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applicator manual ■ ■ ■

Cimjet 334®



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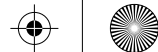
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SECTION 1

OVERVIEW

1 Overview

1.1 Introduction

This guide gives details of the installation, use and maintenance of the Telescopic Cimjet 300 applicator, the Cimjet 334.

If you need information on the basic use of your Cimjet refer to the Cimjet 300 Dispenser Manual.

1.2 The Cimjet 334 Applicator

The Cimjet 334 applicator is a pneumatically driven single stage label applicator.

Figure 2-1 shows the major components of the applicator. The following section shows how the various sensors and applicator parameters affect the applicator operation.

Cimjet 334 uses a pneumatic cylinder together with a sprung and pivoting vacuum pad.

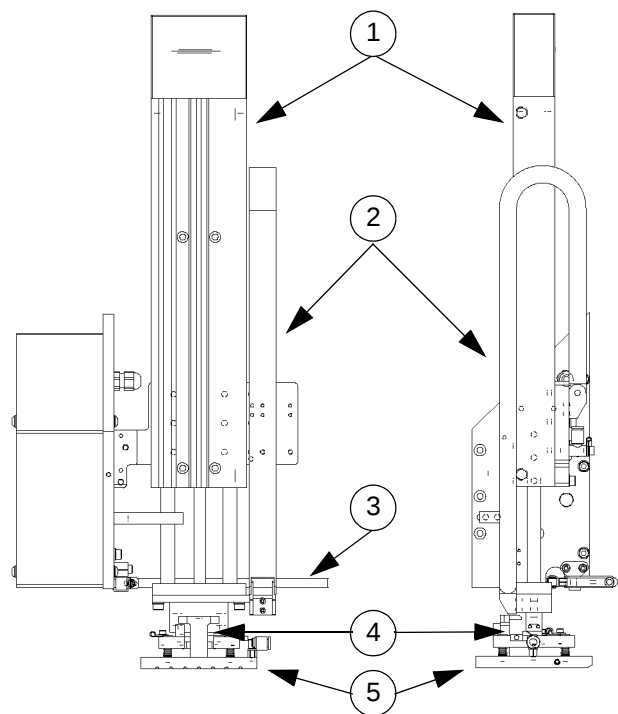


Figure 1–1: Cimjet 334 Applicator

Table 1– 1: Cimjet 334 Applicator Components

1	Applicator Cylinder
2	Energy Chain
3	Air Assist Blow Pipe
4	Applicator Pad Sensor
5	Applicator Vacuum Pad

1.3 Applicator Operation

1.3.1 Application

The Cimjet 334 accepts labels from the Dispenser, retaining them on a vacuum pad until the product is in position. When ready, the Vacuum pad cylinder is extended and the label applied onto the product. This method of label application allows a product to be labelled without stopping the line and can accommodate a variation in case position.

The pivoting pad is controlled by a mechanical stop when the applicator is in the home position.

Torsion springs are used to bring the pad into the apply position when the cylinder moves the pad away from the stop.

The pneumatic valves and vacuum generator are mounted onto the rear of the applicator base plate.

1.3.2 Cylinder Home sensor

A Home sensor mounted on the cylinder and indicates when the cylinder is in the home position.

1.3.3 Applicator Pad sensor

An inductive is used to detect contact with the product.

1.3.4 **Print and Apply Sensors**

Cimjet 334 uses a combination of print sensors and apply sensors to trigger printing and application of the label.

M18 barrel sensors are provided with the machine. These sensors are PNP, polarized, retroreflector type.

Depending on the mode of operation (set via the Restricted Parameters menu) the following sensors are used:

Mode	Sensors Used
Auto Apply	Print Sensor
On Demand	Print Sensor and Apply Sensor
Pre-print	Apply Sensor

Auto Apply

A print sensor triggers the printing of the label, which is then applied to the packs after any Apply Delay time has elapsed.

