FORMAX®

ColorMax7
Digital Color Printer

MAINTENANCE MANUAL
Rev 3

4/2016

SAFETY PRECAUTIONS

THIS EQUIPMENT PRESENTS NO PROBLEM WHEN USED PROPERLY. HOWEVER, CERTAIN SAFETY RULES SHOULD BE OBSERVED WHEN OPERATING THE COLORMAX7 PRINTER.

BEFORE USING THE PRINTER, YOU SHOULD READ THIS MANUAL CAREFULLY AND FOLLOW THE RECOMMENDED PROCEDURES, SAFETY WARNINGS, AND INSTRUCTIONS:

- ✓ Keep hands, hair, and clothing clear of rollers and other moving parts.
- ✓ Avoid touching moving parts or materials while the machine is in use. Before clearing a jam, be sure machine mechanisms come to a stop.
- ✓ Always turn off the machine before making adjustments, cleaning the machine, or performing any maintenance covered in this manual.
- ✓ The power cord and power supply supplied with the machine should be plugged into a properly grounded, easily accessible wall outlet located near the machine. Failure to properly ground the machine can result in severe personal injury and/or fire.
- ✓ The power cord and wall plug is the primary means of disconnecting the machine from the power supply.
- ✓ DO NOT use an adapter plug on the line cord or wall outlet.
- ✓ DO NOT remove the ground pin from the line cord.
- ✓ DO NOT route the power cord over sharp edges or trap it between furniture.
- ✓ Avoid using wall outlets that are controlled by wall switches, or shared with other equipment.
- ✓ Make sure there is no strain on the power cord caused by jamming between equipment, walls or furniture.
- ✓ DO NOT remove covers. Covers enclose hazardous parts that should only be accessed by a qualified service representative. Report any cover damage to your service representative.
- ✓ This machine requires periodic maintenance. Contact your authorized service representative for required service schedules.
- ✓ To prevent overheating, do not cover the vent openings.
- ✓ Use this equipment only for its intended purpose.

In addition, follow any specific occupational safety and health standards for your workplace or area.

This manual is intended solely for the use and information of Formax, its designated agents, customers, and their employees. The information in this guide was obtained from several different sources that are deemed reliable by all industry standards. To the best of our knowledge, that information is accurate in all respects. However, neither Formax nor any of its agents or employees shall be responsible for any inaccuracies contained herein.

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NOTES

SECTION 1 – Before You Begin

The following troubleshooting guides are provided to assist you in solving any problems that might occur with the Digital Color Printer. We have tried to make them as complete as possible, but this section will always be evolving.

Recommended Troubleshooting Supplies

Items that a Technician should have available to them, when they visit a "Digital Color Printer" customer (in addition to standard tools):

- A box or ream of "inkjet suitable" media.
- Known good set of Ink Tanks (Cyan CJ-21, Magenta CJ-23, Yellow CJ-22, Black CJ-24 qty 2);
- Known good Printhead Cartridge (CJ-20)
- Known good Service Station (123-2483)
- Lint-free cloths
- Distilled or Deionized water
- Computer (Win XP, Vista, Win 7, Win 8.8.1; with USB 2.0/3.0 port) and USB cable. It would be best if the computer system has been previously interfaced and tested with ColorMax7. That way they should have documents or jobs already setup to test with printer, drivers loaded, toolbox loaded.
- Operations CD (contains printer software, drivers, operators guide, etc...)
- Service Manual
- Parts Manual; when available.
- Access to internet.

Common Service Tools Needed:

This list is in addition to standard tools.

- Spring Hook
- Needle Nosed Pliers
- Side Cutters
- Voltage Meter
- SAE set of alan wrenches
- #1 and #2 Philips Screwdriver
- T-8/10/15 Torx drivers
- Carpenters Level (18" or longer)

Minimum Computer System Requirements

- Windows XP, Windows Vista, Windows 7 and Windows 8/8.1 (Desktop Mode).
  Supports 32 and 64 bit systems.
- You must have administrative privileges on the system.
- Pentium II, 2 GHz minimum (Pentium Dual Core, 2.5 GHz or better, is optimal)
- System memory – 2 GB minimum; or as recommended for your operating system.
- At least 10 GB free hard-disk space.
- Web Browser: (Microsoft Internet Explorer, Firefox, Chrome, Safari…)
- Java version 6*. (If you have Java 7 or higher installed; you may need to load Java 6 also, or the Toolbox may not open properly.)
  *Java is not required for printers with firmware 2014xxxx or higher loaded.
- CD/DVD drive
- USB 2.0/3.0 port (In the Device Manager; USB 2.0 may be identified as “USB2” or “Enhanced” and USB 3.0 may be identified as “USB3”, “USB 3.0” or “eXtensible”.)
- Microsoft .Net Framework version 3.5 (for 32 bit systems) or Microsoft .Net Framework version 4 (for 64 bit systems) must be installed.
  Note: Even if you have a higher .NET Framework version installed; version 3.5 or 4 must also be installed, or the Toolbox will not open.

IMPORTANT: Before installing the printer software (Toolbox and Driver); you should temporarily disable all Antivirus programs and Firewalls. In addition; you must be logged onto the system with full administrative privileges (admin rights).

How to check your system for the minimum system requirements, shown above:
Right click on "My Computer" and select Properties. The system information, including Operating System, Processor Info and Memory info will be displayed under the "General" tab.

How to check your system for the versions of "Microsoft .NET Framework” installed.
From the Control Panel; open "Add or Remove Programs" and look for "Microsoft .NET Framework 3.5..." in the list.
You may be able to obtain "Microsoft .Net Framework 3.5 or 4” via the Microsoft website.
http://www.microsoft.com

How to check your system for the version of "Java" installed.
From the Control Panel; open "Add or Remove Programs". Look for "Java(TM) 6 .." in the list.
You may be able to obtain Java from the following website: www.java.com
There are also tools on the Java site to help you detect if you have java installed and what version is installed.

Print Engine Reference Note:
Most of the information contained in this Service Manual, for the Print Engine, is based on the Z3 and higher print engines. When servicing a Z2i print engine, please use this information with CAUTION; especially when the Print Engine and Main PC Board connector positions are referenced.

If you Have Setup-Operations Questions:
Please refer to the Operators Guide (Operations Manual) for this model.

SECTION 2 – Troubleshooting

The following troubleshooting guides are provided to assist you in solving any problems that might occur with the Digital Color Printer. We have tried to make them as complete as possible, but this section will always be evolving.

WARNING

POWER-DOWN THE PRINTER AND DISCONNECT THE POWER CORD BEFORE PERFORMING MAINTENANCE/REPAIR.
THERE ARE HIGH VOLTAGES PRESENT BEHIND THE SIDE COVERS!

Print Quality Issues:

Many things can contribute to print quality issues. Here is a list of things to check:

- To reduce print quality issues, the print engine should remain powered-on. Even in its standby state, the printer will run routine maintenance cycles to help keep the printhead nozzles hydrated and clean.
- Verify that the media you are printing on is an "inkjet suitable" media. See Paper Types below.
- Verify that the "graphic" you are printing is of a high quality. See Graphic Types below.
- Check to be sure the printer has an adequate supply of ink (30% or more) in all five Ink Tanks.
- Check to be sure all five color tubes, at both sides of the printhead cartridge, have ink filling them. If not, the cartridge will need to be removed, the printhead nozzle surface re-wetted using deionized or distilled water, and the cartridge reinstalled. Please refer to the appropriate sections in this manual for removing and installing the printhead cartridge.
- Try removing air bubbles from printhead and system using the "Printhead Cartridge Conditioning" routine or Toolbox utility feature "Circulate Ink".
  Note: Do not run the Circulate Ink feature more than twice in a row.
- Replace the Printhead Cartridge. Generally when the ink supply is adequate and the print quality remains poor, even after cleaning; the printhead cartridge should be replaced. Please refer to "Replacing the Printhead Cartridge".

Compatible Paper Types: (look for inkjet suitable stocks)

- Inkjet Paper - all types (recommended for best color output).
- Copier Paper
- Card Stock
- Kromekote
- Coated Paper - Gloss finish
- Coated Paper - Satin finish
- Coated Paper - Matte finish

Incompatible Paper Types:

- Color Laser Gloss
- Digital Printer Gloss
- Any Post Print Coated Substrate (aqueous, gravure or UV)

Compatible Graphic Types:

- In general; scalable, vectorized art will produce the best images and color.
  Note: Graphic types are not really printer dependent. They are dependent on the software program being used to print the graphic, and what types of graphics that program can handle.

Incompatible Graphic Types:

- Low resolution and web images will not produce quality output and should not be used.

Examples of Print Quality Issues (including possible causes and solutions)

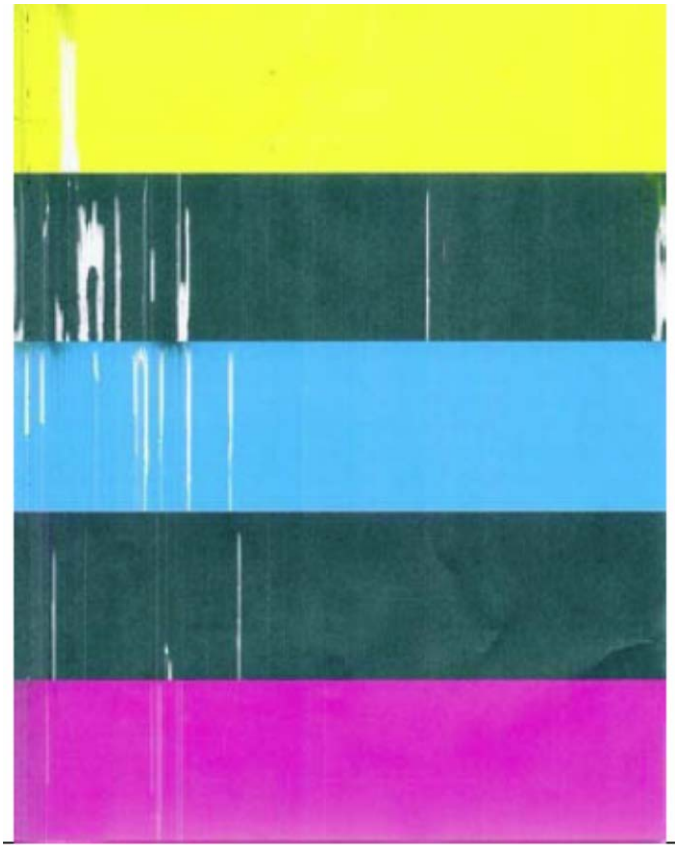
The Memjet printhead cartridge contains 70,400 inkjet nozzles. These nozzles are divided into ten rows; two rows of nozzles for each color channel. Due to the high number of nozzles; it is not uncommon for some nozzles to become contaminated or clogged.

The following examples were produced using a Five Band Color Purge YKCKM. A similar purge pattern can be performed using the "Print Ink Channels" button; located in the Toolbox, Diagnostics Menu.

Air in Printhead Nozzle Area:
Air in the printhead nozzles will show as jagged, irregular shaped lines of missing color. Lines are normally wider than one nozzle.

Possible Solutions:

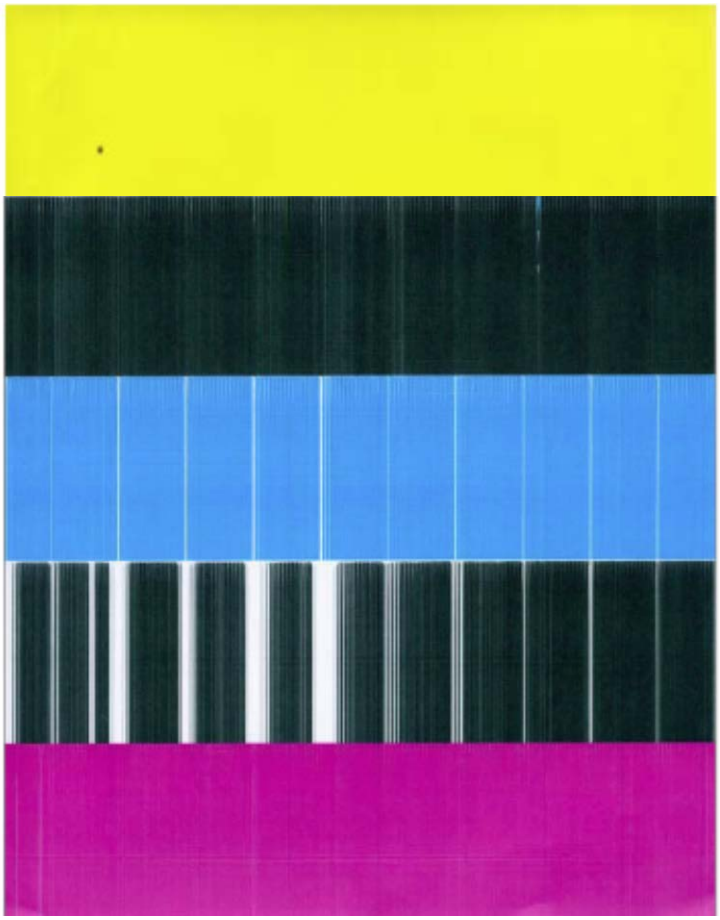
- Press the "Full Clean Printhead" button, located in the Toolbox, User Interface screen, and lightly tap on the ink tubes and Printhead Cartridge as the system is circulating ink. This can help dislodge air bubbles within the Printhead and Ink Tubes.
  Note: It is not a problem if air bubbles accumulate in the ink hoses at the non-operator side of the printhead; since this is the outgoing side.
- Deprime and Reprime the system. Release the Printhead, using the "Release Printhead" button. Remove and re-install the Printhead Cartridge. Then close printhead latch to re-prime the system. Lightly tap on the ink tubes and Printhead Cartridge as the system is priming; to help dislodge air bubbles.
- Inspect the system for possible air leaks (damage to ink tubes or ink revolver couplings).
- Instead of powering the printer off, when not in use, leave the print engine powered-up; so it can perform automatic maintenance routines.



Clogged Nozzles:
Clogged/damaged/dead/ nozzles will normally show as thin, crisp, vertical lines of missing color. Multiple adjacent nozzles, with same issue, will show as wider, crisp, vertical lines of missing color.
Clogged nozzles are normally due to Printhead nozzle dehydration or partial contamination.
Damaged nozzles are normally due to improper cleaning or debris on wiper roller causing damage to head.
Dead nozzles are normally due to the nozzle reaching its "end of life" (~50,000,000 ejections).

Possible Solutions:

- Press the "Full Clean Printhead" button, located in the Toolbox, User Interface screen
- Manually clean the printhead nozzles using distilled water and a lint free cloth.
- Set the following Toolbox features to defaults to improve/increase head maintenance routines: KWS Setting (Light) and Mid-Job Servicing (Default).
- Replace the printhead cartridge and wiper roller.
- Inspect/clean the service station and replace the wiper roller.
- Instead of powering the printer off, when not in use, leave the print engine powered-up; so it can perform automatic maintenance routines.



Color Mixing Issues:
Color mixing will show as muddy, mottled or distorted (grainy) colors.
Color mixing occurs when the ink from one color channel crosses over into another color channel. Since the inkjet nozzle rows are located very close to one another (ten rows of 7,040 nozzles, located within a 0.8 mm space), it is easy for partials or fibers to create bridges across color channels. These bridges allow ink to flow (wick) from one color channel to another; resulting in a "localized" color mixing event; as shown in the examples below.

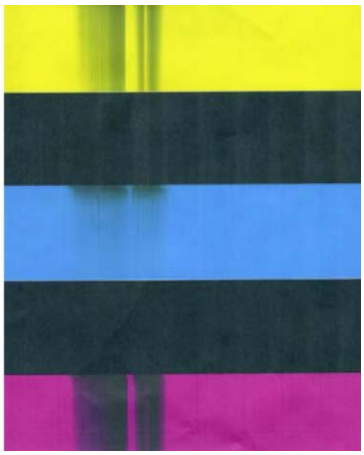
Color mixing can occur for a number of reasons (here are some common ones)

- Printhead Cartridge just installed. It is common to see some color mixing immediately after the system is primed with ink.
- Ink wicking due to fibers bridging (crossing) inkjet nozzles. This can also occur if media is left in contact with the printhead (after a paper misfeed or jam).
- Wiper roller saturation (too much ink on wiper roller). This can occur if the cleaning features (Quick/Normal/Full Clean Printhead) are run too frequently. The printer needs time between cleanings to desiderate the wiper roller.
- Ink flooding on the nozzle plate; due to printer not being level.
- Ink flooding on the nozzle plate; due to excessive back-pressure in the ink system.
- Wiper Roller is not being cleaned properly by the system. This can also occur if there is a problem with the squeegee blade in the Wiper Motor Assembly. The squeegee blade and squeegee roller are responsible for removing ink and debris from the wiper roller.

Tip: Muddy, mottled, distorted (grainy) colors can also be caused by the media you are printing onto. Test the printer, using a compatible "inkjet suitable" media, to determine if this could be the cause.

Possible Solutions:

- Remove media from under printhead.
- Wipe printhead using a lint-free cloth, dampened with distilled water.
- Perform a "Printhead Cartridge Conditioning" routine.
- Allow the printer to sit, powered on, for 2-3 hours to give it time to clean/desaturate the wiper roller.
- Make sure printer is on a sturdy/level floor surface and the Print Engine is level.
- Instead of powering the printer off, when not in use, leave the print engine powered-up; so it can perform automatic maintenance routines. This also allows the pressures in the system to be routinely equalized.
- Inspect/clean the service station. If necessary; they may need to replace the wiper roller, wiper motor assembly or Service Station.

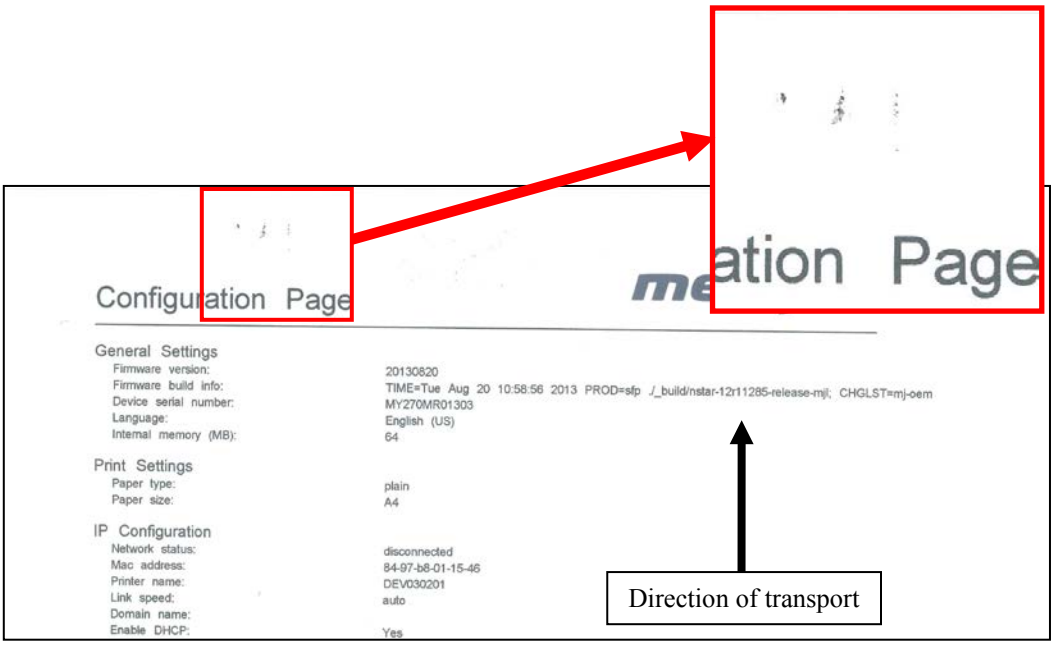


NOTE: The above examples show "localized" color mixing events. "Broad" color mixing events can be caused by an over-saturated wiper roller, or by flooding on the nozzle plate (ink pooling) due to too much back-pressure in the system. They can also be caused by a deformed "purge wick" (ridge of absorbent material) within the capping area. If the "purge wick" touches the printhead nozzles it will cause major ink wicking and color mixing.

Scuff Marks and Smudging Issues:

Scuff Marks occur when the media makes contact with an area of the printhead that has ink on it. Smudging occurs when the wet image, on the media, makes contact with something (most commonly the printhead) before it is dry. This issue will also increase the chance for scuff marks.

Scuff Marks:
Here is an example of "scuff marks" that occurred when the high points (thicker/puffier areas) on this #10 envelope made contact with the printhead.

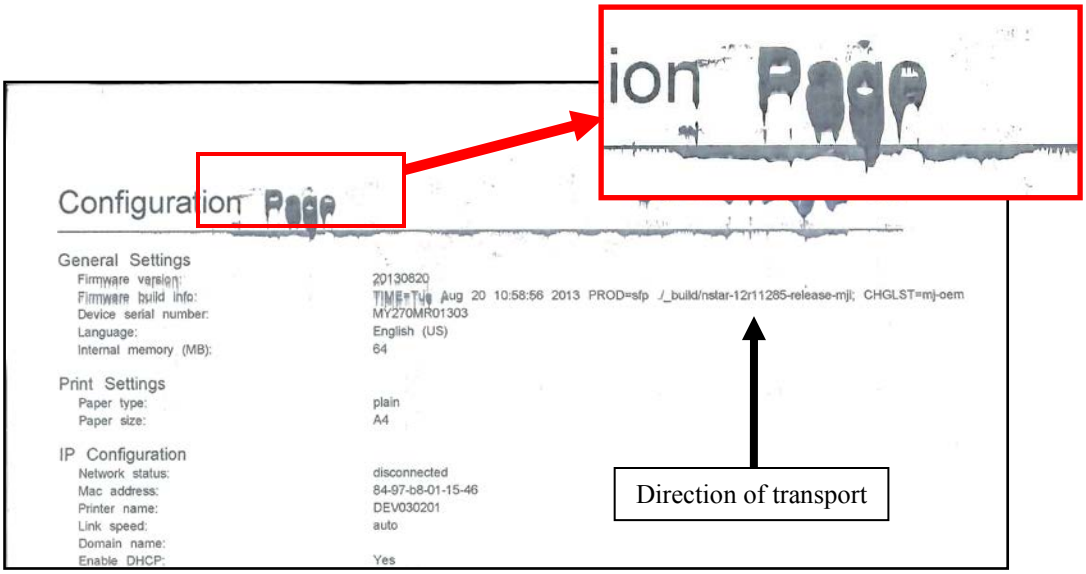


Possible Solutions for Reducing Scuff Marks:

- Make sure the "Head Media Guide" is properly installed.
- Try removing or inserting the "PPS Spacers".
- Make sure media is as flat as possible and folds are as tight as possible.
- Manually wipe the printhead surface, using a lint-free cloth dampened with distilled water to remove excess ink.
- If possible; rotate the media and image 90, 270 or 180 degrees. Sometimes the direction of feed and the mechanics of how the media is driven through the printer can have an effect.
- Allow the printer to sit, powered on, for 2-3 hours to give it time to remove excess ink from the wiper roller; or contact your support representative to have the wiper roller replaced.
- Use a more suitable media (flat and uniform in thickness).

NOTICE! It is OK to run the "Quick Clean Printhead" routine once, to see if this has any effect on improving this issue. However, if it doesn't help, you shouldn't repeat this process or use a higher level cleaning routine. Over-use of the "…Clean Printhead" routines will normally increase this issue, because the wiper roller will become more saturated with ink with each cleaning routine; if done too frequently. An over-saturated wiper roller will leave more ink behind on the printhead.

Smudging:
Here is an example of "smudging" that occurred when an area of this page, with a wet image, made contact with the printhead.
Note: There are also scuff marks in this example. As mentioned previously; smudging will increase the chance for scuff marks; by deposition ink onto other areas of the printhead.



Possible Solutions to Reduce Smudging:

- Check to be sure the "Head Media Guide" is properly installed and clean.
- Try removing or inserting the "PPS Spacers".
- Make sure media is as flat as possible and folds are as tight as possible.
- If possible; rotate the media and image 90, 270 or 180 degrees. Sometimes the direction of feed and the mechanics of how the media is driven through the printer can have an effect.
- Reduce the amount of ink being sprayed onto the media by setting the print quality to "Normal". Spraying less ink will improve the drying time.
- Reduce the print speed to provide more drying time. If you are already printing in Normal Print Quality, you can select (check) the "half speed" box; located under the Print Quality selection in the M Series Driver.
- Use a more inkjet suitable media.

NOTICE! It is OK to run the "Quick Clean Printhead" routine once, to see if this has any effect on improving this issue. However, if it doesn't help, you shouldn't repeat this process or use a higher level cleaning routine. Over-use of the "…Clean Printhead" routines will normally increase this issue, because the wiper roller will become more saturated with ink with each cleaning routine; if done too frequently. An over-saturated wiper roller will leave more ink behind on the printhead.

Fuzzy/Distorted Print

Fuzzy/distorted print can occur for a number of reasons; listed/shown below.

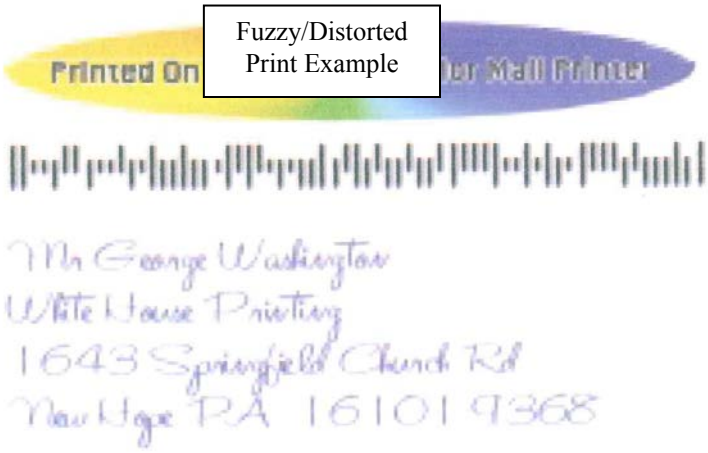
Problem: Poor original image quality (less than 300 dpi).
Solution: Use high quality images.

Problem: Choosing to print image in low resolution from software application.
Solution: Set image to highest resolution possible from software application.

Problem: Paper is buckling or bowing during the time of printing.
Solution: Try removing the PPS spacers. Try printing on a thicker piece of media (i.e. 40lb paper) If problem does not occur on heavier material the media you are feeding may be too flimsy.

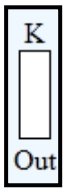
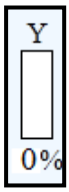
Problem: Damaged Printhead nozzle surface; scratched from improper manual cleaning, or dirty/damaged wiper roller.
Solution: Only use distilled water and a non-abrasive, lint free cloth to manually clean the printhead. Replace the wiper roller at the same time the printhead is replaced. Cover the printer, when not in use, to keep dust/debris (plaster dust) from entering the printer.

Fuzz/Distorted Print Example:



Good Print Example:

The Ink Tank(s)

CONDITION	PROBLEM	SOLUTION
Installed New Ink Tank and shortly after the related Ink Channel (color) stopped printing and or the related color tube went empty. **CAUTION!** Do NOT continue printing in this condition. Damage to the Printhead will result.	One or more of the "septum needles" didn't fully puncture the septum seal on the new Ink Tank. Antistatic Brush Assembly was not installed properly. Defective Ink Tank. Septum seal is not being punctured by needle.	Try removing and re-installing the Tank. See "Installing The Ink Tanks". Is the Antistatic Brush Assembly pinching tubes? Replace defective Ink Tank. Please contact your support representative to report issue.
Ink Level status is displayed as "Out", but there is still ink in the Tank.  Toolbox System Status is displaying "Ink_Out_X" (X = color or multiple)	Visible ink level sensor does not see the presence of ink in the Tank. Printer is not on a stable, level surface; causing ink level sensor to give a premature "Out" condition. QA Chip on Tank may have been corrupted; due to improper removal/install. Inaccurate estimation	Clean prism on Tank. See section titled "Cleaning Ink Tank Contacts & Prism". Place printer on stable, level surface. Replace Ink Tank. To avoid damaging additional Ink Tanks, please see section titled "Replacing The Ink Tanks". To help improve Ink Level estimation accuracy; make sure the firmware is up-to-date and try to minimize manual cleaning printhead.
Ink Level status is displayed as "0%", but there is still ink in the Tank.  Toolbox System Status is displaying "Ink_Out_X" (X = color or multiple)	System has calculated that 250 ml of ink has been used from this Tank. **Note:** To avoid problems that can be caused by an Ink Channel running out of ink; the Tank should be flagged as "Out" or "0%" before it is totally dry. Ink Tanks are overfilled by a small percentage to compensate for this stranded ink. QA Chip on Tank may have been corrupted; due to improper removal/install.	To help improve Ink Level estimation accuracy; make sure the firmware is up-to-date and try to minimize de-priming/re-priming system. Replace Ink Tank. Please see section titled "Replacing The Ink Tanks".
Ink Level status is displayed as "?".  Toolbox System Status is displaying "Tank_Missing_X" (X = color or multiple)	Poor connection between QA Chip contacts and printer. Un-authorized Ink Tank installed. QA Chip on Tank may have been corrupted; due to improper removal/install.	Clean contacts. See section titled "Cleaning Ink Tank Contacts & Prism". Purchase/install Authorized Tank. Replace Ink Tank. To avoid damaging additional Ink Tanks, please see section titled "Replacing The Ink Tanks".

The Printhead Cartridge

The Memjet printhead cartridge contains over 70,000 inkjet nozzles. These nozzles are divided into ten rows; two rows of nozzles for each color channel. Due to the high number of nozzles; it is not uncommon for some nozzles to become contaminated or clogged.

CONDITION	PROBLEM	SOLUTION
Mixed, mottled, muddy or distorted colors.	Ink color channel mixing within the printhead cartridge/nozzles. Print Engine was opened to angle greater than 60º. Incompatible media. Table is not level. Printer was not powered-down properly. Printhead may not have been cleaned or capped. Ink system may not have been stabilized.	Refer to "Printhead Cartridge Conditioning". Do NOT open Print Engine to angle greater than 60º. Use inkjet suitable media Make sure table, that printer is placed on, is level. Make sure to power-down the printer using the ON/OFF button, before shutting off the Main Power Switch.
Thin, crisp vertical line(s) of missing color.	Clogged printhead nozzle(s). Electrical failure or poor electrical connection at printhead.	Clean the Printhead. Reseat the Printhead. Replace the Printhead & wiper roller.
Irregular or Jagged vertical line(s) of missing color.	Air in the system. Air bubbles blocking nozzle(s). Print Engine was opened to angle greater than 60º.	Refer to "Printhead Cartridge Conditioning". Do NOT open Print Engine to angle greater than 60º.
Black scuff marks on media or image smudging occurs.	Media is making contact with the printhead surface.	Install the Head Media Guide. Try adding/removing PPS spacers. Run the media in a different orientation. Incompatible media. Use media that is not bent, bowed or buckled.
Blurry/Grainy Images	Partially clogged nozzle(s). Incompatible media. Low quality image being sent to printer. Damaged/scratched nozzle surface	Clean the Printhead. Use inkjet suitable media. Use high quality graphics that are compatible with your software program. Replace the Printhead & wiper roller.

The ink used in this system may be harmful if swallowed.
Keep new and used printhead cartridges and ink tanks out of reach of children.
Discard unwanted printhead cartridges and empty ink tanks immediately.

The Printhead Cartridge (continued)

CONDITION	PROBLEM	SOLUTION
System will not prime the printhead after installing Printhead Cartridge (One or more of the ink color tubes are not filling with ink.)	Printhead nozzles dry (air pulled through nozzles; not allowing system to create vacuum)	Wet the Printhead nozzles using distilled water and a wet, lint-free cloth.
	Capping station not making good seal against the printhead.	Check for obstruction. Is the Head Media Guide in the way? Try removing it.
	Damaged Ink Coupling (revolver)	Check/replaced damaged Ink Revolver. Replace Ink Tanks.
	Toolbox displays …Low_Ink or Ink_Out… message. Toobox displays Ink_Error or Ink Valve Error.	See Service Menu, Commands Help "nvm_hw" settings. Check to be sure Wiper_motor = E and Pump_motor = B. Check/clean Sensor board on Dual Pinch Valve. Check ink tubes. Is the Antistatic Brush Assy pinching tubes?
	Pinched/kinked ink tube(s)	Replace ink tanks. Replace the Ink Tank Replace the printhead.
	Ink Tanks may be 1/3 full or less. Ink Tank Issue Printhead ink channel(s) are clogged	
Ink leaking from the printhead nozzles	Print Engine was opened to angle greater than 60º.	Do NOT open Print Engine to angle greater than 60º.
	Printer not level.	Make sure the Print Engine is level.
	Excessive back-pressure within ink system; caused by print engine being powered-down when not in use.	Allow print engine to remain powered-up, when not in use, so it can routinely cycle the pinch valve to equalize back-pressure in the system. Replace the capping station or the entire service station.
	Wicking material, inside capping station, is making contact with the printhead nozzles.	Install missing Ink Tanks. Verify that Ink Tank Latches are fully closed and locked. Clean Ink Couplings.
	Opening in ink system; allowing loss of vacuum.	Verify that Printhead Latch is fully closed and locked. Check for cut in ink line(s) or damage Ink Revolver.

The Printer

Troubleshooting Tip: If you recently replaced the Main Board and you are experiencing problems; please see "Replacing the Main PC Board (MPCA)" and "MPCA (Main Printed Circuit Assembly) Connections"; to verify your connections. Also check for damaged wires and loose connections.

NOTE: The printer will not print if any of the five ink tanks are empty or missing.

Dots or Lines Printed on Media

CONDITION	PROBLEM	SOLUTION
Multiple horizontal black lines are printed down the length of the media.	You have exceeded the maximum print width of 8.5".	Reduce paper width to 8.5" to avoid exceeding the max print width of printer. NOTE: This symptom only occurs with older firmware. Contact Tier 2 Support to update the printer's firmware.
A thick horizontal black line is printed at or near the trailing edge of the media.	Purge Bar (intrapage spitting) is hitting trailing edge of media. Media is hesitating or skewing during transport. Hole in media is passing over the Paperpath Entry sensor. Media is oddly shaped (running media with open flap at trailing edge).	To help keep nozzles from drying (clogging); all nozzles of the printhead are purged, between each page (intrapage spitting). Check/adjust media feed setup. Check for proper install of Forwarding Roller Guide Assembly. Check for obstruction within the Print Engine. Rotate media and image so hole in media does not travel over the Paperpath Sensors. Adjust the "Purge Bar Position" value; located in the User Interface Menu of the Toolbox. Default = 3000. If you don't see this feature in the User Interface Menu; please contact Tier 2 support to update the printer's firmware. Use compatible media.
Very small dots (gray overspray) are being printed down length of media.	These dots are formed by interpage nozzle spitting. Controlled by the KWS (Keep Wet Spitting) setting.	Interpage (on the page) nozzle spitting is normal. This feature is used to help keep nozzles from drying (clogging). With firmware version 110928_u and higher the Toolbox provides a "KWS Setting" that can be used to adjust the Level of spitting.

Power (Power-Up) Problems

CONDITION	PROBLEM	SOLUTION
Main Power Switch is ON, but the ON/OFF button does not illuminate.	No power being delivered to printer or print engine not powered-on.	Check that the power cord is plugged in. Check that the wall power outlet is live. Check that Main Power Switch is turned ON. Press the ON/OFF button and wait 45 seconds.
	ON/OFF button pressed more than once.	After pressing the ON/OFF button it takes about 45 seconds for the print engine to power-up and the lights to illuminate.
	Problem within printer. (ON/OFF Button, Fuse, Receptacle, Power Supply, Main PCB)	Try powering-up engine using small red button, located below power connection on Main PCB. If it powers up then there is an issue with the ON/OFF button. Disconnect Power Cord and check Fuse in Receptacle. Replace bad Fuse. If Fuse is OK, reconnect power and check output on Receptacle. Replace receptacle if bad. If Receptacle is OK check input to Power Supply. If Input to power supply is OK then check Power Supply Output. If output is bad, replace Power Supply. If Power Supply is providing power (24VDC) to Main PCB, replace Main PCB.
	Wrong model selection in Toolbox	Check “set_model” in Toolbox, Service Menus, Commands Help menu. Valid for FW 2014xxxx or higher

Service Station Problems

Troubleshooting Tip: With firmware 20130820 or higher; you can open the clamshell and inspect the movement of the wiper roller if you press the "Wipe Printhead" button in the Toolbox".

CONDITION	PROBLEM	SOLUTION
Service Station Drive Motor stalls.	Service Station was not installed properly.	Eject Service Station. Cycle print engine off/on. If drive motor turns without stalling then motor is OK. Before re-installing Service
		Make sure SS is installed squarely. Check for physical resistance to movement.
	Wiper roller securing latches are not closed; preventing Service Station sled from moving properly. Jammed gear train due to broken post or improperly seated gears.	Station, make sure: wiper roller latches are closed and not damaged, reseat the roller gears and/or squeegee, clean debris from blade and rollers.
	Damaged Service Station	Replace Service Station.
	Damaged Lifting Arm	Replace damaged Lifting Arm.
	Damaged Motor	Replace Motor
Wiper Motor doesn't turn or stalls	Cable not connected.	Verify ribbon cable and motor cable are properly connected to board on side of Service Station.
	Squeegee blade wedged, not seated properly.	Reseat squeegee blade.
	Debris build-up on blade and rollers, increasing friction.	Clean rollers and blade.
	Bad wiper roller motor.	Replace Wiper Motor Assembly or Service Station.
	Bad DPCA board.	Replace DPCA board.
Color mixing occurs after wiper roller performs a cleaning	Wiper Roller is over-saturated; usually due to excessive cleaning.	Allow printer to sit, powered ON, for 2-3 hours or replace wiper roller.
	Squeegee blade is wedged, not seated properly, bowed or gouged (badly scratched). Not removing ink/debris from roller.	Reseat wiper roller squeegee blade. If squeegee blade is damaged/bowed, replace components or Service Station.
	Wiper roller not turning	Verify ribbon cable and motor cable are properly connected to board on side of Service Station. Check/replace Wiper Motor Assembly. Check/replace DPCA board.
Service Station cannot be removed from the Print Engine	Wiper Roller Latches were not completely closed when the Station was installed. Latches now hooked on bottom of paper path.	Secure latches and reinstall. If wiper roller latches are damaged; replace Wiper Motor Assembly or Service Station.
	Service Station manually installed too far with Lifting Arms up.	Make sure arms are down before manually installing Service Station.
	Damaged Lifting Arms	Replace Lifting Arms.

Interface Communication Problems

CONDITION	PROBLEM	SOLUTION
M Series Driver does not respond to printer being connected via USB. Driver shows printer off-line, even with printer connected and powered-up.	Wrong USB port selected in "M Series Driver".	Verify that you are selecting the appropriate USB port in the driver Ports Tab. **Note:** During driver install the USB port was automatically assigned. However if someone changes the port setting in the driver you will need to manually reassign the port.
	More than one copy of the "M Series Driver" is present and the wrong one was selected.	If a second M Series Driver was loaded; be sure to select the appropriate one as your default.
	System is hung-up.	Clear spooler; then turn printer and computer OFF and ON.
	USB Port, or Cable Connection problem	Test using known good USB cable; replace cable if necessary. If still no communication; check printer using another known good system (computer, software, cable).
No communication with Toolbox utility.	Computer system does not meet minimum requirements.	Check that computer system meets minimum requirements.
	Java/Microsoft .NET Framework not installed or version not supported.	Install/Update Java to version 6. Install Microsoft .NET Framework 3.5 (32 bit) or 4 (64 bit).
	Printer's Toolbox (Embedded Web Server) not responding.	Close and reopen Toolbox utility.
	Firewall is blocking communication with Toolbox.	Change firewall settings to allow access.
	System is hung-up.	Reboot printer/computer.
	USB Cable connection issue.	Check/replace USB cable.
Job is sent, but printer does not feed or print.	Toolbox set to "Ink Estimation Mode"	Open Toolbox Ink Usage menu, Disable (uncheck) Ink Estimation Mode and press Submit.
	Printer not connected to computer.	Connect printer cable to computer and resend job.
	Printer Error	Open Toolbox utility to view errors.
	Media Sensor is covered in Print Engine.	Open clamshell and remove media.
	Improper Driver Config.	Uninstall, Re-install Driver.
	System is hung-up.	Reboot printer/computer.
	Incorrect settings for wiper & pump motors.	Check "nvm_hw" values in Toolbox, Command Help menu. wiper=E, pump=B
Erratic output (printing garbage, feeding blanks, etc.)	Problem with software	Test from another software prgm.
	Improper driver selected.	Use M Series Driver
	System disrupted by static energy	Cycle Printer power & try again.

Feeding Problems

CONDITION	PROBLEM	SOLUTION
Intermittent feeding	Media Support Wedge not used.	The Media Support Wedge adds a slope to the stack and helps feeding.
	Side Guides set too tight to media.	Readjust Side Guides.
	Dirty Feed Rollers.	Clean the Feed Roller with distilled water and a cloth. DO NOT use any solvents or detergents as they may damage Rollers.
	Paper stuck together.	Fan media before placing it in Printer.
	Uneven mail piece.	Tap inserts to front of envelopes and retry.
Multiple feeds (double feeding)	Separator gap not set properly.	Adjust Separators to thickness of media.
	Worn Sheet Separators	Replace worn Sheet Separators.
	Media stuck together.	Fan the media before loading in Printer.
Failure to feed	Toolbox set to "Ink Estimation Mode"	Open Toolbox Ink Usage menu, Disable (uncheck) Ink Estimation Mode and press Submit.
	Side Guides set too tight to media.	Readjust Side Guides.
	Feed gap too tight.	Adjust Separator to thickness of media
	Feed gap too loose.	Adjust Separator to thickness of media.
	Material is out of specification.	Maximum thickness is 0.020".
	Motor on, Rollers not turning.	Check for broken Drive Belt and replace. Check for loose set screws on Drive Pulley or Belt Drive Roller Pulley.
	Clutch not engaging (forwarding rollers turning, but paper feed rollers not turning)	Check drive to clutch.
		Check connection J551 at Main PCB. Replace Clutch.
	Motor not driving	Check that motor is receiving power from the power supply.
	No power.	See Power Problems in this Section.
Jams	Paper path obstruction.	Clear jam and remove pieces remaining under Printhead. Try removing PPS spacers (blue plastic inserts) from platen.
	Paper not loaded properly.	Instruct operator in proper loading of media.
	Media Support Wedge not adjusted properly.	Adjust Media Support Wedge.
	Separators improperly adjusted.	Adjust Separators to thickness of media.
	Media curled or bent.	Uncurl media.
	The Separators are worn.	Replace Separator tip.
	PaperPath Exit sensor is having trouble seeing the underside of the media (non-reflective colors).	In Toolbox, select (check) "Ignore Exit Sensor". Feature added with firmware version 110928_u and higher.
	Feeder Encoder dirty misadjusted.	Check/adjust Feeder Encoder

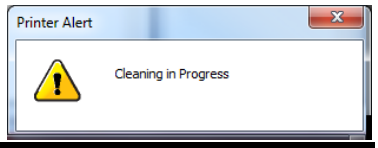
Feeding Problems (continued)

CONDITION	PROBLEM	SOLUTION
Right edge of media being damaged as it travels through print engine area	Media is hitting the limits inside the print engine.	Make sure Adjustable Media Side Guide is at least 1/8" away from side frame. If stock is over 9.5" wide; you need to use narrower stock.
Blank piece(s) fed at end of job and or last piece does not exit the Print Engine. **Note:** It is normal to get blanks at end of job when using "Max Throughput" mode. **Tip:** If last page stops inside Print Engine, the printer may stay in the "Maintenance Mode" until the media is cleared from the print engine	Toolbox "Cutsheet Feeding Mode" is set to Max Throughput. Feed Sensor is dirty/dusty/damaged Improper Connection at I/O board. Improper Connection of J703 at Main PCB Damage to cable that runs between S4 on I/O board to J703 on Main PCB.	In the Max Throughput mode the printer will feed 1 or 2 blanks at end of job. Set to "Safe Feed" to eliminate this issue. Check/Clean/Replace Feed Sensor and or Reflector. Check Connections at I/O board. Check to be sure J703 at Main PCB is connected to proper socket. Repair cable.
Feed Section Feeding Faster than Print Engine. (Causing media to buckle/jam as it enters printengine.)	Problem with Feeder Encoder Sensor Signal.	Check Connection to Encoder Sensor. Clean Encoder Wheel. Check/adjust Encoder Sensor Position on Encoder Wheel.

Error's and Warnings

Alert Window Messages

Messages sent from the driver and displayed on PC screen in a small popup window.



MESSAGE	SOLUTION
Cleaning in Progress	Wait until the message disappears. The printer will start printing your job once the cleaning process has completed.
Excessive Tilt Error	See details under "Toolbox System Status Messages" section.
Incompatible Printhead	Remove and re-insert your printhead cartridge. Replace printhead. Printhead cartridges must be purchased from authorized supplier for this printer model.
Incorrect … Ink Tank	Replace Ink Tank. Ink Tanks must be purchased from authorized supplier for this printer model.
…. Ink Low Example: Black Ink Low	Reorder Ink
…. Out of Ink Example: Cyan Ink Out	Replace empty Ink Tank
Load Paper	Out of Paper. Load paper into printer and press the PAPER/RESUME button.
Mechanical Jam	Check for and remove obstruction, then press PAPER/RESUME button. Check/Clean sensors.
Missing Printhead	Remove printhead cartridge. Check/clean electrical contacts. Reinsert printhead. Replace printhead.
Multiple Inks Low	Reorder Ink
Multiple Ink Tanks Out	Replace empty Ink Tanks
Multiple Ink Tanks are missing	Insert missing Ink Tanks. Clean electrical contacts and re-seat Ink Tanks.
Multiple Unauthorized Ink Tanks	Remove and re-insert Ink Tank. Replace Ink Tank. Ink Tanks must be purchased from authorized supplier for this printer model.
Paper Jam	Remove jammed media. Check for proper feed setup, then press PAPER/RESUME button. Check/Clean sensors. If stock has non-reflective colors on underside; in the Toolbox, select (check) "Ignore Envelope Sensor". Feature added with firmware version 110928_u and higher.
Printhead Latch Open	Ensure printhead cartridge has been inserted properly then closer the printhead latch so it locks.
Print Zone Assembly (Clamshell) Open	Check to be sure the Clamshell is completely closed and latched. Make sure Print Engine Latches are secure.
The … Ink Tank is missing	Insert missing Ink Tank. Clean electrical contacts and re-seat Ink Tank.
Unauthorized … Ink Tank Installed	Ink Tanks must be purchased from authorized supplier for this printer model.
Unauthorized Printhead	Printhead cartridges must be purchased from authorized supplier for this printer model.

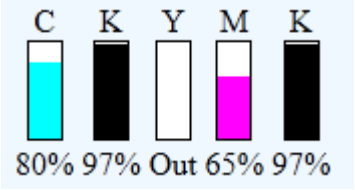
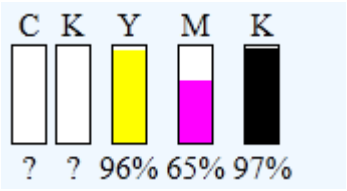
Toolbox System Status Messages

Displayed, in red, in the M Series Toolbox utility.

SYSTEM STATUS	PROBLEM	SOLUTION
PAPERPATH_FEED_TIME OUT	Out of Paper Media is not reaching the print engine. Hesitation in media feed.	Load media into printer and press the PAPER/RESUME button. If media is present; check/adjust the guides and separators. **Tip:** It is also possible to get this error if the media jams after reaching the Paperpath Exit sensor, and the trailing edge is still in the Entry sensor. See below.
	Possible Paper Jam; if error is shown in combination with "Reason: Uncapped printhead or clamshell open" message.	See "Paperpath_Paperjam" solutions.
PAPERPATH_PRINTZONE _BLOCKED **or** **PAPERPATH_PAPERJAM** Paperpath: Entry:Yes Exit:Yes or Paperpath: Entry: No Exit:Yes or Paperpath: Entry:Yes Exit:No No = not blocked Yes = blocked (interrupted)	Paper Jam Media jam detected. Printer has detected that one of the media sensors is blocked (interrupted).	Carefully open the Clamshell, remove jammed Media from printer and close the Clamshell. The System Status message in red should go away. The toolbox "Paperpath" line should change to: Paperpath: Entry: No Exit: No After you clear the jam you can; Press RESUME button to continue printing or press the CANCEL button to cancel the job.
DOOROPEN_FRONT	Printer has detected that the "Clamshell" is open. Sensor cable P2002 may be unplugged. Z2i engine doesn't have switch. Must disable recognition of switch.	Verify that the "Clamshell" is closed and securely latched at both sides. If closed; check clamshell latch & switch. Use Scan Sensors feature in the Toolbox Service Menus to test clamshell switch. Select (check) the "disable_clamshell" feature in the Service Menu, "Printer Control Config". To permanently save change; be sure to power-down engine after pressing Submit.
MAINTENANCE_BUSY	Printer is performing maintenance.	No action is required. Wait for printer to finish.
	Printer is waiting to perform maintenance; if error is shown in combination with "Reason: Uncapped printhead or clamshell open" and there is no maintenance activity (noise) coming from printer.	Remove media from print engine. See "Paperpath_Paperjam" solutions. If problem continues clean Paperpath Entry and Exit sensors. If problem continues check/test/replace sensor(s).

Toolbox System Status Messages (continued)

Displayed, in red, in the M Series Toolbox utility.

SYSTEM STATUS	PROBLEM	SOLUTION
X_INK_LOW Example: CYAN_ INK_LOW	X = Color. One or more Ink Tanks are low on ink.	Ink Tank replacement will be necessary soon. Reorder Ink
INK_OUT_X Example: INK_OUT_YELLOW  	X = Color or "MULTI" One or more Ink Tanks are out of ink MULTI = more than one.	Replace empty Ink Tank(s) Verify that Ink Tanks are seated firmly and latches are fully closed. Clear error by cycling print engine power, using ON/OFF button. See "Troubleshooting", "The Ink Tanks" for additional details.
INK_OUT_ANY	Tank improperly flagged as out. This was a firmware bug.	Update the firmware to 20130820 or higher. After doing so; Tanks with this condition can still be used.
CARTRIDGE_MISSING_X  	X = Color or MULTI Missing Ink Tank, or Ink Tank not being recognized	Replace Ink Tank(s) using proper procedure. Insert missing Ink Tank. Clean Ink Tank contacts as outlined in "Operator Maintenance" section. Clear error by pressing the "Refresh Ink Levels" button in the Toolbox. Clean Ink Tank contacts located at the back of the Ink Tank slot. If problem continues with known good Tank, then replace the ink tank interface board (board that makes contact with Tank inside the printer).
DATA_PATH_UNDERRUN	Media is not making it from the entry sensor to exit sensor in the appropriated time. Possible issue with format or orientation of job being sent. Possible issue with Encoder in Print Engine. Resistance to Print Engine drive or media movement.	Check for dirty grit rollers within print engine. If media is slick (slippery), try a different media. Check/clean sensors. Try changing the orientation setting in the software/driver or setting a different media size. Check/clean encoder and wheel. Units with Uncovered Encoder Wheel: Carefully clean the Encoder Wheel, located at the operator side of the print engine, using a lint free cloth dampened with distilled water. Install the Encoder Shield Kit (part # 42-900-20). Check for mechanical issues that may cause resistance to transport or media movement. Check belt tension. Use tool (42-110-54) to properly set belt tension.

Toolbox System Status Messages (continued)
Displayed, in red, in the M Series Toolbox utility.

SYSTEM STATUS	PROBLEM	SOLUTION
TILT_ERROR **or** **EXCESSIVE_TILT_ERROR**	The printer's electronics have detected that the print engine is too far out of level. Tilt sensor needs to be re-calibrated.	If just powered on, wait a few minutes; error may clear by itself. Once Tilt level reading changes to "black" you can clear the error using the "Clear Error" feature in the Toolbox. Make sure printer is placed on sturdy, level, worktable. Do NOT level the printer, level the table. Do NOT move the printer while the power is on. If problem persists; see "How to Zero the Tilt Sensor".
MECH_FAIL_PERMANENT **Reason: Sled lift failed** **Reason: Ink valve failed** **Reason: Sled home failed** ***[Fatal 71 02-? Offline cancelpage]*** **NOTE**: If you get this error, please update the printer's firmware to 20130820 or higher. After doing so, you will see the message change to: MECH_FAIL_PERMANENT	Mechanical failure or sensor failure. One of the printer's mechanical components was not properly registered at the expected position.	If the Service Station was just installed; check to be sure it was installed properly. Depending on the "reason"; check/ the associated component and related sensors. Using the Scan Sensors page in the Toolbox, perform the toggle test on the Sensor responsible for registration of the failed mechanical component position. Lifter Arm Sensor is dirty or damaged, Lifter Motor Cable is unplugged, operator's side Lifting Arm is damaged, or the Lifting Arm mechanism is stuck. Dual Pinch Valve problem: Check Sensor board connector and flag/sensors alignment. Check Valve motor connector. Check P2005 cable on MPCA. At this point, this error may represent an Ink Pump error, since there is no return signal from the pump and therefore, a separate message describing an Ink Pump error. Check/replace the Ink Pump.
System Status: ONLINE **Reason: Uncapped printhead or clamshell open**	Service Station was just ejected (using Eject Service Station button). Service Station Home or Index Sensors are damaged/malfunctioning	Re-install the Service Station (as outlined in this manual) Use the Toolbox Scan Sensors feature to test these sensors. May need to remove Service Station and manually interrupt/uninterrupted each sensor.

Toolbox System Status Messages (continued)
Displayed, in red, in the M Series Toolbox utility.

SYSTEM STATUS	PROBLEM	SOLUTION
[Crit 63 03-phead offline cancelpage restart] J250/260 Disconnected or Swapped: System Status: [Crit 63 03-phead offline cancelpage restart] Mech State: STANDBY Mech Status: [Crit 63 03-phead offline cancelpage restart] Maint Status: MAINT Reason: Printhead error Firmware: 20130820 Serial Number: SG16PZ401713 Printhead: A022C5 - Primed	Problem communicating with Printhead or Pen Board. Dirty/damaged contacts. Cable unplugged or swapped. Cable or Board fault.	Eject Printhead and inspect/clean contacts (printhead and pen board). Look for bent pins. Replace Printhead Check/reseat the Cat5 cables (P250/260 & J250/260) that connect between the Main PCB and Pen Board. Make sure cable positions were not mistakenly swapped. Try replacing Cat5 cables. Try replacing the Main PCB. Try replacing the Pen Board.
PRINTHEAD_MISSING NOTE: This message can be misleading. If a printhead serial number (example: A022C5) is displayed the printer is seeing that a printhead is installed. Printhead Latch Open: System Status: PRINTHEAD_MISSING Mech State: STANDBY Mech Status: ONLINE Maint Status: MAINT Reason: Uncapped printhead or clamshell open Firmware: 20130820 Serial Number: SG16PZ401713 Printhead: A022C5 - Primed J2001 Disconnected: System Status: PRINTHEAD_MISSING Mech State: STANDBY Mech Status: ONLINE Maint Status: MAINT Reason: Printhead error Firmware: 20130820 Serial Number: SG16PZ401713 Printhead: A022C5 – Primed	System hasn't fully initialized. Printhead Latch open or problem with latch sensor signal. Maintenance may be disabled.	If just powered on, or printhead was just installed; wait a few minutes, error should clear by itself. Make sure printhead latch is closed. Check cable J2001 at Main PCB. Check Latch Sensor using Sensor_Check_Script. NOTE: This sensor output is not shown in Toolbox, Scan Sensors feature (FW 20130820). Make sure “disable_maint” is unchecked it Toolbox; under Service Menus, Printer Maint Config. If not, uncheck, press Submit and them power-down the print engine. You may also want to check for proper Printer Control Config settings at this time. You can use the "Reset to Factory Settings" button, if you are unsure of the proper settings. Make a note of the tof_adjustment and left_adjustment before resetting. IMPORTANT! Make sure you power-down the print engine properly, after submitting changes; or they will not be permanently saved. They will revert back to previous settings if print engine is not powered-down properly.
PRINTHEAD_MISSINGQA P1 Disconnected: System Status: PRINTHEAD_MISSINGQA Mech State: STANDBY Mech Status: ONLINE Maint Status: MAINT Reason: Printhead error Firmware: 20130820 Serial Number: SG16PZ401713 Printhead: 0 * pwm - 1008 set load [expr {[fmult -6 - Primed	No printhead installed Printhead not making proper connections. Problem with printhead. Cable unplugged, damaged or misconnected.	Install Printhead Cartridge. Remove printhead and check/clean contacts; then reinstall printhead. Look for bent pins at Pen Board. Replace printhead. Check the P1 (MPCA P1) connection at the Main PCB. Try re-seating this connection.

Toolbox System Status Messages (continued)
Displayed, in red, in the M Series Toolbox utility.

SYSTEM STATUS	PROBLEM	SOLUTION
PRINTHEAD_UNPRIMED	**Printhead priming process has failed.**	If just powered on, wait a minute; error may clear by itself. If priming fails; replace missing/empty Ink Tanks or Tanks that are reading less than 30%. Check for kinked or pinched ink tubes (Forwarding Roller Guide Assembly may be pinching tubes). Wet print nozzles using deionized or distilled water and try re-priming again **Warning:** If priming fails a second time, let printer sit for a few hours before attempting again. Release Printhead and reinstall; using proper techniques.
MECH_CANCELPAGE	Job was canceled by user pressing the CANCEL button. Job was interrupted by "Clamshell" being momentarily opened.	Wait until print job has cleared from printer. Then manually clear job from computer's print queue. Then send new print job. Check to be sure "Clamshell" is securely latched, and then press "Clear Error" button to continue. If problem continues check Paperpath Entry sensor, Clamshell Latches and Switch.

Tip: The printer will not print if any of the five ink tanks are empty or missing.

Control Panel Light Sequences
See Section titled "Printer Status Light Indicators".

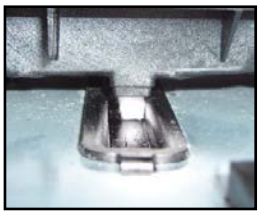
Ink Accumulating in the Wrong Areas of the Printer

Ink deposited into the Service Station during purging, cleaning, capping travels from the service station into a trough below the service station, where it is channeled down into the Waste Ink Tray. If ink is accumulating in areas that are not normal waste ink paths please check the following possibilities.

Ink Accumulating Under the Wiper Motor, in the Service Station Tray.
Wiper motor gearbox may pick up this ink and thrown it inside the Service Station Slot and onto the lower rollers in the Print Engine. This ink will then be transferred onto the upper rollers and onto the media as it is fed through the printer.

- Check to be sure the printer is on a Level Surface.
- Replace the Service Station

Ink Accumulating under the Service Station (on base of Service Station Slot).
Waste ink from the Service Station flows through the wicking material and out the hole, located on the bottom of the service station. In some cases the wicking material that hangs out this hole may not be directed into the trough located below the Service Station. If this occurs ink will build up on the base of the Service Station Slot.



- Check to be sure the wick is hanging in the waste ink trough.

Ink Accumulating in the Body of the Printer or Under the Printer.
If you find ink below the Waste Ink Tray, in the lower body of the printer, or outside the printer.
.

- Proper Shipping/Service precautions may not have been followed. For example if printer was tilted and there was ink in the un-sealed ink system, it could end up anywhere inside the printer.
- Check to be sure the printer is on a Level Surface
- Check to be sure the service station wick is hanging in the waste ink trough.
- Check to be sure the Waste Ink Tray is properly installed.
- If the absorbent material is saturated, replace the Waste Ink Tray.
- Check for damage to *the* ink delivery system. Damaged Ink Tubes, Ink Tanks, Ink Couplings (revolvers), etc…

Jams in the Printer

When the printer detects a media feed problem, it will stop automatically.
Depending on where the media stops; the message "PAPERPATH_PAPERJAM" or "PAPERPATH_FEED_TIMEOUT" will be displayed in the Toolbox.
Once the jam has been removed from the system and the print engine is closed; press the PAPER/RESUME button on the control panel or press the Clear Error button in the Toolbox to continue printing.

TIP: If the printer will not "resume" after a "PAPERPATH_PAPERJAM" is detected (Toolbox System Status changes to "ONLINE" and the Mech State changes to "PREP", but it will not continue printing); this is normally an indication that one or more of the media sensors is still interrupted. Please be sure to remove media from and check/clean the Paperpath sensors and the Feed Sensor.

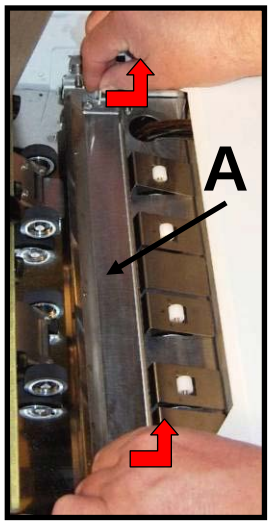
Some possible causes for jamming are:

1. Feeding more than one piece of media at a time (double-feeding), due to improper sheet separation adjustment, improper media loading, or nested media (envelopes that are caught under the flap of another envelope or stick to one another).
2. Damaged media, such as dog-eared (turned down corners), curled or bowed media.
3. Media that is not stiff enough may not be usable. Media that meets Postal stiffness requirements for automated feeding is acceptable in the Digital Color Printer.
4. Media that is too thick for the printer.
5. Media that is too wide for the printer or media that skews as it travels through the printer.

Removing Jammed Media

Clearing a jam depends on where the jam occurred.

From the Feed Section: Remove media stack. Loosen and lift the sheet separators to clear the jam. Then re-adjust the sheet separators as described in this manual.



Under the Antistatic Brush Assembly: If necessary, remove the Antistatic Brush Assembly [A] to access jammed material. Unlatch the two latches (one on either side of the Assembly) and lift the assembly off the four mounting pins as shown. **Do not bend the guide fingers!** Clear the jam, and then carefully reinstall the Antistatic Brush Assembly. Make sure brush assembly is correctly reinstalled and aligned before starting to print. Assembly should sit flat on transport area surface

CAUTION
BE CAREFULL NOT TO PINCH OR CUT THE INK HOSES WHEN RE-INSTALLING THE ANTISTATIC BRUSH ASSY.

From the Print Engine Area: Open the Top Cover. Lift up on the two latches (*one on each side of the print engine assembly*) and raise (swing open) the Print Engine Assembly [C]. Clear the jam, then lower and re-latch the Print Engine Assembly. Then close the Top Cover.

CAUTION: Do NOT open the Print Engine Assembly to an angle greater than 60º. Damage to the ink color tubes and other issues will result.

Misfeeds

Misfeeds can be corrected by readjusting the Sheet Separators to the media or replacing them. See "Replacing the Sheet Separators".

