key on the Operator Interface (the list of triggered alarms will be displayed).
2. Using the Cursor Keys, scroll to the alarm you need to resolve.

3. Press the ✓ACK Key on the Operator Interface
   a. If the alarm condition has been resolved the alarm notification will be removed from the list of alarms and the list will be refreshed
   b. If the alarm condition has not been resolved the alarm notification will remain in the list of alarms
4. If the alarm condition remains, refer to the complete list of alarms in Appendix B to identify the source of the problem.
5. Once identified, resolve the cause of the alarm and repeat steps 1-3.

### *Warming Pallets*

Warming pallets mode will allow the machine to index, raise the pallets, and flash (based on the set time per flash) in order to increase or maintain the temperature of the pallets.

Upon completion of the Print Finish function, press the START button to enter the Warming Pallets mode. The LED will flash red, indicating you are in Warming Pallets mode.

To initiate printing, simply press the 'Print Start' button and printing will start on the next indexer cycle.


### *Pause*

The Pause light will illuminate with either a red or green light, depending on the defined setup (toggle or momentary) of the FOOT PEDAL. The FOOT PEDAL can be set to Toggle (red and green lights) or Momentary (no lights) mode.

*Pause – Toggle Mode*: allows the operator to control the indexing of the machine by pressing the FOOT PEDAL. If the FOOT PEDAL is pressed (once the machine stops) it will not index. Press the FOOT PEDAL again and the machine will continue to index.

*Pause – Momentary Mode*: allows the operator to control the indexing of the machine by pressing and releasing the FOOT PEDAL. If the FOOT PEDAL is pressed (once the machine

stops) and held it will not index. Once the FOOT PEDAL is released the machine will continue to index.

**NOTE**: The FOOT PEDAL setup is defined in the SETUP function key on the Operator Interface.

### *Skip*

The Skip light will illuminate with either a red or green light, depending on the defined setup of the FOOT PEDAL. The FOOT PEDAL can be set to either Toggle (red and green lights) or Momentary (no lights) mode.

*Skip – Toggle Mode*: allows the operator to control skipping a shirt by pressing the FOOT PEDAL. If the FOOT PEDAL is pressed the machine will skip pallets continuously until the FOOT PEDAL is pressed again. When pressed again, the next pallet will not be skipped.

*Skip – Momentary Mode*: allows the operator to control skipping a shirt by pressing the FOOT PEDAL. If the FOOT PEDAL is pressed and held, the machine will skip pallets continuously until the FOOT PEDAL is released. Once released, the machine will resume normal printing. If the FOOT PEDAL is pressed and released, the machine will skip one pallet and then resume normal printing.

**NOTE**: The FOOT PEDAL setup is defined in the SETUP function key on the Operator Interface.

### *Test*

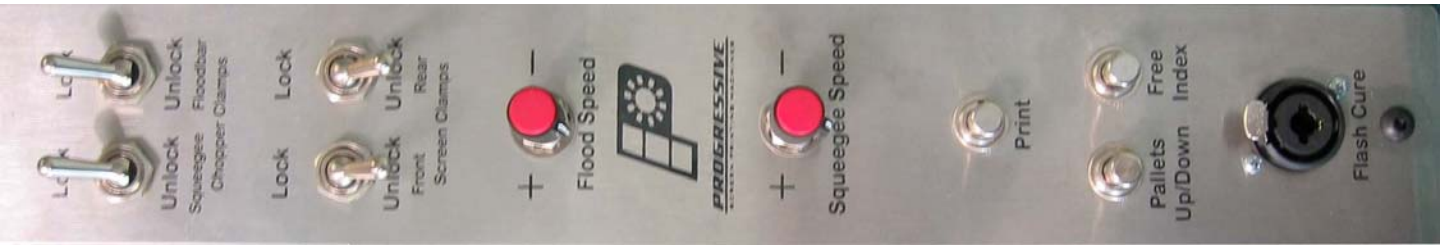
The Test LED will illuminate once the TEST button on the Control Panel is pressed (see Test Mode in the Main Control Panel Operation section).

A solid green light indicates test mode is on. A blinking green light indicates test mode is in process.

# Print Arm Control Functions

## Controls

There are several different types of buttons/switches/plugs on top of the printhead arm. They include – Chopper Clamps, Screen Clamps, Flood Speed, Squeegee Speed, Print, Pallets Up/Down, Free Index, and Flash Cure.




### *Chopper Clamps*

Chopper Clamps (which is an air clamp) locks the squeegee and floodbar in place.

### *Screen Clamps*

Screen Clamps (which is an air clamp) locks the screen in place.

### *Flood Speed*

Flood Speed controls the speed of the flood motion of the printhead.

### *Squeegee Speed*

Squeegee Speed controls the speed of the squeegee motion of the printhead.

### *Print*

Print is used to manually cycle the selected Print Station. In addition, it is used in the SETUP of the selected Print Station.

### *Pallets Up/Down*

Pallets Up/Down controls the up and down motion of the pallets.

### *Free Index*

Free Index controls the pallets by disengaging the Indexer from the Wheel, which will allow the pallets to manually index from print station to print station.

### *Flash Cure*

Flash cure receptacle is used to plug in the Flash Cure unit for operation with the machine.

# Quartz Flash Operation

## Wiring Main Power to Flash

While the wiring of the quartz flash is not complicated, Workhorse Products requires that you have a licensed electrician connect the incoming 3 Phase (or Single Phase) power to ensure proper connection.

1. L1, L2, L3 coming in should be connected as labeled in the control.
2. The ground wire would be connected to the ground terminal just above the main breaker.

## Installing The Flash

To ensure proper installation of your flash, follow the below steps. This procedure will ensure the installation of your flash does not damage the quartz bulbs.

1. Place the machine in a safe condition with the **pallets raised.**
2. Roll the flash up to the print station you are going to use and remove all interference (i.e. screen holder, print head, etc.).
3. Check to make sure there is enough clearance for the flash to roll in over the pallets. If there is not enough clearance, loose the kip levers on the side of the flash and turn the hand wheel on the top to adjust the height.
4. Once you have removed all interferences and adjusted the height, roll the flash into the print station.
5. Line the flash up over the pallet.
6. Using the hand wheel set the desired height of the flash in relation to the pallet. (This will vary based on flash time and material being flashed).
7. Tighten the kip levers.

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**WARNING**: If the pallets were not in the up position when the height was set, they may break the quartz bulbs when they rise.

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## Timer Parameters (Universal Flash Only)

Timer settings were properly set at the factory and should require no alteration. However, if the timer is not set accurately, follow these steps to establish the timer parameters.

1. The mode indicator for the timer is located on the bottom right corner. If the timer is not set for mode "D" you should change it using a small Phillips screwdriver on the bottom **right** corner. Ensure the mode is set to "D".

2. The duration setting should be 0 – 10 seconds. Just below the center of the dial is a small box that shows the duration increments. It should be set to **seconds**. Additionally, there are 6 small white windows in the face. They should read 0, 2, 4, 6, 8, and 10. If either of the timer parameters is wrong, change them to reflect the proper setting by turning the small Phillips screw on the bottom **left** of the face.
3. To set the time for the flash, simply rotate the outer clear plastic cover which, in turn, moves the red pointer.
4. The "zone" switches on the front of the control are simple on/off switches for the various zones. The switch all the way to the left (small zone) controls the first 3 bulbs, the second switch (medium zone) controls the next 3 bulbs, and the switch on the right (large zone) controls the three bulbs closest to the center of the machine.

If you are printing a large zone you will need to have all three switches turned on.

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**NOTE:** Single Phase flashes will only have two zone switches. Once for the first four bulbs and one for the last four bulbs.

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# Maintenance/Troubleshooting

## Maintenance

Your Falcon was designed for minimal maintenance; however, there are a few specific areas of maintenance that should be accomplished to ensure longer life. In general, keeping your machine clean and free from spray adhesive and lint will aid in the preservation of the machine.

## Print Head Maintenance

The chopper assembly on each print head rides on, and is supported by, a linear rail and bearing. There is a grease fitting on the front of each linear bearing. These bearings should receive one pump from a grease gun monthly. You should also take that time to perform a visual inspection of all components on the assembly and make sure there is no foreign substance build up on the linear rail.

## Shaft / Wheel Maintenance

The table/wheel on your Falcon is equipped with a grease fitting that is connected to both the upper and lower bushings. These bushings should be packed with grease weekly to ensure proper lubrication of the bushings.

The lift cylinders that raise the table on your machine do so by pushing upward on the bottom of the table. The area that they come in contact with should be visually inspected while performing the shaft maintenance. Addtionally, the lower portion of the table where the lift cylinders come in contact should be coated with a thin layer of grease.

## Servo Mechanism Maintenance

The servo indexing mechanism on your Falcon is equipped with a pressurized oiling system. The oil level in the reservoir should be checked periodically to ensure it does not run low. In the event the machine runs out of oil, and alarm code will be displayed on the Main Control Panel and the machine will not run. The proper oil for your machine is listed on the label that is affixed to the reservoir.

Depending on the size of your Falcon, you will either have linear bearings on the assembly, or shafts with bushings. Linear bearings will have grease fittings that should be greased weekly. If your machine is equipped with Thompson shafts, you should coat the exposed portion of the shafts with grease weekly.

## Maintenance Record

| Date | Shaft | Wheel bottom | Indexer Rails | PH Linear Rails | | Date | Shaft | Wheel bottom | Indexer Rails | PH Linear Rails |
|---|---|---|---|---|---|---|---|---|---|---|
| Ship Date | √ | √ | √ | √ | | | | | | |
| | | | | | | | | | | |
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## Troubleshooting

Your Falcon is equipped with Graphical Diagnostic capabilities. In the event you experience a problem with the machine, our technicians will work with you to determine the faulty component/s through the use of those tools. The diagnostics were described in 'Hardware Test' section.

