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Safety Information

1

Overview

Introduction

Many safety features have been incorporated into the design and manufacture of the XyflexPro system. This chapter describes the safety features, cautions and warnings associated with the repair and maintenance of the XyflexPro system.

All personnel responsible for repair and maintenance of the system must read and understand the provided documentation, before attempting service or maintenance procedures. Safety must be considered and practiced at all times.

Failure to adhere to the recommendations and procedures could expose personnel to potentially hazardous conditions.

In This Chapter

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Safety Precautions

List of Safety Precautions

The following general safety precautions must be considered and practiced at all times:

- All personnel must read all instructions carefully. Failure to comply with the instructions could result in injury or property damage.
 - Lift and move the system using only equipment with adequate weight capacity and only at designated lift points.
 - Be sure that the system is operating properly. The system will not operate with the safety door open.
 - Keep hands away from heads, needles, belts, etc. during operation and whenever electrical power and air are on.
 - Do not attempt to operate the system with any doors open or covers removed.
 - Do not attempt to defeat safety interlocks.
 - Should any malfunction occur, press the white **MACHINE OFF** push button or one of the red **E-Stop** switches.
 - Never reach for parts in progress or a fixture that has become loose. Press one of the red **E-Stop** switches.
 - Never put fingers or objects into the openings of the system.
 - Always wear eye protection.
 - Wear proper apparel. Do not wear loose clothing or jewelry.
 - Maintain a clean working environment.
 - Disconnect the air and electrical power when handling, moving or servicing.
-

Safety Labels And Terms

Usage

Safety labels are used to identify potentially hazardous conditions or materials that are encountered during system setup and operation. International symbols (pictograms) are used to identify the hazard type. Labels are affixed to the equipment in the vicinity of the potential hazard and appear throughout this manual. Labels appearing in the manual are accompanied by a “signal” word that indicates the severity of the hazard.

SEMI S13-0298 classifies hazard severity via specific signal words.

Classification of Hazards

Caution - Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Warning - Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Danger - Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Definitions

The following pictograms are used on the labels that are affixed to the machine. Each label contains a “signal” word which indicates the type and/or severity of consequences associated with the exposure or operation.

Some or all of the following labels may be used depending on optional equipment supplied.



Attention

Attention - Indicates a practice or recommendation which, if ignored, could cause damage or malfunction of the system.

Is also used to provide supplementary information or clarification of a specific statement or procedure.



Caution

Caution - General caution statement.



Hand Cut Hazard

Moveable axes or sharp edges are present.



Keep Hands Clear

Keep hands clear - Moving parts.



Pressurized Device

Release air pressure before servicing.



Consult Manual

Consult manual before performing this operation.



Eye Protection Required

Eye protection required.



Chemical Hazard

Chemical hazard - Consult Material Safety Data Sheet (MSDS) for hazards listing.



Laser Hazard

Laser in use.



Protective Gloves Required

Wear protective gloves.



Burn Hazard

Burn Hazard - Hot surface -Allow to cool before servicing.



Poison

Hazardous materials.



Hazardous Voltage

Danger of electrical shock or burn - Disconnect power before servicing.



Exposed Belt Drive

Exposed belt drive - Lockout and Tagout before servicing.



Equipment Starts Automatically

Equipment starts automatically. Lockout and Tagout before servicing.

Safety Features

Introduction

The following safety features are intended to protect personnel from injury, while protecting the machine from damage. See Figure 1-1 and Figure 1-2.

Protective Covers

Protective covers have been designed to fully enclose the machine (except the conveyor openings). The covers restrict access to any moving parts, dangerous voltages, pneumatic pressures, or dispensing materials used in the machine.

Safety Relay Circuit

This circuit is directly hard wired to the controllers that drive all axis and conveyor motion and will disable any and all motion on the machine if the safety door is opened.

Safety Door Interlock Switch

The Interlock switch prevents the safety door from being opened while the machine is operating. The control system continuously checks the status of the **door closed** and **door locked** signals.

The interlocks are spring loaded; even in a machine power-off condition, the door remains locked. A reset must be performed, and power applied to the machine, before the operating system will permit the door to be opened.

Emergency Stop Palm Switches

Emergency stop (**E-Stop**) palm switches are the fastest and most effective method of halting machine operation in the event of a malfunction. **E-Stop** switches are located at the front and rear of the machine. All electrical power and pneumatic pressure to the machine is terminated when an **E-Stop** switch is pressed, except the uninterruptible power supply (UPS). This allows the computer to remain on until the operator shuts it down or until the automatic shutdown feature of the computer activates.

Main Power Switch (Lockout/Tagout)

The Main power (**Lockout/Tagout**) switch allows service personnel to disable all electrical power and pneumatic pressure to the machine for repair or maintenance. A long-stemmed padlock can be inserted to ensure that power cannot be inadvertently applied to the machine.

Safe Touch Controls

The lower access panel on the front of the machine does not require interlocks or access panel locks. The layout of components has been designed such that no voltages or other hazards can be reached without manually removing covers within this compartment.

Access Panel Locks

Access panel locks are designed to eliminate casual opening of panels wherever a dangerous condition can exist.

Pneumatic Dump Valve The pneumatic dump valve (located behind the rear access panel) (Figure 1-2) works in conjunction with the three emergency stop palm switches. Whenever an **E-Stop** switch is pressed, the spring-loaded dump valve opens, discharging all pneumatic pressures safely within the machine.

