

Atlas Print System User's Guide

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1.1 Description

The Atlas inkjet system is a series of print technologies that includes the Monet+ and Renoir inks to provide high-resolution images at high speeds on a wide variety of materials.

Although both technologies provide outstanding image quality, they have varying strengths. As a result, it is important to choose the technology that best suits the situation.

Although the Monet+ and Renoir ink delivery systems and printheads are almost identical, they are not interchangeable. As a result, it is important not to use Renoir and Monet+ inks in the same ink delivery system or printhead otherwise *serious* damage can occur.

1.1.1 Monet+ Ink

The Monet+ ink used on the Atlas and Sapphire systems is a non-volatile solvent-based ink. For the BK700, this is available in a single head (BK791-A) to provide 1” of print at 256 DPI vertically and a software selectable horizontal resolution ranging from 110 to 660 DPI. For the BK1700, the single head, Sapphire 200 and Sapphire 300 are available to provide 2.56” of print up to 300 DPI vertically. Multiple heads can also be stitched together for a greater print area.

The main advantages of the Atlas Monet+ ink are high speeds and lower ink consumption costs. It also has fast drying characteristics on a large variety of materials including most glossy and coated stocks. CIELAB (Commission Internationale de l'Eclairage) testing has shown that the Monet+ ink is up to 43% darker when compared to the original Monet ink.

1.2 System Drawings

1.2.1 Inkwell Dimensions

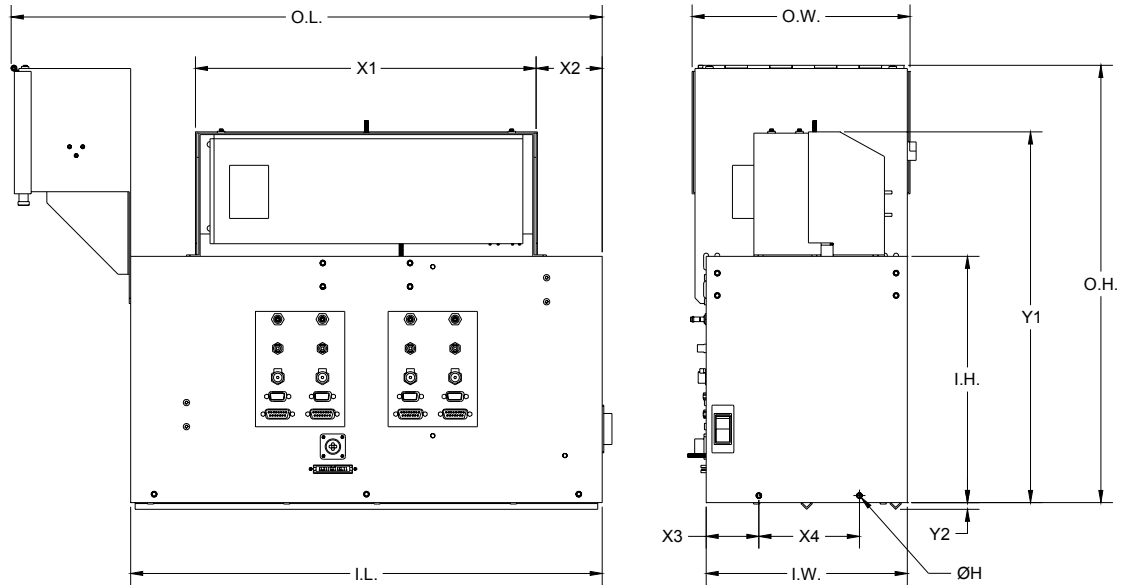


Table 1-1: *Inkwell Dimensions*

Symbol	Description	Dimensions	
O.L.	Overall Length	26.45"	672 mm
O.W.	Overall Width	9.75"	248 mm
O.H.	Overall Height	19.51"	496 mm
I.L.	Inkwell Length	21.10"	536 mm
I.W.	Inkwell Width	9.00"	229 mm
I.H.	Inkwell Height	11.00"	279 mm
X1	Power Supply Assembly Width	15.24"	387 mm
X2	Power Supply Assembly Location	2.96"	75 mm
X3	Mounting Hole Location (Both Sides of Inkwell)	2.36"	60 mm
X4	Mounting Hole Spacing (Both Sides of Inkwell)	4.50"	114 mm
Y1	Height from bottom of inkwell to top of power supply cover	16.56"	421 mm
Y2	Rib height	0.30"	8 mm
H	Mounting Holes (2 on each side of Inkwell)	10-32 UNF (4X)	

1.2.2 Printhead Dimensions

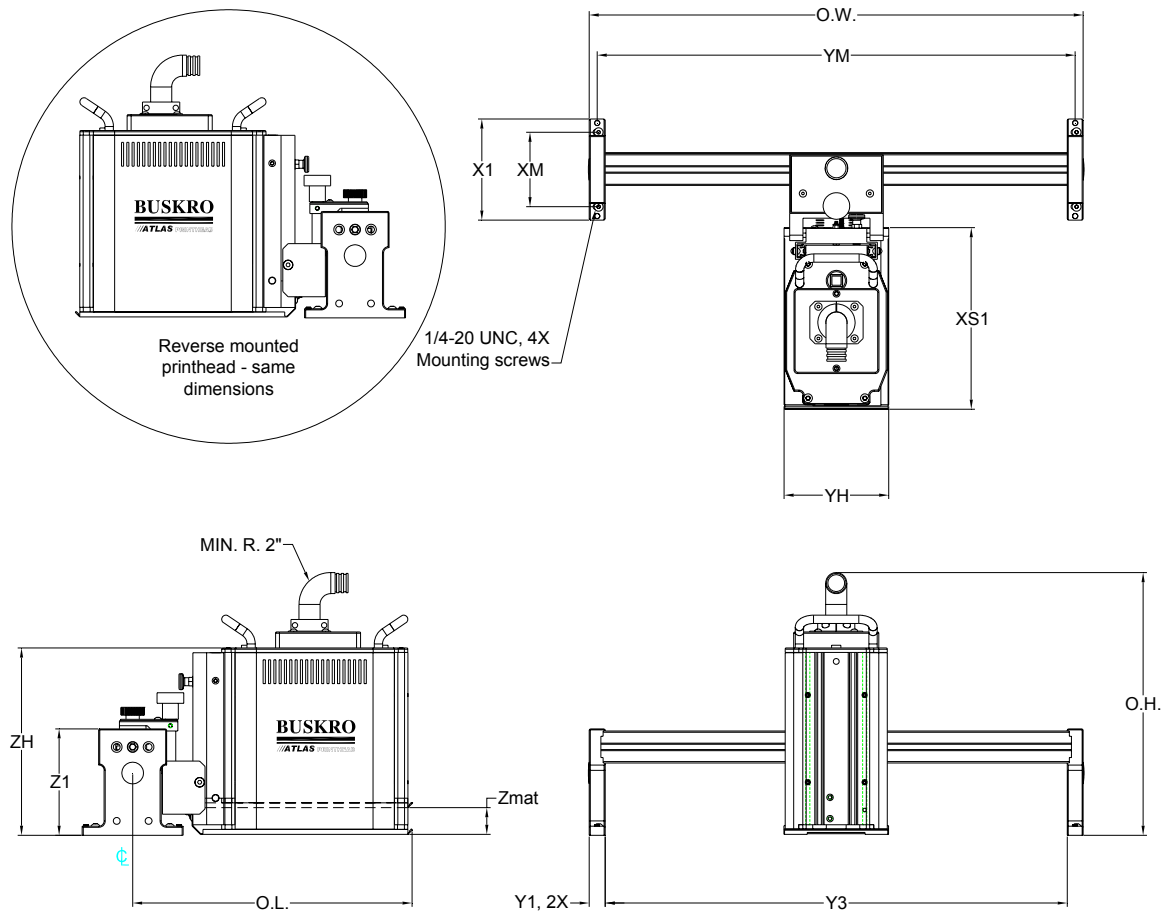


Table 1-2: Printhead Dimensions on Standard BK79B-22 Bridge

Symbol	Description	Dimensions	
O.L.	BK791 (Single Head) overall length from center of rail	11.32"	288 mm
XS1	BK791 overall shield length	8.53"	217 mm
ZH	BK791 height to top surface	8.80"	224 mm
YH	BK791 shield width	4.92"	125 mm
O.H.	Overall height to top of umbilical	13.60"	345 mm
O.W.	Overall width of bridge	23.45"	596 mm
X1	Bridge rail mount length	4.75"	121 mm
Z1	Bridge rail mount height	5.00"	127 mm
Y1	Bridge rail mount thickness	0.75"	19 mm
XM	Bridge rail mount mounting screw spacing	3.50"	89 mm
YM	Bridge rail mount mounting screw spacing	22.70"	577 mm
Y3	Bridge rail length	22.00"	818 mm
Zmat	Height adjustment	1.25"	32 mm

1.2.3 Printhead Components

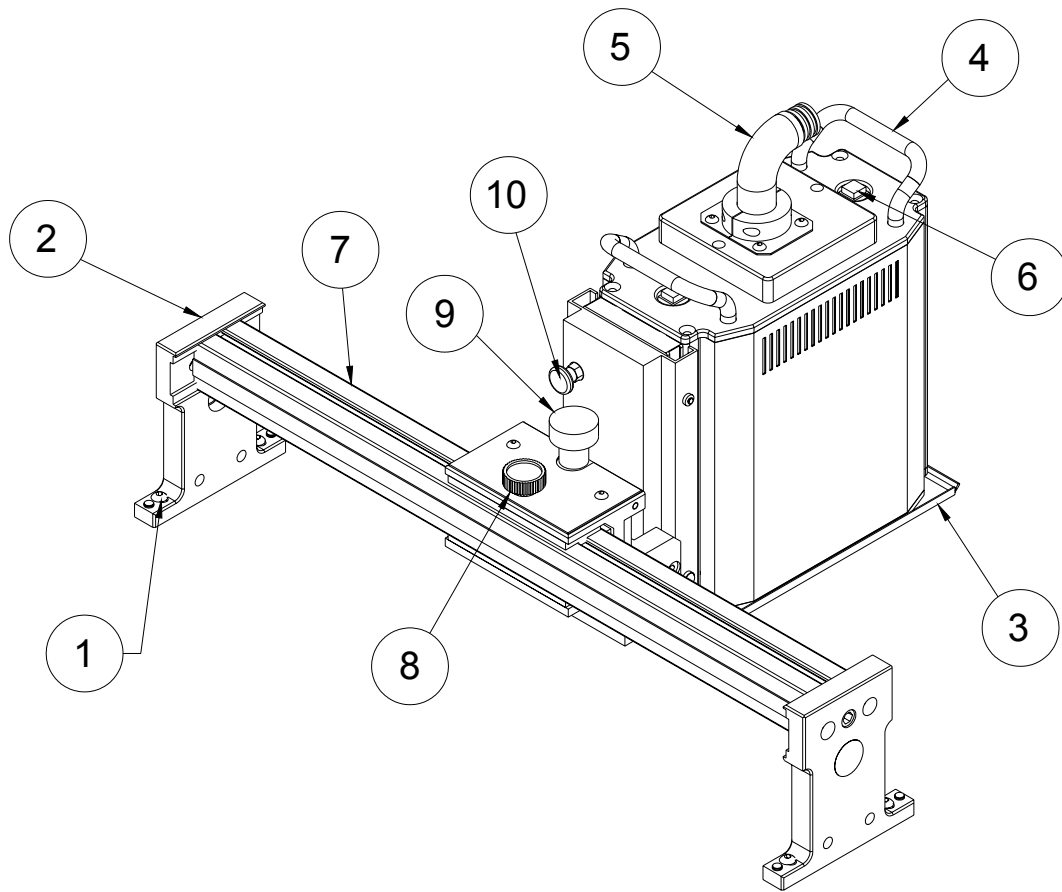


Table 1-3: *BK79 Series Printhead Components*

Item	Description
1	Mounting screw (four ¼-20 UNC)
2	Bridge rail mount (two per bridge)
3	Printhead shield
4	Printhead handle (one on single head, two on dual head)
5	Printhead umbilical (connect to inkwell)
6	Priming button (one on single head, two on dual head)
7	Bridge rail (standard 22" but custom length possible for other transport bases)
8	Lateral adjustment release knob
9	Height adjustment knob
10	Release knob for maintenance

1.2.4 Single Head Printhead Specifications (BK791)

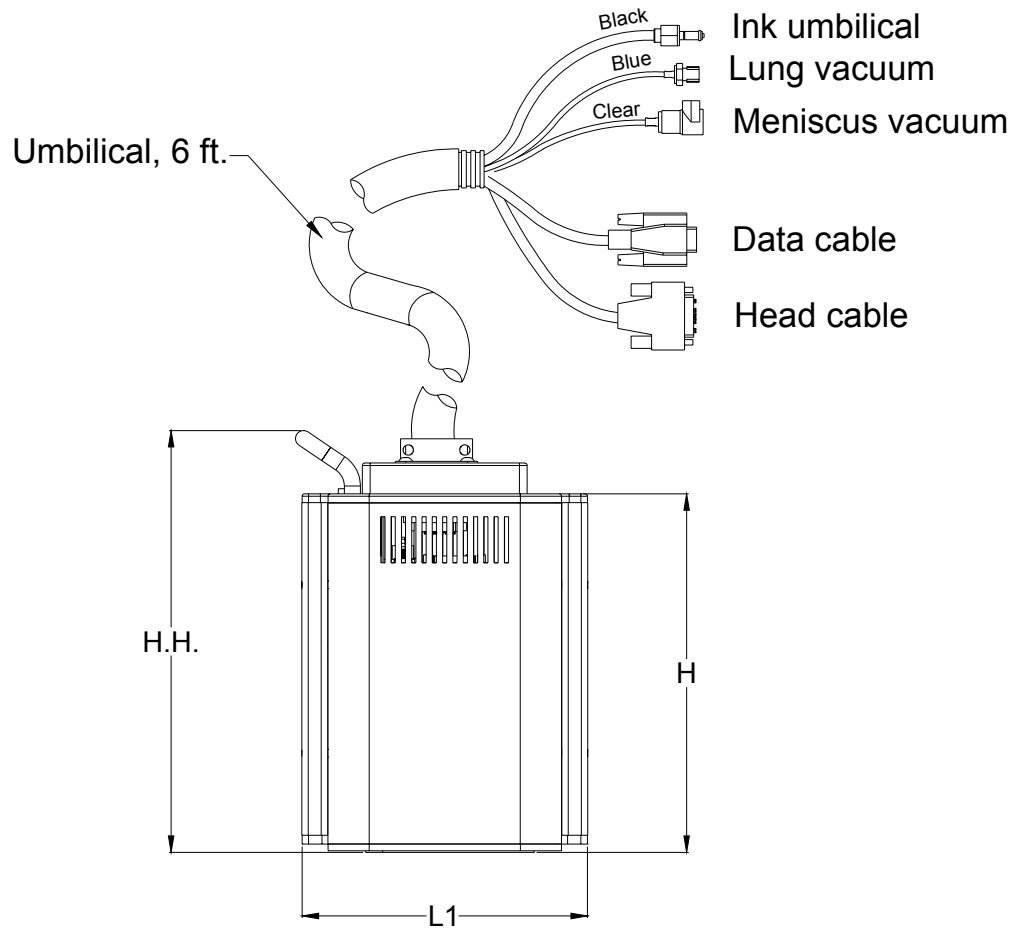


Table 1-4: *Single Head Printhead Specifications*

General		
Vertical Resolution	256 DPI	
Horizontal Resolution	110, 220, 330, 440, 660 DPI	
Vertical Print Swath	1"	25.4 mm
Horizontal Print Swath	39"	990.6 mm
Physical		
Printhead Length (L1)	6.93"	176 mm
Printhead Height to Handle (H.H.)	10.27"	261 mm
Printhead Height (H)	8.73"	222 mm
Printhead Weight	9 lbs	4 kg

1.2.5 Sapphire Print head Specifications (BK792-A-15-S or BK793-A-15-S)

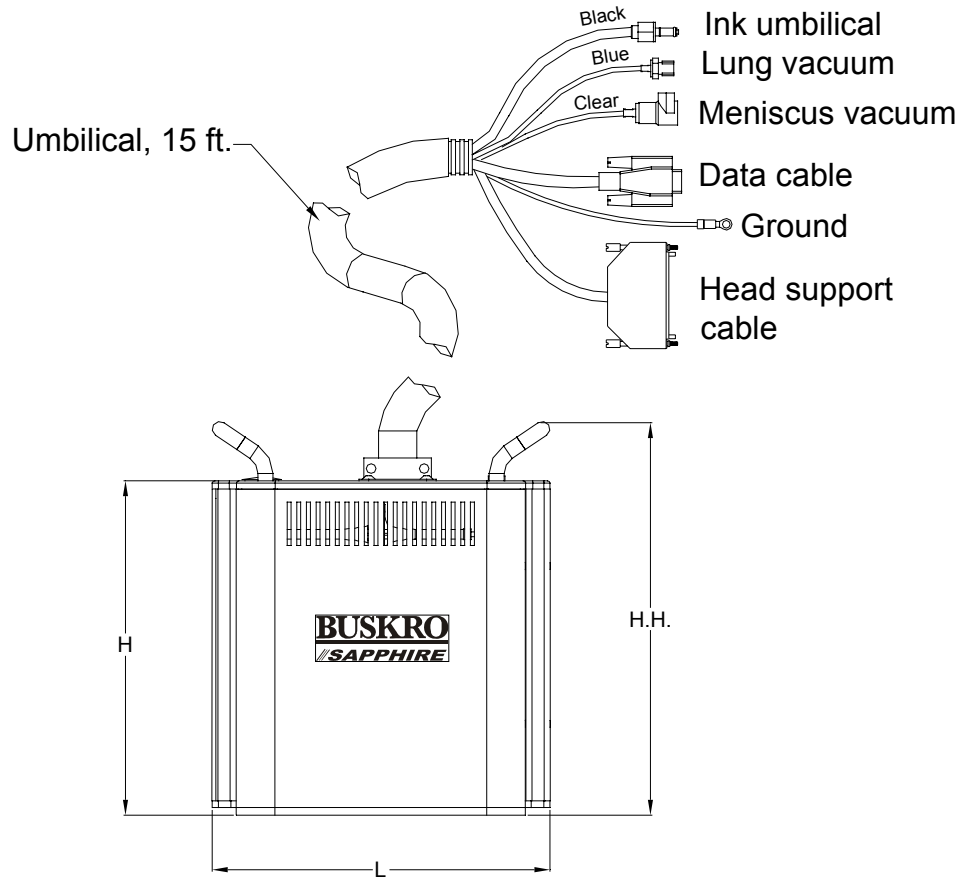


Table 1-5: Sapphire Print head Specifications

General		
Vertical Resolution	200 or 300 DPI	
Horizontal Resolution	110, 220, 330, 440, 660 DPI	
Vertical Print Swath	2.56"	65 mm
Horizontal Print Swath	39"	990.6 mm
Physical		
Length (L)	8.75"	223 mm
Overall Height to Handle (H.H.)	10.27	261 mm
Enclosure Height (H)	8.73"	222 mm
Weight	14 lbs	6.4 kg

Note: The Sapphire print head is only available on the BK1700 controller. Contact Buskro for more details.

1.2.6 Production Specifications

Table 1-6: *Production Rates*

Resolution (DPI)	Single Head (BK791)	
	Surface Speed	Production Rate
110	984 fpm (5.0 m/s)	40,000 pph
220	984 fpm (5.0 m/s)	40,000 pph
330	827 fpm (4.2 m/s)	40,000 pph
440	630 fpm (3.2 m/s)	40,000 pph
660	413 fpm (2.1 m/s)	28,000 pph

Legend:

DPI	Dots Per Inch	m/s	Meters Per Second
fpm	Feet Per Minute	pph	Pieces Per Hour

Note: The values shown in **Table 1-6** indicate jetting speeds. For Monet+ inks, this represents theoretical maximum printing speeds. For Renoir inks, the jetting speed is identical but the production rates will be slower due to required curing.

For more information on Renoir curing speeds, ask Buskro for information on the BK750 Curing Station.

2.1 Introduction

The system support box is essentially the inkwell containing the ink delivery system and all related electronics. The architecture of the system can be seen in **Figure 2-1** while the components can be seen in **Figure 2-2**.

Figure 2-1: System Support Box Architecture

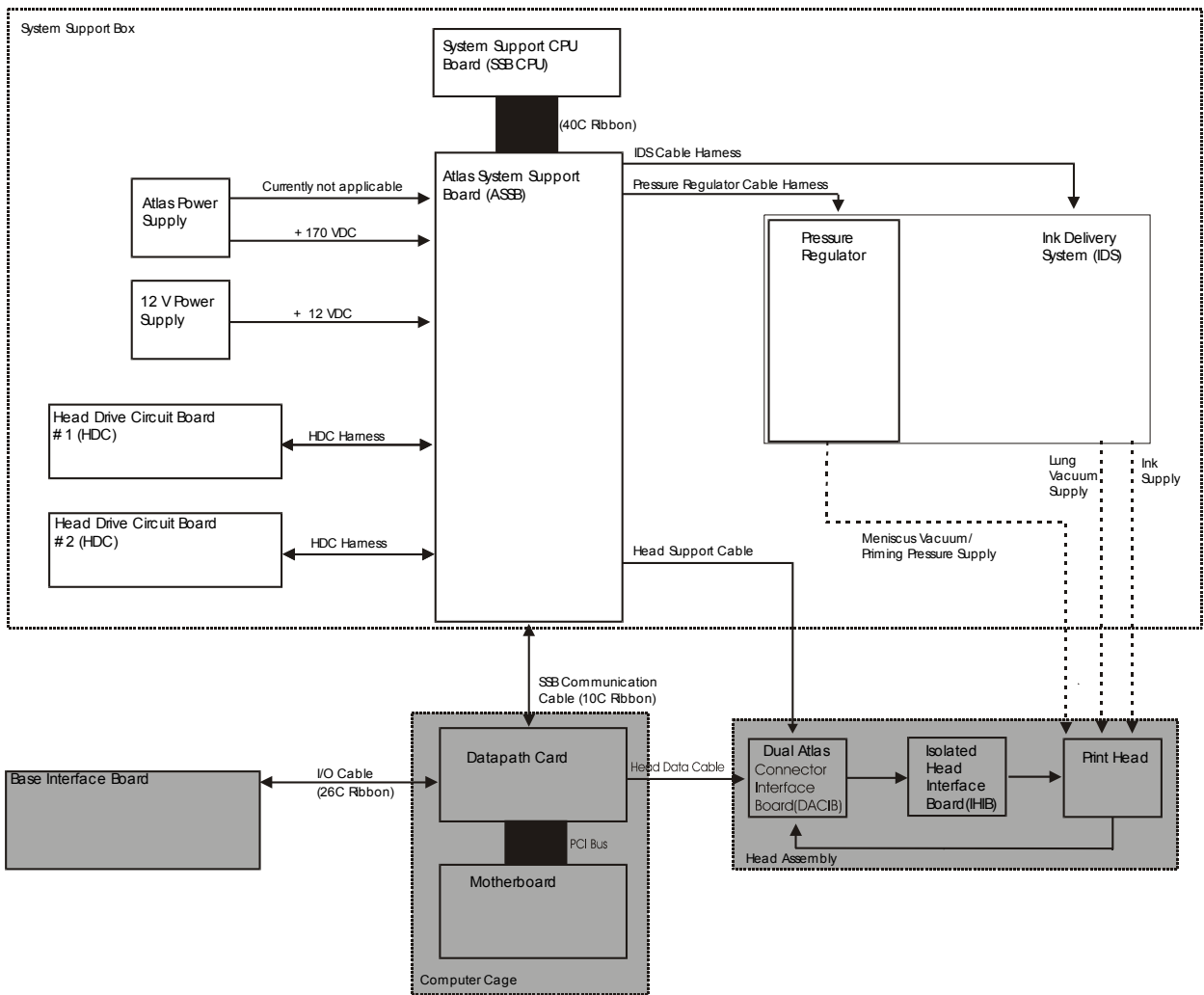
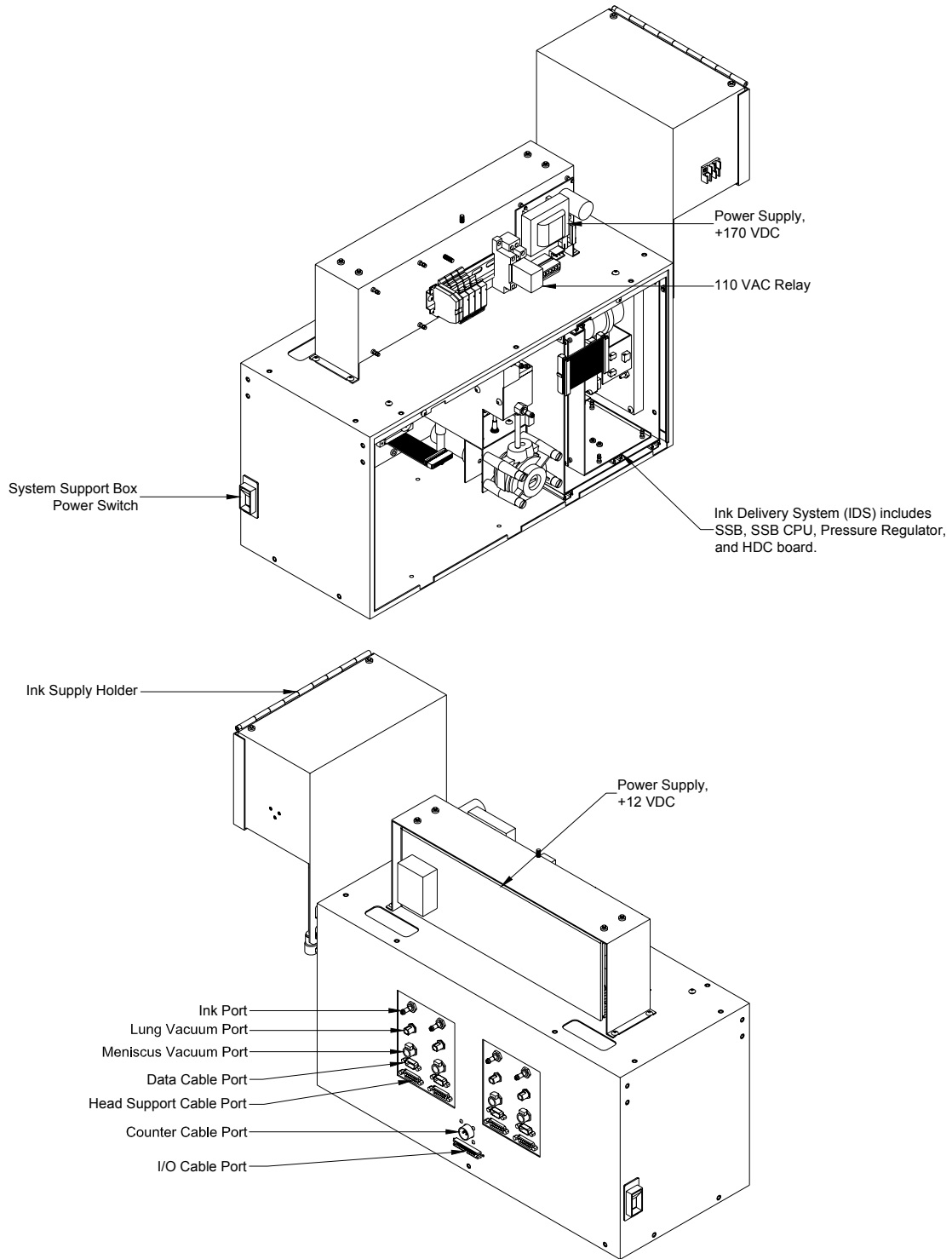


Figure 2-2: *System Support Box Components*



2.2 Atlas System Support Board (ASSB)

The Atlas System Support Board (**Figure 2-3**) interconnects all the components required to drive the print system. It also monitors and controls the ink level in the printhead and sets the fire-pulse amplitude delivered by the HDC to the printhead. The main connections on the ASSB are summarized in **Table 2-1**.

Figure 2-3: Atlas System Support Board

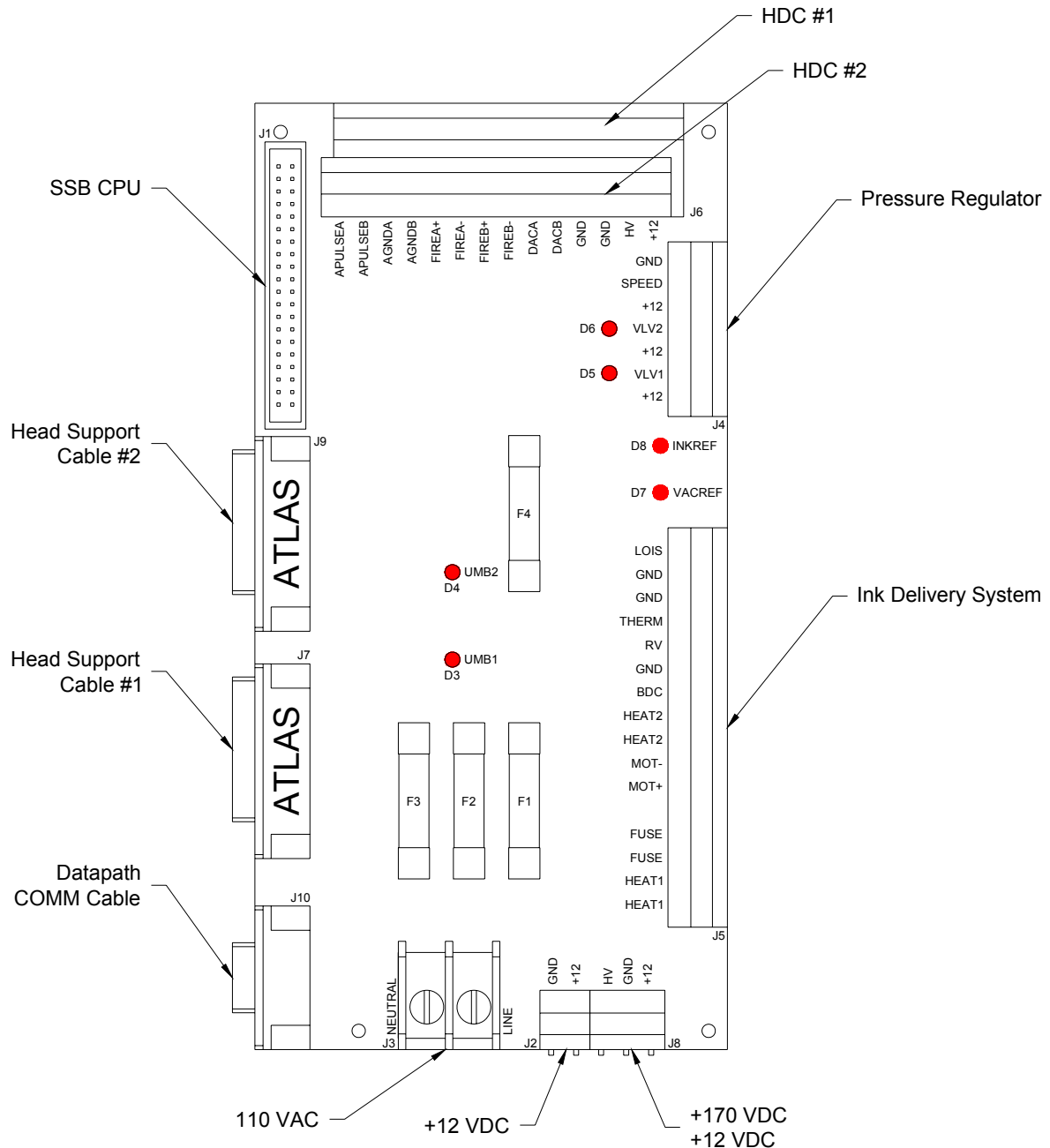


Table 2-1: *Atlas System Support Board Connections*

Component	Description
J1	Connection for System Support Board CPU (SSB CPU)
J2	Connection for Atlas Power Supply (12 VDC)
J3	Connection for incoming power (120 VAC)
J4	Connection for the pressure regulator
J5	Connection for the Ink Delivery System (IDS)
J6	Connection for the Head Drive Circuit Board (HDC)
J7	Connection for the Head Support Cable #1
J8	Connection for the Atlas Power Supply (+170 VDC, +12 VDC)
J9	Connection for the Head Support Cable #2
J10	Connection for the Datapath Card Cable
F1	Fuse, +12 VDC (2 A)
F2	Fuse, 120 VAC Line (3 A)
F3	Fuse, 120 VAC Neutral (3 A)
F4	Fuse, +12 VDC (1 A)
D3	UMB #1 LED indicates printbar #1 solenoid valve is open (printbar filling with ink)
D4	UMB #2 LED indicates printbar #2 solenoid valve is open (printbar filling with ink)
D5	Priming Valve #1 LED indicates priming valve #1 is active
D6	Priming Valve #2 LED indicates priming valve #2 is active
D7	Vacuum Refresh LED (On Elite only)
D8	Ink Pump LED indicates that ink is being pumped from the IDS

2.3 System Support Board CPU (SSB CPU)

The System Support Board CPU (**Figure 2-4**) provides the intelligence for the ASSB. The SSB CPU board performs the following functions:

1. Communicates with the Datapath card via the ASSB to display error icons and printhead temperature and voltage readings.
2. Controls opening and closing of the Ink Supply Line Valve in the printhead.
3. Commands the Pressure Regulator to prime a printhead when the priming button is pressed.
4. Controls the sequence for refilling the printhead with ink.
5. Controls low-on-ink sensing using the float switch installed in the subcontainer.