Listed below are some common faults and their remedies.

| | |
|---|---|
| Printhead rests in a flooded position | ***Check type of Ink in Print Head set-up*** |
| Flash does not cycle off | Check flash setting is 'normal' in the timers menu. |
| Yellow 'Reset' light does not come on at start up of machine | Yellow safety cable is unplugged. |
| Flash time is set but Flash only blinks on then off again | Raise 'Max. Time' under timers menu. |
| Print head does not flood during index | Set to 'Flood w/ Index' in PH set-up screen |
| Pallets are getting to hot | Turn off 'Flash with Index' in PH set-up screen |
| Print Head wont move even if "on" | Check PH set up and turn off 'Flash' for that head |
| Machine wont index and times out | Turn off Safety Mat in Main Set-Up Menu |
| Table raises but heads will not print | Check Table up Sensor |
| Blue light will not come on | Check Down & In Synch sensor |

# Appendix A – Glossary

| | |
|---|---|
| Blue Block | Air/Oil mixing valve for indexer lubrication. |
| Blue Light | Light on top of machine that illuminates when capture fork may be engaged. |
| Capture Fork | The U shaped device that connects the Table/Wheel to the Indexer. |
| Chopper | Assembly that contains the squeegee/floodbar cylinders. |
| Flash Continuous | Timer mode where the quartz flash bulbs come on at 'start' and off on 'stop'. |
| Flash Normal | A timer mode where the bulbs cycle on and off based on operator time settings. |
| Free Index | When Servo mechanism capture fork is disengaged allowing manual rotation. |
| Homing Sequence | Automatic motion for properly aligning the servo-mechanism. |
| Indexer | See Servo Mechanism |
| Inverter | Electronic Device that controls printhead motor speed. Has red numbers displayed |
| LED | Small Lights located on Main Control Panel (Light Emit. Diodes). |
| Lubricator/Oiler | Component that contains pump and oil reservoir for the indexer. |
| Manual Flash | A set up option to alert the machine to the use of a manual IR flash. |
| Pause Mode | A temporary pause to automatic indexing by use of the foot pedal |
| Print to Front | Machine will flood inward and print outward. |
| Print to Rear | Machine will flood outward and print inward. |
| Servo Mechanism | Electro-mechanical assembly that creates the rotation of the table/wheel. |
| Skip Mode | A skip shirt function initiated by use of the foot pedal |
| Table | The portion of the machine that rotates and lifts. |
| Toggle Switches | Switches used to turn on/off desired print heads. |
| Waterbase Mode | Print head will go to a flooded condition if machine is stopped. |
| Wheel | Same as Table. |

# Appendix B - Alarm List

| Alarm | Description | Possible Resolution |
|---|---|---|
| E-STOP | The E-STOP button is engaged | Disengage the E-Stop button |
| SERVO ON LIMIT SENSOR | The Servo has reached the limit of its travel | Technical assistance required, please contact Progressive Machine, Inc. |
| YELLOW SAETY CABLE | Safety cable is not connected | Reconnect Safety cable |
| SERVO FAULT | The Servo amplifier has determined that conditions of operation are not acceptable | Open electrical panel to determine fault code on the servo amplifier |
| WHEEL DOWN & IN-SYNC SENSOR | Machine could not see the sensor indicating the Wheel was down and in-sync | Validate Sensor Test through Hardware Test function |
| INDEX TIMED OUT | Index function did not complete in allotted time | Test the Index Control function within the Hardware Test |
| LEFT SAFETY BAR | The left safety bar has been triggered, ceasing operation of the machine | Reposition left safety bar |
| RIGHT SAFETY BAR | The right safety bar has been triggered, ceasing operation of the machine | Reposition right safety bar |
| WHEEL UP SENSOR | Machine could not see the sensor indicating the Wheel was up | Validate Sensor Test through Hardware Test function |
| PRINTHEAD 1 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 2 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 3 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 4 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 5 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test |

| Alarm | Description | Possible Resolution |
|---|---|---|
| | | function |
| PRINTHEAD 6 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 7 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 8 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 9 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 10 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 11 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 12 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 13 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 14 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 15 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |
| PRINTHEAD 16 SENSOR TIMED OUT | Printhead function did not complete in allotted time | Validate the forward and reverse stroke of the printhead through the Hardware Test function |

| Alarm | Description | Possible Resolution |
|---|---|---|
| LOW LUBE OIL | The amount of lubrication in the oil tank has fallen below the required level | Refill the oil tank to ensure proper lubrication |
| LOW AIR SUPPLY | The air supply pressure is low | Adjust air supply pressure |
| AIR PRESSURE RETURNED – ✓ACK TO CLEAR | Sufficient air supply has been returned to the machine (after a low air supply alarm was triggered) | Press the ✓ACK button |
| SAFETY MAT FAULT – ✓ACK TO CLEAR | Functions of the safety mat were not properly executed | Press the ✓ACK button |
| SAFETY MAT MALFUNCTION – ✓ACK TO CLEAR | Multiple inputs for the safety mat did not happen simultaneously | Press the ✓ACK button |
| PRINTHEAD 1 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 2 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 3 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 4 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 5 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 6 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait |

| Alarm | Description | Possible Resolution |
|---|---|---|
| | | approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 7 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 8 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 9 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 10 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 11 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 12 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 13 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, |

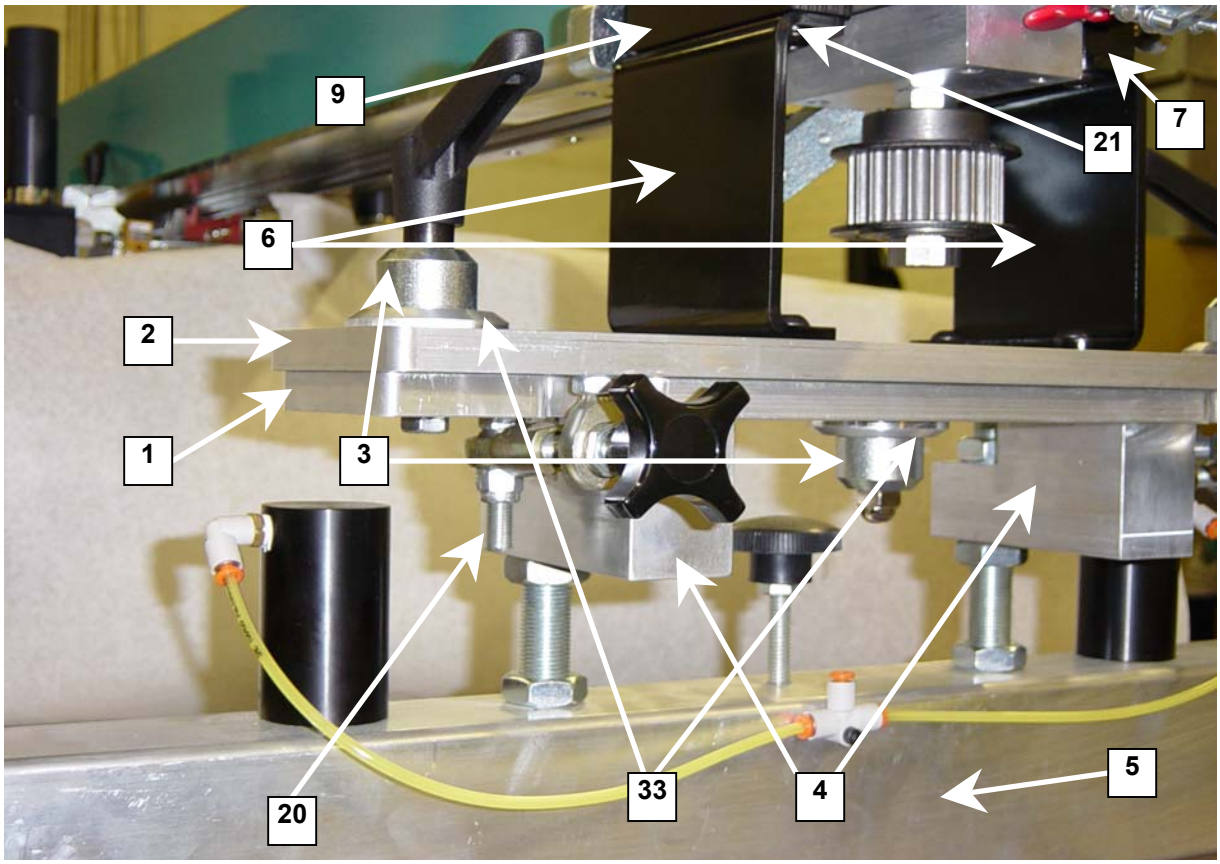
| Alarm | Description | Possible Resolution |
|---|---|---|
| | | and begin normal operation |
| PRINTHEAD 14 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 15 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |
| PRINTHEAD 16 DRIVE FAULT | The inverter for the printhead experiences a fault | Press the E-Stop, Turn the power to the machine off, wait approximately 10 seconds, turn the power to the machine back on, pull out the E-Stop, and begin normal operation |