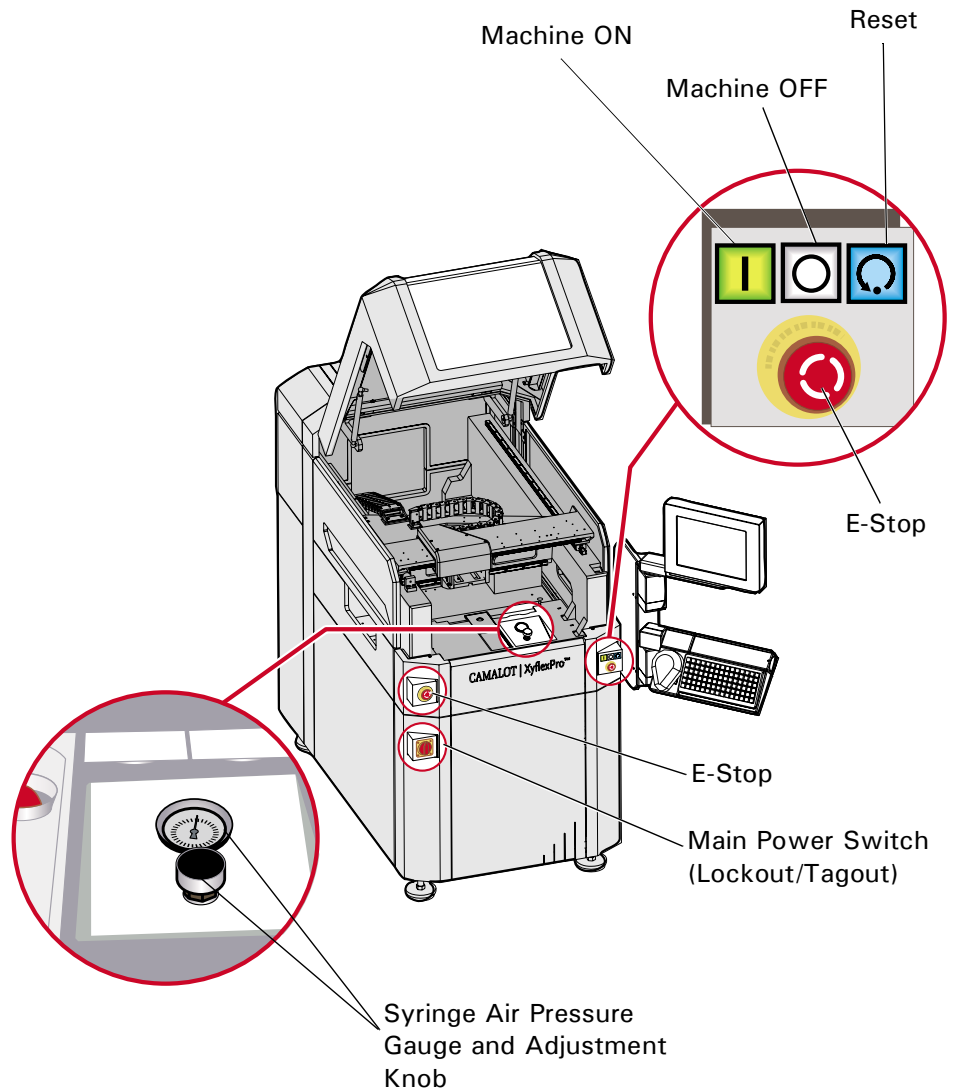


Figure 1-1

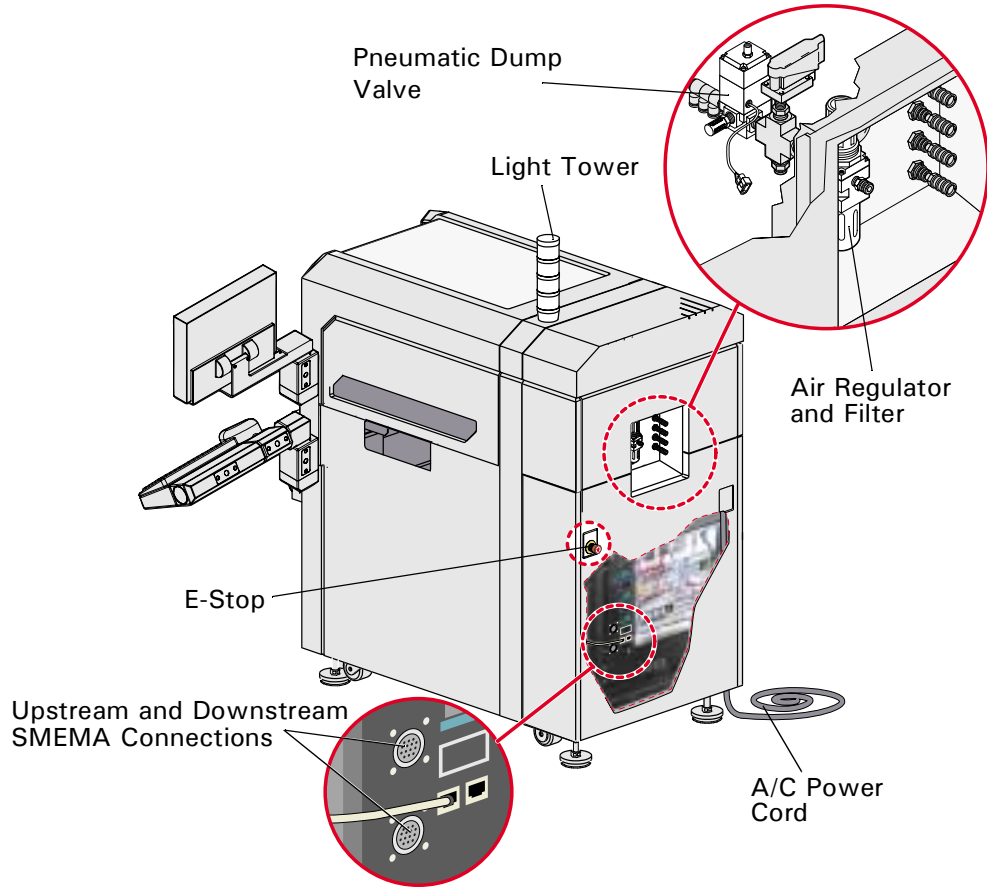


Figure 1-2

Material Handling

Introduction

Many materials used in the dispensing process, during cleaning and lubrication are potentially hazardous.

Dispensing Material Disposal

Used (empty) syringes and dispense material that was deposited onto a rag or wipe during the dispense unit purging process should be fully cured and then disposed of in accordance with National and Local regulatory requirements.

Material Safety Data Sheets (MSDS)

Material Safety Data Sheets (MSDS) are provided by manufacturers and distributors of hazardous substances. There is no single standard MSDS form, therefore many different types of MSDS forms may be used. What is consistent, is the type of information included on each MSDS form.

It is required that all personnel have ready access to the MSDS.

A table is provided in this **Maintenance and Repair Guide** for identifying potentially hazardous materials. We have listed materials supplied in the machine support kit for you and inserted the appropriate MSDS sheet(s) following the table for your convenience.

In order to keep the table current, you will need to add all other materials that are present in your environment and insert the appropriate MSDS.

Master MSDS Table

The following table is provided for listing any of the materials used for maintenance or dispensing that may be required. Be sure to identify (by an X) whether or not (YES or NO) the applicable MSDS is available for reference. Place the applicable Material Safety Data Sheets (MSDS) behind the table at the end of this section.

Materials Used for Maintenance or Dispensing		
Materials	YES	NO
Super Lube Oil, Synthetic Lubricant with Teflon	X	
Super Lube Grease, Synthetic Lubricant w/ Teflon	X	
Nye, Rheolube Oil, 728H	X	
Loctite, Small Screw Threadlocker, 222	X	
DU-Lite, RG-55, Penetrating, Rust Preventative Oil	X	
THK, Nigace, AFB Lubricating Grease	X	
NSK, Grease, No. 1 (MULTEMP LRL No. 3)	X	

Alarms And Troubleshooting

Overview

Introduction

There are several conditions created by the day to day operation of the system that trigger one of several system alarms. In most cases the alarm will cause the yellow or blue light tree indicator to illuminate. In addition, an Alarm Status window appears at the bottom of the Main screen with a message indicating the nature of the error. Most alarm conditions require operator intervention.

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This chapter contains the following topics.

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The Alarm Status Window

Description

The Alarm Status window appears at the bottom of the Machine screen. You can modify the appearance of the window and specify the level of detail that is displayed depending on your personal preference.

Status Window Contents

The default Alarm Status window displays a cumulative list of alarm condition messages, each on a separate line. The window is divided into four columns that provide the Alarm Type, Severity, State and Date.

Status Window Display Options

The Alarm Status window display modes are as follows:
Figure 2-1 illustrates the three display modes.

Maximize

In this mode the status window is expanded (half of the machine screen view). A list of alarm condition messages appears.

Single Line

In this mode a single message is displayed, depending on the sort method used. See the section titled - **Sorting Alarm Data**.

Hide

In this mode the Alarm status window appears only when a new alarm condition is triggered. The window display will show the Maximize or Single Line view depending on the default setting.

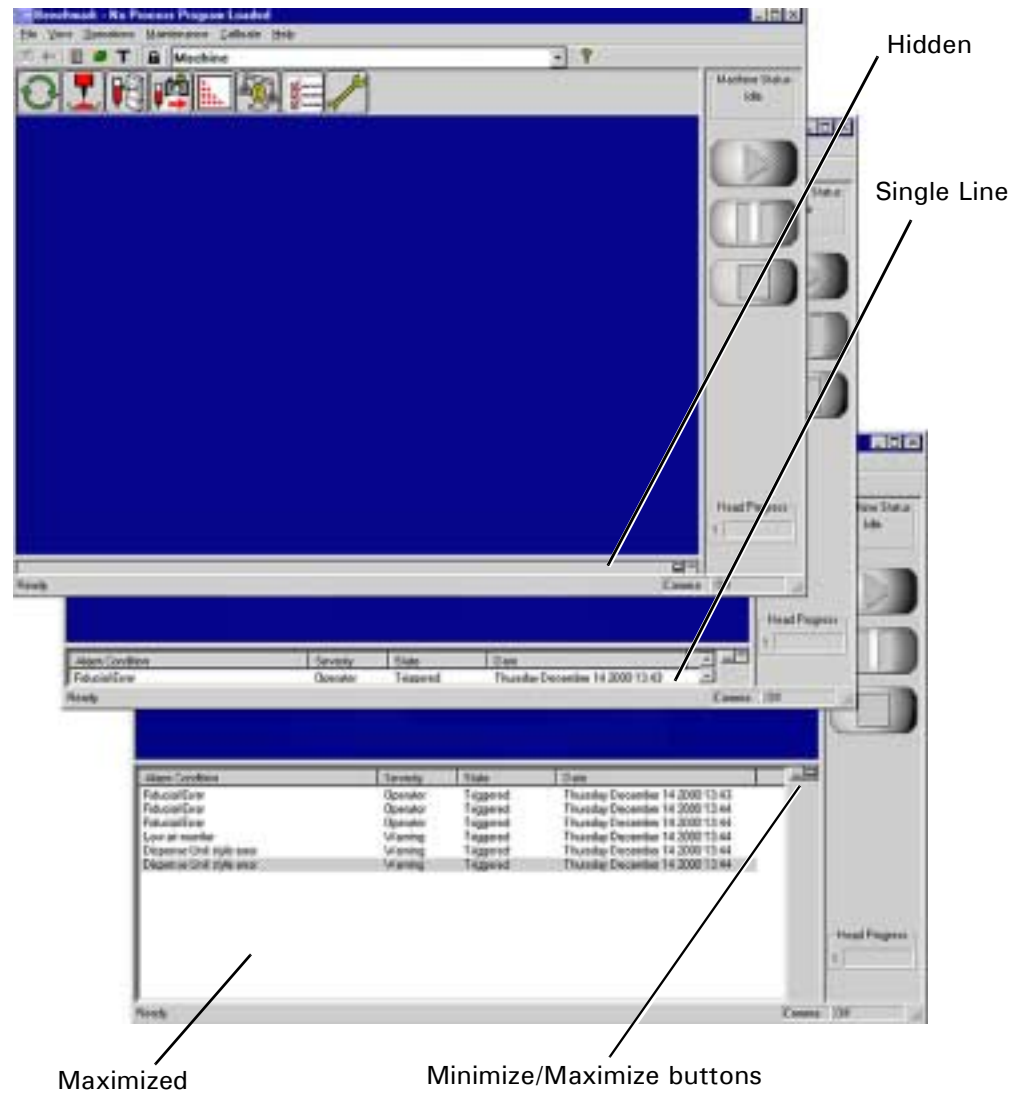


Figure 2-1

Changing The Display Mode

To change the display mode select the **Minimize** or **Maximize** buttons in the upper-right corner of the Alarm Status window. Alternately, Select **View > Alarms** and select **Hide**, **Maximize**, or **Single Line**.