On Demand Mode

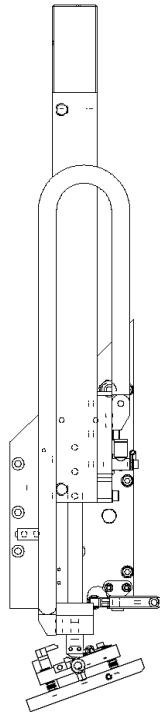
A print sensor triggers the printing of the label. This is followed by an apply sensor which triggers the application of the label.

Pre-print

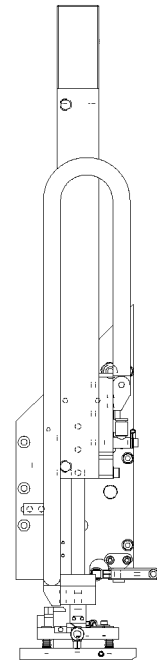
The label is automatically pre-printed and kept on the pad ready to be applied. An apply sensor triggers the application of the label.

1.4 Application Cycle

When Run Mode is started Cimjet moves the applicator into the **home** position.



Home Position



Apply Position

Figure 1-2: Applicator Home Position

SECTION 1 - OVERVIEW

1.4.1 Auto Apply mode

Cimjet detects a product using the **Print** sensor and automatically starts the print cycle.

During printing the vacuum is turned on and an air jet is used to ensure that the label comes into contact with the vacuum pad.

Cimjet then waits for **Apply Delay** before starting the Apply cycle.

When the Apply delay timer is complete the applicator extends. This action causes the application pad to rotate into the normal apply position.

No Apply sensor is used.

Now Cimjet will either detect a product or **Cyl Down Time** will elapse. Products are detected by the sprung section of the applicator pad being deflected. An inductive sensor detects this deflection. When this occurs the vacuum is turned off and Cimjet pauses for **Pad On Time**, before retracting the applicator.

If a product is not detected and **Cyl Down Time** elapses the vacuum is turned off and the applicator is returned to the home position.

As a safety and performance check Cimjet ensures that the applicator has returned to the home position, as detected by the **Home** position sensor mounted on the cylinder, within **Cyl Up Time**.

If the applicator does not return within this time the error **CYLINDER FAULT** is generated.

1.4.2 On Demand Mode

Cimjet detects a product using the **Print** sensor and automatically starts the print cycle.

During printing the vacuum is turned on and an air jet is used to ensure that the label comes into contact with the vacuum pad.

Cimjet then waits for **Apply** sensor before starting the apply cycle.

When the **Apply delay** timer is complete the applicator extends. This action causes the application pad to rotate into the normal apply position.

Now Cimjet will either detect a product or **Cyl Down Time** will elapse. Products are detected by the sprung section of the applicator pad being deflected. An inductive sensor detects this deflection. When this occurs the vacuum is turned off and Cimjet pauses for **Pad On Time**, before retracting the applicator.

1.4.3 Pre-print Mode

In pre-print mode a label is held on the applicator pad ready for application.

At machine start-up a label is printed automatically.

No print sensor is used.

Cimjet then waits for **Apply** sensor before starting the apply cycle.

When the **Apply delay** timer is complete the applicator extends. This action causes the application pad to rotate into the normal apply position.

Now Cimjet will either detect a product or **Cyl Down Time** will elapse. Products are detected by the sprung section of the applicator pad being deflected. An inductive sensor detects this deflection. When this occurs the vacuum is turned off and Cimjet pauses for **Pad On Time**, before retracting the applicator.

The cylinder is then retracted and the next label printed.

SECTION 1 - OVERVIEW

SECTION 2

INSTALLATION

2 Installation

This section covers the additional installation requirements. This includes the positioning of the Cimjet 334, the positioning and connection of the sensors and the power and air requirements. Standard installation requirements are detailed in the Cimjet 300 Dispenser manual.

2.1 Fitting the Applicator to the Cimjet Dispenser

Your Cimjet 300 is normally supplied with the 334 applicator fitted.

