

Orion 130 Ver. 2

Dec 2017 and up (PLC programs 2_17 and up)
(Elc. Drawing 9211-80-001-F and up)

Operator's Manual

Orion 130 v2

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Page 2

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Contents

1. Safety	4
1.1. Symbols and their Interpretations	4
1.2. Liability.....	4
1.3. General Warnings and Cautions	4
1.4. Application Restrictions	4
2. Installation Instructions	5
2.1. Warnings and Cautions	5
2.2. Selecting the Location	5
2.3. Leveling the Machine	5
2.4. Connecting to Power	6
2.5. Connecting to Air Supply	6
2.6. Setting Pressure Regulator	6
3. Operating Controls	7
3.1. Front Panel Controls	7
3.2. Left Side Controls	7
3.3. Operating Control Functions	8
3.4. The Screen Map	9
3.4.1. Boot Up Control and Automatic Screen	10
3.4.2. Manual Mode.....	10
3.4.3. Setup Screen.....	11
3.4.11. Accessories	15
4. Operation	19
4.1. Startup	19
4.2. Preparing to Print	20
4.2.1. Mounting the pad	20
4.2.2. Work support knee	20
4.2.3. Flow controls	21
4.2.4. Pad stroke.....	21
4.2.5. Assembling the ink cup and cliché.....	22
4.2.6. Dismanteling the ink cup and cliché	23
5. Guidelines for Operating the Machine.....	24
6. Options.....	25
7. Cliché sizes	26
8. Cup size changeover	27
9. Technical Information	28
9.1. Machine Specifications.....	28
9.2. Machine Dimensions	29
10. Maintenance.....	30
10.1. Wire Termination	30
10.2. Lubrication Schedule	30
10.3. Preventative Maintenance Schedule.....	31
10.4. Troubleshooting Guide	32
10.5. Fault Messages	33
10.6. Electrical Schematics.	34
10.7 Pneumatic Diagram.....	36

1. Safety

1.1. Symbols and their Interpretations



WARNING: Neglecting a safety instruction identified with the WARNING symbol may lead to personal injury.



CAUTION: Neglecting a safety instruction identified with the CAUTION symbol may lead to property damage.



POINTER: It is strongly recommended to observe instructions identified with a POINTER symbol.

1.2. Liability



- In no event will *ITW Trans Tech* be responsible or liable for indirect or consequential damages resulting from the use of this equipment.
- The information contained in this manual is subject to change due to improvements in design.
- Though this document has been checked for inaccuracies, *ITW Trans Tech* does not assume responsibility for any errors contained herein.
- This manual is provided as an aid when operating the Orion 130 pad printing machine. Prior to operation, it is strongly advised that the user be thoroughly familiar with the Orion 130 operating manual.
- *ITW Trans Tech* is not responsible or liable for any disadvantage occurred for not following the operating instructions.



- All operators must be adequately trained.

1.3. General Warnings and Cautions



- Switch off main disconnect switch ([see page 6](#)) prior to connecting/disconnecting power.



- Disconnect the air supply prior to servicing the machine.

1.4. Application Restrictions



- Any use other than described in this manual may cause damage to the equipment, personal injury, or property damage.

2. Installation Instructions

2.1. Warnings and Cautions



The machine operates on 100-240 volts, single phase AC power. Some options such as an Electronic Shuttle require the use of 115VAC.



Switch off main disconnect switch prior to connecting power and air.

Be alert and verify that safe start-up conditions exist prior to connecting the air supply and switching on the main disconnect switch as the machine may move when air pressure is applied.

Check the water trap as per connected system water accumulation dictates and drain as required by pressing the drain valve [\(see 2.5\)](#).

Apply oil or a thin layer of grease to unprotected ferrous parts to prevent rusting, especially after cleaning with solvents.

2.2. Selecting the Location



Choose a well-ventilated area away from direct sunlight to install your pad printing machine. The ideal conditions for the inks used in pad printing are approximately 20° C (68° F) and 40 - 60 % humidity. Make sure the machine is positioned away from walls and other obstructions and placed on a flat surface. The guards, operating panel and other machine openings must be accessible. Ensure adequate area for setup tooling and for storage of parts before and after printing.

2.3. Leveling the Machine

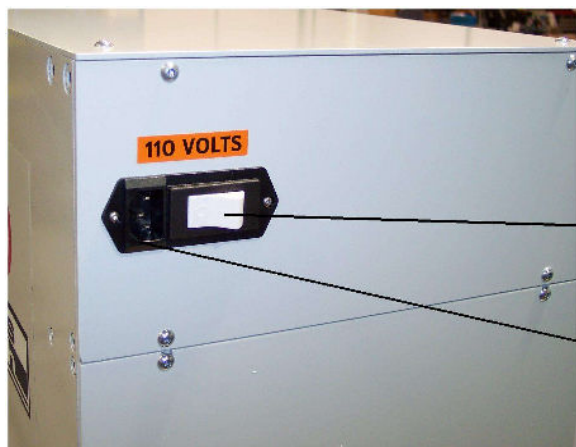


Before operation, the machine must be leveled. The level of the machine is adjusted by four (4) feet, one at each corner of the machine base.

Level the machine as follows:

1. Loosen upper jam nuts.
2. Place bubble levels on machine base, one parallel to the long side of the base and another parallel to the short side of the base.
3. Adjust bottom nuts on left front and left rear screws until bubble level on the long side reads level. It may be necessary to 'follow' with the right rear to keep machine stable if big adjustments are required.
4. Adjust bottom nuts equally on right and left rear screws until bubble level on the short side reads level.
5. It may be necessary to repeat steps 3 and 4 several times until both levels read level and the weight is evenly distributed on the four feet.
6. Turn the upper jam nuts clockwise to tighten.

2.4 Connection to power



The machine is equipped with a power cable ending in a Nema 5-15 plug.

Power requirement:

◆ 120 VAC

40 watts

A 230VAC single phase power cord can also be used.

Main disconnect switch

Power cord receptacle

2.5 Connection to air supply



The machine requires clean, dry air.

Minimum requirement:

6 bar (85 psi)

5 cfm

Air connection is to a quick disconnect adapter (included) or to 3/8" NPT female thread.