Figure 2-4: System Support Board CPU

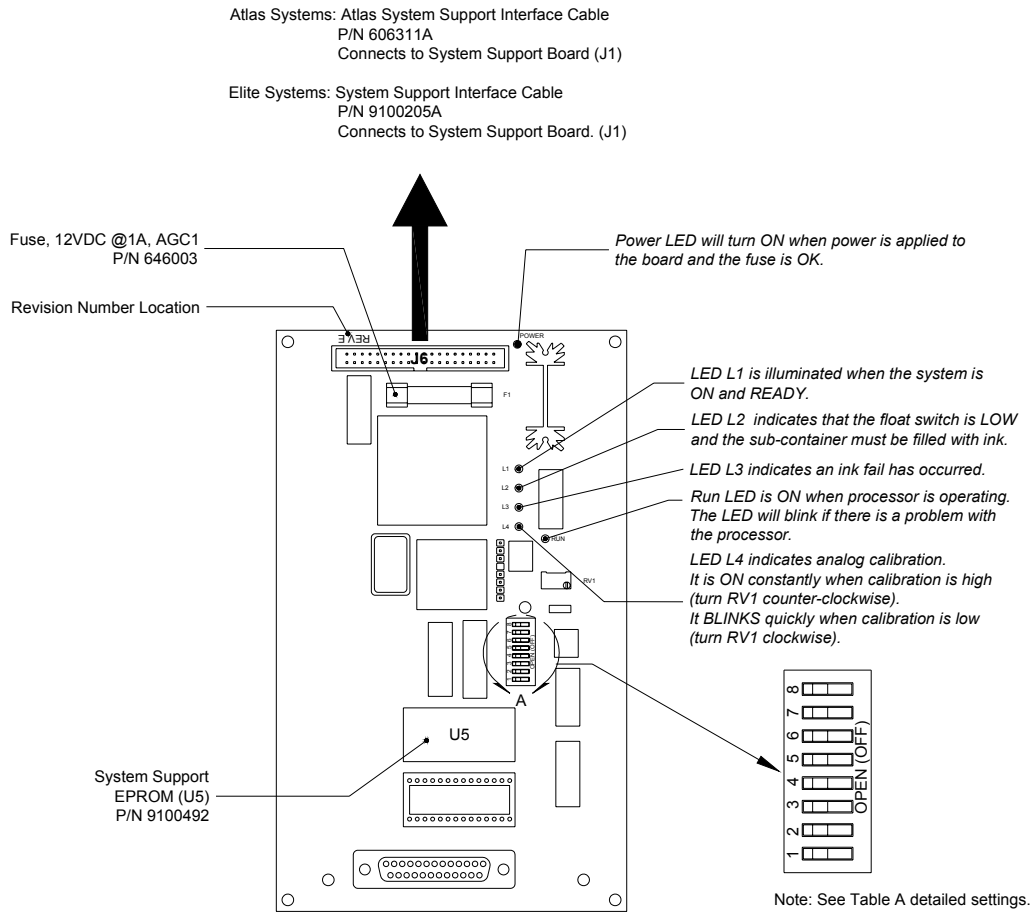


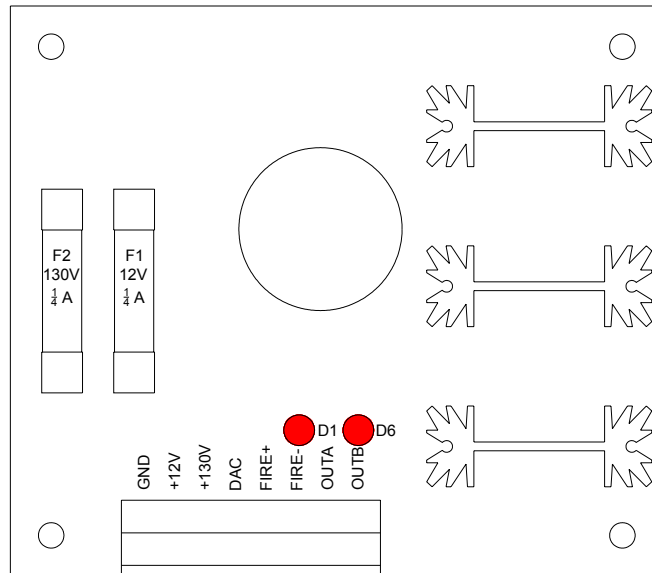
Table A - System Support Board CPU DIP Switch Assignments

DIP	Setting	Function	
8	ON	Factory Reset (all other DIP switches must be Off)	
	OFF	When not performing Factory Reset	
7	ON	For Rev E Board	
	OFF	For Rev A-D Board	
6	OFF	Controller Gain Bit 1	
5	ON	For ATLAS Printheads	
	OFF	For ELITE Printheads	
4	ON	For ATLAS Printheads	
	OFF	For ELITE Printheads	
3	ON	For ATLAS Printheads	
	OFF	For ELITE Printheads	
1 and 2		Pos 1 Pos 2 System Support Box Address	
		OFF OFF	For Printheads 1 and 2
		ON OFF	For Printheads 3 and 4
		OFF ON	For Printheads 5 and 6
		ON ON	For Printheads 7 and 8

2.4 Head Drive Circuit Board (HDC)

The Head Drive Circuit Board (**Figure 2-5**) generates the high and low voltage signal required to fire the printhead and also regulates the printhead voltage. When the low voltage signal is received by the HDC board, LED D1 turns on. When the high voltage signal is outputted by the HDC board in order to fire the printhead, LED D6 turns on.

Figure 2-5: *Head Drive Circuit Board*



2.5 Lung Vacuum

The purpose of the lung vacuum is to remove air from the ink before it reaches the jetting module in the printhead. This enhances jetting performance. In general, ink saturated with air travels from the IDS into the lung cavity in the printhead. Since the lung cavity is separated by a fine membrane, only air is allowed to pass through the membrane in order to remove it from the ink. The lung vacuum should measure in the range of 14 to 16 inches of mercury (in Hg). If the vacuum drops below 14 in Hg, there may be a loss in jets during printing.

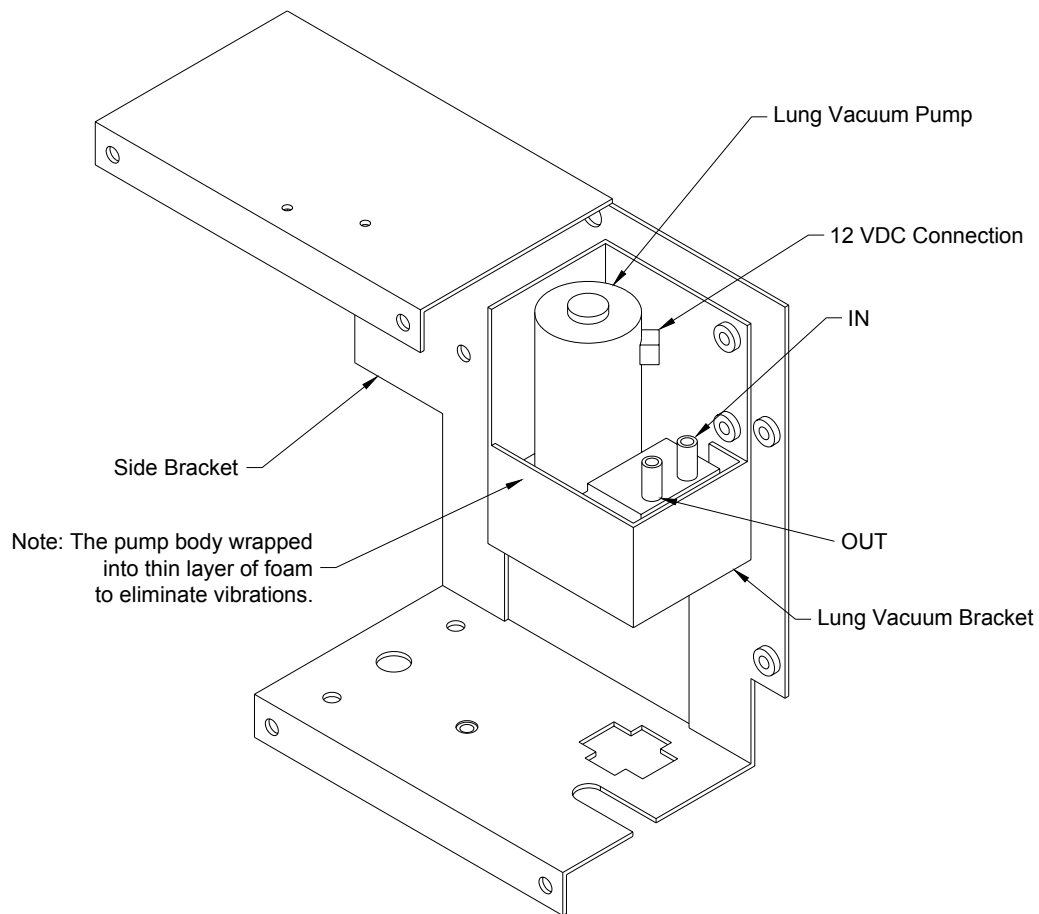
Note: The lung pressure should measure -16 in Hg.

To measure the lung vacuum, a gauge is required. This can be ordered from Buskro under P/N 9100337A (Lung Vacuum Gauge Assembly).

2.5.1 Lung Vacuum Function

The lung vacuum is generated by the 12 VDC pump shown in **Figure 2-6**. To generate the lung vacuum, the IDS must be powered ON by switching the main switch on the side of the system support box. Each time the system support box is powered ON, the lung vacuum pump will *instantaneously* generate approximately 15 in Hg of vacuum.

Figure 2-6: Lung Vacuum Pump in the IDS

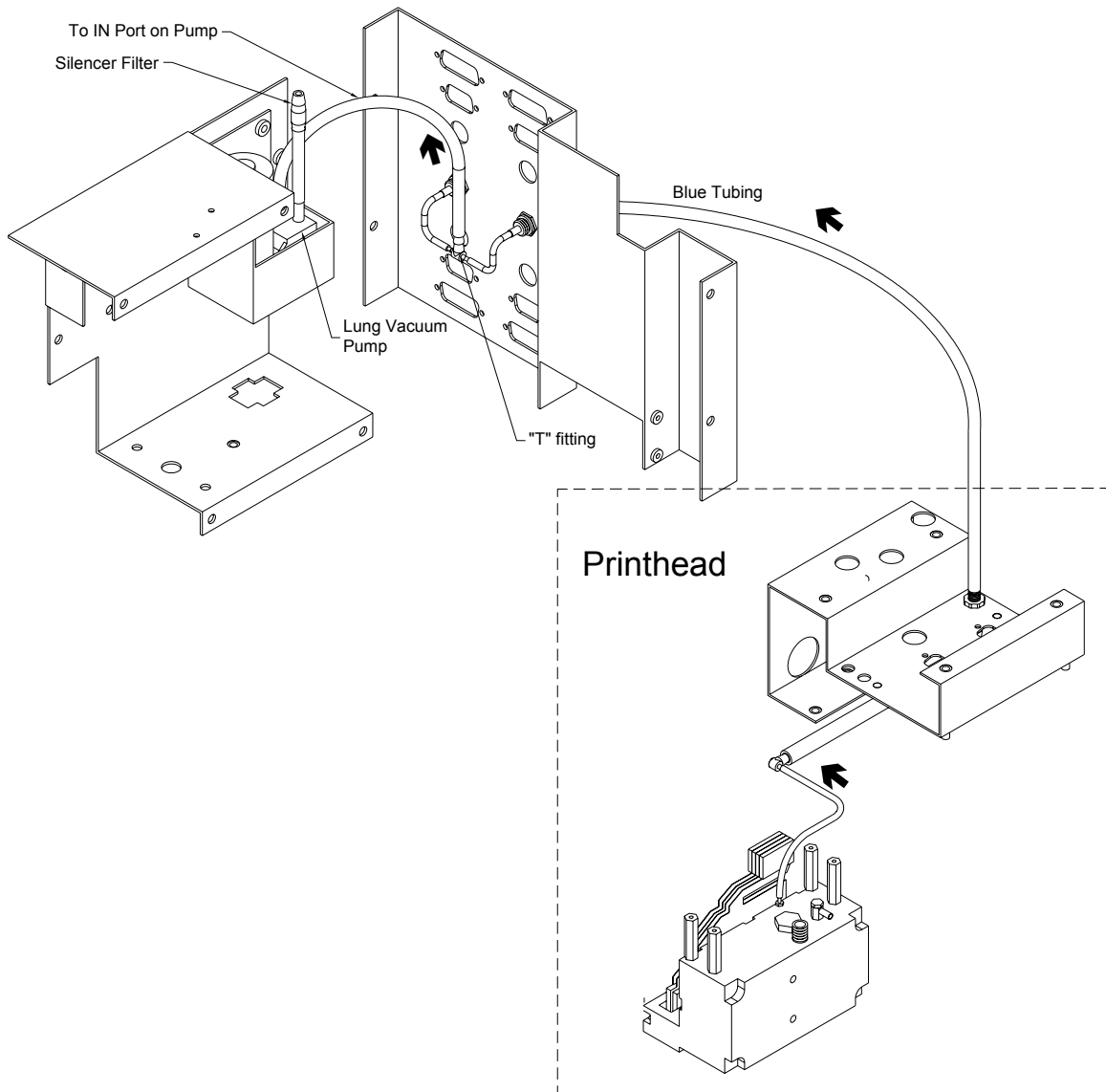


Note: The lung vacuum pump must be on whenever the IDS is on. It will make a slight "buzzing" sound under normal conditions.

2.5.2 Physical Connection

The lung vacuum pump is connected to the printhead through a series of hoses and fittings. The vacuum supply route can be seen in **Figure 2-7**.

Figure 2-7: Lung Vacuum Supply Route (BK791 Shown)

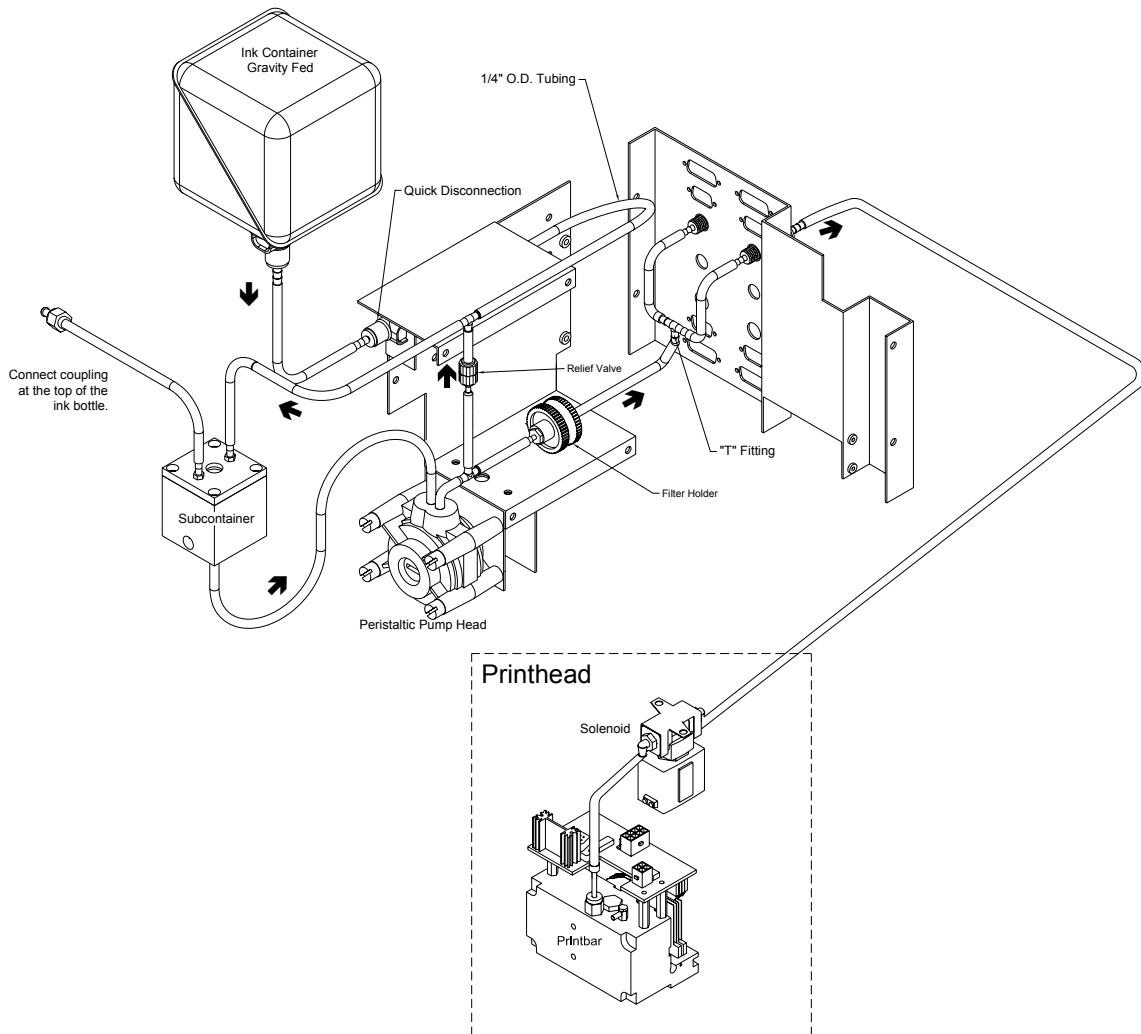


2.6 Ink Supply Line

The ink supply line controls the flow of ink from the ink container (located in the ink bottle holder) to the printhead. The sequence of the ink flow from the container is summarized below and can be seen in **Figure 2-8**:

1. Ink starts in the ink container and is gravity fed into the subcontainer.
2. The subcontainer float switch determines the amount of ink in the subcontainer.
3. The peristaltic pump head pumps ink through the filter. If pressure reaches 20 psi, ink is released back into the subcontainer through the relief valve.
4. The hydrophilic filter filtrates ink before exiting the system support box.
5. Ink travels from the system support box to the printhead.
6. The printhead solenoid valves open and close to supply ink to each printbar individually.

Note: The vent tubing must be connected to a coupling at the top of the ink bottle holder box. The vent tube eliminates vacuum developing in the subcontainer that could cause an ink level misreading.

Figure 2-8: Ink Supply Route

Note: The relief valve is an essential part of the assembly. It is required to avoid a pressure build-up in the ink lines. The relief valve must be installed with the arrow pointing in the direction shown above.

2.6.1 Maintaining the Ink Line

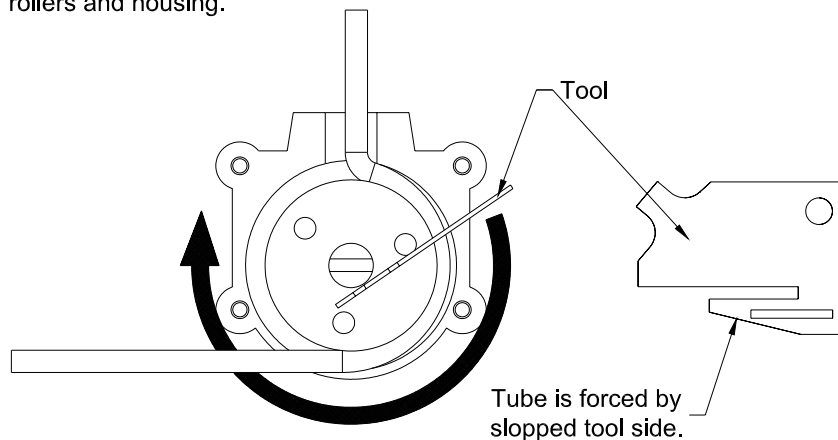
In order to ensure optimum performance of the IDS, it is important to replace the relief valve, filter, and the tubing line running through the peristaltic pump once every six months. In order to do this, refer to the following instructions:

1. Turn off the system support box.
2. Using a flat-head screwdriver, turn the peristaltic pump clockwise in order to remove ink from the ink line between the pump and the relief valve.
3. Connect the syringe to the coupling on the subcontainer and remove the ink.
4. Replace the relief valve. The arrow on the relief valve must match the direction of ink flow indicated in **Figure 2-8**.
5. Replace the filter in the filter holder. Note that the filter used depends on the type of ink (9101288 for Monet+ ink, 9101289 for Renoir ink).
6. Replace the tubing in the peristaltic pump using the tool provided (**Figure 2-9**).
7. Ensure all lines are connected properly and are tie-wrapped on all fittings to prevent ink leakage.

Note: It may be necessary to replace the tubing in the peristaltic pump more frequently than specified above. This should be determined by regularly inspecting the tubing for signs of wear.

Figure 2-9: *Installing Tubing in the Peristaltic Pump*

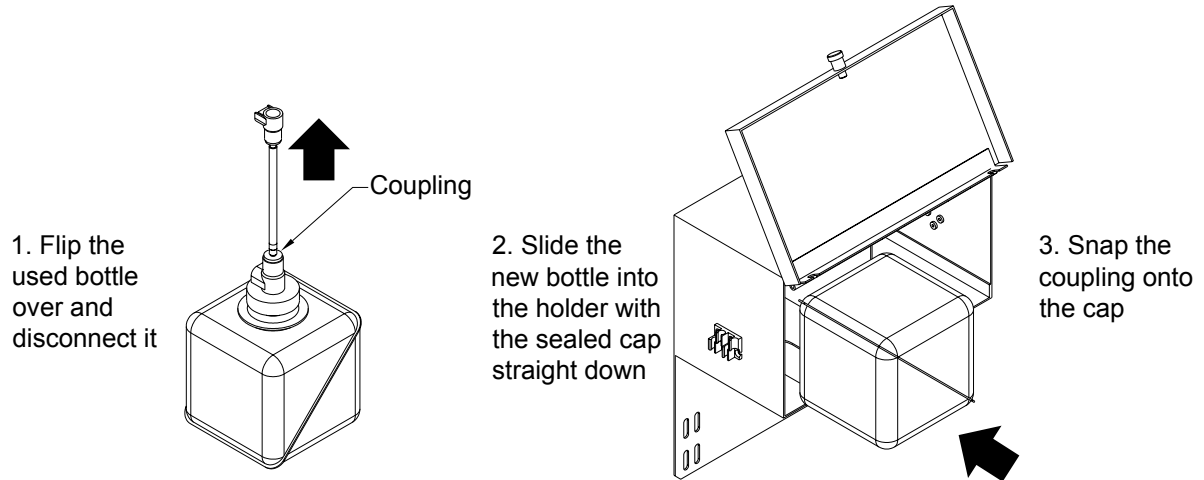
1. Position the tool below the shaft to allow proper clockwise movement.
2. Fully rotate the tool in the direction shown until the tube is squeezed in between the rollers and housing.



2.6.2 Replacing and Maintaining the Ink Bottle

When replacing an ink bottle, follow the instructions shown in **Figure 2-10**.

Figure 2-10: *Ink Bottle Replacement*

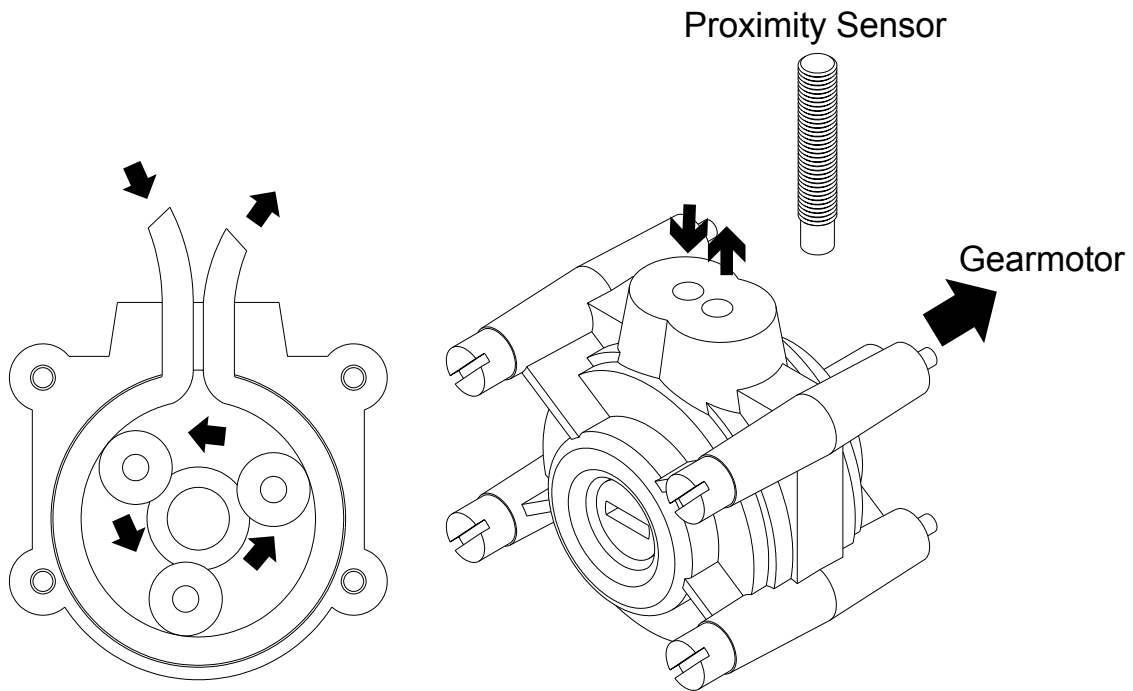


Note: Ink should **NOT** be recycled by placing used ink back into the bottle. Not only can this damage the head, but may also contaminate the filter and result in the ink line bursting due to back pressure. In addition, aggressive chemicals such as isopropyl alcohol or acetone should not be added to the ink bottle. Buskro is not responsible for any damage caused by improper use of the ink.

2.6.3 Peristaltic Pump Head

The peristaltic pump head is responsible for pumping ink from the subcontainer to the printhead. The number of strokes is controlled electronically by the proximity sensor installed above the pump head and the gearmotor installed over the metal coupling. The peristaltic pump head displaces a certain amount of ink per stroke. The arrows show the direction of the ink pumping (**Figure 2-11**). The 12 VDC gearmotor drives the pump in a counter-clockwise direction.

Figure 2-11: *Peristaltic Pump Head*

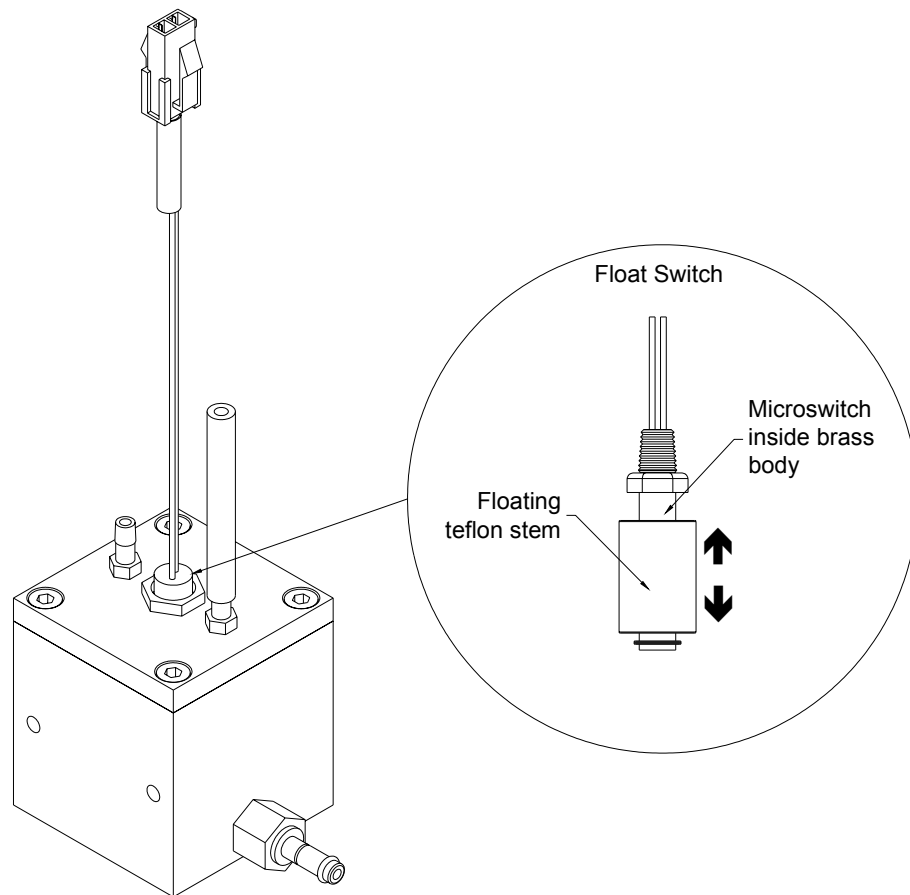


Note: Tubing must be installed properly as shown to prevent ink from pumping backwards.

2.6.4 Float Switch

The float switch (**Figure 2-12**) is responsible for sensing the ink level within the subcontainer.

Figure 2-12: *Subcontainer with Float Switch*



Note: If a ink low icon appears in Compose, the float switch has indicated that the ink level is low in the subcontainer.



