



Videojet 1220/1520 Service Manual

P/N 462272-01

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Compliance Information

For Customers in the European Union

This equipment displays the CE mark to indicate conformance to the following legislation:

EN55022:2006 + A1:2007 Class A	Emissions Standard for industrial environments
EN61000-6-4 2007	Generic Emissions Standard for Heavy Industrial Environments
EN61000-3-2 2006	Harmonic Current Fluctuations
EN61000-3-3 2008	Voltage Fluctuation and Flicker
EN61000-6-2 2005	Immunity Characteristics for Industrial Environments

Following the provisions of **EU EMC Directive 2004/108/EC**

EC Low Voltage Directive 2006/95/EC

Essential health and safety requirements relating to electrical equipment designed for use within certain voltage limits.

IEC 60950-1:2001

Safety requirements for information technology equipment including electrical business equipment.

EN 60529:1991

Degrees of protection provided by enclosures (IP code).

For Customers in the U.S.A.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received, including interference that may cause undesired operation.



Warning

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference, when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio

frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded cables must be used with this unit to ensure compliance with Class A FCC limits.

The user may find the following booklet prepared by the Federal Communications Commission helpful: How to Identify and Resolve Radio-TV Interference Problems. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-00-00345-4.

This equipment has been tested and certified for compliance with U.S. regulations regarding safety and electrical emissions by:

Electromagnetic Testing Services Limited

Pratts Fields

Lubberhedges Lane

Stebbing, Dunmow

Essex, CM6 3BT

England, UK

This equipment has been investigated by Underwriters Laboratories Inc. in accordance with the standard for safety: UL 60950-1: Safety of information technology equipment first edition. Subject 2178 marking and coding equipment, electronics.

Report reference E252185.

For Customers in Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This equipment has been tested and certified for compliance with Canadian regulations regarding safety and electrical emissions by:

Electromagnetic Testing Services Limited

Pratts Fields

Lubberhedges Lane

Stebbing, Dunmow

Essex, CM6 3BT

England, UK

This equipment has been investigated by Underwriters Laboratories Incorporated in accordance with the standard for safety: CAN/CSA C22.2 No. 60950-1-03. Safety of information technology equipment. Subject 2178 marking and coding equipment, electronics.

Report reference E252185.

Pour la clientèle du Canada

Le present appareil numerique n'émet pas de bruits radioelectriques dépassant les limites applicables aux appareils numerique de la class A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Cet équipement est certifié CSA.

This equipment has been investigated by Underwriters Laboratories Incorporated in accordance with the standard for safety: CAN/CSA C22.2 No. 60950-1-03. Safety of information technology equipment. Subject 2178 marking and coding equipment, electronics.

Report reference E252185.



Warning

This product is not intended for use in the immediate/direct visual field of the display work place. To avoid disturbing reflections on the display work place, this product shall not be placed in the immediate/direct field of vision.

Support and Training

Contact Information

If you have any questions or need assistance, please contact at 1-800-843-3610 (for all customers within the United States). Outside the U.S., customers should contact their distributor or subsidiary for assistance.

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Service Program

About *Total Source*® Commitment

Total Source® TOTAL SERVICE PLUS RELIABILITY, is the commitment to provide you - our customer - the complete service you deserve.

The *Total Source* Commitment

The *Total Source*® Service Program is an integral part of our business in providing marks, codes, and images where, when, and how often customers specify for packages, products, or printed materials. Our commitment includes:

- Applications support
- Installation services
- Maintenance training
- Customer response center
- Technical support
- Field service
- Extended hours phone assistance
- Parts and supplies
- Repair service

Customer Training

If you wish to perform your own service and maintenance on the printer, Videojet Technologies Inc. highly recommends you complete a Customer Training Course on the printer.

Note: The manuals are intended to be supplements to (and not replacements for) Videojet Technologies Inc. Customer Training.

For more information on Videojet Technologies Inc. Customer Training Courses, call 1-800-843-3610 (within the United States only). Outside the U.S., customer should contact a Videojet subsidiary office or the local Videojet distributor for further information.

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Introduction

1

Videojet 1220/1520 Printer

The Videojet 1220/1520 is a continuous ink jet printer that can print fixed and variable codes at high line speeds on consumer and industrial products. The printer delivers superior uptime, print quality, and ease of use to the operators.

About the Manual

The Videojet 1220/1520 Service Manual is written for the service technician of the printer. The Service Manual contains the installation, service, and troubleshooting procedures.

Related Publications

The Videojet 1220/1520 Operator Manual (Part Number: 462268) is available for reference.

Language Codes

When you order these manuals, make sure to add the 2-digit language code at the end of the part number. For example, the part number of the Spanish version of the Operator Manual is 462268 -04. Use the list of language codes shown in Table 1-1 on page 1-2 to identify the translated versions of the manual.

***Note:** Availability of the Operator Manual is indicated by an asterisk (*). Availability of the Service Manual is indicated by a plus sign (+). Contact the Videojet distributor or subsidiary for more information.*

Code	Language	Availability (see note)	
01	English (US)	*	+
02	French	*	+
03	German	*	+
04	Spanish	*	+
05	Portuguese Brazilian	*	
06	Japanese	*	+
07	Russian	*	
08	Italian	*	
09	Dutch	*	
10	Chinese (Simplified)	*	+
11	Arabic	*	
12	Korean	*	+
13	Thai	*	
15	Norwegian	*	
16	Finnish	*	
17	Swedish	*	
18	Danish	*	
19	Greek	*	
20	Hebrew	*	
21	English (UK)	*	+
23	Polish	*	
24	Turkish	*	+
25	Czech	*	
26	Hungarian	*	
33	Vietnamese	*	
34	Bulgarian	*	
36	Chinese (Traditional)	*	

Table 1-1: List of Language Codes

Content Presentation

This manual contains different types of information like safety guidelines, additional notes, User Interface (UI) terminology and so on. To help you identify the different types of information, different writing styles are used. This section describes these writing styles.

The Word 'Printer'

The word 'printer' indicates the Videojet 1220/1520 printer, from this point onwards, in this manual.

Positional References

Unless stated to the contrary, positions and directions such as left, right, front, rear, to the right and to the left are given with respect to the printer when viewed from the front.

Units of Measurement

This manual uses metric units of measurement. The equivalent English measures are included in parenthesis. For example, 240 mm (9.44 inches).

Note: The default date display format is UK (day/month/year) for Videojet 1220/1520 .

Safety Information

The safety information includes warning and caution statements.

Warning

The warning statements indicate hazards or unsafe practices that can result in personal injury or death.

For example:



Warning

PERSONAL INJURY. The cleaning agent is poisonous if taken internally. Do not drink. Seek medical attention immediately if ingested.

Caution

The caution statements indicate hazards or unsafe practices that can result in damage to the equipment.

For example:



Caution

EQUIPMENT DAMAGE. Do not fit or remove any connector on the printer when the power is on, otherwise the printer may get damaged.

Additional Notes

Notes provide additional information about a particular topic.

For example:

Note: You can set the password protection for some functions to prevent any unauthorized access.

User Interface Terminology

The user interface (UI) elements are shown in italics. For example, *Messages* (see Figure 1-1).

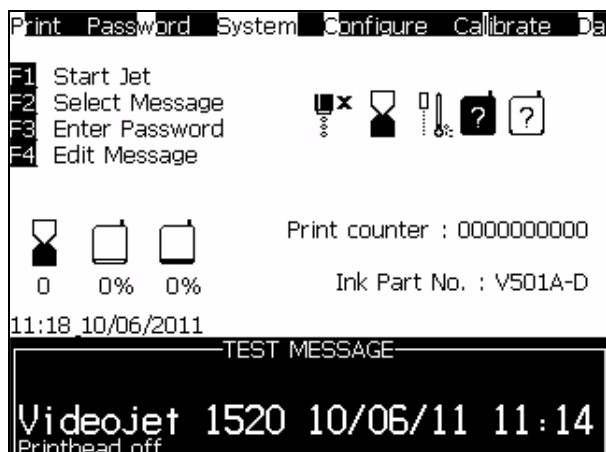


Figure 1-1. Menu Screen

Keys
















Key	Style Used
	Left arrow key
	Right arrow key
	Up arrow key
	Down arrow key
 	Enter key
 	Esc key
	F1 key
	F2 key
	F3 key
	F4 key
	Alt key
	Ctrl key
	Shift key

Table 1-2: Content Presentation Style for Keys

Abbreviations and Acronyms

Abbreviation	Expansion
AC	Alternating Current
CSB	Control System Board
DC	Direct Current
EHT	Extra High Tension
FPGA	Field Programmable Gate Array
IEC	International Electrotechnical Commission
LED	Light Emitting Diode
LCD	Liquid Crystal Display
MOD	Modulation
MS	Microsoft
PC	Personal Computer
PCB	Printed Circuit Board
PIB	Printer Interface Board
PSU	Power Supply Unit
USB	Universal Serial Bus
VDC	Volts of Direct Current
FIB	Front Panel Interface Board

Table 1-3: Abbreviations and Acronyms

Chapters in the Manual

Chapter No.	Chapter Name	Description
1.	Introduction	Contains the information about this manual, the related publications, and writing styles used in this manual
2.	Safety	Contains the safety and hazard information
3.	Main Parts	Describes the main parts of the printer

Table 1-4: List of Chapters

Chapter No.	Chapter Name	Description
4.	Installation	Explains the installation procedures of different parts of the printer
5.	Printer Operation	Contains the information on how to use the UI to setup and operate the printer
6.	User Interface	Explains how to use the UI to create and store messages
7.	Replacement Instructions	Explains the procedures to remove and replace the parts of the printer
8.	Maintenance	Provides the maintenance and cleaning procedures of the printer.
9.	Troubleshooting	Contains diagnostic and troubleshooting procedures
10.	IPL	Contains the illustrated parts list of orderable parts
11.	Appendix A	Describes clean start, quick start, clean stop and quick stop procedures
12.	Appendix B	Contains encoder setup information
13.	Appendix C	CSB Test Points

Table 1-4: List of Chapters (Continued)

Introduction

The policy of Videojet Technologies Inc. is to manufacture non-contact printing/coding systems and ink supplies that meet high standards of performance and reliability. We enforce strict quality control techniques to eliminate the potential for defects and hazards in our products.

The intended use of the Videojet 1220/1520 printer is to print information directly onto a product. Use of this equipment in any other fashion may lead to serious personal injury.

The safety guidelines provided in this chapter are intended to educate the technicians on all safety issues, so that the printer is serviced and operated in a safe manner.

General Safety Guidelines

- Always refer to the correct service manuals as per the specific Videojet printer model.
- Only Videojet-trained personnel must carry out installation and maintenance work. Any such work undertaken by unauthorized personnel may damage the printer and will invalidate the warranty.
- To avoid damage to the printer components, use only soft brushes and lint free cloths for cleaning. Do not use high pressure air, cotton waste, or abrasive materials.
- The printhead must be completely dry before attempting to start the printer, otherwise the printhead may get damaged.
- To prevent nozzle clogs, always wear rubber gloves whenever the nozzle tubing manifold is to be disconnected from the printhead valve module.

Electrical Safety Guidelines

This section explains the safety guidelines related to electrical power supply and electrical cables.

Electrical Power Supply



Warning

PERSONAL INJURY. Lethal voltages are present within this equipment when it is connected to the mains electrical supply. Only trained and authorized personnel must carry out the maintenance work.



Warning

PERSONAL INJURY. 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. Non-adherence to this warning can result in death or personal injury.



Warning

PERSONAL INJURY. A high AC voltage is present at the inverter and backlight. Extreme caution is required when diagnosing failure in these areas.

Electrical Cables



Warning

PERSONAL INJURY. Use only the mains power cable supplied with the printer. The end of this cable must have an approved, three-pole, mains plug that has a protective ground conductor.

The electrical power cables, sockets and plugs must be kept clean and dry.

For pluggable equipment, the socket-outlet must be installed near the equipment and must be easily accessible.



Warning

PERSONAL INJURY. Always inspect the cables for damage, wear, corrosion, and deterioration. Make all grounding/bonding connections void of areas of paint, ink build-up, and corrosion.

Bonding and Grounding



Warning

PERSONAL INJURY. The printer must be connected only to an AC power supply that has a protective ground conductor and must be according to IEC requirements or applicable local regulations.



Warning

PERSONAL INJURY. Do not use the printer if there is any interruption in the protective ground conductor or if the protective ground conductor is disconnected. The failure to follow this warning can cause an electrical shock.

 **Warning**

PERSONAL INJURY. Always ground conductive equipment to an earthing electrode or to the building grounding system with approved cables as per NEC standards in order to drain all potential static discharge. For example, a metal service tray to earth ground.

 **Warning**

PERSONAL INJURY. A resistance reading from the grounded service tray to the equipment chassis or mounting bracket should be 0 to less than 1 ohm. A resistance check should be made using a safe and reliable ohmmeter and should be done on a frequent basis

 **Warning**

PERSONAL INJURY. The PCBs contain static sensitive devices. A suitably grounded, antistatic wrist strap must be worn when working on or handling PCBs.

 **Warning**

PERSONAL INJURY. Always prevent static discharge from occurring. Use proper Grounding and Bonding methods. Only use Videjet approved metallic service trays and ground cables.

 **Warning**

PERSONAL INJURY. Always bond conductive equipment together with approved cables to maintain them at the same potential and minimize static discharge. For example, printhead to metal service tray.

**Warning**

PERSONAL INJURY. The Optional Wash Station has been *solely* designed for the cleaning of the printhead.

Do not use it for purging or printing operations or for any other purposes.

Always ensure that the jet is stopped and that any hazardous voltages are switched off prior to the commencement of the printhead wash down.

**Caution**

EQUIPMENT DAMAGE. Always empty the service trays frequently. Some inks and cleaning solutions are flammable. Make sure that the waste fluids are disposed according to HAZMAT.

Fuses

**Warning**

PERSONAL INJURY. To ensure continued protection against fire hazards, replace fuses only with the specified type and rating.

Fluid Safety Guidelines

This section describes the hazards that may occur while handling ink, make-up fluid, and cleaning solutions, and the safety precautions that a user must take to prevent the hazards.

Read the Material Safety Data Sheets

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*.

Ink and Make-up Fluid

Warning

PERSONAL INJURY. The ink and make-up fluid are irritating to the eyes and respiratory system. 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.

Warning

PERSONAL INJURY. The ink and make-up fluid are volatile and highly flammable. They must be stored and handled in accordance with local regulations.

Do not smoke or use a naked flame in the vicinity of these substances.

Immediately after use, remove any tissue or cloth that becomes saturated with these substances. Dispose all such items in accordance with the local regulations.

In the event that any ink or make-up fluid container is not completely empty after use, it should be resealed. Only full bottles are recommended for use when replenishing ink or make-up fluid; partially filled bottles must be disposed in accordance with the local regulations.

Warning

PERSONAL INJURY. When setting up the nozzle, direct the ink stream into a beaker or suitable container. To avoid the contamination of the ink, do not re-use any ink collected in this way. Dispose all waste ink in accordance with the local regulations.

**Warning**

PERSONAL INJURY. Prolonged breathing of make-up fluid or cleaning fluid vapor may cause drowsiness and/or effects similar to alcoholic intoxication. Use only in open, well-ventilated areas.

Cleaning Agent

**Warning**

PERSONAL INJURY. The cleaning agent is poisonous if taken internally. Do not drink. Seek medical attention immediately if ingested.

**Warning**

PERSONAL INJURY. The cleaning agent is irritating to the eyes and respiratory system. To prevent personal injury when handling this substance:

Always wear protective rubber gloves and clothing.

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 the cleaning agent.

If cleaning agent contaminates the skin, rinse off with running water for at least 15 minutes.

**Warning**

PERSONAL INJURY. The cleaning agent is volatile and highly flammable. It must be stored and handled in accordance with local regulations.

Do not smoke or use a naked flame in the vicinity of the cleaning agent.

Immediately after use, remove any tissue or cloth that becomes saturated with cleaning agent. Dispose all such items in accordance with local regulations.

 **Caution**

EQUIPMENT DAMAGE. Make sure that the cleaning agent is compatible with the ink used before carrying out printhead cleaning otherwise the printhead may get damaged.

 **Caution**

EQUIPMENT DAMAGE. Any cleaning solutions containing either chloride, including hypochlorite bleaches or hydrochloric acid, can cause unacceptable surface pitting and staining. These should not be used in contact with stainless steels. If wire brushes or wire scouring pads are used, these should be made of stainless steel. Make sure that any abrasive media used is free from sources of contamination, especially iron and chlorides.

Compressed Air Safety Guidelines

 **Warning**

PERSONAL INJURY. Airborne particles and substances are a health hazard. Do not use high pressure compressed air for cleaning purposes.

UI Related Safety Guidelines

 **Caution**

DATA SECURITY. To prevent unauthorized access to the software, ensure that **Clear Password** is executed when exiting from a higher level password.

**Caution**

RISK OF DATA LOSS. Ensure that the correct message name is selected for message deletion as no message selection confirmation prompt is given. All messages apart from the TEST MESSAGE will be deleted.

**Caution**

RISK OF DATA LOSS. The **Delete User Field** option does not ask for confirmation to delete a user field.

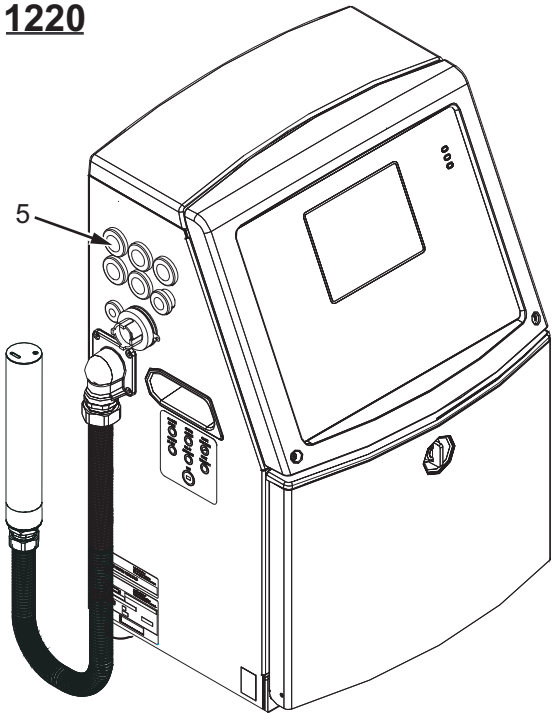
Other Important Guidelines

- 1 **DEGRADED PERFORMANCE.** Machine functions that only Videojet-trained personnel can access are set at password level 3 (MASTER password). To obtain the 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* tab at www.videojet.com.
- 2 **EXCESSIVE USE OF MAKE-UP FLUID.** As solvent is used during the stop cycle, repeatedly stopping and starting the printer can lead to excessive use of make-up fluid or solvent. This makes the viscosity go out of the range and can lead to a Ink Core Level High error.
- 3 **QUICK STOP.** After a quick stop, the machine must not be left in the same state for any length of time as drying ink may make restarting difficult.
- 4 **PRINTER OVERHEATING.** Report all overheating incidents to a maintenance engineer.
- 5 **DAMAGE TO GUTTER.** Never attempt to bend the gutter. Its position is fixed.
- 6 **DAMAGE TO CHARGE ELECTRODE.** The charge electrode is not adjustable so, do not attempt any mechanical adjustments.
- 7 **EQUIPMENT DAMAGE.** Adhere to prescribed circuit limitations when using any external input or output devices with the printer.

- 8** EQUIPMENT DAMAGE. The DIN connector for the lamp stack must not have any inductive load placed on it as it may cause damage to the PCB.
- 9** EQUIPMENT DAMAGE. Do not fit or remove any connector on the printer when the power is on, otherwise the printer may get damaged.
- 10** RISK OF EXPLOSION. If the battery is replaced by an incorrect type, it will lead to an explosion. Always dispose the used batteries according to the instructions and local regulations.
- 11** HEATER. In a fault condition, heater can reach 70 °C. Do not touch the plate on which the heater is mounted. The failure to follow this warning can cause personal injury.

Printer Overview

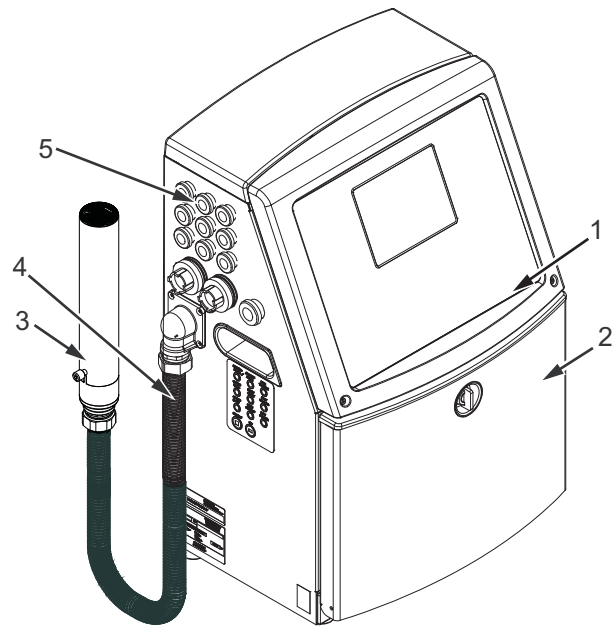
1220



- 1. Electronics Compartment Door
- 2. Ink Compartment
- 3. Printhead
- 4. Umbilical
- 5. Connector Panel
- 6. Electronics Compartment*
- 7. Mains Power Switch
- 8. Back Filter*

** The components are not shown in the picture.*

Figure 3-1: Main Parts of the Printer (Videojet 1220)



- | | |
|---------------------------------|-----------------------|
| 1. Electronics Compartment Door | 7. Mains Power Switch |
| 2. Ink Compartment | 8. Back Filter* |
| 3. Printhead | |
| 4. Umbilical | |
| 5. Connector Panel | |
| 6. Electronics Compartment* | |

** The components are not shown in the picture.*

Figure 3-2: Main Parts of the Printer (Videojet 1520)

Figure 3-3 shows the schematic diagram of Videojet 1220/1520 printer.

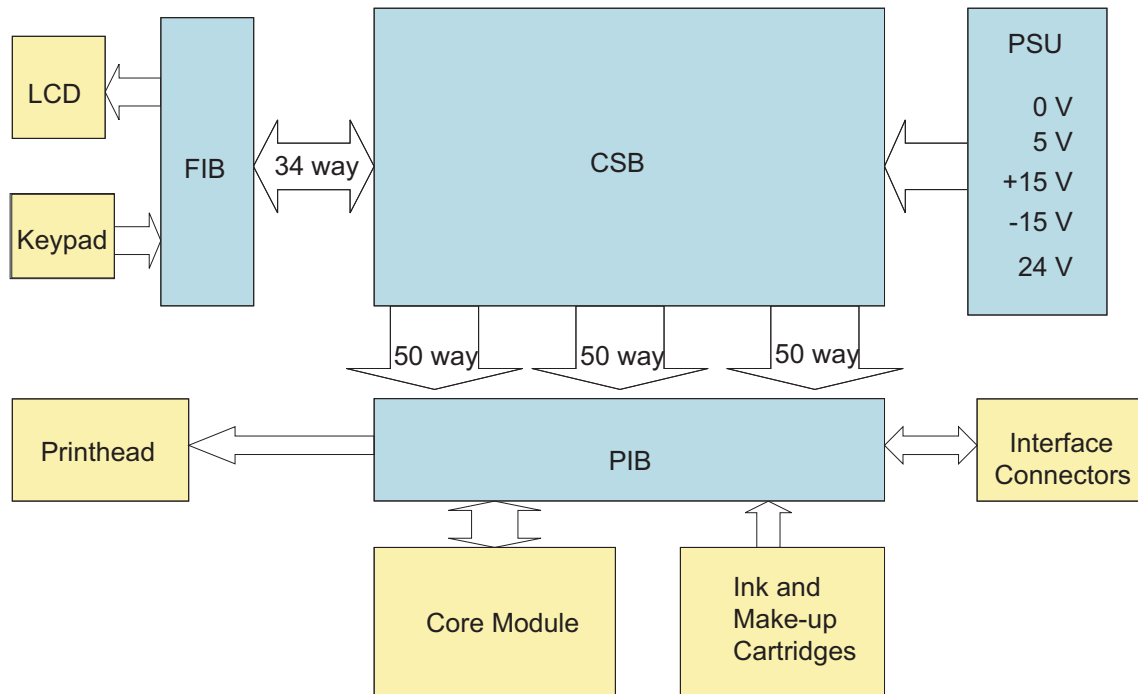


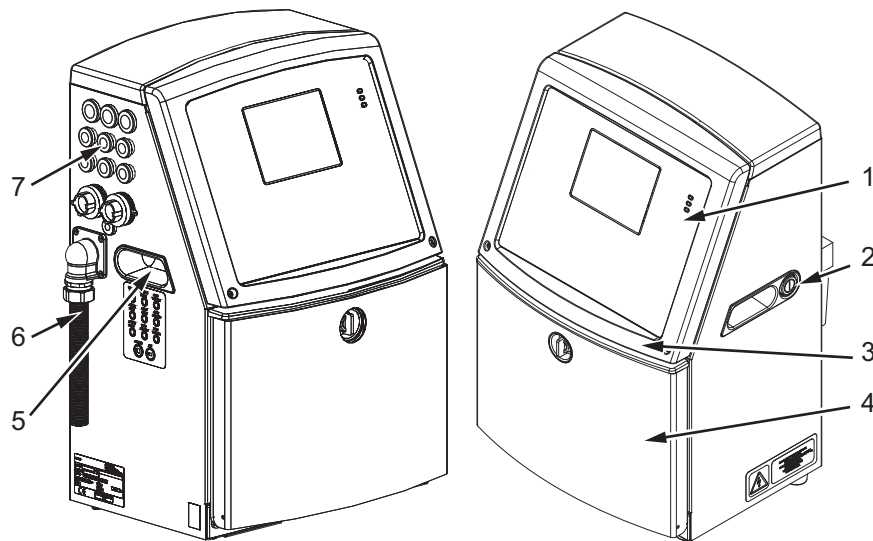
Figure 3-3: System Overview

Cabinet

The cabinet of Videojet 1220/1520 printer is made of stainless steel. The cabinet includes the following parts:

- Control panel
- Electronics compartment door
- Mains power switch
- Ink compartment door
- Connector panel
- Umbilical

Refer to Figure 3-4 on page 3-4 and Figure 3-5 on page 3-5 to see the parts of the cabinet.

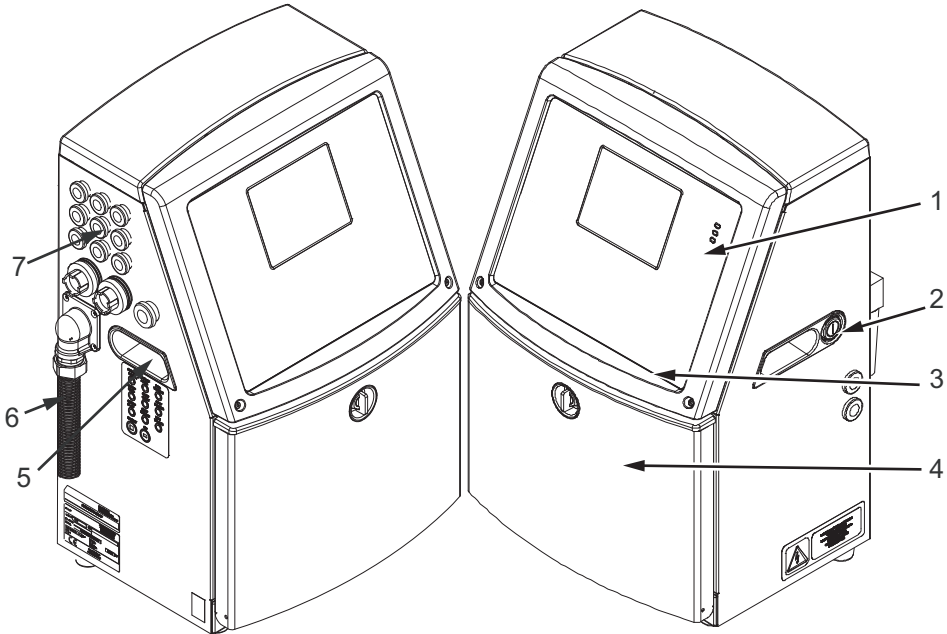


- | | |
|---------------------------------|--------------------|
| 1. Control Panel | 5. Handle |
| 2. Mains Power Switch | 6. Umbilical |
| 3. Electronics Compartment Door | 7. Connector Panel |
| 4. Ink Compartment Door | 8. Back Filter* |

**The component is not shown in the figure.*

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

Figure 3-4: Printer Cabinet (Videojet 1220)



- 1. Control Panel
- 2.
- 3. Electronics Compartment Door
- 4. Ink Compartment Door
- 5. Handle
- 6. Umbilical
- 7. Connector Panel
- 8. Back Filter*

**The component is not shown in the figure.*

Figure 3-5: Printer Cabinet (Videojet 1520)

Control Panel

The control panel (Figure 3-6) provides the user interface to the printer. Refer to Chapter 3 in the Videojet 1220/1520 Operator Manual for more information.



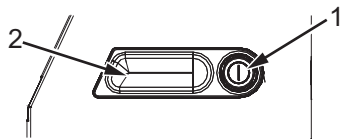
- | | |
|--------------------|--------------------------------------|
| 1. Status LEDs | 5. Display |
| 2. Arrow Keys | 6. Contrast Key (Brightness Control) |
| 3. Keypad | 7. Function Keys |
| 4. Information Key | |

Figure 3-6: Control Panel

Mains Power Switch

The mains power switch (item 1, Figure 3-7) is a green push button to turn on or off the power supply to the printer. You can find the switch on the right side of the printer.

Note: The handles (item 2) are provided for easy movement of the unit.



1. Mains Power Switch
2. Handle

Figure 3-7: Mains Power Switch

Electronics Compartment Door

The electronics compartment door (item 3, Figure 3-5 on page 3-5) is mounted on two hinges. The door has a seal that is water resistant and prevents entry of any dust into the cabinet.

Note: The seal depends on the model of the printer. Videojet 1520 has IP55 (standard) and IP65 (optional) sealing. Videojet 1220 is fitted with IP55.

The door is closed using two M4 x 30 socket head screws. The door contains control panel (refer to “Control Panel” on page 3-6) and front panel interface board.

See “Electronics Compartment” on page 3-22 for more information on the electronics compartment.

LCD and Front Panel Interface Board

The front panel interface board (FIB), provides the interface between the CSB and the LCD and keyboard. This assembly is located inside the electronics compartment door.

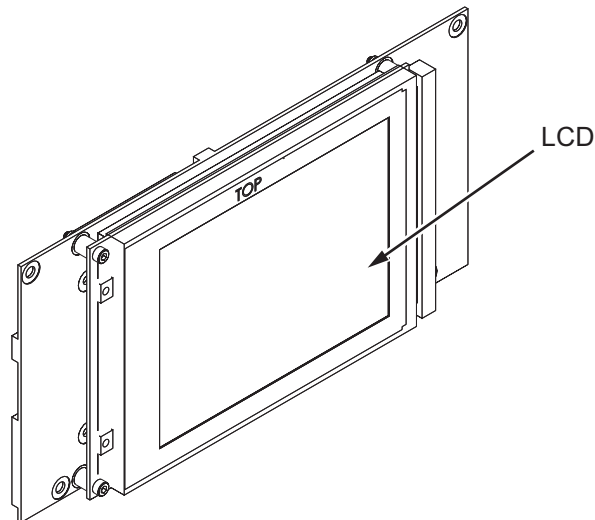
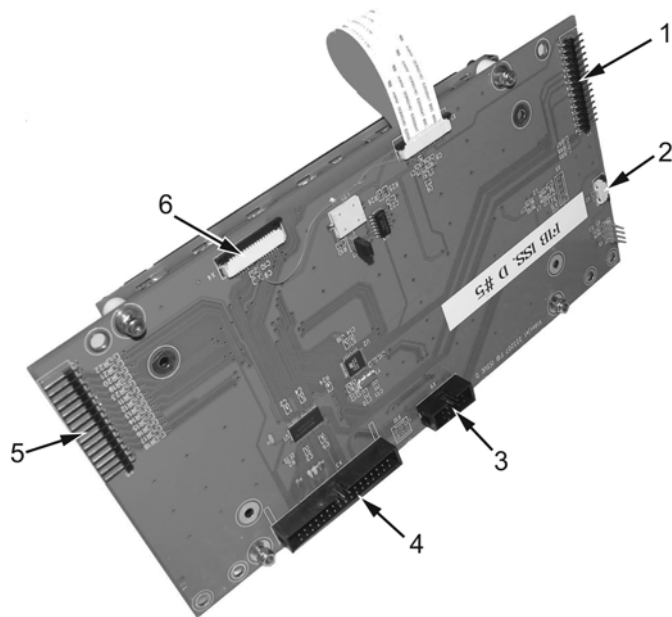


Figure 3-8: LCD



- | | |
|--------------------------------------|-------------------------|
| 1. Keypad Right | 4. 34-way Ribbon to CSB |
| 2. Touch Panel (Future Option) | 5. Keypad Left |
| 3. Program (Only Used In Production) | 6. Mono LCD |

Figure 3-9: FIB

Ink Compartment Door

The ink compartment door (item 4, Figure 3-5 on page 3-5) is mounted on a hinge pin. The door has a seal that is water resistant and prevents entry of any dust into the cabinet.

Note: The seal depends on the model of the printer. Videjet 1520 has IP55 (standard) and IP65 (optional) Videjet 1220 is fitted with IP55 sealing.

Umbilical

The umbilical (item 6) connects the printhead to the printer cabinet. It sends the control signals and ink to the printhead.

Connector Panel

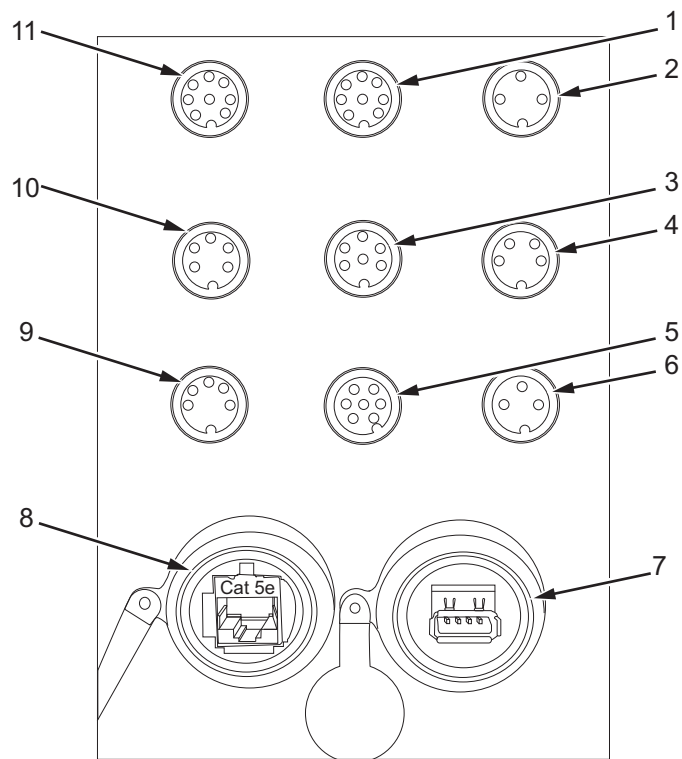
The connector panel (item 7) provides inputs for several types of external devices.

Table 3-1 provides the connectors available for the printer.

Connector Type	PCB	Standard	Optional
Print Trigger1	PCB 0	Videojet 1220	-
Print Trigger1	PCB 1	Videojet 1520	Videojet 1220
COMMS RS232	PCB 2	Videojet 1520	Videojet 1220
COMMS RS485	PCB 1	Videojet 1520	Videojet 1220
Shaft Encoder	PCB 2	Videojet 1520	Videojet 1220
Relay Switches	PCB 1	Videojet 1520	Videojet 1220
Status Output (Lampstack)	PCB 2	Videojet 1520	Videojet 1220
USB	-	Videojet 1520 Videojet 1220	-
Message A Input	PCB 3		Videojet 1520
Print Trigger 2	PCB 3		Videojet 1520
Message B Input	PCB 3		Videojet 1520
Ethernet	-	Videojet 1520	-

Table 3-1: Connector Panel Ports

Note: All the connectors are sealed to provide the required protection from water and dust according to the IP55 standard for Videojet 1220 and IP 55 and IP 65 standard for Videojet 1520.



- | | |
|--------------------|---------------------|
| 1. Message A Input | 7. USB |
| 2. Print Trigger 2 | 8. Ethernet |
| 3. Status Output | 9. RS485 |
| 4. Shaft Encoder | 10. RS232 |
| 5. Relay Switches | 11. Message B Input |
| 6. Print Trigger 1 | |

Figure 3-10: Connector Panel

Print Trigger 1 Connector

The product detector connector, detects the product and informs the printer, when to print on the product. The printer provides a +15 VDC, 200mA output for use by a photoelectric cell (PEC), inductive proximity detector. The print trigger 1 connector (item) is a 3 way DIN connector. The pin functions are shown in Table 3-2.

Note: Photoelectric cell (PEC) is also called as inductive proximity detector or product detector.

The default configuration is a NPN (current sinking input). This input can be changed to a PNP (sourcing input) with the movement of a jumper located on the back of the control panel. If the input is configured for PNP the maximum input voltage will be +24 VDC and the maximum current is 60 mA.

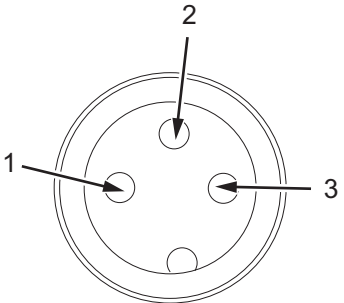


Figure 3-11: Print Trigger Connector Pin Diagram

Note: Figure 3-11 represents the view of the connector on the side of the printer.

Pin	Function
DIN Pin 1	+15 VDC supply to sensor
DIN Pin 2	Sensor output
DIN Pin 3	0 VDC common

Table 3-2: Print Trigger 1 Connector Pinouts

Note: The mating cable (male, 3 pin DIN connector -P/N: 500-0036-578) is used to interface other product detectors to the printer.

Print Trigger 2 Connector

The printer provides +15VDC, 100mA output for use by a photoelectric cell (PEC), inductive proximity detector or micro switch. The print trigger 2 connector (item 2) is a 3 way DIN connector. The pin functions are shown in Table 3-3 on page 3-12. This connector is also used in cross print applications.

Note: The maximum input signal is 60 mA and 24VDC.

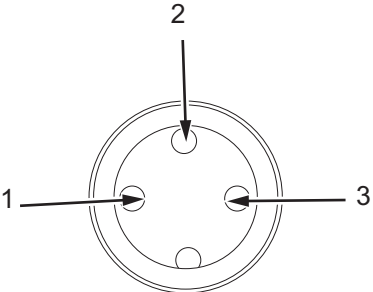


Figure 3-12: Print Trigger 2 Connector

Note: Figure 3-12 represents the view of the connector on the side of the printer.

Pin	Function
DIN Pin 1	+15 VDC supply to sensor
DIN Pin 2	Sensor Output
DIN Pin 3	0 VDC common

Table 3-3: Print Trigger 2 Connector Pinouts

Shaft Encoder Connector

The printer provides a nominal +15 VDC (100 mA total) output for use by a shaft encoder with a maximum frequency of 100 kHz. The shaft encoder connector (item 4) is a 4 way DIN connector. The pin allocation is shown in Table 3-4.

Note: For 24 VDC, the maximum current is 60 mA.

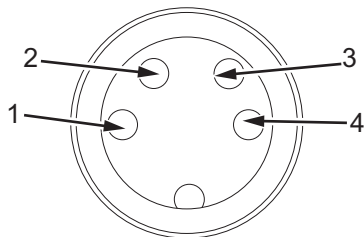


Figure 3-13: Shaft Encoder Connector Pin Diagram

Note: Figure 3-13 represents the view of the connector on the side of the printer.

Pin	Function
DIN Pin 1	+15 VDC supply to shaft encoder
DIN Pin 2	Shaft encoder input 'A'
DIN Pin 3	Shaft encoder input 'B'
Din Pin 4	0 VDC common

Table 3-4: Shaft Encoder Connector Pinouts

Note: The shaft encoder output must be of the PUSH/PULL type.

Status Output Connector

The printer provides an output for a set of status lights through the status output connector (item 3, Figure 3-10 on page 3-10). This is a 6-way DIN connector. The pin allocation is shown in Table 3-5 and Figure 3-14.

Lamp color	Function
Green	Print Ready Output
Yellow	Warning Output
Red	Fault Output

Note: For 24 VDC, the maximum current rating is 900 mA.

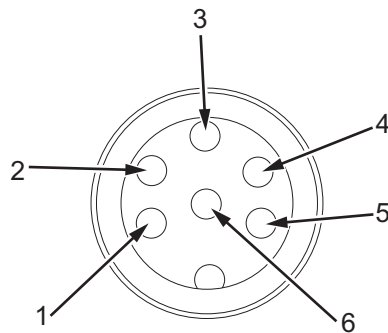


Figure 3-14: Status Output Connector Pin Diagram

Note: Figure 3-14 represents the view of the connector on the side of the printer.

Pin	Function
DIN Pin 1	Red lamp negative supply
DIN Pin 2	Amber lamp negative supply
DIN Pin 3	Green lamp negative supply
DIN Pin 4	+24 VDC supply to the strobe/siren
DIN Pin 5	Strobe/siren negative supply
DIN Pin 6	+24 VDC common to the traffic lights

Table 3-5: Status Output Connector Pinouts

Note: The mating cable (male, 6 pin DIN connector - P/N: 500-0036-577).

USB Connector

The USB Connector (item 7) allows for data to be transferred to and from a connected USB flash drive.

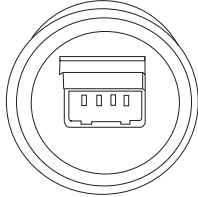


Figure 3-15: USB Connector

Note: Figure 3-15 represents the view of the connector on the side of the printer.

Relay Switches

The relay switches connector (item 5) is a 7 way DIN connector. This connector supports the following relays:

- Relay 'A' duplicates the functionality of the green LED on the keyboard, and you can use the relay to provide a 'Print Ready' output.
- Relay 'B' duplicates the functionality of the yellow LED on the keyboard, and you can use the relay to provide a 'warning' output.

Maximum Contact Loading

0.5A @ +24 VDC

These relays have electrical ratings of 1 - 30 VDC, 300 mA maximum. It is suggested to use +24 VDC. For example, if the printer is in a print ready state, the normally open (N.O.) contacts closes and informs the host that the printer is in a print ready state. If the printer is removed from the print mode for any reason (removed from print), printer faults out, thus opens the contacts. The pin allocation is shown in Table 3-6.

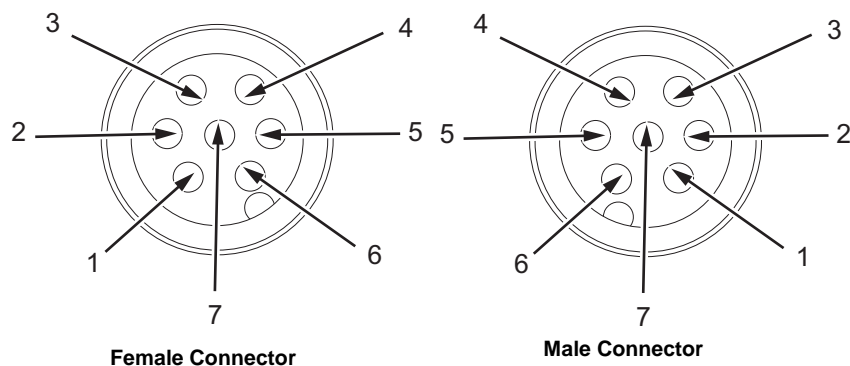


Figure 3-16: Relay Switches Connector Pin Diagram

Note: Female connector (Figure 3-16) represents the view of the connector on the side of the printer.

Connector Pin		Function	Wire Color
Female Pin	Male Pin		
DIN Pin 1	DIN Pin 6	Relay A - Normally open contact	White
DIN Pin 2	DIN Pin 5	Relay A - Normally closed contact	Red
DIN Pin 3	DIN Pin 4	Relay A - Common contact	Black
DIN Pin 4	DIN Pin 4	Relay B - Normally open contact	Green
DIN Pin 5	DIN Pin 2	Relay B - Normally closed contact	Blue
DIN Pin 6	DIN Pin 1	Relay B - Common contact	Brown
DIN Pin 7	DIN Pin 7	Not used	-

Table 3-6: Relay Switches Connector Pinouts

Note: The mating cable - P/N SP378810 (male, 7 pin DIN connector - P/N: 500-0036-583).

Note: These outputs are cold contact relays. It will not supply control voltage to the host system. If the host is going to send a control voltage through these contacts, it is suggested to use +24VDC.

Ethernet Connector

The ethernet connector (item 8) is used to connect the printer to a remote computer or network to import data or control the printer remotely.

Note: Ethernet Connector is not available in 1220 model.

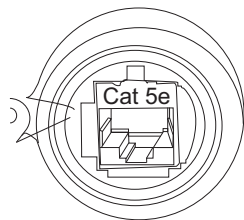


Figure 3-17: Ethernet Connector

Note: Figure 3-17 represents the view of the connector on the side of the printer.

RS-485 Connector

The RS-485 connector (item 9) is a 5 way DIN (180 degree or stereo type) connector. Use this to connect the printer to an RS-485 network to import data or control the printer remotely at up to 1Mbps (bi-directional, half-duplex). The pin allocation is shown in Table 3-7.

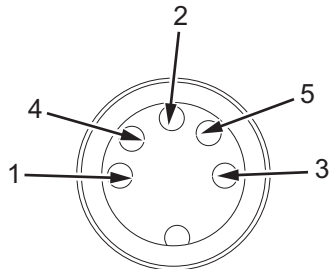


Figure 3-18: RS-485 Connector

Note: Figure 3-18 represents the view of the connector on the side of the printer.

Pin	Function
DIN Pin 1	Line A
DIN Pin 2	Line B
DIN Pin 3	0 VDC Common
DIN Pin 4	-
DIN Pin 5	-

Table 3-7: RS-485 Connector Pinouts

RS-232 Connector

The printer has an RS-232 communication port at up to 250 kbps, 1-8-1, no parity, bi-directional, full-duplex. The RS-232 connector (item 10) is a 5 way DIN connector. The pin allocation is shown in Table 3-8.

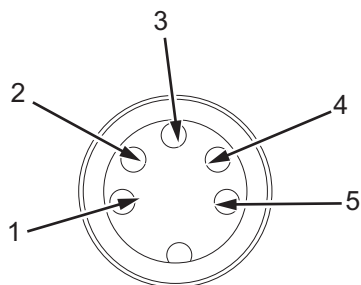


Figure 3-19: RS-232 Connector

Note: Figure 3-19 represents the view of the connector on the side of the printer.

Pin	Function
DIN Pin 1	0 VDC common
DIN Pin 2	Transmit data out from the printer.
DIN Pin 3	Receive data into the printer.
Din Pin 4	RTS output from the printer.
Din Pin 5	CTS input to the printer.

Table 3-8: RS-232 Connector Pinouts

Message A and B Input Connectors

There are eight external message inputs provided on PCB 3 with four inputs on each of two Message connectors as shown in Table 3-9 on page 3-17 and Table 3-10 on page 3-18. The user has to link adjacent pins to indicate a logic '1' value on that bit. The link short-circuits a resistive 15V DC supply to an opto-isolated input.

The 1520 printers use the message inputs to select messages numbers coded in Binary Coded Decimal (BCD) format (00-99) with Message A as the least significant digit.

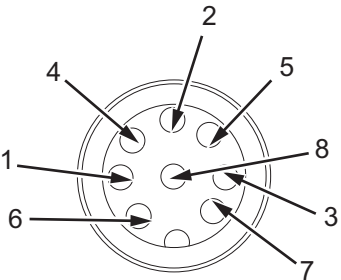


Figure 3-20: Message A Input Connector

Note: Figure 3-20 represents the view of the connector on the side of the printer.

Pin	Message Selection Bit
DIN Pin 1	0 (Least significant bit +15V DC supply)
DIN Pin 2	0 (Least significant bit input)

Table 3-9: Message A Input Connector Pinouts

Pin	Message Selection Bit
DIN Pin 3	1 (Second bit +15V DC supply)
Din Pin 4	1 (Second bit input)
Din Pin 5	2 (Third bit +15V DC supply)
Din Pin 6	2 (Third bit input)
Din Pin 7	3 (Most significant bit +15V DC supply)
Din Pin 8	3 (Most significant bit input)

Table 3-9: Message A Input Connector Pinouts (Continued)

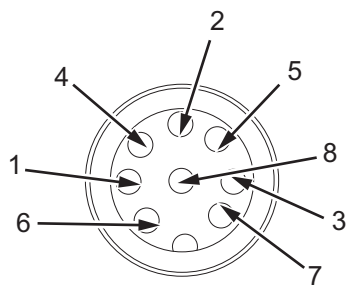


Figure 3-21: Message B Input Connector

Note: Figure 3-21 represents the view of the connector on the side of the printer.

Pin	Function
DIN Pin 1	4 (Least significant bit +15V DC supply)
DIN Pin 2	4 (Least significant bit input)
DIN Pin 3	5 (Second bit +15V DC supply)
Din Pin 4	5 (Second bit input)
Din Pin 5	6 (Third bit +15V DC supply)
Din Pin 6	6 (Third bit input)
Din Pin 7	7 (Most significant bit +15V DC supply)
Din Pin 8	7 (Most significant bit input)

Table 3-10: Message B Input Connector Pinouts

Note: Message A and B connectors are not available in 1220 model.

An Example:

Input	Message Selection Bits							
	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0	0
9	0	0	0	0	1	0	0	1
54	0	1	0	1	0	1	0	0
99	1	0	0	1	1	0	0	1

Table 3-11: Message Selection Bits - An Example

Back Filter

The ink compartment draws the air from the outside atmosphere to keep the compartment cool. The back filter removes the dust from the air that goes inside the ink compartment (see Figure 3-23). The IP55 back filter is standard for Videojet 1220/1520. The IP65 back filter is not available for Videojet 1220 and is optional for Videojet 1520.



Figure 3-22: Back Filter(IP55 Version) - Videojet 1220



Figure 3-23: Back Filter (IP55 Version)-Videojet 1520



Figure 3-24: Back Filter (IP 65 Version)-Videojet 1520

Electronics Compartment

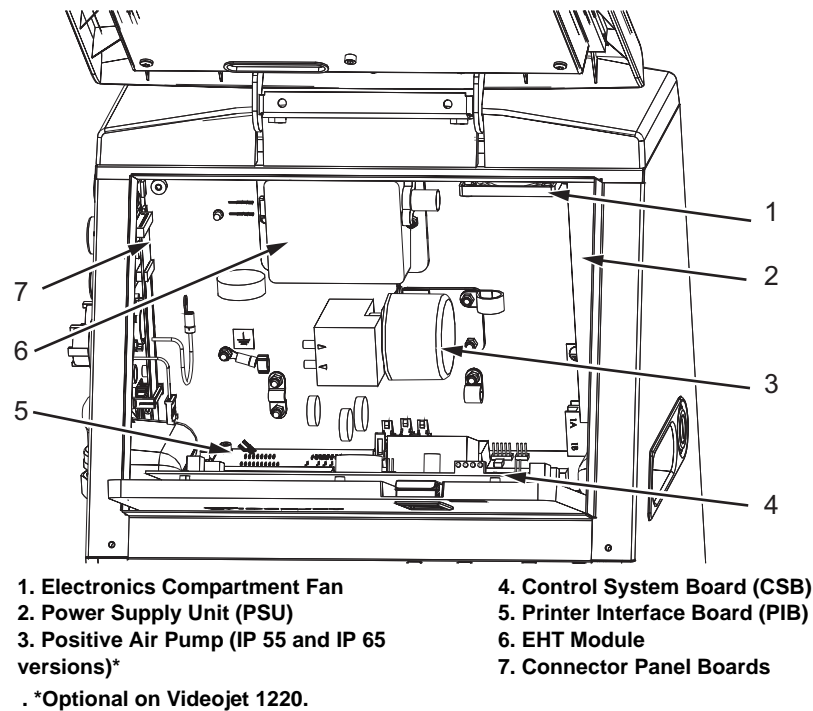


Figure 3-25: Electronics Compartment (Videojet 1220)

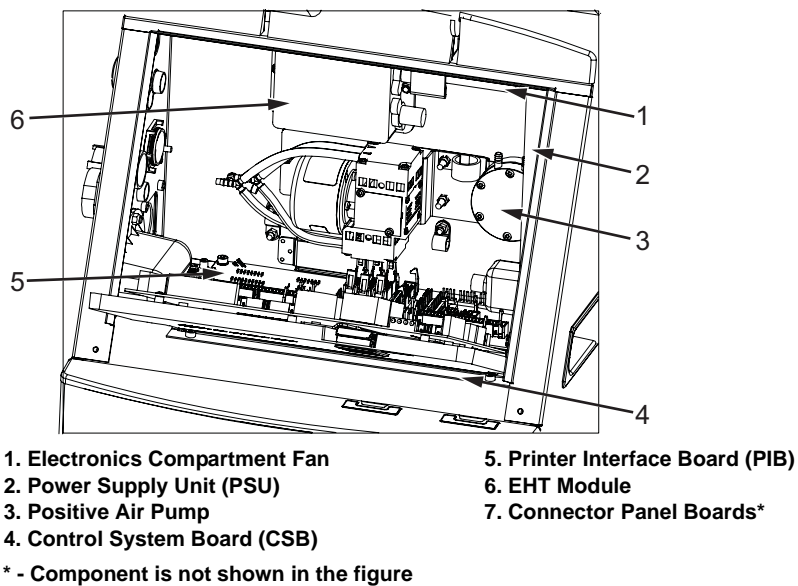


Figure 3-26: Electronics Compartment (Videojet 1520)

Power Supply Unit

The Power Supply Unit (PSU) is the main source of power to the printer. The mains input circuit is shown in the Figure 3-27. The AC electrical power is supplied through three core cables. The line and neutral are fed to the On/Off switch. After the On/Off switch the line and neutral are fed to TB1 connector on the PSU.

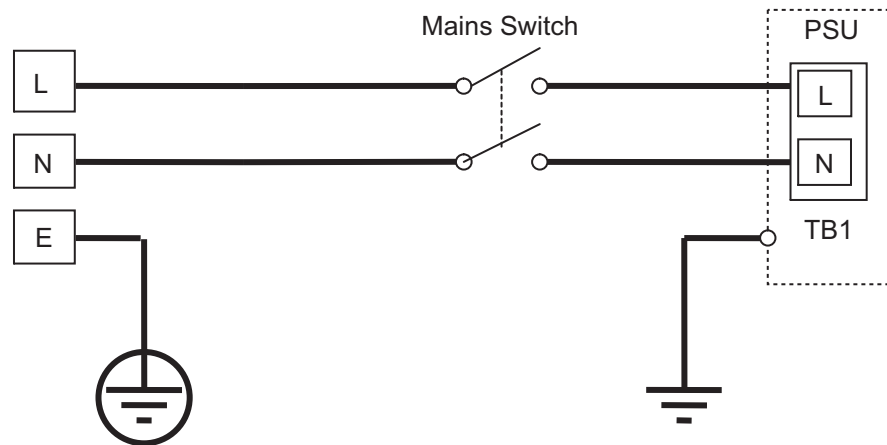


Figure 3-27: Mains Input Circuit

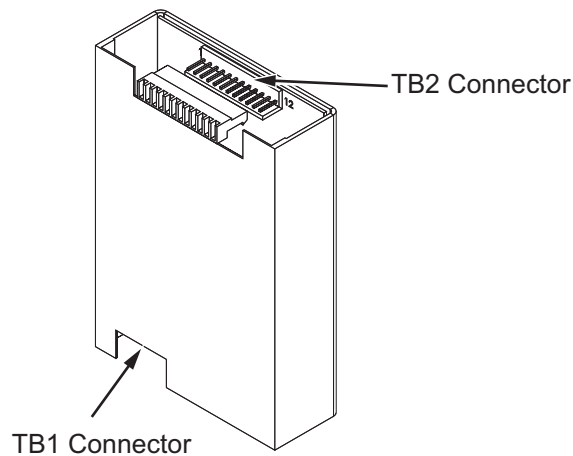
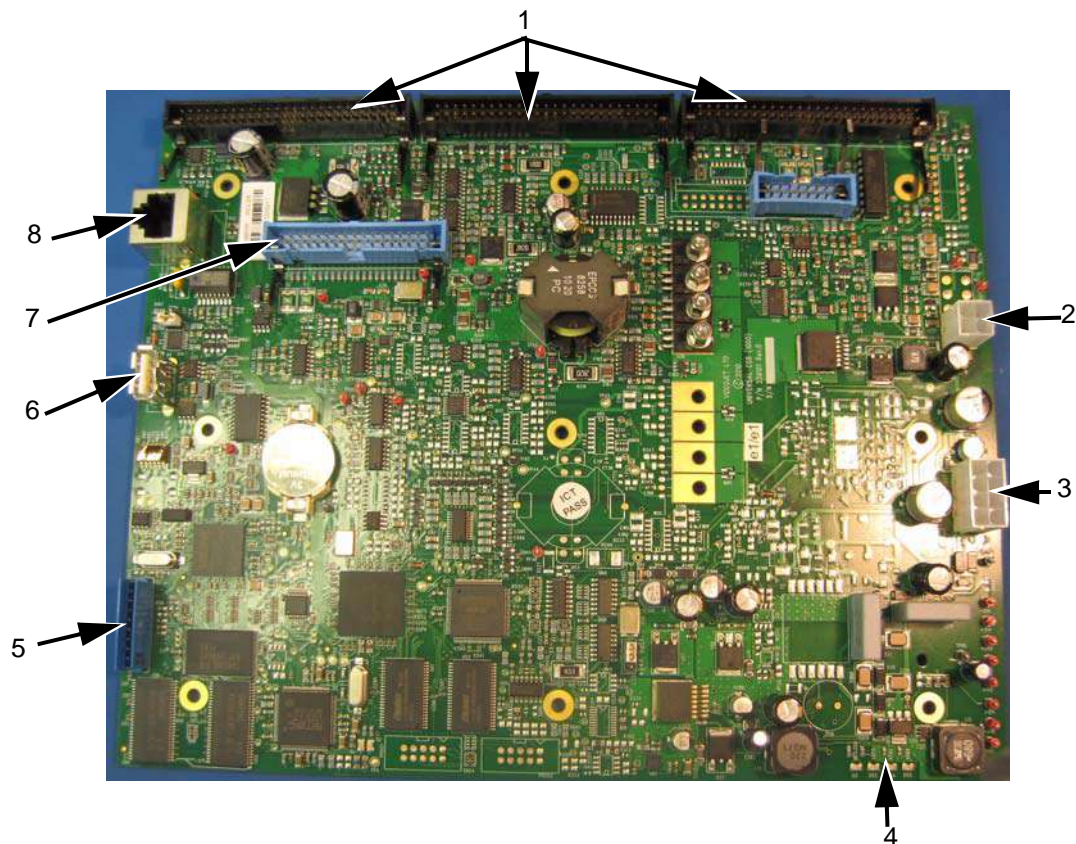


Figure 3-28: Power Supply Unit

The PSU features are as follows:

- The PSU provides four DC voltage levels (+24 VDC, +15 VDC, +5 VDC, and -15 VDC) to the CSB.
- The input power to the PSU ranges from 100 to 240 VAC, 50 - 60 Hz.

Control System Board



- | | |
|--|-----------------------------|
| 1. Connectors CN1, CN2 and CN3 | 5. JTAG |
| 2. Charge Tunnel and Modulation Signal Connector | 6. USB 2 Host Device |
| 3. Input Power Connector | 7. User Interface Connector |
| 4. LEDs | 8. Ethernet Connector |

Figure 3-29: Control System Board

Connectors 1, 2, and 3

The ribbon cables from the PIB connect to the CSB through the connectors 1, 2 and 3 (item 1, Figure 3-29) and relay the data that reaches PIB from different parts of the printer to the CSB.

Charge Tunnel and Modulation Signal Connector

The charge tunnel and modulation signals are generated on the CSB. These signals are sent directly to the printhead through the umbilical. All other input or output signals are sent through the PIB.

Charge 1 MOD Connector

Pin	Function
DIN Pin 1	Charge
DIN Pin 2	GND
DIN Pin 3	GND
DIN Pin 4	MOD

Table 3-12: Pin Functions for Charge 1 MOD Connector

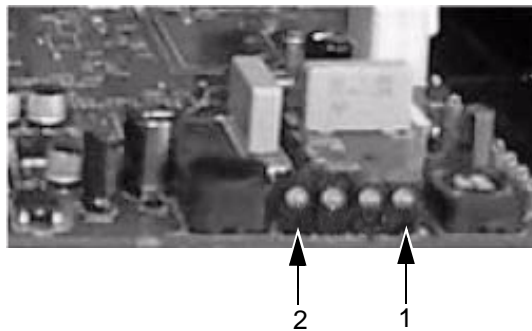
Input Power Connector

You can check the voltages at input power connector (item 3,) to make sure that the power supply from the mains power supply is of the correct value.

Pin	1	2	3	4	5	6	7	8
Signal	+15 V	0 V	+5 V	-15 V	+5 V	+24 V	0 V	N/C

Table 3-13: Pin Connections - Input Power Connector

LEDs



- 1. Power LED
- 2. Ethernet LED

Figure 3-30: Status LEDs

LED	Description
Power	Indicates the status of 3.3 VDC
Ethernet	Indicates the status of Ethernet communications

Table 3-14: Status LEDs

Electronics Compartment Fan

A cooling fan circulates the air inside the electronics compartment. The top-cover casting of the printer dissipates the heat.

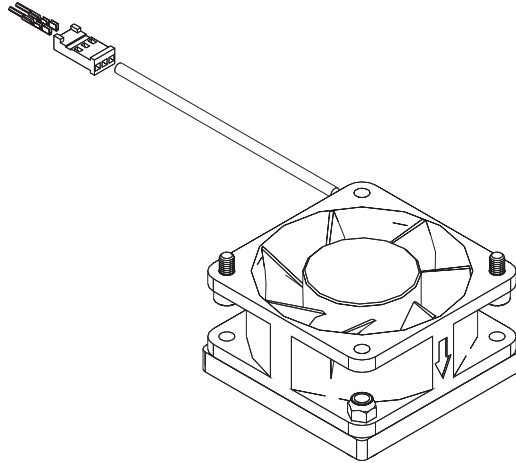


Figure 3-31: Cooling Fan

Positive Air Pump

The positive air pump is optional for 1220 and standard for 1520. The positive air pump assembly provides dust free air to the printhead and thus prevents the accumulation of dust in the printhead and contamination of the ink (see Figure 3-32 and Figure 3-33).

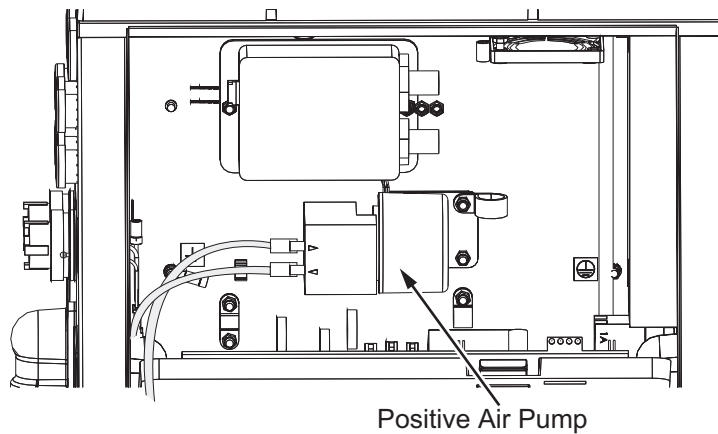
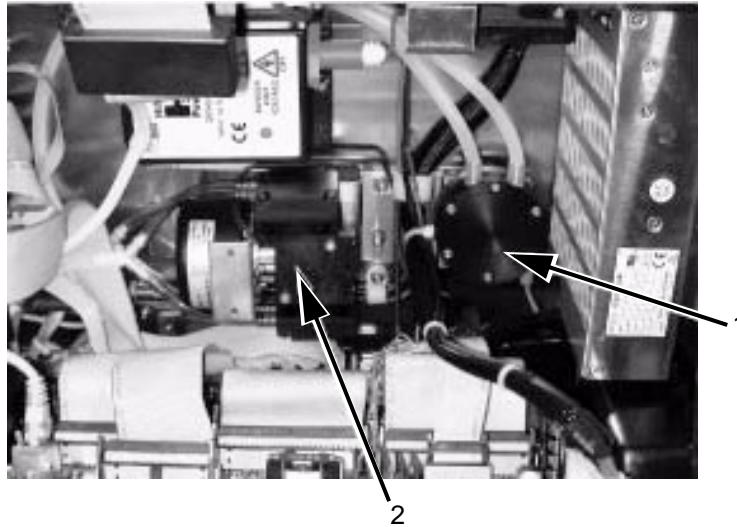


Figure 3-32: Positive Air Pump (Videojet 1220)



1. Dampener
2. Positive Air Pump

Figure 3-33: Positive Air Pump (Videojet 1520)

Note: When a customer orders a Videojet 1520 printer with an air dryer kit, the positive air pump is not fitted to the printer. The air dryer supplies positive air to the printhead from an external air source. Air dryers are required when the printer is operated in an environment with elevated humidity or where certain water sensitive inks are used. Please contact Videojet Technologies Inc. Customer Service Department at 800.843.3610 (United States only), or contact the local Videojet Technologies Inc. representative for more information.