How to Zero the Tilt Sensor

CAUTION! Prior to using this option, verify that your printer is on a sturdy, level surface. This is of utmost importance, since being out of level can cause the printer to perform poorly. Level the table surface, Not the printer.
If the printer was recently powered on, wait at least 20 minutes before performing this task. This will allow the printer's electronics time to warm-up and its tilt sensor values to settle.
NOTE: If the Tilt error can be cleared by clicking on the "Clear Error" button in the Toolbox, then there is no need to proceed.

Once you verify that the printer is on a sturdy level surface; proceed with the appropriate procedure below, to reset the printer's baseline to zero.

Using the PAPER and CANCEL buttons to Zero the Tilt Readings.
Valid for Printers with Firmware 110928_u or higher installed.

1. Open the Toolbox utility.
2. Simultaneously press and hold the PAPER and CANCEL buttons for 5 seconds. Then release the buttons.
3. In the "User Control" screen; verify that the Tilt readings have been zeroed (0.0 + or – 0.20).
   NOTE: If you are unable to zero the Tilt readings using this procedure; please use the process described below "Using the Service Menu Features to Zero the Tilt Readings".
4. If the Tilt readings have been zeroed but a "Tilt Error" is still showing at the top of the Toolbox screen; click on the "Clear Error" button. This should clear the Tilt Error.
5. Hit the printer's ON/OFF button to power-down the printer.
6. After the printer shuts down completely (all lights off), hit the ON/OFF button again to power-up the printer.
   NOTE: These last two steps are done to insure that the printer saves the settings.

Using the Service Menu Features to Zero the Tilt Readings.
Valid for printers with all firmware versions.

1. Open the Toolbox utility.
2. Click on "Service Menus".
3. Type password (servicepw or 630). Try both.
4. Click on "Printer Maint Config".
5. Click on the "Zero Tilt Sensor" button.
6. Go to "User Control" and verify that the Tilt readings have been zeroed (0.0 + or – 0.20).
7. If the Tilt readings have been zeroed but a "Tilt Error" is still showing at the top of the Toolbox screen; click on the "Clear Error" button. This should clear the Tilt Error.
8. Hit the printer's ON/OFF button to power-down the printer.
9. After the printer shuts down completely (all lights off), hit the ON/OFF button again to power-up the printer.
   Note: These last two steps are done to insure that the printer saves the settings.

SECTION 3 – *Toolbox Service Features*

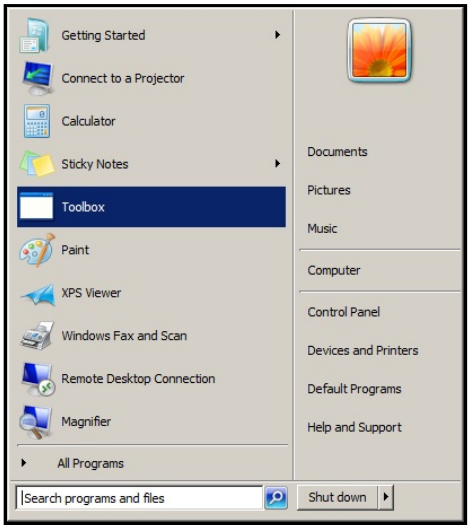
Using / Opening the Printer Toolbox

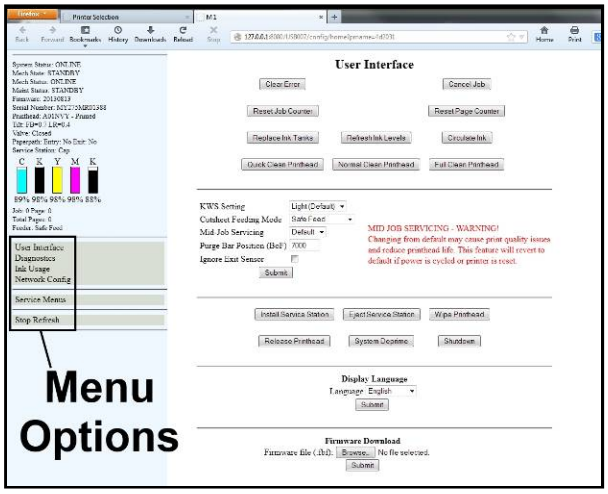
Once the Printer Driver is installed you have access to the Toolbox. The Toolbox lets you check printer status, monitor ink usage, perform diagnostic checks, print reports and run maintenance tasks on the Printer from your computer.

NOTE: Please refer to the Operators Guide for more details about other features in the Toolbox that are not covered in this Service Manual.

To open the Toolbox:

Open the Start Menu, then click on **Toolbox**. When the **User Interface** window opens you will find a series of Menu Options you can click on at the lower left of the screen. You can check the Printer Status in the upper left part of the screen.

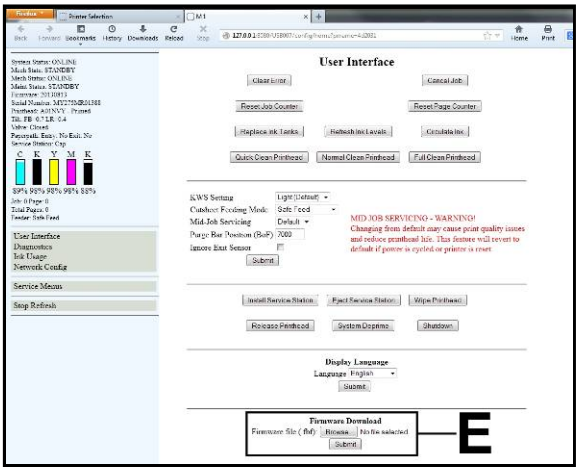


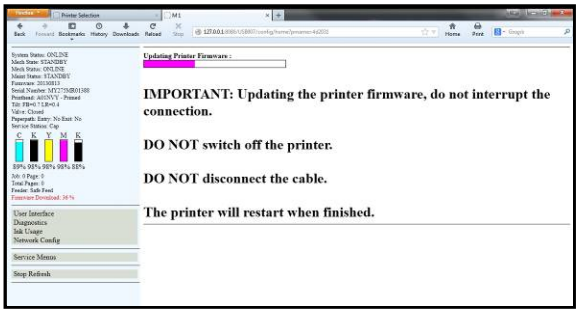


Firmware Download Feature

[E] Firmware Download – Get the latest version of firmware for your Printer.
How to download new firmware:

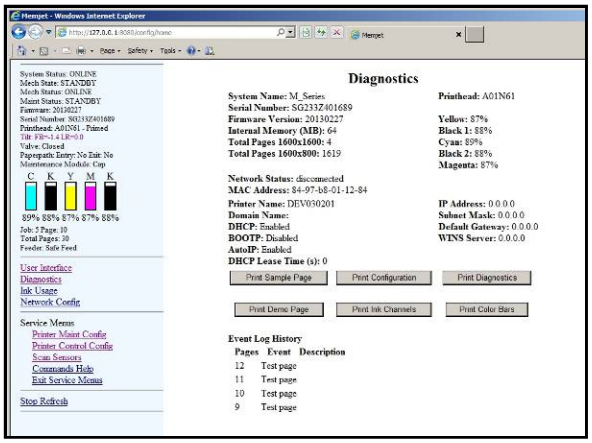
1. When you are notified that new firmware is available for your Printer, download the *.fbf file and save it to your desktop.
2. Open the Toolbox. On the "User Interface" page, find **Firmware Download.**
3. Click the "Browse" button, then select the file you just saved to your desktop.
4. Click "Submit". **DO NOT touch the Printer until the firmware is loaded!** A message will appear on your screen warning you not to unplug or shut off the Printer.
5. Once the firmware finishes loading (*about 5-10 minutes*), the Control Panel lights and the Printer shuts OFF, then restarts automatically to complete the installation.





Diagnostics Menu

From this screen you can see the current status of your Printer. You can also:



Print Sample Page – Prints type and color bands to check print quality.

Print Configuration Page – Displays the current configuration of the Printer including Firmware Version, Network Connection, Printer Serial Number and more.

Print Diagnostic Page – Displays basic Printer information, memory, Network Settings, Event Log and RAM partitions.

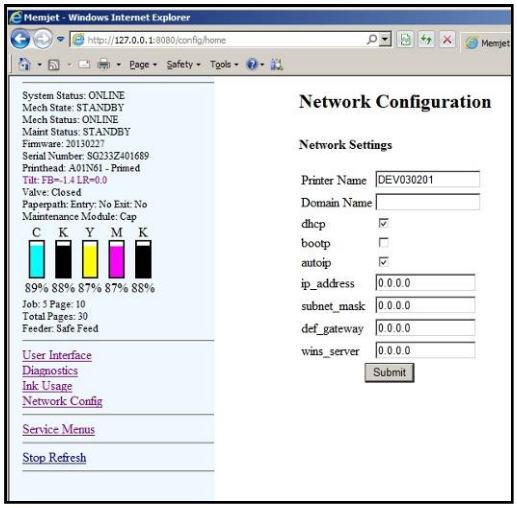
Print Demo Page – Prints a 4-color sheet.

Print Ink Channels – Prints 5 bars (*1 bar from each ink tank*) to indicate how well the Printhead Nozzles are working. **NOTE: This function can also be accessed by pressing the "Print Ink Channels" button on the right side of the Print Engine.**

Print Color Bars Page – Prints a series of 8 color bars to indicate how well the Printhead is mixing colors and printing.

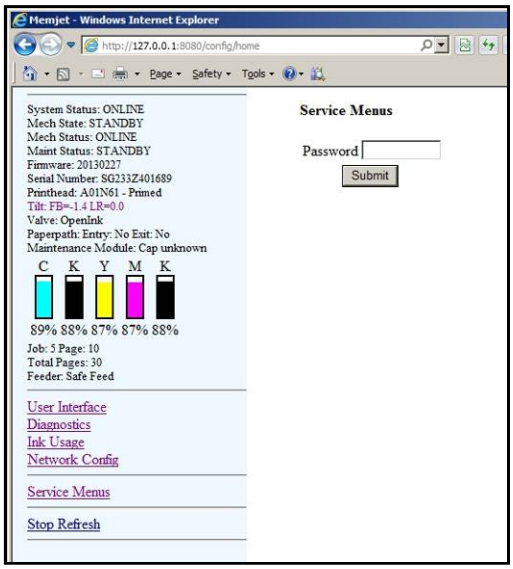
Network Configuration Menu

1. The **"Network Configuration"** page opens. Use **Network Settings** to enter the correct settings for your network.
2. Connect Ethernet cable to Network Port on Rear Panel of Printer.

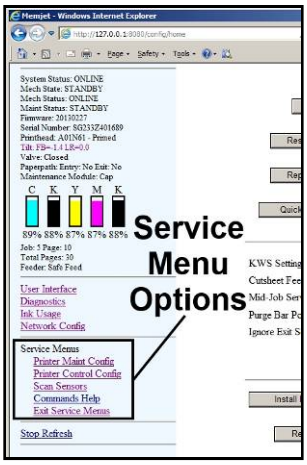


Service Menus

For authorized service personnel only. Provides access to more advanced Printer Control and Maintenance menus. **Enter password "630"** to view the Service menus.



You will notice that several new menu options are available: **"Printer Maint Config," "Printer Control Config," "Scan Sensors," "Commands Help,"** and **"Exit Service Menu."**

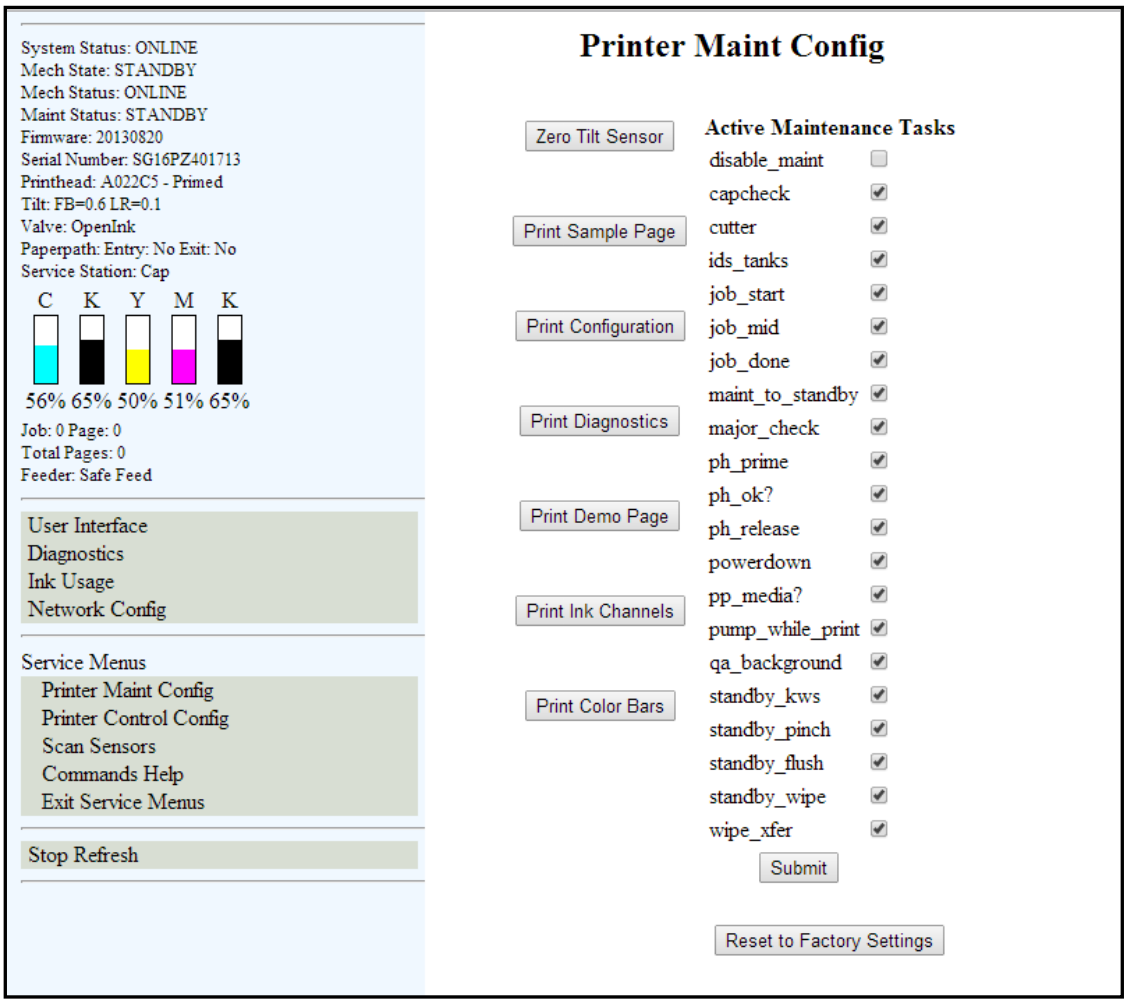


Printer Maintenance Configuration Screen:

Allows technician to enable or disable certain maintenance functions.
"Zero Tilt Sensor" can reset the Tilt Warning in the Printer Status column.
You can also **"Print Sample Page," "Print Configuration," "Print Diagnostics," "Print Demo Page," "Print Ink Channels"** and **"Print Color Bars"** without returning to the **Diagnostics** screen.
You can also return the Printer to the default settings by pressing the **"Reset to Factory Settings"** button.

NOTE: After changing the settings on this page and pressing Submit, you must properly power-down the Print Engine, before they will be saved and take effect. If you skip this step the printer will revert to the previous settings; after a power loss or improper power off (turning the Main Power Switch OFF without powering down the Print Engine).

CAUTION!
To help avoid issues caused by setting these items improperly; please don't change selections from default (shown below) unless instructed by a Tier 2 Support Agent or following a written procedure from this manual.



Printer Control Configuration Screen:

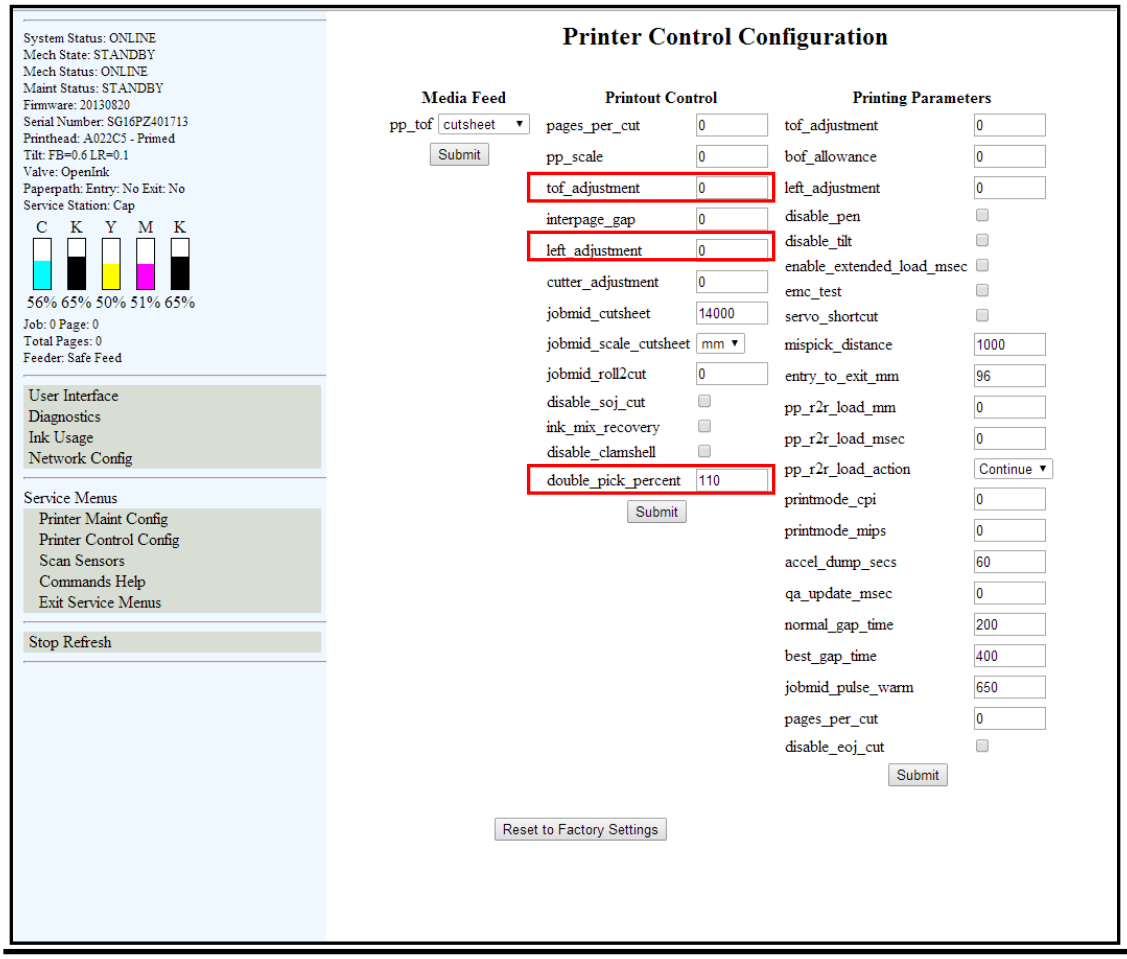
Allows technician to make fine adjustments as to how a job is fed into and through the Printer and how it will print.
You can also return the Printer to the default settings by pressing the **"Reset to Factory Settings"** button.

NOTE: After changing the settings on this page and pressing Submit, you must properly power-down the Print Engine, before they will be saved. If you skip this step the printer will revert to the previous settings, after a power loss or improper power off (turning off Main Power Switch without powering down the Print Engine).

CAUTION!
With exception to the features outlined below in red; please don't make changes from default unless instructed by a Tier 2 Support Agent or following a written procedure from this manual.
If you aren't sure if the settings are correct or not, press the "Reset to Factory Settings" button. Then properly power the Print Engine off/on, to save these changes into non-volatile memory.

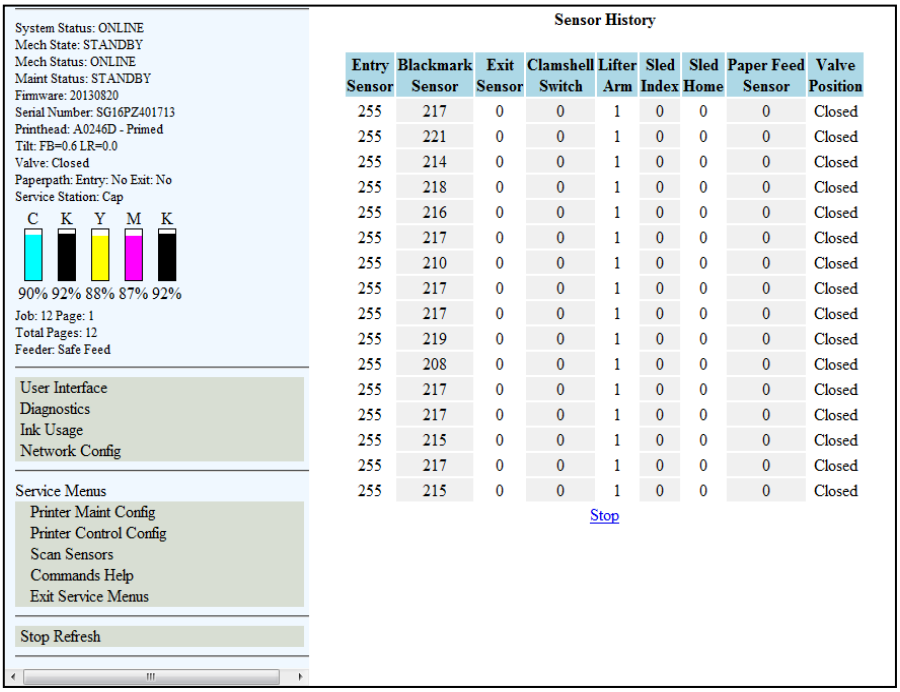
Notes about "jobmid_cutsheet":
It is normal for the "jobmid_cutsheet" value to change automatically with the "Mid Job Servicing" level set in the User Interface screen (values shown below). If you type in a "custom" value, it will be reset to the value set by the "Mid Job Servicing" level in the User Interface screen.

Mid Job Servicing setting = jobmid_cutsheet value
Off = 32,000 meters
Level 1 = 500 meters
Level 2 = 375 meters
Level 3 = 250 meters
Level 4 = 100 meters
Default = 14,000 millimeters (14 meters)



Scan Sensors Screen:

Scan Sensors (*Check/Pole Sensor Conditions*)**:** Provide status and history log on sensors located throughout the Printer.
(*See chart below*)



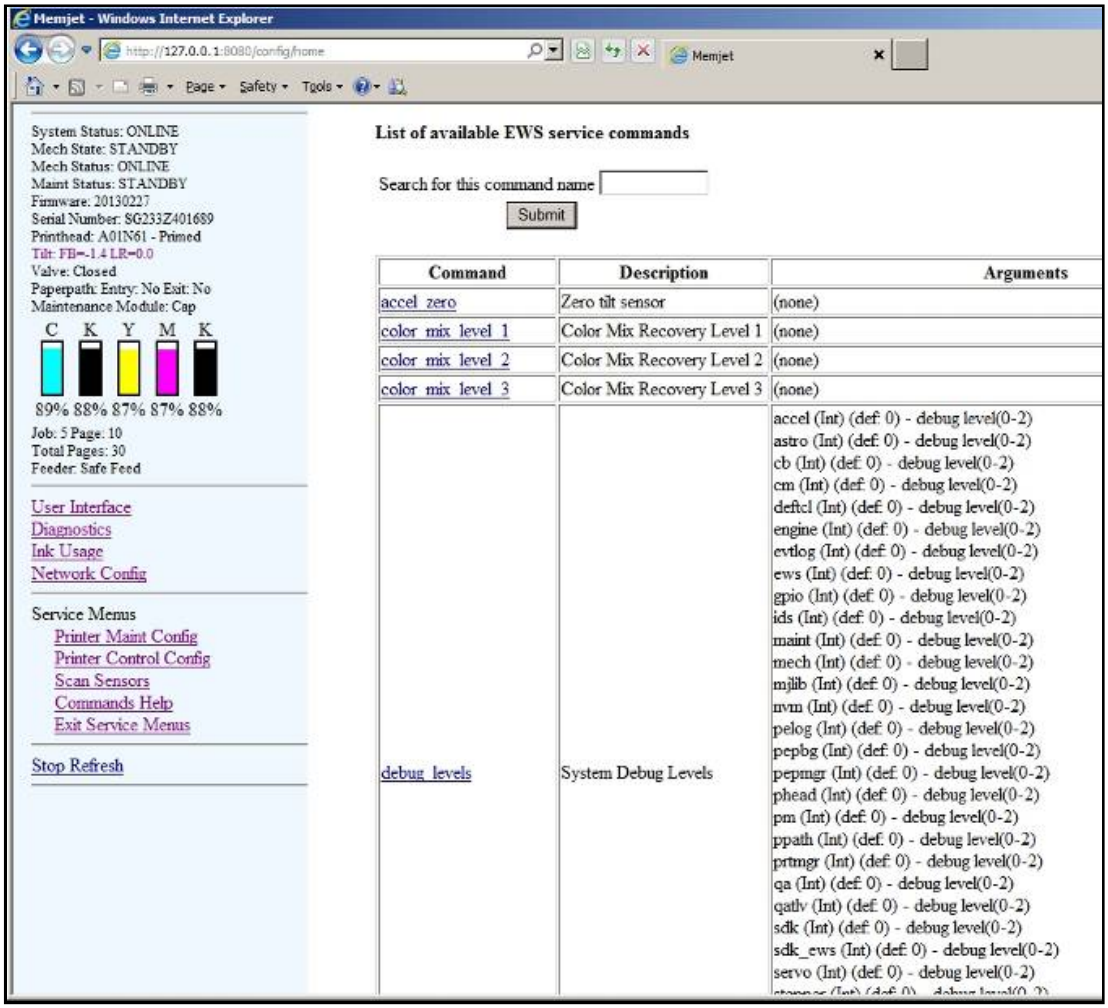
Entry Sensor	Blackmark Sensor	Exit Sensor	Clamshell Switch	Lifter Arm	Sled Index	Sled Home	Paper Feed Sensor	Valve Position
255	217	0	0	1	0	0	0	Closed
255	221	0	0	1	0	0	0	Closed
255	214	0	0	1	0	0	0	Closed
255	218	0	0	1	0	0	0	Closed
255	216	0	0	1	0	0	0	Closed
255	217	0	0	1	0	0	0	Closed
255	210	0	0	1	0	0	0	Closed
255	217	0	0	1	0	0	0	Closed
255	217	0	0	1	0	0	0	Closed
255	219	0	0	1	0	0	0	Closed
255	208	0	0	1	0	0	0	Closed
255	217	0	0	1	0	0	0	Closed
255	217	0	0	1	0	0	0	Closed
255	215	0	0	1	0	0	0	Closed
255	217	0	0	1	0	0	0	Closed
255	215	0	0	1	0	0	0	Closed

SENSOR	DESCRIPTION
Entry Sensor (*Paper Path Entry*)	Interrupted (*media present*) = 0-60 Uninterrupted (*no media*) = 255
Blackmark Sensor	**NOTE: Not applicable for this model.** The Blackmark Sensor's output is for printers designed to run a “continuous” web of media (*i.e. labels*).
Exit Sensor (*Paper Path Exit*)	Uninterrupted = 0 Interrupted (*blocked*) = 1 **Tip**: If media has dark colors on the underside, you may experience “paper jam” conditions when there is no physical media in the machine. If the Exit Sensor appears to be operating normally, select **“Ignore Exit Sensor”** then click **“Submit”** in the User Interface screen to bypass the Exit Sensor.
Clamshell Switch	Clamshell Open = 1 Clamshell Closed = 0
Lifter Arm	Up = 1 Down = 0
Sled Index	Cap Position = 0 Print/Wipe Positions = 1
Sled Home	False = 0 True = 1
Paper Feed Sensor	Covered (*media present, sensor dirty*) = 1 Uncovered (*no media*) = 0
Valve Position	Displays the operating positions of the Dual Pinch Valve: “OpenAir,” “OpenInk,” and “Closed”. “Unknown” will display as the Valve transitions between positions. **NOTE: If “Unknown” displays for more than a few seconds, it may indicate a problem.**

Commands Help Screen:

Printer Commands Help Screen:
Provides a list and descriptions of available EWS service commands.

CAUTION!
To help avoid issues that may be caused by using these commands improperly; commands should not be used unless you are following the instruction of a Tier 2 Support Agent or are following a written procedure from this manual.



Exit Service Menus:

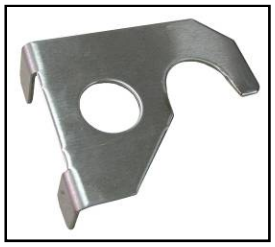
Clicking **"Exit Service Menus"** closes the Service Menu options and takes you back to the **User Interface** screen.
Tip: If you don't Exit the Service Menus, the customer will have access to these features until the printer is powered off/on.

SECTION 4 – *Measurements and Adjustments*

CAUTION

ALWAYS WEAR A WRIST STRAP THAT IS GROUNDED WHEN TOUCHING ELECTRONIC DEVICES.

Drive Belt Tension Adjustment



REQUIREMENT:

To ensure the Drive Belt has the proper tension, use the 42-101-33T Belt Tension Tool to properly adjust Motor Belt Drive tension without guesswork.

ADJUST BELT TENSION:

[A] Unplug the Printer. Remove the right-hand Side Cover (5 screws).

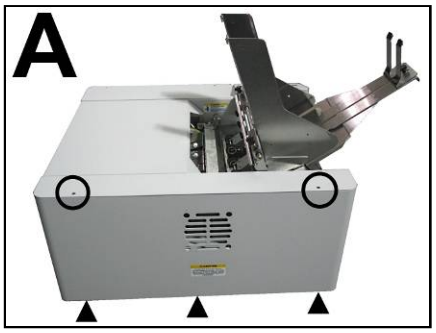
[B] Loosen the two screws that mount the Main Drive Motor to the Frame.

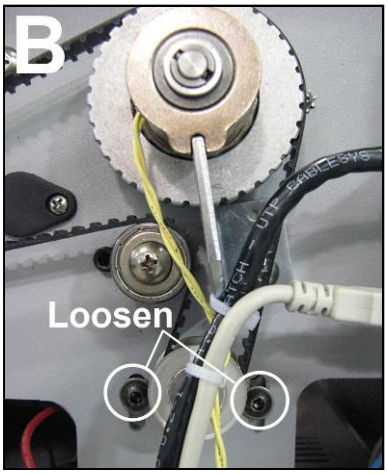
[C] Install the Tool so the two ears fit around the outer edges of the Drive Belt. Then fit the other end into the gap between the Clutch Assembly and Belt Pulley.

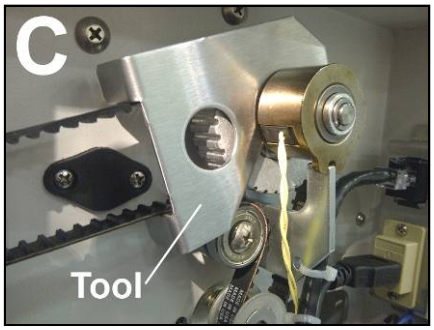
[D] Reach inside the Frame to hold the Motor in place and retighten the Motor mounting screws.

[E] REMOVE the Belt Tension Adjustment Tool.

[F] Reinstall the right-hand Side Cover.







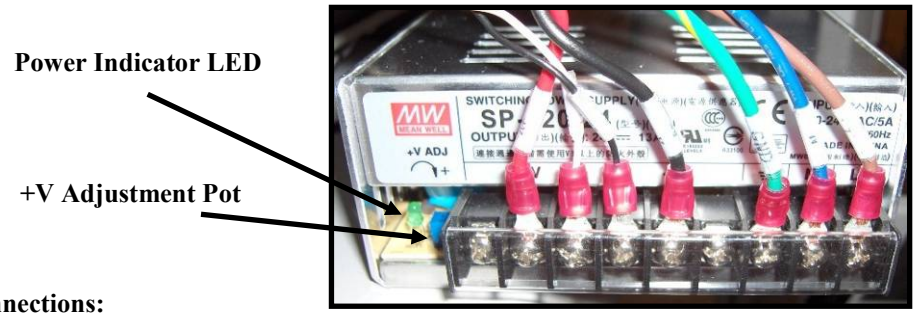
Power Supply

The Power supply converts the incoming AC voltage into 24 VDC.
The DC output provides power to the electronics for the entire printer.

Power Supply Measurements:
Input: 100 – 240 VAC (This is an auto-switching power supply)

Output: 24 VDC (+ or – 0.2 VDC)

Adjustment: There is normally no need to adjust the power supply output. However, if the voltage reading is out of the tolerance range; an adjustment can be done using the +V Adjustment Pot shown in the image below.



Connections:

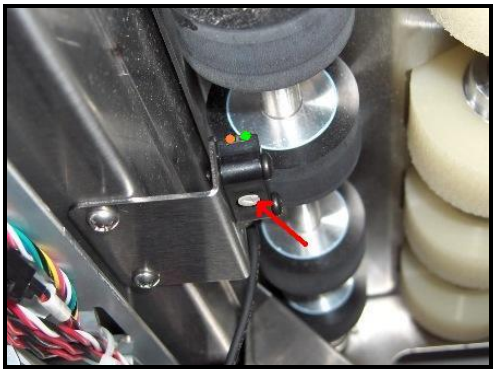
N/C	RED to Print Engine	White to I/O Board (J1)	Black to I/O Board (J1)	Black to Print Engine	N/C	Green/Yellow to Frame Ground	Blue from AC Receptacle	Brown from AC Receptacle
V+ 24 VDC			**V-** Logic Ground (GND)			⏚ Earth Ground	**N** Neutral	**L** Line

Troubleshooting Tip: If you don't get any DC output (measuring 0 VDC and Power Indicator light is off); check the AC Input to the power supply.
If you have proper AC input, but no DC output, then the power supply may be bad. Test the supply with the output connections disconnected, to be sure nothing is shorting-out the supply. Cycle power before re-testing.
If you don't measure a proper AC input (110-240 VAC) then you may have a blown fuse in the receptacle, a bad receptacle (check to be sure switch is ON), or no power from wall outlet.

Media Sensors

Feed Sensor

The feed sensor detects the media as it feeds between the sheet separation area and the print engine.
This is a retro-reflective sensor.
The sensor is located below the deck of the printer (see image below).
The sensor looks up at a reflector, which is attached to the underside of the plate on the center pressure rollers.
When the paper passes between the sensor and reflector, the light beam is broken and the sensor responds as being interrupted (paper present).



Feed Sensor Tests
Remove the non-operator side cover to access the Feed Sensor and I/O Board.
There are three ways you can test the Feed Sensor.

1 - Measure sensor output at the I/O Board: between GND and TP4:
0 V open (no paper); 7.5 VDC interrupted (paper present)

2 - Check the LED conditions at the sensor:
Open (no paper) = Both Green & Orange LEDs are illuminated
Interrupted (paper present) = Only the Green LED is illuminated

Tip: We have seen a few cases where the sensor is lazy (due to dust/damage/improper adjustment or reflector angle) and it will toggle when you give it enough time to do so, but it may not always toggle at the small gap generated between pieces. To test for this possibility; interrupt/uninterrupt the sensor quickly, while watching the LED conditions.

3 - You can use the resettable job counter to test sensor function.
As paper interrupts this sensor the job counter will increment by one.

Feed Sensor Adjustment
The potentiometer, located on the bottom of the feed sensor (see red arrow in the image above) is used to adjust the intensity of this sensor. In general, the intensity will be set to MAX. However if you have a glossy piece of media that is being seen as open (no paper), when it is over the sensor; you can try to adjust the sensor intensity lower until the sensor reads correctly.

Cleaning Note: The Feed Sensor should be cleaned using compressed air and a soft bristled brush. To avoid splattering ink through-out the print engine; do NOT blow air into the capping station or onto the wiper roller. **Tip:** If cleaning and adjustment does not cure issue, as a last effort before replacement, you can try to clean with a damp cloth or cotton swab.

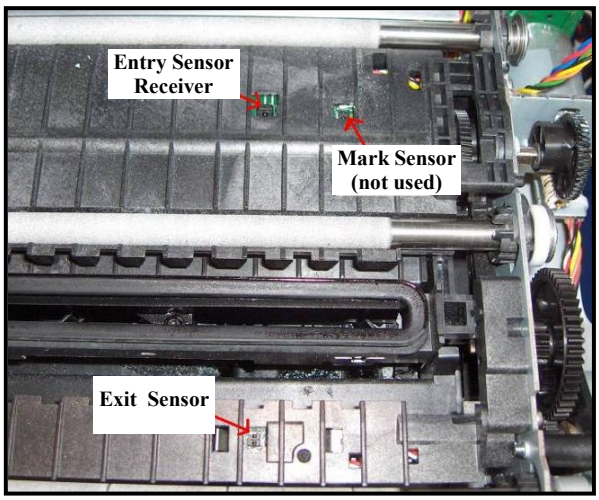
Troubleshooting Tips:

1) If the sensor signal (Senor LEDs or voltage at I/O Board) is NOT switching check the following:
   a) Check the sensor connection to the I/O board.
   b) Check to be sure the sensor and reflector are clean.
   c) Check the angle of the reflector (could be bent).
   d) Check the intensity adjustment on the sensor.
   e) Replace the sensor, reflector and bracket (cover) that the reflector attaches to.

2) If the sensor signal (Senor LEDs or voltage at I/O Board) is switching, but the Toolbox, Scan Sensors condition does not change (with paper present/not present) check the following:
   a) Check/measure the Paper Feed Sensor output at S4 (J9) on Interface (I/O) board. This can be done by connecting meter between GND and TP4. You should measure ~0 VDC when the Paper Feed Sensor is uncovered (not interrupted, no paper present). You should measure ~ 7.5 VDC when the Paper Feed Sensor is covered (interrupted, paper present).
   If readings are OK, then Paper Feed Sensor signal in and out of the I/O Board is good.
   If readings are BAD, then Paper Feed Sensor wiring/connection to the I/O Board is bad or the I/O Board is bad.
   b) Check/measure the Paper Feed Sensor output at J703 on the Main PC Board (Z3 and higher print engines). This can be done by connecting meter between the two wires of J703.
   You should measure ~0 VDC when the Paper Feed Sensor is uncovered (not interrupted, no paper present). You should measure ~ 7.5 VDC when the Paper Feed Sensor is covered (interrupted, paper present)
   If readings are OK, then Paper Feed Sensor signal to the Main PC Board is good. This would indicate a problem on the Main PCB. Replace Main PCB.
   If readings are BAD, then there is a problem with connection or wiring between the I/O Board and Main PC Board. Check wiring/connections.

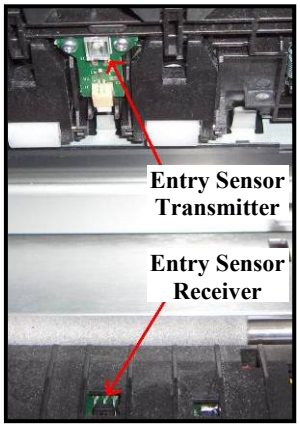
Print Engine Sensors

There are two media sensors within the feed path of the print engine that are used to monitor paper entering and exiting the print engine area.
There is also a Margin sensor in the paper feed path, but this sensor is not active (not used).



Measurement: Use the Toolbox utility to view the condition of the Print Engine Sensors. You can use the information provided on the User Interface Menu or in the Service Menus under Scan Sensors.

Entry Sensor



The entry sensor is an interruptive sensor. It consists of a receiver (below) and a transmitter (above).
When nothing is in this sensor the sensor should read open (Toolbox shows "Paperpath: Entry: No") .
If paper breaks this sensor beam, the sensor should read interrupted (Toolbox shows "Paperpath: Entry: Yes").

Entry Sensor Test: (viewed in Toolbox, User Interface Menu)
Paperpath: Entry: No = interrupted (paper present)
Paperpath: Entry: Yes = open (no paper)

Exit Sensor

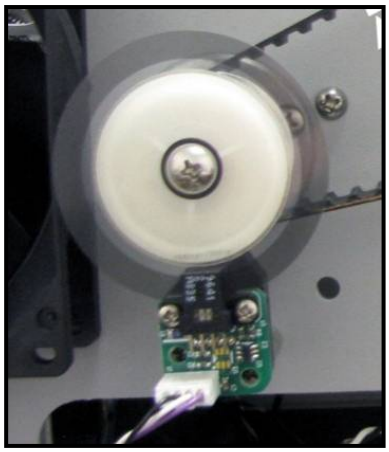
The exit sensor is a reflective sensor. It consists of a single device located below the feed deck. It emits light that is reflected off the bottom side of the media and back to the sensor.
When nothing is above this sensor area the sensor should read open (Toolbox shows "Paperpath: Exit: No").
If paper or something reflective is positioned above the sensor area the sensor should read interrupted (Toolbox shows "Paperpath: Exit: Yes").

Exit Sensor Test: (viewed in Toolbox, User Interface Menu)
Paperpath: Exit: No = interrupted (paper present)
Paperpath: Exit: Yes = open (no paper)

Troubleshooting Tip: If these sensors are always reading interrupted (Yes), try cleaning them.
Cleaning Note: Media sensors should be cleaned using compressed air and a soft bristled brush.
To avoid splattering ink through-out the print engine; do NOT blow air into the capping station or onto the wiper roller. If cleaning does not cure issue, as a last effort before replacement, you can try to clean with a damp cloth or cotton swab.

Feeder Encoder Sensor and Encoder Wheel

The Feeder Encoder is responsible for matching the speed of the feed section with the speed of the print engine. If a problem develops with this sensor (example: encoder wheel gets dirty), then you will normally see issues with the transition of media from the feed section to the print engine.

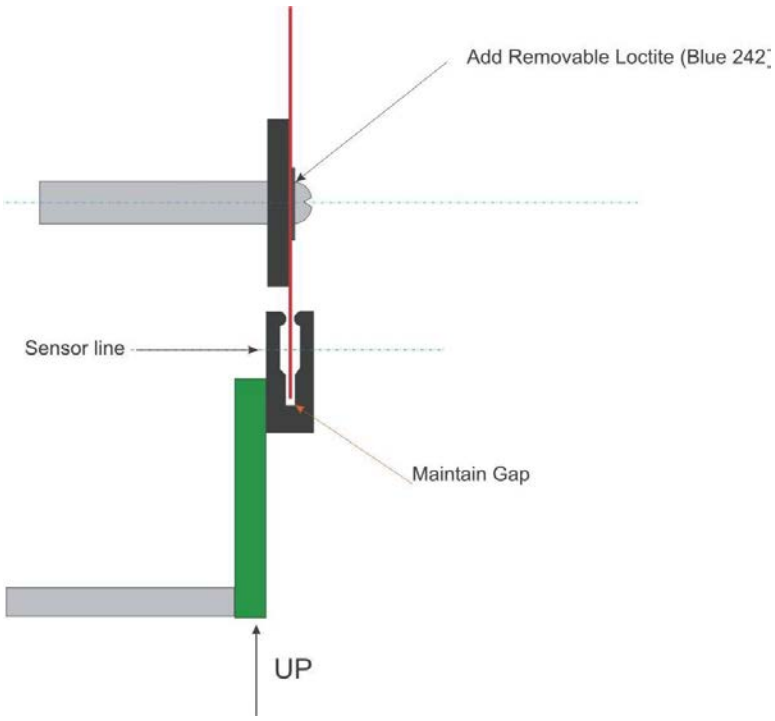


Possible Symptom: Frequent paper jams at entrance side of print engine.

- Media crashing into the entrance side of print engine. Media is being delivered too fast.
- Media getting held back by the feed section. Feed section seems to stop prematurely; with media partially fed into the print engine.
- The following messages may appear in the Toolbox utility.
  PAPERPATH_PRINTZONE_BLOCKED
  or
  PAPERPATH_PAPERJAM

Cleaning: Clean the sensor using compressed air.
Clean the encoder wheel using a soft damp cloth.
If the encoder wheel becomes discolored or damaged it may need to be replaced.
If cleaning and adjustment does not cure issue, as a last effort before replacement, you can try to clean the encoder sensor with a damp cloth or cotton swab.

Adjustment:
The position of the encoder can be adjusted by loosening the two screws that secure the sensor to the mounting posts. Normally the encoder sensor is adjusted so it sits at the highest point. However if you experience feeding issues; try adjusting it lower.



Feeder Encoder Sensor and Wheel (Side View)

Dust Exhaust Fans

In conjunction with the Antistatic Brush Assembly the fans and air plenums are used to remove dust and debris from media. This is done to reduce the amount of dust and debris that enters the print-engine area. One fan is attached to the printer's bottom frame and one is attached to the non-operator side frame.

Measurement: Fans are turned on/off with the same signal/timing as the Feeder Motor drive signal. Feeder Motor on = fans on. Feeder Motor off = fans off. You can use the Paper Feed test (press and hold the PAPER button for 4 seconds) to activate.

Input (I/O Board, J2, MOTOR IN): see Feeder Motor signal
Output (I/O Board J3, J5, J11, J12, J13, FAN #): 24 VDC

Cleaning: Dust can be cleaned from the fans using a vacuum and soft brush. To avoid damage; disconnect the fans from the Interface (I/O) Board before cleaning. A spinning fan will generate voltage which could cause damage to the electronics. Don't forget to reconnect.

Troubleshooting Tip:
If the Feeder Motor is turning, but the fans are not turning on at the same time; check the fan connections or replace the I/O board.
If the fans are receiving 24 VDC, but not turning, then check for obstructions and or replace the fan.
You can safely switch any of the FAN connection positions for the purpose of troubleshooting.

Feeder Motor (feed section)

The Feeder Motor, in the feed section, gets its drive from J4 on the Interface (I/O) Board. The I/O board receives the motor power at J2. The motor power is provided by the DPCA board (from J18C).

Measurement:
You can use the Paper Feed test (press and hold the PAPER button for 4 seconds) to activate.

Input (I/O Board J2, MOTOR IN): Measure at I/O board from negative (right) side of D1 to negative (right) side of D3.
Low Speed (6 ips, Best Print Quality): 5-7 VDC
High Speed (12 ips, Normal Print Quality): 10-12 VDC

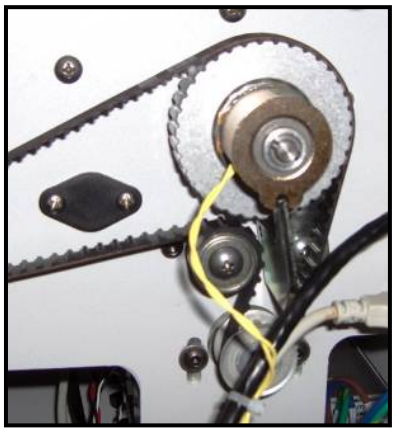
Output (I/O Board J4, MOTOR OUT): Same as above.
J2 (input) is connected directly to J4 (output).

Troubleshooting Tips:
Fans are turned on/off with the same timing/signal as the feeder motor drive signal.
Feeder motor on = fans on. Feeder Motor off = fans off.
If the fans are turning ON, but the Feed Motor isn't driving; check motor connection from the I/O board (J4) to the motor. Also check for power at the motor. If you are getting power to motor, but no motor drive, then you may need to replace the motor.
If the Feed Motor and fans are NOT turning on than there are many fault possibilities:
- A logic fault is keeping the system from driving the motor. Check Toolbox for error.
- A fault with the connection between the Main PC Board (P2006) and DPCA board .
- A problem with the DPCA board. Check output J18C on DPCA board.
- The connection from the DPCA board (J18C) to the I/O board (J2) is faulty.

Clutch (Feed Roller Drive)

The clutch is used to engage/disengage drive to the feed rollers. When the Feeder Motor is driving and the clutch is engaged; the feed rollers are driven to deliver media into the print engine.

Measurement:
To check the clutch for proper operation:
Measure from TP3, to the bottom pin on J7 (Clutch In), on the Interface (I/O) Board, while performing a Paper Feed test (press and hold the PAPER button for 4 seconds).
- You should measure **24 VDC** when the clutch is **engaged**.
- You should measure **0 VDC** when the clutch is **disengaged**.

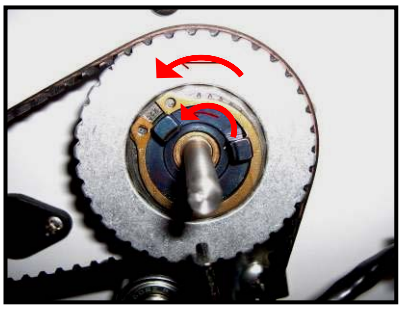


Clutch Resistance Check:
Measure with the clutch disconnected from I/O Board.
- A good clutch will read ~225 Ohms
- A bad clutch or bad connection to the clutch will read open.

Troubleshooting Tips:

- If you are NOT getting any drive to the Clutch, during the Paper Feed Test; then the I/O Board (Clutch Out) may NOT be receiving a drive signal from the Main PCB. In this case the issue may be as simple as the Paperpath Sensors being interrupted. Toolbox will normally show PaperPath_PaperJam or PaperPath_PrintZone_Blocked. This issue needs to be resolved before the system will engage the clutch.
- If you are NOT getting any drive to the Clutch, during the Paper Feed Test and the Toolbox displays "PaperPath_Feed_Timeout".
  Check that the Feed Sensor is working properly. A interrupted feed sensor or a sensor that intermittently reads uninterrupted/interrupted can cause this issue.
  If the Main PCB was recently removed/replaced; J551 may have been mistakenly attached to the wrong point. Check the connection J551 on the Main PCB.
- During the paper feed test; if the Dust Exhaust Fans are turning on but the Clutch and Feed Rollers are not engaging; then you can temporarily connect one of the Fans to the "Clutch In" (J7) connection on the I/O Board to verify that the I/O Board is providing a Clutch signal.
  If the fan, temporarily connected to J7, drives during the Paper Feed Test then the clutch signal to the I/O Board is OK. In this case the problem is most likely with the Clutch and or Feed Roller Drive Pulley.
  If the Fan, temporarily connected to J7, does not drive, then this indicates that the clutch signal is not being received by the I/O Board. In this case, check connection J551 at the Main PCB and check the cable (J8 from I/O Board to J551 on Main PCB) for possible damage.
  Check the output at the J551 on the Main PCB. It should provide 24 VDC to drive the clutch and 0 VDC when not driving the clutch. If J551 on the Main PCB doesn't provide 24VDC to drive the clutch; try disabling the Feed Sensor by removing the reflector (plate that reflector attaches to) from above the sensor. If the clutch (or fan connected to Clutch signal) drives with the reflector removed; then the issue is most likely being causes by the feed sensor and or reflector.
  NOTE: Don't forget to return the Fan to its proper location on the I/O Board; after performing the above tests.

Feed Roller Drive Pulley Test:

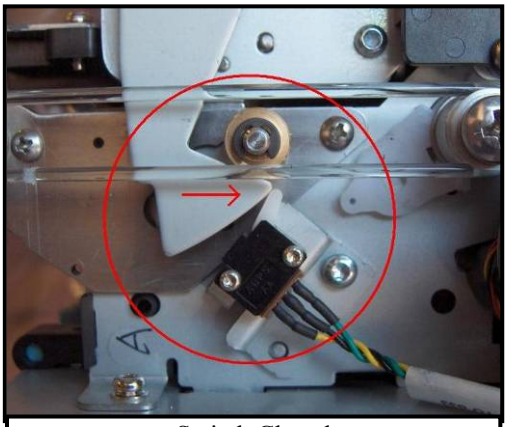


With the clutch removed; rotate the Feed Roller Drive Pulley (sprocket) counter-clockwise. The center section (clutch drive spline) should also drive counter-clockwise with the rotation of the Pulley. If the center section does not drive with the counter-clockwise rotation of the Pulley; then the Feed Roller Drive Pulley may need to be replaced.

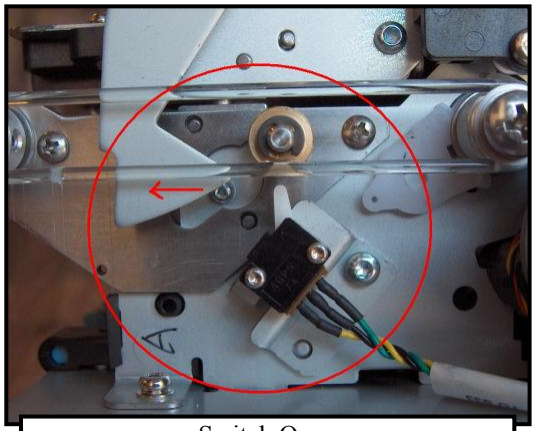
Tip: There have been a few cases where a Feed Roller Drive Pulley was improperly assembled by the factory.
In this case the center section (clutch drive spine) will NOT be driven when the Feed Roller Drive Pulley is rotated counter-clockwise. However the center drive spline will be driven when the Feed Roller Drive Pulley is rotated clockwise. If this is the case; remove the Pulley from the shaft. Remove the snap-ring that secures the clutch drive spline. Remove the clutch drive spline from the assembly. Flip the clutch drive spline over and insert it back into the Pulley. Reinstall the snap-ring. Reinstall the Feed Roller Drive Pulley (clutch drive splines facing out) and test for proper operation.

Print Engine Clamshell (Door) Switch

The Print Engine Open Switch is activated by the Print Engine Latch on the non-operator side. When the latch is released, to open the top section of the Print Engine, the switch position is toggled.
Note: This switch is not on Z2i print engines. It is present on Z3and higher print engines.



Switch Closed
Latch Closed/Locked



Switch Open
Latch Open/Unlocked

Measurement: Use the Toolbox utility to view the condition of this switch.

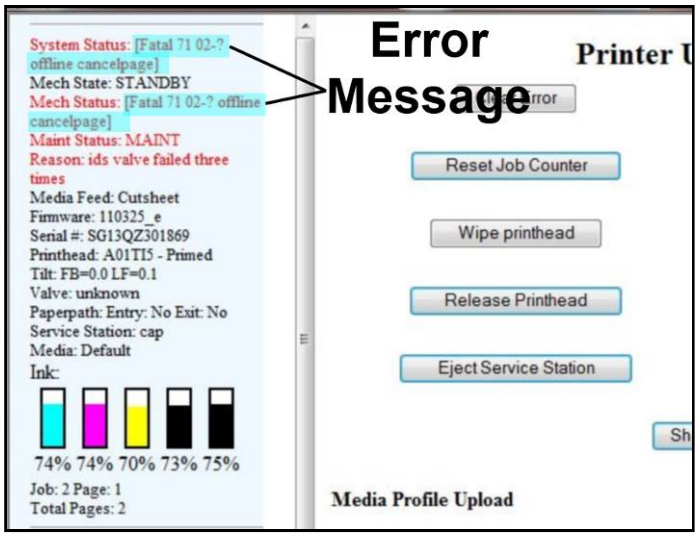
Symptom: If a problem develops with this switch the Toolbox will display the message "DoorOpen_Front". You will not be able to print until this issue is resolved.

Possible Solutions: Check that the latch arm is activating the switch. Replace the switch.
If you just updated the firmware on a Z2i engine; you may need to run the Z2i Default Script. This script sets the system to ignore the door switch signal. Contact Tier 2 to obtain Z2i Default Script.

Dual Pinch Valve Connection

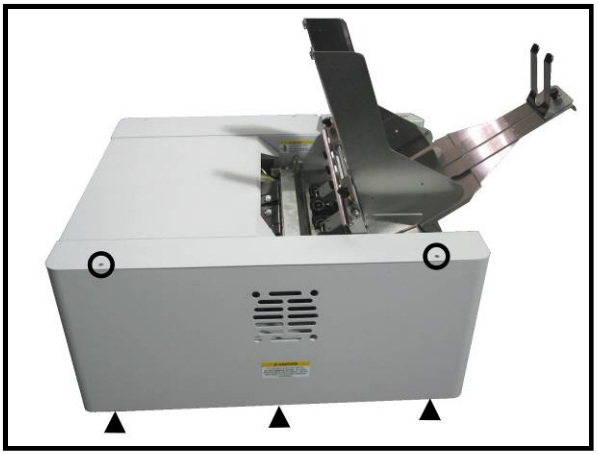
If you should receive the **[System Status:** ***Fatal 71 02-? offline cancelpage]*** or ***[System Status: MECH_FAIL_PERMANENT]*** message, in the Toolbox utility window; along with the message ***"Reason: ids valve failed three times"*** or ***"Reason: Ink valve failed";*** the printer has detected a problem with the Dual Pinch Valve. It is possible that the Dual Pinch Valve's Printed Circuit Assembly connector may be loose or disconnected.
Please use the following procedure to resolve.
IMPORTANT: If you see the message "Fatal 71 02…" you are using old firmware. It is mandatory that you update the firmware to 20130820 or higher.

This message appears in the "System Status" and "Mech Status" lines in the top left corner of the Printer Control Screen in the Printer Toolbox.



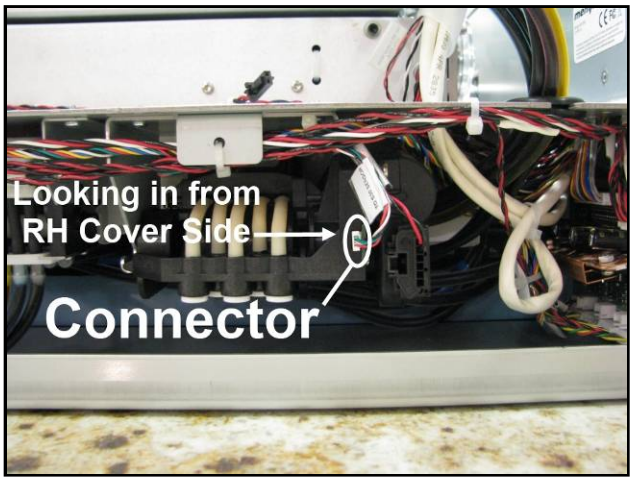
1. **Shut off the Printer.**
   [A] Press the Power Button on the Control Panel.
   [B] Wait for the Printer to Stop Processing.
   [C] Press the Main Power Switch on the Rear Panel.
   [D] Unplug the power cable.

2. Remove the Non-Operator Side Cover. Remove the (2) screws at the top of the Cover. Then remove the (3) screws from the bottom of the Cover.



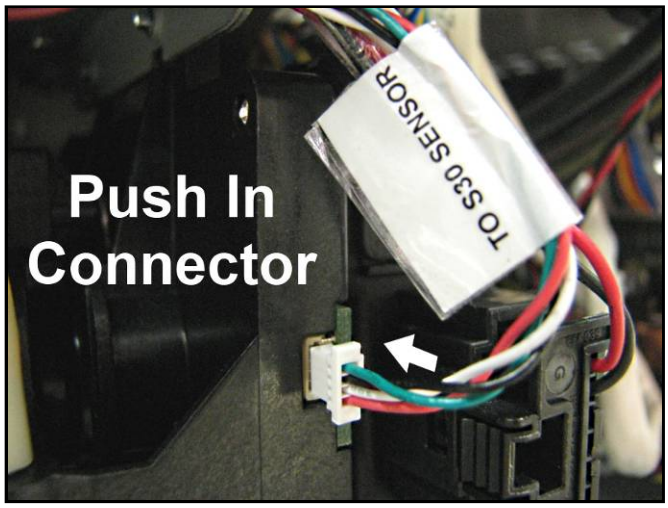
3. Look through the open side of the Printer. The Dual Pinch Valve connector (white) is located just behind the metal duct, for the lower dust exhaust fan.

   Note: The factory has started to hot-glue this connection; to help prevent it from coming loose in transit.



4. Use a long-blade flat-tip screwdriver to carefully reach across the print engine and push in or reconnect the small white PCA connector.

5. Reinstall the Non-Operator Side Cover.



Print Engine Drive Belt Tension Adjustment

This procedure should be followed whenever the belt, motor, or components that the belt drives, have been disturbed/adjusted/replaced. It may also be necessary to periodically perform this adjustment on machines in the field (belt may stretch from use).

NOTICE:

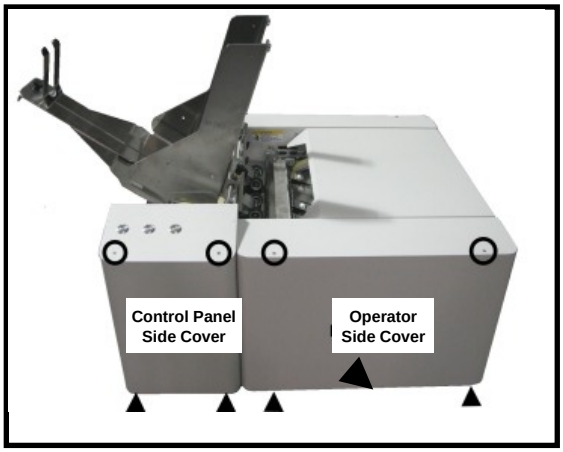
- If belt is set too tight. This adds excessive force for the motor to drive the media transport system; which can cause "DataPath_Underrun" messages. In addition the Transport Motor may over-heat and be damaged. We have also seen cases where the belt stretched and fell off the drive sprockets or the belt broke.
- If belt is too loose. This causes irregularities with media transport; which can cause distortion/degradation of print, "Paperpath PaperJam" messages and "DataPath_Underrun" messages.

Tools Needed: #1 & #2 Philips, T10 Torx Screwdriver, Drive Belt Tension Tool (42-110-54)

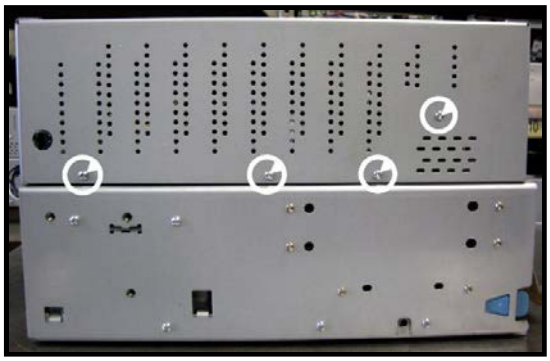
Procedure

NOTE: Images shown with print engine removed from printer frame, for clarity. You do NOT need to remove the print engine from the printer frame.

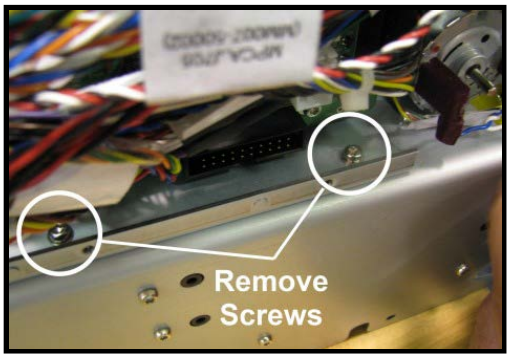
1. Power-down and unplug the printer.
2. Remove the Operator Side Cover.
   You don't need to remove the Control Panel Side Cover.



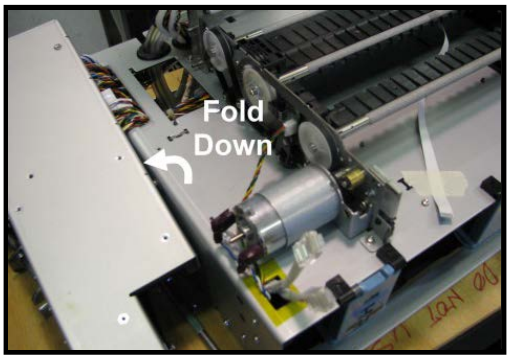
3. Disconnect the cables (USB, Network, Power) from the left side of the MPCA (Main PC Board).
4. Remove the T10 Torx screws (4 or 5), that secure the MPCA cover, and remove the cover. Set aside.