If you are fitting a **new applicator** or **changing the type of applicator** proceed as follows:

1. Switch off machine power and disconnect the main power cable.
2. Switch off the air supply if fitted.
3. Remove the existing applicator if fitted.
4. Remove the rear cover of the machine.
5. Bolt the 334 applicator into position.
6. Connect the air supply pipes to the relevant pneumatic schematic.
7. Connect the applicator wiring according to the electrical schematics
8. Ensure that the **“Correct Applicator type”** is selected in the Machine Options parameters.

SECTION 2 - INSTALLATION

2.2 Wiring the Applicator

1. Switch off machine and disconnect the machine power.
2. Remove the rear cover from the machine.
3. Connect the applicator inputs and outputs to the Main Control board:

Table 2– 1: Applicator Connections

Signal	Connector
Applicator Pad Sensor	X26
Cylinder solenoid	X11
Pad Vacuum/Air Assist Blow Pipes	X18
Cylinder Home sensor	X27

For the Cimjet 334 Applicator we have supplied the Electrical Schematics at the rear of this Applicator Guide. If, however, you require the following details, please refer to your Cimjet 300 User Guide:

- Full Wiring Details
- Access to Fault and Warning Connections

2.3 Positioning the applicator

The Cimjet 334 applies labels to the top or the side of packs.

The standard cylinder can apply labels up to 170mm from the edge of the machine base plate. When the cylinder is extended the pad should still be in contact with the product. A shorter distance between the pad and the product will speed up the application cycle.

Two factors determine the position of the label on the pack:

- The position of the applicator relative to the conveyor. This sets the label position at 90 degrees to the product motion.
- The position of the sensors and the setting of the apply delay. These factors affect the position in the direction of the product motion.

Once a suitable combination of these two factors has been determined the stability of the machine should be checked. If the Cimjet could become unstable, it must be secured in place by fixing the stand to the floor or bracing it to the conveyor.

The overall size of the applicator fitted with a 100 x 100mm pad is shown in the following figure.

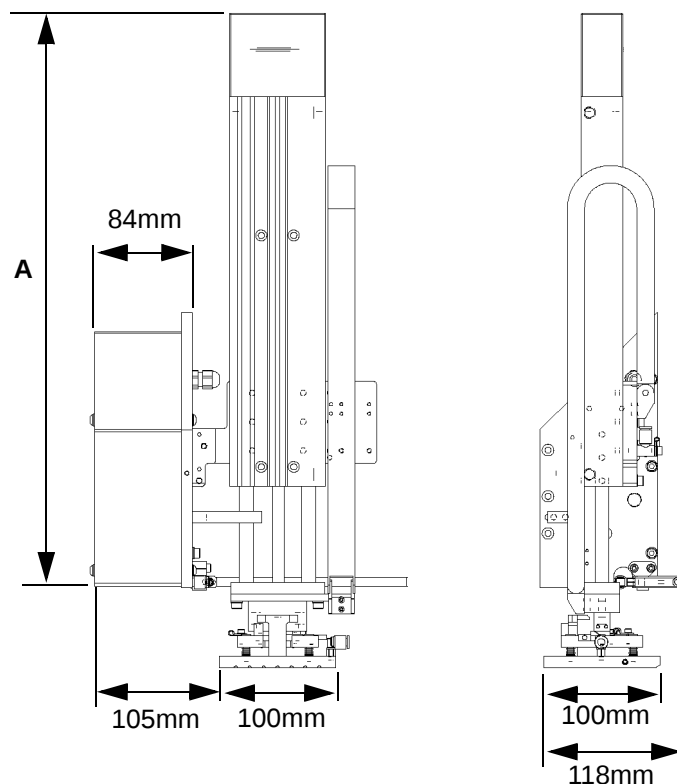


Figure 2-1: Applicator Overall Size

SECTION 2 - INSTALLATION

Table 2– 2: Cylinder Dimensions

Cylinder Stroke Length	Dimension A
100 mm	300 mm
200 mm	400 mm
300 mm	500 mm
400 mm	600 mm

2.4 Connecting External Sensors

2.4.1 Wiring the Sensors

The Print and Apply Sensors are connected to Cimjet 300 via the 9 pin D type connector **X23** on the rear of the machine.