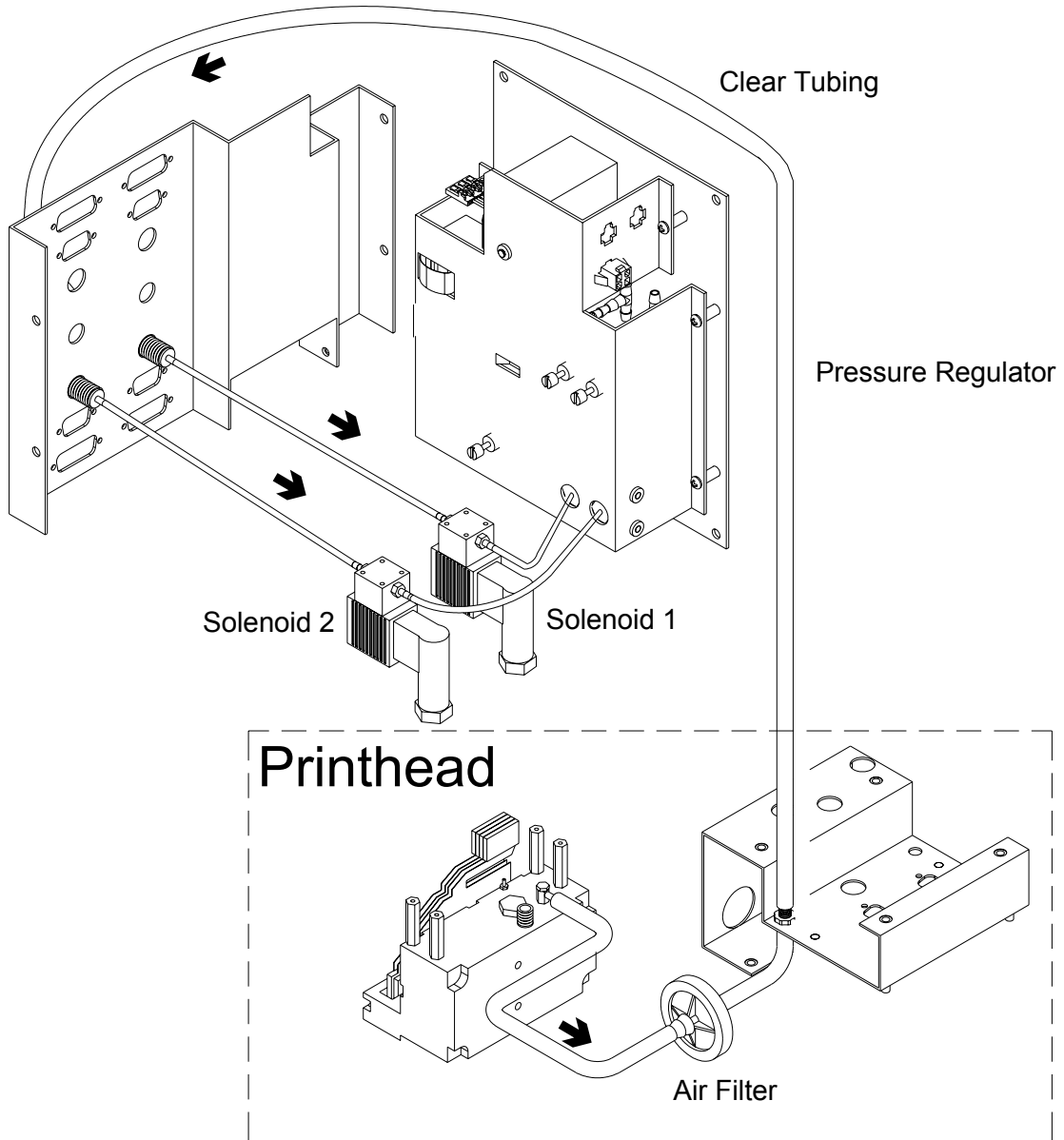
2.7 Pressure Regulator, Meniscus Vacuum

The meniscus vacuum is responsible for maintaining a continuous negative pressure (-3.3 inches of water) required to prevent ink “weeping” (leaking out of the head) and for creating a positive purge pressure (110 inches of water) to prime the printheads. The pressure regulator generates the positive and negative pressures. The meniscus vacuum line can be seen in **Figure 2-13**. In order to prevent ink from being drawn into the pressure regulator, a hydrophobic filter is installed for each printbar to stop ink from passing through. This filter is also used to filter air used when purging the printhead. If ink enters the filter, it must be replaced.

The two solenoid valves (Solenoid 1 and Solenoid 2 in **Figure 2-13**) are used to maintain the meniscus vacuum when the system support box is powered off. This prevents ink from leaking out of the printhead. The solenoids are closed through a 12 VDC relay in the terminal block assembly (**Section 2.10**).

Note: If ink leaks from the printhead while the system support box is powered off, there is likely a leak in the meniscus line or the solenoid is not closing properly.

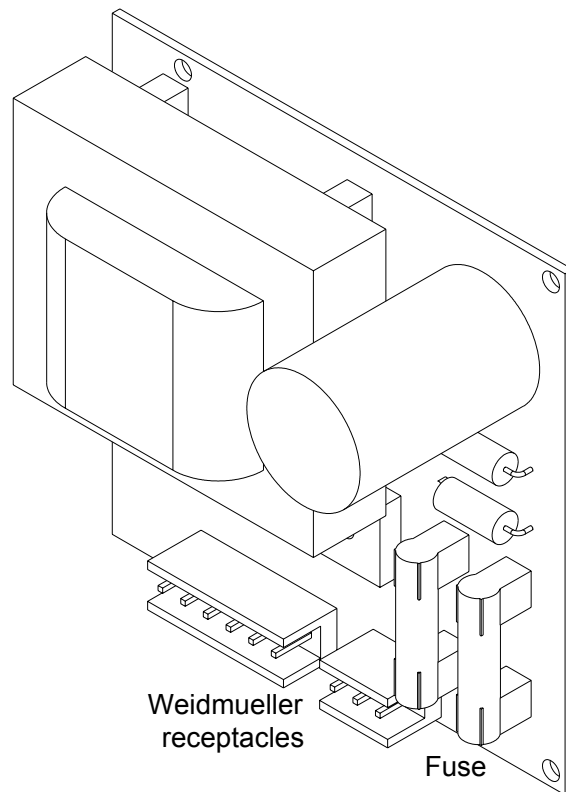
Figure 2-13: *Meniscus Vacuum Supply Route*



2.8 Atlas Power Supply, 170 VDC

The Atlas power supply (P/N 9101158) mounted on the front of power supply housing and above the Atlas inkwell container, is responsible for providing the +170 VDC required to fire the piezo crystals in the printhead. Weidmueller connectors are used to interface the board to the ASSB.

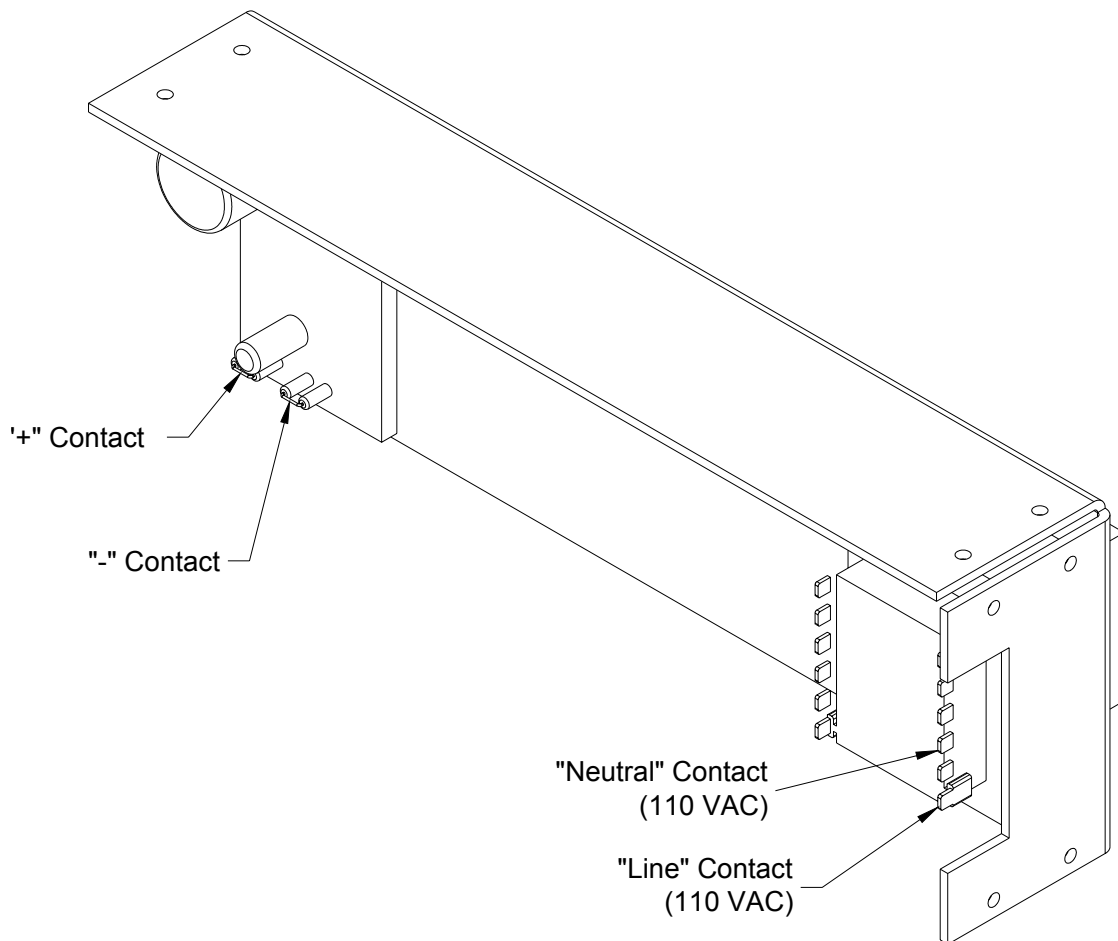
Figure 2-14: *Atlas Power Supply, +170 VDC*



2.9 Power Supply, 12 VDC

The 12 VDC Power Supply (P/N 9101209) is located inside the power supply housing above the inkwell container and is responsible for providing +12 VDC to the Atlas System. This supplies 12 VDC for the ASSB, the garmotor, the pressure regulator pump and the solenoid valves installed in the main box and printhead assemblies.

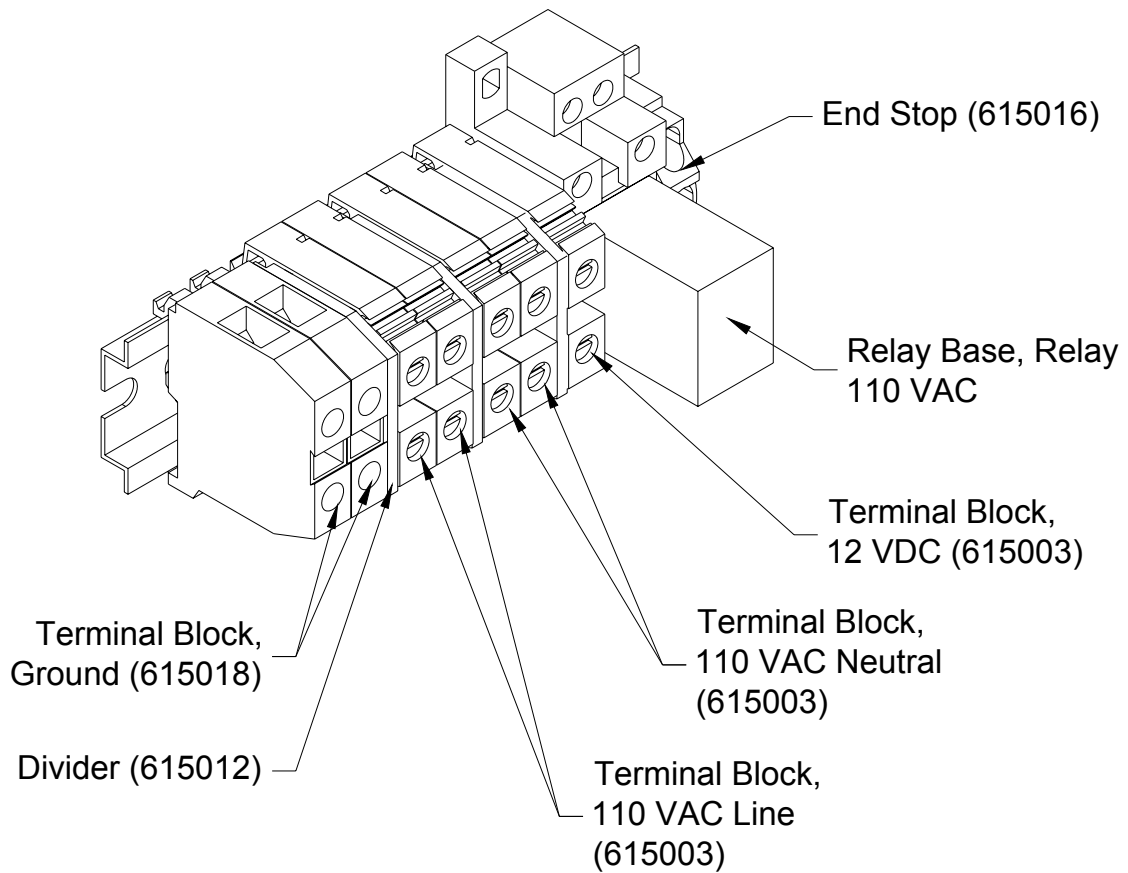
Figure 2-15: 12 VDC Power Supply



2.10 Terminal Block Assembly

The terminal blocks located at the front wall of the power supply housing distribute the necessary power to various components. The 110 VAC relay is installed to instantaneously disconnect the solenoid valves in the meniscus vacuum line and provide permanent negative pressure.

Figure 2-16: *Terminal Block Assembly*



3.1 Features

3.1.1 Universal front/back Mounting

The printhead is constructed with identical aluminum extrusions on either end permitting universal front or back mounting depending on the arrangement of the bridge.

3.1.2 Rugged Umbilical

All printhead “life support” requirements emanating from the controller are ported through a single ruggedly encased umbilical providing excellent protection. These essential elements, which include vacuum, ink, and data lines, are equipped with sealed, drip-free connectors for rapid connection to the controller.

3.1.3 Individual Height Control

In order to accommodate various product thicknesses, the height of each printhead can be adjusted individually.

3.1.4 Leveling Control for Print Optimization

A simple spring-loaded head leveling arrangement is provided to permit convenient and rapid head leveling for the purpose of optimizing the print quality. In addition, this construction provides head compliance in the event of a double-feed situation.

3.1.5 Portable

Since the printhead is capable of sliding relative to the mounting assembly, the BK79 series printhead can be easily attached or removed from the mount for unparalleled portability.

3.1.6 Scalable Bridge Arrangement

The printhead bridge uses a standard aluminum extrusion with two end mounts. As a result, the extrusion can be cut to length to straddle any custom application.

3.1.7 Convenient Maintenance System

The BK79M printhead mount is equipped with a convenient release knob that automatically raises the printhead for rapid access to the printhead face in the event wiping and purging is required.

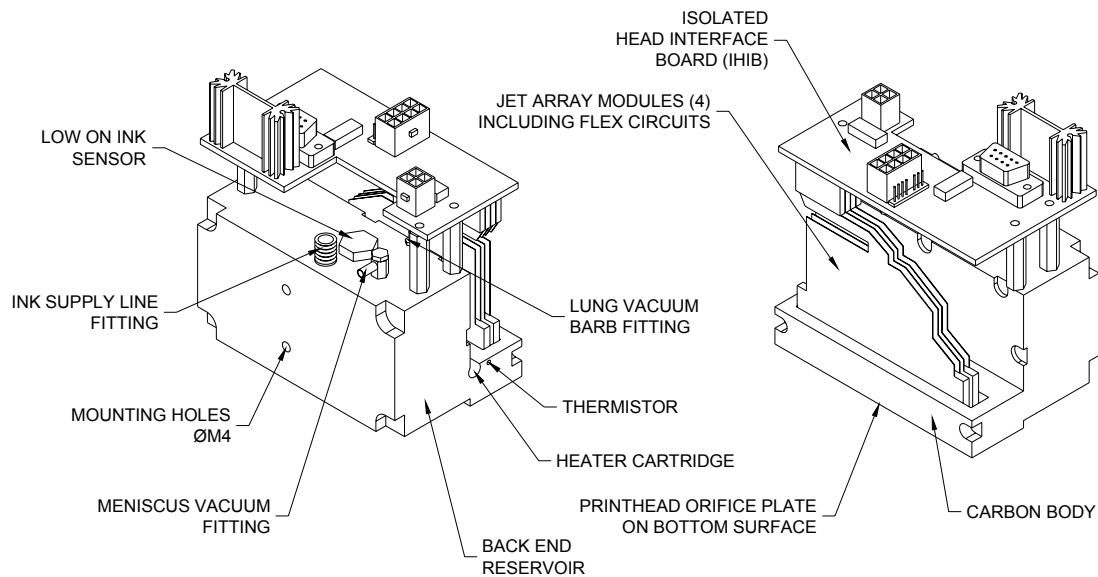
3.1.8 Ease of Servicing

The printhead is equipped with two removable covers providing complete access to the printbar, electronics, valves, and hoses for easy servicing and/or removal. In addition, the printbar itself is equipped with a rapid disconnect and filter for clean ink flushing when needed.

3.2 Components

3.2.1 The Printbar

The printbar is a monochrome 256-jet head that uses Drop-On-Demand (DOD) technology that applies voltage to the Piezo-electric crystals in the head to jet ink. In the case of single head printheads, only one printbar is used while in dual head printheads, two printbars are included for each head. An illustration of the printbar can be seen in **Figure 3-1**.

Figure 3-1: The Printbar

The ink reservoir in the printbar normally holds 40 mL of ink and also contains a Low On Ink Sensor (LOIS), a heater cartridge and thermistor to maintain the required temperature, and a lung vacuum feature to remove air from the ink.

For single head printheads, 1 inch of print coverage is available at 256 DPI vertically. For Sapphire printheads, 2.56 inches of print coverage is available at 200 or 300 DPI vertically. The horizontal DPI is software selectable through Compose (110, 220, 330, 440, and 660 DPI).

3.2.2 Lung Vacuum

The lung vacuum is designed to de-aerate the ink to prevent loss of jets due to air bubbles. It is described in **Section 2.5** and should measure approximately 16 inches of mercury (16 in Hg).

3.2.3 Ink Supply Line

The ink supply line is described in **Section 2.6**.

3.2.4 Meniscus Vacuum

The meniscus vacuum described in **Section 2.7** should measure approximately 3.3 inches of water (3.3 in Wg). If the meniscus vacuum is too low, ink may leak from the printhead. Conversely, if the meniscus vacuum is too high, there may be a loss of jets during printing. If either of these conditions are observed, the meniscus vacuum can be measured using a low-pressure gauge (P/N 9100338A). If an incorrect meniscus vacuum is measured at the head, another reading should be taken directly from the pressure regulator to ensure that the problem is not in the meniscus vacuum line itself.

Note: If the hydrophobic filter in the printhead on the meniscus line fills with ink, it must be replaced.

3.2.5 Priming Button

The priming button(s), located on the top of the printhead assembly, is available to remove air from the printhead. To prime the printhead, the button must be pressed and held for a minimum of **2 seconds**. A number of conditions must be met in order for priming to occur. These conditions are outlined below.

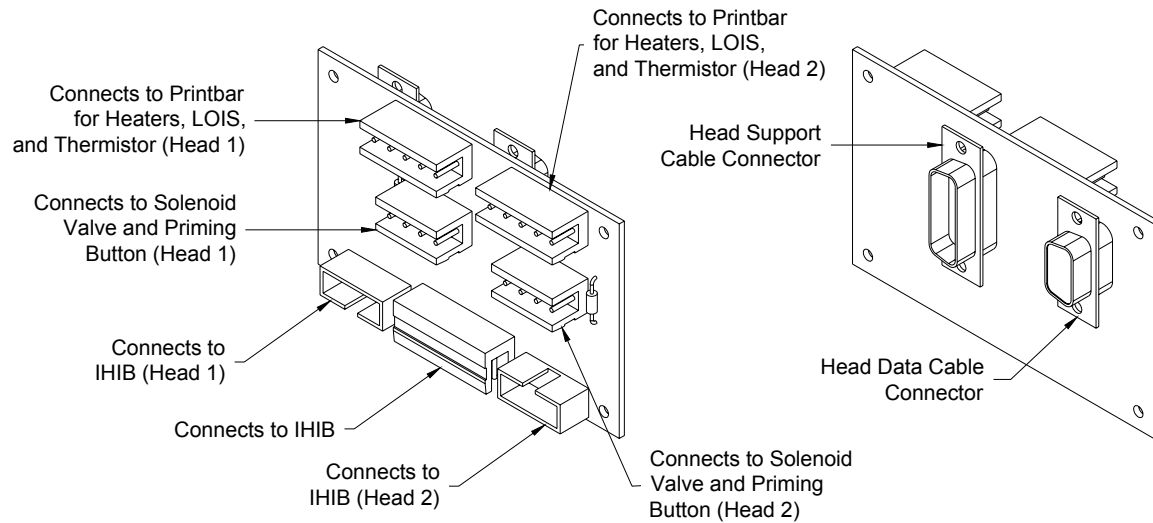
1. The Atlas System Support Box power must be ON.
2. The printhead must be at its operating temperature (**Section 5.2.2**).
3. The ink refill process must be inactive.
4. There must be sufficient ink in the subcontainer of the Ink Delivery System.
5. A period of 10 seconds must elapse between the start of one prime to the start of another.

If any of the above conditions are not met, priming may not occur.

3.2.6 Dual Atlas Connector Interface Board (DACIB)

The DACIB (**Figure 3-2**) is used to interface the printhead with the system support box and the datapath card through the head support cable and head data cable respectively.

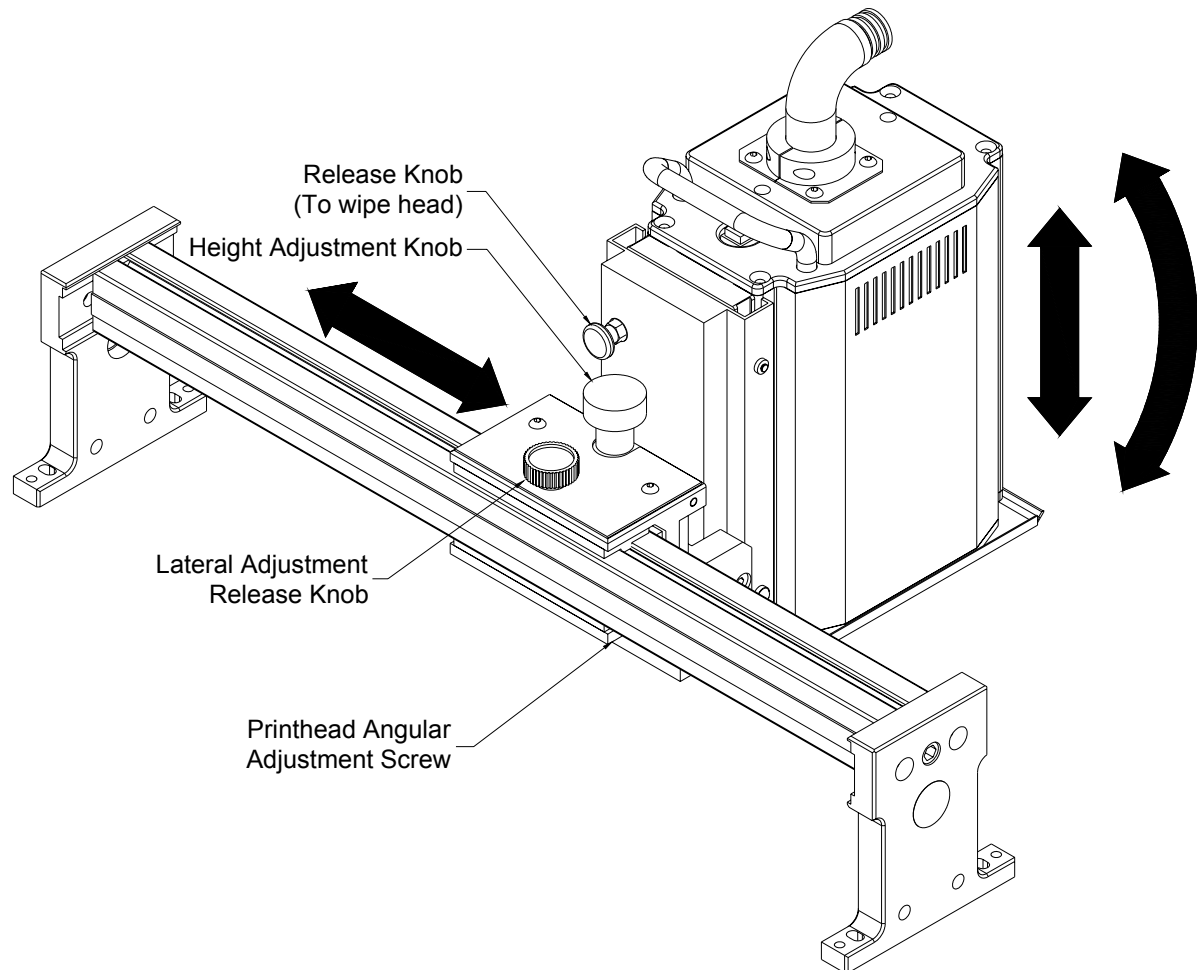
Figure 3-2: *Dual Atlas Connector Interface Board (DACIB)*



3.3 Printhead Adjustments

In order to provide flexibility, each printhead is designed to allow individual lateral, vertical, and angular adjustments. This is achieved by adjusting the associated knobs and screw shown in **Figure 3-3**.

Figure 3-3: *Printhead Adjustments*



3.3.1 Lateral Adjustment

Lateral adjustment is achieved by turning the release knob (**Figure 3-3**) counter-clockwise and sliding the printhead along the rail. Once in position, the release knob should be turned clockwise to lock the printhead in place. This adjustment provides proper placement of print on the piece.

3.3.2 Height Adjustment

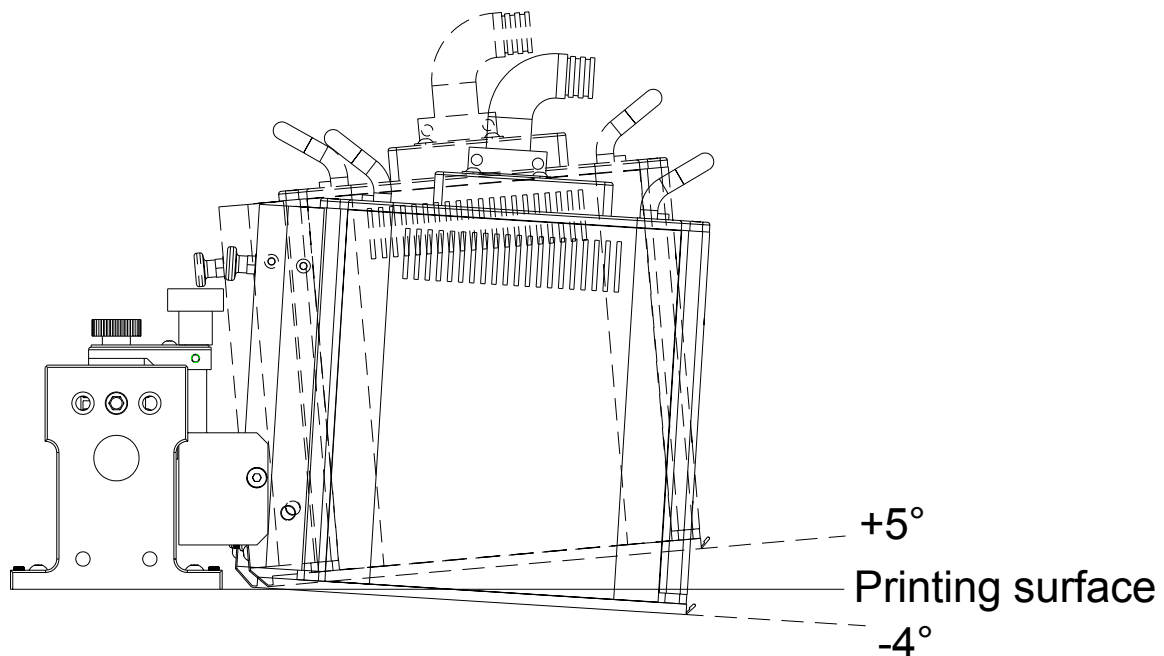
Height adjustment is achieved by turning the height adjustment knob (**Figure 3-3**).

Clockwise rotation raises the printhead while counter-clockwise lowers it. This adjustment provides the ability to run a range of material thicknesses up to 1.25". In general, the printhead should be as close to the material (without interfering with transport) as possible in order to obtain optimum print quality.

3.3.3 Angular Adjustment (Printhead Leveling)

Angular adjustment is achieved by turning the angular adjustment screw (**Figure 3-3**) with a 3/16 hex key tool. This provides a 9-degree adjustment range as shown in **Figure 3-4**. In order to obtain optimum print quality, the lower surface (shield) must be parallel with the tabletop.

Figure 3-4: *Printhead Angular Adjustment*



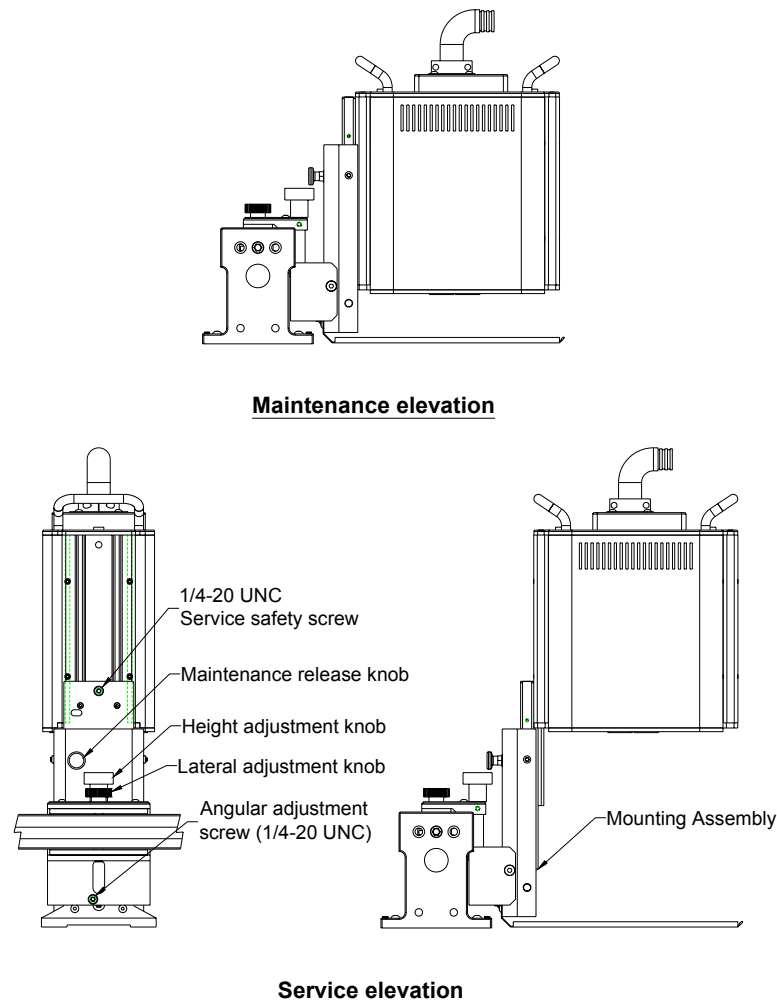
Note: Height and angular printhead adjustments are important to achieve optimum print quality.

3.3.4 Raising the Printhead

In order to simplify maintenance and service, the printhead housing can slide vertically relative to the mounting assembly. In order to clean or wipe the printhead, the maintenance release knob shown in **Figure 3-5** can be pulled to automatically raise the head to the required level. When cleaning is completed, the printhead can be pushed down until it snaps in place.

In cases where the printhead needs to be serviced, the printhead must either be removed from the mounting assembly or raised high enough to access the screws securing the main covers. In order to do this, the service safety screw must be loosened.

Figure 3-5: *Raising the Printhead*



3.4 Printhead Connections

There are five main types of connections from the printhead to the inkwell. They are:

1. Ink Umbilical – Black tubing
2. Lung Vacuum – Blue tubing
3. Meniscus Vacuum – Clear tubing
4. Data Cable – 15-Pin Cable
5. Head Cable – 26-Pin Cable

Each single head printhead uses one of each of these cables while dual head printheads use an additional meniscus line. In addition, the ink line and meniscus connectors are different between the Monet+ and Renoir systems in order to prevent mixing technologies.

Note: Monet+ and Renoir inks cannot be used in the same ink delivery system or printhead or **SERIOUS** damage can occur. This is due to chemical compatibilities of the inks with the components used.

Always turn OFF the controller before disconnecting the data or head cables otherwise the printhead can be damaged.

