Installation

4

Introduction

This chapter describes the procedures to install Videojet 1510 Excel printer.

Caution

EQUIPMENT DAMAGE. Only Videojet trained personnel must carry out the installation and maintenance work. Any such work undertaken by unauthorized personnel can damage the printer and invalidate the warranty.

Warning

PERSONAL INJURY. Make sure that the mains electrical supply is within the range indicated by the label adjacent to the mains inlet of the printer. If the voltage ratings differ, do not use the printer until you consult your Videojet supplier.

Use only the mains power cable supplied with the printer. This cable must terminate in an approved, three-pole, mains plug which has a protective ground conductor.

Keep electrical power cables, sockets and plugs clean and dry at all times.

Warning

PERSONAL INJURY. The printer must be connected to an AC power supply, which has a protective ground conductor in accordance with IEC requirements or applicable local regulations. Any interruption of the protective ground conductor or disconnection to the protective ground terminal may render the apparatus dangerous.

Warning

PERSONAL INJURY. Lethal voltages are present within this equipment when it is connected to the mains electrical supply. Observe all statutory electrical safety codes and practices. Unless it is necessary to run the printer, disconnect the printer from the mains electrical supply before removing the covers, or attempting any service or repair activity. The failure to follow this warning can cause death or personal injury.

Tools and Supplies

Tools

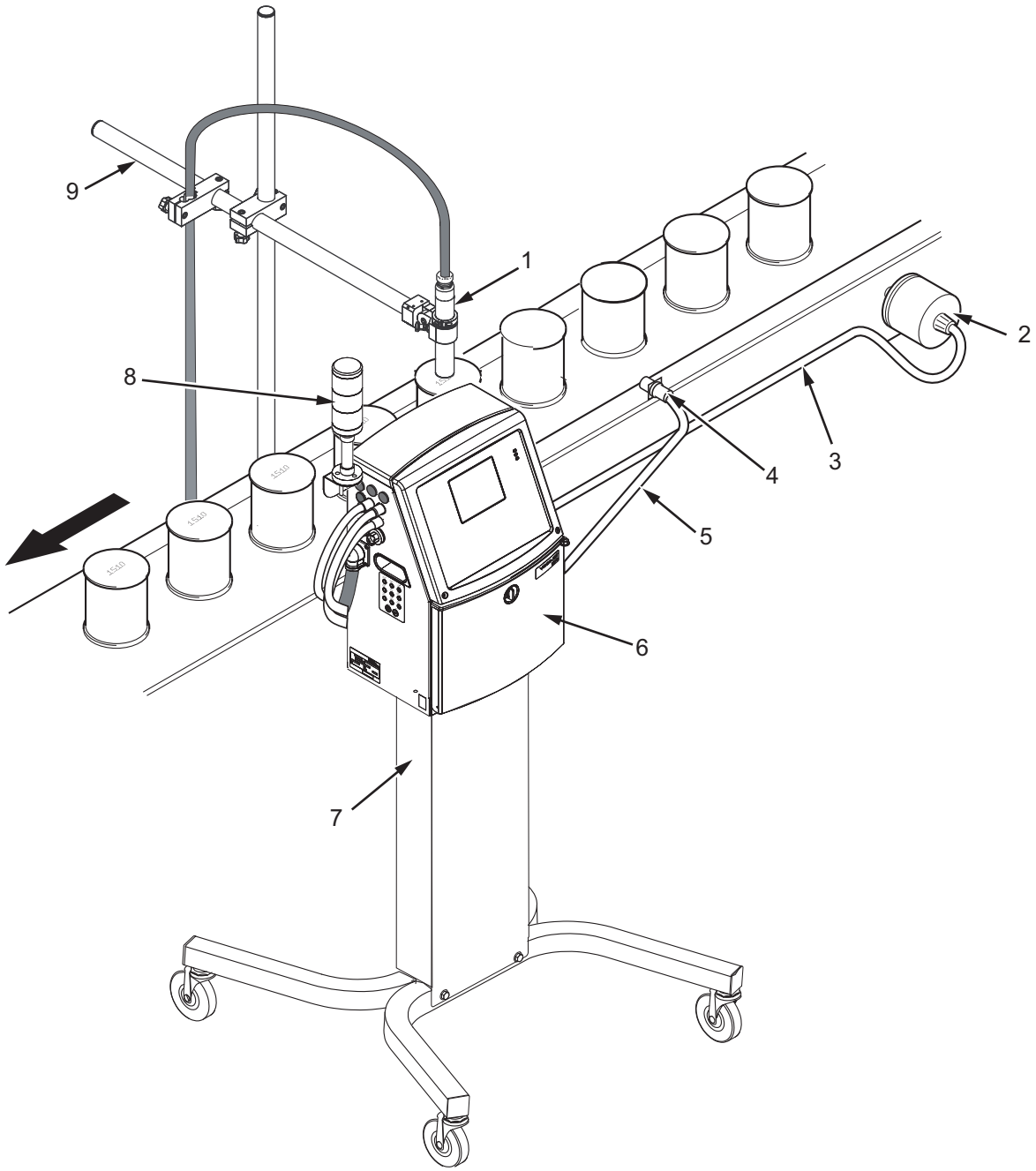
Refer to the service tool kit listed in "Tools Kit" on page 10-56 for information on tools and supplies required to install the printer.

Supplies

- Two cartridges of ink
- Two cartridges of make-up fluid
- Wash bottle
- Wash solution
- Gloves
- Tissue

Typical Production Line

A typical printer installation is shown in Figure 4-1 on page 4-3, where the printer (item 6) is mounted on a printer stand (item 7). The printhead (item 1) is configured to print vertically with the help of a clamp and bracket assembly. A stack light (item 8) is fitted to the printer.



1. Printhead
2. Shaft Encoder
3. Shaft Encoder Cable
4. Print Trigger
5. Print Trigger Cable
6. Printer
7. Printer Stand
8. Stack light
9. Printhead Stand

Figure 4-1: Typical Production Line Installation

Unpack and Inspect the Printer

1 Open the shipping box, and make sure that all the parts listed in the packing list are present in the box. If any part is missing, contact Videojet Technologies Inc.

- Refer to Chapter , “Support and Training” for Videojet contact information.
- Refer to Chapter 10, “Illustrated Parts List” for part numbers.

2 Make sure that there are no damaged parts. If you find any damaged part, contact Videojet Technologies Inc. to order a new part.

Commission the Printer

This section describes the tasks that a user must perform to commission the printer.

Inspect the Ink System

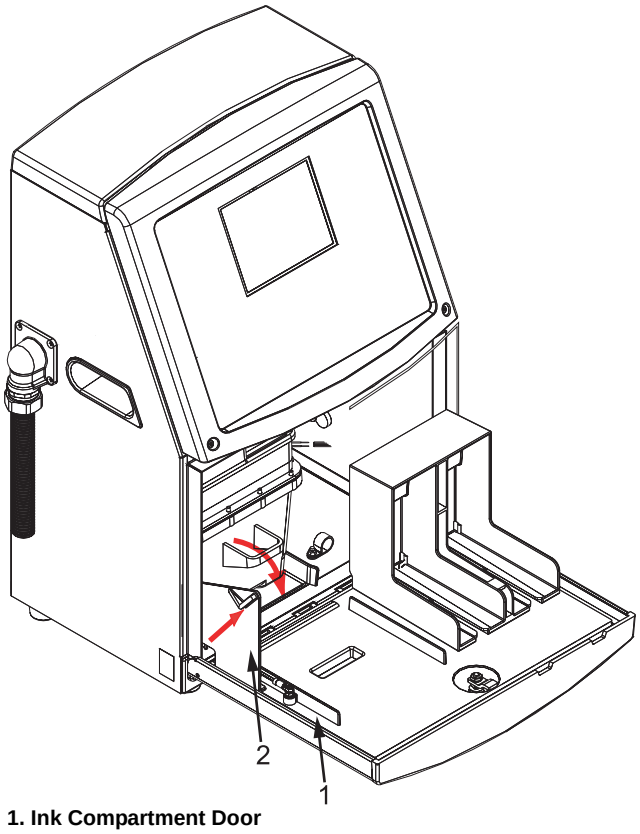
1 Put the printer on a stand or table.

Note: *The printer can be mounted on three types of stands: mobile printer stand, static printer stand, or the wall-mounting assembly. Refer to the respective installation instructions to install the printer on a stand.*

2 Turn the knob and open the ink compartment door (see Figure 4-2).

Figure 4-2: Turn the Knob

3 Push the plate (item 2, Figure 4-3 on page 4-5) in the direction shown to open the ink compartment door (item 1) completely.