Connection for air supply

Adjusting knob

Connection for air supply

Pressure gauge

Bowl with filter inside

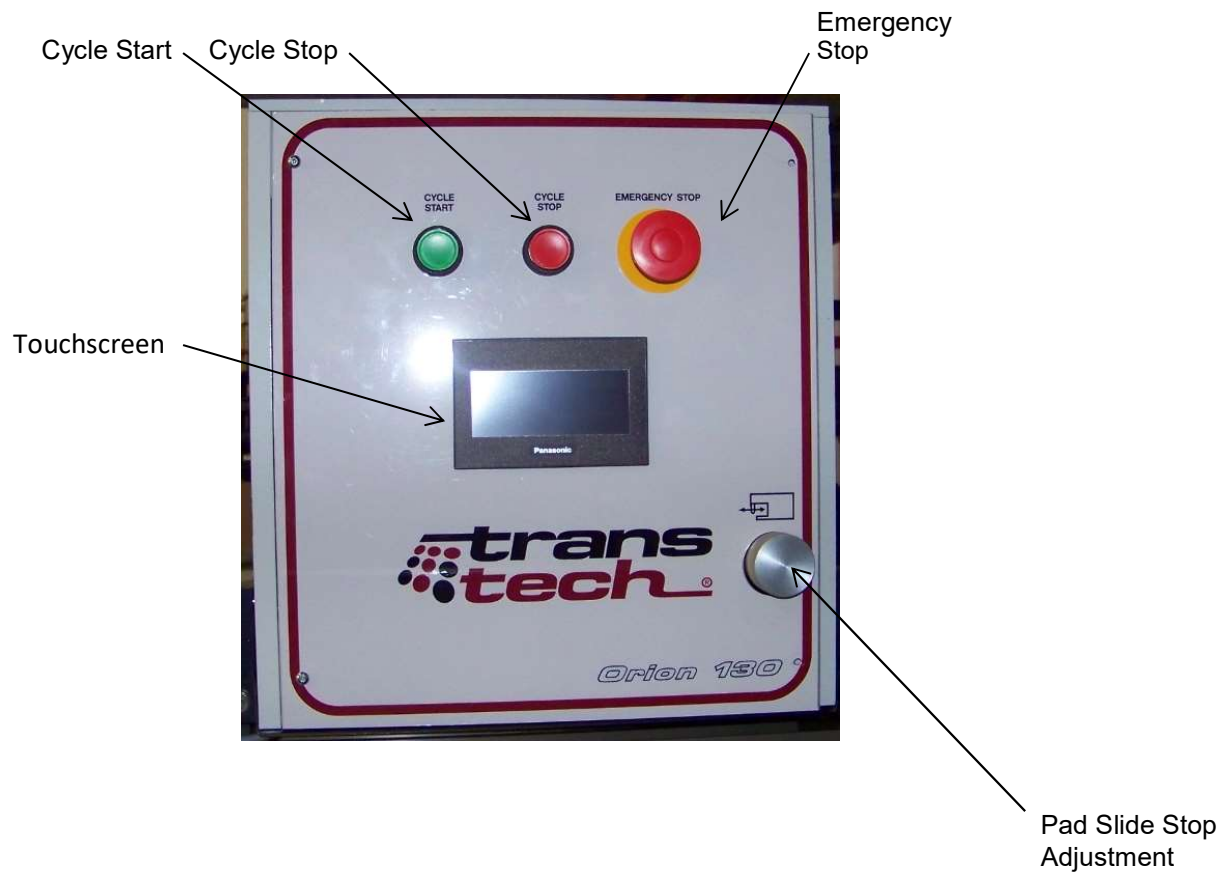
Drain valve for water trap

2.6 Air pressure regulator

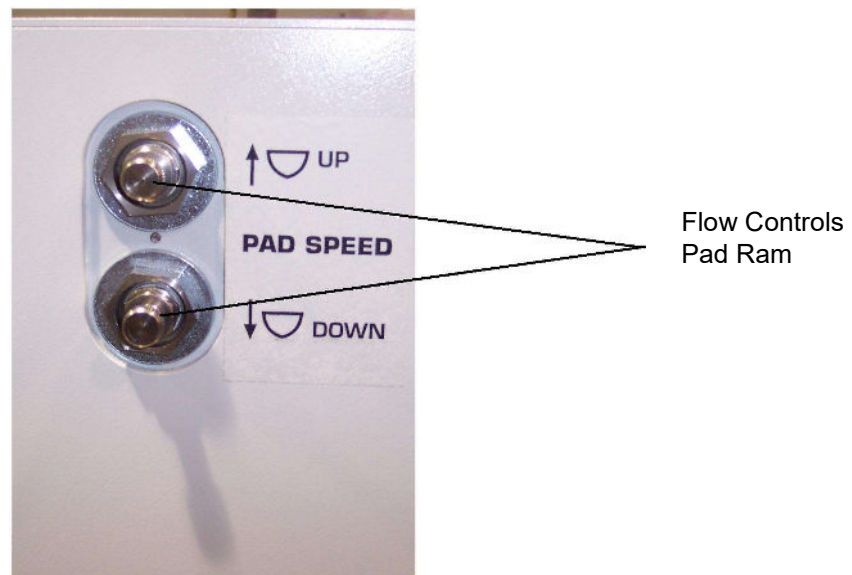
Adjust system pressure to 6 bar (85 psi) by lifting the adjusting knob to unlock, then turning the knob clockwise to increase the pressure or counterclockwise to decrease the pressure. Push down on the adjusting knob to lock the regulator after making adjustments.

3 Operating Controls



3.1 Front Panel



3.2 Left Side



3.3. The Operating Control Functions

Button	Description	Result
Cycle Start	-Active after main disconnect is switched ON and E-STOP is cleared. -Lamp is illuminated when power is on.	<ul style="list-style-type: none"> · Initiate main air valve · Start printing cycle
Cycle Stop	-Lamp is illuminated when printer is in HOME position. -Lamp flashes when an error condition exists.	<ul style="list-style-type: none"> · Stop printing cycle <p>Printer motion will not stop immediately. The printer will complete the active print cycle and stop in the HOME position.</p> 
E-Stop	-Press to activate. -Pull to release.	<ul style="list-style-type: none"> · Interrupts power to inputs and outputs. · Machine motion is immediately halted. <p>The machine may continue to move for a short distance after E-STOP is pressed.</p> 
Touch Screen	-Active after E-Stop is reset.	<ul style="list-style-type: none"> · All setup, operating mode and manual functions are input via the touch screen.
Pad slide stop - front	-Adjust the position of the image on the part in the Y direction. (see page 7)	<ul style="list-style-type: none"> · Loosen M8 lock screw before making adjustment. <ul style="list-style-type: none"> ⇒ Turn knurled screw clockwise to move image toward printer. ⇒ Turn knurled screw counterclockwise to move image away from printer. · Tighten m8 lock screw after making adjustment.
Pad stroke down limit - part	-Adjust the pad down stroke limit over the part. (see page 7)	<ul style="list-style-type: none"> · Loosen lock screw before making adjustment. <ul style="list-style-type: none"> ⇒ Move slide up to shorten stroke. ⇒ Move slide down to lengthen stroke. · Tighten lock screw after making adjustment.
Pad stroke down limit - cliché	-Adjust the pad down stroke limit over the cliché. (see page 7)	<ul style="list-style-type: none"> · Loosen lock screw before making adjustment. <ul style="list-style-type: none"> ⇒ Move slide up to shorten stroke. ⇒ Move slide down to lengthen stroke. · Tighten lock screw after making adjustment. · The pad cleaner stroke limit is adjusted at the same time as the pad stroke down limit over the cliché. It can not be adjusted separately.
Flow controls	-Adjust the speed of the pad ram. -Adjust the speed of the pad slide. (see page 7)	<ul style="list-style-type: none"> · Loosen lock ring before making adjustment. <ul style="list-style-type: none"> ⇒ Turn knurled screw clockwise to slow down movement. ⇒ Turn knurled screw counterclockwise to speed up movement. · Tighten lock ring after making adjustment.
Foot Pedal	Stop and start the printer. (see page 7)	<ul style="list-style-type: none"> · When in single cycle mode, pressing the foot pedal or the START button will start a print cycle. · When in continuous cycle mode, pressing the foot pedal once or pressing the START button will start a print cycle. Pressing the foot pedal again will stop the printer at the end of the active step of the print cycle. Press again to continue the print cycle.

3.4.1. Boot Up Control

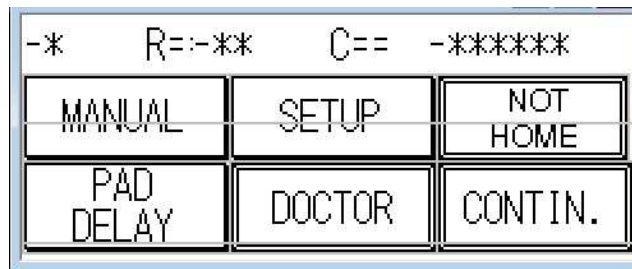


Normal boot up displays.

Boot up display when E-Stop button is pressed.
Pull E-Stop button to release (screen versions may vary.)

Push the green Start button to turn on the main air valve.

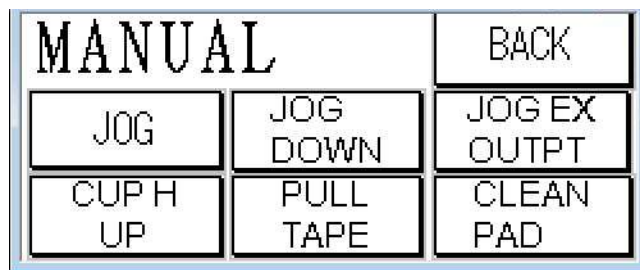
3.4.2. Automatic Screen - Default screen after main air on.



Default display for AUTO screen. If DCTR is enabled, pad motion is inhibited

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
-*	# of Prints	Number of print cycles to be executed per Start input.
R=.*	Rate Indicator	Machine rate in cycles/minute.
C== -*****	Cycle Counter	Overall cycle counter (See 3.4.6 to reset)
MANUAL	Manual Mode	Touch to jump to the MANUAL screen.
SETUP	Setup Screen	Touch to jump to SETUP screen.
Not Home	Home Display	Displays if the printer is in the Home position (Output Y1 On).
PAD DELAY	Pad Delay	Touch to jump to PAD DELAY screen.
DOCTOR	Doctor Mode	Touch to disable printing pad from going down. Cycle counter does not count. Also used with Cupslide to activate doctoring mode.
CONTIN.	Continuous	Touch to enable continuous printing. End of Cycle output Mode will not turn on until the Stop button initiates a cycle stop at the Home Position.

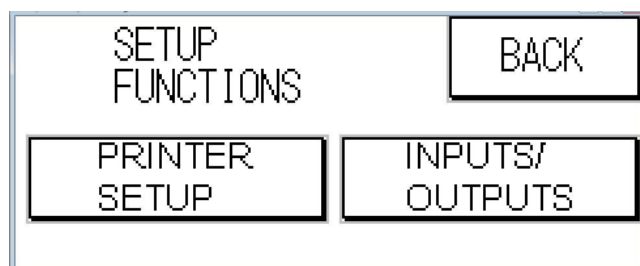
3.4.3 Manual Mode Screen



The part counter will not count.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
JOG	Jog	Touch to jog the printer through the printing sequence. Multiple inputs are required to complete one cycle.
JOG DOWN	Jog Down	Touch to jog printing pad down and up.
JOG EX OUTPT	Jog Extra Output	Touch to jog selected Extra Output function.
CUP H UP	Cup Holder Up	Touch to toggle the cup driving pins up and down. Must be down to print.
PULL TAPE	Pull Tape	Touch to cycle the tape roll the selected amount of time, if installed.
CLEAN PAD	Clean Pad	Touch to cycle the pad cleaner function.

3.4.4 Setup Options Screen



<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
PRINTER SETUP	Printer Setup	Touch to jump to Setup screen.
INPUTS/OUTPUTS	Inputs/Outputs	Touch to jump to Input screen.

-* X PRINT		BACK
AUTO DCTR	INC # PRINT	CYCLE DELAY
BATCH COUNT	RESET COUNT	ACCS.

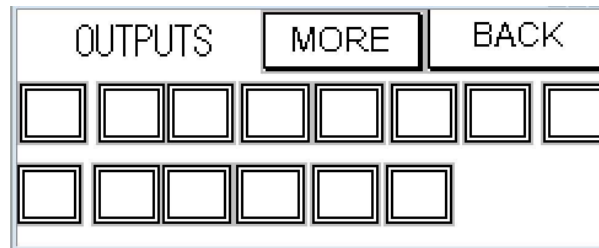
<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
AUTO DCTR	Auto doctor	Touch to jump to the Auto doctor screen
INC # PRINT	Increment prints	Touch to increase the number of prints per part from 1 to 4 and then loop back to 1.
CYCLE DELAY	Cycle Delay	Touch to jump to the Cycle Delay screen.
BATCH COUNT	Batch Count	Touch to jump to the Batch count screen.

INPUTS				MORE		BACK	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Displays the current state of the PLC digital inputs.
 The first row displays inputs X0 – X7.
 The 2nd row displays inputs X8 – XF.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
MORE	More	Touch to jump to the Outputs screen.
BACK	Back	Touch to jump to the previous screen.