Setting The Default Display Mode

The default display mode determines whether the Alarm Status window will appear minimized or maximized when it is visible.

Establish the alarm display default mode as follows:

1. Select **View > Configuration**.
2. Select the **Display Settings** tab. The Display Settings Configuration view appears. See Figure 2-2.
3. Select the **Maximize** or **Single Line** radio button.

4. Select the **OK** button.

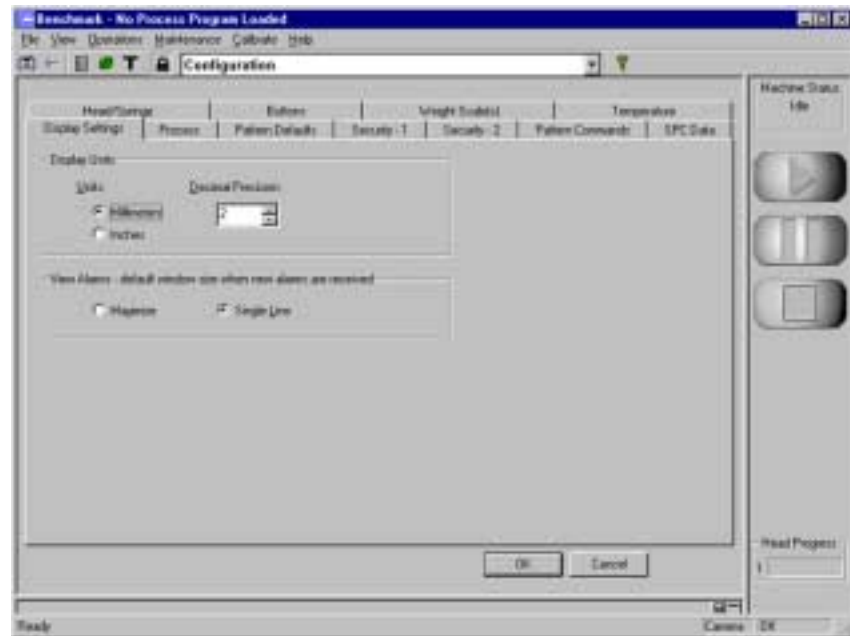


Figure 2-2

Alarm Severity And State

Introduction

All alarms are saved in a log file. The log file categorizes each alarm condition based on it's current state.

Alarm State Description

The three alarm states are as follows:

- Triggered- Indicates that an alarm has occurred but has not been acted upon.
- Acknowledged- The operator has indicated an awareness of the alarm. Assumes that the alarm condition will be dealt with (if required) at a later time.
- Cleared- Indicates that the alarm condition has been corrected.

There are several alarm types. Some alarms are informative, and alert the operator to a condition such as a low material supply. You may wish to acknowledge this type of alarm and continue operation, keeping a close eye on the amount of remaining material.

Other alarms require more immediate attention, such as those that indicate a machine failure or process error. In some cases a triggered alarm will automatically cause the machine to stop.

The corrective action for any particular alarm depends on what type of alarm it is. All operators should fully understand the meaning of each alarm condition.

Alarm Severity Description

Each alarm condition is assigned a severity based on one of four types. The severity of an alarm condition is shown in the severity column in the Alarm Status window.

The four levels of severity are:

- Operator
 - Equipment
 - Material
 - Warning
-

Alarm Scenarios

Following are examples of typical alarm situations:

- Alarm is triggered as a warning:
Machine continues to operate, but may stop when all parts currently in process have exited the machine.
- Alarm is triggered indicating a fatal error
Machine stops running immediately.
- Alarm is triggered, but condition clears before parts in progress have exited machine.

As a general rule all alarm conditions should be resolved immediately.

Filtering Alarm Data

Introduction

Various filters have been incorporated into the software that allow you to select which alarm conditions are visible in the **Alarm Status Display** window.

Procedure

To establish which alarm state types are displayed:

1. Click the right trackball button to display the **Alarm Status** popup menu. See Figure 2-3.

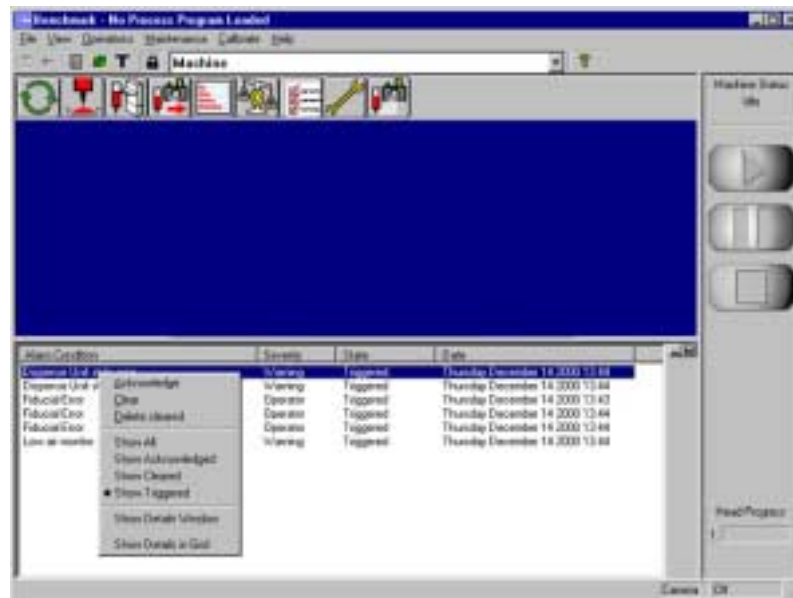


Figure 2-3

2. Select from the following:
 - **Show All**
Displays a list of all alarms in the log file.
 - **Show Acknowledged**
Displays a list of only those alarms which have been acknowledged.
 - **Show Cleared**
Displays a list of all alarms that have been cleared.
 - **Show Triggered**
Displays a list of all alarms which have been triggered, but have not been acknowledged or cleared.

Resolving Alarm Conditions

Introduction

Resolving an alarm condition requires operator intervention. The corrective action required depends on the nature of the alarm. Please see the Alarm Definitions table at the end of this document for alarm causes and possible remedies.



Attention

Use caution when placing your hands inside the machine.

Alarm Details Window

The **Alarm Details** window provides information and a list of recovery options for the selected alarm.

1. To display the Alarm Details window, double click left on the alarm entry in the alarm display window.
2. Alternately click right on the alarm entry and select **Show Details Window** from the popup menu. See Figure 2-4.

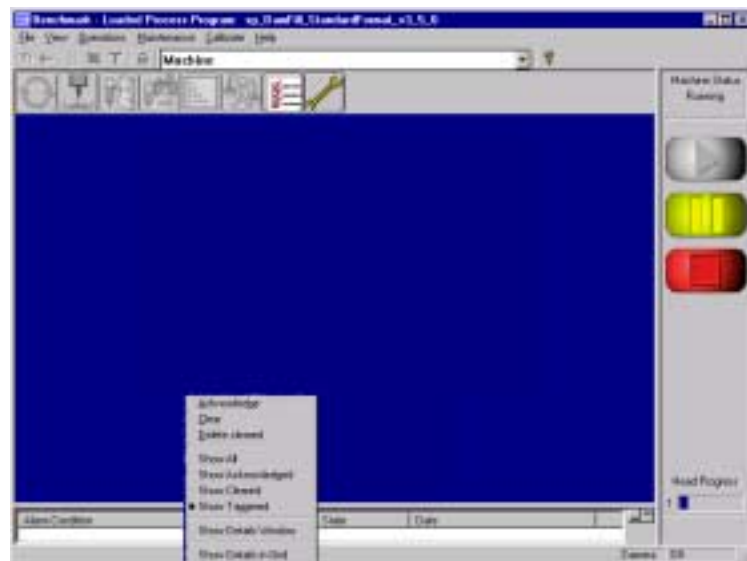


Figure 2-4

The Alarm Details window appears. See Figure 2-5.

Resolving An Alarm

To resolve an alarm:

1. Take corrective action as required to correct the condition that triggered the alarm.
2. Display the Alarm Details window for the selected alarm condition.
3. Select appropriate action(s) from the list of recovery options.
See Figure 2-5.
4. Follow any on-screen instructions.