1. Ink Compartment Door
2. Plate

Figure 4-3: Ink Compartment Door

4 Remove and discard the foam pads (see Figure 4-4 on page 4-5).

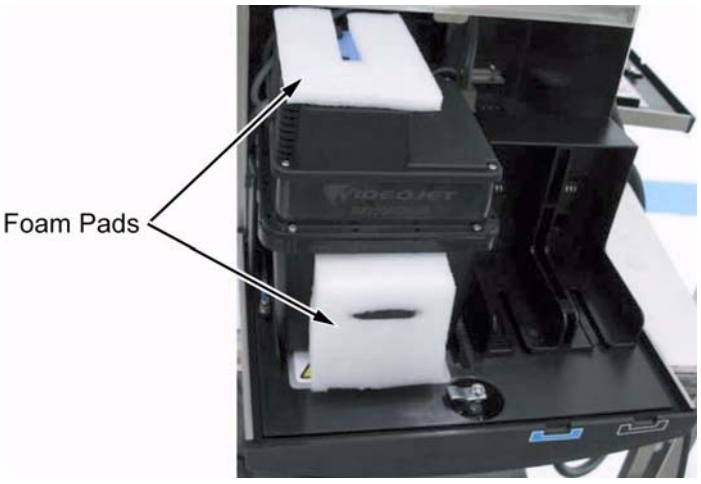
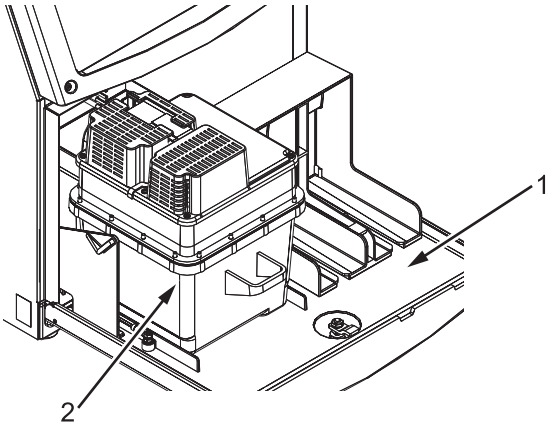


Figure 4-4: Foam Pads Removal

5 Remove and discard the foam pads that are attached to the CSB in the electronics compartment.

6 Pull the ink core module out of the ink compartment (see Figure 4-5 on page 4-6). Inspect the ink core for shipping damages such as cracks.



1. Ink Compartment Door
2. Ink Core Module

Figure 4-5: Pull Ink Core Module

7 Make sure that the ink core manifold is connected to the ink core module correctly (see Figure 4-9).

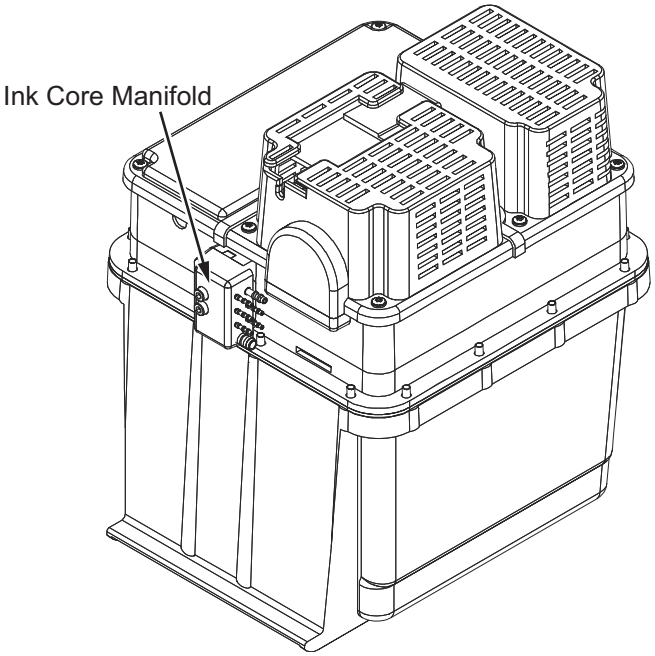
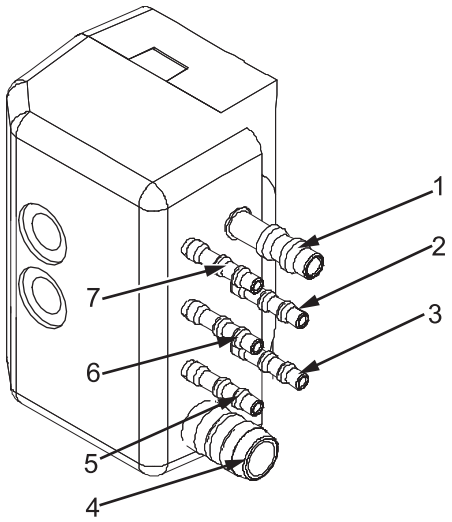


Figure 4-6: Ink Core Manifold

8 Make sure that all the tubes are connected to the ink core manifold (see Figure 4-7).

9 Make sure that the air vent tube is connected to the solvent recovery system at the bottom rear of the cabinet.



1. Clear Tube (5/32 inch)
2. Red Stripe Tube (1/8 inch)
3. Green Stripe Ink Tube (1/8 inch)
4. Air Vent
5. Blue Stripe Tube (1/8 inch)
6. Black Stripe Make-up Tube (1/8 inch)
7. Clear Tube (1/8 inch)

Figure 4-7: Tubes to Ink Core Manifold

10 Push the ink core module into the ink compartment.

11 Close the ink compartment door.

Inspect the Electronics System

12 Open the electronics compartment and make sure that all the electrical cables are fitted and routed correctly.

13 Make sure that the pneumatic tube that connects to positive air pump and filter (if fitted) is connected correctly.

Note: *Printers using the Dry Air kit will not have a positive air pump.*

Inspect the Printhead

14 Remove the printhead cover (see Figure 4-14) and inspect for damages like:

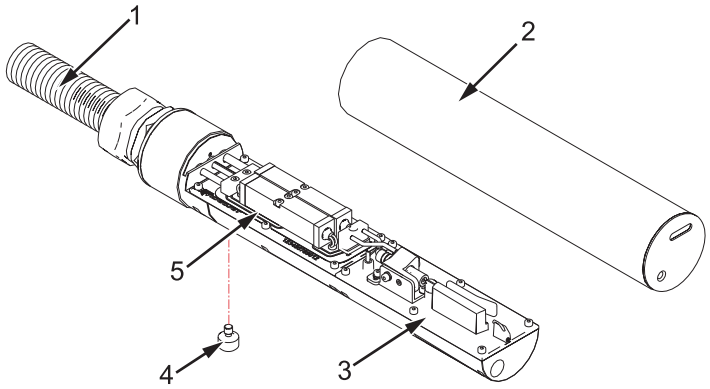
- Loose tubing, decks, screws and manifolds
- Damage to printhead sleeve
- Scratches to printhead assembly
- Loose fitting of the umbilical on the back of the printhead
- Cracks and abrasions on the black umbilical rubber jacket

15 Check the distance between the nozzle and the charge electrode (Table 4-1).

Microns	Charge Electrode Distance
60 Microns	1 mm
70 Microns	2.3 mm

Table 4-1: Charge Electrode Distance

16 Replace the printhead cover.



1. Umbilical
2. Printhead Cover
3. Printhead Engine
4. Printhead Cover Screw
5. Printhead Valve Module

Figure 4-8: Printhead Cover Removed

Log into UI

17 Connect the printer to the AC power supply and turn on the printer. The <01 Edit> screen appears (see Figure 4-9).

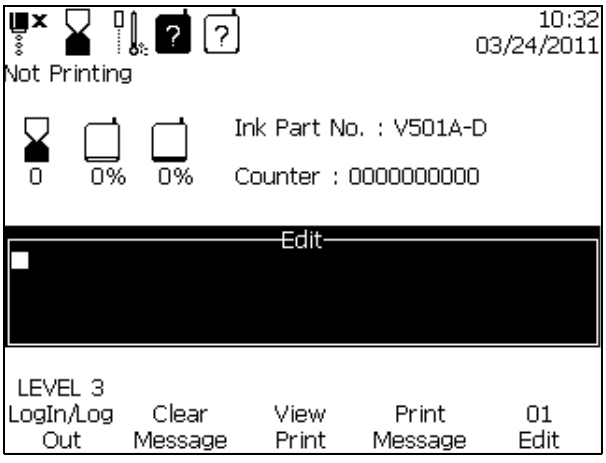
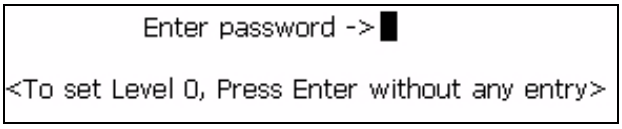


Figure 4-9: <01 Edit> Screen

18 If you cannot see the display, adjust the contrast using the contrast adjustment button  .

19 Log into the user interface (UI) at level 3 password. Press the *F1* key.The following message appears:



To obtain the daily password, do one of the following:

- Call Videojet Technologies Inc. Customer Service Department at 1-800-843-3610 (United States only), or contact the local Videojet Technologies Inc. representative.
- Access *Service* > *Videojet Password Generator* tab on www.videojet.com.

Note: *The printer may display a* ***No Ink Parameters*** *warning and an* ***Ink Core Change*** *alarm. These are normal indications that the ink core is new and not programmed.*

Install Ink and Make-up Cartridges

20 Open the ink compartment door (refer to Step 2 and Step 3 on page 4-4).

Warning

PERSONAL INJURY. The ink, solvent and make-up fluid are irritating to the eyes and respiratory system. To prevent personal injury when handling these substances follow the guidelines given below:

Always wear protective clothing and rubber gloves.

Always wear goggles with side-shields or a face mask. It is also advisable to wear safety glasses when carrying out maintenance.

Apply barrier hand cream before handling ink.

If ink or make-up fluid contaminates the skin, wash immediately with soapy water. DO NOT use washdown or solvent to clean ink stains from the skin.