5. Remove the three T10 Torx screws (one screw not shown) from the bottom of MPCA panel.
   TIP: You may need to use a 90 degree ratchet wrench with a T10 Torx bit, to access these screws.

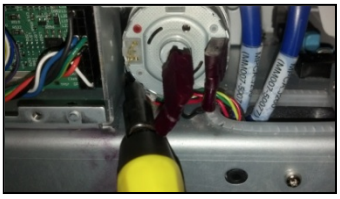


6. Carefully fold the MPCA panel (MPCA tray/frame) down out of the way.
NOTE: Be Careful! DO NOT pull, pinch or strain wiring. You may also disconnect the two RJ45 style cables (J250/260) from the Main PCB to improve flexibility. Please be sure to re-attach each of these cables to their proper positions.

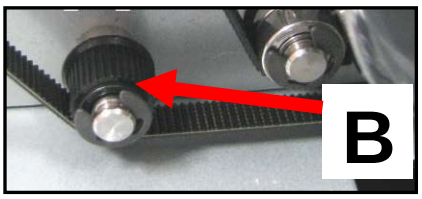


7. Loosen (do not remove) the T-10 Torx screw that secures the Belt Tensioner's **[A]** position.

Tip: Once you are familiar with the location of this screw; you may be able to skip steps 5 & 6. With practice this screw can be reached using a T10 Torx bit in a ratchet wrench, from above; or using a T10 Torx screwdriver (with 3.75" or longer shaft), from between the Motor and the MPCA panel, as shown.

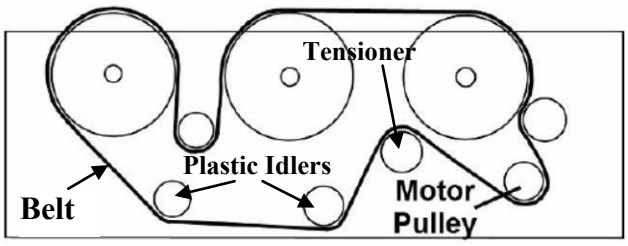


8. Optional. This would be a good opportunity to remove the two black plastic idlers **[B]**; to inspect, clean and lubricate their inner hubs and shafts**.**
Use plastic-safe grease (Super Lube 21030 or equivalent).
Replace worn idlers (123-2708).
NOTE: If these idlers are worn or difficult to turn this will also increase the resistance of transport drive.



Tip: To relax the belt tension and make this process easier; manually pivot the Belt Tensioner clockwise and temporarily re-secure the T-10 Torx Screw **[A]**, to hold the position. Just be sure to loosen this screw **[A]** again, once the idlers are reinstalled, before you continue to the next step.

9. Carefully open the Clamshell.
10. Using the Paper Transport shafts, spin the Transport to center the belt and equalize tension.
11. Place the Drive Belt Tension Tool **[C]** (42-110-54) as shown.
12. While pressing down on the Tool **[C],** to pre-tension the Drive Belt, tighten the T10 Torx screw **[A]** to secure the Belt Tensioner's position.
13. Remove the Tool **[C].**
14. Carefully close the Clamshell and reassemble printer.
15. Test for proper operation.



Belt Routing Diagram

Interface (I/O) Board Test Points

This board is located on the non-operator side of the printer.
NOTES: There are two versions of the Interface (I/O) Board (42-500-30 and 42-500-30 Rev B).
The Rev B board has additional FAN connections.
The measurement information shown below is valid for both.

GND: Logic Ground
Connect your ground lead here for all measurements, except TP3 (clutch).

24VDC (12VDC): Power In
24 VDC. Improperly tagged on original version of board; should be 24VDC**.**

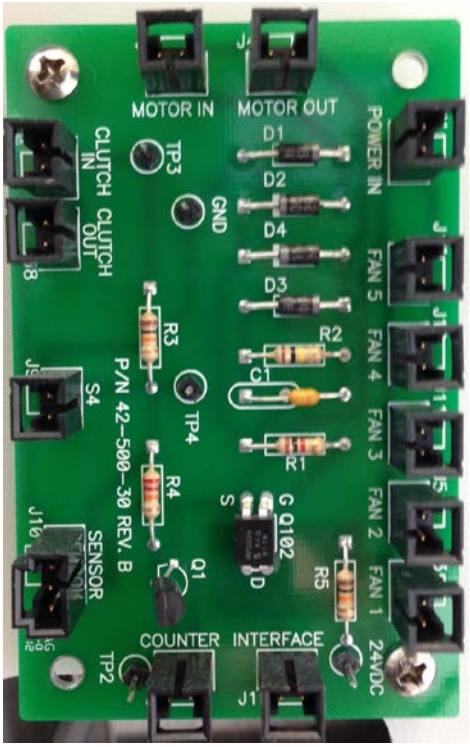
TP2: Counter
3 VDC open (no paper); 0 VDC interrupted (paper present)
Count should also increase, by one digit, each time the Feed Sensor is interrupted.

TP3: Clutch
Must measure from TP3 to the bottom pin on J8 (Clutch Out).
24 VDC = on (engaged), 0 VDC = off (disengaged)

TP4: Sensor (Feed Sensor)
0 VDC open (no paper); 7.5 VDC interrupted (paper present)
You can also use the counter to verify that the Feed Sensor is working.
Count will increase each time the Feed Sensor is interrupted.

Motor (In): Measure from right side of D1 to right side of D3
0 VDC = off (no Feeder Motor drive)
5-7 VDC = low speed (6 ips, Best Quality)
10-12 VDC = high speed (12 ips, Normal Quality)

Interface Board (42-500-30)



Interface Board (42-500-30 REV. B)

Section 5 – Disassembly/Assembly Procedures

Preparing the Printer for Service

NOTE: We suggest the use of protective gloves during this process.

For System you Can Deprime.

If possible; please follow the procedure, as outlined below, before performing service tasks.

Please complete the following to prepare the printer for service.

1. Plug in the printer. Turn the printer's Main Power Switch ON; then press the control panel's ON/OFF button. Wait about 45 seconds for the print engine to power-up (ON/OFF button will illuminate).
2. Open the Toolbox utility.
3. Deprime system using the "System Deprime" feature located in Toolbox utility.
   NOTE: Use the System Deprime feature, NOT the Release Printhead feature.
4. Remove the Service Station from the printer, using the "Eject Service Station" feature in the Toolbox utility. Refer to "Installing the Service Station", located in the Operator's Guide, for help with this process. Follow the sequence in reverse.
5. Wrap the Service Station in paper towels and place into resealable bag.
6. Power-down the system using the ON/OFF button and wait until all lights are off.
7. Turn off the Main Power Switch. Then disconnect the power cable from the printer and wall outlet.
   IMPORTANT! Do NOT switch off the power at the power outlet or remove the power cable until all lights are off. Failure to do so may damage your printer.
8. Disconnect the USB or Ethernet cable from your printer
9. Remove the Printhead Cartridge and install protective covers on printhead. Store Printhead Cartridge in a sealed plastic bag with a damp cloth. Be careful to avoid spills or stains during this process.
   CAUTION: Make sure contacts are dry before re-installing printhead.
10. Remove all five Ink Tanks. Be careful to avoid spills or stains during this process. Wrap each ink tank in a clean, lint-free, absorbent material and place them in a sealed plastic bag as a precaution against any spillages during transport.
11. Place paper towels into each Ink Tank slot, making sure the towels make contact with the back of the slots. This is done to absorb any ink that may leak from septum needles.
    NOTE: Even though the system is deprimed, some ink will remain in the lower areas of the tubing. In transit, this residual ink may drain out.
12. Keep the printer as level as possible during service.
    CAUTION! During the service process the print engine should remain semi-level at all times. Failure to do so may cause the print engine to leak ink.
13. When you have finished servicing the printer; please refer to Section 2 of the Operator's Guide for details on how to properly install the Service Station, Printhead Cartridge, Ink Tanks, etc. Remember the printhead cartridge "nozzle surface" needs to be wetted using distilled water and a lint free cloth or the priming process may fail.

For System you can NOT Deprime.

We realize that in many cases it will not be possible to deprime the system before performing service. In these cases we recommend the following:

1. Leave the Printhead and Ink Tanks installed. This will help seal the ink inside the system.
2. Power OFF the printer and disconnect the power cord.
3. Manually remove the Service Station**.** Wrap the Service Station in paper towels and place into resealable bag.
4. Inspect the Waste Ink Tray. If it is nearly full, replace it before tilting the unit.
5. Keep the printer as level as possible during service**.** If it needs to be tilted; keep time to a minimum.
   CAUTION! During the service process the print engine should remain semi-level at all times. Failure to do so may cause the print engine to leak ink. Try to keep the printhead capped. The longer it remains uncapped; the more chance there will be for print quality issues.

Installation and Service Videos (where to find)

Installation and Service Videos are also available for this product.

Basic Disassembly

Turn off Power

Disconnect Power Cord

Disconnect Interface Cable

Service Disassembly Procedures

WARNING!

THE FOLLOWING DISASSEMBLY SHOULD ONLY BE DONE BY A QUALIFIED, TRAINED SERVICE REPRESENTATIVE.

WARNING!

ALWAYS POWER DOWN THE PRINTER BEFORE CONNECTING OR DISCONNECTING ANY WIRING HARNESSES OR CABLE CONNECTIONS TO AVOID SERIOUS SHOCK OR INJURY.

CAUTION

- **ALWAYS USE APPROPRIATE PERSONAL PROTECTION EQUIPMENT (PPE).**
- **DISPOSE OF ALL MAINTENANCE WASTE IN ACCORDANCE WITH LOCAL REGULATIONS.**

CAUTION

USE ELECTROSTATIC DISCHARGE (ESD) PROTECTION WHEN WORKING AROUND ELECTRONIC DEVICES:

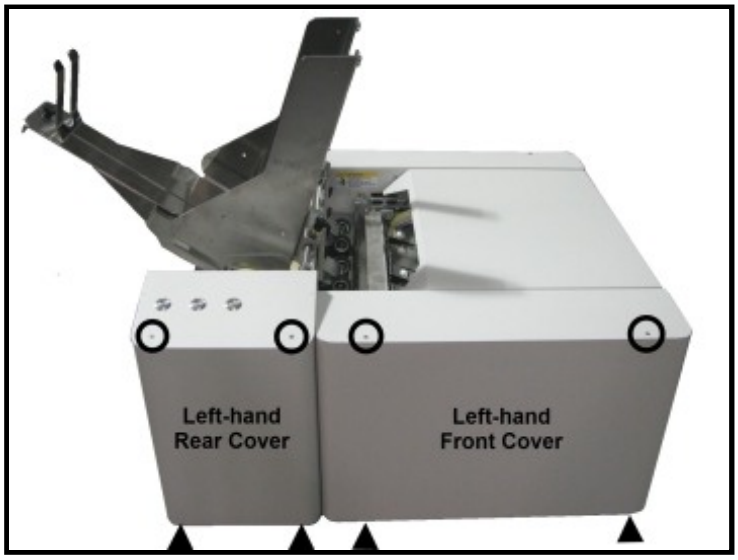
- **USE STATIC-FREE WORKSTATIONS WHEN UNIT COVERS ARE REMOVED.**
- **WEAR GROUNDED WRIST STRAPS WHEN WORKING ON UNIT.**
- **TRANSPORT ELECTRONIC SUBASSEMBLIES IN SEALED STATIC-SHIELDING PACKAGING.**

Left-hand (Operator) Side Covers

1. Remove (2) screws at the top and bottom of the Left-hand Rear Side Cover. Remove the Cover.

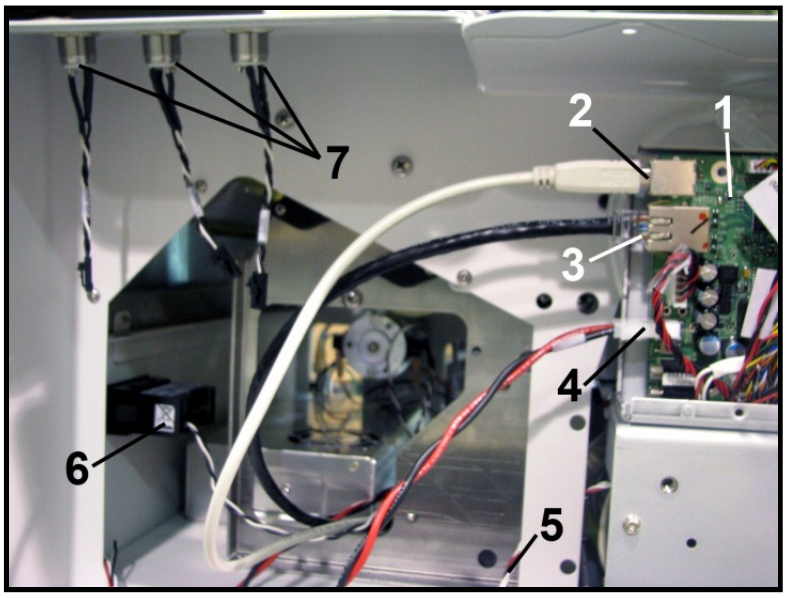
2. Remove (2) screws at the top and bottom of the Left-hand Front Side Cover. Pull Cover away from machine and set aside.

3. **Reassemble in reverse order.**



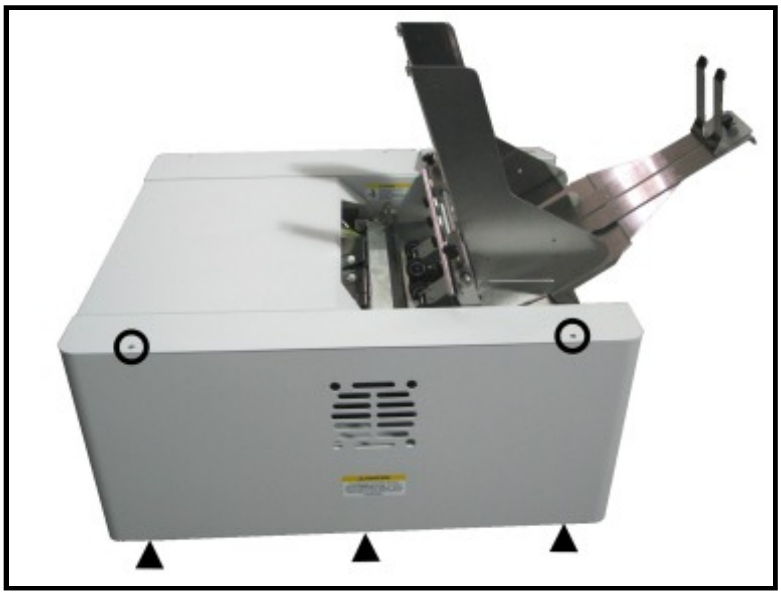
Components under Left-Hand (Operator) Side Covers

1. Main Print Engine Printed Circuit Board
2. Printed Circuit Board USB Connector
3. Printed Circuit Board Network Connector
4. Printed Circuit Board Main Power Connector
5. Wiring harness for Control Panel Buttons
6. LCD Counter
7. Control Panel Buttons



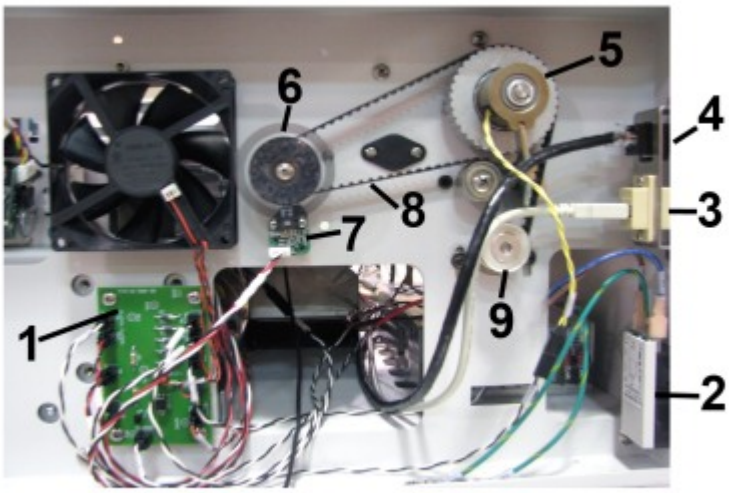
Right-hand (Non-Operator) Side Cover

1. Remove the (2) screws at the top of the Cover. Then remove the (3) screws from the bottom of the Cover.

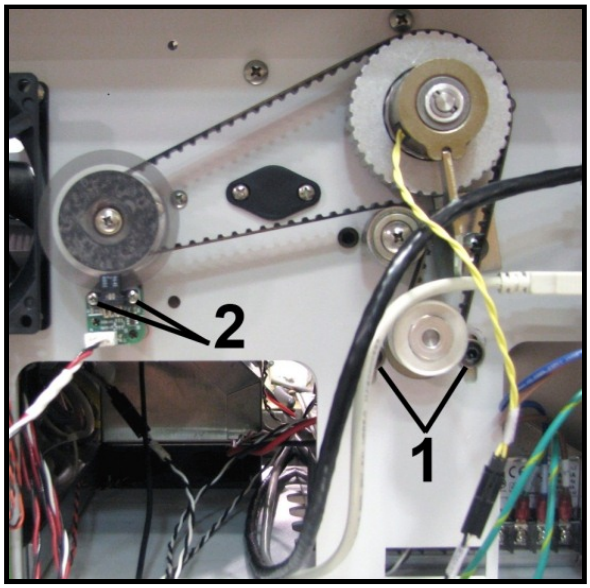


Major Components under Right-Hand (Non-Operator) Side Cover

1. Interface PC Board
2. Main Power Plug, Switch, Fuse
3. USB Connector
4. Network Connector
5. Feed Clutch and Feed Roller Assembly
6. Encoder
7. Encoder Sensor
8. Drive Belt
9. Drive Motor & Roller Drive Pulley



Replacing Motor Drive Belt or Motor



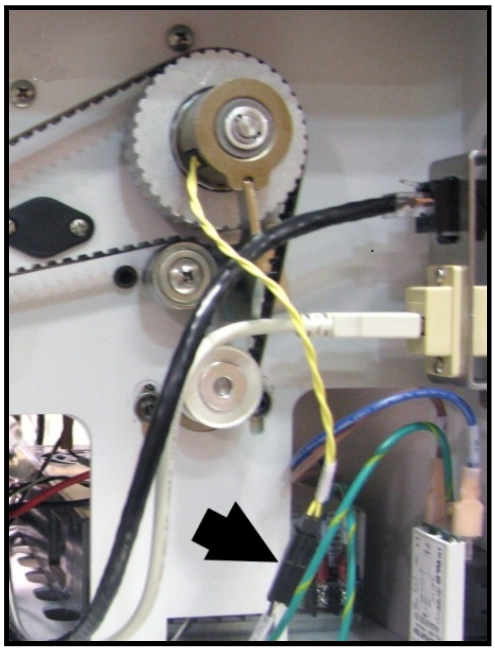
1. Remove Right-hand Side Cover.
   NOTE: To remove the motor, remove the five screws holding the right-hand side cover.
2. **[1]** Loosen the (2) motor mounting screws to relieve tension on the Motor Drive Belt.
   [2] Then remove the (2) screws] and the Encoder Sensor.
   NOTE: To remove the Motor, disconnect the wires and remove the two mounting screws.

   CAUTION

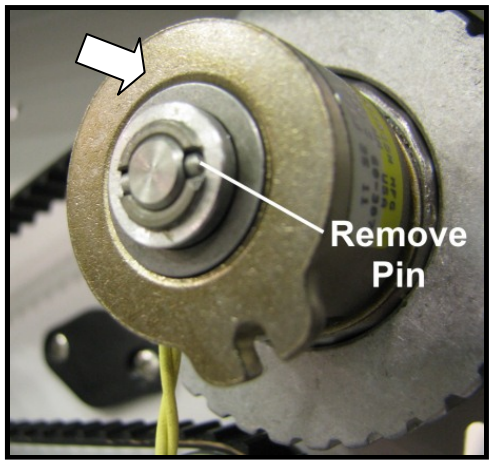
   DO NOT SCRATCH OR OTHERWISE DAMAGE THE ENCODER WHEEL WHEN REMOVING THE MOTOR DRIVE BELT.
3. Carefully remove the Motor Drive Belt by lifting it over and around the Encoder Wheel.
4. Replace the belt in reverse order, and then adjust the belt per the adjustment instructions in Section 4.

Replacing the Clutch

1. Remove Right-hand Side Cover.
2. Disconnect the Clutch from the wiring harness.

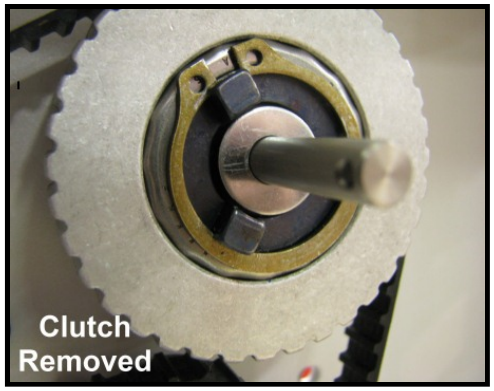


3. Push the Clutch toward the pulley to get access to the mounting pin. Remove the retaining pin.



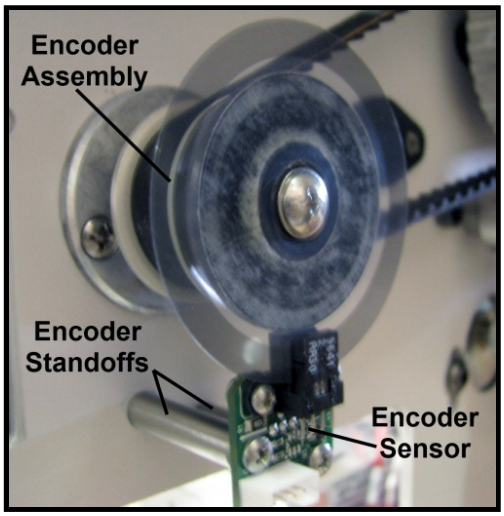
4. Remove the Clutch from the Feed Roller Shaft.

5. **Reassemble in reverse order.**



Replacing the Feeder Encoder and/or Encoder Sensor

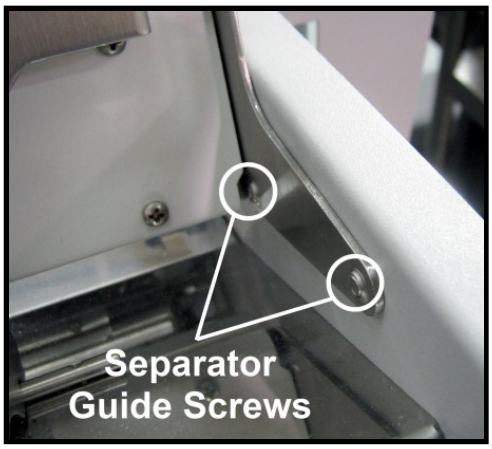
1. **Remove the Encoder Sensor from the Rear Side Frame.**
   [A] Remove the (2) Screws holding the Encoder Circuit Board to the two standoffs.
   [B] Remove the Encoder Sensor by carefully moving the Sensor down and away from the Encoder Wheel. **NOTE:** Be very careful not to damage Encoder Wheel.
2. **Remove the Encoder Wheel Assembly from the Pull Out Shaft Assembly.**
   Remove Screw and Washer from the center of Encoder Wheel. **Do not bend or damage the Encoder during removal.**
3. **To Reinstall:** Insert Screw with Washer through the Encoder Wheel. Apply Blue Loctite to threads. Insert Screw into threaded end of the Pull Out Shaft.



4. **Reassemble in reverse order. NOTE:** Check that Encoder Wheel and Drive Belt turn freely.

Replacing Feed Rollers

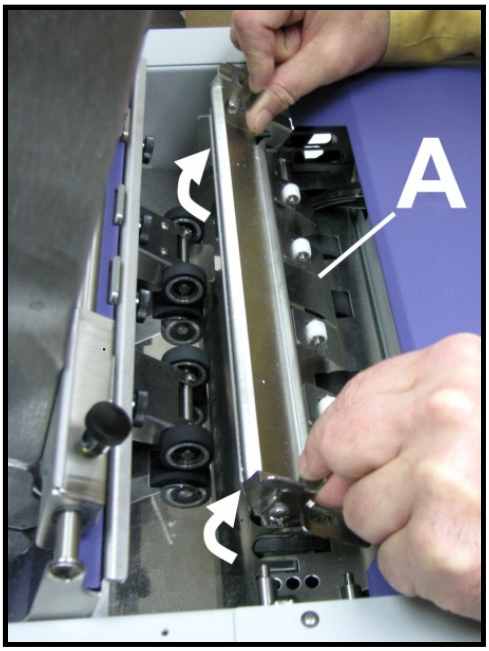
1. Unplug the Printer from power.
2. Follow the instructions above and remove the Right-hand Side Cover, Drive Belt and Clutch before beginning the replacement of the Feed and Forwarding Rollers.
3. Remove the Rear Left-hand Side Cover and set aside.
4. Remove the Side Paper Guides and the Rear Paper Support.
5. Move the Sheet Separators to the up position. Remove two screws from each side of the Separator Guide Assembly and remove it from the machine.



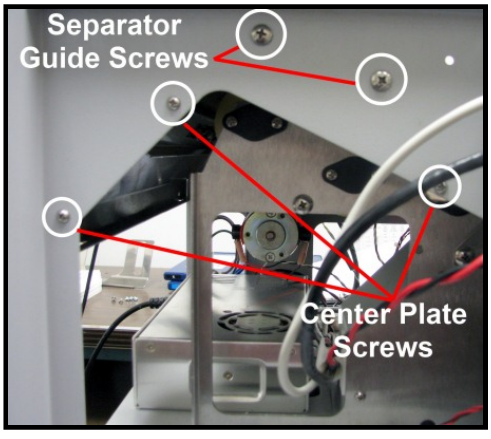
6. Remove Antistatic Brush Assembly **[A]** from mounting studs. Unlatch the two latches (*one on either side of the Assembly*) and lift the assembly off the four mounting pins as shown. **Do not bend the brushes!**

CAUTION
DO NOT BEND, PINCH OR CUT THE INK LINES LOCATED DIRECTLY IN FRONT OF THE BRUSH ASSEMBLY.

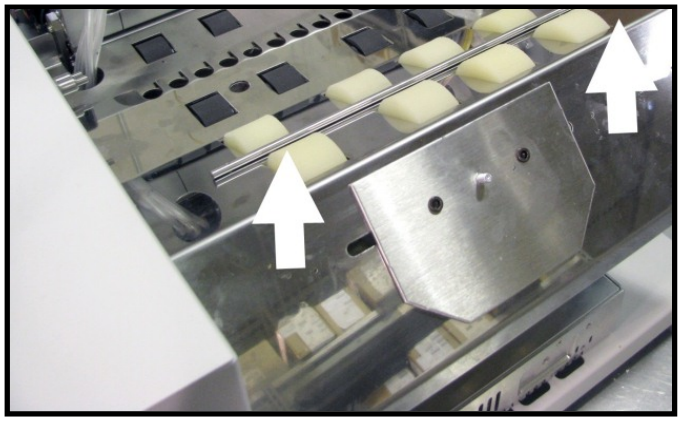
NOTE: Make sure Brush Assembly is correctly reinstalled and aligned before starting to print. Assembly should sit flat on transport area surface.



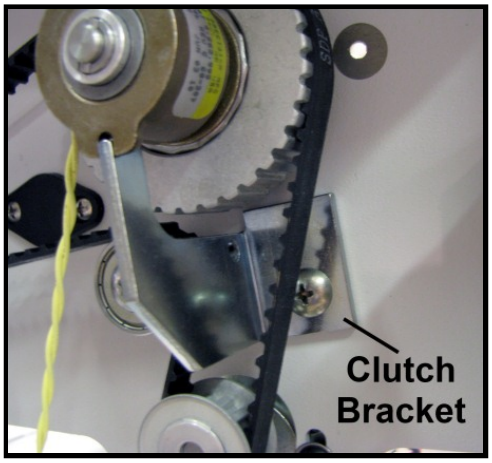
7. Remove the (3) screws on each side of the machine that hold the Center Plate in place. Then remove the (2) screws on the Rear Panel.



8. Lift the Center Plate Assembly from the machine and set aside.

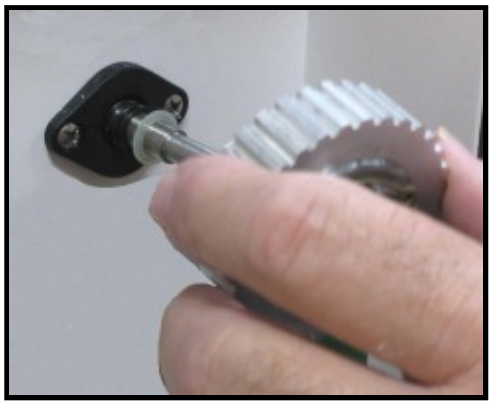


9. Remove the screw holding the Clutch Support Bracket and remove the bracket.



10. Remove the Rear Feed Roller Drive Pulley.

NOTE: The spring and washer keep tension on the clutch so that the pin holding the clutch remains in place. Reassemble these parts as shown.



11. Remove the washer and spring from the Feed Roller Shaft.

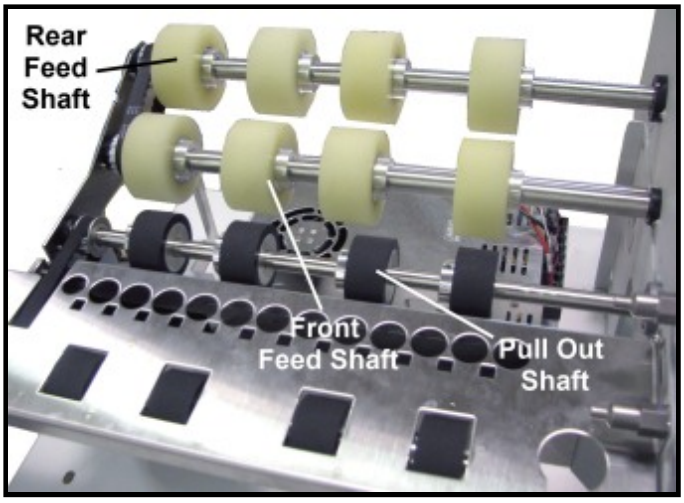
NOTE: The spring and washer keep tension on the clutch so that the pin holding the clutch remains in place. Reassemble these parts as shown.

12. Remove the two screws holding the Bearing Housing to the Side Frame. Push the Rear Feed Roller Assembly toward you to release it from the bearing on the other side of the machine. Carefully remove the belt. Then lift the Roller and Shaft Assembly from the machine.

13. The Front Feed Rollers and Pull Out Rollers and Shafts can be removed in the same manner as the Rear Feed Rollers and Shaft. Remove the bearing cap on the Side Frame, slide the Roller and Shaft toward you, carefully remove the belts and lift out of the machine.

14. The Rollers are attached to the Shafts with Allen screws. Loosen the screws to slide the Rollers off the Shafts.

15. **Reassemble in reverse order.** Take care to reinstall the belts that drive the Rollers during assembly.

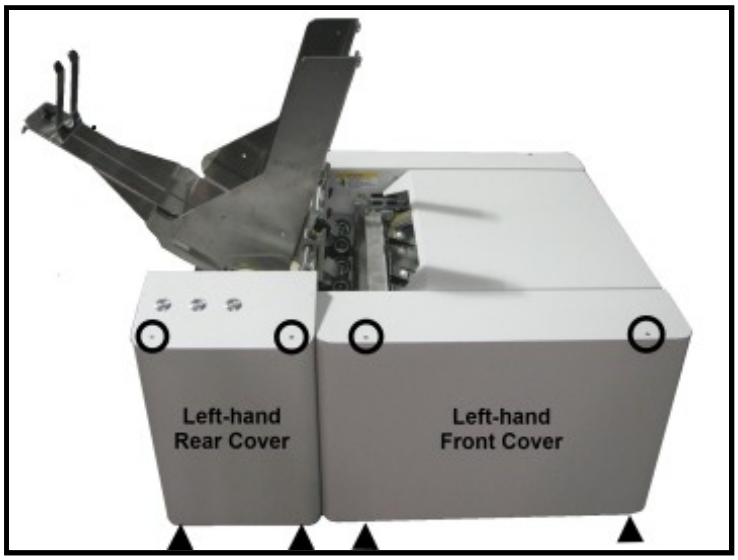


Replacing Delivery Rollers

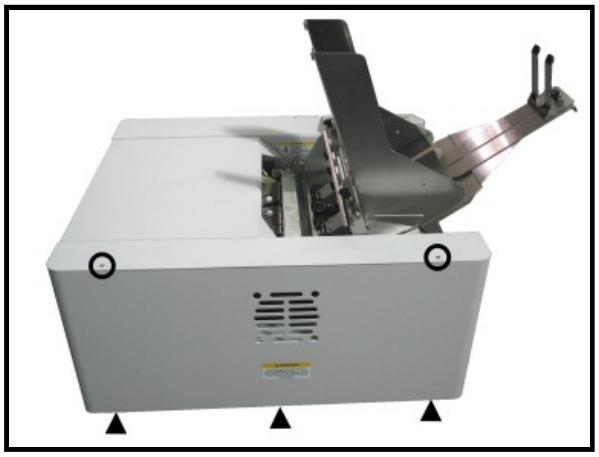
The Delivery Rollers are part of the Front Center Assembly on the feed end of the Print Engine.

1. Remove the Left hand Rear Side Cover. Remove (2) screws at the top and bottom of the Rear Left-hand Side Cover. Remove the Cover.

2. Remove (2) screws at the top and bottom of the Front Left-hand Side Cover. Pull Cover away from machine slightly.



3. Remove the Right-hand Side Cover. Remove the (2) screws at the top of the Cover. Then remove the (3) screws from the bottom of the Cover.



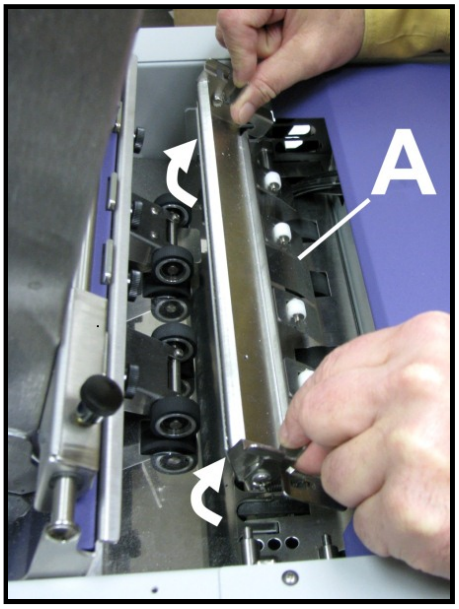
4. **Remove Top Cover.** Remove "cover pivot screw" on right-hand side (non-operators side). Remove Top Cover and set aside.

   Tip: To save time; you can skip this step. Top cover will be released once you remove the operator side-frame (step 8).

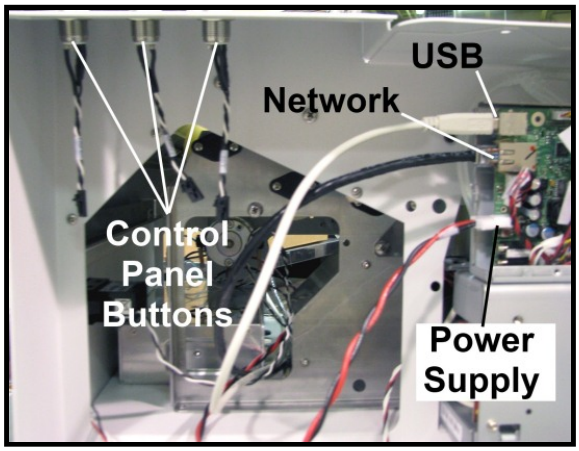
5. **Remove Antistatic Brush Assembly [A]** from mounting studs. Unlatch the two latches (*one on either side of the Assembly*) and lift the assembly off the four mounting pins as shown. **Do not bend the brushes!**

CAUTION
DO NOT BEND, PINCH OR CUT THE INK LINES LOCATED DIRECTLY IN FRONT OF THE BRUSH ASSEMBLY.

NOTE – Make sure Brush Assembly is correctly reinstalled and aligned before starting to print. Assembly should sit flat on transport area surface.

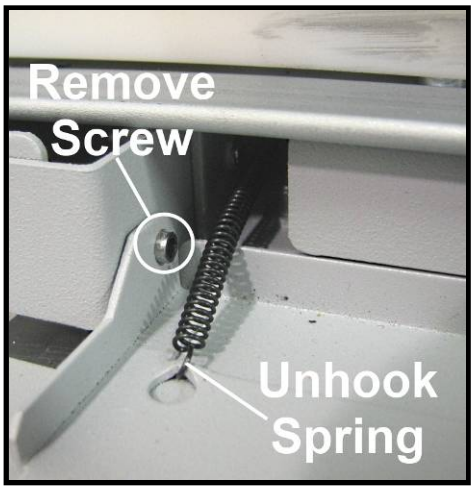


6. Unplug Network, USB and Main Power connectors from Print Engine Circuit Board. Disconnect the wires attached to the Power, Paper and Cancel Buttons at connectors. **NOTE:** Wires are labeled to simplify reconnection.

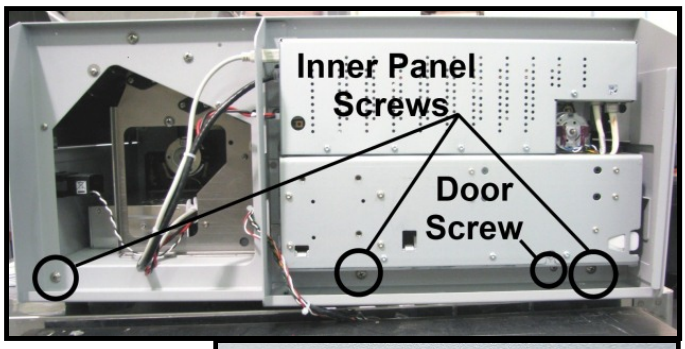


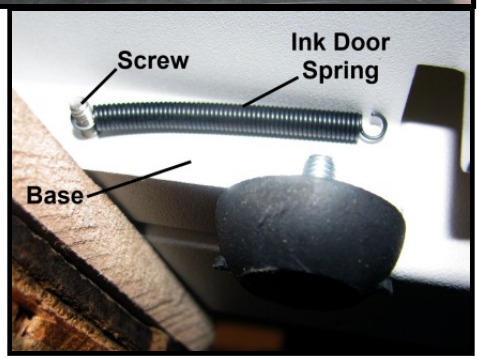
7. **Remove Ink Tank Door.** Carefully unhook the (2) springs (*one on each side*), then remove the mounting screw from the left-hand side (Control Panel Side). Remove Door and set aside.

   Tip: To save time; you can skip this step. Ink Tank Door will be released once you remove the operator side-frame (step 8).

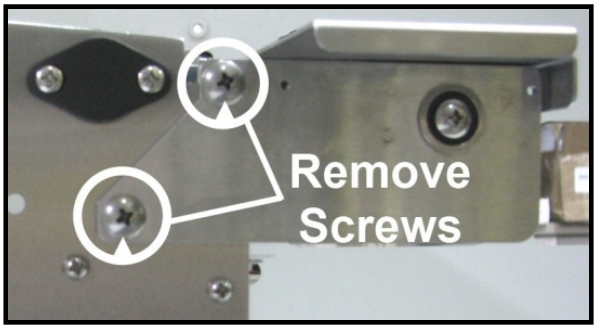


8. **Remove Left hand Inner Side Frame** (3 screws). Remove the Ink Tank Door mounting screw. First remove the Door Spring attached to the screw under the Base Plate. Then remove the screw. **NOTE: Be careful not to lose the Ink Door Spring.**

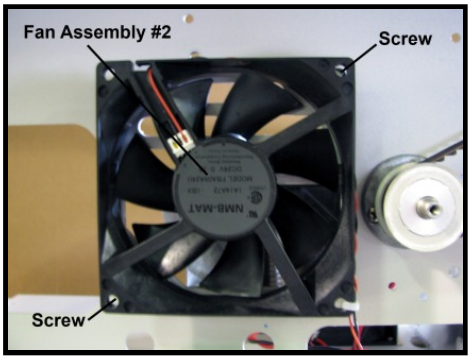


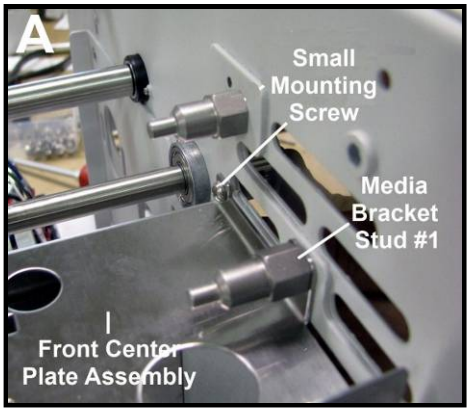


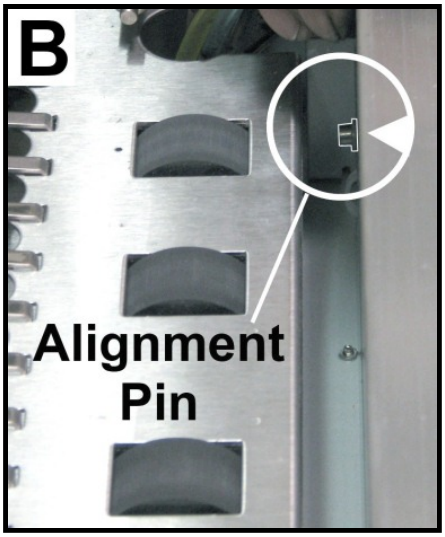
9. Remove (2) Screws holding Front Center Plate Assembly to the Intermediate Side Frame on right hand side.



10. Remove Side Fan (2 screws).
[A] Remove Media Bracket Stud #1 (1 screw) and the small screw holding the Assembly on left-hand side.
[B] Take the Front Center Plate by sliding it off the alignment studs on the Print Engine.

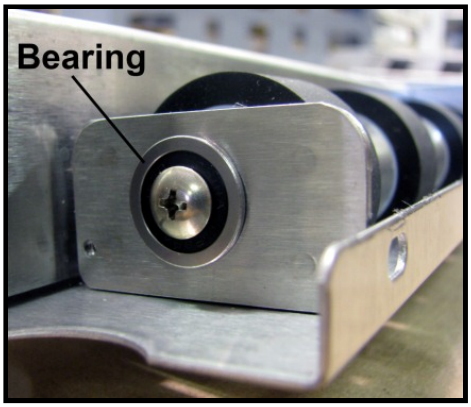






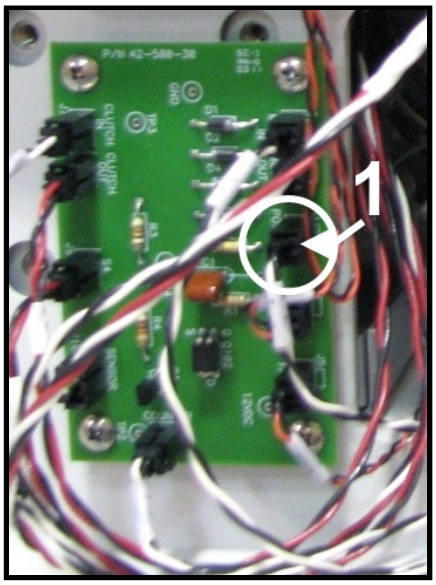
11. Remove Front Center Plate Assembly. Remove the (2) screws holding the Delivery Roller Shaft to the Assembly. **NOTE: you will have to remove the Bearing to remove Shaft from the Assembly.** The Rollers are attached to the shafts with Allen screws. Loosen the screws to slide the rollers off the shafts.

12. **Reassemble in reverse order.** Take care to reinstall the belt that drives the Rollers during assembly.



Replacing Interface (I/O) Board

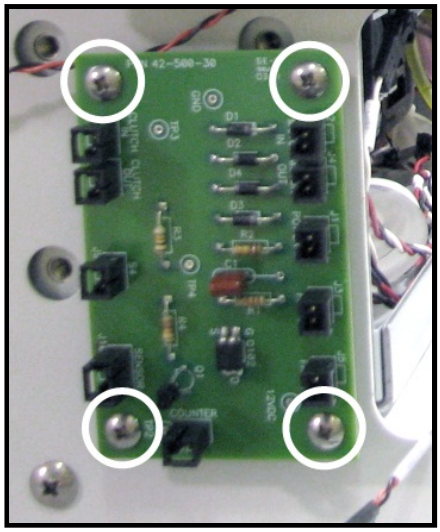
1. Remove the Right hand Side Cover.
2. Carefully unplug all connections from the I/O Board. **NOTE:** The connector locations on Rev B boards are different than shown here. Wires are labeled for easy reconnection.



CAUTION

DO NOT DAMAGE THE WIRES WHEN REMOVING THEM.

3. Remove the (4) screws that attach the PC Board to the Side Frame and remove the PC Board.



CAUTION

MAKE SURE THAT YOU ARE PROPERLY GROUNDED BEFORE HANDLING THE PC BOARD. STATIC ELECTRICITY CAN DAMAGE THE BOARD.

4. **Reassemble in reverse order.**

Replacing the Main PC Board (MPCA)

Valid for Z3 and higher Print Engines.

WARNING

THE FOLLOWING PROCEDURE SHOULD ONLY BE DONE BY A QUALIFIED, TRAINED SERVICE REPRESENTATIVE.

Before you Begin:

- Verify that you have ordered and received the proper version board for the Print Engine that is installed, in your printer. See chart below.

Part #	***For Print Engine Serial Number Range***	**Description**
42-110-02	*SG09CZ1#####*	Main Boards are no longer available for the Z2i engine. In this case, you must replace the Print Engine. In addition, please see Appendix H "Side Frame Modification".
42-500-200	*SG10KZ1##### to SG10UZ1#####* & *SG11FZ3##### to SG126Z3#####*	Main PCB for Z3 Print Engine
	Higher than *SG126Z3#####*	Main PCB for Z4 Print Engine
	MY###MR#####	Main PCB for MR Print Engine

NOTE: Part # 42-500-300 was dropped; since it was identical to 42-500-200.

- When ordering a new board; please be sure to provide the serial number of the printer and the print-engine with your order. This info is needed in order for the print-engine serial number to be programmed into the new board.
- Follow proper static handling precautions.
- Do not pull on the wires to disconnect cables. Damage will result. Print Engine wiring harnesses are NOT available as spare parts.
- To disconnect the cables; pull on the connector, NOT the wires.
  The use of a "connector puller tool", like the one shown below, is suggested.
  SAP# 9101827U, JST TOOL

CAUTION

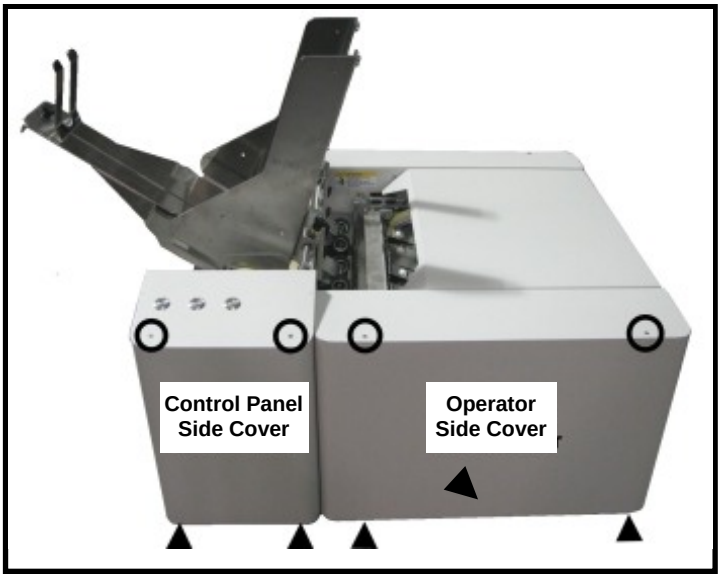
ALWAYS WEAR A WRIST STRAP THAT IS GROUNDED WHEN TOUCHING ELECTRONIC DEVICES.

Procedure:

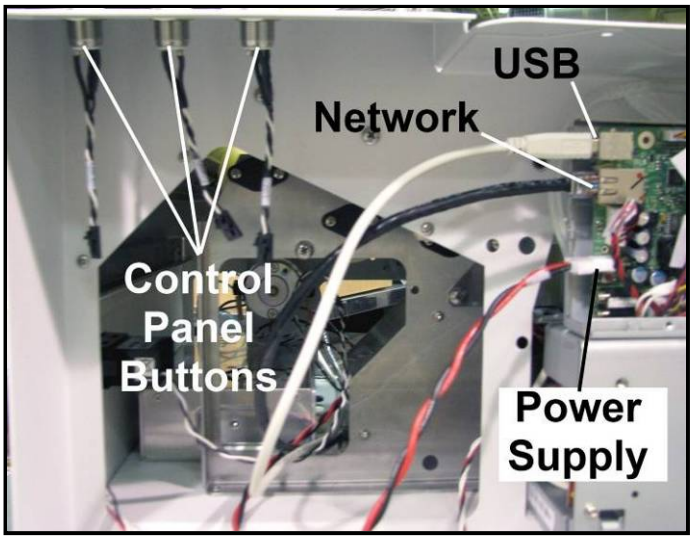
1. **Turn off the Printer**

CAUTION
WHENEVER POWERING DOWN UNIT, ALWAYS: **1. PRESS THE POWER BUTTON ON THE CONTROL PANEL.** **2. WAIT FOR THE PRINTER TO STOP PROCESSING.** **3. THEN PRESS THE MAIN POWER SWITCH ON THE REAR PANEL.**

2. **Disconnect Power Cord**
3. **Disconnect Interface Cable**
4. **Remove Control Panel Side Cover.** Remove (2) screws at the top and bottom of the Control Panel Side Cover. Pull cover away from machine and set aside.
   Tip: Keep track of where screws are removed from. They are different.
5. **Remove Operator Side Cover.** Remove (2) screws at the top and bottom of the Operator Side Cover. Remove the Cover.



6. **Unplug USB, Network and Power Supply cables from the Main Print Engine PCB**.



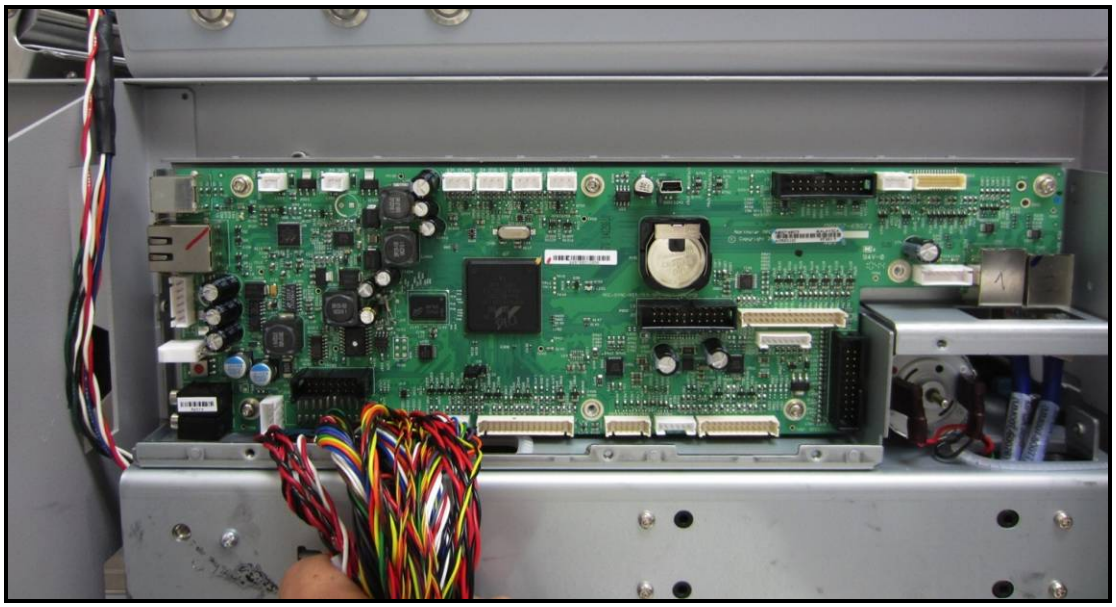
7. **Remove the Main PCB Cover**
   Using a T10 Torx driver remove the screws that secure the cover. There will be 4 or 5 screws, depending on print-engine version.
   Tip: The top section of this cover wraps around the back-side of the enclosure. Once the screws are removed, lift the cover up and then towards you; so the cover clears the back side of the enclosure.

8. **Carefully disconnect all connections from Main PCB**
   IMPORTANT! Do not pull on wires to disconnect; pull on connector. Before you disconnect; check to be sure each connection is tagged so you know where to re-attach it.

9. **Remove the T10 screws that secure the Main PCB to the frame.**

10. **Carefully remove the Main PCB.**

11. **Install the New Main PCB to the frame using the T10 screws.**



12. **Carefully reconnect all connections to the New Main PCB, in the following order.**

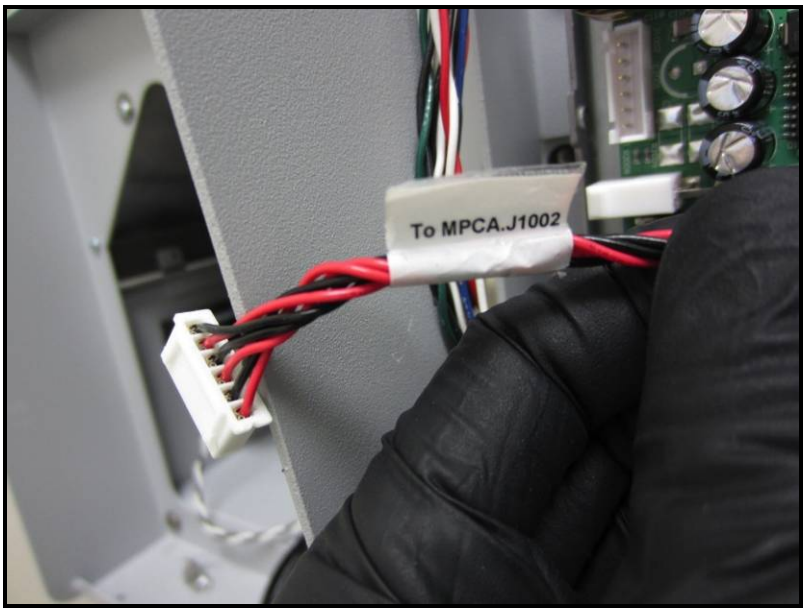
    Please follow this process, step by step, to be sure each connection is installed into the appropriate socket.

    WARNING: The images shown in the following process are valid for the installation of a board into a Z3 or higher print-engine. If you have a Z2i engine; do NOT use the following images to guide you through the connection process. The cables and socket (connection) positions are different on Z2i boards. We have not developed a document with Z2i images. If you have a Z2i board installation you will need to carefully read the tags on the cables and locate the corresponding socket location on the board (they are labeled).

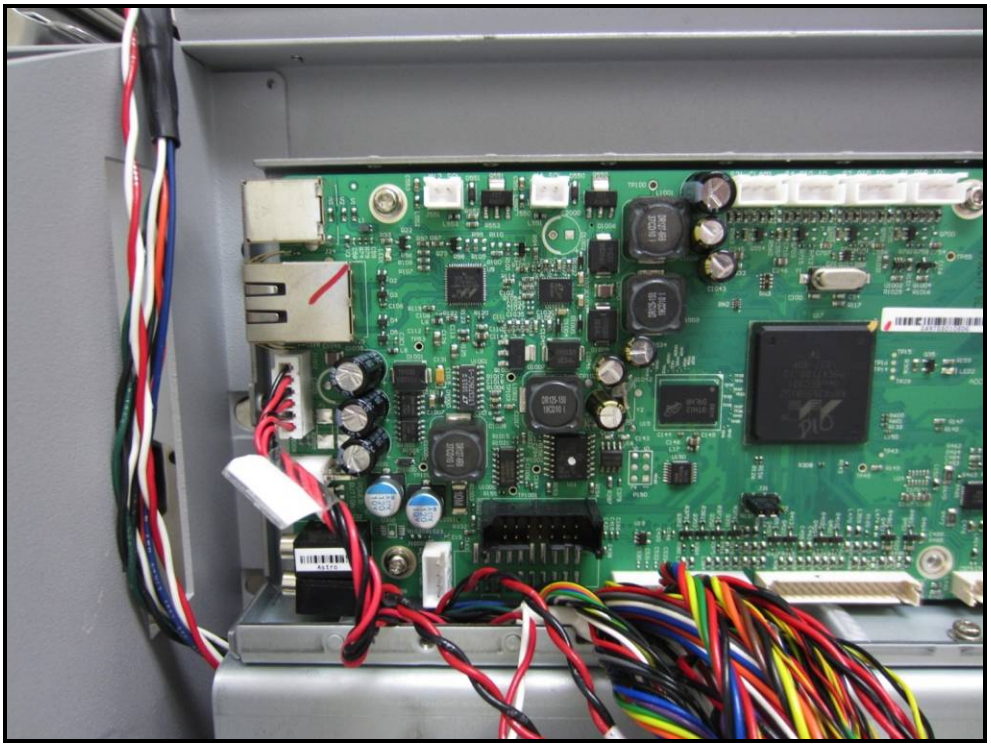
    Tip: Triple check that all connections have been properly made before installing the Main PCB Cover.

CAUTION
ALWAYS WEAR A WRIST STRAP THAT IS GROUNDED WHEN TOUCHING ELECTRONIC DEVICES.