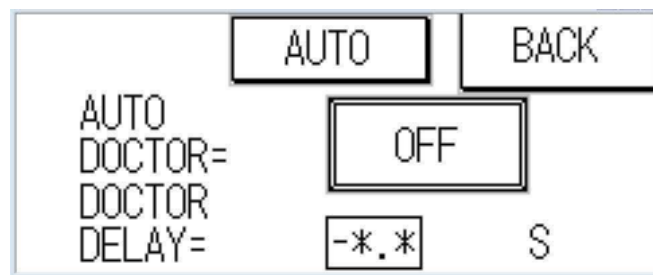
3.4.8 Outputs Screen



Displays the current state of the PLC digital outputs.
 The first row displays outputs Y0 – Y7.
 The 2nd row displays inputs Y8 – YD.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
MORE	More	Touch to jump to the Outputs screen.
BACK	Back	Touch to jump to the previous screen.

3.4.9 Auto doctor Screen

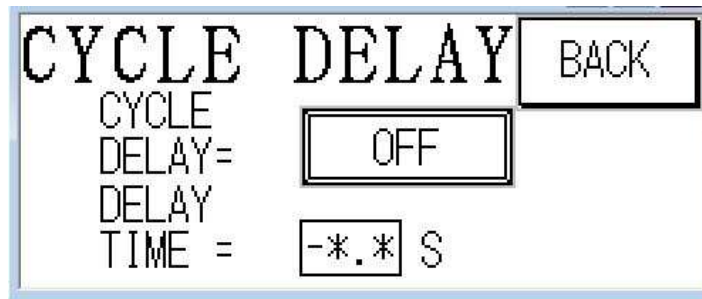


Auto doctor forces the printer to continuously stroke the ink cup(s) (the pad ram will follow) until a print cycle is initiated. The printer will print as normal and then resume the ink cup stoking upon completion of the print cycle. Use this if the image is larger than the ink cup.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
AUTO	Auto	Touch to jump to the Main Auto screen.
BACK	Back	Touch to jump to the previous screen.
OFF	Off	Touch to toggle the Auto doctor function.
-.*	Time Display	Touch the cell to display a numeric keypad where the actual delay time between cup doctoring motion can be changed. Min. value = 0.1s, Max. value = 9.9s Push ENT. after inputting value on keypad.

3.4.10

Cycle Delay Screen

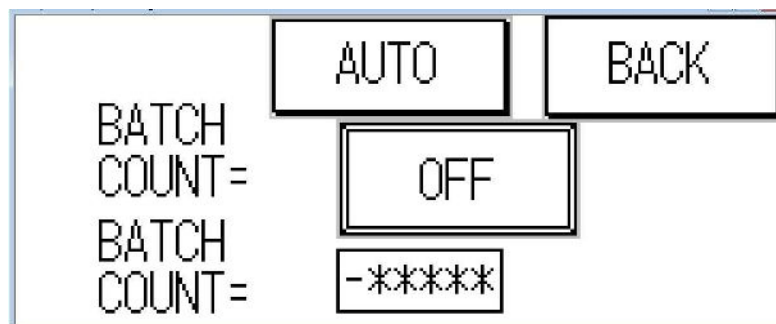


Cycle Delay delays the start of the next cycle in Continuous mode only.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
OFF	Off	Touch to toggle the Cycle Delay function.
-*.*	Time Display	Touch the cell to display a numeric keypad where the actual delay time between cycles can be changed. Min. value = 0.1s, Max. value = 9.9s Push ENT. after inputting value on keypad.

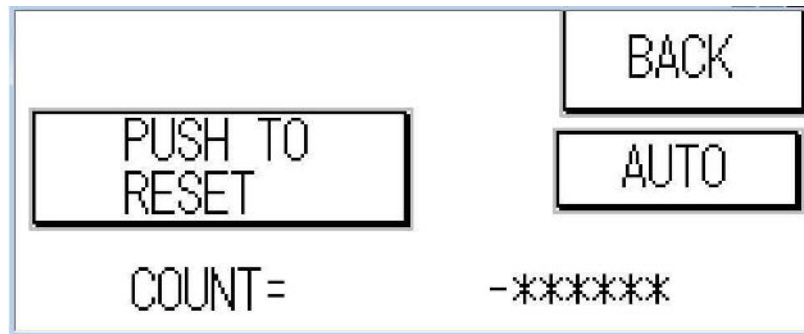
3.4.11

Batch Count Screen



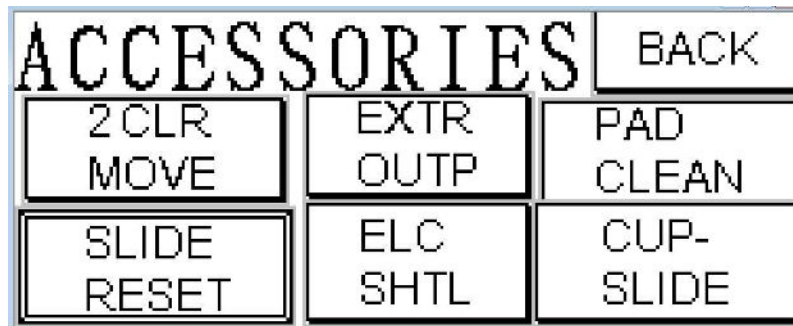
Batch Count stops and inhibits the printer from printing after the inputted number of cycles has been met.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
AUTO	Auto	Touch to jump to the Main Auto screen.
BACK	Back	Touch to jump to the previous screen.
OFF	Off	Touch to toggle the Batch Count function.
-*****	Numeric Display	Touch the cell to display a numeric keypad where the batch count can be changed. Min. value = 1, Max. value = 32000 Push ENT. after inputting value on keypad.



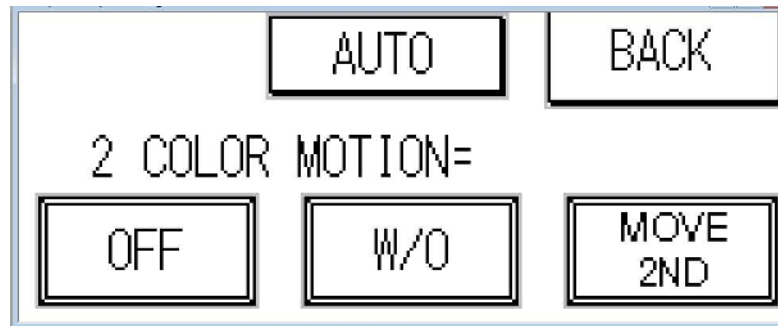
Resets the overall totalizing print cycle counter.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
PUSH TO RESET	Push to Reset	Touch to reset the cycle counter to zero.
AUTO	Auto	Touch to jump to the Main Auto screen.
_*****	Numeric Display	Displays the current Cycle



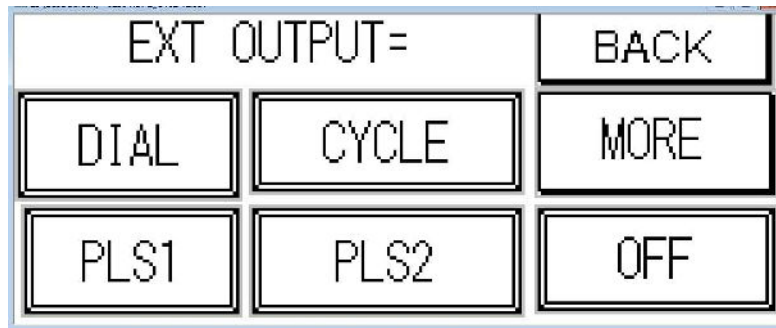
Jumps to the selected screen when applicable.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
2 CLR MOVE	2 Color Motion	Touch to jump to the 2 Color Motion screen.
EXTR OUTP	Extra Output	Touch to jump to the Extra Output screen.
PAD CLEAN	Pad Clean	Touch to jump to the Pad Clean screen.
SLIDE RESET	Slide Reset	Touch to reset the 2 Color Move device if locked.
ELC SHTL	Electronic Shuttle	Touch to jump to the Electronic Shuttle screen.



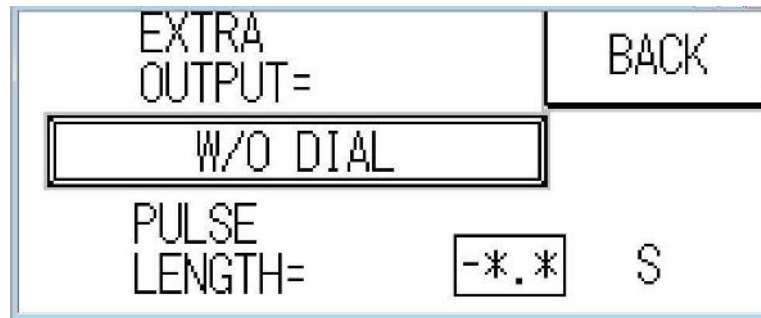
The 2 Color Motion function allows a part slide (or pad slide) to move between two end stops while printing. The pad will come down on the 2nd part location a 2nd time during the cycle without picking up a new image. Use a 2 position single solenoid valve to control an air cylinder. Control this valve with output Y5. Two limit switches must also be wired in parallel to indicate when the printing pad is enabled to come down on the part. Connect these switches to input XB.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
AUTO	Auto	Touch to jump to the Main Auto screen.
BACK	Back	Touch to jump to the previous screen.
OFF	Off	Touch to toggle the Two Color Motion function. The PLC input XB is still active if WITH is selected.
W/O	With/Without	Touch to enable the input and output functionality.
MOVE 2 ND	Move 1 st /2 nd	Touch to toggle between the 2 Color Motion slide moving before or after the first print is completed.