Warning

Read and understand the Material Safety Data Sheet (MSDS) before using any ink, make-up fluid, or cleaning solution. An MSDS exists for each type of ink, make-up fluid, and cleaning solution. For more information, visit *www.videojet.com* and navigate to *Documentation* > *Material Safety Data Sheets*

21 Access *04 System - System Info* > *01 Info - Version Info* to view the version information. Record the following:

- SW Version
- PE Firmware Version
- CE Image Version

Confirm that the CSB / Ink Core "utilization" are set at *Medium/ Medium* for 1510 Excel.

22 Perform a hardware test. Access *04 Edit* > *Service Printer - Service 1* > *Service 2* > *Service 3* > *Service 4* > *Service 5* > *Service 6* > *HARDWAR TEST*. Press the *F1* Key (Figure 4-10).

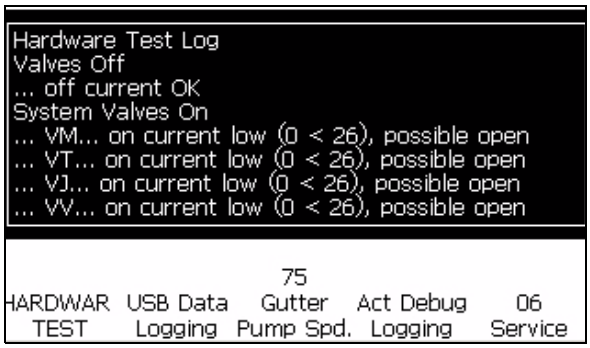
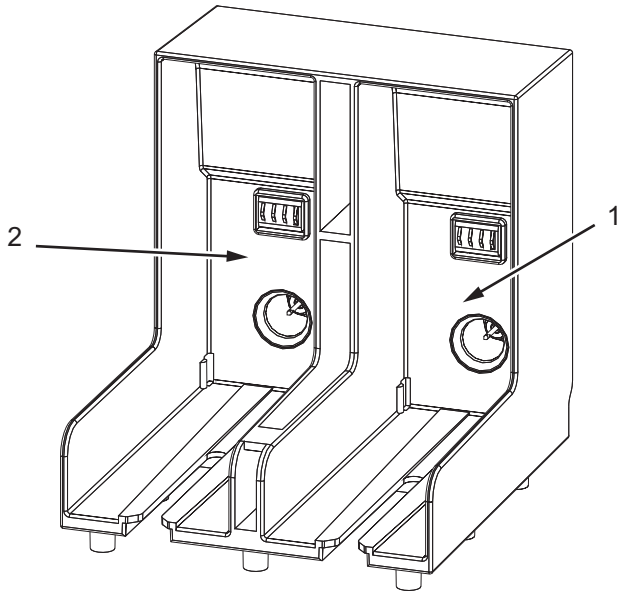


Figure 4-10: Hardware Self-test

23 Install one new cartridge of ink and one new cartridge of make-up fluid in the printer (Figure 4-11 on page 4-11).

24 Make sure that the ink out and make-up out icons disappear.



1. Ink Receptacle
2. Make-up Receptacle

Figure 4-11: Ink and Makeup Cartridge Holder

25 If unknown ink and unknown make-up icons are displayed, perform the 'Update Ink Core' Parameters.

Note: *Make sure that the ink and make-up cartridges are inserted into the correct slots.*

To update the parameters, do the following tasks:

a. Select 01 Edit> 02 Edit >03 Edit> 04 Edit - Service Printer > 01 Service > 02 Service > 03 Service - Auto Prime > 01 Prime > 02 Prime - Update Core. The ink data is displayed on the screen.

b. Make sure that the part number on the ink cartridge matches with the part number displayed on the screen. Record the part number. (See Figure 4-24 on page 4-19).

c. Press the *Enter* key and wait for about 4 to 5 seconds. The ink data displayed on the screen disappears and the new ink type information appears.

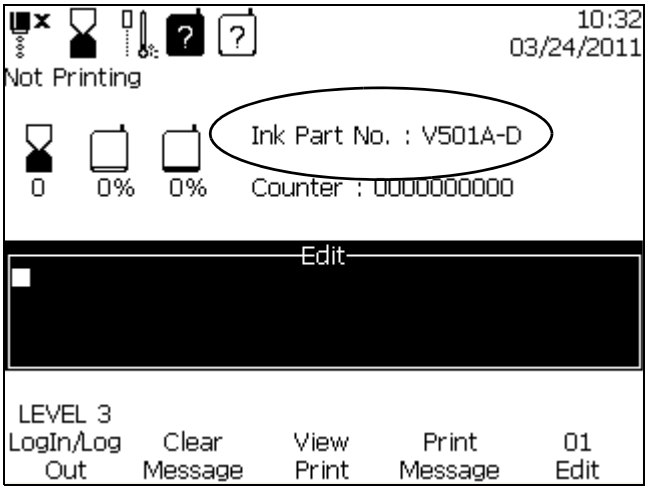


Figure 4-12: Ink Data

26 Verify and record the ink reference and expiration date. Access 01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service - Printer Log > 01 Log - Ink Data > 01 Ink - Ink Data (see Figure 4-13 on page 4-12).

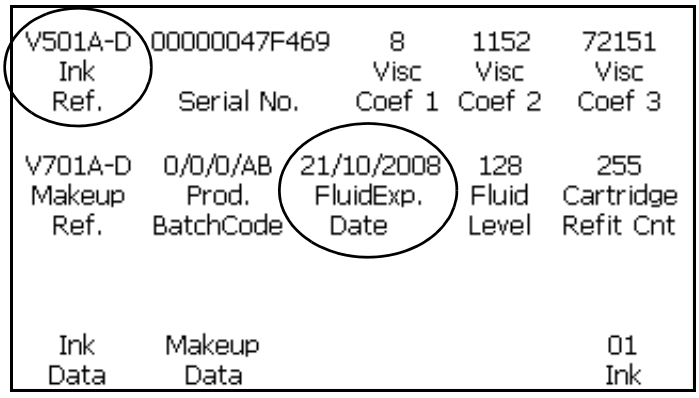


Figure 4-13: Ink Smart Chip Data

27 Verify and record the make-up type and expiration date. Access 01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service - Printer Log > 01 Log - Ink Data > 01 Ink - Makeup Data (see Figure 4-14 on page 4-13).

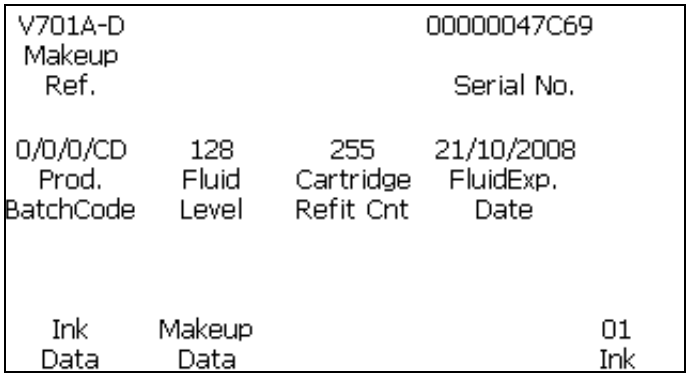


Figure 4-14: Makeup Smart Chip Data

28 Verify and record the 'Time Ink On'. Access 01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service - Printer Log > 01 Log - Run Times > 01 Run Time (see Figure 4-15).

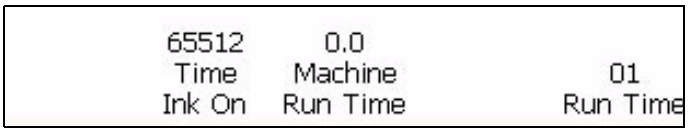


Figure 4-15: 01 Run Time

Configure the Printer

29 Please make sure printhead is clean and dry. Calibrate the HV. Refer to "Calibrate HV" on page 4-37.

30 Set date and time. Access 01 Edit >02 Edit >03 Edit >04 Edit - System Set-Up> 01 System (see Figure 4-16).

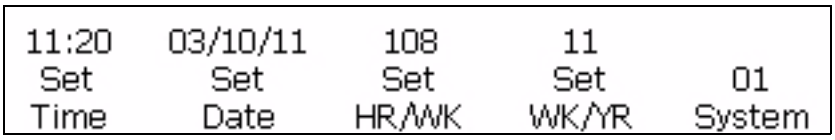


Figure 4-16: Set Time/Date

31 Set the nozzle type and the conduit length.

- Access 01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service > 02 Service > 03 Service - Nozzle Setting > 01 Settings - Nozzle Type (see Figure 4-17 on page 4-14). Make sure you select the correct nozzle type for the current configuration (60 micron or 70 micron).

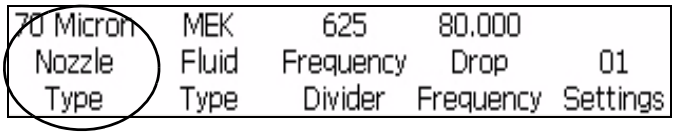


Figure 4-17: Nozzle Type

- Access 01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service > 02 Service > 03 Service - Ink Pressure > 01 Pressure - Conduit Length (see Figure 4-18 on page 4-14). Make sure that the conduit length is set correctly for the current configuration (see Table 4-2).