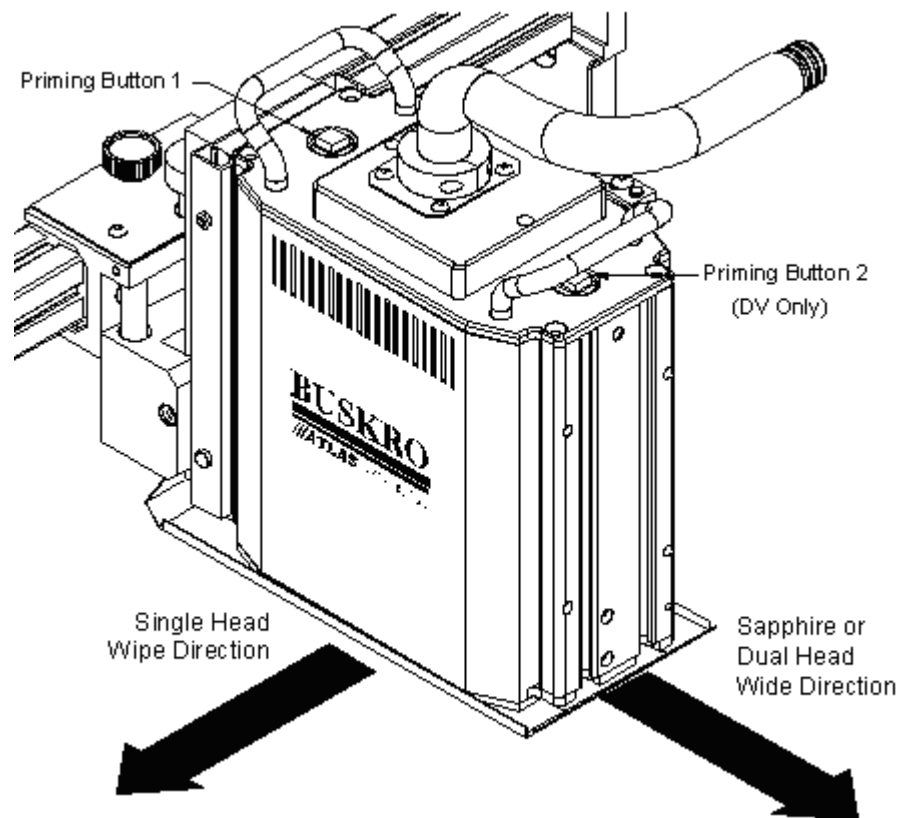
4.1 General Maintenance

4.1.1 Printhead Cleaning (Priming)

Priming is recommended when a printhead has not been in use for an extended time period or if a loss of jets is visible in the print (i.e. a void in the image). This is done to remove trapped air bubbles at the orifice plate. To prime and clean the printhead:

1. Pull the maintenance release knob to raise the printhead.
2. Place the ink tray (P/N 9101302) underneath the printhead. Alternatively, hold a lint free fibreless wipe (P/N 800900) underneath the printhead.
3. Press the priming button on the top of the printhead. Hold for approximately 10 seconds to allow ink to drip out of the printhead and then release.
4. Using the specified wipes, lightly press against the bottom of the printhead and move the wipe in the direction shown in **Figure 4-1**.
5. Repeat steps 3-4 with the second priming button on dual head designs.

Figure 4-1: *Priming and Wiping (Dual Head Shown)*



Note: A soft, fibreless wipe with no chemical additives must be used to clean the printhead otherwise it can be damaged or fibers from the wipe may cause blockage. No other wipes are acceptable (i.e. paper towels, toilet paper, tissue paper, or sponges).

4.2 Monet+ Ink Printhead Maintenance

The Atlas printheads use a non-volatile solvent based ink known as Monet+ ink. Since the Monet+ ink has different properties from the Renoir ink, maintenance requirements are different. As a result, it is important to follow the proper maintenance section based on the technology being used.

4.2.1 Monet+ Printhead Shut-down

To shut-down the printhead, reference the following steps:

1. Pull the maintenance release knob to raise the printhead.
2. Place the ink tray (P/N 9101302) underneath the printhead.
3. Shut off the power to the system support box (inkwell) and the controller.

4.2.2 Monet+ Printhead Start-up

To start-up the printhead, reference the following steps:

1. Turn the controller and system support box power ON.
2. Start Compose and wait until the “**Normal Status**” icon appears. It should take approximately 1 minute for the printhead to heat up to its operating temperature. The temperature can be read in the diagnostics screen (**Section 5.2.2**).
3. Use the priming button to purge any air bubbles from the printhead (**Section 4.1.1**).

Note: It is possible to leave the system on overnight in order to minimize start-up time. However, it is important to clean the heads daily by soaking a clean room grade fibreless wipe (P/N 800900) with the maintenance spray (P/N BKSPR-MO+125) and holding it under the orifice plate of the printhead.

5.1 Integration

In general, Buskro print technology is designed to work with a Buskro controller (i.e. BK700 Portable Controller) equipped with Compose software. Due to the modular design of the Controller, all Buskro inkwells are designed with the same mounting configuration. Specific information on the BK700 Controller and the requirements for integrating it with the print technology can be found in the Controller manual (P/N 9101797).

5.2 Compose Software

The Compose software is a Windows[®] based application that controls all operational aspects of a Buskro inkjet system. Detailed information is not provided in this manual.

5.2.1 Printhead Drivers

In order to integrate the print technology with Compose, the proper printhead driver (**Table 5-1**) must be specified in the Setup menu (**Figure 5-1**) beside “Type:”.

Figure 5-1: *Compose Setup Window*

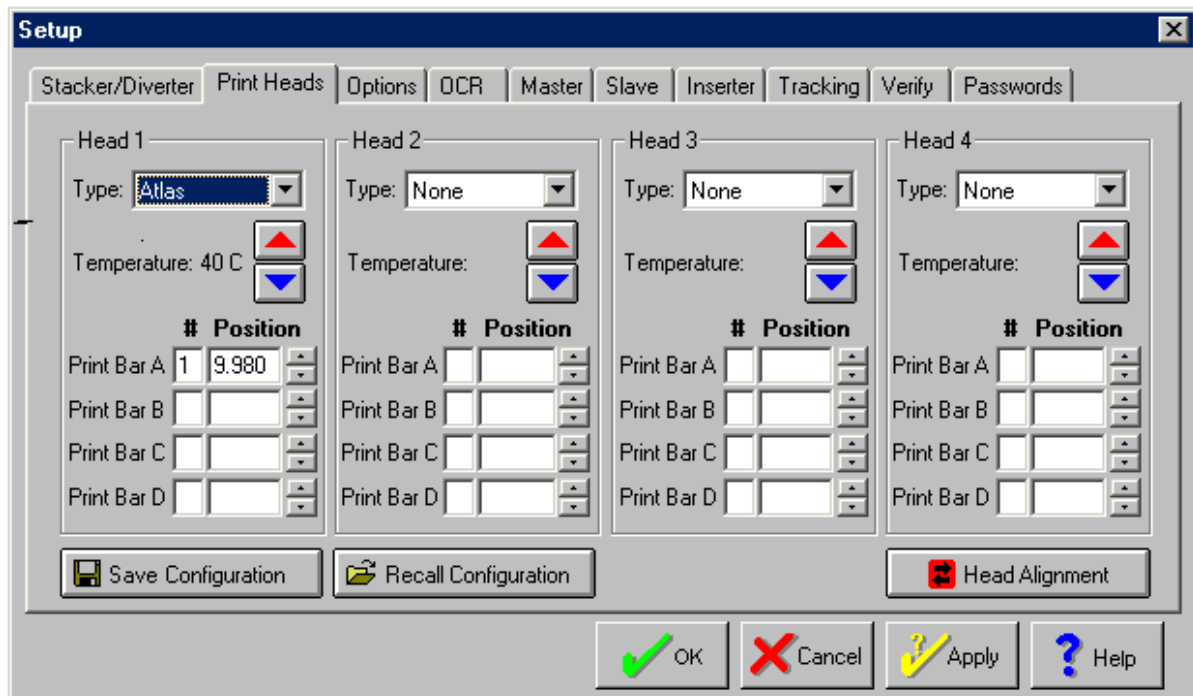
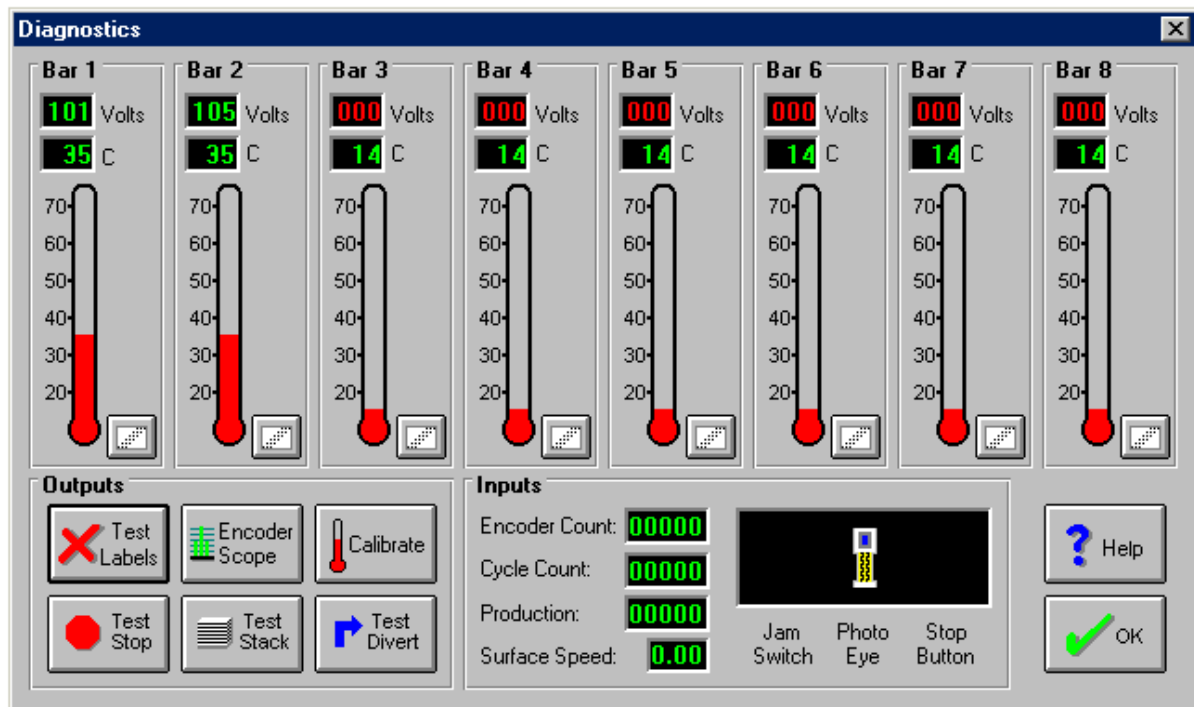


Table 5-1: Printhead Driver

Print Technology	Product Code	Inches of Print	Driver Name
Atlas	BK791-A	1	Atlas Atlas-HS (High Speed)
Atlas UVC	BK791-U	1	Atlas-UVC Atlas-UVC-HS (High Speed)

5.2.2 Diagnostics Screen

The Compose diagnostic screen displays the voltage and temperature readings for each printbar (**Figure 5-2**). The voltage value is preset before shipment and normally ranges between 90 and 110 Volts. The temperature reading depends on the ink technology used. For the Atlas heads, the temperature should be approximately 35°C while the Atlas-UVC is approximately 52°C.

Figure 5-2: Compose Diagnostics Window (Single Atlas-DV Shown)

5.2.3 Printhead Voltage Setting

Each individual printbar is tuned to operate at a specific drive voltage (normally 90-110V). This drive voltage is written on each printbar and requires the proper voltage setting in Compose. The minimum and maximum voltage setting for the printhead is 70 and 200 respectively.

In order to properly set the voltage, the COMPOSE4.INI file must be modified using a text editor. Within the INI file, the keyword “**HeadVolt**” must be found. The temperature for each individual printbar can be set here. A sample section of the COMPOSE4.INI file can be seen below:

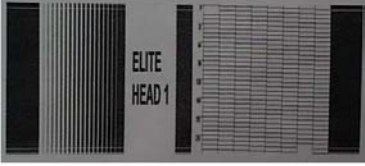
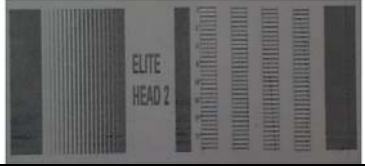
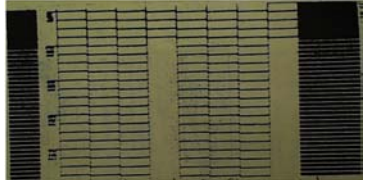

```
[Head Support]
ResMaxWarmup=25 (for ELITE only)
LOISTrip=88
UMBDelay=50 (for ELITE only)
VacRefStroke=3 (for ELITE only)
VacRefTime=120 (for ELITE only)
HeadVolt1=160.0
HeadVolt2=160.0
HeadVolt3=160.0
HeadVolt4=160.0
HeadVolt5=160.0
HeadVolt6=160.0
HeadVolt7=160.0
HeadVolt8=160.0
```


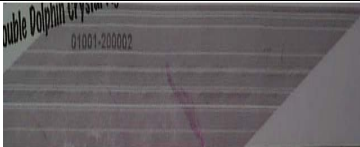
Note: The proper voltage is set at the factory.

6.1 Troubleshooting Guide

The purpose of this chapter is to provide a basic troubleshooting guide for basic print problems. Some possible problems are described in **Table 6-1**.

Table 6-1: *Troubleshooting Guide*

Problem	Example	Action
Lines in Print		<ul style="list-style-type: none"> • Prime system • Measure Lung Vacuum (need 16 in Hg) • Monet+ Only: Hold a wipe soaked with flushing solution on the orifice plate for 10-15 seconds
Head Prints every other Channel		<ul style="list-style-type: none"> • Check VGA Cable to Printhead • Defective HDC Board
Head missing ¼ of print		<ul style="list-style-type: none"> • Check flex connectors at the head • Defective driver chips on head that must be factory repaired
Split Image		<ul style="list-style-type: none"> • Verify v1.3 PCI Controller Chip or higher on the Data Path Card • Verify USB Disabled in CMOS in PCI/PNP • Verify USB Disabled in Windows • Belt speed is below minimum speed of 0.15 m/s
Ink is Dripping from Print Head		<ul style="list-style-type: none"> • Measure meniscus vacuum (need 3.3 in Wg) • Check meniscus hose and hydrophobic filter for ink blockage • Check solenoid valve that allows permanent meniscus vacuum

Problem	Example	Action
No ink in the Ink Supply Line		<ul style="list-style-type: none"> • Check that the UMB LED is lit on the SSB • Measure ink low reading on head (LOIS/GND) (should be below 4.3 VDC for low ink) • Check solenoid valve installed in the printhead • Check PVC membrane disc in the filter holder mounted behind peristaltic pump head. Replacement is necessary if ink is recycled from the ink tray • No ink in the subcontainer
Peristaltic Pump constantly pumping ink		<ul style="list-style-type: none"> • Low ink level in the head (temporary) • SSB malfunction • LOIS malfunction
Pump Fail Icon		<ul style="list-style-type: none"> • Loss of power in 12 VDC wiring related to float switch installed inside the subcontainer.
Low on ink icon		<ul style="list-style-type: none"> • Subcontainer low on ink (temporary)
Print is streaking		<ul style="list-style-type: none"> • Check 3 Pin connector on printhead • Change 10 Pin ribbon cable on printhead

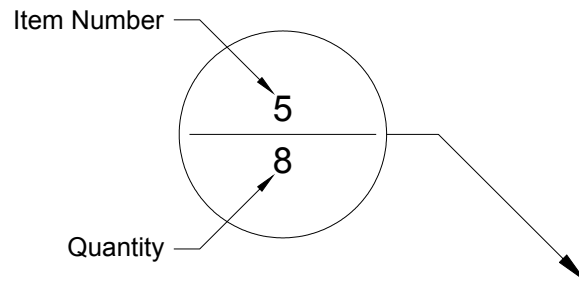
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Balloon Annotation and Parts Listing



Item	Part Number	Quantity	Description	Reference
1				
2				

The following is a description of how to interpret the information in this section:

Item:

This column indicates the item number used for each unique part in an assembly drawing. It is matched with the top number in the balloon pointing at the associated part.

Part Number:

This column represents the Buskro part number.

Quantity:

This represents the total number of a given part in an assembly. It is matched with the bottom number in the balloon pointing at the associated part.

Description:

This column contains a brief description of the part.

Reference:

This column indicates the page location for sub-assemblies.

Table A-1: *Inkwell, Single IDS, Monet (9100979A)*

Item	Part Number	Quantity	Description	Reference
1	401510	4	Screw, BHCS, 4-40 UNC x 1/4"	
2	402510	10	Screw, BHCS, 6-32 UNC x 1/4"	
3	404510	18	Screw, BHCS, 10-32 UNF x 1/4"	
4	420008	1	Nut, 10-32 UNF	
5	603300	1	Switch, Breaker, 5A, 1 Pole	
6	606330A	1	Cable, Main Power Supply	
7	614114A	1	Cable, Panel Mount Counter	
8	615131	1	Cable Clamp, 3/8", Metal	
9	803020	2	Electrical Warning Label	
10	9100717	1	Plug, 6-Pin, Mate-n-lok	
11	9100748A	1	Cable, I/O Panel Mount	
12	9100979	1	UV/Solvent Inkwell Container	
13	9101165	2	Drawer Slide	
14	9101209A	1	Power Supply Housing Assembly	
15	9101217	1	Rear Door	
16	9101220	1	Housing Cover	
17	9101228A	1	Ink Delivery Module, Monet	
18	9101788	1	Bracket, Umbilical Mount	
19	9101796	1	Eye Protection Label	
20	9102151A	1	Syringe Assembly	
21	9102156	1	Ink Bottle Holder	
22	9102237	1	Holder Door	
23	9102625	1	Coupling, Panel Mount, 1/4"	
24	9103909A	1	Bottle Coupling Assembly	

Figure A-1: *Inkwell, Single IDS, Monet (9100979A)*

NOTE:

The circled items consist of (2) 420008, (1) 9100212A, and (1) 9102157. These items have been moved to 9103186A.

These parts are included in this drawing to show their points of installation.

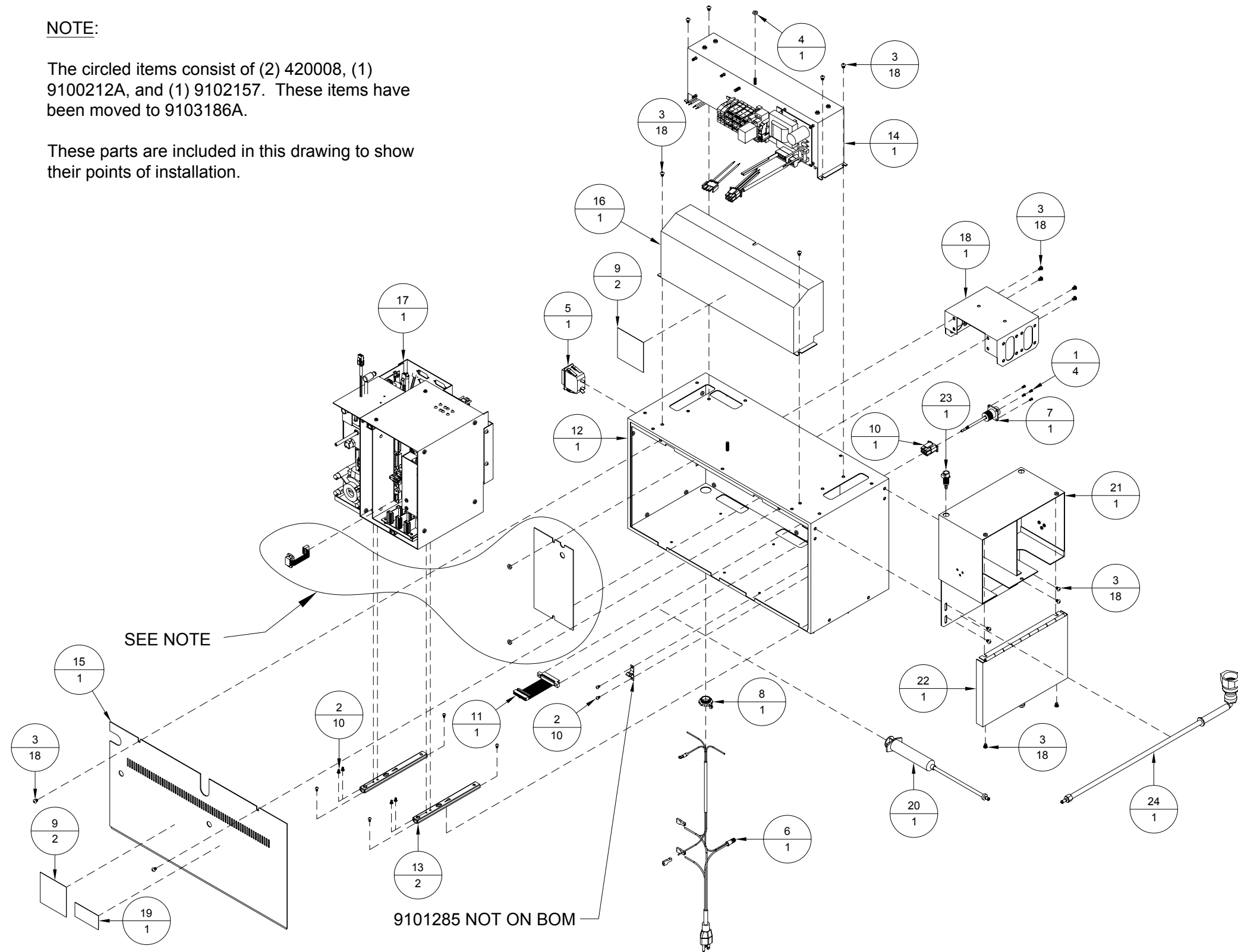
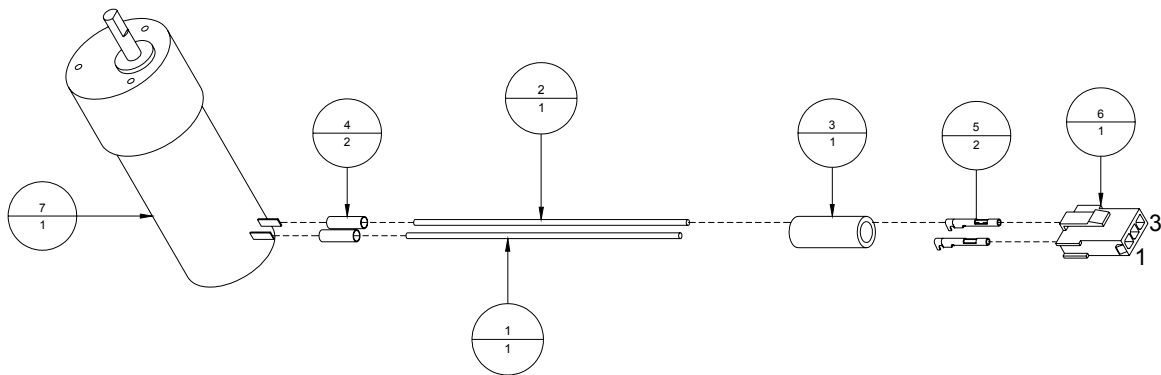


Table A-2: Gear Motor Assembly (9100936A)

Item	Part Number	Quantity	Description	Reference
1	606023	4"	Wire, #18, Green, Hookup	
2	606025	4"	Wire, #18, Orange, Hookup	
3	609001	2"	Shrink Wrap, 1/4" I.D.	
4	609004	2 x 1"	Shrink Wrap, 1/8" I.D.	
5	614002	2	Female Contact, Socket	
6	614003	1	Cap Receptacle	
7	9100936	1	Motor, Gear, R 187:1, 12 VDC	

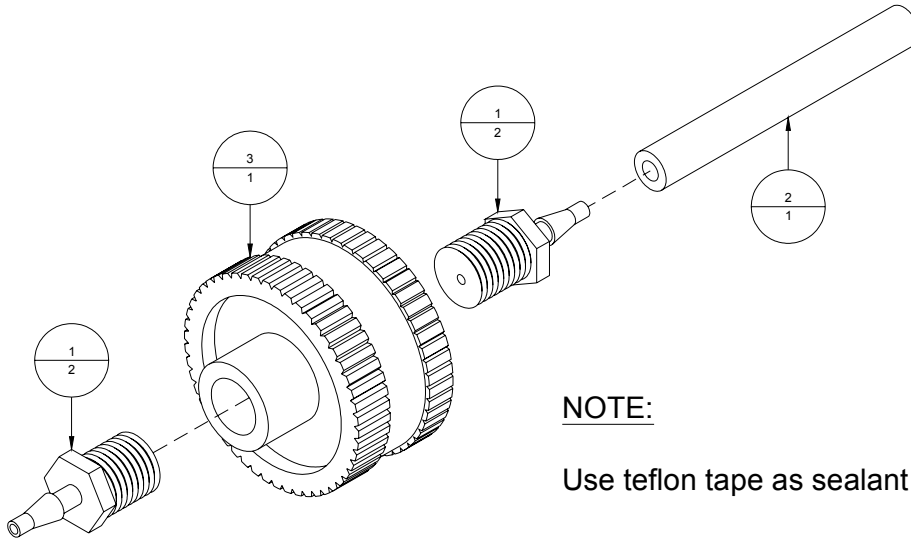
Figure A-2: Gear Motor Assembly (9100936A)



Contact #	Function on gearmotor	Color	Length"	Wire #
1	-	GN	4	18
2	n/a	n/a	n/a	n/a
3	+	OG	4	18

Table A-3: *Filter Holder Assembly, Monet (9100964A)*

Item	Part Number	Quantity	Description	Reference
1	9100149	2	Connector, 1/8" NPT, 1/8" I.D.	
2	9100960	1	Tubing, PharMed, 1/8" x 1/4", 12"	
3	9102675A	1	Filter Body Assembly	

Figure A-3: *Filter Holder Assembly, Monet (9100964A)***NOTE:**

Use teflon tape as sealant for all three threads.

Direct filter holder cap towards pump head.

Table A-4: *Electrical Board Bracket Assembly (9100969A)*

Item	Part Number	Quantity	Description	Reference
1	401310	5	Screw, PHMS, 4-40 UNC x 1/4"	
2	402510	2	Screw, BHCS, 6-32 UNC x 1/4"	
3	440530	5	Washer, #6, Nylon	
4	606030A	1	Cable, High Voltage Power Supply	
5	606311A	1	Cable, System Support Interface, Atlas	
6	615076A	2	Cable, HDC	
7	9100208	1	System Support CPU Board	
8	9100969	1	System Support Board, Atlas	
9	9100994	2	Head Drive Circuit Board (HDC), Atlas	
10	9101230	1	Electrical Boards Bracket	
11	9101285	1	Catch Stopper (Part of IDS BOM)	

Figure A-4: *Electrical Board Bracket Assembly (9100969A)*

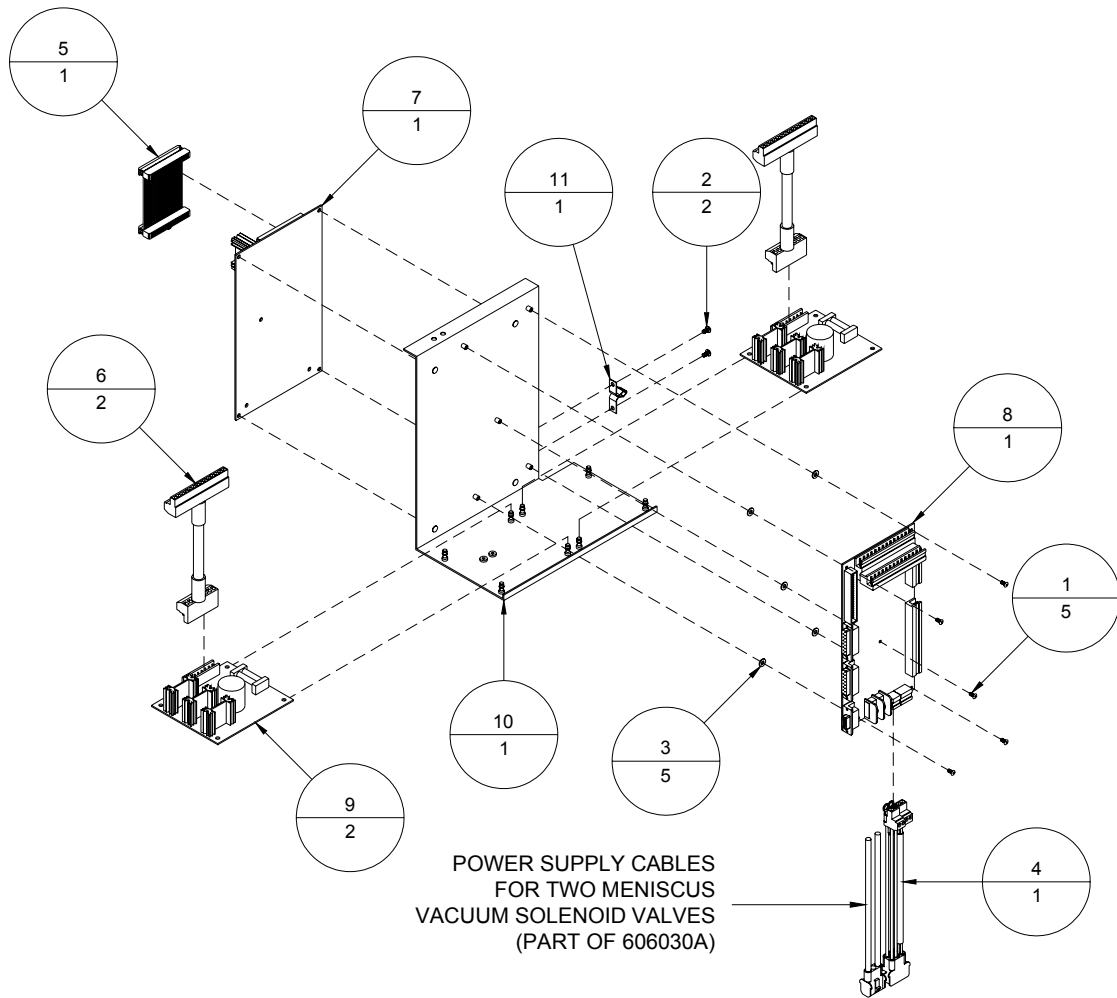


Table A-5: "U" Holder Assembly (9101164A)

Item	Part Number	Quantity	Description	Reference
1	401310	3	Screw, PHMS, 4-40 UNC x 1/4"	
2	404550	1	Screw, BHCS, 10-32 UNF x 3/4"	
3	9100876	1	Coupling, 0.5" dia.	
4	9100931	1	Peristaltic Pump Head	
5	9100936A	1	Gear motor Assembly	Page A-3
6	9101164	1	"U" Holder	
7	9102116	1	Tubing, PharMed, 1/8" x 1/4", 16"	

Figure A-5: "U" Holder Assembly (9101164A)

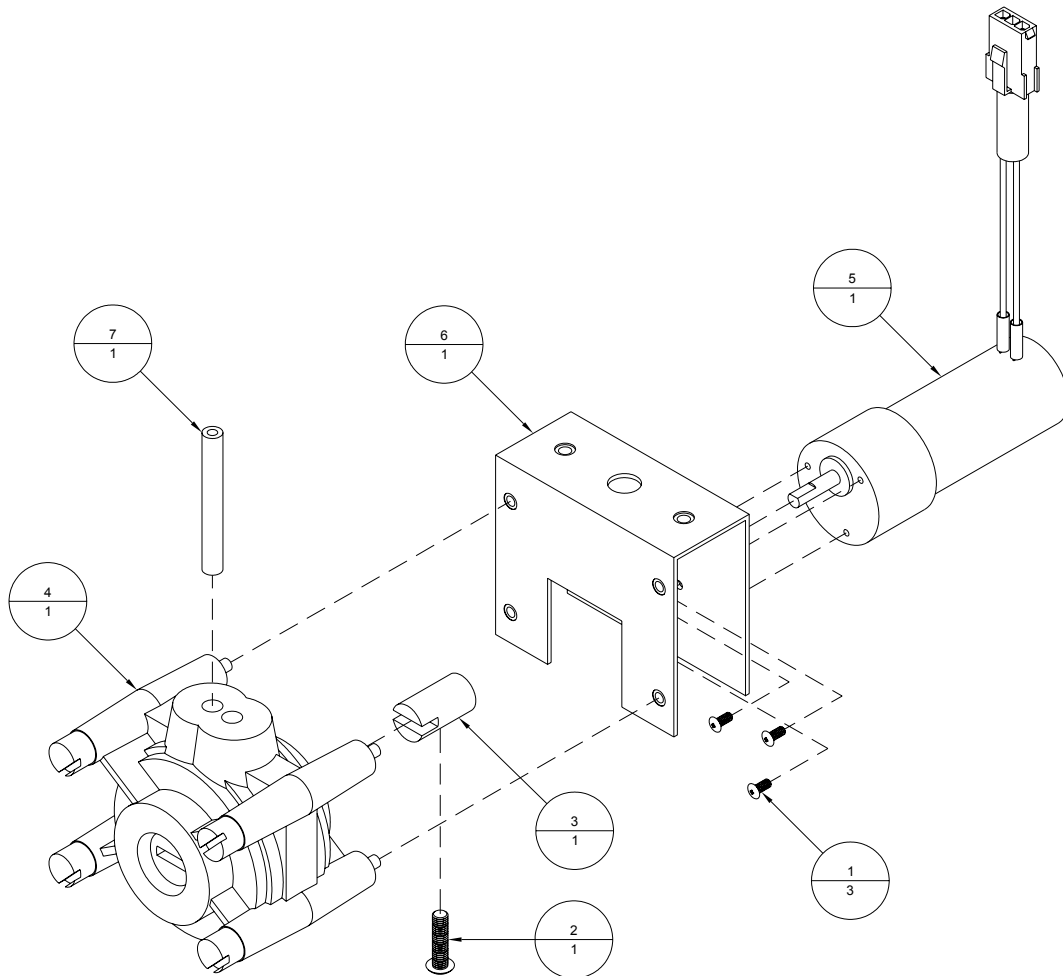
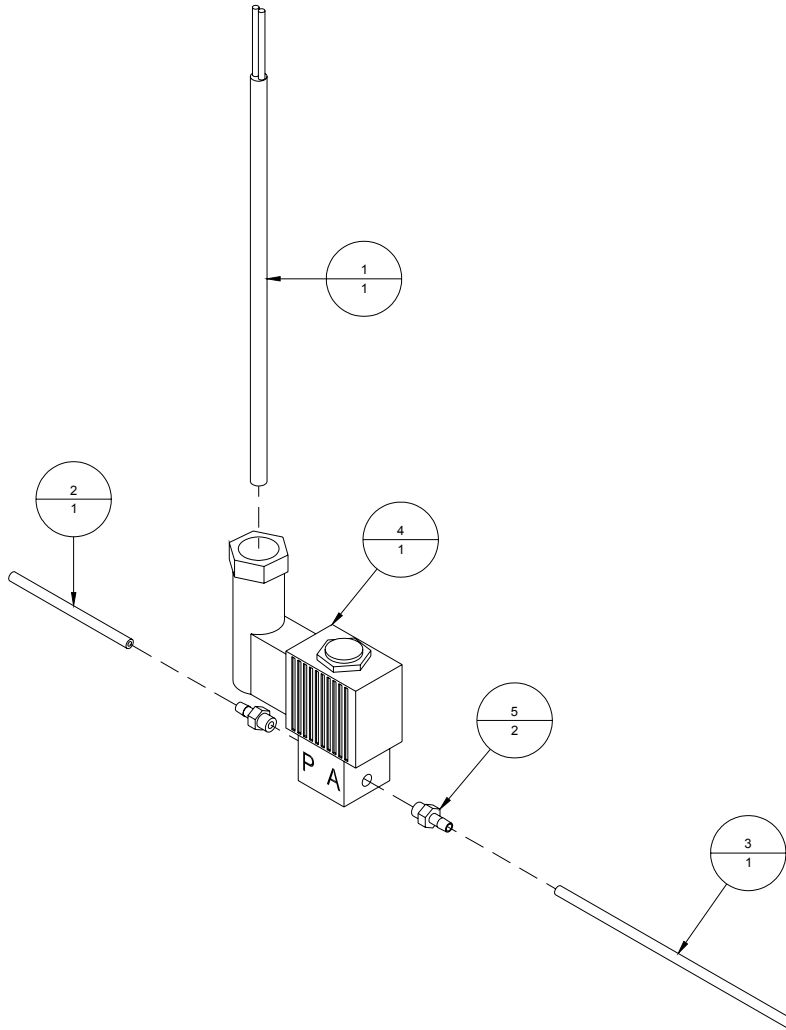


Table A-6: *Solenoid Valve Assembly, Air (9101208A)*

Item	Part Number	Quantity	Description	Reference
1	606531	25"	Cable, #22-2, Shielded	
2	9100170	5"	Tubing, Viton, 1/16" I.D.	
3	9100170	10"	Tubing, Viton, 1/16" I.D.	
4	9101208	1	Solenoid Valve, 12 VDC, N.C., Air	
5	9101583	2	Fitting, Nylon, 10-32 UNF, 1/16" I.D.	