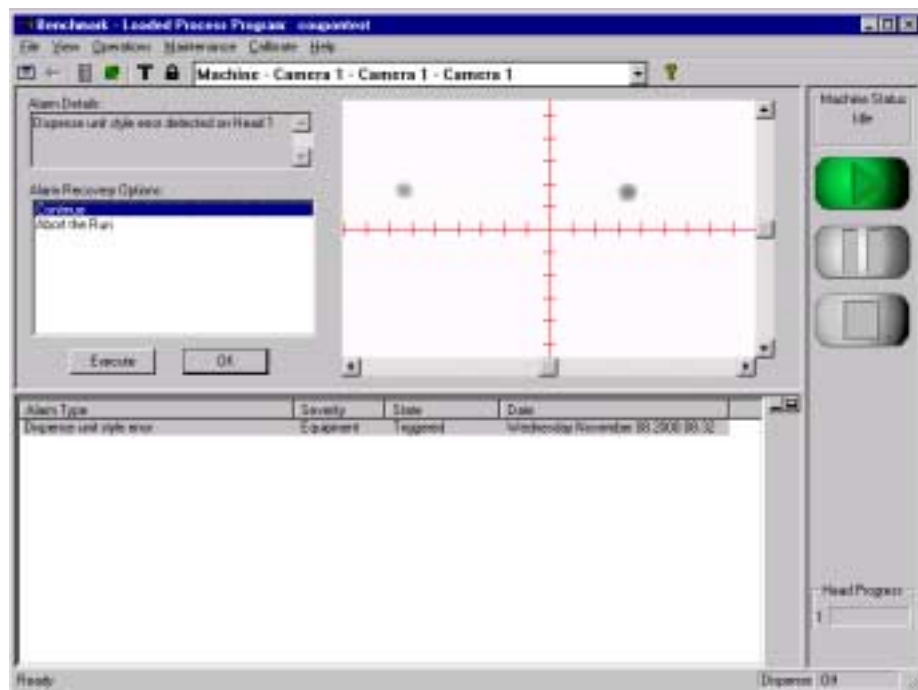


Figure 2-5

Acknowledging And Clearing Alarms

Clearing/
Acknowledging



Attention

Clearing or Acknowledging an alarm has any no effect on the machine's ability to operate. It is expected that you will take appropriate corrective action before clearing an alarm or operating the machine.

To Acknowledge or Clear an alarm condition:

1. Place the trackball pointer over the specific alarm in the Alarm Status window.
 2. Click the right trackball button.
The **Alarm Status** popup menu appears. See Figure 2-6
 3. Select **A**cknowledge, **C**lear or **D**elete cleared as appropriate.
-

Showing And Sorting Alarm Details

Introduction

The Alarm Status window contains a Details column that is hidden by default.

To display the details column:

1. Place the trackball pointer over the specific alarm in the **Alarm Status** window and click the right trackball button.
The Alarm Status popup menu appears.
2. Select **Show Details in Grid**.
The **Details** column is visible and a horizontal scroll bar is added to the bottom of the window. See Figure 2-6.
3. Use the scroll bar to change the view of the columns in the Alarm Status window.

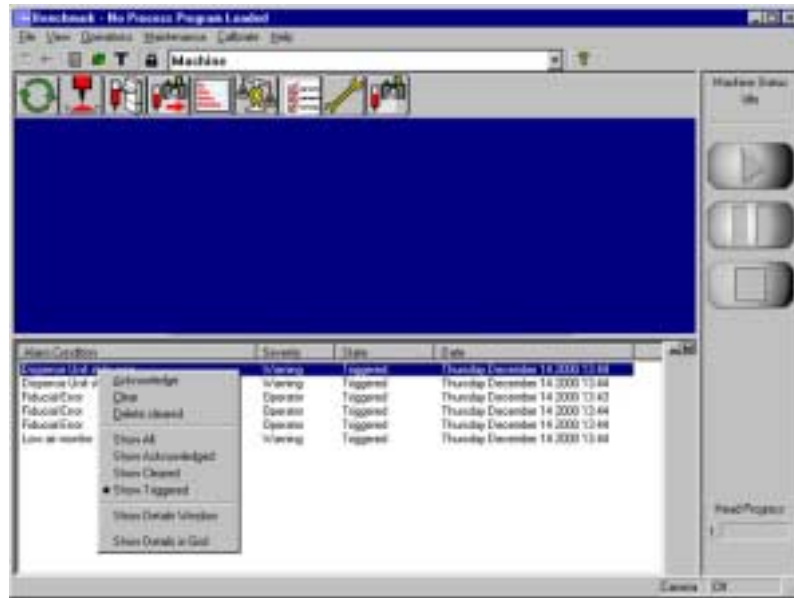


Figure 2-6

Sorting Alarm Data

You can change the sorting of the alarm list by clicking on any of the column heads in the **Alarm Status** window. The default sorting method is by the date column, with the most recent alarms at the top of the list.

Alarm Definitions

Introduction

The following table is provided as a reference to assist in determining alarm causes and possible remedies.

Alarm Condition	Description	Possible Remedy
Head Error	Head is disabled. Head is not initialized.	Enable and initialize head.
Fiducial Error	Taught fiducial is different from current vision.	Check for correct fiducial definition. Check fiducial location and shape. Check Camera Focus. Align manually or skip and continue.
Fiducial Error - Batch	Fiducial error occurred during Batch mode.	Check fiducial and continue running program.
Fiducial Error: Chip Definition	Taught chip definition is different from current view.	Check for correct chip template. Check Camera F-Stop & Focus. Can manually skip and move on.
Material Low Warning	Syringe material getting low according to LL or syringe counter. (Low Limit)	Replenish material, Clear and continue.
Material Low Error	Syringe material getting low according to LL Sensor syringe counter. (Replace limit)	Replace empty syringe with full syringe.
Coordinate System Status Error	Following error on one or more servo motors.	Check affected axis for a binding or bad motor. Initialize machine.
Controller Motor Error	Identifies which motor failed.	Check affected axis for errors. Check parameters and reinitialize machine.
Controller Amp Status Error	One or more halls commutation signals was lost.	Check connections to motor. Replace motor. Replace amplifier.

Alarm Condition	Description	Possible Remedy
Controller Motor Error-Negative End Limit	An axis has reached an end limit switch.	Unlock door and move axis off of limit. Lock door and reinitialize.
Controller Motor Error- Positive End Limit	An axis has reached an end limit switch.	Unlock door and move axis off of limit. Lock door and reinitialize.
Controller Motor Error- Home Not Complete	An axis did not complete the home within the allotted time.	Check connections on 645 pump. Replace pump amp. Replace home sensor on pump
Failed to Home Head XY	The X or Y axis failed to servo and start the home action.	Check X or Y motors and amplifiers.
Failed To Home Z Axis	The Z axis failed to servo and start the home action.	Check Z motors and amps.
Conveyor Travel Time-out	The part failed to reach the next station in the allotted time.	Check for obstruction on the conveyor and select Continue. Check conveyor belts. Check conveyor motor connections.
Out of Travel Range X Max	A coordinate in the process program is outside of the limits of the coordinate system.	X or Y axis - 1. Process program or substrate is too large for the machine. 2. Process program offset is incorrect. Offset the process program to the correct feature or substrate. Z Axis 1. A dispense height or lift height in the process program is outside of the software limit. Example: Where dispense and lift height are each 15 mm, total lift is 30 mm. Software limit is 29 mm.
Out of Travel Range X Min		
Out of Travel Range Y Max		
Out of Travel Range Y Min		
Out of Travel Range Z Max		
Out of Travel Range Z Min		

Alarm Condition	Description	Possible Remedy
Conveyor Vacuum Timeout	Vacuum sensor did not detect a part on the vacuum chuck.	Check part on vacuum chuck.
Rectangle Missing Template	A template was specified which does not exist.	Use a valid template.
Invalid Template Data	Template contains an invalid parameter.	Recheck data on template being used.
Invalid Command Data		Recheck command parameters.
Function not available while running.	Attempted an operation that cannot be done while machine is running.	Stop machine and change function.
The Pre-dispense Plate is Full	The pre-dispense plate is full.	Clean ceramic plates and reset.
Invalid Parameter	Parameters are out of tolerance.	Check parameters.
Temperature controller out of range	Temperature out of set limits. The device is outside of the alarm range as set in the temperature configuration window.	<p>If the temperature setpoint was changed, wait until the device reaches the set temperature. Then clear the fault and continue.</p> <p>If the device temperature is greater than 125 degrees C, there is a sensing device fault. Check connections to the thermocouple or RTD.</p> <p>If the device temperature is below room temperature or negative, the connections to the thermocouple or RTD are reversed.</p>
Temperature controller ramping	Heated chuck or DU is in the process of heating to set temperature.	Clear error and continue running program.
Dispense unit style error	The software detects a DU which is not installed.	Check software setting for proper DU Install correct DU.
Dispense unit style error at process program load	The process program requires a different DU	Install the correct DU