***Note**: During the installation procedure, set the printhead elevation at the correct value (in centimeters). If the printhead is below the cabinet - enter a negative number. The printhead should be at the same height as the point where the umbilical exits the cabinet.*

Printer	Conduit Length
Videojet 1510 Excel	3 m (standard), 6m (optional)

Table 4-2: Conduit Length

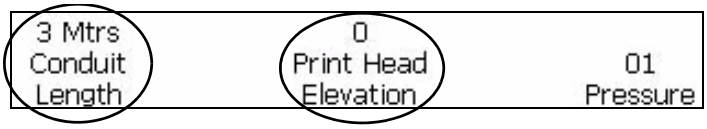


Figure 4-18: Conduit Length

Prime the Ink Core Module

32 Start *Prime Core* (01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service > 02 Service > 03 Service -Auto Prime > 01 Prime) (Figure 4-19) and record the time to prime.

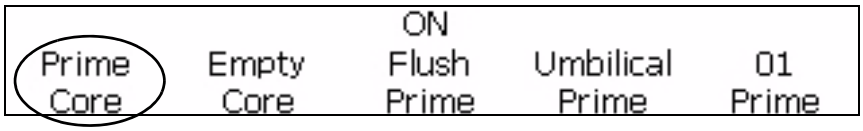
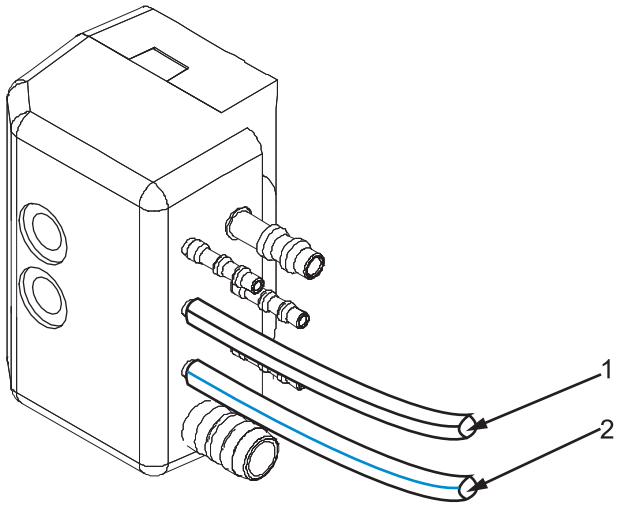


Figure 4-19: Prime Core

33 Make sure that the fluid flows through the black-striped tube (item 1, Figure 4-20) and blue-striped tube (item 2).



1. Black Striped Tube
2. Blue Striped Tube

Figure 4-20: Prime Core

34 Monitor the flow of fluid as it is pulled toward the ink core. As the ink core reaches a low level, the red LED is turned off and is replaced with a Ink Core low icon.

Note: *When ink core is empty, the red LED is illuminated.*

Note: *Make sure to see that the ink is being pulled from the cartridge to the gutter pump and then sent to the ink core. If the ink is not flowing, the system shows the cartridge empty icon even though no fluid was pulled from it.*

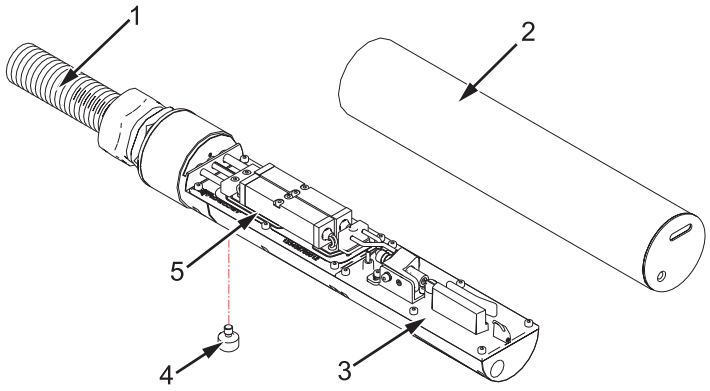
35 01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service - Printer Log > 01 Log - Ink Data > 01 Ink - Ink Data The *Prime Core* procedure stops automatically when the ink core level reaches middle level.

If the ink level stalls above 'low' but below 'middle', replace the cartridge when prompted to allow the completion of the *'Prime Core'*procedure.

Note: *The printer indicates if another cartridge is required to complete the procedure.*

Perform System Flush Purge and Umbilical Purge

36 Remove the printhead cover screw that fastens the printhead cover to the printhead chassis and remove the printhead cover (see Figure 4-21).



1. Umbilical
2. Printhead Cover
3. Printhead Engine
4. Printhead Cover Screw
5. Printhead Valve Module

Figure 4-21: Printhead Cover Removed

Caution

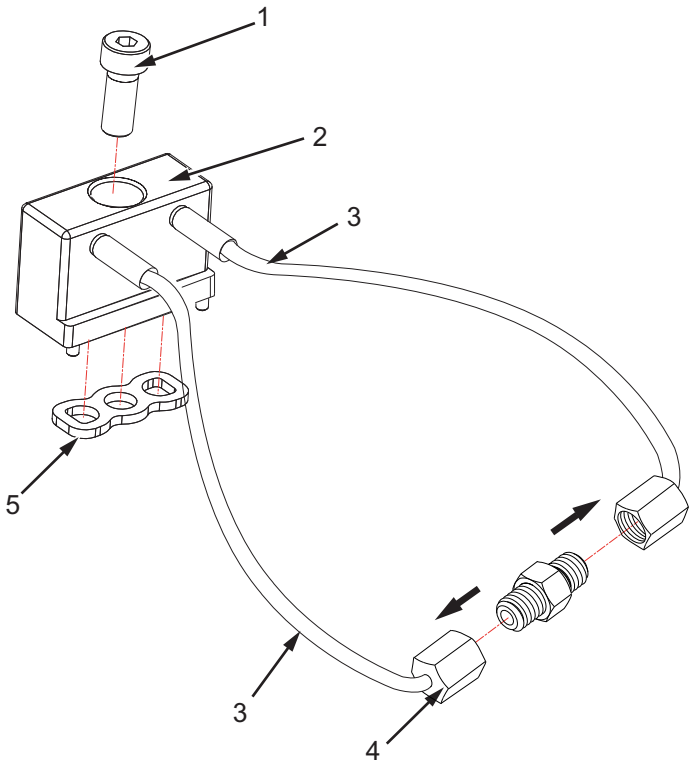
EQUIPMENT DAMAGE. Always wear a set of rubber gloves before disconnecting the nozzle tubing manifold. This helps to prevent nozzle clogs.

37 Remove the M2 x 6 socket-head-cap screw (item 1, Figure 4-22) that attaches the front tubing manifold to the printhead valve module.

38 Remove the 2-way manifold gasket (item 5).

39 Put the 2-way manifold gasket provided in the bypass kit on the ports of the printhead valve module.

40 Fit the nozzle bypass manifold (that has the loop of tube) (Part Number 399247) to the printhead valve module using the M2 x 6 socket-head screw.



1. M2 x 6 Socket-head Screw
2. Nozzle Bypass Manifold
3. Tubing
4. Quick Disconnect
5. 2 Way Manifold Gasket

Figure 4-22: Bypass Manifold

41 Open the quick disconnect (item 4) in the middle of the loop and direct the supply side into a receptacle.

42 Start Flush Prime (01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service > 02 Service > 03 Service - Auto Prime > 01 Prime).

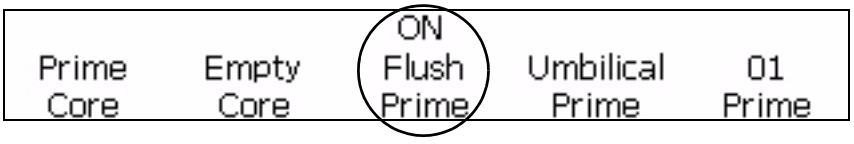


Figure 4-23: System Flush Purge

43 Observe if the fluid flows through the flush supply line (red stripe) and flows out of the loop in the end.

Make sure that the fluid that is ejected is clear (make-up, not ink).

Note: *Allow the system flush procedure to stop automatically after completion. The procedure takes 15 minutes.*

44 Connect the quick disconnect in the middle of the loop connector and perform umbilical prime. This procedure will not finish automatically,

so Ink off the mains power switch to stop the umbilical prime process after a few seconds.

Figure 4-24: Umbilical Prime

45 Remove the nozzle bypass manifold and the 2-way manifold gasket.

46 Fit the front tubing manifold to the printhead valve module using M2 x 6 socket-head-cap screw. Make sure to fit the gasket under the manifold.

Perform Ink Stream Alignment and Viscosity Calibration

47 Remove the make-up cartridge from the make-up stall.

48 Turn the ink ON in the service mode (access 01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service > 02 Service).

Figure 4-25: Ink On

You can see the ink stream toggling at the start, because of air bubbles that remain in the system. Also refer to "How to Clear a Clogged Nozzle" on page 9-43.

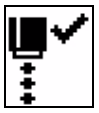
49 Check the position of the ink stream into the gutter:

- If the ink stream is aligned into the gutter, go to Step 50.
- Else, do mechanical adjustments to the nozzle (refer to "Nozzle Adjustment" on page 4-34).

Note: *Inspect the nozzle orifice and charge electrode to make sure that the stream travels through the center of the electrode and runs parallel to the walls of the electrode/charge tunnel.*

If adjustments are at either end of the ranges, there can be a nozzle partial clog even though the ink stream is not severely misaligned.