Figure A-6: *Solenoid Valve Assembly, Air (9101208A)***NOTE:**

THE "P" SIDE OF SOLENOID GOES TO THE PRESSURE REGULATOR.
THE "A" SIDE GOES TO THE PRINTHEAD.

USE PTFE TAPE.

Table A-7: *Power Supply Housing Assembly (9101209A)*

Item	Part Number	Quantity	Description	Reference
1	404510	2	Screw, BHCS, 10-32 UNF x 1/4"	
2	404520	4	Screw, BHCS, 10-32 UNF x 3/8"	
3	606000	12"	Wire, #16, Black, Hookup	
4	606002	2 x 12"	Wire, #16, Blue, Hookup	
5	606009	12"	Wire, #16, White, Hookup	
6	606021	2 x 12"	Wire, #16, Brown, Hookup	
7	609001	2 x 1"	Shrink Wrap, 1/4" I.D.	
8	609111A	1	Cable, Power Supply	
9	610100	1	Relay, 120 VAC	
10	615003	5	Terminal Block, M10/10, Grey, 10 mm, 7.5 A	
11	615004	1	Relay Base	
12	615012	3	End Section, FEM6, Grey, 2.5 mm	
13	615016	1	End Stop, BAM, 9.1mm	
14	615018	2	Ground Block, M10/10.P, GR & YE	
15	615021	5.5"	T-Rail, DIN	
16	615064A	1	Cable, Atlas Supply	
17	9101158	1	Power Supply, Atlas, 170 V	
18	9101209	1	Power Supply, 12 VDC, 10.2 A	
19	9101219	1	Power Supply Housing	

Figure A-7: Power Supply Housing Assembly (9101209A)

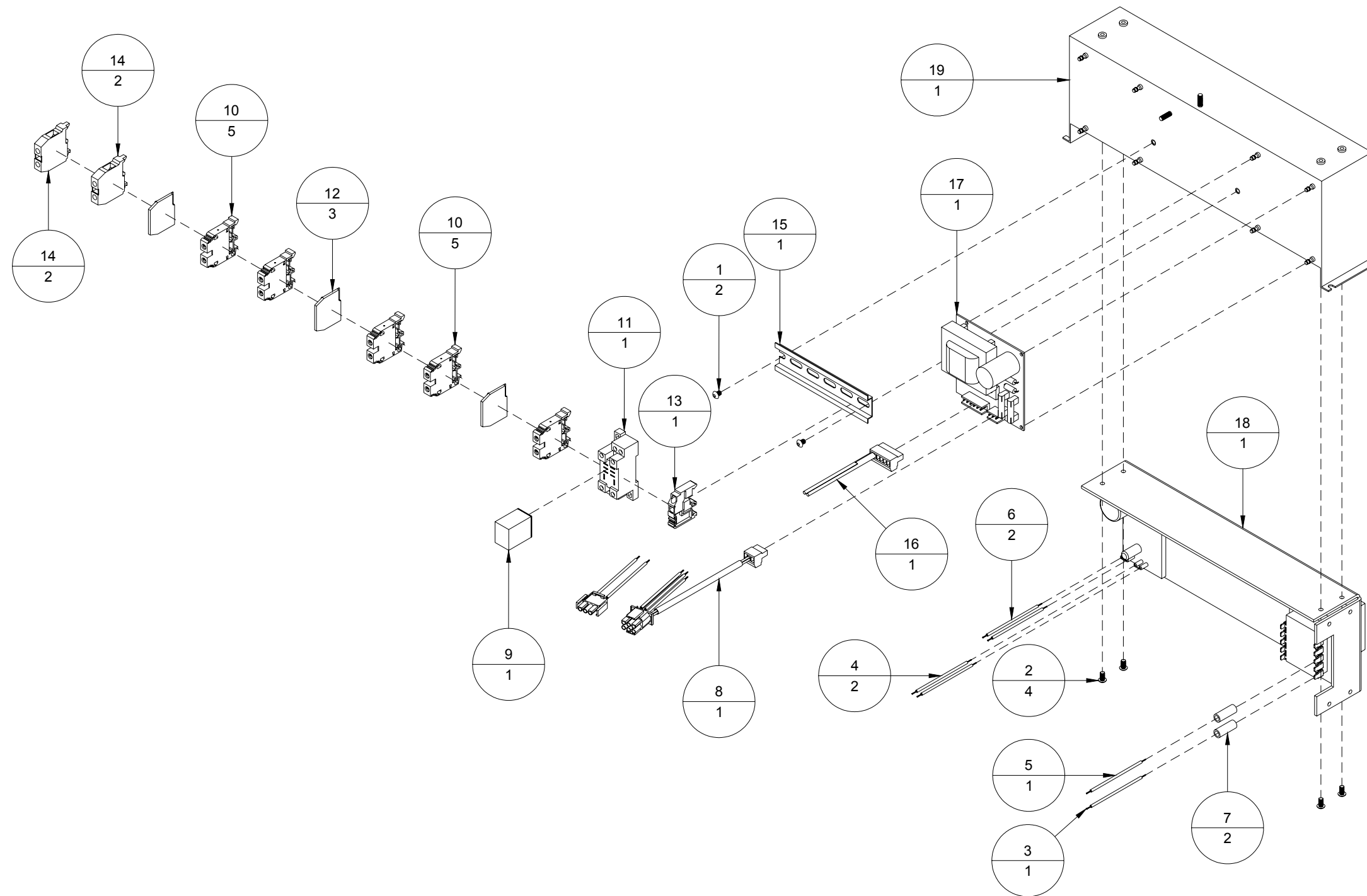


Table A-8: Ink Delivery Module, Monet+ (9101228A)

Item	Part Number	Quantity	Description	Reference
1	402510	10	Screw, BHCS, 6-32 UNC x 1/4"	
2	404510	14	Screw, BHCS, 10-32 UNF x 1/4"	
3	413506	8	Screw, BHCS, M3 x 6 mm	
4	615140	15	Lashing Tie (Not Shown)	
5	9100206A	1	Cable, Pressure Regulator	
6	9100969A	1	Electrical Board Bracket Assembly	Page A-5
7	9101165	2	Drawer Slide	
8	9101208A	2	Solenoid Valve Assembly, Air	Page A-7
9	9101228	1	Main Container	
10	9101229A	1	Side Bracket Assembly	Page A-11
11	9101231A	1	Terminal Bracket Assembly, Monet	Page A-13
12	9101285	1	Roller Catch - Roller	
13	9101584	1	Tray, Ink Spill	
14	BK-PVM-700	1	Pressure Regulator, 2 Channel	

Figure A-8: Ink Delivery Module, Monet+ (9101228A)

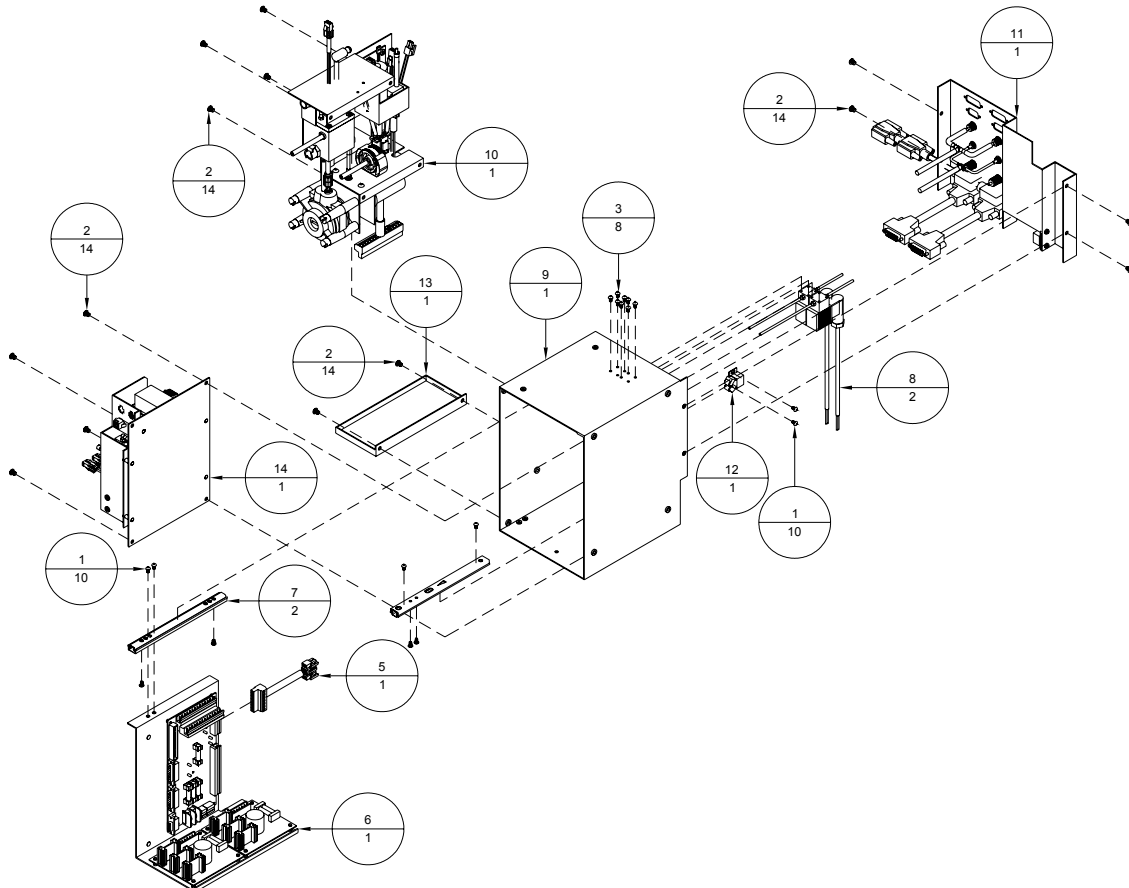
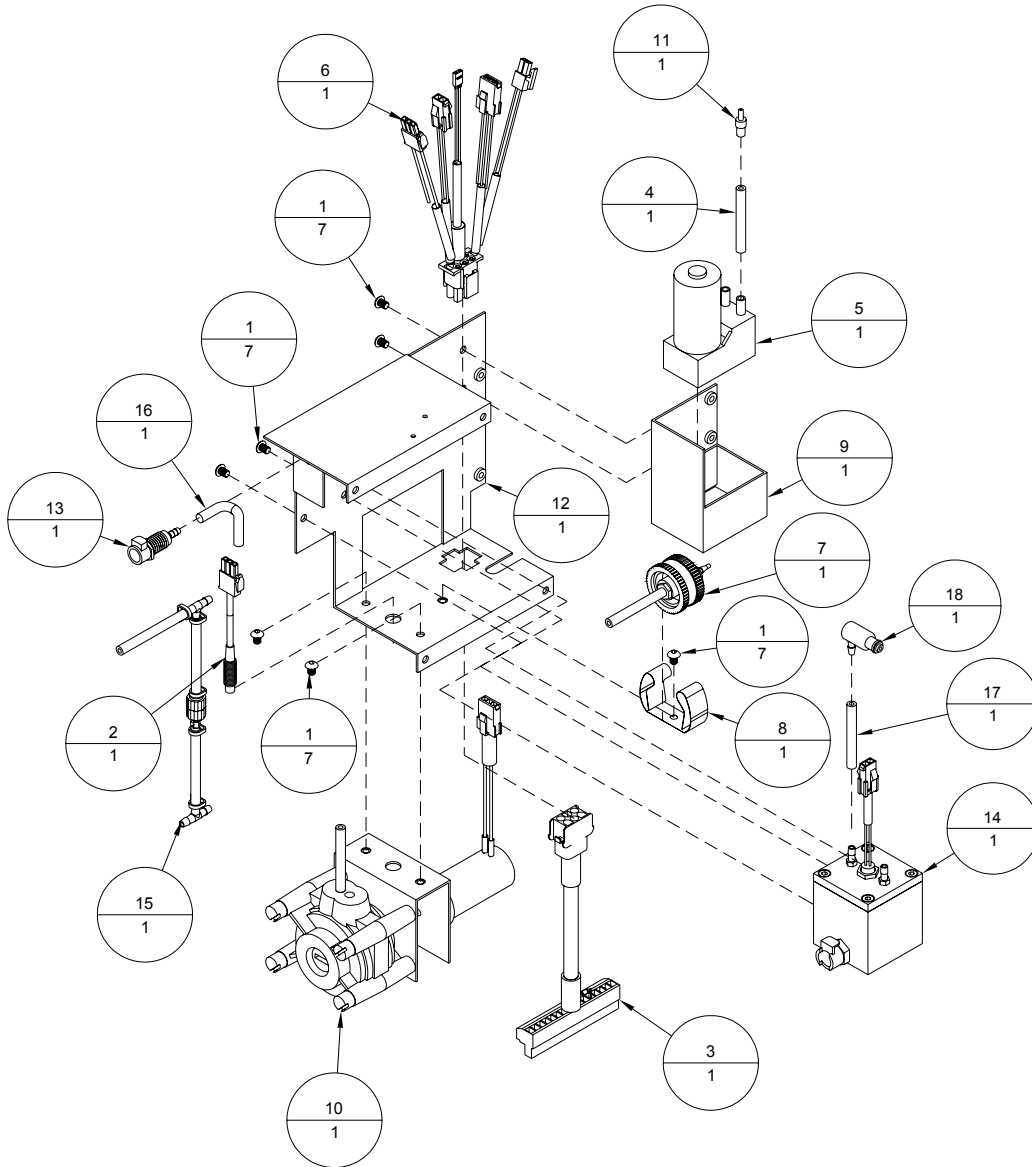


Table A-9: *Side Bracket Assembly (9101229A)*

Item	Part Number	Quantity	Description	Reference
1	404510	7	Screw, BHCS, 10-32 UNF x 1/4"	
2	630004A	1	Cycle Proximity Switch Assembly	
3	640301A	1	Cable, IDS Drive	
4	9100472	1	Tubing, Silicone, 1/4" O.D., 2.5"	
5	9100921	1	Lung Vacuum Pump	
6	9100921A	1	Adapter Cable Assembly	
7	9100964A	1	Filter Holder Assembly	Page A-4
8	9100971	1	Gripper Clip	
9	9101049	1	Lung Vacuum Pump Bracket	
10	9101164A	1	U Holder Assembly	Page A-6
11	9101170	1	Fitting, Straight Reducer, 1/8" To 1/16" I.D.	
12	9101229	1	Side Bracket	
13	9101692	1	Coupling, 1/8" I.D. Tubing, Panel Mount	
14	9101693A	1	Subcontainer Assembly	Page A-16
15	9101700A	1	Relief Valve Assembly, 20 PSI	Page A-16
16	9102116	2.5"	Tubing, PharMed, 1/4" x 1/8"	
17	9102116	24"	Tubing, PharMed, 1/4" x 1/8"	
18	9102148	1	Coupling Insert, Elbow, 1/8" I.D.	

Figure A-9: *Side Bracket Assembly (9101229A)***NOTE:**

TIE WRAP ALL TUBES TO FITTINGS.

Table A-10: *Terminal Bracket Assembly (9101231A)*

Item	Part Number	Quantity	Description	Reference
1	402510	2	Screw, BHCS, 6-32 UNC x 1/4"	
2	615140	6	Lashing Tie	
3	615322	4	Female Screwlock, 4-40 UNC	
4	9100170	2	Tubing, Viton, 1/16" ID, 2"	
5	9100960	1	Tubing, Norprene, 1/8" x 1/4", Black, 8"	
6	9100962	2	Coupling, Hose Barb, Panel Mount, 1/16" I.D.	
7	9100963	1	T Connector, 1/8"x 1/16"x1/16"	
8	9100981	2	Coupling Body, Panel Mount, 1/8" O.D.	
9	9101162A	2	Cable, Head Support Interface, Atlas	
10	9101231	1	Terminal Bracket	
11	9101285	1	Roller Catch - Roller	
12	9101290	1	Fitting, Tee, 1/8" I.D.	
13	9101692	2	Coupling, 1/8" I.D. Tubing, Panel Mount	
14	9102116	2 x 4"	Tubing, PharMed, 1/4" x 1/8"	
15	9102116	8"	Tubing, PharMed, 1/4" x 1/8"	
16	9102805A	2	Cable, Printhead Data, 6', Right	

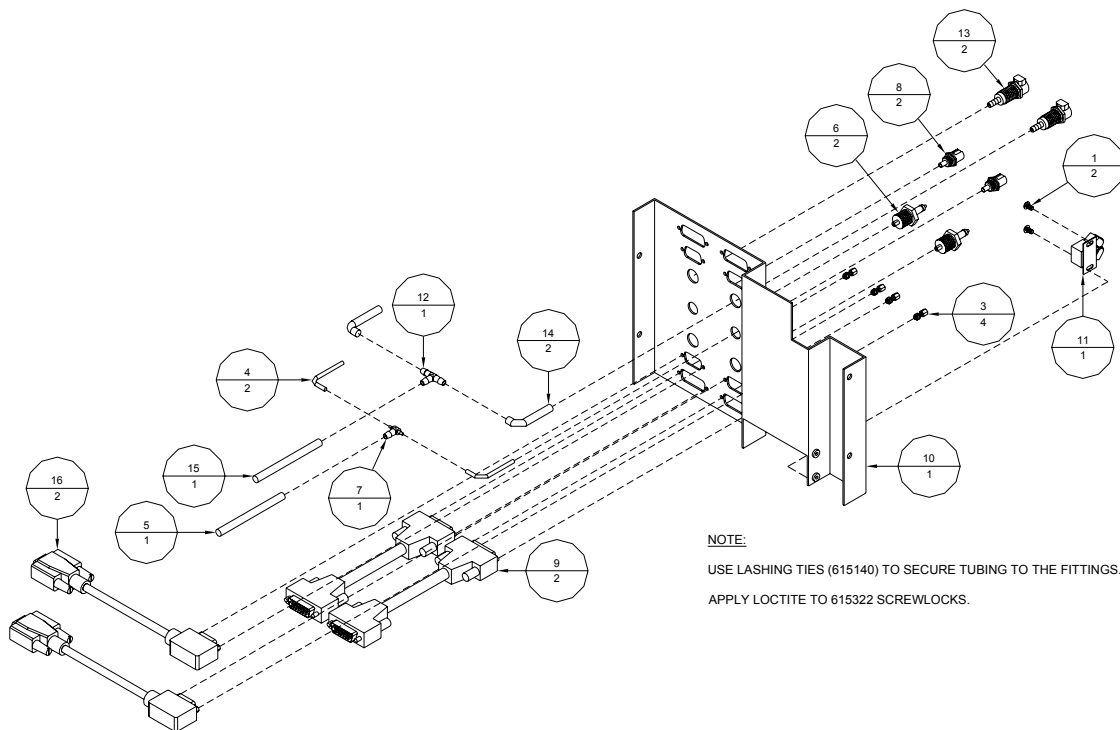
Figure A-10: *Terminal Bracket Assembly (9101231A)*

Table A-11: *Ink Delivery Module, Reverse, Monet (9101232A)*

Item	Part Number	Quantity	Description	Reference
1	402510	10	Screw, BHCS, 6-32 UNC x 1/4"	
2	404510	14	Screw, BHCS, 10-32 UNF x 1/4"	
3	413506	8	Screw, BHCS, M3 x 6 mm	
4	9100206A	1	Cable, Pressure Regulator	
5	9100969A	1	Electrical Board Bracket Assembly	Page A-5
6	9101165	2	Drawer Slide	
7	9101208A	2	Solenoid Valve Assembly, Air	Page A-7
8	9101228	1	Main Container	
9	9101229A	1	Side Bracket Assembly	Page A-11
10	9101234A	1	Terminal Bracket Assembly, Reverse, Monet	Page A-15
11	9101285	1	Roller Catch - Roller	
12	9101584	1	Tray, Ink Spill	
13	BK-PVM-700	1	Pressure Regulator, 2-Channel	

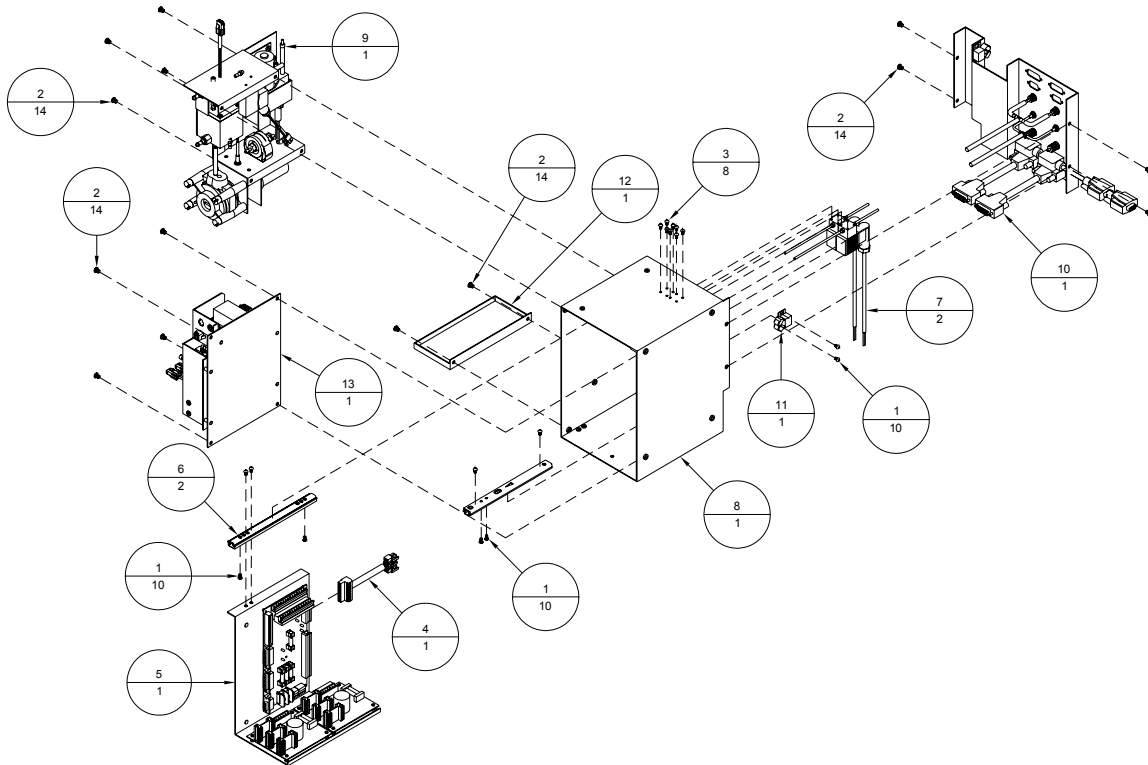
Figure A-11: *Ink Delivery Module, Reverse, Monet (9101232A)*

Table A-12: *Terminal Bracket Assembly, Reverse (9101234A)*

Item	Part Number	Quantity	Description	Reference
1	402510	2	Screw, BHCS, 6-32 UNC x 1/4"	
2	615140	6	Lashing Tie	
3	615322	4	Female Screwlock, 4-40 UNC	
4	9100170	2 x 2"	Tubing, Viton, 1/16" ID	
5	9100960	10"	Tubing, Norprene, 1/8" x 1/4", Black	
6	9100962	2	Coupling, Hose Barb, Panel Mount, 1/16" I.D.	
7	9100963	1	"T" Connector, 1/8"x 1/16"x1/16"	
8	9100981	2	Coupling Body-Panel Mount, 1/8" O.D.	
9	9101162A	2	Head Support Interface Cable, Atlas	
10	9101231	1	Terminal Bracket	
11	9101285	1	Roller Catch – Roller	
12	9101290	1	Fitting, Tee, 1/8" I.D.	
13	9101692	2	Coupling, 1/8" I.D. Tubing, Panel Mount	
14	9102116	2 x 4"	Tubing, PharMed, 1/4" x 1/8"	
15	9102116	10"	Tubing, PharMed, 1/4" x 1/8"	
16	9102705A	2	Cable, Printhead Data, 6', Left	

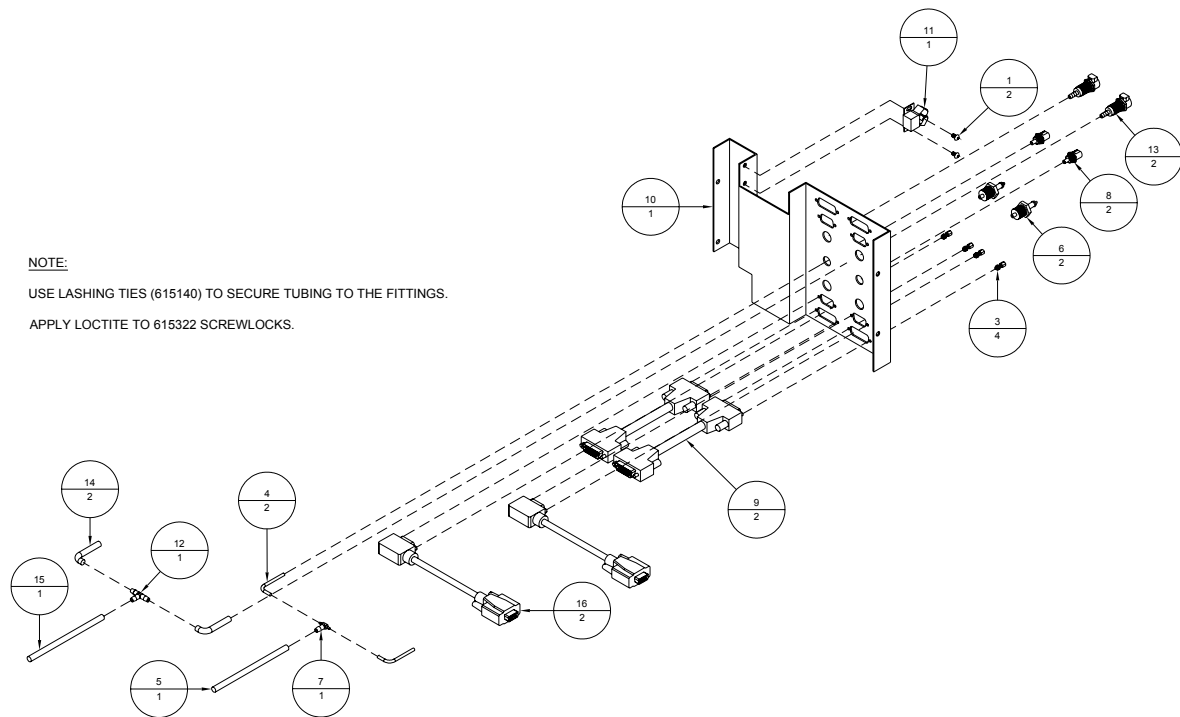
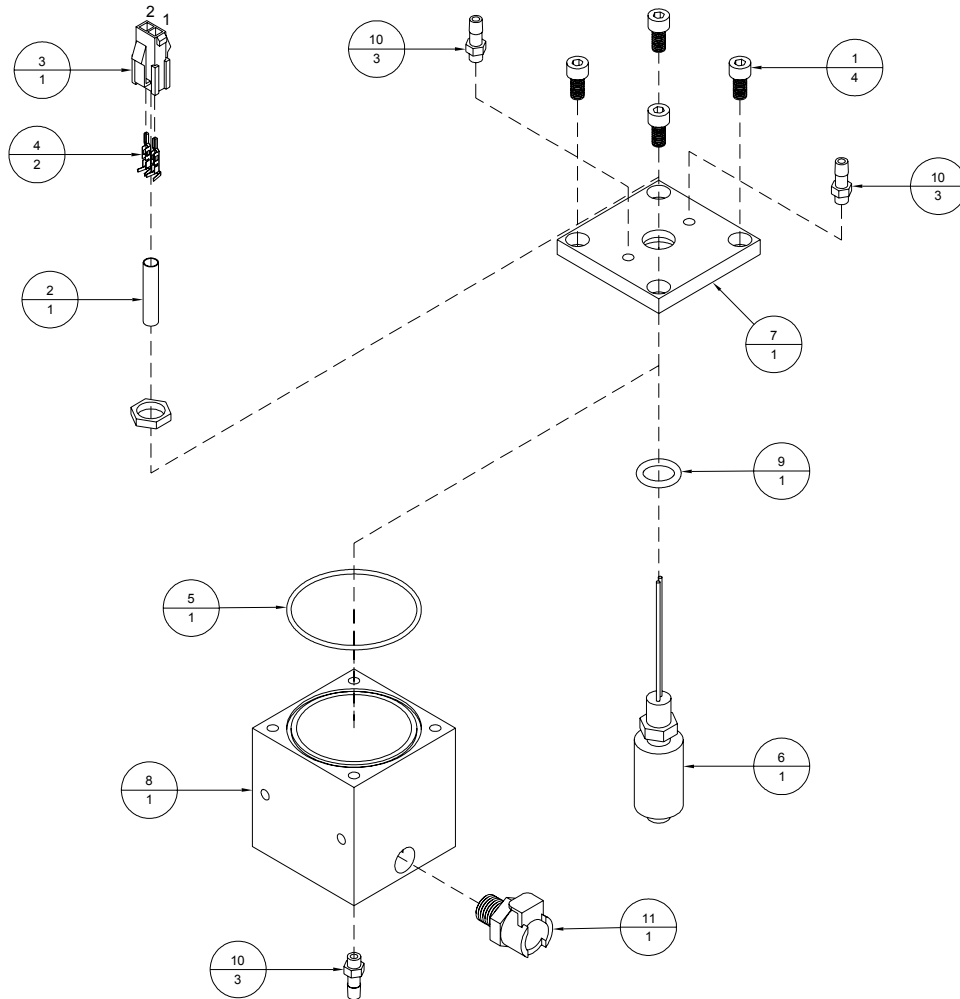
Figure A-12: *Terminal Bracket Assembly, Reverse (9101234A)*