Displays Extra Output options. This function turns on PLC output Y9 in different modes. PLC input X6 is used to verify that the device is in a position for the DIAL selection only.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
DIAL	Dial	Touch to toggle the dial table functionality.
CYCLE	Cycle	Touch to toggle the output to turn on during the cycle.
MORE	More	Touch to jump to the Extra Output Dial screen.
PLS1	Pulse 1	Touch to toggle the output pulse functionality at the beginning of the print cycle for the duration as specified by the Pulse Length in the Extra Output Dial screen.
PLS2	Pulse 2	Touch to toggle the output pulse functionality at the end of the print cycle for the duration as specified by the Pulse Length in the Extra Output Dial screen.
OFF	Off	Touch to turn off any selected function on this screen.



Displays Extra Output option for the Dial.

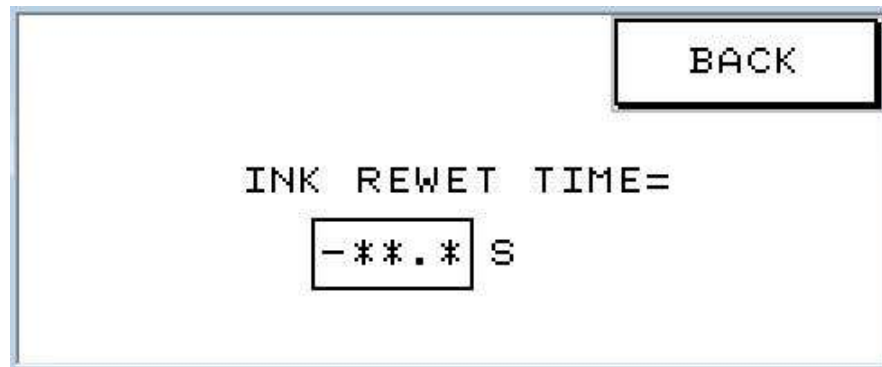
<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
W/O DIAL	Without Dial	When selected, this function overrides the Pulse selections and dedicates PLC output Y9 to that of a rotary dial function. Y9 turns on at the beginning of the print cycle and turns off after the PLC input X6 transitions from off to on. A fault message will occur if the Dial function is selected and input X6 is not "on" when the printer attempts to print on the part.
-*.*	Time Display	Touch the cell to display a numeric keypad where the pulse length time between cycles can be changed. Min. value = 0.1s, Max. value = 5.0s Push ENT. after inputting value on keypad.

PAD CLEAN=		BACK
OFF	W/O	REWET
INTERVAL=		-*****
PULLTIME=		-.*.s

Displays Pad Clean options. This function turns on PLC outputs YB and YC to activate a pad clean air cylinder. The pad cleaner will remain in the out (clear) position until the interval count has been reached. PLC output YB then turns on to bring the tape stop mechanism in to stop the pad ram over the tape plate for the pad to go down onto. The pad goes back up to the top, the pad ram goes back to the front, and the tape stop mechanism returns out to the clear position via output YC. The rewet timer establishes a dwell time with the ink reservoir over the image which allows the image to re-wet before the print cycle takes place.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
OFF	Off	Touch to toggle the Pad Clean function. The PLC input for the tape cleaner is still active if OFF is selected.
W/O	With/Without	Touch to enable the input and output functionality.
REWET	Rewet	Touch to jump to the rewet screen.
INTERVAL	Interval	Touch the cell to display a numeric keyboard where the interval between print cycles and a tape clean cycle can be changed. Min. value = 1, Max. value = 32000 Push ENT. after inputting value on keypad.
PULTIME	Pull Time	Touch the cell to display a numeric keypad where the pull time of the tape advance motor can be changed. Min. value = 0.1s, Max. value = 5.0s Push ENT. after inputting value on keypad.

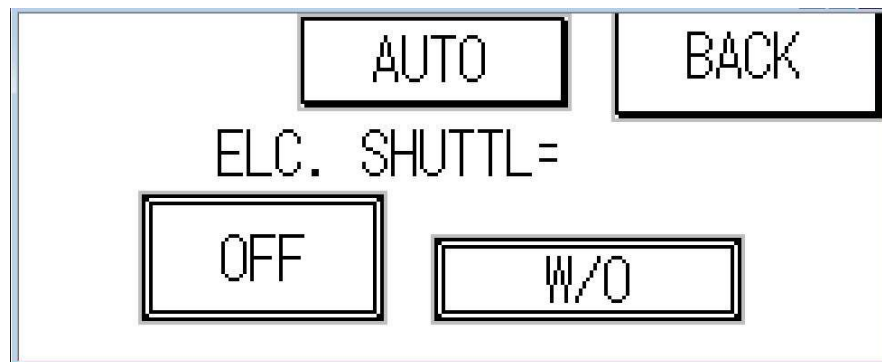
3.4.18 Rewet Time Screen



Displays post tape clean ink rewet delay time change option. This is the time delay that the ink cup will remain static over the image at the completion of a tape clean cycle and before the regular print cycle takes place. Adjust to allow the dried ink in the etched plate to rewet itself to a point where all of the ink can be transferred to the printing pad during pickup.

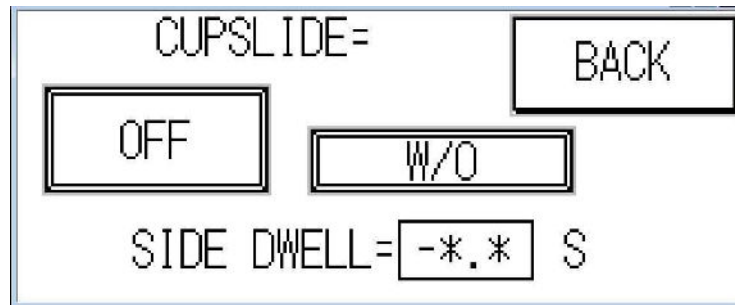
<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
Ink Rewet Time	Rewet	Touch the cell to display a numeric keyboard where the rewet can be changed. Min. value = 0.1, Max. value = 9.9 Push ENT. after inputting value on keypad.

3.4.19 Electronic Shuttle Screen



Displays Electronic Shuttle options. This function turns on PLC outputs Y300-Y304 on the additional PLC expansion module to control an IAI electronic shuttle. This moves the part from the left load side to the right to where each position can be freely programmed for printing. See the 9185-02-000 manual for instructions.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
AUTO	Auto	Touch to jump to the Main Auto screen.
BACK	Back	Touch to jump to the previous screen.
OFF	Off	Touch to toggle the Electronic Shuttle function. The PLC inputs for the shuttle are still active if OFF is selected.
W/O	With/Without	Touch to enable the input and output functionality.



Displays Cupslide options. This function turns on PLC outputs Y7 and Y8 to reciprocate an air cylinder continuously. The ink reservoir that is reciprocated over a cliché will reach an end of travel, dwell for an inputted amount of time, and then reciprocate and dwell indefinitely. This continues until a print cycle is initiated by the operator, or a safety circuit is compromised. The cupslide waits on whichever side it finds itself until the pad ram assembly is back at the front switch or printing down on the part.

<u>Display/Softkey</u>	<u>Function</u>	<u>Result</u>
BACK	Back	Touch to jump to the previous screen.
OFF	Off	Touch to toggle the Cupslide function. The PLC inputs for the cupslide are still active if OFF is selected.
W/O	With/Without	Touch to enable the input and output functionality.
SIDE DWELL	Side Dwell	Touch the cell to display a numeric keyboard where the dwell time on each side can be changed. Min. value = 0.1, Max. Value = 5.0 Push ENT. after inputting value on keypad.

4. Operation

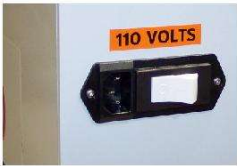
4.1. Startup



1. Verify ink cup drive fingers are down and engaged into ink cup(s).
-release handles must be rotated so they fall down into their slots.
Note: The bottom of the plungers should never touch the bottom of the slots. The downward force is only supplied by the magnet assembly.



2. Close guard doors
3. Connect main air connection to machine.



4. Turn on main disconnect switch.



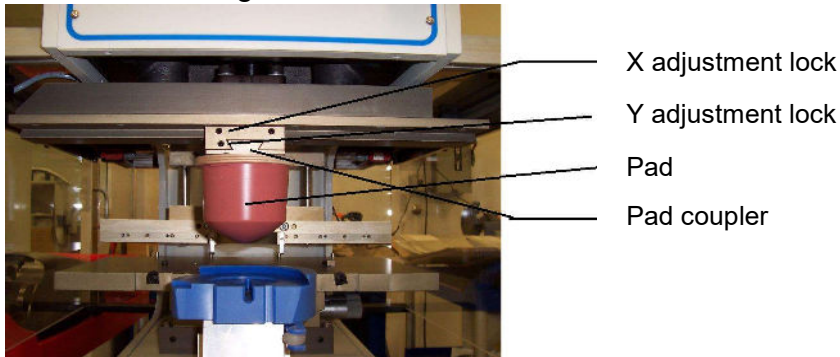
5. Release the Emergency Stop button.



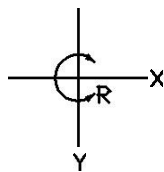
6. Push the Cycle Start button to turn on main air valve.

4.2 Preparing to Print

4.2.1 Mounting the Pad



Attach a suitable pad to the pad coupler using flat head wood screws for wood back pads or flat head cap screws for aluminum back pads.



X, Y and R adjustments (viewed from above part, standing in front of and facing the machine).