Printer Interface Board

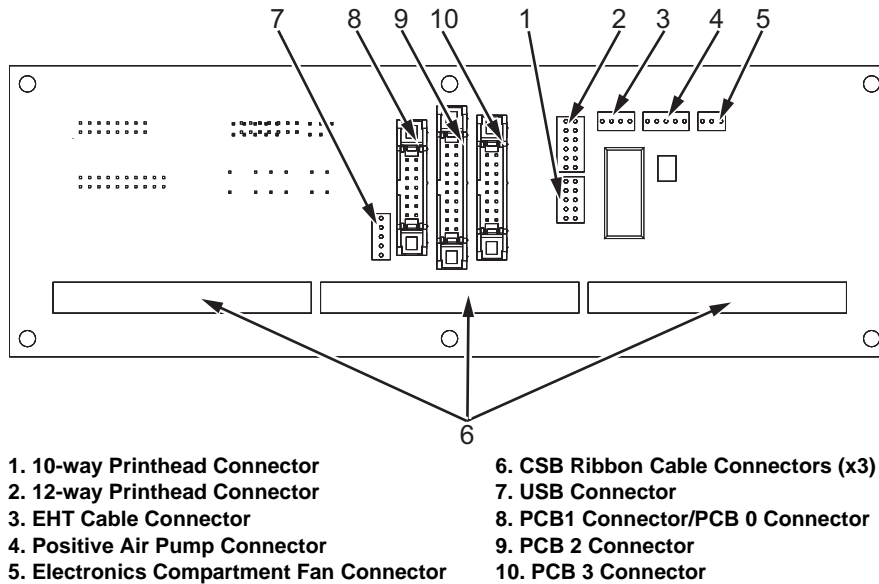


Figure 3-34: Printer Interface Board (PIB) - Electronics Compartment Side (Videojet 1220)

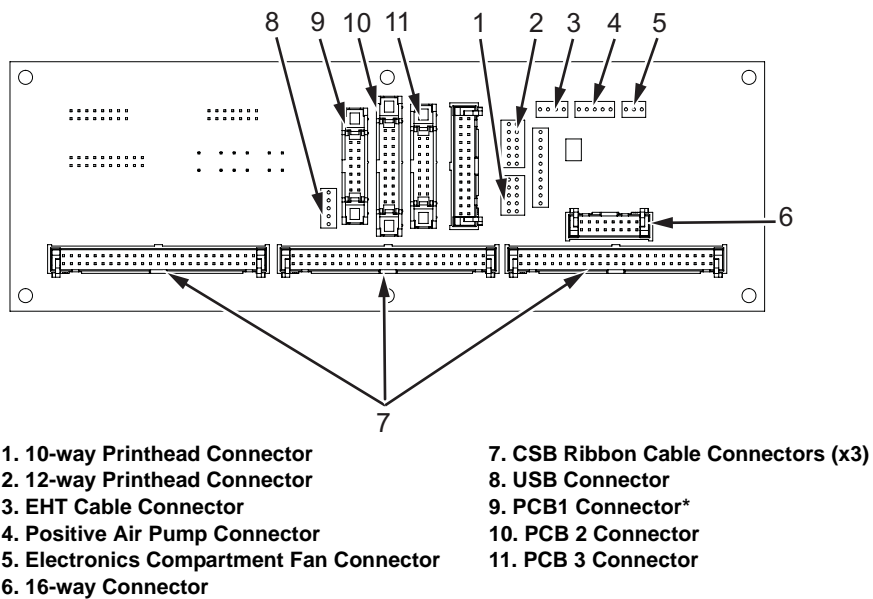
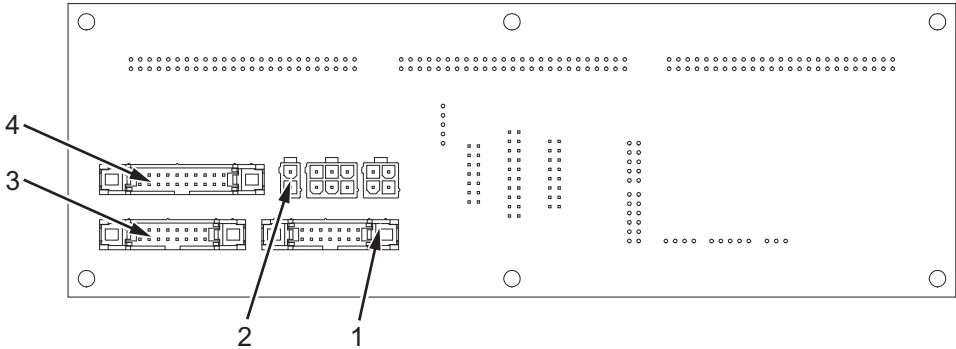
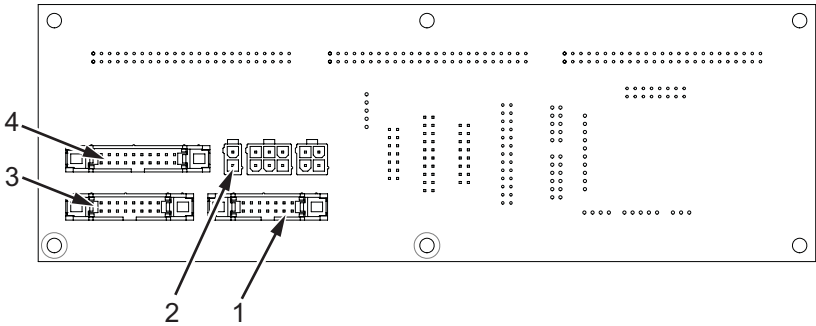


Figure 3-35: Printer Interface Board (PIB) - Electronics Compartment Side (Videojet 1520)



- 1. 14-way Ink Door Ribbon Cable Connector
- 2. Ink Compartment Fan Connector
- 3. 16-way Ink Core Module Ribbon Cable Connector
- 4. 20-way Ink Core Module Ribbon Cable Connector

Figure 3-36: Printer Interface Board (PIB) - Ink Compartment Side (Videojet 1220)



- 1. 14-way Ink Door Ribbon Cable Connector
- 2. Ink Compartment Fan Connector
- 3. 16-way Ink Core Module Ribbon Cable Connector
- 4. 20-way Ink Core Module Ribbon Cable Connector

Figure 3-37: Printer Interface Board (PIB) - Ink Compartment Side (Videojet 1520)

The description of different connectors on the PIB is provided in the Table 3-15.

Connector	Description
10-way Printhead Connector 12-way Printhead Connector	Connection to valves, phase detector, strobe LED, heater and thermistor, and gutter detect
EHT Cable Connector	Input to EHT module
Positive Air Pump Connector	Input to positive air pump
Fan Connector	Input to electronics compartment fan

Table 3-15: PIB Connectors

Connector	Description
CSB Connectors (x3 - Videojet 1220 and x4 - Videojet 1520)	Input to CSB
USB Connector	External USB (not the USB connection on CSB)
PCB 0 Connector	Print Trigger 1
PCB1 Connector	Print Trigger 1, COMMS RS-485, and Relay Switches
PCB 2 Connector	COMMS RS-232, Shaft Encoder, Status Output
PCB 3 Connector	Message A and B Input, Print Trigger 2
Ink System	Ink pump, valves, sensors, level detectors, smart chip supplies validation system

Table 3-15: PIB Connectors (Continued)

EHT Module

The extra high tension (EHT) module (item 2, Figure 3-38 on page 3-30) generates the high tension voltage (0 to 8000 VDC) that is supplied to the deflector plate in the printhead.

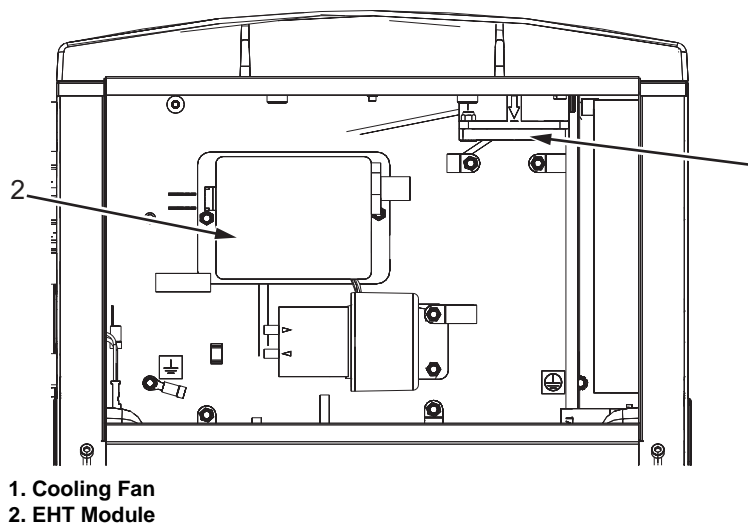
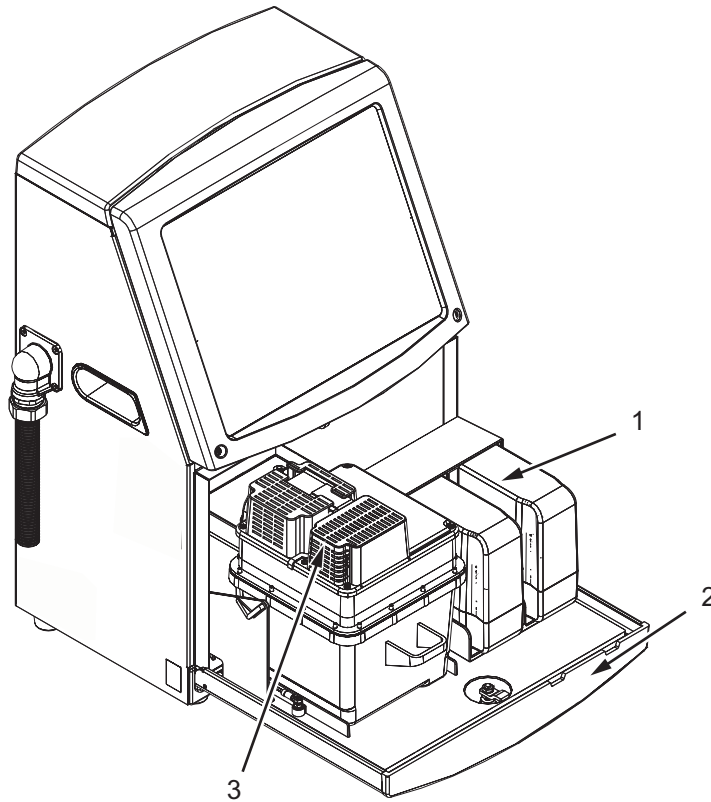


Figure 3-38: Cooling Fan and EHT Module

Ink Compartment

The ink system provides a continuous supply of ink to the printhead at the correct pressure, temperature and viscosity. The ink system is housed in the printer cabinet and the different components of the system are interconnected by PTFE tubing.



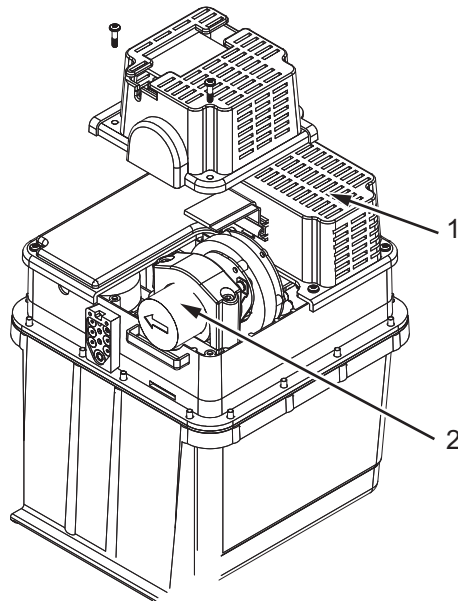
- 1. Smart Cartridges
- 2. Ink Compartment Door
- 3. Ink Core Module
- 4. Ink Compartment Fan*

**The component is not shown in the picture*

Figure 3-39: Ink Compartment

Ink Core Module

The ink core module maintains the pressure and viscosity of the ink in the printer.



- 1. Ink Core
- 2. Ink Core Pump

Figure 3-40: Ink Core Module

The ink core module contains the following subsystems:

- Ink core pump
- Ink core

Ink Core Module Connections

There are three input, three output, and one vent hydraulic connections to the ink core module.

Connections	Type of Tube
Input Hydraulic Connections	<ul style="list-style-type: none"> • Ink addition tube (black-striped tube) • Gutter pump discharge (blue-striped tube) • Make-up addition tube (green-striped tube)
Output Hydraulic Connections	<ul style="list-style-type: none"> • Flush supply tube (red-striped tube) • Ink supply tube (clear tube) • Ink Commissioning Tube (clear tube)
Vent	Vent or breather tube (clear tube)

Table 3-16: Ink Core Module Connections

Two ribbon cables provide the electrical interface between the ink core module and the electronic system. The cables connect directly from the ink core module to the PIB and allow for the transfer ink core data.

Ink Core Pump

The ink core pump is a positive displacement gear pump driven by a 24 VDC brushless motor.

The pump provides stable ink pressure to the nozzle during printing and also provides a flow of ink to other components inside the ink core module.

Smart Cartridges

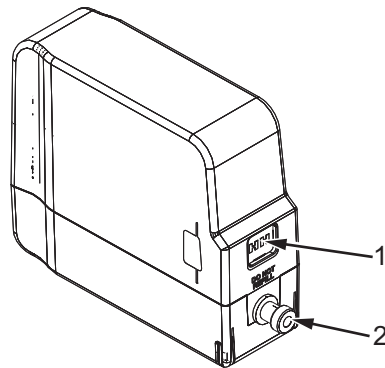
Two types of cartridges are used in the printer.

- Ink cartridge - This contains the ink.
- Make-up cartridge - This contains the make-up fluid.

Functions

The cartridge is based on smart chip technology that helps you to:

- Store the information about the ink levels and make-up fluid
- Use the correct type of ink or make-up fluid
- Know the expiry date of the ink



1. Smart Chip PCB
2. Septum

Figure 3-41: Smart Cartridges

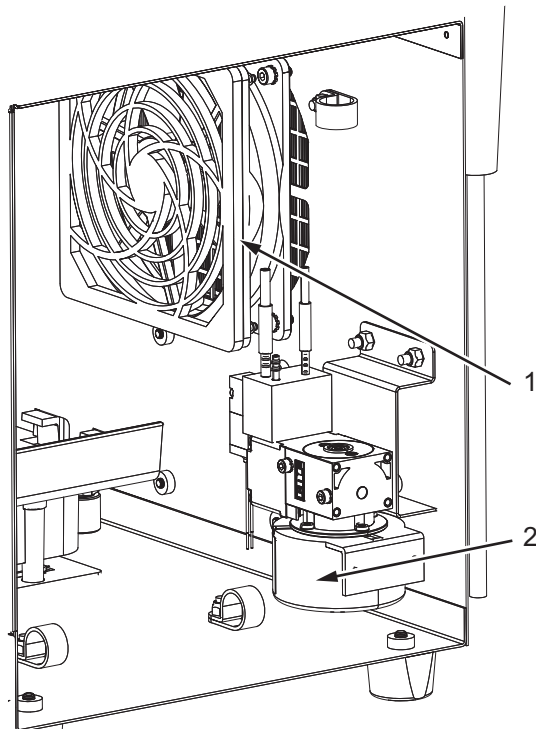
Ink Compartment Fan

The ink compartment fan (item 1, Figure 3-42 on page 3-34 and Figure 3-43 on page 3-35) cools the ink compartment.

Gutter Pump

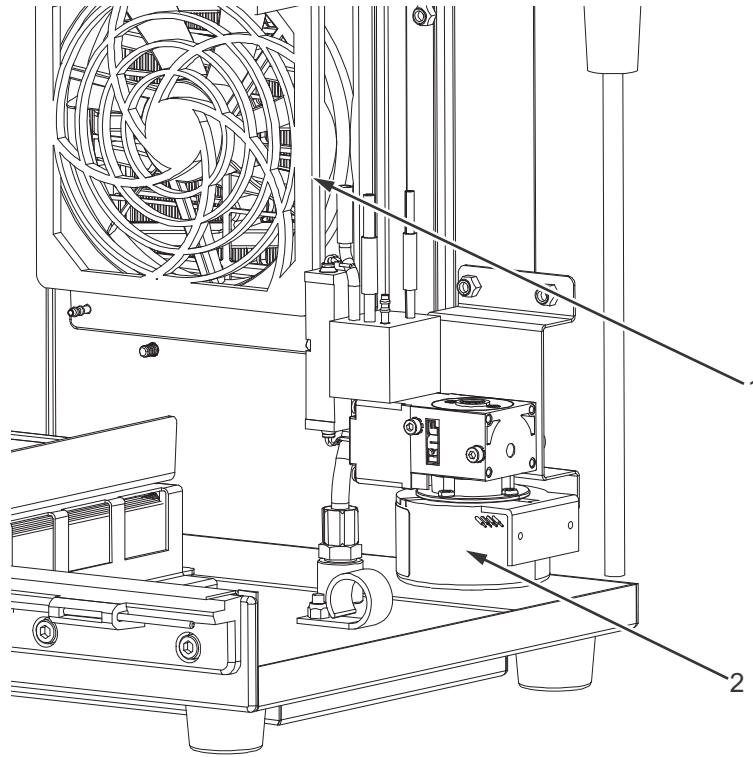
The gutter pump (item 2, Figure 3-42 on page 3-34 and Figure 3-43 on page 3-35) is fitted to the rear of the cabinet inside the ink compartment. The functions of the gutter pump are as follows:

- Vacuum generation for gutter suction
- Vacuum generation to assist in nozzle back flushing
- Ink delivery to the ink core module during printer installation



1. Ink Compartment Fan
2. Gutter Pump

Figure 3-42: Fan and Gutter Pump (Videojet 1220)



- 1. Ink Compartment Fan
- 2. Gutter Pump

Figure 3-43: Fan and Gutter Pump (Videojet 1520)

Condenser Assembly (Videojet 1520 only)

The condenser assembly recovers solvent from the ink core vapour.

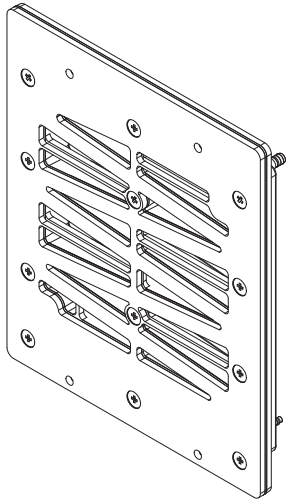


Figure 3-44: Condenser Assembly (Videojet 1520)

Vent Recovery System (Videojet 1220 only)

The vent recovery system converts the solvent/ air vapour created in the mixer tank into recoverable solvent. Refer to the Figure 3-45 on page 3-37.

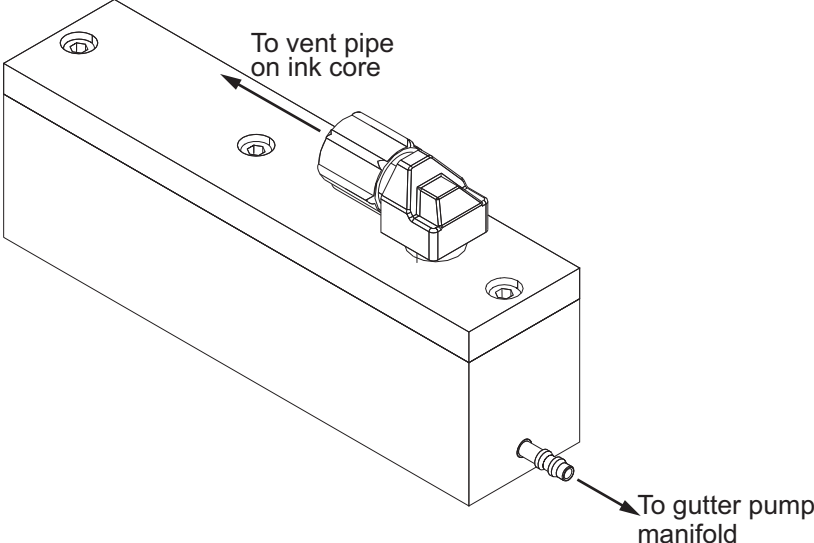
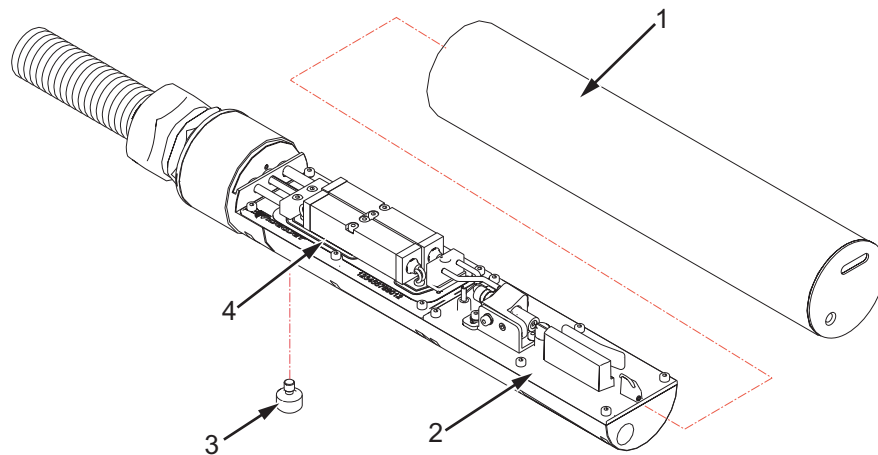


Figure 3-45: Vent Recovery System (Videojet 1220 only)

Printhead

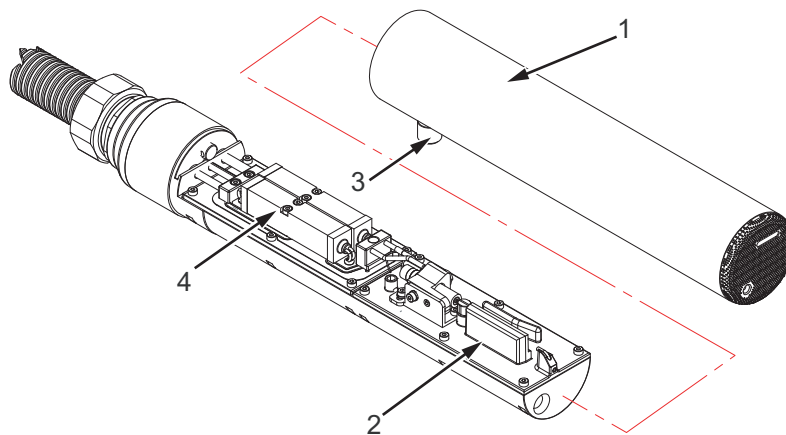
The printhead contains the following parts:

- Printhead cover
- Printhead engine
- Printhead valve module



- 1. Printhead Cover**
2. Printhead Engine
3. Knurled Screw
4. Printhead Valve Module

Figure 3-46: Printhead (Videojet 1220)



- 1. Printhead Cover**
2. Printhead Engine
3. Printhead Screw
4. Printhead Valve Module

Figure 3-47: Printhead (Videojet 1520)

Printhead Cover

The printhead cover (item 1, Figure 3-46Figure 3-47) is attached to the printhead with a knurled screw (item 3). The cover protects the printhead

components. Removal of the cover is sensed by the printer through the cover switch. When the cover is removed the voltage to the deflector electrodes is turned off.

Printhead Valve Module

The printhead valve module (item 4) consists of the bleed/gutter valve, ink feed valve, solvent feed valve, and the head heater.

Printhead Engine

The printhead engine (item 2) consists of the nozzle, charge electrodes, time of flight sensors, deflection plate, and gutter tube.

Nozzle

The nozzle (item 8, Figure 3-48 on page 3-40 Figure 3-49 on page 3-41) creates the ink droplets.

Charge Electrode

The charge electrode (item 9) applies an electrical charge to each ink droplet. The charge applied to the droplet is variable and affects the position of the droplet on the substrate.

Phase Detectors

The phase detectors (item 12) measure the ink drop velocity and perform phasing.

Gutter Tube

The gutter tube (item 11) is the return path for the uncharged ink droplets that are not used for printing. The gutter delivers the ink back into the ink core.

The gutter detect senses when ink is present in the gutter. The ink feed tubes are metallic and a signal is fed to one of them. A signal return lead is connected to the other. When ink (which is conductive) is present, the signal passes through it to the return lead. The gutter detect signal is then fed, via the umbilical, to the CSB in the electronics system.

Deflection plate

The deflection plate (item 10) is supplied with a fixed positive DC voltage (0 - 8000 VDC) from the EHT Module. This voltage deflects the charged drops over the top of the gutter, through the printhead slot, and onto the substrate.

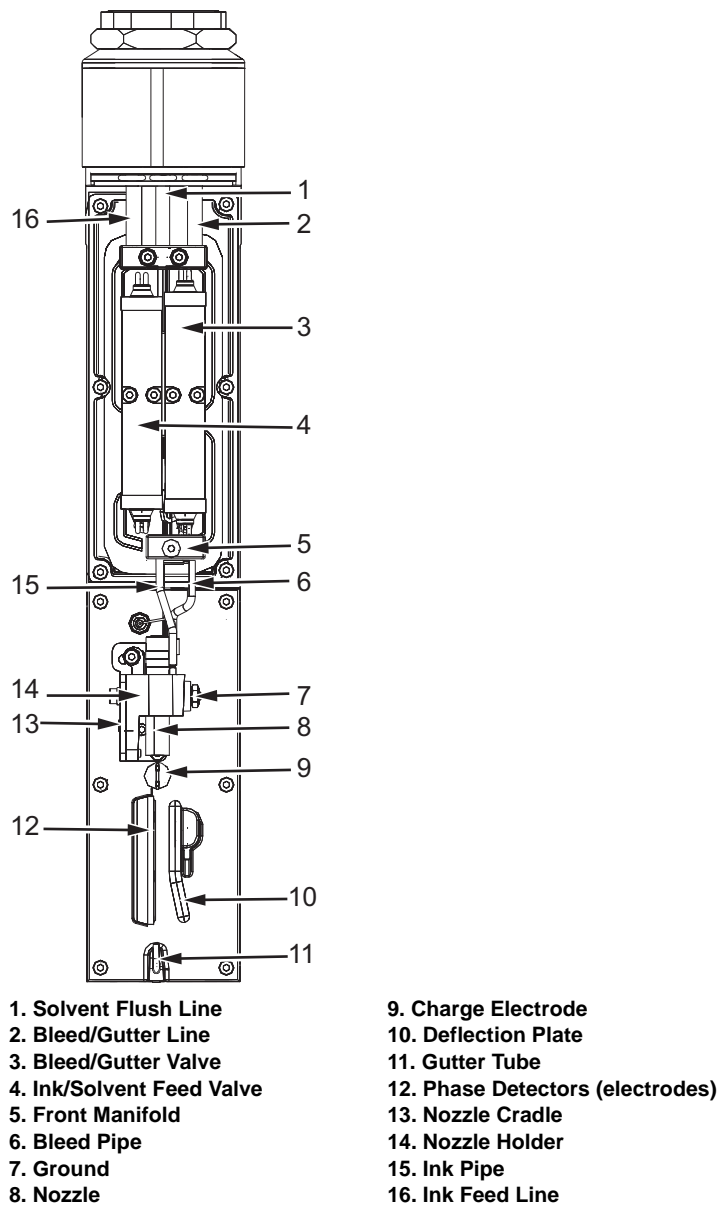
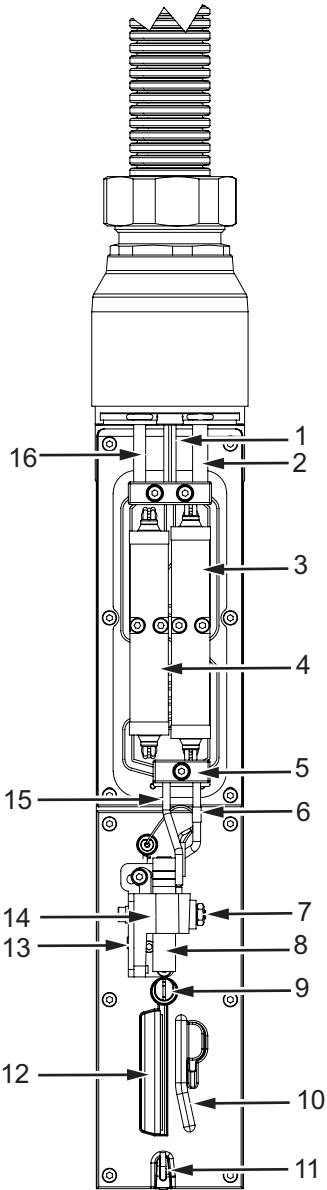


Figure 3-48: Printhead Components



- 1. Solvent Flush Line
- 2. Bleed/Gutter Line
- 3. Bleed/Gutter Valve
- 4. Ink/Solvent Feed Valve
- 5. Front Manifold
- 6. Ink Pipe
- 7. Ground
- 8. Nozzle
- 9. Charge Electrode
- 10. Deflection Plate
- 11. Gutter Tube
- 12. Phase Detectors (electrodes)
- 13. Nozzle Cradle
- 14. Nozzle Holder
- 15. Bleed Pipe
- 16. Ink Feed Line

Figure 3-49: Printhead Components

Printhead Functions

The phasing and velocity fly-by sensors and supporting circuitry contribute directly or indirectly to the performance of six critical control functions during steady-state operation:

- Phasing
- Modulation control
- TOF measurement
- Pump speed control
- Target pressure control
- Viscosity control

The functions of the ink core module are shown in Table 3-17.

Name	Function	Frequency
Phasing	Between prints, charge transfer to test drops is measured by the LEAD fly-by sensor (phase detector) in order to synchronize drop charging to drop break-off, thereby optimizing print quality.	Performed approximately 25 times per second
Modulation Control	Between prints, modulation amplitude is validated by performing an abbreviated auto-modulation test using the LEAD fly-by sensor (phase detector). The amplitude is changed in small increments whilst measuring the rate of change of the phase angle in order to verify that the amplitude setting remains at or near the “appropriate setting”.	Performed continuously
TOF Measurement	Between prints, drop velocity is monitored by measuring the TIME OF FLIGHT of the test drops from the LEAD (phase) sensor to the TRAILING (velocity) sensor. The measured result is referred to as the “actual velocity”.	Performed every TENTH phasing test
Pump Speed Control	A pressure transducer inside of the Core measures “actual pressure”. This pressure is compared to the “target pressure”. The resultant error is used to increase or decrease the pump speed.	Performed once per second
Target Pressure Control	The “target pressure” represents the nominal pressure the printer determines that it must operate at in order for the actual velocity to be equal to the “velocity set point”. The printer makes modifications to the target pressure by reviewing the “history” of the velocity error parameter (“PID” control). “Velocity error” refers to the difference between the actual velocity and the set point.	Occur every 10 seconds

Table 3-17: Ink Core Module Functions

Name	Function	Frequency
Viscosity Control	Once the printer has determined its “target pressure”, it has the means to perform viscosity adjustments. Determination concerning viscosity is made by comparing the empirically-determined “target pressure” to a reference pressure known as the “temperature-compensated target pressure”. This value is acquired indirectly from data encoded on the ink cartridge Smart Chip. This reference pressure is mathematically determined and represents the pressure required to acquire the correct “actual velocity” under ideal viscosity conditions. If the target pressure deviates from the reference pressure, the printer attributes this to viscosity variation and responds accordingly.	Pressure is constantly measured. The printer adds make-up if the pressure goes outside the given range for a set time period.

Table 3-17: Ink Core Module Functions

Printhead Operation

The flush supply and ink supply lines merge at Pico valve V1. The ink is heated as it flows through the manifold assembly to the nozzle. The nozzle is outfitted with both the feed and the bleed ports. The nozzle bleed port provides a source of vacuum, used during manual irrigation/backflushing.

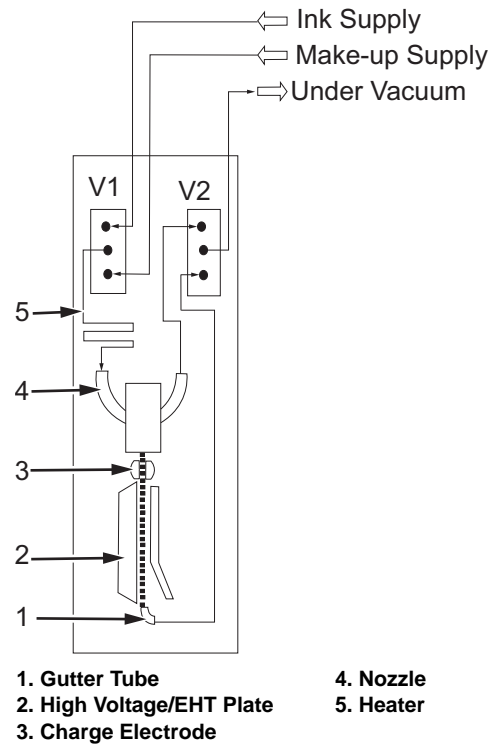


Figure 3-50: Printhead Operation

The flow of ink is as follows:

- 1 The ink and solvent mixture flows through the feed line (item 16, Figure 3-48 on page 3-40) into the printhead.
- 2 The ink enters the feed valve (item 4).
- 3 The valves open or close as per the print requirements.

Note: The bleed valve opens and closes as needed during flushing the nozzle and supplying ink to the nozzle.

- 4 The ink flows into the nozzle.

To adjust the nozzle refer to “Nozzle Adjustment” on page 4-42.

- 5 The piezoelectric crystal vibrates the nozzle at a frequency of around 64 KHz nominal value in the longitudinal direction.

This vibration enables the nozzle to breakup the stream of ink into droplets.

- 6 The ink drops enter the charge electrode (item 9) where they are charged at different voltage levels based on the character to be generated.
- 7 The charged ink drops then pass through the EHT/ High Voltage Field (item 2, Figure 3-50) and over the phase detectors.
- 8 The High Voltage/EHT plate deflects the charged drops of ink at various angles depending on the charge placed on the drop at the moment of breakoff.
- 9 An electrically conductive ink is supplied under pressure by the ink core to the nozzle assembly (item 6, Figure 3-51) through the ink feed pipe (item 1).
- 10 An ink stream is formed as the ink is forced out of the nozzle jet orifice (item 5).

A modulation signal is applied to a ceramic transducer which is clamped to the nozzle assembly. The transducer crystals (item 3 and item 4) causes the nozzle assembly to vibrate longitudinally, breaking up the ink stream into droplets, a small distance away (the break up point) from the nozzle jet orifice. The frequency of modulation is 64 kHz (nominal value).

The ink droplets are produced at the same rate as the modulation frequency and are uniform in size and separated by equal distances. The nozzle orifice diameter is 60 or 70 microns.

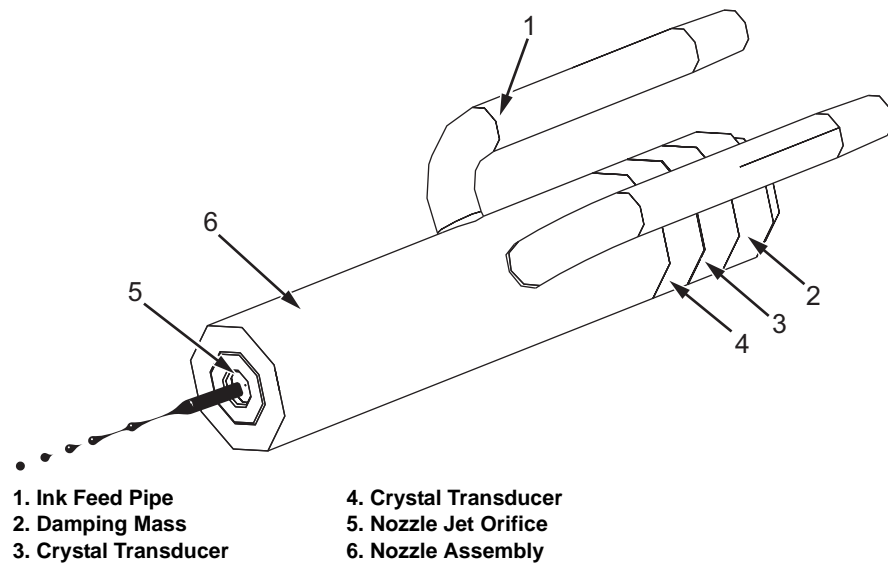


Figure 3-51: Ink Jet Formation

Droplet Charging

- 11 The charge electrode (item 2 in Figure 3-52) is positioned at the break up point of the ink stream and extends for several drops either side of it.

Note: This allows a tolerance for break up position and shields the ink stream from the influence of the other electrostatic fields. The distance between the nozzle assembly (item 1) and the charge electrode is 1 mm (60um) and 2.3 mm (70um).

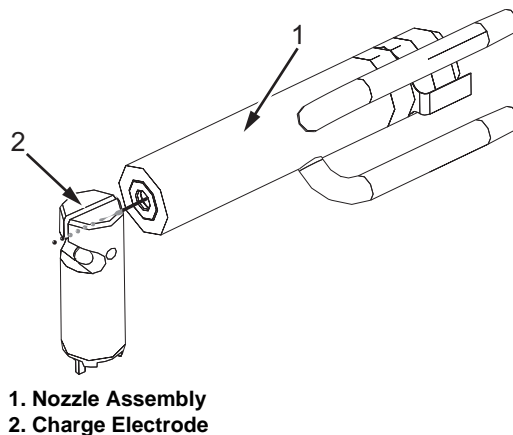


Figure 3-52: Charge Electrode

The ink stream and the charge electrode can be considered as the two electrodes of a capacitor. By raising the charge electrode to a specific positive voltage (with a charge pulse) the section of the ink system within

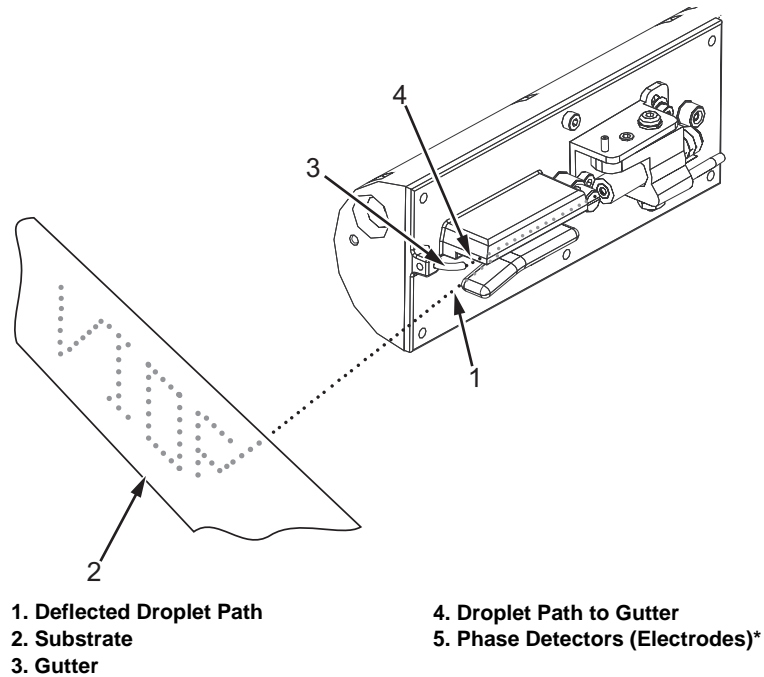
the charge electrode will have a negative charge induced on it. When a drop of ink then breaks from the jet it will have trapped on it a charge directly proportional to that on the charge electrode. If the positive voltage is then removed from the charge electrode, the negative charge on the jet will discharge through the ink jet and nozzle assembly to ground. However, the drop of ink which has become detached from the jet cannot discharge as it no longer has a conductive path to ground.

Droplet Deflection

- 12** The droplet stream passes through an electrostatic field maintained by the deflector electrodes that are connected to a high tension supply (typically 6 kV).
- 13** The negatively charged droplets are deflected by the field towards the high voltage deflector electrode.

The distance a drop is deflected is proportional to the charge carried. The charge carried is proportional to the voltage applied to the charge electrode when the drop became detached from the ink jet.

The charged droplets once deflected leave the printhead to form characters in a dot matrix format on the substrate. Droplets which are not required for printing are not charged and are therefore not deflected.



* The part is not shown in the figure

Figure 3-53: Droplet Deflection

Umbilical

The umbilical has the electrical wiring and ink system tubing from the printer to the printhead.

The Hydraulic System

This section describes the combined operation of the ink system, printhead and umbilical to print on a substrate. The Figure 3-54 on page 3-48 shows the hydraulic system of the printer.

The hydraulic system of the printer consists of the following components:

- Ink cartridge
- Make-up cartridge
- Ink core module
- Umbilical
- Printhead

- Gutter pump
- Condenser

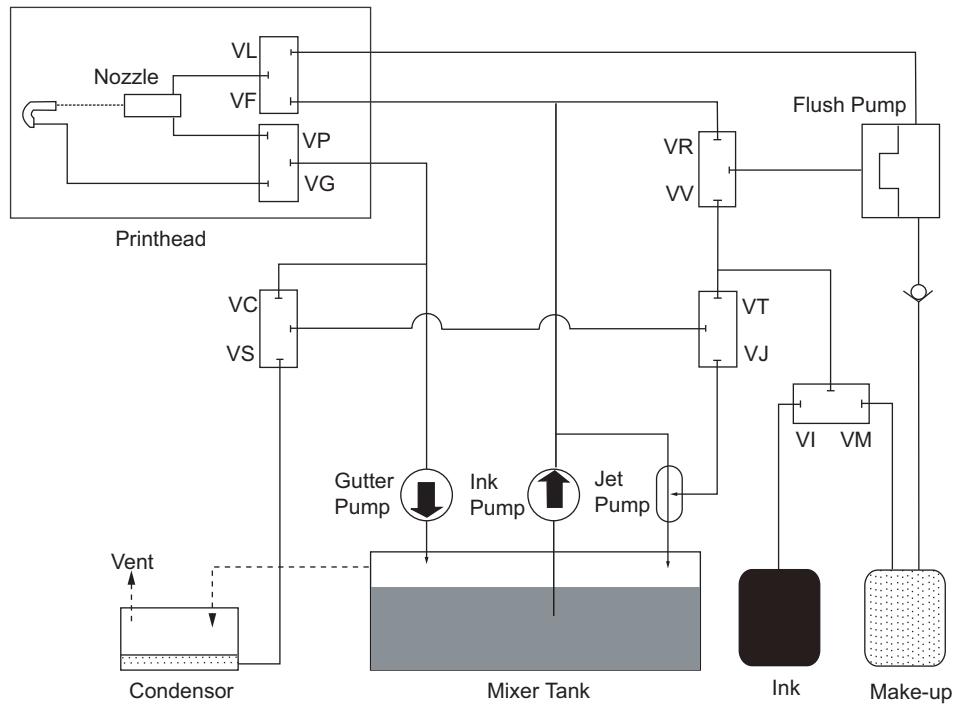


Figure 3-54: Hydraulic System Components

Introduction

This chapter describes the procedures to install Videojet 1220/1520 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

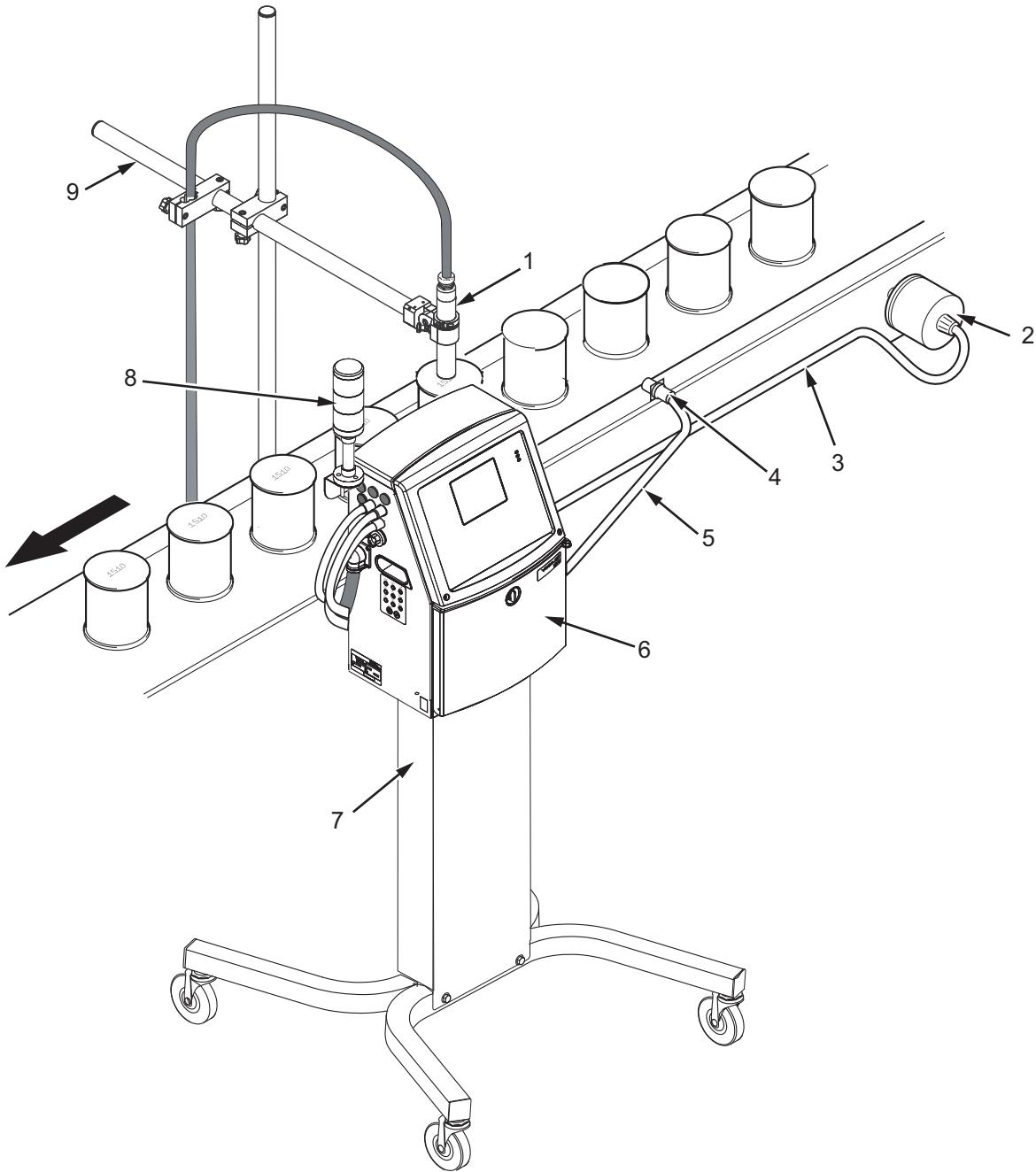
Refer to the service tool kit listed in “Tools Kit” on page 10-63 for information on tools and supplies required to install the printer.

Supplies

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

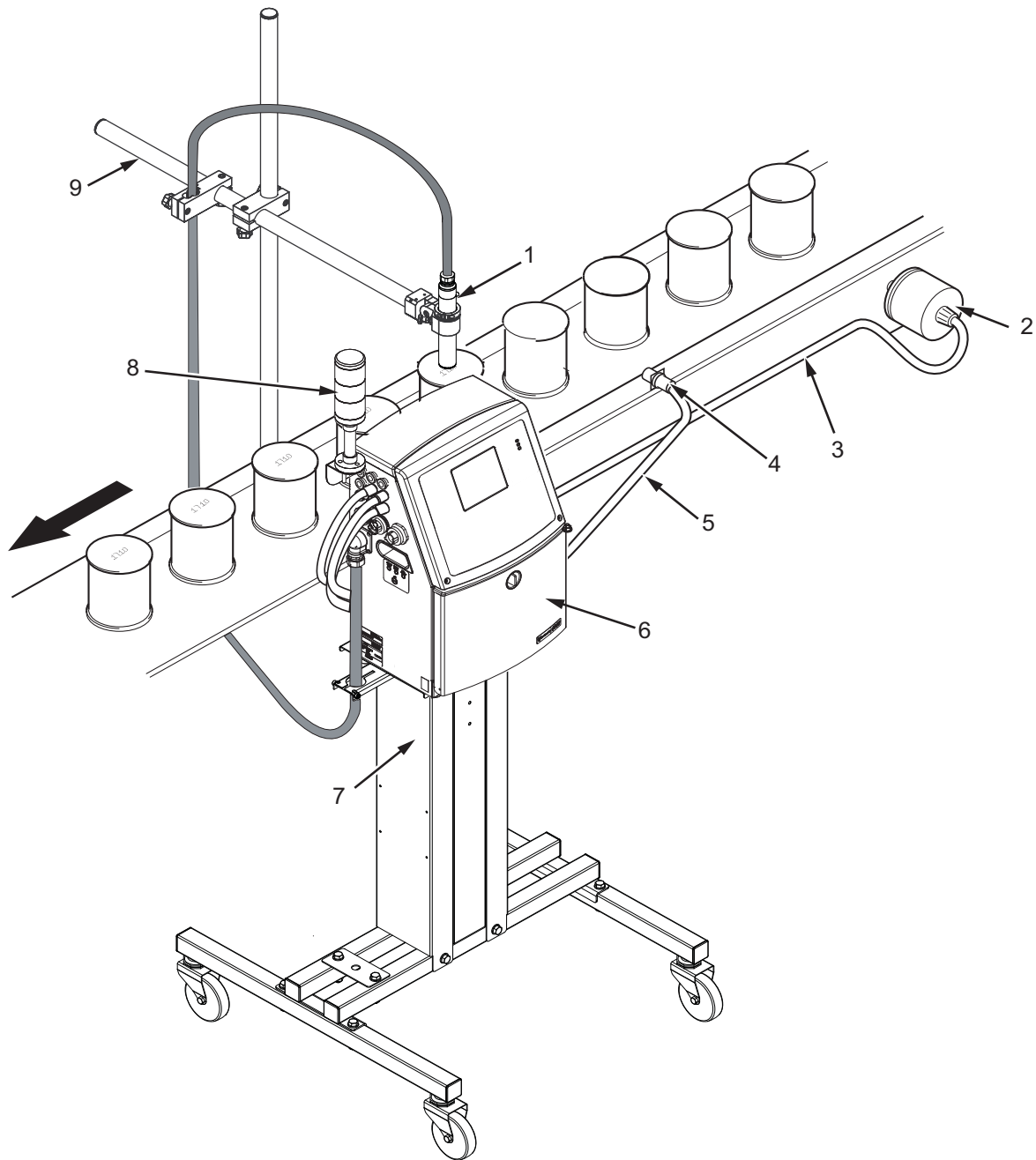
Typical Production Line

A typical printer installation is shown in Figure 4-2 on page 4-4, 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 (Videojet 1220)



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

Figure 4-2: Typical Production Line Installation (Videojet 1520)

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.

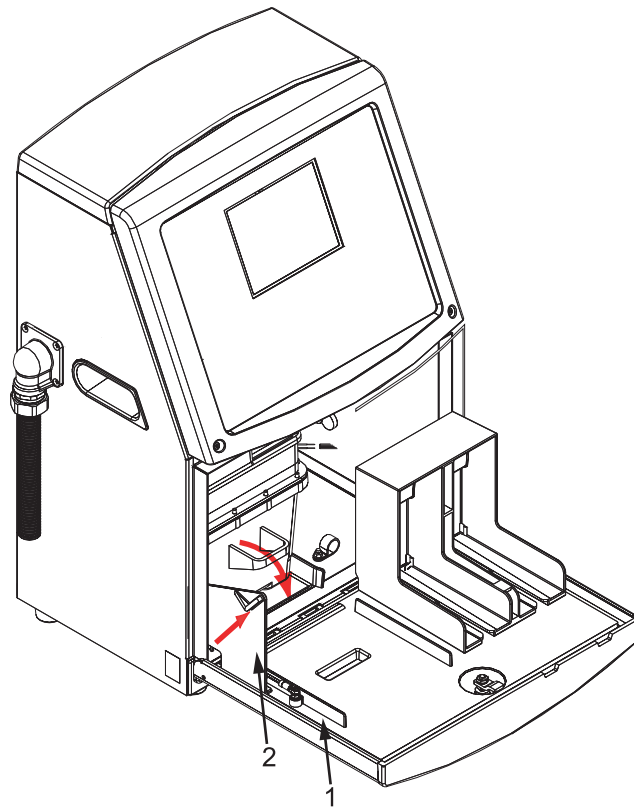
Note: The printer can be mounted on three types of stands: mobile printer stand, static printer stand, or the wall-mounting assembly. Refer to the respective installation instructions to install the printer on a stand.

- 2 Turn the knob and open the ink compartment door (see Figure 4-3).



Figure 4-3: Turn the Knob

- 3 Push the plate (item 2, Figure 4-4 on page 4-6) in the direction shown to open the ink compartment door (item 1) completely.



- 1. Ink Compartment Door
- 2. Plate

Figure 4-4: Ink Compartment Door

- 4 Remove and discard the foam pads (see Figure 4-5 on page 4-6).

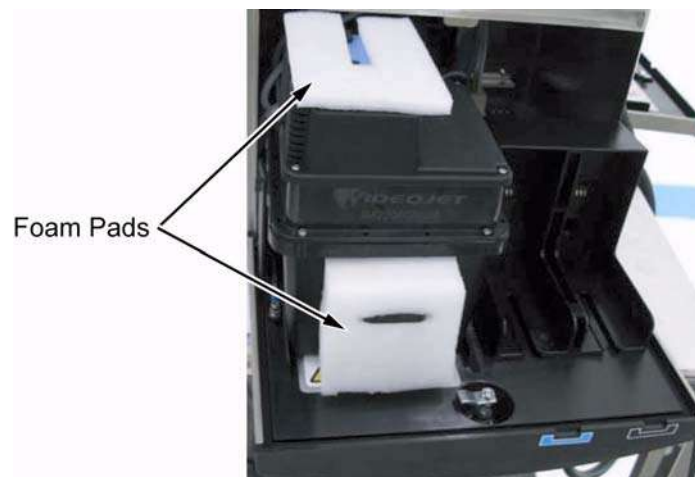
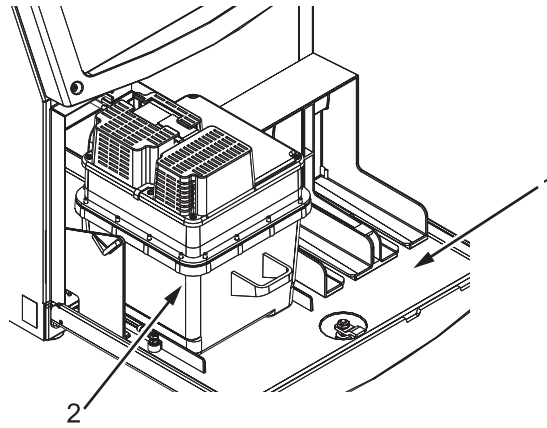


Figure 4-5: Foam Pads Removal

- 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 4-6 on page 4-7). Inspect the ink core for shipping damages such as cracks.



1. Ink Compartment Door
2. Ink Core Module

Figure 4-6: Pull Ink Core Module

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

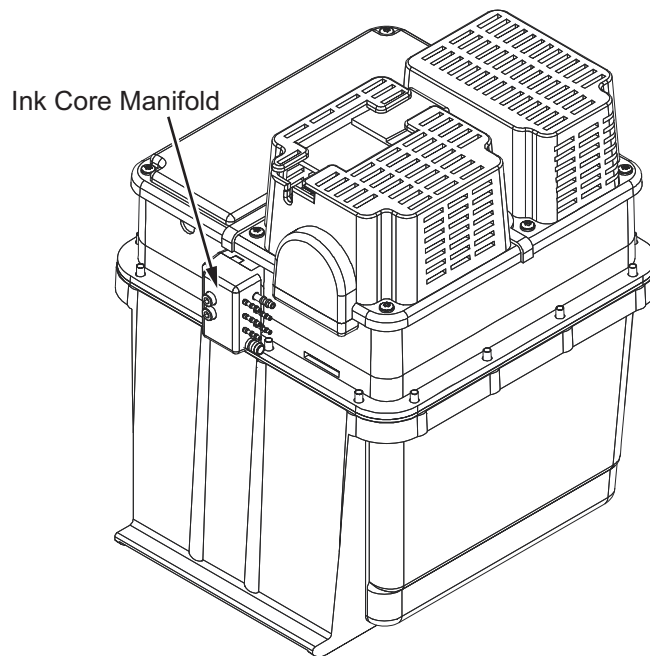
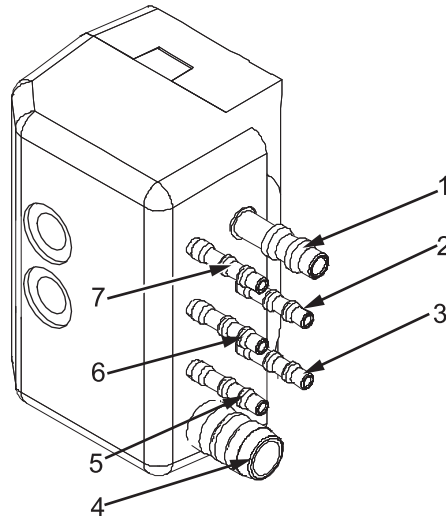


Figure 4-7: Ink Core Manifold

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

- 9 Make sure that the air vent tube is connected to the solvent recovery system at the bottom rear of the cabinet (1220) or to the condenser assembly inside the hydraulics compartment (1520).



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

Figure 4-8: 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 is connected correctly to either the positive air pump or the dry air kit filter.

Note: Videojet 1220 does not have either positive air pump or dry air kit as standard.

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

Inspect the Printhead

- 14 Remove the printhead cover (see Figure 4-10) 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.

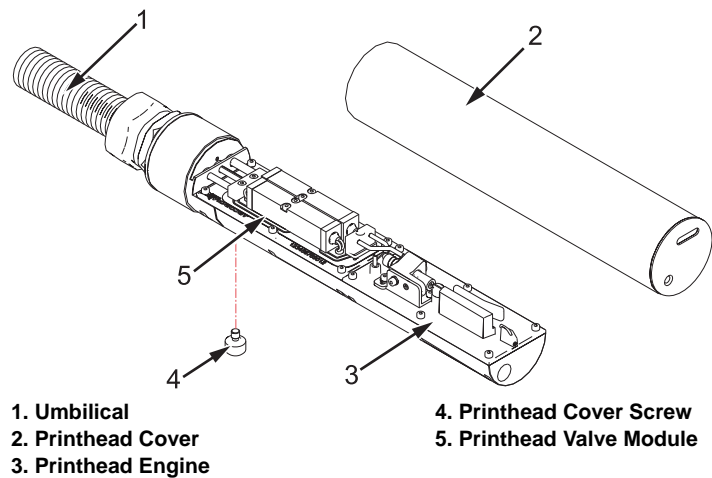


Figure 4-9: Printhead Cover Removed (Videojet 1220)

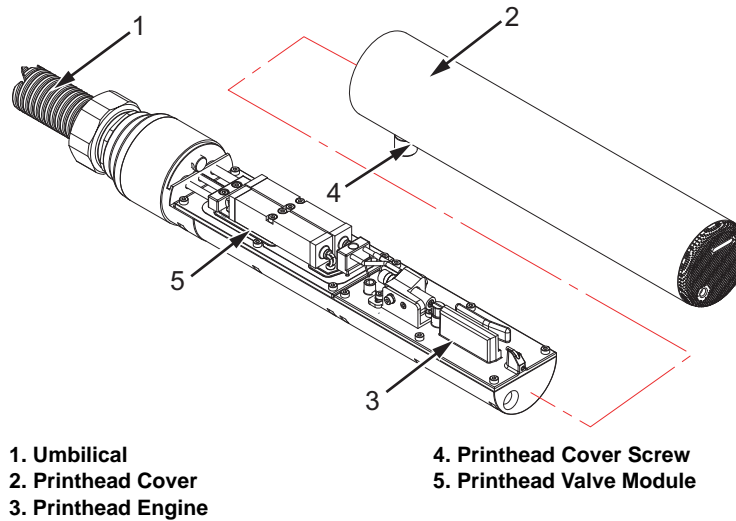


Figure 4-10: Printhead Cover Removed (Videojet 1520)

Log into UI

- 17 Connect the printer to the AC power supply and turn on the printer. The menu screen appears on the display (see Figure 4-11 on page 4-10).

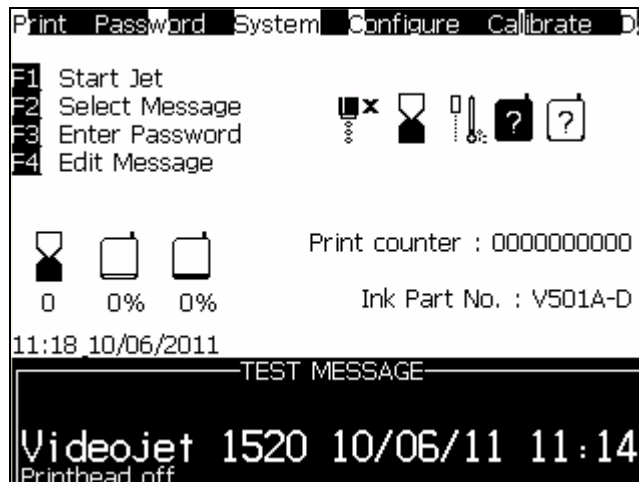



Figure 4-11: Menu Screen

- 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. On the *Password* menu, select *Enter Password*. The *Enter Password* dialog box appears. Alternatively, press F3 for entering password.

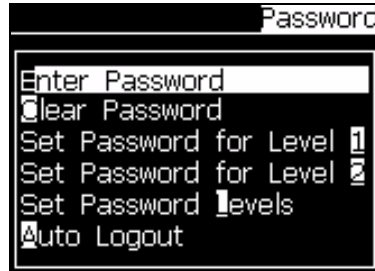


Figure 4-12: Password Menu

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 4-5).



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 *Data Logging > Version Info* menu 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 *Low+/Low+* for 1220 and *Medium+/Medium+* for 1520.

22 Perform a hardware test. *Calibrate > Hardware Self-test*. Press the *Enter* Key (Figure 4-13)

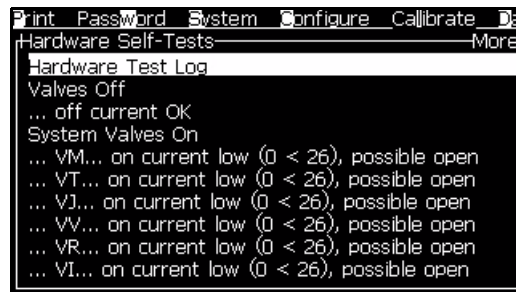
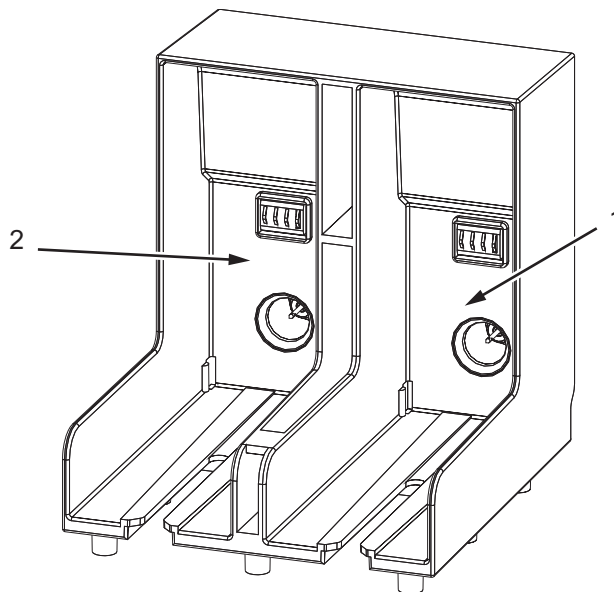


Figure 4-13: Hardware Self-test

- 23 Install one new cartridge of ink and one new cartridge of make-up fluid in the printer (Figure 4-14 on page 4-13).
- 24 Make sure that the ink out and make-up out icons disappear.



1. Ink Receptacle
2. Make-up Receptacle

Figure 4-14: 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 *Calibrate > Update Ink Core Parameters*. 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 4-15 on page 4-14).
- 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.