Table A-13: *Subcontainer Assembly (9101693A)*

Item	Part Number	Quantity	Description	Reference
1	404220	4	Screw, SHCS, 10-32 UNF x 3/8"	
2	609000	1	Shrink Wrap, 3/16" I.D., 5"	
3	9100206	1	Receptacle, 2-Pin, Mini-Fit Jr	
4	9100207	2	Contact, Male, 18-22 AWG	
5	9100877	1	O-Ring, 1/16" Dia.	
6	9100966	1	Float Switch, micro-miniature	
7	9100973	1	Ink Subcontainer Lid	
8	9101166	1	Drainable Subcontainer	
9	9101297	1	O Ring, 7/16" x 5/8" x 3/32"	
10	9101582	3	Fitting, Nylon, 10-32 UNF, 1/8" I.D.	
11	9102150	1	Coupling Body, 1/8" NPT	

Figure A-13: *Subcontainer Assembly (9101693A)*



Contact #	Function	Color	Length"	Wire #
1	LOIS	as is	6	as is
2	GND	as is	6	as is

Table A-14: *Relief Valve Assembly (9101700A)*

Item	Part Number	Quantity	Description	Reference
1	615140	5	Lashing Tie	
2	9101290	2	Fitting, Tee, 1/8" I.D.	
3	9101700	1	Check Valve, 20 PSI	
4	9102116	3 x 2.5"	Tubing, PharMed, 1/4" x 1/8"	

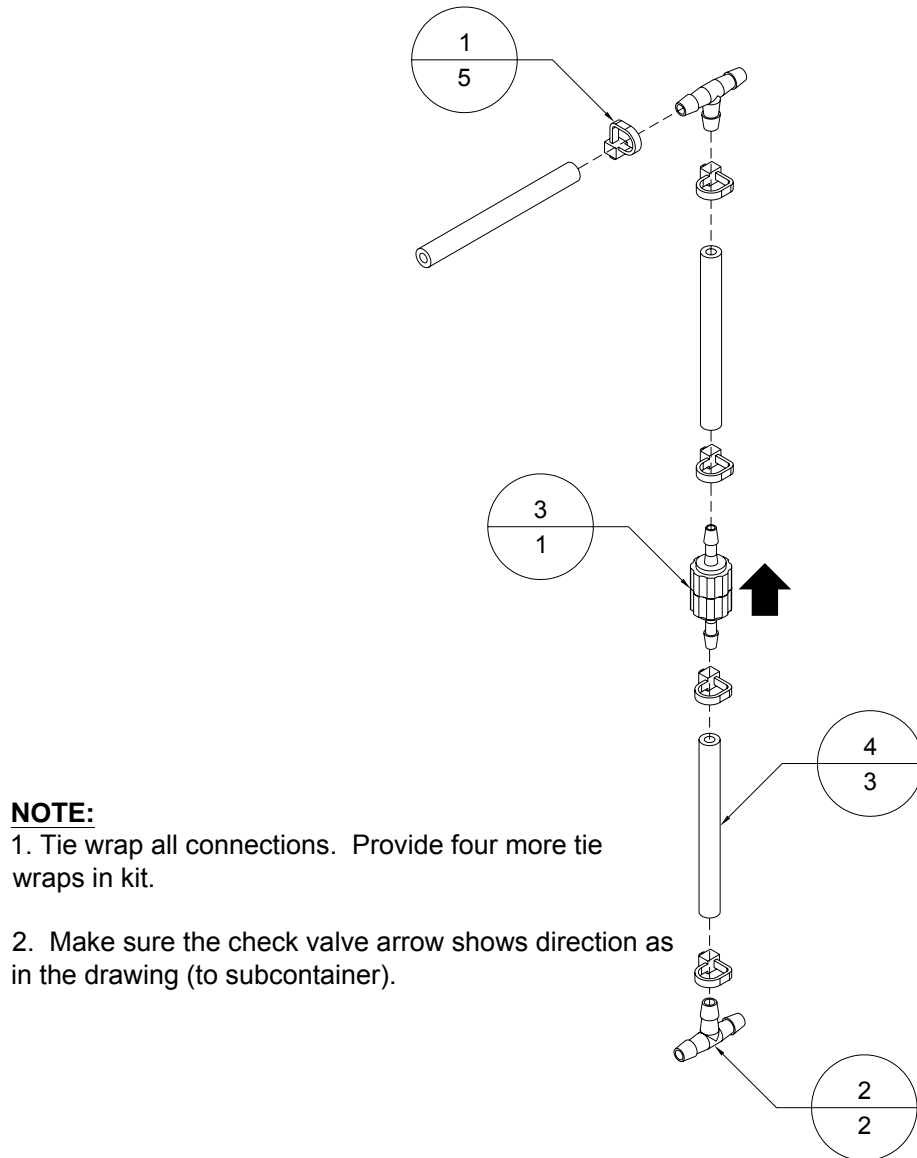
Figure A-14: *Relief Valve Assembly (9101700A)*

Table A-15: *Syringe Assembly (9102151A)*

Item	Part Number	Quantity	Description	Reference
1	9101292	1	Syringe, 30cc	
2	9102111	6"	Tubing, Black, PE, 1/4" x 1/8"	
3	9102151	1	Coupling Insert, Inline, 1/8" I.D., Straight Thru	

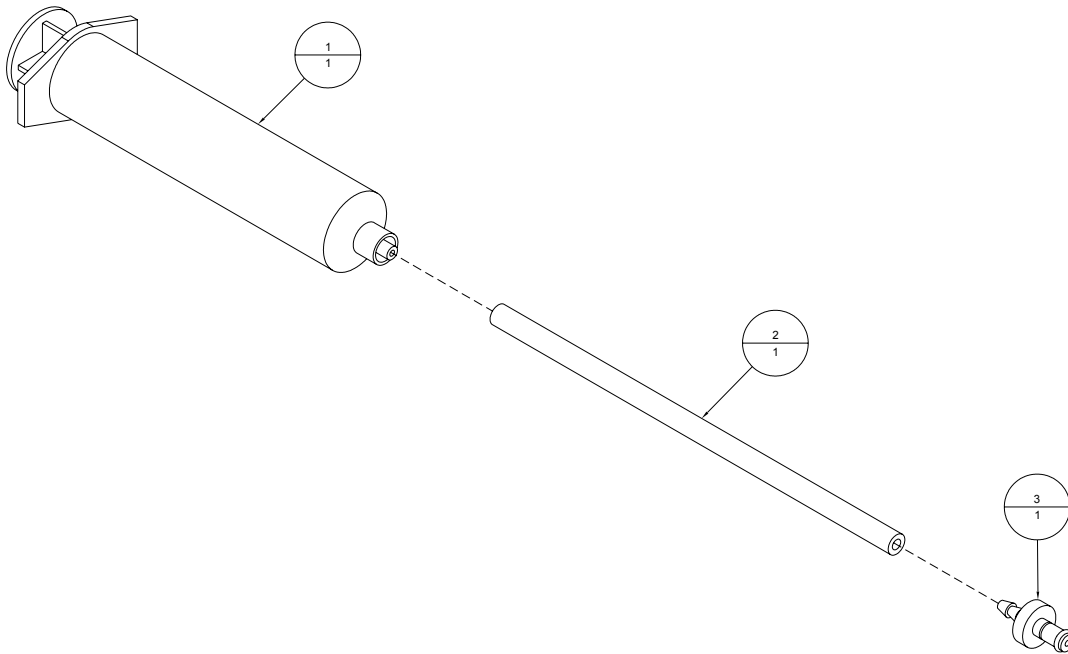
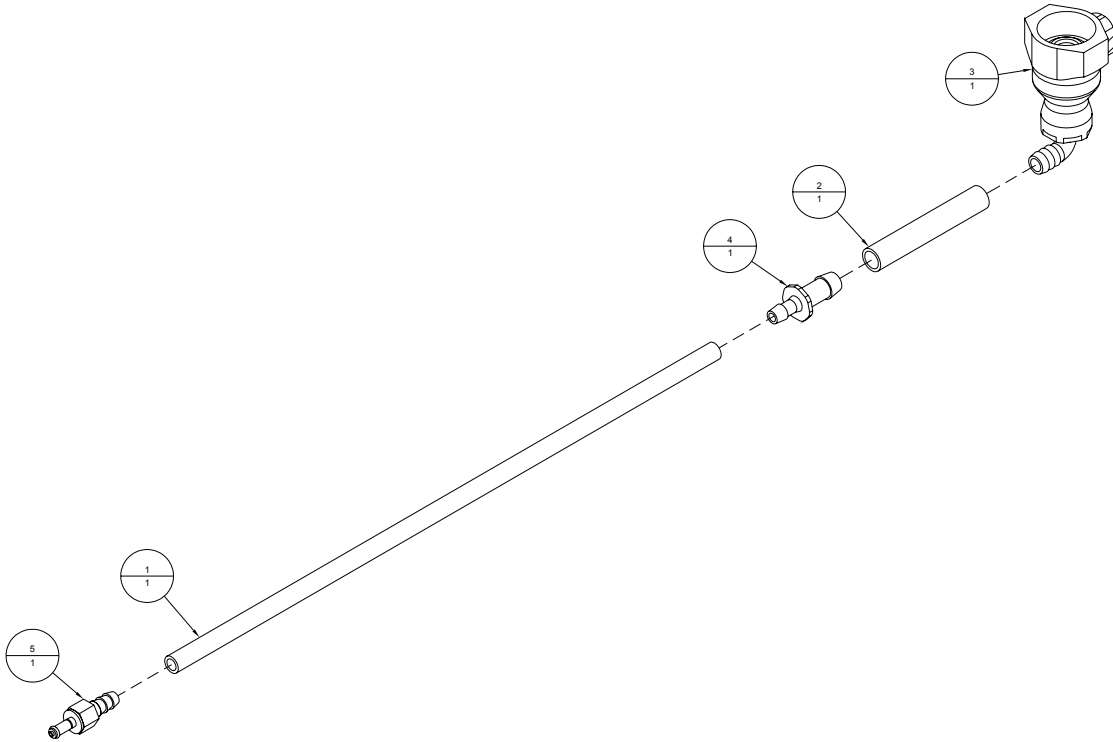
Figure A-15: *Syringe Assembly (9102151A)*

Table A-16: *Bottle Coupling Assembly (9103909A)*

Item	Part Number	Quantity	Description	Reference
1	9102132	1	Tubing, PharMed, 3/8" x 1/4", Almond, 15"	
2	9103908	1	Tubing, PharMed, 1/2" x 3/8", Almond, 3"	
3	9103909	1	Coupling, UDC, Non-Spill, 3/8" I.D., Elbow	
4	9103911	1	Fitting, Straight-Thru, 3/8"x1/4", Tube-Tube, PP	
5	9103912	1	Coupling Insert, 1/4" Tubing, Inline, PP, Shutoff	

Figure A-16: *Bottle Coupling Assembly (9103909A)*

Printhead Assembly Drawings

Appendix **B**

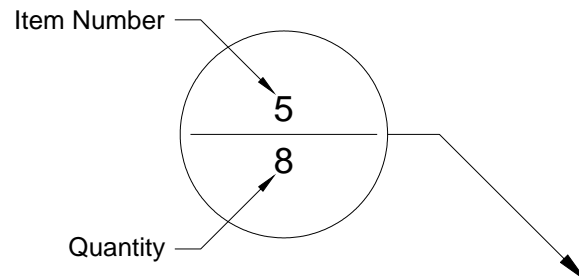
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Balloon Annotation and Parts Listing



Item	Part Number	Quantity	Description	Reference
1				
2				

The following is a description of how to interpret the information in this section:

Item:

This column indicates the item number used for each unique part in an assembly drawing. It is matched with the top number in the balloon pointing at the associated part.

Part Number:

This column represents the Buskro part number.

Quantity:

This represents the total number of a given part in an assembly. It is matched with the bottom number in the balloon pointing at the associated part.

Description:

This column contains a brief description of the part.

Reference:

This column indicates the page location for sub-assemblies.

Table B-1: *Printhead, BK791 Atlas w/ Rail Mount (BK791-A-06 or BK791-A-15)*

Item	Part Number	Quantity	Description	Reference
1	404240	2	Screw, SHCS, 10-32 UNF x 5/8"	
2	404510	8	Screw, BHCS, 10-32 UNF x 1/4"	
3	9101302	1	Ink Tray	
4	9101598	1	Bracket, Top Port, Single/Dual	
5	9101735	4	Fitting, Half	
6	9101773	2	Collar, Locking Shaft	
7	9101776A	6'	Umbilical Assembly, BK791	Page B-7
	9101784A	15'	Umbilical Assembly, BK791	Page B-8
8	BK791-A	1	Printhead, BK791 Atlas	Page B-2
9	BK79M-1	1	Mount, BK791 Series Printhead	Page B-3

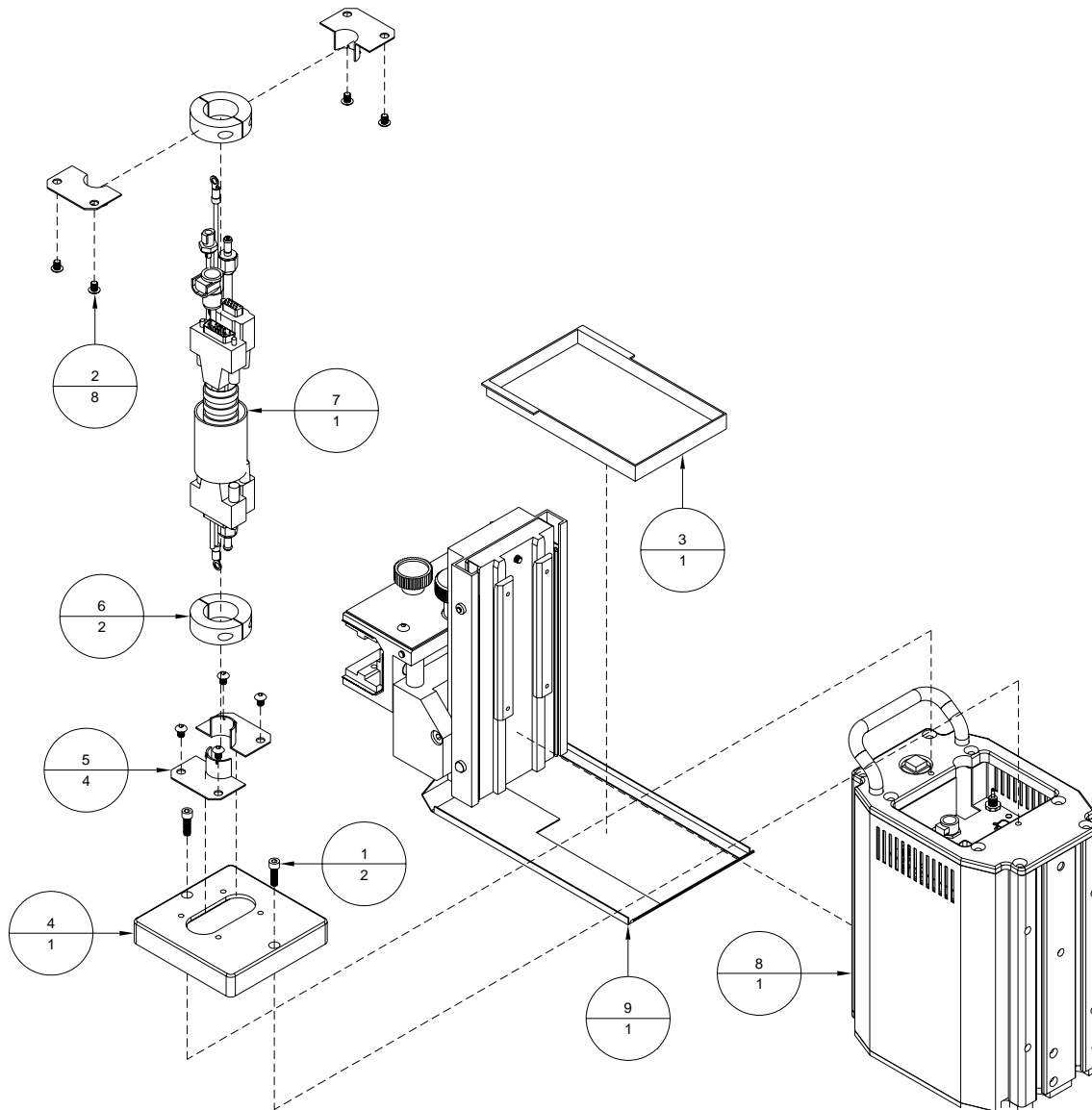
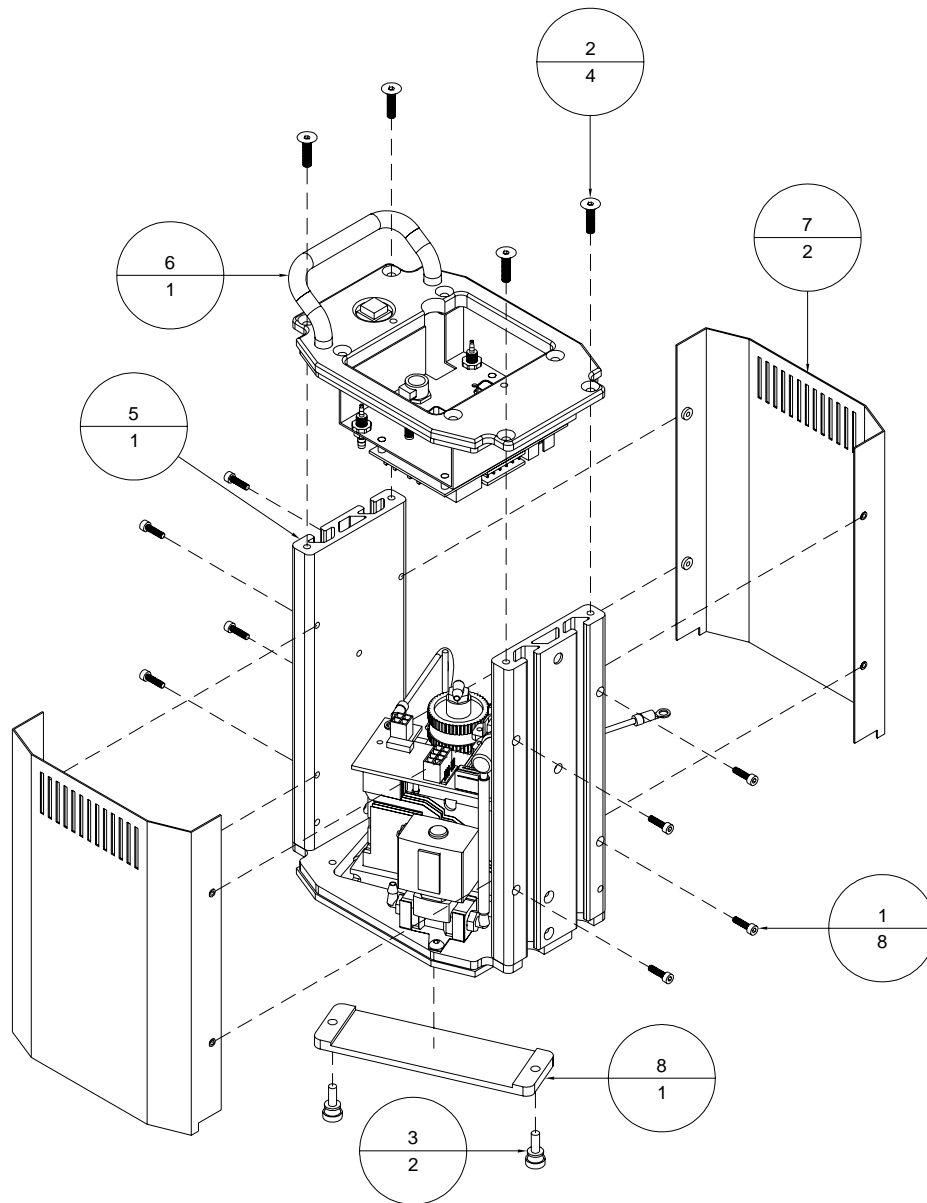
Figure B-1: *Printhead, BK791 Atlas w/ Rail Mount (BK791-A-06 or BK791-A-15)*

Table B-2: *Printhead, BK791 Atlas (BK791-A)*

Item	Part Number	Quantity	Description	Reference
1	402230	8	Screw, SHCS, 6-32 UNC X 1/2"	
2	404050	4	Screw, FHCS, 10-32 UNF X 3/4"	
3	438171	2	Thumbscrew, 10-32 UNF X 3/8"	
4	9100141	1	Printhead Support Chip c/w Label (Not Shown)	
5	9102105A	1	Bottom Plate Assembly, Single	Page B-13
6	9102106A	1	Top Plate Assembly, Singlehead	Page B-14
7	9102107	2	Cover, Reversible Singlehead	
8	9103427	1	Plate Cap, Single Head	

Figure B-2: *Printhead, BK791 Atlas (BK791-A)*

Note: 9100141 is assembled on the data path card.

Table B-3: *Mount, BK791 Series Printhead (BK79M-1)*

Item	Part Number	Quantity	Description	Reference
1	404510	2	Screw, BHCS, 10-32 UNF x 1/4"	
2	9101983A	1	Head Support Assembly	Page B-9
3	9101994A	1	Rail Mounting Assembly	Page B-10
4	9102108	1	Shield, Singlehead	
5	9102114	1	Shield, Singlehead, Reverse (Not Shown)	

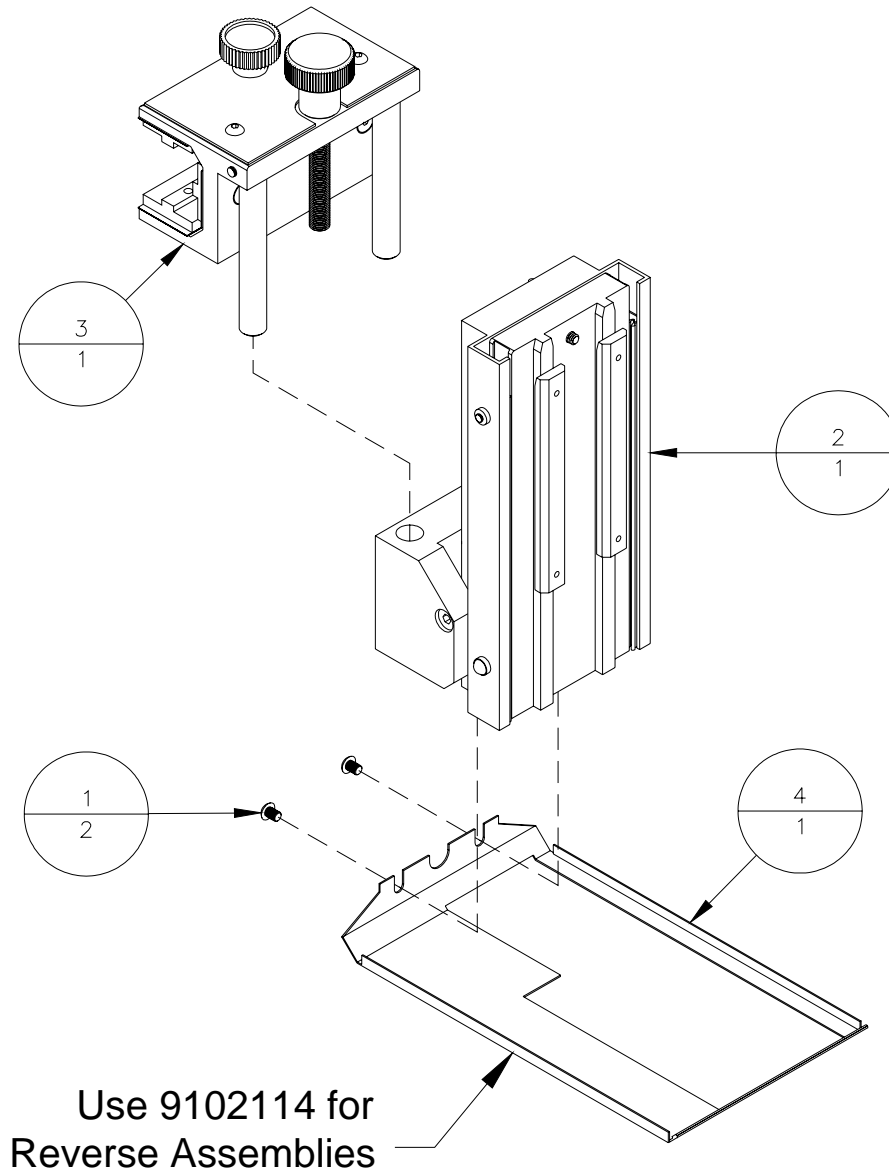
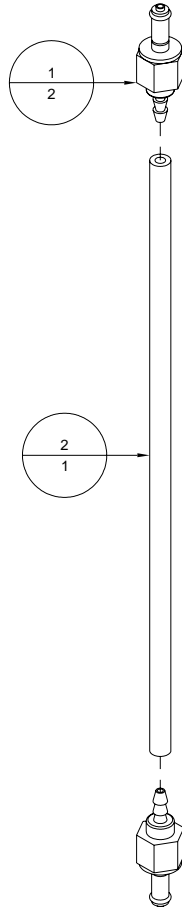
Figure B-3: *Mount, BK791 Series Printhead (BK79M-1)*

Table B-4: *Umbilical, Ink Line Assembly, Atlas, 6' (9101691A)*

Item	Part Number	Quantity	Description	Reference
1	9101691	2	Coupling Insert, In-line, 1/4" O.D.	
2	9102111	1	Tubing, PE, Black, 1/8"x1/4", 72"	

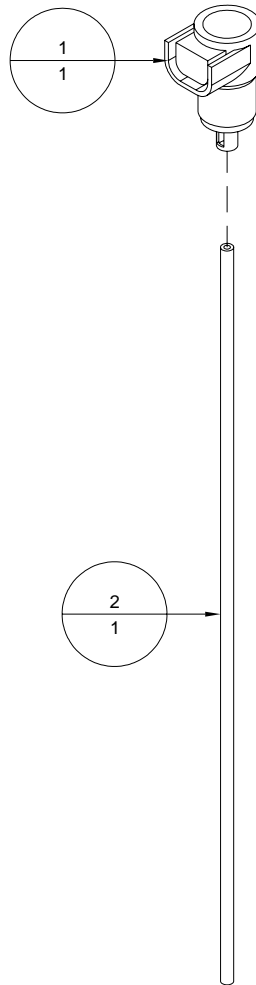
Figure B-4: *Umbilical, Ink Line Assembly, Atlas, 6' (9101691A)***NOTE:**

Use heat gun to soften tube ends before coupling attachment.

Also available in 15' version (9101212A)

Table B-5: *Meniscus Vacuum Hose Assembly, Atlas, 6' (9101696A)*

Item	Part Number	Quantity	Description	Reference
1	9100961	1	Coupling, In-line	
2	9102333	1	Tubing, Teflon, 1/8" O.D. x 1/16" I.D., White	

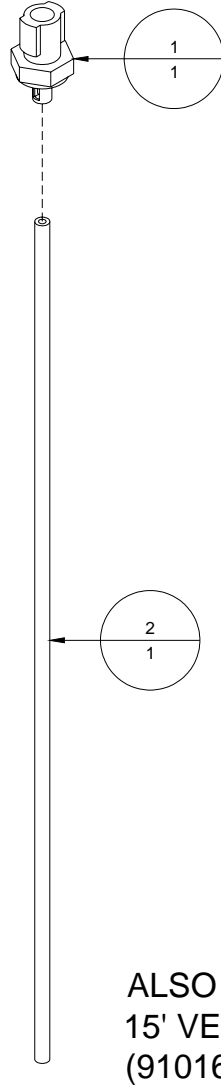
Figure B-5: *Meniscus Vacuum Hose Assembly, Atlas, 6' (9101696A)*

NOTE: Also available in 15' version (9101694A)

Table B-6: *Lung Vacuum Hose Assembly (9101697A)*

Item	Part Number	Quantity	Description	Reference
1	9100982	1	Coupling, In-Line	
2	9101697	1	Tubing, Teflon, 1/8" x 1/16", Blue	

Figure B-6: *Lung Vacuum Hose Assembly (9101697A)*



ALSO COMES IN
15' VERSION
(9101699A).