Alarm Condition	Description	Possible Remedy
Weight scale communications error	Weight scale is not talking to the computer / comport.	Check weight scale data cable connections. Check the Inside Out Network Utilities configuration.
Weight scale error	The weight scale failed to zero.	Check connections to the scale. Check that the dispense cup has not overflowed into the scale.
Weight scale head not okay	Identifies the head where the weight scale failed.	Check all communications.
Weight scale dispense error	No material was dispensed into the cup.	Check or purge DU.
Weight scale no pre-dispense template	A predispense template was defined within the weight scale template. This template was later deleted prior to running the weight scale template.	Identify a different predispense template or create a predispense template with the same name in the weight scale template.
Weight scale global tolerance exceeded	The dispense weight has exceeded the tolerance set in the template.	Change weight scale purge cup and zero out scale.
Weight scale uninitialized request	Attempting to use a weight scale that has not been initialized.	Check comport connections and initialize machine.
Z Sense Failure	No touch probe motion was detected.	If the touch probe did not extend, check the pneumatic valve operation. If the touch probe did extend, check the touch probe connector or replace the touch probe.
Needle calibration failure	No signal was received from the needle calibration plunger.	Check the needle calibration plunger taught position. Verify that the DU can reach the plunger. Check the camera to needle offset. Check the wiring to the needle calibrator.

Alarm Condition	Description	Possible Remedy
Low air monitor	Insufficient air pressure to the system.	Check for proper air pressure setting at the air/filter regulator (located at the rear of the system).
No Weigh Template selected	BEGIN_WEIGH command is missing a template selection.	Select a template or delete the BEGIN_WEIGH command.
Missing matching END_WEIGH command	BEGIN_WEIGH command without a matching END_WEIGH command.	Place an END_WEIGH command in the process program.
Nested Weigh Blocks	Missing dispensing command between BEGIN_WEIGH and END_WEIGH commands.	Insert a dispensing command between the BEGIN_WEIGH and END_WEIGH command.
Emergency Stop Switch was Pressed	An E-Stop switch has been pressed.	Pull out all Emergency Off Switches as required.
WARNING: The Pot Life timer is nearly expired	The dispense material has almost reached its expiration point.	No action is required, this is a message to the operator that the Pot Life timer is almost expired.
ERROR: The Pot Life timer has expired	Dispense material has expired.	Change expired material and reset.

Preventive Maintenance

Overview

Introduction

The XyflexPro system has been designed to require minimal maintenance. It does require periodic lubrication and cleaning. Use only those lubricants specifically recommended by Speedline Camalot. Use of any other lubricant may void the warranty.

In This Chapter

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Schedule And Materials

Preventive Maintenance Schedule

Introduction

To assure maximum machine reliability and safe operation, cleaning and lubrication must be performed at specific intervals. These procedures are listed in the Preventive Maintenance table below. See the section titled - **Cleaning and Lubrication** for individual procedures.



Caution

When performing any type of lubrication to the system be sure the correct lubricant is used. Failure to adhere to this caution may cause failure of a component.

Preventive Maintenance Table

The following table is a preventive maintenance schedule for your XyflexPro system.

Task	Time Interval	Lubricant
Clean the X and Y slide rails with penetrating lubricant to prevent corrosion.	Monthly	DU-LITE RG-55
Clean the conveyor slide rails with penetrating lubricant to prevent corrosion.	Monthly	DU-LITE RG-55
Inspect air regulator filter. Replace	Monthly Yearly	
Clean CPU air filters	Monthly	
Clean encoder strip	Monthly	
Grease conveyor width screw	6 months	Die Makers grease
Grease rear conveyor slide rail bearings	6 months	THK Type "AFB" grease

System Support Kit

Introduction

The XyflexPro system is shipped with a system support kit. The kit contains special tools and lubricants required for basic maintenance. These are provided to facilitate specific maintenance and lubrication tasks.

Support Kit P/N 50805

The following items are contained in the XyflexPro System Support Kit.

Part Number	Description	Quantity
38659	Grease Gun	1
35757	Tool, Hood Switch Opening	1
38660	Grease Cartridge, Lithium	1
8027	Wrench Set L	1
9284	Wrench Set	1
34520	Grease, No. 2 Lithium, 1.75oz.	1
17514	Case, Molded, Std	1
17513	Label, Std, Component Kit	1
38684	Lubricant, Penetrating	1
38695	Oil And Solvent Wipes	5
13731	Lubrication Nozzle	1
37784	Cup, Weigh, Dish	400

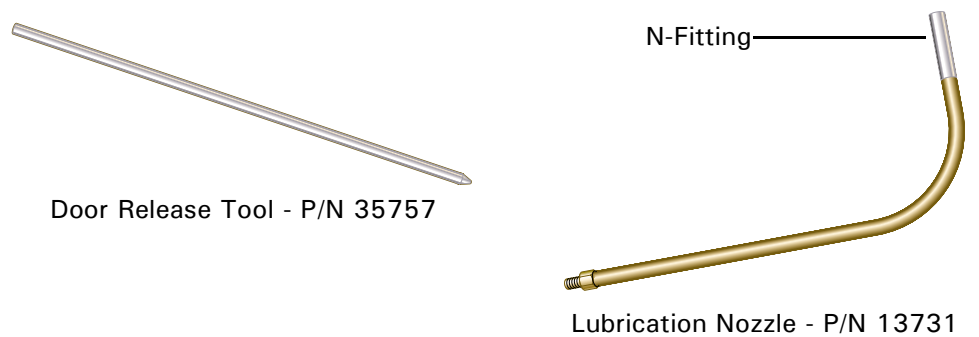


Figure 3-1

Cleaning And Lubrication

Basic Information

Introduction

Lubricate all system components at the recommended interval in the Preventive Maintenance table. Be sure the proper lubricant is used when performing any maintenance.



Attention

Machine part locations are referenced **Left** and **Right** when viewing the machine from the front, unless noted otherwise.



Keep Hands Clear

Moving parts. Only qualified personnel should be allowed to perform maintenance to machines.



Chemical Hazard

Be sure that the applicable Material Safety Data Sheet (MSDS) Warnings are observed.

Preparing The Machine For Maintenance

To gain access to the machine interior and secure the machine for maintenance, perform the following:

1. Turn **OFF** the main power switch, located at the left side of the machine.
2. Secure the switch with an approved LOCKOUT/TAGOUT procedure.

Using The Manual Release Tool

Introduction

The machine safety door is locked (when closed) whenever system power is Off, or in the event of a power failure. In order to gain access to the inside of the machine under these conditions, a manual release tool is provided.

Procedure

1. Remove the plastic plug from the access hole in the side of the safety door. See Figure 3-2.

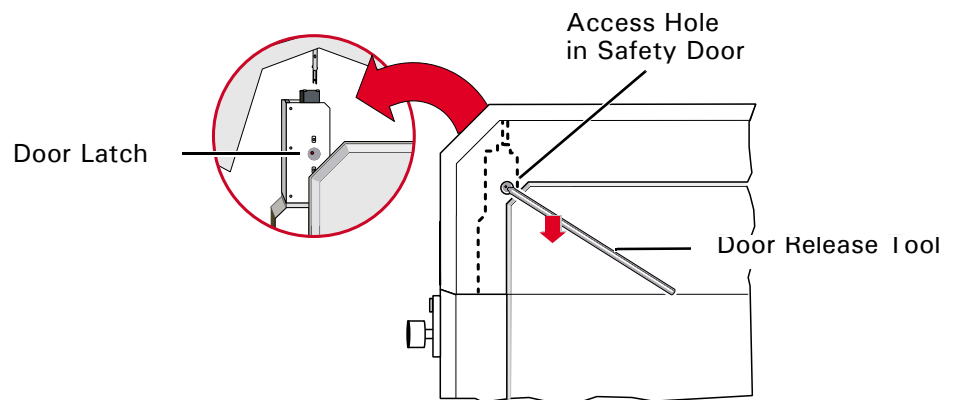


Figure 3-2

2. Push the tool straight in until the tapered end engages the lock mechanism.
 3. While lifting the door, move the tool straight down until the lock releases.
 4. Raise the safety door.
-

X-Gantry Slide Rails

Introduction

The X-Gantry has an upper and lower slide rail. The slide rail bearings are maintenance free. The slide rails should be wiped clean and lubricated monthly with rust preventive.

Procedure

1. Position the head forward and all the way to the right of the machine. This will provide access to the left side of the upper and lower slide rails. See Figure 3-3.
-



Caution

Never spray rust preventive directly into the machine. Some parts will not operate properly and could be damaged if contacted by rust preventive. Always apply the rust preventive to a clean, lint-free cloth. Then wipe onto the surface as needed.