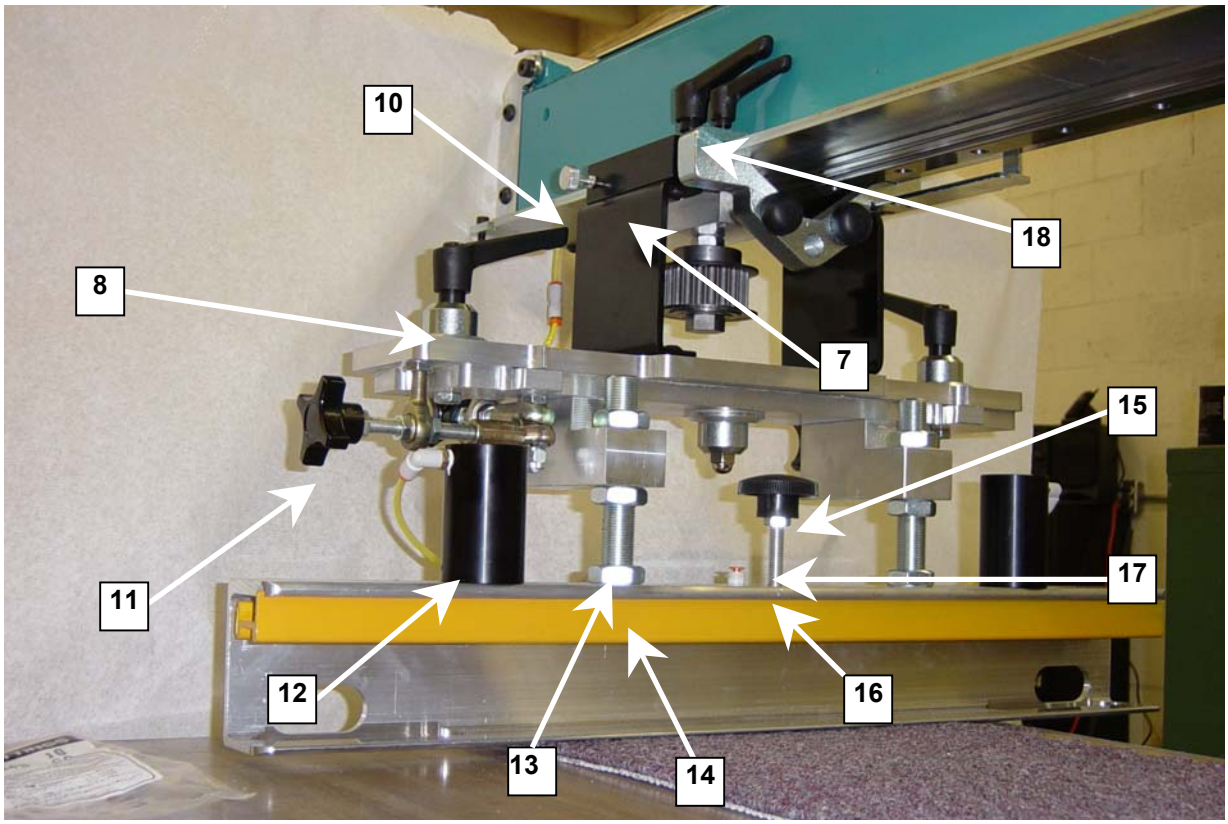
# Appendix C – Drive Fault List

| Display | Protective Function | Description |
|---|---|---|
| | Over Current Protection | The inverter cuts off its output when the output current of the inverter flows more than 200% of the inverter rated current. |
| | Over Voltage Protection | The inverter cuts off its output if the DC voltage of the main circuit increases higher than the rated value when the motor decelerates or when regenerative energy flows back to the inverter due to a regenerative load. This fault can also occur due to a surge voltage generated at the power supply system. |
| | Current Limit Protection (Overload Protection) | The inverter cuts off its output if the output current of th einverter flows at 180% of the inverter rated current for more than the current limit time (S/W). |
| | Heat Sink Over Heat | The inverter cuts off its output if the head sink over heats due to a damaged cooling fan or an alien substance in the cooling fan by detecting the temperature of the heat sink. |
| | Electronic Thermal | The internal electronic thermal of the inverter determines the over heating of the motor if the motor is overloaded and the inverter cuts off the output. The inverter cannot protect the motor when driving a multi-pole motor or when driving multiple motors. Overload capacity: 150% for 1 minute. |
| | Low Voltage Protection | The inverter cuts off its output if the DC voltage is below the detection level because insufficient torque or over heating of the motor can occur when the input voltage of the inverter drops. |
| | Input Phase Open | The inverter cuts off the output when one or more of the input (R, S, T) phase is open and the output load is over 50% of the inverter rated current for more than 1 minute. The inverter checks whether the phas is open by detecting the DC voltage of the main circuit. |
| | Output Phase Open | The inverter cuts off its output when the one or more of the output (U, V, W) phase is open. The inverter detects the output current to check the phase open of the output. |
| | BX Protection (Instant Cutoff) | Use for the emergency stop of the inverter. The inverter instantly cuts off the output when the BX terminal is turned ON, and returns to regular operation when the BX terminal is turned OFF. Take caution when using this function. |
| | Inverter Overload | The inverter cuts off its output when the output current of the inverter flows more than the rated level. |
| | External Fault A | Use this function if the user needs to cut off the ouput by an external fault signal (Normal Open Contact). |

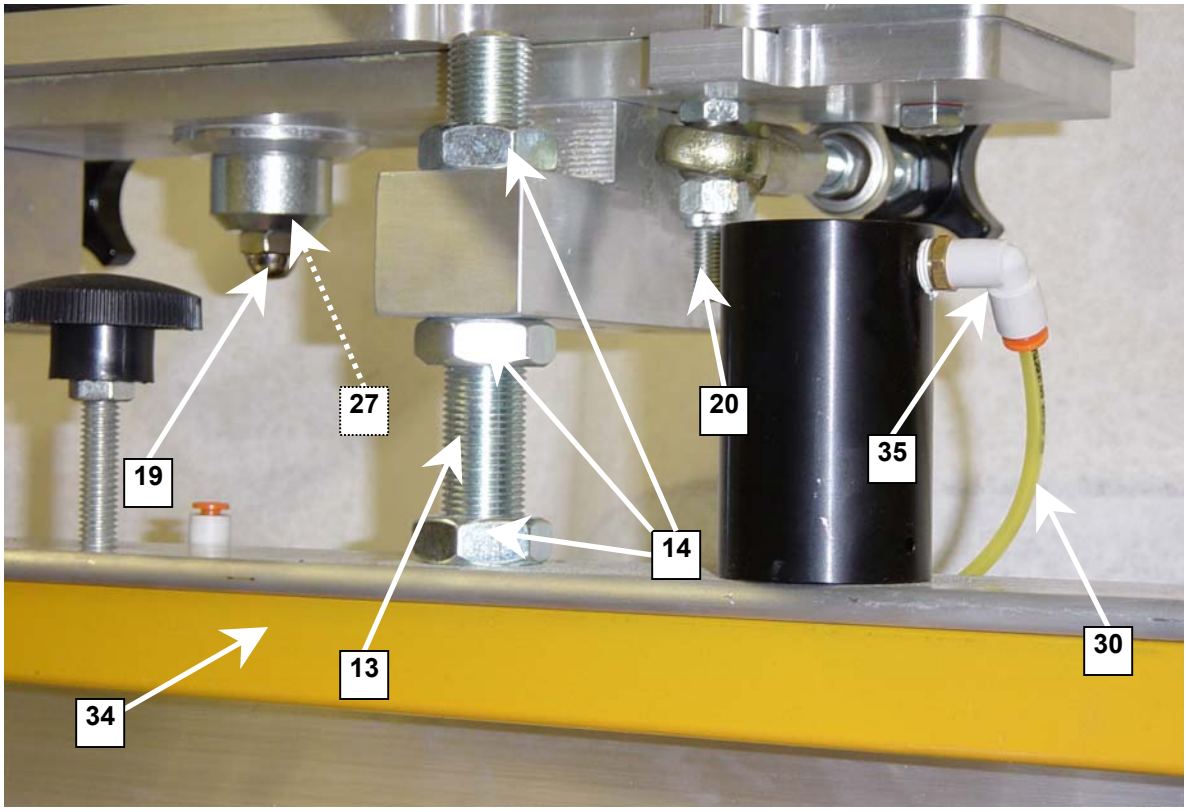
| Display | Protective Function | Description |
|---|---|---|
| | External Fault B | Use this function if the user needs to cut off the output by an external fault signal (Normal Close Contact). |
| | Operating Method when the Frequency Reference is Lost | There are 3 modes, continue operation, decelerate and stop, and free run, according to the I/O-48 (Operating Method when the Frequency Reference is Lost) setting. |
| | EEPROM Error 1 | The EEPROM of keypad has a fault causing parameter read/write error. |
| | EEPROM Error 2 | The ROM version of inverter and keypad is different. |
| | Inverter H/W Fault | A fault signal is outputted when an error occurs to the control circuitry of the inverter. There are the Wdog error, the EEP error, and the ADC Offset for this fault. |
| | CPU Error | The CPU has a fault. |
| | EEP Error | The EEPROM on inverter main board has a fault. |
| | Mis-wiring | The input/out wiring of inverter is wrong. |
| | Fan Fault | The cooling fan does not rotate. |
| | Ground Fault | A ground fault occurs. |
| | NTC Damage | A NTC is damaged. |