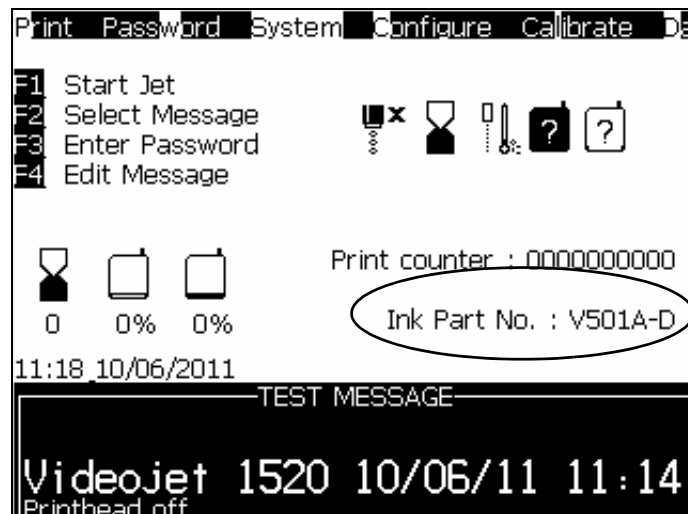


Figure 4-15: Ink Part Number

- 26 Verify and record the ink reference and expiration date. Access *Calibrate > View Ink Smart Chip Data* menu (see Figure 4-16 on page 4-14).

Make sure that the ink reference matches with the number displayed on the menu screen.

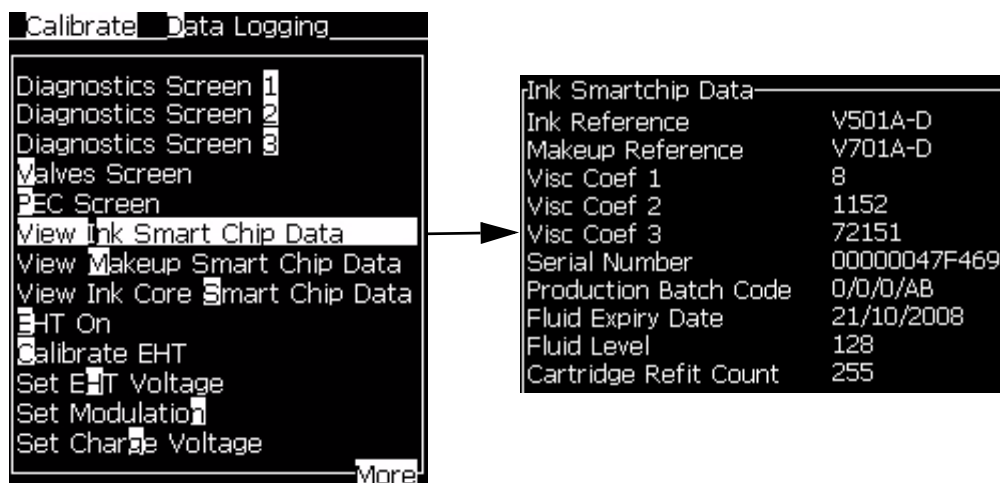


Figure 4-16: View Ink Smart Chip Data Option

- 27 Verify and record the make-up type and expiration date. Access *Calibrate > View Makeup Smart Chip Data* menu (see Figure 4-17).

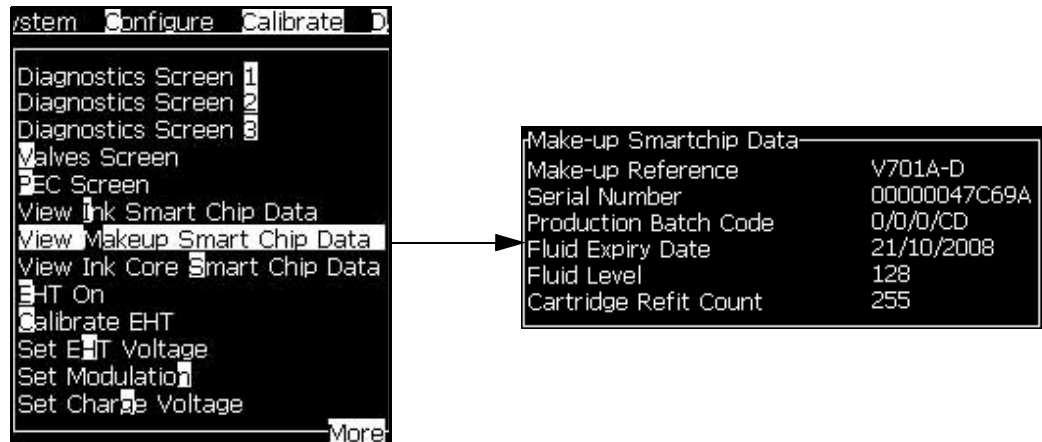


Figure 4-17: View Makeup Smart Chip Data Option

- 28** Verify and record the ink core 'Run Hours'. Access *Calibrate > View Ink Core Smart Chip Data* menu (see Figure 4-18 on page 4-15).

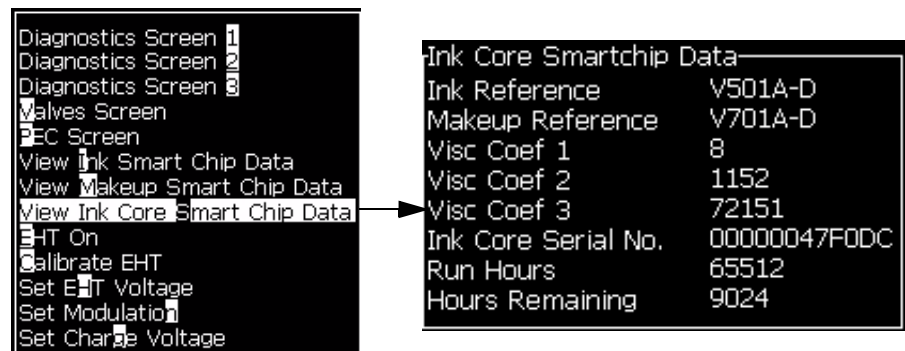


Figure 4-18: View Ink Core Smart Chip Data

Configure the Printer

- 29** Please make sure printhead is clean and dry. EHT. Refer to "Calibrate EHT" on page 4-45.
- 30** Set date and time. Access *Configure > Set Time/Date* (see Figure 4-19).

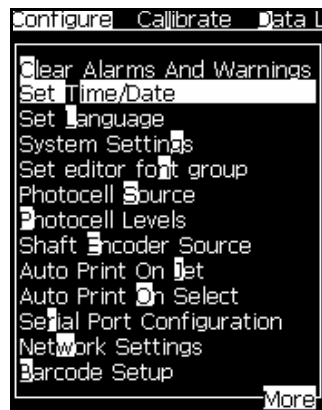


Figure 4-19: Set Time/Date

31 Set the nozzle type and the conduit length.

- Access *Configure > System Settings*. The *System Settings* dialog box appears (see Figure 4-20 on page 4-16). Make sure you select the correct nozzle type for the current configuration (60 micron or 70 micron).

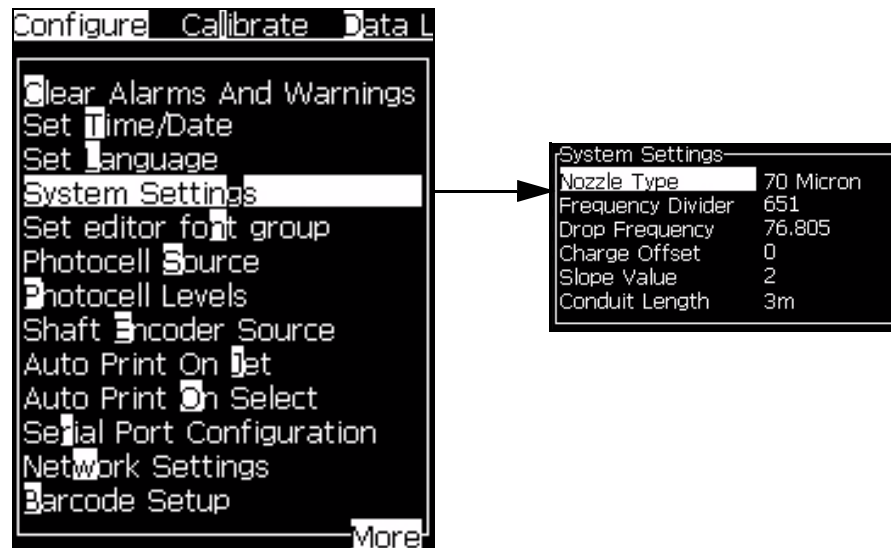


Figure 4-20: System Settings

- Access *Calibrate > Printhead Elevation*. The *Printhead Elevation* dialog box appears (see Figure 4-21 on page 4-17). 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
	3 m (standard), 6m (optional)

Table 4-2: Conduit Length

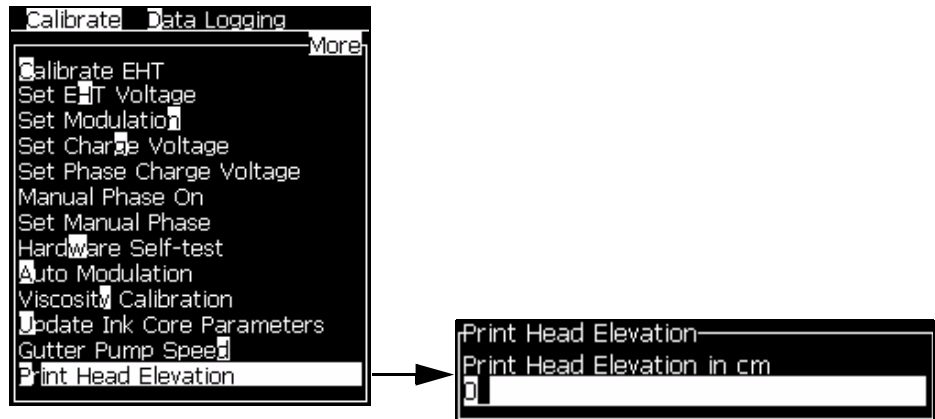


Figure 4-21: Printhead Elevation

Prime the Ink Core Module

- 32 Select *System > Fill Ink Core* to prime the printer with the ink (see Figure 4-22 and record the time to prime).

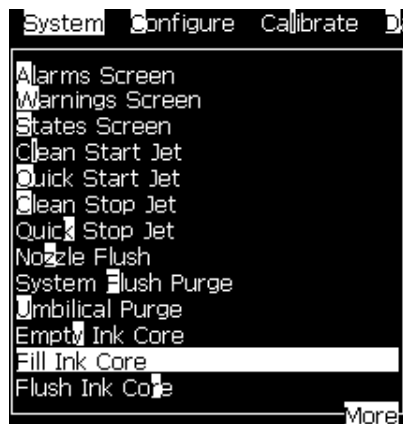
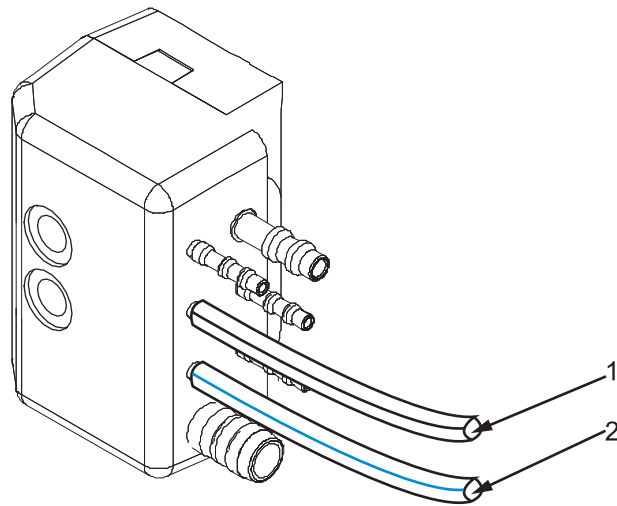


Figure 4-22: Fill Ink Core Menu

- 33 Make sure that the fluid flows through the black-striped tube (item 1, Figure 4-23) and blue-striped tube (item 2).



- 1. Black Striped Tube
- 2. Blue Striped Tube

Figure 4-23: 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** The *Fill Ink 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 '*Fill Ink Core*' procedure.

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

Note: Monitor the *Diagnostics Screen Two* to track the Ink Core Level from Empty to Low to Middle (Select *Calibrate > Diagnostics Screen 2*). The *Diagnostics Screen Two* appears (see Figure 4-24 on page 4-19).

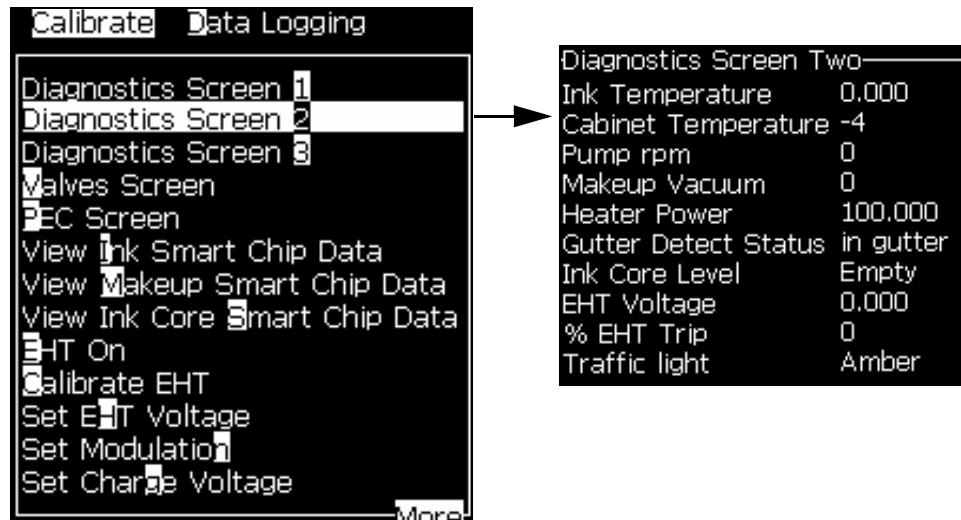


Figure 4-24: Diagnostics Screen Two

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 4-25Figure 4-26).

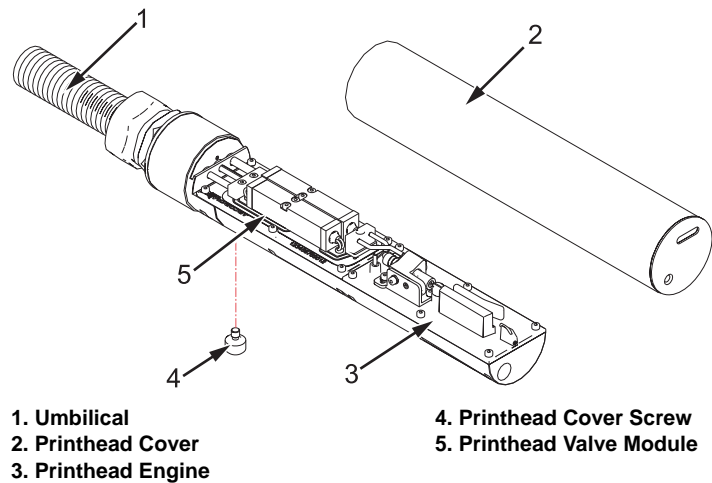
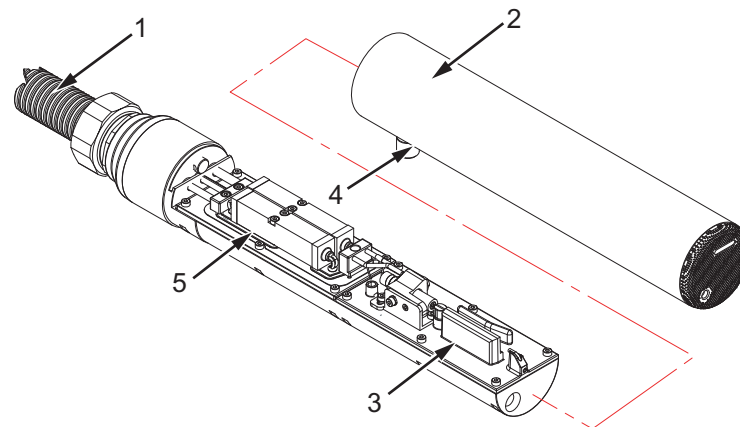


Figure 4-25: Printhead Cover Removed (Videojet 1220)



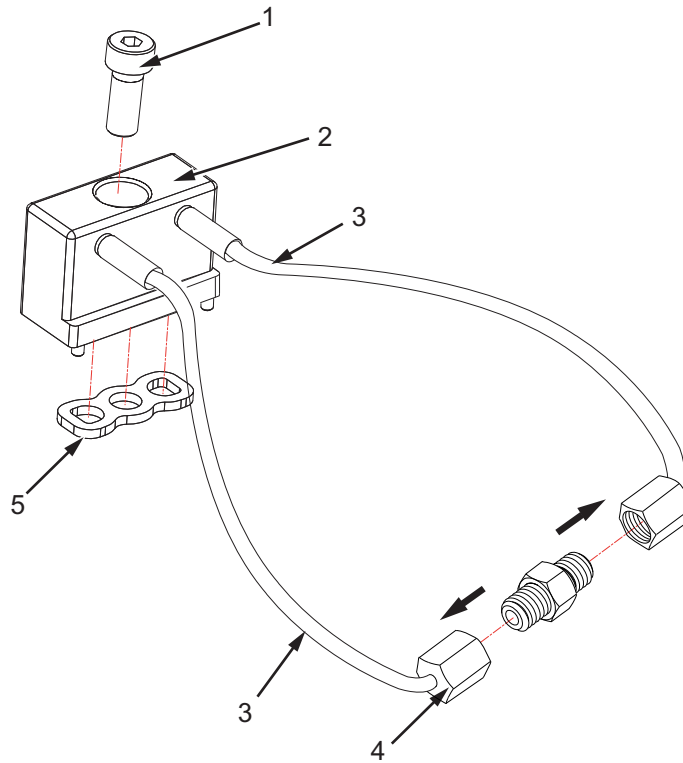
- | | |
|----------------------------|----------------------------------|
| 1. Umbilical | 4. Printhead Cover Screw |
| 2. Printhead Cover | 5. Printhead Valve Module |
| 3. Printhead Engine | |

Figure 4-26: Printhead Cover Removed (Videojet 1520)

 **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 4-27) 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 | 4. Quick Disconnect |
| 2. Nozzle Bypass Manifold | 5. 2 Way Manifold Gasket |
| 3. Tubing | |

Figure 4-27: 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 System Flush Purge (select *System > System Flush Purge*).

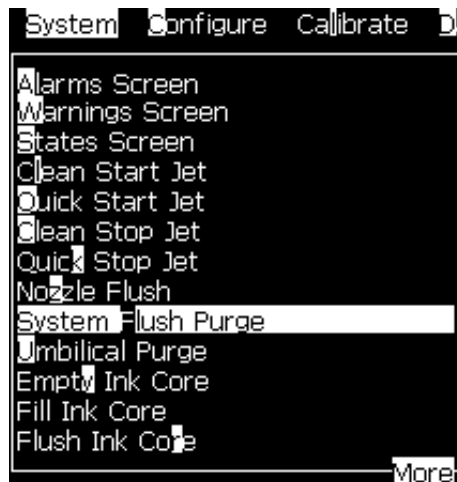


Figure 4-28: System Flush Purge

- 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 purge. This procedure will not finish automatically, so perform a Quick stop to stop the umbilical purge process after a few seconds.

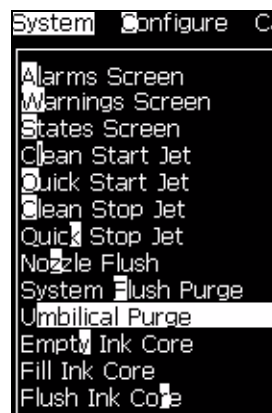


Figure 4-29: Umbilical Purge

- 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 Start the jet using quick start.

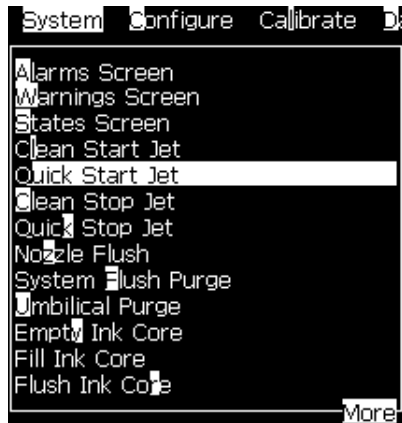


Figure 4-30: Quick Start Jet

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 9-48.

- 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 4-42).

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 (Figure 4-31).

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

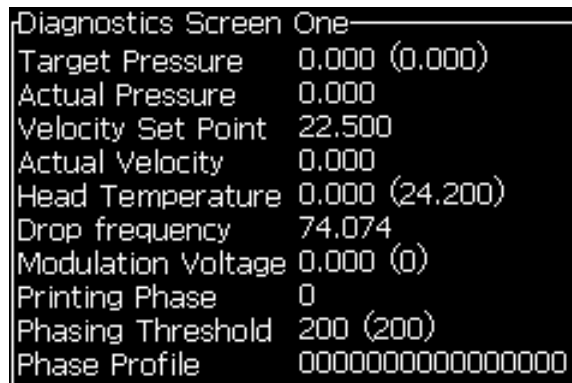


Figure 4-31: Diagnostics Screen One

- 52 Perform viscosity calibration. Follow the prompts provided by the printer, assuming that the ink is known perfect ink (see Figure 4-32).

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

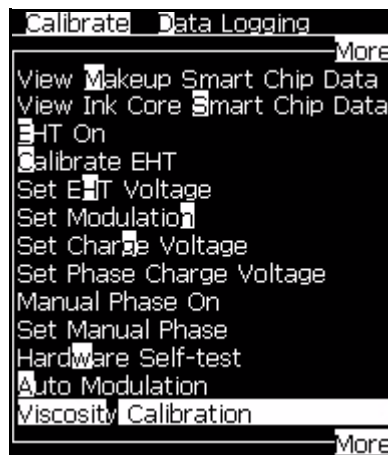


Figure 4-32: Viscosity Calibration

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 4-45.

- 53 Record *Target Pressure* (both the values). To record the pressure, access *Calibrate > Diagnostics Screen 1*.

Diagnostics Screen One	
Target Pressure	2.638 (2.625)
Actual Pressure	2.633
Head Temperature	35.03 (35.949)
Velocity Set Point	20.000
Actual Velocity	19.975

Figure 4-33: Steady State



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 4-54 on page 4-43 for more information.
- 55 Insert a fresh make-up fluid cartridge again.

Clean Stop and Clean Start the Printer

- 56 Put a piece of paper under the printhead (to capture splatter) and press the *F1* key to do a clean stop.

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 *F1* key to do a clean start.

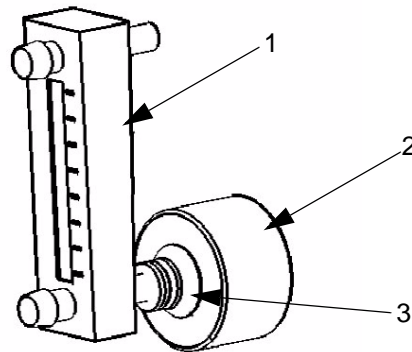
During startup, perform clean start if the ink splatters inside the printhead, check the ink stream alignment again and make sure that the flush pump is fully primed.

Perform Final Checks

- 58** Make sure that auto modulation is enabled (*Calibrate > Auto Modulation*).
- 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 *System > Warnings* Screen.

- 60** Use a flow meter and make sure that the rate of positive air flow out of the printhead slot is above 4 SCFH. To measure the air flow rate using an airflow meter, do the following tasks:
- a. When measuring airflow, make sure that the printhead is horizontal and the airflow meter is vertical (Figure 4-34).



1. Airflow Meter
2. Printhead Cap
3. Suction Cap

Figure 4-34: Airflow Meter

- b. Make sure that the suction cup fits on the face of the printhead cap and seals it completely.
- c. For the perforated printhead cover, make sure that there is a gap between the cap and the cover (Figure 4-35 on page 4-27) to assure that the airflow through the cover is not restricted.

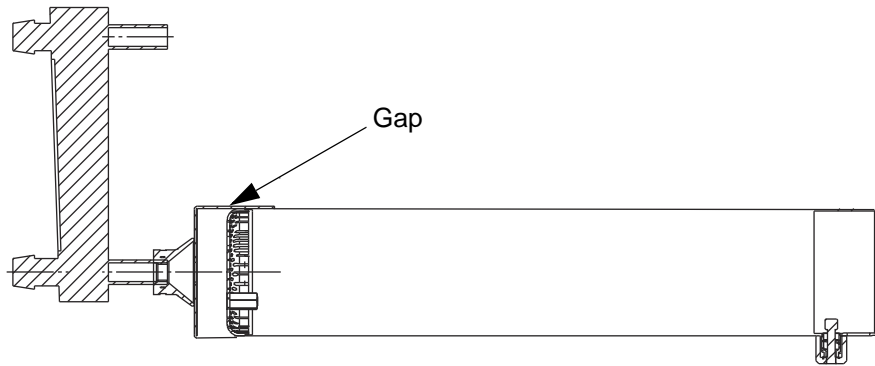


Figure 4-35: Printhead Cover with Perforated End Cap

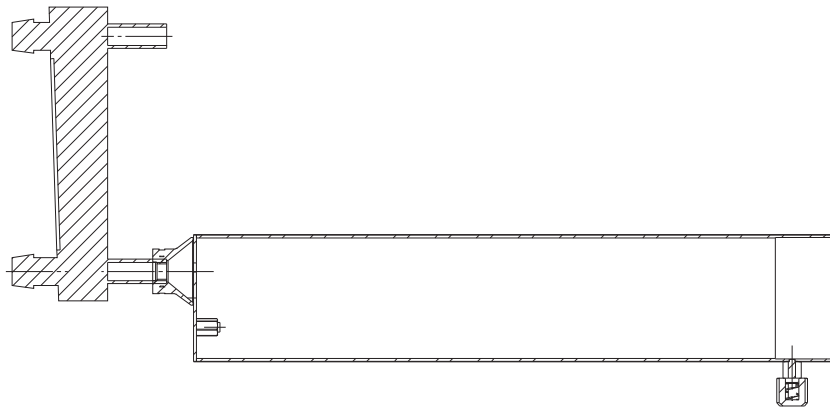


Figure 4-36: Printhead Cover with Plain End Cap

Cover	Min Flow in SCFH	Max Flow in SCFH
Videojet 1220	2	6
Perforated Videojet 1520	11	16

Note: 1220 does not have positive air as standard.

Note: Adjust the dry air kit regulator, to make sure that the positive air flow rate out of the printhead slot is between Min Flow and Max Flow values.

- 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 *Configure > Backup System Settings*.



Figure 4-37: Backup System Settings

- 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.

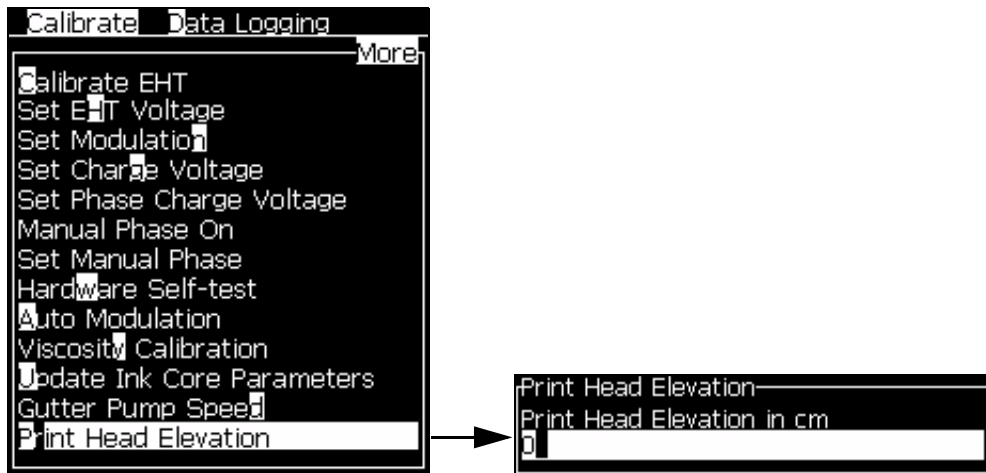


Figure 4-38: Printhead Elevation

- 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	<p>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:</p> <ul style="list-style-type: none"> • 1111111110000000 • 0001111111000000 • 0000011111111100 <p>Note: The ones can also be wrapped around: 1111110000000111</p>

Table 4-3: Typical Diagnostics Screen Values

Machine Parameter	Typical Value (see Note above)
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.
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	<ul style="list-style-type: none"> • 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.

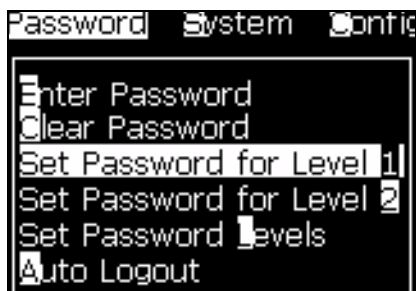


Figure 4-39: Password Menu



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 1520 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 *Configure> Shaft Encoder Source*. The *Print Control* menu appears (see Figure 4-40 on page 4-32).
- 2 Set the *Shaft Encoder Source* to *Internal*.

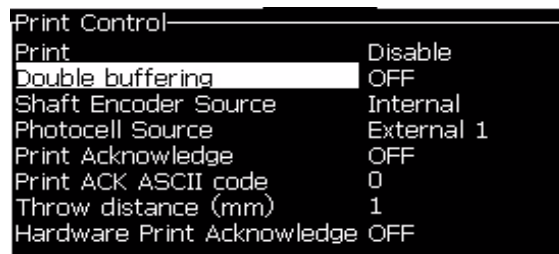


Figure 4-40: Internal Shaft Encoder Source

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 4-41). The message width is increased by approximately 3% for each increment.

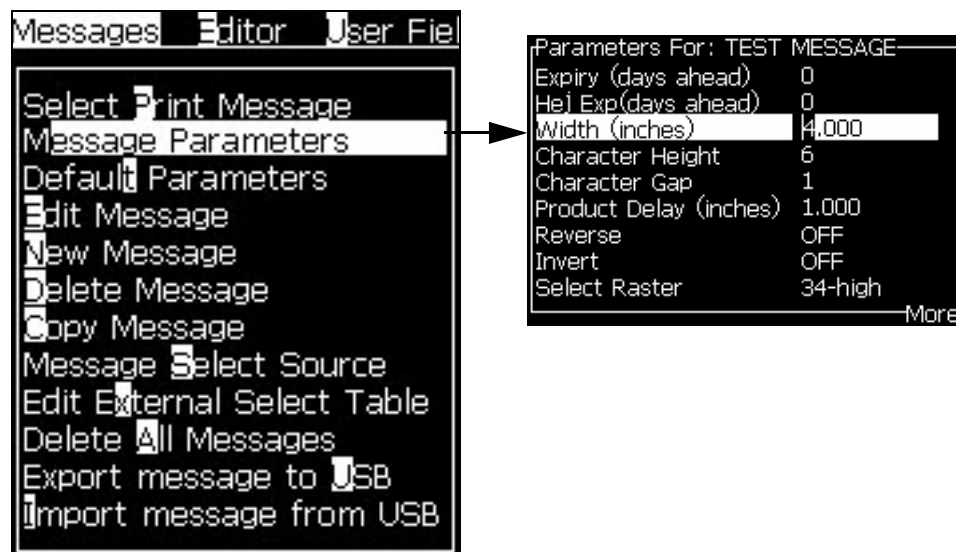


Figure 4-41: Message Width

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).

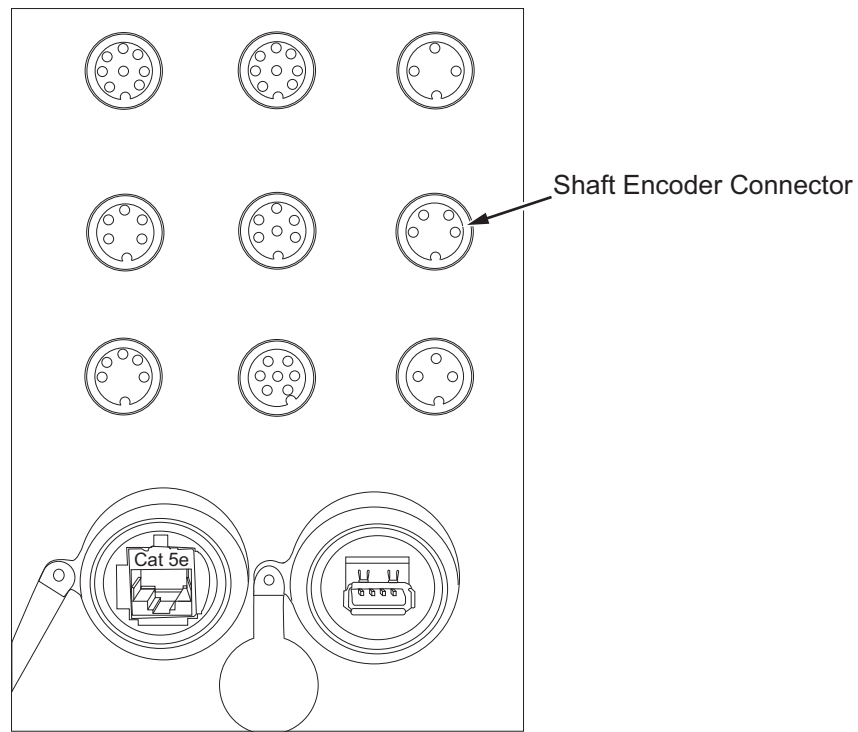
Note: Make sure that the movement of the product is directly related to the movement of the conveyor.

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 4-42 on page 4-34 - shows the shaft encoder connector on the connector panel.
 - Figure 4-43 on page 4-34 - describes the shaft encoder connector socket pin layout.

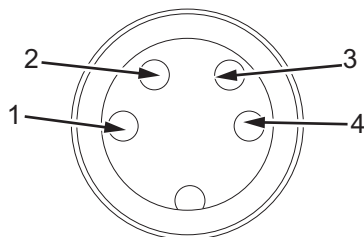
Note: You can configure the printer to accept a two-phased encoder input (quadrature).

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 4-42: 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 4-43: 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 *Configure* > *Shaft Encoder Source* in the UI. The *Print Control* menu appears (see Figure 4-44 on page 4-35).

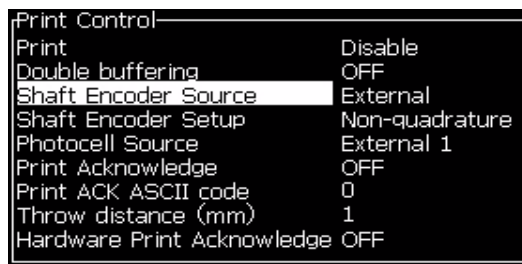


Figure 4-44: Print Control Menu

- 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,

$1800 \text{ PPR} / 12 \text{ inches (calculated distance)} = 180 \text{ pulses per inch (PPI)}$

- 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,

$\text{PPI of channel A and B} = 180 \times 4 = 720 \text{ PPI}$

- 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, $720 \text{ PPI} / 60 = 12$

- 11 Set the correct width setting. Navigate to *Print > Line Configuration > Message Configuration*. Press the right cursor key to change setting to *Divider/Strokes*. Scroll down to *Encoder Resolution* and enter the value 720 for the PPI option.
- 12 Go to *Message > Message Parameters > Width (Divider)*. Enter the value of 12 for the divider. This divides the $720 \text{ PPI} / 12 = 60$. 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 *Configure > Shaft Encoder Source*. The *Print Control* menu appears.
- 2 Set the *Shaft Encoder Source* to *Auto Encoder* (Figure 4-45).

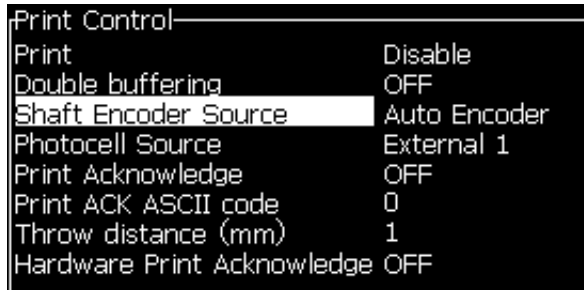


Figure 4-45: Auto Encoder

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.

Enter the throw distance (access *Print > Print Control*). See Figure 4-46 on page 4-36.

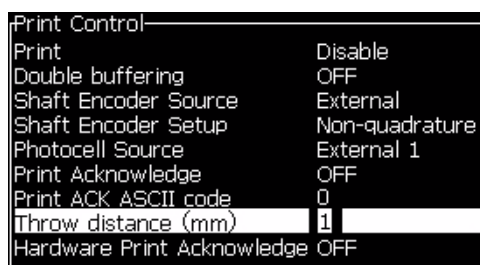
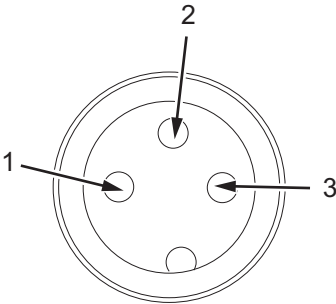


Figure 4-46: Throw Distance

Install the Print Trigger

Figure 4-2 on page 4-4 and Figure 4-2 on page 4-4 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 4-47: 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 4-48).

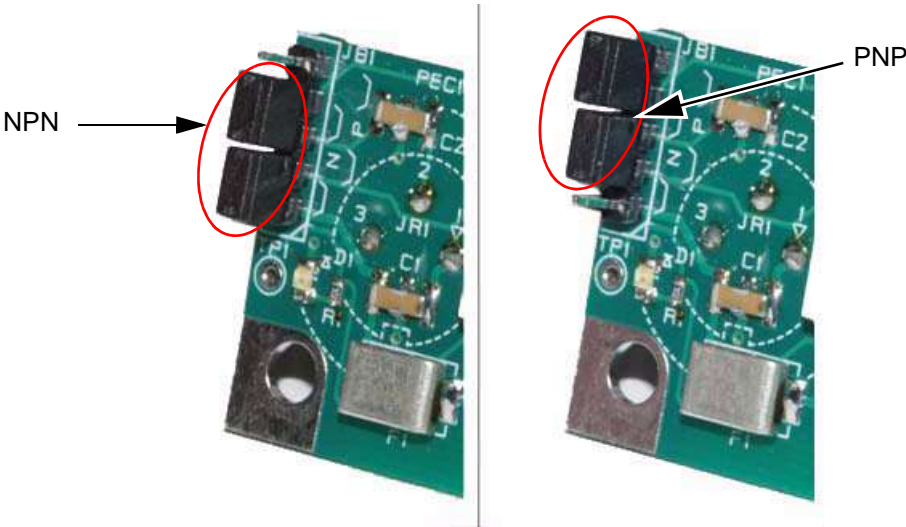


Figure 4-48: Print Trigger Configuration

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 photocell source. Access *Configure > Photocell Source*. The *Print Control* menu appears.

Set the relevant photocell level(s) to *Active high* or *Active low* based on the device type. Access *Configure > Photocell Levels*. The *Photocell Levels* menu appears.

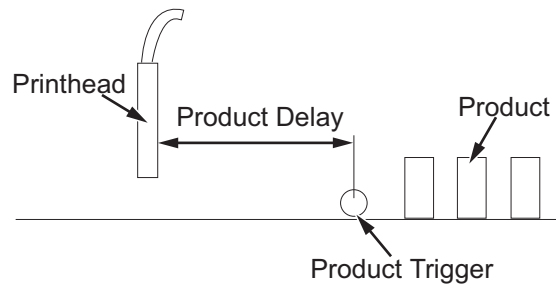
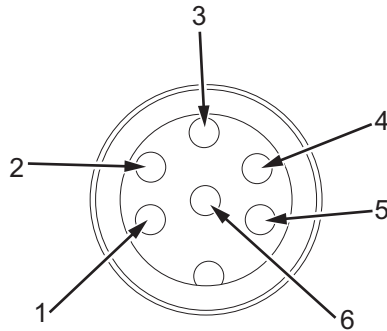


Figure 4-49: Product Delay

Install the Stack light



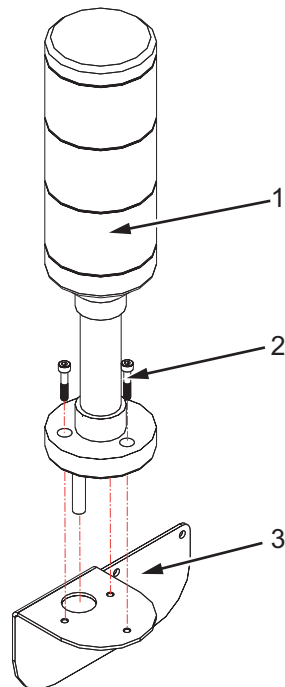
- | | |
|-------------------------------|--|
| 1. Red lamp negative supply | 4. +24 VDC supply to the strobe/siren
(Maximum Rating = 900 mA) |
| 2. Amber lamp negative supply | 5. Strobe/siren negative supply |
| 3. Green lamp negative supply | |

Figure 4-50: Status Output Connector Pin Diagram

Do the following tasks to install a stack light:

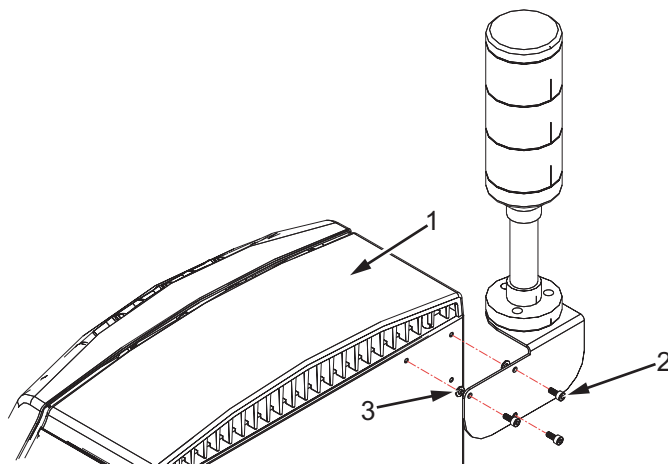
- 1 Fit the stack light (item 1, Figure 4-51 on page 4-40) to the stack light mounting bracket (item 3) using three M4x10 socket-head cap screws (item 2).
- 2 Fit the stack light mounting bracket to the printer cabinet (item 1, Figure 4-52 on page 4-40), using three M4x10 socket-head cap screws (item 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 4-51: Stack light

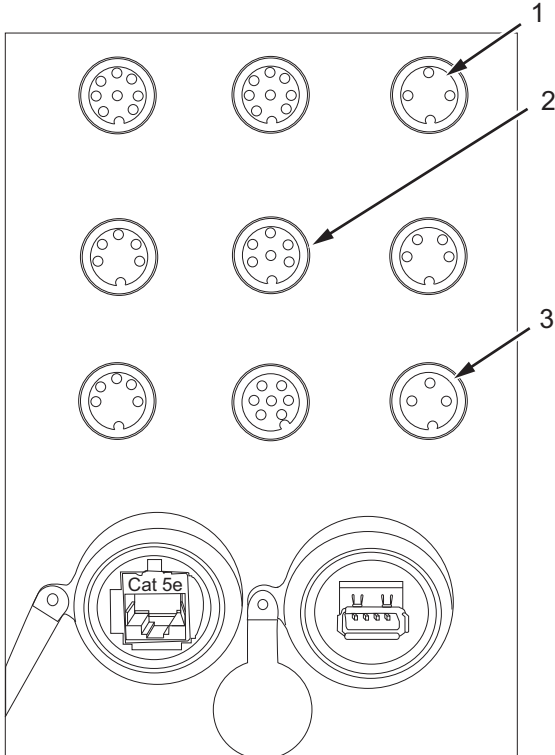


- 1. Printer Cabinet
- 2. M4 x 10 Socket-head cap Screws (x3)
- 3. M4 Plain Nylon Washers (x3)

Figure 4-52: 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 4-53 on page 4-41).



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

Figure 4-53: 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 9-48).



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 Go to *System > Gutter Fault Shutdown Enable*. Press the *Enter* Key.
- 5 Toggle to set the value to *Disable* and press the *Enter* key.

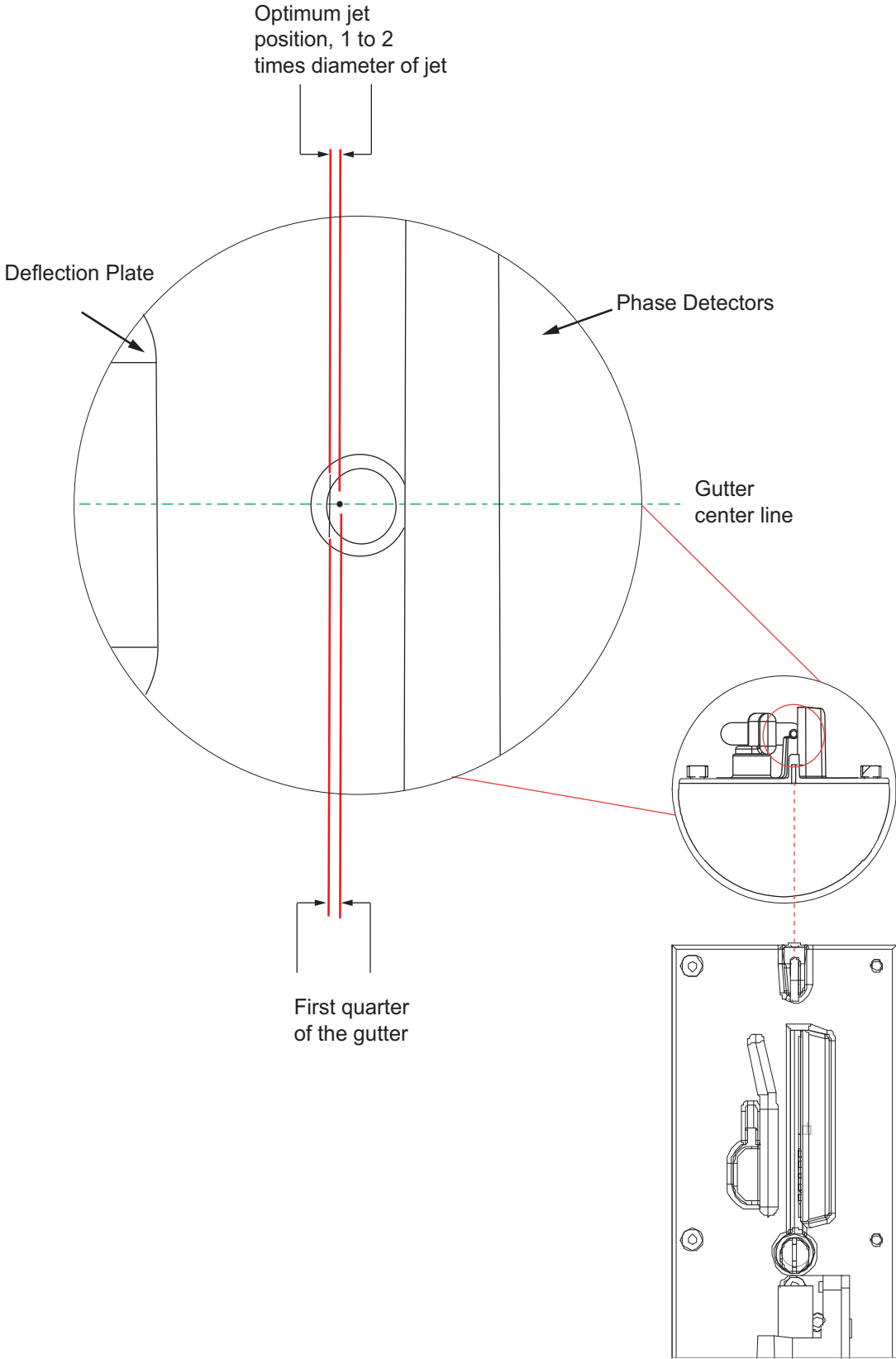


Figure 4-54: Ink Stream Alignment

- 6 Perform a quick start. 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).

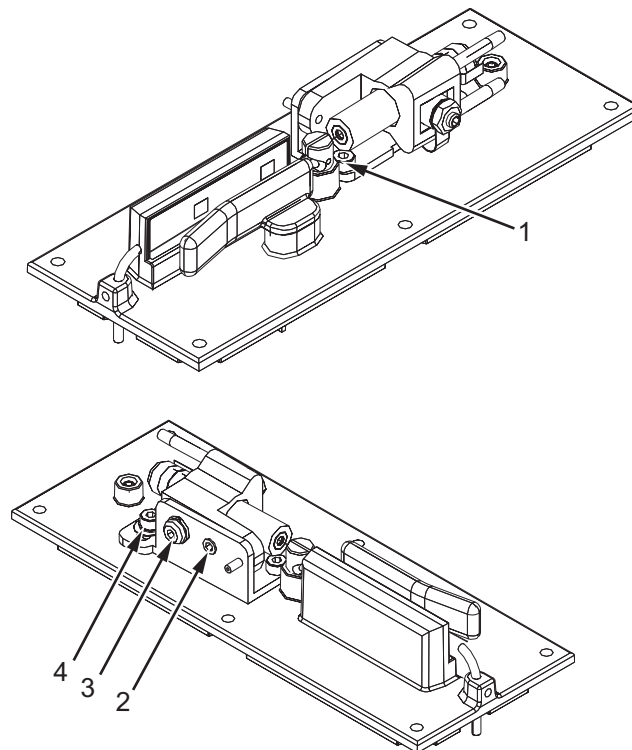
Note: You must perform a quick start rather than a clean start when you are aligning the printhead during the commissioning process. However, if you are aligning the printhead of a printer that has already been in operation for some time, you may perform either a quick start or a clean start at this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

 **Caution**

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

- 7 Adjust the ink jet position, if necessary using the horizontal adjustment screws (item 2, Figure 4-55) 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 | 3. Horizontal Locking Screw |
| 2. Horizontal Adjustment Screw | 4. Vertical Locking Screw |

Figure 4-55: Printhead Adjustment Screw Location

Perform Calibration and Testing

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

Calibrate EHT

Do the following tasks to calibrate the EHT:

Note: Please make sure printhead is clean and dry.

- 1 Open the *Calibrate* menu.

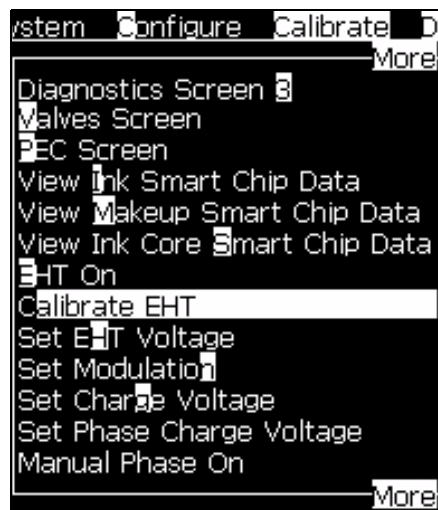


Figure 4-56: Calibrate Menu

- 2 Select *Calibrate EHT*. The *EHT Calibration* Message appear based on the condition.

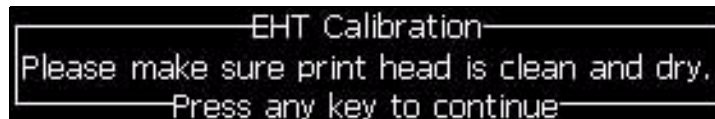


Figure 4-57: EHT Calibration Message

- 3 Press *Enter*. EHT Calibration Sweep occurs. Refer to Figure 4-58.



Figure 4-58: EHT Calibration Sweep

Calibrate Viscosity

Do the following tasks to calibrate the viscosity:

- 1 Start the jet using quick start.

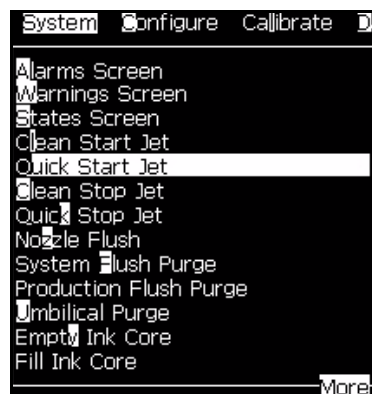


Figure 4-59: Quick Start Jet

- 2 Purge ink for 30 minutes.
- 3 Verify whether the target pressure and temperature compensated target pressure difference is between ± 0.02 . If Yes, perform "Ink in Specification" on page 4-46. If No, perform "Ink Out of Specification" on page 4-47.

Ink in Specification

- 1 Perform quick stop jet.
- 2 Update software using the Safe Screen Software Upgrade. Refer "Safe Screen Software Upgrade" on page 9-40.
- 3 Perform quick start jet.
- 4 Pull makeup cartridge. Wait for 30 minutes.
- 5 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).
- 6 Perform viscosity calibration (*Calibrate > Viscosity Calibration*).

Ink Out of Specification

- 1 Perform quick stop jet.
- 2 Update software using the Safe Screen Software Upgrade. Refer .
- 3 Flush bypass tool with appropriate cleaner.
- 4 Disconnect nozzle manifold and replace with bypass tool.
- 5 Perform Umbilical Purge.
- 6 Drain ink core until empty.

Note: when ink core is empty, it will spit foam out of the bypass tool. Also, in Diagnostic Screen two the Pump RPM value will reach maximum to around 2400 to 2800.

- 7 Restart the printer.
- 8 Log into the user interface (UI) at level 3 password.
- 9 Perform a Fill Ink Core. Repeat from Steps 4 to Step 8.
- 10 Perform Umbilical Purge to bring ink to bypass tool.
- 11 Restart the printer to stop the jet.
- 12 Log into the user interface (UI) at level 3 password.
- 13 Disconnect bypass tool and reconnect nozzle manifold.
- 14 Perform quick start jet.
- 15 Pull makeup cartridge. Wait for 30 minutes.
- 16 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.
- 17 Perform viscosity calibration (*Calibrate > Viscosity Calibration*).

Introduction

This chapter describes the procedures you can perform at level 3. For information on other tasks, refer to the Operator Manual.

Reset Run Hours

If the *Service* icon appears, you can reset the time until the next service is due and the icon is removed.



Note: The contact information that is displayed on screen when this icon appears can be configured by selecting **Data Logging menu > Enter Service Information** option.

- 1 Navigate to *Data Logging > Reset Run Hours..*



Figure 5-1: Data Logging Menu

- 2 Press the *Enter* key. The *Reset Run Hours* menu appears.

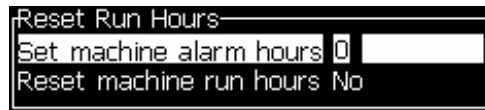


Figure 5-2: Reset Run Hours Menu

- 3 Select *Set machine alarm hours*.

For example:

- a. Enter the number of hours until the next ink system filter is due. For more information refer to the Table 8-1 on page 8-1 for maintenance schedule.
 - b. Press the *Enter* key to save the settings.
- 4 If you want to reset the run hours, set *Reset machine run hours* to *Yes*.

Restore Calibration Parameters

The following procedure may be performed in order to recover previously backed-up job and printer configuration information from a USB flash drive:

- 1 Insert the USB flash drive into the external USB port of the printer.
- 2 Select *Configure > Restore System Settings*.

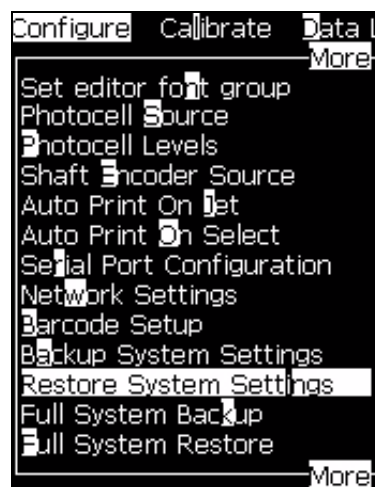


Figure 5-3: Restore System Settings

- 3 Respond to the system prompts as required. After completion, power cycle the printer.

Perform System Backup

Do the following tasks to perform a complete backup of all programmable printer files, including job and printer configuration information:

- 1 Press the *F1* key to stop the ink jet.
- 2 Insert a USB flash drive into the external USB port of the printer.
- 3 Select *Configure > Full System Backup*.

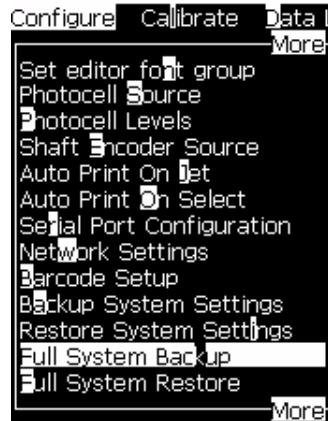


Figure 5-4: Full System Backup

- 4 Follow the printer prompts and complete the backup.

Perform Full System Restore

Do the following tasks to recover previously backed-up information from the USB flash drive:

- 1 Press the *F1* key to stop the ink jet.
- 2 Insert a USB flash drive into the external USB port of the printer.
- 3 Select *Configure > Full System Restore*. The *Restore Options* dialog box appears.

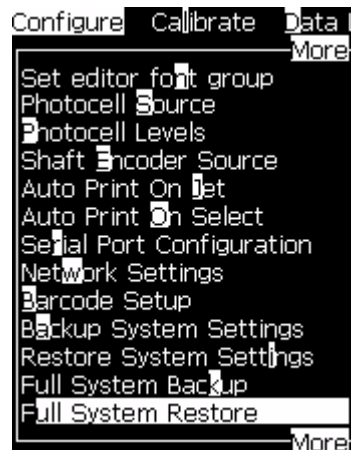


Figure 5-5: Full System Restore

- 4 Use the *Right* or *Left* arrow keys to scroll through the available options to restore.



Figure 5-6: Restore Options

- 5 Press the *Enter* key to restore the selected option.

Perform Umbilical Purge

You should perform umbilical purge in the following conditions:

- To prevent debris from blocking the nozzle if the printer has not been used for a long time
- If contamination of the umbilical is suspected
- If a new umbilical has been fitted
- If the ink color or type is to be changed

Note: *If you change the type of ink then, you must change the ink core module.*

Refer to “Perform System Flush Purge and Umbilical Purge” on page 4-19 for information on how to perform umbilical purge.

Introduction

Refer to Videojet 1220/1520 Operator Manual for information on how to navigate in the UI, create the messages, edit the messages, save the messages, and create the user fields.

Menu Description

This section describes the options available at Level 3 password for *System*, *Configure*, *Calibrate* and *Data Logging* Menus.

Refer to the Operator Manual for complete information on *Messages*, *Editor*, *User Fields*, *Print*, *Password*, *System*, *Configure*, *Calibrate* and *Datalogging* menus.

System

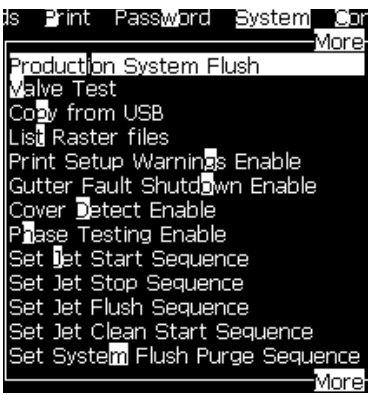
System Menu	Command	Function
	Production System Flush	Only for use in manufacturing.

Table 6-1: System Menu and Commands


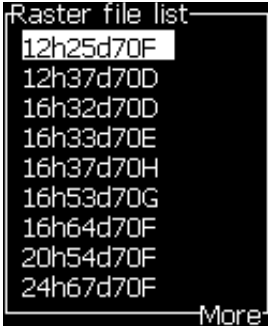
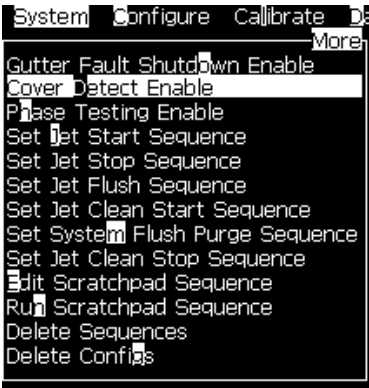
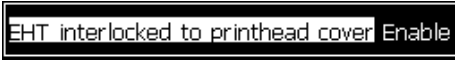

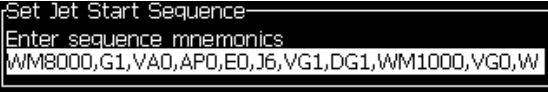
System Menu	Command	Function
	Valve Test	<p>Opens the <i>Valve Test</i> dialog box. You can toggle the Test Type between Open/Close and Continuity. You can toggle the Valve Selection between Ink Add, Makeup Add, Gutter, Solvent Recovery, Mixing, Transfer, Head Feed, Head Purge, Head Flush, Flush-pump Vacuum, and Flush-pump Pressure.</p> 
	List Raster Files	<p>Displays the list of raster files in the printer.</p> 
	Cover Detect Enable	<p>Allows the printer to enable/disable the feature.</p> 
	Phase Testing Enable	<p>Allows the printer to enable/disable the feature.</p> 
	Set Jet Start Sequence	<p>Opens the <i>Set Jet Start Sequence</i> dialog box. User can set the ink jet starting sequence mnemonics.</p> 

Table 6-1: System Menu and Commands (Continued)

System Menu	Command	Function
	Set Jet Stop Sequence	<p>Opens the <i>Set Jet Stop Sequence</i> dialog box. User can set the ink jet stop sequence mnemonics.</p> <pre>Set Jet Stop Sequence Enter sequence mnemonics WM8000,G1,EO,AMO,AP0,AV0,AIO,VIO,WM2000,VP1,</pre>
	Set Jet Flush Sequence	<p>Opens the <i>Set Jet Flush Sequence</i> dialog box. User can set the sequence mnemonics in which the ink jet has to be flushed.</p> <pre>Set Jet Flush Sequence Enter sequence mnemonics VA0,EO,AMO,AP0,AV0,AIO,AR0,G1,DG1,VF0,WM1000,</pre>
	Set Jet clean Start Sequence	<p>Opens the <i>Set Clean Start Sequence</i> dialog box. The ink jet is started and Starting the jet is displayed. User can set the sequence mnemonics in which the flush and bleed has to be performed to eliminate ink splashing and spray before ink is fed to the nozzle.</p> <pre>Set Clean Start Sequence Enter sequence mnemonics WM8000,G1,VA0,EO,VV1,VR1,J6,VG1,WM500,VG0,W</pre>
	Set System Flush Purge Sequence	<p>Opens the <i>Set System Flush Purge Sequence</i> dialog box. Allows the user to enter the sequence mnemonics in which the system has to be flush purged.</p> <pre>Set System Flush Purge Sequence Enter sequence mnemonics VA0,EO,DP350,WM3000,J10,VR1,VL1,WM500,VRO,VLO</pre>

Table 6-1: System Menu and Commands (Continued)


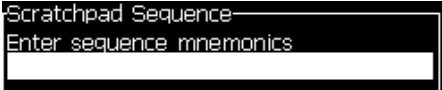

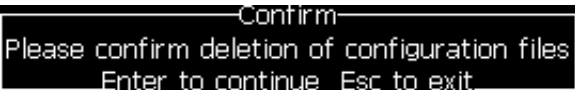
System Menu	Command	Function
	Set Jet Clean Stop Sequence	<p>Opens the <i>Set Clean Stop Sequence</i> dialog box. The ink jet is stopped and you can set the sequence mnemonics in which the nozzle and related ink core module pipes has to be cleaned.</p> 
	Edit Scratchpad Sequence	<p>Creates custom diagnostic routine.</p> 
	Run Scratchpad Sequence	<p>The user can enter any sequence of mnemonics into the scratchpad for fault-finding and testing purposes. This initiates custom diagnostic routine.</p>
	Delete Sequences	<p>The software prompts the user to confirm the deletion.</p> 
	Delete Configs	<p>The software prompts the user to confirm the deletion.</p> 

Table 6-1: System Menu and Commands (Continued)

Configure

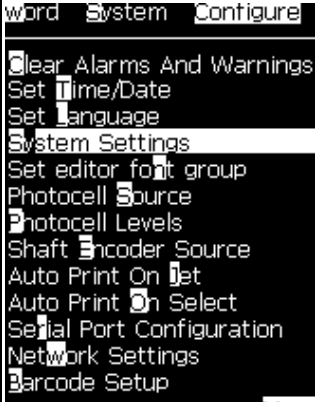
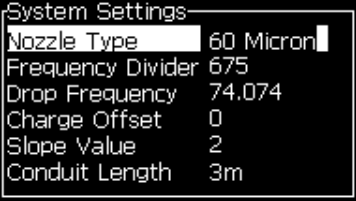
Configure Menu	Commands	Function
	System Settings	Displays the ink core system settings. 