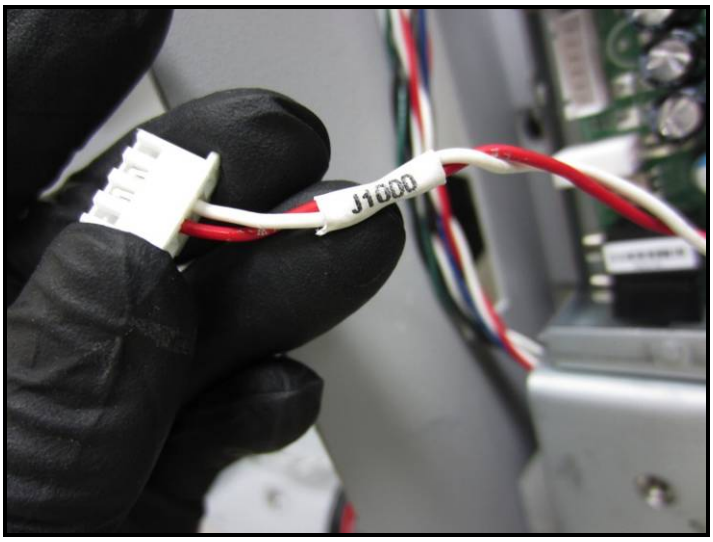
a. **J1002 Cable**



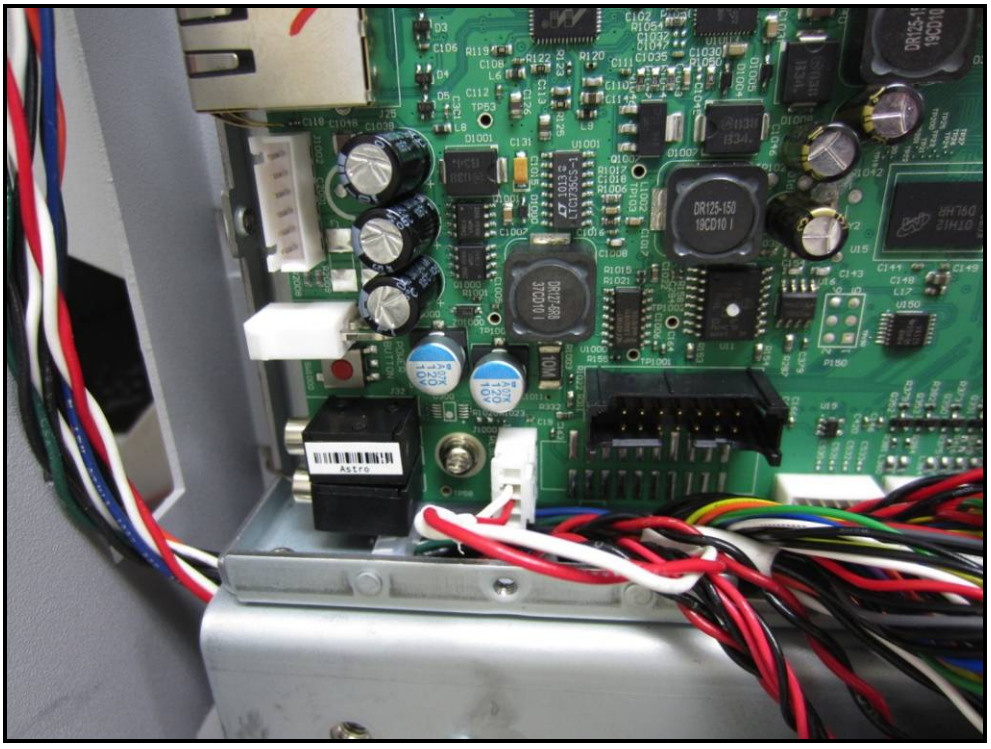
J1002 Socket Location (Connection)



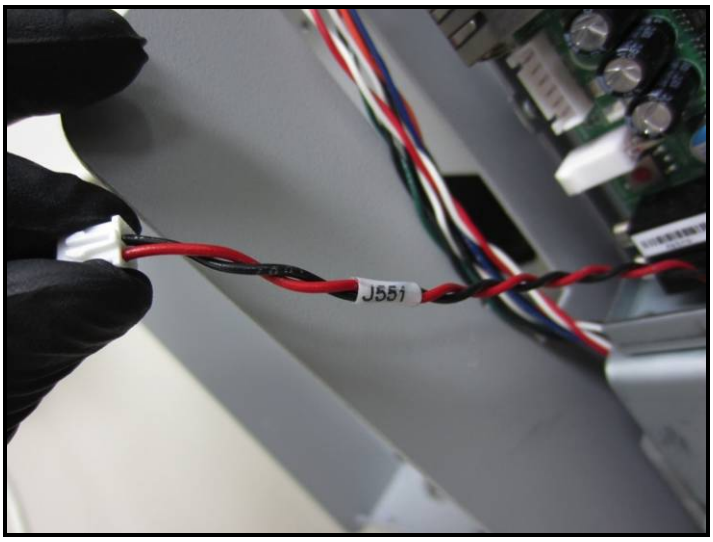
b. J1000 Cable



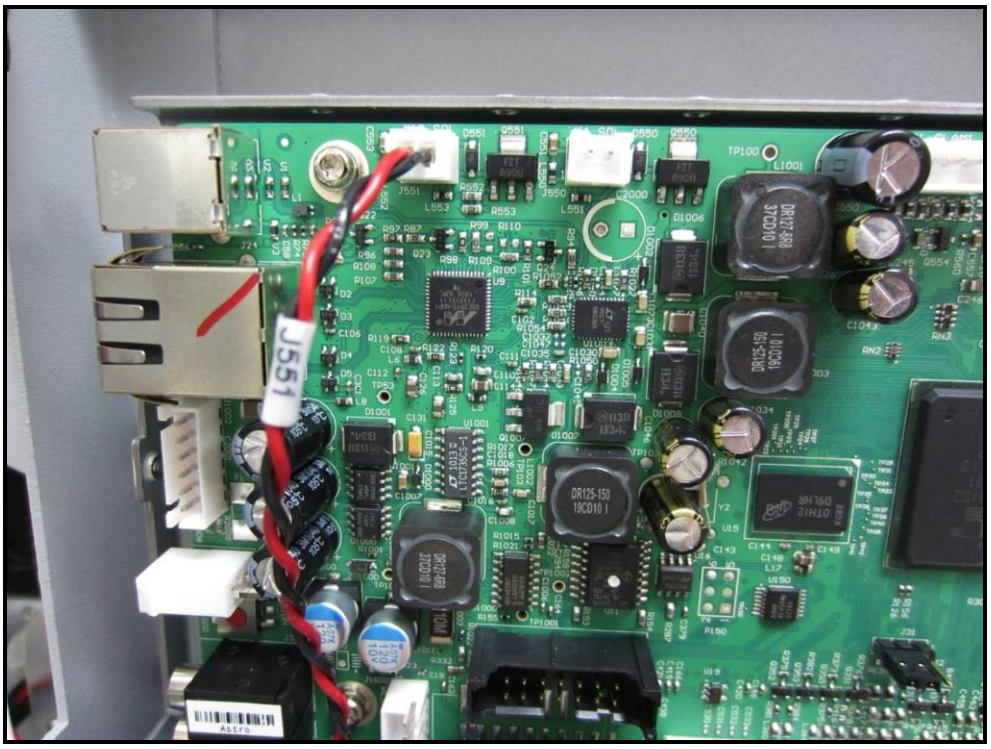
J1000 Socket Location (Connection)



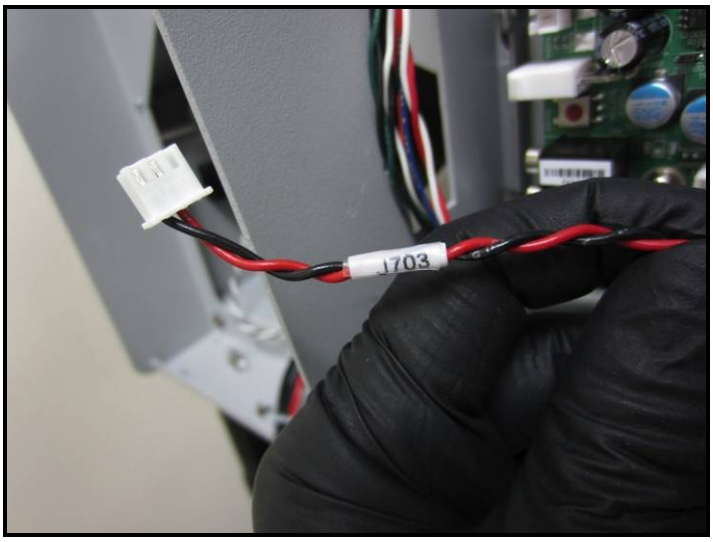
c. J551 Cable



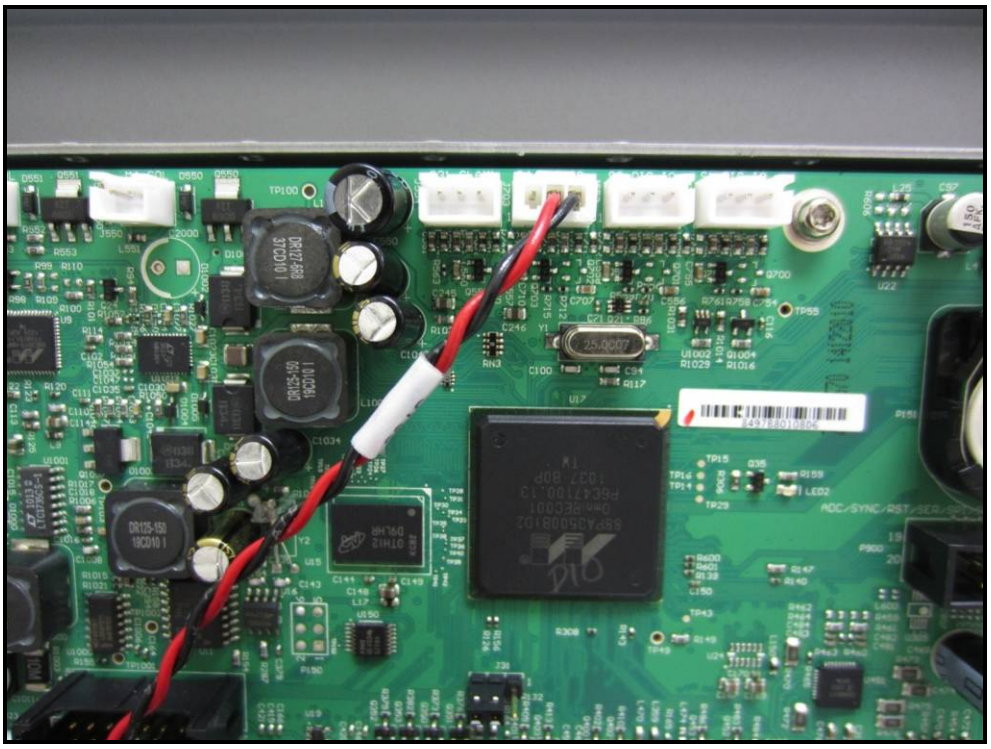
J551 Socket Location (Connection)



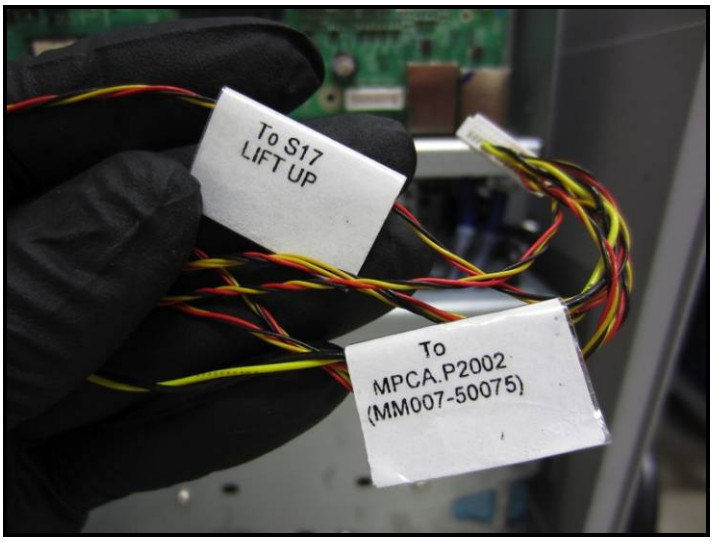
d. J703 Cable



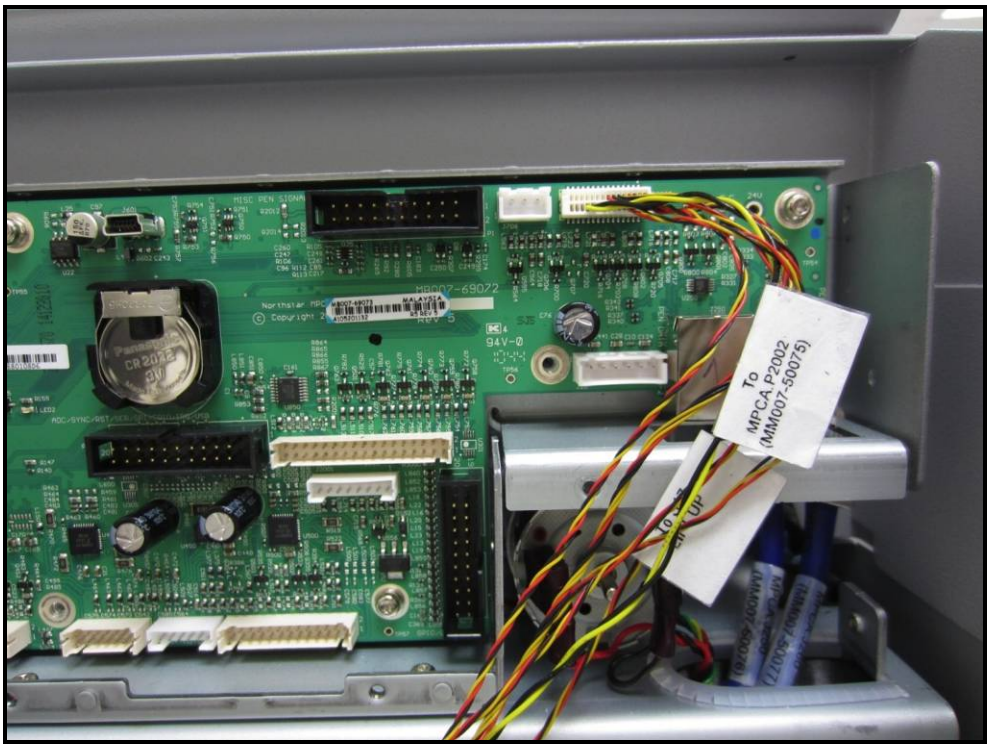
J703 Socket Location (Connection)



e. P2002 Cable

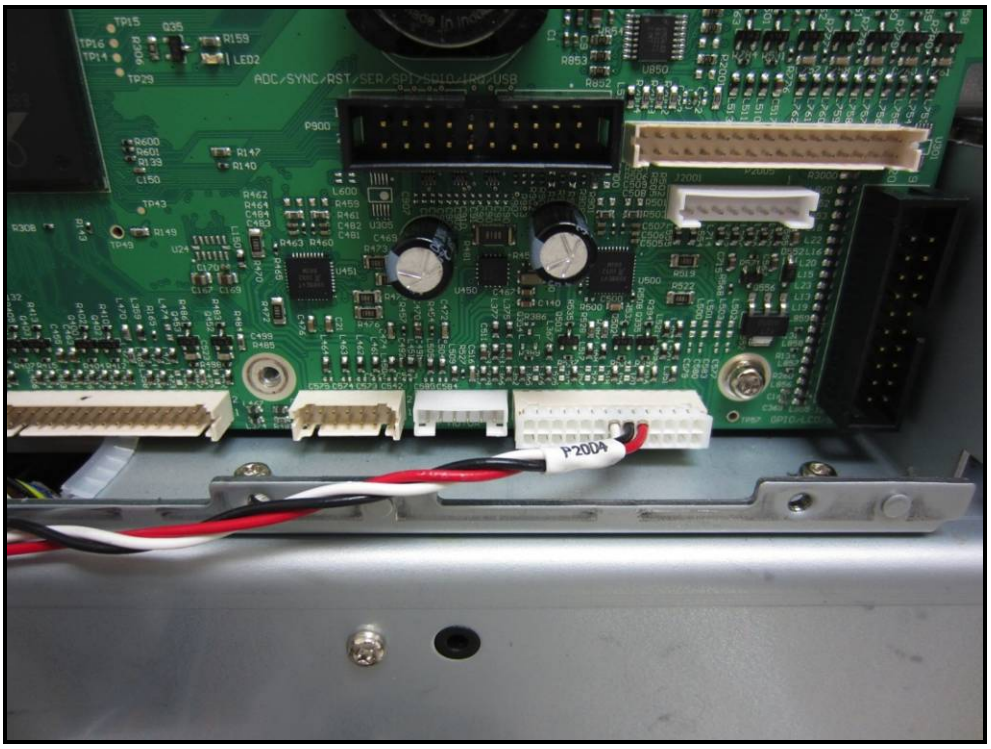


P2002 Socket Location (Connection)



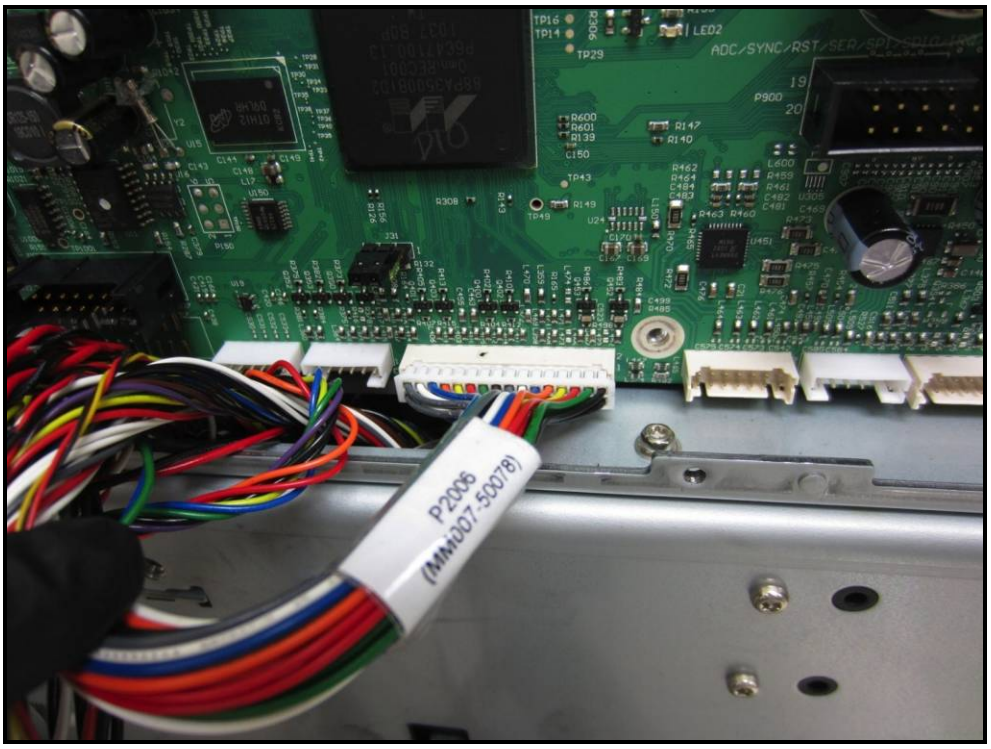
f. P2004 Cable

P2004 Socket Location (Connection)

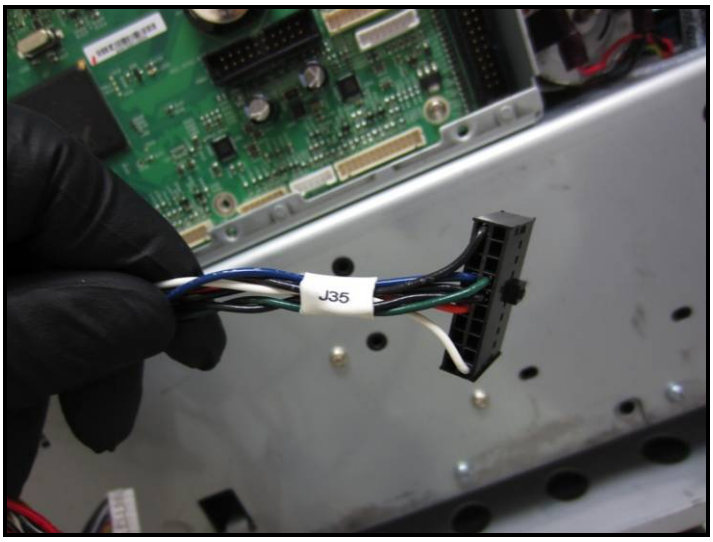


g. P2006 Cable

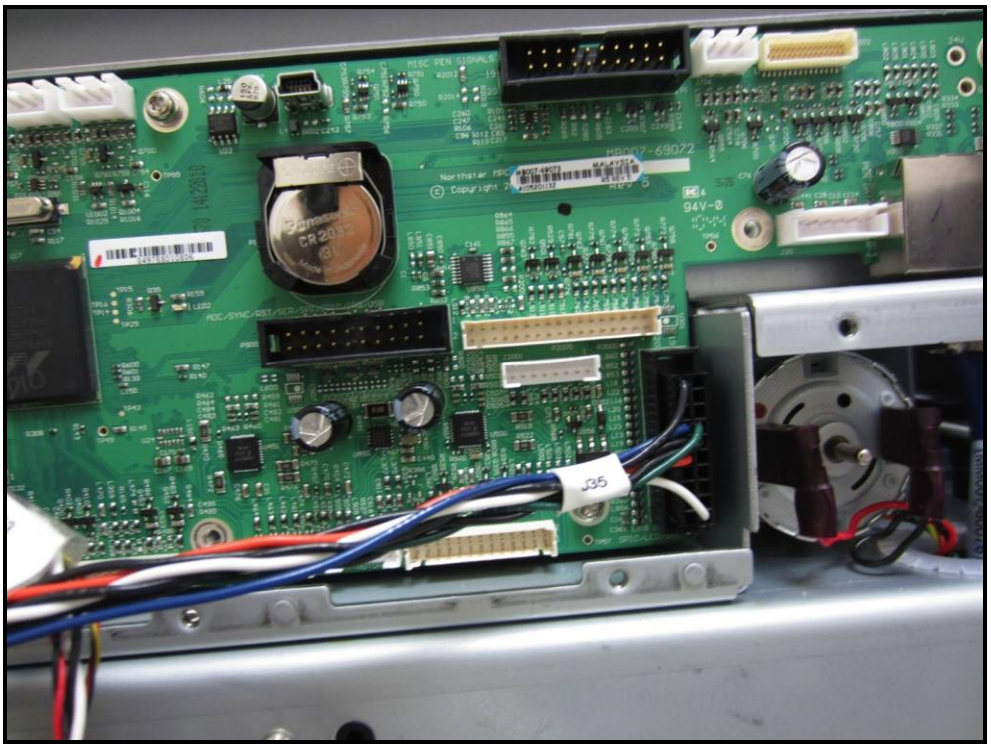
P2006 Socket Location (Connection)



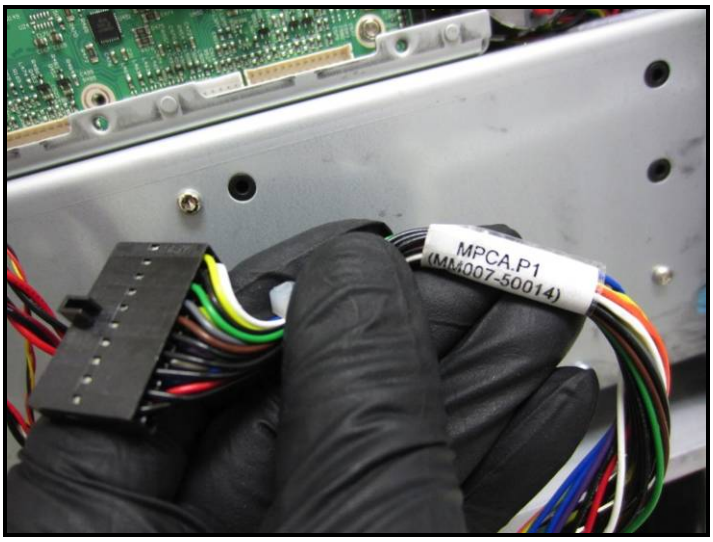
h. J35 Cable



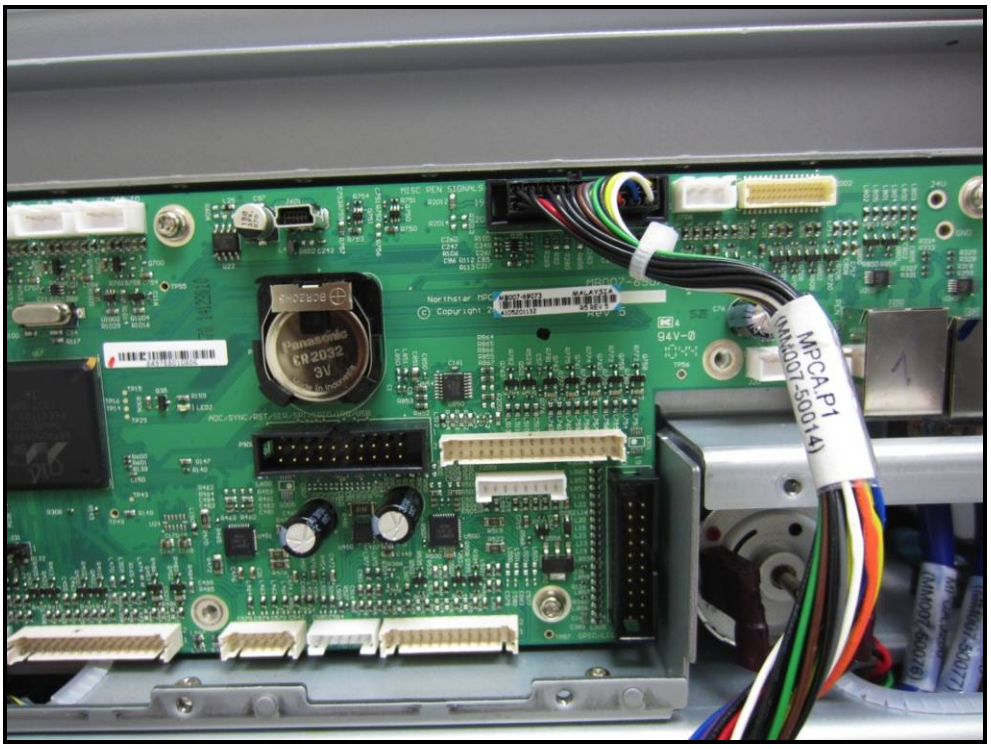
J35 Socket Location (Connection)



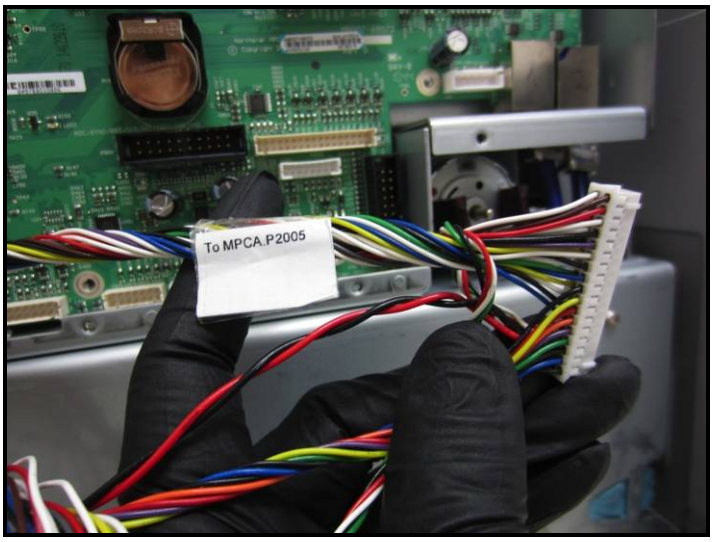
i. P1 Cable



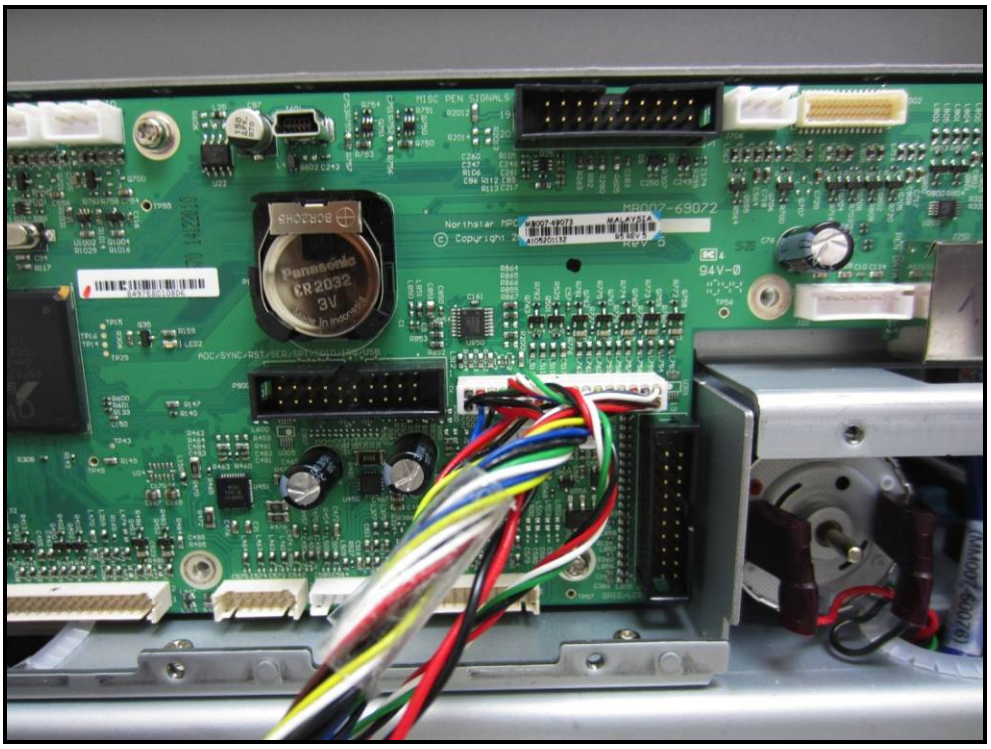
P1 Socket Location (Connection)



j. P2005 Cable

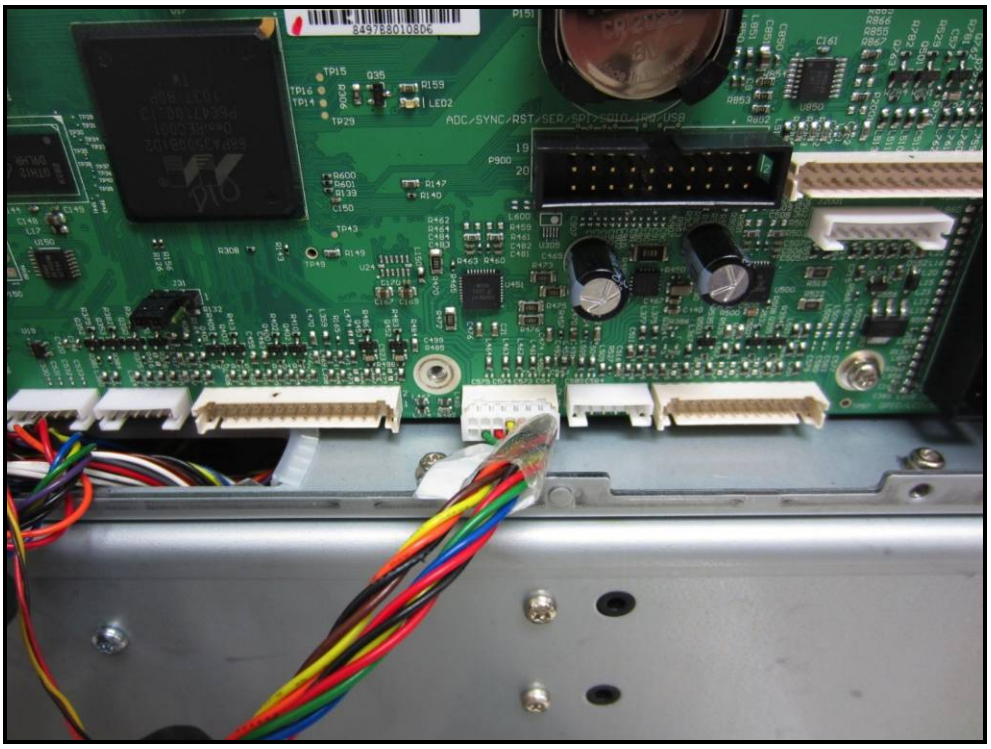


P2005 Socket Location (Connection)

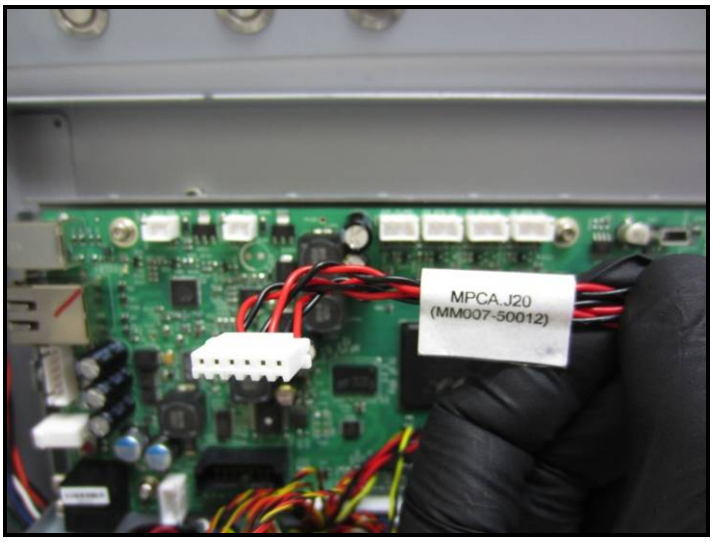


k. P2003 Cable

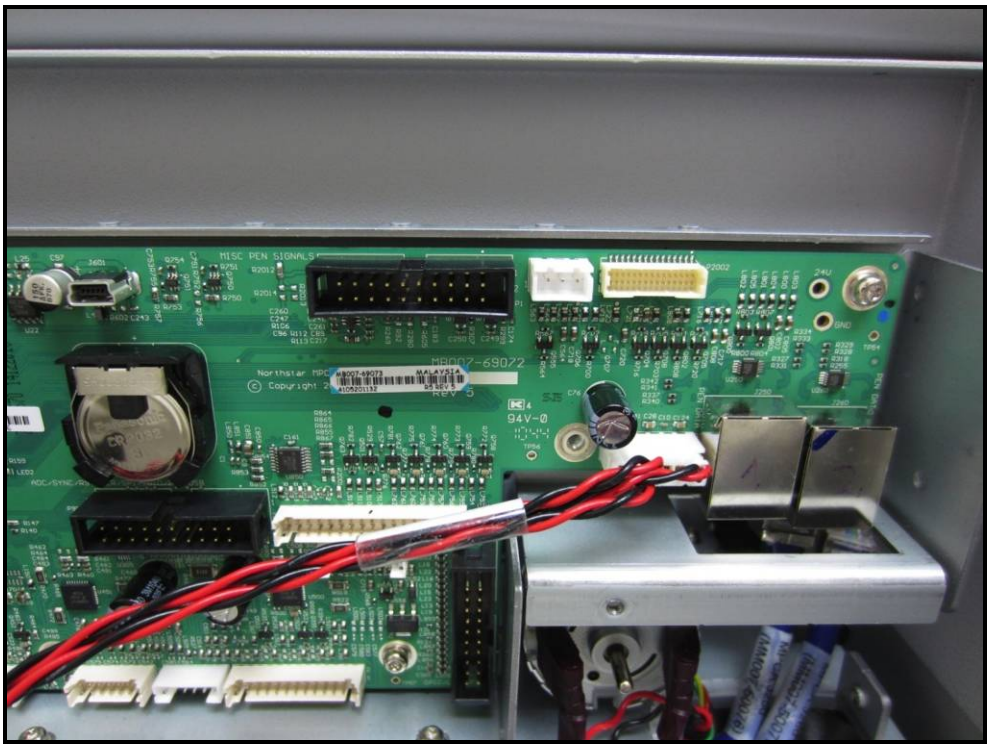
P2003 Socket Location (Connection)



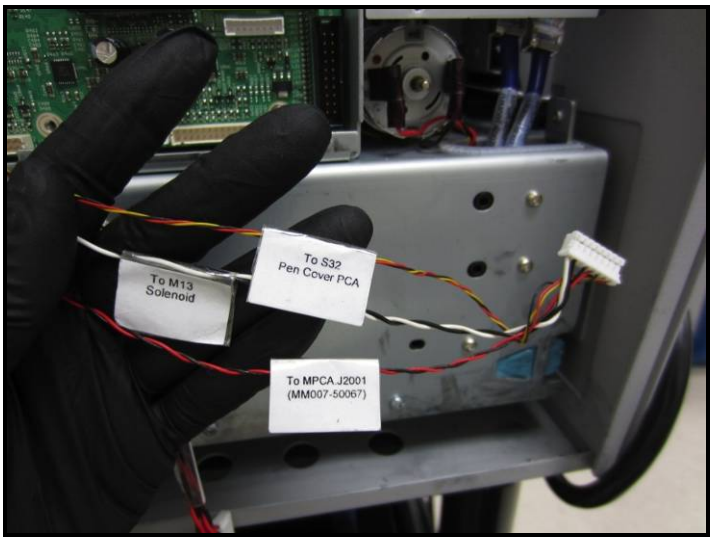
l. J20 Cable



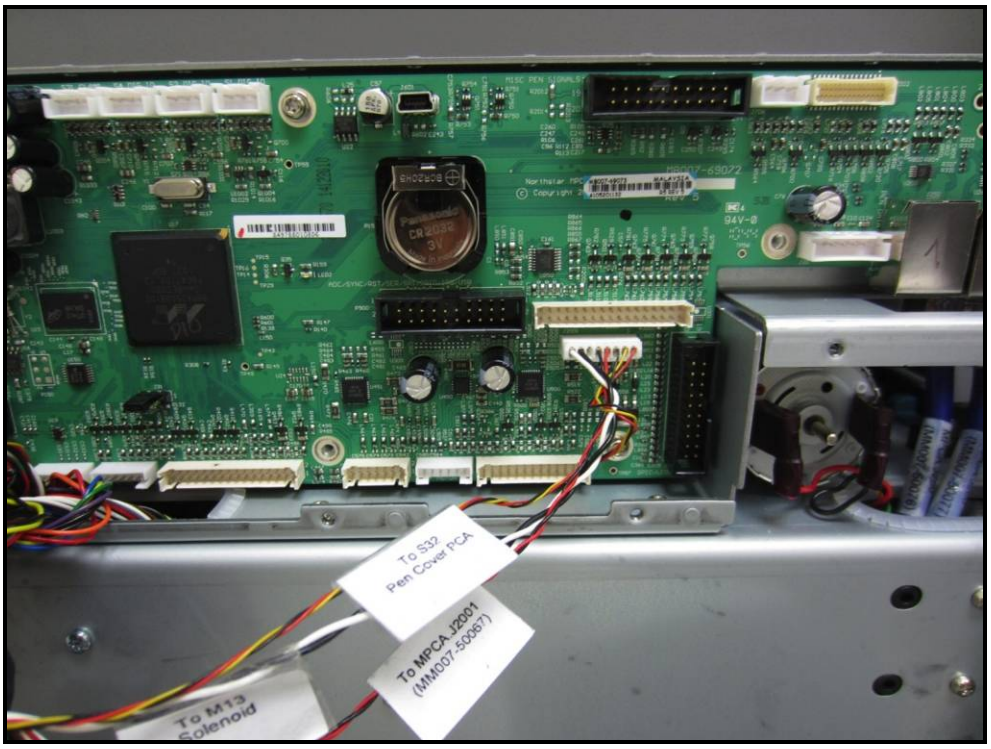
J20 Socket Location (Connection)



m. J2001 Cable

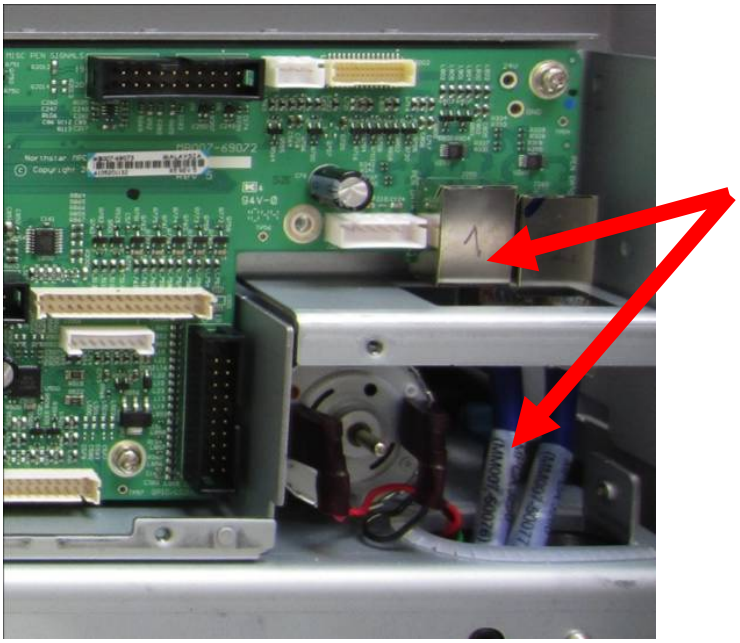


J2001 Socket Location (Connection)



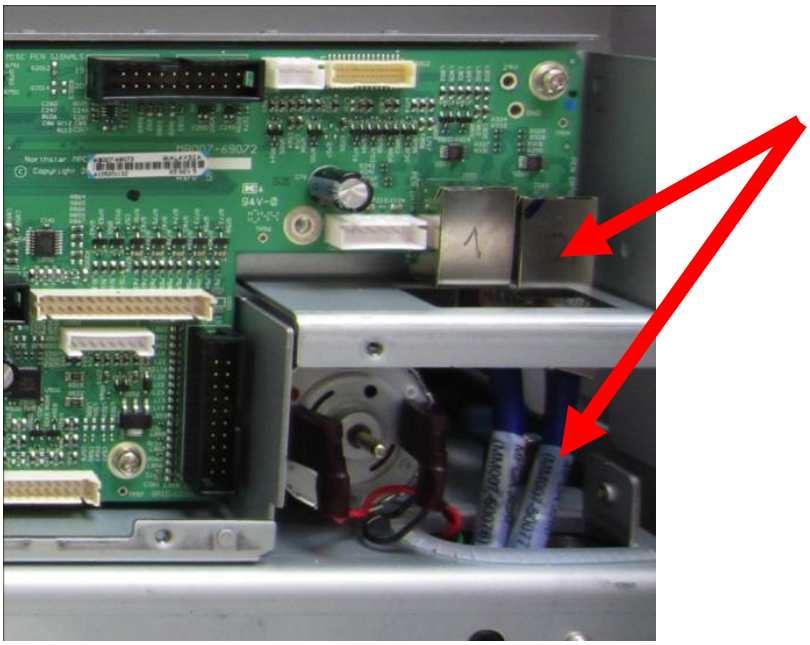
n. **J250 Data Cable**

J250 Data Cable Socket Location (Connection)



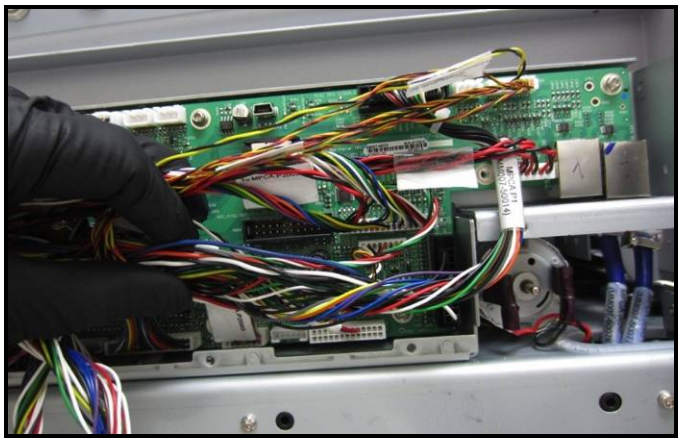
o. **J260 Data Cable**

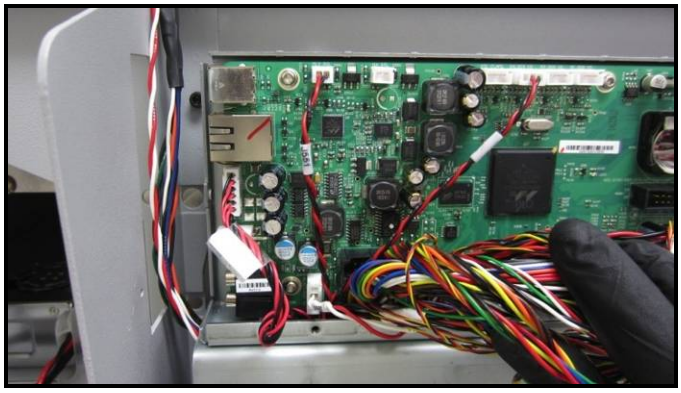
J260 Data Cable Socket Location (Connection)

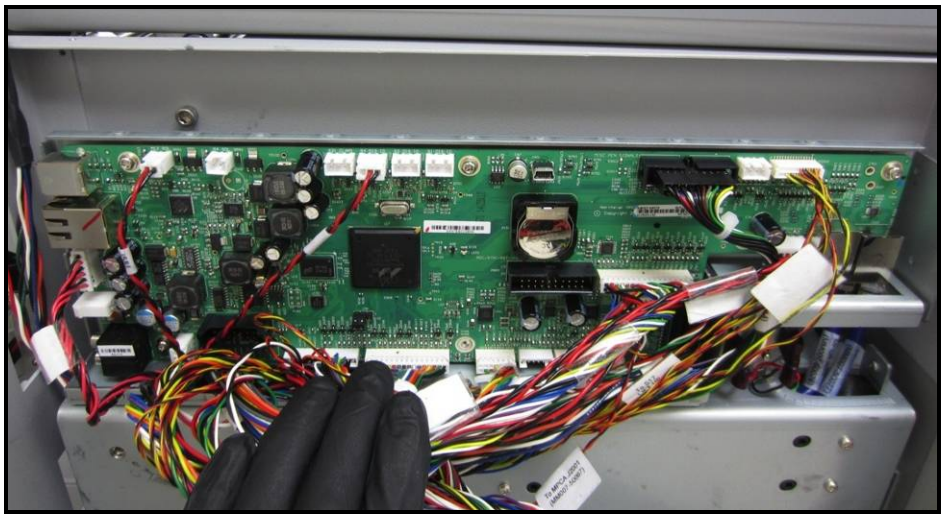


13. Verify that All Cables Are Installed

NOTE: There will be 10 open sockets after all cables have been installed.
Open Sockets: J550, J554, J553, J750, J706, J504, J353, J400, J37, P900.







14. **Reinstall the Main PCB Cover** with 4 or 5 screws removed in Step 7.
    Do NOT over-tighten the screws. Be careful not to pinch any wires.

    Tip: Triple check that all connections have been properly made before installing the Main PCB Cover.

15. **Reconnect USB, Network and Power Supply Cables to Main PCB** removed in Step 6.

16. **Reconnect the Power Cord and Interface Cable;** removed in steps 2 and 3.

17. **Power the Printer ON and perform a quick Test;** before you re-install side covers.
    Example: Demo Page Print from Toolbox or Test Page from M Series Driver.
    Also check that the latest firmware version is installed.

18. **If Test was satisfactory, Reinstall the Side Covers**; removed in steps 4 and 5.

19. **Test Printer for Proper Operation using the customer's software application and media.**

MPCA (Main Printed Circuit Assembly) Connections

NOTE: Valid for Z3 and higher Print Engines. This info is NOT valid for Z2i Print Engines

The following chart shows where the connections to the MPCA come from and a brief description of what they are used for (what they do).

LABEL	COMING FROM	DESCRIPTION
J1002	Driver Printed Circuit Assembly (DPCA)	Power Supply.
J551	Interface I/O board	Clutch Control.
J703	Interface I/O board	Feeder Sensor Control.
P2004	Feeder Encoder Reader Board	Feeder Encoder Control.
P2002	Lower Clamshell	Service Station Home Sensor, Service Station Index Sensor, Service Station Lifts Up Sensor, Exit Sensor, Entry Sensor, Black Mark Sensor, Clamshell Open/Closed Switch.
P2006	Driver Printed Circuit Assembly (DPCA)	Motor PWM Control/Encoder signals for (**a**) Print Engine Paper Motor, (**b**) Print Engine Pump Motor, (**c**) Feeder Motor, (**d**) Wiper Motor
J35	Control Buttons	Power/Paper/Cancel Buttons/LED
P1	Pen Driver Printed Circuit Assembly (PPCA)	Printhead QAI Bus and 2.5 VDC QAI power, 3.3 VDC logic power for Printhead, VPOS enable & VPOS power good signal, DOUT from Printhead, Printhead reset lines, 5 VDC power for current sense buffer, analog current sense line from PPCA, pushbutton (2) inputs to MPCA.
P2005	Ink level PCA, Pinch Valve, Ink Cartridge QAI interfaces	Ink Level Optical Sensors, Print Engine Accelerometer (level sense), Pinch Valve Actuator and Position Sensors, Ink Cartridge QAI, Temperature Sensor.
P2003	Service Station Lifter Motor & Encoder, Service Station Transport Motor	Service Station Lifter Arm and Transport Drive signals.
J20	Pen Driver Printed Circuit Assembly (PPCA)	Primary 24 VDC supply to PPCA.
J2001	Upper Clamshell	Printhead Latch solenoid, Printhead Latch Open/Closed Sensor, Label Gap IR transmitter LED.
J1000	Power Button	ON/OFF Switch.
J250 (CAT-5)	PPCA	Data input to Printhead.
J260 (CAT-5)	PPCA	Data input to Printhead.

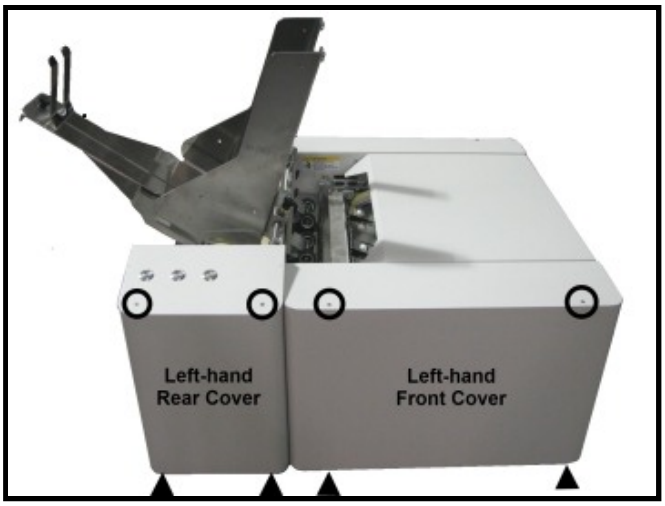
Removing the Print Engine

Note: There is a “service video” available for this procedure.

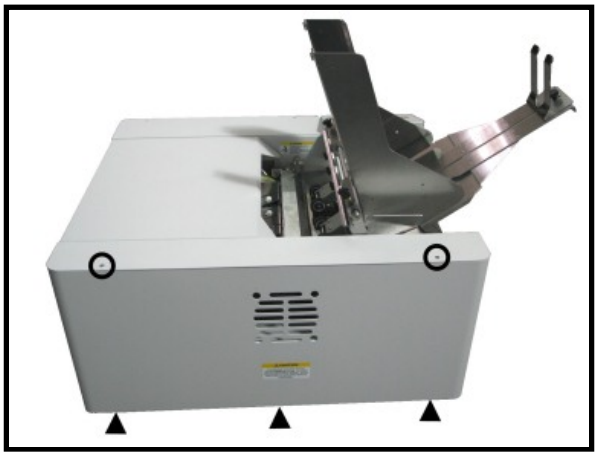
1. Open the Top Cover. Open the Toolbox, press the Release Printhead button. Printer will "deprime" pumping all the ink back to the ink tanks, then the Printhead Cover will open. Remove the Printhead Cartridge and carefully put it back in the original packaging. Shut the printer down by first pressing the Control Panel Power button, then the Main Power switch on the rear panel. Unplug the unit.

2. **Remove the Left hand Rear Side Cover** by removing the (2) screws at the top and bottom of the Cover.

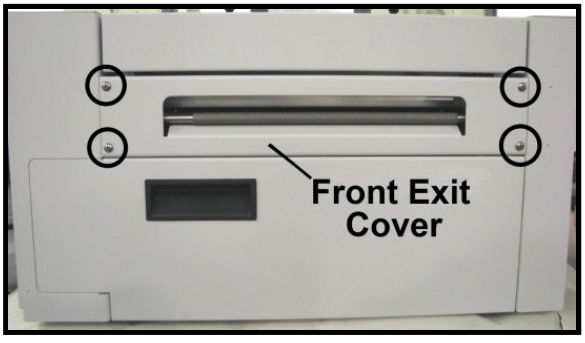
3. Remove two screws at the top and bottom of the Front Left-hand Side Cover. Pull Cover away from machine slightly.



4. **Remove the Right-hand Side Cover** by removing the (3) screws at the top of the Cover. Then remove the (3) screws from the bottom of the Cover.

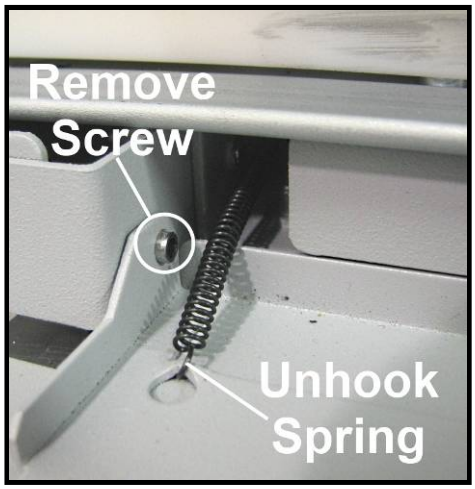


5. **Remove Front Exit Cover** by removing (4) screws.



6. **Remove Ink Tank Door.** Carefully unhook the (2) springs (*one each side*), then remove the mounting screw from the left-hand side (Control Panel Side). Remove Door and set aside.

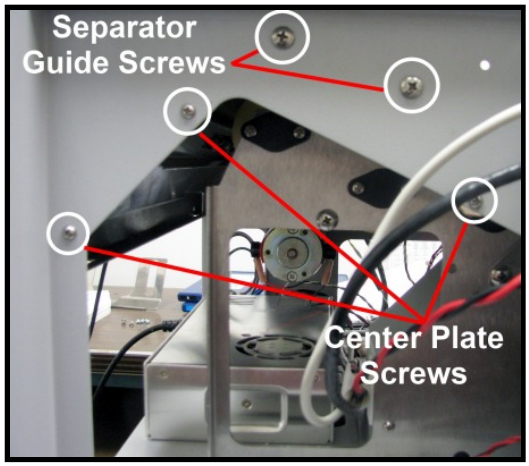
   Tip: To save time; you can skip this step. Ink Tank Door will be released once you remove the operator side-frame (step 12).



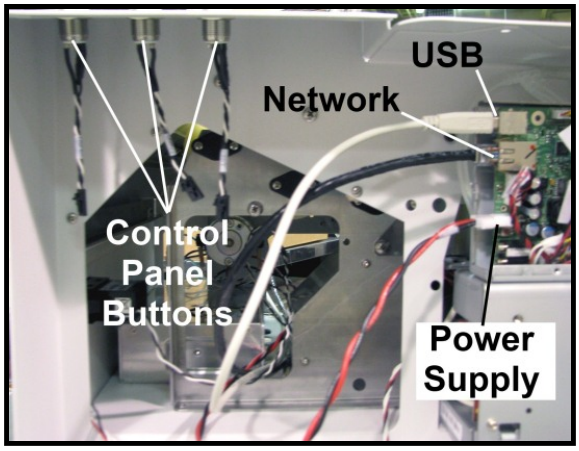
7. **Remove Top Cover.** Remove "cover pivot screw", at non-operator side. Remove Top Cover and set aside.

   Tip: To save time; you can skip this step. Top cover will be released once you remove the operator side-frame (step 12).

8. **[A]** Remove the (2) screws holding the left-hand side Media Separator Guide.
   [B] Remove the (3) screws on left-hand side of the machine that hold the Center Plate in place.



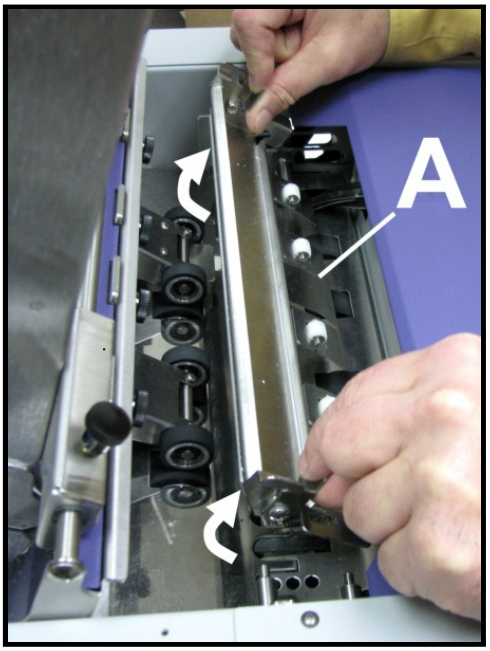
9. Unplug Network, USB and Main Power connectors from Print Engine Circuit Board. Disconnect the wires attached to the Power, Paper and Cancel Buttons at connectors. **NOTE:** Wires are labeled to simplify reconnection.



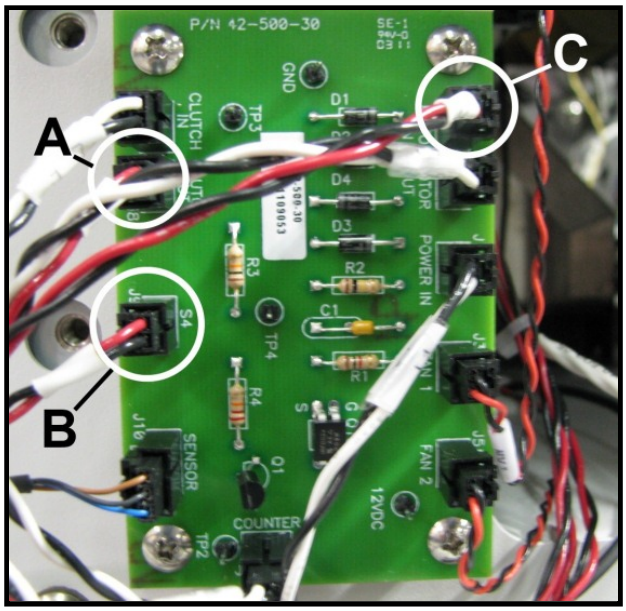
10. Remove Antistatic Brush Assembly **[A]** from mounting studs. Unlatch the two latches (*one on either side of the Assembly*) and lift the assembly off the four mounting pins as shown. **Do not bend the brushes!**

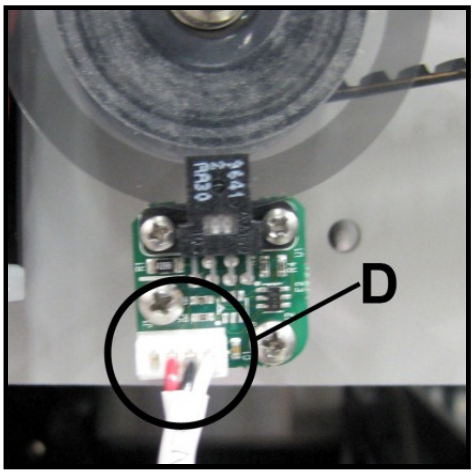
CAUTION
DO NOT BEND, PINCH OR CUT THE INK LINES LOCATED DIRECTLY IN FRONT OF THE BRUSH ASSEMBLY.

NOTE – Make sure Brush Assembly is correctly reinstalled and aligned before starting to print. Assembly should sit flat on transport area surface.

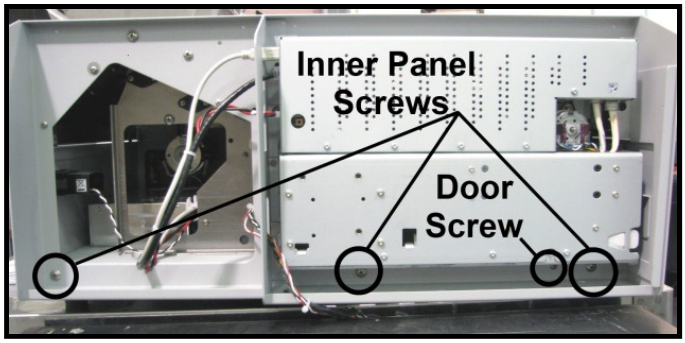


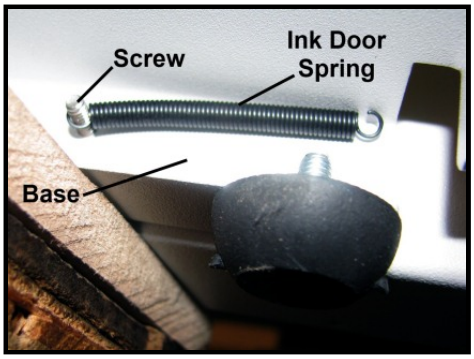
11. Disconnect the following wires from the Interface Printed Circuit Board located on the right hand side of the Printer Frame.:
[A] Clutch Out (J8),
[B] S4 (J9)
[C] Motor In (J2).
NOTE: Connector location **[C]** on Rev B boards is different than shown here.
[D] Disconnect the Encoder wire from the Encoder Printed Circuit Board. Pull these wires clear from the other wiring so they won't snag when the Print Engine is removed.



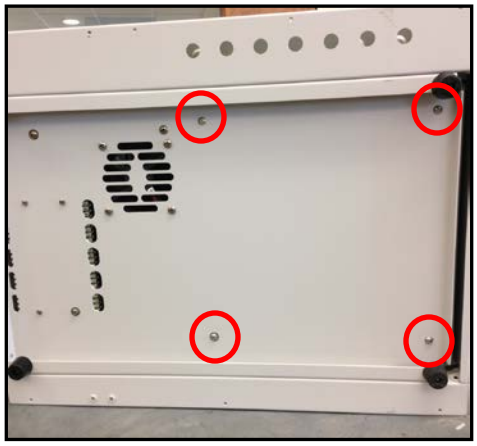


12. Remove Left-hand Inner Side (operator side) Frame (3 screws). Remove the Ink Tank Door Spring mounting screw. First remove the Door Spring attached to the screw under the Base Plate. Then remove the screw. Then carefully remove the Inner Side Frame from around the Print Engine and Ink Lines. **NOTE: be careful not to lose the Ink Door Spring.**



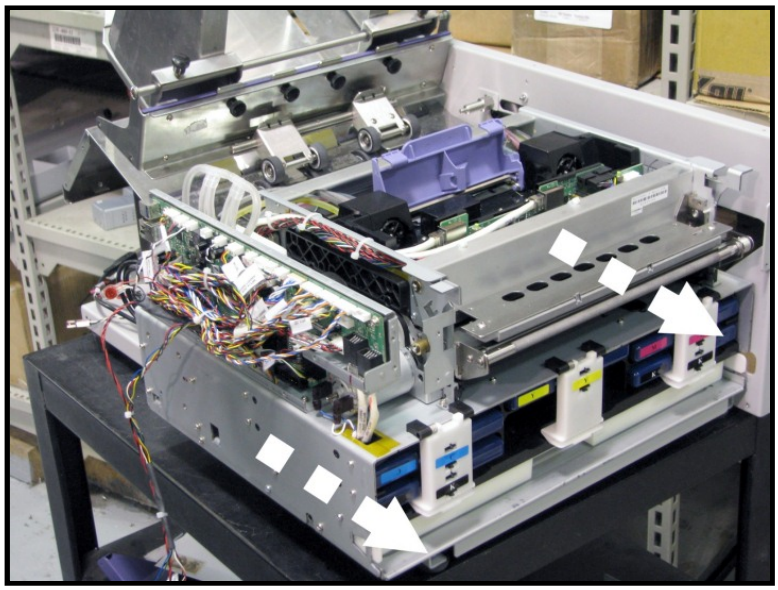


13. Slide the printer off the side of the work table so you can reach underneath to access and remove the four Allen screws; securing the Print Engine to the Base Plate.



NOTE: The image above shows a printer on its side to help identify screw locations only. This is NOT the suggested way to access and remove these screws.

14. Carefully slide Print Engine out of Printer. (Print Engine is entire unit including the Ink Station)



15. Reassemble in reverse order.

IMPORTANT!

WHEN REINSTALLING THE PRINT ENGINE, MAKE SURE THAT THE ALIGNING PINS ARE FLUSH WITH EACH OTHER WHEN THE PRINT ENGINE IS PUSHED AGAINST THE FRONT CENTER PLATE ASSEMBLY. EVEN A SLIGHT MISALIGNMENT MAY CAUSE FEEDING AND PRINTING PROBLEMS. ALSO BE CAREFUL NOT TO PINCH WIRES OR INK TUBES IN THIS PROCESS.

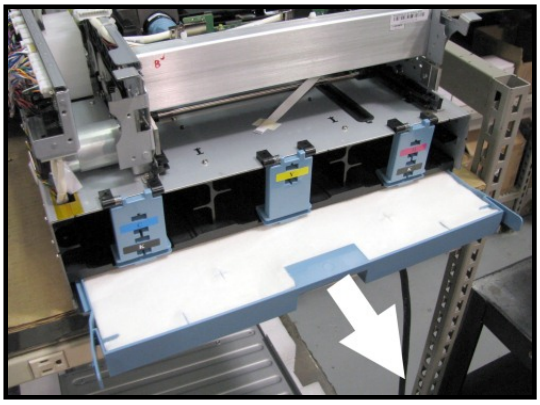
Print Engine Basic Disassembly

The Print Engine must be removed from the Printer for these procedures. See "Removing the Print Engine" in previous pages. It is also assumed that the ink tanks, printhead and service station are removed.

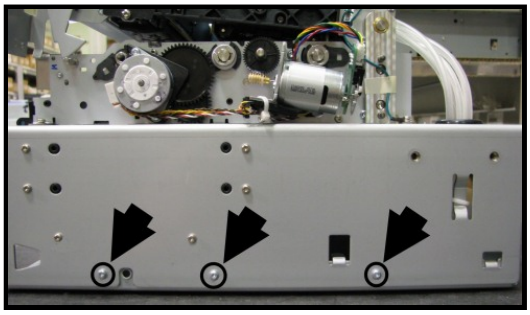
Removing the Print Engine Base

Provides access to parts located underneath the Print Engine.

1. **Remove Ink Waste Tray** from below Ink Reservoirs and put aside.