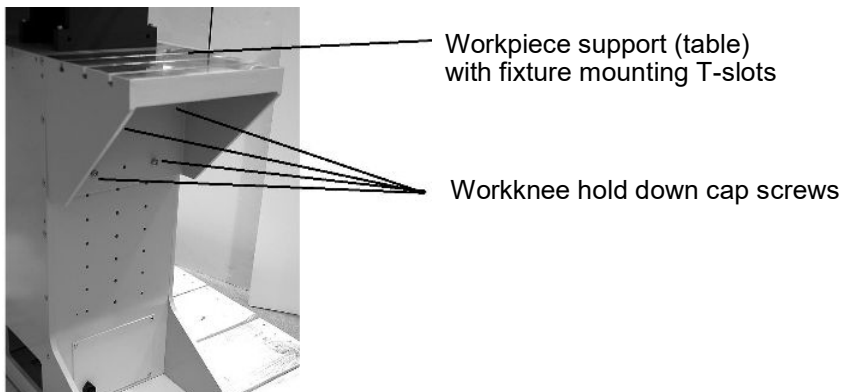
The pad adjustment in the X and Y directions is used to adjust the position of the pad over the image on the cliché. The *Pad Slide Stop* is used to adjust the position of the image in the Y direction on the part. The X-R adjustments on the optional XR Table cliché holder are used to adjust the position of the image in the X and Radial directions on the part.



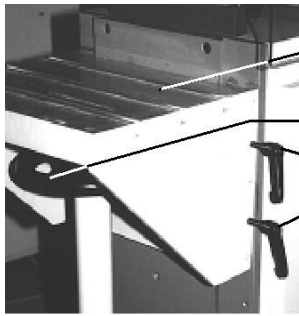
When setting up and adjusting the pads, care must be taken to ensure that the pad or coupler is not positioned within the limits of the cup travel. Verify that the pad will clear the cup when in the full back position prior to cycling the machine. Failure to do so may allow the pad and/or pad coupler to contact the cup with enough force to damage the cup and machine.

4.2.2 Workpiece Support

The Workpiece support can be adjusted by removing the 4 cap screws under the top and carefully pulling the workknee forward so that the dowel pins are free of the front mounting plate. Insert the workknee into the desired set of dowel holes and insert the 4 cap screws back into the workknee and fasten to the mounting plate.



Optional Infinitely Adjustable Workpiece Support below:



Workpiece support (table)
with fixture mounting T-slots

Table height adjusting wheel

Table lock



Lock the table before printing. Failure to
do so may result in print distortion.

4.2.3 Flow Controls



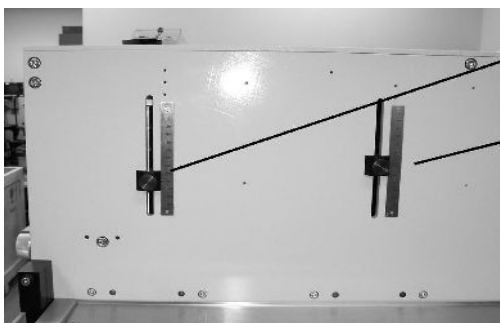
The **Flow Controls** are used to adjust the speed of the
pad ram movement.

- ◆ Turn clockwise to decrease speed.
- ◆ Turn counterclockwise to increase speed.

4.2.4 Pad Stroke

The **Pad Stroke** adjustments are used to adjust the compression of the pad at
the cliché and part.

- ◆ The upper pad stroke limit is fixed.
- ◆ Adjust the stroke until the pad is compressed just far
enough to pick up or release the entire image. Too
much compression will cause the image to distort.



Adjustment for pad stroke (lower limit)
over part.

Adjustment for pad stroke (lower limit)
over cliché.

4.2.5 Assembling the Doctor Cup and Cliché



Before operating the printer, the air supply must be on, the main disconnect switch must be on, E-Stop must be reset and the front and side guards must be closed.

◆ If the front or side guards are opened while the printer is running, the printer will stop immediately. The guards must be closed before printer operation can resume.

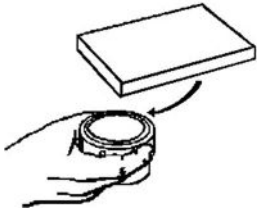
◆ If a printer or automation error is detected, the printer will stop immediately (see *Machine Alarm Messages and Troubleshooting Guide* [pages 32](#)). The fault condition must be corrected before printer operation can be resumed.

1. Turn on the air supply to the printer.
2. Switch on the main disconnect and press the Start button to initialize the control and enable the air supply.
3. Make sure that the cup driving pins and cliché holder are assembled and locked in position.
4. Verify that the doctor stroke hole matrix is set for the cup size that will be installed ([see chart on page 27](#)).
5. Press the MANUAL button then press the RAISE CUP button to raise the cup driving frame and driving forks.
6. Open the safety guard.
7. Fill the first ink cup with properly thinned and mixed ink to an adequate level. Verify the ink consistency before mounting to the cliché. For normal production requirements, fill the cup with ink until the magnets are just covered. Fill Express Liner to the bottom of the doctor ring if using SpaceFrame.



If using a steel foil or plastic cliché, care must be exercised to ensure that the magnet plate (used to hold the cliché) and the bottom of the cliché are clean and free from burrs before assembly and that the cliché is properly positioned over the locating pins. (Ask your sales representative for a copy of instruction "How To Mount Clichés On Magnet Plates" if further explanation is needed.)

8. While holding the cup firmly, place the cup near and parallel to the image end, image side (bottom) of the cliché and place the far ink cup edge onto the cliché until the image is centered in the ink cup. Carefully lower the near side cup edge to the cliché.



Avoid rough handling to prevent accidental separation.

9. Repeat steps seven (7) and eight (8) for each cup to be installed.
10. Turn over the assembled cup(s) and cliché so cup(s) is/are on top. The magnet in the cup will hold the cup and cliché together.

Handling of the Ink Cup



Always protect the doctor ring in the ink cup from being damaged.

If stored separately, place the ink cup in the protective plastic shipping container.

Rotate the cup frequently (steel cliché 2 hrs., polymer cliché 1 hr.) while in operation.

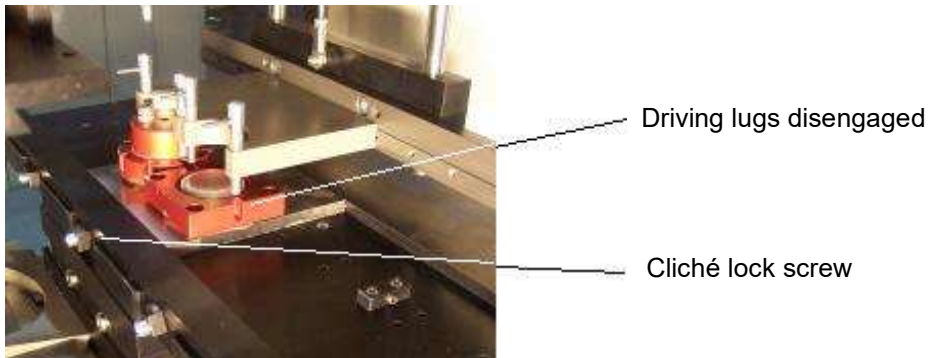


WARNING

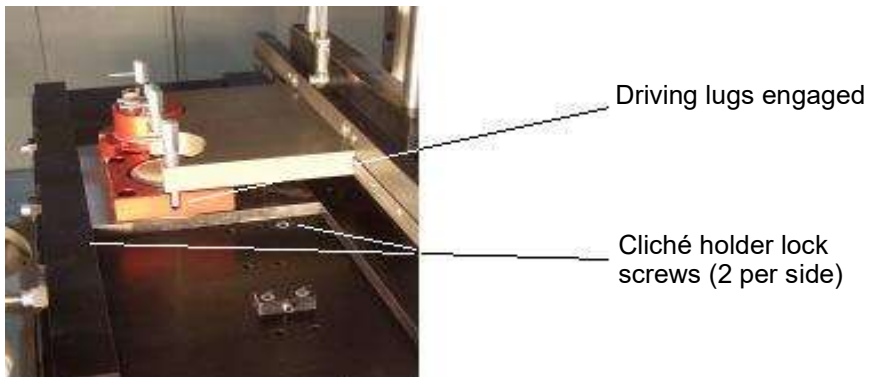
The doctor ring has a very sharp edge that may cause personal injury if improperly handled.

PLEASE HANDLE WITH CAUTION!

11. Turn over the assembled cup(s) and cliché so cliché is on bottom. The magnet in the cup will hold the cup and cliché together.
12. Set the cup and cliché assembly in the cliché holder and push cliché against the left side and rear stop pins.



13. Tighten the cliché locking screws to secure the cliché in the cliché holder.
14. Rotate the cups and position them until the grooves in the cups are aligned with the lugs on the forks.
15. Close the safety guards.
16. Push the RAISE CUP button to engage the driving fork lugs into the grooves.



17. If forks do not lower completely, press *RAISE CUP* button to raise forks, open the guard and repeat steps fourteen (14) through sixteen (16).
18. Press *BACK* button to return to print mode.
19. Mount pad(s) and adjustable coupler to pad bar ([see page 20](#)).
20. The machine is now ready to adjust for printing ([see page 20](#)).

4.2.6 Dismantling of Doctor Cups and Cliché

1. Stop machine at the end of print cycle by pressing *STOP* pushbutton or by deselecting *Continuous Cycle* ([see page 10](#)).
2. Press *Manual* touch cell.
3. Press *Cup Holder Up* touch cell to raise cup driving forks.
4. Open safety guard.
5. Loosen cliché locking screws.
6. The cliché and cup and/or SpaceFrame assembly can now be removed carefully from the machine.
7. Turn over the cup and/or SpaceFrame and cliché assembly so cliché is on top. The magnet in the cup and/or SpaceFrame will hold the cup and cliché together.
8. While holding the cliché firmly, slide the cup and/or SpaceFrame off the edge of the cliché. The sliding motion will strip the remaining ink from the cliché.
9. Repeat step eight (8) for each cup and/or SpaceFrame.

