Staged Board Handling
Assembly
T46102003 Rev. H
11-03 tcs,kk, stb
This document supports
46102003 Rev G
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T46102003 Rev. H  Staged Board Handling Assembly

This Document Supports Assembly 46102003 Rev. G

SEE DETAIL A

DETAIL A
SCALE 1/2
Notes

1. Attach to both bearing blocks.
2. Do not put 80027002 under drive pulley.
3. (Deleted)
4. Remove set screw in timing pulley prior to installing hex shaft, then reinstall set screw.
5. Install in front set of holes
6. Locate valves 46314601 behind the console I/O (toaster) boxes. Locate the Sensor PCB Assy 46184501 with 80029804 under the center bay of the upright casting and connect the sensors to 1PL thru 5PL.
7. Apply 1 - 1.15 lbs to set timing belt tension.
8. Apply 6 - 8 lbs to set transfer belt tension.
9. Belt to deflect 1/16" on center with 2 oz of force.
10. Bag & attach detail #s 29, 31, 34, 35 and Det. 15 Qty 12.
11. Remove adhesive backing from the label. Locate and place the label per dimensions.
12. Remove existing hose in Board Handling Air Cylinder. Connect Fitting (45360302) to Board Handling Air Cylinder and Board Handling Hose to Fitting.
13. Set flow controls so that the retract and extend stroke of Cylinder is .400SEC.
14. Position the Support Brackets, 46445402 and 46445502, onto the Board Handling Assembly Rails and secure each with two screws, 80052204.
15. Connect the pneumatic tubing, 40835912, to the Board Support pneumatic cylinders and Board Clamp cylinders as defined in the pneumatic diagram (of this document).
16. Remove fixed orifice, closest to the Actuator Arm in each of the Board Handling Clamp Cylinders.
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**USED BUT NOT SHOWN ITEMS**

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Staged Board Handling Assembly

Functional Description

The Staged Board Handling assembly allows simultaneous transfer and staging of multiple P.C. boards, thereby increasing machine throughput. It accepts boards from the input conveyor, transports the board to the placement location, clamps and secures the board in position, and allows other boards to be transported out of, or into, the machine while the primary board is being populated.

Maintenance Concept

The following table defines the recommended maintenance concept for this assembly. For a more detailed explanation of the Maintenance Concept and its structure refer to the Prerequisite Information/Introduction module.

<table>
<thead>
<tr>
<th>Maintenance Procedures</th>
<th>Recommended Frequency</th>
<th>Minimum Skill Required</th>
<th>Spares Kit Required</th>
<th>Tool Kit Required</th>
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<td>Converting from 5mm to 3mm Edge Clearance</td>
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<td>Maintenance Technician</td>
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<td>Maintenance Technician</td>
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<td>2&quot; Board Setup</td>
<td>As Required</td>
<td>Maintenance Technician</td>
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Procedures and Adjustments

Adjustments and corrective maintenance procedures required of the customer are presented in the following subsections.

Board Handling Calibration (OS/2 UPS)

Preliminary Checks:

- Sensors are turned fully clockwise to insure maximum sensitivity.
- Board staging is adjusted to .800 in.
- Board transfer hesitation is nonexistent. (Hesitation could be the sign of a tight spots within the rails of the board transfer system.)

If any one of these items are incorrect, set to the correct dimensions then repeat all three steps.

- Customer board transfers in and stops .250 in. from the board stops before driving to its final location against the board stops.

If the customer board transfer distance is incorrect then proceed with the following steps for Calibration of the Board Handling System. If the transfer distance value is correct then discontinue this procedure.

1. Adjust the transfer rails to the width of the Calibration plate.
   a. Select the System Setup icon and click on the Machine menu bar heading.
   b. Select the Setup menu option.
   c. Select the Zero Axes menu option. (A message is displayed indicating the Platform is automatically going to be placed in setup mode.)
   d. Click the Yes push button. (A message is displayed indicating that zeroing is complete) and select OK.
   e. Select the Production Control icon.
   f. Select the Manual Control menu bar heading.

If the operator is located at the rear of the GSM, select the rear button in the Manual Control window.
g. From the Device list box, select PWC.

h. From the increment list box, select the desired increment to move the rail to the width of the calibration plate + .020 in.

i. Select the Exit menu bar heading.

j. Palm down the Platform.

k. Open the Platform cover.

l. Remove the board support pins.

m. Physically place the calibration plate approximately 1” to the right of the board stops.