2. **Remove Engine Base.** Remove (6) T-10 screws, (3) on each side) of the Print Engine Assembly. **(Set aside for reassembly).**



Print Engine Components -- Underside

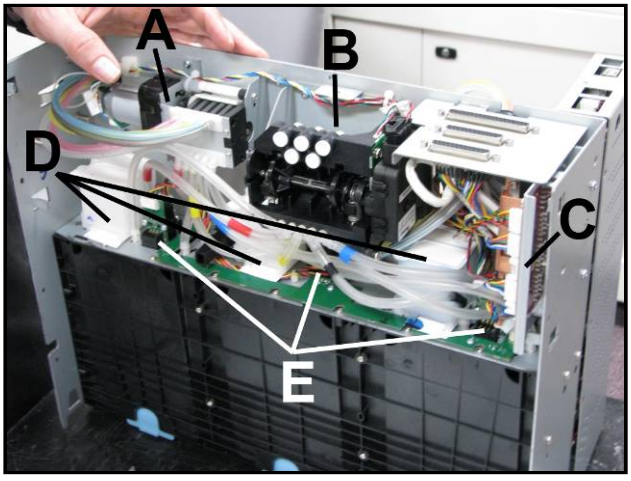
[A] Peristaltic Pump

[B] Dual Pinch Valve

[C] DPCA Board

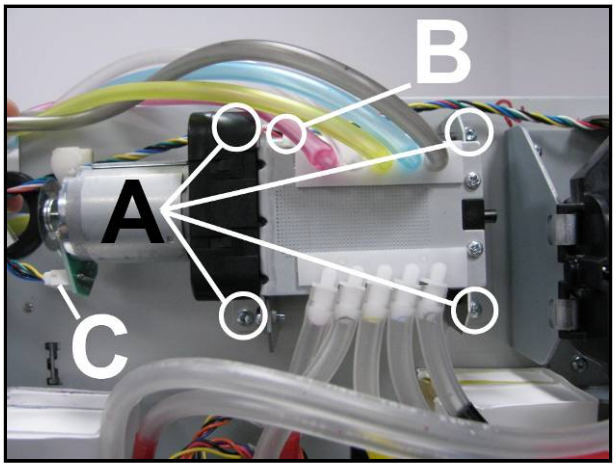
[D] Buffer Boxes (3 Sets of 2)

[E] Q/A Chip Assembly for Ink Tanks (3 – one per Buffer Box)



Replacing Peristaltic Pump Assembly

Remove old Pump Assembly:



[A] Remove (4) screws that hold bracket to chassis.

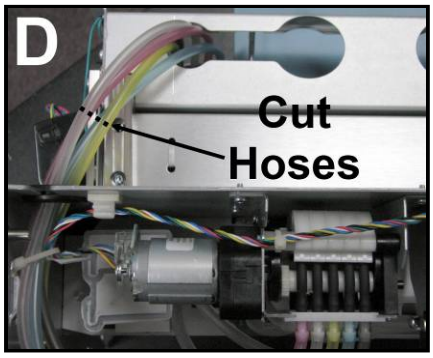
[B] Cut cable tie holding wiring harness to Assembly.

[C] Unplug connector from pump motor circuit board.

[D] Cut as shown or remove hoses from barbs. **IMPORTANT! Make sure you know where each ink hose connects**.

Remove old Pump Assembly.

Install new Pump Assembly:



Plug wire connector into new Pump Assembly Motor circuit board **[C]**.

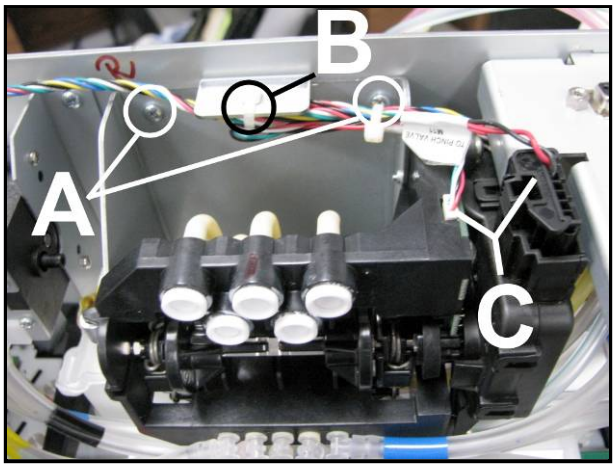
Attach to chassis with (4) screws **[A]**.

Cable tie wire harness to assembly as shown in Step 1 **[B].**

Attach ink hoses in order shown to hose splice connectors (*included with kit*) **[D].**
IMPORTANT! Make sure you know where each ink hose connects for reassembly.

Replacing Dual Pinch Valve Assembly

Remove old Valve Assembly:



[A] Remove (4) screws that hold bracket to chassis.

[B] Cut cable tie holding wiring harness to top flange on Bracket Assembly.

[C] Unplug the (2) connectors from the Valve Assembly.

[D] Disconnect ink hoses. **IMPORTANT! Make sure you know where each ink hose connects**.

Remove old Pinch Valve Assembly.

Install new Pinch Valve Assembly:

Plug wire connectors into new Pinch Valve Assembly **[C]**.

Attach to chassis with (4) screws **[A]**.

Cable tie wire harness to top flange on Pinch Valve Assembly as shown in Step 1 **[B]**.

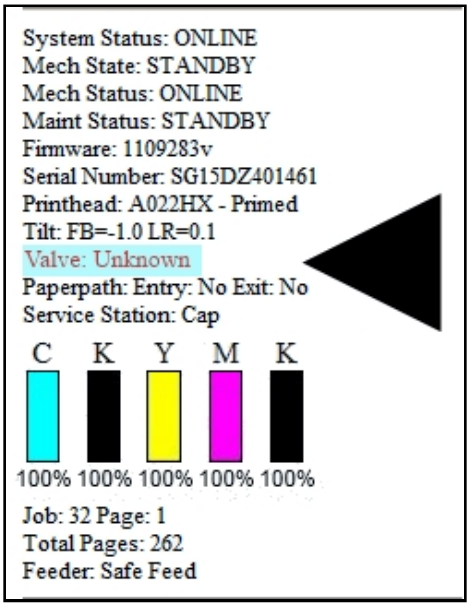
Attach ink hoses in order shown to hose splice connectors (*included with kit*) **[D]**.

Cleaning Dual Pinch Valve Sensors

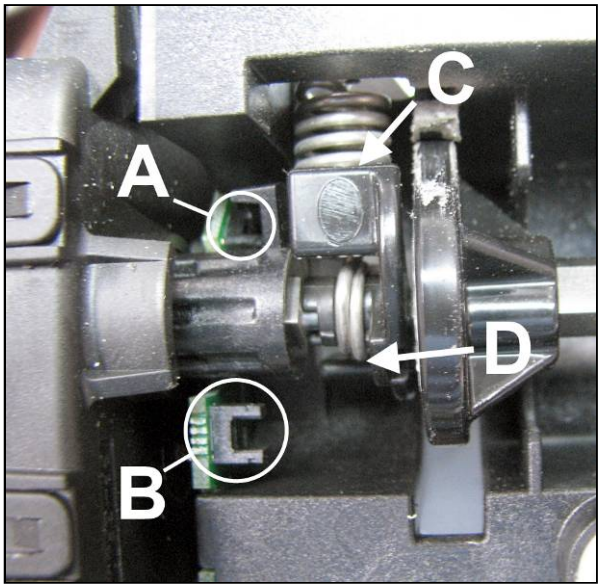
If **"Valve: Unknown"** appears for other than a few seconds in the **"Valve:"** line of the Printer Toolbox, it may indicate that the DPV Sensors are blocked (dusty/dirty).

The Print Engine must be removed and turned on its side for this procedure. See **"Removing the Print Engine"** on previous pages.

CAUTION! Please be sure the Waste Ink Tray and Service Station are removed from the Print Engine, before turning the print engine on its side. This will help reduce the chance that waste ink will run out of these items and into areas it should not be; causing damage and creating allot of cleanup time. Try to finish this procedure as quickly as possible.
Once the print engine is upright again, re-install the Waste Ink Tray as soon as possible.



1. **Remove the Print Engine Base.**
2. **Locate the Dual Pinch Valve (DPV) Assembly.**
3. Use canned air to blow the debris off the two Sensors **[A & B]** located on the DPV Sensor PC Board.
4. As a preventive measure, apply a small amount of Super Lube 21030 grease (or equivalent) to the space between the springs and the DPV Adaptor **[C & D]**. (*You will need a small brush or toothpick to reach these small, tight areas.*)



CAUTION

DO NOT GET GREASE ON THE SURROUNDING AREAS INCLUDING THE DPV SENSOR PC BOARD, SENSORS OR SENSOR FLAGS.

Replacing Dual Pinch Valve Sensor PC Board

The Dual Pinch Valve Sensor PC Board Replacement Kit (**42-900-85**) includes a new Sensor Printed Circuit Board, three (3) metal Inserts and a Pinch Valve Wrench.

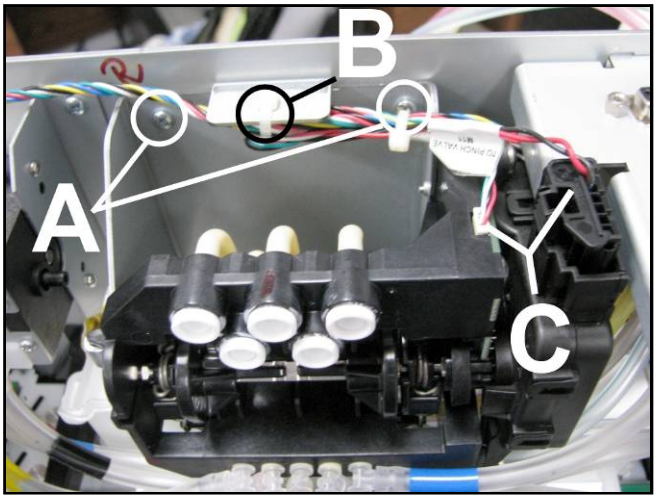
Remove the Dual Pinch Valve Assembly.

[A] Remove (4) screws that hold Bracket to Chassis.

[B] Cut cable tie holding wiring harness to top flange on Bracket Assembly.

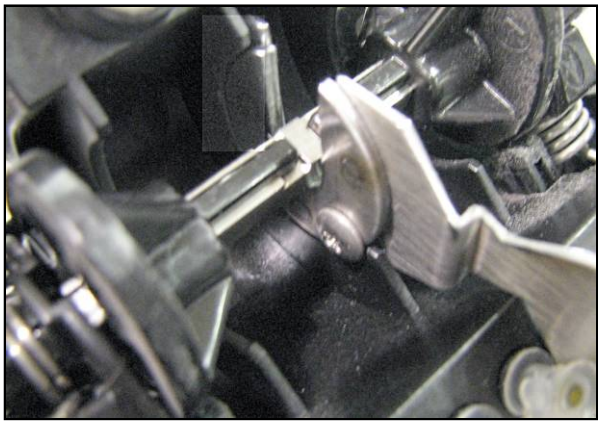
[C] Unplug the (2) connectors from the Valve Assembly.

IMPORTANT! Ink hoses are still attached. Carefully pull Pinch Valve Assembly away from chassis without kinking or pulling out hoses.



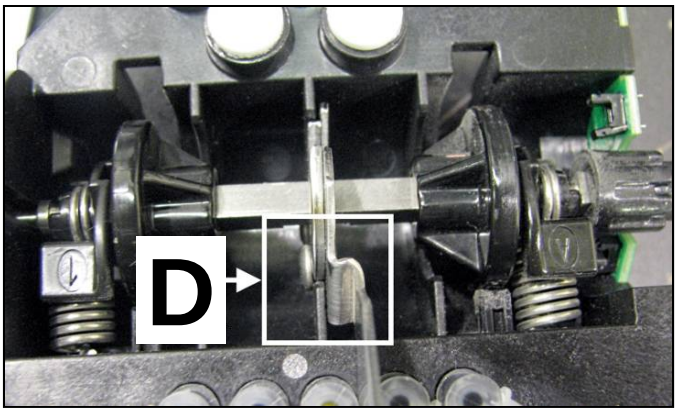
Sensor Board Replacement Procedure

1. **Secure the spring-loaded shaft** using the **Dual Pinch Valve Wrench** included in Kit. Position the wrench exactly as shown.
   The **Pinch Valve Wrench** holds the spring-loaded Pinch Valve Shaft in alignment while the Motor Assembly is detached from the Valve Body.

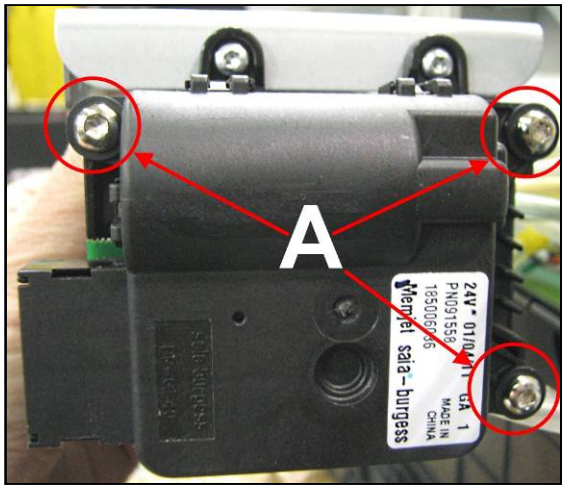


NOTE: The Wrench fits around the shaft as shown. Please be sure that the Wrench head and the screw head **[D]** fit around the Pinch Valve housing Rib; as shown.

IMPORTANT! Make sure the Wrench is positioned correctly before proceeding. If this step is not done correctly; damage to the Sensors on the Dual Pinch Valve Sensor PC Board may result.

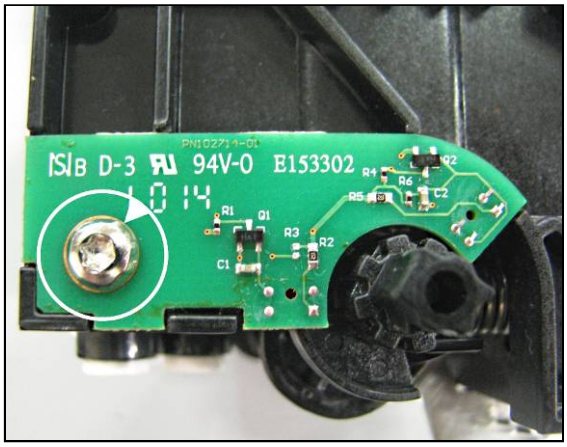


2. **Detach the Motor Assembly.** Remove the three (3) screws **[A]** holding the Pinch Valve Motor Assembly on the Pinch Valve Body. Remove the Motor Assembly.

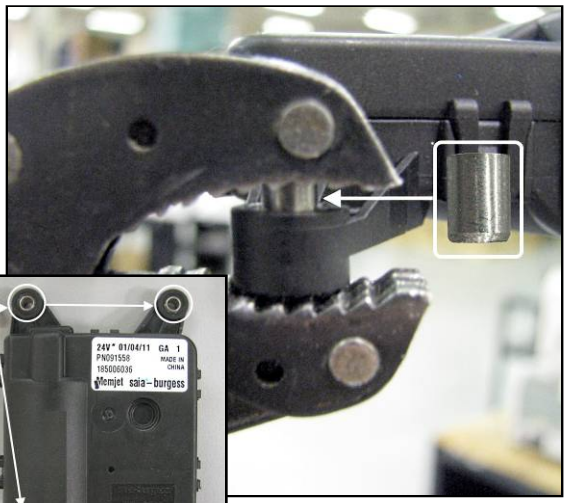


3. Remove the single screw, shown, and then remove the Dual Pinch Valve Sensor PC Board from the Valve body.

4. Install the new Dual Pinch Valve Sensor PC Board using the screw removed in previous. **NOTE:** Make sure the PC Board is installed flush against the Pinch Valve body.

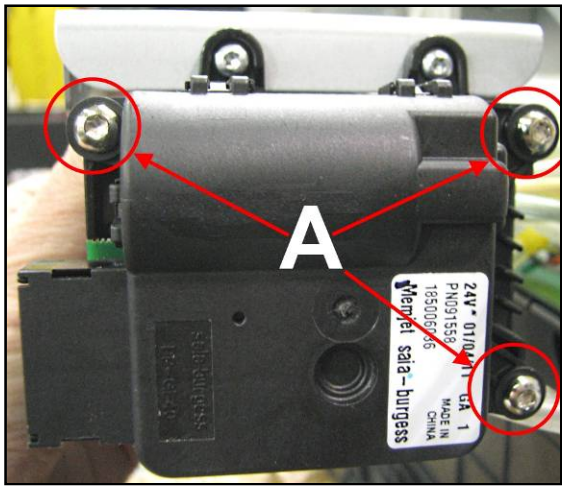


5. **Install (3) metal Inserts in the Motor Assembly mounting holes.**
The **Inserts** are added to align the Motor Assembly with the Valve Body during re-assembly; thereby keeping the Pinch Valve Shaft aligned. Since the Sensor Flag is mounted to the Pinch Valve Shaft, misalignment can cause contact between the Flag and Sensors; causing damage to the sensors.



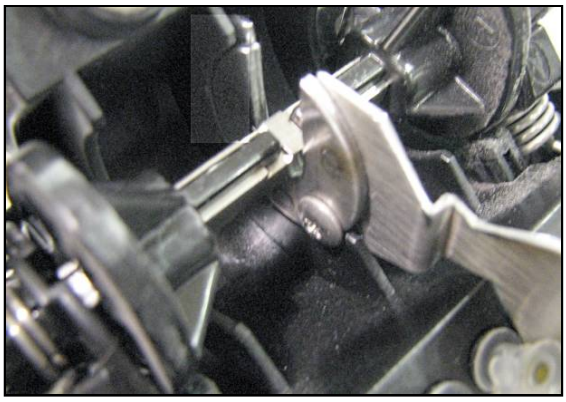
With the rounded end of the insert facing down, press the three (3) inserts into the Motor Assembly mounting holes as shown.
NOTE: Insert is self-aligning, but to ensure it is evenly aligned with the mounting hole and to prevent accidental damage, use a flat surface (*a flat metal bar for example*) to provide even pressure to press the insert in partially. Then use pliers or another tool to press the insert the rest of the way in.

6. **Attach the Motor Assembly.** Install all three (3) screws **[A]** and then tighten them to secure the Pinch Valve Motor Assembly to the Pinch Valve Body.



7. **Remove the Pinch Valve Wrench.**

8. Reinstall the Pinch Valve Assembly in reverse order.



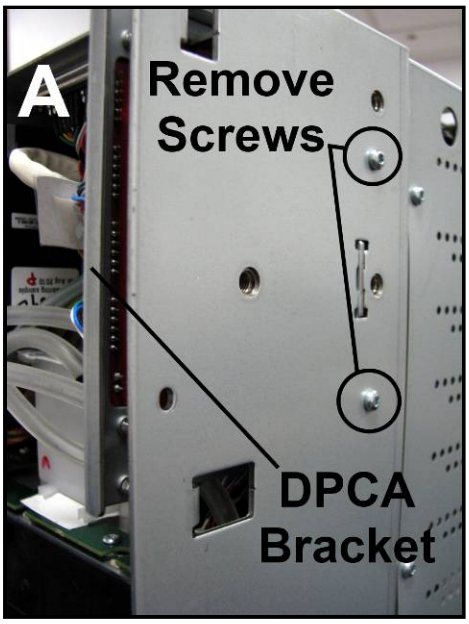
Replacing DPCA Board

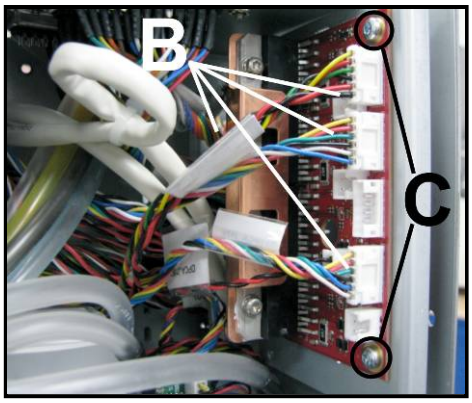
[A] Remove (2) screws on the outside of the chassis that attach the Circuit Board Bracket to chassis.

[B] Carefully move the DPCA Assembly out to unplug the wire harness connectors. **NOTE:** Make sure you know which connectors go with which socket.

[C] Remove the (3) screws attaching the DPCA to the bracket.

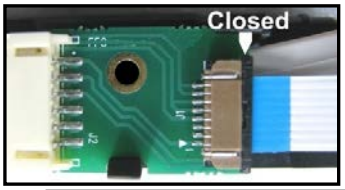
Remove DPCA Board.

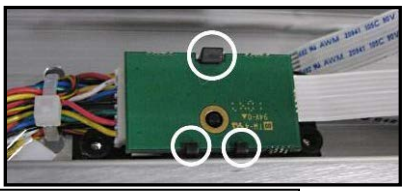




Install in reverse order.

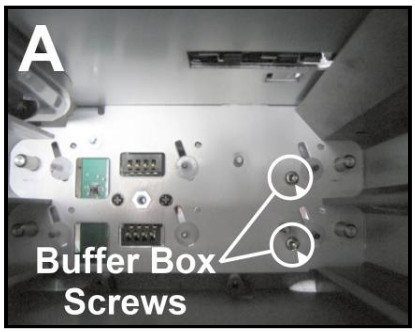
Troubleshooting Tip: The most likely cause for a DPCA board failure is a short in one of the cables or components (motors) that connects to this board. Please be sure to check all connections to/from the DPCA board for proper connection and for possible Pinched/damage wires.
In particular, check to be sure the ribbon cable that connects between the Service Station and Print Engine is securely and squarely connected at both ends. A misalignment at these cable connections can cause a short or intermittent short.
Also verify that the wiper motor assembly is clean. Debris and coagulated ink can stall the wiper motor, pulling excessive current and damaging the board.
If you skip these steps the new DPCA board may be destroyed as well.



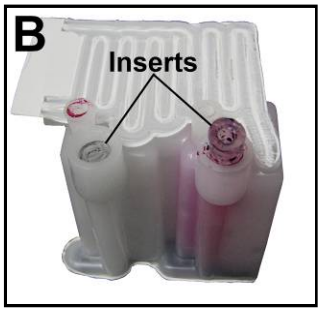


Check Service Station, Ribbon Cable Connections.

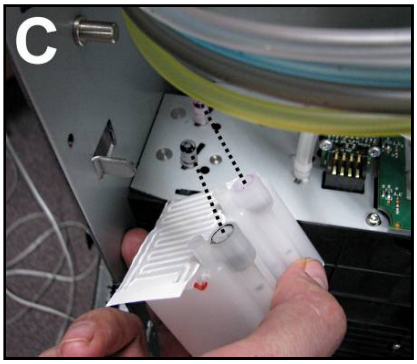
Replacing Buffer Boxes (3 per machine)



[A] Each Buffer Box is held in place by (2) screws accessed through the ink tank station. Using a long Phillips screwdriver, remove the screws and pull up on the Box to remove it from the chassis.



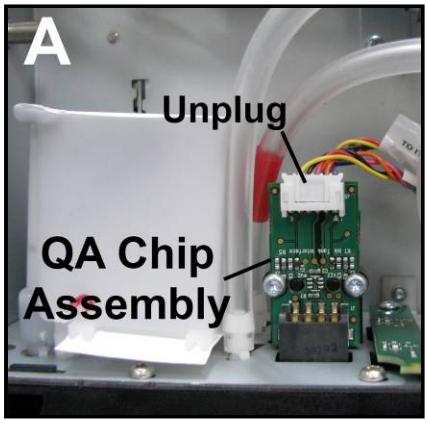
[B] If necessary, remove Tubing Inserts (2) from the used Buffer Box and insert into the new Buffer Box. **NOTE: One or both inserts may stay on the Print Engine or in the Buffer Box; simply make sure you have both. Put each one in the same color chamber it came from, ie, blue to blue, black to black, etc.**



[C] Push new Buffer Box down onto the ink ports. Attach with (2) screws from inside Ink Tank Station.

Replacing the Ink Tank Interface Boards

The Ink Tank Interface Boards are attached to the print engine on plastic blocks. The assembly (Ink Tank Interface Boards and plastic block) is known as a "QA Chip Assembly".



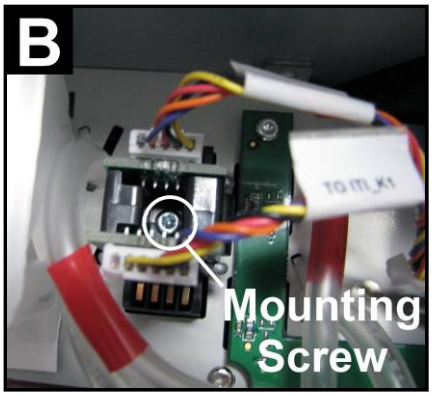
[A] Unplug wire harness from printed circuit board(s).

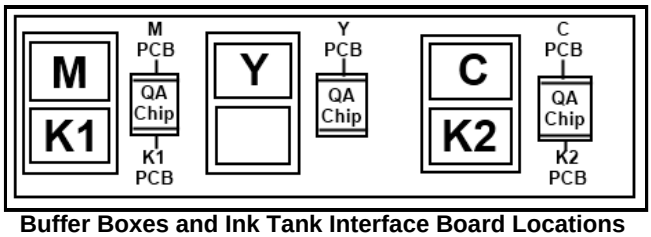
[B] Remove the QA Chip Assembly by remove the single (1) mounting screw; that secures the QA Chip Assembly to the inner frame of the print engine. Then remove the QA Chip Assembly.

Remove the two screws that secure the Ink Tank Interface Board(s) to the side of the Assembly.

Replace the defective/damaged Ink Tank Interface Board.

IMPORTANT!
Please be sure you have ordered and are replacing with the appropriate Ink Tank Interface Board.
M, Y, C = 123=2616
K1 = 123-2614
K2 = 123-2615





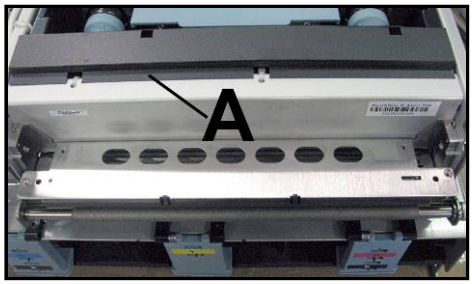
Buffer Boxes and Ink Tank Interface Board Locations

Install in reverse order.
IMPROTANT: Make sure wire harnesses are plugged into the correct printed circuit boards.

Removing the Pen Driver Printed Circuit Assembly (PCA)

Location: Upper Clamshell next to the Printhead Cartridge Bay.

[A] Remove the Pen Driver PCA Cover (lightly glued in place).



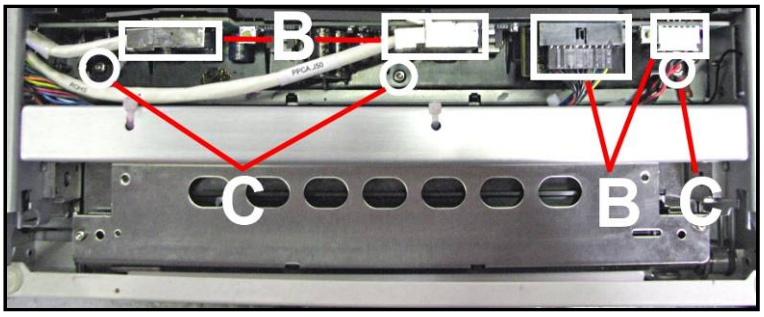
[B] Disconnect the (2) Ethernet data cables, then unplug the power connector and Main PCA harness connectors.

[C] Remove (3) screws holding the head board mount.

[D] Remove the Pen PCA from the unit.

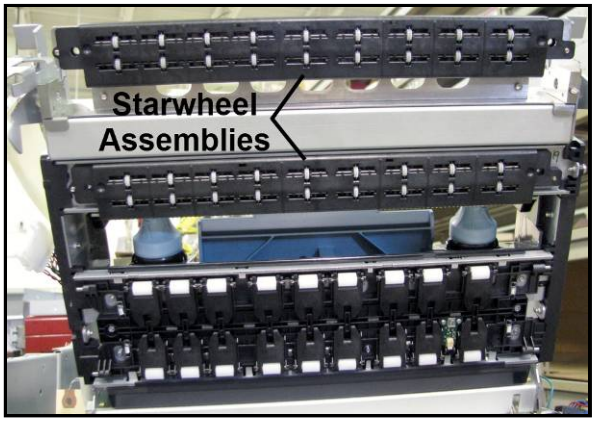
[E] Remove (2) screws attaching the PCA to the head board mount.

Install in reverse order.



Removing the Starwheel Assemblies

Location: Upper Clamshell. Open the Print Engine Clamshell to access the two Starwheel Assemblies. One is just inside the exit end of the Clamshell, the other one is mounted externally on the Clamshell Frame over the Exit Center Plate Assembly. The removal procedure is similar.

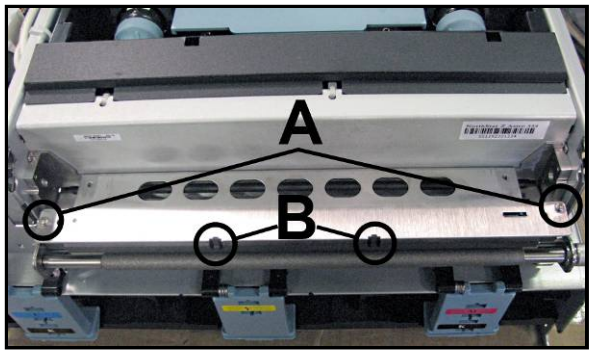


External:

[A] Remove (2) screws from top of Exit Wheel Bracket.

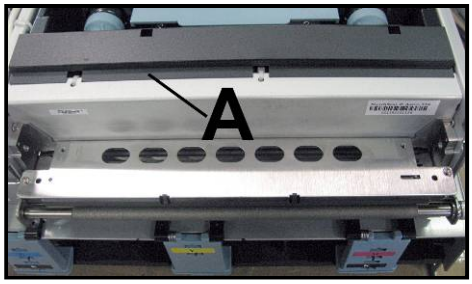
[B] Carefully release the locking tabs holding the Starwheel Assembly to the Clamshell. **NOTE: Locking tabs break easily!** Remove the Starwheel Assembly.

Install in reverse order.



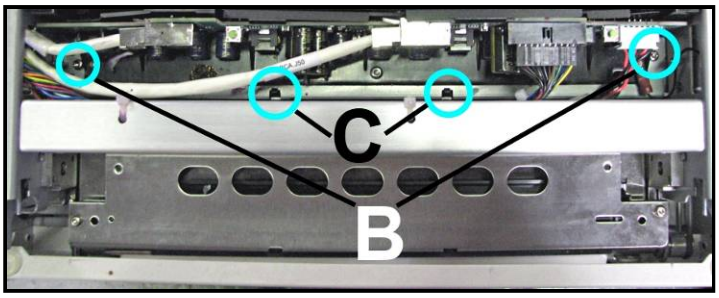
Internal:

[A] Remove the Pen Driver Printed Circuit Board Cover.



[B] Remove (2) screws from bottom of Pen Driver Printed Circuit Board Bay.

[C] Locate and carefully release the (2) black locking tabs holding the Starwheel Assembly to the metal bracket. **NOTE: Locking tabs break easily!** Remove the Starwheel Assembly.



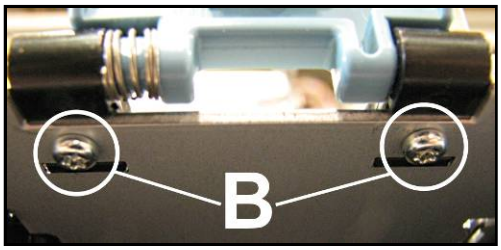
Install in reverse order.

Replacing the Ink Tank Latches

Ink Tanks must be removed prior to replacing latches. See **"Replacing Ink Tanks"** in the **Maintenance Section.** Printer must be flat on a level surface.

[A] Lift the latch.

[B] Remove (2) screws located on underside of the latch hinge block. (*May require a mirror to find the screw heads.*) Remove the Latch Assembly.



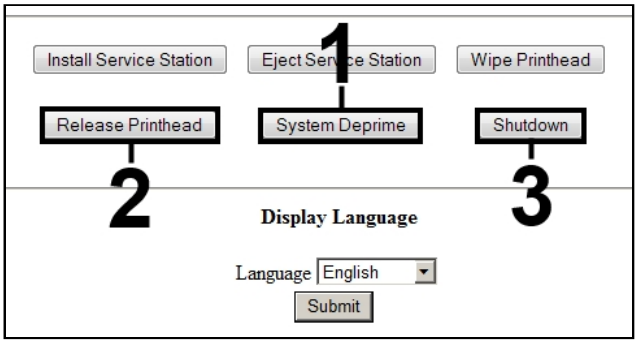
CAUTION
Latches are spring-loaded, **watch that springs don't fly off.**

Replacing the Printhead Lever Latch

Note: There is a "service video" available for this procedure.
The Printhead Lever Latch is easily broken if forced open manually.
Tools & Supplies needed: nitrile powder-free gloves, needle nose pliers or tweezers, small flathead screwdriver.
Follow the steps below to replace the Latch:

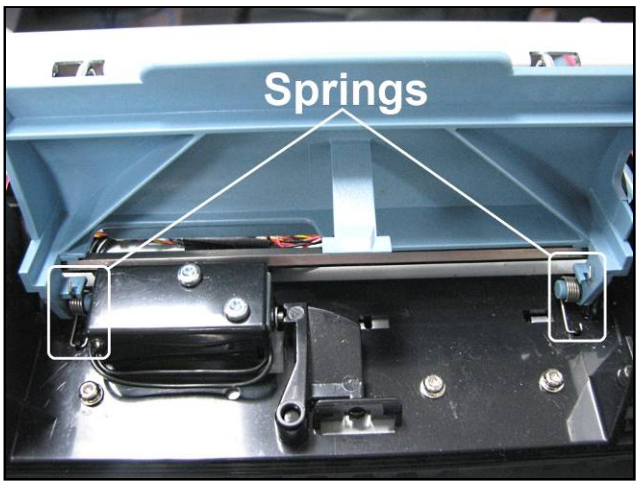
Remove the Printhead Latch

1. Go to the Printer Toolbox **User Interface** screen and click **"System Deprime"**.
2. Click **"Release Printhead"** to release the Printhead Latch.



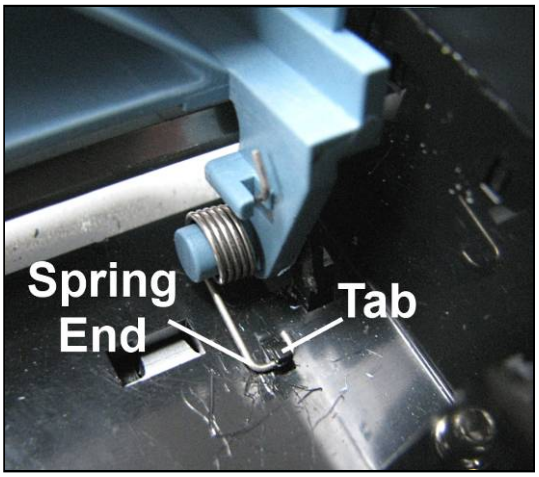
3. Once the Latch pops up, click **"Shutdown"** to shut down the Printer.

4. Lift the Latch manually to access the (2) Latch Springs.



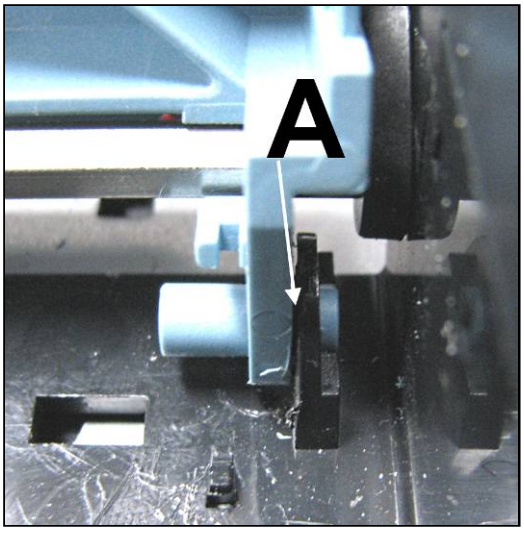
5. Remove the Printhead Cartridge by tilting it toward the ink lines, then carefully lifting it out of the Printhead Compartment. Place in a moistened packaging cap to avoid dehydration.

6. Use needle-nose pliers or tweezers to gently pull the rounded end of the Spring out from beneath the plastic tab in the housing and remove the Spring. Repeat the procedure to remove the second Spring.



7. **Gently** insert a small, flathead screwdriver between the blue Printhead Latch Pin and the black plastic hinge **[A]** and rotate to pop the Printhead Latch out of the hinge without damaging either piece.

CAUTION
BE CAREFUL. Black Plastic Hinge breaks easily. Use only gentle pressure when removing/installing the Printhead Latch Pin.



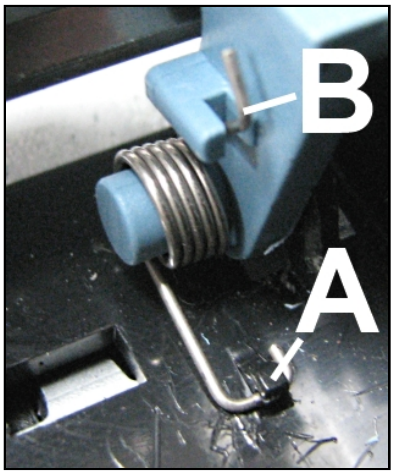
8. The other side should easily slide out of the hinge.

9. Discard the Printhead Latch according to local

regulations.

Intall the new Printhead Latch:

1. Align the right tab of the Latch with the right hinge and gently press into place. Repeat for the left side.



2. **[A]** Use needle-nose pliers to install the right Spring into the plastic tab in the base of the housing.
   NOTE: Be sure to orient the Spring as shown.

   [B] Use the needle-nose pliers to position the other end of the Spring into the notch in the Printhead Latch.

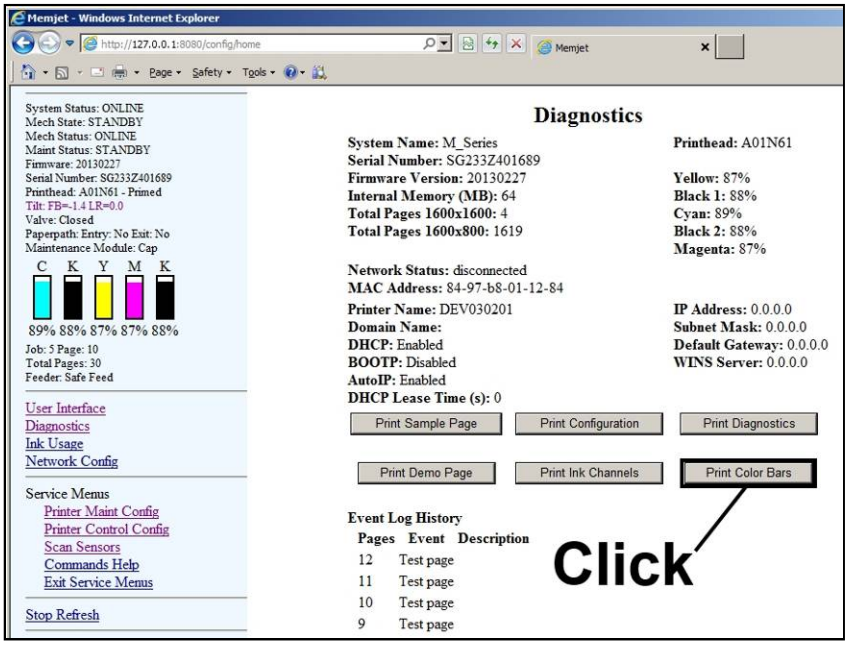
3. Repeat **Steps 2A** and **2B** for the left side.

4. Remove the Printhead from the protective cap and wipe the Printhead surface according to standard installation procedure, then install.
5. Restart the Printer.
6. Manually close the Printhead Latch until it clicks. The Printer will automatically prime and be ready for testing. **NOTE: If the Printhead Latch is closed with the system powered down, the Printer will not prime automatically.**

Testing

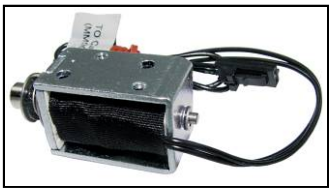
1. Restart the Printer if necessary.

2. Open the Printer Toolbox, navigate to the **Diagnostics** screen and click **"Print Color Bars"** to confirm the the unit is functioning properly.



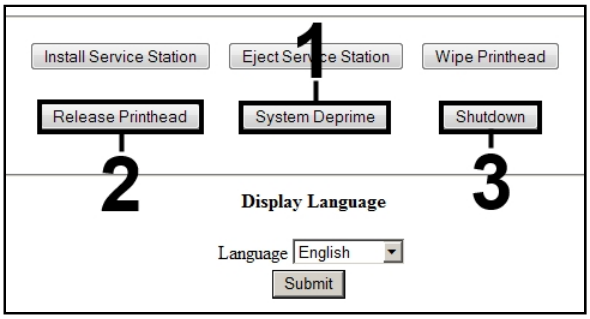
Replacing the Printhead Lever Latch Solenoid

Follow the steps below to replace the Lever Latch Solenoid:



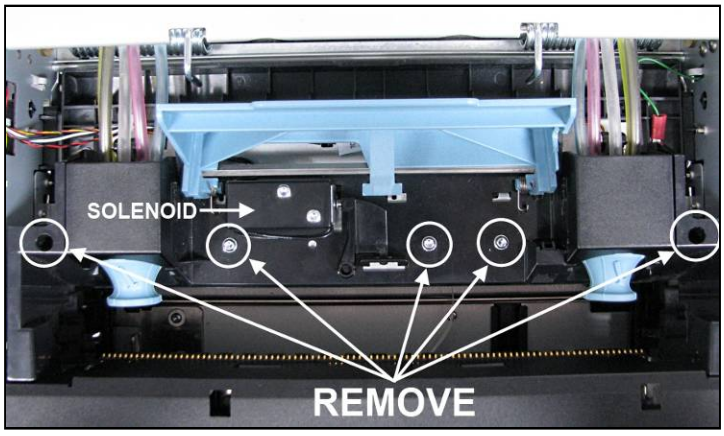
Remove the Printhead Latch Solenoid

1. Go to the Printer Toolbox **User Interface** screen and click **"System Deprime"**.
2. Click **"Release Printhead"** to release the Printhead Latch.
3. Once the Latch pops up, click **"Shutdown"** to shut down the Printer.

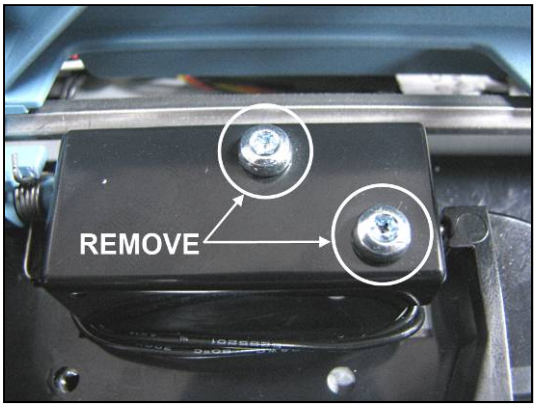


4. Lift the Latch manually to access the Solenoid and Latch Support Base.
5. Remove the Printhead Cartridge by tilting it toward the ink lines, then carefully lifting it out of the Printhead Compartment. Place in a moistened packaging cap to avoid dehydration.

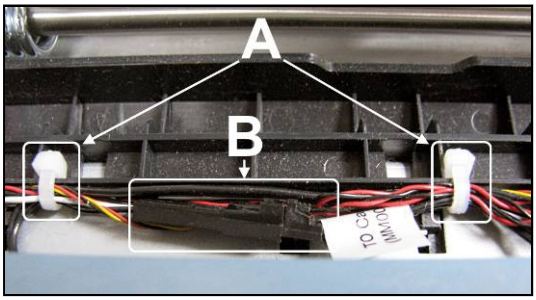
6. Remove the five (5) screws securing the Latch Support Base Assembly to the Print Engine frame.



7. Remove the two (2) screws securing the Solenoid to the Base Assembly.

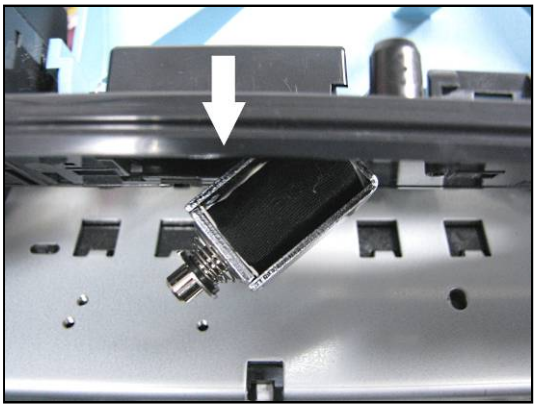


8. Cut two cable ties **[A]**. Unplug the Solenoid connector **[B]** from the wiring harness.



9. Carefully lift the Base Assembly just enough to remove the Solenoid assembly from under the Base Assembly.

10. Install the new Solenoid. **Reassemble in reverse order.**



Replacing the Clamshell Latch Pins

The Upper and Lower Latch Pin Kits replace Print Engine Clamshell Latch Pins that may have become bent or broken.

TIP: It is possible to perform these procedures without removing the Print Engine from the printer. However, when replacing the Lower Latch Pins; you will find it is easier to access the screws if the Print Engine is removed from the Printer body.

Upper Clamshell Latch Pin Replacement - Kit (42-900-35)

This kit and procedure is used to replace Upper Latch Pins that may have become bent or broken.
The 42-900-35 Kit consists of: (1) Latch Pin, (1) 5/64 Allen screw.

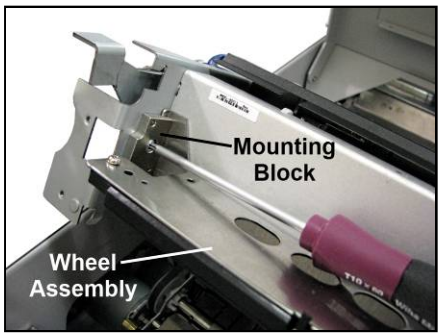
NOTE: Check that the Latch Pins are pressed in on your Print Engine; not welded. Later versions have welded pins that cannot be replaced.

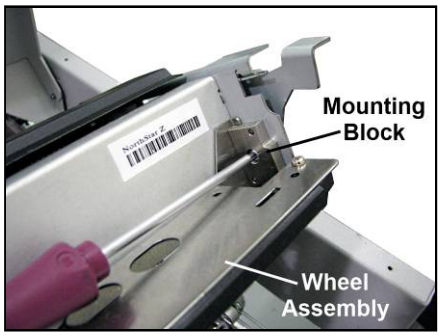
Tools Needed: Small T10 x 80 screwdriver, 5/64 hex head screwdriver, small wire clippers, small semi-round file and (2) small cable ties.

TIP: It is possible to perform this procedure without removing the Print Engine from the printer.

PROCEDURE:

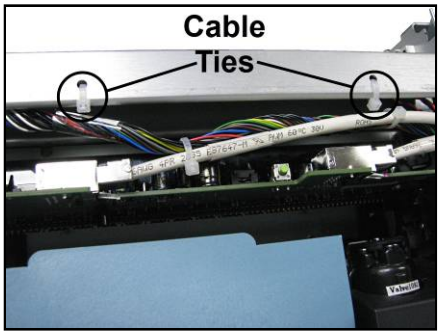
1. Power down and and unplug Printer. Open the Top Cover.
2. Release the two Latches and open the Print Engine Clamshell.
3. Place a towel (or other covering) over the lower section of the Print Engine to help keep any debris (metal shavings) from entering the Print Engine.
3. **Remove the Upper Exit Wheels Assembly.** Remove (1) T-10 screw on each side. Remove the mounting blocks and the Wheel Assembly.





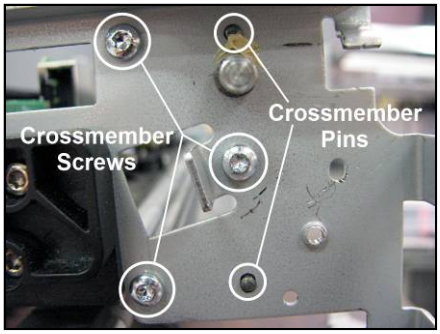
4. **Remove the Pen Driver Cover.** The cover is glued in place along the top edge of the Print Engine frame crossmember. Carefully slide the tip of a small flat blade screwdriver under the Cover lip to separate it from the Crossmember. Remove the Cover.

5. Cut and remove the (2) cable ties holding the wire harness to the Print Engine Frame Crossmember.

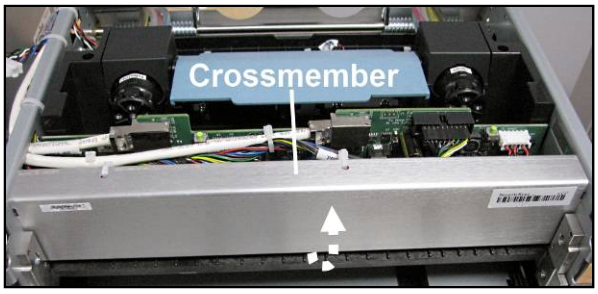


6. **Remove Latch Levers (*both sides*).** Carefully remove the C-clip holding the Latch Lever onto the Upper Latch Pin. **DO NOT LOSE!** Must be reinstalled later. **Repeat the procedure for the Latch Lever on the other side.**
7. Slide the Latch Lever and Spring off of the Upper Latch Pin. **NOTE: You may have to separate the Lever from the Spring. Repeat procedure on the other side.**

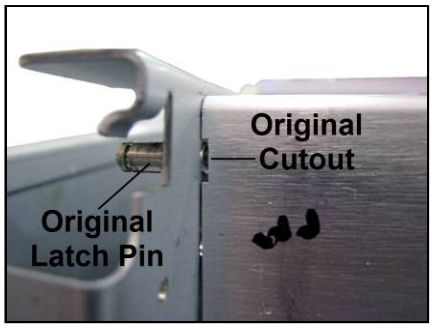
8. **Remove the Print Engine Frame Crossmember.** Remove the (3) screws securing the Crossmember to the Print Engine Side Frame. **Repeat procedure for the other side.**

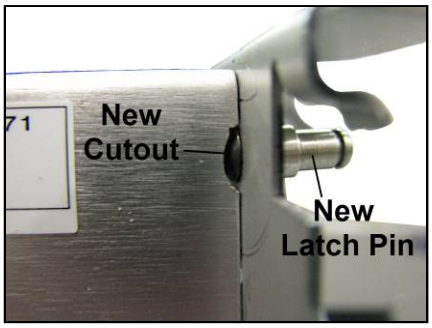


9. Carefully pull the Side Frames away from the Crossmember to slide it off the lower mounting pins. Pivot the bottom of the Crossmember up and carefully remove the Crossmember from the upper mounting pins.



10. Use the small file to enlarge and round out the cutouts located on the upper edge of the Crossmember.



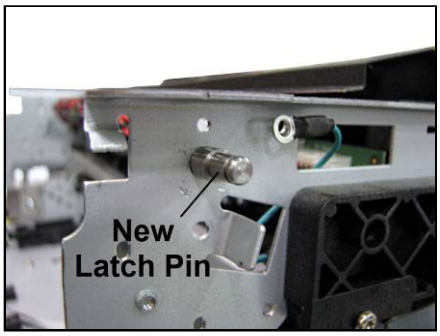


NOTE: This is done so the Crossmember will fit around the mounting screw for the new Latch Pin. If you are only replacing one Latch Pin, you only need to modify that side of the Crossmember.

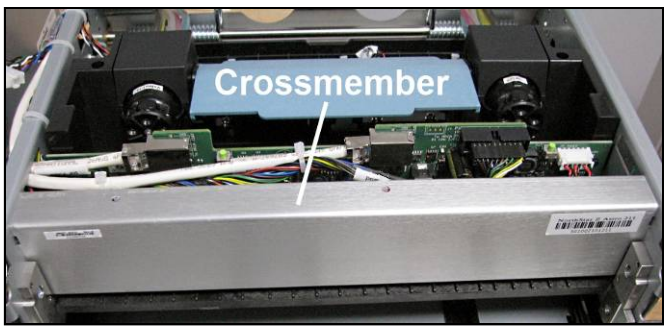
CAUTION
DO NOT allow any metal filings to fall inside the Print Engine or Printer.

11. **If necessary,** remove the old Latch Pin with pliers.

12. **Install the new Upper Latch Pin** using the socket head screw supplied with the kit. (*Make sure the Pin stays straight as you install it*.)



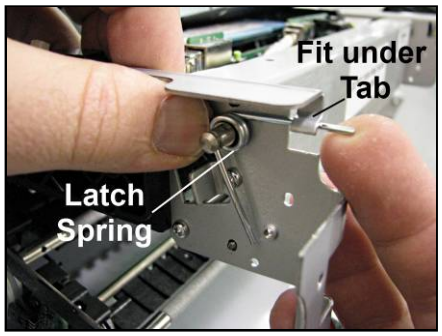
13. **Reinstall the Crossmember.** Remember to install the Crossmember over the upper side frame pins first, then pivot the Crossmember down to fit over the lower side frame pins.
NOTE: If the enlarged cutout(s) do not fit over the new Latch Pin screw head(s), remove the Crossmember and continue filing as needed.

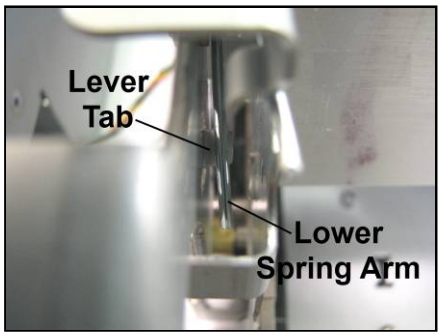


Once the Crossmember fits correctly, reinstall the (3) mounting screws on each side.

14. Slide the Latch Lever Spring onto the Latch Pin, then slide the Latch Lever for that side onto the Pin. Repeat the procedure for the other side.

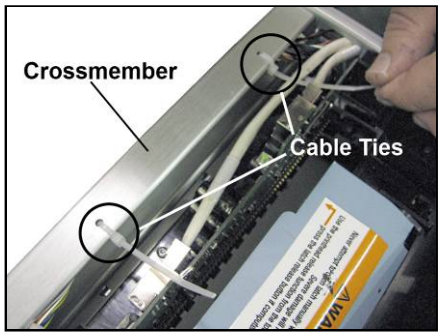
15. Maneuver the spring so the upper arm fits under the tab on the Side Frame. The lower spring arm fits over the tab on the Latch Lever.
NOTE: This can be tricky, you may require two small flat blade screwdrivers or other tools to snap the lower spring end over the Lever tab. Repeat procedure for the other side.



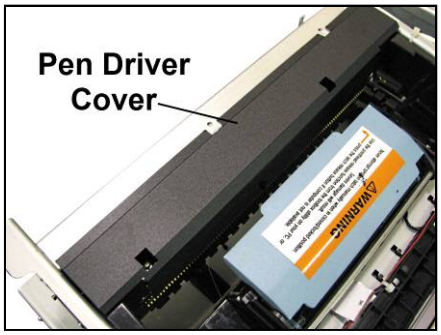


16. Reinstall the C-clip that secures the Latch Lever to the Upper Latch Pin**. Repeat procedure for the other side.**

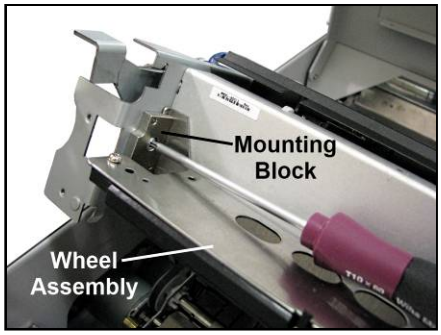
17. Replace the two cable ties that secure the wire harness to the Crossmember (*removed in Step 5*.) Trim excess.

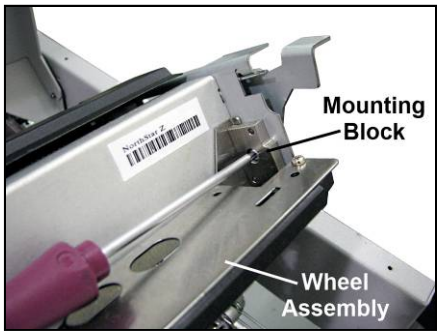


18. **Reinstall the Pen Driver PCA Cover.**
NOTE: If the adhesive on the Cover lip no longer sticks, you can use thin double-sided tape or adhesive transfer tape secure it to the top of the Crossmember.



19. Reinstall the mounting blocks and Exit Wheels Assembly.





20. Carefully remove the towel and vacuum any debris from the Print Engine and Printer.

21. Close the Upper Clamshell and Top Cover.

Lower Clamshell Latch Pin Replacement Kit (42-900-30)

This kit and procedure is used to replace Lower Latch Pins that may have become bent or broken.

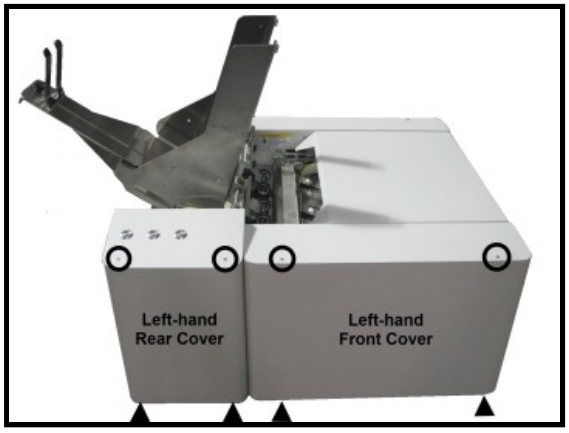
The 42-900-30 Kit consists of: (1) Latch Pin, (1) Allen screw.

Tools Needed: Small Phillips screwdriver, small long shaft Phillips screwdriver, 1/16 Allen head screwdriver, and Pliers.

NOTE: Check if the Latch Pins are pressed-in on your Print Engine; not welded. Later versions have welded pins that cannot be replaced.

Remove the Side Covers:

Left-hand Side Cover:
Remove (2) screws at the top and bottom of the Left-hand Rear Side Cover. Remove the Cover**.**



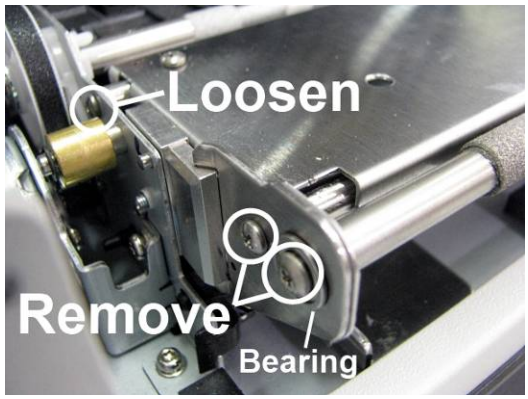
Right-hand Side Cover
Remove the (3) screws at the top and bottom of the Cover.

PROCEDURE:

1. **[A]** Release the two Latches and open the Print Engine Clamshell.

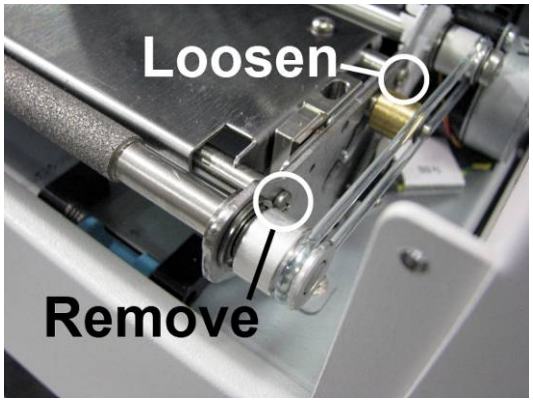
   [B] Remove (2) screws from Operator side of Exit Center Plate Assembly.

   [C] Loosen (1) screw.

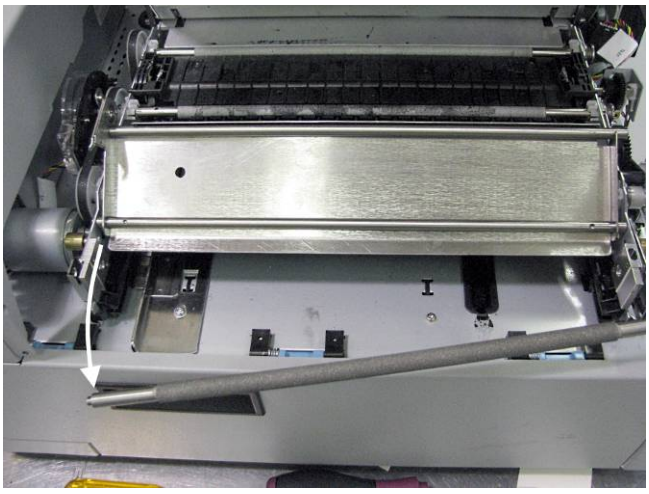


2. **[A]** Remove (1) screw from non-operator side of Exit Center Plate Assembly.

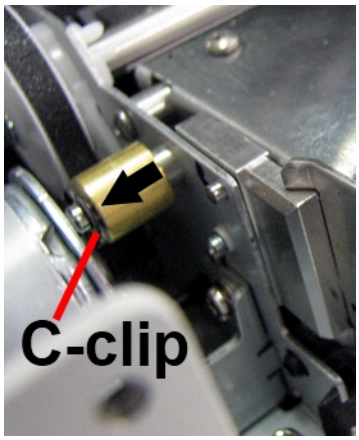
   [B] Loosen (1) screw.



3. Detach Exit Roller from the Operator side. **NOTE: Be careful not to drop or lose the bearing.** Then pivot Exit Center Plate up out of the way.

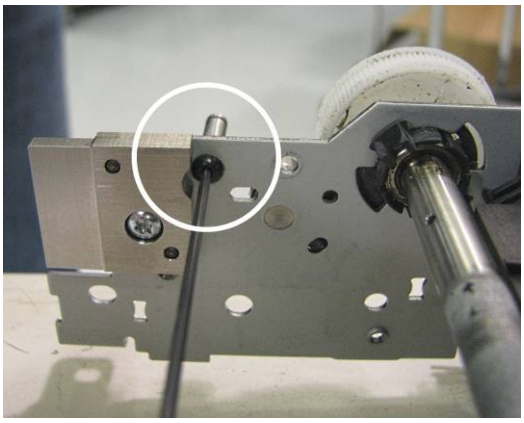


4. Remove the C-clip from the Latch Roller, then slide the Latch Roller off the old Latch Pin. Keep C-clip and Latch Roller for reinstallation.



5. Remove Latch Pin with pliers. **NOTE: Only works if Latch Pin is press fit, if Latch Pin is welded, this procedure will not work.**

6. Align new Latch Pin with existing hole. Attach with Allen screw.

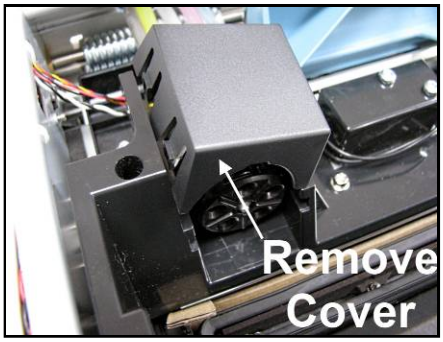


7. Reinstall Latch Roller and secure with C-clip.
8. Reinstall Exit Roller and Exit Center Plate Screws.
9. Reinstall Side Covers.