5 Guidelines for Operating the Printer

Following is a general guideline for setting up and operating your pad printing machine. Your application may require a different procedure. Please contact Trans Tech to arrange specific training.

1. Verify that machine is connected to adequate air supply and that the regulator is adjusted to the proper pressure ([see page 6](#)).
2. Check general condition of machine and ensure proper operation of safety doors. Repair or replace any components found to be defective.
3. Prepare and install the ink cup(s) and cliché (see page [23](#)).
4. Install suitable pad(s) ([see page 20](#)).
5. Mount suitable Workpiece holding device to table ([see page 20](#)).
6. Close all safety doors.
7. Select *MANUAL* and press the *JOG* touch cells to move the slide to the rear position.
8. Press the *JOG DOWN* touch cell to pick up the image from the cliché with the pad.
9. Adjust pad stroke limit ([see page 21](#)) to compress the pad over the image on the cliché just enough to pick up the whole image. Press the *JOG DOWN* button to jog pad down while making adjustment.
10. Adjust the pad position as required over the image so the center of the pad is near the center of the image but that the actual tip of the pad is not directly in the image.
11. Press the *JOG* touch cell to move the slide to the forward position.
12. Press the *JOG DOWN* touch cell to transfer the image from the pad to the Workpiece.
13. Adjust the height of the Workpiece table ([see page 20](#)) and the position of the pad stroke limit ([see page 21](#)) to compress the pad on the Workpiece just enough to release the whole image.
14. If desired, the machine cycle can now be verified in single step mode by pressing the *JOG* button. The machine will execute one step for each time the button is pressed. Adjust the speed of the print cycle by adjusting flow controls ([see page 7](#)). "Option" selected devices will not jog.
15. Press the *BACK* touch cell to return to print mode. Select the desired operating modes by pressing the *CONTINUOUS* touch cell and/or *INCREASE # OF PRINT* touch cell in the Printer Setup screen if so required. Press *START* or the footswitch to initiate the print cycle. Press the *CONTINUOUS* touch cell or the *STOP* button to stop the print cycle. The printer will stop at the end of the cycle in the home position (see footswitch operation on [page 8](#)).

6 Options Notes

6.1 Cupslide

The cupslide can be installed on the printer by first removing the cliché holder and risers, or the optional XR table and risers. The cupslide will straddle the printer and be positioned via the side saddle set screws. Align the front-to-back cupslide position so that the center of the cupslide cliché plate is centered under the middle of the pad ram when the pad ram is in the back position.

The cupslide can be locked down via two M8 cap screws on the inside of the Orion frame which are threaded into the bottom of the cupslide.

If the cupslide is installed, the PLC outputs for Printer Fault will no longer react as those functions, but will control the cupslide valves instead.

A cupslide “Blocking Valve” is also installed in the inside of the printer to disable the Orion pad ram from moving backwards unless the cupslide is stopped at either side on a proximity switch. This is wired into output Y6.

The Stop key can be used to force the cupslide to go to the left side if it does not move in certain situations. The cupslide must first be selected as “Installed” via the software. An air piloted valve will then be activated to prevent the “Pad slide to rear” motion unless the cupslide cup is on either side of the cupslide (checked via proximity switches.)

Note: Cycle the main disconnect switch after selecting/deselecting “Cupslide Installed”.

6.2 Two Color Motion

Two color motion can be used to print two different images on something using one image pickup, but two separate pad-down-to-part motions. The printed part will also be moved to the second print location for the second print. One input is used to tell the control the fixture is in either position. The output will turn on a 2-position single spring return valve during one of the prints.

7 Cliché Sizes

Cup Diameter Standard Pitch Standard Cliché Depth		Required Cliché Length
60 mm Cup	1 Color	80 mm
3 1/8" pitch	2 Color	150 mm
150 mm deep	3 Color	250 mm
	4 Color	350 mm
	5 Color	400 mm
90 mm Cup	1 Color	125 mm
5" pitch	2 Color	250 mm
250 mm deep	3 Color	400 mm
	4 Color	500 mm
130 mm Cup	1 Color	150 mm
6 1/4" pitch	2 Color	350 mm
300 mm deep	3 Color	500 mm

60mm cup cliché plate spacers
(narrow in front, wide in rear)



130mm cup - no spacers required

90mm cup cliché plate
spacer (rear only)

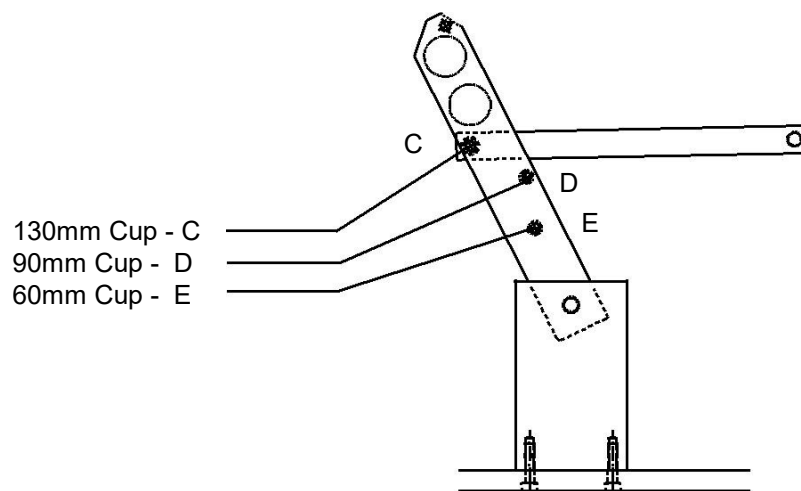


8 Change Over

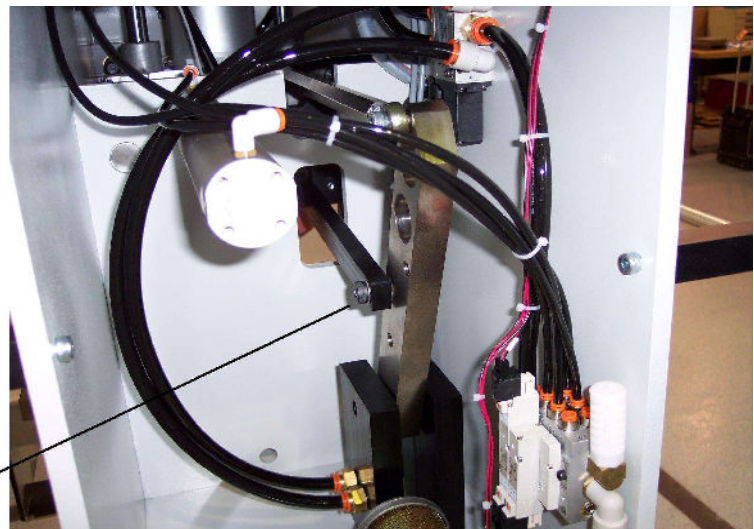
The ink cup doctor stroke is set for the selected cliché depth by fastening the drive bolt to the threaded linkage holes as shown in the following chart. Use an 8mm allen wrench on the drive bolt.