While in some cases, an ink stream can be misaligned, you can adjust the ink stream to flow correctly into the gutter. But a misaligned ink stream leads to incorrect pressure setting as the printer needs more than normal pressure to get the correct velocity with a slightly clogged nozzle.

50 Make sure that the jet startup is complete. The jet running icon on the main screen must be solid (must not flash)  .

51 Make sure that the printer has reached steady state. Steady state indicates: actual velocity = velocity set point, ±0.1 m/s (check these parameters on Diagnostics Screen One .

Note: *The printer may take a few minutes to reach the steady state.*

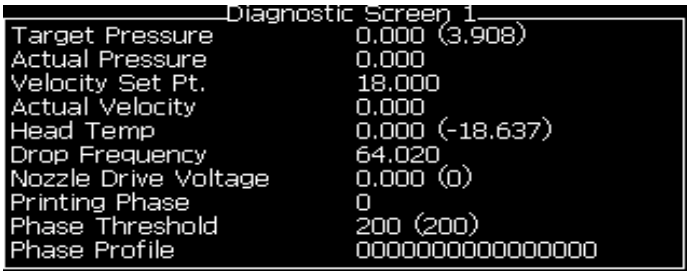


Figure 4-26: Diagnostics Screen One

52 Perform viscosity calibration. Follow the prompts provided by the printer, assuming that the ink is known perfect ink (see Figure 4-27 (01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service > 02 Service > 03 Service - Auto Prime > 01 Prime > 02 Prime).

Note: *Perfect ink is the ink that is pulled directly from an ink cartridge known to be within a specific viscosity range.*

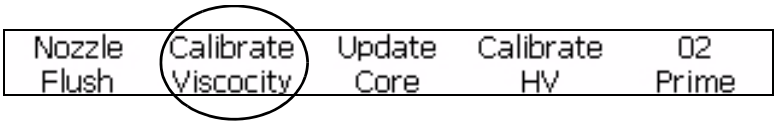


Figure 4-27: Viscosity Calibration

Note: *Perform this procedure every time the following are replaced:*

- *Ink core module*
- *Printhead engine*
- *CSB*

Note: *Perform the viscosity calibration if the viscosity is incorrect. The viscosity is correct if target pressure and the temperature-compensated target pressure were equal before the components were replaced. Refer "Perform Calibration and Testing" on page 4-37.*

53 Record *Target Pressure* (both the values). To record the pressure, access 01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service > Diagnostic Screens > 01 Diagnostic > Diagnostics Screen1.

Caution

EQUIPMENT DAMAGE. If the viscosity calibration is not done, the viscosity high/low warning will not disappear from the screen. This calibration step is the most critical step in installing the printer.

54 Check the ink stream alignment and make the fine adjustments if necessary. The ink stream must be centered horizontally and vertically not more than 2 to 3 stream widths from the top of the gutter. The top of the gutter is the arc opposite the EHT plate (angled plate). Refer to Figure 4-45 on page 4-35 for more information.

55 Insert a fresh make-up fluid cartridge again.

Head Stop and Head Start the Printer

56 Put a piece of paper under the printhead (to capture splatter) and press the HEAD key to do a head stop.

Note: *Exit the service mode with the ink and high voltage "on", then use the HEAD key to stop the jet.*

During shutdown if ink splatters inside the printhead, check the ink stream alignment again and make sure that the flush pump is fully primed.

Note: *The flush pump is a controlled diaphragm inside the ink core module.*

57 Put another piece of paper under the printhead and press the HEAD key to do a head start.

During startup, perform head start if the ink splatters inside the printhead, check the ink stream alignment again and make sure that the flush pump is fully primed.

Perform Final Checks

58 Make sure that auto modulation is enabled 04 Edit - System Set-up > 01 System > 02 System > 03 System - Status Screens > 01 Screen> 02 Screen> 03 Screen - Enables Screen).

59 Install the printhead cover and verify that the amber light is turned off:

If the amber light is turned on when with the printhead cover fitted, check the *Current Warnings* screen and perform the required troubleshooting. Access 04 Edit - Service Printer > 01 Service - Diagnostic Screens > 02 Diagnostic - Warnings Screen.

60 Use a Dry Air kit to adjust the rate of positive air flow from the printhead slot. Adjust the regulator of the Dry Air kit until the rate of positive air flow is above 4 SCFH.

61 Take a sample print.

62 Close the ink compartment door.

63 Make sure that the electronics compartment and the ink compartment doors are closed and locked.

Caution

EQUIPMENT DAMAGE. Do not perform Step 65 until the system is ready for production, as it affects the viscosity adjustments of the printer.

64 Backup printer settings using a USB flash drive. Select 05 Service - System Backup (01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service > 02 Service > 03 Service > 04 Service > 05 Service).

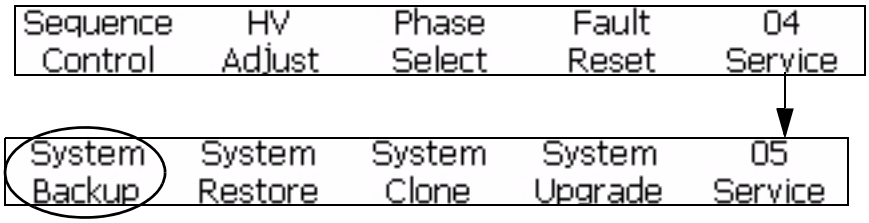


Figure 4-28: System Backup

65 If production printing is necessary, measure the vertical distance between the umbilical exit point on the side of the cabinet and the bottom of the printhead when it is fitted to the conveyor. This is the *Printhead Elevation*. Enter the value (in centimeters) in the UI.

Note: *Printhead Elevation value for printheads below the exit point will be a negative number.*

Figure 4-29: Printhead Elevation

66 Press the *Enter* key to backup the settings.

67 Validate machine parameters (refer to Table 4-3).

Machine Parameter	Typical Value (see Note above)
Head Temperature	35 °C
Drop Frequency	75 to 77 Hertz
Modulation Voltage	Variable (auto sets on jet start)
Printing Phase	Variable (auto controls)
Phasing Threshold	200 (auto controls after setup 195- 250 nominally)
Phase Profile	Variable combinations of 1 and 0: For every 16 digits there should always be between 7 and 9 consecutive ones. The rest of the digits should be zeros. For example: • 1111111110000000 • 0001111111000000 • 0000011111111100 ***Note:*** *The ones can also be wrapped around: 1111110000000111*
Ink Temperature	Typically 10 °C - 35 °C, subject to the environmental temperature (Higher and lower temperatures may be seen when running at environmental extremes of -5 °C or 45 °C)
Electronics Temperature	Typically 15 °C to 50 °C This is subject to the environmental temperature.
Pump rpm	1200-1800
Makeup Vacuum	Variable Subject to the amount of make-up fluid available in the cartridge.

Table 4-3: Typical Diagnostics Screen Values

Machine Parameter	Typical Value (see Note above)
Heater Power	Variable Relative to the environmental temperature. Zero above 35 °C
Gutter Detect Status	In Gutter - When Ink Jet is running normally
Ink Core Level	Mid Level
EHT Voltage	4 KV to 8 KV
% EHT Trip	85%
Traffic light	• Green - Printing (no warnings or errors) • Green and Yellow - Printing, but with errors • Yellow - Not printing, warnings or errors present • Red - Failure state

Table 4-3: Typical Diagnostics Screen Values (Continued)

Set the Password Levels

Consult the customer and find out which machine functions must be available for different personnel and which passwords they want to use. Set the passwords for levels 1 and 2. You can also set the password levels for the menus. Use the *DailyPassword* application for the daily level 3 password.

Notes: *The password levels of functions set at password Level 0, 1 or 2 can be changed at Password Level 2. The password level of functions set at Password Level 3 cannot be changed at any password level. Contact the Videojet representative or access Service > Videojet Password Generator tab on www.videojet.com to obtain the password.*

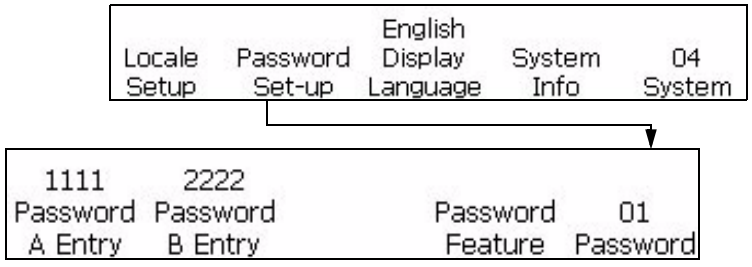


Figure 4-30: Password Menu

Caution

Machine functions that only trained personnel can access are set at password level 3 (master password). Contact the Videojet representative or access *Videojet Password Generator* on web page http://www.videojet.com/usa/videojetpasswordgenerator to obtain the password.

Set the Throw Distance

Set the throw distance from 5 mm to 15 mm. The optimum printhead distance for the 1510 Excel printer is 11 mm.

Install the Encoder

The printer has two options to adjust print pitch. The first is external encoding (shaft encoder). This is when the product is transported on a conveyor or transport. Make sure that the shaft encoder is directly related to the movement of the conveyor for the external encoder to work properly.

The second varying speed option is to use the auto encoder option. This option is used when a shaft encoder cannot be used since there is no way of tracking the production line movement. The auto encode option uses a very accurate detector to sense the leading and trail edge of each product and adjust the width of the code for every product.