Table 6-2: Configure Menu and Commands

Calibrate Menu

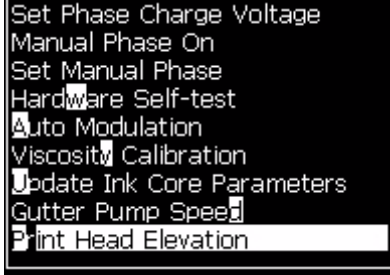
Calibrate Menu	Commands	Function
	Diagnostics Screen 1, 2 and 3	Opens the Diagnostics screen and displays information on the ink system status, which can be useful when diagnosing printer faults. Refer to “Diagnostic Screen One” on page 6-6, “Diagnostics Screen Two” on page 6-7, and “Diagnostics Screen Three” on page 6-8.
	Set Charge Voltage	Use this option to set the Charge Voltage.
	Set Phase Charge Voltage	Use this option to set the Phase Charge Voltage.
	Manual Phase On	Use this option to enable or disable manual phasing.
	Set Manual Phase	When Manual Phasing is enabled, use this option to set the manual phasing value.
	Auto Modulation	Use this option to enable/disable auto modulation.

Table 6-3: Calibrate Menu and Commands

Calibrate Menu	Commands	Function
	Viscosity Calibration	Use this option to calibrate the viscosity of the ink.
	Update Ink Core Parameters	Use this option to update the ink cartridge parameters.
	Gutter Pump Speed	Use this option to adjust the Gutter Pump Speed. Note: If the gutter pump speed is too low, the gutter will flood.

Table 6-3: Calibrate Menu and Commands (Continued)

Diagnostics Screen

Diagnostic Screen One

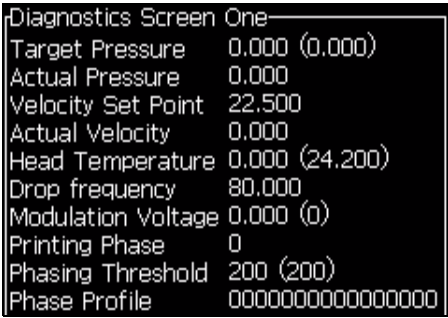
Diagnostics Screen One Menu	Commands	Function
 <pre> Diagnostics Screen One Target Pressure 0.000 (0.000) Actual Pressure 0.000 Velocity Set Point 22.500 Actual Velocity 0.000 Head Temperature 0.000 (24.200) Drop frequency 80.000 Modulation Voltage 0.000 (0) Printing Phase 0 Phasing Threshold 200 (200) Phase Profile 0000000000000000 </pre>	Target Pressure	Empirically and theoretically determined pressures required to match the actual velocity to the set point.
	Actual Pressure	Pressure measured at the pressure transducer in the Core.
	Head Temperature	Temperature measured by the temperature sensor in the printhead.
	Velocity Set Point	Required drop velocity.
	Actual Velocity	Drop speed measured in the printhead.
	Drop Frequency	Actual nozzle frequency
	Modulation Voltage	Actual modulation voltage
	Printing Phase	Actual phase selected for printing.
	Phasing Threshold	Threshold value required to optimize the actual phase profile (obtain eight 1's and eight 0's)
	Phase Profile	Digital representation of the results of the actual phasing test

Table 6-4: Diagnostics Screen One Menu and Commands

Diagnostics Screen Two

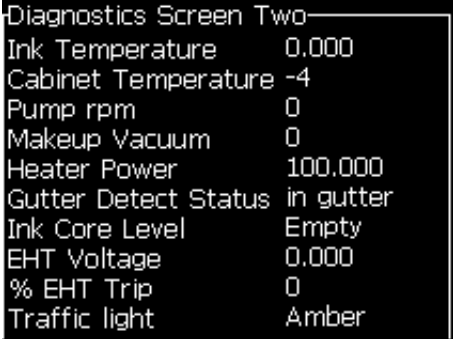
Diagnostics Screen Two Menu	Commands	Function
 <pre> Diagnostics Screen Two Ink Temperature 0.000 Cabinet Temperature -4 Pump rpm 0 Makeup Vacuum 0 Heater Power 100.000 Gutter Detect Status in gutter Ink Core Level Empty EHT Voltage 0.000 % EHT Trip 0 Traffic light Amber </pre>	Ink Temperature	Temperature measured by the temperature sensor in the Core.
	Cabinet Temperature	Temperature measured by the sensor on the CSB.
	Pump rpm	Measured pump rpm
	Makeup Vacuum	Use this option to view the measured makeup vacuum pressure.
	Heater Power	Percentage of current heater power with respect to the maximum allowable.
	Gutter Detect Status	Actual state of gutter detect circuitry in the printhead and on the CSB.
	Ink Core level	Shows the actual level of fluid in the ink core module
	EHT Voltage	Actual EHT voltage
	% EHT Trip	Percentage of measured EHT leakage current with respect to the maximum allowable value.
	Traffic light	The actual illuminated color on the stacklight

Table 6-5: Diagnostics Screen Two Menu and Commands

Diagnostics Screen Three

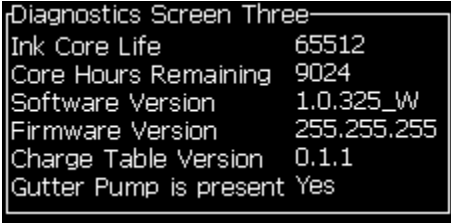
Diagnostics Screen Three Menu	Menu Option	Function
	Ink Core Life	Display the increase in the ink core life.
	Core Hours Remaining	Provides the remaining core hours
	Software Version	Displays the current version of the installed software.
	Firmware Version	Displays the current version of the installed firmware.
	Charge Table Version	Displays the current version of the installed raster file.
	Gutter Pump is Present	Displays information confirming the presence/absence of the gutter pump.

Table 6-6: Diagnostics Screen Three Menu and Commands

Data Logging Menu

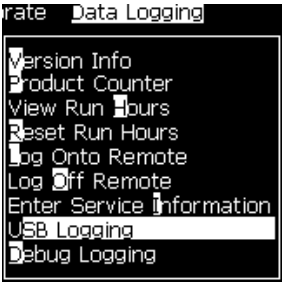
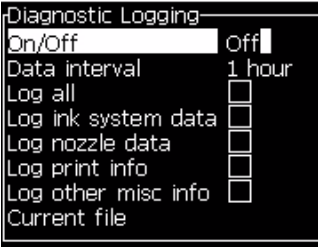
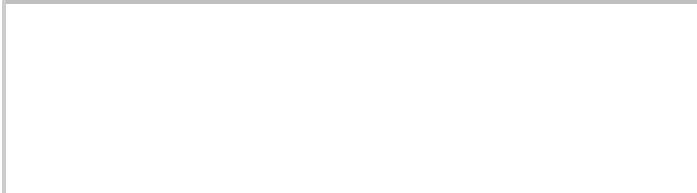
Data Logging Menu	Commands	Function
	USB Logging	Use this option to perform diagnostic logging on data. 
	Debug Logging	Use this option to activate/deactivate the Debug Logging feature.

Table 6-7: Data Logging Menu and Commands

Replacement Instructions

7



When you order a spare part kit, the replacement instructions of the respective spare part are provided along with the kit. For more information, contact Videojet Technologies Inc. Refer to Chapter , “Support and Training” for the contact information.

The replacement instructions are available for the parts included in the following table.

Spare Part
Control System Board
Power Supply Unit
Liquid Crystal Display (LCD) or the Front Panel Interface Board (FIB)
Keyboard/Electronics Compartment Door
Ink Core Module
Ink Pump
Printhead Engine Assembly
Printhead Valve Module Assembly
Umbilical Assembly
Printer Interface Board (PIB)
Electronics Compartment Fan
Septum Assembly
Gutter Pump
Power Switch
Ethernet Connector
Positive Air Kit
Ink Door Assembly
Ink System Fan

Table 7-1: Available Instructions

Spare Part
EHT Module
USB Connector
Plug and Power Cable
CSB Lithium Battery
PCB 1, 2, 3 and 5
Printhead Bonding
Encoder and Adaptor Cable
Print Ready and Warning Output Cable

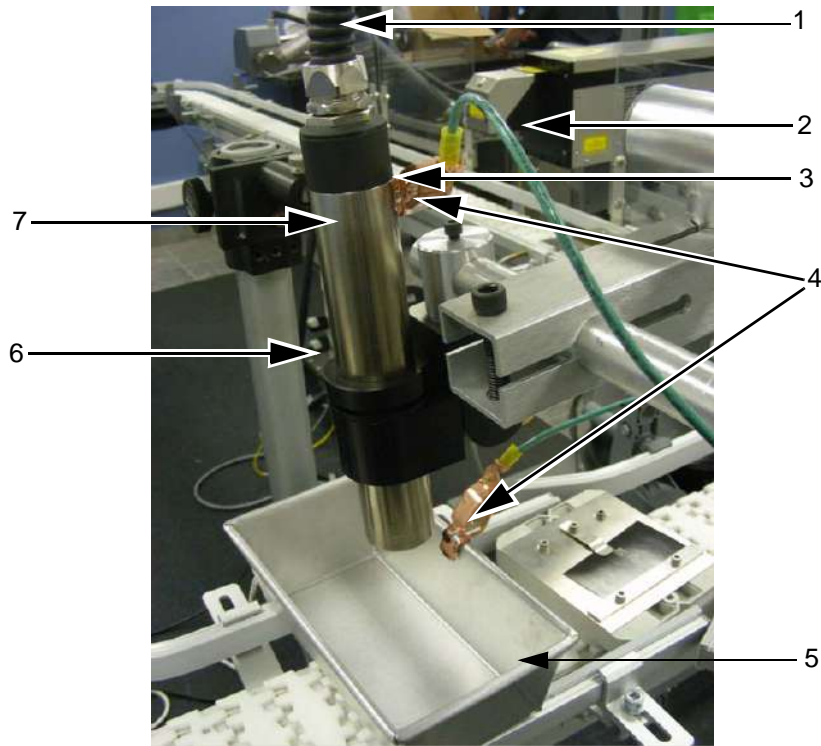
Table 7-1: Available Instructions

Printhead Bonding during Printing

Do the following tasks to establish bonding for the printhead and receptacle:

- 1 Make sure that the printhead cover (item 6, Figure 7-1 on page 7-3) is attached.

Note: The printhead is ground through the printhead screw (item 3) and umbilical (item 1). If there is no screw, you must provide the printhead with the path to the electrical ground.



- | | |
|---------------------|--------------------|
| 1. Umbilical | 5. Receptacle |
| 2. Earth Bond Strap | 6. Printhead Cover |
| 3. Printhead Screw | 7. Printhead |
| 4. Crocodile Clip | |

Figure 7-1. Printhead and Receptacle

- 2 Use a metal or other conducting receptacle (item 5, Figure 7-1) to collect the printhead fluid.
- 3 Connect one end of the earth bond strap (item 2) using crocodile clip (item 4) to the receptacle. Make sure that the connection is rigid.
- 4 Connect the other end of the earth bond strap to the printhead cover screw. Make sure that the connection is rigid.
- 5 Check the path from the electrical ground to the main printer cabinet using a multi-meter or a similar device to make sure that the earth loop is closed.
- 6 After the checks are completed, continue the printing operation.

Bonding during Servicing

 **Warning**

PERSONAL INJURY. This operation must be carried out by a trained service technician only.

- 1 Remove the printhead cover (see Figure 7-1 on page 7-3).
- 2 Locate the printhead screw into the printhead (Figure 7-2) and make sure that the screw is in contact with the earth wire in the umbilical.

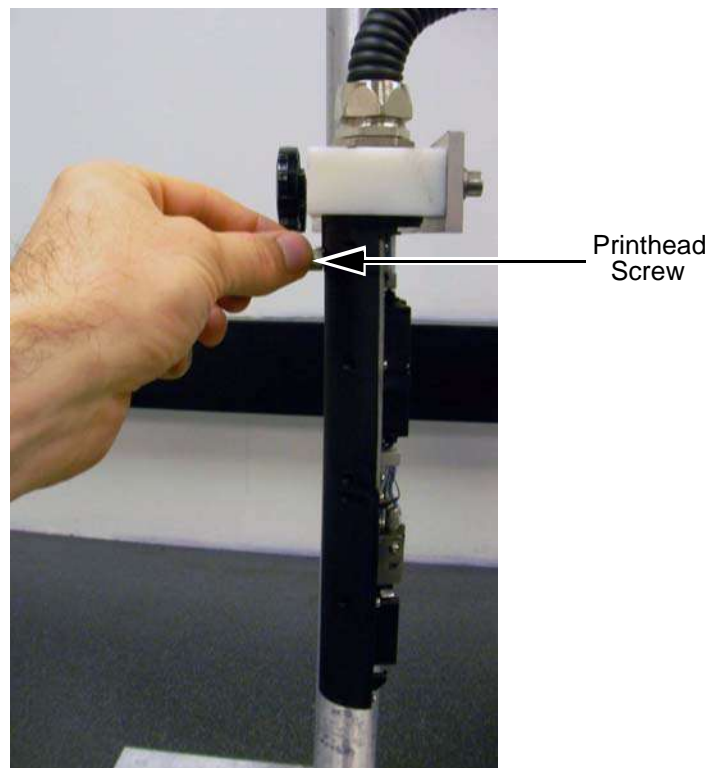
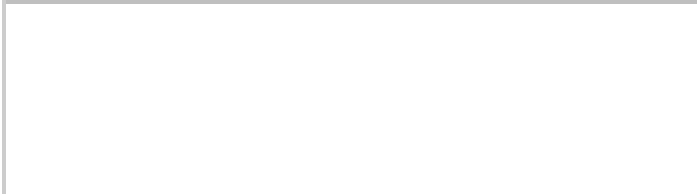


Figure 7-2. Printhead Screw

- 3 Follow Step 2 to Step 5 under “Printhead Bonding during Printing” on page 7-2.
- 4 Perform the required maintenance operation. Refer to the Chapter 8, “Maintenance” for more information on maintenance procedures.
- 5 Remove the printhead screw.
- 6 Refit the printhead cover.

The printhead bonding instructions is complete.



The preventative maintenance schedules mentioned in this chapter must be carried out by a trained and authorised personnel.

Actual intervals depend on machine running hours. The figures below are based on eight hours usage per day. If the actual usage is higher, the intervals should be reduced.


Task	Frequency
Clean the Printhead	Weekly.
Replace the Core Module	9000 hours or three years, whichever occurs first (for Videojet 1220) and 12000 hours (for Videojet 1520)
Replace the Ink pump	 24,000 hours for Videojet 1520. 18,000 hours for Videojet 1220. Replace the pump when the printer indicates that it is reaching the end of life.
Replace the Fan Filter (IP55)	2,000 hours
Replace the Floor Filter (IP55)	Must be replaced with the ink core module
Replace the Fan Filter	2,000 hours
Replace the Floor Filter	Must be replaced with the ink core module
Replace the Air Dryer Filter (if fitted)	2,000 hours

Table 8-1: Preventative Maintenance Schedule

 **Warning**

PERSONAL INJURY. It is possible that in a fault condition the heater can reach 70 °C. Do not touch the plate on which heater is mounted. The failure to follow this warning can cause personal injury.

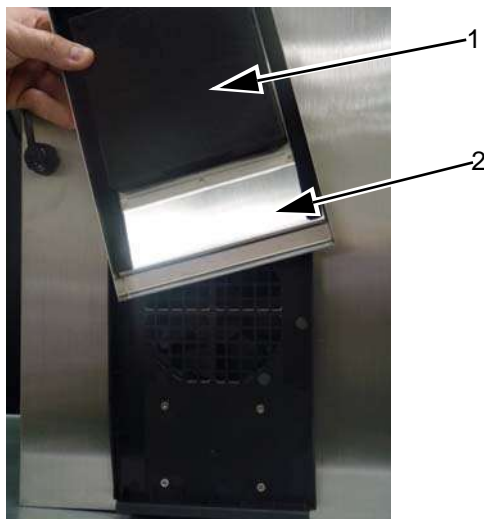
Note: If the printer is in shutdown state for more than ten days, perform “Ink Change Procedure” on page 8-8.

Replacement of Ink System Fan Filter for IP55 and IP65 (Videojet 1220/1520)

How to Remove the Old Ink System Fan Filter for IP55 and IP65

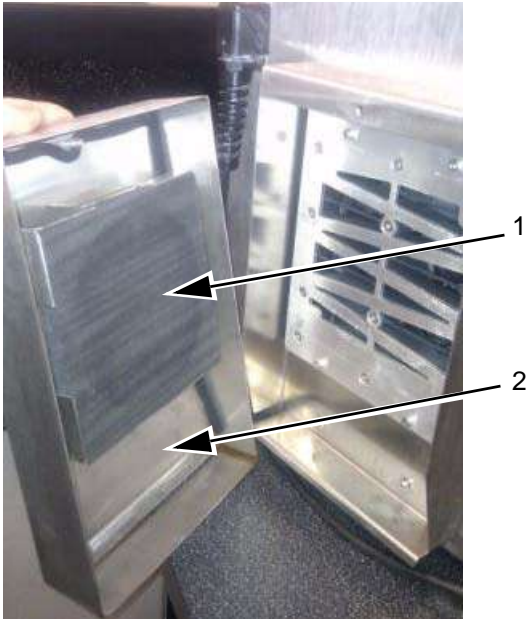
Do the following tasks to remove the old ink system fan filter:

- 1 Turn the knob and open the ink system fan filter cover (item 2, Figure 8-1, Figure 8-2 and Figure 8-3).
- 2 Remove the fan filter element (item 1) from the fan filter cover.



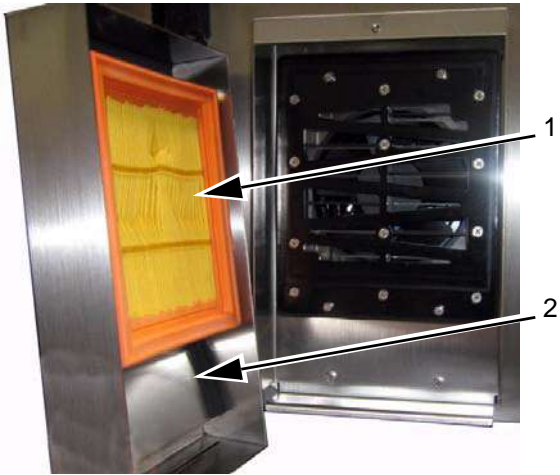
1. Fan Filter Element
2. Fan Filter Cover

Figure 8-1. Ink System Fan Filter - IP55 (Videojet 1220)



1. Fan Filter Element
2. Fan Filter Cover

Figure 8-2. Ink System Fan Filter - IP55 (Videojet 1520)



1. Fan Filter Element
2. Fan Filter Cover

Figure 8-3. Ink System Fan Filter - IP65

- 3 Discard the fan filter element according to the local regulations.
The removal of ink system fan filter for IP55 and IP65 is complete.

How to Install the New Ink System Fan Filter

Do the following tasks to install the new ink system fan filter:

- 1 Insert the new ink system fan filter element inside the fan filter cover.
- 2 Close the ink system fan filter cover carefully.

The installation of ink system fan filter for IP55 and IP65 is complete.

Replacement of Floor Filter (Videojet 1520 for (IP65))

How to Remove the Old Floor Filter IP65

Do the following tasks to remove the old floor filter:

- 1 Loosen the four M4 x 16 cap-head screws (item 1, Figure 8-4 on page 8-4) and remove the screws.
- 2 Detach the ink core support channel (item 2).
- 3 Remove the six screws, and lift the filter clamp (item 4).
- 4 Remove the filter element (item 5) from the filter tray (item 6).

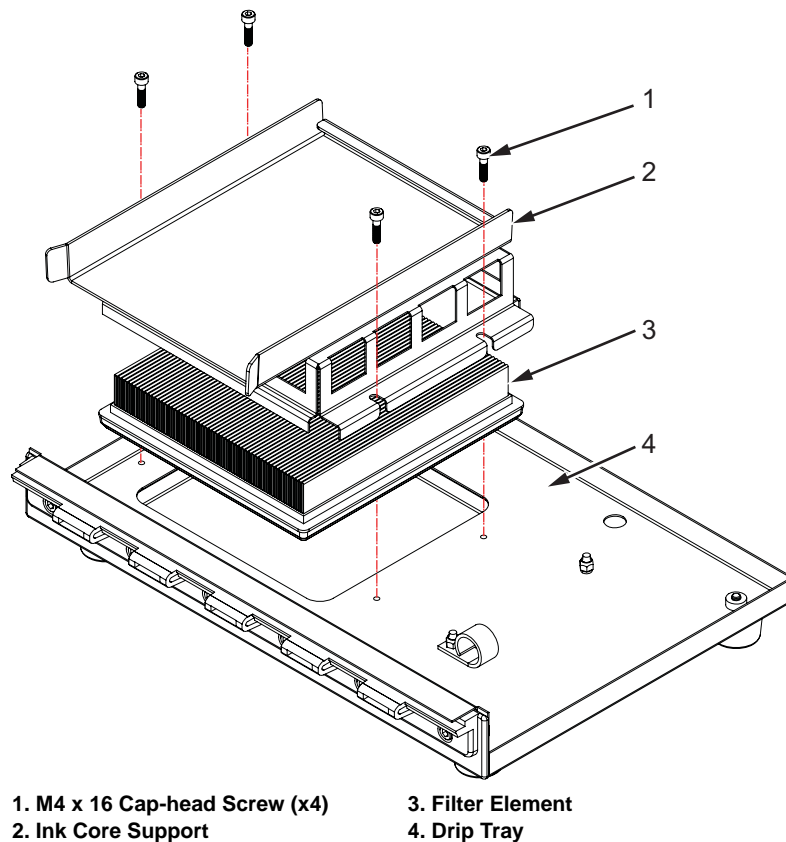


Figure 8-4. Floor Filter - IP65

- 5 Discard the old floor filter element according to the local regulation.
The removal of old floor filter for IP65 is complete.

How to Install the New Floor Filter IP65

Do the following tasks to install the new floor filter:

- 1 Insert the new floor filter element on the filter tray.
- 2 Fit the filter clamp to the filter tray using the four screws.
- 3 Attach the ink core supportchannel.
- 4 Tighten the M4 x 40 cap-head screws.

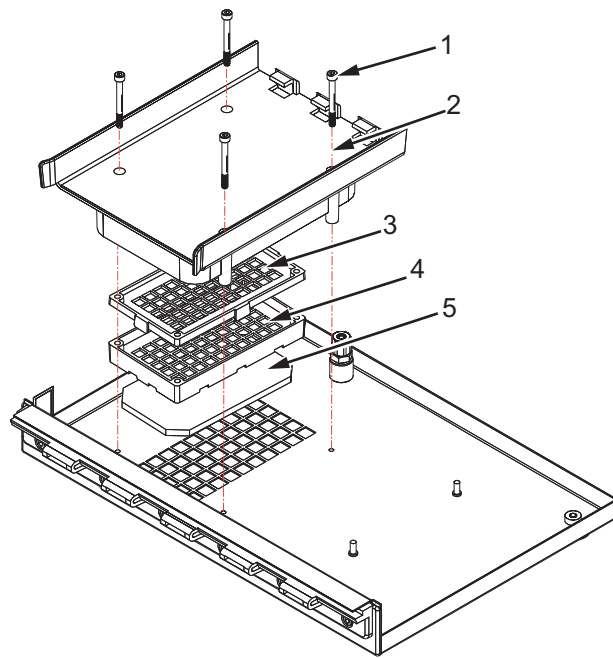
The installation of new floor filter for IP65 is complete.

Replacement of Floor Filter for IP55

How to Remove the Old Floor Filter IP55

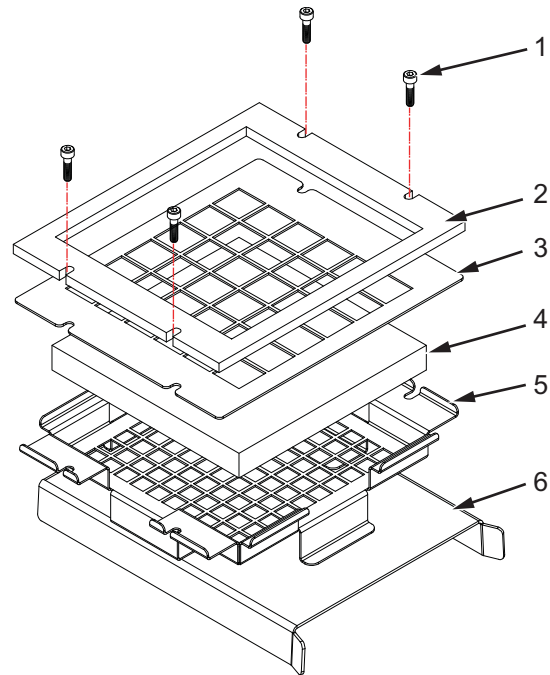
Do the following tasks to remove the old floor filter:

- 1 Loosen the four M4 x 40 cap-head screws (item 1, Figure 8-6) and remove the screws.
- 2 Detach the ink core support channel (item 2).
- 3 Detach the ink side filter top (item 3) and ink side filter base (item 4).
- 4 Remove the floor filter element (item 5) from the cabinet base.



- | | |
|--------------------------------|-------------------------|
| 1. M4 x 40 Cap-head Screw (x4) | 4. Ink Side Filter Base |
| 2. Ink Core Support Channel | 5. Floor Filter Element |
| 3. Ink Side Filter Top | |

Figure 8-5. Floor Filter - IP55 (Videojet 1220)



- | | |
|------------------------------|---------------------|
| 1. M4 x 16 Cap-head Screw | 4. Filter Element |
| 2. Floor Filter Cover Gasket | 5. Filter holder |
| 3. Filter Cover | 6. Ink Core Support |

Figure 8-6. Floor Filter - IP55 (Videojet 1520)

- 5 Discard the old floor filter element according to the local regulations.
The removal of old floor filter for IP55 is complete.

How to Install the New Floor Filter for IP55

Do the following tasks to install the new floor filter:

- 1 Insert the new floor filter element on the cabinet base.
- 2 Attach the ink side filter base and ink side filter top above the floor filter element.
- 3 Attach the ink core support channel.
- 4 Tighten the M4 x 40 cap-head screws.

The installation of new floor filter for IP55 is complete.

Ink Change Procedure

Parts/tools Requirement

Parts	Quantity	Part Number
Ink Core with or without pump	1	
1520 core with pump		SP392093
1520 core without pump		SP392165
1220 core with pump		SP392126
1220 core without pump		SP392167
Empty Cartridges	4	SP399246
Make-up cartridges matching the existing make-up in the core to be flushed	4	
Nozzle Bypass Manifold (Loop Connector) Kit with gasket	1	399247

Table 8-2: Parts and their Quantity

Note: Refer to Videojet 1220/1520 Service Manual Product CD for Instruction sheets.

How to Perform Ink Change

Do the following tasks to change the ink:

- 1 Perform steps 1 through 7 of "How to Prepare for Long-term Shutdown (Storage) or Transportation" in Videojet Operator Manual.
- 2 Change the ink core.
- 3 Refit the existing ink pump on the new ink core, if the new ink core does not have a ink pump.
- 4 Perform the normal installation procedures which includes the Priming and Calibration of the newly installed ink core.

For more information, refer to the Ink Core Module Instructions.

Read the Operator Manual

The Videojet 1220/1520 Operator Manual (Part Number: 462268) contains the troubleshooting procedures that an operator is allowed to perform. Refer to the operator manual for these procedures.

This chapter contains the troubleshooting procedures that only trained personnel or a service technician is allowed to perform.



Warning

PERSONAL INJURY. It is possible that in a fault condition the heater can reach 70° C (158° F) temperature. Do not touch the plate on which heater is installed. The failure to follow this warning can cause personal injury.

Important Guidelines

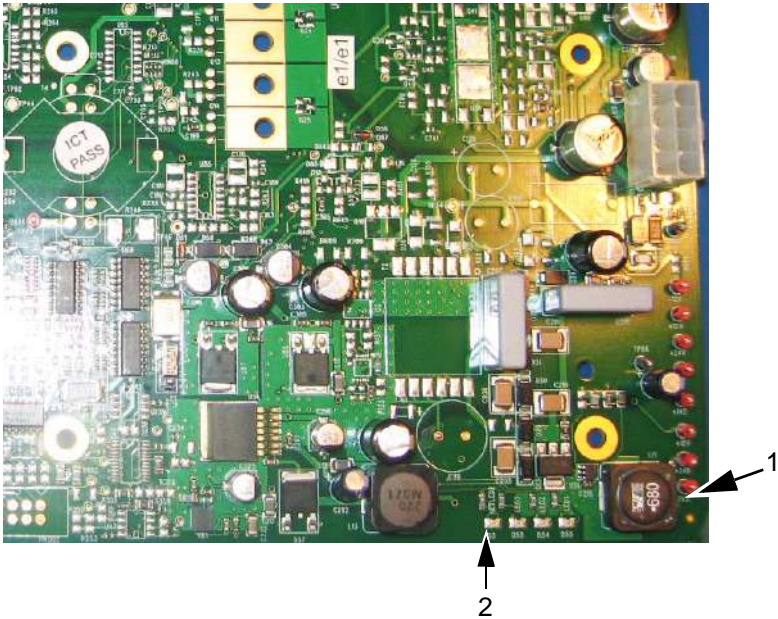
- Before you perform fault diagnosis or do any repairs described in this section, Videojet recommends to shift the printer from the production line to a clean environment.
- When a fault condition occurs, the first step to locate the cause must be to check the following:
 - The fault and status icons displayed on the display (refer to “Printer Status Icons” on page 9-6).
 - The status LEDs on the CSB.
- Table 9-6 on page 9-6 through Table 9-8 on page 9-13 list the possible printer status icons. These tables contain either remedial action or a reference to more detailed fault finding information.
- When you need to replace a part (for example, CSB, LCD and so on), refer to the related replacement instructions. For more information on how to obtain the related instructions, refer to Chapter 7, “Replacement Instructions”.

Startup Problems

Printer Fails to Start

Possible Cause	Remedial Action
Printer does not start	Check the power cord and plug for damage.
No mainspower supply	Make sure that the mains power supply is available. To turn on the printer, press the green push button.
Mains Power supply input cable disconnected or defective	1. Make sure that the mains power supply cable is connected. 2. Check the continuity of the cable. If the cable is defective, repair or replace the cable.
Printer mains power circuit breaker has tripped	Reset the circuit breaker - Turn off and turn on the circuit breaker.
Mains Power switch is faulty	Check mains if the switch is working.Replace the switch if faulty.
Cable between mains switch and PSU is disconnected or faulty	1. Check the cable connections. Reconnect if necessary. 2. Check the cable for continuity. Replace if faulty.
PSU output not reaching the CSB	Check relevant LEDs 2 (dim or bright) and 4 on CSB (see).LED 2 (power) must be ON and LED 4 (board processor) must be flashing
Cable between PSU and CSB is faulty or disconnected	1. Check if the cable between PSU and CSB is connected. Reconnect if necessary. 2. Check the cable for continuity, replace if faulty.
PSU faulty	Replace the PSU
CSB failed	1. Make sure that LEDs2 (dim or bright), 3, 4 and 5 on CSB are illuminated (see Figure 9-1 on page 9-3). 2. Change the CSB

Table 9-1: Printer Startup Problem and Remedies




- 1. CSB
- 2. Ethernet LED

Figure 9-1: Status LEDs

Display Faults

Backlight

 **Warning**

LETHAL VOLTAGES. A high AC voltage is present at the inverter and backlight. Extreme caution is required when diagnosing failure in these areas.

Note: Some DVMs may not show the 1000 VAC correctly. Use an oscilloscope fitted with a high voltage probe to measure the voltage.

Possible Cause	Remedial Action
Backlight inverter faulty	<ol style="list-style-type: none"> 1. Check for 24 VDC at 3 way input connector on backlight converter (Pins 1 and 2 on CSB B/LIGHT connector). 2. Check for 1000 VAC at output leads from backlight inverter (Pins 3 and 5). 3. If 24 VDC is present but 1000 VAC is missing, replace the LCD/backlight assembly.
Cable between CSB and backlight is disconnected or faulty	<ol style="list-style-type: none"> 1. If 24 VDC is not present at backlight inverter but is present at Pins 1 and 3 of B/LIGHT connector on CSB, make sure that the cable is connected between the CSB and the backlight. 2. Check the cable for continuity, replace if faulty.
Backlight faulty	If 1000 VAC is present at output of backlight inverter but backlight is not illuminated, replace the LCD/Backlight assembly.
CSB faulty	Check for 24 VDC on pins 1 and 3 of B/LIGHT connector on CSB. If 24 VDC is not present, replace the CSB.

Table 9-2: Display Backlight Failure

LCD Faults


Possible Cause	Remedial Action
LCD contrast not set correctly	Press  to set the contrast.
Ribbon cable between CSB and LCD is faulty	Check the cable for continuity. Replace if faulty.
CSB faulty	Replace the CSB.
LCD faulty	Replace the LCD assembly.

Table 9-3: LCD Failure

Keypad Faults

Possible Cause	Remedial Action
Ribbon cable between CSB and keypad is disconnected or faulty	<ol style="list-style-type: none"> 1. Make sure that the ribbon cable between CSB and the keypad is connected. 2. Replace the cable for continuity, replace if faulty.
CSB faulty	Replace the CSB.
Keyboard faulty	Replace the keyboard.

Table 9-4: Keypad Failure

Beacon Indication

Beacon Color	Description
Red	<ul style="list-style-type: none"> • Alarm present • Jet off • All relays are off
Amber	<ul style="list-style-type: none"> • Jet on/off • Warning present • Print not enabled • Relay 2 is set
Green	<ul style="list-style-type: none"> • Print enabled • No warnings • Relay 1 is set
Green and Amber	<ul style="list-style-type: none"> • Print enabled • Warning present • Relay 1 and 2 is set
Red and Amber	<ul style="list-style-type: none"> • Alarm present • Warning present • Jet off • Relay 2 is set
No Lights	<ul style="list-style-type: none"> • Jet on or off • No alarms • No warnings • Print disabled • All relays are off

Table 9-5: Alarm Light Conditions

Printer Status Icons

The printer status icons are divided into three groups:

- The indicator icons - These icons show the status of the ink jet.
- The fault icons - These icons indicate a fault condition. During a fault condition, the printer stops printing.
- The warning icons - These icons indicate a warning condition. The printer continues to print until the warning condition becomes a fault condition.

Indicator Icons


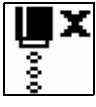
Icon	Name	Description
	Jet Running	The ink jet is running and the machine is ready to print. When the machine starts, this icon flashes.
	Jet Stopped	Indicates that the ink jet has stopped. When the machine stops, this icon flashes.

Table 9-6: Indicator Icons

Fault Icons



Fault	Reason	Causes	Action
EHT Trip 	Excessive current in the EHT circuit as measured by the CSB.	The printhead is dirty or wet	<ol style="list-style-type: none"> 1. Clean and dry the printhead. 2. Restart the inkjet; monitor for ink buildup on the printhead during the printing operations, if possible.
		The EHT circuit is not calibrated	<ol style="list-style-type: none"> 1. Stop the ink jet. 2. Calibrate EHT (refer to “Calibrate EHT” on page 4-45). 3. Restart the inkjet and monitor the system performance.
		Short in umbilical or EHT resistor	<ol style="list-style-type: none"> 1. Stop the inkjet and turn off the printer. 2. Unplug the EHT wire from the EHT power supply. 3. Measure the resistance between the EHT wire and the EHT plate (44 mega-ohms). Note: <i>Not all meters can measure high resistance, use parallel resistor to calculate resistance.</i> 4. If open or short circuit exists, remove the printhead engine and inspect the EHT resistor. If you need any support, please contact Videojet Technologies Inc. 5. Replace the umbilical.
		Defective EHT power supply	Replace the EHT power supply.
		Defective CSB	Replace the CSB.
Charge Error 	Hardware Fault	<ul style="list-style-type: none"> • A short-circuited charge electrode • Faults in the CSB 	<ul style="list-style-type: none"> • Make sure the charge tunnel/charge electrode is clean and dry. • Clear the fault and restart the inkjet. If the problem continues, call Videojet Technologies Inc. Customer Service Department at 1-800-843-3610 (United States only), or contact the local Videojet Technologies Inc. representative • If the problem continues, replace the CSB

Table 9-7: Fault Icons


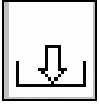
Fault	Reason	Causes	Action
Gutter Fault 	Ink jet is on, but ink stream is not detected in the gutter for more than 5 seconds	Nozzle is clogged	1. Perform a nozzle back flush. 2. Restart the inkjet and make sure that the ink stream is entering the gutter.
		Inadequate ink pressure	1. Check for the presence of pump fault (refer to "Pump Fault" on page 9-9) 2. Check the actual pressure using diagnostics screens.
		Ink stream is misaligned	1. Perform a nozzle flush. 2. Restart the inkjet and make sure that the ink stream is entering the gutter. 3. Perform an ink stream alignment (refer to "Nozzle Adjustment" on page 4-42).
		No vacuum	1. Clean the printhead. 2. Perform a nozzle flush and check for flow in the return line to make sure the proper operation of the vacuum system. 3. Remove the printhead engine and inspect the length of tubing between the gutter and the printhead valve module for clogs. 4. Loosen and clean valve V2 (VP and VG).
		The gutter sense chamber is defective	1. Remove the printhead engine and inspect the gutter sense chamber. 2. Check CSB test points for the gutter sense signal. 3. Check umbilical wires related to the gutter sense signal. 4. Replace the umbilical if required.
Ink Core Empty 	The low level sensor in the ink core module is not covered.	New installation	Perform "Fill Ink Core" procedure to maintain correct level in ink core module.
		Ink Core Level Low warning has occurred, and the printer is unable to add ink.	1. Make sure the ink core is seated on a level surface. 2. Make sure the ink core and make-up cartridge are installed. 3. Check the ink core life. For more information, refer to "Ink Core Level Low" on page 9-25.
		Grounding is not correct	Check the green ground wire and plug under the motor cover

Table 9-7: Fault Icons (Continued)


Fault	Reason	Causes	Action
Pump Fault 	The pump speed is greater than 98% of the maximum value and the actual pressure is greater than 0.2 bar below the target pressure.	Presence of leaks in the ink compartment, electronics compartment or umbilical	<ol style="list-style-type: none"> 1. Inspect the ink compartment, electronics compartment, and umbilical for leaks. 2. Repair if possible. 3. Monitor the speed of the pump: <ol style="list-style-type: none"> 1. Tip the core forward, check if the speed increases. 2. Bring the core back to the normal position. 3. Tip the core backward. Check if the speed decreases. This is a good test to check if the filter in the ink core is cracked or if there is a leak in the ink core. If the speed of the pump changes on tipping the core, replace the core.
		Erroneous pressure indication	<ol style="list-style-type: none"> 1. Inspect the electrical connections between the ink core module and the PIB, and between the PIB and the CSB. 2. Check and compare the voltage readings at the test points related to pump and pressure: (refer to "CSB Test Points" on page 9-39). Also, remove the top cover of the ink core module and measure the voltage between points + Press and - Press.
		Defective pump	<ol style="list-style-type: none"> 1. Inspect the electrical connections between the ink core module and the PIB, and between the PIB and the CSB. 2. Open the pump compartment, and inspect the pump. 3. Replace the pump, if required.
		Ink too thin	<ol style="list-style-type: none"> 1. Check the <i>Diagnostics Screen One</i>. 2. Compare the target pressure with the temperature-compensated target pressure. 3. If the target pressure is significantly less than (1 bar) the temperature-compensated target pressure, the ink is too thin. 4. Recover the viscosity by allowing the jet to run continuously, or by draining and re-priming the system.

Table 9-7: Fault Icons (Continued)

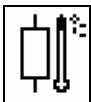
Fault	Reason	Causes	Action
		Erroneous velocity indication	<ol style="list-style-type: none"> 1. Clean the printhead. 2. Check the <i>Diagnostics Screen One</i>. 3. Compare the <i>Actual Velocity</i> with the <i>Velocity Set Point</i>. 4. Remove the printhead engine and measure the resistances between the copper pads on the underside of the printhead engine; compare to the expected values. 5. With an oscilloscope, check the waveforms at the CSB test points related to velocity: "PHA", TP69, TP58, TP59, TP60, and TP61 (refer to "CSB Test Points" on page 9-39).
<p>Cabinet Too Hot</p> 	<p>The cabinet temperature measured by the CSB is above 80° C (178° F)</p>	The electronics compartment is overheated.	<ol style="list-style-type: none"> 1. Open the electronics compartment. 2. Inspect the electronics compartment components for any damage or overheating. 3. If possible, operate the printer with the electronics compartment door open and monitor the <i>Cabinet Temperature</i> through the <i>Diagnostics Screen Two</i>. 4. Make sure that the fan inside the electronics compartment is working. 5. Check the filters at the bottom and behind the cabinet. Make sure that they are not clogged, else replace the filters.
		The ambient temperature is too high.	<ol style="list-style-type: none"> 1. Move the printer to a location where the ambient temperature is lower, or attempt to lower the temperature at the current location. 2. Monitor the <i>Cabinet Temperature</i> through the <i>Diagnostics Screen Two</i>.
		The heat sink is insulated or obstructed.	Remove the insulation/obstruction from the surroundings of the heat sink.
		The mains power supply is defective.	<ol style="list-style-type: none"> 1. Check the voltage levels of the mains power supply being supplied to the CSB. 2. Replace the mains power supply.
		The CSB is defective.	Replace the CSB.

Table 9-7: Fault Icons (Continued)


Fault	Reason	Causes	Action
Ink System Service Overdue 	The ink core module is in use for more than 12000 hours and requires maintenance	Refer Table 8-1 on page 8-1 for ink core life	Replace the ink core.
Ink Core Expired	The ink core has expired	.	Ink core needs to be replaced.
Unable to Control Viscosity	The printer has been unable to perform automatic viscosity control for 60 minutes or more.	Presence of <i>Ink Core Level High</i> warning, and target pressure has been greater than 0.1 bar above temperature-compensated target pressure for 1 hour.	Refer to “Ink Core Level High” on page 9-24.
		No make-up cartridge, empty make-up cartridge or invalid make-up cartridge, and target pressure has been greater than 0.1 bar above temperature-compensated target pressure for 1 hour.	Refer to “No Make-up Cartridge” on page 9-22.
		Faulty make-up valve	Check valve functionality
		Printer is unable to obtain a phase profile for 60 minutes.	Refer to “Phase Threshold Error” on page 9-16.
		Printer is unable to measure velocity for 60 minutes.	Refer to “No Time for TOF” on page 9-30.

Table 9-7: Fault Icons (Continued)



Fault	Reason	Causes	Action
Mod Driver Chip Over Temperature	Mod amplifier hardware has shutdown.	Mod amplifier temperature is more than the specified limit.	1. Check the fan at the top of the electronics compartment. 2. Make sure the heat sink does not have any debris.
Rasters Memory Overflow Detected 	Not enough memory to store all requested raster tables.		Remove the rasters that are not used. Follow the procedure to delete rasters.
Valve Error Contact the Service Department 	Hardware error in valve hit / hold drive circuit.	Faulty power supply or control system board	Contact the Videjet Technologies Inc. Customer Service Department at 1-800-843-3610 (United States only), or contact the local Videjet Technologies Inc. representative.
Bad Phasing	Unable to obtain phase data during startup.	Loose Connection	Check for any loose connections between the cabinet and printhead.
Modulation Readback Failed	Hardware error, ADC not working or readback invalid.	CSB Failure	Replace CSB.

Table 9-7: Fault Icons (Continued)

Warning Icons


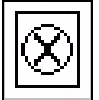
Warning	Reason	Causes	Action
Printhead Temperature Too High 	The printhead temperature is 3° C (37.4° F) more than the setpoint, with head heater enabled.	The printhead is (temporarily) overheated.	Allow the inkjet to run. The printhead temperature should correct itself.
		The ambient temperature is too high.	If print quality or performance issues are noted, consider operating the printer in a cooler environment.
		Defective power supply	<ol style="list-style-type: none"> 1. Check the voltages from the mains power supply that is being supplied to the CSB. 2. Replace the mains power supply.
		Defective temperature control circuit (short)	<ol style="list-style-type: none"> 1. Inspect the electrical connections between the CSB and the PIB, and between the PIB and the umbilical. 2. Remove the printhead valve module. 3. Inspect the electrical connections between the printhead valve module and the deck. 4. Measure the resistance between the copper pads on the underside of the printhead valve module and compare these values to the expected values. 5. Check the umbilical wires for continuity.
Incorrect Raster or Raster Family Name 	Requested raster table not loaded into the system. Warning appears immediately.	<ol style="list-style-type: none"> 1. Corruption of data 2. Invalid use of file names 	<ol style="list-style-type: none"> 1. Delete custom files. 2. Check file names and reload raster.

Table 9-8: Warning Icons

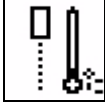
Warning	Reason	Causes	Action
Printhead Temperature Too Low 	The printhead temperature is more than 3° C (37° F) below the target temperature. Error duration before warning is 30 seconds	The printhead has not yet reached operational temperature.	Allow the inkjet to continue to run. The printhead temperature should correct itself.
		The ambient temperature is too low.	If print quality or performance issues are noted, consider operating the printer in a warmer environment.
		Defective power supply	<ol style="list-style-type: none"> 1. Check the voltages from the mains power supply being supplied to the CSB. 2. Replace the mains power supply.
		Defective temperature control circuit (open)	<ol style="list-style-type: none"> 1. Inspect the electrical connections between the CSB and the PIB, and between the PIB and the umbilical. 2. Remove the printhead valve module. 3. Inspect the electrical connections between the printhead valve module and the deck. 4. Reset the printhead valve module, start the printer and monitor printhead temperature. 5. If problem persists, measure the resistance between the copper pads on the underside of the printhead valve module and compare these values to the expected values. 6. Check the umbilical wires for continuity
TOF Too High	Measured jet velocity is more than 10% above target velocity.	<ol style="list-style-type: none"> 1. Viscosity too low. 2. Pressure too high. 3. Restrictions in the nozzle. 	<ol style="list-style-type: none"> 1. Check the viscosity and pressure values. 2. Perform ink purge and reload.
TOF Too Low	Measured jet velocity is more than 10% below target velocity.	<ol style="list-style-type: none"> 1. Viscosity too High. 2. Pressure too Low. 3. Restrictions in the nozzle. 	<ol style="list-style-type: none"> 1. Check the viscosity and the pressure values. 2. Perform backflush and reload.

Table 9-8: Warning Icons (Continued)

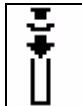
Warning	Reason	Causes	Action
Gutter Fault Shutdown Disabled	Operator has disabled machine shutdown on gutter fault. Warning appears immediately	Gutter fault is disabled	Enable Gutter fault when troubleshooting is complete
Printhead Cover Removed 	Lid switch circuit is open	The printhead cover is removed or not seated correctly	<ol style="list-style-type: none"> 1. Install the printhead cover. 2. Make sure the printhead cover is completely seated on the printhead - slide the printhead completely into the sleeve.
		Missing Magnet	Make sure the magnet is there in front of the printhead sleeve.
		Defective lid switch	<ol style="list-style-type: none"> 1. Stop the inkjet and turn off the printer. 2. Remove the printhead engine and inspect the lid switch. 3. Measure the resistance between the copper pads on the underside of the printhead engine and compare readings to the expected values. 4. Check umbilical wires for continuity.
		Open circuit	Inspect the cabling from the umbilical to the PIB and from the PIB to the CSB.
		Defective CSB	Check measurement on the CSB.

Table 9-8: Warning Icons (Continued)

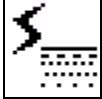
Warning	Reason	Causes	Action
<p>Phase Threshold Error</p> 	<p>The printer is unable to acquire a phase profile with the phase threshold set to the minimum value.</p>	<p>The printhead is dirty</p>	<p>Clean and dry the printhead.</p>
		<p>The ink stream is misaligned</p>	<ol style="list-style-type: none"> 1. Perform a nozzle backflush. 2. Restart the inkjet. 3. If the ink stream is still misaligned, perform ink stream alignment (refer to "Nozzle Adjustment" on page 4-42).
		<p>No break-off</p>	<ol style="list-style-type: none"> 1. Perform a visual inspection to verify break-off. 2. If break-off does not exist, check electrical connections on the printhead engine and in the electronics compartment. 3. Attempt to set the modulation manually to obtain break-off. 4. If break-off cannot be obtained, check the modulation signal on the CSB. If the modulation signal does not exist, refer to "CSB failed" on page 9-17. 5. If the modulation signal is present on the CSB, check for the modulation signal in the printhead. 6. Remove the printhead engine and check its electrical connections. 7. Replace the printhead engine.
		<p>Phase Charge incorrectly set</p>	<ol style="list-style-type: none"> 1. Check the <i>Phase Charge</i> setting. 2. Adjust the <i>Phase Charge</i> setting to recover the phase profile.
		<p>Electrical malfunction in TOF circuit</p>	<ol style="list-style-type: none"> 1. Check the electrical connections between the CSB and the PIB, and between the PIB and the umbilical. 2. Remove the printhead engine and check the electrical connections. 3. Check the resistance between the copper pads on the underside of the printhead engine, and compare the readings with the expected values. 4. Check for continuity in the umbilical wires.

Table 9-8: Warning Icons (Continued)

Warning	Reason	Causes	Action
		No charge pulses	<ol style="list-style-type: none">1. With the ink jet running but the printer not printing, check for the presence of charge pulses at the charge tunnel.2. If pulses are not present, check for the presence of charge pulses at TP CHG on the CSB3. Check for continuity in the umbilical wires.
		CSB failed	With test equipment, check for presence of all related signals on CSBTP38, CHG, and PHA .

Table 9-8: Warning Icons (Continued)


Warning	Reason	Causes	Action
Ink Viscosity Too High 	The target pressure is greater than 0.1 bar above the temperature-compensated target pressure	The ink is too thick.	<ol style="list-style-type: none"> 1. The printer should add make-up fluid to correct the ink viscosity. 2. Monitor the progress of make-up additions using <i>Diagnostics Screen Two</i>. If the printer does not appear to be attempting to add make-up (allow at least five minutes for a make-up addition to be attempted), see causes below. 3. If make-up addition capability is confirmed but printer operations are impaired by thick ink, consider flushing the system.
		The make-up cartridge is removed or seated improperly.	<ol style="list-style-type: none"> 1. Install or reset the make-up cartridge. 2. Make sure that the <i>No Make-up</i> icon disappears.
		The make-up cartridge is of the wrong type.	<ol style="list-style-type: none"> 1. Install a cartridge of the correct make-up type. 2. Make sure that the <i>Wrong Make-up</i> icon disappears.
		The make-up add line is disconnected or leaks.	<ol style="list-style-type: none"> 1. Open the ink compartment door and gently pull the ink core module out. 2. Locate the green-striped tube behind the ink core module. 3. Make sure that the quick disconnect in this line is secure and that the line is not leaking.
		The ink core module level is high.	<ol style="list-style-type: none"> 1. Confirm the condition by checking icons on display screen. 2. To clear the condition, perform the following steps: <ul style="list-style-type: none"> • Direct the printhead into a service tray. • Disable the gutter fault. • Raise the ink stream above the catcher. • Allow the ink stream to flow into the service tray until the ink core module level is restored to normal.
		The ink core module level is defective	Replace the ink core module.

Table 9-8: Warning Icons (Continued)

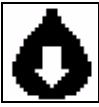

Warning	Reason	Causes	Action
<p>Ink Viscosity Too low</p> 	<p>The target pressure is lesser than 0.1 bar below the temperature-compensated target pressure.</p>	<p>The ink is too thin.</p>	<ol style="list-style-type: none"> 1. Allow the inkjet to run so that the excess make-up fluid evaporates. The following actions will help to recover the viscosity: <ul style="list-style-type: none"> • Avoid nozzle backflushing and improper printhead cleaning (with the vacuum applied). • Use the Quick start and Quick stop options whenever possible. • Run Gutter Pump at maximum speed. • Check for flow in the green-striped tube to make sure that make-up is not being unnecessarily added. 2. If printer operations are affected by thin ink, flush the system. Perform the following steps: <ul style="list-style-type: none"> • Direct the printhead into a service tray. • Disable the gutter fault. • Raise the ink stream above the catcher. • Allow the ink stream to flow into the service tray until the viscosity is restored (the printer will add fresh ink to compensate for system losses).
<p>Pressure too High</p> 	<p>The actual pressure is more than 0.2 bar above the target pressure.</p>	<p>Printer transient Erroneous pressure indication</p>	<p>Printer will correct itself</p> <ol style="list-style-type: none"> 1. Inspect electrical connections between the ink core module and the PIB, and between the PIB and the CSB. 2. Replace the ink core module. Check and compare the voltage readings at the test points related to pump and pressure: TP20, TP21, TP22, and TP47 (refer to “CSB Test Points” on page 9-39). Also, remove the top cover of the ink core module and measure the voltage between points + Press and - Press.

Table 9-8: Warning Icons (Continued)



Warning	Reason	Causes	Action
Pressure Too Low 	The actual pressure is > 0.2 bar below the target pressure.	Printer transient.	Printer will correct itself.
		Leak in the ink compartment, electronics compartment, or umbilical.	1. Inspect the ink compartment, electronics compartment, and umbilical for leaks. 2. Repair if possible.
		Erroneous pressure indication.	1. Inspect the electrical connections between the ink core module and the PIB, and between the PIB and the CSB. 2. Check and compare the voltage readings at the test points related to pump and pressure: TP20, TP21, TP22, and TP47 (refer to "CSB Test Points" on page 9-39). Also, remove the top cover of the ink core module and measure the voltage between points + Press and - Press.
		Defective pump	1. Inspect electrical connections between the ink core module and the PIB, and between the PIB and the CSB. 2. Open the pump compartment, and inspect the pump. 3. Replace the pump.
No Ink Cartridge  No ink available for addition to the ink core module	No ink cartridge is present	Insert an ink cartridge into the proper cartridge holder.	
	The ink cartridge is empty	Remove the empty cartridge and insert a new ink cartridge.	
	The printer is unable to read the ink cartridge smart chip	1. Make sure that the ink cartridge is installed correctly and locked into the holder. 2. Remove the ink cartridge. Check if the smart chip is present and is clean. 3. If another ink cartridge is available, insert it into the printer and see if the printer can read its smart chip. 4. Check if the smart chip reader (inside the receptacle) is positioned correctly and is clean. 5. Check the electrical connections between the smart chip reader and the PIB board, and between the PIB board and the CSB.	

Table 9-8: Warning Icons (Continued)




Warning	Reason	Causes	Action
Wrong Ink Cartridge 	Ink type in cartridge incompatible with ink core module. fluid reference and fluid type must match ink core module.	A cartridge containing the wrong ink type has been inserted into the printer	<ol style="list-style-type: none"> 1. Remove the ink cartridge. 2. Check the label on the ink cartridge to confirm the ink type. 3. Insert a cartridge of the correct ink type into the printer.
		A make-up cartridge has been accidentally inserted into the ink cartridge holder	<ol style="list-style-type: none"> 1. Remove the cartridge. 2. Check the label on the cartridge to confirm fluid type. 3. Insert a cartridge of the correct ink type into the printer.
		The smart chip on the ink cartridge is programmed incorrectly or does not match the label.	<ol style="list-style-type: none"> 1. Remove the cartridge. 2. Check the label on the cartridge to confirm fluid type. 3. Insert a cartridge of the correct ink type into the printer.
Ink Cartridge Expired	Ink past expiry date		Check the label on cartridge for expiration date. Replace the old cartridge with new ink cartridge.
Ink Cartridge Low 	Less than 5% of the required ink remains in the ink cartridge.	Ink used for printing	Insert a new ink cartridge into the proper cartridge holder after ink cartridge becomes empty.
Ink Cartridge Empty 	Ink cartridge smart chip data shows 0%.		<ol style="list-style-type: none"> 1. Check if the current cartridge has fluid and is locked into position. 2. Replace the empty cartridge with a new ink cartridge.
Ink Insertions Exceeded	This ink cartridge is inserted more than 10 times.		Replace ink Cartridge.

Table 9-8: Warning Icons (Continued)

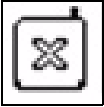

Warning	Reason	Causes	Action
<p>No Make-up Cartridge</p> 	<p>No make-up fluid available for addition to the ink core module</p>	<p>Make-up cartridge is not present</p>	<p>Insert a make-up cartridge into the proper cartridge holder.</p>
		<p>The make-up cartridge is empty</p>	<p>Remove the empty cartridge and insert a new make-up cartridge.</p>
		<p>The printer is unable to read the make-up cartridge smart chip.</p>	<ol style="list-style-type: none"> 1. Ensure that the make-up cartridge is seated correctly in its receptacle. 2. Remove the make-up cartridge. Make sure that the smart chip is present and is clean. 3. If another make-up cartridge is available, insert it into the printer and see if the printer can read its smart chip. 4. Check that the smart chip reader (inside the receptacle) is positioned correctly and is clean. 5. Check the electrical connections between the smart chip reader and the PIB, and between the PIB and the CSB.
<p>Wrong Make-up Cartridge</p> 	<p>The cartridge inserted into the make-up cartridge holder contains the wrong make-up type.</p>	<p>A cartridge containing the wrong make-up type has been inserted into the printer</p>	<ol style="list-style-type: none"> 1. Remove the make-up cartridge. 2. Check the label on the make-up cartridge to confirm the make-up type. 3. Insert a cartridge of the correct make-up type into the printer.
		<p>An ink cartridge was accidentally inserted into the make-up cartridge holder.</p>	<ol style="list-style-type: none"> 1. Remove the cartridge. 2. Check the label on the cartridge to confirm fluid type. 3. Insert a cartridge of the correct make-up type into the printer.
		<p>The smart chip on the make-up cartridge is programmed incorrectly or does not match the label.</p>	<ol style="list-style-type: none"> 1. Remove the make-up cartridge. 2. Check the label on the make-up cartridge to confirm the make-up type. 3. Insert a cartridge of the correct make-up type into the printer.

Table 9-8: Warning Icons (Continued)


Warning	Reason	Causes	Action
Makeup Cartridge Low 	Less than 5% of the make-up in the make-up cartridge remains.	Make-up used during jet on operations.	Make preparations to insert a fresh make-up cartridge into the proper cartridge holder. Replace the cartridge following Make-up Out indication.
Clean Start / Stop Inhibited	Viscosity is too low, so clean start / stop inhibited to prevent solvent addition		<ol style="list-style-type: none"> 1. Start printer with the quick start procedure and allow the printer to print at a high duty cycle to lower the fluid level in the core. 2. Let the printer idle to burn off excess make-up fluid.
Makeup Insertions Exceeded	This make-up cartridge is inserted more than 10 times		Replace make-up cartridge. Note: Repeated insertions can lead to a 'viscosity too high' condition as excessive punctures reduce the seal on the cartridge.

Table 9-8: Warning Icons (Continued)


Warning	Reason	Causes	Action
Ink Core Level High 	The high level sensor in the ink core module is covered.	Excessive clean start and stops.	<ol style="list-style-type: none"> 1. Use Quick Start and Quick stop options until ink core module level is restored. 2. Keep jet running to use excess make-up. 3. If printer operation is impaired by high ink core module level (presence of <i>Unable to Control Viscosity</i> warning), raise the ink stream above the catcher to restore the ink core module level to normal.
		Excessive nozzle backflushing	<ol style="list-style-type: none"> 1. Use Quick Start and Quick stop options until ink core module level is restored. 2. Keep jet running to use excess make-up. 3. If printer operation is impaired by high ink core module level (presence of <i>Unable to Control Viscosity</i> warning), raise the ink stream above the catcher to restore the ink core module level to normal.
		Improper printhead cleaning	<ol style="list-style-type: none"> 1. Use Quick Start and Quick stop options until ink core module level is restored. 2. Keep the jet running to use excess make-up. 3. If printer operation is impaired by high ink core module level (presence of <i>Unable to Control Viscosity</i> warning), raise the ink stream above the catcher to restore the ink core module level to normal.
		Leak	<ol style="list-style-type: none"> 1. Make sure the ink core is seated on a level surface in the cabinet. 2. Check for flow in the black or green striped tubing (ink and make-up add line). 3. If flow is present continuously, disconnect the line and check for presence of vacuum. 4. Replace the ink core module, if required.
		Grounding is not correct	Check the green ground wire and lug under the motor cover

Table 9-8: Warning Icons (Continued)


Warning	Reason	Causes	Action
Ink Core Level Low 	The middle level sensor in the ink core module is uncovered.	Ink usage during printing	<p>The printer should add ink to restore ink core module level to middle. However, if the printer is attempting to add ink, but the level is not restored, perform the following:</p> <ol style="list-style-type: none"> 1. Confirm that the printer is attempting to add ink by monitoring the ink add valve on the <i>Valves Screen</i>. The screen should indicate that the valve is opening. 2. If the printer is not attempting to add ink, check if a valid cartridge of the correct ink type is inserted into the ink cartridge receptacle. 3. If the printer is attempting to add ink, but the level is not restoring, troubleshoot the ink addition system as follows: <ol style="list-style-type: none"> 1. Make sure the ink cartridge is not empty. 2. Make sure the ink core is seated on a level surface in the cabinet. 3. Stop the jet and perform a valve test. Make sure that the ink add valve is operational. If it is not operational, remove and clean the valve. 4. Inspect the black-striped tubing and the ink receptacle septum needle for obstruction. 5. Troubleshoot the venturi system - use the temporary gauge manifold to check the venturi vacuum. 6. Replace the ink core, if required.
		Grounding is not correct	Check the green ground wire and lug under the motor cover

Table 9-8: Warning Icons (Continued)

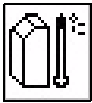
Warning	Reason	Causes	Action
Cabinet Hot 	The cabinet temperature measured by the CSB is greater than 70° C (158° F)	The electronics compartment is overheating.	<ol style="list-style-type: none"> 1. Open the electronics compartment. 2. Inspect the electronics compartment components for damage or overheating. 3. If possible, operate the printer with the electronics compartment door open and monitor the <i>Cabinet Temperature</i> using the <i>Diagnostics Screen Two</i>.
		The ambient temperature is too high.	<ol style="list-style-type: none"> 1. Move the printer to a location where the ambient temperature is lower, or attempt to lower the temperature at the current location. 2. Monitor the <i>Cabinet Temperature</i> using the <i>Diagnostics Screen Two</i>.
		The heat sink is insulated or obstructed.	Remove the insulation / obstruction from the vicinity of the heat sink.
		The mains power supply is defective.	<ol style="list-style-type: none"> 1. Check the voltages from the mains power supply being supplied to the CSB. 2. Replace the mains power supply if found faulty.
		The CSB is defective.	Replace the CSB.
		Electronics compartment fan is defective	Make sure the fan operates properly.
		Filters are defective	Make sure the filters are not clogged or dirty. Replace the filters, if required.

Table 9-8: Warning Icons (Continued)



Warning	Reason	Causes	Action
Pump RPM Near Max 	The pump speed is greater than 98% of the maximum value	Ink too thin	<ol style="list-style-type: none"> 1. Check the <i>Diagnostics Screen One</i>. 2. Compare the <i>Target Pressure</i> with the temperature-compensated target pressure. 3. If the <i>Target Pressure</i> is significantly less than (1 bar) than the temperature-compensated target pressure, the ink is too thin. 4. Recover the viscosity by allowing the jet to run continuously, or by flushing and priming the system.
		Leak	<ol style="list-style-type: none"> 1. Inspect the ink compartment, electronics compartment, and umbilical for leaks. 2. Repair if possible. 3. While monitoring the pump speed (rpm) from diagnostic screen 2, tip ink core backwards. If the speed decreases, there is a damaged filter in the core. Replace the core.
		Erroneous velocity indication	<ol style="list-style-type: none"> 1. Clean the printhead. 2. Check the <i>Diagnostics Screen One</i>. 3. Compare the <i>Actual Velocity</i> with the <i>Velocity Set Point</i>. 4. Replace the printhead engine.
		Defective pump or pump at end of life.	<ol style="list-style-type: none"> 1. Inspect electrical connections between the ink core module and the PIB, and between the PIB and the CSB. 2. Open the pump cover, and inspect the pump. 3. Replace the pump.
Ink Core Empty 	Ink core module low probe is uncovered - tank close to empty or empty.	Motor grounding	<ol style="list-style-type: none"> 1. Check ink core connections 2. Check the replenishment cartridges, ink- add circuit and valves. 3. Check Grounding. 4. Check ink cartridge data (expiration date, type, and so on). 5. Check make-up cartridge data. 6. Check if printer must draw any vacuum. 7. Replace the ink core.
Pump Fault	The pump speed is greater than 98% of the maximum value	Refer to <i>Pump RPM Near Max</i> .	Refer to <i>Pump RPM Near Max</i> .