For full connection details refer to the Technical Guide and Electrical Schematics section of the Cimjet 300.

Depending upon the installation, different wiring configurations can be used.

- In **simple applications** with only Print and Apply Sensors, wire the sensors directly to **X23**.
- In **more complex applications** with a number of connections to X23, it is recommended that a single multi-core cable be run in conduit to a junction box. The junction box can then be mounted at a convenient position and individual cables run to the sensors and conveyor control etc.

2.4.2 Fitting the Sensors

When the optimum position of the sensors on the conveyor is determined:

- Mount the sensor firmly in place and then mount the sensor reflector directly opposite.
- All print and apply sensors are “Dark energised” and should be adjusted accordingly.

2.4.3 Testing the Sensors

Viewing the status of the inputs in the Engineer Mode Diagnostic screen will test the functionality of the sensors. Take the Cimjet out of Auto Mode; press the Engineer Mode button then the Display I/O button. The status of the inputs can then be seen. Passing an object between the sensor and reflector should cause the status to change from **OFF** to **ON**.

2.5 Positioning Print and Apply Sensors

Depending on the mode of operation, set via the Restricted Parameters menu, the Cimjet 334 can use a combination of Print sensor only, Apply sensor only or both Print sensor and Apply sensor

The sensors must be positioned correctly to obtain the best possible results. Different considerations are required for different operation modes

2.5.1 Auto Apply Mode

In this mode only the Print sensor is used and the label is applied automatically after the Apply delay timer has elapsed.

The Print sensor should be positioned far enough away from the Cimjet applicator (up stream) to allow enough time for the label to be printed.

To achieve this set the Apply Delay timer to zero and position the sensor so that the label is firmly and fully applied to the pack as early on as possible. Make sure it is applied as close as possible to the nearest edge. Use the Apply Delay timer to fine-tune the label's position on the pack.

Note: If the conveyor speed varies, the label position may differ from pack to pack and in extreme cases may even miss the pack completely. This can be avoided by using **On Demand** mode, which requires both Print and Apply sensors.

2.5.2 On Demand Mode

In On Demand Mode, a Print Sensor triggers the printing of the label and an Apply sensor the application of the label.

When the Apply sensor is triggered Cimjet waits for the Apply Delay timer to elapse and then extends the applicator cylinder to the Apply position and applies the label onto the pack.

The Apply Sensor position and the Apply Delay parameter setting determine the position of the label on the pack.

Consequently:

- The **product's** pitch and speed, and the speed of **printing** determine the position of the **Print sensor**.
- The Print sensor must be mounted far enough away from the Cimjet applicator (up stream) to allow a label to be printed before the product reaches the applicator. If this distance is greater than a product pitch then steps must be taken to increase the print speed or increase the product pitch.
- The Apply sensor should be mounted as **close to the applicator as possible**. This sensor triggers the application of the printed label onto the pack and the location of this sensor will set the position of the label on the pack.

A user parameter (Apply Delay) may be used to delay the application of the label but the zero delay label position is set by the sensor position.

SECTION 2 - INSTALLATION

2.5.3 Pre-print Mode

In Pre-print mode, the label is automatically pre-printed and held on the applicator vacuum pad, ready for application to the product.

When the Apply sensor is triggered Cimjet waits for the Apply Delay timer to elapse and then extends the applicator cylinder to the Apply position and applies the label onto the pack.

The applicator is returned to its Home position and the next label is then immediately printed and held on the Vacuum pad.