When the product speed is constant, the printer uses internal encoding.

Internal Encoding

An internal clock sets the stroke rate to a constant pace. Refer to “Internal Encoding” on page B-1, for more information on internal encoding.

Do the following tasks to set encoding source to internal encoder:

1. Navigate to 01 Edit > 02 Edit > 03 Edit > 04 Edit - Print Set -Up > 01 Print > 02 Print > 03 Print > 04 Print - Select Encoder (see Figure 4-31 on page 4-25).
2. Set <Select Encoder> to <Int>.

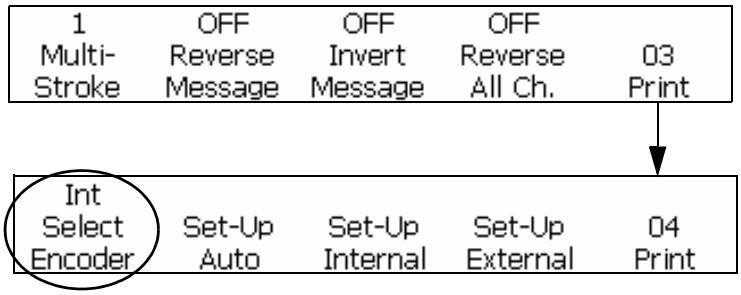


Figure 4-31: Internal Shaft Encoder

Note: *A width of 1 will provide the fastest print that the printer can achieve in each font using the Internal Shaft Encoder option (refer to Figure 4-32). The message width is increased by approximately 3% for each increment.*

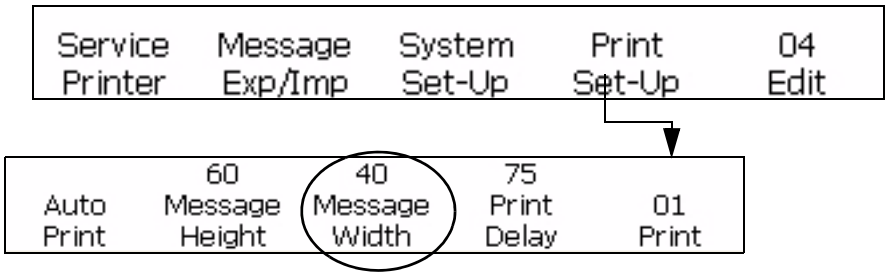


Figure 4-32: Messages Width

External Encoding

If the conveyor speed varies, an external shaft encoder must be fitted in order to maintain constant message width. If the product moves, the encoder turns and if the product stops, the encoder stops. (refer to "External Encoding" on page B-2 for more information).

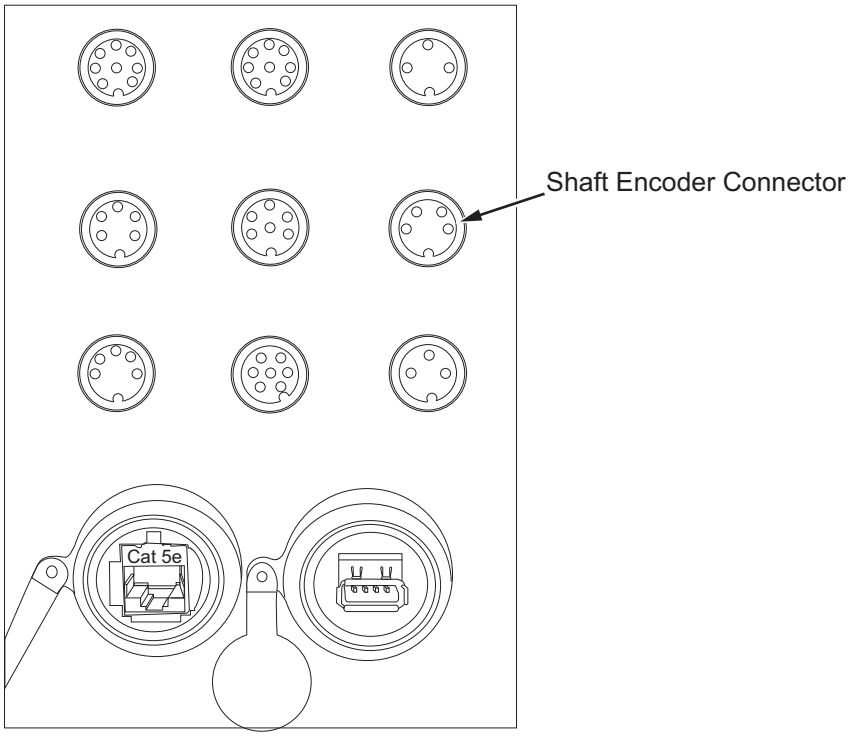
Note: *Make sure that the movement of the product is directly related to the movement of the conveyor.*

Do the following tasks to install an external shaft encoder:

1. Turn off the printer.
2. Connect the shaft encoder cable to the shaft encoder connector. See the following pictures for connections:
   - Figure 4-33 on page 4-26 - shows the shaft encoder connector on the connector panel.
   - Figure 4-34 on page 4-26 - describes the shaft encoder connector socket pin layout.

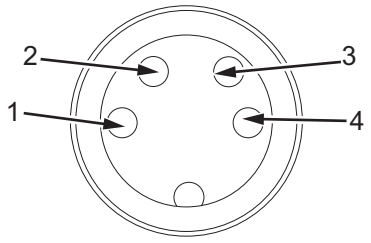
Note: *You can configure the printer to accept a two-phased encoder input (quadrature).*

Note: *Using quadrature shaft encoders to determine changes of direction disables the width function (that is, the width must be set to 1). If width control is required, an external divider box must be provided.*



Note: Availability of connectors depends on the printer model you choose.

Figure 4-33: Connector Panel



1. Pin 1 = +15VDC Supply
2. Pin 2 = Signal A Input
3. Pin 3 = Signal B Input
4. Pin 4 = OV Common

Figure 4-34: Encoder - Socket Pin Layout

3 Two LEDs on the boards show the operating status of the shaft encoder inputs. Use the LEDs to confirm that a shaft encoder is connected correctly.

4 Set the shaft encoder source to External. Navigate to 01 Edit > 02 Edit > 03 Edit > 04 Edit - Print Set -Up > 01 Print > 02 Print > 03 Print > 04 Print - Select Encoder.

Figure 4-35: Select Encoder

5 Make sure to set the physical parameters for external encoder.

6 Make sure the encoder movement is in direct relation to the movement of the product being printed on.

7 Calculate the distance (in inches/mm) the product moves per revolution of the shaft of the encoder.

8 Divide the PPR of the encoder by the calculated distance (inches/mm).

For example,

1800 PPR/12 inches (calculated distance) = 180 pulses per inch (PPI)

9 Since the printer is setup in the non-quad encoder mode, the printer uses both edges of the A and B channels to calculate the PPI.

Therefore, as per the example,

PPI of channel A and B = 180 x 4 = 720 PPI

10 To determine the correct width factor divide the PPI value by 60. This give you the width factor to divide the incoming pulses.

For example, 720 PPI / 60 = 12

11 Set the correct width setting. In Encoder Resolution (01 Edit > 02 Edit > 03 Edit > 04 Edit> - Print Set-Up > 01 Print > 02 Print > 03 Print > 04 Print - Set-Up External > 01 Ext-E) enter the value 720 for the PPI option.

12 Go to 01 Edit > 02 Edit > 03 Edit > 04 Edit> - Print Set-Up > 01 Print. Enter the value of 12 for the divider. This divides the 720 PPI / 12 = 60. This is the print pitch value the printer uses for printing.

Auto Encoding

When auto encoding is selected, the signal from the product detector is used to determine the product speed, and code the product at a set stroke rate. For more information, refer to "Auto Encoding" on page B-5 and the Operator Manual.

Do the following tasks to set encoding source to internal encoder:

1. Navigate to 01 Edit > 02 Edit > 03 Edit > 04 Edit - Print Set -Up > 01 Print > 02 Print > 03 Print > 04 Print - Select Encoder.
2. Set <Select Encoder> to <Auto>.

Set the Speed compensation

Speed compensation enables the printer to print a message in the same position on a product as the product speed changes. This feature can be useful if the conveyor speed is very high and the product is relatively small. The printer computes a variable stroke delay for each product. As the product speed is reduced, the variable stroke delay increases. The correct print distance must be entered. The nominal value is 11 mm and the range is 5 mm to 15 mm.

Note: *When speed compensation is ON, the print delay is increased by 60 strokes (approximately one inch, or 25.4 mm). Therefore, one inch must be subtracted from the existing delay in order for the printed code to remain in the same position on the product.*

Turn on *Speed Comp.* based on the method of encoding (for example, see Figure 4-36). Access 01 Edit > 02 Edit > 03 Edit > 04 Edit - Print Set -Up > 01 Print > 02 Print > 03 Print > 04 Print - Set-Up External > 01 Ext-E.