2. Wipe the upper and lower slide rails with a clean cloth to remove dirt and residue. See Figure 3-3.
3. Spray DU-LITE RG-55 rust preventive on a clean cloth and wipe the slide rails.
4. Position the head to the left side and wipe the sliding rails on the right side.

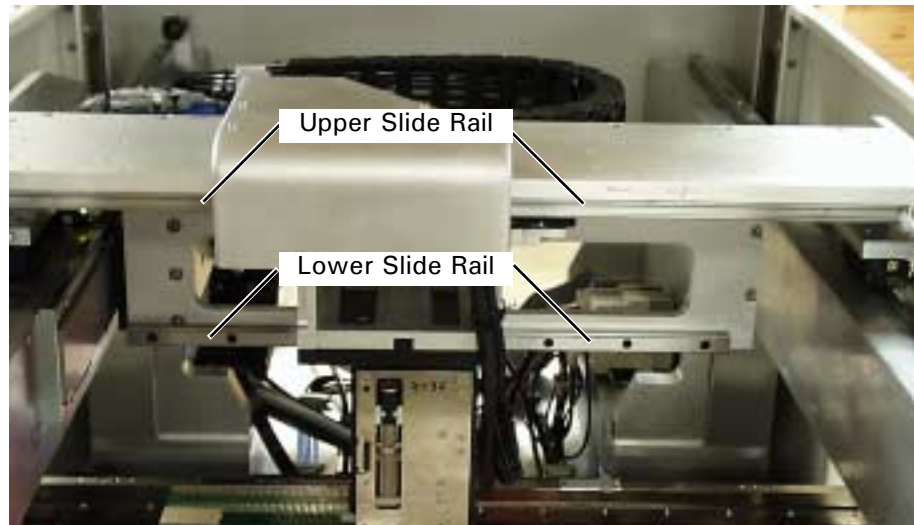


Figure 3-3

Y-Gantry Slide Rails

Introduction

The Y-Gantry has a slide rail on each side. The slide rail bearings are maintenance free. The slide rails should be wiped clean and lubricated monthly with rust preventive.

Procedure

1. Position the Gantry all the way to back of the machine. This will provide access to the front half of the slide rails. See Figure 3-4.



Caution

Never spray rust preventive directly into the machine. Some parts will not operate properly and could be damaged if contacted by rust preventive. Always apply the rust preventive to a clean, lint-free cloth. Then wipe onto the surface as needed.

2. Wipe the front half of the slide rails with a clean cloth to remove dirt and residue. See Figure 3-4.
3. Spray DU-LITE RG-55 rust preventive on a clean cloth and wipe the slide rails.
4. Pull the gantry to the front of the machine and wipe the rear half of the sliding rails.

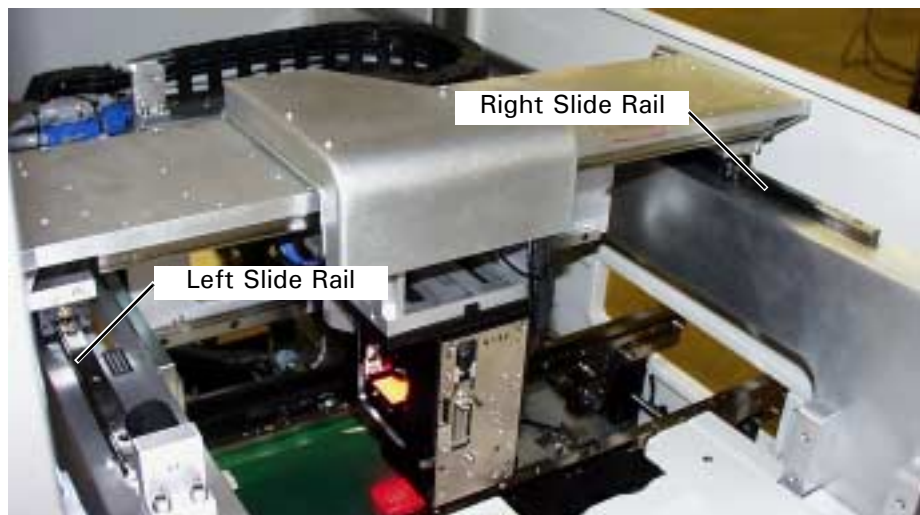


Figure 3-4

Conveyor Width Screw

Introduction

Grease the conveyor width screws (1 each side) every 6 months. Use Die Makers grease (provided in the support kit) for this purpose.

Procedure

Grease the conveyor width screws as follows:

1. Using a clean cloth, remove all dirt and residue from the conveyor width screws and anti-backlash nuts. See Figure 3-5.
2. Apply a small amount of Die Makers grease to each conveyor width screw just in front of and behind the anti-backlash nut.
3. Move the conveyor rails in and out several times to distribute the grease evenly on the conveyor width screws.

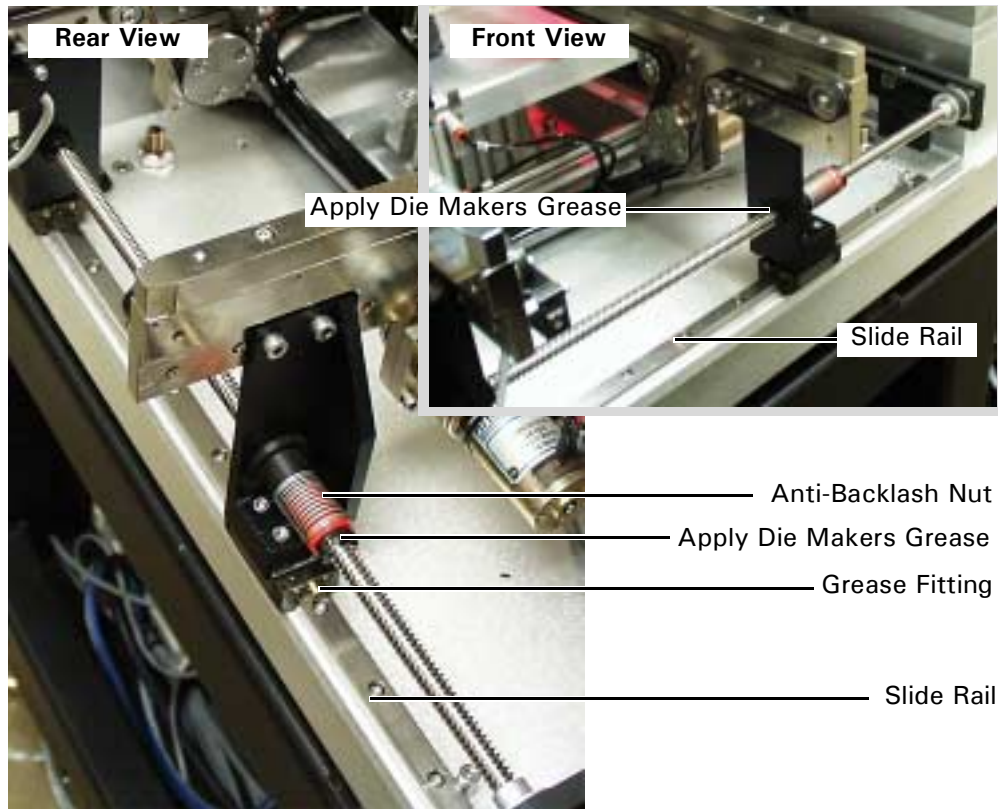


Figure 3-5

Conveyor Slide Rails And Bearings

Introduction

The conveyor slide rails should be wiped clean and lubricated monthly. The rear conveyor slide rail bearings should be lubricated every 6 months using only **THK** type “**AFB**” grease. See Figure 3-5. Lubrication of the front slide rail bearings is unnecessary since the front rail is fixed.

Procedure - Slide Rails



Attention

Never spray rust preventive directly into the machine. Some parts will not operate properly and could be damaged if contacted by rust preventive. Always apply the rust preventive to a clean cloth and then wipe onto the surface as needed.

1. Wipe the rails with a clean cloth to remove dirt and residue.
 2. Wipe the rails with a clean cloth or shop wipe saturated in DU-LITE RG-55 Rust Preventative.
-

Procedure - Slide Rail Bearings

Grease each rear conveyor rail slide bearing as follows:

1. Adjust the conveyor rails so that the rear rail is approximately half way between its full open and closed position.
 2. Wipe off the rail slides with a clean cloth or shop wipe.
-



Caution

Be sure the grease gun is loaded with **THK Type “AFB”** grease and that the adapter is installed.

3. Make sure that grease is visible at the tip of the grease gun adapter. If not, extend the grease gun handle fully and then depress handle until free-travel is eliminated and grease appears.
-



Attention

One full (1) stroke of the grease gun handle is equal to 3 and 3/8 inches of movement. One third (1/3) stroke is equal to 1 and 1/8 inches of movement.