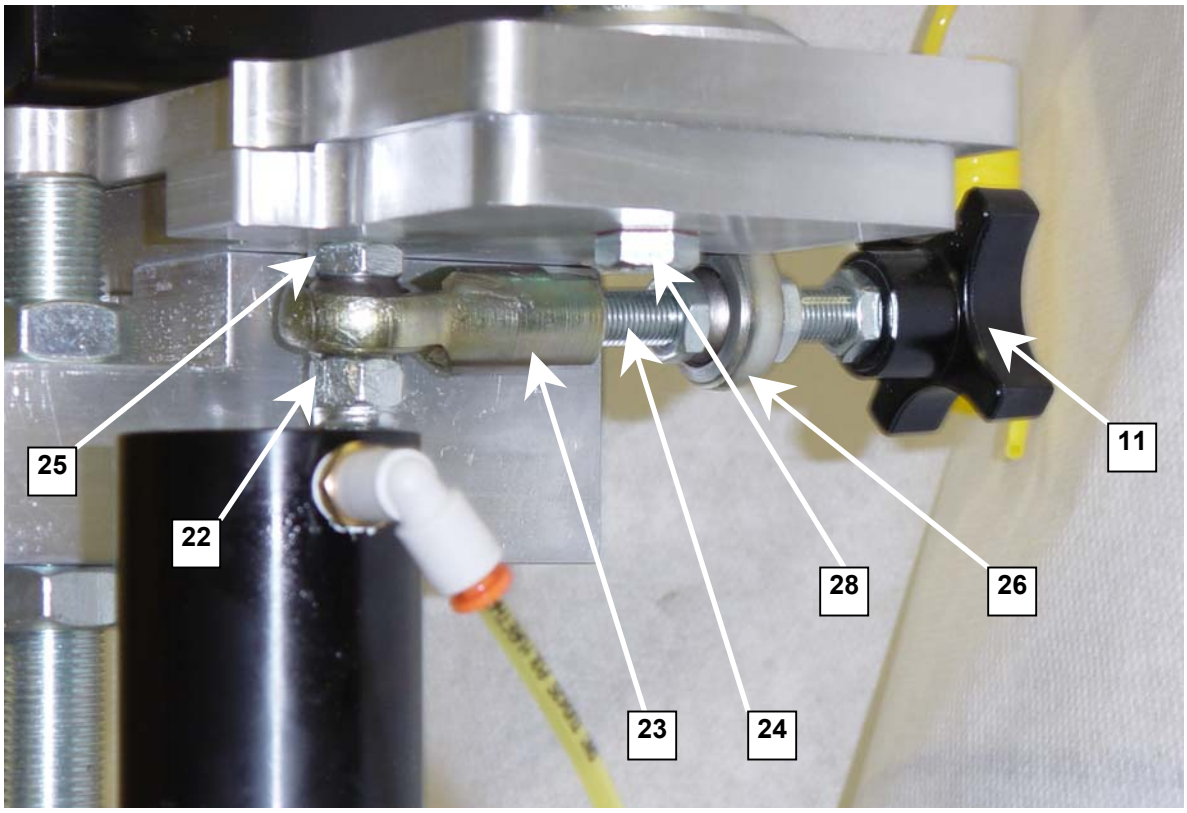
# Front Micro Assembly



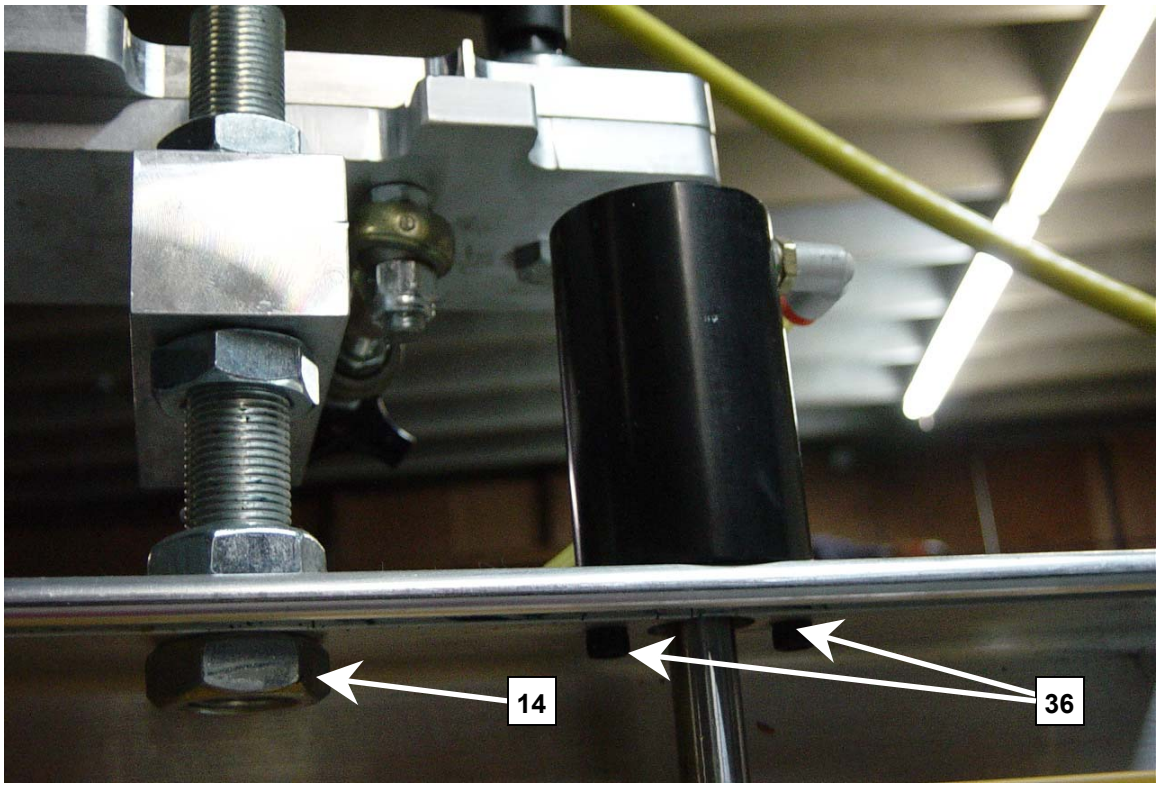



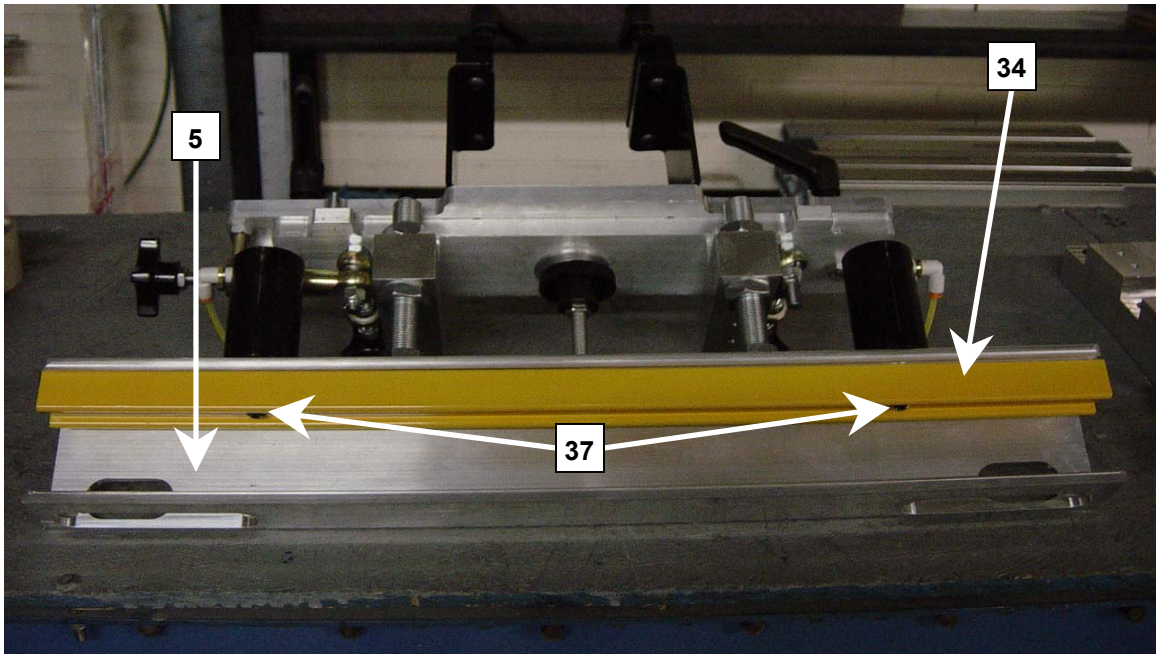
# Front Micro Assembly



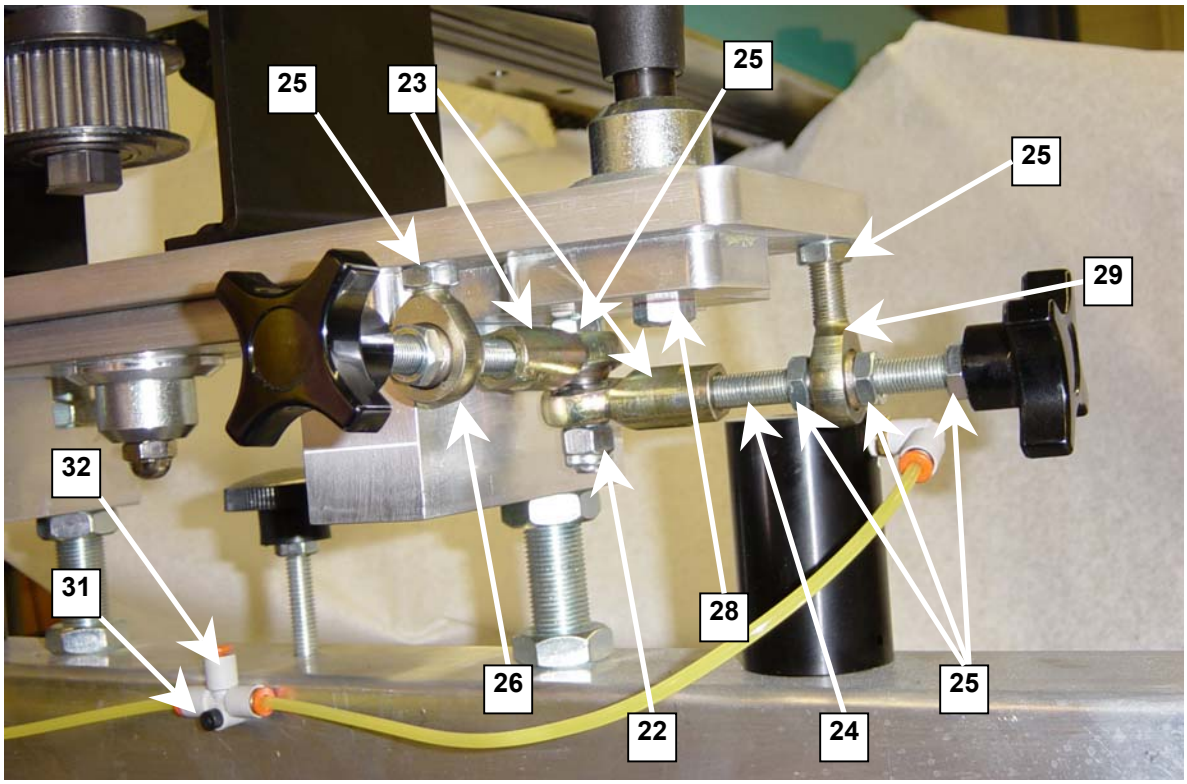



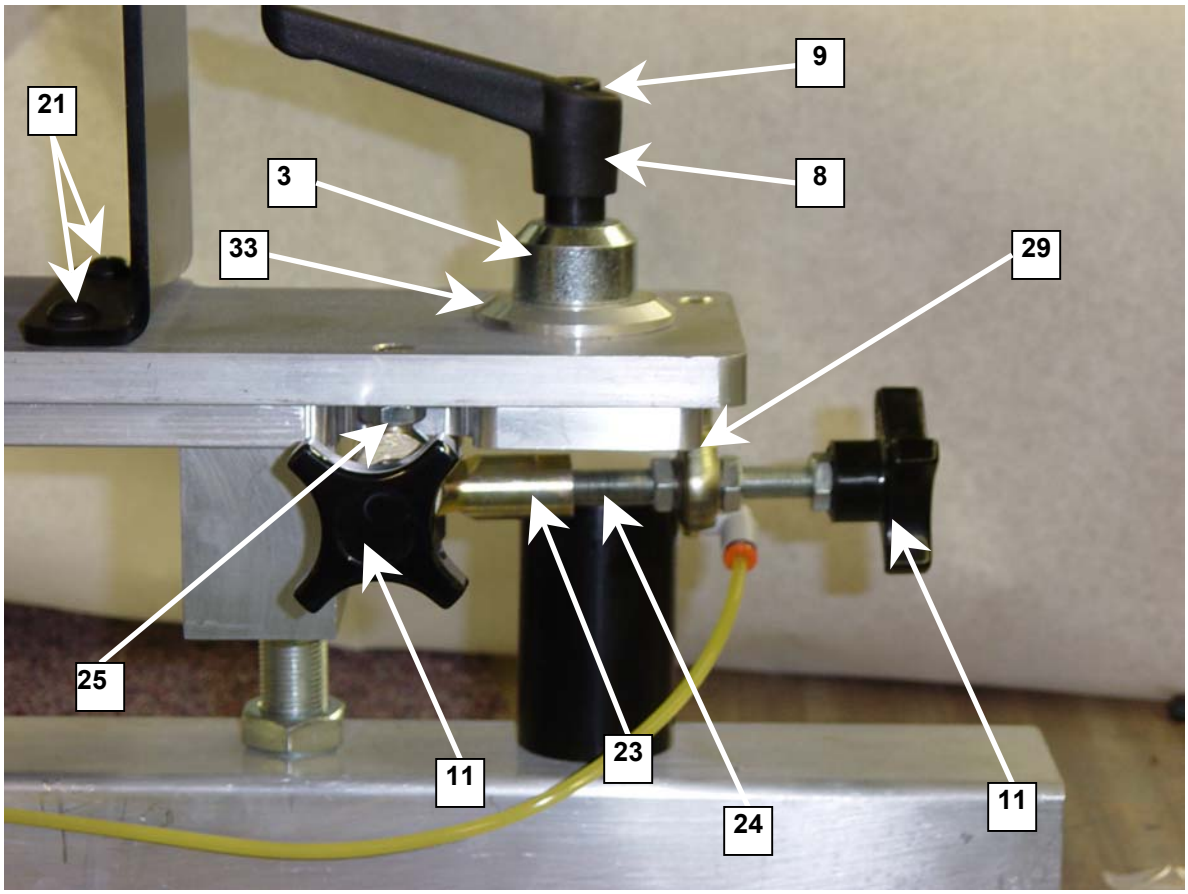
# Front Micro Assembly



# Front Micro Assembly

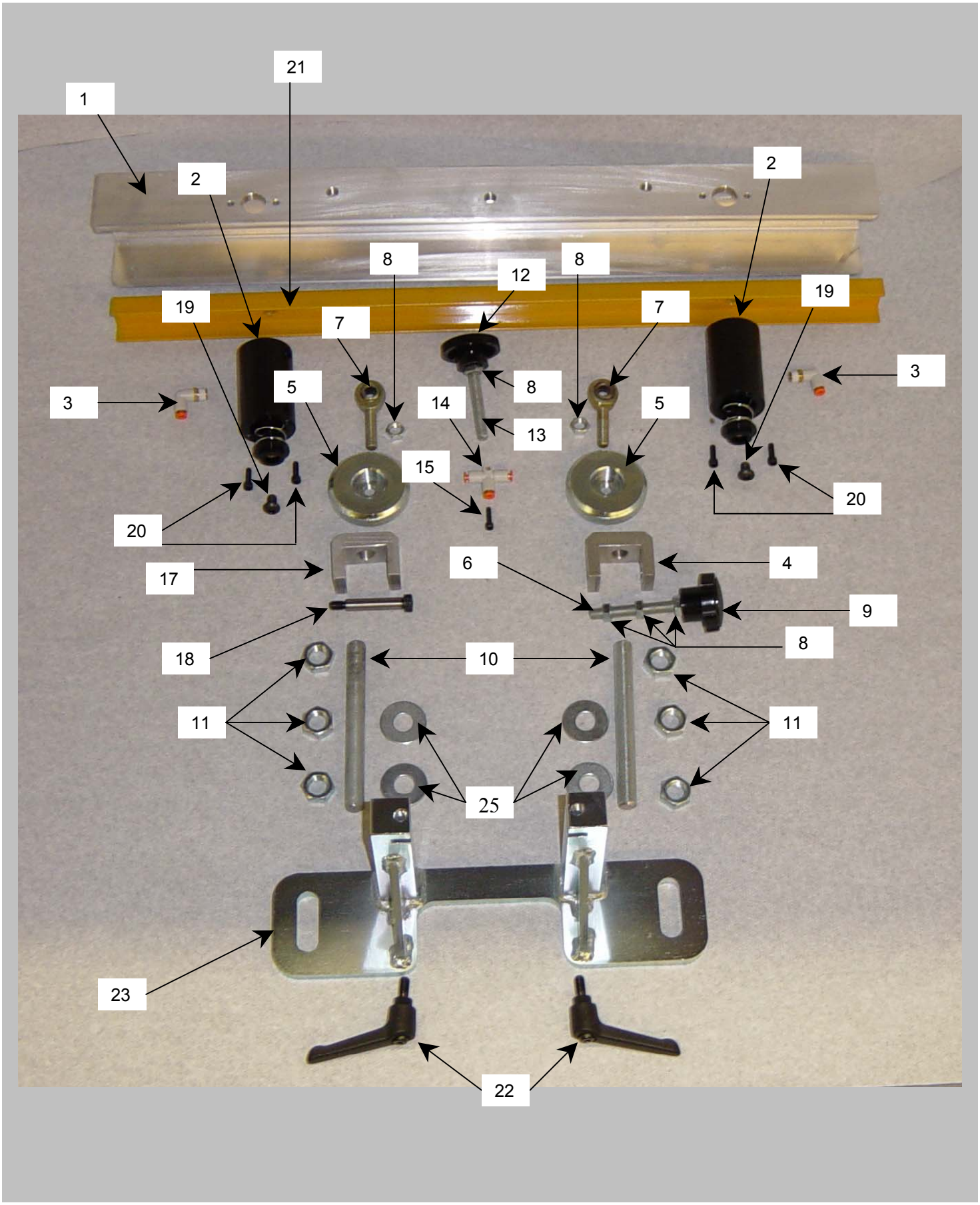


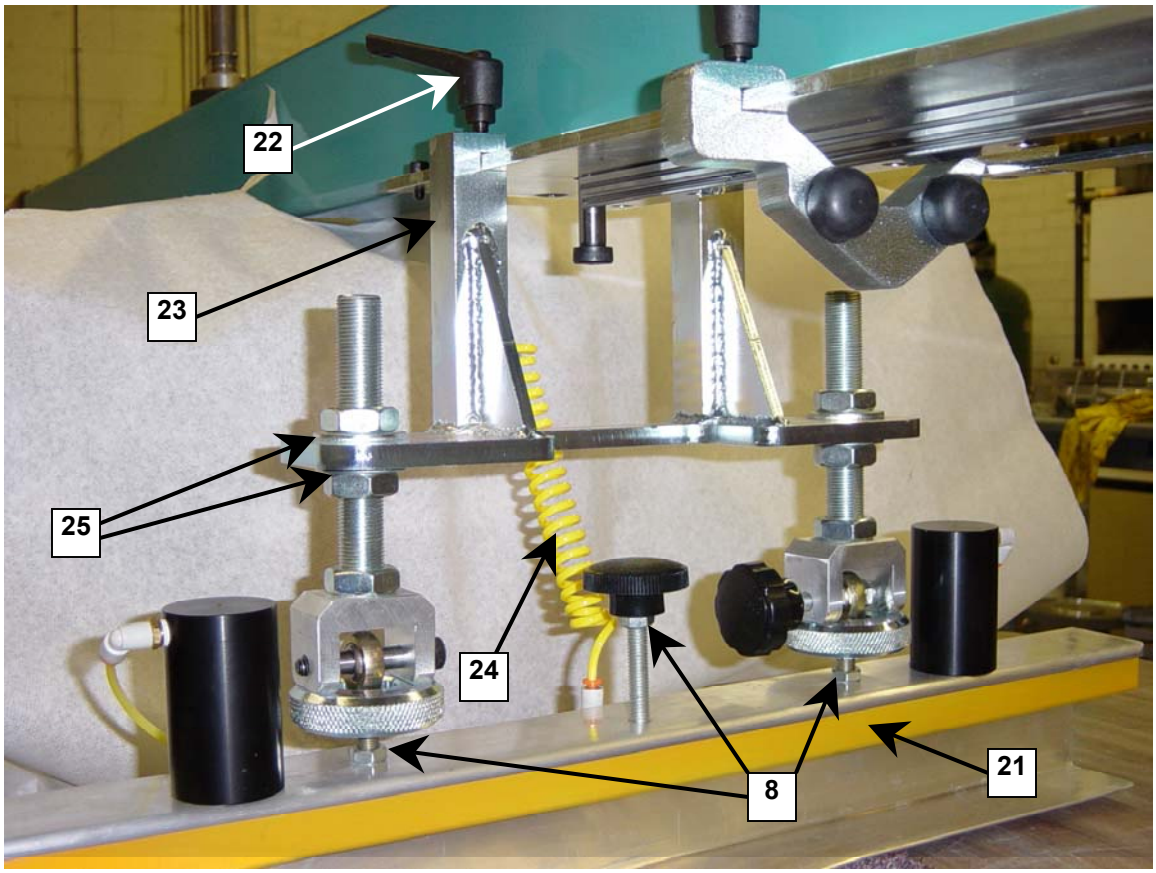
# Front Micro

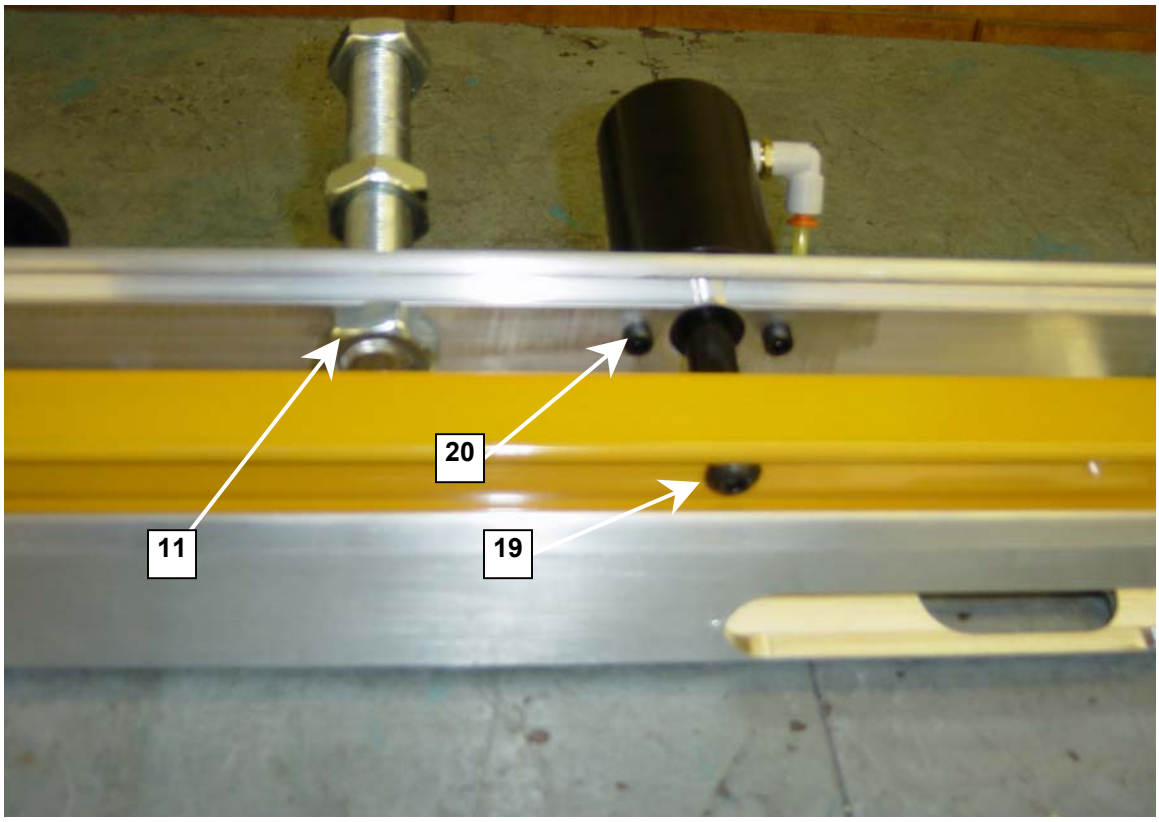
| REF# | DESCRIPTION | P/N |
|---|---|---|
| 1 | SMALL OR BOTTOM PLATE | 70-71-007 |
| 2 | LARGE OR TOP PLATE | 70-71-006 |
| 3 | CUSTOM STEEL SPACER | 70-80-023 |
| 4 | ALUMINUM ELBOW BLOCK | see part 1 |
| 5 | FRONT SCREEN HOLDER | 70-72-164 |
| 6 | BLACK MONUTING BRACKETS | 70-71-001 |
| 7 | RIGHT HAND UPRIGHT BLOCK W/ PLUNGER | 70-71-002 |
| 8 | 3/8-16 FEMALE KIP LEVERS ON SPACER | 35-11-005 |