Table 9-8: Warning Icons (Continued)






Warning	Reason	Causes	Action
No Ink Core	No data from ink core smart chip - ink core not plugged in.	Ink core not inserted or not plugged properly. Distorted data is transmitted	<ol style="list-style-type: none"> 1. Insert ink core. 2. Make sure that the connections between the ink core and the printer are correct. 3. Check the ink core data. If necessary, replace the ink core.
Ink Core Service Soon (0.5% Left) 	Ink core module is very near the end of service life.	0.5% ink core life left. Refer Table 8-1 on page 8-1.	Make preparations to replace the ink core module.
Ink Core Service Soon (2% Left) 	Ink core module nearing the end of service life.	2% ink core life left. Refer Table 8-1 on page 8-1.	Make preparations to replace the ink core module.
Ink Core Service Soon (5% Left) 	Ink core module nearing the end of service life.	5% ink core life left. Refer Table 8-1 on page 8-1.	Make preparations to replace the ink core module.
Ink Core Service Soon (10% Left) 	Ink core module nearing the end of service life.	10% ink core life left. Refer Table 8-1 on page 8-1.	Make preparations to replace the ink core module.
Ink core will expire in x days	nk core module nearing end of service life, where x represents number of days remaining.		Make preparations to replace the ink core module.
Product Delay Too Short 	Compile time greater than product delay.	Not enough time to build a message.	<ul style="list-style-type: none"> • Enable the double buffering option. • Increase the print delay. • Check the product detector for double triggering problems.

Table 9-8: Warning Icons (Continued)




Warning	Reason	Causes	Action
Inter-print Gap Too Short* 	Insufficient time to compile between prints.	Not enough time to build a message.	<ul style="list-style-type: none"> • Enable the double buffering option. • Increase the print delay. • Check the product detector for double triggering problems. • If continuous print is active, increase the distance between the prints. • Make sure the message does not have leading or trailing spaces.
Print Queue Too Deep* 	Too many products between PEC and printhead.	Continuous Print delay set incorrectly	Increase the distance between repeat prints.
		Check Product Detector	<ul style="list-style-type: none"> • Check the setup and sensing of the detector for double triggering problems. • Reduce the printhead to product detect distance settings.
		Message stretched	Check the line speed setting to make sure that the printer is printing at the proper speed.
		Encoder Problem	Check the shaft encoder and settings to make sure that the messages are printed completely and that the code is not stretched over several products.
Print Overlap* 	Print starts before end of current print.	Check Product Detector	Check the setup and sensing of the detector for double triggering problems.
		Message stretched	Check the line speed setting to make sure that the printer is printing at the proper speed.
		Encoder Problem	Check the shaft encoder and settings to make sure that the messages are printed completely and that the code is not stretched over several products.
		Print Settings	Toggle media width filtering.

Table 9-8: Warning Icons (Continued)


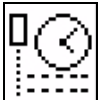
Warning	Reason	Causes	Action
No Time to Phase* 	Less than 6 milliseconds from the end of one print to the beginning of the next.	The line speed is too slow	Increase the line speed, if possible.
		The distance between adjacent products is too short.	Increase the distance between adjacent products, if possible.
		The message is too long.	Reduce the message length, if possible.
		The selected font is too big.	Enter the message again using a smaller font, if possible.
No Time for TOF 	The printer is unable to acquire an actual velocity and thus cannot perform TOF velocity control.	No phase profile.	1. Observe <i>Diagnostics Screen One</i> . Note the <i>Phase Profile</i> . 2. If phase profile is not present (all zeroes), allow the printer to adjust the phase threshold to attempt and acquire a phase profile. 3. If the phase threshold is reduced to the minimum value and a phase profile still has not been acquired, see causes and perform actions under "Phase Threshold Error" on page 9-16".
		The printer is unable to set the modulation automatically.	1. Observe <i>Diagnostics Screen One</i> . Note the <i>Phase Profile</i> . 2. If the phase profile is erratic (1's and 0's present, but randomly), the modulation value acquired automatically by the printer may be erroneous. 3. Perform a visual inspection of the printhead to confirm incorrect modulation value. 4. Attempt to manually set the modulation to restore break-off; monitor diagnostics screen to assess status of automated controls. 5. If modulation cannot be restored manually, see causes and actions under "Phase Threshold Error" on page 9-16.

Table 9-8: Warning Icons (Continued)


Warning	Reason	Causes	Action
Overspeed* 	The message cannot be printed at the required width	The line speed is too fast.	<ol style="list-style-type: none"> 1. Reduce the line speed. 2. If the encoder source is Internal, adjust the width to obtain the desired characters per inch.
		The width setting is too low.	<ol style="list-style-type: none"> 1. Increase the width setting. 2. Test the print to see if the warning condition gets cleared.
		The max printed dots parameter is too high	<ol style="list-style-type: none"> 1. Edit the current message; examine the max printed dots parameter. 2. Reduce the max printed dots to the minimum allowable value.
		The selected font is too large.	Create a new message - use a smaller font if this is feasible. Ensure that the max printed dots is set to the minimum allowable value.
		Continuous Print problems	<ol style="list-style-type: none"> 1. Increase the continuous print delay. 2. Increase the print delay. 3. Check the product detector for any noise or multiple detects.
Maximum Print Rate Exceeded Current print go received less than one millisecond from last print go		Print Matrix problems	Make sure that the print matrix is correct.
		Product detector problems	Check product detector for any noise or multiple detects.
		Shaft Encoder problems	Correct the parameters for character pitch.
		Line speed problems	Check line configuration to make sure that the line speed is set up correctly.
No Valid Ink Parameters	Ink core module not programmed or invalid values in smart chip	Ink core not inserted or not plugged properly. Distorted data is transmitted	<ol style="list-style-type: none"> 1. Insert ink core. 2. Make sure that the connections between the ink core and printer are correct. 3. Check the ink core data. If necessary, replace the ink core.
Possible Ink Coefficient Update	Ink cartridge coefficients do not match ink core module coefficients	Ink Core problems	<ol style="list-style-type: none"> 1. Update the ink core data. 2. Check the make-up and ink cartridge parameters. 3. Check the ink core parameters.

Table 9-8: Warning Icons (Continued)

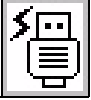


Warning	Reason	Causes	Action
USB Connection Is Over Current 	External USB device drawing excessive current	Defective, or improper USB flash drive.	Use a different USB flash drive.
Suspected Head Heater Failure	Heater set to 100% for more than one minute to achieve set temperature.	Printhead valve deck problems	Check whether the valve deck assembly is mounted correctly (loose screws).
		Wiring problems	Check the wiring between the Umbilical and PIB.
Creating Raster Catalog	Software busy. Raster being replaced. Cannot print.		Wait for raster catalog to complete.
Bad Nozzle!!! Please Replace Or Repair	Nozzle taking excessive current - possible short circuit.		<ol style="list-style-type: none"> 1. Replace the printhead engine. 2. Check the connection of the printhead engine to the copper pads below the printhead engine. 3. Check the nozzle drive signal on the CSB.
Tank Not Filling	Ink core module still LOW after 5 attempts to add ink to increase the level.		<ol style="list-style-type: none"> 1. Check for the loose pipes. 2. Check for the ink leak. 3. If the problem continues, call Videojet Technologies Inc. Customer Service Department at 1-800-843-3610 (United States only), or contact the local Videojet Technologies Inc. representative
DAC Overflow 	Charge DAC not operating correctly - CSB hardware fault.		Replace the CSB. If the problem continues, call Videojet Technologies Inc. Customer Service Department at 1-800-843-3610 (United States only), or contact the local Videojet Technologies Inc. representative
DAC Comms Error 	Charge DAC not operating correctly - CSB hardware fault.		Replace the CSB. If the problem continues, call Videojet Technologies Inc. Customer Service Department at 1-800-843-3610 (United States only), or contact the local Videojet Technologies Inc. representative

Table 9-8: Warning Icons (Continued)

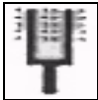

Warning	Reason	Causes	Action
Tuning Required 	Nozzle tuning is required and the Auto Tuning function is disabled.	Modulation voltage about to adjust itself outside the control range (0 - 200 VAC)	Enable Auto tuning.
TOF Warning	The <i>Actual Velocity</i> deviates from the <i>Velocity Set Point</i> by +/- 1%.	Erroneous TOF measurement.	Clean and dry the printhead.
		Nozzle partially obstructed.	Perform a nozzle backflush.
		Improper modulation setting.	See actions above for "The printer is unable to set the modulation automatically." on page 9-30.
		Pump or pressure problem.	See causes and actions described in "Pressure Too Low" on page 9-20.
Service Due 	Printer requires servicing.	The life of ink core module is over.	Replace the ink core module.
		Valve error	<ol style="list-style-type: none"> 1. Run a <i>Valve Test</i> and a <i>Hardware Self Test</i> to determine which valve is defective. 2. If a valve (or valves) is not functioning, check electrical connections. Attempt to clear any clogged valves. 3. If all the valves are functioning, check CSB test points related to valves to identify potential electrical issues. They are: TP1 for CPU RD (refer to "CSB Test Points" on page 9-39).

Table 9-8: Warning Icons (Continued)

*Disable this warning if not required (under *Configure* menu)

Voltage Checks

Table 9-9 is a representation of the power connector with the voltages shown for each pin. Use Pin 2 as the 0 V reference.



Figure 9-2: CSB Power Connectors

Note: Allow $\pm 5\%$ tolerance on all voltages. The power connector must be connected to the CSB to carry out this check.

PIN 4 -15V	PIN 8 No-connect
PIN 3 +5 V	PIN 7 0 V
PIN 2 0 V	PIN 6 +24 V
PIN 1 +15 V	PIN 5 +5 V

Table 9-9: CSB Power Connector Voltage Check

Jet Start and Stop Diagnostics

Use the following flow charts to diagnose problems that occur because of dirty inkjet starts and stops.

Quick Start Diagnostics

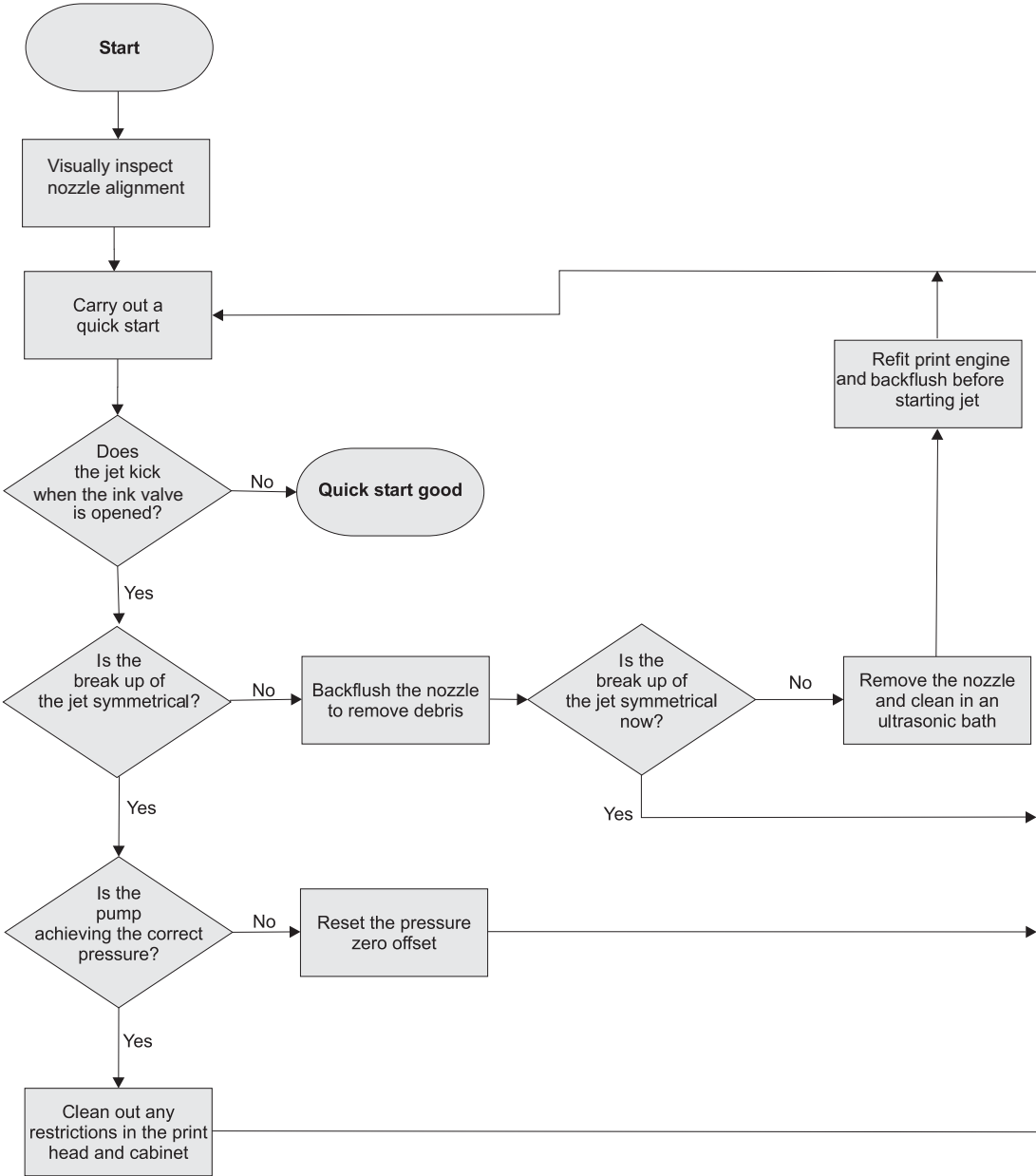
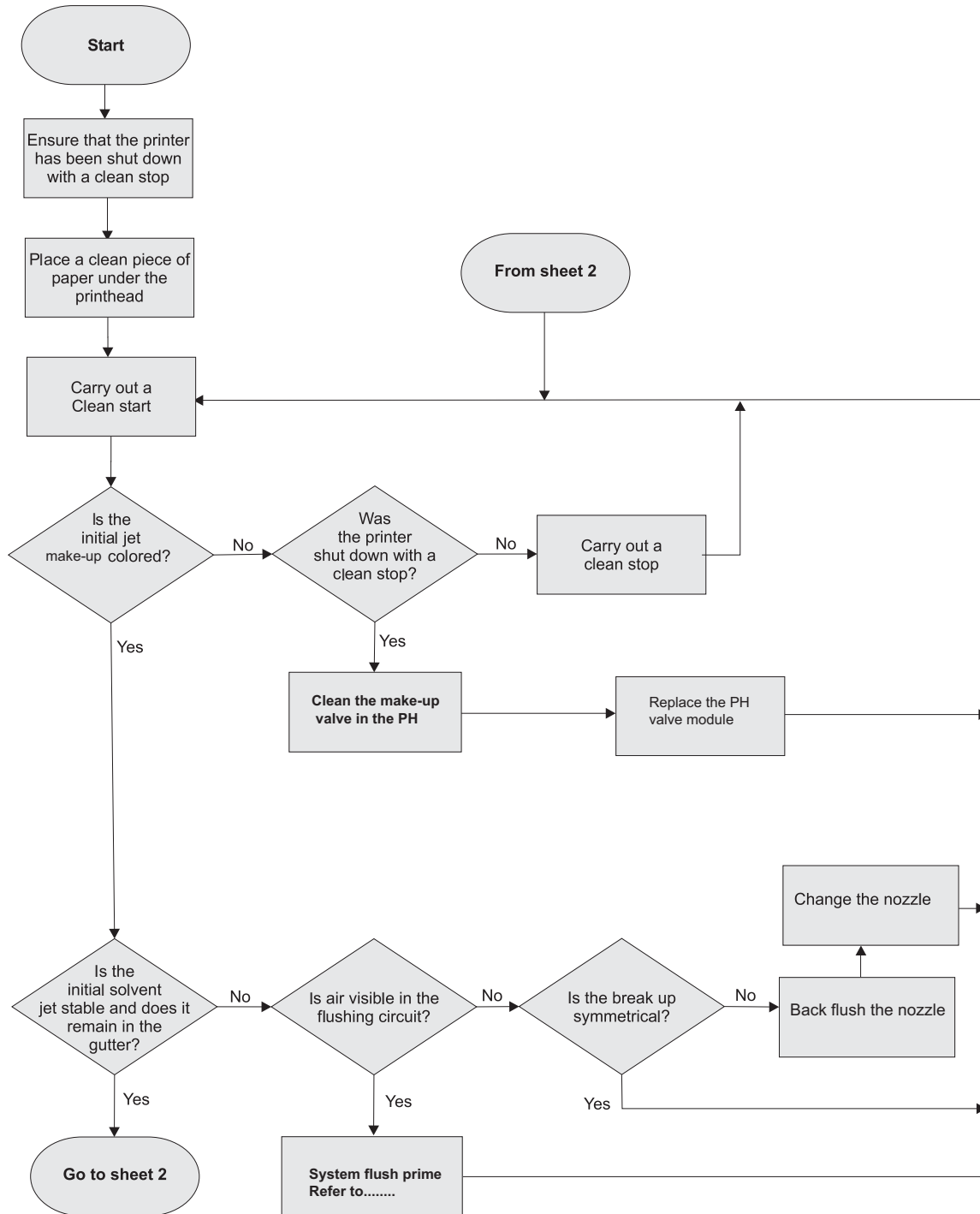
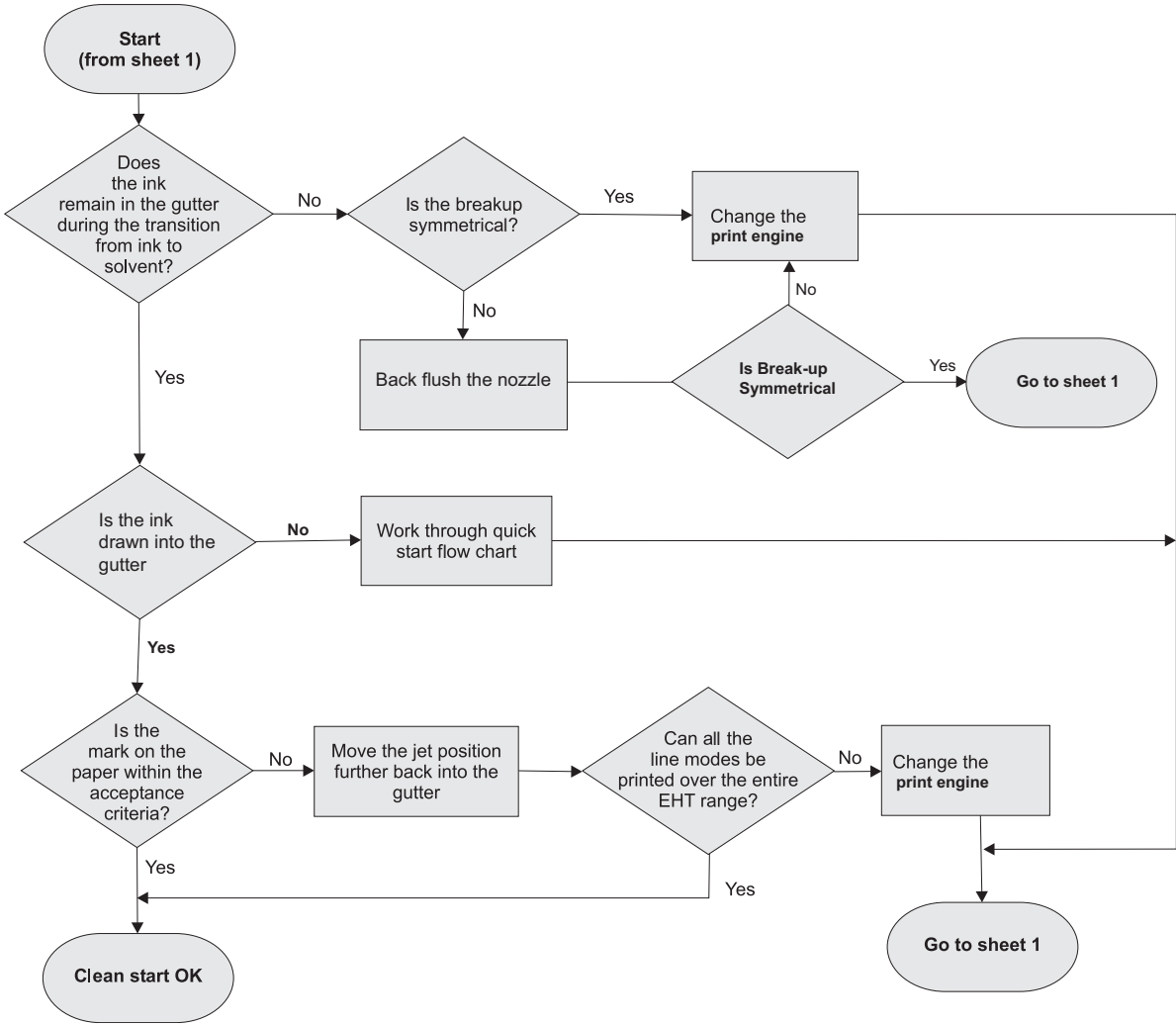


Figure 9-3: Quick Start Diagnostics Flowchart

Clean Start Diagnostics



Sheet 1



Sheet 2

Figure 9-4: Clean Start Diagnostic Flowchart

Clean Stop Diagnostic

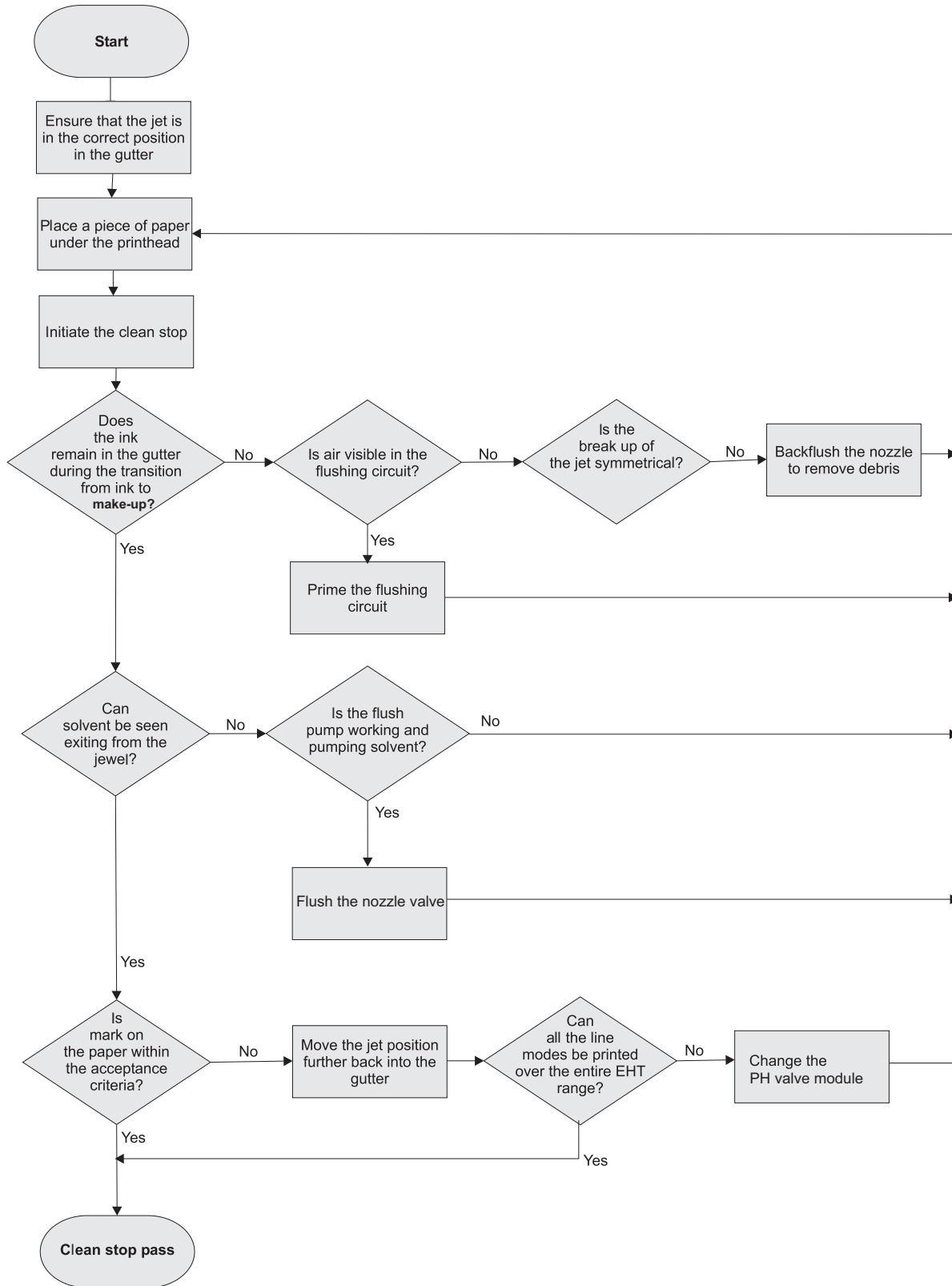


Figure 9-5: Clean Stop Diagnostics

CSB Test Points

Refer to Appendix C, “Universal CSB Test Points” for complete information on test points of the new Universal CSB.

Safe Screen Software Upgrade

For Videojet 1220/1520 printers running CE Image 1.1.30 and later versions, software may be installed using the package installer feature which bundles software, firmware, rasters, fonts, languages and other binaries into a single distributable which is installed in one step.

Note: This section emphasizes the need to back up viscosity data and messages for softwares 315B and later.

Important Notes

- For all new printers, refer to “Procedure for installing .INST or INST3 files” on page 9-42 for installing .INST or .INST3 files as the printer has no messages to back up and restore.
- If the printer has the latest WINCE, you can go to “Procedure for installing .bin,.nb0, 3.bin and 3.nb0 files.” on page 9-45 for installing of other CE components.

Update from USB (.exe files)

Step 1 - Prepare for .exe Update

Make sure the following files are present on USB Flash Drive:

- CalypsoUpdate43s.exe

Files needed for the new Universal CSB:

- CalypsoUpdate43s.exe3

Step 2 - Installation of .exe files

For Videojet 1220/1520:

- 1 Insert USB Flash Drive into USB port.
- 2 Login to the UI at password Level 3.
- 3 Press *CTRL+F4* to select *Copy From USB*.

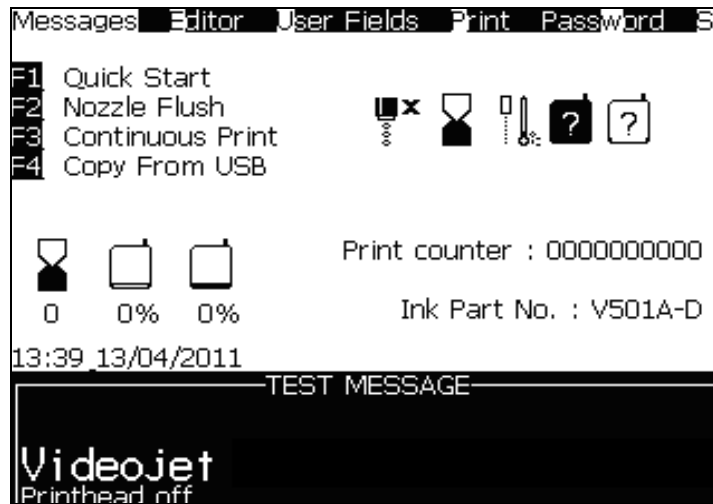


Figure 9-6: Main Screen

- 4 Select *CalypsoUpdate43s.exe* from list and press *Enter*.
- 5 Printer should display when complete and alert that printer needs to be restarted.

Backup Calibration Data and Messages

Step 1- Backup Calibration Data and Messages

Before starting, make sure there are no files on the USB Flash Drive.

For Videojet 1220/1520:

- 1 Insert USB Flash Drive into USB port.
- 2 Login to the UI at password Level 3.
- 3 Navigate to *Configure > Full System Backup*.

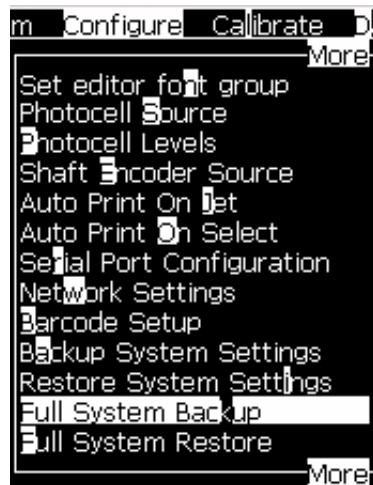


Figure 9-7: Configure Menu

- 4 Follow prompts to copy data to USB Flash Drive.
- 5 Printer should display *Backup Complete*.

Procedure for installing .INST or INST3 files

Step 1 - Prepare Binary

- Copy the appropriate .INST and INST3 file into the root of a USB Flash Drive.
- Do not insert USB Flash Drive until directed.
- Make sure printhead cover/sleeve is installed.

Step 2 - Installing INST Files

- 1 Turn the printer on with the right contrast arrow key held down. This will access the *Safe menu*.

Note: Safe menu is available only in English.



Figure 9-8: Safe Menu

- 2 Login using level 3 password for date listed on Safe Screen. A *Safe Mode Menu* appears.
 - Choose option 1 - *Reset Messages*, follow prompts, do not restart the printer when complete and exit back to main menu.
 - Choose Option 2 - *Reset Configuration Files*, follow prompts, do not restart the printer when complete and exit back to main menu.
 - Choose Option 5 - *Wipe out Calypso*.

Note: This process will wipe the existing viscosity calibration data.

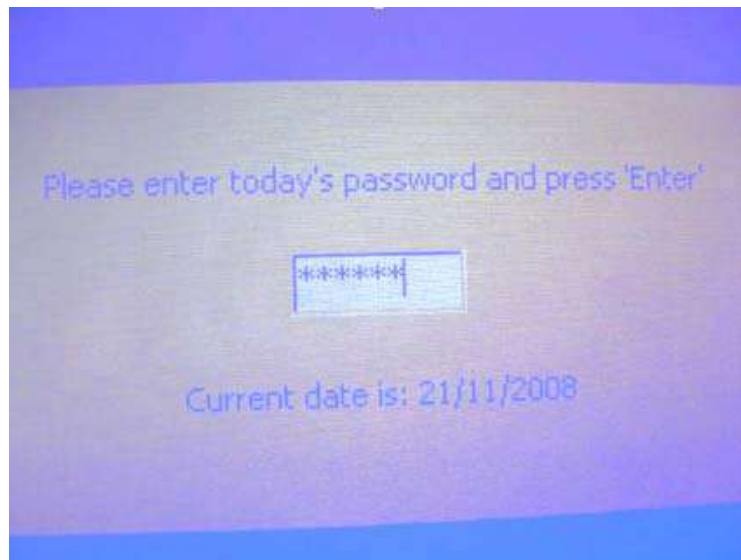


Figure 9-9: Safe Mode Menu

- 3 Press '1' to confirm.
- 4 Wait for onscreen confirmation that this has completed.
- 5 The "Procedure for installing .bin,.nb0, 3.bin and 3.nb0 files." on page 9-45 is not needed if Window CE version has not changed. If new CE version, do not turn off the printer, proceed to "Procedure for installing .bin,.nb0, 3.bin and 3.nb0 files." on page 9-45, otherwise proceed to Step 6.
- 6 Turn off the printer and wait for ten seconds, then turn the printer on.
- 7 A dialogue will appear asking the user to choose between the two interfaces.

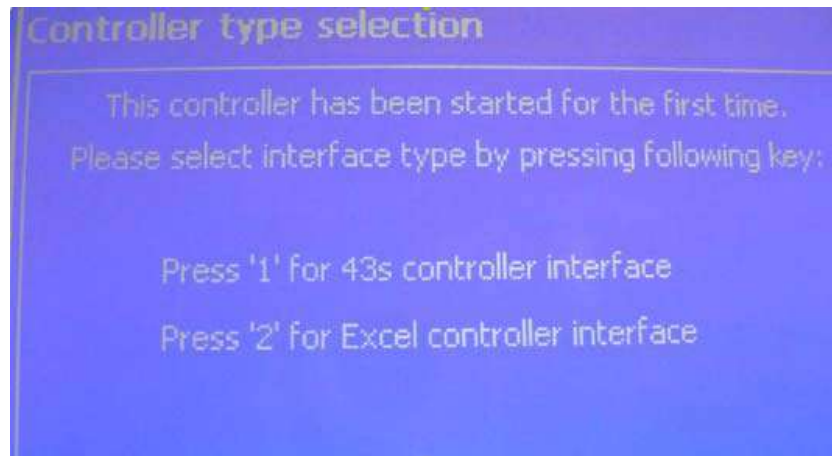


Figure 9-10: Controller Type Selection

- 8 Insert the prepared USB Flash Drive into USB port.
- 9 Wait for ten seconds and then select the appropriate interface for your machine.
- 10 The .inst package will install and when complete, printer will re-start.

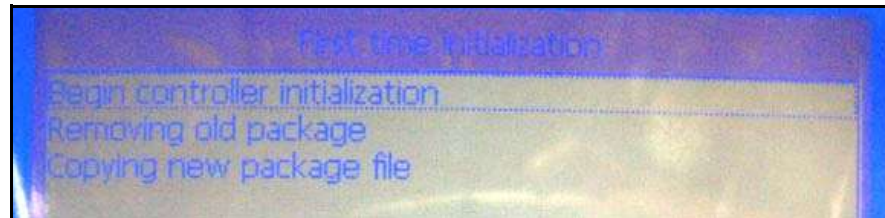


Figure 9-11: Installation

- 11 Enter Level 3 password.
- 12 HV/EHT will re-calibrate, press *Enter* to start calibration.
- 13 Perform *Update Ink Core Parameters*.
- 14 Proceed to “Restoring Viscosity Data And Messages” on page 9-47 for installation of viscosity calibration and messages.

Procedure for installing .bin,.nb0, 3.bin and 3.nb0 files.

Make sure the following files are present on USB Flash Drive:

- nk.bin
- Stepldr.nb0
- Eboot.nb0

Files needed for the new Universal CSB

- nk3.bin
- Stepldr3.nb0
- Eboot3.nb0

Do not insert USB Flash Drive until directed.

- 1 Press option 7 to *Program Window Ce Components* in *Safe Mode Menu*.

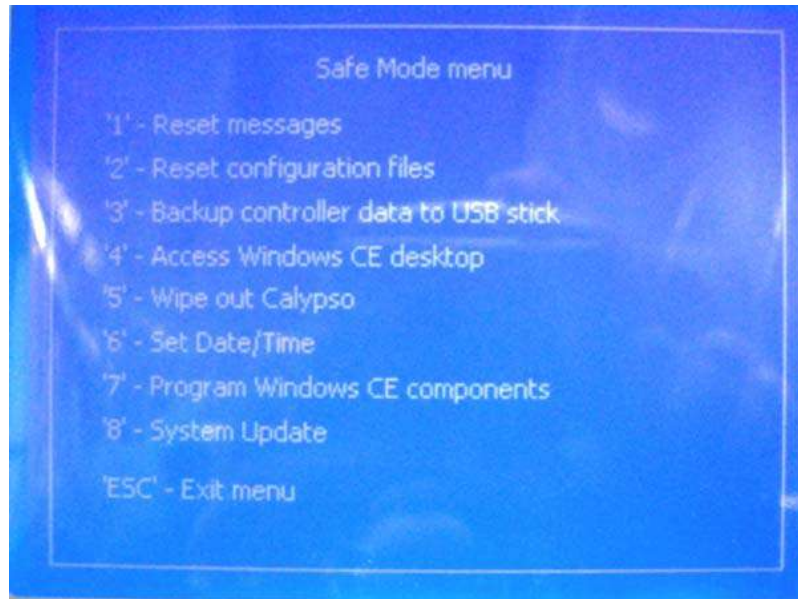


Figure 9-12: Program Windows CE Components

- 2 Insert USB Flash Drive into USB port.
- 3 Press option 4 to *Upgrade the StepLoader* and follow prompts.

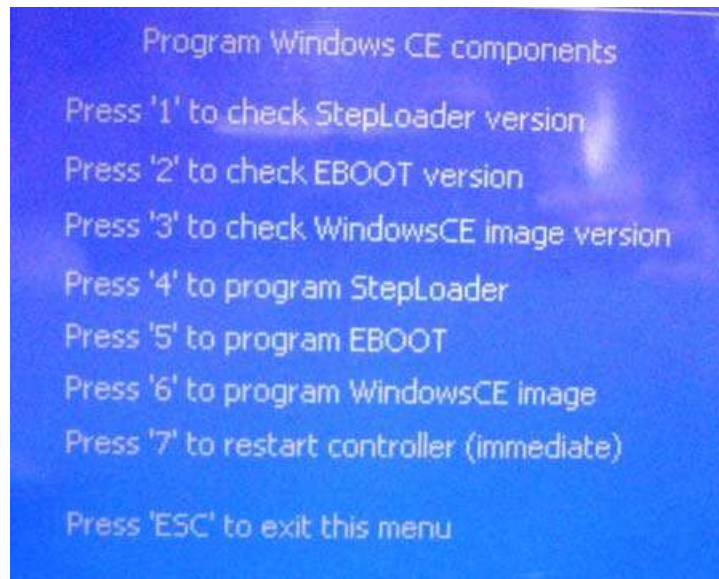


Figure 9-13: Program Windows CE Components

- 4 Once Upgrade is complete, press *ESC* if additional items need to be upgraded otherwise go to Step 8.
- 5 Press option 5 to *Upgrade the EBOOT* and follow prompts.
- 6 Once Upgrade is complete, press *ESC* if additional items need to be upgraded otherwise go to Step 8.
- 7 Press option 6 to *Upgrade the WindowCE image*.
- 8 Once update is complete, remove USB Flash Drive and restart the printer and go back to Step 7 from “Step 2 - Installing INST Files” on page 9-42.

Restoring Viscosity Data And Messages

For Videojet 1220/1520:

- 1 Navigate to *Configure > Full System Restore*.
- 2 Printer will provide an option to update *Messages, Settings, Rasters, All, Fonts* and *Application*. Use the left and right arrow keys to select required option.
- 3 Select to restore *Settings (Calibration Data)*.



Figure 9-14: Restore Settings

- 4 After the settings have been updated, press any key and printer will reboot.

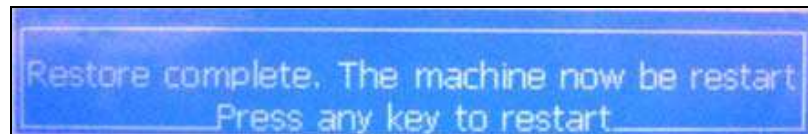


Figure 9-15: Restore Settings

- 5 After printer reboots, repeat Step 2 and Step 3 but select *Messages*.
- 6 Printer is ready to put back into operation.

How to Clear a Clogged Nozzle

To clear the blockage in the nozzle, you require to do the procedures described in this section. A blockage in the nozzle may be present if the printhead engine module is showing signs of a misaligned ink stream/loss of ink stream.

Perform a Nozzle Flush

Do the following tasks to perform a nozzle flush:

- 1 Remove the printhead cover screw that fastens the printhead cover to the printhead chassis and remove the printhead cover (see Figure 4-26 on page 4-20).
- 2 Support the printhead in a suitable stand and place a container underneath to collect any extra solvent.
- 3 Make sure the container is connected to the electrical ground.
- 4 Initiate *System > Nozzle Flush*.

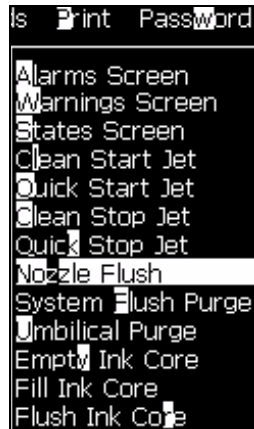


Figure 9-16. Nozzle Flush

- 5 Press the *Enter* key. The nozzle orifice must be washed with washdown to clear any blockages while nozzle flush is running.
- 6 If the problem is not resolved even after five nozzle flushes, perform a clean start (refer to “Perform a Clean Start” on page 9-49).

Perform a Clean Start

For information on how to perform a clean start, refer to “Clean Stop and Clean Start the Printer” on page 4-25.

A clean start will clean the nozzle with a higher operating pressure.

You can perform the Clean Start procedure for three times. If the ink jet remains misaligned, perform system flush purge (refer to “Perform System Flush Purge (with Nozzle Attached)” on page 9-49).

Perform System Flush Purge (with Nozzle Attached)

Do the following tasks to perform a system flush purge with the nozzle attached:

- 1 Start System Flush Purge (select *System > System Flush Purge*).



Figure 9-17: System Flush Purge

- 2 Allow the system flush purge to run completely. Do not stop the purge prematurely.
- 3 After system flush purge is completed, perform a clean start (refer to “Clean Stop and Clean Start the Printer” on page 4-25).
- 4 If the ink stream is still misaligned, clean the nozzle with a syringe and cleaning liquid (refer to the next procedure).

Clean the Nozzle with a Syringe and Cleaning Liquid

Do the following tasks to clean the nozzle with a syringe and cleaning liquid:

- 1 Turn off the mains power switch of the printer.
- 2 Turn off the AC power supply to the printer.
- 3 Disconnect the mains power cord from the electrical outlet.
- 4 Remove the printhead cover screw that fastens the printhead cover to the printhead chassis and remove the printhead cover (see Figure 4-26 on page 4-20).



Caution

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

- 5 Remove the M2 x 6 socket-head-cap screw that attaches the front tubing manifold to the printhead valve module(see Figure 4-27 on page 4-21).
- 6 Use a syringe to flush the nozzle with 50 ml of cleaning liquid:
 - a. Inject the solvent through the feed side of the manifold. You must see a stream of cleaning liquid that flows out of the nozzle.
 - b. Use an empty syringe to push air through the nozzle. You can repeat the process any number of times as it does not add any fluid to the system.
- 7 If the ink stream is still misaligned, contact Videojet Technologies Inc. Refer to Chapter , “Support and Training” for Videojet contact information.

Note: When the nozzle misalignment clears after a clean start, the ink stream goes out of alignment in the gutter and the system identifies a drop in target pressure that can result in the system erroneously detecting low viscosity fluid. So, it is critical that the nozzle orifice and charge electrode are inspected to verify that a slight misalignment is not present.

How to Correct Loss of Modulation

Do the following tasks if a printhead engine module indicates loss of modulation:

- 1 Perform the following procedures as a slightly misaligned ink stream or partially clogged orifice can cause bad drop formation that causes bad modulation:
 - a. “Perform a Nozzle Flush” on page 9-48
 - b. “Perform a Clean Start” on page 9-49.
- 2 Use a magnifying loupe to inspect the ink stream for drop formation. You must perform this task to make sure that the nozzle creates the droplets.
- 3 If the ink stream remains solid, check the modulation wire (small black wire) on the printhead engine module to make sure that it is not damaged and is correctly connected.
- 4 If you see a broken modulation wire, contact Videojet Technologies Inc. to change the printhead engine module.
- 5 If the modulation wire is not broken, use an oscilloscope to measure the MOD test point on the CSB to make sure that the on-board power supplies the modulation voltage.

- 6 Another possible cause of a loss of modulation is a bad connection under the printhead engine module itself.
 - a. Turn off the printer.
 - b. Remove the printhead engine module and test for continuity between the CSB and the printhead circuit.
 - c. If the continuity is good, install again the printhead engine module.
 - d. Restart the printer.

The Illustrated Part List (IPL) contains the illustrations and the parts lists for the different assemblies in the printer. The parts lists give the part numbers, description and quantity of all the items and the modules in the printer. You can order the items and the modules for which the part numbers are given.

How to Read the IPL

This section describes how the higher assemblies are broken down to their related sub assemblies and other separate parts.

Illustrations

Table 10-1 on page 10-2 shows the symbols used to indicate the different levels of main assemblies in a printer, and the sub assemblies under the main assembly.






Assembly	Symbol
Main Assembly	
↓	
Sub Assembly 1	
↓	
Sub Assembly 2	
↓	
Sub Assembly 3	
↓	
Sub Assembly 4	
⋮	
↓	

Table 10-1: Symbols Representation - Assemblies

⋮ → Indicates further explosion.

Alphabets

- An alphabet is assigned to the main assemblies of a printer and each sub assembly under the main assembly. See Figure 10-1 on page 10-3.

For example: If A, B, C and D identify the main assemblies of a printer, then the alphabets E, F, and so on identify sub assemblies below each main assembly in a sequence.

- The alphabets assigned to main assemblies are used only for one time.
- The alphabets "I" and "O" are not used because they look like the numbers 1 and 0.

Numbers

A natural number (1,2,3....) is assigned to the stand alone parts (in ascending order) through out the breakdown of main assemblies. See Figure 10-1.

Note: The numbers assigned to main assemblies can be used only for one time.

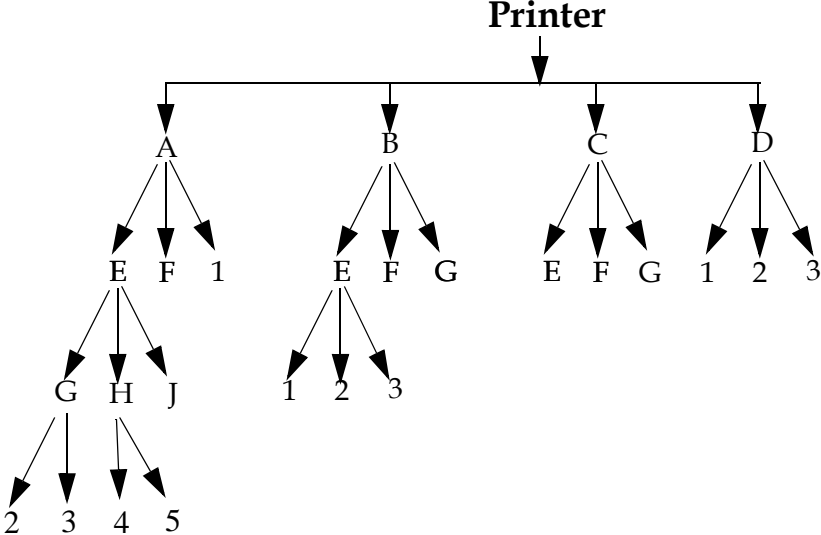


Figure 10-1: Graphical Representation of the Different Subassemblies and Parts

Tables

Figure 10-2 describes the styles used to show the explosion of the main assemblies in parts lists.

	Item Number	P/N	Description	Qty
Main Assembly →	A			
	3			
Subassembly 1 →	E			
	4			
Subassembly 2 →	H			
	5			
Parts under the Subassembly OR Stand-alone Part →	6			
	J			
	7			
	8			

Figure 10-2: Representation of the different Subassemblies and parts in the Table

Notes

Notes provide useful information. Some examples for note are as follows:

Note: To order this item, use part number of item 9 in this table.

Note: This screw is a part of Core Module.

Note: This item can be ordered separately.

Videojet 1220/1520 Printer

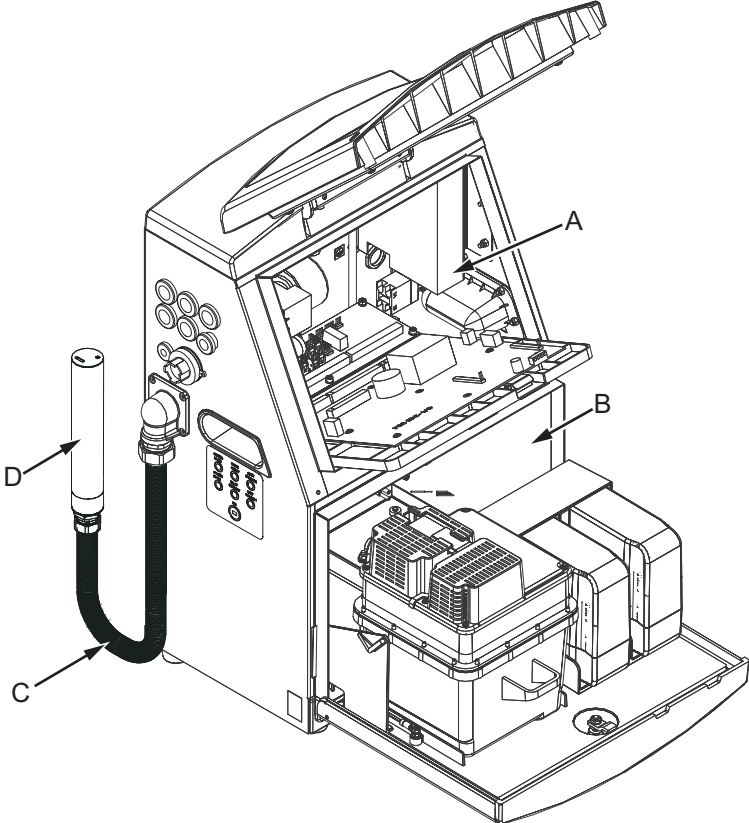


Figure 10-3: Main Parts of the Printer (Videojet 1220)

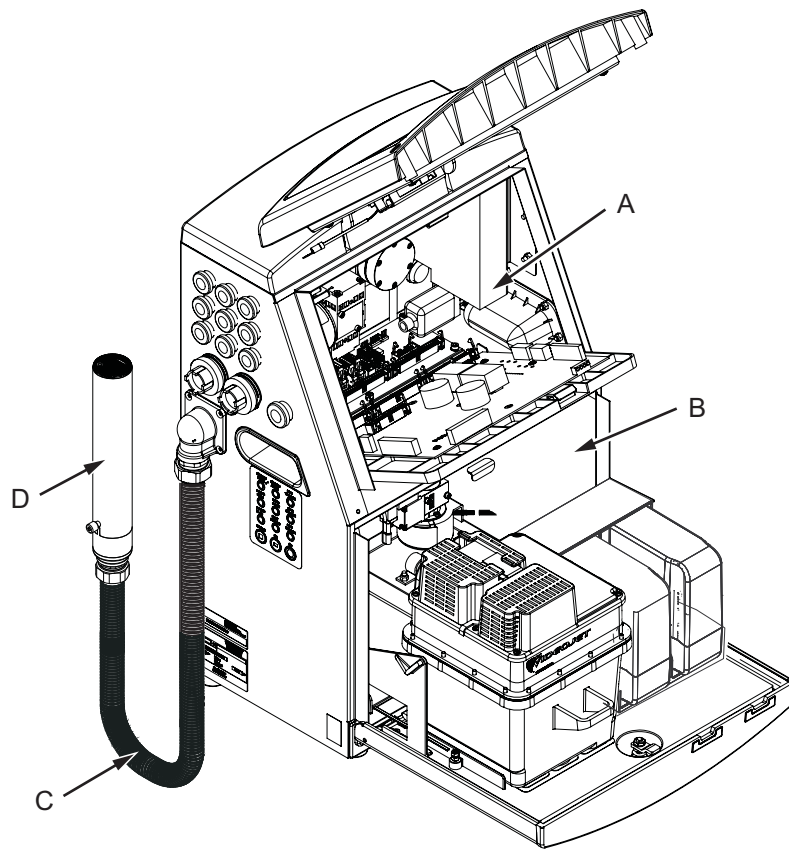


Figure 10-4: Main Parts of the Printer (Videojet 1520)

Table 10-2 shows the sub assemblies of the printer.

Item	Descriptions
A	Electronics Compartment
B	Ink Compartment
C	Umbilical
D	Printhead

Table 10-2: Videojet 1220/1520 Printer Assemblies

Electronics Compartment

A

1220

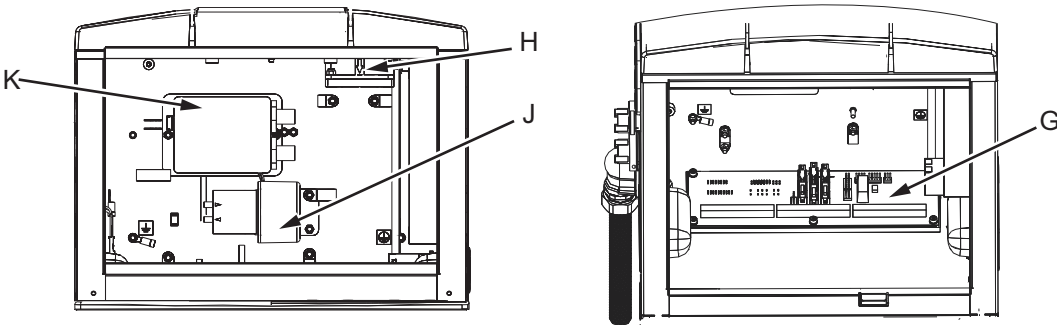
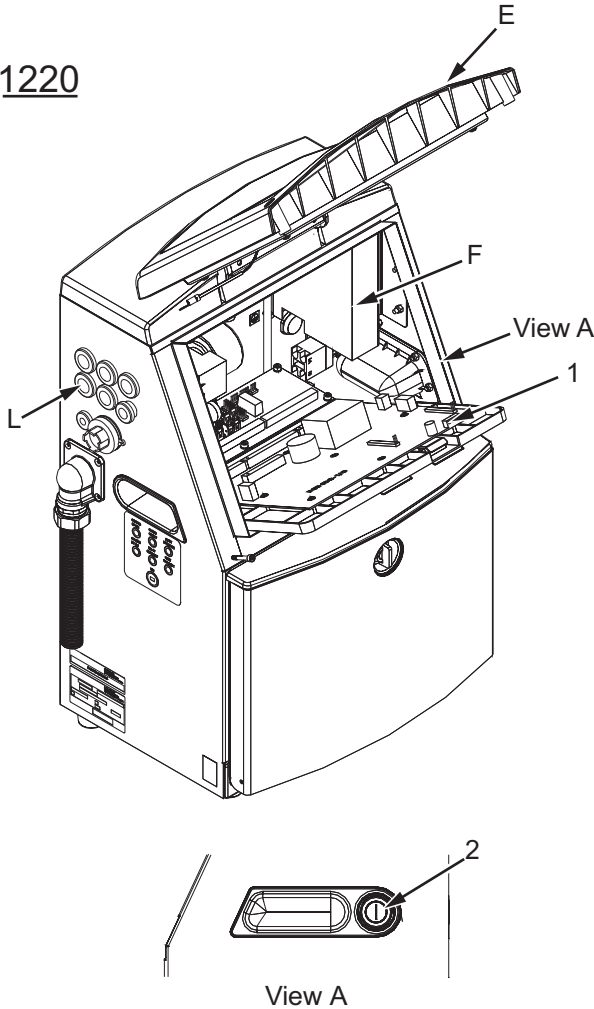


Figure 10-5: Electronics Compartment (Videojet 1220)

A

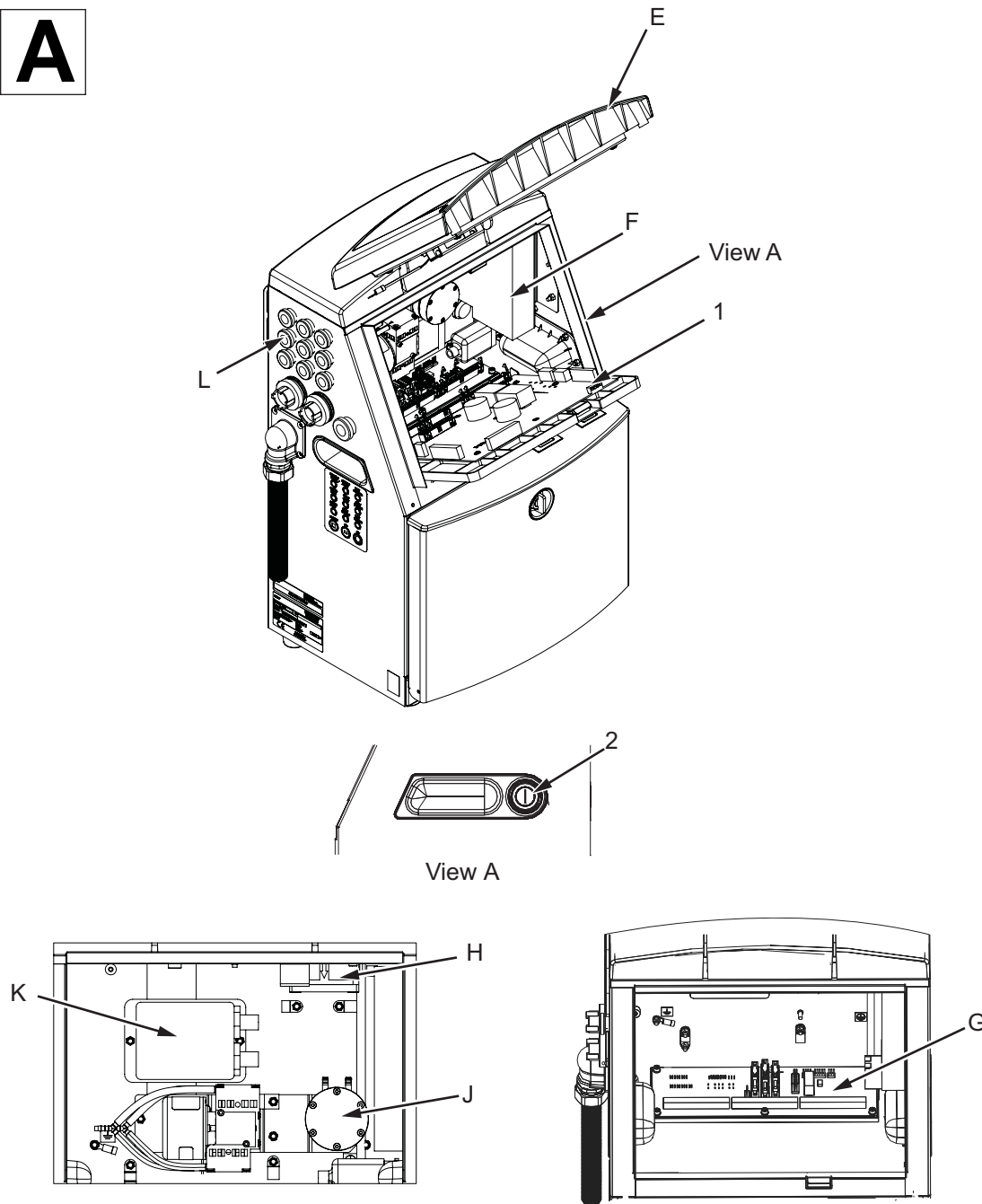


Figure 10-6: Electronics Compartment (Videojet 1520)

Control System Board (CSB) with Back Plate

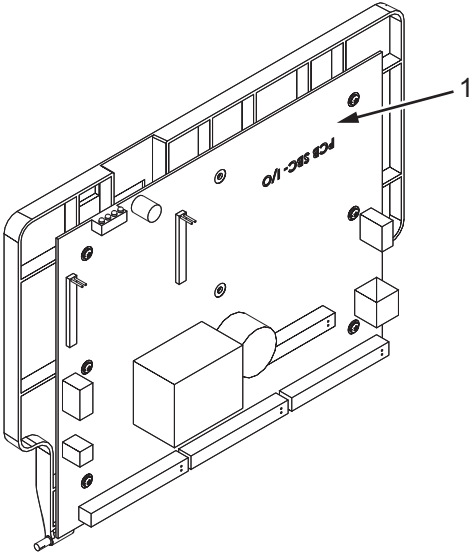


Figure 10-7: Control System Board Assembly

Power Switch

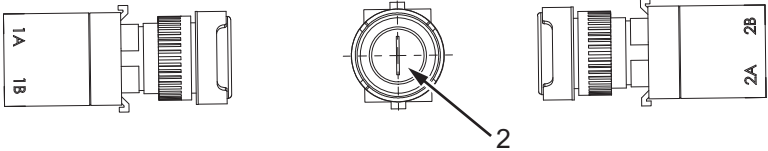


Figure 10-8: Power Switch

Electronics Door Assembly

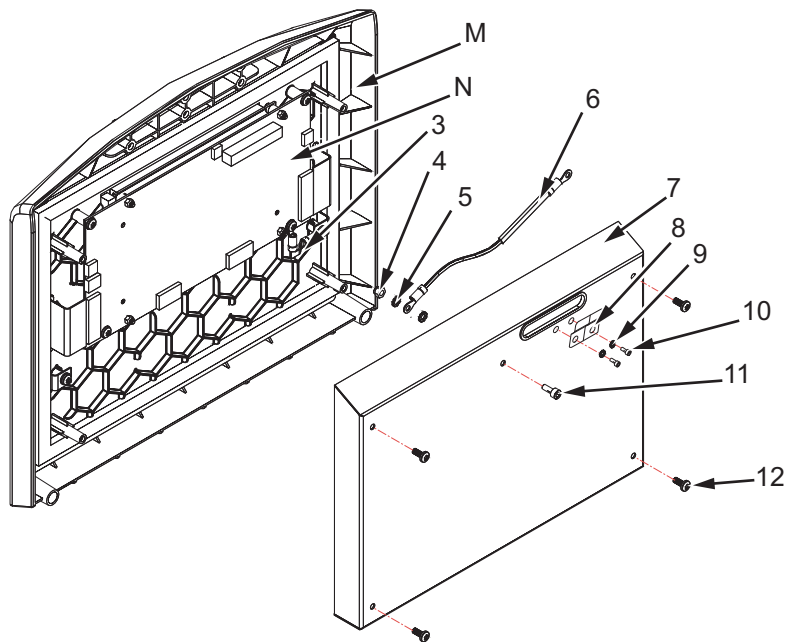


Figure 10-9: Electronics Door Assembly

Display Door

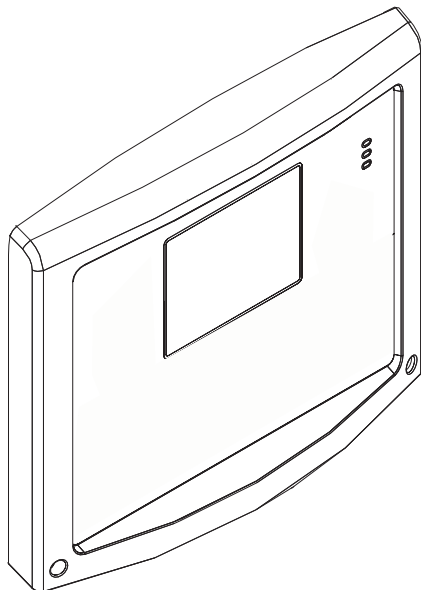


Figure 10-10: Display Door

LCD and FIB Assembly

P

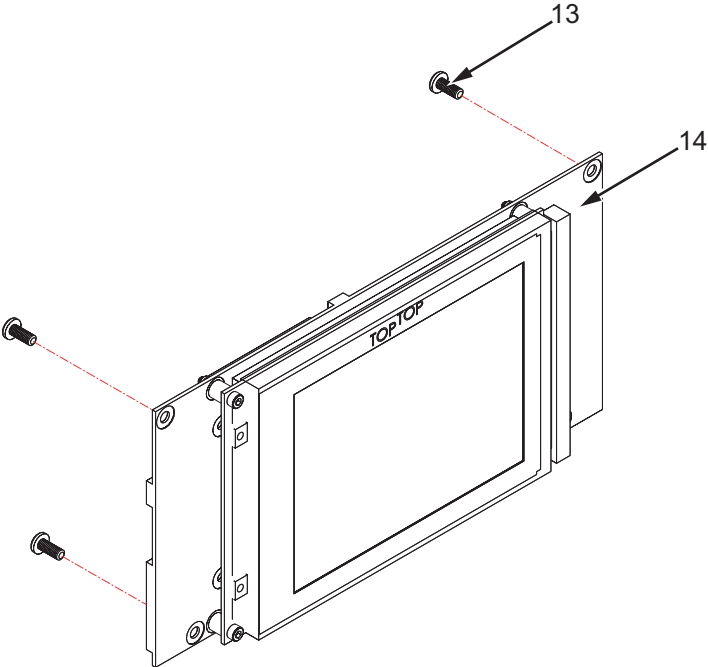


Figure 10-11: LCD and FIB

Power Supply Unit Assembly

F

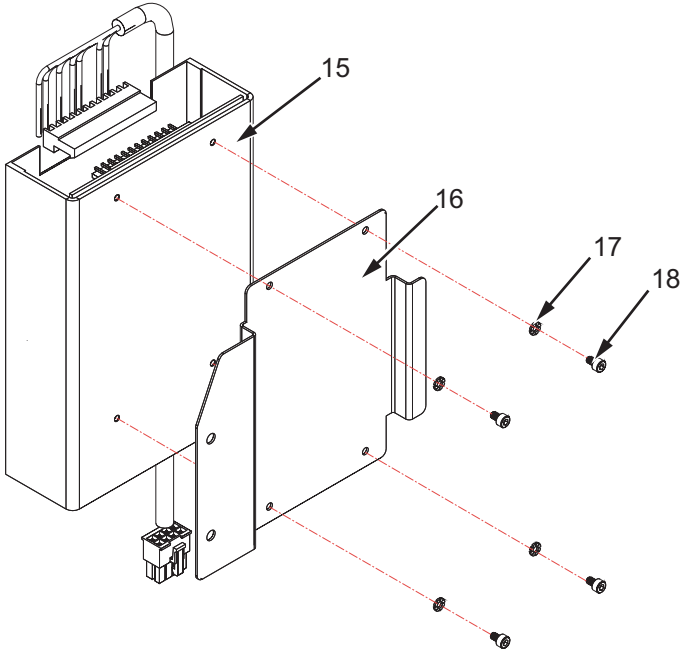


Figure 10-12: Power Supply Unit Assembly

Printer Interface Board Assembly (PIB)