4. After pressing the grease gun adapter onto the rear slide fitting, apply one and one-third (1 and 1/3) strokes of grease.
 5. Wipe off any excess grease.
-

CPU Air Filters

Introduction

There are two air filters in the CPU access cover. Clean the CPU filters once a month.

Procedure

1. Open the CPU access cover as shown in Figure 3-6.



Figure 3-6

2. Remove the nuts (3 each side) that secure the filter retainers. See Figure 3-7.



Figure 3-7



Pressurized Device

Wear safety goggles when using compressed air for any cleaning or drying operation.

3. Remove the filter retainers and filters.
 4. Clean with a vacuum or compressed air.
 5. Replace the filters and reinstall the filter retainers and nuts.
Do not over tighten the filter retainer nuts.
 6. Close and secure the CPU access cover.
-

Air Regulator Filter

Introduction

The air regulator filter is mounted on the rear pneumatic panel. The filter should be inspected for contamination monthly.

Procedure

1. Disconnect the air supply hose from the air regulator or otherwise shut off the air supply to the machine.
2. Unscrew and remove the metal air filter cover as shown in Figure 3-8.



Figure 3-8

3. Pull out the clear cover cylinder. See Figure 3-9.



Figure 3-9

4. Remove the filter element and inspect. See Figure 3-10.
-



Attention

The element should be replaced yearly. If the element shows evidence of water or oil contamination, replace it immediately.

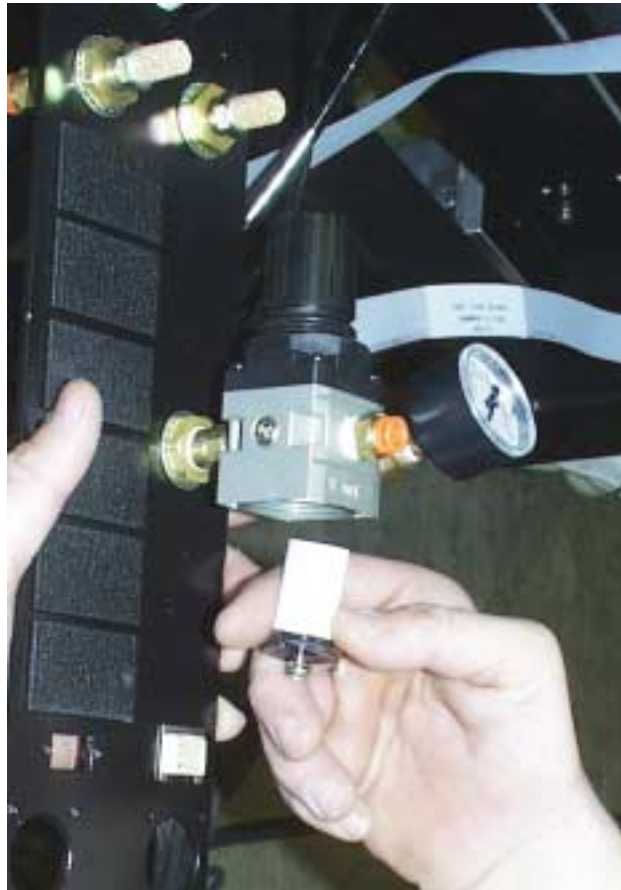


Figure 3-10

5. Replace the filter element, and clear cover.
 6. Replace and tighten the metal air filter cover.
 7. Reconnect the air supply line and/or restore air pressure.
-

X and Y Axes Encoders

Introduction

The X and Y axes utilize linear motors. Axis positioning is determined by linear encoder strips. These must be kept clean. Use only a clean, lint free cloth for cleaning.

Procedure

The X-axis encoder strip is located underneath the Y-Gantry. The Y-axis encoder is located on the left side of the machine on top of the gantry support.



Caution

The use of any solvent based cleaner will damage the encoder strips.

See Figure 3-11. The encoder strips should be cleaned periodically with a clean, lint free cloth only.

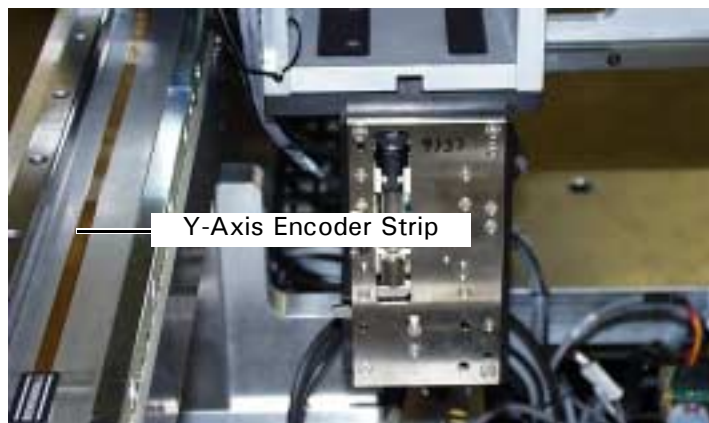
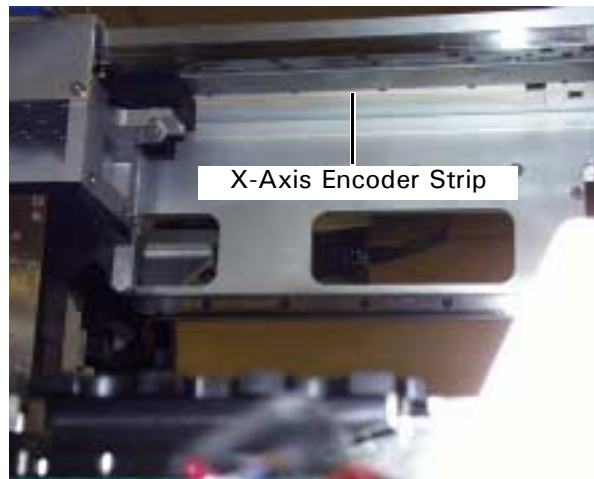


Figure 3-11

Replacement Procedures

Machine Preparation

Procedure

To gain access to the machine interior and secure the machine for maintenance, perform the following:

1. Open the Safety Door.
 2. Turn **OFF** the main power switch, located on the front left side of the machine.
 3. Secure the switch with an approved LOCKOUT/TAGOUT procedure.
-

Conveyor Belt Replacement

Introduction

Two different conveyor styles are utilized on the XyflexPro. Regardless of which conveyor is installed, the procedure for removing and installing a conveyor belt is the same. Disassembly of the machine is not required.



Attention

Do not replace individual belts. If one belt is worn, all belts should be replaced.

Procedure

1. Position the gantry to the rear of the machine and open the conveyor to allow the best access to the belt.
2. Grasp the belt near the outermost pulley and slide it off the edge of the pulley while operating the conveyor belt by hand. See Figure 3-12.



Figure 3-12

3. Once the belt is free of the end pulley, carefully remove the remainder of the belt from the inside pulleys and discard. See Figure 3-13.



Figure 3-13



Attention

Make sure that the shiny side of the belt faces in (dull side out) and contacts each respective pulley.

4. Carefully route a new belt around (shiny side in) the inside pulleys beginning with the large one. Consult the diagram in Figure 3-14 for the correct belt routing.

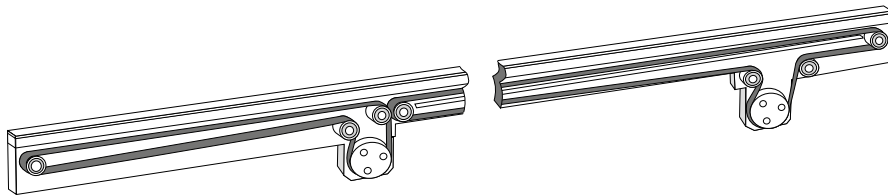


Figure 3-14

5. Stretch the belt and feed it onto the outermost pulley while operating the conveyor by hand. See Figure 3-15.

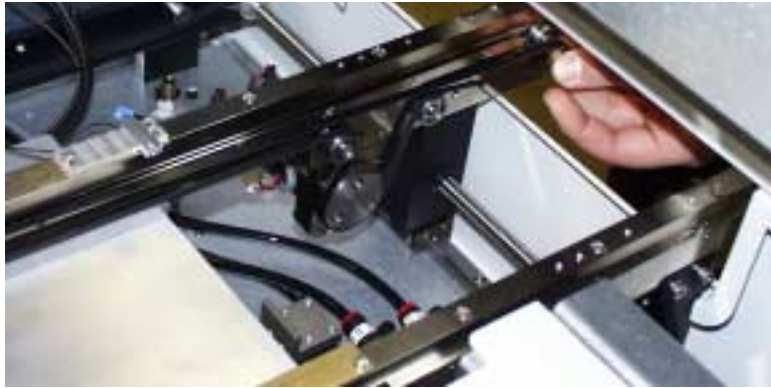


Figure 3-15

Glossary

A

Array	A program consisting of coordinates which are arranged in a matrix consisting of a pre-determined number of rows and columns. The dispense coordinates are established by the intersection of imaginary grid lines at the intersection of the rows and columns.
Auger	See Leadscrew .
Automatic Correction Vision	The ability of the system to automatically compensate for misalignment. At run time a standard reference mark (fiducial) is compared to a taught model. It also allows the operator to see, using the monitor display, the exact location at which the needle will dispense.
Automatic Needle Calibrator	A feature which provides automatic adjustment of the needle position and height in order to maintain a consistent gap between the needle and the substrate.