2. Use discrete I/O to "Fire up" the board stops.

a. Palm up the Platform.

b. Click on the Machine Status icon and select the Diagnostics menu bar heading.

c. Click on the Discrete I/O menu option.

d. Select the Board Handling menu option. From the Select Outputs box, choose BOARD_STOPS_LANE1.

e. Select the Set Outputs push button. (A message is displayed indicating that the Platform will placed into DIAGNOSTIC MODE.) Select the Yes push button to continue.

f. Push the calibration plate against the board stops.

g. Select Exit.

3. Measure the accuracy of the board handling system.

a. Close the Platform cover and push the start button to enable the axes.

b. Select the System Setup icon.

c. Select the Machine menu bar heading. Click on the Setup menu option.

d. Click on the Camera menu bar option.

e. Set the Device to PEC camera Beam 1. (PEC camera Beam 2 for Dual Beam Platform).

- Set Default light level for OUTER RING = 25

- Set Default light level for INNER RING = 25
f. Push *Activate* button.

g. Push *Manual Control* button.

h. Set the GSM to Beam 1 X/Y (Beam 2 X/Y for dual Beam) and move the head until the cross-hairs line up with the right edge of the CAL part holder.

i. Select *Board Transfer* and move the board to the right 11.3 inches.

j. Set the device to Beam 1 X/Y (Beam 2 X/Y for dual Beam) and move the head to the right 11.3 inches.

4. Measure the difference between the movement of the head and the movement of the board.

   a. While still in *Manual Control* set device to Beam 1 X/Y (Beam 2 X/Y for dual Beam) and move in increments of .100 and .010 until the cross-hairs are aligned with the original starting location.

   b. Multiply this additional movement by 200.

   \[ \text{ex.} \, .120 \times 200 = 24 \]

5. Set the new value into the Platforms System Parameters:

   a. Click on the *System Setup* icon.

   b. From the *Machine* menu bar heading, select the *Configuration* menu option.

   c. Select the *Parameters* menu bar heading.

   d. Click on the *Axes* menu option. The Axis Parameter Configuration box is displayed.

   e. Select *Transfer Belts Axis* from the Axis choice group box.

   f. Select *Conversion Factor 2 Parameter* from the Constant Values group box.

   g. Change the Conversion Factor 2 by the number achieved in step 4b.

   -Subtract this value from the current value if you had to move the head left to achieve your final alignment.

   -Add this value from the current value if you had to move the head right to achieve your final alignment.
h. Select **Save** push button. (A message to cycle machine power is displayed.)

i. Select the **OK** push button.

6. Close all UPS windows and any other applications.

7. Palm down the Platform.

8. Power down the Platform.

9. Remove calibration plate from the Platform.

10. Wait six seconds and power up the Platform.

---

**Board Handling Calibration (Windows UPS+)**

Preliminary Checks:

- Sensors are turned fully clockwise to insure maximum sensitivity.

- Board staging is adjusted to .800 in.

- Board transfer hesitation is nonexistent. (Hesitation could be the sign of a tight spots within the rails of the board transfer system.)

---

**NOTE**

If any one of these items are incorrect, set to the correct dimensions then repeat all three steps.

---

- Customer board transfers in and stops .250 in. from the board stops before driving to its final location against the board stops.

---

**NOTE**

If the customer board transfer distance is incorrect then proceed with the following steps for Calibration of the Board Handling System. If the transfer distance value is correct then discontinue this procedure.

---

1. Install the Calibration Plate.

   a. From the UPS+ Control Panel, select the **Zero** icon to zero the Platform.

   b. From the UPS+ Control Panel, select the **Setup** tab. Select **Manual Control**, the Manual Control dialogue box displays.

   c. Select the **Board Handling** tab.
d. Increment the spacing of the rails to the width of the calibration plate + .020 inches. Palm down the machine.

e. Open the Platform cover, and remove the board support pins.

f. Place the calibration plate approximately 1 inch to the right of the board stops.

g. Palm up the machine. Using discrete I/O, actuate the board stops to the UP position. Refer to the Discrete I/O Help Topic in the Voyager Information Browser.

h. Open the Platform cover and slide the calibration plate against the board stops.