G

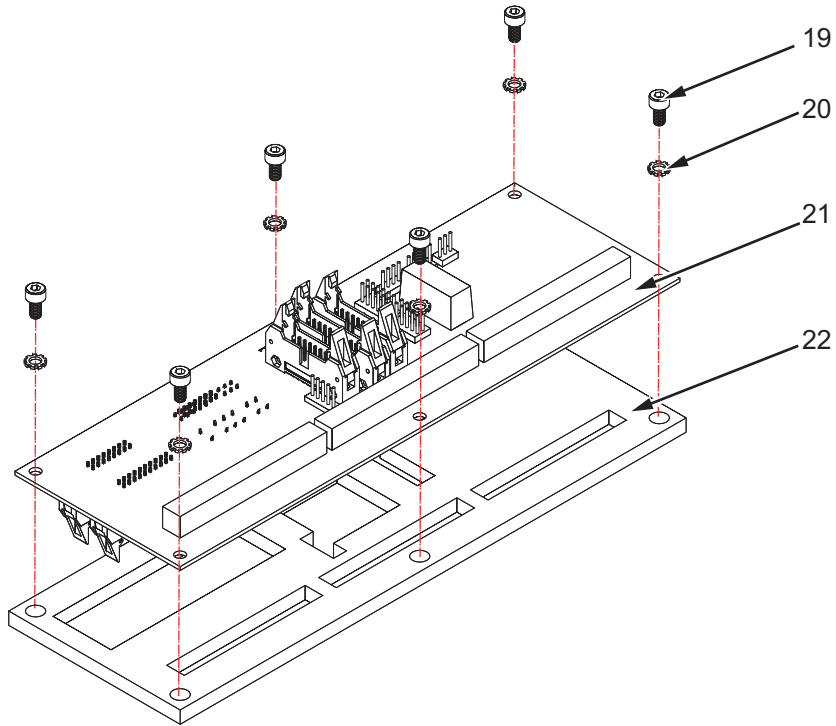


Figure 10-13: Printer Interface Board Assembly (Videojet 1220)

G

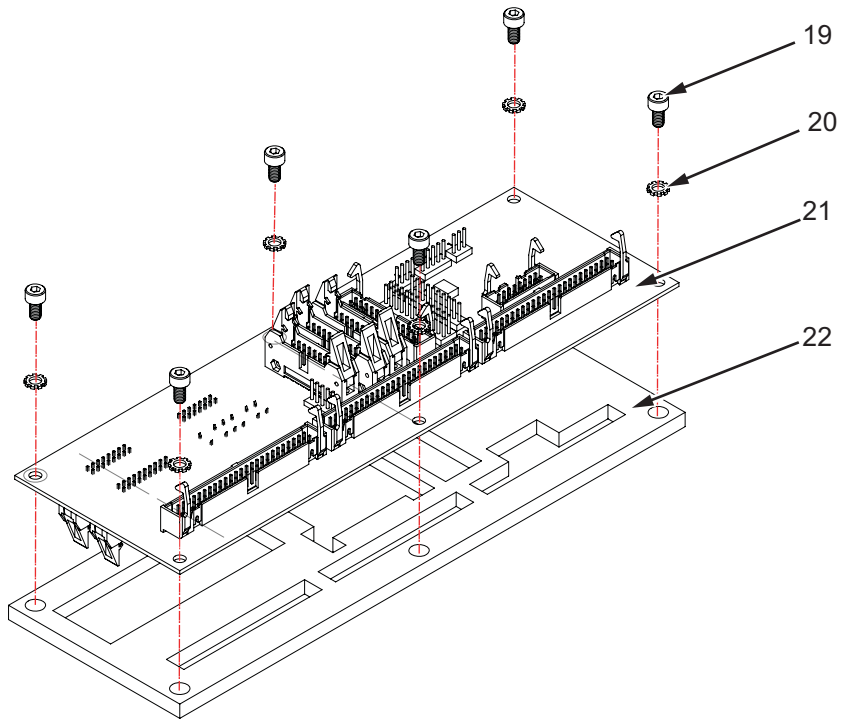


Figure 10-14: Printer Interface Board Assembly (Videojet 1520)

Electronics Fan Assembly

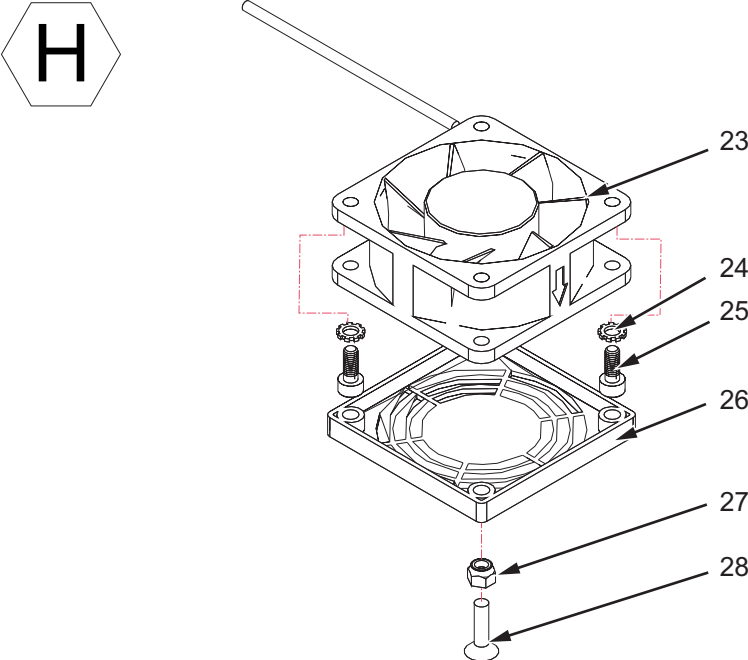


Figure 10-15: Electronics Fan Assembly

Positive Air Pump Assembly (Optional for 1220)

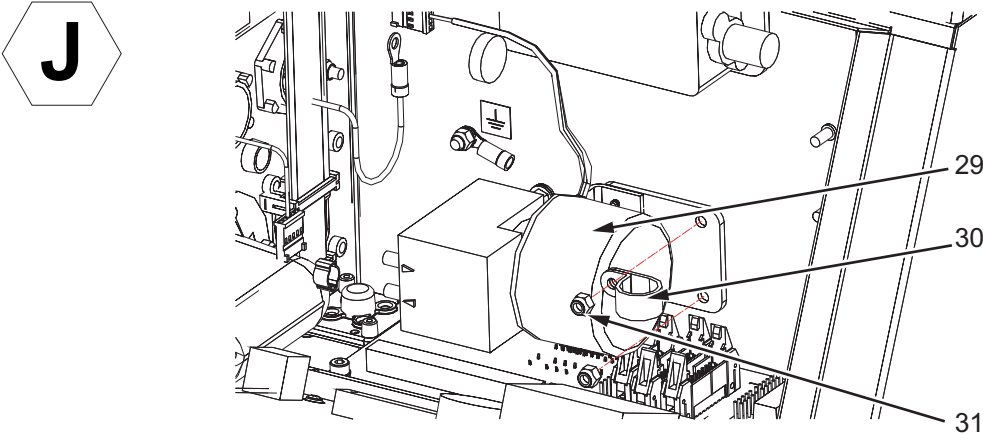


Figure 10-16: Positive Air Pump Assembly (Videojet 1220)

Double Headed Air Pump Assembly (Single Head Printer)

J

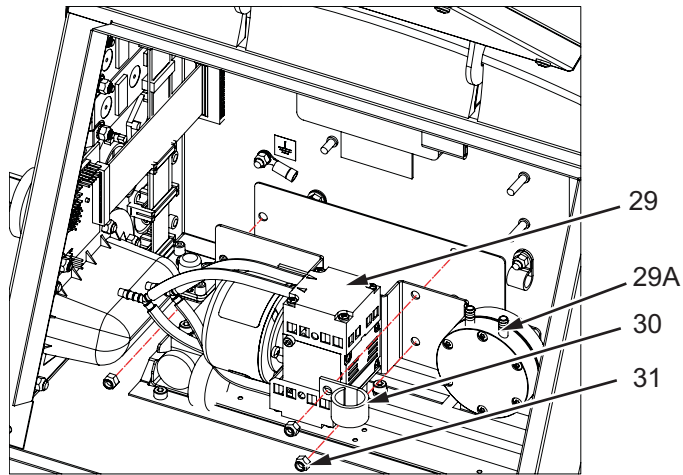


Figure 10-17: Positive Air Pump Assembly (Videjet 1520)

EHT Module

K

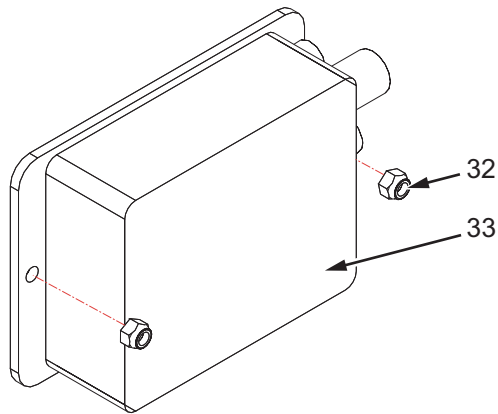


Figure 10-18: EHT Module

Connector Panel

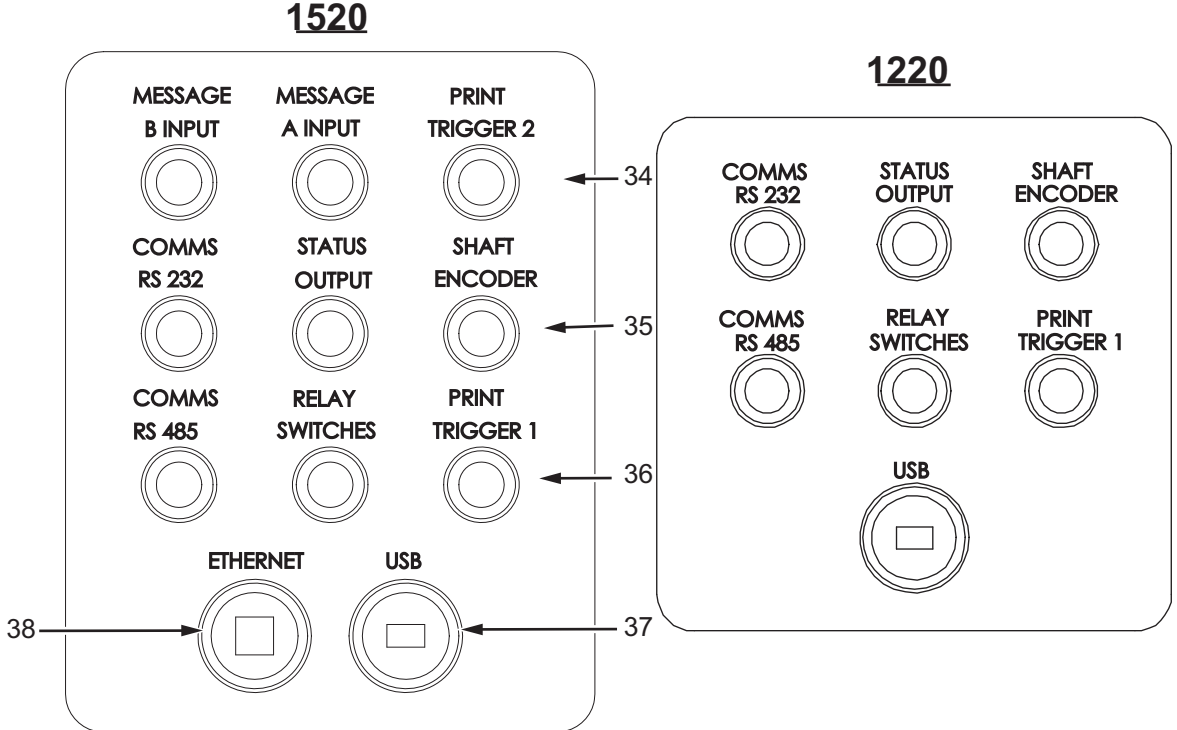


Figure 10-19: Connector Panel

PCB 2 Assembly (Option for Videojet 1220)

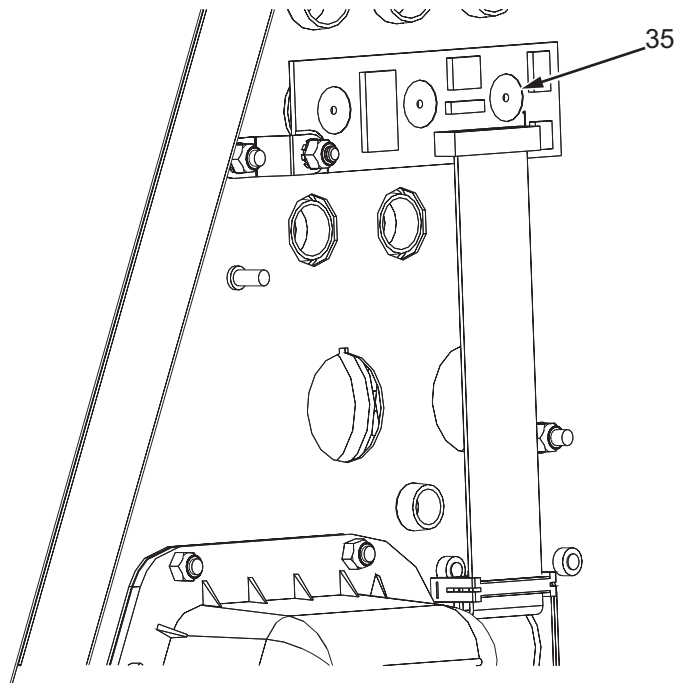


Figure 10-20: PCB 2 Assembly

PCB 1 Assembly (Option for Videojet 1220)

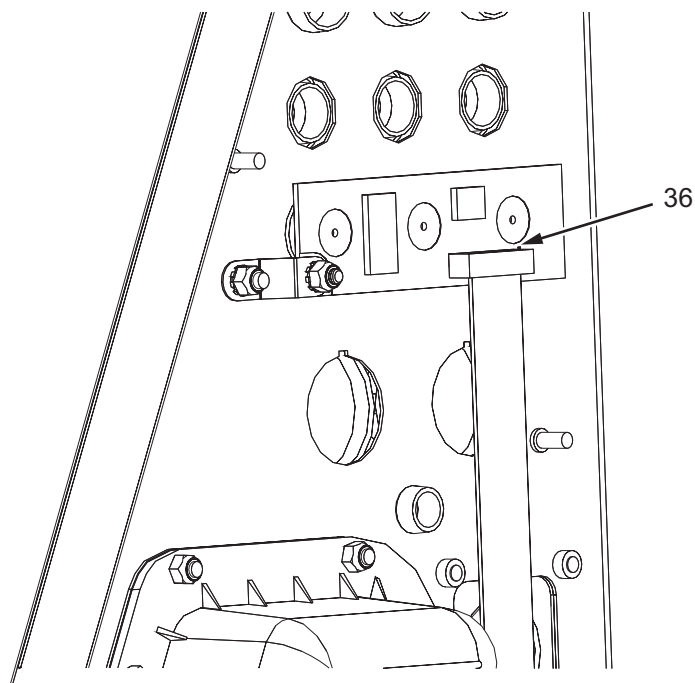


Figure 10-21: PCB 1 Assembly

Item Number	P/N	Description	Qty
A		Electronics Compartment	
1	SP392121 (Videojet 1520) SP392123 (Videojet 1220)	Control System Board (CSB) with Back Plate	1
2	SP219041	Power Switch	1
E		Electronics Door Assembly	
3		Membrane Ground Wire	1
4		M4 Nyloc Nut	1
5		M4 ET Washer	2
6		Display Ground Wire	1
7		Display Rear Cover	1
8		Display Ribbon Connector Clamp	1
9		M4 ET Washer	2
10		M4 x 8 Cap-head Screw	2
11		M4 x 10 Cap-head Screw	1
12		K40 x 10 Pan-head Torx Screw	4
N		Display Door with Keypad (See Table 10-4 on page 10-19 for part numbers of different languages)	
P	399091	Liquid Crystal Display and Front Panel Interface Board Assembly	
13		Screw	4
14		LCD and FIB Assembly	1
F	399077	Power Supply Unit (PSU) Assembly with Mount	
15		PSU	1
16		PSU Mounting Plate	1
17		M3 ET Washer	4
18		M3 x 5 Cap-head Screw	4

Table 10-3: Electronics Compartment

Item Number	P/N	Description	Qty
G	399078 (Videojet 1220) 399473 (Videojet 1520)	Printer Interface Board (PIB) Assembly	
19		M4 x 8 Cap-head Screw	6
20		M4 ET Washer	6
21		PIB	1
22		PIB Gasket	1
H	399079	Electronics Fan Assembly	
23		Fan, 60 mm	1
24		M4 ET Washer	2
25		M4 x 10 Cap-head Screw	2
26		Finger guard, 60 mm	1
27		M4 Nyloc Nut	2
28		M4 x 16 Counter Sunk Screw	2
J	SP500084 (Videojet 1220) SP399399 (Videojet 1520)	Positive Air Pump Assembly (Optional for Videojet 1220) Double Headed Air Pump Assembly (for single head system) (Videojet 1520)	
29A		Dampener	1
30		P-Clip	1
31		M4 Nyloc Nut	2
K	399081	EHT Module Assembly	
32		M4 Nyloc Nut	2
33		EHT Module	1
L		Connector Panel	
34	SP500096 (Videojet 1520)	PCB 3 Assembly	1
35	SP500097	PCB 2 Assembly	1

Table 10-3: Electronics Compartment (Continued)

Item Number	P/N	Description	Qty
36	SP500095 Videojet 1520) SP500098(Videojet 1220)	PCB 1 Assembly PCB 0 Assembly	1
37	399084	USB Connector	1
38	399083	Ethernet Connector(Videojet 1520)	1

Table 10-3: Electronics Compartment (Continued)

Display Door with Keypad in Different Languages

Part Number	Display Door with Keypad (400 Series)	Languages
399116	Display door with keypad English	English (US), English (UK and Ireland), Chinese (Simplified), English (Indian), Philippines (English)
399117	Display door with keypad European	French, German, Spanish, Portuguese (Brazilian), Italian, Dutch, Danish, Portuguese (Portugal), Swiss (German), Swiss (French), Swiss (Italian), Spanish (CALA)
399118	Display door with keypad Chinese	Chinese (Traditional)
399119	Display door with keypad Turkish	Norwegian, Finnish, Swedish, Turkish
399120	Display door with keypad Russian	Russian
399121	Display door with keypad Polish	Polish
399122	Display door with keypad Korean	Korean
399123	Display door with keypad Greek	Greek
399124	Display door with keypad Katakana	Japanese
399125	Display door with keypad Bulgarian	Bulgarian
399126	Display door with keypad Czech	Czech, Hungarian
399127	Display door with keypad Arabic	Arabic
399128	Display door with keypad Hebrew	Hebrew
399542	Display door with keypad Thai	Thai
399544	Display door with keypad Vietnamese	Vietnamese

Table 10-4: Display Door with Keypad

Ink Compartment

B

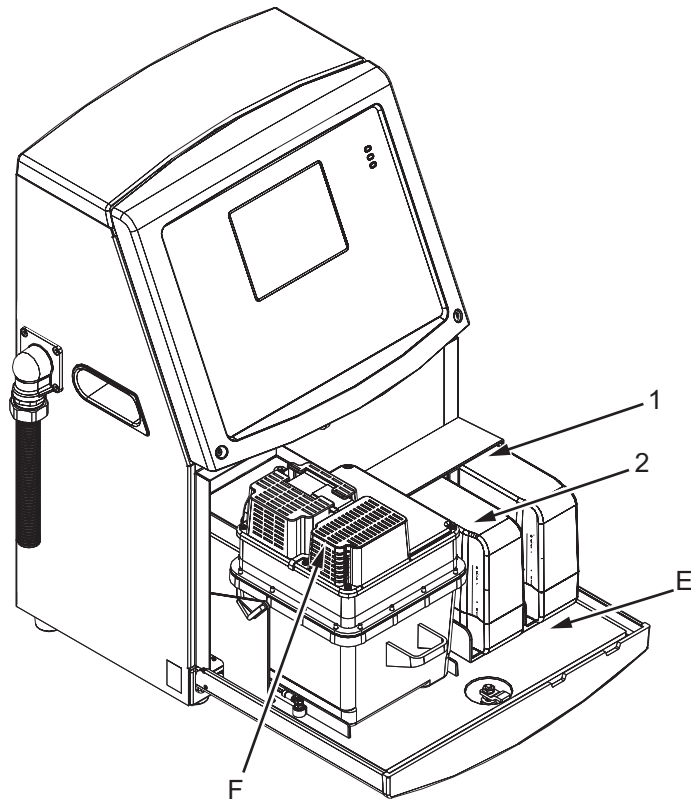


Figure 10-22: Ink System

Ink Cartridge

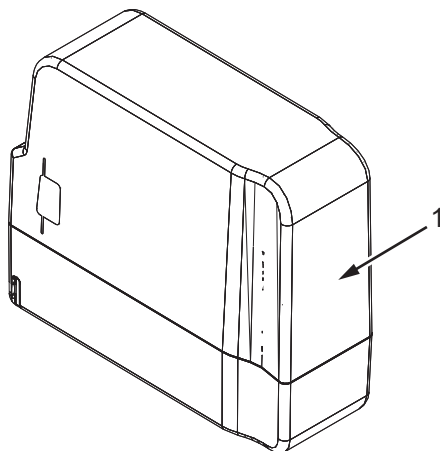


Figure 10-23: Ink Cartridge

Make-up Cartridge

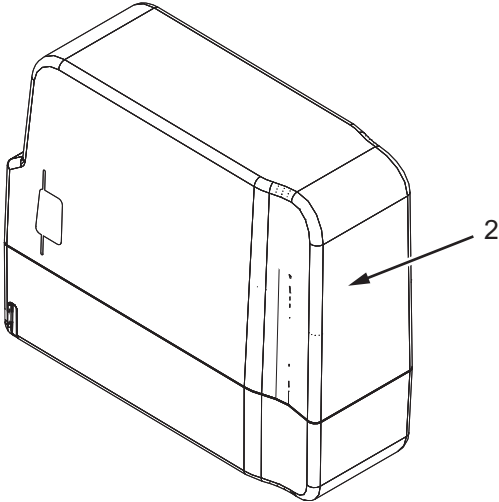


Figure 10-24: Make-up Cartridge

E

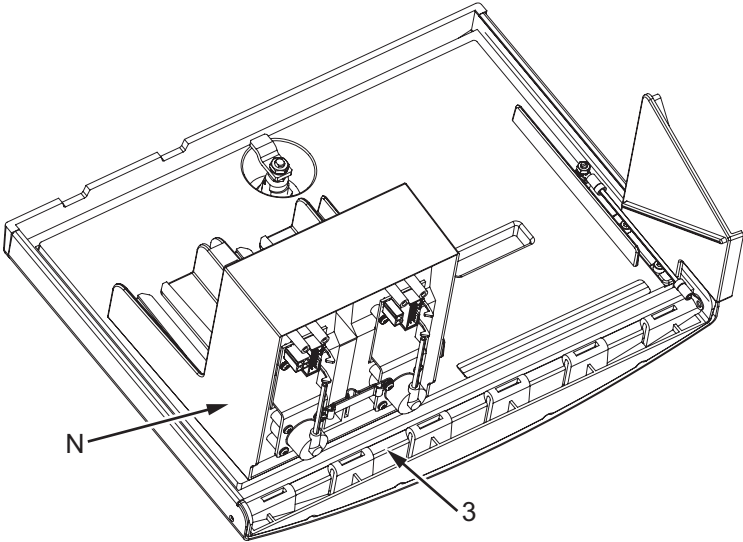


Figure 10-25: Ink Door Assembly

Septum Assembly

N

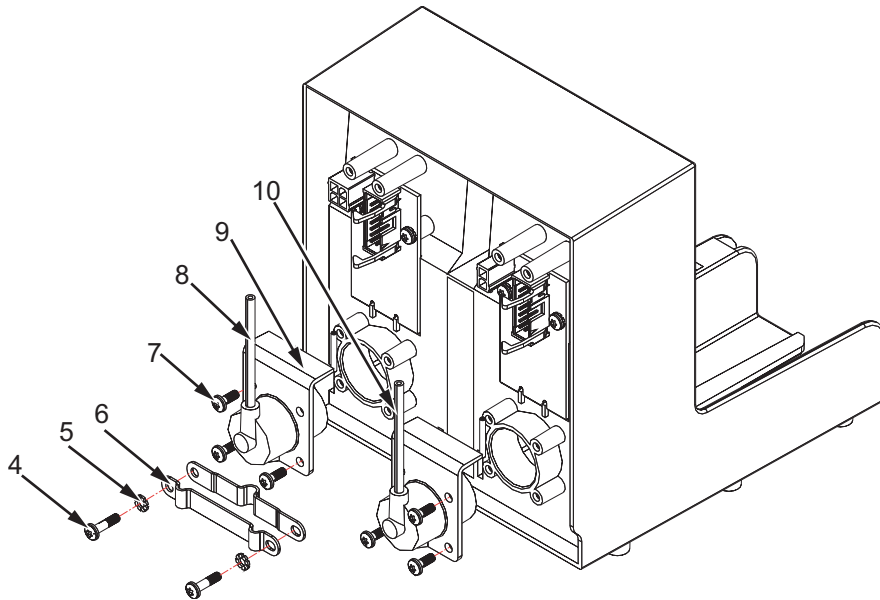


Figure 10-26: Septum Assembly

Ink Core Module Assembly

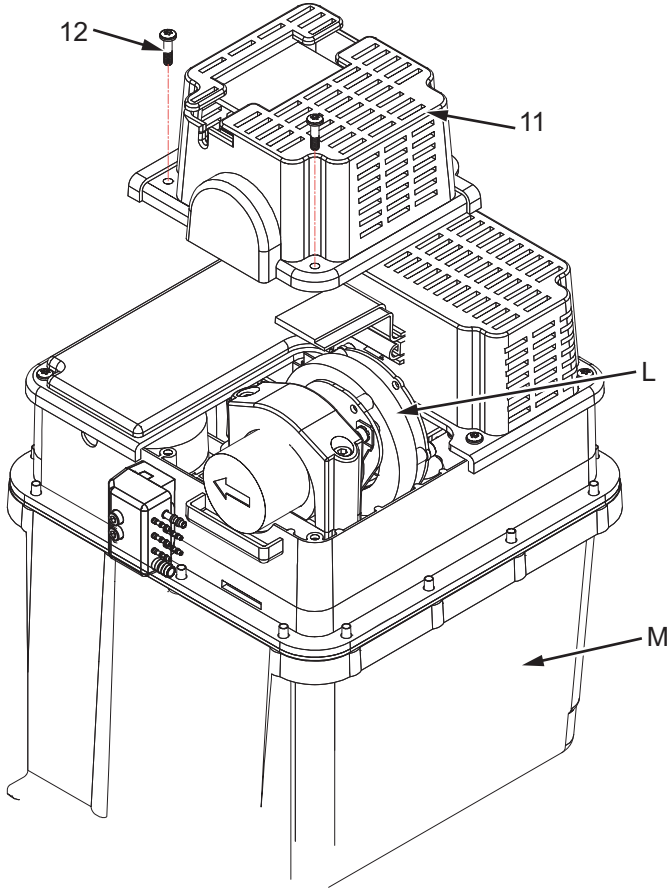


Figure 10-27: Core Module

Ink Core Pump

L

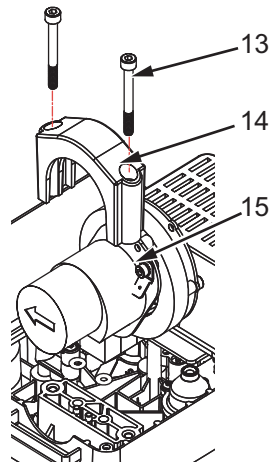


Figure 10-28: Ink Core Pump Assembly

Ink Core Without Pump

M

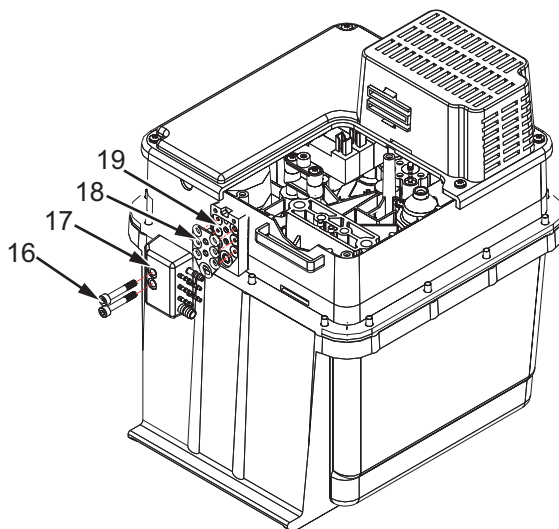


Figure 10-29: Ink Core Module Without Pump

Gutter Pump Assembly

G

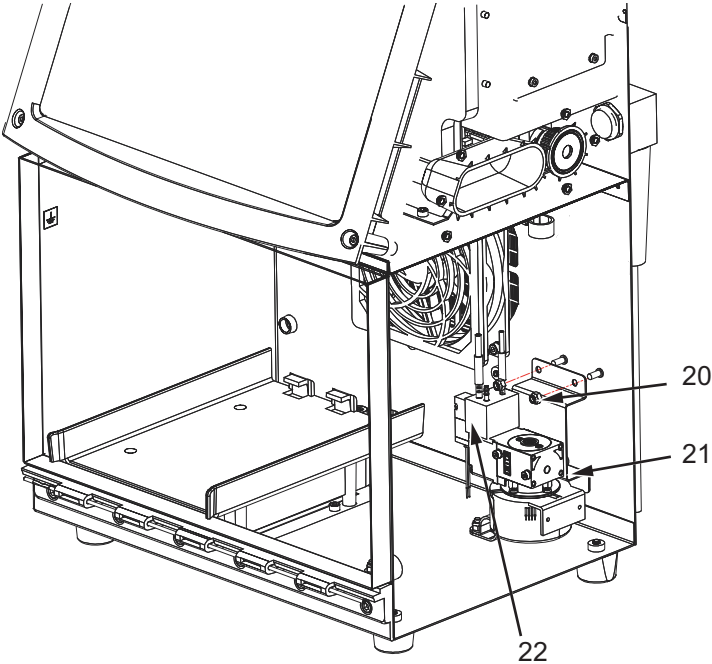


Figure 10-30: Gutter Pump Assembly (Videojet 1220)

G

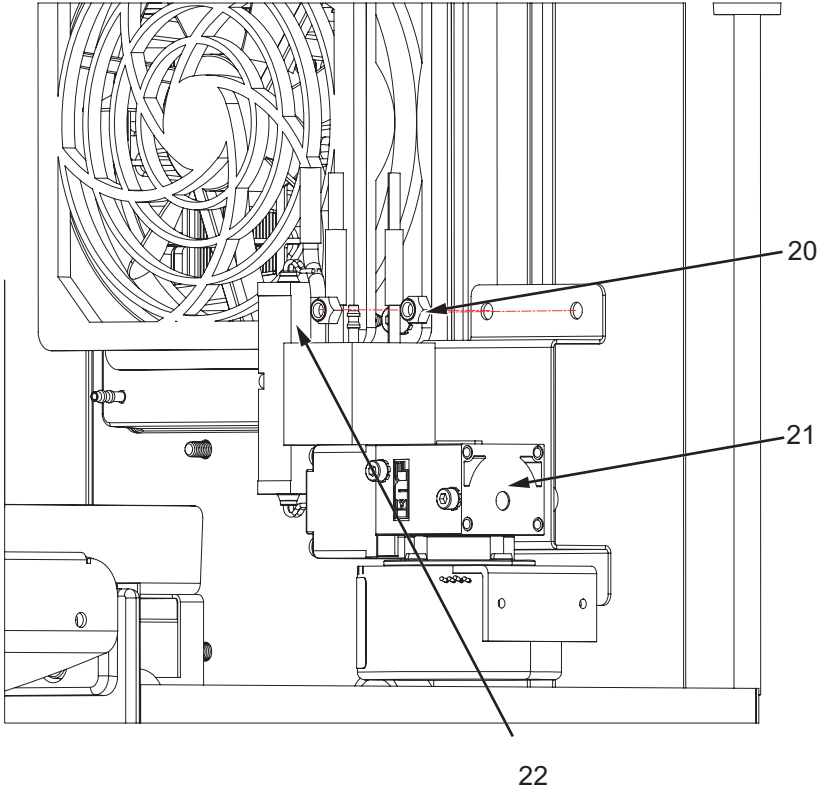


Figure 10-31: Gutter Pump Assembly (Videojet 1520)

Ink System Fan

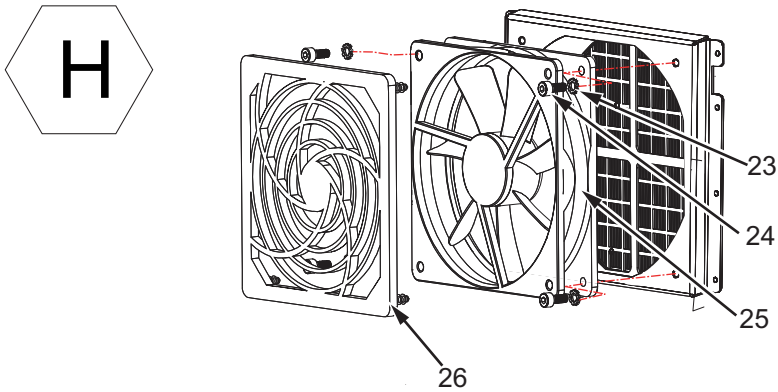


Figure 10-32: Ink System Fan Assembly

Condenser Assembly (Videojet 1520 only)

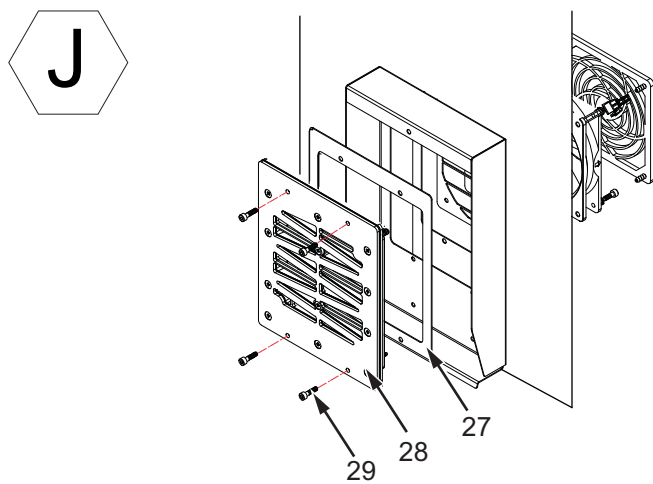


Figure 10-33: Condenser Assembly (Videojet 1520)

Ink System Filter Assembly - IP65 (Optional for Videojet 1520)

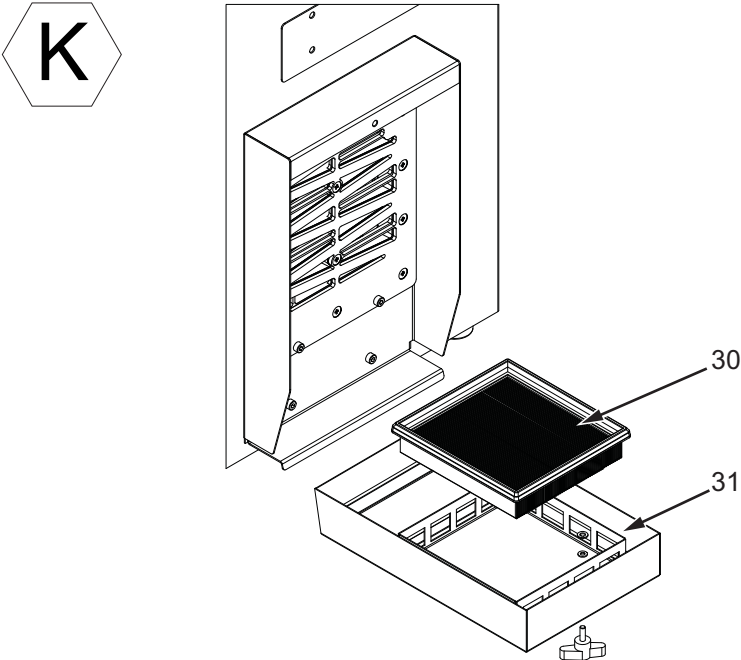


Figure 10-34: Ink System Filter Assembly - IP65

Ink System Filter Assembly - IP55 (Videojet 1220)

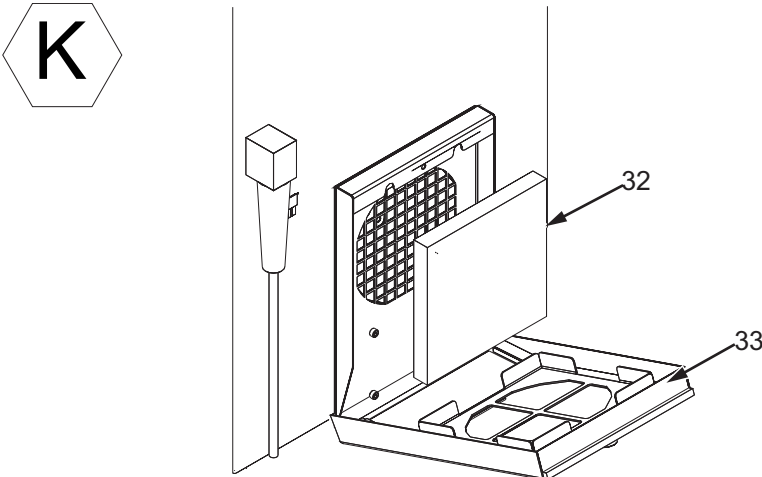


Figure 10-35: Ink System Filter Assembly - IP55

Ink System Filter Assembly - IP55 (Videojet 1520)

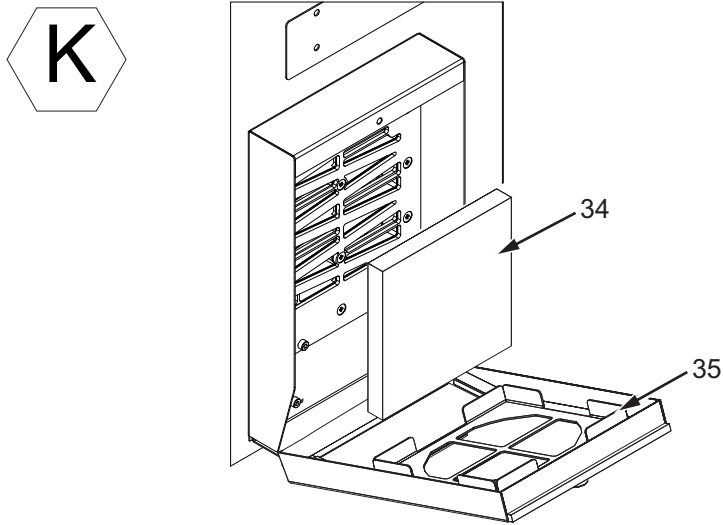


Figure 10-36: Ink System Filter Assembly - IP55

Floor Filter IP65 (Optional for Videojet 1520)

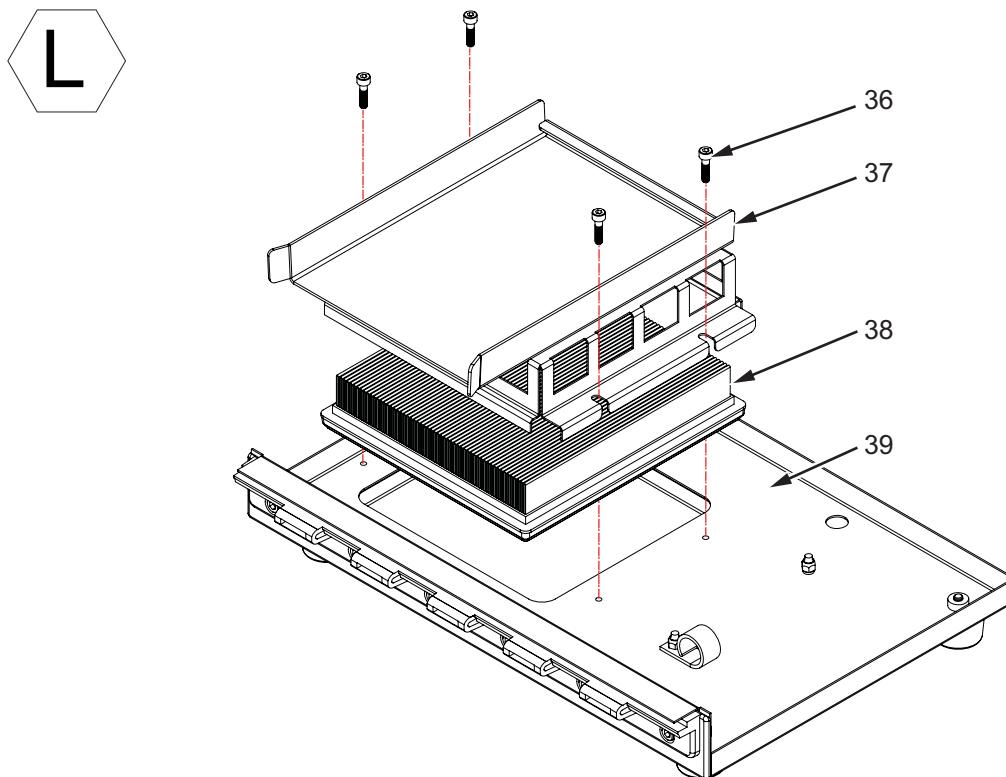


Figure 10-37: Floor Filter IP65



Floor Filter(Videojet 1520)

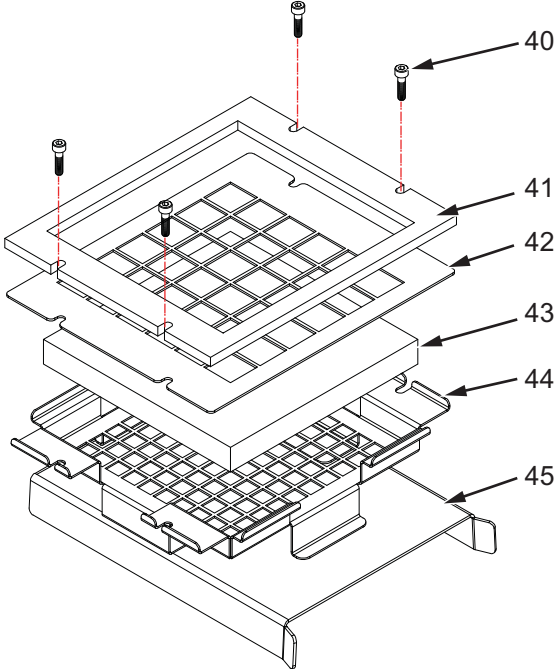


Figure 10-38: Floor Filter IP55

Floor Filter IP55 (Videojet 1220)

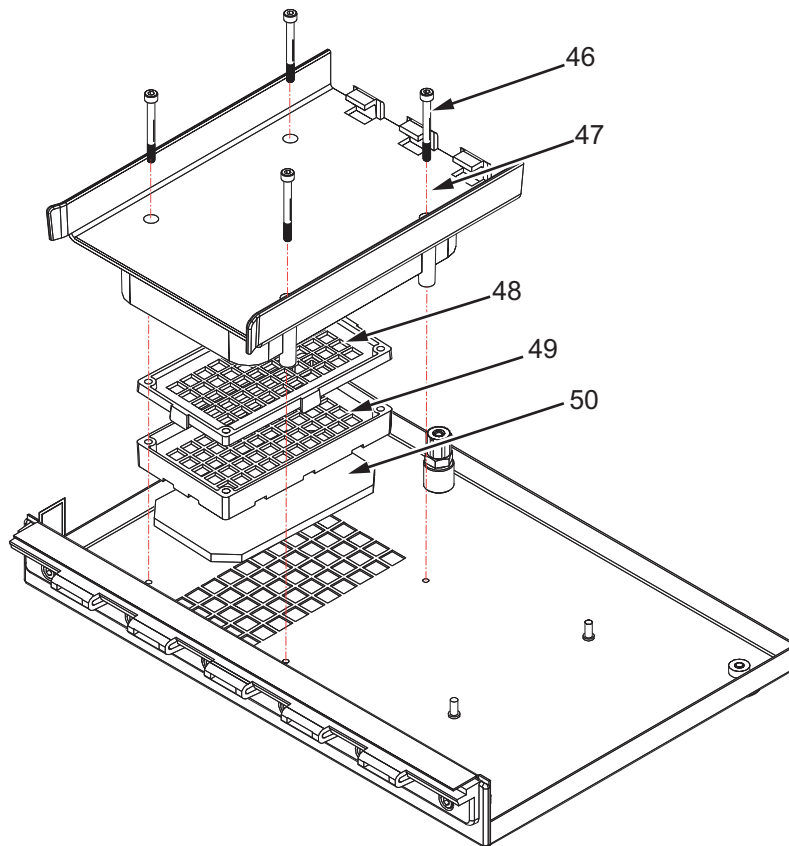


Figure 10-39: Floor Filter - IP55

Vent Recovery System (Videojet 1220)

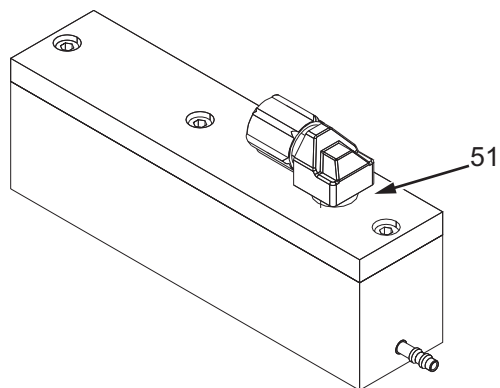


Figure 10-40: Vent Recovery System (Videojet 1220)

Cabinet Foot

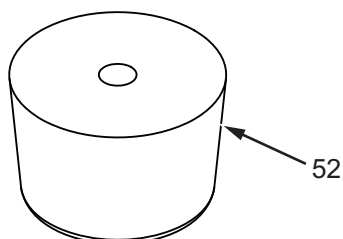


Figure 10-41: Cabinet Foot

Item Number	P/N	Description	Qty
B		Ink Compartment	
1		Ink Cartridge	1
2		Make-up Cartridge	1
E	399071 (IP55) 399472 (IP65 Videojet 1520)	Ink Door Assembly	
	399392 (IP55) 399585 (IP65 Videojet 1520)	Ink Door Assembly FG	
3*		Hinge Pin	1
N	399073	Septum Assembly	
	399391	Septum Assembly Kit FG	
4		K30 x 12 Pan-head Torx Screw	2
5		M3 ET Washer	2
6		Tube and Ribbon Cable Clamp	1
7		K30 x 8 Pan-head Torx Screw	6
8		Black Stripe Tube (Ink System)	1
9		Septum	2
10		Green Stripe Tube (Make-up System)	1
F	SP392126 (Videojet 1220) SP392093 (Videojet 1520)	Ink Core with Pump	

Table 10-5: Ink Compartment

Item Number	P/N	Description	Qty
	SP392127 (Videojet 1220 FG) SP392094 (Videojet 1520 FG)	Ink Core with Pump FG	
11		Ink Core Pump Cover	1
12		K30 x 12 Pan-head Torx Screw	2
L	399076	Ink Core Pump	
	399384	Ink Core Pump FG	
13		M4 x 35 Cap-head Screw	2
14		Saddle Clamp	1
15		Ink Core Pump	1
M	SP392167 (Videojet 1220) SP392165 (Videojet 1520)	Ink Core without Pump	
	SP392168 (Videojet 1220 FG) SP392166 (Videojet 1520 FG)	Ink Core Module without Pump FG	
16		M3 x 7 Manifold Screw	2
17		Ink Core Manifold (Male)	1
18		Ink Core Manifold Gasket	1
19		Ink Core Manifold (Female)	1
G	399171	Gutter Pump Assembly	
	399393	Gutter Pump Assembly FG	
20		M4 Nyloc Nut	2
21		Gutter Pump	1
22		3 Way Valve	1
H	399080	Ink System Fan Assembly	
23		M4 ET Washer	4
24		M4 x 10 Cap-head Screw	4
25		Fan	1

Table 10-5: Ink Compartment

Item Number	P/N	Description	Qty
26		Fan Guard	1
J	399350	Condenser Assembly	
27		Condenser Body Gasket	1
28		Condenser Assembly	1
29		M4 x 16 Cap-head Screw	4
K		Ink System Filter Assembly	
		IP 65 (Videojet 1520)	
30	SP234502	Filter Element	1
31	395763	Filter Cover	1
		IP 55 (Videojet 1220)	
	399239	IP55 filter kit spares	1
32		Filter Element	1
33	SP399029	Filter cover	1
		IP 55 (Videojet 1520)	
34	234081	Filter Element	1
35	395762	Filter Cover	1
L		Floor Filter Assembly	
		IP 65 (Videojet 1520)	
36		M4 x 16 Cap-head Screw	4
37		Ink Core Support	1
38		Ink Side Filter	1
39	SP234502	Filter Element	1
		IP 55 (Videojet 1520)	
40		M4 x 16 Cap-head Screw	4
41		Floor Filter Cover Gasket	1
42		Filter Cover	1
43	234081	Filter Element	1

Table 10-5: Ink Compartment

Item Number	P/N	Description	Qty
44		Filter holder	1
45		Ink Core Support	1
		IP 55 (Videojet 1220)	
46		M4 x 40 Cap-head Screw	4
47		Ink Core Support Channel	1
48		Ink Side Filter Top	1
49		Ink Side Filter Base	1
50	SP223302	Filter Element	1
51	399281	Vent Recovery System (Videojet 1220 only)	1
	392004	Cabinet Feet Kit	
52	234500	Cabinet Foot	4

Table 10-5: Ink Compartment

*- Items are not shown in the figure.

Printhead

D

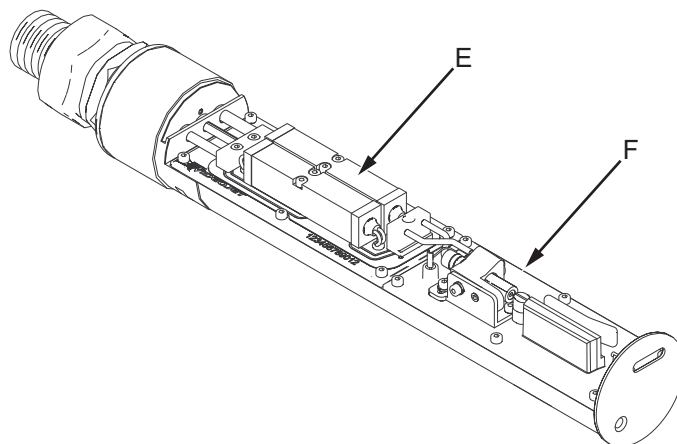


Figure 10-42: Printhead

D

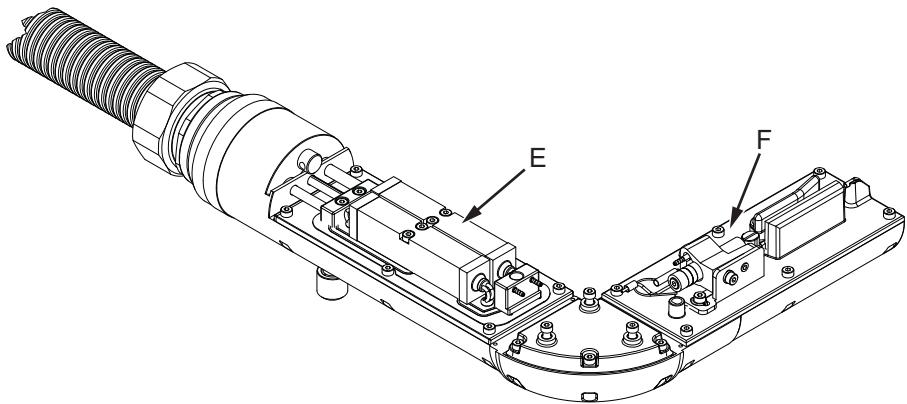


Figure 10-43: 90 Degree Printhead

Printhead Valve Module

E

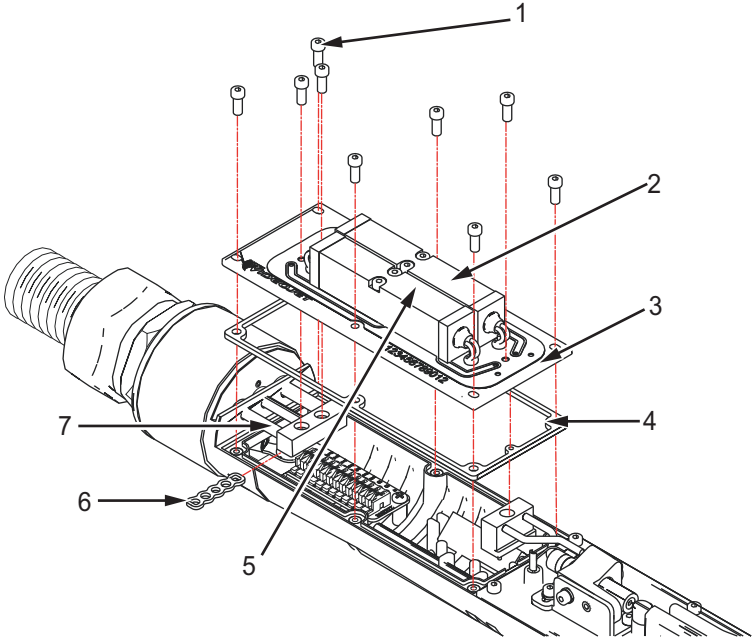


Figure 10-44: Printhead Valve Module

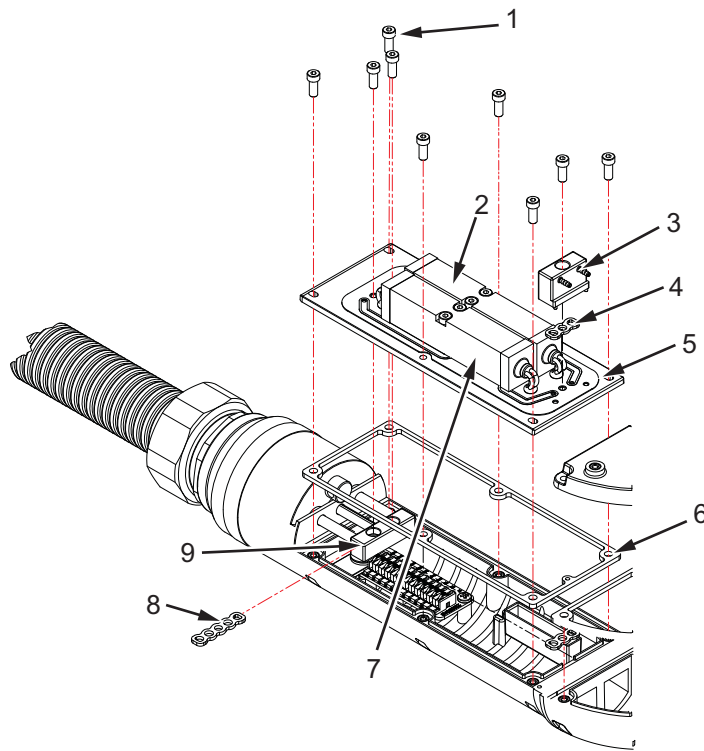


Figure 10-45: 90 Degree Printhead Valve Module

Printhead Engine

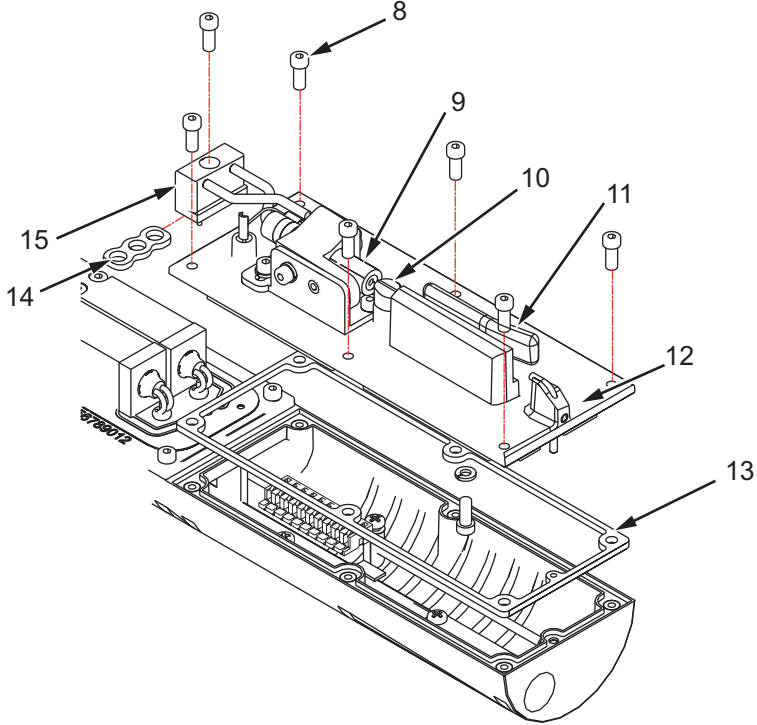


Figure 10-46: Printhead Engine

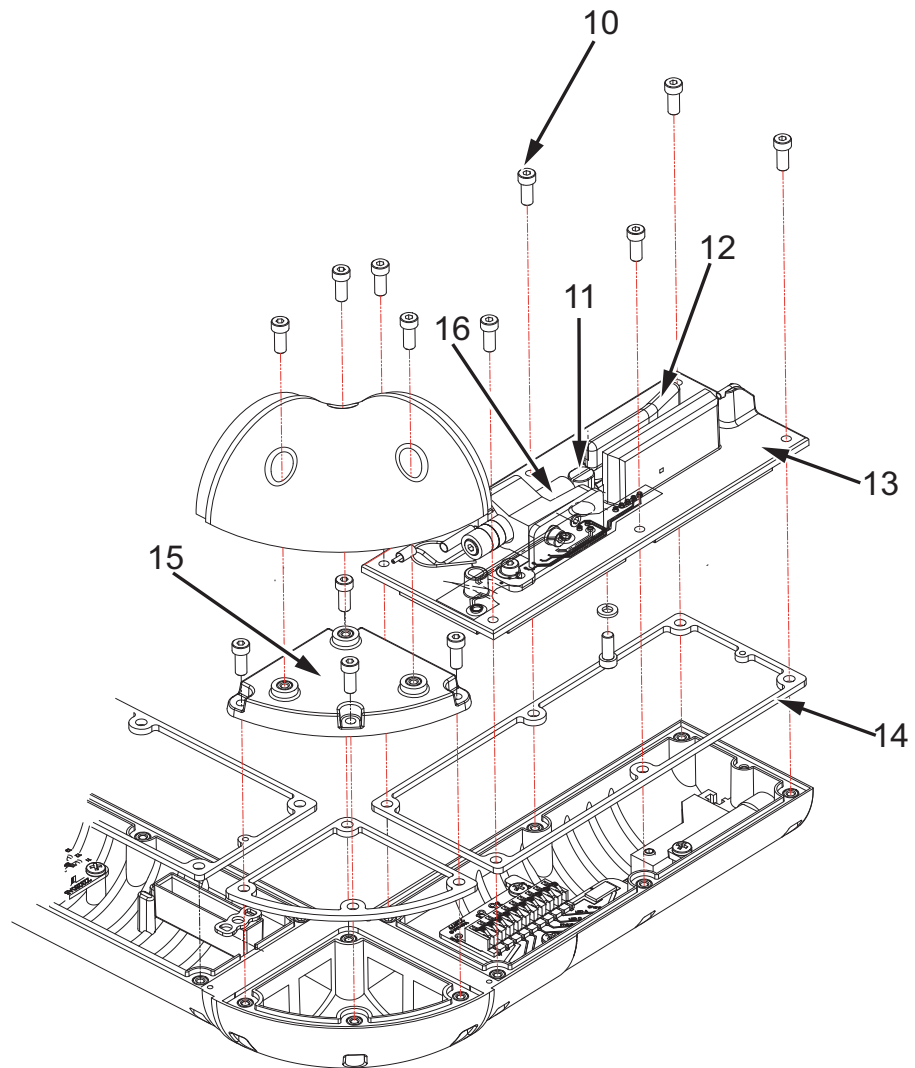


Figure 10-47: 90 Degree Printhead Engine

Printhead

Note: Refer to Table 10-7 on page 10-40 for information on 90 degrees printhead

Item Number	P/N	Description	Qty
D		Printhead	
E	399181	Printhead Valve Module	
	399386	Printhead Valve Module FG	

Table 10-6: Printhead Assembly

Item Number	P/N	Description	Qty
1		M2 x 6 Cap-head Screw	9
2		Gutter Valve	1
3		Printhead Valve Module Deck	1
4	Refer to Item 16	Printhead Valve Module Gasket	1
5		Feed Valve	1
6	Refer to Item 16	Rear Manifold Gasket	1
7		3 Way Manifold Assembly (Rear Tubing Manifold)	1
F	399422	Printhead Engine (60 micron)	
	399180	Printhead Engine (70 micron)	
	399586	Printhead Engine FG (60 micron)	
	399385	Printhead Engine FG (70 micron)	
8		M2 x 6 Cap-head Screw	8
9		Nozzle Assembly	1
10		Charge Electrode	1
11		Deflector Plate	1
12		Printhead Engine Deck	1
13	Refer to Item 16	Printhead Engine Gasket	1
14	Refer to Item 16	Front Tubing Manifold Gasket	1
15		2 Way Manifold Assembly (Front Tubing Manifold)	1
16	399336	Printhead Gasket Kit	
		Gasket, Printhead	10
		Gasket, 3 way Manifold	10
		Gasket, 2 way Manifold	10
*		Connection Manifold Gasket	10
*		4.47 x 1.78 O-ring	10

Table 10-6: Printhead Assembly

90 Degree Printhead

Item Number	P/N	Description	Qty
D		Printhead	
E	399181	Printhead Valve Module	
	399386	Printhead Valve Module FG	
1		M2 x 6 Cap-head Screw	9
2		Gutter Valve	1
3		2 Way Manifold Assembly (Front Tubing Manifold)	1
4	Refer to Item 17	Front Tubing Manifold Gasket	1
5		Printhead Valve Module Deck	1
6	Refer to Item 17	Printhead Valve Module Gasket	1
7		Feed Valve	1
8	Refer to Item 17	Rear Manifold Gasket	1
9		3 Way Manifold Assembly (Rear Tubing Manifold)	1
F	SP399621	90 Degree Printhead Engine (60 micron)	
	SP399622	90 Degree Printhead Engine (70 micron)	
	SP399658	90 Degree Printhead Engine FG (60 micron)	
	SP399659	90 Degree Printhead Engine FG (70 micron)	
10		M2 x 6 Cap-head Screw	14
11		Charge Electrode	1
12		Deflector Plate	1
13		Printhead Engine Deck	1
14	Refer to Item 17	Printhead Engine Gasket	1
15		Corner Chassis Cap-Insert Assembly	1
16		Nozzle Assembly	1
17	399660	90 Degree Printhead Gasket Kit	

Table 10-7: 90 Degree Printhead Assembly

Item Number	P/N	Description	Qty
		Gasket, Printhead	10
		Gasket, 3 way Manifold	10
		Gasket, 2 way Manifold	10
*		Connection Manifold Gasket	10
*		4.47 x 1.78 O-ring	10
		Gasket, Corner	10

Table 10-7: 90 Degree Printhead Assembly

*- Items are not shown in the figure

Cables

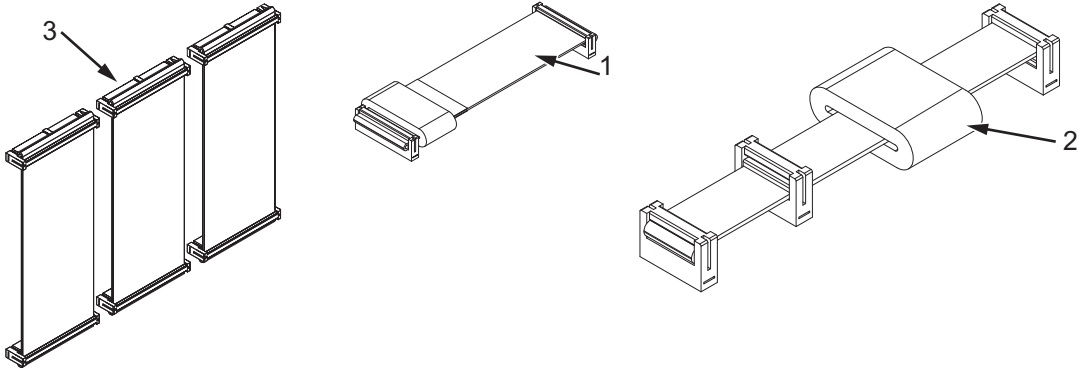


Figure 10-48: Cables

Item Number	P/N	Description	Qty
	399237 (Videojet 1220/1520)	Ribbon Cable Spare Kit	
1		Ribbon Cable Assembly Display	1
2	SP399052	Ribbon Cable Assembly Smart Chip and Pump 14 Way	1
3		50 Way Ribbon Cables	3