OFF	Non-quadr	540	2	
Speed Comp.	Encoder Setup	Encoder Resolution	Reduction Factor	01 Ext-E

Figure 4-36: Speed Compensation Setting Example

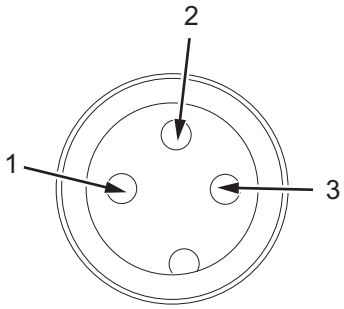
Enter the throw distance (access 01 Edit > 02 Edit > 03 Edit > 04 Edit - Print Set -Up > 01 Print > 02 Print > 03 Print > 04 Print > 05 Print > 06 Print - Throw Distance)

1	ON	OFF		
Throw Distance	Reverse Barcode	5x7 SL Tower	Special Print Mode	06 Print

Figure 4-37: Throw Distance

Install the Print Trigger

Figure 4-3 on page 4-5 shows a print trigger (item 4) connected through a cable (item 5) to print trigger 1 connector on the connector panel.



1. +15 VDC Supply to Sensor
2. Sensor Output
3. 0 VDC Common

Figure 4-38: Print Trigger 1 Connector Pin Diagram

Note: *Print Trigger 2 is for reverse print and is not a product detector trigger, but a change in state reverses the direction of print. It has an NPN and PNP connection. The Print Trigger 2 option is available with the optional PCB3 connector.*

Do the following tasks to install a print trigger:

1 The print triggers may be either NPN or PNP devices. The default signal input is NPN. Set Jumper JB1 on the PCB 0, 1 or 3 to match the device type (see Figure 4-39).

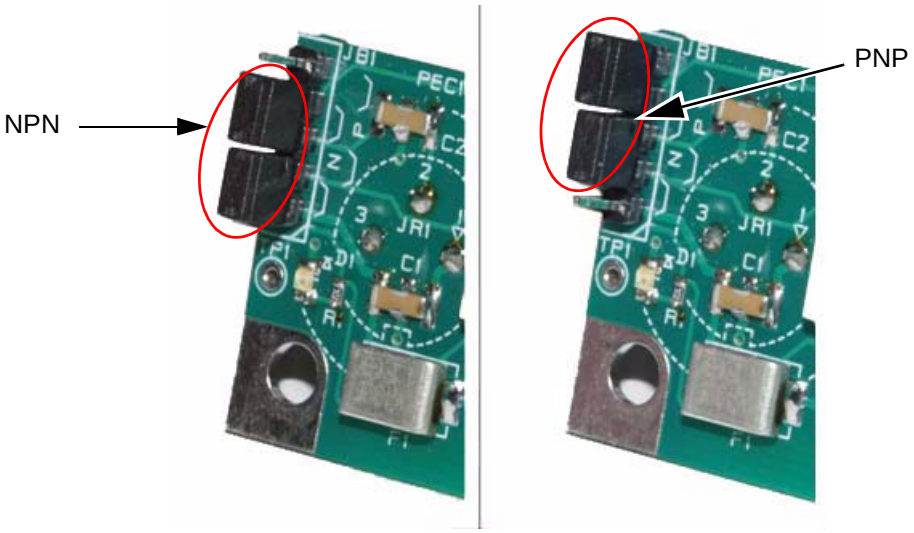


Figure 4-39: Print Trigger Configuration

Table 4-4 lists the settings for the type of print trigger.

Print trigger	Device type	Jumper 1	Pins	Jumper 2	Pins
1	NPN	A-B	1-2	C-D	3-4
1	PNP	B-C	2-3	D-E	4-5

Table 4-4: Jumper Settings

2 Turn on the printer.

3 Select the product detector. Access <07 Print - Product Detector> (01 Edit > 02 Edit > 03 Edit > 04 Edit - Printer Set -Up > 01 Print > 02 Print > 03 Print > 04 Print > 05 Print > 06 Print > 07 Print).

Set the relevant photocell level(s) to *Active high* or *Active low* based on the device type.

4 Access 07 Print - Active Level (01 Edit > 02 Edit > 03 Edit > 04 Edit - Printer Set -Up > 01 Print > 02 Print > 03 Print > 04 Print > 05 Print > 06 Print > 07 Print).

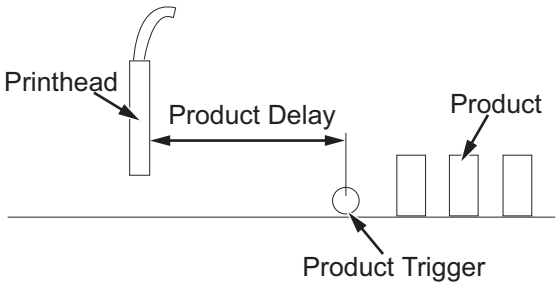
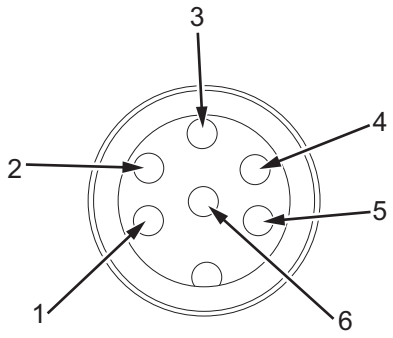


Figure 4-40: Product Delay

Install the Stack light



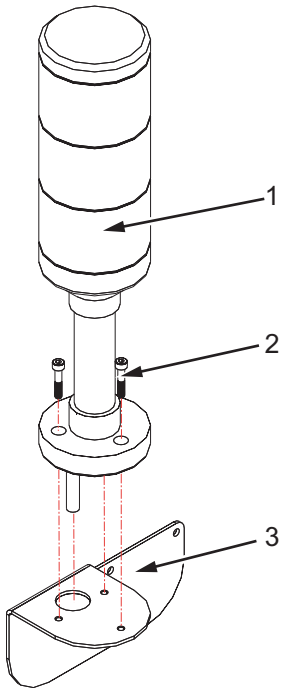
1. Red lamp negative supply
2. Amber lamp negative supply
3. Green lamp negative supply
4. +24 VDC supply to the strobe/siren (Maximum Rating = 900 mA)
5. Strobe/siren negative supply
6. +24 VDC common to the traffic lights

Figure 4-41: Status Output Connector Pin Diagram

Do the following tasks to install a stack light:

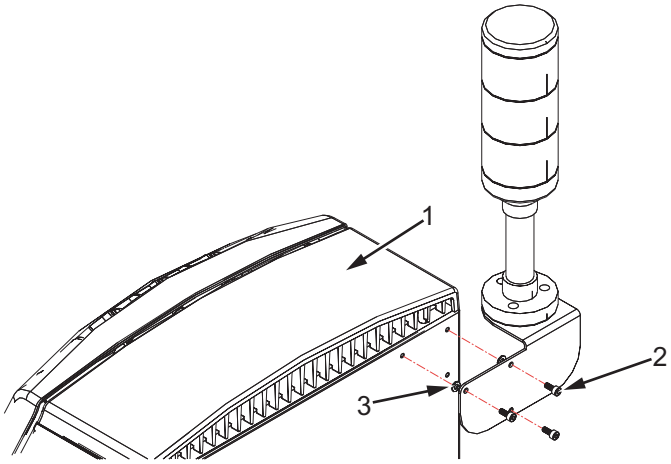
1. Fit the stack light (item 1, Figure 4-42 on page 4-32) to the stack light mounting bracket (item 3) using three M4x10 socket-head cap screws (item 2).
2. Fit the stack light mounting bracket to the printer cabinet (item 1, Figure 4-43 on page 4-32), using three M4x10 socket-head cap screws (item 2) and three M4 plain nylon washers (item 3).

   Note: *The position of the M4 plain nylon washers is important to maintain the IP rating.*



1. Stack light
2. M4x10 Socket-head cap Screws (x3)
3. Stack light Mounting Bracket

Figure 4-42: Stack light

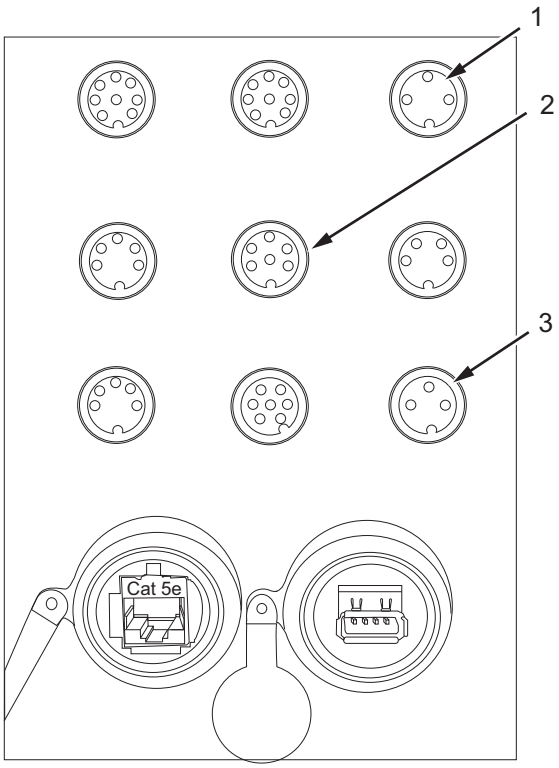


1. Printer Cabinet
2. M4 x 10 Socket-head cap Screws (x3)
3. M4 Plain Nylon Washers (x3)

Figure 4-43: Stack light Installation

Note: *Position of washers are important for IP rating.*

3 Insert the stack light connector into the status output connector on the connector panel (see Figure 4-44 on page 4-33).



1. Reverse Print Input
2. Status Output Connector
3. Product Detect Input (PEC1)

Figure 4-44: Connector Panel

The installation of the stack light is complete.