2. Measure the accuracy of the Board Handling System.

   a. Close the Platform cover, and push the START button to enable the axes.

   b. From the UPS+ Control Panel, select the Setup tab. Select Manual Control, the Manual Control dialogue box displays.

   c. Select the Cameras tab. Set the PEC Beam 1 light level for both the inner ring and outer ring for 25 (Beam 2 for Dual Beam machines).

   d. In the Manual Control dialogue box, select the Beam 1 tab (Beam 2 tab for Dual Beam). Move the head until the cross hairs line up with the left edge of the CAL part holder.

   e. Select the Board Handling tab, and move the board to the right 11.3 inches.

   f. Select Beam 1 (Beam 2 for Dual Beam machines) and move the head to the right 11.3 inches.

   g. While still in Manual Control, move Beam 1 (Beam 2 for Dual Beam machines) in increments of .100 and .010 until the cross hairs are again aligned with the left edge of the CAL part holder.

      Multiply the additional movement by 200.

      example: .120 x 200 = 24.

3. Set the new value into the Platform System Parameters.

   a. From the UPS+ Control Panel, select the Setup tab. Select Machine Configuration, the Machine Configuration dialogue box displays.

   b. Select Parameters>Axes. In the Axis Choice group box, select Transfer Belts.
c. Select *Conversion Factor* 2 from the Constant Values group box.

d. Change the Conversion Factor 2 by the number achieved in step 2h.

- Subtract this value from the current value if the head was moved to the left to achieve the final alignment.

- Add this value to the current value if the head was moved right to achieve the final alignment.

e. Select *OK* > *Yes*.

4. Perform a long zero to activate the new axis parameters.
5mm to 3mm Edge Clearance Conversion

The 5mm to 3mm edge clearance conversion is to allow for additional board surface area population (if required). The 5mm to 3mm edge clearance conversion must be simultaneously performed at all rail subassemblies of the Staged Board Handling Assembly. To convert from 5mm to 3mm edge clearance (or 3mm to 5mm), perform the following procedure. Refer to the appropriate Assembly Support Documents for details relating the subassemblies of the Staged Board Handling Assembly.

1. Power down the machine and perform Lockout/Tagout according to local procedures.

**WARNING**
The machine must be powered down and the local Lockout/Tagout procedure performed to ensure personal safety during this procedure.

2. Open the Platform front and/or rear cover to access the Staged Board Handling Assembly
3. Remove the six screws and two E clips securing the card clamp on each of the Lift Assemblies and remove the card clamps. Refer to the illustration on the previous page.

4. Remove the four screws securing the card guide on each of the Lift Assemblies.

5. Flip the Lift Assembly card guides over (end-over-end), locate them on the locator pins, and secure them in position with the screws removed in step 4.

6. Reposition the Board Clamps onto the Lift Assemblies and secure them in position with the six screws removed in step 3.

7. Remove the four screws and two E clamps securing the card guide on each Movable Rail Assembly.

8. Lift the card guide from each Movable Rail Assembly (noting the card guide orientation) and relocate each board guard (found at the outside end of the Rail Assemblies) to its outward position for 5mm edge clearance or its inward position for 3mm edge clearance.

9. Flip the Movable Rail Assembly card guides over (end-over-end), locate them on the locator pins, and secure them in position with the screws removed in step 7.

10. Remove the four screws and two E clamps securing the card guide on each Fixed Rail Assembly. (Two of the four screws also secure a Sensor Assembly.)

11. Lift the card guide and Sensor Assembly from each Fixed Rail Assembly (noting the card guide orientation) and relocate each board guard (found at the outside end of the Rail Assemblies) to its outward position for 5mm edge clearance or its inward position for 3mm edge clearance.

12. Flip the Fixed Rail Assembly card guides over (end-over-end) and locate them on the locator pins.

13. Position the Sensor Assemblies on the Rail Assemblies and secure the Sensor Assemblies and card guides in position with the screws removed in step 10. Ensure the longer screws are used to secure the Sensor Assemblies.

14. New axis parameters require you to change the positive soft limit only and add 2000 to the Y offset.

**NOTE**

5mm card guide: parallel alignment should not exceed .030 from end to end.