| 9 | LEFT HAND UPRIGHT BLOCK NO PLUNGER | 70-71-003 |
| 10 | SPRING PLUNGER ON SLIDE MNT BRCKTS | 35-12-007 |
| 11 | 3/8-24 FOUR PRONG PLASTIC KNOB | 35-12-002 |
| 12 | CYLINDER FOR SCREEN CLAMP | 20-06-013 |
| 13 | 3/4-16 THREADED ROD - ELBOW BLOCK | 30-67-013 |
| 14 | 3/4-16 NUT - THRD ROD - ELBOW BLOCK | 30-41-005 |
| 15 | 3/8-16KNURLED PLASTIC KNOB | 35-12-006 |
| 16 | 3/8-16x3 THRD ROD - KNURL PLASTIC KNOB | 35-12-006 |
| 17 | 3/8-16 NUT FOR PLASTIC KNURLED KNOB | 30-41-001 |
| 18 | 5/16-18x3/4 MALE KIP LEVER SLIDE MNT BRKT | 35-11-010 |
| 19 | 3/8-16 ACORN NUT | 30-38-004 |
| 20 | 3/8-16x2-3/8 THREADED ROD THRU PLATES | 30-67-011 |
| 21 | 5/16-18 x 1/2" SCREWS - BLACK MNT BRKTS | 30-20-023 |
| 22 | 3/8-24 NYLOC NUT | 30-42-007 |
| 23 | 3/8-24 FEMALE ROD ENDS | 35-13-001 |