DRIVE BOLT PLACEMENT

130mm Cup - C
90mm Cup - D
60mm Cup - E



Drive Bolt

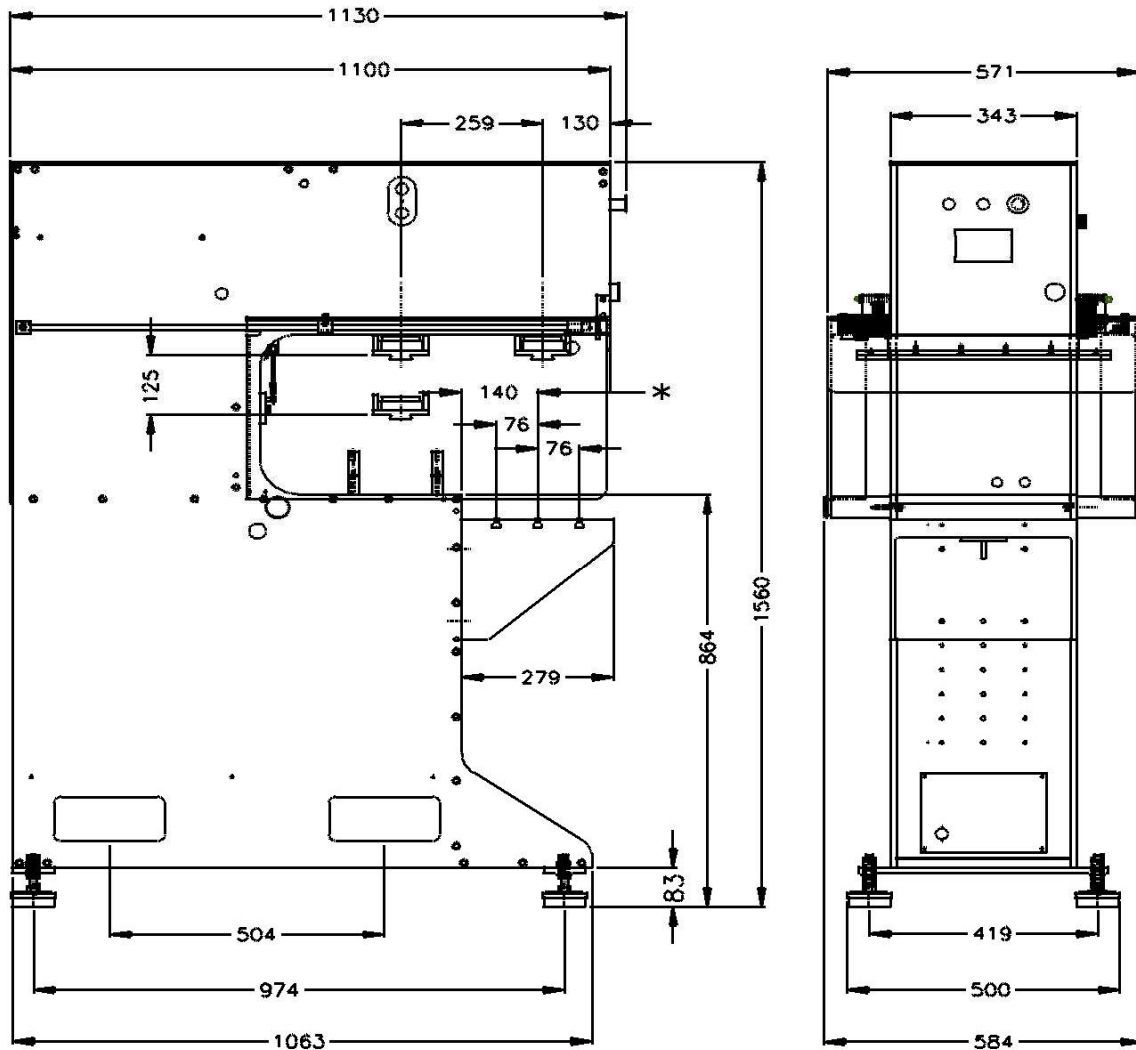


9 Technical Information

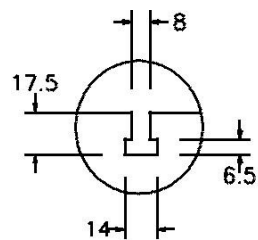
9.1 Printer Specifications

Single Cycle	Yes
Multiple Cycles	up to 4 prints per print cycle
Continuous Cycle	Yes
Parts Counter	Up-count 6 Digit / Reset
Machine Cycle Rate Indicator	Cycles/min.
Infinitely Variable Speed	Yes
Ink Cup Diameter	60mm, 90mm, and/or 130mm
Maximum Print Diameter	115mm (for 130mm cup)
Cliché Size	150mm x 500mm
Cycles per Hour	1500 max. continuous, stroke set @ ~ 50mm
Pad Print Delay	0.0 to 5.0 sec.
Pad Pressure	1100 pounds of force at 90 psi
Drive	Pneumatic
Power	.4A @ 120VAC (range is 100-240VAC)
Control Voltage	24VDC
Control System	Programmable LOGIC Controller: -24 VDC, 24 I/O'S -Inputs wired for sourcing (PNP), Outputs dry contacts - System expandable by 1 expansion unit (16 I/O's) - Programmable via PC
Machine Weight	approx. 1040 lbs.

9.2 Printer Dimensions



* DIMENSION EQUALS 142mm FOR
ADJUSTABLE KNEE ASSEMBLY



* Highest workknee position 200mm
Lowest workknee position 517mm

VIEW "A"
SCALE 4:1

10 Maintenance

10.1 Wire Termination

The machine is equipped with screwless wire terminals. When connecting or disconnecting wires, please refer to the illustrations below.

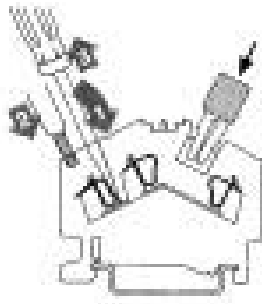


Illustration: 2- Wire Insertion/removal Diagrams

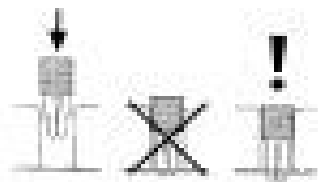


Illustration: 2-7. Jumper Insertion Diagram

10.2 Lubrication Schedule

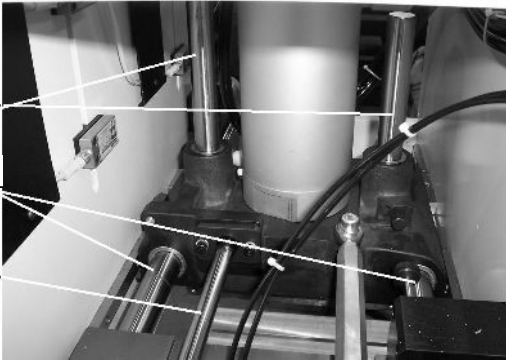
Lubricate the following items with light machine oil such as Mobil Oil Corp. DTE 25 every 50 hours of operation:

Note: Temperature and humidity controlled areas can increase the lubrication interval as per inspection.

Pad ram shafts

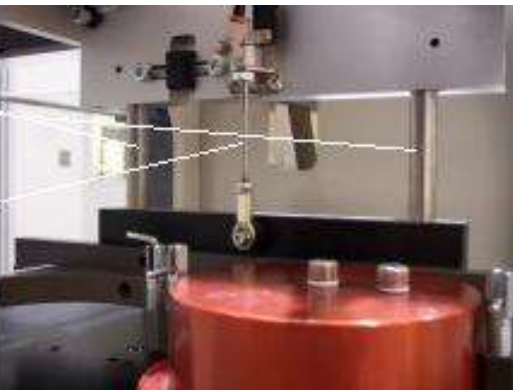
Doctor slide shafts

Doctor slide cylinder rod



Lift block shafts

Lift block cylinder rod



10.3 Preventative Maintenance Schedule

Description	Maintenance required:	Frequency
Water Trap	Check for accumulation of water. Drain if required. See section 2.5 photo.	Every 8 hours of operation
Pneumatic Components	Check for air leaks. Tighten connections, repair or replace components as required	Every 8 hours of operation
Safety Guards	Test for proper function. When opening any guard, the machine should stop immediately. Repair all defective guards and switches	Every 8 hours of operation
E-stop	Test for proper function. When pressing the E-stop pushbutton, the machine should stop Immediately. All machine functions are disabled	Every 8 hours of operation
Controls	Test for proper functions. Test all buttons for proper machine functions	Every 8 hours of operation
Doctor Slide and Pad Ram	Clean slides of all ink and other residue. Ink and residue build up in the area of the guide rails may lead to excessive friction and premature failure. See section 10.2 photo. Inspect guide rails for wear. Oil guide rails with a light machine oil.	Every 8 hours of operation Every 50 hours of operation
Air Filter	Remove and clean filter element inside of air regulator bowl with alcohol. Replace if needed. See section 2.5 photo.	Every 2000 hours of operation (dirty plant air may necessitate more frequent changes)

10.4 Troubleshooting Guide

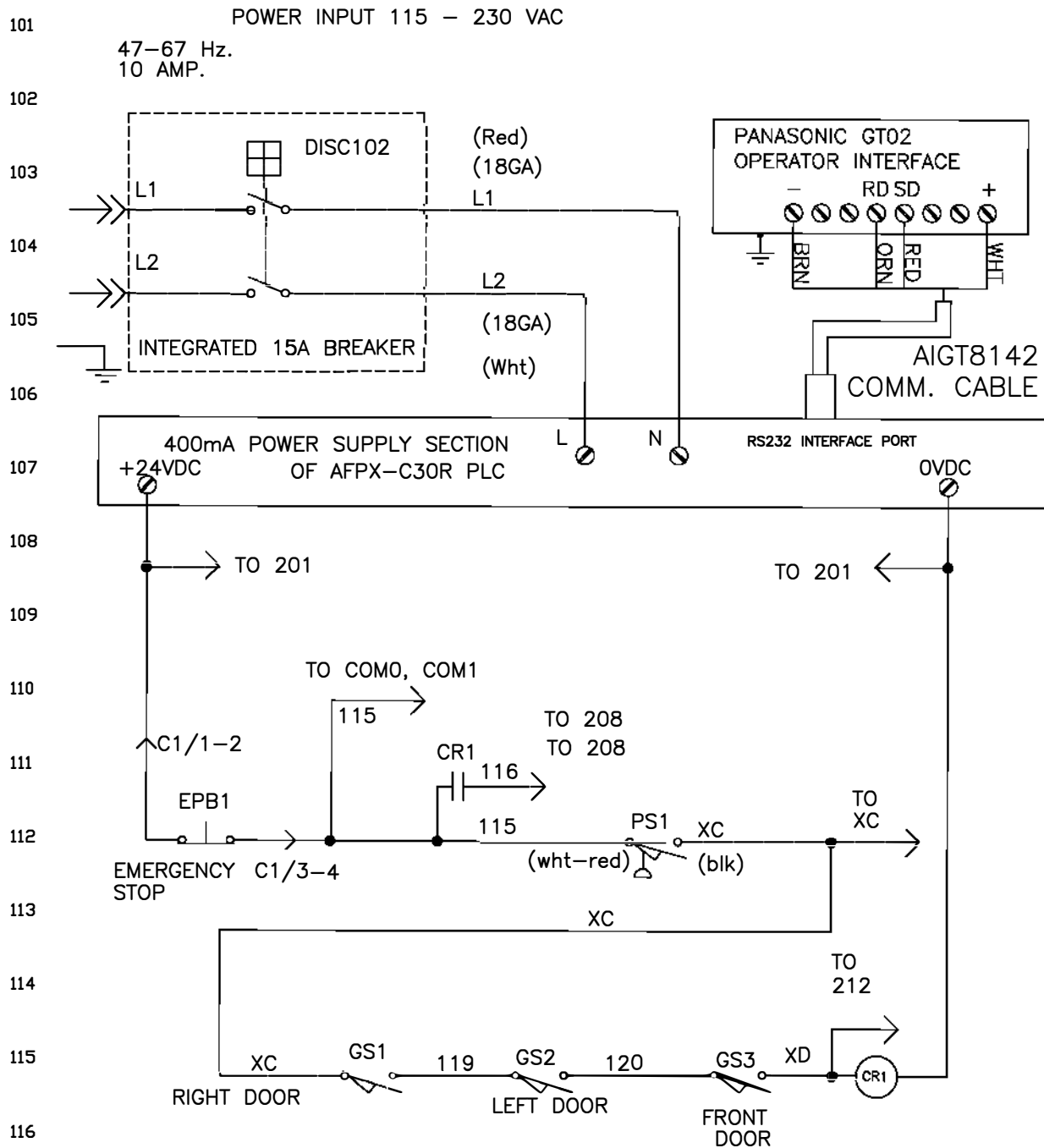
All of the below possible causes have related fault messages displayed on the front operator display. These are the more common faults that may occur. Always check the screen display for the actual fault message.