B

Benchmark Software	A software package running under Windows NT that provides the user interface and hardware control of the system.
Board Zero	The vertical point where the needle just contacts the substrate.

C

Camera Calibration	A procedure which teaches the system the relationship between the camera's view of the dispense area (in pixels) to the amount of physical movement of the dispense unit.
Camera-to-Needle Offset	A taught value that establishes the position of the camera relative to the needle.
Cartridge	A removable component of the dispense unit containing the leadscrew and dispense needle.
Chip Fiducial	References which are used to locate precisely the edges and orientation of a chip.
Command (Column)	Displays the Benchmark commands used in a process program.
Converge	The point at which dispense settings yield a target weight which is within a specified goal (tolerance).
CPU	<u>C</u> entral <u>P</u> rocessing <u>U</u> nit –Computer.

D

Dam and Fill	An application in which a line (Dam) of material is dispensed surrounding an area which will then be filled with material in order to encapsulate a component or circuit. The purpose of the dam is to contain the fill material within a specific area.
Dispense Height	The distance between the tip of the needle and the substrate.
Dispense On Down	A function that causes the leadscrew to begin rotating as the needle approaches the dispense position. This assures that adequate material is available when the needle reaches the correct dispense height.
Dispense Unit (DU)	A device that controls and delivers material within the dispensing process.
Dot Dwell	Establishes a delay before movement of the DU between dispense commands. This will ensure that all material is expelled from the needle before the DU is moved to the next dispense position.
Dot Size	Establishes the amount of leadscrew rotation in degrees, when a dispense command is executed.

E

Emergency Stop Switches	Red button switches which are used for an emergency situation to stop machine operation. When pressed, all operation is halted, and all pneumatic pressures and electric currents are terminated. Power is maintained to the UPS to allow the computer to automatically shutdown.
Encapsulation	The process of completely covering a component or an area with material.
End Corner	Establishes the end point of an underfill sequence. Values range from zero (0) to three (3) clockwise, with zero indicating the upper right corner.
E-Stop	See Emergency Stop Switches .

F

Fiducial	Also referred to as reference points. Used by the vision system to align the dispense program with the actual substrate. See also Chip Fiducials , Synthetic Fiducials , Taught Fiducials .
Filled Rectangle	Used with Dam and Fill and Globtop Applications where a specific area is dispensed with material until a component or circuit is completely covered (encapsulated).
First Pass Num	Indicates which Pass group will be executed first when a DoPass command is executed.
Fixture Offset	The location of the leading edge of the process board relative to the camera.

G

Globtop	A process whereby material is dispensed until a part or circuit is covered (encapsulated). Similar to Dam and Fill, but does not use a Dam to constrain the flow of material.
----------------	---

H

Hard Stops	A device which is triggered by air pressure and restricts the travel of a part or substrate on a conveyor belt.
Head	The assembly that holds the dispense unit.

L

Last Pass Num	Indicates which Pass group will be executed last when a DoPass command is executed.
Leadscrew	A shaft which rotates inside the cartridge in the dispense unit. The leadscrew incorporates an archimedes screw (auger) to deliver material to the needle. The volume of material delivered is dependent on the speed and amount of rotation of the leadscrew, air pressure and the pitch of the auger.
Length Offset	Establishes how a line of material will be dispensed relative to the length of the part. A value of zero (0) would indicate a line equal to the length of the part (corner to corner). A positive number would indicate a line beyond the length of the part (offset from the corners). A negative number would indicate a line short of the length of the part (offset from the corners). This field is used with an underfill application.
Lift Height	Sets the height of the needle between dispense commands.
Line Delay	Using the command delays movement of the dispense head at the beginning of a line sequence to allow sufficient time for the material to start flowing. This may be required to compensate for higher viscosity materials which do not begin to flow immediately. During the delay, air pressure is applied to the head and the dispensing unit motor turns.
Line Off Advance	Using the command causes the dispense unit to shut off prior to the end of a line sequence when using materials with a higher viscosity. The extra material that would weep from the needle is used to finish the line segment.
Line Template	A group of line related dispensing parameters that can be assigned to a dispensing command in a process program.
Line Width	A setting that establishes the volume of material while dispensing a line.
Link Line Last	Establishes the end point (coordinate) of a line sequence.
Lockout/Tagout	A switch provided to safely disable all power and air from the machine for maintenance purposes. The switch also cuts power to the UPS.
Luer Lock Fitting	A threaded fitting used primarily on the feed tube and material supply syringe.

M

Move Template	Controls lift height and speed settings for the Move command.
MSDS	Abbreviation for Material Safety Data Sheets provided by manufacturers and distributors of hazardous substances.

N

Needle Gap	The distance between the tip of the needle and the substrate.
Needle Gauge	A measure of the size of the needle based on it's inside diameter.

O

Optimize	A procedure which rearranges the dispense sequence to ensure the most efficient movement between heads or machines when dispensing a program.
-----------------	---

P

Park Position	A taught location where the dispense head will wait while the next board is being loaded.
Pass Num	The number assigned to a Pass group of commands.
Pixel	The smallest image-forming unit of a video display.
Pneumatic Dump Valve	A device which discharges all air pressure within the machine when an Emergency Stop Switch is pressed.
Position Offset	The distance from the edge of a component to the dispensing needle.
Pre-Dispense Dot	A sample dot which is used to establish material flow prior to an actual dispense sequence.
Pre-Dispense Line	A sample dispense line which is used to establish material flow prior to an actual dispense sequence.
Process Program	An application specific group of dispensing commands and parameters that are executed by the system during production.
Purge	A procedure which is used to remove air or aged material from the dispense unit and/or syringe, typically when a new syringe is installed.

R

Reference Designator	An industry standard code which is used to identify specific components on the process board. ie: C101, R203. These are typically printed on the board.
RPM	Determines the rotation speed (in revolutions per minute) of the leadscrew in a DU while dispensing.

S

Shape Code	Defines a component's generic type according to its physical characteristics (size, shape, etc.).
Start Corner	Establishes the beginning of an underfill sequence. Values range from zero (0) to three (3) clockwise, with zero indicating the upper right corner.
Synthetic Fiducials	Industry standard board markings which are supplied with the Benchmark software.

T

Target Weight	The ideal weight to achieve and maintain for a particular dispensing sequence.
Taught fiducials	A user taught reference mark (usually a board detail) which is used to align the dispense with the board in production.
Template	A saved group of often used dispense parameters which can be applied to various process program commands.
Theta	Performs a rotation of a block of commands contained within a NewCoord command.
Timer Timeout	The amount of time between execution of the Timer command and the command that follows.
Tolerance	The amount of allowed deviation from the target weight when using the weight scale.
Transition Down	A value used to control overshoot in the Z-axis. Z (vertical) motion speed is reduced within this distance from the dispense coordinate.
Transition Up Height	A value used to eliminate tailing as the needle is raised from the dispense coordinate. The Z (vertical) motion speed is reduced for this distance as the needle is raised.

U

Underfill	The process of dispensing material under a component. This is done using a series of critically timed application program segments which causes material to flow underneath the component from one side to the other. The process displaces all air and moisture underneath the part.
Unfilled Rectangle	A dispense sequence which creates a dam of high viscosity material surrounding a part. The purpose of the dam is to contain the fill material which will be used to encapsulate the part.
UPS	A backup power source (<u>U</u> ninterruptible <u>P</u> ower <u>S</u> upply) for the system computer. Allows time to perform a controlled computer shutdown in the event of a power failure or Emergency Stop situation.

V

Vision Window A window that appears during certain software procedures that allows the operator to view the dispense area through the camera.

W

Weight Scale A measurement tool that is used to ensure dispensing consistency by adjusting dispense parameters to maintain a target weight.

Weight Template A template that applies specific dispense parameters related to the function of the weight scale.

Windows NT Server Operating system generally used by network shared services.

X

X-Axis Side to side area of head travel.

X Position Specifies a dispense position with respect to the X-axis.

X' Position Specifies an end position for a or **Linkline** command with respect to the X-axis.

Y

Y-Axis The front to back area of head travel.

Y Position Specifies a dispense position with respect to the Y-axis.

Y' Position Specifies an end position for a or **Linkline** command with respect to the Y-axis.

Z

Z-Axis The vertical area of travel.

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