Table B-7: *Umbilical Assembly, BK791, 6' (9101776A)*

Item	Part Number	Quantity	Description	Reference
1	606023	1	Wire, #18, Green, 72"	
2	606323	1	Cable, Monitor Extension, 6'	
3	609116	2	Terminal, Ring, #10, 22-18 AWG, Red	
4	9101161A	1	Cable, Head Support, Atlas, 72"	
5	9101691A	1	Umbilical, Ink Line Assembly, 6'	Page B-4
6	9101696A	1	Meniscus Vacuum Hose Assembly, 6"	Page B-5
7	9101697A	1	Lung Vacuum Hose Assembly	Page B-6
8	9101775	1	Hose, Corrugated Loom, 60"	
9	9101776	1	Sleeving, Braided Expandable, 60"	

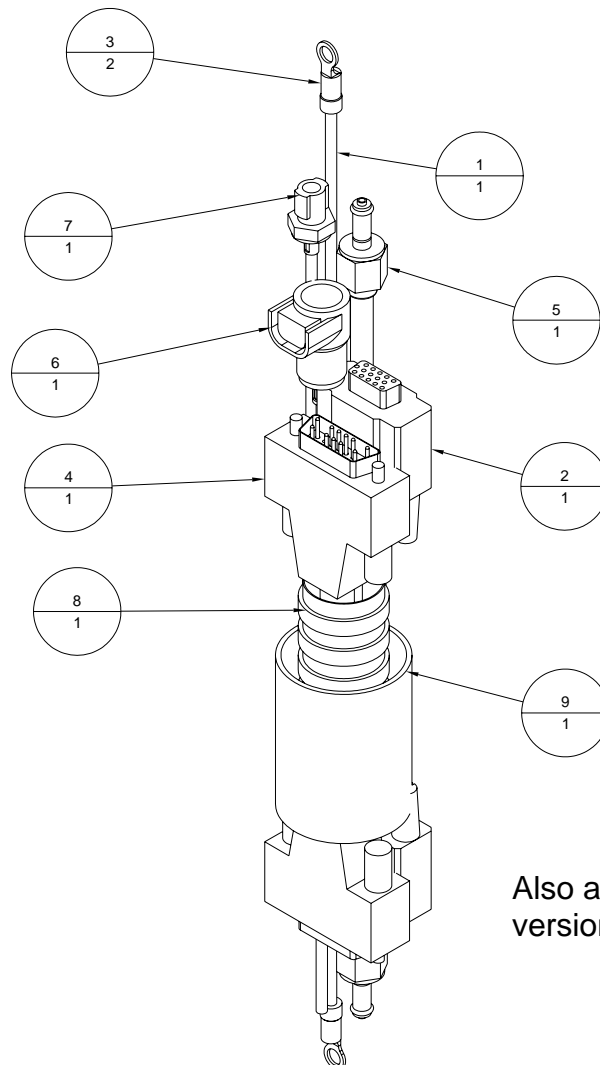
Figure B-7: *Umbilical Assembly, BK791, 6' (9101776A)*

Table B-8: *Umbilical Assembly, BK791, 15' (9101784A)*

Item	Part Number	Quantity	Description	Reference
1	606023	1	Wire, #18, Green, 15'	
2	609116	2	Terminal, Ring, #10, 22-18 AWG, Red	
3	9101163A	1	Cable, Head Support, Atlas, 15'	
4	9101212A	1	Ink umbilical assembly, Monet+, 15'	Page B-4
5	9101694A	1	Meniscus Vacuum Hose Assembly, 15'	Page B-5
6	9101699A	1	Lung Vacuum Hose Assembly, 15'	Page B-6
7	9101775	1	Hose, Corrugated Loom, 170"	
8	9101776	1	Sleeving, Braided Expandable, 170"	
9	9102687A	1	Cable, Printhead Data, 15'	

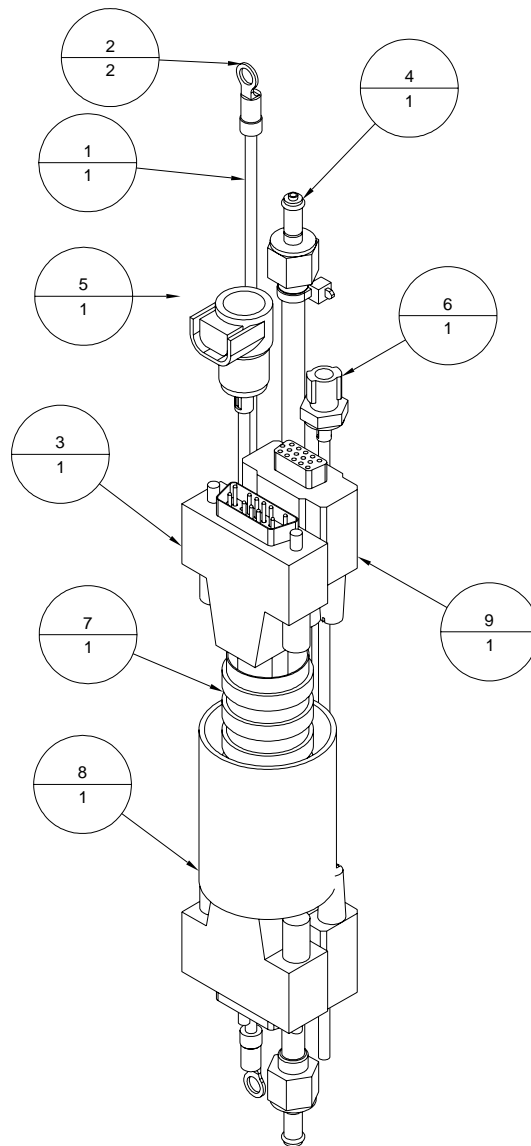
Figure B-8: *Umbilical Assembly, BK791, 15' (9101784A)*

Table B-9: *Head Support Assembly (9101983A)*

Item	Part Number	Quantity	Description	Reference
1	402250	4	Screw, SHCS, 6-32 UNC x 3/4"	
2	402310	4	Screw, PHMS, 6-32 UNC x 1/4"	
3	403306	2	Screw, PHMS, M4 x 6 mm	
4	403310	2	Screw, PHMS, 8-32 UNC x 1/4"	
5	415310	2	Shoulder Bolt, 5/16" x 1/2", (1/4-20)	
6	439009	2	Lockwasher, #10	
7	9101165	2	Drawer slide	
8	9101874	2	Spring, Compression	
9	9101983	1	Mounting Block, Slider	
10	9101996	1	Gas Spring	
11	9102090	1	Support Block, Head Mounting	
12	9102094	2	Profile Bar	
13	9102097	1	Bracket, Printhead Mounting	
14	9102126	1	Locknut, Nylon Insert, M4 x 0.7	
15	9102127	1	Screw, SHCS, 1/4-20 UNC x 1.25"	
16	9102128	1	Screw, SHCS, 1/4-20 UNC x 3/8", SS	
17	9102792	1	Plunger, 3/8-16 UNC, Lever Type	

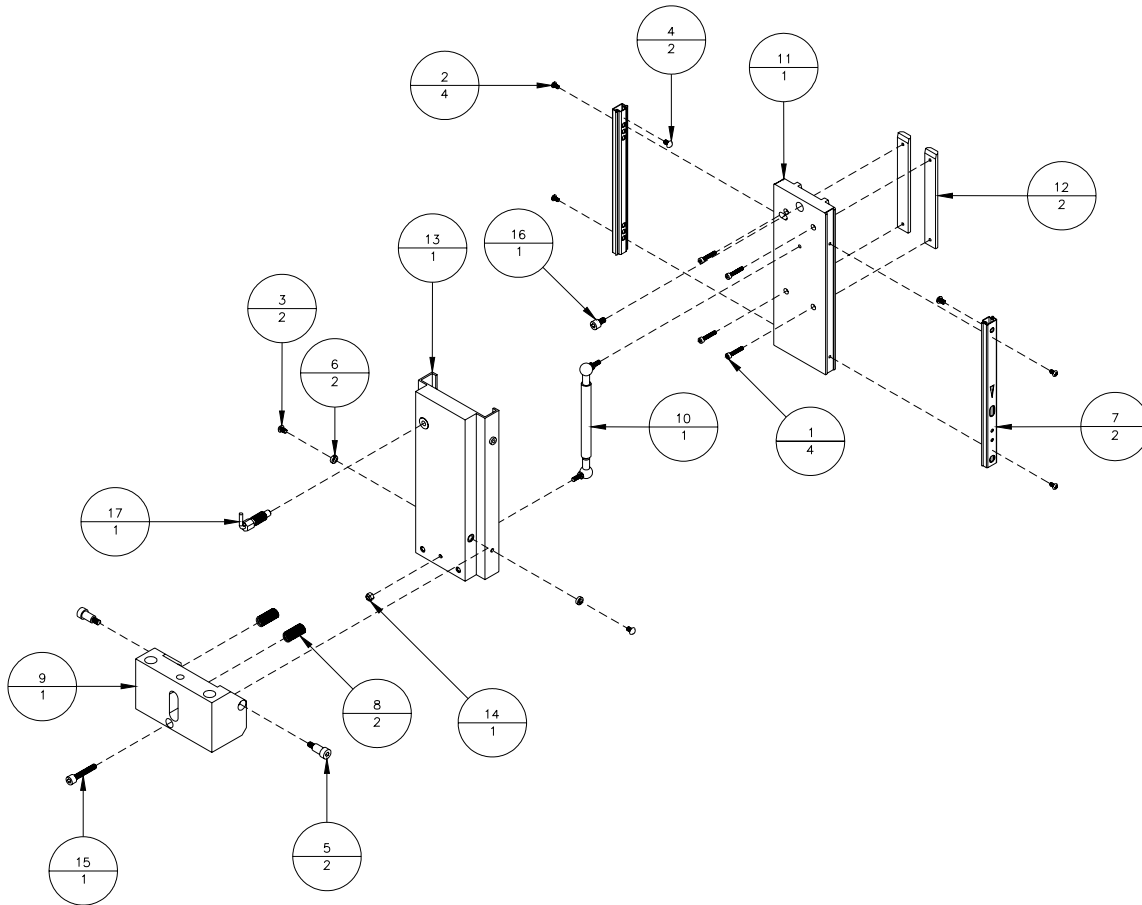
Figure B-9: *Head Support Assembly (9101983A)*

Table B-10: *Rail Mounting Assembly (9101994A)*

Item	Part Number	Quantity	Description	Reference
1	404030	6	Screw, FHCS, 10-32 UNF x 1/2"	
2	404510	2	Screw, BHCS, 10-32 UNF x 1/4"	
3	404807	3	Screw, SHSS, 10-32 UNF x 3/16"	
4	438010	1	Knob, Gate Adjustment	
5	505463	1	Flange Bushing, 1/4 ID x 3/8 OD x 3/8 Long	
6	505464	1	Flange Bushing, 1/4 ID x 3/8 OD x 1/2 Long	
7	9101128	2	Dowel Pin, 1/2" Dia. x 4"	
8	9101260	18	Shim, 1.25 x 2.812 x 0.005", 15 Series	
9	9101398	1	Economy T-slot Stud, 5/16-18 UNC x 1"	
10	9101603	3	Bearing Pad, 15 Series, 4.3: Long	
11	9101994	1	Rail Mounting Bracket	
12	9101995	1	Rod, Threaded, 3/8-24 UNF	
13	9102155	1	Rail Bracket Cover	
14	9102240	1	Knob, Thumb, Knurled	

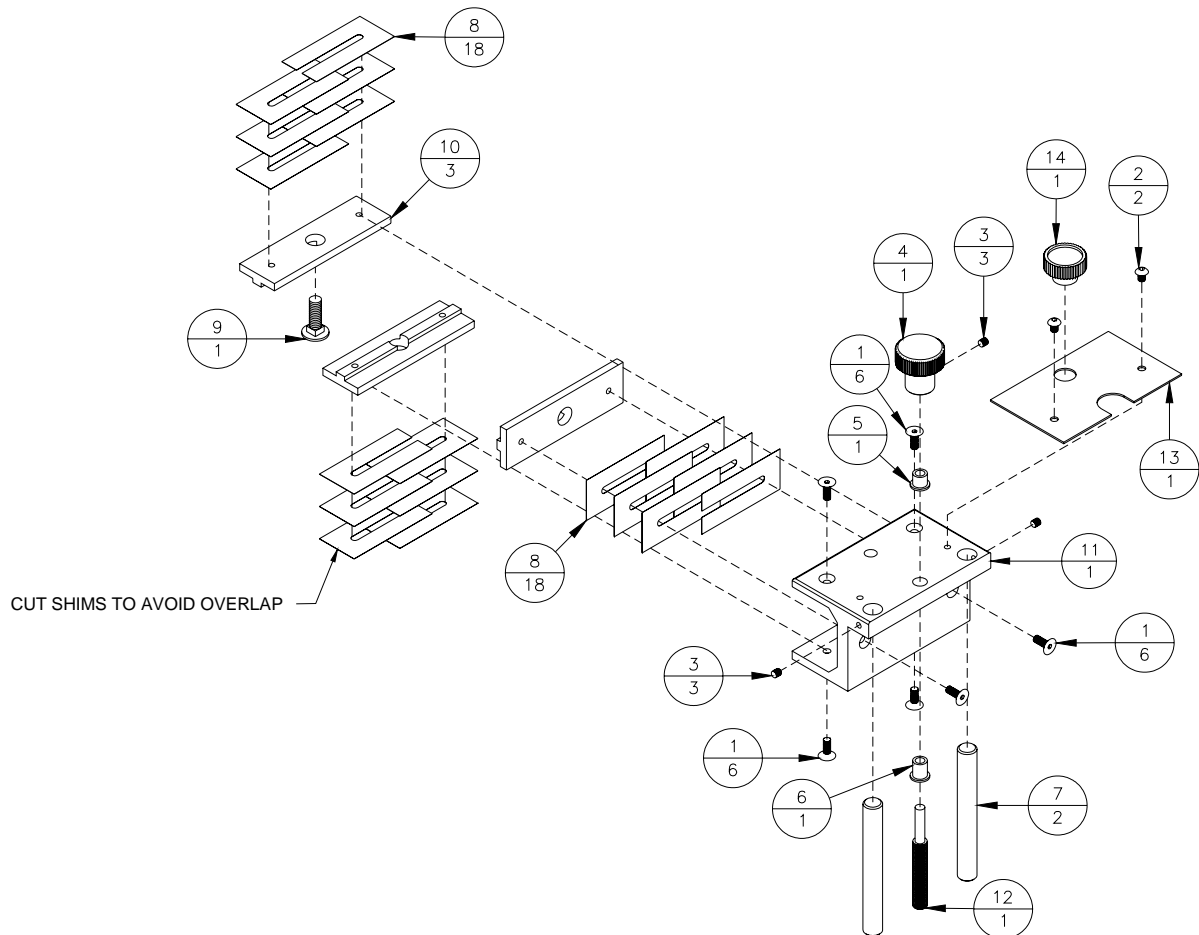
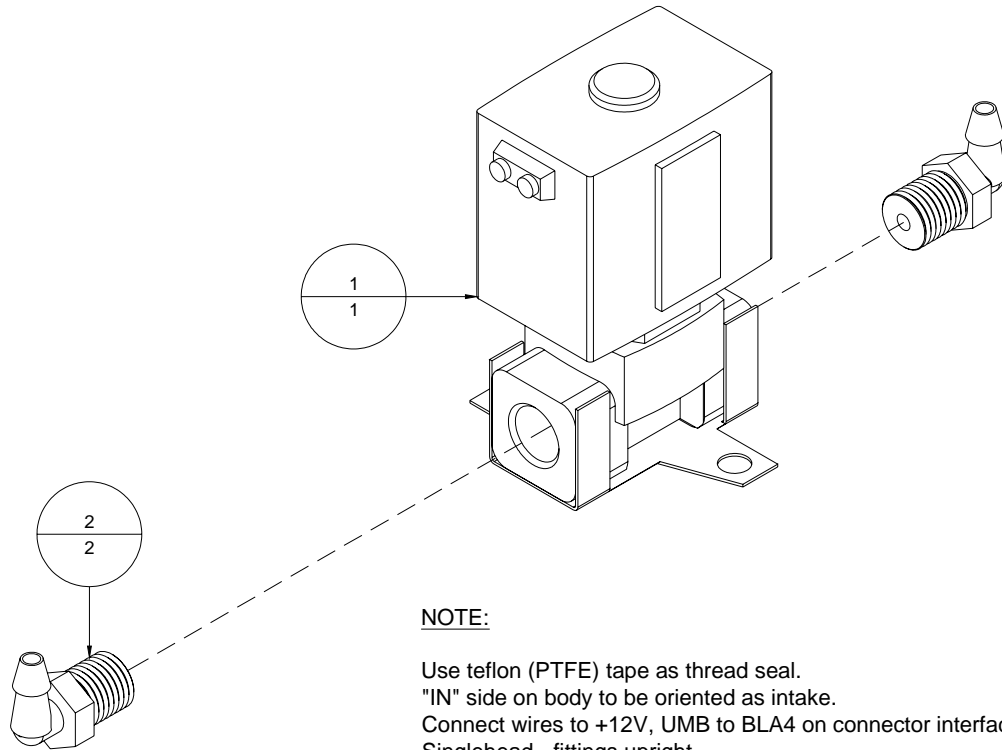
Figure B-10: *Rail Mounting Assembly (9101994A)*

Table B-11: *Solenoid Valve Assembly (9102085A)*

Item	Part Number	Quantity	Description	Reference
1	9101436	1	Solenoid Valve, 12 VDC	
2	9102085	2	Connector, Elbow, ¼" O.D. Tube	

Figure B-11: *Solenoid Valve Assembly (9102085A)***NOTE:**

Use teflon (PTFE) tape as thread seal.
 "IN" side on body to be oriented as intake.
 Connect wires to +12V, UMB to BLA4 on connector interface board.
 Singlehead - fittings upright.

Table B-12: *Bottom Plate Assembly, BK791 (9102105A)*

Item	Part Number	Quantity	Description	Reference
1	404050	4	Screw, FHCS, 10-32 UNF x 3/4"	
2	404285	1	Screw, SHCS, 10-32 UNF x 2"	
3	404510	3	Screw, BHCS, 10-32 UNF x 1/4"	
4	414212	2	Screw, SHCS, M4 X 12	
5	436325	2	Dowel Pin, 1/8"DIA x 5/8"	
6	439008	1	Lockwasher, #10, External Tooth	
7	440005	2	Washer, #6 ID	
8	609116	3	Terminal, Ring, #10, 22-18 AWG, Red	
9	609119	1	Terminal, Ring, #4, 22-18 AWG, Red	
10	615140	6	Lashing Tie, Small (Not Shown)	
11	9100135A	1	Data Ribbon Cable, Atlas	
12	9101591	1	Insulation Block, Fixed	
13	9101697	5"	Tubing, PVC, 1/8" x 1/16", Blue	
14	9101697	1"	Tubing, PVC, 1/8" x 1/16", Blue	
15	9102085A	1	Solenoid Valve Assembly	Page B-11
16	9102088	2	Extrusion, Al, Profile 8 (Item)	
17	9102105	1	Plate, Bottom, Reversible Single Head	
18	9102246	5"	Wire, #18, Green/Yellow	
19	9102246	12"	Wire, #18, Green/Yellow	
20	9102350A	1	Ferrule Assembly, Atlas Printhead	Page B-16
21	9103562	1	Check Valve, 1/16" I.D., 1.5 PSI	
22	9104156	1	Printhead, Atlas w/ IHIB, 256/30	

Figure B-12: *Bottom Plate Assembly, BK791 (9102105A)*

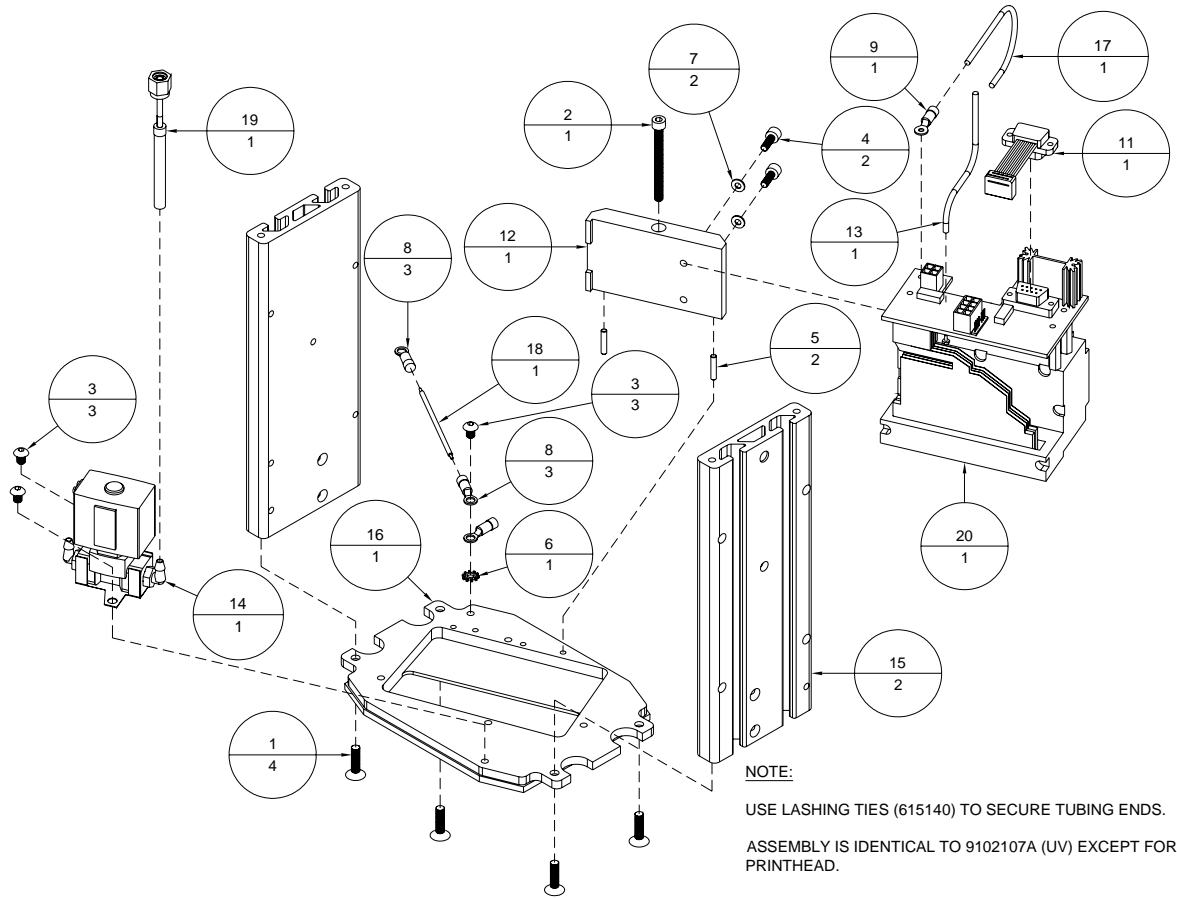


Table B-13: *Top Plate Assembly, Single (9102106A)*

Item	Part Number	Quantity	Description	Reference
1	404030	4	Screw, FHCS, 10-32 UNF x 1/2"	
2	404520	2	Screw, BHCS, 10-32 UNF x 3/8"	
3	615140	3	Lashing Tie, Small (Not Shown)	
4	9100216A	1	Priming Button Cable	
5	9100472	2 x 3"	Silicone Tubing, 1/4" OD x 1/8" ID	
6	9100965	1	Air Filter	
7	9101774	1	Handle, Double Curved	
8	9102106	1	Plate, Top, Reversible Singlehead	
9	9102109A	1	Port Bracket Assembly	Page B-15
10	9102111	6.5"	Tubing, PE, 1/4" x 1/8", UV Resistant	

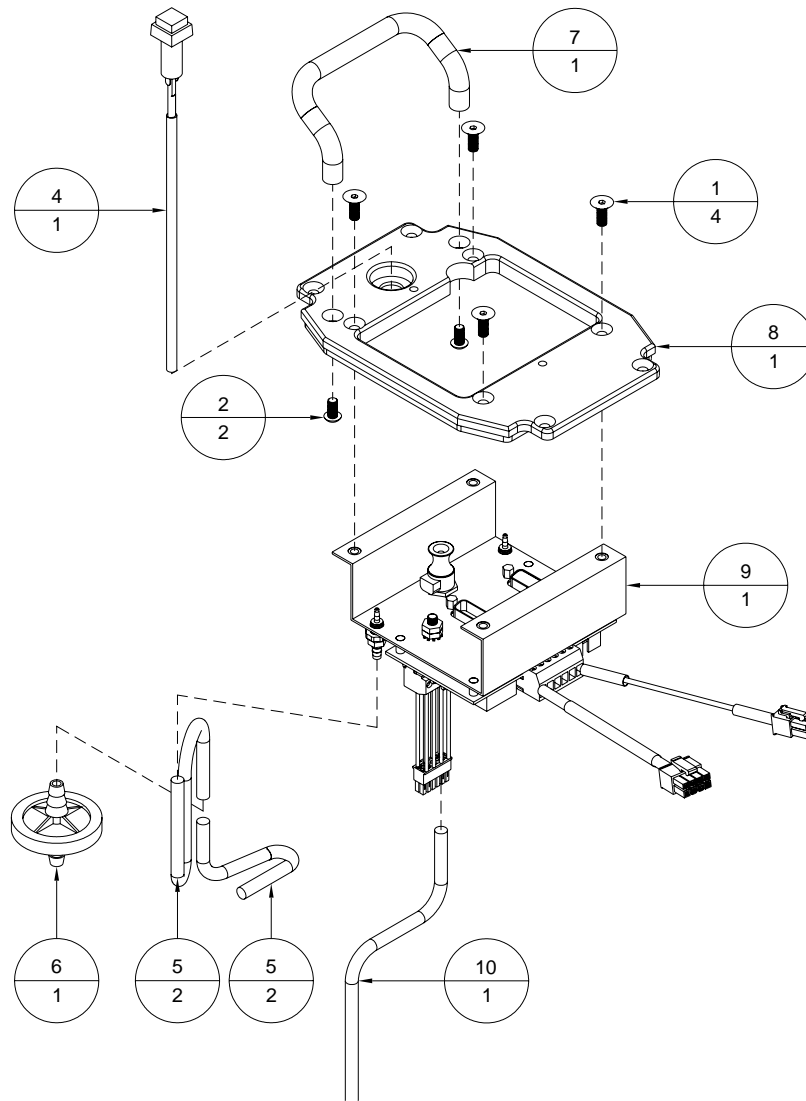
Figure B-13: *Top Plate Assembly, Single (9102106A)*

Table B-14: *Port Bracket Assembly, Singlehead (9102109A)*

Item	Part Number	Quantity	Description	Reference
1	401310	4	Screw, PHMS, 4-40 UNC x 1/4"	
2	420008	2	Nut, 10-32 UNF	
3	439008	1	Lockwasher, #10, External Tooth	
4	606014A	1	Singlehead Control Cable, Atlas	
5	615066	1	Female Connector, 4 Pin, BLA4	
6	615322	4	Female Screwlock, 4-40 UNC	
7	9100214A	1	Printhead Flying Lead Cable	
8	9100472	1	Tubing, Silicone, 1"	
9	9101170	1	Connector, Inline, 1/4" O.D. to 1/8" O.D.	
10	9101588	2	Connector, Reducing Bulkhead, 1/8" x 1/4"	
11	9101599	1	Dual Atlas Interface Board	
12	9102109	1	Mounting Bracket, Singlehead	
13	9102625	1	Coupling Body, 1/8" I.D. Tubing, Panel mount	
14	9102627	1	Plug, Body, EPDM O-Ring	

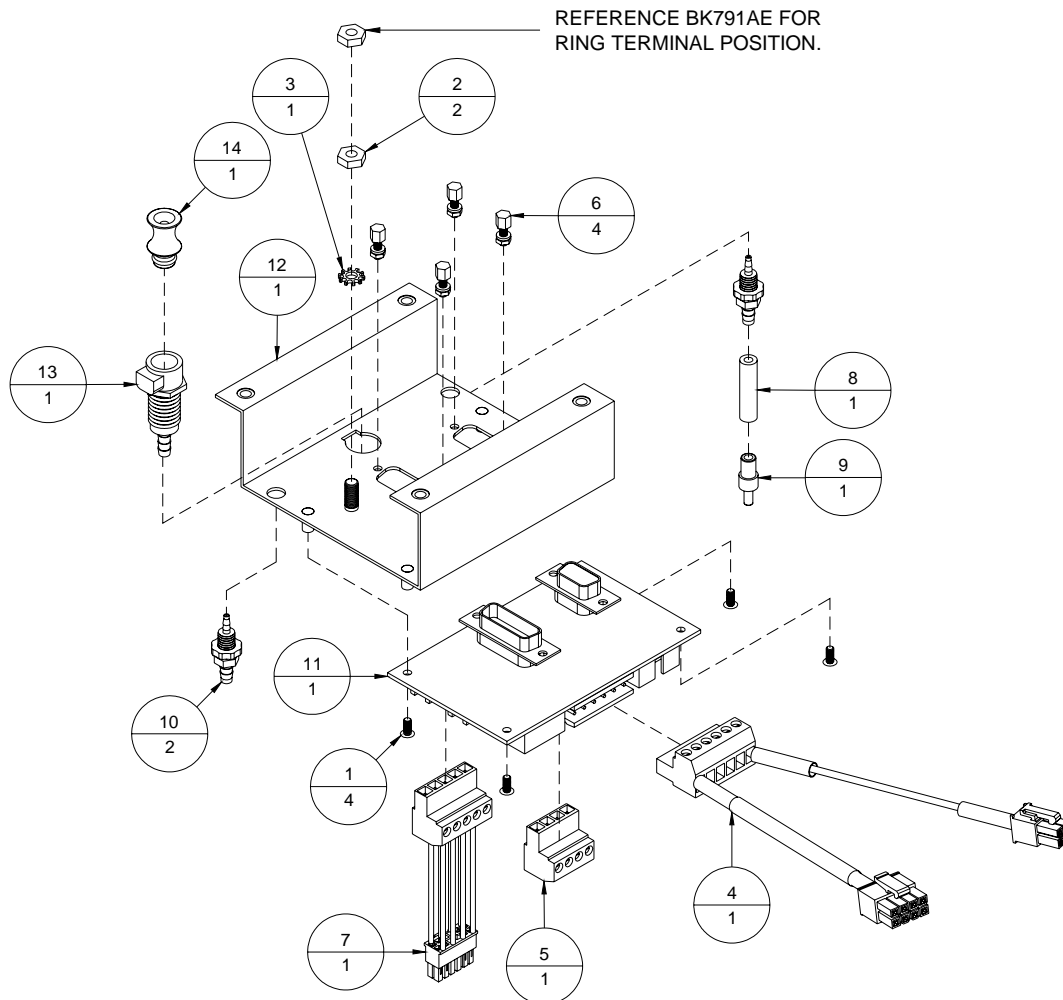
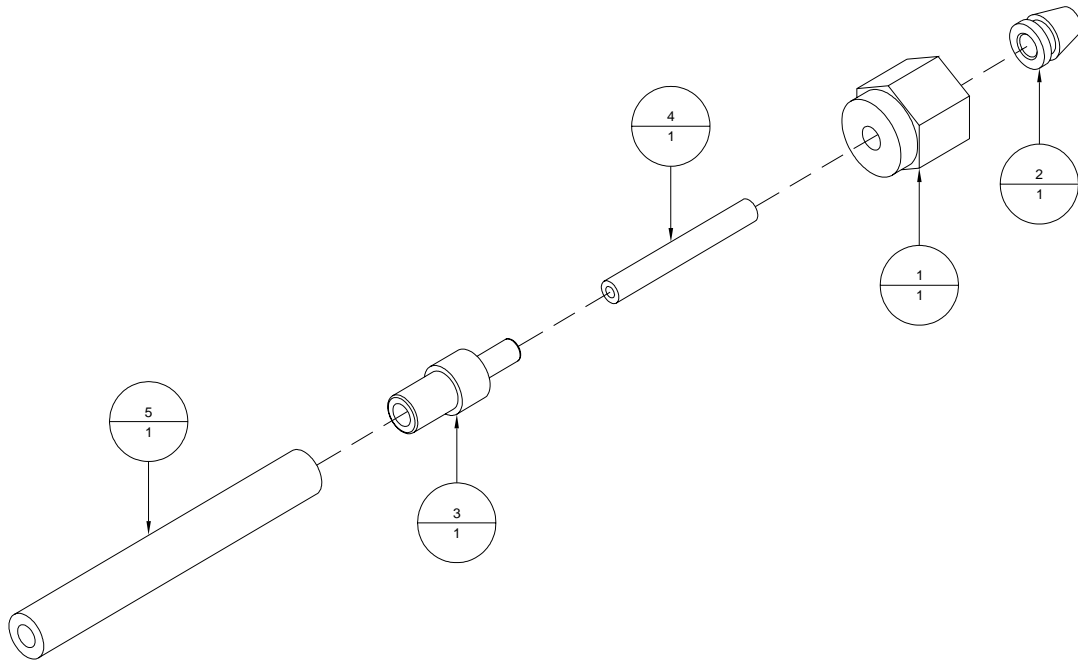
Figure B-14: *Port Bracket Assembly, Singlehead (9102109A)*

Table B-15: *Ferrule Assembly, Atlas BK791 Printhead (9102350A)*

Item	Part Number	Quantity	Description	Reference
1	9100938	1	Fitting, Nut	
2	9100958	1	Ferrule Set	
3	9101170	1	Fitting, Straight Reducer, 1/8" to 1/16" ID	
4	9101695	1	Tubing, PE, 1/8" x 1/16", UV Resistant, 9"	
5	9102111	1	Tubing, PE, 1/4" x 1/8", UV Resistant, 2"	

Figure B-15: *Ferrule Assembly, Atlas BK791 Printhead (9102350A)*

List of Schematics

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Figure C-6: Wiring Diagram - Atlas Inkwell Power (9100979AE)	C-6
Figure C-7: Wiring Diagram - Off Head Supply (9101229AE).....	C-7

Figure C-1: Printhead, BK791 Atlas, Wiring Diagram (BK791AE)