Replacing the Ink Revolvers

First Deprime the system and remove the Printhead Cartridge. New Ink Revolver includes attached leader hoses and hose connectors.
NOTE: Procedure is similar for both Valve side Ink Revolver and Pump side Ink Revolver (*they are labeled*).

IMPORTANT! Make sure you replace the Valve side Ink Revolver in the Valve side and Pump side in the Pump side.



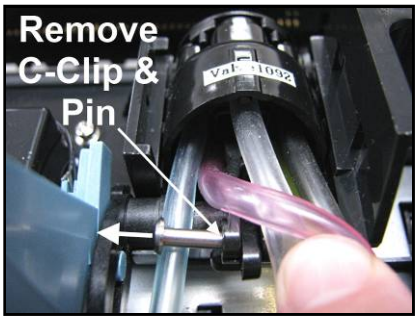
1. Remove Cover by squeezing sides to release the tabs. Lift Cover out and set aside.
   NOTE: Cover does not have to be removed to clean Ink Revolver Couplings.

Replacing the Ink Revolvers:

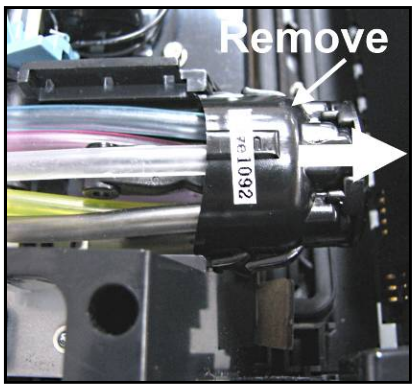
1. Route the hose leads from the new Revolver through the same frame cutout as the existing hoses.

2. **Work one hose at a time:** Carefully match, cut and connect the existing Ink Hoses to the hose leads on the new Ink Revolver. Trim the hose leads to fit as needed. Use the hose connector barbs included in kit.
   IMPORTANT! Do not mix colors! Ink Hoses, including the two black Ink Hoses, are NOT interchangeable!

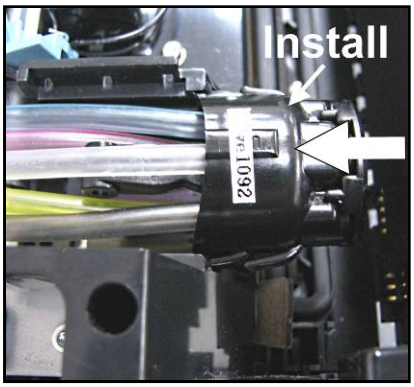
3. Once all the hoses have been connected to the new Ink Revolver, remove the C-Clip from the hinge pin holding the Ink Revolver. Remove the pin.



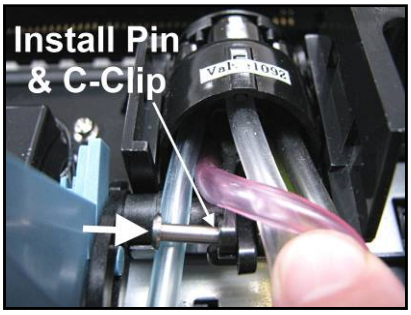
4. Slide the old Ink Revolver forward in its track and remove.



5. Slide the new Ink Revolver back in its track and align the yoke on rear with the hinge bracket. Make sure the new Revolver is turned correctly.



6. Reinstall the Pin and C-clip.



7. Reinstall the Ink Revolver Cover.

Replacing Lifter Motor Assembly or Lifter Gear

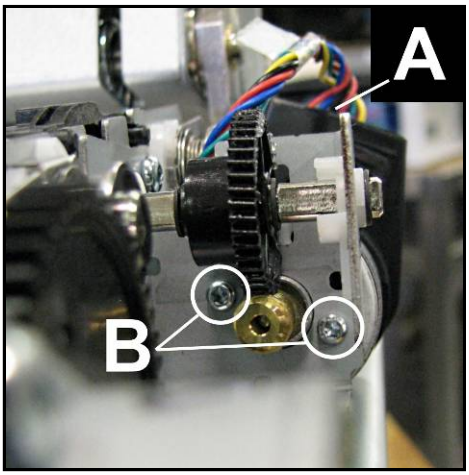
Remove Lifter Motor Assembly Only:

[A] Unplug the wire harness from the Lifter Motor Assembly.

[B] Remove the (2) screws holding the Motor Assembly to the Motor Assembly Bracket.

[C] Gently remove the Motor Assembly. Take care that the Worm Gear does not damage the Lifter Gear.

Install in reverse order. NOTE: Make sure Worm Gear and Lifter Gear are engaged correctly. Apply a small amount of gear lube to Lifter Gear.



Remove Lifter Motor Assembly and Lifter Gear

[A] Remove (2) screws holding Lifter Motor Assembly Bracket.

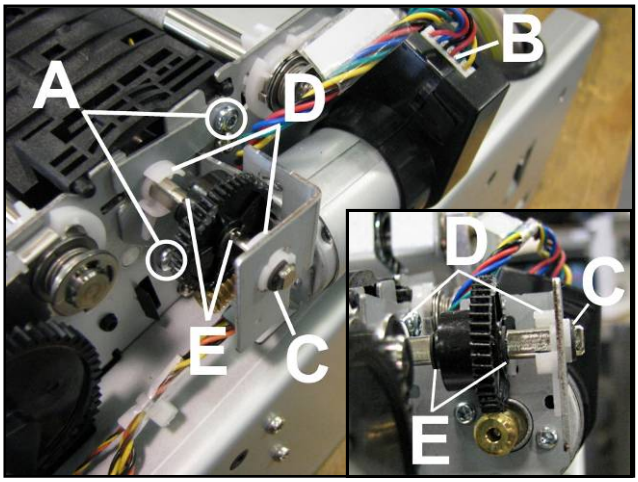
[B] Unplug the wire harness from the Lifter Motor.

[C] Remove the C-clip located on the end of the shaft.

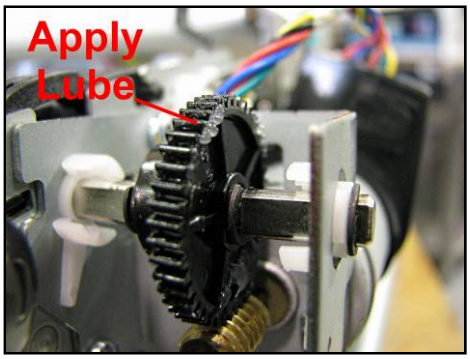
[D] Unpin pegs and turn the (2) plastic bayonet bearings to release the Motor Bracket.

[E] Remove the (2) C-clips (*one on either side*) of the Lifter Gear.

[F] Slide Lifter Motor Assembly and Lifter Gear off of shaft.



Install in reverse order. NOTE: Make sure Worm Gear and Lifter Gear are engaged correctly. Apply a small amount of synthetic grease to Lifter Gear (Super Lube 21030 or equivalent).



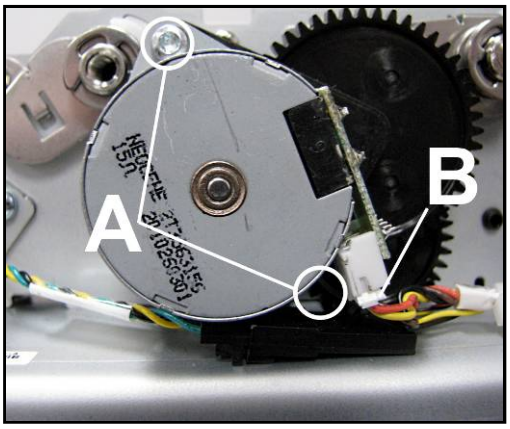
Replacing Stepper Motor

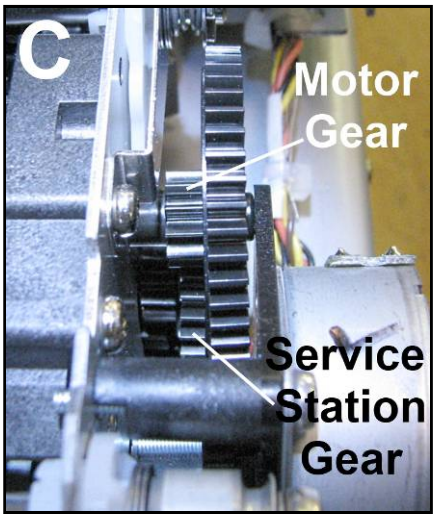
[A] Remove (2) screws.

[B] Unplug the wire harness from the Stepper Motor Printed Circuit Board.

[C] Note the position of the motor gears to make sure gears will mesh with the Service Station gear (*if Service Station is installed.*)

Install in reverse order.

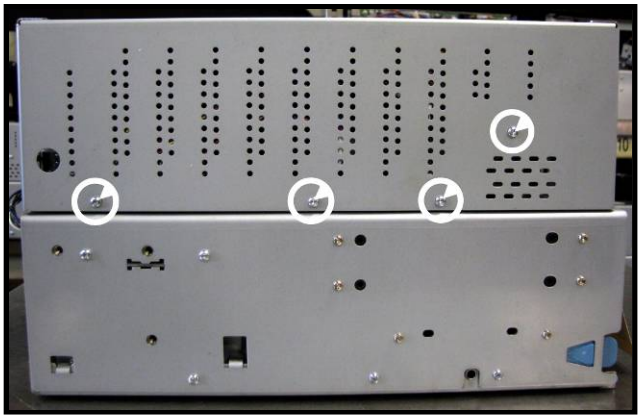




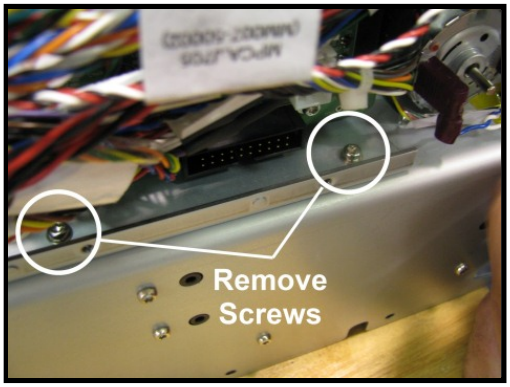
Accessing Items Behind the Main Printed Circuit Assembly (MPCA)

To get access to parts on the Print Engine clamshell, the MPCA Panel Cover must be removed and the panel folded out of the way.

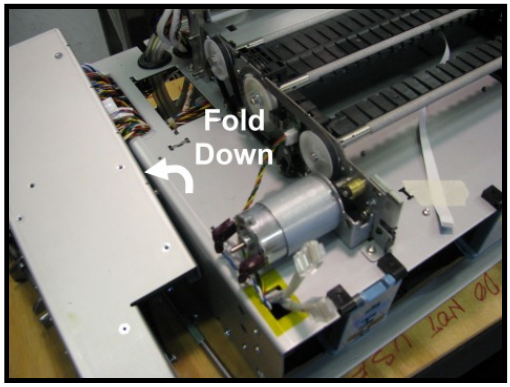
1. Remove (4) screws to remove the Cover. Set aside. **NOTE: End panel screws intentionally left off to improve accessibility.**



2. **Remove two (2) mounting screws from bottom of MPCA panel.**

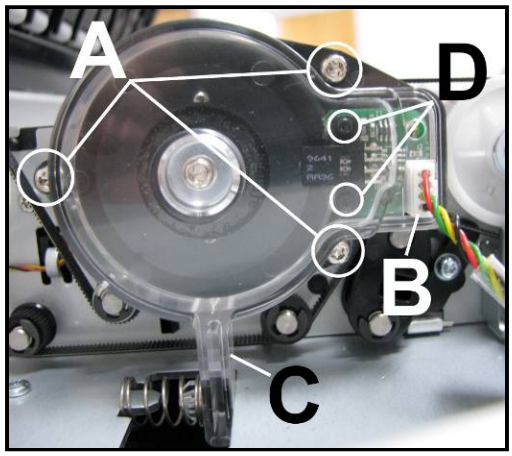


3. **Fold Main Printed Circuit Assembly down out of the way. NOTE: Be Careful! DO NOT pull, pinch or strain wiring.**



Replacing Encoder or Encoder Sensor

Printers with Z3/Z4/MR Print Engines have an enclosed Encoder Assembly (*see picture at below*).



[A] Remove (3) screws holding Encoder Cover in place.

[B] Unplug the wire harness from the Encoder Sensor.

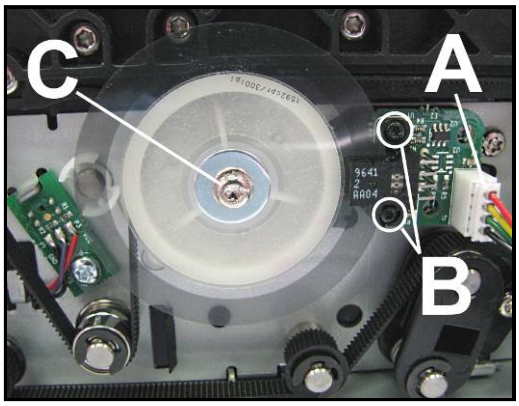
[C] Carefully pivot the Cover away from the Encoder Wheel. Be careful of the spring.

[D] Remove the (2) screws holding the Encoder Sensor in place and pull away from Encoder wheel. **NOTE: Be careful not to damage the Wheel.**

[E] Remove the single screw holding the Encoder Wheel to the roller shaft remove the Encoder Wheel Assembly. **NOTE:** Be careful of the tension spring and washers located on the shaft behind the Encoder Assembly.

Install in reverse order.

Printers with earlier Z2i Print Engines may have an exposed Encoder Assembly (*see picture at right*).



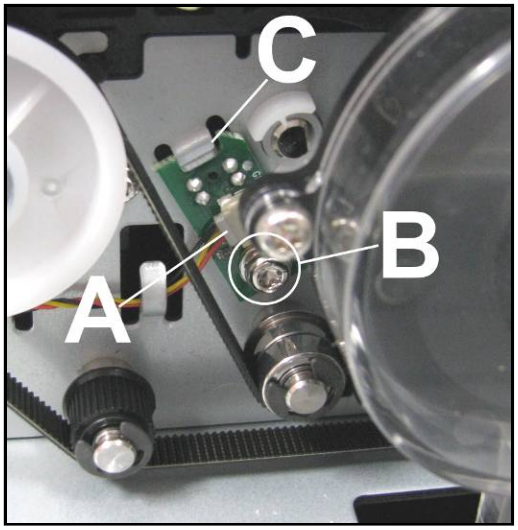
[A] Unplug the wire harness from the Encoder Sensor.

[B] Remove the (2) screws holding the Encoder Sensor in place and pull away from Encoder wheel. **NOTE: Be careful not to damage the Wheel.**

[C] Remove single screw and washer to remove the Encoder Assembly.

Install in reverse order.

Replacing Service Station Lifter Arm Sensor



[A] Unplug the wire harness from the Lifter Arm Sensor.

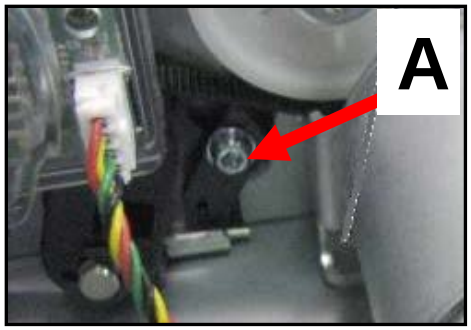
[B] Remove (1) screw holding the Sensor to the Print Engine Frame.

[C] Slide Sensor out of the retainer clip and remove the Sensor.

Install in reverse order.

Replacing Paper Path Motor or Drive Belt

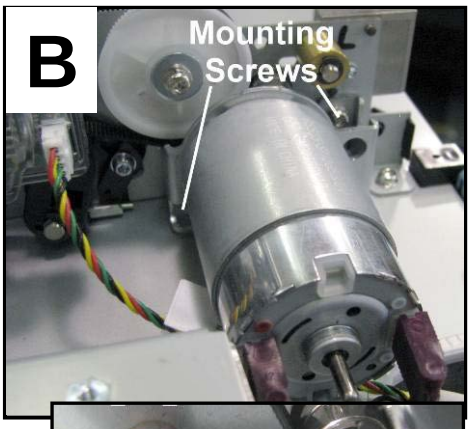
16. Loosen (do not remove) the screw that secures the Belt Tensioner **[A]**. Pivot the Belt Tensioner "clockwise", to release the belt tension. While holding it in this position, secure the screw.



17. Remove (2) screws that attach the Motor Assembly **[B]** to the lower Print Engine Clamshell. Pull the Motor straight out so the Motor Pulley clears the drive belt. **NOTE: If replacing the Motor, unplug the two wire connectors from the motor.**

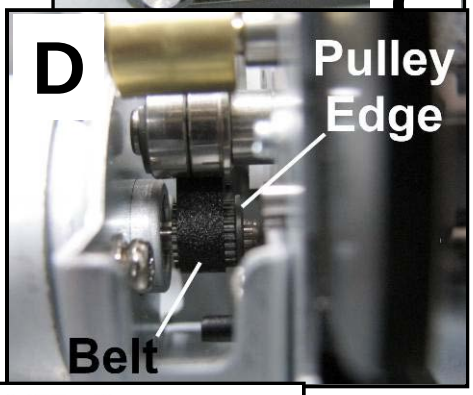
18. **If replacing the drive belt on a Z3/Z4/MR Print Engine (with enclosed encoder),** follow the steps on the previous page for removing the Encoder *Cover (steps A-C only). See "Replacing Encoder or* Encoder Sensor", "Printers with Z3/Z4/MR Print Engines".
Then remove the drive belt**.**

Tip: This would be a good opportunity to remove each of the black plastic idlers **[C]**; to clean and lubricate their inner hubs and shafts**.** Inspect and replace worn idlers.

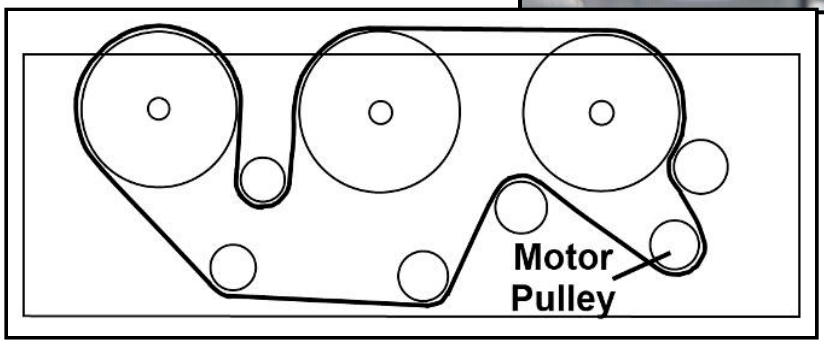


19. Install the drive belt and/or Motor in reverse order. **NOTE:** Make sure that the belt stays inside the raised edges of the motor pulley and roller studs **[D]**.

20. Loosen (do not remove) the screw that secures the Belt Tensioner. Allow the Belt Tensioner to rotate "counter-clockwise", by itself. Spin the transport to center the belt. Then tighten the screw to secure the Belt Tensioner's position.



Belt Routing Diagram



Replacing Belt Drive Gear Pulleys

There are three. One is mounted on the Exit Grit Roller Shaft, one is located behind the Encoder Assembly on another Grit Roller Shaft and one is mounted on the Entry Grit Roller Shaft. First, you may need to loosen or remove the Drive Belt, see "**Replacing the Paper Path Motor or Drive Belt**".

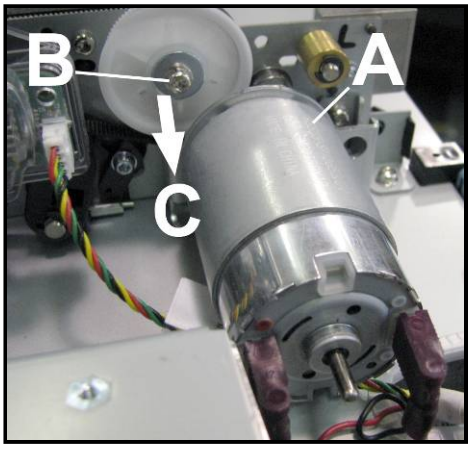
Exit Grit Roller Gear Pulley

[A] Remove the Paper Path Motor. See "**Removing Paper Path Motor**".

[B] Remove the screw, washer, C-clip and plastic washer from end of Exit Grit Roller Shaft. (Note order for reassembly.)

[C] Remove Pulley from Shaft.

Install in reverse order. NOTE: Align slot on Pulley with pin in Shaft before installing.



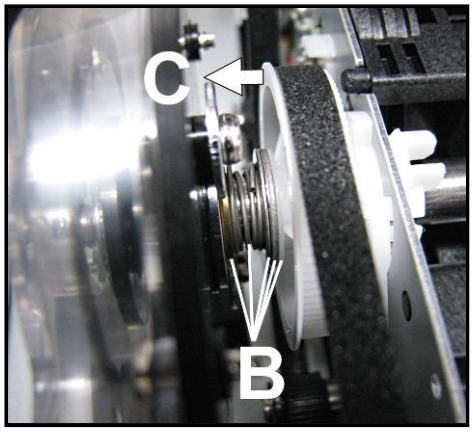
Encoder Grit Roller Gear Pulley

[A] Disconnect and remove the Encoder Assembly. See "**Removing Encoder and Sensor Assembly**".

[B] Remove the washer, tension spring, thin washer, washer and plastic washer from end of Grit Roller Shaft. (Note order for reassembly.)

[C] Remove Pulley from Shaft.

Install in reverse order. NOTE: Align slot on Pulley with pin in Shaft before installing.

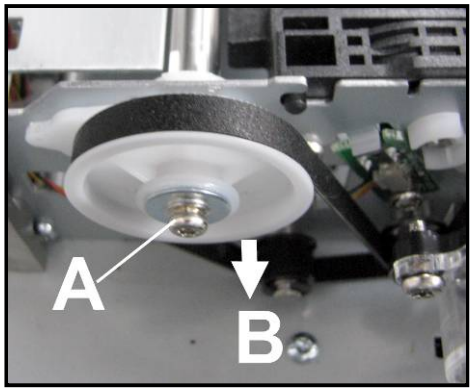


Entry Grit Roller Gear Pulley

[A] Remove the screw, washer, C-clip and plastic washer from end of Grit Roller Shaft. (Note order for reassembly.)

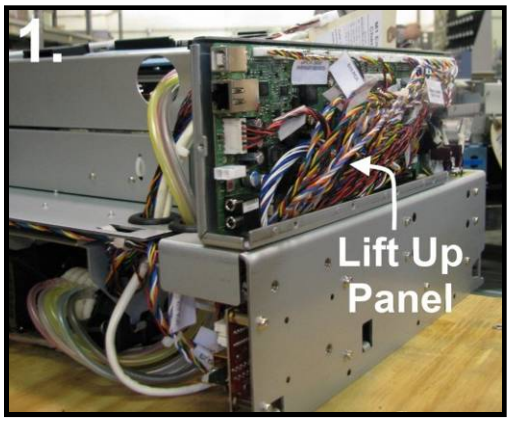
[B] Remove Pulley from Shaft.

Install in reverse order. NOTE: Align slot on Pulley with pin in Shaft before installing.

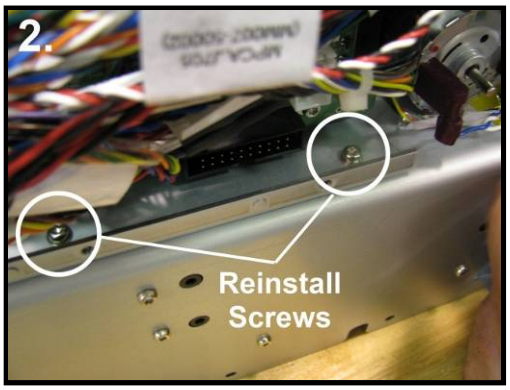


Reinstall the Main Printed Circuit Assembly

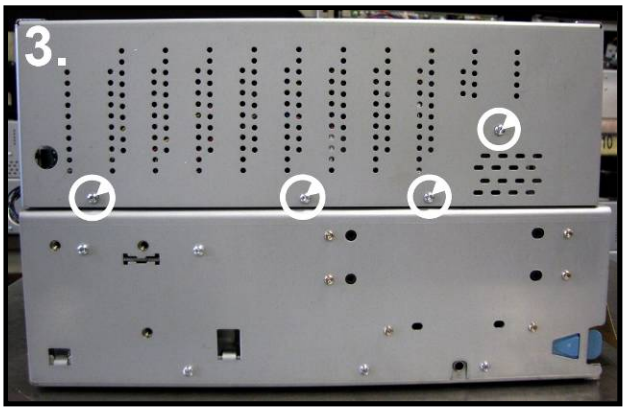
1. Gently lift up the Wiring Panel.
   NOTE: DO NOT pinch or cut wires running through Frame.



2. Reinstall the two (2) mounting screws into bottom of MPCA Panel.



3. Reinstall (4 or 5) screws to attach the Cover.

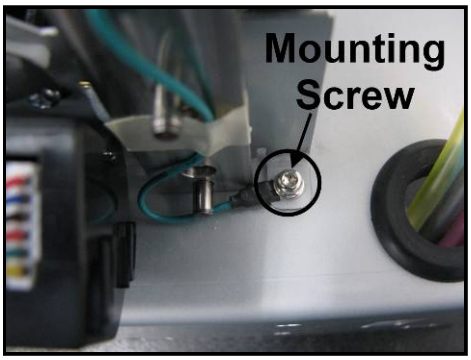


Accessing Items Under the Clamshell Assembly

Provides access to parts under the Clamshell Assembly.

1. Remove the (4) screws attaching the clamshell to the chassis (1 at each corner).
2. Gently lift the Clamshell Assembly from the chassis – **Take care not to pinch or damage any wires or ink hoses.**

NOTE: Remember to reinstall the ground cable when reattaching Clamshell Assembly to chassis. Check that no wires or hoses are being snagged or pinched.



Clamshell Assembly Components -- Underside

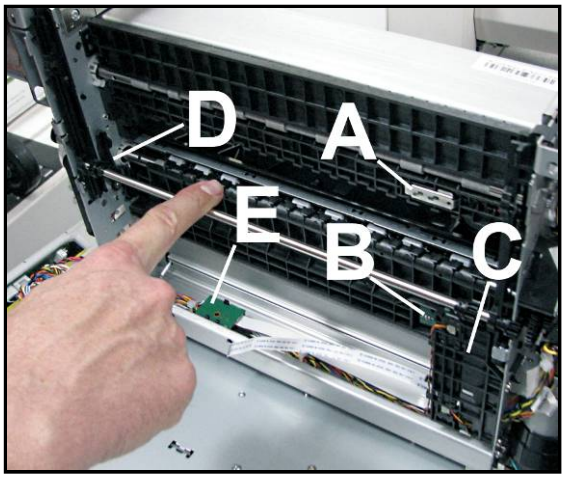
[A] Exit Sensor

[B] Paperpath Entry Sensor Emitter

[C] Service Station PCA Sled

[D] Wiper Lifter Arms (Left & Right)

[E] Wiper Motor PCA and Flex Cable



Replacing Paperpath Exit Sensor

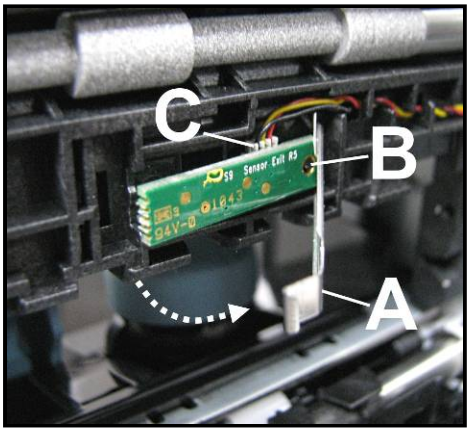
The Paperpath Exit Sensor is a "reflective style" sensor located in the lower Clamshell.

[A] Unlatch Exit Sensor Cover.

[B] Carefully pull Entry Sensor off locating pin.

[C] Turn Sensor over and unplug wiring harness.

Install in reverse order.



Replacing Paperpath Entry Sensor

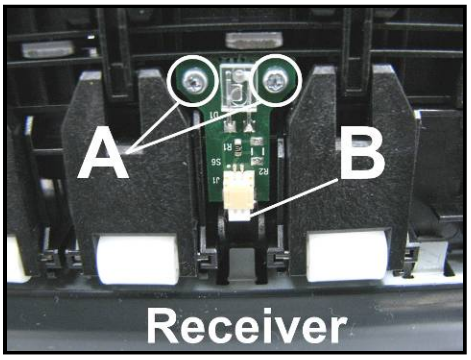
The Paperpath Entry Sensor consists of a Receiver located in the upper Clamshell and an Emitter located in the lower Clamshell.

Receiver (Under Upper Clamshell):

[A] Remove (2) screws.

[B] Disconnect wiring harness.

Install in reverse order.



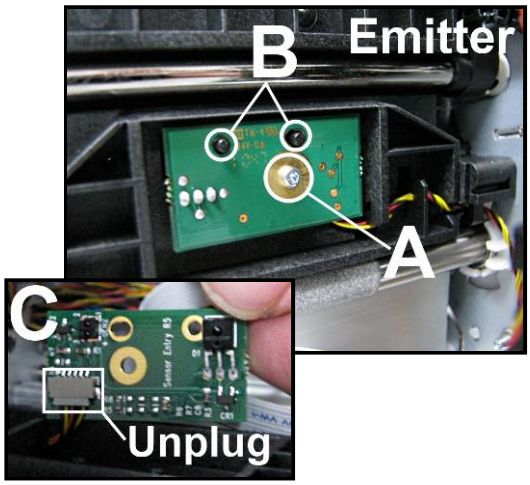
Emitter (Under Lower Clamshell):

[A] Remove (1) screw.

[B] Carefully pull Entry Sensor off locating pins.

[C] Turn Sensor over and unplug wiring harness.

Install in reverse order.



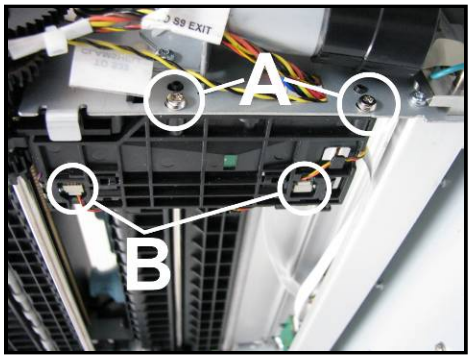
Replacing Service Station Sled Printed Circuit Boards

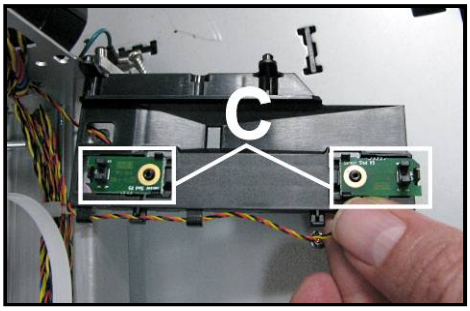
[A] Remove (2) screws.

[B]. Carefully disconnect the (2) connectors.

[C] Swing Sled away from Clamshell and turn over. Carefully unclip the two printed circuit boards.

Install reverse order. NOTE: Make sure wire harnesses are plugged into correct printed circuit board.





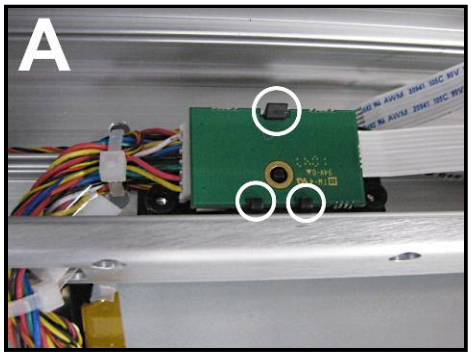
Replacing Wiper Motor Flex Cable PCA

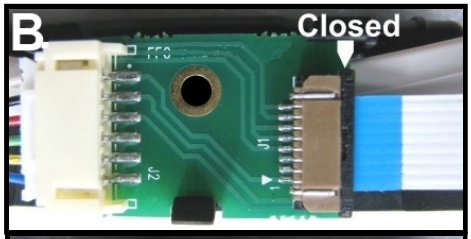
[A] Carefully unclip the Printed Circuit Board from the holder and turn it over. **NOTE: Tabs break easily.**

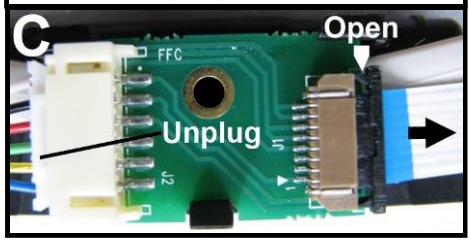
[B] Disconnect the Ribbon Cable. Slide the Latch open on the Circuit Board to release the Ribbon Cable.

[C] Disconnect the Wiring Harness.

Install in reverse order. NOTE: Make sure ribbon cable and wiring harness are plugged in correctly.

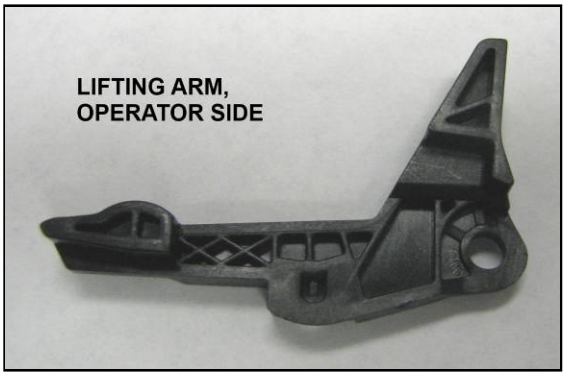


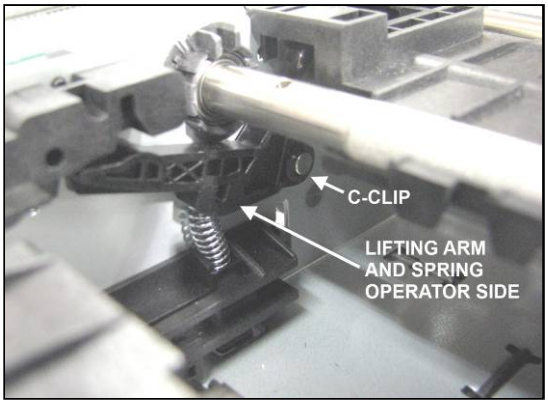


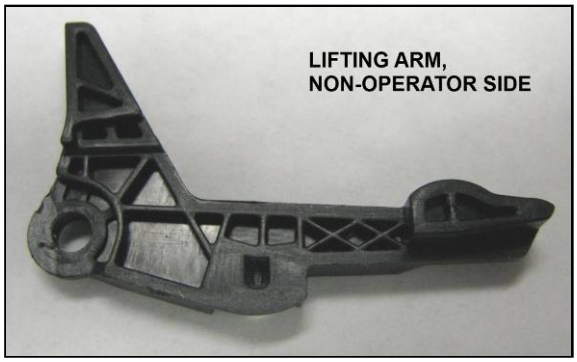


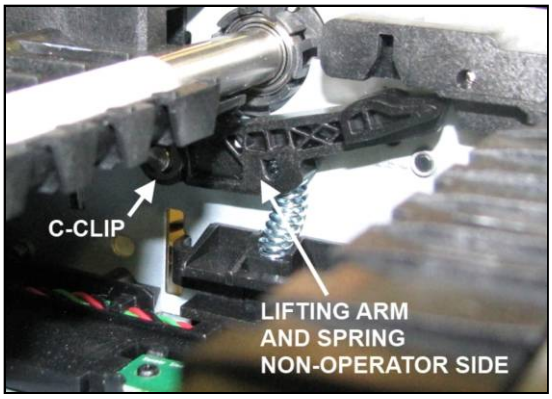
Replacing Service Station Lifting Arms

Replacement Kit (42-900-05) includes two Lifting Arms and two C-Clips (one each for Operator and Non-Operator Side installation.)





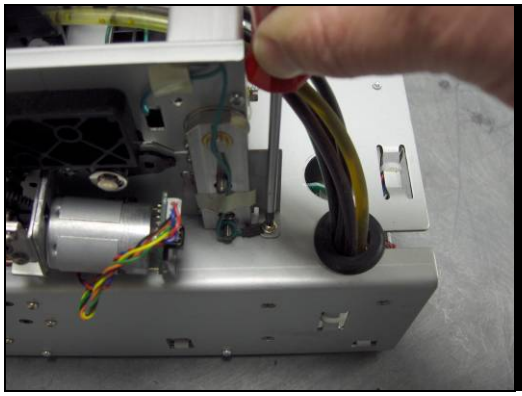
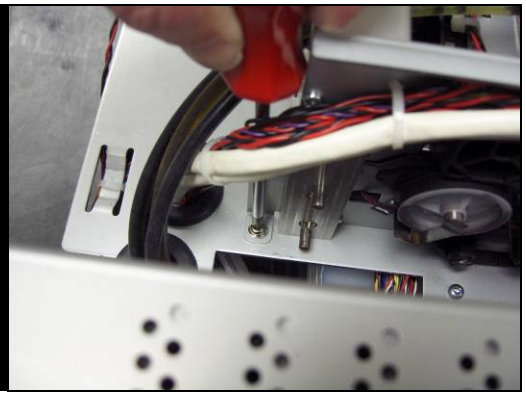
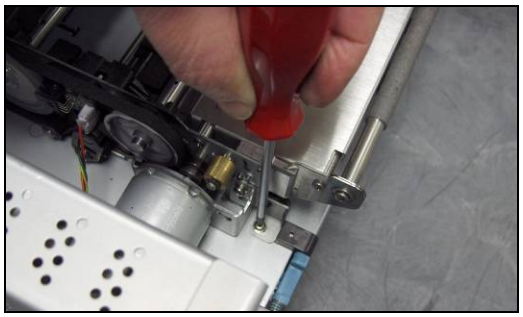
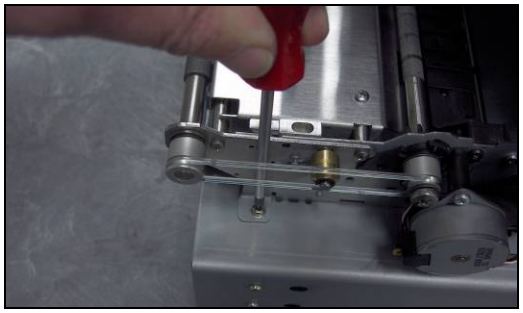




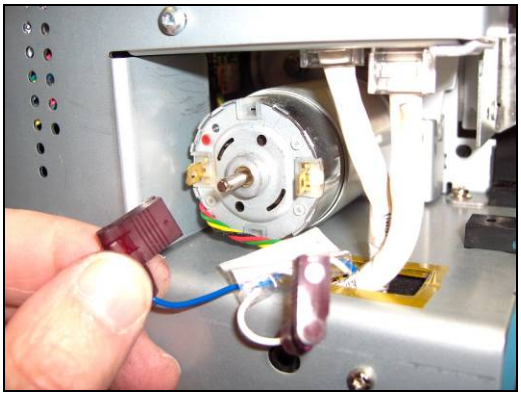
Before you begin:

- Prepare the printer ready for service.
  Tip: Depriming is not possible if lift arms are broken. In this case leave the printhead and tanks installed, to reduce the chance of ink leakage.
- Service Station must be removed prior to servicing the Lifting Arms. See "Removing the Service Station".
- Check the Index, Home and Lift Arm sensors for proper function. See “Scan Sensors” feature. If sensor problem is found you can clean /replace the sensors, during this procedure.
- Remove the Print Engine from the printer. See “Removing the Print Engine”

1. Remove the four screws that secure the clamshell to the deck.

2. Disconnect the Transport Motor on the Print Engine.



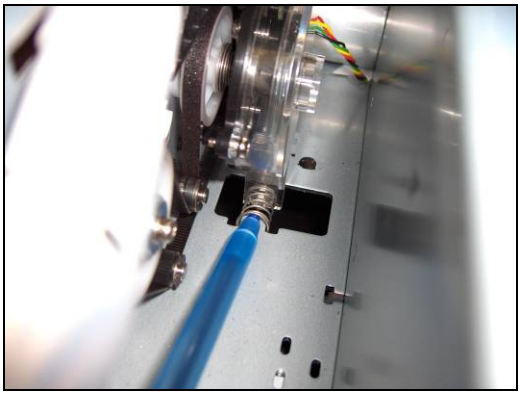
Note: This is a picture of an older Print Engine. On current Print Engines the Main PCB cover will need to be removed before you can access the motor wire connections.

3. Disconnect encoder sensor connector. (this is an image of the Z2i engine).

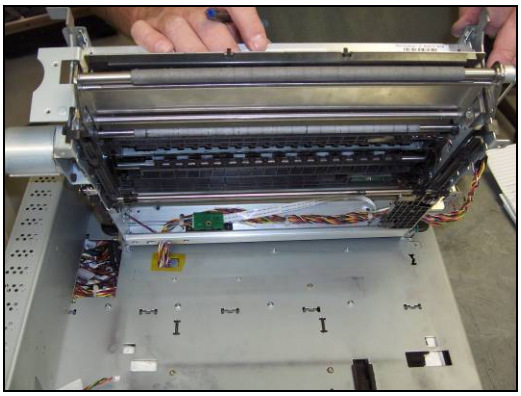
Encoder on Z2i Print Engine

Encoder on Z3/Z4/MR Print Engine

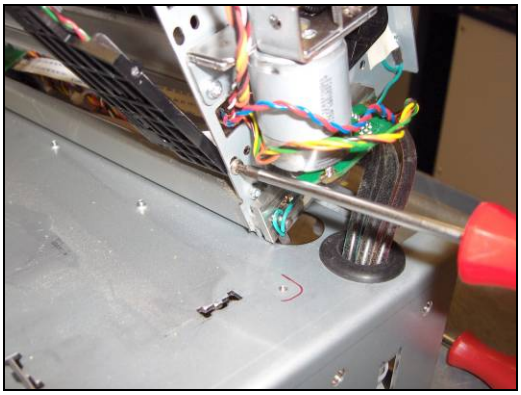
4. Remove Spring, located at the bottom of the encoder assembly (Z3/Z4/MR Print Engines Only)



5. Carefully maneuver the top section of the print engine so the motor clears the board housing. Tilt the top section of the print-engine back to expose the underside. Be careful not to damage wires or kink/pinch ink tubes.

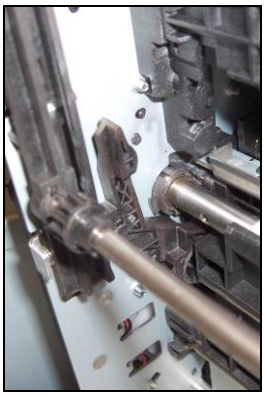
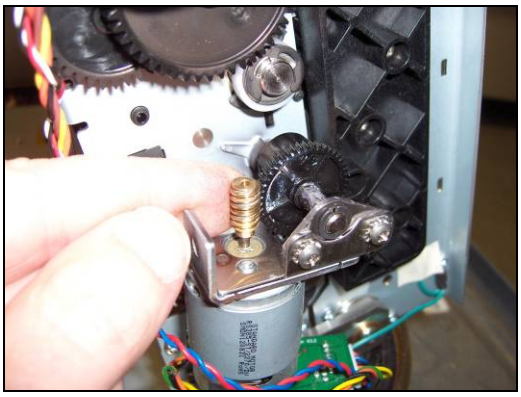


6. Remove the two screws that secure the Service Station Sensor bracket to the frame.

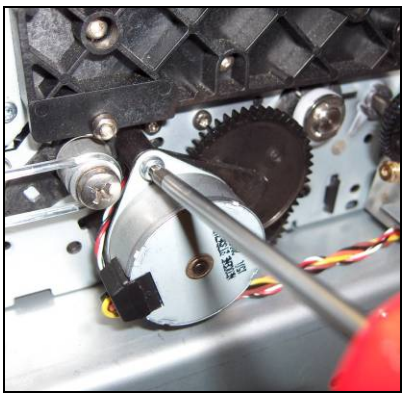
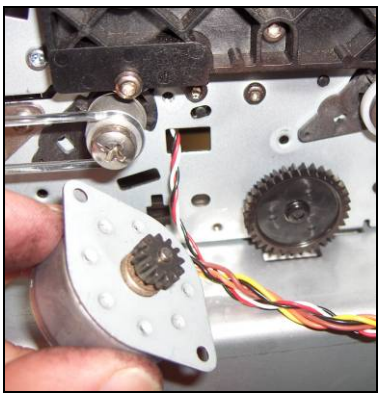
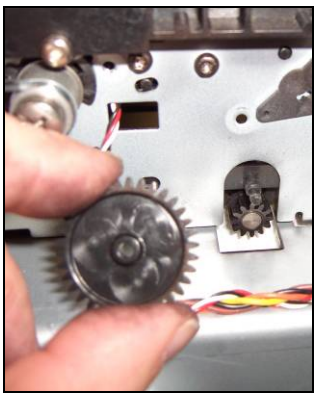


Tip: This is a good point at which to clean/replace sensors; if needed.

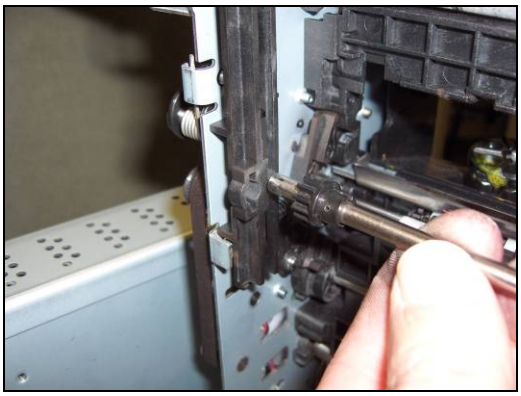
7. Turn the lifting arm motor (worm gear) to raise the lifting arms to their highest position.
Tip: A long, straight, 5/64”Allen wrench can be pushed into the round hole at the end of the worm gear and used to spin the gear. This is not a hex shaped hole, in the worm gear, but you can usually get enough friction to turn the gear.

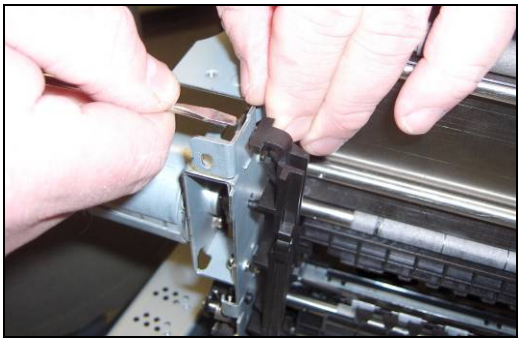

8. Remove the Service Station Drive Motor (Servo), bracket and drive gears. This will allow free the Service Station Drive Shaft so it can be shifted towards the non-operator side of the Print Engine.

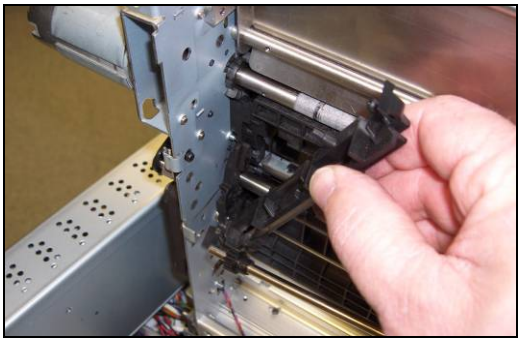




9. Slide the Service Station Drive Shaft towards the non-operator side of the Print Engine to release it from the Service Station Side Rail (operator side).

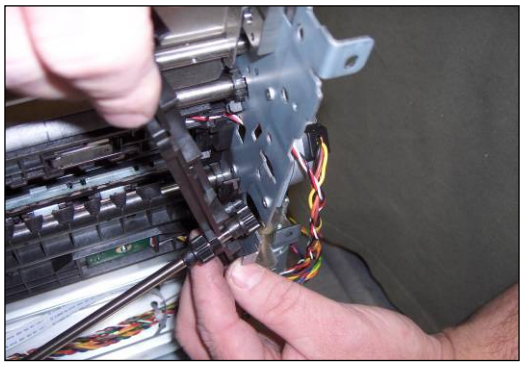


10. Remove the Service Station Side Rail Tracks.

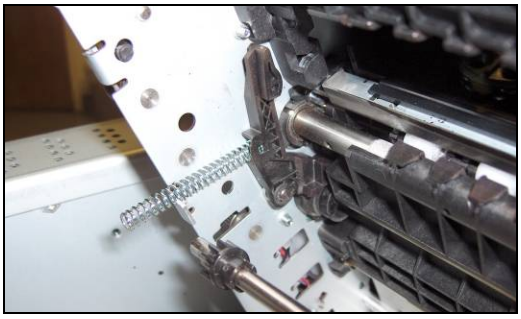




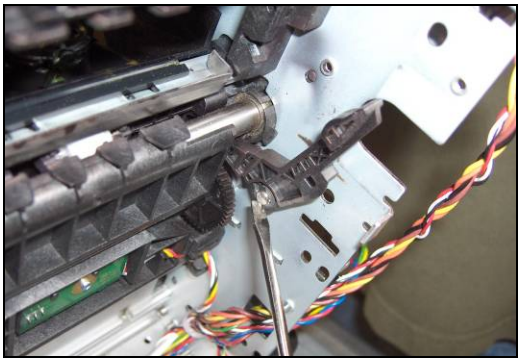
NOTE: The Service Station Drive Shaft will be removed with the Service Station Side Rail on the Non-Operators side.

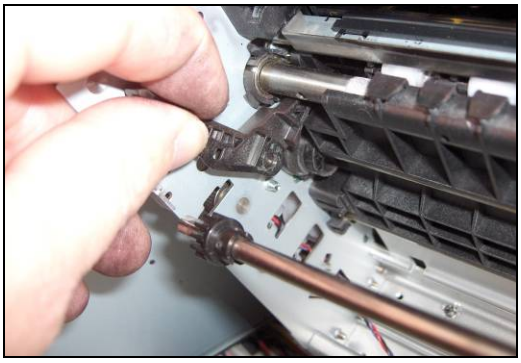


11. Remove the Lifting Arm Spring(s)

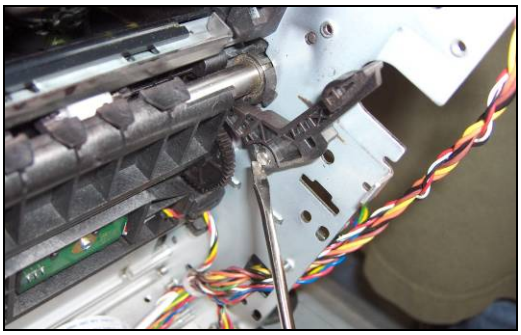


12. Remove c-clip that secures each of the Lifting Arm(s). Then remove the Lifting Arm(s)

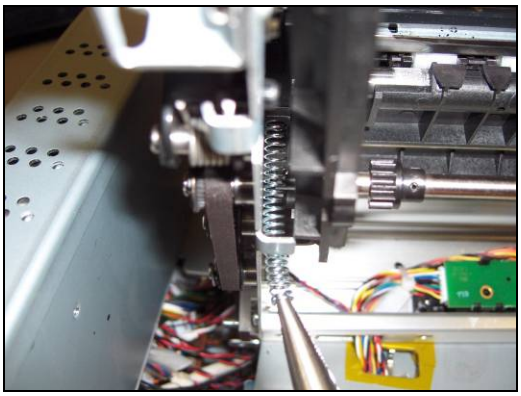
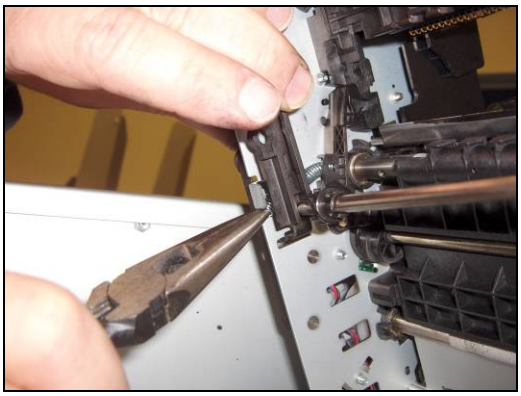
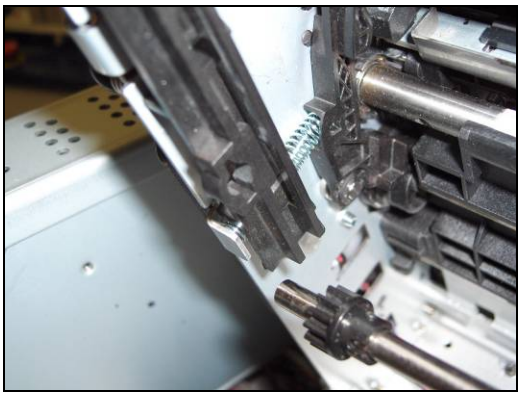




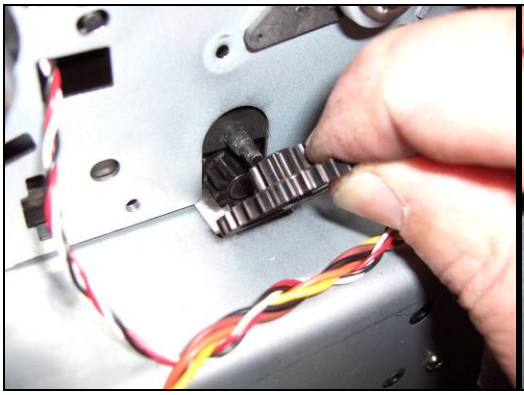
13. Apply a plastic-safe synthetic grease or lubricant (Super Lube 21030 or equivalent) to the Lifting Arm pivot pin and the area of the lifting arm that contacts the Lifting Arm Cam. Super Lube 21030 or equivalent is suggested.
    Then install the new Lifting Arm(s) and secure using c-clip.

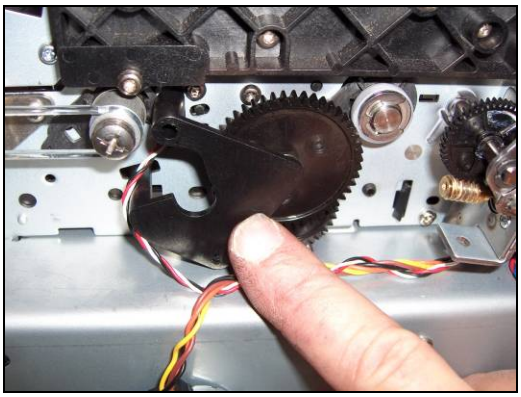
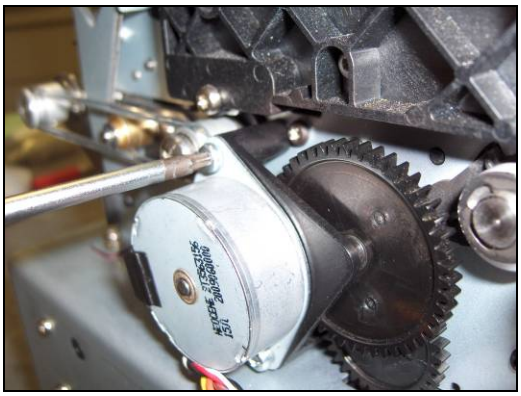



14. Reinstall the Service Station Side Rail Tracks and Lifting Arm Springs using the following technique.

15. Reinstall the Service Station Servo Motor, Bracket and Gears.



16. Lower the Lifting Arms. If the Lift Arms are not lowered, turn the lifting arm motor (worm gear) to lower the lifting arms to their lowest position.

17. Temporarily install the Service Station to test for proper movement. Verify that it moves freely (without resistance), as you drive it all the way into the back of the opening and then out again; using the large drive gear. If you feel any resistance you need to correct this issue before proceeding. Resistance may be caused by installing the Service Station crooked, by Side Rail Tracks that are not properly attached, by a poorly adjusted Service Station Guide, or by lack of lubrication. See Appendix C “Service Station Guide Installation Instructions” for aligning the Service Station guide.
CAUTION! Before you re-install the service station, you must be sure the Lifting Arms are lowered. If not, the arms can be captured above the Service Station and the new arms may be broken when you power-on the printer.

18. Remove the Service Station from the print engine.
19. Re-install print engine and other components in reverse order.
    Realign outline marks, from step 1, before securing the Clamshell to the deck (Ink Tank section).
    Tip: Leave the side covers off until you are sure the printer is fully operations.
20. Power the printer on and verify proper service station motor drive and lift arm motor drive.
    After power-up; the first thing you should notice is the lift arms raise, lower, then stop in the lowered position. The printer does this to verify that the arms are in the lowest position before driving the service station.
    Then you should notice the Service Station drive components driving for a number of cycles. Then they will stop. At this time the Toolbox will show a "Fatal 71 02" or "MECH_FAIL_PERMANENT" message, indicating that the printer is having problems recognizing and moving the service station components; this is normal, since the Service Station is not installed.
    IMPORTANT: If you see the message "Fatal 71 02…" you are using old firmware. It is mandatory that you update the firmware to 20130820 or higher.
21. Power-down the printer and disconnect the power cord from the printer.
22. Verify that the Lift Arms are in the lowered position and then re-install the service station. Be sure to start it squarely and don't drive it in more than 1/4" past when it engages with the drive gears.

    CAUTION! Before you re-install the service station, you must be sure the Lifting Arms are lowered. If not, the arms can be captured above the Service Station and the new arms may be broken when you power-on the printer.
23. Power the printer on and test for proper operation.

Section 6 – Service Maintenance

General, periodic maintenance is needed to keep the Printer in good working order. Many tasks can be performed by operators with basic supplies, no special tools needed. Other tasks should only be performed by trained service personnel.

Maintenance Supplies & Equipment: Flashlight, small telescoping mirror, hard-bristled toothbrush, tweezers, small flathead screwdriver, powder-free nitrile gloves, protective clothing and eyewear, vacuum with wand, deionized/distilled water, Super Lube 21030 synthetic grease (or equivalent), Loctite 38650 copper anti-seize (or equivalent), can of compressed air, foam or lint-free cotton swabs, lint-free wipes, disposable shop towels.

Maintenance Schedule

NOTE: High volume usage may require more frequent maintenance.

AS NEEDED MAINTENANCE (Depending on Printer usage)	
Cleaning (Remove media fibers and ink residue):	Media path, Service Station (Wiper Roller, Platen)
Ink Revolver Couplings	Inspect and clean after every Printhead removal.
Printhead	Wipe as needed to maintain print quality.
Wiper Roller	Replace with Printhead to help avoid possible damage to new head.
Printhead Pen Driver PCA	Clean contacts after every Printhead removal.
Lubrication (Super Lube 21030)	Service Station (cams, lifting arm pivot points and guide tracks), Lift Motor Gear
Printhead, Head Media Guide, Lip of Cap	Wipe these areas clean after system is primed or as needed.
Replacement	Wiper Roller, Ink Waste Tray, Ink Revolver Couplings, Tubing, Belts.
DAILY MAINTENANCE	
Ink Cartridge(s)	Clean manually prior to installing, after paper jams and when automated servicing does not clear nozzles.
Media Path	Clean to remove excess ink residue and debris.
Print Engine: System Components, Paper Path surfaces (upper and lower.)	Clean to remove excess ink residue and debris. **NOTE: DO NOT wipe Starwheel Assemblies.**
Printhead	**Clean after:** Installing and priming, removing and replacing, priming or repriming, contamination.
Service Station: **Capping Station and Platen**	Empty/clean excess ink residue and debris.
BI-WEEKLY MAINTENANCE	
Encoder Wheel (Z2i Print Engines with exposed Encoder Wheels only.)	Clean spattered ink or residue.
Media Sensors	Clean to remove excess ink residue and debris.
Print Engine	Clean to remove excess ink residue and debris.
Wiper Roller, Cap Station Seal	Inspect for proper operation and wear.
MONTHLY MAINTENANCE	
Grit Rollers	Inspect for proper operation and residue build-up.
Ink Tubing, Connections, Peristaltic Pump, Pinch Valve & Vents, Buffer Boxes, Ink Revolver Couplings	Inspect for leaks, kinks, pinches, proper operation.
Ink Waste Tray	Inspect for excessive ink saturation or leakage.
Lift Motor Gear	Inspect for proper operation, debris and wear.
YEARLY MAINTENANCE	
Check Firmware Version	Verify latest version and update if needed.
Grit Rollers	Clean to remove excess ink residue and debris.
Ink Tank Latches/Ink Tank Bay	Inspect for proper operation, wear, debris, leakage.
Inspect Moving Parts: Media Path, Pump, Pinch Valves and Service Station	Verify smooth operation. Listen for unusual noise indicating damage or wear.
Lubrication (Super Lube 21030)	Lifter Motor Gear, Service Station (cams, lifting arm pivot points, wiper roller gears, guide tracks)
Lubrication (Loctite 38650)	Grit Roller Ground Clips, Springs and Washers
Service Station: Wiper Roller, Sled Assembly,	Clean to remove excess ink residue and debris.

WARNING!

ALWAYS POWER DOWN THE PRINTER BEFORE CONNECTING OR DISCONNECTING ANY WIRING HARNESSES OR CABLE CONNECTIONS TO AVOID SERIOUS SHOCK OR INJURY.

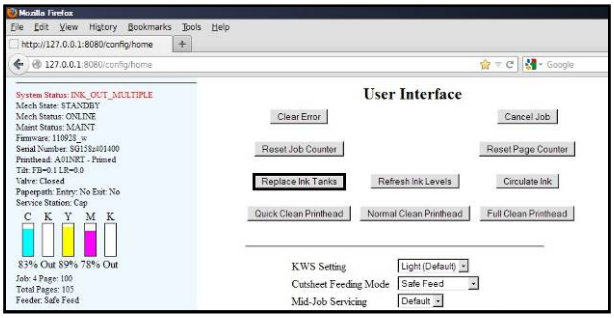
CAUTION

- **ALWAYS USE APPROPRIATE PERSONAL PROTECTION EQUIPMENT (PPE).**
- **USE ELECTROSTATIC DISCHARGE (ESD) PROTECTION WHEN MAINTAINING EQUIPMENT.**
- **DISPOSE OF ALL MAINTENANCE WASTE IN ACCORDANCE WITH LOCAL REGULATIONS.**

Replacing the Ink Tanks

Replace the printer Ink Tanks when the ink runs out.

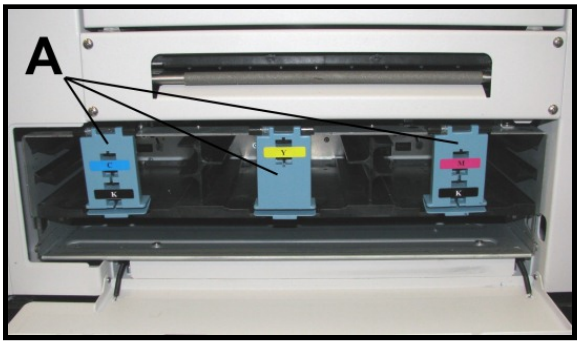
1. **Open the Printer Toolbox.** Go to the Start Menu, then open the "Toolbox". You will see System Status information in the upper left corner of the **User Interface** window. Note that some or all of the **"CKMYK"** boxes may be low or empty.