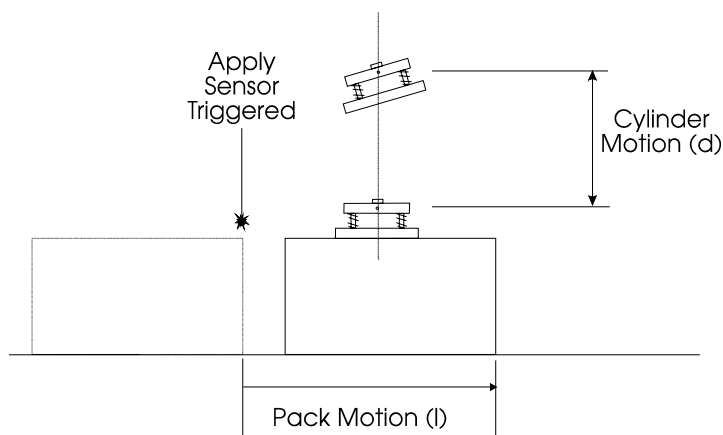


Figure 2-2: Applicator working range

2.6 Calculating sensor position

The following example provides guidelines for calculating the required position of the print and apply sensors (with label positioned early on the pack).

If the Cimjet is not printing the same data for each label, the additional label imaging time must also be taken into account.

Example:

Cylinder stroke for this example is 100 mm (d)

Conveyor Speed = 15m/min

Label Height = 100mm

Print Speed = 125mm/s

Apply Delay = 0 ms

Application Time = 0.4 Sec (Time for Cylinder to Travel d+Pad on Delay)

Time to Print and Apply Label =

Print Time + Apply Delay + Application Time

= Label Height/Print Speed + Apply Delay + Application Time

= $100/125 + 0 + 0.4 = 1.2$ seconds

Distance from Applicator Axis to apply sensor (l) =

Conveyor Speed * Print and Apply Time

= $15/60 * 1.2 = 0.3$ m

SECTION 2 - INSTALLATION

2.7 Machine Speed

The maximum product rate that the Cimjet 300 can deal with is determined by the overall cycle time.

To calculate the theoretical maximum throughput use the following:

Cycle Time

= Print Time + Apply Delay + Apply Time + Return Time

Note that if the label printed is not the same for each product then the imaging time of the printer will add to the cycle time.

Example:

Using the same figures as we used in the sensor placement example and assuming a cylinder return time of 0.4 seconds the total cycle time will be:

Cycle Time =

$$100/125 + 0 + 0.4 + 0.4 = 1.6$$

The maximum throughput is, therefore:

$$60/1.6 = 37.5 \text{ ppm.}$$

2.8 Compressed Air Consumption

As the Cimjet 334 uses a vacuum generator the exact calculation of air consumption is not possible. It is, however possible to calculate a typical consumption.

For each label application the following air is used:-

1. Linear Cylinder Volume * 2 (.040L * 2 = .080 L)
2. Application Pad Vacuum generator consumption * print time + Apply Time. (.566L/sec)
3. Blow pipe consumption * print time+Apply Time. (.25L/sec)

Example

Assumptions

Printing a 100mm long label at 125mm/s, therefore printing time is $100/125 = .8$ secs.

Application takes .3 secs.

Air Consumption

Holding Pad Vacuum and blow pipe are on for the printing time (.8 secs) plus the application time (.3)

Vacuum Consumption = $(.8+.3) * .566 = .623\text{L}$

Blow pipe Consumption = $(.8+.3) * .25 = .275\text{L}$

Cylinder Motion = .080L

Total Consumption per cycle = 0.978L max.

SECTION 3

APPLICATOR PARAMETERS

3 Applicator Parameters

The Cimjet 300 User Guides describe the general method of setting user and restricted mode parameters. This Section provides details of the additional *applicator specific* parameters.

- In Restricted Access Mode:
- Press **RESTRICTED SETUP**
- Press **SET PARAMETERS**
- Press **MACHINE OPTIONS**
- Press **APPLICATOR**

The additional 334 applicator parameters are:

Table 3– 1: Applicator Parameters

Apply Parameters	Description
Apply Delay Range: 0 - 2000ms Default: 100ms	This parameter allows the application of the label onto the pack to be delayed. Try not to use long apply delays as this adds to the overall machine cycle time and reduces the throughput Cimjet can deal with.
Cyl Timeout Range: 0 - 2000ms Default: 1200ms	Set this parameter to the time it takes for the application cylinder to reach its forward limit. This time is used to detect that a product has not been detected and to trigger the return of the applicator to the home position.
Pad on Time Range: 0 - 2000ms Default: 0ms	In some applications it is desirable for the applicator to continue forwards for a short time. In the majority of applications this parameter should be set to zero.
Cyl up time Range: 0 - 200ms Default: 1500ms	To allow Cimjet to detect problems with the air supply, for example, it checks the time taken for the applicator to return to the home position after an apply. If the pad is not home within Cyl Up Time the error CYLINDER FAULT is generated. The parameter should be set to the maximum possible time for the cylinder return plus 25 percent.

SECTION 3 - APPLICATOR PARAMETERS

Table 3– 1: Applicator Parameters

Apply Parameters	Description
Pad Ignore Time Range: 0 - 2000ms Default: 100ms	When the application cylinder is set to move quickly, or where a large pad is being used, the product detection sensor in the pad can be triggered as the pad starts to move. To overcome this, the Pad Ignore Time parameter is set. Cimjet will not act on any product detection signals seen during this time. This parameter should be set to the smallest value that gives a reliable application without false triggering of the product sensor. Note that if this parameter is set to a very high value the pad will not return when a real product is detected.
Blow Output Logic Range: Negative or Positive Default: Positive	Not used on Cimjet 334
Operating Mode Range: Auto Apply, On-Demand or Pre-Print Default: On-Demand	This parameter sets Auto Apply, On-Demand or Pre-Dispense mode. The operation of these three modes is described in the previous section.
Label Detect Range: On or Off Default: Off	When fitted this option detects if a label is present on the Vacuum pad.

SECTION 4

MAINTENANCE

4 Maintenance

4.1 General Lubrication and Cleaning

The applicator uses sealed bearing, only occasional lubrication of the cylinder shafts with a light oil is required.

A monthly application is sufficient.

Label adhesive can bleed onto the vacuum pad and inhibit the vacuum or cause the label to catch on the surface of the pads. These should be cleaned with Isopropanol.

4.2 Compressed Air

As an ejector style vacuum generator is used it is essential to ensure that the compressed air supply is clean and dry.

Take care to check the water trap of the Cimjet filter regulator weekly.

This check must be performed more regularly if the factory air is particularly wet.

The main supply pressure should be checked, the line pressure must be 6 Bar.

4.3 Cylinder Speed

The speed of the application cylinder is adjusted by restrictors mounted in the cylinder solenoid valve.

Take care not to damage the product being labelled by setting the speed too high.

In addition to the restrictors a safety pressure regulator is mounted within the rear covers of the applicator. This regulator limits the input pressure to the cylinder only.

This regulation of the pressure limits the forces that can be applied by the cylinder to prevent serious injuries if hands or figures get trapped by the applicator.

DO NOT attempt to alter the setting of this regulator; it is factory set sealed to show if any unauthorised adjustments have been made.

4.4 Blow Pipe/Vacuum Adjustment

The blow pipe and vacuum generator share a common air supply. The supply to each device is determined by the setting of a control valve.

Set the valve to give a working vacuum, with your worst case air supply conditions.

4.5 Checking the Pad Home Stop

A Nylatron™ stop is used to push the applicator pad into the home position. This stop will wear over time and should be checked once a month and replaced as necessary.

SECTION 4 - MAINTENANCE

SECTION 5

TROUBLESHOOTING

5 Troubleshooting

This section is designed to assist with diagnosing problems with the 334 Applicator. For details on Dispenser problems please refer to the Operator Manual Troubleshooting Guide.

5.1 Diagnostic Screen

The Engineer Mode Diagnostic screen can be used to see the status of the Cimjet Inputs or to activate the Cimjet Outputs.

The full range of I/O can be found in the Cimjet 300 operating manual. The relevant I/O listed here refers to the 334 applicator only.