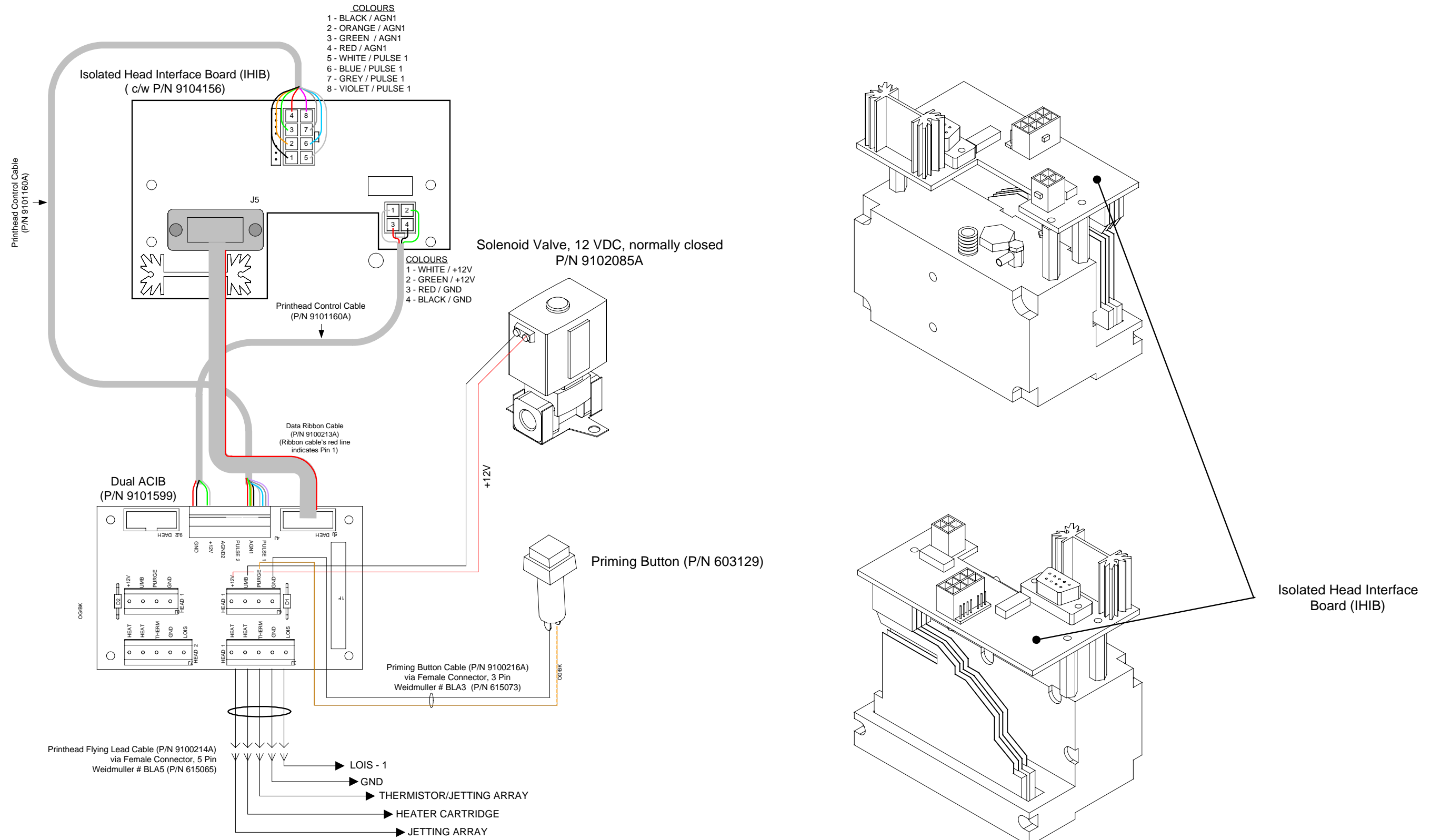


Figure C-2: Printhead, BK791 Atlas, Grounding Diagram (BK791AE)

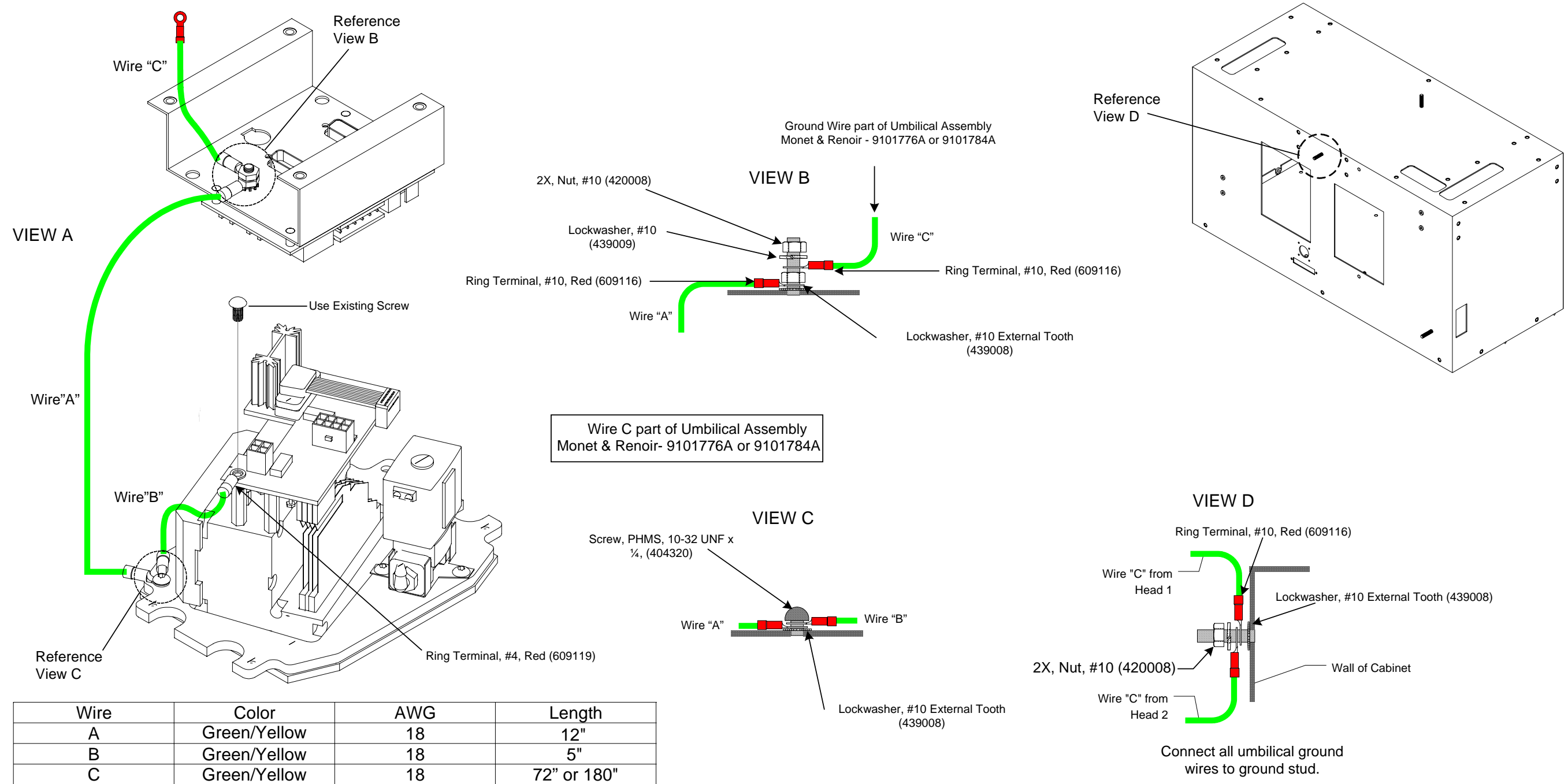
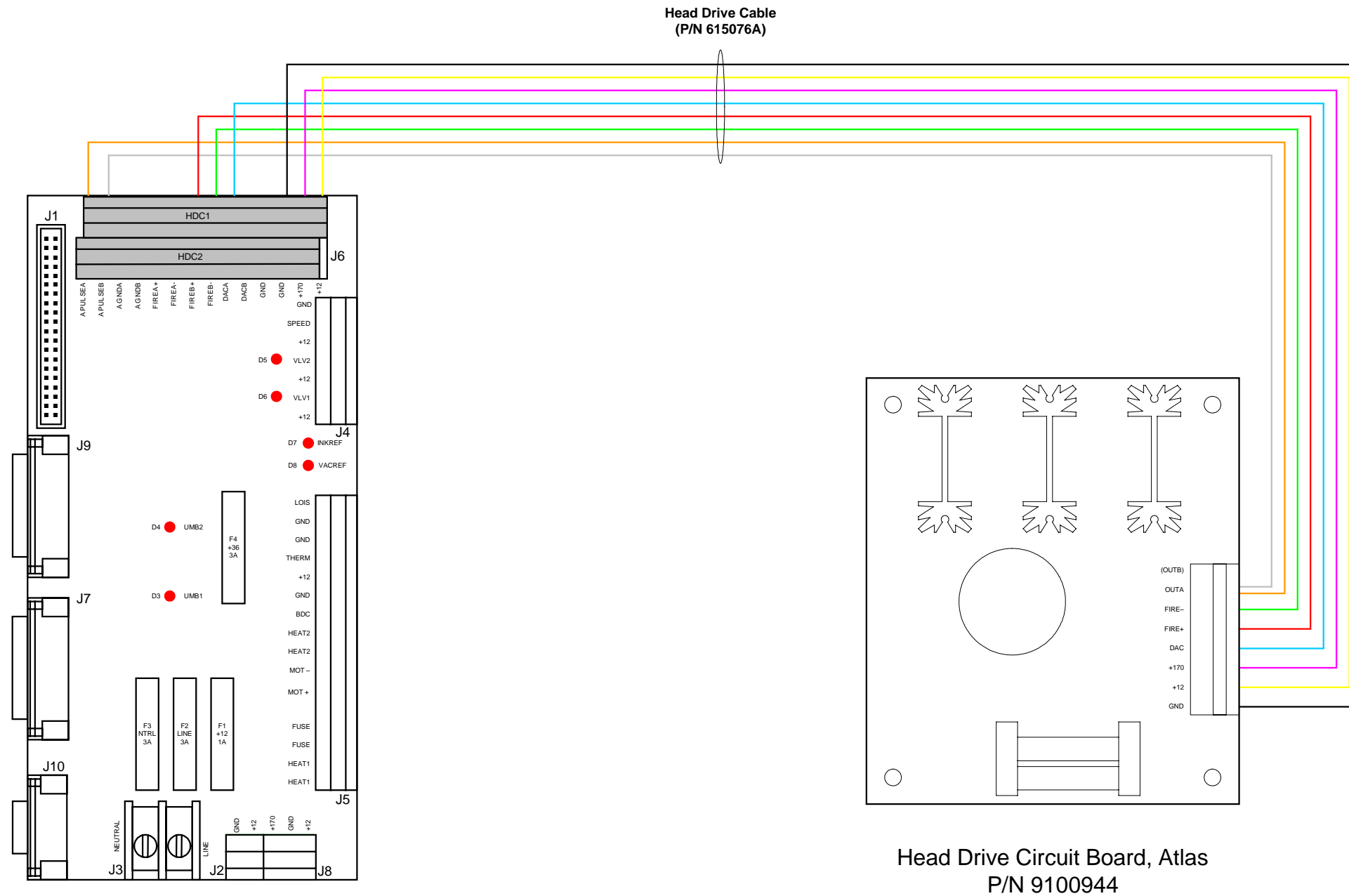


Figure C-5: Wiring Diagram - Head Drive Circuit Board, Atlas (9100944AE)



NOTES

The wiring is identical for both HDC #1 and HDC #2.

Head Drive Cable #1 from HDC #1 connects to the J6-HDC1 on the System Support Board.

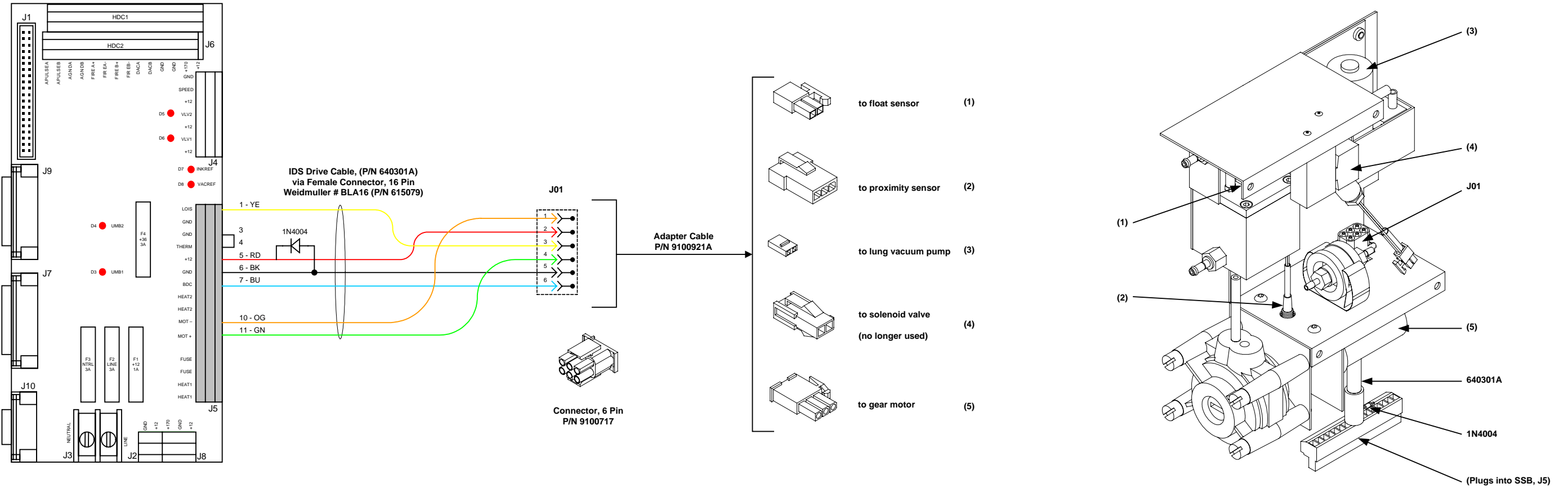
Head Drive Cable #2 from HDC #2 connects to the J6-HDC2 on the System Support Board.

WIRING COLORS

HDC:	ASSB:	
+12	Yellow	+12
+ 130	Violet	-250
GND	Black	GND
FIRE-	Green	FIREB-
FIRE+	Red	FIREB+
OUTA	White	PULSEB
	Orange	PULSEA
DAC	Blue	DACA
OUTB	not wired	

Figure C-7: Wiring Diagram - Off Head Supply (9101229AE)

**System Support Board, Atlas
P/N 9100969**



Monet+ MSDS Sheets

Appendix **D**

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D-1: MONET+ INK**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

TRADE NAME: Monet+ Ink
Item: BKINK-MO+BK1000
Product Type: Inkjet Printing Ink
Distributor: Buskro Ltd.
Address: 1-1738 Orangebrook Court
 Pickering, ON L1W 3G8, Canada
EMERGENCY TELEPHONE: **CHEMTREC (24-hour)**
North America call 800-424-9300
International call 703-527-3887 (collect calls accepted)
Information Telephone: 905-839-6018
Date Prepared: October 15, 2005
MSDS Version: C

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY: GLYETHER/RESIN/DYE

HAZARDOUS COMPONENTS	CAS #	WEIGHT %
GLYCOL ETHER	111-77-3	70-80%
No PEL established. OSHA reportable (1%)		
DYE Chromium III	TS1017	10-20%
SARA III Section 313: (1%) reportable		
COBALT COMPOUND	7440-48-4	< 1%
SARA III Section 313: Cobalt compounds at .05%		

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

3. HAZARDS IDENTIFICATION

HMIS CODES: H F P P
 2 2 0 B

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Irritation of respiratory tract, headache, dizziness, nausea and possible narcosis.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Eye: Severe irritation, tearing, redness and blurred vision.

Skin: Prolonged or repeated contact may cause sensitization and dermatitis.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

May be harmful if swallowed; may produce central nervous system depression and kidney and liver damage.

ACUTE HEALTH HAZARDS

Severe eye irritation; may cause skin irritation and dermatitis.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

N/A

CHRONIC HEALTH HAZARDS

The injury produced upon repeated administration is generally associated with the liver.

CARCINOGENICITY

None

4. EMERGENCY AND FIRST AID MEASURES**SWALLOWED**

Do NOT induce vomiting. Call a doctor and contact local poison control center immediately.

EYE CONTACT

Flush eyes thoroughly with water. Seek medical attention if irritation persists.

SKIN CONTACT

Wash contaminated areas with soap and water.

INHALED

Remove victim to fresh air.

5. FIRE FIGHTING MEASURES**FLASH POINT:**

> NA

METHOD USED:

TCC

FLAMMABLE LIMITS IN AIR BY VOLUME

LOWER: 1-2%

UPPER: 10-15%

EXTINGUISHING MEDIA

Water spray, foam, carbon dioxide or dry chemical.

SPECIAL FIREFIGHTING PROCEDURES

Wear self-contained breathing apparatus and protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Vapors may form explosive mixture with air. Vapors may travel considerable distance to a source of ignition and flash back.

6. ACCIDENTAL RELEASE MEASURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Eliminate all sources of ignition.

Soak up on paper or other absorbent and scoop into closed containers.

Flush area with plenty of water.

7. HANDLING AND STORAGE**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING**

Flammables handling and storage: Store at room temperature. Keep away from heat, sparks, and flame. Store in a standard flammable liquid storage room or cabinet. Keep container closed when not in use. Drums and other metal containers should be grounded before opening or pouring.

OTHER PRECAUTIONS

Special sensitivity: Heat, light, moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**RESPIRATORY PROTECTION**

Use an approved respirator for organic vapors and fumes if ventilation is not adequate.

VENTILATION

Mechanical ventilation is acceptable.

PROTECTIVE GLOVES

Rubber.

EYE PROTECTION

Goggles or safety glasses with side shields.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

N/A

WORK/HYGIENIC PRACTICES

Avoid contamination of food, drink, etc. No smoking when handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: 212° F

VAPOR PRESSURE (mm of Hg): ND

EVAPORATION RATE (BUTYL ACETATE=1): < 1

PHYSICAL STATE: Liquid

ODOR: N/A

SPECIFIC GRAVITY (H₂O=1): < 1

VAPOR DENSITY (AIR = 1): ND

MATERIAL VOC: Not measured

COLOR: Black

SOLUBILITY IN WATER: Low

10. REACTIVITY**STABILITY**

Stable

CONDITIONS TO AVOID

Heat, spark, flames, light.

INCOMPATIBILITY (MATERIALS TO AVOID)

Oxidizing materials.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS

Oxides of Carbon and various Hydrocarbons.

HAZARDOUS POLYMERIZATION

N/A

11. TOXICOLOGICAL INFORMATION

No information available.

12. ECOLOGICAL INFORMATION

Do not discharge product uncontrolled into the environment.

13. DISPOSAL CONSIDERATIONS**WASTE DISPOSAL METHOD**

Waste shall be disposed of in accordance with federal, state, and local environmental control regulations.

14. TRANSPORTATION INFORMATION

D.O.T. SHIPPING NAME: Not D.O.T. Regulated

15. PRODUCT REGULATORY INFORMATION**OSHA STATUS**

Product not tested. It is not considered to be toxic per 29CFR1910.1200 but is considered to be a skin/eye irritant.

USA TSCA STATUS

This product meets the requirements of the Toxic Substances Control Act.

INTERNATIONAL EXPORT/IMPORT STATUS

Not determined for every country. Contact BUSKRO LTD. for certification if required. Formulas are proprietary, so ingredient lists may only be released to Customs/Health offices designated to control trade secrets.

SARA TITLE III SECTION 313 TOXIC CHEMICALS

SARA listed ingredients contain cobalt compounds less than .05%

RCRA HAZARDOUS WASTE NUMBER/STATUS

If discarded in its purchased form, this product would be a federal hazardous waste either by listing or by characteristic. Under RCRA it is the responsibility of the product user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste (40CFR261.20-24).

OZONE-DEPLETING CHEMICALS

No regulated ingredients.

NEW JERSEY

REPORTABLE COMPONENTS CAS #
DYE Chromium III TS1017

CALIFORNIA PROPOSITION 65 (CARCINOGENS)

None

CALIFORNIA PROPOSITION 65 (REPRODUCTIVE TOXINS)

None

16. DISCLAIMER

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. This information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. BUSKRO LTD. makes no warranty, express or implied, as to the accuracy or completeness of this information. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions and/or compliance with federal, state, and local laws and regulations.

D-2: MONET+ FLUSHING SOLUTION

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: Monet+ Flushing Fluid
Item: BKFSH-MO+1000
Product Type: Inkjet Flushing Fluid
Distributor: Buskro Ltd.
Address: 1-1738 Orangebrook Court
 Pickering, ON L1W 3G8, Canada
EMERGENCY TELEPHONE: **CHEMTREC (24-hour)**
North America call 800-424-9300
International call 703-527-3887 (collect calls accepted)
Information Telephone: 905-839-6018
Date Prepared: October 15, 2005
MSDS Version: C

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY:	GLYCOL ETHER/DAA	
HAZARDOUS COMPONENTS	CAS #	WEIGHT %
GLYCOL ETHER	TS1026	35-65%
	OSHA PEL / ACGIH TLV 100 ppm. STEL 150 ppm	
DIACETONE ALCOHOL	123-42-2	25-35%
	OSHA PEL/ACGIH TWA 50 ppm.	
PYRROLIDONE, 2-	616-45-5	5-15%
	MANUFACTURER RECOMMENDS PEL 100 ppm	

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

3. HAZARDS IDENTIFICATION

HMIS CODES:
H F P P
2 2 0 H

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Irritation of respiratory tract, headache, dizziness, nausea and possible narcosis.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Eye: Severe irritation, tearing, redness and blurred vision.

Skin: Prolonged or repeated contact may cause sensitization and dermatitis.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

May be harmful if swallowed; may produce central nervous system depression and kidney and liver damage.

ACUTE HEALTH HAZARDS

Severe eye irritation; may cause skin irritation and dermatitis.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

N/A

CHRONIC HEALTH HAZARDS

The injury produced upon repeated administration is generally associated with the liver.

CARCINOGENICITY

Product not tested. IAEC, NTP, OSHA listed carcinogen components equal to or greater than 0.1% by weight will be listed in paragraph 2 and described as carcinogens, if any.

4. EMERGENCY AND FIRST AID MEASURES**SWALLOWED**

Do NOT induce vomiting. Call a doctor and contact local poison control center immediately.

EYE CONTACT

Flush eyes thoroughly with water. Seek medical attention if irritation persists.

SKIN CONTACT

Wash contaminated areas with soap and water.

INHALED

Remove victim to fresh air.

5. FIRE FIGHTING MEASURES

FLASH POINT: > 140° F
METHOD USED: TCC

FLAMMABLE LIMITS IN AIR BY VOLUME

LOWER: 1-2%
UPPER: 10-15%

EXTINGUISHING MEDIA

Water spray, foam, carbon dioxide or dry chemical.

SPECIAL FIREFIGHTING PROCEDURES

Wear self-contained breathing apparatus and protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Vapors may form explosive mixture with air. Vapors may travel considerable distance to a source of ignition and flash back.

6. ACCIDENTAL RELEASE MEASURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Eliminate all sources of ignition.
Soak up on paper or other absorbent and scoop into closed containers.
Flush area with plenty of water.

7. HANDLING AND STORAGE**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING**

Flammables handling and storage: Store at room temperature. Keep away from heat, sparks, and flame. Store in a standard flammable liquid storage room or cabinet. Keep container closed when not in use. Drums and other metal containers should be grounded before opening or pouring.

OTHER PRECAUTIONS

Special sensitivity: Heat, light, moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**RESPIRATORY PROTECTION**

Use an approved respirator for organic vapors and fumes if ventilation is not adequate.

VENTILATION

Mechanical ventilation is acceptable.

PROTECTIVE GLOVES

Rubber.

EYE PROTECTION

Goggles or safety glasses with side shields.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

N/A

WORK/HYGIENIC PRACTICES

Avoid contamination of food, drink, etc. No smoking when handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: 200° F - 300° F

VAPOR PRESSURE (mm of Hg): ND

EVAPORATION RATE (BUTYL ACETATE=1): < 1

PHYSICAL STATE: Liquid

ODOR: Alcohol

SPECIFIC GRAVITY (H₂O=1): < 1

VAPOR DENSITY (AIR = 1): ND

MATERIAL VOC: Not measured

COLOR: Clear Pale Yellow

SOLUBILITY IN WATER: Miscible

10. REACTIVITY**STABILITY**

Stable.

CONDITIONS TO AVOID

Heat, spark, flames, light.

INCOMPATIBILITY (MATERIALS TO AVOID)

Oxidizing materials.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS

Oxides of Carbon and various Hydrocarbons.

HAZARDOUS POLYMERIZATION

N/A

11. TOXICOLOGICAL INFORMATION

No information available.

12. ECOLOGICAL INFORMATION

Do not discharge product uncontrolled into the environment.

13. DISPOSAL CONSIDERATIONS**WASTE DISPOSAL METHOD**

Waste shall be disposed of in accordance with federal, state, and local environmental control regulations.

14. TRANSPORTATION INFORMATION

D.O.T. SHIPPING NAME: Not D.O.T. Regulated

15. PRODUCT REGULATORY INFORMATION**OSHA STATUS**

Product not tested. It is not considered to be toxic per 29CFR1910.1200 but is considered to be a skin/eye irritant.

USA TSCA STATUS

This product meets the requirements of the Toxic Substances Control Act.

INTERNATIONAL EXPORT/IMPORT STATUS

Not determined for every country. Contact BUSKRO LTD. for certification if required. Formulas are proprietary, so ingredient lists may only be released to Customs/Health offices designated to control trade secrets.

SARA TITLE III SECTION 313 TOXIC CHEMICALS

Product not listed. SARA listed ingredients at or above De Minimis reporting levels are noted in Section 2, if any.

RCRA HAZARDOUS WASTE NUMBER/STATUS

If discarded in its purchased form, this product would be a federal hazardous waste either by listing or by characteristic. Under RCRA it is the responsibility of the product user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste (40CFR261.20-24).

OZONE-DEPLETING CHEMICALS

No regulated ingredients.

NEW JERSEY

REPORTABLE COMPONENTS CAS #	
GLYCOL ETHER	TS1026
DIACETONE ALCOHOL	123-42-2
PYRROLIDONE, 2-	616-45-5

CALIFORNIA PROPOSITION 65 (CARCINOGENS)

None

CALIFORNIA PROPOSITION 65 (REPRODUCTIVE TOXINS)

None

16. DISCLAIMER

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. This information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. BUSKRO LTD. makes no warranty, express or implied, as to the accuracy or completeness of this information. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions and/or compliance with federal, state, and local laws and regulations.

D-3: MONET+ MAINTENANCE SPRAY

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: Monet+ Maintenance Spray
Item: BKSPR-MO+125
Product Type: Inkjet Maintenance Spray
Distributor: Buskro Ltd.
Address: 1-1738 Orangebrook Court
 Pickering, ON L1W 3G8, Canada
EMERGENCY TELEPHONE: **CHEMTREC (24-hour)**
North America call 800-424-9300
International call 703-527-3887 (collect calls accepted)
Information Telephone: 905-839-6018
Date Prepared: October 15, 2005
MSDS Version: C

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY:	GLYCOL ETHER/DAA	
HAZARDOUS COMPONENTS	CAS #	WEIGHT %
GLYCOL ETHER	TS1026	35-65%
	OSHA PEL / ACGIH TLV 100 ppm. STEL 150 ppm	
DIACETONE ALCOHOL	123-42-2	25-35%
	OSHA PEL/ACGIH TWA 50 ppm.	
PYRROLIDONE, 2-	616-45-5	5-15%
	MANUFACTURER RECOMMENDS PEL 100 ppm	

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

3. HAZARDS IDENTIFICATION

HMIS CODES:
H F P P
2 2 0 H

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Irritation of respiratory tract, headache, dizziness, nausea and possible narcosis.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Eye: Severe irritation, tearing, redness and blurred vision.

Skin: Prolonged or repeated contact may cause sensitization and dermatitis.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

May be harmful if swallowed; may produce central nervous system depression and kidney and liver damage.

ACUTE HEALTH HAZARDS

Severe eye irritation; may cause skin irritation and dermatitis.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

N/A

CHRONIC HEALTH HAZARDS

The injury produced upon repeated administration is generally associated with the liver.

CARCINOGENICITY

Product not tested. IAEC, NTP, OSHA listed carcinogen components equal to or greater than 0.1% by weight will be listed in paragraph 2 and described as carcinogens, if any.

4. EMERGENCY AND FIRST AID MEASURES**SWALLOWED**

Do NOT induce vomiting. Call a doctor and contact local poison control center immediately.

EYE CONTACT

Flush eyes thoroughly with water. Seek medical attention if irritation persists.

SKIN CONTACT

Wash contaminated areas with soap and water.

INHALED

Remove victim to fresh air.

5. FIRE FIGHTING MEASURES

FLASH POINT: > 140° F
METHOD USED: TCC

FLAMMABLE LIMITS IN AIR BY VOLUME

LOWER: 1-2%
UPPER: 10-15%

EXTINGUISHING MEDIA

Water spray, foam, carbon dioxide or dry chemical.

SPECIAL FIREFIGHTING PROCEDURES

Wear self-contained breathing apparatus and protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Vapors may form explosive mixture with air. Vapors may travel considerable distance to a source of ignition and flash back.

6. ACCIDENTAL RELEASE MEASURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Eliminate all sources of ignition.
Soak up on paper or other absorbent and scoop into closed containers.
Flush area with plenty of water.

7. HANDLING AND STORAGE**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING**

Flammables handling and storage: Store at room temperature. Keep away from heat, sparks, and flame. Store in a standard flammable liquid storage room or cabinet. Keep container closed when not in use. Drums and other metal containers should be grounded before opening or pouring.

OTHER PRECAUTIONS

Special sensitivity: Heat, light, moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**RESPIRATORY PROTECTION**

Use an approved respirator for organic vapors and fumes if ventilation is not adequate.

VENTILATION

Mechanical ventilation is acceptable.

PROTECTIVE GLOVES

Rubber.

EYE PROTECTION

Goggles or safety glasses with side shields.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

N/A

WORK/HYGIENIC PRACTICES

Avoid contamination of food, drink, etc. No smoking when handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: 200° F - 300° F

VAPOR PRESSURE (mm of Hg): ND

EVAPORATION RATE (BUTYL ACETATE=1): < 1

PHYSICAL STATE: Liquid

ODOR: Alcohol

SPECIFIC GRAVITY (H₂O=1): < 1

VAPOR DENSITY (AIR = 1): ND

MATERIAL VOC: Not measured

COLOR: Clear Pale Yellow

SOLUBILITY IN WATER: Miscible

10. REACTIVITY**STABILITY**

Stable.

CONDITIONS TO AVOID

Heat, spark, flames, light.

INCOMPATIBILITY (MATERIALS TO AVOID)

Oxidizing materials.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS

Oxides of Carbon and various Hydrocarbons.

HAZARDOUS POLYMERIZATION

N/A

11. TOXICOLOGICAL INFORMATION

No information available.

12. ECOLOGICAL INFORMATION

Do not discharge product uncontrolled into the environment.

13. DISPOSAL CONSIDERATIONS**WASTE DISPOSAL METHOD**

Waste shall be disposed of in accordance with federal, state, and local environmental control regulations.

14. TRANSPORTATION INFORMATION

D.O.T. SHIPPING NAME: Not D.O.T. Regulated

15. PRODUCT REGULATORY INFORMATION**OSHA STATUS**

Product not tested. It is not considered to be toxic per 29CFR1910.1200 but is considered to be a skin/eye irritant.

USA TSCA STATUS

This product meets the requirements of the Toxic Substances Control Act.

INTERNATIONAL EXPORT/IMPORT STATUS

Not determined for every country. Contact BUSKRO LTD. for certification if required. Formulas are proprietary, so ingredient lists may only be released to Customs/Health offices designated to control trade secrets.

SARA TITLE III SECTION 313 TOXIC CHEMICALS

Product not listed. SARA listed ingredients at or above De Minimis reporting levels are noted in Section 2, if any.

RCRA HAZARDOUS WASTE NUMBER/STATUS

If discarded in its purchased form, this product would be a federal hazardous waste either by listing or by characteristic. Under RCRA it is the responsibility of the product user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste (40CFR261.20-24).

OZONE-DEPLETING CHEMICALS

No regulated ingredients.

NEW JERSEY

REPORTABLE COMPONENTS CAS #	
GLYCOL ETHER	TS1026
DIACETONE ALCOHOL	123-42-2
PYRROLIDONE, 2-	616-45-5

CALIFORNIA PROPOSITION 65 (CARCINOGENS)

None

CALIFORNIA PROPOSITION 65 (REPRODUCTIVE TOXINS)

None

16. DISCLAIMER

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. This information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. BUSKRO LTD. makes no warranty, express or implied, as to the accuracy or completeness of this information. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions and/or compliance with federal, state, and local laws and regulations.