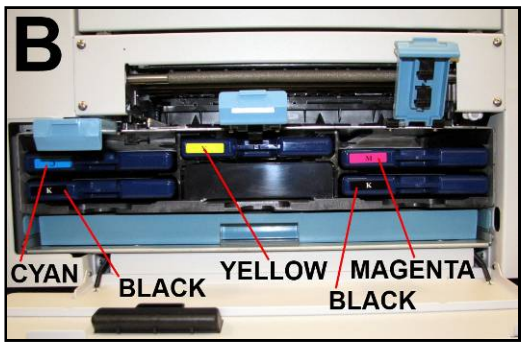
2. **Click "Replace Ink Tanks".** This disconnects Printer communication with the Ink Tanks and allows safe installation and replacement. Once the "Confirm" screen displays, it is safe to remove the Ink Tanks. **IMPORTANT: DO NOT press "Continue" until after you have removed and replaced the Ink Tank(s) and closed the Ink Tank Latches.**

3. Open the Ink Tank Door (*hinged at bottom*). Open the three Latches **[A]** and pull the Ink Tank(s) from the unit.

4. Remove the new Ink Tank(s) from packaging.

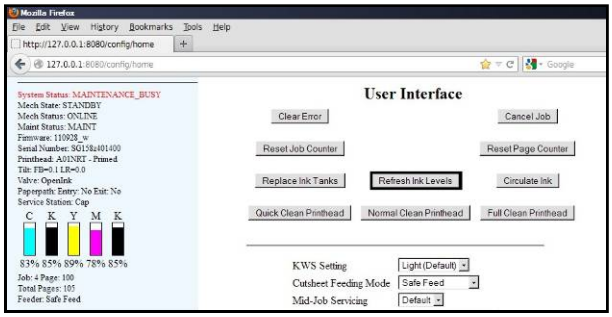


5. Insert the new Ink Tanks (*labels up*) into their appropriate color slots **[B]**. Close the three Ink Tank Latches.
INSTALLATION TIP: Make sure the Ink Tanks seat properly. Insert the Ink Tank into the appropriate Ink Station, then pull the Ink Tank back about an inch and push forward firmly to insure that the Ink Nozzles penetrate the seals on the Ink Tanks.



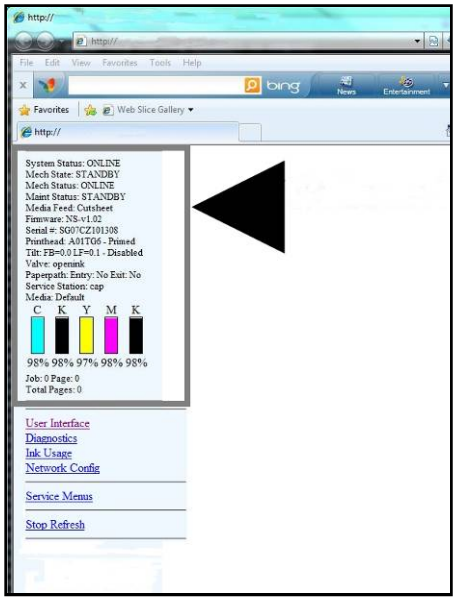
6. Click **"Continue"** on the **Confirm** screen, then **"Refresh Ink Levels"** on the **User Interface** screen. The ink colors fill in as the Ink Tanks are installed. If the ink colors do not fill in after a few seconds, click **"Replace Ink Tanks"** again and reinstall the Ink Tank(s).

   NOTE: If the Ink Tank is installed, but the Ink Tank indicator still does not refresh, see "Cleaning Ink Tank Contacts" below.



7. When the Printer stops processing and all the fields in System Status are *black*, the Printer is ready for use.

8. Close the Ink Tank Door.



WARNING!

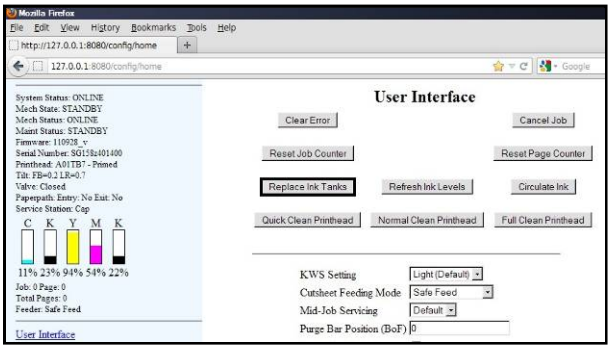
The ink in the Ink Tanks may be harmful if swallowed. Keep new and used Ink Tanks out or reach of children. Discard empty Ink Tanks immediately.

Cleaning Ink Tank Contacts

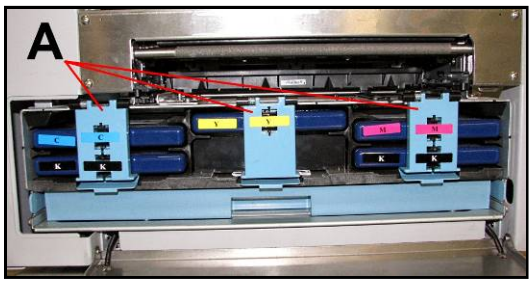
When reinstalling or replacing Ink Tanks, the Ink Level indicator in the Toolbox may not refresh. This may be due to a dirty Ink Tank Level Prism and/or QA Chip contacts on that Ink Tank(s). You can clean the contacts as follows:

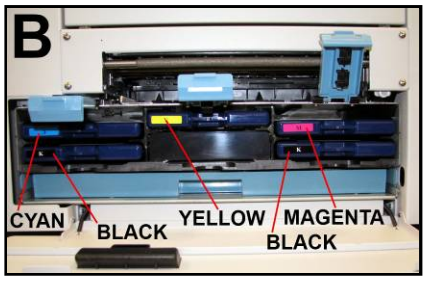
1. **Remove the Ink Tank(s).** Open the Toolbox. Click **"Replace Ink Tanks"**. Once the "Confirm" window opens, it is safe to remove the Ink Tanks. **IMPORTANT: DO NOT press "Continue" until after you have removed and replaced the Ink Tank(s) and closed the Ink Tank Latches.**

"

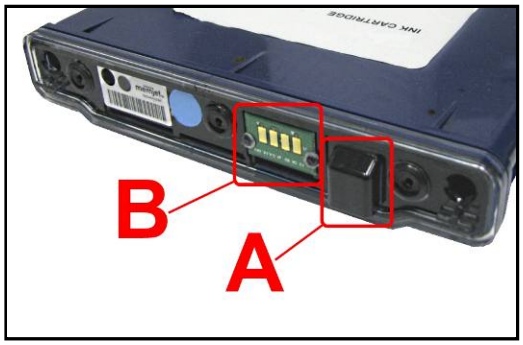


2. Open the Ink Tank Door, release the Ink Tank Latch(es) **[A]** needed and remove the Ink Tank(s) **[B]** that did not refresh.



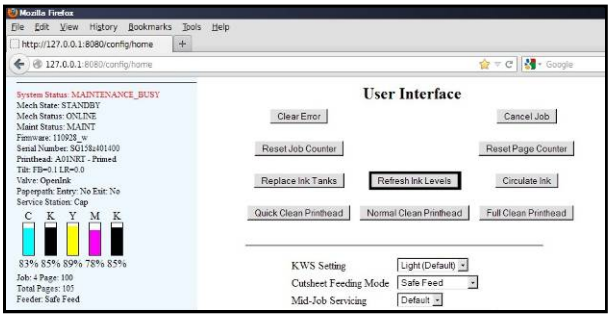


3. Clean the Ink Level Prism **[A]** and QA Chip contacts **[B]** with a clean, dry, lint-free cloth. **NOTE: You can dampen the cloth with distilled water to wipe the Prism, but DO NOT get the QA Chip contacts wet.**



4. Reinstall the Ink Tank(s) (*labels up*), latch the Ink Tank Latch(es) and click **"Continue"** on the **Confirm** screen, then **"Refresh Ink Levels"** on the **User Interface** screen.

5. Close the Ink Tank Door.



Storage

New Ink Tanks should be stored in their original packaging and kept away from heat.

Opened Ink Tanks should remain in the Printer.

Nominal Ink expiration date: 24 months following date of manufacture (*ink fill date*).

Disposal

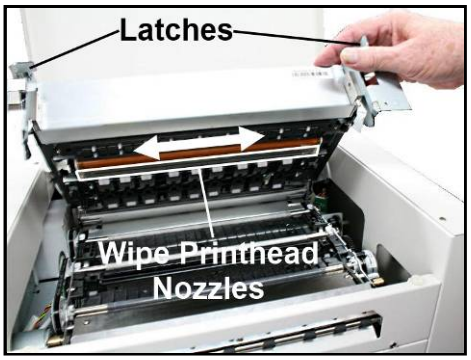
The Ink Tank may be disposed of in a normal manner.

Clean up spills with soap and water. Abrasive soap is effective in cleaning ink off your hands.

Cleaning the Printhead Cartridge

The Printhead Cartridge in the Printer is cleaned automatically each time the machine is turned on or when the "Quick Clean Printhead" routine is performed by the operator. This can be found under the **Service** tab, "Quick Clean Printhead" in the Printer Driver or the User Interface in the Printer Toolbox. "Normal Clean Printhead" and "Full Clean Printhead" can be used to more thoroughly clean or clear the Printhead.

If running the automated Cleaning Levels doesn't help improve print quality, the Printhead Cartridge can be cleaned manually.



1. Open the Top Cover.
2. Release and lift up the two latches **at the same time** to raise the Print Engine Clamshell.
3. Moisten the Printhead nozzles using deionized/distilled water (*reference ASTM D5127-90 Type E-II Electronic Grade Water*) and a damp, lint-free cloth, wiping end to end. (*Gray strip located below orange strip.*) **Take care not to damage the copper contacts, the metal plate, or the gold Printhead surface.**
4. **Close and relatch the Print Engine Clamshell.**

Generally, when the ink supply is adequate and the print quality remains poor, or when the automated cleaning processes or manually cleaning the Printhead has not helped the image quality, the Printhead should be replaced.

CAUTION

- **Use electrostatic discharge (ESD) protection when handling.**
- **Hold the Printhead Cartridge by the handles ONLY.**
- **DO NOT touch the ink couplings, nozzle surface or electrical contacts.**
- **DO NOT unpack the Printhead Cartridge until the Printer is ready for installation. Once unwrapped, delay in installing the Printhead can compromise print quality due to dehydration.**
- **DO NOT place an unwrapped Printhead on any surface before installing. Protect the Printhead from scratches, dust, fibers, dirt and other contaminants at all times.**

Replacing the Printhead Cartridge

ATTENTION

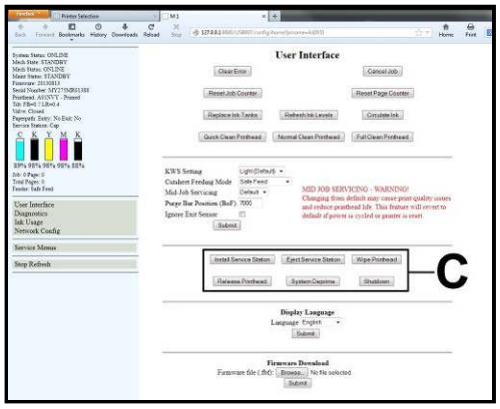
If you experienced fuzzy print quality or an abrupt failure in a particular area of nozzles on the previous printhead; we recommend that you have the service station inspected/cleaned and the wiper roller replaced, before installing the new printhead. If not; the chance of damage to the new printhead is greatly increased.
Service station maintenance and wiper roller replacement should only be performed by a qualified/trained person.

The following procedure describes how to remove the Printhead Cartridge from the printer.

NOTE: We recommend the use of nitrile powder-free gloves for this process.

1. Plug in the printer. Turn the printer's Main Power Switch ON; then press the control panel's ON/OFF button. Wait about 45 seconds for the print engine to power-up (ON/OFF button will illuminate).
2. Open the Top Cover.
3. Open the Toolbox utility.
4. Click on the button labeled "Release Printhead"; located in the Advanced Buttons area [C] of the User Interface screen.
   The printer will run a partial deprime routine and then the printhead latch will release so it can be opened.

   WARNING! If the printhead latch fails to release do not force the latch open. Severe damage will result. Contact technical support.

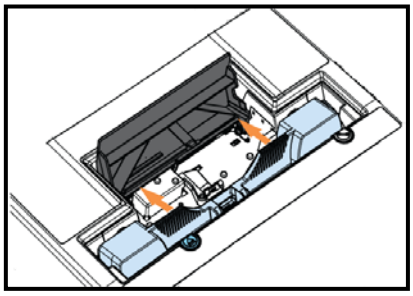


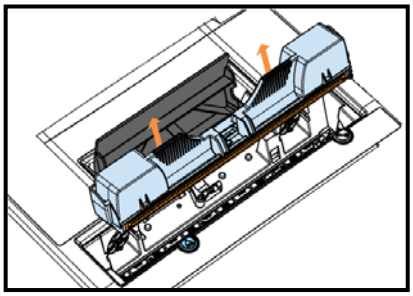
5. Open the Printhead Latch fully to disengage the ink couplings from the printhead cartridge.

WARNING

Never attempt to open the Printhead Latch manually, when in the closed/locked position. Severe damage will result. Use the Release Printhead button from the Toolbox Utility.

6. Remove the old printhead as shown below. Tilt the cartridge back and then lift up to remove.





7. To help reduce ink spills; place the printhead into the old protective packaging and discard.
8. Once the old Printhead Cartridge has been removed; please refer to the section titled "Installing the Printhead Cartridge"; to install the new Printhead Cartridge.

Printhead Storage & Shelf Life

Properly stored, unopened, Printhead Cartridges have a shelf life of up to 1 year.

Storage Temperature Range:	**Long Term:** 14° F to 86° F (-10° C to 30° C) **Short Term:** -11° F to 140° F (-25° C to 60° C) **NOTE:** Cumulative storage duration above 86° F (30° C) must not exceed 72 hours.
Humidity Range:	5% to 95% Relative Humidity, non-condensing
Atmospheric Pressure Range:	70 kPa to 106 kPa
Electrostatic Discharge:	8 kV air discharges or 4 kV contact discharges* *When tested in accordance with IEC 61000-4-2

If you find it necessary to remove the printhead from the printer, for a few hours/days, it must be properly protected and sealed; to help reduce damage, nozzle dehydration and clogging.

- Follow the "Replacing the Printhead Cartridge" procedure to remove the Printhead Cartridge.
- Install the protective cover on the printhead. Be careful to avoid ink spills (drips) and stains during this process.
- Store Printhead Cartridge in a sealed plastic bag, along with a cloth that has been dampened with distilled water.
- Re-install the "Cap Protectors" onto the Ink Revolver Couplings.
- The Printhead should be re-installed as soon as possible. Please see the section titled "Installing the Printhead Cartridge".
  CAUTION: Make sure the cartridges electrical contacts are dry before re-installing printhead.

Printhead Service Life

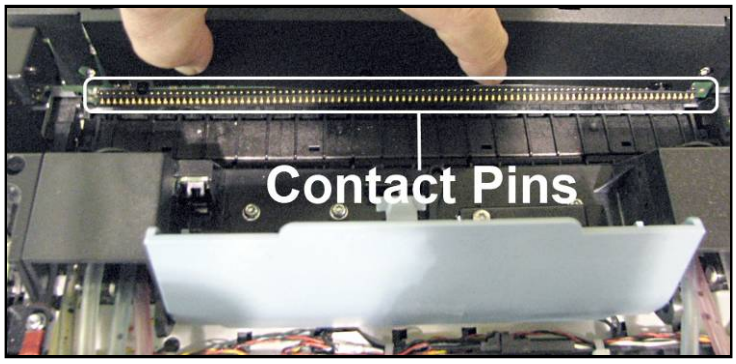
Manufacturer's estimated rating: ~125,000 linear inches of continuous printing.
For example; if printing media that is 4.2" in length, at best print quality, with 100% ink coverage (each nozzle firing at 1600 dpi down length of media); the printer is depositing 4.2 liner inches of print per piece. At this rate, you can expect a yield of approximately 30,000 pieces before head replacement may be needed.
If printing a typical logo (1" high) you can expect a yield of approximately 125,000 pieces before head replacement may be needed.
NOTICE: **Individual results will vary.**
The estimations, provided above, are NOT an expression of Warranty. This information is being provided for informational purposes only. The decision on when a printhead is no longer producing acceptable output varies greatly from customer to customer; since this decision is based upon the customer's expectations (what they consider is or is not acceptable output).
Printhead degradation will depend on the make-up of the images printed, the operating environment, servicing, media characteristics (*including cleanliness*) and other factors. The Printhead has a total of 70,400 nozzles (14,080 per color channel, 5 color channels). Since every print job is different, most do not use the entire width of the Printhead nor do they require that every nozzle be fired. Therefore some nozzles do not fire as often as others. The most often used nozzles will degrade more quickly. Noticing the effects of failing nozzles depends partly on the relative position of those nozzles to each other.

Printhead Disposal

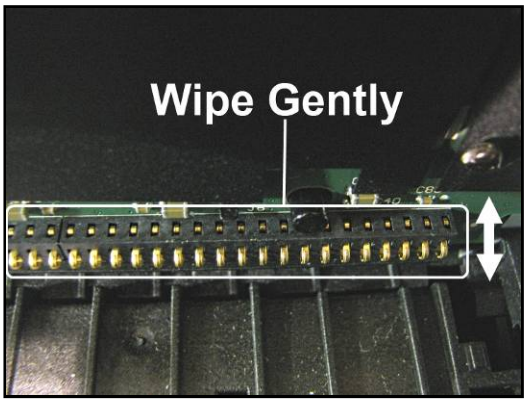
The Printhead Cartridge may be disposed of in a normal manner.
To help avoid ink spills; place the Printhead Cartridge back into its original packaging, before disposal.
Clean up spills with soap and water. Abrasive soap is effective in cleaning ink off your hands.

Cleaning Pen Driver Printed Circuit Board Contacts

Clean the Printed Circuit Board contact pins that connect with the Printhead Cartridge.



1. **Remove the Printhead Cartridge.** Locate the contact pins along the base of the Pen Driver Printed Circuit Board. (Positioned opposite the Ink Revolvers.)
2. Dampen a new, lint free cloth in deionized/distilled water.
3. Use a very gentle up and down motion to clean the contact pins. **NOTE: Hold down plastic cover to keep moisture away from the rest of the Circuit Board.**



CAUTION

CONTACT PINS ARE EASILY BENT OR DAMAGED!

USE ONLY A VERY GENTILE UP AND DOWN MOTION FOR CLEANING. BENT PINS CAN DAMAGE THE PRINTHEAD AND THE CIRCUIT BOARD.

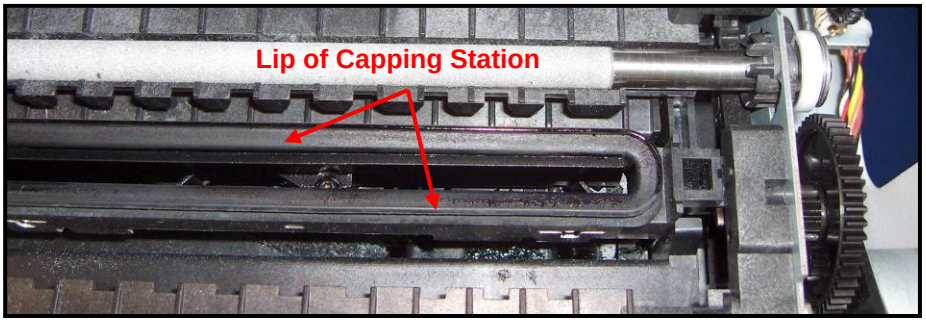
Inspecting & Cleaning the Lip of the Capping Station

The Capping Station (Cap) is part of the Service Station. When the printer is idle, the Service Station automatically caps the printhead to keep the nozzles hydrated.
Excess ink can accumulate on the Lip of the Cap. This commonly occurs after a printhead cartridge is installed and the system is primed. During the printhead priming process the system performs multiple purges of ink into the Cap. This can cause excess ink to build on the lip of the Cap. This excess ink will then be transferred to the printhead surface, when the printhead is capped; creating a greater chance for "scuff marks" to occur on the media.

Procedure:

1. Power-down the printer using the ON/OFF button.
2. After the Control Panel Lights have all turn OFF; Open the Top Cover.
3. Carefully release the Latches and Open the Clamshell.

4. Using a lint free cloth; carefully wipe the excess ink from the Lip of the Capping Station.



5. Inspect the lip of the cap for signs of wear or damage. If the lip is uneven or cracked, it should be replaced. Please contact your service support representative to have this item replace.
6. Carefully close and latch the Clamshell.
   Important! Make sure to hold the latches open (unlocked position) until the clamshell is closed. Then slowly release the latches. If this rule is not followed damage to the latch posts and or door switch may result.
7. Close the Top Cover.
8. Power-On the printer.

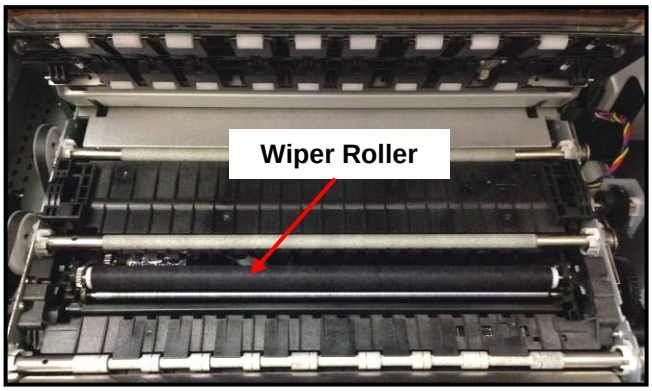
Inspecting the Wiper Roller

The Wiper Roller should be routinely inspected for signs of wear and debris.

Directions:

1. Power ON the printer and power-up the print engine.
2. After the printer has finished performing maintenance, carefully release the Latches and Open the Clamshell.

3. Open the Toolbox and press the "Wipe Printhead" button.
4. The Wiper Roller will be presented through the opening in the lower section of the print engine. The Service Station will cycle through its normal wiping and capping routine; providing you with the opportunity to inspect the condition of the Wiper Roller.
   CAUTION: Keep all loose items and hands away from the moving parts within the print engine. Do NOT try to touch or clean the moving components. Injury or damage may result.



5. Inspect the Wiper Roller for signs of damage/wear (fabric is fuzzy, torn, uneven) and debris (fibers, hair, particle accumulation, etc…).
   Contact your service support representative if you see signs of wear or debris on the roller. The wiper roller may need to be cleaned or replaced.
   NOTE: A new (unused) Wiper Roller will be white. Once the roller has been used, for a short period of time, it will turn black with ink. This is normal.
   WARNING: Without training and experience it can be difficult to identify a worn or dirty wiper roller. When in doubt, the Wiper Roller should be replaced. Operating the printer with a worn or dirty wiper roller can cause damage to the printhead. If the printhead is replaced it is also recommended that the Wiper Roller be replaced at the same time.
6. As soon as you are finished inspecting the Wiper Roller; carefully close and latch the Clamshell.
   WARNING: If you leave the Clamshell open too long this may cause nozzle dehydration.
   Important! Make sure to hold the latches open (unlocked position) until the clamshell is closed. Then slowly release the latches. If this rule is not followed damage to the latch posts and or door switch may result.
7. Close the Top Cover.

Cleaning/Replacing Service Station Items

The Service Station contains separate areas/devices that are used to perform the following tasks.

- Cleaning. The Wiper Roller cleans the Printhead nozzles of excess ink and debris.
- Printing/Purging. The Printing Platen acts as a base to support media during printing. It also contains a purging area; which captures and absorbs ink that is purged, to help keep nozzles clear.
- Capping. The Capping Station seals and protects the printhead nozzles when not in use.
- Evacuating Waste Ink. In addition to the function of supporting the above items; the Service Station Tray is lined with wicking material that absorbs the waste ink and transfers it out of the Tray and into the "waste ink trough". This waste ink then flows from the "trough" to the "Waste Ink Tray", which is located behind the Ink Tank Door.

As the above components become worn/dirty, from use, they can lose their ability to perform as intended. If you experience print quality issues that are not resolved by performing the steps found in the Troubleshooting Section under "Print Quality Issues"; it may be time to have the Service Station, or components within the Service Station, cleaned or replaced.

CAUTION

THESE PROCEDURES SHOULD ONLY BE PERFORMED BY A QUALIFIED/TRAINED PERSON.

Please use nitrile powder-free gloves and have plenty of paper towels on-hand for these procedures.

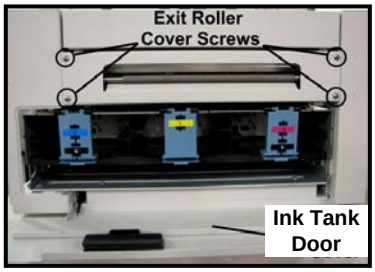
WARNING

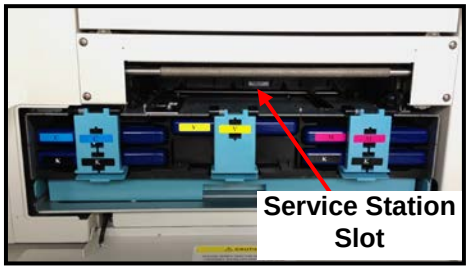
If the Printhead Cartridge is still installed; when you remove the Service Station, the Printhead will remain un-capped. This can cause dehydration of nozzles and printing issues. If you want to reduce the chance for printhead nozzle dehydration; it is highly recommended that you eject the Printhead and follow the procedures described under "Printhead Cartridge Storage and Handling", before you begin this process.

Removing the Service Station

1. Open the Top Cover
2. Open the Ink Tank Door (*hinged at bottom*) to expose the "Service Station Slot".

Tip: On older units you will need to remove the Exit Roller Cover by removing the four (4) screws. This is not necessary on newer units.



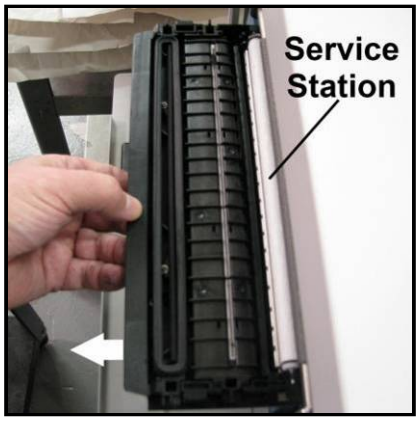


3. Power-up the printer.
4. Open the Printer Toolbox. In the User Interface window, press the "**Eject Service Station**" button.

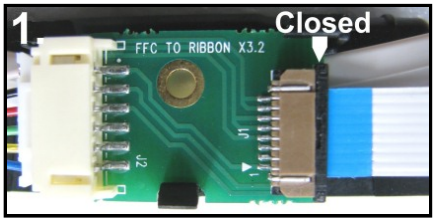
5. Once the Service Station has ejected; power OFF the printer. Press the ON/OFF button once and wait about 45 seconds for the print engine to power off (all control panel light's off). Then turn the Main Power Switch OFF.

6. Slide the Service Station out of the Service Station slot**.**
CAUTION: Do not pull Station all the way out until you disconnect the Ribbon Cable.

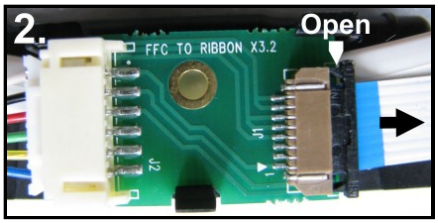
   NOTE: It is a good idea to place an absorbent towel under the Service Station as you remove it to prevent any drips or leaks.



4. Disconnect the Ribbon Cable. Slide the Latch open on the Service Station Circuit Board to release the Ribbon Cable.
CAUTION! This latch can be broken if you pull it out too far. Be careful!



5. Remove the Service Station completely from the print engine and place it on a non-absorbent surface (plastic bag) to protect the surface you are placing it on.

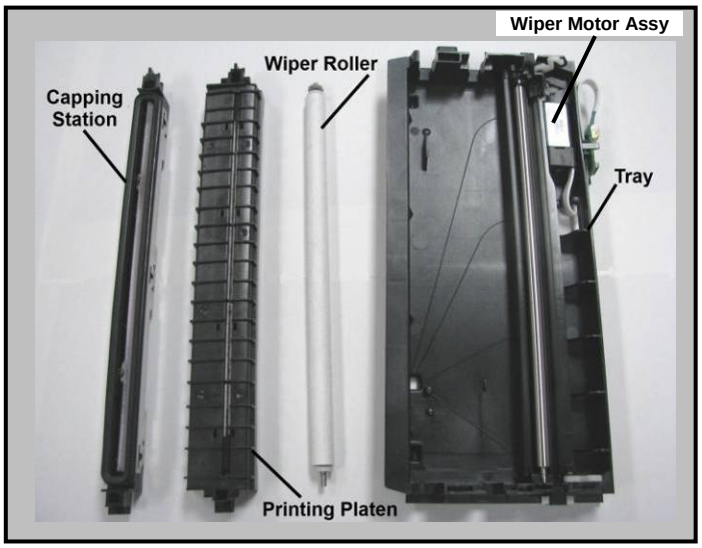


6. If you are replacing or re-installing the Service Station, please see the section titled "Installing the Service Station".

7. If you are cleaning or replacing items in the service station; please see the next section titled "Cleaning the Service Station".

Cleaning the Service Station

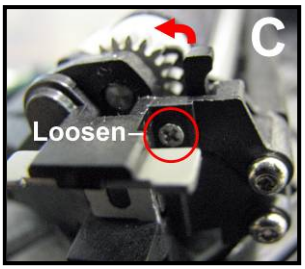
Caution: Please be sure that you are using proper cleaning techniques to clean items that come in contact with the printhead. Use only distilled or deionized water and lint free cloths. If you don't follow this rule, you will introduce contamination into the printhead; which can damage the printhead and ink system.



Wiper Roller Removal and Cleaning or Replacement

Tip: Although the wiper roller can be cleaned; this process is time-consuming. When you factor in labor costs; you may find it more cost-effective to replace the wiper roller instead. We also recommend that the wiper roller be replaced whenever a new printhead is installed.

Removal:



1. Lift up, about one inch, on the Wiper Motor Assembly; to expose the latch retaining screws [C] (one at each end).
   NOTE: Early versions of this assembly did not have retaining screws.
2. Carefully loosen the two small screws retaining the wiper roller latches.
   Tip: To avoid loosing these screws; don't remove the screws. You only need to back-out the screws far enough so the latches can be opened.
3. Release the two latches that secure the wiper roller.
4. Remove the Wiper Roller from the Wiper Motor Assembly.

Cleaning/Replacement:

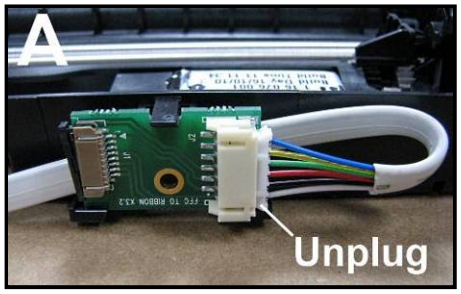
1. Using distilled water; immerse for 10 minutes, then remove and pat dry with absorbent lint free towel.
   WARNING! Do NOT rub the roller, when cleaning or drying it. This will cause damage to the roller fabric. Do NOT use tap/mineral/spring water to clean the wiper roller; doing so will introduce contaminants into the roller. A contaminated roller will cause damage to the printhead and ink system. Allow the roller to dry completely, before re-installing it.
2. If the Wiper Roller shows signs of wear (fabric surface torn, un-even or fuzzy), it should be replaced. Be sure to remove the plastic cover from the new Wiper Roller before installing it.

Install:

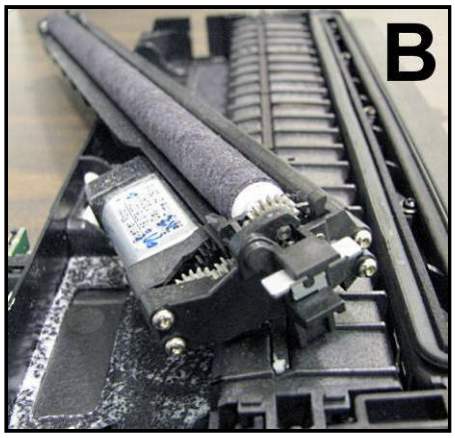
1. Re-install the Wiper Roller into the Wiper Motor Assembly. Make sure the gear on the Wiper Roller engages the gear in the Wiper Motor Assembly.
   TIP: If you are planning to clean the Wiper Motor Assembly; don't re-install the wiper roller until you have completed the Wiper Motor Assembly cleaning process.
2. Carefully close the latches. Make sure the latches are fully locked and then tighten the latch retaining screws [C] (don't over-tighten).

Wiper Motor Assembly Removal and Cleaning

Removal:



1. Disconnect (unplug) the wiper motor cable from the Service Station Printed Circuit Board [A].
2. Remove the Printed Circuit Board [A] from the Service Station Tray. Carefully release clips to remove board.
3. Lift out the Wiper Motor Assembly [B].
4. Remove the Wiper Roller from the Wiper Motor Assembly [C] [D]. See procedure on previous page.

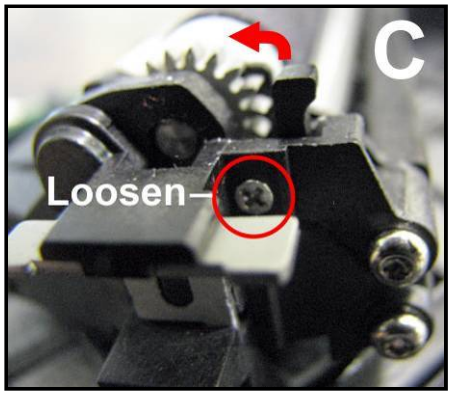


Cleaning:

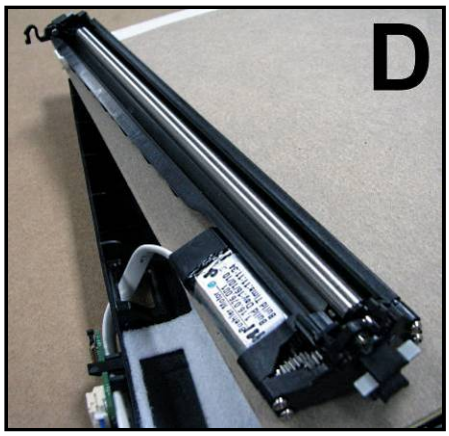
1. Pour distilled water into a flat-bottom container to the depth of about 17mm.
2. Carefully immerse the Wiper Motor Assembly, motor side up, into the water.

WARNING

DO NOT IMMERSE MOTOR OR GET MOTOR WET; TO AVOID DAMAGE.



3. If vents are showing, carefully add more water until they are covered. Allow the Wiper Motor Assembly to soak for 10 minutes.
4. Carefully remove the Wiper Motor Assembly. Inspect the vents and remove any debris with tweezers. Pat dry with an absorbent lint-free towel.
   NOTE: If this assembly shows signs of wear or damage it should be replaced. If the Service Station is more than one year old, depending on monthly volume, it may be worthwhile to replace the entire Service Station instead of replacing components.
5. Lightly lubricate the Wiper Motor Gears (3) with synthetic PTFE grease (Super Lube 21030 or equivalent).



Install:

1. Allow the Wiper Motor Assembly to dry.
2. Re-install in reverse order.
   NOTE: Make sure the wiper roller is re-installed, wiper roller latches are fully closed/locked and the wiper roller retaining screws are fully tightened (do not over-tighten).
   TIP: If you are planning to clean the Service Station Tray; don't re-install this component until you have

completed the Service Station Tray cleaning process.

Printing Platen and Capping Station Removal and Cleaning

Removal:

Both of these items simply lift out for removal from the Service Station.

Cleaning:

3. Rinse off ink using tap water.
   Tip: Make sure the valve, located on the bottom of the Capping Station, is clear of debris and working.
4. Pat dry with an absorbent lint-free cloth.
5. After cleaning the Capping Station; wipe the capping lip with a lint free cloth, dampened with distilled water. This will help insure that the contaminants on the cap are removed, before the cap makes contact with the printhead.
   NOTE: If either of these items show signs of wear or damage they should be replaced. If the Service Station is more than one year old, depending on monthly volume, it may be worthwhile to replace the entire Service Station instead of replacing components.

Install:

1. Allow the Printing Platen and Capping Station to dry.
2. Reinstall Printing Platen and Capping Station into Service Station Tray.
   TIP: If you are planning to clean the Service Station Tray; don't re-install this component until you have completed the Service Station Tray cleaning process.

Cleaning the Service Station Tray

1. If present; remove the Service Station Printed Circuit Board, Wiper Motor Assembly, Printing Platen and Capping Station from the Tray; as described on the previous pages.
2. Wipe the Tray with a damp, lint-free cloth to remove the major ink buildup. Be careful not to damage/peel-off the wicking material; from the surface of the Tray.
3. Then rinse the Tray using tap water.
4. Allow the tray to dry.
   NOTE: If the Tray shows signs of wear or damage (wicking material torn or coming loose from surface of tray) the Tray should be replaced. If the Service Station is more than one year old, depending on monthly volume, it may be worthwhile to replace the entire Service Station instead of replacing components.
5. Reinstall the Service Station Printed Circuit Board, Wiper Motor Assembly, Printing Platen and Capping Station, into the Tray; as described on the previous pages.

Suggestion for High Volume Users:

For printers that are being used at high volumes (over 200,000 pieces per month), we recommend purchasing a second service station to reduce down-time for Service Station Maintenance. The new/clean service station can be swapped with the dirty one. Then the dirty Service Station can be cleaned according to the above instructions and made ready for the next time Service Station Maintenance is required.

Installing the Service Station

CAUTION

THIS PROCESS MUST BE PERFORMED BY A QUALIFIED/TRAINED PERSON.

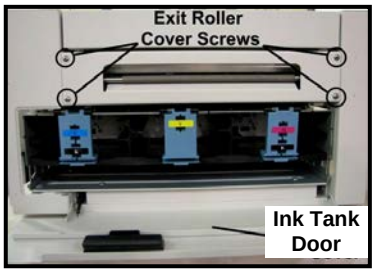
Please use nitrile powder-free gloves and have plenty of paper towels on-hand for these procedures.

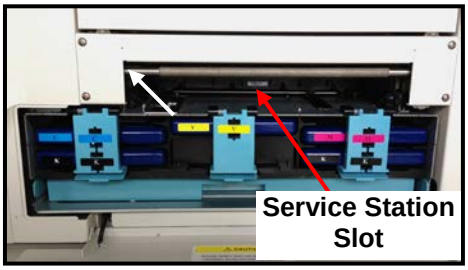
The Service Station fits in the slot immediately above the Ink Tank slots.

PROCEDURE:

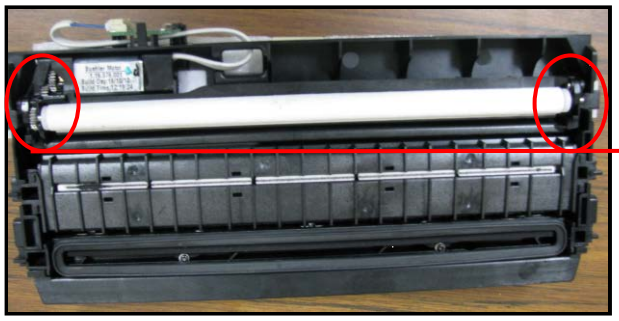
1. Make sure the printer is powered OFF.
   If the printer is <u>not</u> powered off, press the ON/OFF button once and wait about 45 seconds for the print engine to power off (all control panel light's off). Then turn the Main Power Switch OFF.
2. Open the Top Cover.
3. Open the Ink Tank Door (*hinged at bottom*) to expose the "Service Station Slot".

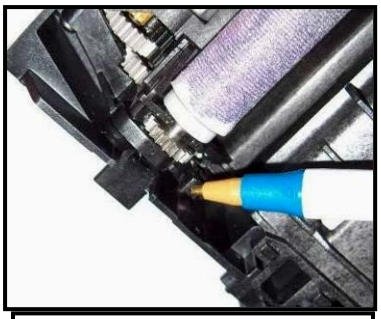
   Tip: On older units you will need to remove the Exit Roller Cover by removing the four (4) screws. This is not necessary on newer units.





4. If you are installing a New Service Station; carefully remove the Service Station from its packaging.
   NOTE: Loose parts may fall out. Keep wiper roller side facing up, when removing the packaging.
5. Check to be sure that the wiper roller latches are secure.

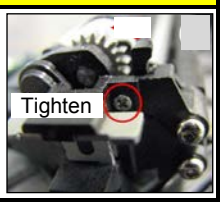




Check the latch at each end of the wiper roller.

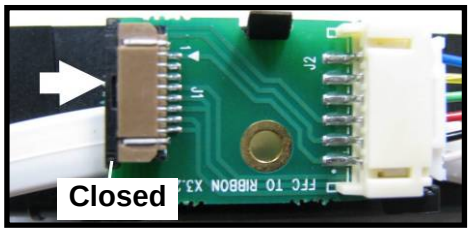
CAUTION!

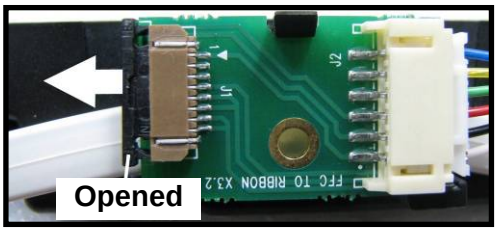
Make sure the latches for the Wiper Roller are fully latched and secured before installing the Service Station. Current versions of this assembly also have latch retaining screws that secure the latches from opening in transit or use. Make sure theses screws have been tighten (do NOT over-tighten). NOTE: Early versions of this assembly did not have latch retaining screws.



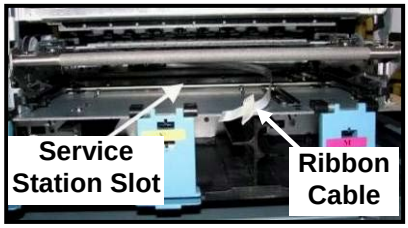
6.

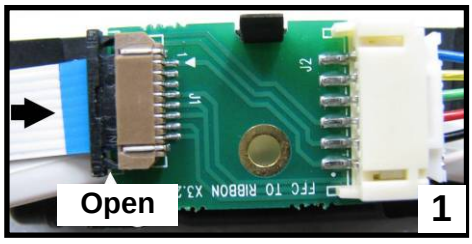
7. Slide the Cable Securing Latch open on the Service Station Circuit Board; as shown below.

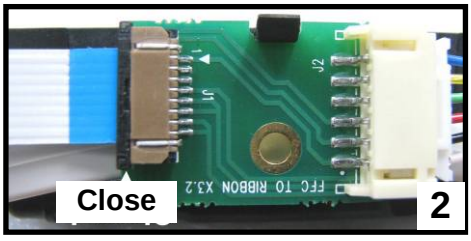




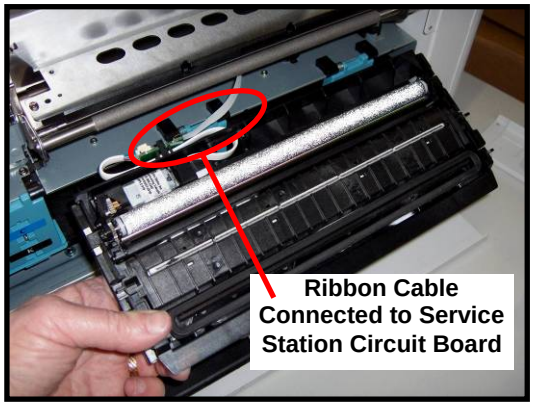
8. Locate the Ribbon Cable (from within the Service Station Slot).
Insert the Ribbon Cable (blue side up) into the space under the Cable Securing Latch [1].
Make sure the ribbon cable is pushed in all the way and is NOT crooked. Then close the Cable Securing Latch [2].

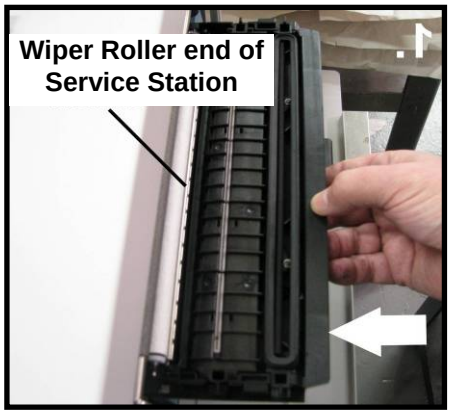






9. Once the Ribbon Cable is properly connected to the Service Station Circuit Board; gently slide the Service Station, wiper roller end first, into the Service Station Slot until it stops. The Service Station fits into the slot immediately above the Ink Tank slots.
NOTE: The Ink Tank Door must be open to perform this procedure.

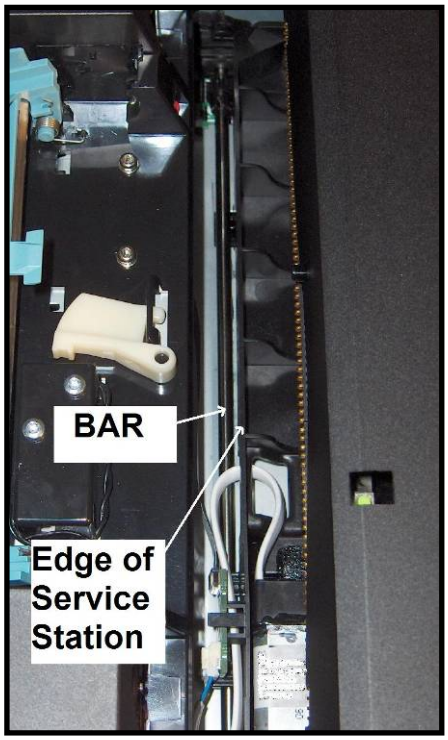




10. Look down through open area, in the Print Engine, to make sure the Service Station is aligned with the "Bar"; (Service Station Drive Shaft) as shown.

If the Printhead Cartridge is not installed (has been removed), you can look down through the top of the Print-Engine, through the Printhead Cartridge opening.

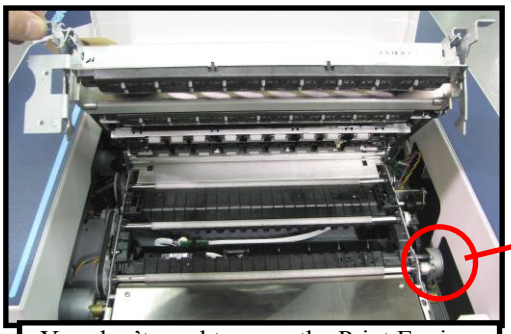
If the Printhead Cartridge is still installed, you must open the Clamshell to see into this area; as shown.



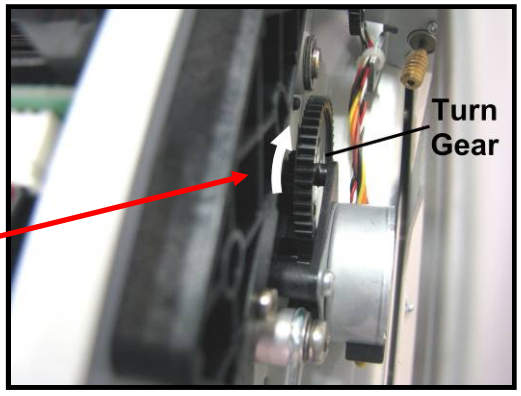
IMPORTANT!
The Service Station must perfectly aligned with the "Bar" to prevent misalignment and jamming of the service station.

11. GENTLY push in on the Service Station with one hand, while slowly turning the "Large Gear" clockwise with the other hand. It should be easy to turn this gear and the service station should start to drive into the print engine squarely.
Once the Service Station moves about ¼ inch past the "Bar" (shown in previous step), stop turning the gear. Do NOT manually drive the Service Station into the print engine beyond this point.

NOTE: The "Large Gear" is located on the non-operator side of Print Engine; as shown below. You <u>don't</u> need to open the Print Engine to access this gear.



You <u>don't</u> need to open the Print Engine.
Shown for clarification purpose only.



12. Turn the printer's Main Power Switch ON; then press the control panel's ON/OFF button.
After printer initialization (~45 seconds) the Print Engine will automatically pull the Service Station the rest of the way in.
NOTICE: If the Service Station should get jammed during this process (you hear motor stall noise or gear slipping noise); immediately turn OFF the printer's Main Power Switch. This is one of the only exceptions for turning off the printer using the main power switch, before properly powering-down the print engine. Remove the Service station by turning the Large Gear counter-clockwise. Re-check that the Wiper Roller is properly installed and latched at each end. Then re-install the Service Station starting from step 8 above.

Tip: The "Eject Service Station" button, located in the M Series Toolbox, should be used if the service station needs to be removed in the future.

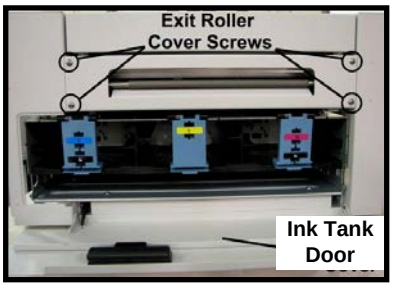
13. Verify that the wick, located on the bottom of the Service Station, is hanging into the waste ink trough; as shown (as viewed looking into the Service Station Slot, from the exit end of the printer).

WARNING

Waste-ink from the Service Station flows through wicking material and out the hole, located on the bottom of the service station. If this wicking material is not directed into the trough; waste-ink will build up on the base of the Service Station Slot. This misdirected waste-ink will eventually find its way onto the Ink Tanks, inside the body of the printer and even under the printer; causing damage to the system.

14. Close the Ink Tank Door.

NOTE: If using an older printer you will need to re-install the Exit Roller Cover plate, using the 4 screws, before closing the Ink Tank Door.
Make sure the cover is installed in the proper orientation.
TIP: Since the Exit Roller Cover is also an integral part of the frame structure; you may need to push in on the outer frames to get the screw holes in the Exit Roller Cover to align.



15. Close the Top Cover

16. Power the printer on and Test for proper operation.

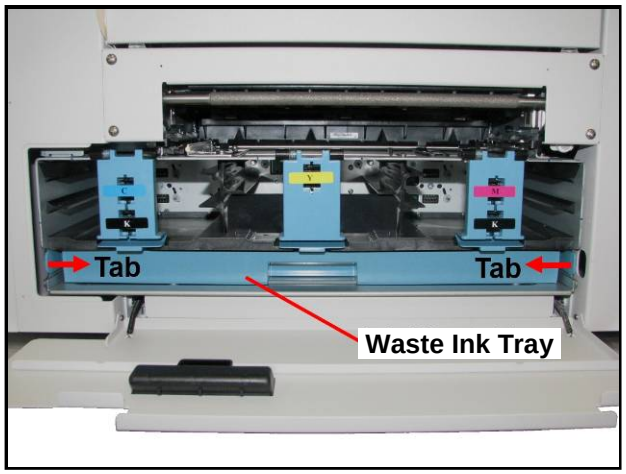
Still Experiencing Print Quality Issues?

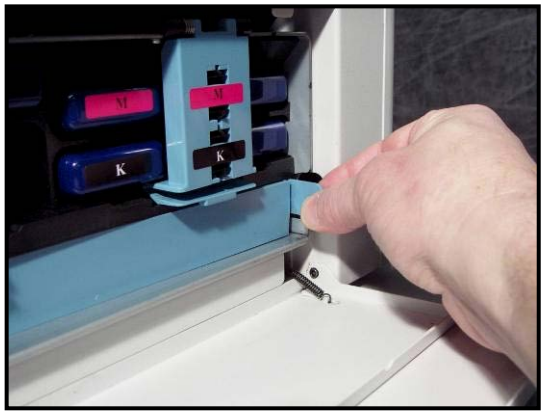
If you still experience print quality issues, after performing all the cleaning processes, outlined in this section, please refer to the "Troubleshooting Guide" for additional help. If you have exhausted all cleaning and troubleshooting options, and you have replaced the Printhead Cartridge and Wiper Roller; then this may indicate that the printer requires technical service.

Inspecting/Replacing the Waste Ink Tray

The Waste Ink Tray (123-2487) is filled with an absorbent material, used to capture the waste ink that drains from the Service Station.

1. If the printer is on; press the ON/OFF button to power-down the print engine. Wait about 45 seconds until the system shuts down (all control panel lights will go off).
   Turn off the Main Power Switch and unplug the printer from the power receptacle.
   WARNING! If this power-down process is not followed; ink color mixing and printhead nozzle clogging may result.
2. Unplug the power cable from the printer.
3. Open the Ink Tank door
4. The Waste Ink Tray is secured to the print engine frame by two tabs.
   One tab is located at the left side of the tray and one at the right side.
   Simultaneously push the two tabs in towards the tray, while pulling the tabs out towards you. The Waste Ink Tray should release from the frame and begin sliding towards you.
5. Slide the Waste Ink Tray out from under the print engine.
6. If the absorbent material is saturated with ink (entire white absorbent pad is now colored); the Waste Ink Tray (123-2487) should be replaced.
   WARNING: Do NOT remove the Waste Ink Tray for more than a minute or two. With the tray removed; waste ink will drip onto the base of the printer. This ink will eventually end up in areas that are undesirable; causing damage to the system or other items/properly.
7. When re-installing the Waste Ink Tray, push the tray in evenly and slide it all the way back until it stops. Make sure the tray securing tabs snap into the print engine frame.

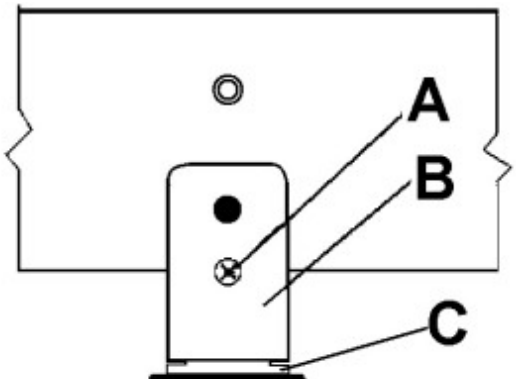




Replacing the Sheet Separators

The Sheet Separators insure separation of the pieces as they are being fed. If you experience double sheet feeding and cannot adjust the Separators to prevent it, they should be replaced. Replacement of the Sheet Separators is not difficult.

1. Turn off the Printer and unplug it from the power source.
2. Release the Separator-by loosening the Locking Knob and moving the Paper Side Guides to their maximum open position.
3. Lower the Separators so that they touch the Feed Roller.
4. Remove the screw **[A]** and the Separator Cover **[B]**. Then remove the Separator **[C]** by prying it out of the holder.
5. Install a new Separator in place and replace the Separator Support and screw.



Cleaning the Printer Body

WARNING

THE PRINTER IS A PRECISION MACHINE THAT SHOULD BE CLEANED REGULARLY TO INSURE MANY YEARS OF SERVICE.
BEFORE PERFORMING ANY MAINTENANCE, DISCONNECT THE MACHINE FROM ITS POWER SOURCE!
DO NOT REMOVE SIDE COVERS! HIGH VOLTAGES PRESENT.

Clean the Printer regularly to remove accumulated paper dust and ink. Depending on the types of media that are run, paper dust may accumulate inside the printer and on the transport.

1. If the printer is on; press the ON/OFF button to power-down the print engine. Wait about 45 seconds until the system shuts down (all control panel lights will go off). Turn off the Main Power Switch and unplug the printer from the power receptacle.
2. Unplug the power cable from the printer.
3. Interior: Use a vacuum with a soft brush attachment to help loosen dust particles. Take care not to damage the PC Boards or electrical wiring.
4. Exterior: Wipe clean with a lint-free cloth using any standard nonabrasive household cleaner that does not contain plastic harming solvents.
5. Reconnect the power cord and Turn ON the Main Power Switch. Then press the ON/OFF button on control panel to power-up the Print Engine.

CAUTION

NEVER SPRAY OR POUR CLEANERS DIRECTLY ON OR INTO THE PRINTER. EXCESS LIQUID COULD HARM ELECTRONIC PARTS. DAMPEN A LINT-FREE CLOTH WITH THE CLEANER AND APPLY IT TO THE PARTS TO BE CLEANED.

Cleaning the Feed Rollers and Forwarding Rollers

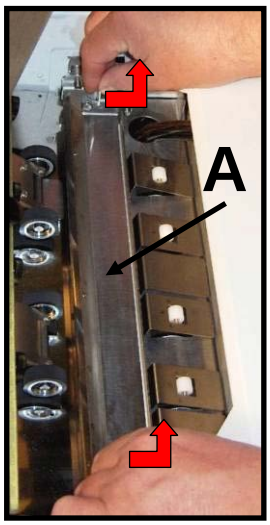
The rubber feed and forwarding rollers can become glazed with paper lint and ink from the media. They should be regularly cleaned with a mild household cleaner on a damp lint-free cloth.
NOTE: Do NOT use solvents to clean the Rubber Rollers.

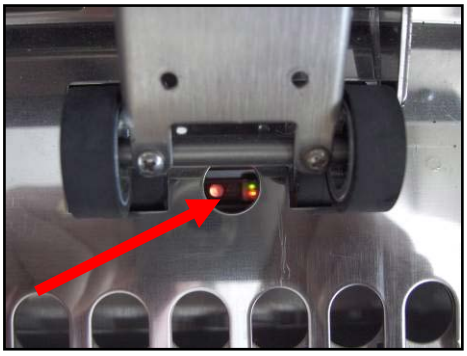
1. If the printer is on; press the ON/OFF button to power-down the print engine. Wait about 45 seconds until the system shuts down (all control panel lights will go off). Turn off the Main Power Switch and unplug the printer from the power receptacle.
2. Unplug the power cable from the printer.
3. Follow the procedures under “Removing Jammed Media” to open the Feed Roller Assembly and remove the Forwarding Roller Guide Assembly.
4. Use a vacuum with a soft brush attachment to help loosen and remove dust particles.
5. Dampen a cloth with a mild household cleaner, which does not contain plastic or rubber harming solvents, and wipe-down the rubber rollers to remove debris.
   CAUTION: Be careful not to drip any liquids into the sensors or electronics.
6. Reinstall the Forwarding Roller Guide Assembly and close and latch the Feed Roller Assembly.
7. Reconnect the power cord and Turn ON the Main Power Switch. Then press the ON/OFF button on control panel to power-up the Print Engine.

Cleaning the Feed Sensor

This sensor is located between the media hopper and the print engine. It has two functions.
It is used to control the delivery of media to the print engine and it also drives the LCD counter; located on the entrance side of the printer.
TIP: If the LCD counter is not incrementing with each piece of media, then the sensor is not working properly (dusty/dirty). This can be intermittent. If in doubt; clean the sensor.

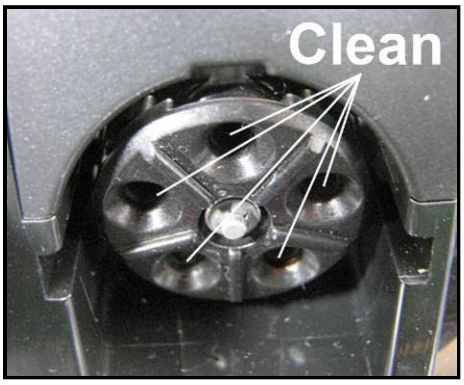
1. Remove the Antistatic Brush Assembly [A]
2. Place a piece of paper into this area, as shown, to catch any screws that you might drop during this process.
3. Remove the two Philips head screws, as shown.
4. Remove the reflector plate.
   Note: There is a reflector attached to the underside of this plate. Please be sure to inspect/clean.
5. You can now access this sensor through hole in the table-top.
6. Clean the Feed Sensor using compressed air and a soft brush or swab (q-tip).
7. Re-assemble in reveres order.
   NOTE: Verify that the ink tubes are not pinched by the fingers on the Antistatic Brush Assembly.





Cleaning the Ink Revolver Couplings

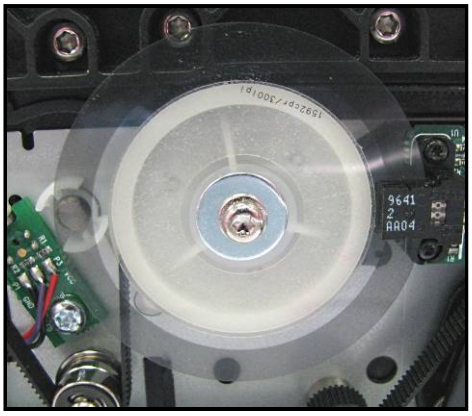
This process should be performed just before a printhead cartridge is installed or re-installed; to remove contaminated/dry ink and other debris from the Ink Revolver Couplings. If this step is skipped; the printhead and or ink system could become contaminated resulting in an increase in print quality issues.



1. If Printhead Cartridge is installed; follow the procedure for releasing and removing the Printhead Cartridge. See section titled “Replacing the Printhead Cartridge”.
2. If the printer is on; press the ON/OFF button to power-down the print engine. Wait about 45 seconds until the system shuts down (all control panel lights will go off). Turn off the Main Power Switch and unplug the printer from the power receptacle.
3. Lightly moisten a foam swab with distilled water.
4. Insert the swab into one of the ink channel holes and rotate the swab to clean the chamber.
5. Use a new swab for each of the remaining ink channels, until all 10 openings are clean. (*5 on each side.*)
6. Install the Printhead as described in the section titled “Installing the Printhead Cartridge”.

Cleaning the Encoder Wheel - Z2i Engine

If your machine has this type of Encoder Wheel in the Print Engine Area (*see picture at right*), excess ink spray or splashes may accumulate on the Wheel. This may disable the Printer and issue a **"DATA_PATH_UNDERRUN"** error in the Toolbox. It is necessary to wipe off any excess ink spray or splashes to continue optimum performance.