Symptom	Possible Cause	Remedy
Machine won't cycle	Low or no air pressure	Provide clean, dry air of at least 90 psi
		Adjust system pressure regulator to 85 PSI
	Machine in MANUAL mode	Press BACK button
	Guard door(s) not closed	Close all guards
	Pneumatics not initialized	The E-Stop button must be released and the Start button must be pressed once to initialize the pneumatics after applying power
	Automation not in position	Check automation - reset if needed. Check input X6 on PLC - should be high (24vdc)
Print cycle not completed	Low air pressure	Adjust air pressure regulator to 85 psi
Machine cycle too slow	Automation not in position	Check automation - reset if needed.
	Pad stroke too long	Raise work table
		Use taller pad
	Flow controls set too slow	Turn flow control knobs counterclockwise to increase speed
	Print cycle delay enabled	Decrease time or disable print cycle delay
	Pad delay enabled	Decrease time or disable pad delay
	Air volume/pressure too low	Service air filter
		Verify adequate air supply
		Adjust system pressure regulator to 85 psi

10.5. Fault Messages

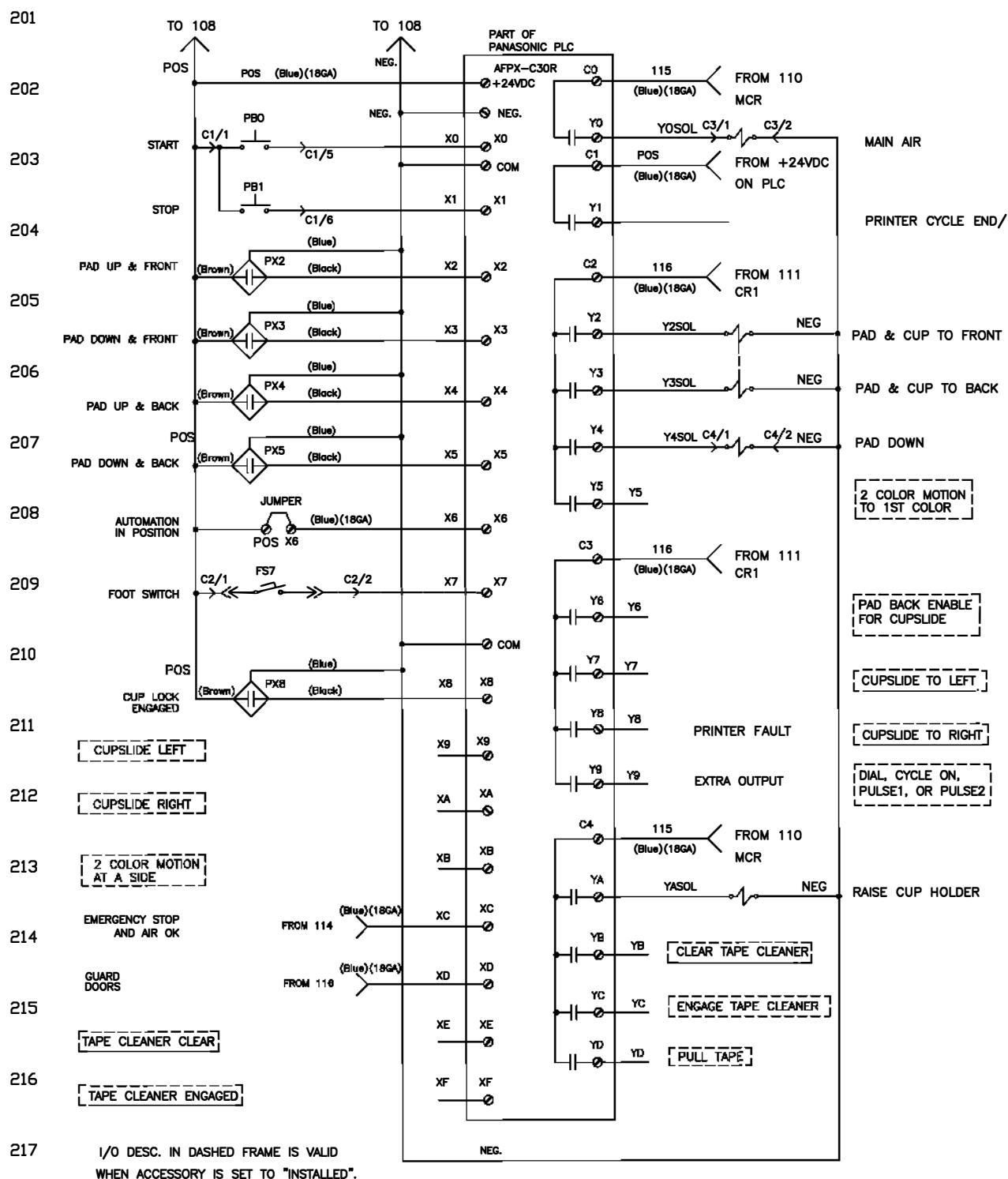
Value(Hex)	Fault Message	Action
0	(none)	none
1	Estop pushed	Pull Estop to release
2	Guard door open	Close guard door, clear light curtain
3	Pad Safety, not in position	Jog table into pos, spd table up or slow printer down
4	Batch count reached	Reset or turn off Batch Counter in Setup screen Push
5	Push "START" for air on	start button
6	Push "START" to reset	Push Start or Stop button
7	Finish tape cycle w/Start key	Push Pad Clean in Manual screen
8	Cup holder up	Lower cup holder in manual mode
21	Prox. X2 off or sol Y2 stuck on	Check pad front/up switch
23	Prox. X2 on or sol Y3 stuck off	Check pad front/up switch
24	Prox. X2 on or sol Y4 stuck on	Check pad front/up switch or pad ram valve
25	Prox. X3 off or sol Y3 stuck on	Check pad front/down switch
26	Prox. X3 on or sol Y4 stuck off	Check pad front/down switch
27	Prox. X4 off or sol Y4 stuck off	Check pad back/up switch or pad ram valve
28	Prox. X4 off or sol Y3 stuck on	Check pad back/up switch
29	Cupslide not at either side	Check pad back/up switch or pad forward/back valve
30	Prox. X4 on or sol Y2 stuck off	Check pad back/down switch
31	Prox. X5 off or sol Y4 stuck on	Check pad back/up switch or pad ram valve
32	Prox. X4 on or sol Y4 stuck on	Check tape clean out valve and switch Check
33	Prox. XC on or sol YF stuck on	tape clean out valve and switch
34	Prox. XC off or sol YF stuck off	
35	Spare T153	
36	Spare T150	
37	Prox. XB off or sol Y5 stuck off	Check pad slide left/right valve and switches
38	Prox. XB on or Y5 stuck on	Check pad slide left/right valve and switches
39	Prox. XB off, Y5 stuck on	Check pad slide left/right valve and switches
40	Prox. XB on, Y5 stuck off	Check pad slide left/right valve and switches
41	Spare T145	
42	Spare	
43	Spare	
44	Spare	
45	Prox. XA off, Y7 on	Check tape cleaner in switch, or in/out valve
46	Prox. XA on, Y7 off	Check tape cleaner in switch, or in/out valve
47	Cup not locked, X8	Check cup lock switch
48	Cupslide Still at Right Side	Check Cupslide at Right switch, or valve Y7
49	Cupslide not at Left Side	Check Cupslide at Left switch, or valve Y7
50	Cupslide Still at Left side	Check Cupslide at Left switch, or valve Y8
51	Cupslide not at Right Side	Check Cupslide at Right switch, or valve Y8
52	Elc Shuttle not Homed, Input X300	Check elc. shuttle "Homed" output to input X300
53	Elc Shuttle not Home, Input X301	Check elc. shuttle home position output to input X301
54	Elc Shuttle not in Position, Input X302	Check that the elc. shuttle was able to physically reach its destination position when it then outputs the signal to input X302.
55	Tape Cleaner not out – Prox XF on or Sol YB not on	Check tape cleaner in switch, or in/out valve
56	Tape Cleaner not out – Prox XE off or Sol YB off	Check tape cleaner in switch, or in/out valve
57	Tape Cleaner not in - Prox XE on or Sol YC off	Check tape cleaner out switch, or in/out valve
58	Tape Cleaner not In – Prox XF not on or SOL YC off	Check tape cleaner out switch, or in/out valve

10.6 Electrical Schematic – Page 1 of 2



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	-	RS	5/06	INITIAL RELEASE		
	REV	BY	DATE	DESCRIPTION	DATE	
		RS			3/1/07	
	ASSY NO.			SHEET	REV.	
	9211-80-001M			1 OF 2	F	
					SYSTEM NAME	ORION 130 VER. 2 NEW IO
					ASSY NAME	POWER WIRING
					CUSTOMER NAME	STANDARD

10.6 Electrical Schematic, con't – Page 2 of 2



F	RS	12/17	GTO2 AND NEW IO
-	RS	5/06	INITIAL RELEASE

REV	BY	DATE	DESCRIPTION		
DRAWN BY			DATE		
RS			3/1/07		
ASS'Y NO.			SHEET	REV	
9211-80-002M			1 OF 2	F	

SYSTEM NAME	ORION 130 VER. 2 NEW IO
ASS'Y NAME	I/O WIRING
CUSTOMER NAME	STANDARD

10.7 Pneumatic Schematic – Page 1 of 1