Nozzle Adjustment

Two adjustments are required; nozzle vertical adjustment and nozzle horizontal adjustment.

Note: *Make sure that the adjustments are not at either end of the adjustment ranges. If adjustments are at either end of the ranges, there can be a partial clog in the nozzle even though the ink stream is not severely misaligned (to remove the blockage in the nozzle, refer to "How to Clear a Clogged Nozzle" on page 9-43).*

Warning

PERSONAL INJURY. The ink and make-up fluid are irritating to the eyes and respiratory system. Remember the following guidelines to prevent personal injury when handling these substances:

Always wear protective clothing and rubber gloves.

Always wear goggles with side-shields or a face mask. It is also advisable to wear safety glasses when carrying out maintenance.

Apply barrier hand cream before handling ink.

If ink or make-up fluid contaminates the skin, wash immediately with soap water. DO NOT use washdown or solvent to clean ink stains from the skin.

Do the following tasks to align the ink stream:

1. Loosen the printhead screw and remove the cover from the printhead.
2. Secure the printhead vertically in a suitable stand with the nozzle pointing downwards.
3. Put a suitable container beneath the printhead to collect the ink.
4. The *Gutter Fault Shutdown* is automatically disabled upon entering the *Service* mode (Frame <*Service 01*>) and automatically enabled upon leaving the *Service* mode.

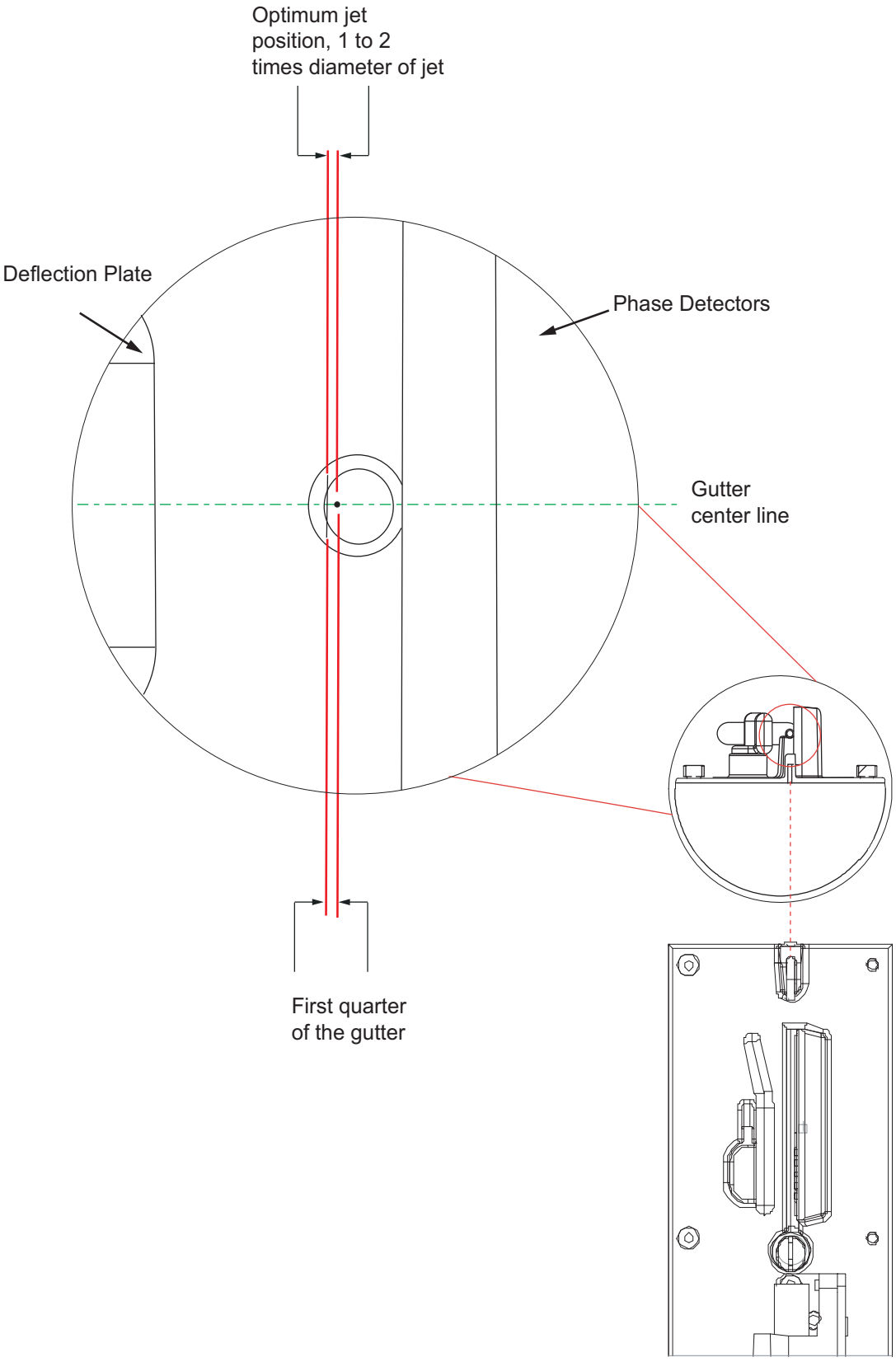


Figure 4-45: Ink Stream Alignment

5 Perform a ink on. When the ink jet has started, check that the ink jet is in the correct position in the gutter (see Figure 4-49 on page 4-37).

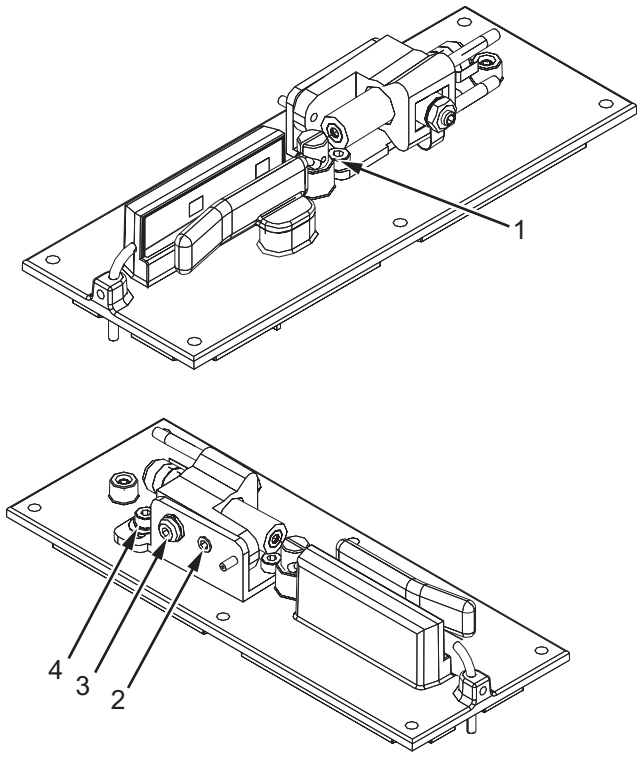
Note: *You must perform a ink on rather than a head start when you are aligning the printhead during the commissioning process. However, if you are aligning the printhead of a printer that has already been in operation for some time, you may perform either a ink on or a head start at this point.*

Caution

EQUIPMENT DAMAGE. Never attempt to bend the gutter. Its position is fixed.

6 Adjust the ink jet position, if necessary using the horizontal adjustment screws (item 2, Figure 4-46) and vertical adjustment screw (item 1).

When the adjustment has been made, make sure that the horizontal adjustment screws are tight and the ink jet position is correct.



1. Vertical Adjustment Screw
2. Horizontal Adjustment Screw
3. Horizontal Locking Screw
4. Vertical Locking Screw

Figure 4-46: Printhead Adjustment Screw Location

Perform Calibration and Testing

The system calibration and test procedures must be performed when printhead engine module, HV supply, CSB, or umbilical is changed.

Calibrate HV

Do the following tasks to calibrate the HV:

Note: *Please make sure printhead is clean and dry.*

1 Access *Calibrate HV* (01 Edit > 02 Edit > 03 Edit > 04 Edit - Service Printer > 01 Service > 02 Service > 03 Service - Auto Prime > 01 Prime > 02 Prime).

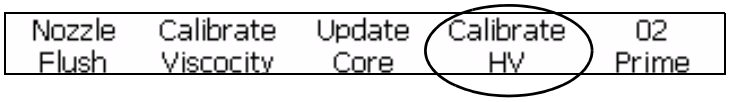


Figure 4-47: 02 Prime

2 Press the *F4* key to select Calibrate HV.

3 Calibration sweep occurs. Refer to Figure 4-48.

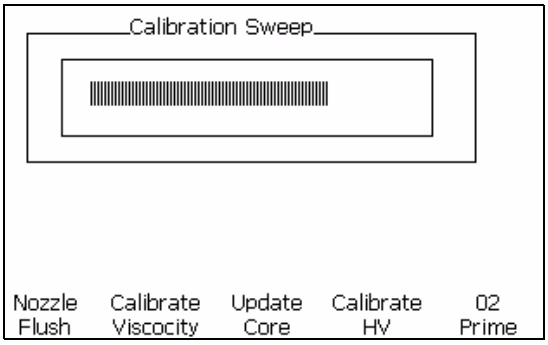


Figure 4-48: Calibration Sweep