Table 10-8: Cables

*- Items are not shown in the figure

Optional Accessories

Beacon Kit

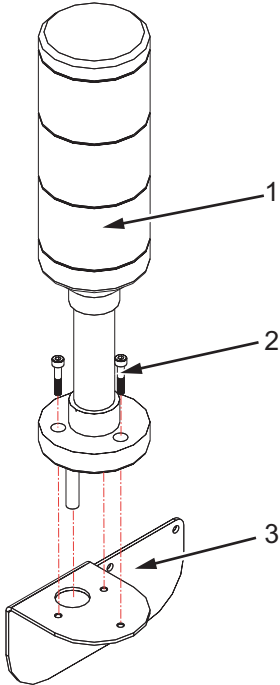


Figure 10-49: Beacon Kit

Dry Air Kit Assembly

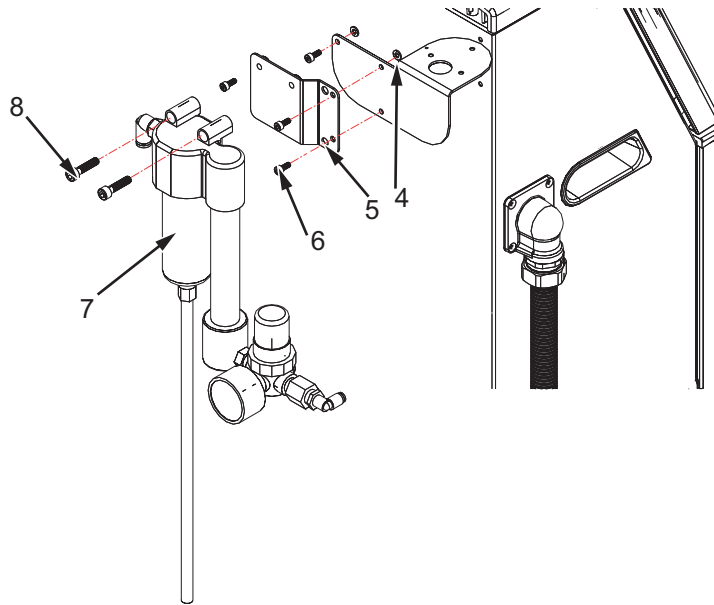


Figure 10-50: Dry Air Kit Assembly

Static Stand

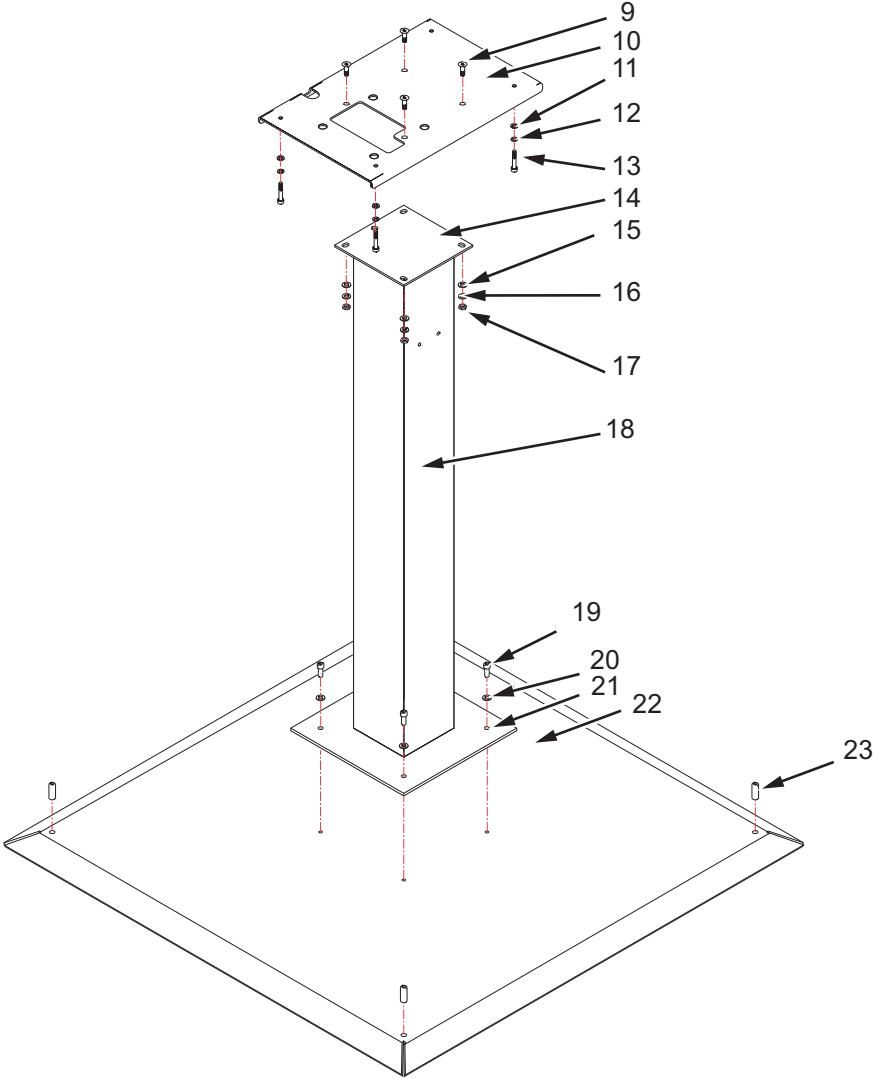


Figure 10-51: Static Stand

Mobile Stand

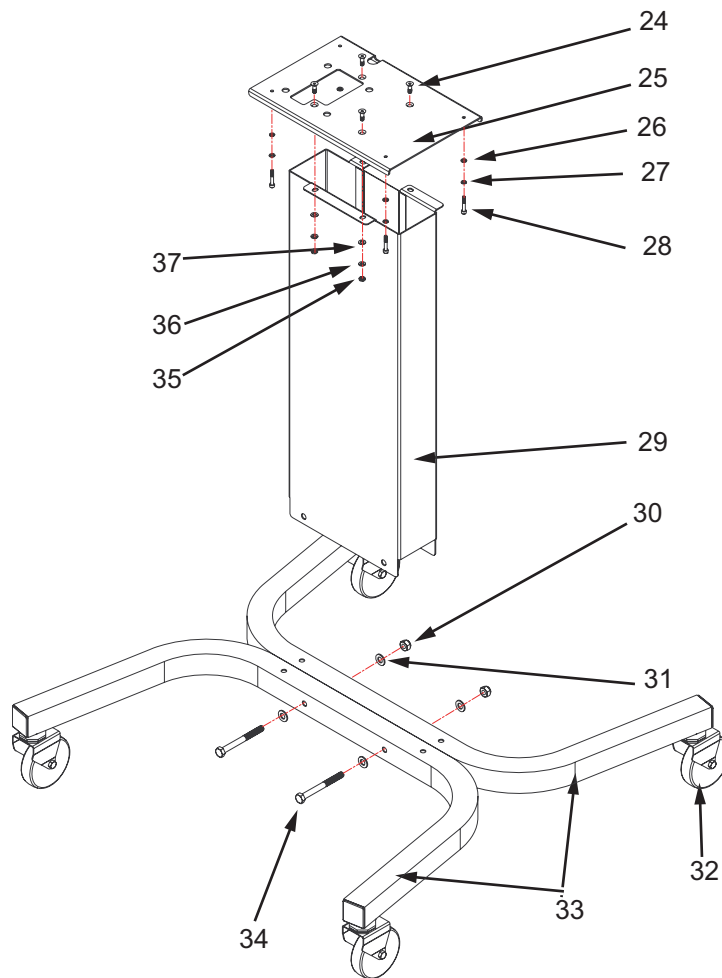


Figure 10-52: Mobile Stand

Printhead Stand

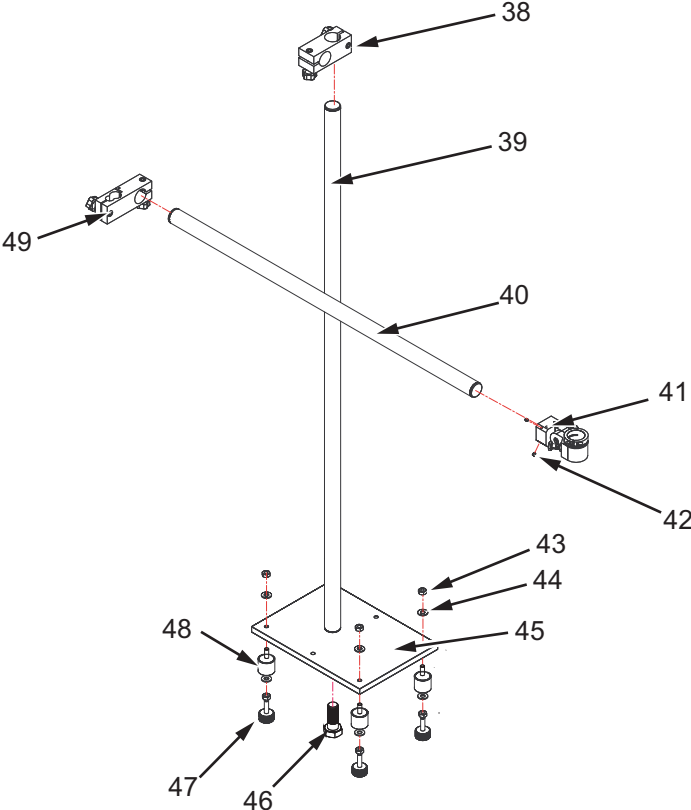


Figure 10-53: Printhead Stand

Printhead Photocell Holder



Figure 10-54: Printhead Photocell Holder - 6 mm, 8 mm, 18 mm

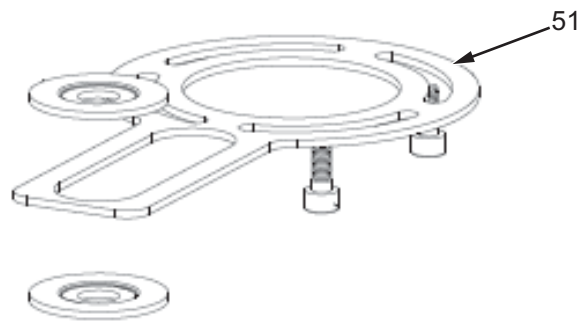


Figure 10-55: Printhead Photocell Holder -6 mm, 8 mm, 18 mm

Printer Wall Mount

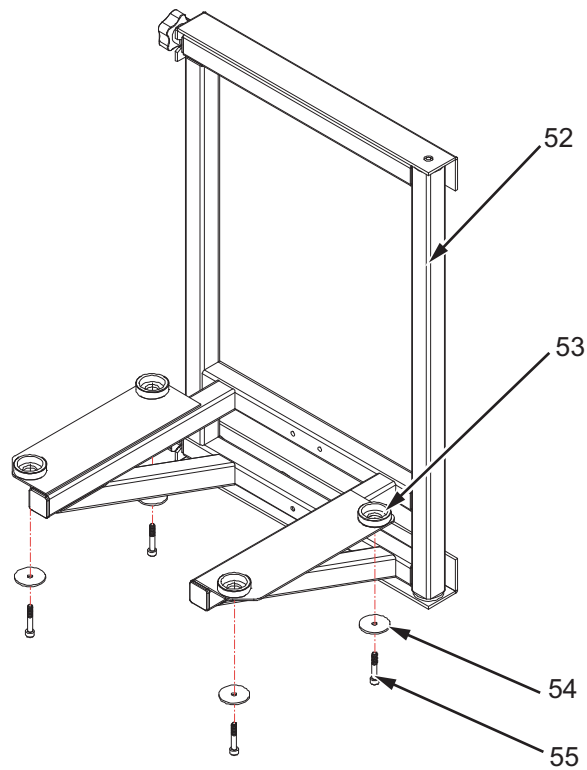


Figure 10-56: Printer Wall Mount

Wash Station Assembly

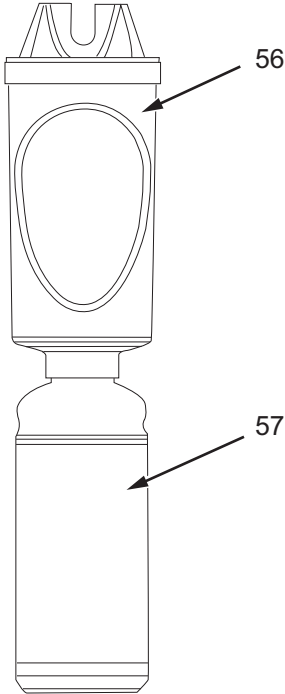


Figure 10-57: Wash Station Assembly

Shaft Encoder



Figure 10-58: Shaft Encoder

Shaft Encoder Accessories

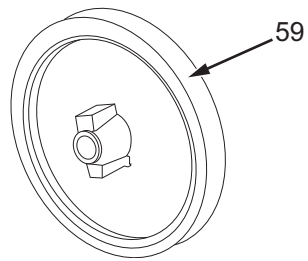


Figure 10-59: Circular Wheel

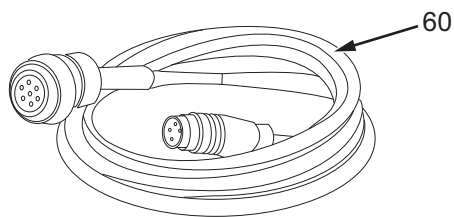


Figure 10-60: Shaft Cable



Figure 10-61: Spring Bracket

Product Detectors



Figure 10-62: Detector EZ

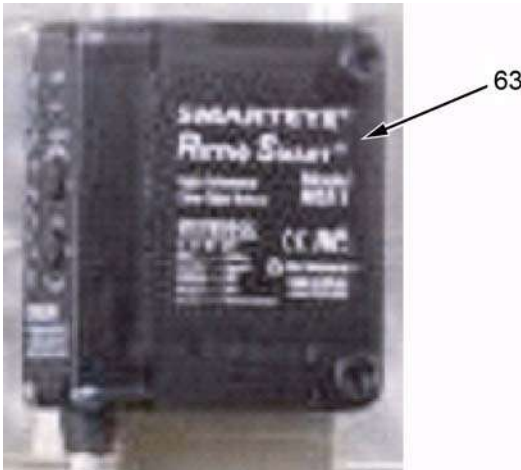


Figure 10-63: Detector Retro Smart

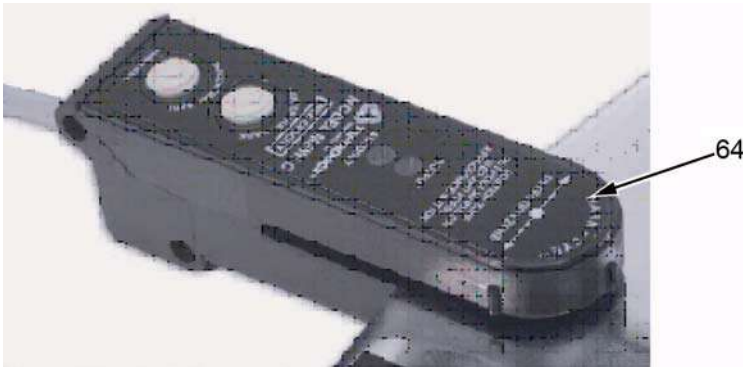


Figure 10-64: Detector Label Eye

Power Accessories



Figure 10-65: Power Conditioner

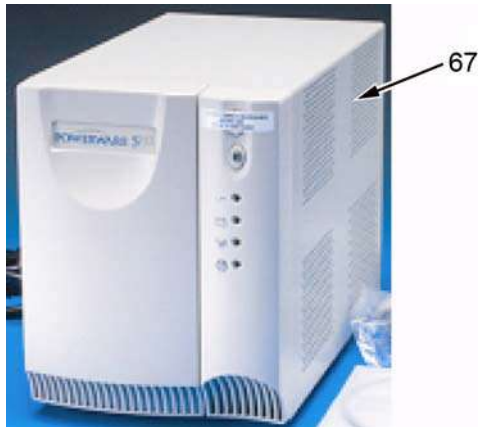


Figure 10-66: Uninterrupted Power Supply

Power Cord

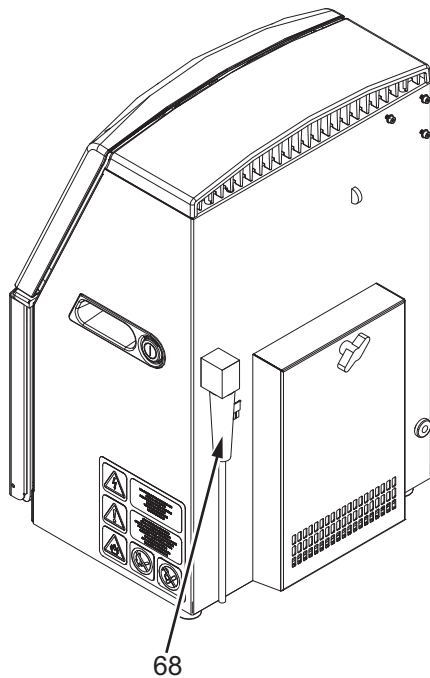


Figure 10-67: Power Cord (Videojet 1220)

Din Plugs



Figure 10-68: 3 Way DIN Plug



Figure 10-69: 7 Way DIN Plug

Item Number	P/N	Description	Qty
	399089	Beacon Assembly	
1		Beacon	1
2		M4x10 Socket-head Cap Screw	3
3		Beacon Mounting Bracket	1
	399090	Air Dryer Assembly	
4		M4 Nylon Washers	2
5		Air Dryer Mounting Bracket	1
6		M4 x 10 Socket-head Cap Screw	3
7		Air Dryer	1
8		1/4 inch-20 x 1 inch Socket-head Screw	2
	399099	Static Stand	
9		M6 x 16 Long Flat Socket-head Screw	4
10	234116	Adapter Plate	1
11		M5 Flat Washers	4
12		M5 Spring Lock Washers	4
13		M5 x 20 Long Socket-head Screw for IP55 Printers (or) M5 x 30 Long Socket-head Screw for IP65 printers	4
14		Column Top Plate	1
15		M6 Flat Washer	4
16		M6 Spring Lock Washer	4
17		M6 Hex Nut	4
18		Column	1
19		Cap-head Hex Screw, 1/4" x 20 UNC x 0.625	4
20		Flat Washer	4
21		Column Bottom Plate	1
22		Floor Plate	1

Table 10-9: Accessories

Item Number	P/N	Description	Qty
23		3/8" - 16 Flat Point Socket-head, 1" Long	4
	399100	Mobile Stand	
24		M6 x 16 Long Flat Socket-head Screw	4
25	234116	Adapter Plate	1
26		M5 Flat Washer	4
27		M5 Spring Lock Washer	4
28		M5 x 20 Long Socket-head Screw for IP55 Printers (or) M5 x 30 Long Socket-head Screw for IP65 Printers	4
29		Column	1
30		Acorn Hex Nut	2
31		Flat Washer	4
32		Castors	4
33		Legs	2
34		Hex-head Bolt	2
35		M6 Hex Nut	4
36		M6 Spring Lock Washer	4
37		M6 Plain Washer	4
	399086	Printhead Stand	
38		Clamp Assembly	1
39		Vertical Tube	1
40		Printhead Cross Tube	1
41		Printhead Mount Assembly	1
42		M6 x 8 Grub Screw	2
43		M10 Nut	8
44		M10 Washer	8
45		Stand Base Plate	1
46		M16 X 40 Hex Bolt	1
47		Adjustable Foot	4

Table 10-9: Accessories (Continued)

Item Number	P/N	Description	Qty
48	399093	Anti-vibration Mounting	4
49		Umbilical Clamp Assembly	1
50	399278	Printhead Photocell Holder 6 mm, 8 mm, 18 mm	1
51	399294	Printhead Photocell Holder 6 mm, 8 mm, 18 mm	1
	399201	Printer Wall Mount (Stainless Steel)	
52		Wall Mounting Stand	1
53		Stand Cups	4
54		Clamp Washer	4
55		M5 x 30 Socket-head Screw or M5 x 20 Socket-head Screw	4
56	399085	Wash Station Assembly	1
	202047	250ml Wash Bottle	1
57	301-0007-005	Empty 1 Liter Bottle	1
58		Shaft Encoder	
		Encoders	
	41000255	2500 PPR	1
	377530	3600 PPR (use with 21000217)	1
	41000256	5000 PPR	1
		Encoder Kits	
	378815	1800 PPR kit (encoder, 25ft cable)	1
	40331750	2500 PPR kit (encoder, mounting bracket, wheel)	1
	378821	3600 PPR kit (encoder, 25ft cable)	1
	80200266	5000 PPR kit (encoder, mounting bracket, wheel)	1
59	21000217	12 inch Circular Wheel	1
	377529	12 inch Circular Wheel (With replaceable ring)	1
	377523	Replaceable ring for part 377529	1

Table 10-9: Accessories (Continued)

Item Number	P/N	Description	Qty
60	378192	3 m Shaft Cable	1
	378193	6 m Shaft Cable	1
	378985	Encoder Adapter Cable Kit(Videojet 1220/1520)	1
61	377519	Spring Bracket	1
62	234211	Detector EZ-Pro Proximity Fiber	1
	234212	Detector EZ-Pro Through Beam fiber	1
63	234215	Detector Retro Smart (Clear Materials)	1
64	234213	Detector Label Eye (Web Printing)	1
	234214	Detector Mark Eye (Web Registration Mark)	1
65*	378981	Product Detector Adapter Cable (Videojet 1220/1520)	1
66	356841-02	120 V Power Conditioner	1
	234597	240 V Power Conditioner	1
67	80000008	Uninterrupted Power Supply (120 V Version)	1
68		Power Cord (Refer to Table 10-10 on page 10-58)	1
69	500-0036-578	3 Way DIN Plug (Photo Cell) For product detector and reverse printing input	1
70	500-0036-583	7 Way DIN Plug (Relays) For Print Ready output and warnings	1
71*	500-0036-577	6 Way DIN Plug (Alert Beacon)	1
72*	500-0036-581	4 Way DIN Plug (Shaft Encoder)	1
73*	500-0036-584	8 Way DIN Plug (Message Select A/B)	1
74*	500-0076-141	DIN Plug Dust Cap	1
75*	399133	Exhaust Kit	1
76*	Refer item 48	Anti Vibration Kit Stand	1
77*	399068	Printhead Mounting	1
78*	399098	Universal Printhead Mounting	1
79*	500-0036-582	5 Way DIN Plug (RS232)	1
80*	234433	5 Way DIN Plug (RS485)	1

Table 10-9: Accessories (Continued)

*- Items are not shown in the figure

Power Cord

Part Number	Description
SP399205	Mains Power Cable EUROPEAN
399251	US 120V Molded Plug Power Cord (Type B)
399252	European Union Molded Plug Power Cord (Type F)
399253	Danish Molded Plug Power Cord (Type K)
399254	Italian Molded Plug Power Cord (Type C)
399255	Swiss Molded Plug Power Cord (Type J)
399256	UK Molded Plug Power Cord (Type G)
399257	China Molded Plug Power Cord (Type I)
399258	India Molded Plug Power Cord (Type D)
399261	Swedish Molded Plug Power Cord
399262	Finnish Molded Plug Power Cord
399263	Norwegian Molded Plug Power Cord

Table 10-10: Power Cord

Miscellaneous Accessories

Connectivity

Part Number	Description
80200258	RS-232 Cable
399186	Extension Cables 3 m RS485
399062	Extension Cables 6 m RS232
399279	Lampstack Extension Cable Beacon 6m

Table 10-11: Connectivity

Part Number	Description
223213	External Ethernet Connector Cable 5 m
SP399083	Ethernet Connector Kit Spares
SP399084	USB Connector Kit Spares

Table 10-11: Connectivity

Hydraulics

Part Number	Description
399072	Tubing Kit Spare
SP234277	Spare Ribbon Cable Assembly With Covers
	Ink System Cover
	Ink System Cover Pump
	Ribbon Cable and Heatshrink Assembly, Ink System, 16 Way
	Ribbon Cable and Heatshrink Assembly, Ink System, 20 Way
	Ribbon Cable Lock

Table 10-12: Hydraulics

Printhead and Umbilical

Note: Refer Table 10-13 on page 10-59 for Videojet 1220 and Table 10-14 on page 10-60 for Videojet 1520.

Part Number	Description
392031	Printhead and Umbilical Complete (2 m) 60 micron
399172	Printhead and Umbilical Complete (2 m) 70 micron
399174	Printhead and Umbilical Complete (3 m) 60 micron
399173	Printhead and Umbilical Complete (3 m) 70 micron
392033	Printhead and Umbilical Complete (2 m) 60 micron FG

Table 10-13: Printhead and Umbilical (Videojet 1220)

Part Number	Description
399466	Printhead and Umbilical Complete (2 m) 70 micron FG
399550	Printhead and Umbilical Complete (3 m) 60 micron FG
399387	Printhead and Umbilical Complete (3 m) 70 micron FG
399178	Printhead Chassis and Umbilical (3 m)
399389	Printhead Chassis and Umbilical FG (3 m)
399177	Printhead Chassis and Umbilical (2 m)
399467	Printhead Chassis and Umbilical FG (2 m)
SP399404	Printhead Sleeve and Screw
223277	Printhead Screw Only

Table 10-13: Printhead and Umbilical (Videojet 1220)

Part Number	Description
399506	Printhead and Umbilical Complete (3 m) 60 micron
395679	Printhead and Umbilical Complete (3 m) 70 micron
399555	Printhead and Umbilical Complete (3 m) 60 micron FG
395681	Printhead and Umbilical Complete (3 m) 70 micron FG
399507	Printhead and Umbilical Complete (6 m) 60 micron
395680	Printhead and Umbilical Complete (6 m) 70 micron
399556	Printhead and Umbilical Complete (6 m) 60 micron FG
395682	Printhead and Umbilical Complete (6 m) 70 micron FG
399508	Printhead Chassis and Umbilical (3 m)
399587	Printhead Chassis and Umbilical (3 m) FG
399509	Printhead Chassis and Umbilical (6 m)
399588	Printhead Chassis and Umbilical (6 m) FG
SP399355	Printhead Cover and Screw
395677	Cleaning Brush
395676	Cleaning Kit

Table 10-14: Printhead and Umbilical (Videojet 1520)

90 Degree Printhead and Umbilical

Note: Refer Table 10-15 for Videojet 1220 and Table 10-16 for Videojet 1520.

Part Number	Description
399639	90 Degree Printhead and Umbilical Complete (2 m) 70 micron
399648	90 Degree Printhead and Umbilical Complete (2 m) 70 micron FG
399637	90 Degree Printhead and Umbilical Complete (3 m) 70 micron
399646	90 Degree Printhead and Umbilical Complete (3 m) 70 micron FG
399641	90 Degree Printhead and Umbilical Complete (3 m) 60 micron
399650	90 Degree Printhead and Umbilical Complete (3 m) 60 micron FG
399636	90 Degree Printhead Chassis and Umbilical (2 m)
399657	90 Degree Printhead Chassis and Umbilical (2 m) FG
399634	90 Degree Printhead Chassis and Umbilical (3 m)
399655	90 Degree Printhead Chassis and Umbilical (3 m) FG
SP399518	90 Degree Printhead Sleeve and Screw

Table 10-15: 90 Degree Printhead and Umbilical (Videojet 1220)

Part Number	Description
399644	90 Degree Printhead and Umbilical Complete (3 m) 60 micron
395710	90 Degree Printhead and Umbilical Complete (3 m) 70 micron
399653	90 Degree Printhead and Umbilical Complete (3 m) 60 micron FG
395712	90 Degree Printhead and Umbilical Complete (3 m) 70 micron FG
399645	90 Degree Printhead and Umbilical Complete (6 m) 60 micron

Table 10-16: 90 Degree Printhead and Umbilical (Videojet 1520)

Part Number	Description
395711	90 Degree Printhead and Umbilical Complete (6 m) 70 micron
399654	90 Degree Printhead and Umbilical Complete (6 m) 60 micron FG
395713	90 Degree Printhead and Umbilical Complete (6 m) 70 micron FG
399634	90 Degree Printhead Chassis and Umbilical (3 m)
399655	90 Degree Printhead Chassis and Umbilical (3 m) FG
399635	90 Degree Printhead Chassis and Umbilical (6 m)
399656	90 Degree Printhead Chassis and Umbilical (6m) FG
SP399594	90 Degree Printhead Sleeve and Screw

Table 10-16: 90 Degree Printhead and Umbilical (Videojet 1520)

Tools Kit

There are several tools in the tool kit for normal maintenance of printer.

The Service Tool Kit (TL399250)

Table 10-17 lists the tool kit items and their part numbers.

Part Number	Description
234639	Allen/Hex Key, 0.035 inch, Set of 5
234638	M4 Nut Spinner (7mm)
234642	Ball Driver 2mm
234643	Ball Driver 2.5mm
234644	Ball Driver 3mm
234645	Ball Driver 4mm
234650	Side Cutters
234640	Allen/Hex Key 1.27mm, Set of 5
234641	Allen/Hex Key 1.5mm, Set of 5
234651	Folding Knife
234652	Knife Blades
234653	Spanner/Wrench 7mm
234654	Spanner/Wrench 1/2 inch
234655	Screwdriver Flat Blade 2.5mm
234657	DIN Spanner/Wrench
234658	Tube Cutter
355269	Loupe Magnifying Glass
234494	USB A to USB A Cable
399280	System Manifold Pressure Test Tool
399247	Nozzle Bypass Manifold Kit
234646	Torx Driver T10
234647	Torx Driver T20
234632	USB Memory Stick 2GB
234638	M4 Nut Spinner (7mm)
234648	No.1 Pozidrive
234649	No.2 Pozidrive

Table 10-17: TL399250 Tool Kit Parts List

Part Number	Description
	Tool Bag

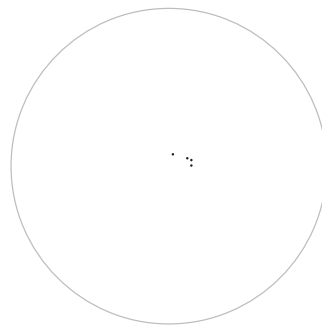
Table 10-17: TL399250 Tool Kit Parts List (Continued)

Clean/Quick Start and Stop Description

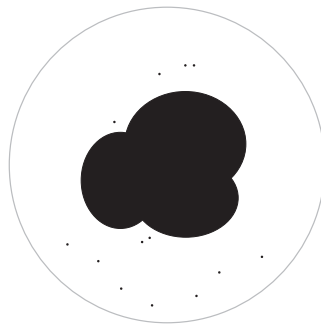
A

Clean Start/Stop Standards

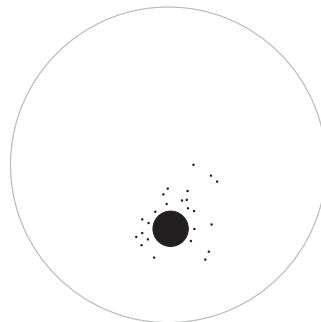
The following illustrations show the minimum acceptable standards for clean start and clean stop. Compare these to samples obtained by placing a sheet of blank paper directly under the printhead.



Typical clean start/stop



Typical dirty start/stop



Minimum standard required

(samples are shown actual size)

Figure A-1: Clean Start/Stop Test Illustrations

Clean Start

The Clean Start sequence is as follows:

- 1 The solvent from the filter is forced through the umbilical connection into the printhead.
- 2 At the printhead, the solvent enters the heater manifold and passes into the main fluid path between the jet valve and the nozzle.
- 3 The jet starts when the nozzle becomes pressurized by the solvent flow.
- 4 If the previous stop was a clean stop, the jet will consist of almost pure solvent. The flow of solvent quickly removes any ink residues in the jet orifice.
- 5 Fluid in the jet is caught by the gutter and directed to the ink core.
- 6 Once the solvent flows through the jet, the jet valve opens, merging ink with the solvent.
- 7 The bleed valve then opens to increase the fluid flow through the nozzle, removing any trapped air bubbles from the nozzle body.
- 8 Once the bleed valve opens, the flush pump valve (V7) turns off, preventing further solvent from being pumped into the nozzle.
- 9 The flush pump returns to its priming stroke and the non-return valves in the pump prevent fluid from the printhead returning to the umbilical connection.
- 10 Approximately ten seconds after the flush pump turns off, the bleed valve closes and ink continues to flow through the jet at 4 bar.
- 11 Modulation is switched on and the ink pressure changes to give the correct jet velocity.
- 12 Heater manifold temperature is allowed to reach the correct value before enabling the phasing checks on the jet.

Quick Start

This method starts without a flushing sequence, and uses the ink supply to bleed the air from the nozzle.

Clean Stop

The Clean Stop sequence is as follows:

- 1 Deflector plate voltages are switched off before beginning this sequence.
- 2 The ink pressure is set to 4 bar and the modulation voltage switches off.
- 3 To increase the ink flow through the nozzle body, the bleed valve turns on.
- 4 The flush pump valve turns on applying solvent pressure to the printhead.
- 5 Pure solvent is forced through the filter to the printhead, mixing solvent into the ink stream in the heater manifold.
- 6 Approximately one second after the solvent starts to mix with the ink, the feed valve (V6) in the cabinet turns off, removing ink pressure from the printhead.
- 7 Ink ceases to flow into the heater manifold and the solvent flushes ink from the nozzle body.
- 8 Five seconds later the bleed valve turns off and then turns on again, introducing solvent into the jet valve, which inhibits the formation of ink residues when the printer is turned off.
- 9 The jet valve (on the heater manifold) turns off, ensuring that no ink diffuses into the solvent. At this point, no ink should be present in the nozzle body.
- 10 The gutter valve switches off, increasing the suction on the bleed system. After a short pause, the bleed valve turns off.
- 11 After another short pause, the gutter valve turns on to clear any fluid from the gutter.
- 12 Once the gutter valve turns off, the main ink pump also turns off.

Quick Stop

Note: This sequence is used to manually stop the jet for a short period, or to automatically stop the jet during instances like EHT trip and charge error.

This method switches off the ink without flushing the nozzle or manifold. Hence the manifold and the nozzle are full of ink when the jet stops. The machine must not be left in this state for long periods, as dry ink in the jet orifice may make restarting difficult. This procedure is primarily intended

for situations where the machine may be stopped and restarted several times in quick succession. Under these conditions, the use of solvent may become excessive and cause dilution of the ink.

Nozzle Flush

When nozzle flush is selected, the vacuum from the venturi is applied to the return side of the nozzle, creating suction at the nozzle orifice. Solvent is applied to the nozzle orifice to clear any blockage.

Nozzle flush automatically times out after 2 minutes but can be stopped at any time before that by pressing *F1* key Abort Flush.

A nozzle flush can be started with the jet running or stopped. If the jet is running, selecting nozzle flush will first turn off the feed valve V6 to stop the flow of ink to the nozzle.

Internal Encoding

Internal encoding is used when product speed is constant. An internal clock sets the stroke-rate to a constant pace.

Internal encoding is used when the product speed is constant. The internal clock of the printer is set to the speed of the product in feet per minute (FPM) or meters per minute (MPM).

Note: Internal encoding is also used when test printing a sample message. For information on test printing a sample message, refer to Operator Manual.

To use internal encoding, it is necessary to determine the product speed. This section describes four methods that can be used to determine the product speed.

Method 1

Use a handheld tachometer that is calibrated to measure linear surface speed in FPM or measure the revolutions per minute of the pulley. Convert RPM to surface speed by using the following formula:

$$\text{Surface speed (FPM)} = [\Pi d \times (\text{RPM})] / 12$$

where $\Pi = 3.14$ and $d =$ pulley diameter in inches.

Method 2

Establish a reference mark on the conveyor belt and measure how many inches (one inch equals 25.4 mm) this mark moves in 5 seconds. This number is equal to the conveyor speed in FPM.

Method 3

If you know the number of products produced per minute on the line, the size of the product, and the gap between each product, you can calculate the product speed.

For example:

1200 products per minute are produced on the line, each product is 2.5 inches wide, and there is a one inch gap between each product.

$$\text{Conveyor speed} = [(\text{products per minute}) \times (\text{size} + \text{gap})] / 12$$

where size and gap are in inches.

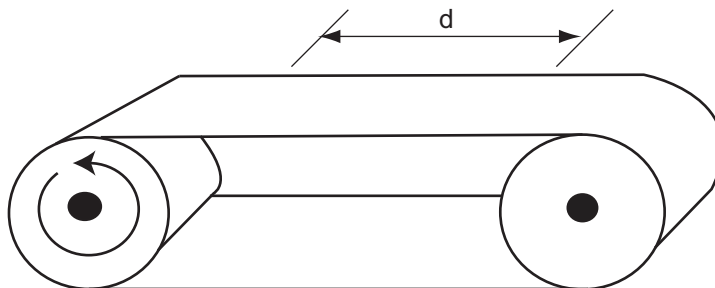
Method 4

It is also possible to use the printer's product counter to determine the number of products per minute, and then calculate the line speed as described in "Method 3" on page B-2.

External Encoding

External encoding is used when the speed of the conveyor varies. A shaft encoder measures the conveyor speed, and transmits the data to the printer. This data enables the printer to vary the stroke rate according to the variation in the speed of the conveyor. You can use the following types of shaft encoding methods:

- A direct shaft encoder maintains a 1:1 ratio between the encoder pulses and print strokes.
- A divided-down shaft encoder is used when the conveyor speed requires fewer pulses than the actual output of the shaft encoder.



d = distance of conveyor (product) travel per revolution of shaft

Figure B-1: Product Distance

Required shaft encoder:

Pulses per Revolution (PPR) = $d \times (\text{strokes per inch})$

Where strokes per inch = $(\text{strokes per character}) \times (\text{characters per inch})$

Example 1

1800 PPR Encoder connected to production line.

$d = 10$ inches of product travel for one revolution

If you want to print using 5x7 SL matrix and the required print pitch is 10 Characters Per Inch (CPI),

then $1800 \text{ PPR} / 10 = 180 \text{ PPI}$,

as the printer can see both edges of incoming channel,

then $180 \times 2 = 360 \text{ PPI}$.

If both A and B channel are in use, then multiply the PPI value that you get by 2 for the second channel.

$360 \times 2 = 720$

Note: If you use both channels, A and B, from the encoder, use the following calculation:

(Encoder PPR/Inches travelled for one revolution) $\times 4$.

The printer PPI is 720 with a print pitch requirement of 10 CPI. The number of strokes required for a 5x7 SL matrix at 10 CPI is 60.

Therefore, $720 \text{ PPI} / 60 \text{ strokes} = 12$

12 is the printer reduction factor or width divider setting. This gives you a print output of 10 CPI of 5x7 SL matrix.

As the 5x7 SL matrix is based on 10 CPI, you can get the top line speed on printer speed chart.

Example 2

1800 PPR Encoder connected to a production line

$d = 23$ inches per revolution

$\text{PPI} = 1800 / 23 = 78 \text{ PPI}$

But, as the setting is a non-quad configuration, the channel uses both the edges so the PPI value is

$78 \text{ PPI} \times 2 = 156$

Example 3

Given information:

d = 23 inches

5 x 7 matrix

10 characters per inch

6 strokes per character

(five printed strokes from the 5 x 7 character, plus one “guard” stroke that leaves a space between the characters.)

23 inches per revolution x 60 strokes per inch = 1380 PPR

Example 4

If the standard 1800 PPR shaft encoder is to be used as shown in Example 1, it will be necessary to provide some type of gearing to supply the required 60 pulses per inch as shown in Figure B-2.

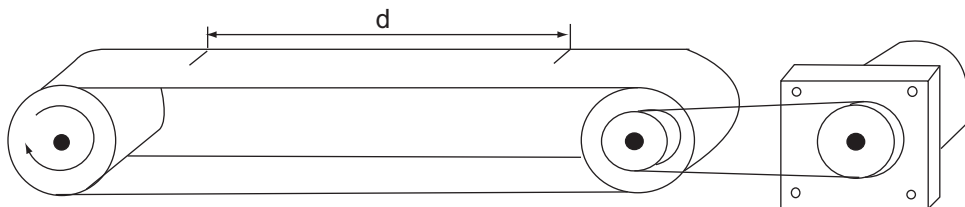
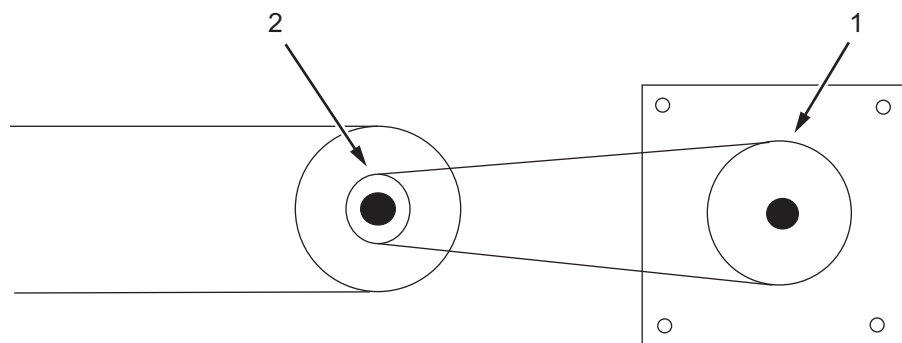


Figure B-2: External Shaft Encoder

To determine the required gearing, the following method is used.

$1800 \text{ PPR} / 1380 \text{ PPR} = 1.3$ or 1:3:1 gear ratio



- 1. Pulley b
- 2. Pulley a

Figure B-3: External Shaft Encoder - With Pulley

If the diameter of “a” = 2.0 inches, then the diameter of “b” is 2.6 inches (2.0 inches x 1.3 = 2.6 inches). For one rotation of “a”, 1380 pulses are produced from the 1800 PPR shaft encoder.

If that same 1800 PPR shaft encoder is connected directly to the shaft on the conveyor, the calculation would be as follows:

$$(1800 \text{ pulses per revolution}) / (23 \text{ inches per revolution}) = 78 \text{ pulses per inch}$$

$$(78 \text{ pulses per inch}) / (6 \text{ strokes per character}) = 13 \text{ characters per inch}$$

Since the standard calls for 10 characters per inch (refer to Example 1), the message would be compressed on the product.

Auto Encoding

Auto encoding is used when the product speed and the conveyor speed are different (product slippage) or when the product is allowed to fall through guides from one level to another. 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. The requirements for auto encoding are the following:

- A product detector
- The length of the detect area (the amount which the detector senses). This value must be entered into the printer.
- The distance between the printhead and the product detector must be set such that, both the leading and trailing edges of the product are sensed by the product detector before the printer starts printing the message.

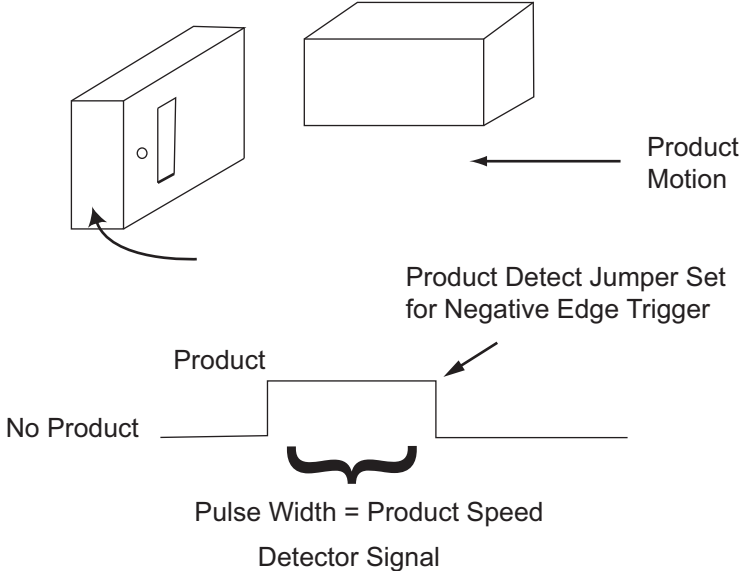


Figure B-4: Auto Encoding

Example

Given information:

Detect area = 5 inches (127 mm)

Pulse width of this product = 0.1 seconds

Then, Product speed = 5 inches/0.1 second = 50 inches per second (127.0 mm/0.1 s = 1270.0 mm/s)

(50 inches per second x 60 seconds per minute)/(12 inches per foot) = 250 FPM

(1270 mm/s x 60 s/minute)/1000 mm/m = 76.2 MPM

Universal CSB Test Points

C

CSB Test Points

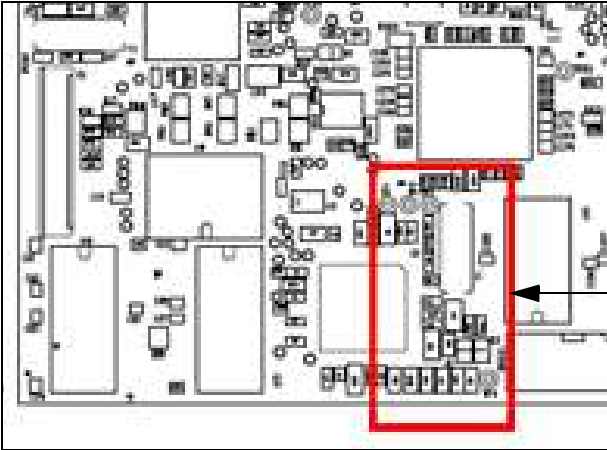
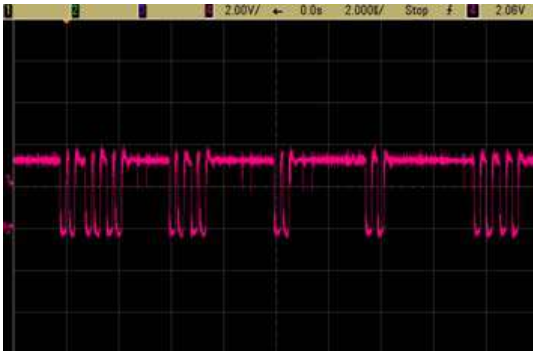
Test Point	Name	Test Equipment Required	Measurement
TP1 - TP4			
TP1	CPU RD	Oscilloscope	

Table C-1: CSB Test Points


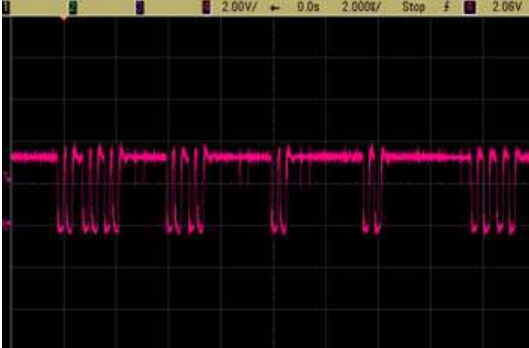
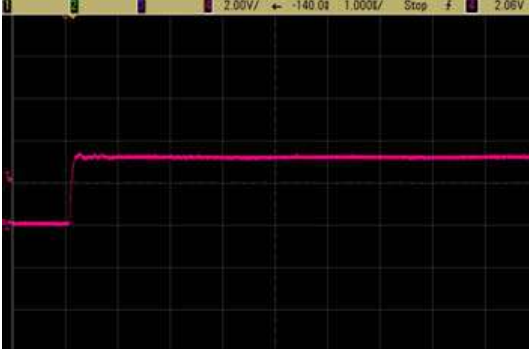
Test Point	Name	Test Equipment Required	Measurement
TP2	CPU WR	Oscilloscope	 <p>The oscilloscope screen shows a signal with a high-frequency burst at the beginning, followed by a steady-state signal with periodic sharp downward spikes. A yellow notification box at the top reads "USB device installed as '/drive0'". The top status bar shows "2.00V", "0.0s", "10.00kV", "Stop", and "2.06V".</p>
TP3	CPU CS	Oscilloscope	 <p>The oscilloscope screen shows a square wave signal with several cycles. The top status bar shows "2.00V", "0.0s", "2.000kV", "Stop", and "2.06V".</p>
TP4	CPU IRQ	Oscilloscope	 <p>The oscilloscope screen shows a single sharp pulse signal. The top status bar shows "2.00V", "140.0k", "1.000kV", "Stop", and "2.06V".</p>

Table C-1: CSB Test Points (Continued)

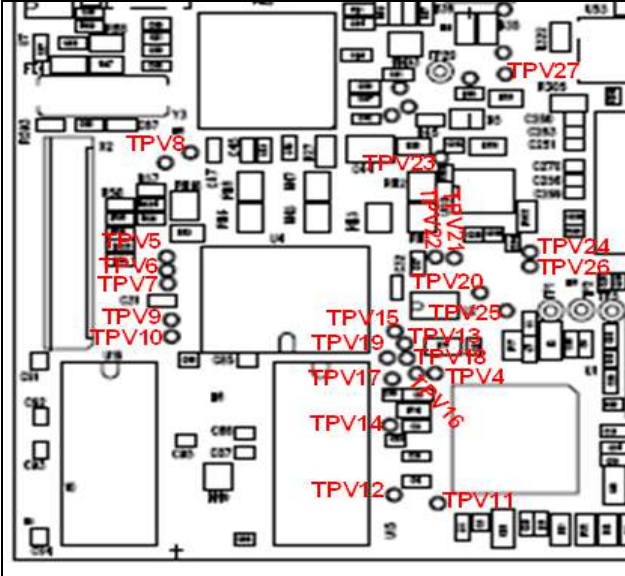

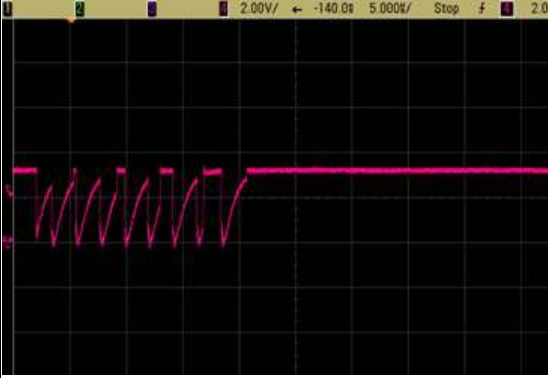
Test Point	Name	Test Equipment Required	Measurement
TPV4 - TPV27			
TPV4	LDATA0	Oscilloscope	
TPV5	LDATA1	Oscilloscope	

Table C-1: CSB Test Points (Continued)

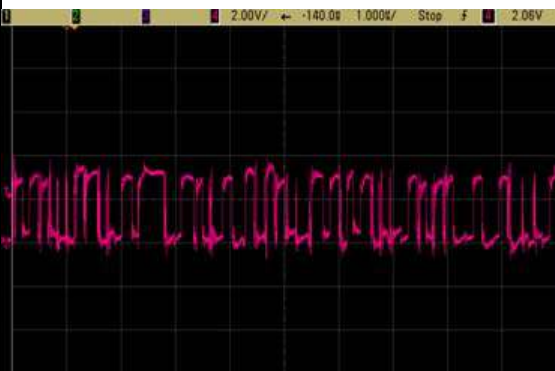
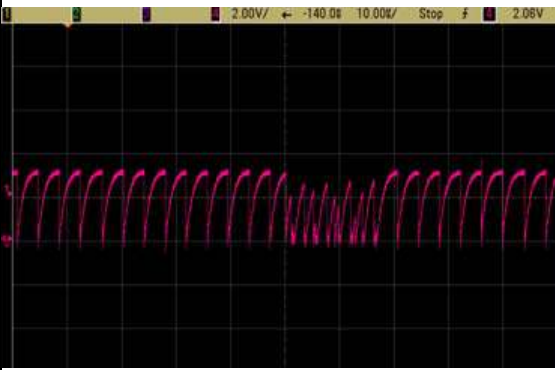
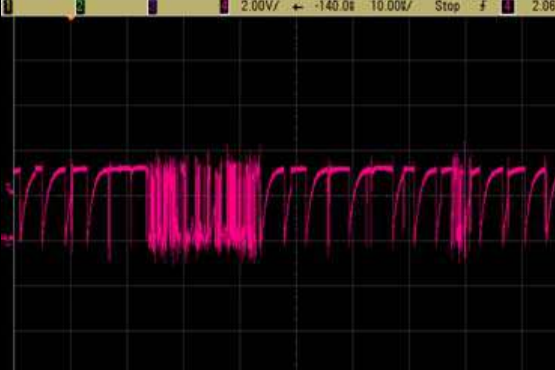
Test Point	Name	Test Equipment Required	Measurement
TPV6	LDATA2	Oscilloscope	
TPV7	LDATA3	Oscilloscope	
TPV8	LDATA4	Oscilloscope	

Table C-1: CSB Test Points (Continued)


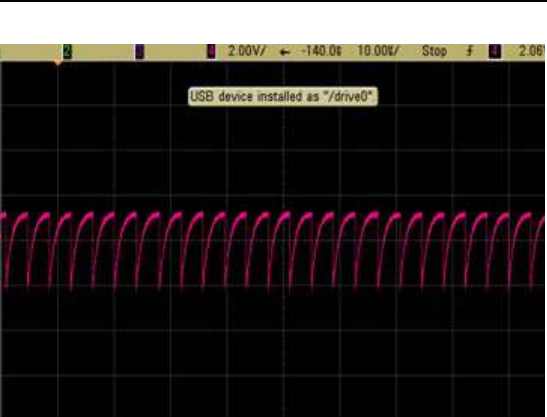
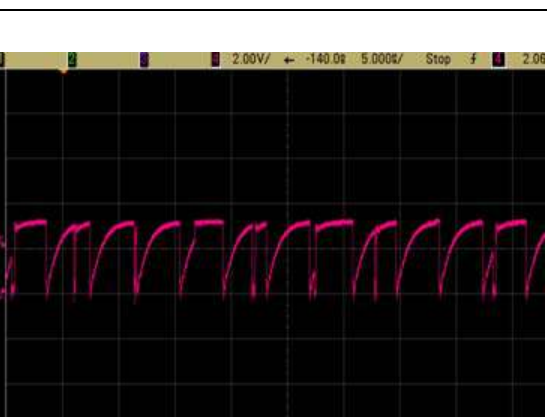
Test Point	Name	Test Equipment Required	Measurement
TPV9	LDATA5	Oscilloscope	
TPV10	LDATA6	Oscilloscope	
TPV11	LDATA7	Oscilloscope	

Table C-1: CSB Test Points (Continued)

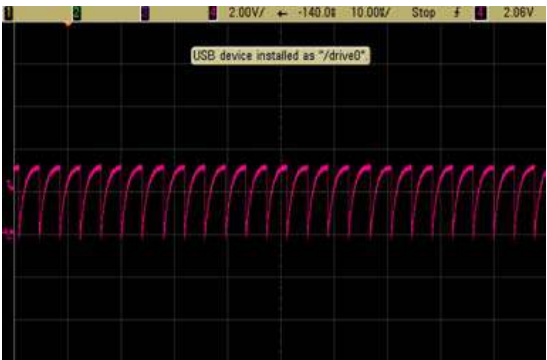
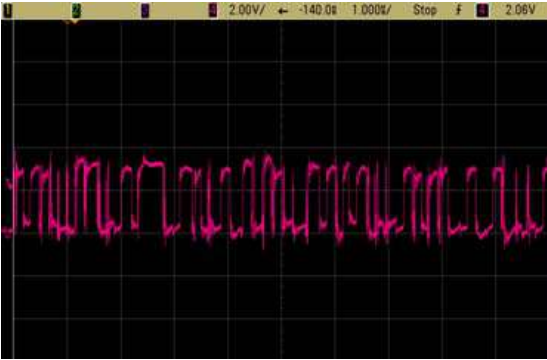
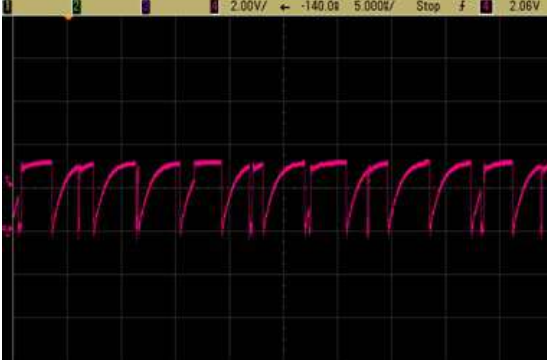
Test Point	Name	Test Equipment Required	Measurement
TPV12	LDATA8	Oscilloscope	 <p>The screenshot shows a regular, periodic waveform on a black background. The waveform consists of a series of rounded, upward-pointing pulses. The top of the screen displays settings: 2.00V/ (vertical scale), -140.0s (horizontal scale), 10.00k/ (time base), Stop (mode), f (frequency), and 2.06V (input level). A message box at the top center reads "USB device installed as '/drive0'".</p>
TPV13	LDATA9	Oscilloscope	 <p>The screenshot shows a complex, irregular waveform on a black background. The waveform consists of a series of sharp, upward-pointing pulses with varying widths and heights. The top of the screen displays settings: 2.00V/ (vertical scale), -140.0s (horizontal scale), 1.000k/ (time base), Stop (mode), f (frequency), and 2.06V (input level). A message box at the top center reads "USB device installed as '/drive0'".</p>
TPV14	LDATA10	Oscilloscope	 <p>The screenshot shows a regular, periodic waveform on a black background. The waveform consists of a series of sharp, upward-pointing pulses. The top of the screen displays settings: 2.00V/ (vertical scale), -140.0s (horizontal scale), 5.000k/ (time base), Stop (mode), f (frequency), and 2.06V (input level). A message box at the top center reads "USB device installed as '/drive0'".</p>

Table C-1: CSB Test Points (Continued)

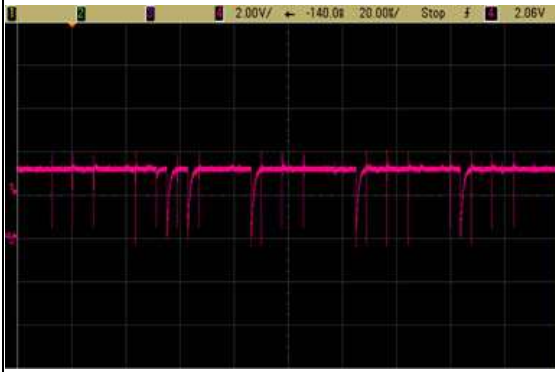
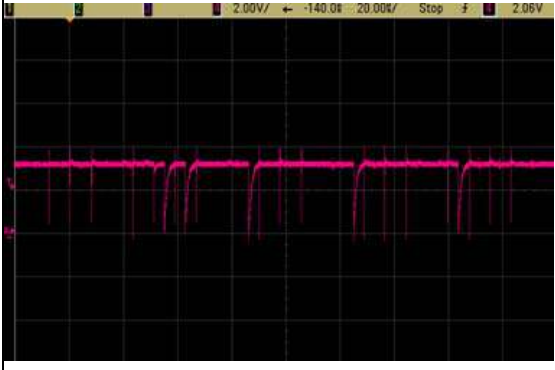
Test Point	Name	Test Equipment Required	Measurement
TPV15	LDATA11	Oscilloscope	
TPV16	LDATA12	Oscilloscope	
TPV17	LDATA13	Oscilloscope	

Table C-1: CSB Test Points (Continued)

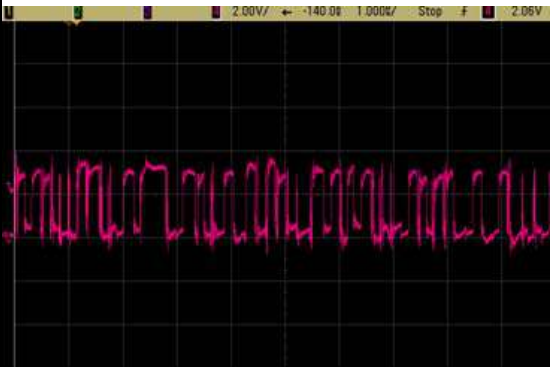
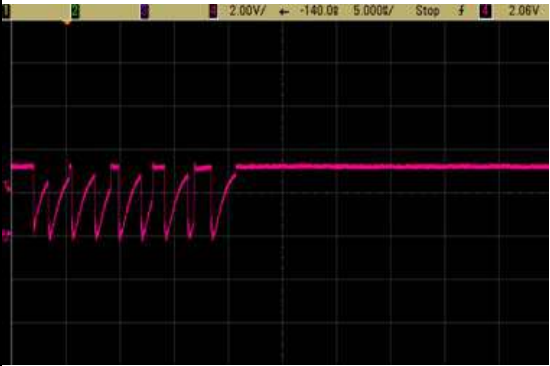

Test Point	Name	Test Equipment Required	Measurement
TPV18	LDATA14	Oscilloscope	
TPV19	LDATA15	Oscilloscope	
TPV20	BA1	Oscilloscope	

Table C-1: CSB Test Points (Continued)

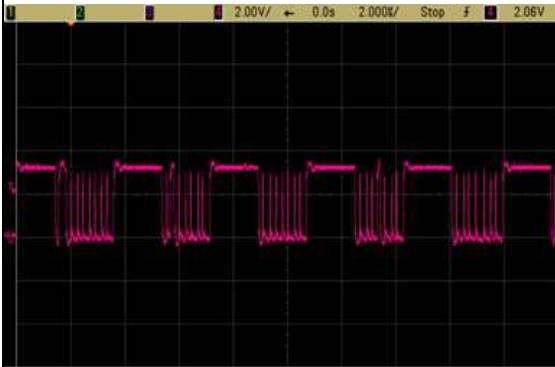
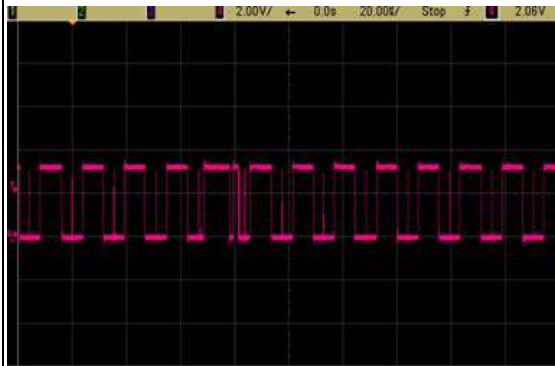
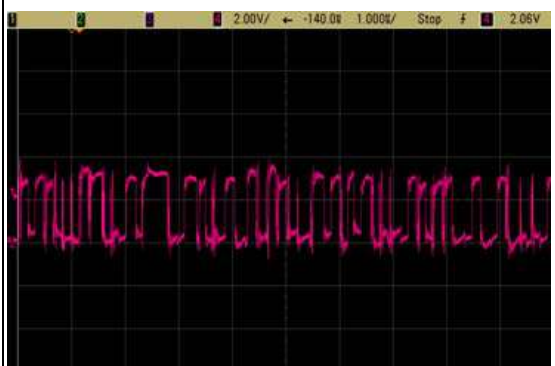
Test Point	Name	Test Equipment Required	Measurement
TPV21	BA2	Oscilloscope	
TPV22	BA3	Oscilloscope	
TPV23	BA4	Oscilloscope	

Table C-1: CSB Test Points (Continued)

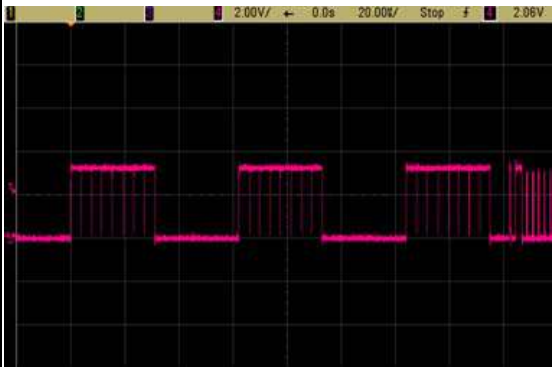
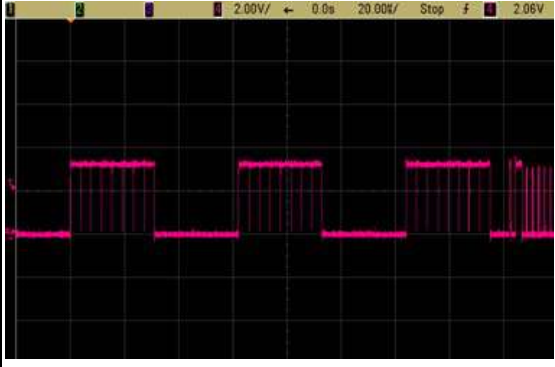
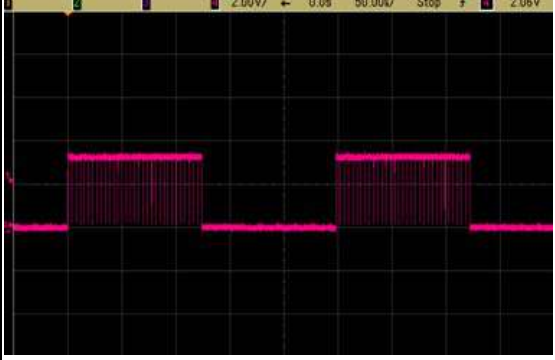
Test Point	Name	Test Equipment Required	Measurement
TP24	BA5	Oscilloscope	
TPV25	BA6	Oscilloscope	
TPV26	BA7	Oscilloscope	

Table C-1: CSB Test Points (Continued)

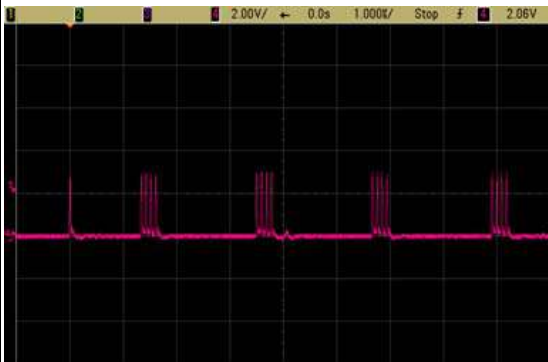
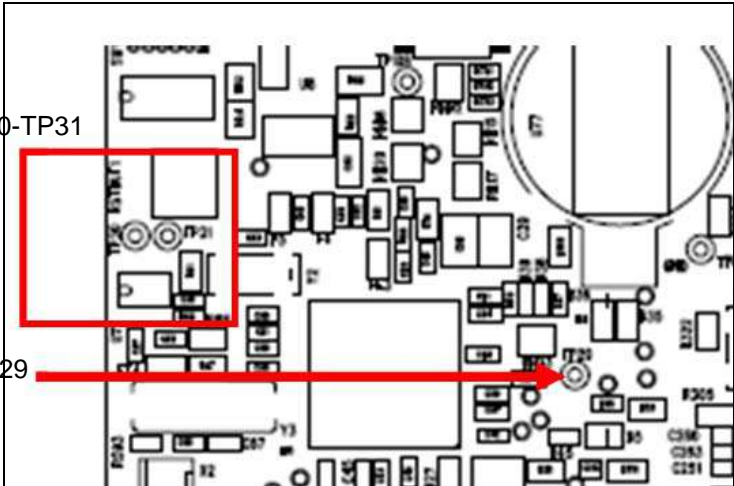
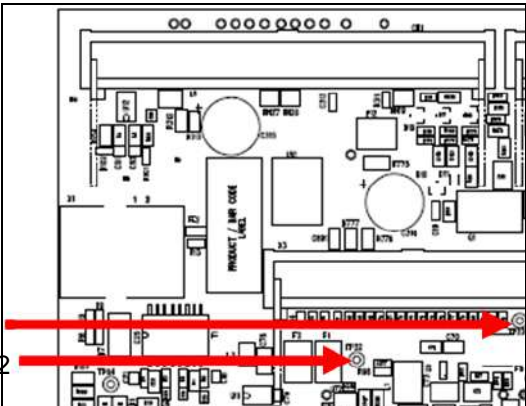
Test Point	Name	Test Equipment Required	Measurement
TPV27	ADDR11	Oscilloscope	
TP29, TP30, TP31			
TP29	CPU RSTOUT	Voltmeter	Reading: 3.3 VDC
TP30	CPU RSTIN	Voltmeter	Reading: 3.3 VDC
TP31	EINT0	Voltmeter	Reading: 3.3 VDC
TP32 - TP33			

Table C-1: CSB Test Points (Continued)

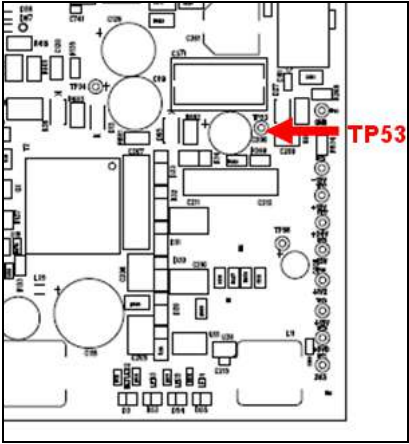
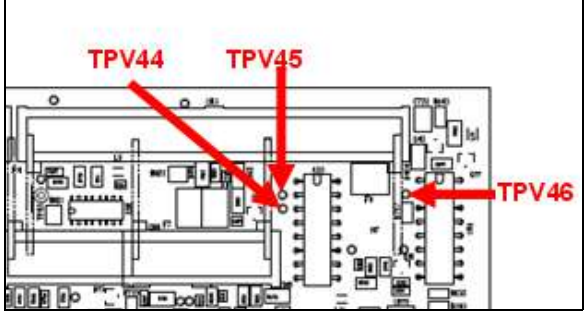
Test Point	Name	Test Equipment Required	Measurement
TP32	3.3 VDC - fused - for LCD	Voltmeter	Reading: 3.3 VDC
TP33	Backlight Power - fused - to LCD	Voltmeter	Reading: 26.17 VDC
TP53			
TP53	Charge Amp supply	Voltmeter	Plus 300VDC - used to measure +300 VDC used in the Charge Amplifier circuit Reading:+312 VDC
TPV42	Ink Temperature	Not used	-
TPV44, TPV45, TPV46			
TPV44	Head Heater Drive	Voltmeter	<ol style="list-style-type: none"> Used to measure the input to the head heater drive circuit on chip U25. Used to measure the signal at TPV44. Measured voltage should be approximately 0.6 VDC.