5.1.1 Inputs

Table 5– 1: Applicator Inputs

Input	Status	LED	Connection
Print/Apply	On/Off	LD1	X23
Apply	On/Off	LD2	X23
Cylinder Home	On/Off	LD7	X27
Applicator Pad Sensor	On/Off	LD8	X26

5.1.2 Outputs

Table 5– 2: Applicator Outputs

Output	Status	LED	Connection
Cylinder Solenoid	Out/In	LD14	X11
Vacuum/Blow Pipe Solenoid	On/Off	LD16	X18

SECTION 5 - TROUBLESHOOTING

5.2 Application problems

5.2.1 Labels are not being printed

- Check that the print and apply sensor is being triggered. Use the I/O screen to check the operation.
- Is a valid label selected? Use the Select Product option of SET mode to select a label or download a new label if emulation mode is being used.
- Check that the apply delay is not set to an excessively long figure.

5.2.2 Cylinders not moving

- Check the setting of the air regulator.
- Check for a mechanical problem, such as a seized bush.
- Ensure that very long delays have not been set.

5.2.3 Labels are being Dropped.

- Check the air supply to the vacuum generator. Look for low air pressure, kinked pipes or leaking joints.
- Check the vacuum pipe work from the vacuum generator to the vacuum pad for kinks or leaks.
- The vacuum generator could be blocked, try replacing the vacuum generator.
- Clean the vacuum pad.

5.2.4 Labels are applied too late

- Check the position of the **Print and Apply** sensor.
- Has the print speed been changed or the label design altered to include information that varies from label to label. Both of these conditions have require the **Print and Apply** sensor to be re-positioned.
- Ensure that the apply delay has not be set to a very high value.

5.2.5 Labels are not Sticking to the Pack

- Check that the pad is coming into full contact with the pack.
- If necessary move the machine closer to the pack.
- If the pack is angled to the applicator pad and has a highly irregular surface try increasing the value of **Pad On Time**.
- This will cause the cylinder to over drive and allow the application pad to conform to the angle of the pack more.

5.2.6 Label is Not being Applied Accurately

- Check that the sensing of the product is reliable. Is the packaging material variable and causing the sensor to trigger early?
- Is the conveyor speed consistent? Variations in the conveyor speed, especially if the Print and Apply sensor is mounted a long way from the machine will cause variations in the position of the label.
- Eliminate the conveyor speed variation.
- Is the height of the packs varying? Variation in the applicator to pack distance means that the Cimjet needs to drive further to label the product. The further it is to the product the later on the product the label will be applied.

5.2.7 Some Packs are not Labelled

If packs are bunching such that the product pitch is smaller than the minimum allowed (see section 2.3) some cases will be missed.

Try the following:

- Can the print speed be increased? You may need to use better quality paper and foil to get the best possible print speed.
- Is it possible to mount the Cimjet closer to the product and reduce the application time?
- Is the apply delay set to zero? If not, reposition the print/apply sensor to minimize the apply delay.
- Can other steps be taken to ensure regular pack spacing?

5.2.8 Pad is not detecting the Pack

If the applicator pad is coming into contact with the product but not retracting, check the following:

- Have Pad Ignore Time or Pad On Time been set to excessively high values?
- Is the product sensor working correctly. Check the operation of the sensor using the I/O screen.
- Ensure that the pad is moving freely.

SECTION 6

RECOMMENDED SPARES

6 Recommended Spares

Table 6– 1: 5825518 100/200 mm Cylinder Uptime Kit

Part No	Qty	Description
5825493	1	Pad Sensor
B03058AA	2	Bush
B03858AA	4	Pad Compression Spring
B03859AA	1	Torsion Spring
B03860AA	1	Torsion Spring
32217BB	1	Pad Stop Pin

Table 6– 2: 5825519P 300/400 mm Cylinder Uptime Kit

Part No	Qty	Description
5825495	1	Pad Sensor
B03058AA	2	Bush
B03858AA	4	Pad Compression Spring
B03859AA	1	Torsion Spring
B03860AA	1	Torsion Spring
32217BB	1	Pad Stop Pin

SECTION 6 - RECOMMENDED SPARES