| 24 | 3/8-24x3-3/4 THRD ROD - 4 PRONG KNOB | 35-12-009 |
| 25 | 3/8-24 NUT - MALE ROD END & 4 PRG KNOB | 30-41-001 |
| 26 | MALE ROD END CUT SHORTER | 35-13-003 |
| 27 | 3/8-16 x 3-3/8" THRD ROD THRU SPCR TO ACORN | 30-67-016 |
| 28 | 3/8-16 x 2-1/2" ALL THREAD HEX BOLT- KIP LEVERS | 30-04-001 |
| 29 | MALE ROD END NOT CUT | 35-13-002 |
| 30 | 5\32 YELLOW TUBING | 20-01-011 |
| 31 | 8/32 x 3/8" SOC HD C/S FOR "T" FITTING | 30-11-002 |
| 32 | 5/32 HOSE T FITTING | 20-02-010 |
| 33 | KIP LEVER SPACER | 70-50-034 |
| 34 | FRONT YELLOW BAR - WITH NOTCH | 70-73-001 |
| 35 | 5/32 HOSE TO 1/8" NPT ELBOW | 20-02-024 |
| 36 | 10/32-5/8 SOC HD C/S (CYLINDER) | 30-11-005 |
| 37 | 5/16-24 x 1/2 BUT HD C/S (CYL ROD END) | 30-20-024 |
| 38 | 5/16-18x1" FLAT HEAD BOLT TOP TO BOTTOM | see part 1 |
| 39 | 3/8-24x4" THRD ROD - 4 PRONG KNOB | 35-12-009 |