Table C-1: CSB Test Points (Continued)

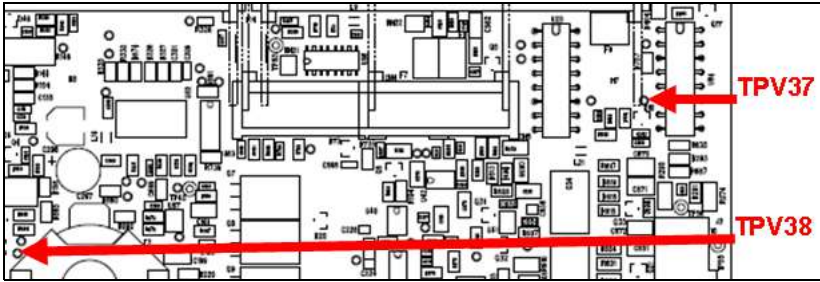
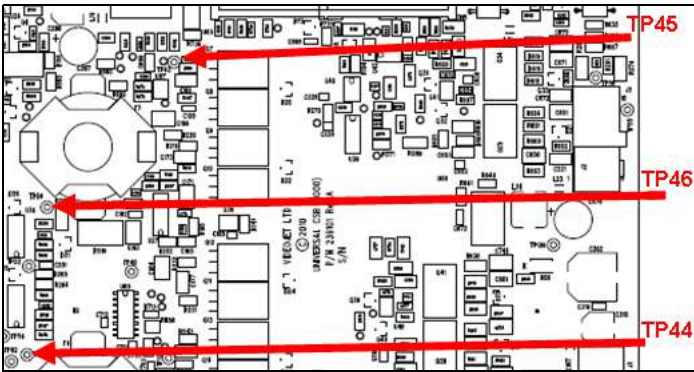
Test Point	Name	Test Equipment Required	Measurement
TPV37 and TPV38			
TPV37	Printhead Cover	Voltmeter	<ol style="list-style-type: none"> 1. Used to measure the signal at TPV37. 2. If the printhead cover is removed, the measured voltage should be 3.3 VDC. 3. If the printhead cover is fitted, the measured voltage should be < 0.5VDC
TP45, TP46 and TP44			
TP44	Modulation Head Monitor	Voltmeter	<ol style="list-style-type: none"> 1. The Modulation Voltage Monitor is an output of the modulation circuit used by the CSB to track modulation voltage. 2. Measure the voltage at MODV. 3. Measured voltage should be less than 2VDC, and the voltage will change as the auto modulation routine is performed.

Table C-1: CSB Test Points (Continued)

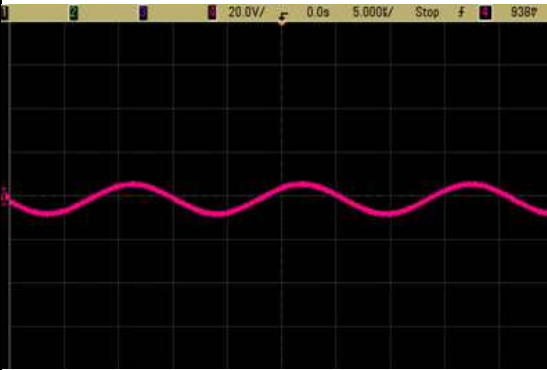
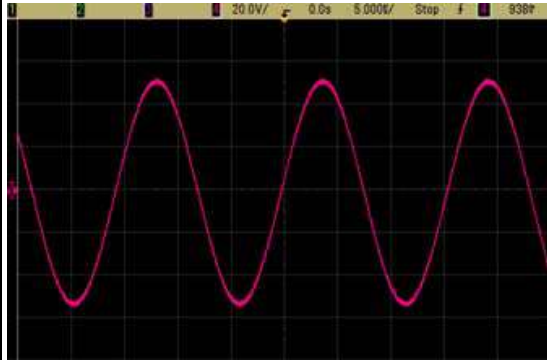
Test Point	Name	Test Equipment Required	Measurement
TP45	Modulation Transformer Primary	Oscilloscope	<ol style="list-style-type: none"> Allows the measuring the modulation of sine wave on the primary side of the modulation power amplifier transformer. Measure the signal at TP45 with an oscilloscope. The following output is considered to be good. 
TP46	Modulation Drive Nozzle 1	Oscilloscope	<ol style="list-style-type: none"> Used to verify output modulation signal supplied by the CSB to the nozzle. With ink jet running, measure signal at TP46. The following output is considered to be good. 

Table C-1: CSB Test Points (Continued)

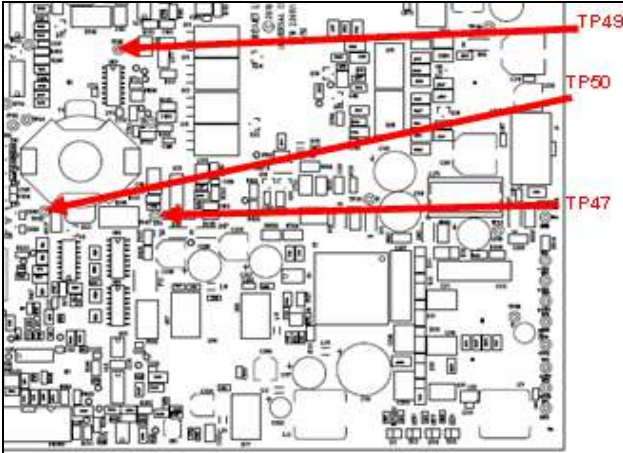
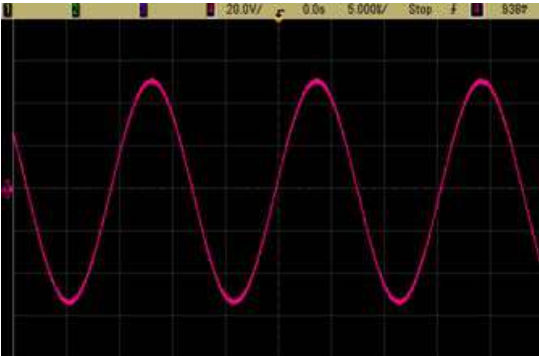
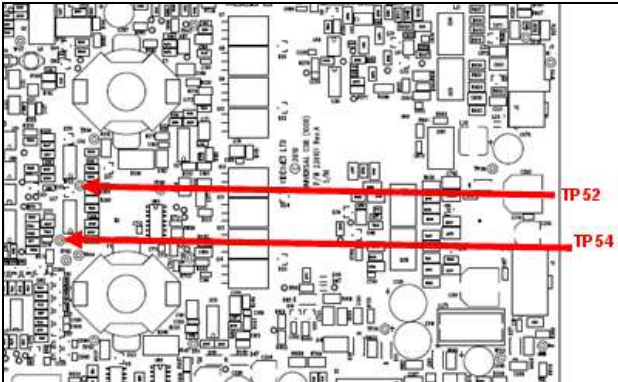
Test Point	Name	Test Equipment Required	Measurement
TP47, TP49, TP50			
TP50	Modulation Drive Nozzle 2	Oscilloscope	<p>Used to verify output modulation signal supplied by the CSB to the nozzle. With ink jet running, measure signal at TP50. The following output is considered to be good.</p> 
TP52, TP54			

Table C-1: CSB Test Points (Continued)

Test Point	Name	Test Equipment Required	Measurement
TP52	Modulation Current Monitor	Voltmeter	<ol style="list-style-type: none"> Allows the measurement of the processed signal used by the CSB to determine the nozzle current. Measure the voltage at TP52. 1 VDC indicates approximately 300 milliamps of nozzle current.
TPV150-TPV154			
TPV150	Modulation Din	Oscilloscope	<p>Data input to Modulation DACs (chips U33 and U76).</p>
TPV151	Modulation NCS	Voltmeter	3.3VDC

Table C-1: CSB Test Points (Continued)

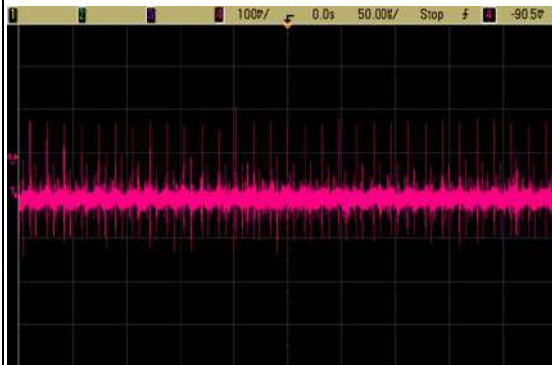
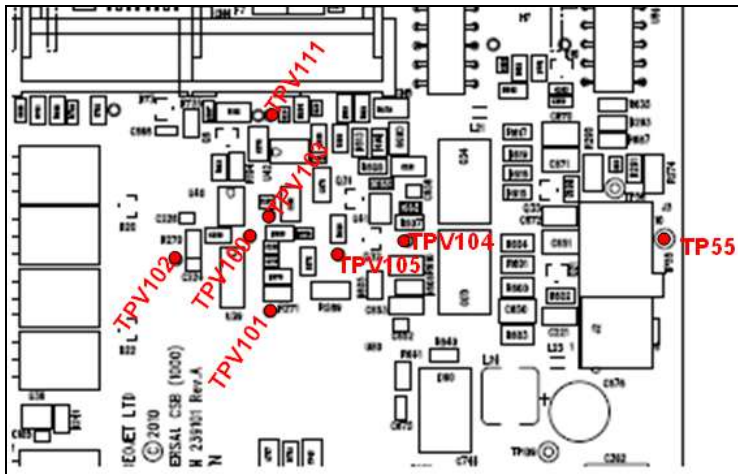
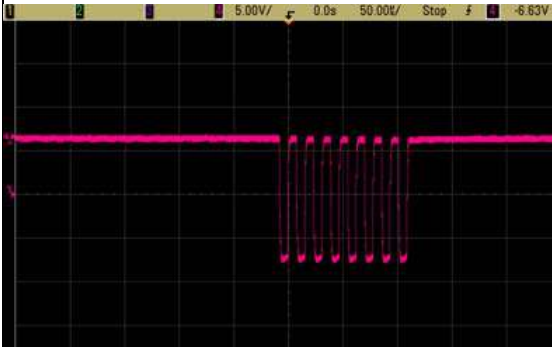
Test Point	Name	Test Equipment Required	Measurement
TPV152	Modulation SCLK	Oscilloscope	
TP55			
TP55	Charge Amplifier out	Oscilloscope	<p data-bbox="847 1262 1393 1417">Used to measure the signal at TP55. When the ink stream is On, and the printer is not printing, the ability to acquire the following signal indicates that the charge amplifier circuit is functioning properly.</p> 

Table C-1: CSB Test Points (Continued)

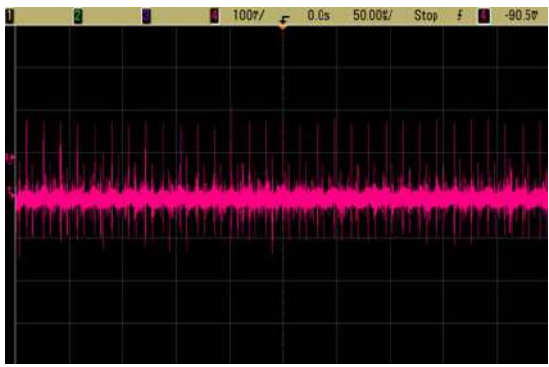
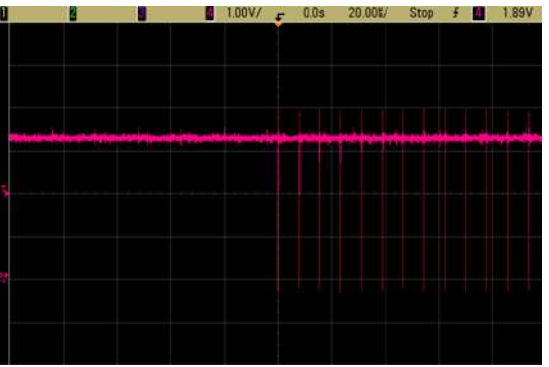

Test Point	Name	Test Equipment Required	Measurement
TPV100	QDAC RNW	Oscilloscope	
TPV101	QDAC NCS	Oscilloscope	
TPV102	QDAC BNA	Voltmeter	3.3 VDC
TPV103	RFBA	Oscilloscope	

Table C-1: CSB Test Points (Continued)

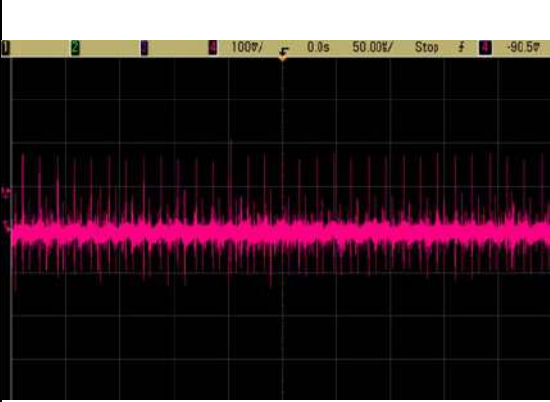

Test Point	Name	Test Equipment Required	Measurement
TPV104	<None>	Oscilloscope	
TPV105	<None>	Oscilloscope	
TPV111	Charge Amp Out	Voltmeter	<ol style="list-style-type: none"> 1. Allows the measurement of the analog output of the charge amplifier circuitry, that is fed back to the CSB's analog-to-digital converter. 2. Measure the voltage at TPV111. With the inkjet running, the voltage should be 2.3 VDC. 3. If the inkjet is Off, the voltage should be 2.048 VDC.

Table C-1: CSB Test Points (Continued)

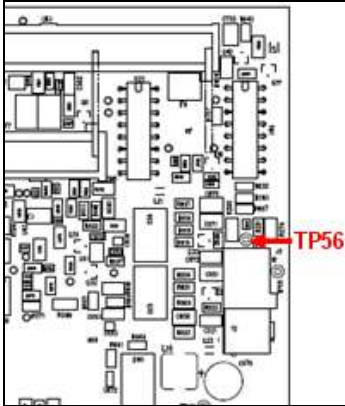
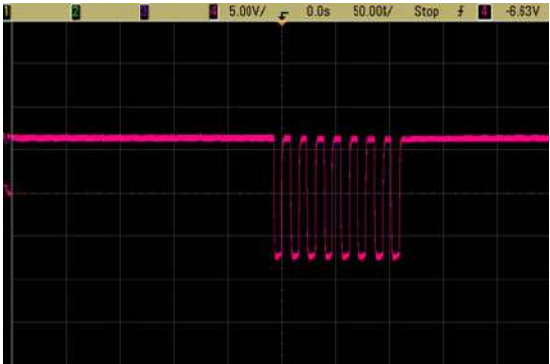
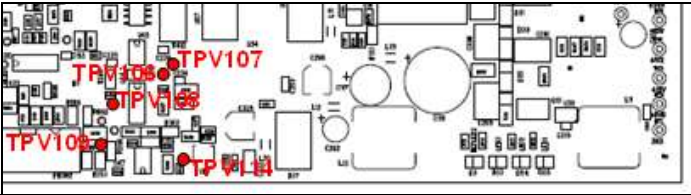
Test Point	Name	Test Equipment Required	Measurement
TP56			
TP56	Charge Amplifier out	Oscilloscope	<p>Used to measure the signal at TP56. When the ink stream is On, and the printer is not printing, the following signal indicates that the charge amplifier circuit is functioning properly.</p> 
TP106, TP107, TP108, TP109 and TP114			

Table C-1: CSB Test Points (Continued)


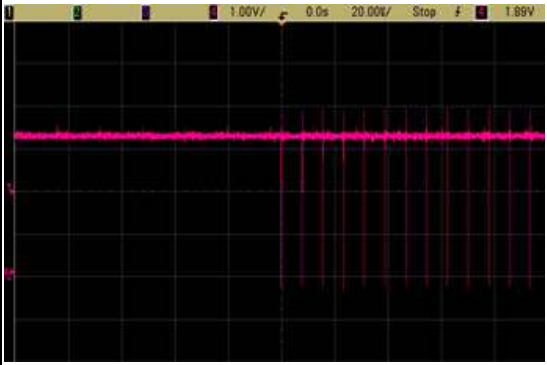

Test Point	Name	Test Equipment Required	Measurement
TPV106	QDAC RNW	Oscilloscope	
TPV107	QDAC NCS	Oscilloscope	
TPV108	QDAC BNA	Voltmeter	3.3 VDC
TPV109	RFBA	Oscilloscope	

Table C-1: CSB Test Points (Continued)

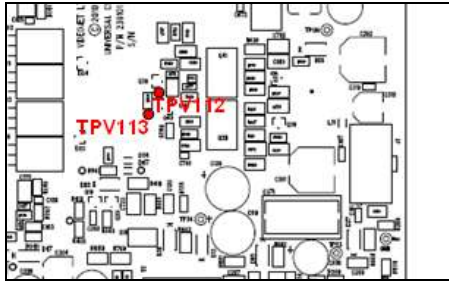

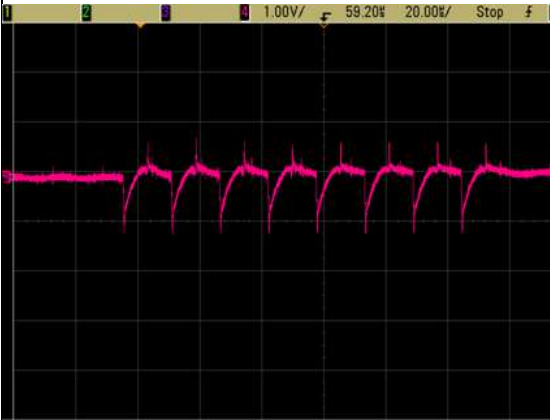
Test Point	Name	Test Equipment Required	Measurement
TPV114	Charge Amp Out	Voltmeter	<ol style="list-style-type: none"> Allows the measurement of the analog output of the charge amplifier circuitry that is fed back to the CSBs analog-to-digital converter. Measure the voltage at TPV114. With the inkjet running, the voltage should be 2.3 VDC. If the inkjet is Off, the voltage should be 2.048 VDC.
TPV112, TPV113			
TPV112	<None>	Oscilloscope	
TPV113	<None>	Oscilloscope	

Table C-1: CSB Test Points (Continued)

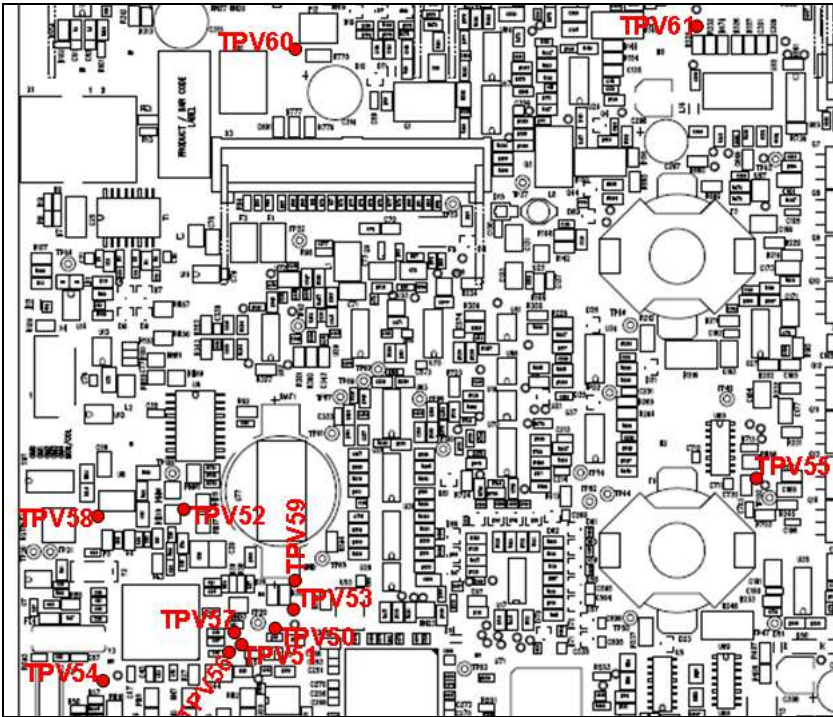

Test Point	Name	Test Equipment Required	Measurement
TPV50 - TPV61			
TPV50	Print Engine Clock	Oscilloscope	

Table C-1: CSB Test Points (Continued)

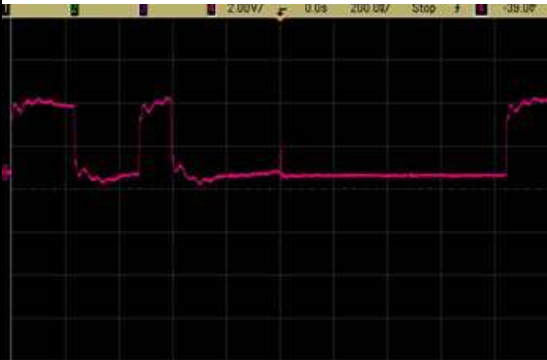
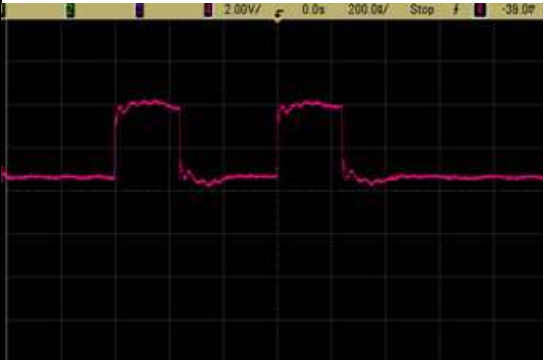
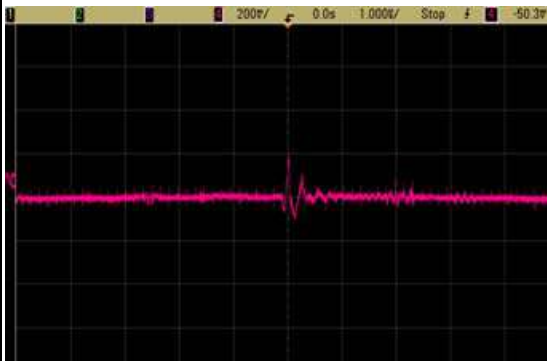
Test Point	Name	Test Equipment Required	Measurement
TPV51	Print Engine MOS	Oscilloscope	
TPV52	Print Engine MIS	Oscilloscope	
TPV53	SPI SSN	Voltmeter	3.3 VDC
TPV54	NP TRIG	Oscilloscope	

Table C-1: CSB Test Points (Continued)


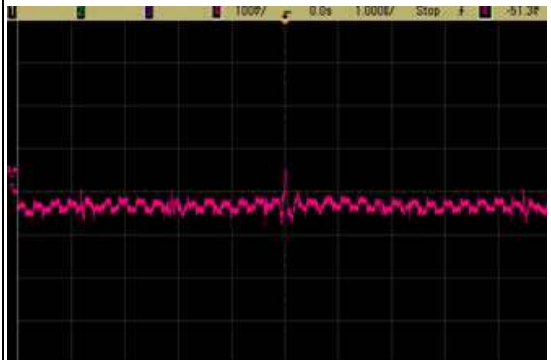
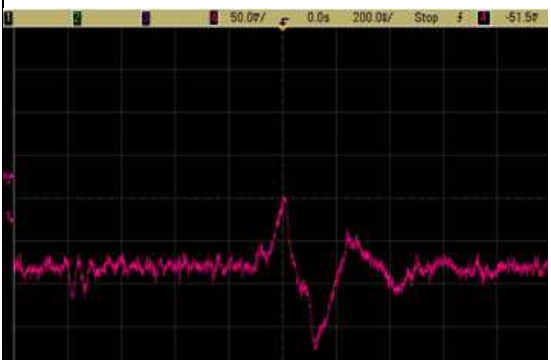
Test Point	Name	Test Equipment Required	Measurement
TPV55	Interrupt	Oscilloscope	 <p>The oscilloscope screen shows a square wave signal with a period of approximately 200 ns. The voltage level is around 2.00V. The top status bar of the oscilloscope displays '2.00V', '0.0s', '200.0ns', 'Stop', and '-50.3%'.</p>
TPV56	SPI NSS	Oscilloscope	 <p>The oscilloscope screen shows a noisy signal with a period of approximately 1.000 ns. The voltage level is around 1.00V. The top status bar of the oscilloscope displays '1.00V', '0.0s', '1.000ns', 'Stop', and '-51.2%'.</p>
TPV57	SPI MOS	Oscilloscope	 <p>The oscilloscope screen shows a noisy signal with a period of approximately 200.0 ns. The voltage level is around 50.0V. The top status bar of the oscilloscope displays '50.0V', '0.0s', '200.0ns', 'Stop', and '-51.5%'.</p>

Table C-1: CSB Test Points (Continued)

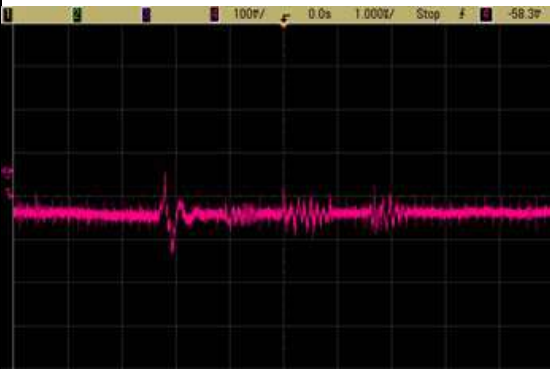

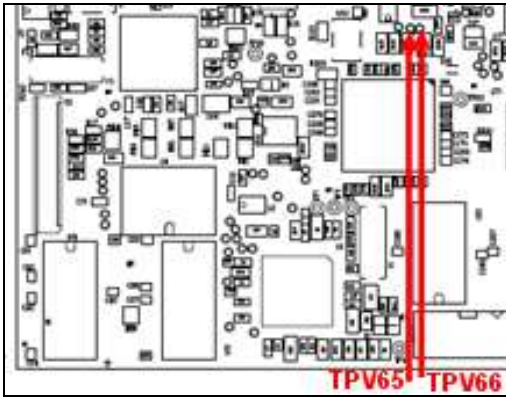
Test Point	Name	Test Equipment Required	Measurement
TPV58	SPI MIS	Oscilloscope	
TPV59	SPI CLK	Oscilloscope	
TPV60	SC Drive Mix	Voltmeter	3.0 VDC
TPV61	Pump Enable	Voltmeter	<ol style="list-style-type: none"> 1. If the ink pump is running, reading of 3.25 VDC is expected. 2. If the ink pump is idle, reading of 0 VDC is expected.
TPV65, TPV66			

Table C-1: CSB Test Points (Continued)

Test Point	Name	Test Equipment Required	Measurement
TPV65	Shaft Encoder Two	Oscilloscope	<p>1. Used to verify the shaft encoder (phase B in a quadrature encoder) is supplying pulses to the printer.</p> <p>2. Make sure that the encoder is connected to the printer and start the conveyor, measure the signal at TPV65.</p> <p>Note: The signal will be present only if a quadrature (two-phase) encoder is in use. The following output is considered to be good.</p>
TPV66	Shaft Encoder one	Oscilloscope	<p>1. Used to verify that the shaft encoder is supplying pulses to the printer.</p> <p>2. Make sure that the encoder is connected to the printer and start the conveyor. Measure the signal at TPV66.</p> <p>The following output is considered to be good.</p>

Table C-1: CSB Test Points (Continued)

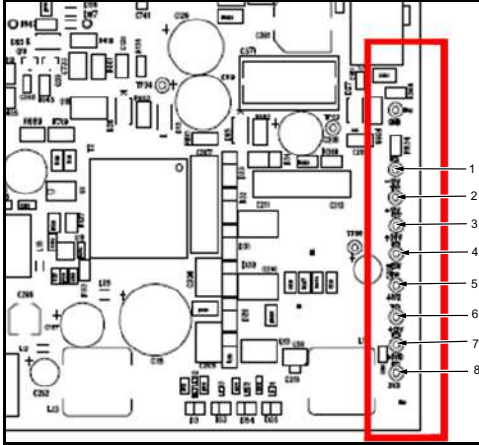
Test Point	Name	Test Equipment Required	Measurement
Power Supplies TP71 - TP73, TP75 - TP78, TP80			<ol style="list-style-type: none"> 1. -12 V (TP75) 2. +12 V(TP72) 3. +13 V 4. +24 V(TP77) 5. IV2(TP80) 6. +15 V(TP73) 7. 3V3(TP71) 8. 3.3 VDC
TP78 (+5VD)	5 VDC (Filtered)	Voltmeter	<ol style="list-style-type: none"> 1. Used to verify the filtered 5VDC level on the CSB. 2. Measure the voltage at +5VD. 3. Measured voltage should be +5VDC.
TP80 (+1V2)	FPGA core VOLTAGE	Voltmeter	<ol style="list-style-type: none"> 1. Used to verify the FPGA core voltage on the CSB. 2. Measure the voltage at +1V2. 3. Measured voltage should be +1.2VDC.
TP75 (-12V)	-12 VDC	Voltmeter	Used to verify regulated -12 VDC produced on the CSB. Measure the voltage at -12V. Measured voltage should be -12VDC
TP72 (+12V)	+12 VDC	Voltmeter	<ol style="list-style-type: none"> 1. Used to verify regulated +12 VDC produced on the CSB. 2. Measure the voltage at +12V. 3. Measured voltage should be +12VDC.
TP77 (+24DC)	+24 VDC	Voltmeter	<ol style="list-style-type: none"> 1. Used to verify unfiltered +24 VDC provided to the CSB from the mains power supply. 2. Measure the voltage at +24 V. 3. Measured voltage should be +24 VDC.
TP71 (3V3)	3.3 VDC	Voltmeter	<ol style="list-style-type: none"> 1. Used to verify the output of the 3.3 VDC voltage regulator (chip U54) on the CSB. 2. Measure the voltage at 3V3. 3. Measured voltage should be 3.3VDC.
TP76 (-15V)	-15 VDC	Voltmeter	<ol style="list-style-type: none"> 1. Used to verify unfiltered -15 VDC provided to the CSB from the mains power supply. 2. Measure the voltage at -15V. 3. Measured voltage should be -15VDC.

Table C-1: CSB Test Points (Continued)


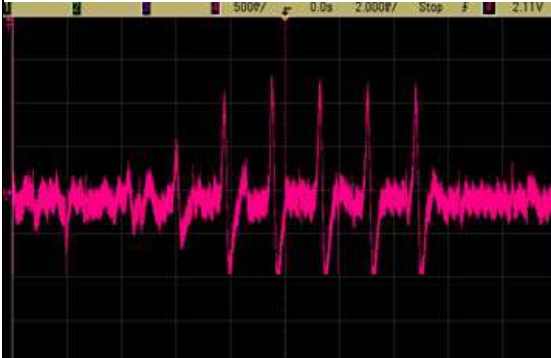
Test Point	Name	Test Equipment Required	Measurement
TP73 (+15V)	+15 VDC	Voltmeter	<ol style="list-style-type: none"> 1. Used to verify unfiltered +15 VDC provided to the CSB from the mains power supply. 2. Measure the voltage at +15V. 3. Measured voltage should be +15VDC.
TP87, TP89 - TP91, TP95 - TP96			
TP87	Velocity	Oscilloscope	<ol style="list-style-type: none"> 1. Used to measure the signal at TP87. 2. Represents the analog signal being detected by the second TOF sensor in the printhead. 3. The following output is considered to be good. 

Table C-1: CSB Test Points (Continued)


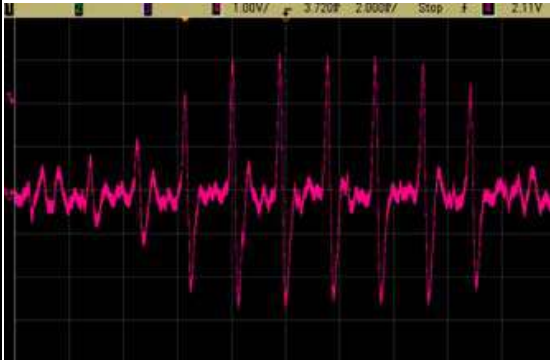
Test Point	Name	Test Equipment Required	Measurement
TP89	Phasing	Oscilloscope	<ol style="list-style-type: none"> 1. Used to measure the signal at TP89. 2. Represents the analog signal being detected by the first TOF sensor in the printhead. 3. The following output is considered to be good. 
TP90	Phasing Signal Amplified	Oscilloscope	<ol style="list-style-type: none"> 1. Allows the monitoring of the processed phasing signal downstream of chip U63 on the CSB. 2. Measure the signal at TP90. The following output is considered to be good. 

Table C-1: CSB Test Points (Continued)

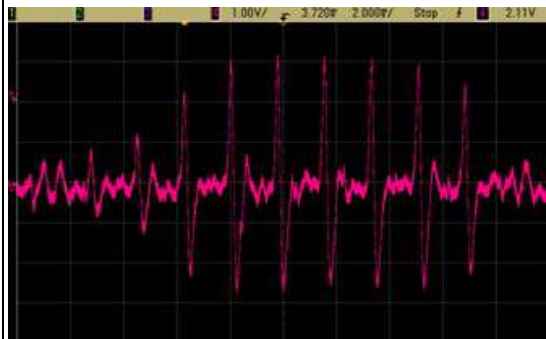
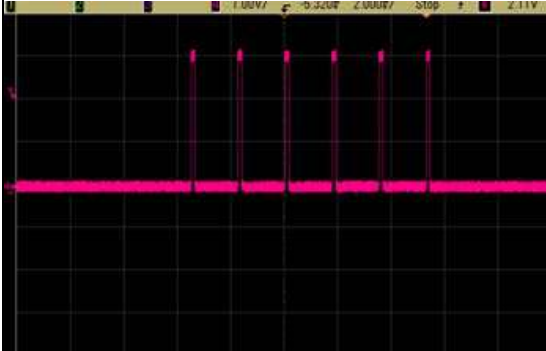
Test Point	Name	Test Equipment Required	Measurement
TP91	Velocity Signal Amplified	Oscilloscope	<ol style="list-style-type: none"> 1. Allows monitoring of the processed velocity signal downstream of chip U63 on the CSB. 2. Measure the signal at TP91. 3. The following output is considered to be good. 
TPV30	Phasing Trigger A	Oscilloscope	<ol style="list-style-type: none"> 1. Allows the monitoring of the trigger signal supplied by chip U61 to the FPGA. 2. Measure the signal at TP95. 3. The following output is considered to be good. 

Table C-1: CSB Test Points (Continued)

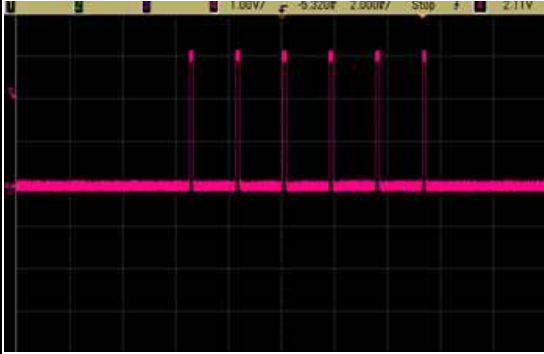


Test Point	Name	Test Equipment Required	Measurement
TPV31	Phasing Trigger B	Oscilloscope	<ol style="list-style-type: none"> Allows the monitoring of the trigger signal supplied by chip U61 to the FPGA. Measure the signal at TP96. The following output is considered to be good. 
TP99, TP100, TP102, TPV32 - 34			
TP102	Velocity 2	Oscilloscope	<ol style="list-style-type: none"> Used to measure the signal at TP102. Represents the analog signal being detected by the second TOF sensor in the printhead. <p>The following output is considered to be good.</p> 

Table C-1: CSB Test Points (Continued)


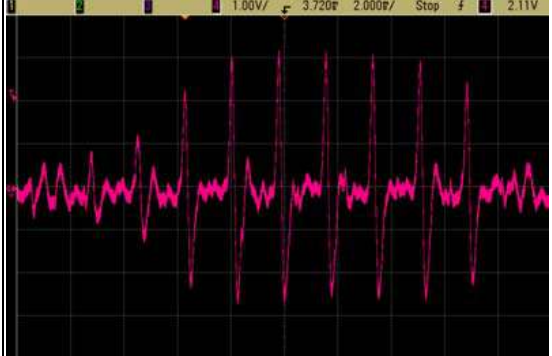
Test Point	Name	Test Equipment Required	Measurement
TP99	Phasing 2	Oscilloscope	<p>1. Used to measure the signal at TP99. 2. Represents the analog signal being detected by the first TOF sensor in the printhead. The following output is considered to be good.</p> 
TP100	Phasing Signal Amplified	Oscilloscope	<p>1. Allows the monitoring of the processed phasing signal downstream of chip U70 on the CSB. 2. Measure the signal at TP100. The following output is considered to be good.</p> 

Table C-1: CSB Test Points (Continued)


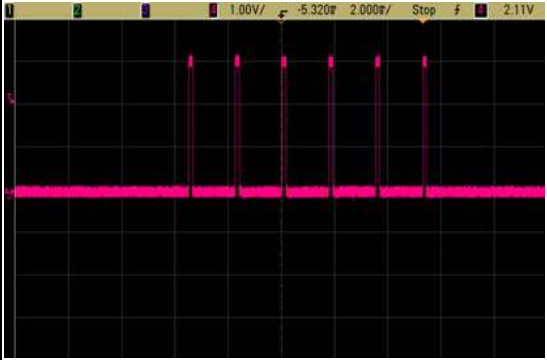
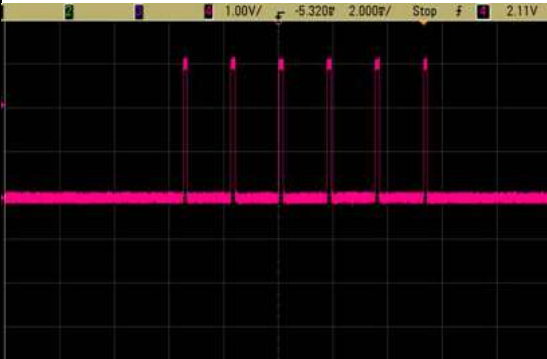
Test Point	Name	Test Equipment Required	Measurement
TPV33	Velocity Signal Amplified	Oscilloscope	<ol style="list-style-type: none"> Allows the monitoring of the processed velocity signal downstream of chip U70 on the CSB. Measure the signal at TPV33. The following output is considered to be good. 
TPV32	Phasing Trigger A2	Oscilloscope	<ol style="list-style-type: none"> Allows the monitoring of the trigger signal supplied by chip U66 to the FPGA. Measure the signal at TPV32. The following output is considered to be good. 
TPV34	Phasing Trigger B2	Oscilloscope	<ol style="list-style-type: none"> Allows the monitoring of the trigger signal supplied by chip U66 to the FPGA. Measure the signal at TPV34. The following output is considered to be good. 

Table C-1: CSB Test Points (Continued)

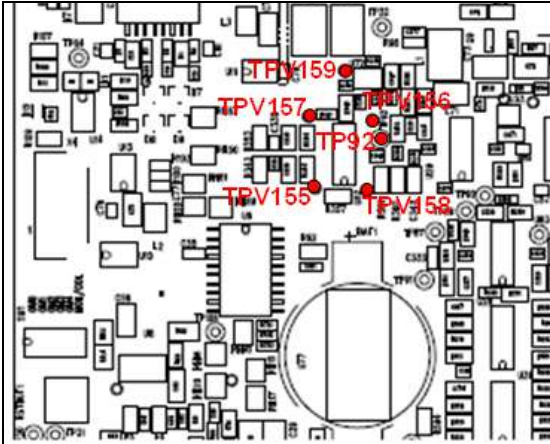
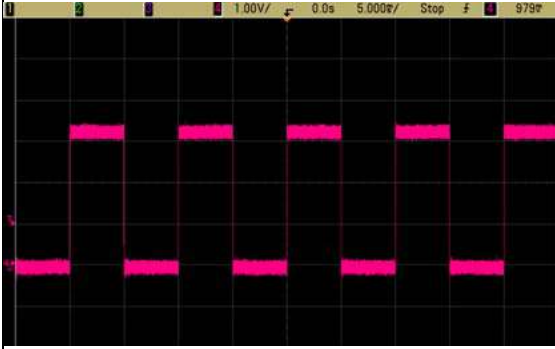
Test Point	Name	Test Equipment Required	Measurement
<p>TP92, TPV155- TPV159</p>			
<p>TP92</p>	<p>Probes Drive</p>	<p>Voltmeter or Oscilloscope</p>	<ol style="list-style-type: none"> 1. Used to verify the common electrical drive signal in the core (mixer tank) level detection circuit. 2. If a voltmeter is used, the voltage shall read 1.6 VDC. If an oscilloscope is used, the following output is considered to be good. 

Table C-1: CSB Test Points (Continued)

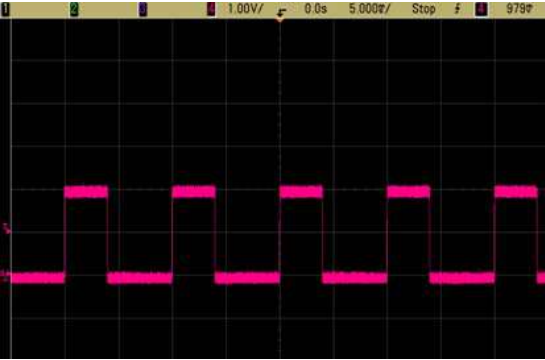
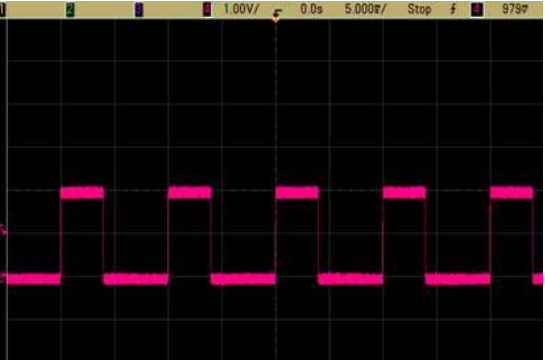
Test Point	Name	Test Equipment Required	Measurement
TPV155	Level Probe 0 (Mixer Tank High)	Voltmeter or Oscilloscope	<p>Used to confirm if the high sensor in the mixer tank is covered or uncovered.</p> <ol style="list-style-type: none"> 1. If a voltmeter is used and the sensor is covered, a voltage of 0.8 VDC indicates that the sensor is uncovered. 2. A voltage of 0 VDC indicates that the sensor is covered. 3. If an oscilloscope is used, the following signal indicates that the sensor is uncovered. 
TPV156	Level Probe 1 (Mixer Tank Middle)	Voltmeter Or Oscilloscope	<p>Used to confirm if the middle sensor in the mixer tank is covered or uncovered.</p> <ol style="list-style-type: none"> 1. If a voltmeter is used and the sensor is covered, voltage of 0.8 VDC indicates that the sensor is uncovered. 2. A voltage of 0 VDC indicates that the sensor is covered. 3. If an oscilloscope is used, the following signal indicates that the sensor is uncovered 

Table C-1: CSB Test Points (Continued)

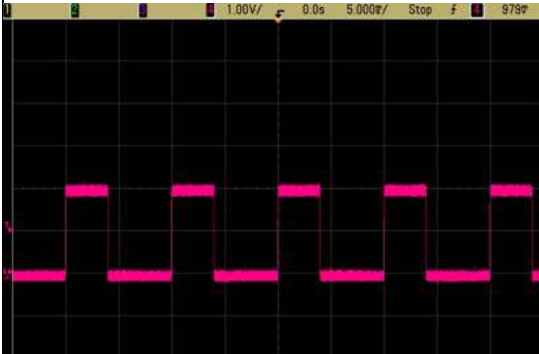
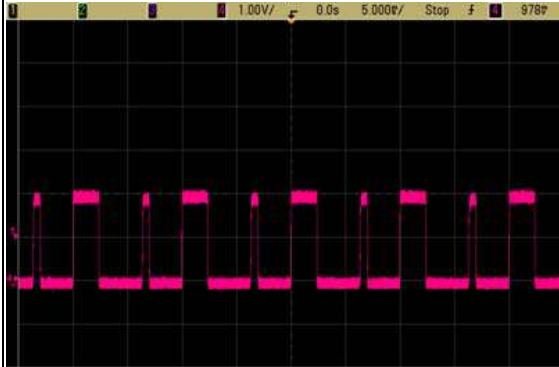
Test Point	Name	Test Equipment Required	Measurement
TPV157	Level Probe 2 (Mixer Tank Low)	Voltmeter or Oscilloscope	<p>Used to confirm if the low sensor in the mixer tank is covered or uncovered</p> <ol style="list-style-type: none"> 1. If a voltmeter is used and the sensor is covered, a voltage of 0.8 VDC indicates that the sensor is uncovered. 2. A voltage of 0 VDC indicates that the sensor is covered. 3. If an oscilloscope is used, the following signal indicates that the sensor is uncovered. 
TPV158	Gutter Sense	Voltmeter or Oscilloscope	<p>Used to confirm the status of the gutter detect circuit.</p> <ol style="list-style-type: none"> 1. If a voltmeter is used and ink is present in the gutter, voltage should read 0 VDC. 2. A voltage of 0.6 VDC indicates that the gutter detect chamber is empty. 3. If an oscilloscope is used, the following signal is expected if the gutter detect chamber is empty. 

Table C-1: CSB Test Points (Continued)

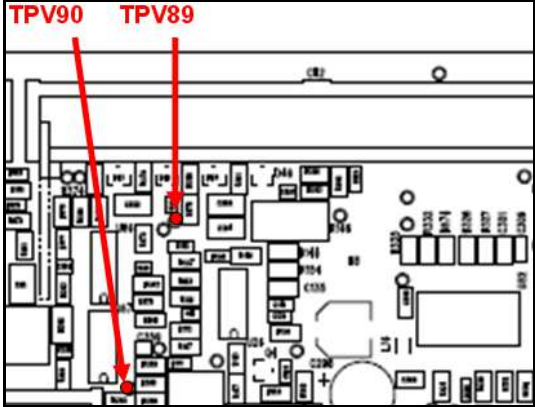
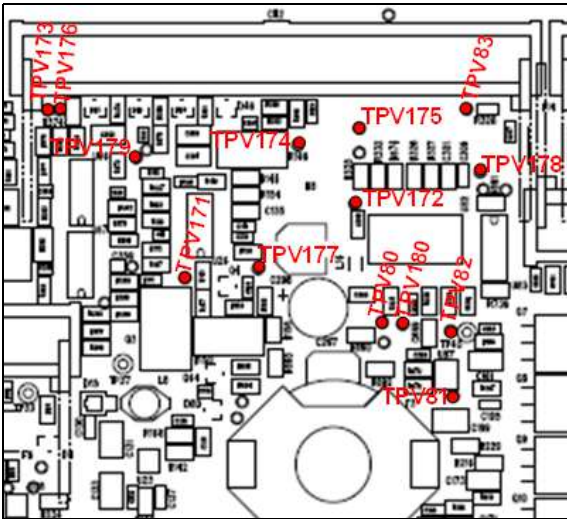
Test Point	Name	Test Equipment Required	Measurement
TPV89, TPV90			
TPV89	Ink Pressure	Voltmeter	Used to verify the electrical output of the pressure transducer monitoring ink pump output in the core. <i>Note: 1 VDC = 1.23 bar.</i>
TPV90	Vacuum	Voltmeter	Used to verify the electrical output of the pressure transducer monitoring vacuum in the make-up addition system in the core. <i>Note: 1 VDC = 208 millibars vacuum.</i>
TPV80 - TPV83, TPV171-TPV180			
TPV80	Pump Forward/ Reverse	Voltmeter	<ol style="list-style-type: none"> Used to verify the digital signal provided by the FPGA to the pump driver chip U82. Voltage measured will be 3.3 VDC (indicating pump forward direction).

Table C-1: CSB Test Points (Continued)

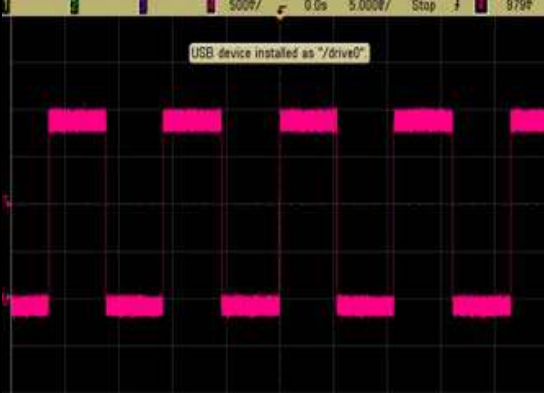
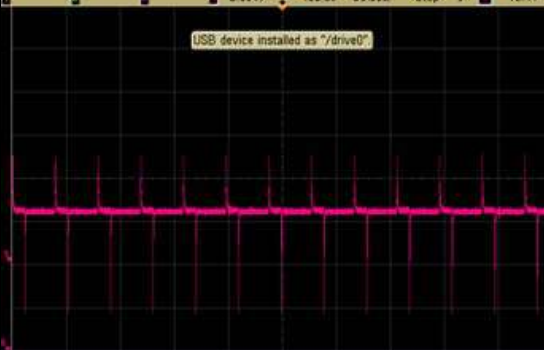
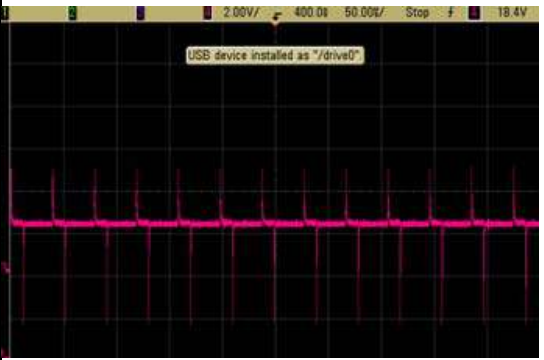
Test Point	Name	Test Equipment Required	Measurement
TPV81	Pump Tacho	Oscilloscope	When Pump is running 
TPV82	Pump Setpoint	Voltmeter	Used to verify the analog signal provided by the FPGA to the pump driver chip U82. Measure the voltage when the pump is running. 1 VDC = 0.7 bar (approximately).
TPV83	Pump Current Sense	Voltmeter	Measure the voltage when the pump is running. Voltage measured will normally be less than 0.1 VDC.
TPV171		Oscilloscope	
TPV172		Oscilloscope	

Table C-1: CSB Test Points (Continued)

Test Point	Name	Test Equipment Required	Measurement
TPV173		Oscilloscope	
TPV174		Oscilloscope	
TPV175		Oscilloscope	

Table C-1: CSB Test Points (Continued)

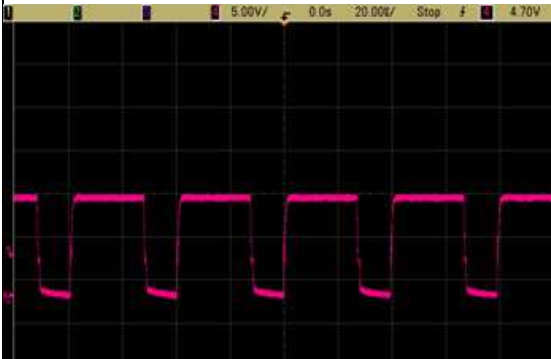
Test Point	Name	Test Equipment Required	Measurement
TPV176		Oscilloscope	
TPV177		Oscilloscope	
TPV178		Oscilloscope	

Table C-1: CSB Test Points (Continued)

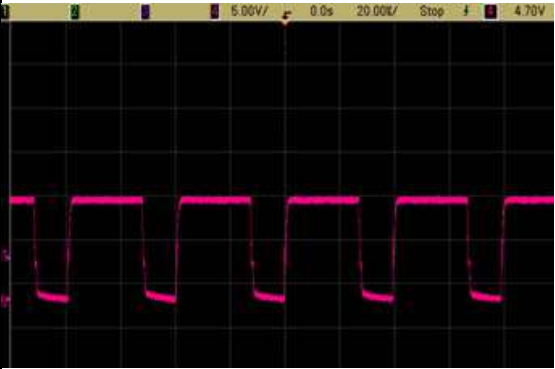
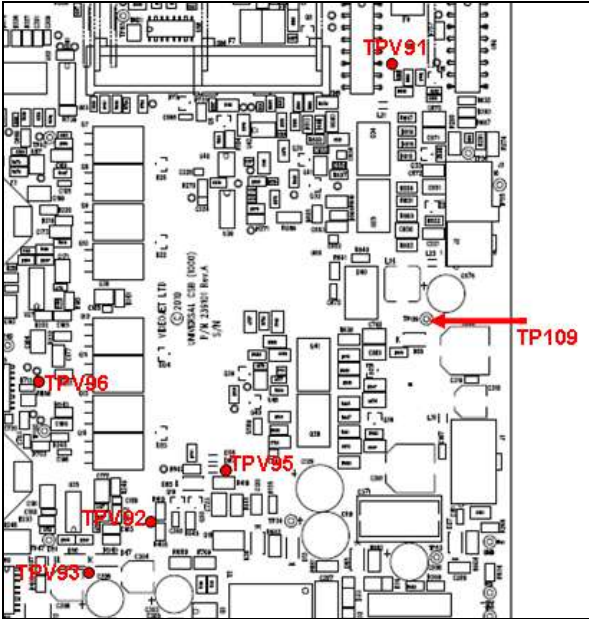
Test Point	Name	Test Equipment Required	Measurement
TPV179		Oscilloscope	
TPV180	REF	Voltmeter	Reference voltage used by chip is U82. The voltage measured will be 6.4 VDC.
<p>TP109, TPV91 - TPV93, TPV95, TPV96 = Valves</p> 			
TPV91	HIT Drive	Voltmeter	<p>Used to verify that the valve drive circuit is being supplied with the correct electronic signal to enable the application of hit voltage when solenoid valves are actuated.</p> <ol style="list-style-type: none"> 1. Measure the voltage at TPV91. 2. If measured voltage = +3.3 VDC, the hit circuit is Off (this is the steady-state condition). 3. If measured voltage = 0 VDC, the hit circuit is on (this indicates that the valves are opened).

Table C-1: CSB Test Points (Continued)

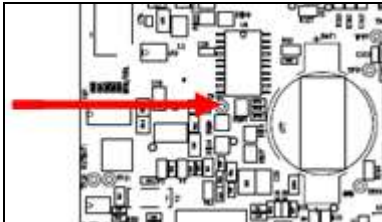
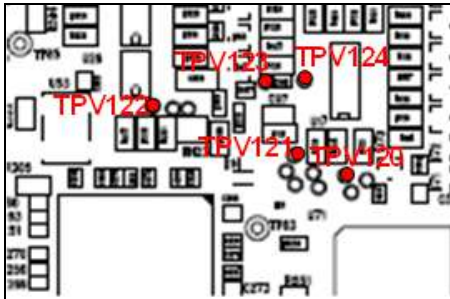
Test Point	Name	Test Equipment Required	Measurement
TPV93	Valve Common	Voltmeter	Measure the voltage at TPV93. The voltage should read 5VDC, unless hit voltage is being supplied during the opening of any valve - the measured voltage will temporarily reach +24VDC.
TPV95	Valve Common Monitor	Voltmeter	Measure the voltage at TPV95. The measured voltage will read 0 VDC unless hit voltage is being supplied during the opening of any valve - the measured voltage will temporarily reach approximately 3.3 VDC.
TPV96	Valve Current Monitor	Voltmeter	<ol style="list-style-type: none"> 1. Measure the voltage at TPV96, if zero valves are open, then the measured voltage will read approximately 0 V. 2. The measured voltage will increase by 0.1 VDC for each valve, that is opened. 3. The measured voltage will increase by 0.07 V, when VV, VR, VS, VI, or VM valves are opened.
TP108			
TP108	VDDIARM	Voltmeter	1.4 VDC
TP81 - TP86	Ground		
TPV120-TPV124			
TPV120	ADC EOC	Voltmeter	0 VDC

Table C-1: CSB Test Points (Continued)

Test Point	Name	Test Equipment Required	Measurement
TPV121	ADC DOUT	Oscilloscope	
TPV122	ADC DIN	Oscilloscope	
TPV123	ADC NCS	Oscilloscope	

Table C-1: CSB Test Points (Continued)

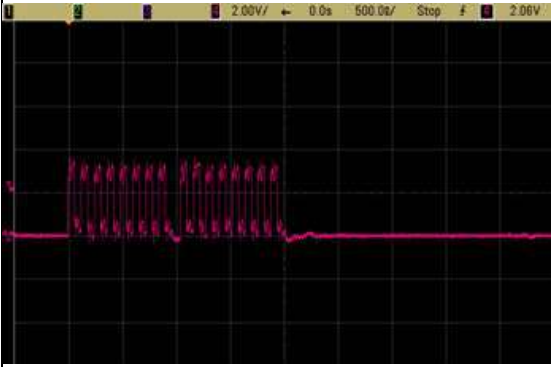

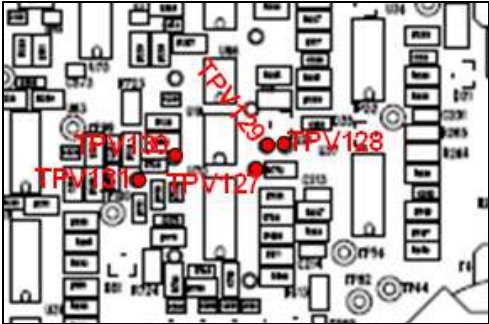
Test Point	Name	Test Equipment Required	Measurement
TPV124	ADC NCS	Oscilloscope	
TPV125, TPV126			
TPV125	EXP SA	Voltmeter	0 VDC
TPV126	EXP SB	Voltmeter	0 VDC
TPV127 - TPV131			
TPV127	DAC SCLK	Voltmeter	3.3 VDC
TPV128	DAC DIN	Voltmeter	0 VDC
TPV129	DAC NLDAC	Voltmeter	3.3 VDC
TPV130	DAC NCLR	Voltmeter	3.3 VDC
TPV131	DAC NCS	Voltmeter	3.3 VDC

Table C-1: CSB Test Points (Continued)

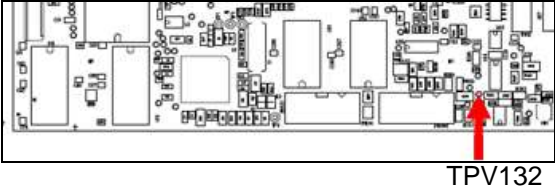
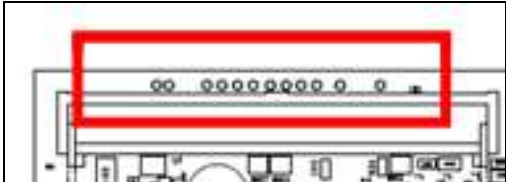
Test Point	Name	Test Equipment Required	Measurement
TPV132			
TPV132	REF P (10-Bit DAC circuit)	Voltmeter	Used to measure the reference voltage in 10-bit 8-channel DAC circuit. 1. Used to measure the DC voltage at TPV132. 2. The measured voltage should be 4.096 VDC.
TPV63, TPV67 - TPV75, TPV77 - TPV78	 <p>Note: Do not use these test points as these test points are not accessible during normal printer operation.</p>		
From Left to Right			
TPV67	PEC1		
TPV63	PEC2		
TPV68	Message Select Bit 0		
TPV69	Message Select Bit 1		
TPV70	Message Select Bit 2		
TPV71	Message Select Bit 3		
TPV72	Message Select Bit 4		
TPV73	Message Select Bit 5		

Table C-1: CSB Test Points (Continued)

Test Point	Name	Test Equipment Required	Measurement
TPV74	Message Select Bit 6		
TPV75	Message Select Bit 7		
TPV77	Spare		
TPV78			

Table C-1: CSB Test Points (Continued)