3mm card guide: parallel alignment should not exceed .020 from end to end.
Transfer Belt Replacement

The Staged Board Handling Transfer Belt may require replacement in the event of severe wear or damage. To replace the Transfer Belt, perform the following procedure.

**NOTE**
The transfer belts must be replaced in sets. If one transfer belt is replaced, its counterpart must also be replaced.

1. Power down the machine and perform Lockout/Tagout according to local procedures.

**WARNING**
The machine must be powered down and the local Lockout/Tagout procedure performed to ensure personal safety during this procedure.

2. Open the Platform front and/or rear cover to access the Staged Board Handling Assembly.

3. Loosen the two screw securing the idler arm and adjust the idler arm to reduce the belt tension as much as possible. Refer to the illustration.

4. Gently work the transfer belt (44548602) over the pulleys and remove the belt.

5. Gently thread the new transfer belt over the pulleys and route it along the proper paths through the assembly. Refer to the exploded view in this Assembly Support Document for illustration of belt path.

6. Proceed to Transfer Belt Tension Adjustment procedure, step 4.
Transfer Belt Tension Adjustment

The Staged Board Handling Assembly transfer belt may require tension adjustment in the event of belt replacement or to accommodate for belt stretch. To adjust the transfer belt tension, perform the following procedure.

1. Power down the machine and perform Lockout/Tagout according to local procedures.

**WARNING**
The machine must be powered down and the local Lockout/Tagout procedure performed to ensure personal safety during this procedure.

2. Open the Platform front and/or rear cover to access the Staged Board Handling Assembly.

3. Loosen the two screw securing the idler arm. Refer to the illustration on the previous page.

4. Adjust the idler arm so the belt is vertical between the pulley on the idler arm and the pulley below it. Refer to the illustration at left.

5. Secure the idler arm in position by tightening the two screws loosened in step 3.

6. If the belt does not slip during board transfer the procedure is complete. If the belt does slip during board transfer, adjust the idler toward the hex shaft in 1/8 inch increments until the belt does not slip.

Hex Drive Shaft Cleaning/Lubrication

Cleaning and lubrication of the Board Handling hex shafts is required at the intervals prescribed in the Maintenance Concept. To clean and lubricate the hex shaft, perform the following procedure.

1. Power down the machine and perform Lockout/Tagout according to local procedures.

**WARNING**
The machine must be powered down and the local Lockout/Tagout procedure performed to ensure personal safety during this procedure.

2. Open the Platform front and/or rear cover to access the Staged Board Handling Assembly.

3. Apply denatured alcohol to a clean cloth and clean the hex shaft (46055401) and the area around the hex shaft on the associated Rail Assemblies.
4. With a clean cloth apply a thin layer of lubricant (Tetra 1000 Oil, UIC part 40833821) to the hex shaft.

2" Board Width Setup

Use the following procedures for 2" Board Width Setup.

1. Power down the machine and perform Lockout/Tagout according to local procedures.

![WARNING]

The machine must be powered down and the local Lockout/Tagout procedure performed to ensure personal safety during this procedure.

2. Make sure all boards are removed from the Platform.

3. Remove board stop and air tubing from the movable (rear) rail and plug the "tee" fitting with a 1/8 inch plug. If plugs are not available then the air-line can be left in the Platform and folded and tied off with a zip-tye.

![NOTE]

Remove the board stops from both movable rails if Dual Lane Platform.

4. Remove the scrap bin(s).

5. Close the PWC to a 1.800 inch stand while making sure that nothing interferes with the free movement of the PWC. Verify dimension of 1.800 inches.

6. Set the mechanical limit switch to make at the 1.800 inch dimension.

![CAUTION]

Make sure that the switch "makes" before the PWC crashes.

7. Update the board handling parameters.
   - Minimum board width or PWC clearance is 50800
   - Add 15,000 to the positive soft limit

8. Adjust the board transfer sensors (inputs and outputs) to a location where the movable rail will not interfere with the sensor's normal operation.
Changes To This Revision

- Pg. 2 - Updated picture to show addition of the following:
- Pg. 3 - Added new views “Details C and D” with added Detail No. 31 - 40 callouts.
- Pg. 7 - New page.
- Pg. 8 - Added notes 12-16.
- Pg. 9 - B/M; added Detail No.’s 31 - 40.