# Rear Micro Assembly

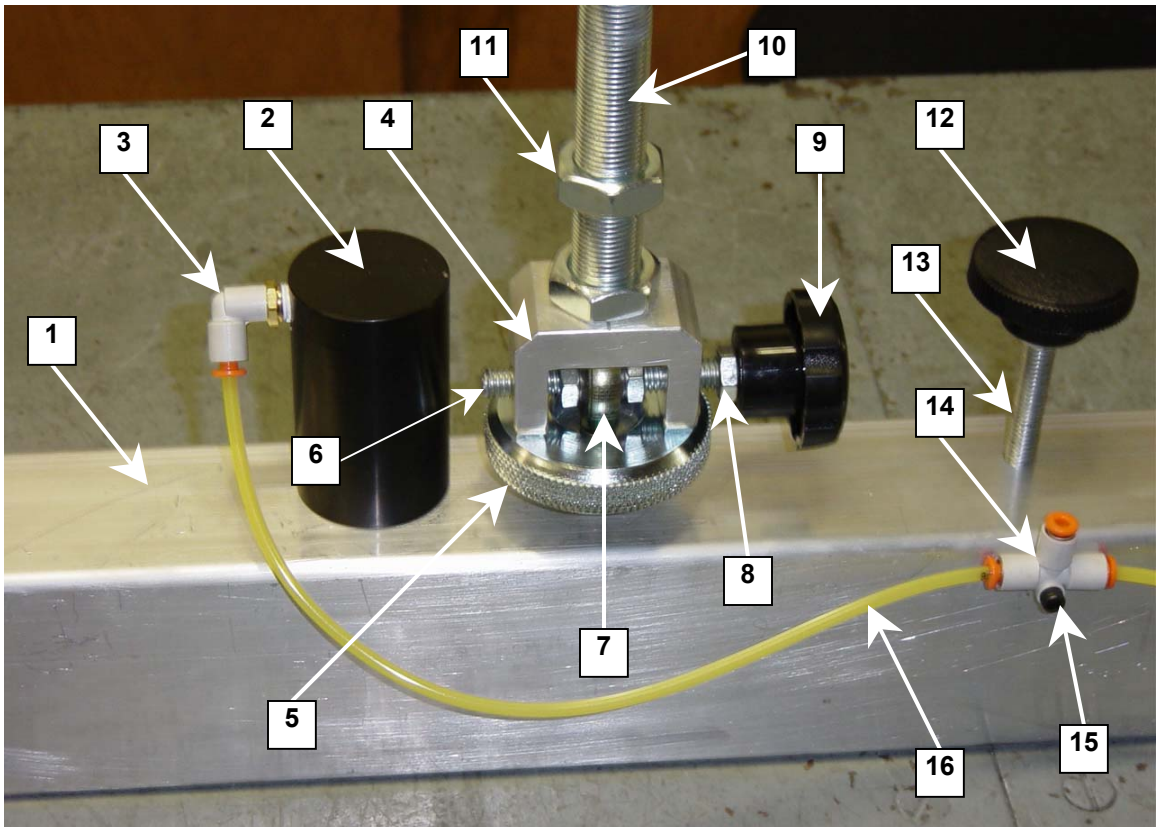


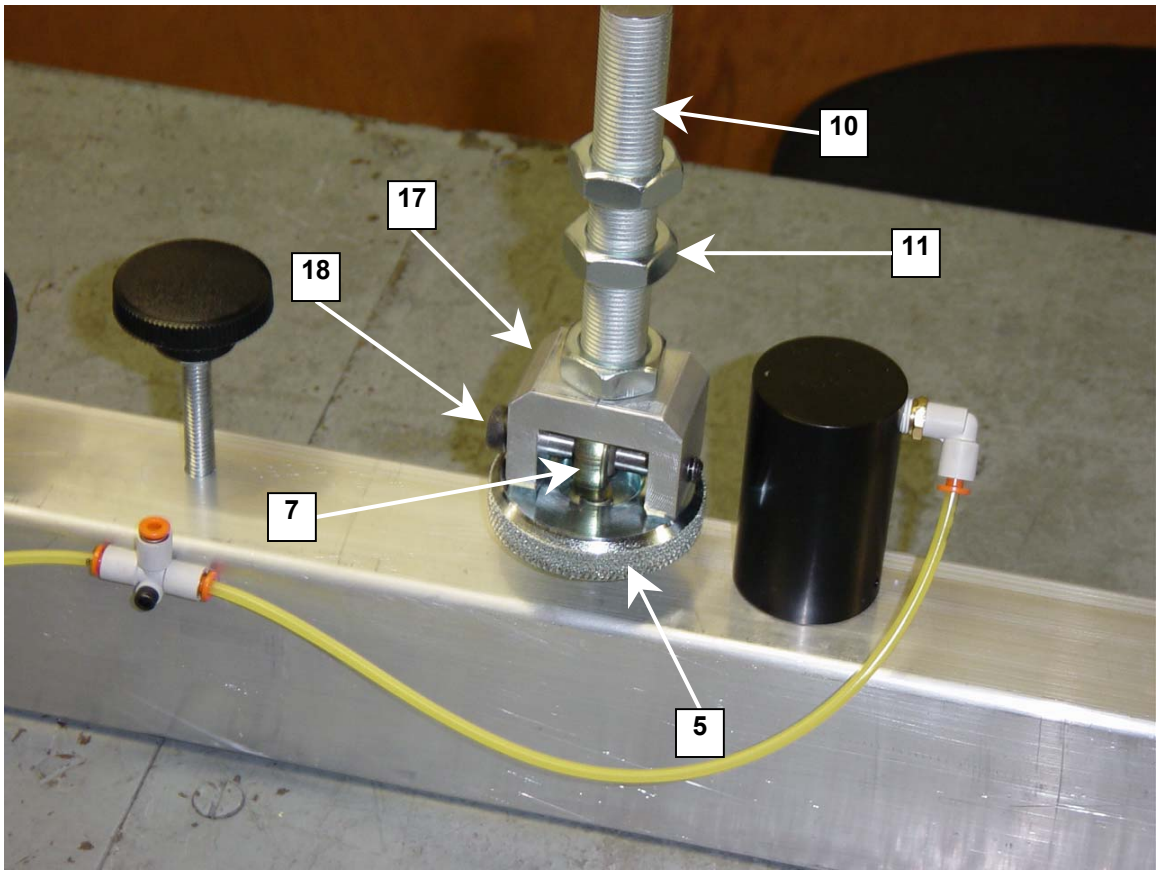
# Rear Micro Assembly



# Rear Micro Assembly

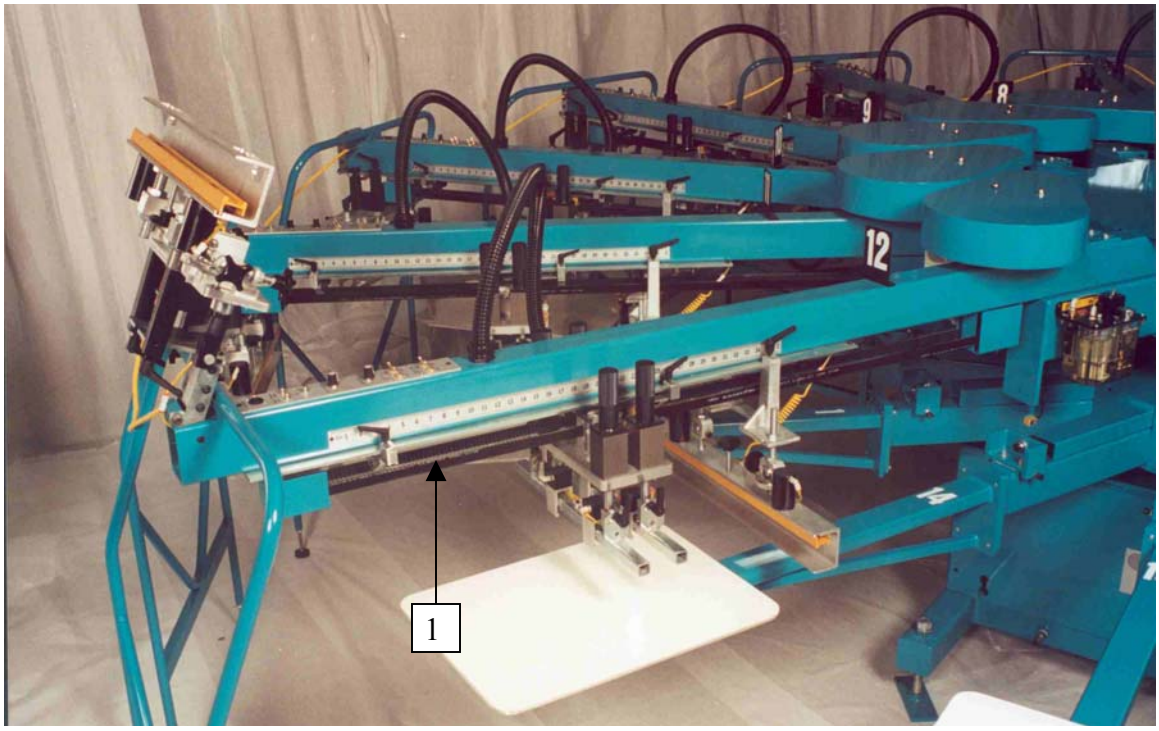


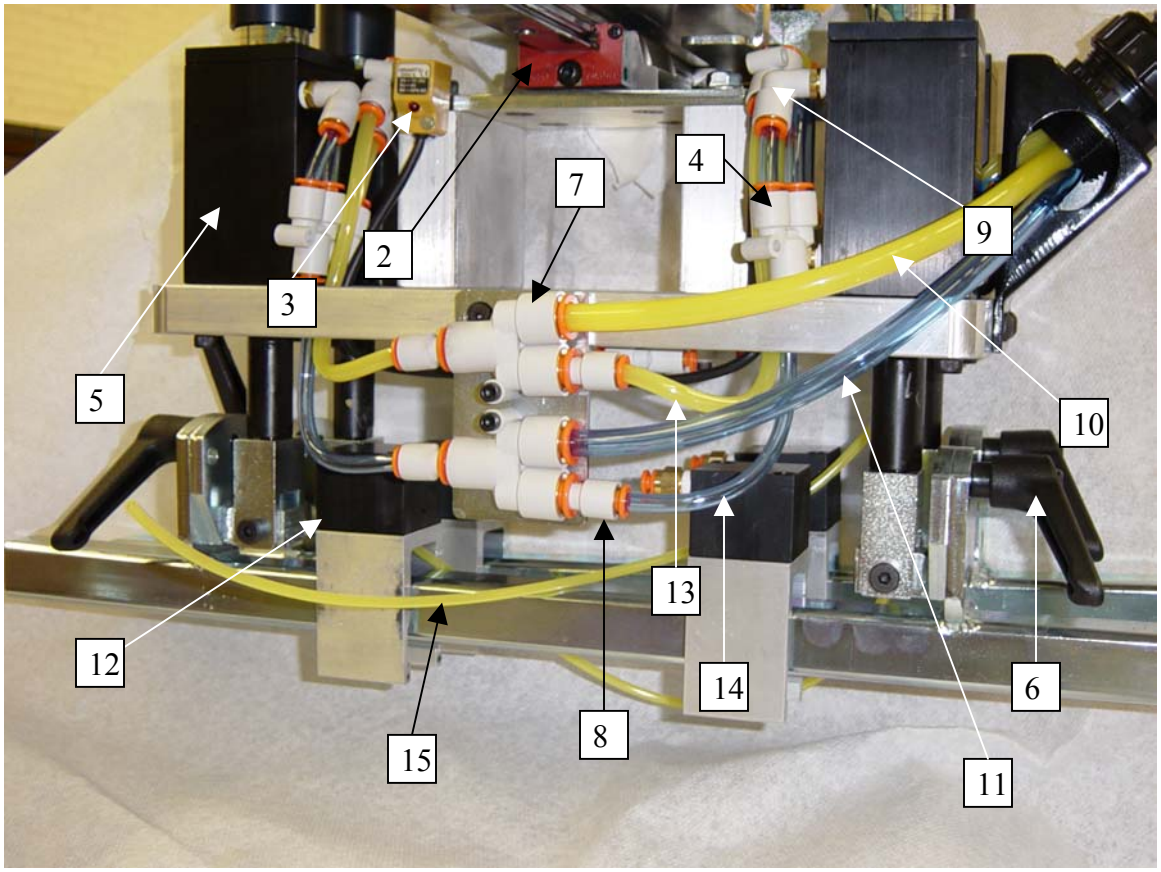



# Rear Micro Assembly

| REF# | DESCRIPTION | P/N |
|---|---|---|
| 1 | REAR SCREEN HOLDER | 70-72-165B |
| 2 | CYLINDER FOR SCREEN CLAMP | 20-06-013 |
| 3 | 5/32 HOSE TO 1/8" NPT ELBOW | 20-02-024 |
| 4 | U BRACKET ALL THREAD | 70-50-031 |
| | U BRACKET NO THREAD | 70-50-032 |
| 5 | KNURLED KNOB - MACHINED | 70-80-004 |
| 6 | 3/8-16 x 3-3/8" THREADED ROD | 30-67-016 |
| 7 | MALE ROD END | 35-13-002 |
| 8 | 3/8-16 NUT ROD END & KNURLED KNOB | 30-41-003 |
| 9 | FLUTED PLASTIC KNOB | 35-12-001 |
| 10 | 9/16-18 x 5" THREADED ROD | 30-67-009 |
| 11 | 9/16-18 NUT (FOR THREADED ROD) | 30-41-002 |
| 12 | KNURLED PLASTIC KNOB | 35-12-006 |
| 13 | 3/8-16 x 3" THREADED ROD (included w/ part 12) | 35-12-006 |
| 14 | 5/32 HOSE "T" FITTING | 20-02-010 |
| 15 | 8/32 x 5/8" BUT HD C/S FOR "T" FITTING | 30-11-002 |
| 16 | 5\32 YELLOW TUBING | 20-01-011 |
| 17 | U BRACKET REAM & THREAD | 70-50-032 |
| 18 | 3/8 x 2-1/4" SHLDR BOLT - M. ROD END & U | 30-03-003 |
| | 3/8-24 JAM NUT | 30-41-001 |
| 19 | 5/16-24 X 1/2 BUT HD | 30-20-024 |
| 20 | 10/32 x 5/8" SOC HD C/S (CYLINDER) | 30-11-005 |
| 21 | REAR YELLOW BAR | 70-73-002 |
| 22 | 5/16-18 KIP LEVER FOR HANGER w/ SCREW | 35-11-010 |
| 23 | REAR MICRO BRACKET | 70-80-012 |
| 24 | COILED YELLOW HOSE | 20-01-008 |
| 25 | 9/16 USS WASHER | 30-68-007 |

# Chopper Assembly



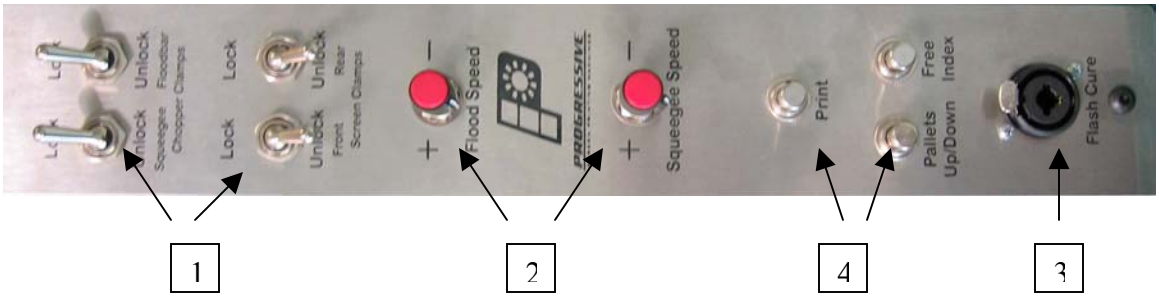




CHOPPER ASSEMBLY

# Chopper Assembly

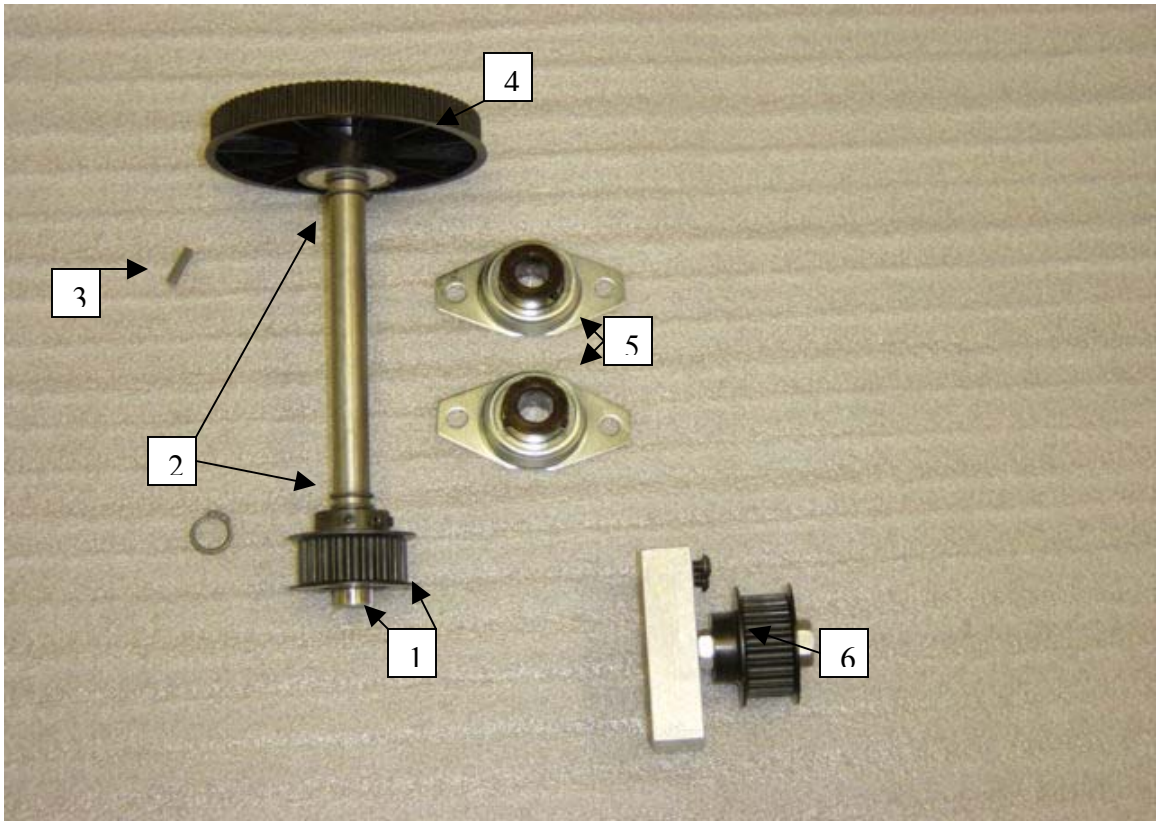
| REF# | DESCRIPTION | PMI # |
|---|---|---|
| 1 | BELTING - LL8M021GT PER FT | |
| | EF1012 | 35-17-014 |
| | EF1214 | 35-17-015 |
| | EF1416 | 35-17-016 |
| | EF1618 | 35-17-017 |
| | EF2022 | 35-17-019 |
| 2 | GK BLOCK 20MM | 35-01-031A |
| 3 | SQUARE PROX SENSORS | 10-10-008 |
| 4 | 1/4" Y FITTING W/ PLUG | 20-02-012 |
| 5 | CHOPPER CYLINDERS LEFT | 20-06-019 |
| | CHOPPER CYLINDERS RIGHT | 20-06-012 |
| 6 | 5/16 -18 x 1/2" KIP LEVER | 35-11-007 |
| 7 | Y FITTING 3/8" HOSE | 20-02-015 |
| 8 | REDUCER 3/8" TO 1/4" HOSE | 20-02-016 |
| 9 | ELBOW FITTING 1/4"HOSE x 1/8" NPT | 20-02-020 |
| 10 | 3/8" YELLOW HOSE/FT | 20-01-004 |
| 11 | 3/8" BLUE HOSE/FT | 30-01-003 |
| 12 | SUARE SPRING CYLINDER w/ EXTRUSION | 20-06-014 |
| 13 | 1/4" YELLOW HOSE/FT | 20-01-006 |
| 14 | 1/4" BLUE HOSE/FT | 20-01-007 |
| 15 | 5/32" YELLOW HOSE | 20-01-011 |

# Print Arm Control Panel



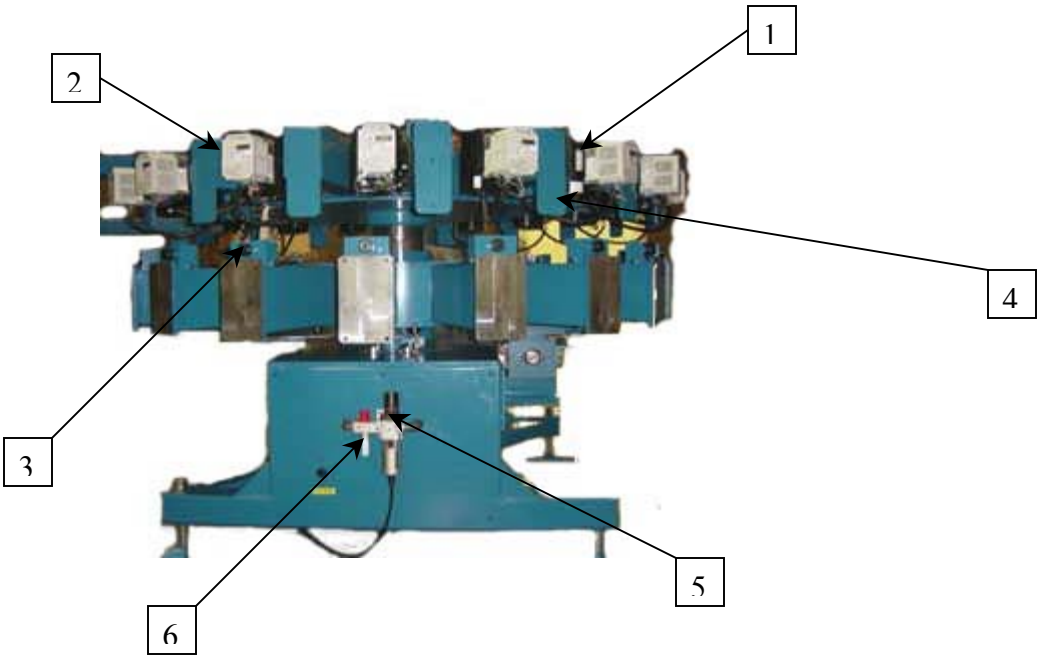

| REF# | DESCRIPTION | PMI# |
|---|---|---|
| 1 | TOGGLE VALVE | 20-07-019 |
| | STRAIGHT FITTING | 20-07-018 |
| | ELBOW FITTING | 20-07-017 |
| 2 | 53C35K CLAROSTAT - POT. 5K OHM | 10-11-007 |
| 3 | NEUTRIK SOCKET | 80-50-002 |
| 4 | PUSH BUTTON | 10-11-026 |
| | | |

# Jack Shaft & Pulleys




| REF# | DESCRIPTION | P/N |
|---|---|---|
| 1 | Lower Pulley and Shaft Combination | 75-15-300 |
| 2 | Snap Rings | 30-53-004 |
| 3 | Motor Key Stock | 80-20-008 |
| 4 | Upper Pulley | 35-18-010 |
| 5 | Jack Shaft Bearings | 35-01-019 |
| 6 | Idler Pulley Assembly | 75-17-600 |

# Base Assembly




| REF# | DESCRIPTION | PMI # |
|---|---|---|
| 1 | ELECTRIC PRINT HEAD MOTOR | 10-20-008 |
| 2 | DRIVE CONTROL - INVERTER | 10-20-010 |
| 3 | REGISTRATION CAM | |
| | 1 ¼" | 35-01-007 |
| | 1 ½" | 35-01-006 |
| 4 | REGISTRATION FORK ASSY | 75-17-004 |
| 5 | FILTER REGULATOR | 20-11-001 |
| | REGULATOR COUPLER | 20-11-002 |
| 6 | VALVE FILTER REGULATOR SHUT OFF | 20-11-003 |
| | | |