Clean with distilled water on a damp, lint-free cloth by grasping the wheel lightly with the cloth and turning the shaft. **Take care not to damage the Encoder Wheel.**

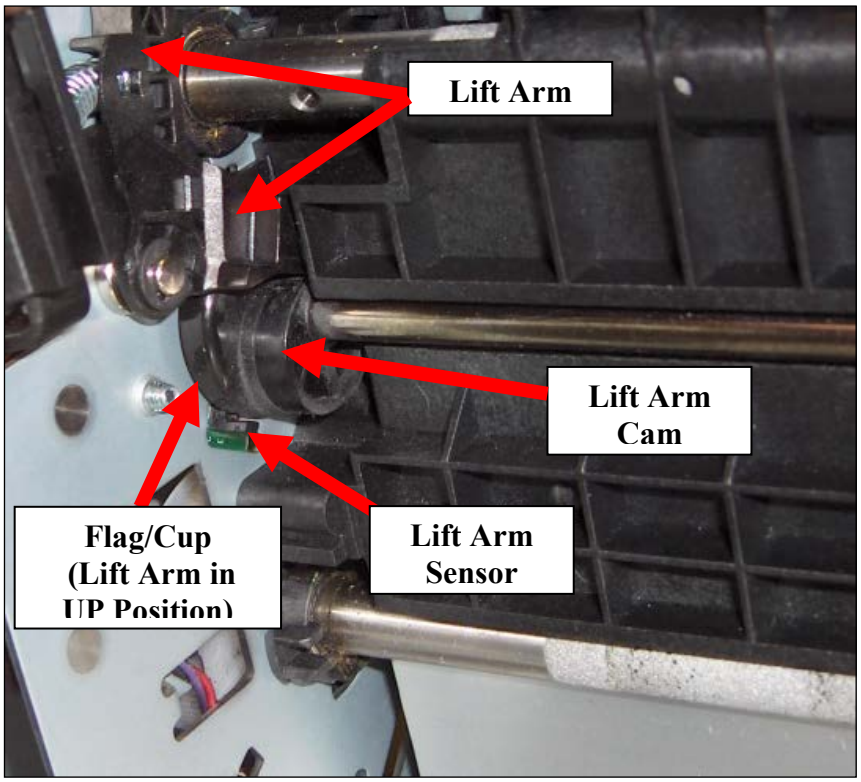
Cleaning the Lift Arm Sensor

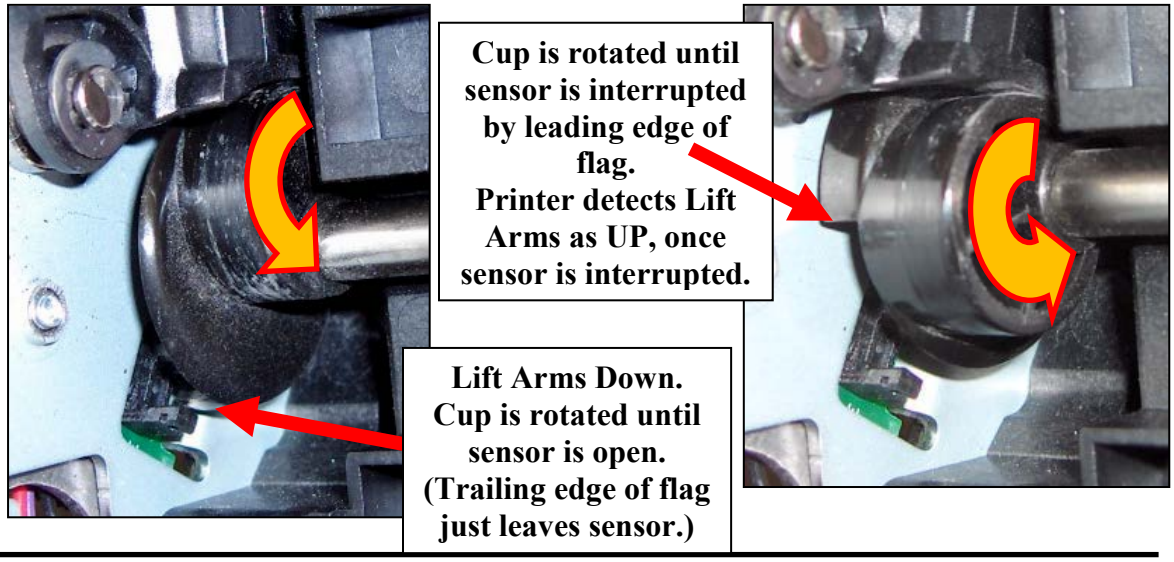
The lift arm sensor is used to detect the position of the shaft/cams that drive the lift arms.
The lift arm cup/flag rotates counter-clockwise through the lift arm sensor. About 1/3 of the cup is open.

- To verify that the Lift Arms are at the "UP" position, the lift arm motor drives the shaft/cams/cup counter-clockwise until the lift arm sensor reads closed (just interrupted by flag/cup).
- To verify that the Lift Arms are at the "DOWN" position, the lift arm motor drives the shaft/cams/cup counter-clockwise until the lift arm sensor reads open.

Cleaning:

- Eject/Remove the Service Station, to provide access to the lift arm sensor.
- Make sure the Lift Arms are in the "Down" position, so both arms of the sensor are exposed.
- Using compressed air, clean the sensor. Be careful to only direct the air into the sensor.





Cleaning the Encoder Wheel on the Lift Motor

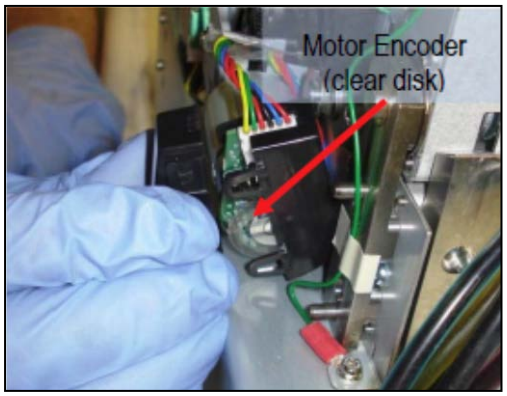
The encoder, on the Lift Motor, is responsible for motor speed control (speed of lift arm movement). If the encoder wheel or sensor gets dusty/dirty, the arms will be driven very quickly (up/down). This can result in improper arm positioning ; which can cause service station movement issues and head maintenance issues.

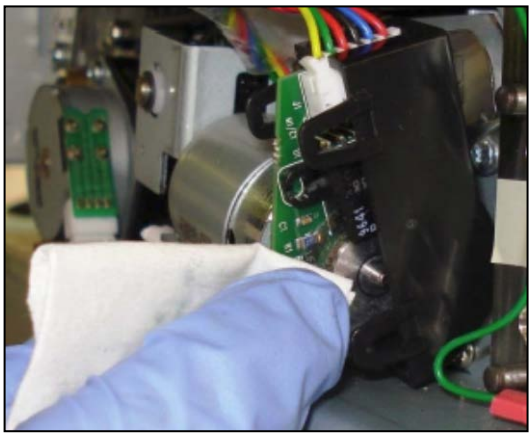
Cleaning:

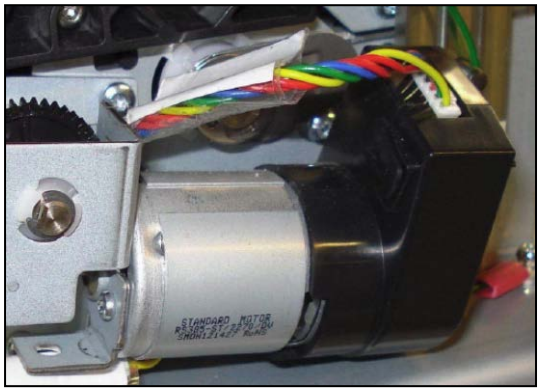
- Remove the black plastic cover; as shown below, to gain access to the encoder wheel.
- Using a lint free cloth, dampened with distilled water; carefully clean the surface of the encoder wheel. Be sure to clean the full circumference and both sides of the encoder wheel.
  Tip: If you remove the motor from the bracket, you can manually rotate the motor by turning the worm gear.
- Use compressed air to blow the dust from this area.

Tip: If the lift arm motor is not turning or there is a problem with the lift arm sensor ((sensor that is interrupted by flag (cup) on end of lift arm shaft)); the "Fatal 71 02…" or "MECH_FAIL_PERMANENT" message will be displayed in the toolbox. Reason: "Lift Arm Failed 3 times" or "Sled lift failed".
IMPORTANT: If you see the message "Fatal 71 02…" you are using old firmware. It is mandatory that you update the firmware to 20130820 or higher.

NOTE: The following images show an enclosed encoder. On early models (Z2i engines) this encoder was exposed (not covered) and will require more frequent cleaning.







Cleaning Other Items inside the Print Engine

Areas in the Print Engine can become glazed with a buildup of dust, paper lint and accumulated ink and need to be cleaned regularly.

This section covers the procedures for cleaning the following items.

Grit Rollers (Media Transport Rollers)

Media (Paperpath) Sensors

Paperpath Surfaces

Printing Platen Surface

WARNING

THE PRINTER IS A PRECISION MACHINE THAT SHOULD BE CLEANED REGULARLY TO INSURE MANY YEARS OF SERVICE.
BEFORE PERFORMING ANY MAINTENANCE, DISCONNECT THE MACHINE FROM ITS POWER SOURCE!
DO NOT REMOVE SIDE COVERS! HIGH VOLTAGES PRESENT.

Procedure:

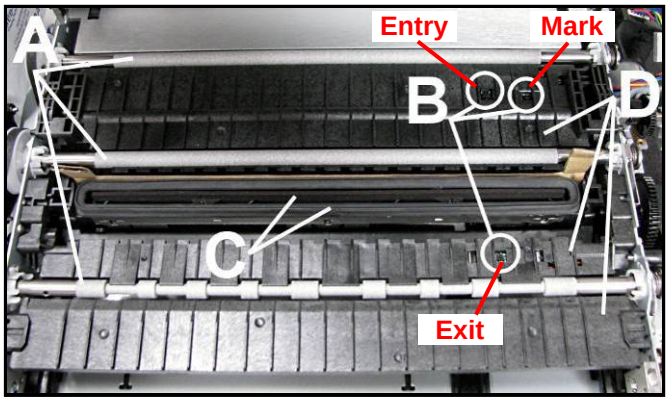
1. If the printer is on; press the ON/OFF button to power-down the print engine. Wait about 45 seconds until the system shuts down (all control panel lights will go off).
2. Turn off the Main Power Switch and unplug the printer from the power receptacle.
3. Open the Top Cover and then carefully open the Clamshell Assembly.
4. Use a vacuum to pick up any loose debris.
   NOTE: Be careful around ink tray and capping station in the Print Engine area as accumulated ink may splash onto other parts of the printer. Take care not to damage the PC Boards or electrical wiring.
   The use of compressed air is not recommended. If you direct the air into an area with wet ink; ink will splash onto other parts of the printer, which could affect operation.

CAUTION

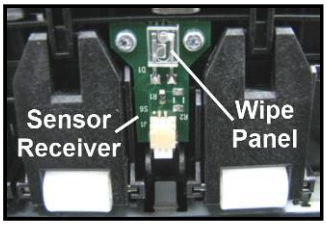
USE ONLY DEIONIZED/DISTILLED WATER TO CLEAN PRINT ENGINE COMPONENTS. AVOID CONTAMINATING THE PRINTHEAD WITH CLEANERS, LUBRICANTS OR OTHER CHEMICALS.

5. Use the procedures, as outlined below, to clean the following items.

Grit Rollers [A]:
Clean as needed using a small stiff-bristled brush (toothbrush), lightly moistened with distilled water.
Do NOT use anything other than distilled water to clean the Rollers.
Pat the roller dry using a lint-free cloth. Do NOT rub with cloth or this may produce lint.



Media (Paperpath) Sensors [B] : Paper lint, dust and ink will build-up on the Media Sensors. Be sure to clean the Paperpath Entry and Paperpath Exit sensors routinely.
Use lightly dampened foam, or lint-free, cotton swab to gently wipe the Sensors. Repeat this process until all ink/debris is removed. Take care not to drip water into the circuit boards.
Use a clean, dry swab to dab surfaces dry.
Remember to wipe the clear panel, on the Sensor Receiver, which is located in the upper Clamshell Assembly (above the Paperpath Entry Sensor). **Note:** The Mark Sensor is not used in the Digital Color Printer.



Capping Station Lip [C]:
Clean as needed with distilled water on a damp, lint-free, cloth. Try to avoid contact with the "wicking material" located in the center of the Capping Station.
Be careful not to splash or drip ink onto other parts of the Printer.

Paperpath Surfaces [D]:
Wipe with distilled water on a damp, lint-free cloth. Pat dry with a lint-free cloth.

6. Reconnect the power cord to the printer and turn the Main Power switch ON.

7. Make sure your hands/clothes/leaning supplies are clear from the print engine; then Power-up the print engine using the ON/OFF button.
After a short period of time, the Capping Station will drop and the Printing Platen will be presented through the same opening. Carefully clean the Printing Platen as described below.

Printing Platen Surface [E]:
Clean the surface as needed with distilled water on a damp, lint-free, cloth. Try to avoid contact with the "wicking material" located in the center of the Platen.

8. Carefully close and Latch the "Clamshell"; using two hands.

Preparing Printer for Transport

Please use this procedure if you ever need to transport the printer to a new location or ship the printer. Please refer to the appropriate sections in the manual for details on installing/removing items from the printer.

Local relocation

Transporting the printer from one room to another in the same building is considered a local relocation. Local relocation does not normally require that the printer be repackaged before transportation.
To move your printer locally:

1. Switch the printer off using the ON/OFF button and wait until all lights turn off.
2. Turn OFF the Main Power Switch. Then disconnect the power cable from the printer and wall outlet.
   IMPORTANT! Do NOT switch off the power at the power outlet or remove the power cable until all lights are off. Failure to do so may damage your printer.
3. Disconnect the USB or Ethernet cable from your printer.
4. Carefully relocate the printer.
   Take care to avoid sharp bumps and strong vibrations during the relocation process.
   If the printer needs to be lifted; two people are required to lift the printer; keeping it as level as possible during this process.
   IMPORTANT! The printer should remain semi-level at all times during transportation and storage. Failure to do so may cause the printer to leak ink.
5. Be sure to select an appropriate location; as described in the "Choosing the Location" section
   Verify that the Print Engine is level before powering it on.

Remote relocation or shipping

Transporting the printer to another building is considered a remote relocation.
When transporting your printer to a remote location, your printer will need to be disassembled and repackaged, as set out below:
We suggest the use of protective gloves during this process.

1. Plug in the printer. Turn the printer's Main Power Switch ON; then press the control panel's ON/OFF button. Wait about 45 seconds for the print engine to power-up (ON/OFF button will illuminate).
2. Open the Toolbox utility.
3. Deprime system using the "System Deprime" feature located in Toolbox utility.
   NOTE: Use the System Deprime feature, NOT the Release Printhead feature.
4. Remove the Service Station from the printer, using the "Eject Service Station" feature in the Toolbox utility. Refer to "Removing the Service Station" section for help with this process.
5. Wrap the Service Station in paper towels and place into resealable plastic bag.
6. Power-down the system using the ON/OFF button and wait until all lights are off.
7. Turn OFF the Main Power Switch. Then disconnect the power cable from the printer and wall outlet.
   IMPORTANT! Do NOT switch off the power at the power outlet or remove the power cable until all lights are off. Failure to do so may damage your printer.
8. Disconnect the USB or Ethernet cable from your printer

9. Remove the Printhead Cartridge and install protective covers on printhead.
   Be careful to avoid ink spills (drips) and stains during this process.
   Store Printhead Cartridge in a sealed plastic bag with a damp cloth.
   CAUTION: Make sure the cartridges electrical contacts are dry before re-installing printhead.

10. Remove all five Ink Tanks. Be careful to avoid spills or stains during this process. Wrap each ink tank in a clean, lint-free, absorbent material and place them in a sealed plastic bag as a precaution against any spillages during transport.

11. Place paper towels into each Ink Tank slot, making sure the towels make contact with the back of the slots. This is done to absorb any ink that may leak from "septum needles".
    NOTE: Even though the system is deprimed, some ink will remain in the lower areas of the tubing. In transit, this residual ink may drain out.

12. Inspect the Waste Ink Tray. If it is saturated with ink; the tray should be replaced before the printer is transported.

13. If re-boxing for transport; remove all accessories from unit before re-boxing.

14. Re-package the printer in the original packaging material, keeping the printer semi-level at all times.
    WARNING! To help avoid damage in transit; the printer should only be shipped in approved factory packaging. See "Unpacking" section for help with re-boxing.
    Follow the sequence in reverse.

15. Ensure transport labels on the exterior box clearly indicate that the box is to be kept semi-level at all times.
    CAUTION! The printer should remain semi-level at all times during transportation and storage. Failure to do so may cause the printer to leak ink. For environmental requirements during storage and shipping, refer to the details found in the "Transport Inspection" section.

16. When re-installing the printer at the new location, please refer to Section 2 (Instilling the Printer) of this guide.
    Be sure to select an appropriate location; as described in the "Choosing the Location" section
    Verify that the Print Engine is level before powering it on

Lubricating the Service Station Friction Points

Friction points on the Service Station should be lubricated to ensure optimum performance and reduce wear. This maintenance should be performed when installing a new Service Station or as needed. Use a plastic-safe synthetic grease or lubricant (Super Lube 21030 or equivalent).

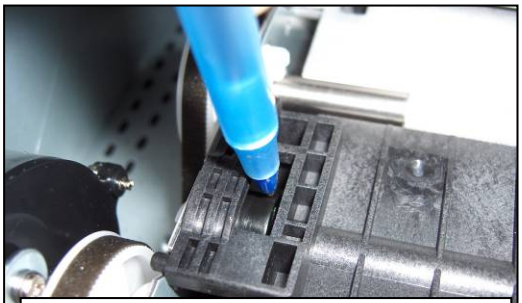
CAUTION

DO NOT USE PETROLEUM-BASED LUBRICANT/GREASE.
DO NOT ALLOW LUBRICATION TO MAKE CONTACT WITH THE ELECTRONICS (Boards, Sensors, Printhead) or SERVICE STATION COMPONENTS (Cap, Wiper Roller).
WE DO NOT SUGGEST THE USE OF SPRAY LUBRICATNTS.
A safer way to lubricate is to use a small paint brush and grease.

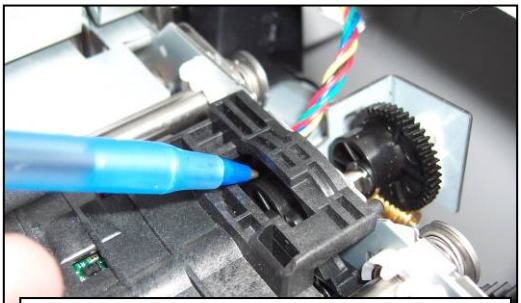
Lubricate Lifting Arm Cams

1. Open the Print Engine Clamshell by releasing and lifting the two locking levers.
2. Apply lubricant to the Lifting Arm Cam through the opening as shown. (***1 on each side***).

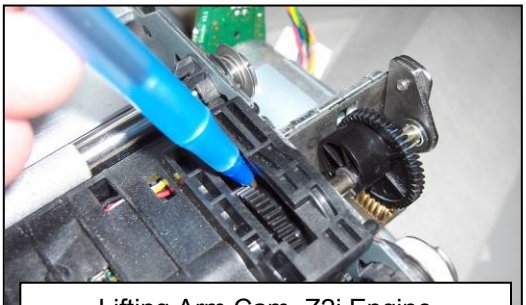
   CAUTION: Be very careful not to get any lubricant on the cup-shaped Flag for the Lift Arm Sensor. This cup-shaped Flag is attached to the left side of the Lift Arm Cam (operator side).



Lifting Arm Cam
(operator side)



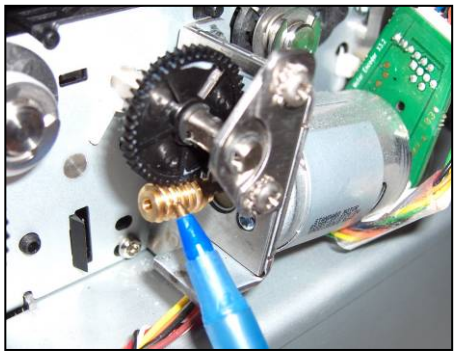
Lifting Arm Cam, Z3/Z4/MR Engine
(non-operator side)



Lifting Arm Cam, Z2i Engine
Cam is to the right of the gear.
(non-operator side)

Lubricate the Worm Gear on the Lifting Arm Motor

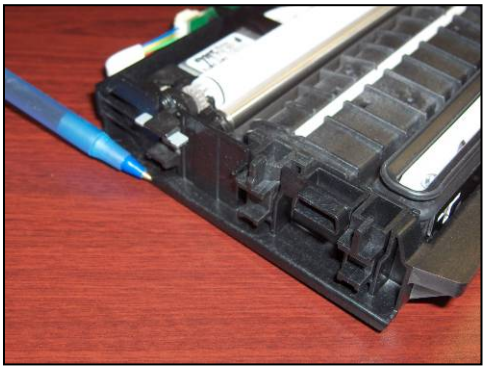
1. Apply lubricant (Super Lube 21030 or equivalent) to the Worm Gear.



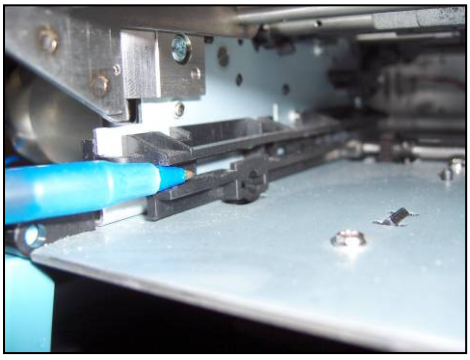
Lubricate Service Station Sled Rails and Service Station Side Rail Tracks

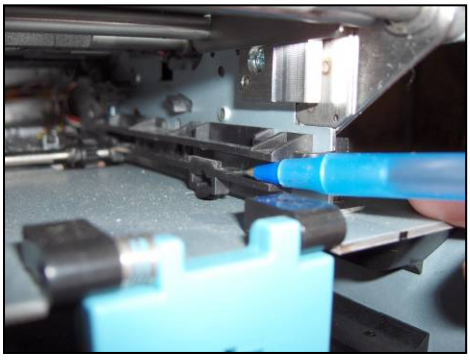
1. **Eject the Service Station.**

2. Apply lubricant (Super Lube 21030 or equivalent) along the full length of the side rails of the Service Station Sled. These edges ride in the Service Station Side Rail Tracks shown in next step.



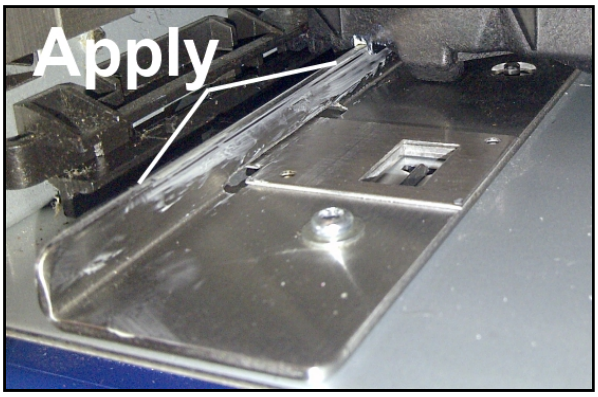
3. Apply lubricant (Super Lube 21030 or equivalent). along full length the Service Station Side Rail Tracks, as shown.
(*1 on each side*).



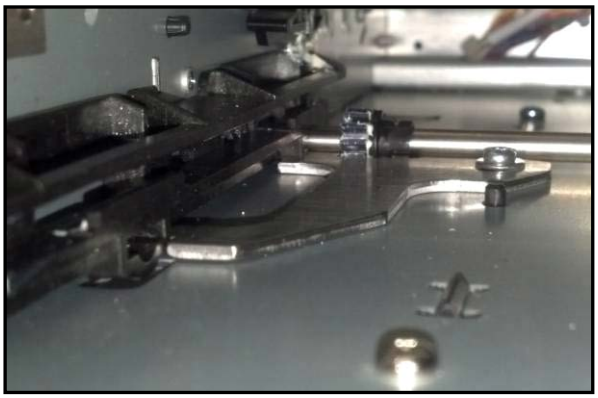


Lubricate Service Station Guide

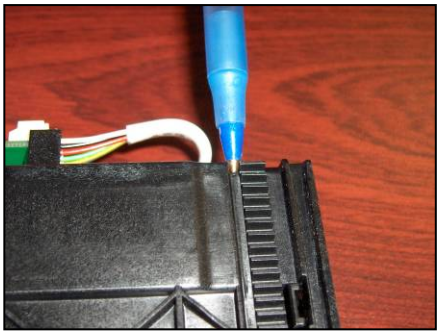
1. Apply lubricant to the Service Station Guide (42-900-25) as shown. (*If your printer is equipped with this type of Guide*).



Newer Print Engines will have a different type of guide (42-900-26) installed; as shown.
This guide is to be used in conjunction with RevC Service Stations. These newer Service Stations have shortened drive tracks; allowing them to be inserted further, before the Service Station engages with the Service Station drive shaft/gears.
NOTE: The RevC Service Station is also backwards compatible with the old-style guide (42-900-25).



2. Apply lubricant (Super Lube 21030 or equivalent) to the grove that the Service Station Guide (42-900-25) will ride in.
Tip: If your print engine has the guide (42-900-26), shown above you do not need to apply lubrication to this grove.

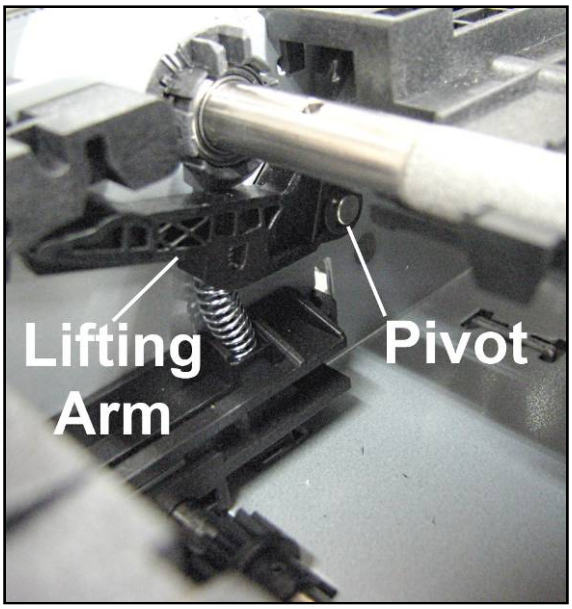


Images shown with Service Station turned up-side-down

Lubricate Lifting Arm Pivot Points

1. Apply lubricant to the Lifting Arm Pivot as shown. **(*1 on each side*).**

   CAUTION: Spray Lubricants can get into the wrong areas and cause damage. A safer way to lubricate is to use a small paint brush and grease (Super Lube 21030 or equivalent).



Lubricating the Grit Roller Ground Clips/Springs

NOTE: The Ground Clips and Thrust Springs provide a path for static energy to discharge from the Grit Rollers to earth-ground. They must be periodically lubricated with a conductive grease to reduce spring wear and provide a good earth-ground connection.

Two Ground Clips and Thrust Springs are located on the right side (non-operator side) of the Print Engine, at the ends of the first two Grit Roller Shafts (shafts nearest the entry end of Print Engine).

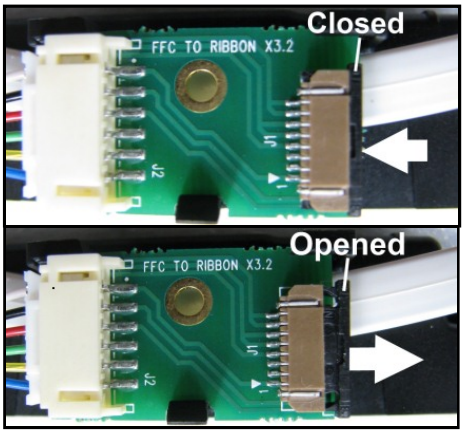
1. Use a small, flathead screwdriver to remove the e-clip, washer and spring from the end of the shaft(s).
2. Use a foam swab to apply a thin film of conductive grease (Loctite 38650 or equivalent) to the washers, ground clips and to the ends of the Thrust Springs.
3. Reinstall the washers, spring and e-clip on the Roller Shafts..

Reinstalling or Replacing the Service Station

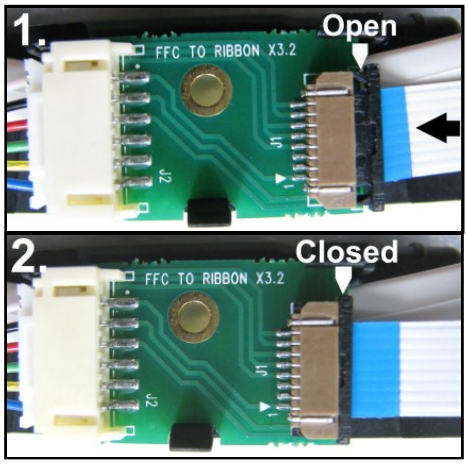
1. Carefully unwrap the new Service Station. (*Or reuse cleaned Service Station*.)
NOTE: Loose parts may fall out. Keep roller side facing up when removing packaging.

CAUTION
MAKE SURE THE LATCHES ON THE WIPER ROLLER ARE FULLY LOCKED BEFORE INSTALLING THE SERVICE STATION.

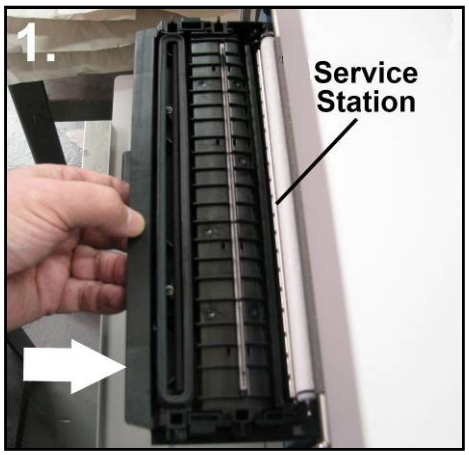
2. **Slide the Latch open on the Service Station Circuit Board.**

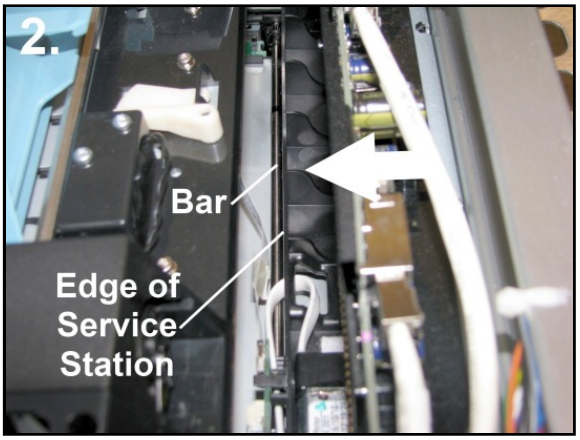


3. **[1]** Plug the Ribbon Connector (*blue side up*) into the space under the Latch.
[2] Close the Latch.

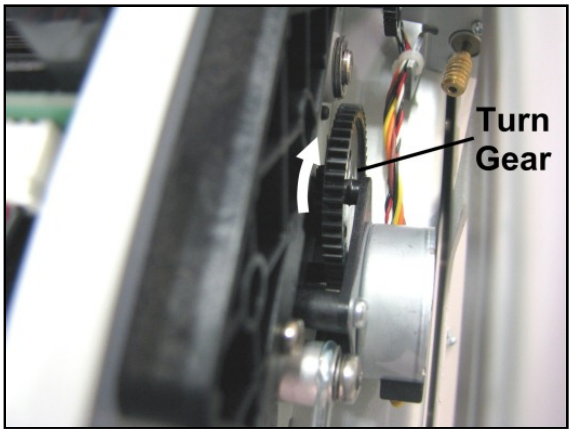


4. **[1]** Slide the Service Station into the Service Station port until it touches the bar. Align with tracks along sides and Guide on Service Station dock floor.
[2] Look down through the Top Cover to make sure Service Station is aligned with the bar.
IMPORTANT! Service Station must be perfectly aligned with bar to prevent misalignment and operating problems.





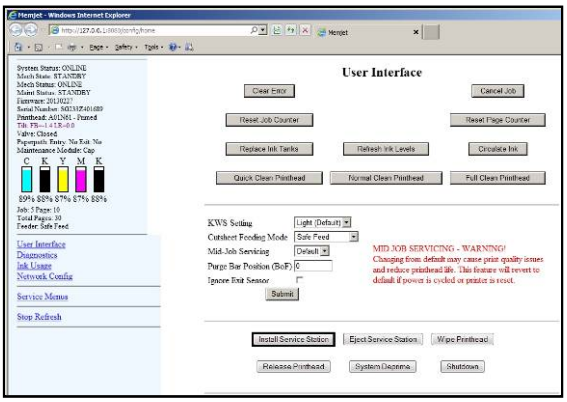
5. **GENTLY** push the Service Station while turning the large Gear on right side of Print Engine clockwise. Gear should engage gear on Service Station Roller and pull it in. Once the Service Station starts moving, stop turning the gear.



6. Power up the unit, then press **"Install Service Station"** in the Printer Toolbox to pull the Service Station in.

   NOTE: Make sure the wick hanging below the Service Station is inside the plastic trough inside the Ink Tank Station to prevent ink seepage.

   NOTE: Service Station should operate smoothly. If it binds, chatters or grinds, reinstall the Service Station. Lubricate Side Tracks and Guide if necessary.

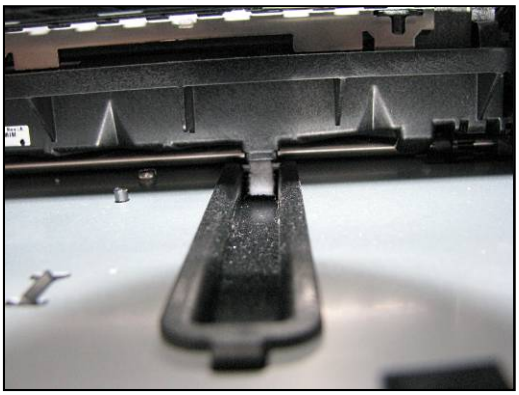


7. **Close the Clamshell Cover. Close the Ink Tank Door.**

CAUTION

HOLD ONTO BOTH LATCHES WHEN OPENING AND CLOSING THE PRINT ENGINE CLAMSHELL TO PREVENT DAMAGE.

DO NOT ALLOW THE CLAMSHELL TO DROP OR SLAM CLOSED.



WARNING!

ALWAYS POWER DOWN THE PRINTER BEFORE CONNECTING OR DISCONNECTING ANY WIRING HARNESSES OR CABLE CONNECTIONS TO AVOID SERIOUS SHOCK OR INJURY.

CAUTION

- **ALWAYS USE APPROPRIATE PERSONAL PROTECTION EQUIPMENT (PPE).**
- **USE ELECTROSTATIC DISCHARGE (ESD) PROTECTION WHEN MAINTAINING EQUIPMENT.**
- **DISPOSE OF ALL MAINTENANCE WASTE IN ACCORDANCE WITH LOCAL REGULATIONS.**

NOTES

Appendix Section

Appendix A –Specifications

SPEED (color or mono) **Page Printing 8.5" x 11"** **No. 10 Envelopes**	Up to 3,600 per hour (1600 x 800 dpi @12 ips) Up to 7,500 per hour (1600 x 800 dpi @ 12 ips)
MEDIA SIZE	Minimum: 3" W X 4.125" L (76.2 mm W x 104.76 mm L) Maximum: 9.5" W x 17" L (241.3 mm W x 431.8 mm L)
MEDIA THICKNESS	Minimum: 0.004" (0.102 mm) Maximum: 0.020" (0.5 mm / 430 gsm / 160# Cover / 240# Index)
PRINT QUALITY	Normal: 1600 x 800 DPI @ 12 ips Best: 1600 x 1600 DPI @ 6 ips
TECHNOLOGY	Memjet® Thermal Inkjet
INK CAPACITY	Cyan (250 ml); Yellow (250 ml); Magenta (250 ml); Black (500 ml)
PRINT AREA	8.5" W x 17" L (215.9 mm W x 43.81 mm L)
COLOR MATRIX	Up to 16.8 million colors
FEEDER	Top Loading Friction Feeder Built-In.
PC INTERFACE	USB, Ethernet
FIRMWARE UPDATE	Electronic Download via PC connection
TRANSPORT	Pressure roller system with Star Rollers
FEATURES	Full color inkjet; fixed head design; high capacity ink tanks; automatic printhead cleaning and capping service station.
FONTS	All available TrueType fonts
DIMENSIONS	24" W x 20.5" H x 20" D x (609.6 mm x 520.7 mm x 508 mm)
WEIGHT	90 lbs. (40.9 kg)
ELECTRICAL	100-240 VAC, 50/60 Hz
FUSE	2.5A, 250V, slow blow
OPTIONS	Conveyor & IR Dryers; Satori Bulk Mailer Software

All Specifications Subject To Change Without Notice

*** Microsoft Office not supported**

Appendix B – Supplies and Optional Hardware

The following supply items and optional hardware are available from your Formax Dealer

Supplies

Description	Part #
Printhead Cartridge	CJ-20
Cyan Ink Tank (250 ml)	CJ-21
Magenta Ink Tank (250 ml)	CJ-23
Yellow Ink Tank (250 ml)	CJ-22
Black Ink Tank (250 ml) - printer requires two	CJ-24

Optional Hardware

Conveyor /Stacker

Catch Tray

Infrared dryer

Appendix C – Service Station Guide Installation Instructions

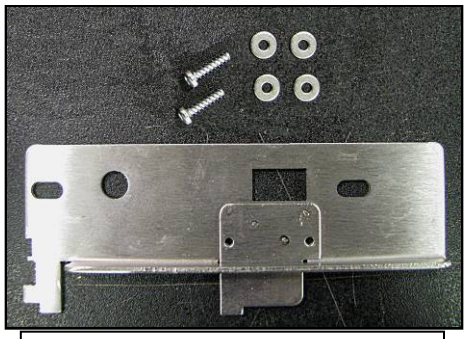
The original Service Station Guide (42-900-25) was designed/developed to help prevent Service Station misalignment during installation.
NOTE: Starting with S/N 100029449; all printers were shipped with a Service Station Guide pre-installed.

Before You Begin:
Newer Print Engines (MR) will have a different type of guide (42-900-26) installed; as shown in the image to the right. This guide is to be used in conjunction with Rev C Service Stations. Rev C Service Stations have shortened drive tracks; allowing them to be inserted further, before the Service Station engages with the Service Station drive shaft/gears.
NOTE: The Rev C Service Station is also backwards compatible with the original (old) guide (42-900-25).


42-900-26

If your print engine does not have a Service Station Guide installed (42-900-25 or 42-900-26), you can choose to install the new guide (42-900-26 along with a new Service Station (be sure it is Rev C or higher) or you can install the original guide (42-900-25) with Rev B or lower Service Stations.

The Service Station Guide Kit (42-900-25) consists of:
(1) Service Station Guide
(2) T10 Torx screws
(4) washers.

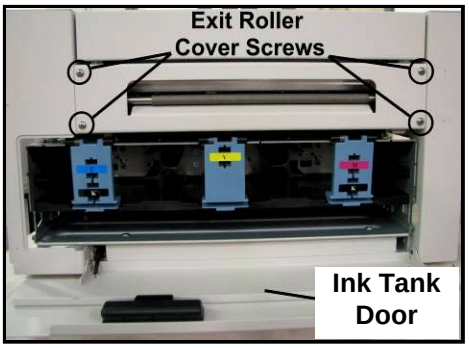

42-900-25

Tools/Supplies Needed:
- T10 Torx screwdriver.
- Small Ratchet Wrench (example: Husky SKU 165 152).
- T10 bit (example: DeWalt DW2067) for ratchet wrench.
- Plastic-safe Grease (example: Super Lube® 21030)
- Small brush to apply grease.
- Rubber gloves
- Towels/Rags

RELEASE AND REMOVE THE PRINTHEAD

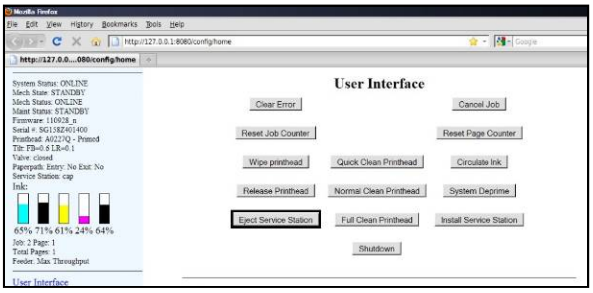
1. **Make sure the printer is powered-up and connect to the computer.**
2. **Open the M Series Toolbox.**
   In the User Interface window, press the **Release Printhead** button.
   The system will do a partial deprime and then the Printhead Latch will open.

3. **Open the Top Cover**.
4. **Carefully remove the Printhead.**
   Place the printhead into the orange clip it originally came in; for safe storage.
5. **Open the Ink Tank Door (hinged at bottom).**
6. Remove the Exit Roller Cover by removing the four (4) screws.



REMOVE THE SERVICE STATION

1. **Using the M Series Toolbox, Eject the Service Station.**
   Press the Eject Service Station button located in the User Interface window.



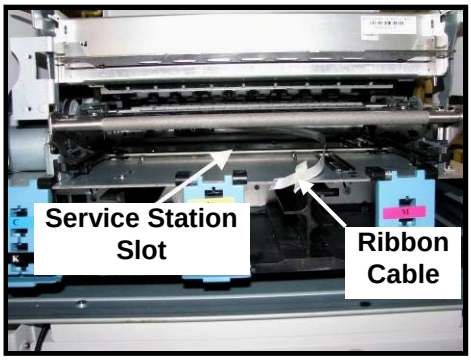
2. Once the printer has ejected the Service Station; **Power-down the printer using the ON/OFF button.** Then Switch the Main Power Switch Off.

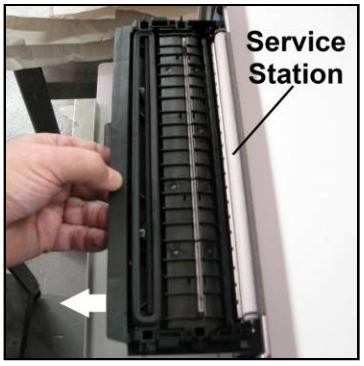
CAUTION

WHENEVER POWERING DOWN UNIT, ALWAYS:
1. **PRESS THE POWER BUTTON ON THE CONTROL PANEL.**
2. **WAIT FOR THE PRINTER TO STOP PROCESSING.**
3. **THEN PRESS THE MAIN POWER SWITCH ON THE REAR PANEL.**

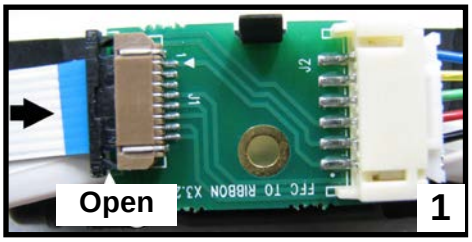
3. **Carefully slide the Service Station out of the Service Station Slot.**

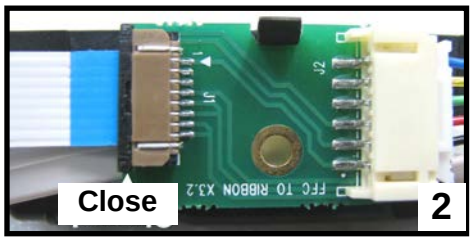
CAUTION: The Ribbon Cable is still connected to the Service Station. Do not pull the Station too far out or you will damage the cable or connections.





4. **Disconnect the Ribbon Cable.** Slide the Latch open on the Service Station Circuit Board to release the Ribbon Cable.





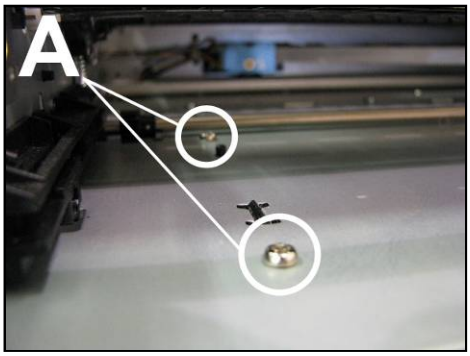
INSTALL THE SERVICE STATION GUIDE

10. Release the two latches and open the Clamshell.

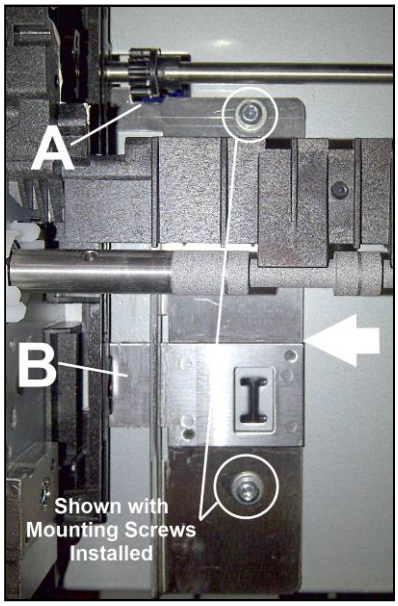
11. Remove the two existing screws [A] from Service Station Slot floor:

[A] Use the T10 screwdriver to remove the innermost screw. Access to this screw cab be obtained through the Printhead area (top of print-engine); since printhead was removed in a previous step. Use a small ratchet tool with a T10 Torx bit to remove the outermost screw.

[B] Apply a little grease along the upright edge of the Guide.



12. Install Guide into the Service Station Slot:



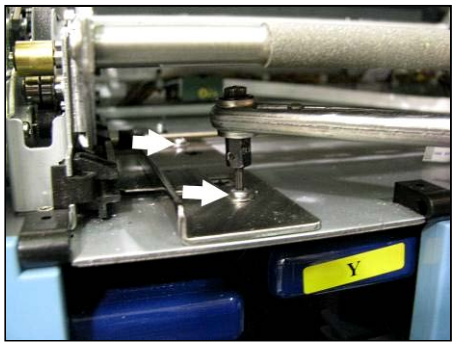
[A] Fit front notches of Guide around the gear on the shaft.
[B] Push Guide over towards the operators side. Position Guide so the holes in the Guide align with the empty screw holes (screws removed in the previous step).

Image shown with table top plates removed.
This is for reference purposes only.

13. While holding the Guide into position; **install the two longer T10 Screws and the Washers** that were included in the kit.
Note: Two washers are used on each screw to prevent the screw from bottoming out before it is able to secure the Guide.

    Secure each screw fully, then back off just enough so the Guide can still be re-positioned with only a small amount of resistance.

    CAUTION: DO NOT over-tighten screws.



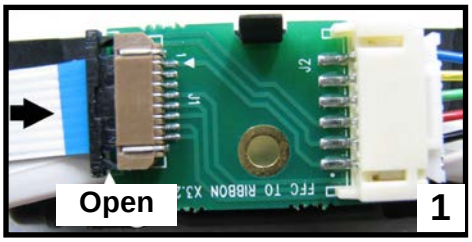
14. Lubricate the following components; as outlined in the section titled "Lubricating the Service Station Friction Points".

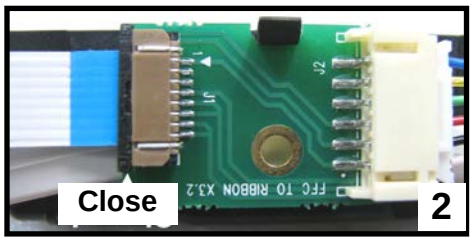
    - The upright edge of the new Service Station Guide
    - The grove that the Service Station Guide rides in, on the bottom of the Service Station.
    - The Service Station Sled side rails (they rides in the Service Station Side Rail Tracks)
    - Service Station Side Rail Tracks (operator and non-operator side)
    - Lifting Arm Cams (operator and non-operator side)
      CAUTION! Be very careful not to get lubrication on the flag (cup) of the Lift Arm Sensor or any other sensors in the unit.
    - Worm Gear on Lifting Arm Motor

continued on next page

REINSTALL THE SERVICE STATION, ALIGN & SECURE THE GUIDE

1. **Reconnect the Ribbon Cable to the Service Station**
   [1] Plug the Ribbon Connector (blue side facing out) into the space under the cable securing Latch.
   [2] Make sure the cable is square with the connector, then close the Latch.



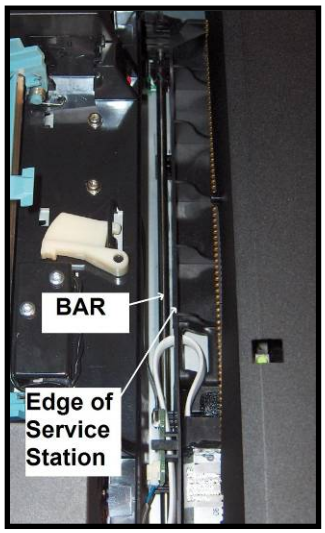


2. **Slide the Service Station into the entrance of the Service Station Slot.**
   Make sure the ridge [B] of the Guide fits into the groove, in the bottom of the Service Station Sled.

   IMPORTANT: The Service Station should slide smoothly as you push it into the slot. If it binds or catches on the Guide, check to be sure the Guide securing screws are loose enough to allow the Guide to self-align. Then try reinstalling the Service Station.

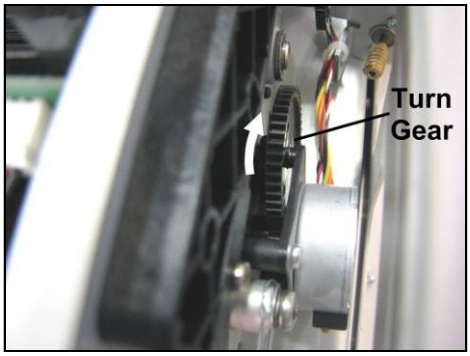
   - Slide the Service Station into the Service Station Slot until it touches the gears on the drive shaft (BAR).
   - Look down through the Top of the printer to make sure the Service Station is aligned with the Service Station Drive Shaft (BAR).

     IMPORTANT! Service Station must be perfectly aligned with BAR to prevent misalignment and operating problems.



3. **Engage the Service Station Sled with the Drive Shaft.** GENTLY push the Service Station in while turning the large Gear clockwise. Gear is located on non-operator side of print-engine.

   The small gears on the Service Station drive shaft (BAR) should engage the gear track on the bottom of the Service Station Sled and start pulling the Service Station into the slot.



4. **Drive the Service Station into the slot, just far enough that you have access to the T10 Torx screw, which is located closest to the exit end of the Guide and printer.**
   Since the screws that secure the Guide are only slightly snug; this process should allow the Guide to self-align.
5. **Using your Ratchet Wrench and T10 Torx bit, tighten the T10 Torx screw to secure the exit end of the Guide.**
   CAUTION: DO NOT over-tighten screws
6. **Using the large Gear, drive the Service Station out (exit direction) just far enough to gain access to the T10 screw located at the inner end of the Guide.** Access to this screw cab be obtained through the Printhead area (top of print-engine); since printhead was removed in a previous step.
   CAUTION: DO NOT over-tighten screws
7. **Using your T10 Torx screwdriver, tighten the screw to secure the inside end of the Guide.**
8. **Make sure the Service Station is still engaged with the Service Station drive gears but not installed more than 1/4 inch past the drive shaft (BAR).**

   WARNING! If you manually position the Service Station too far past the drive shaft (BAR) then the Index Sensor will already be interrupted by the Service Station Sled and the printer will not be able to determine the location of the Service Station. This will cause Service Station positioning problems, drive problems and Toolbox error messages.
9. **Power up the printer**. Turn on the Main Power switch. Then press the ON/Off Button.
   The printer should automatically pull the Service Station all the way into the back wall. It will jog in and out about a small distance, then it will move to the printing or capping position. Watch and listen for proper Service Station movement/operation.

   IMORTANT: If you hear motor stalling noises or grinding noises, the Guide may not have been aligned properly or there is some other obstruction with Service Station or Lifting Arm drive. Contact Tech Support for assistance.
10. **Make sure the Wick, which hangs from the bottom of the Service Station, is hanging into the Trough.**
    If the Wick sits on the side of the trough, ink will leak into the body of the printer, onto the Ink Tanks and out of the printer. This will cause damage to items the ink makes contact with; inside and outside the printer.
    Reposition the wick; as needed.

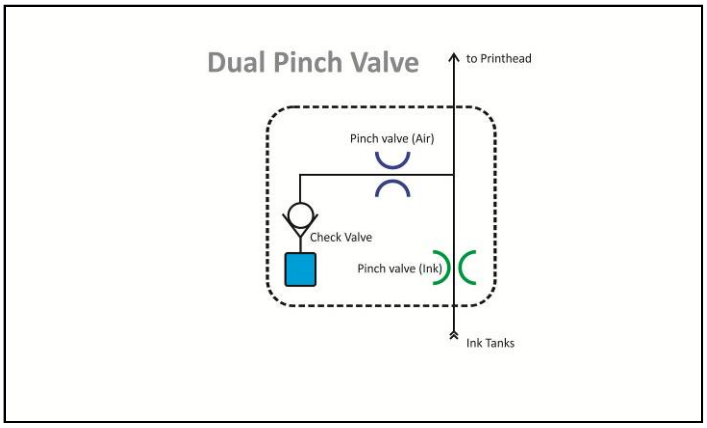
11. **Carefully close the Clamshell.** To avoid damage to the system; hold the Latches open until the Clamshell is closed, then carefully release the Latches to lock the Clamshell.
12. **Install the Printhead as outlined in the Operator's Gide.**
13. **Re-install the Exit Roller Cover.**
14. **Close the Ink Tank Door.**
15. **Close the Top Cover.**
16. **Test the Printer for proper operation.**

Appendix D – Ink Delivery System (IDS)

Theory of Operation

Dual Pinch Valve (DPV) and Pump Control Sequences

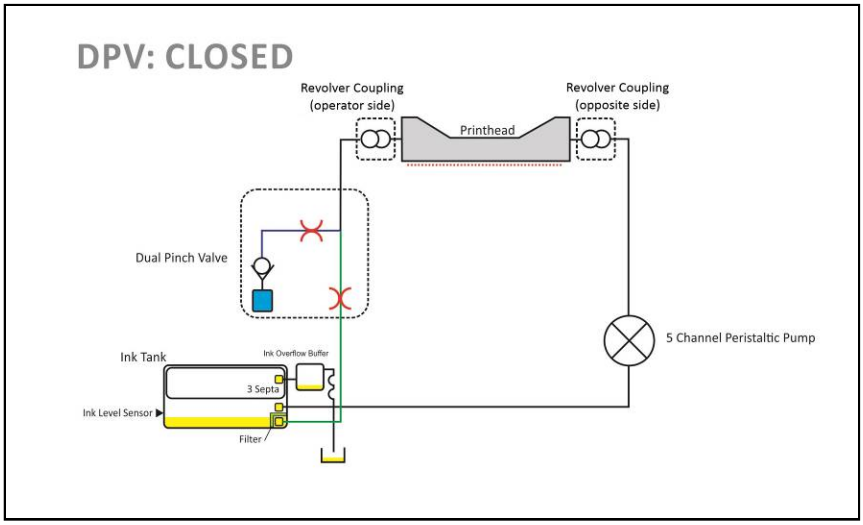
Dual Pinch Valve (DPV)



STOP INK FLOW

PUMP: OFF
DPV: CLOSED

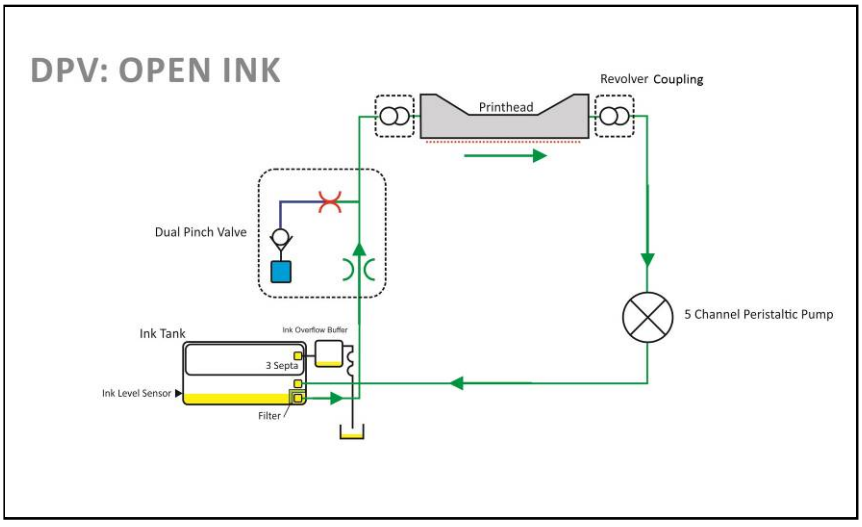
- No Ink Flow
- Printer Powered-Down



ALLOW INK FLOW

PUMP: ON
DPV: OPEN INK

- Allows Ink Flow
- Circulating Ink
- Printing
- Equalizing Pressure

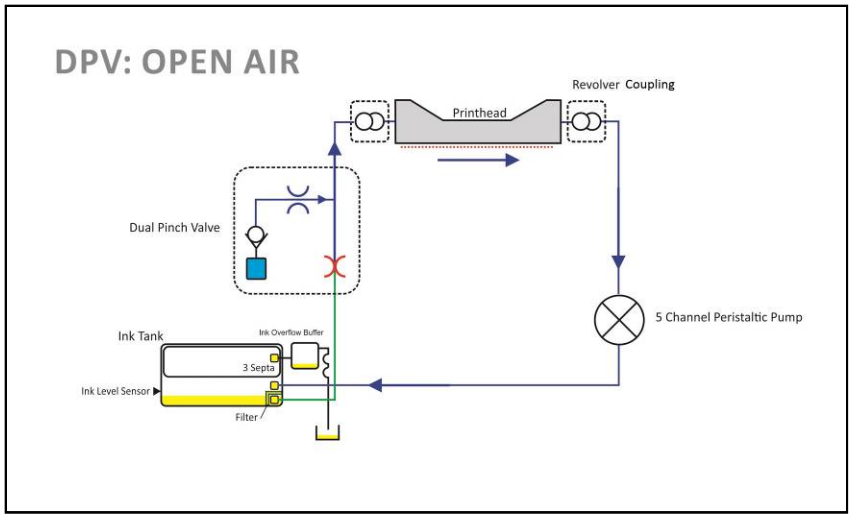


DEPRIME SYSTEM

DPV: OPEN AIR
PUMP: ON

- Dual Pinch Valve opens air inlet and closed ink flow from Tanks.
- As pump runs, air is pulled into the system and ink travels back into the Ink Tanks.

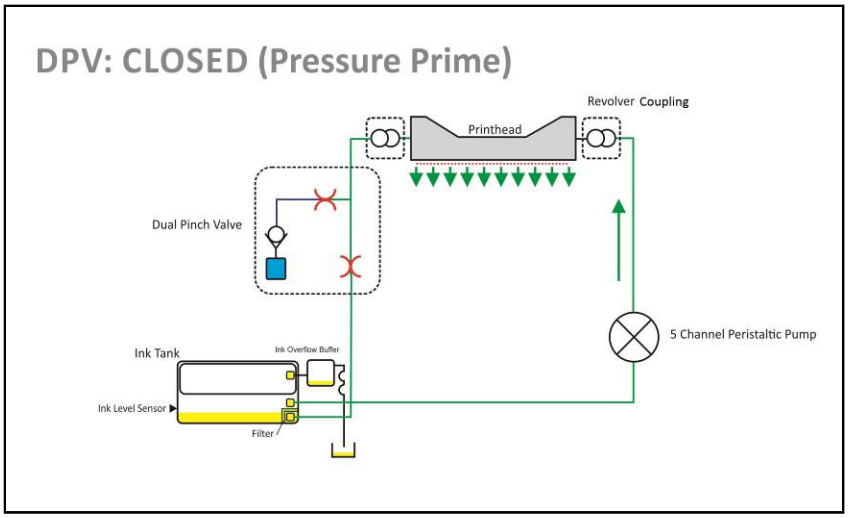
NOTE: When Head Release button is pressed the system only does a partial deprime.



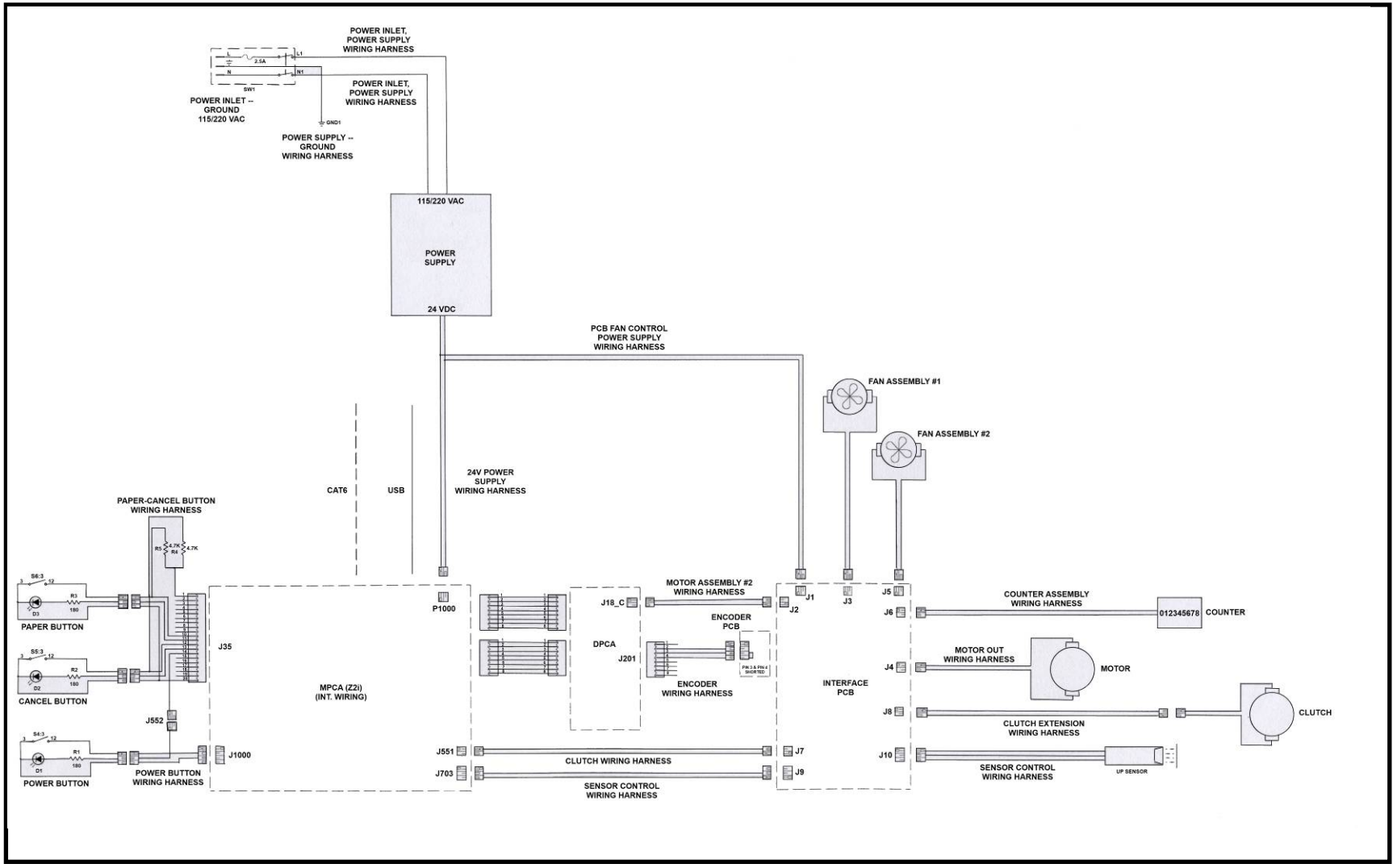
PRESSURE PRIME

DPV: CLOSED
PUMP: Runs backwards (briefly)

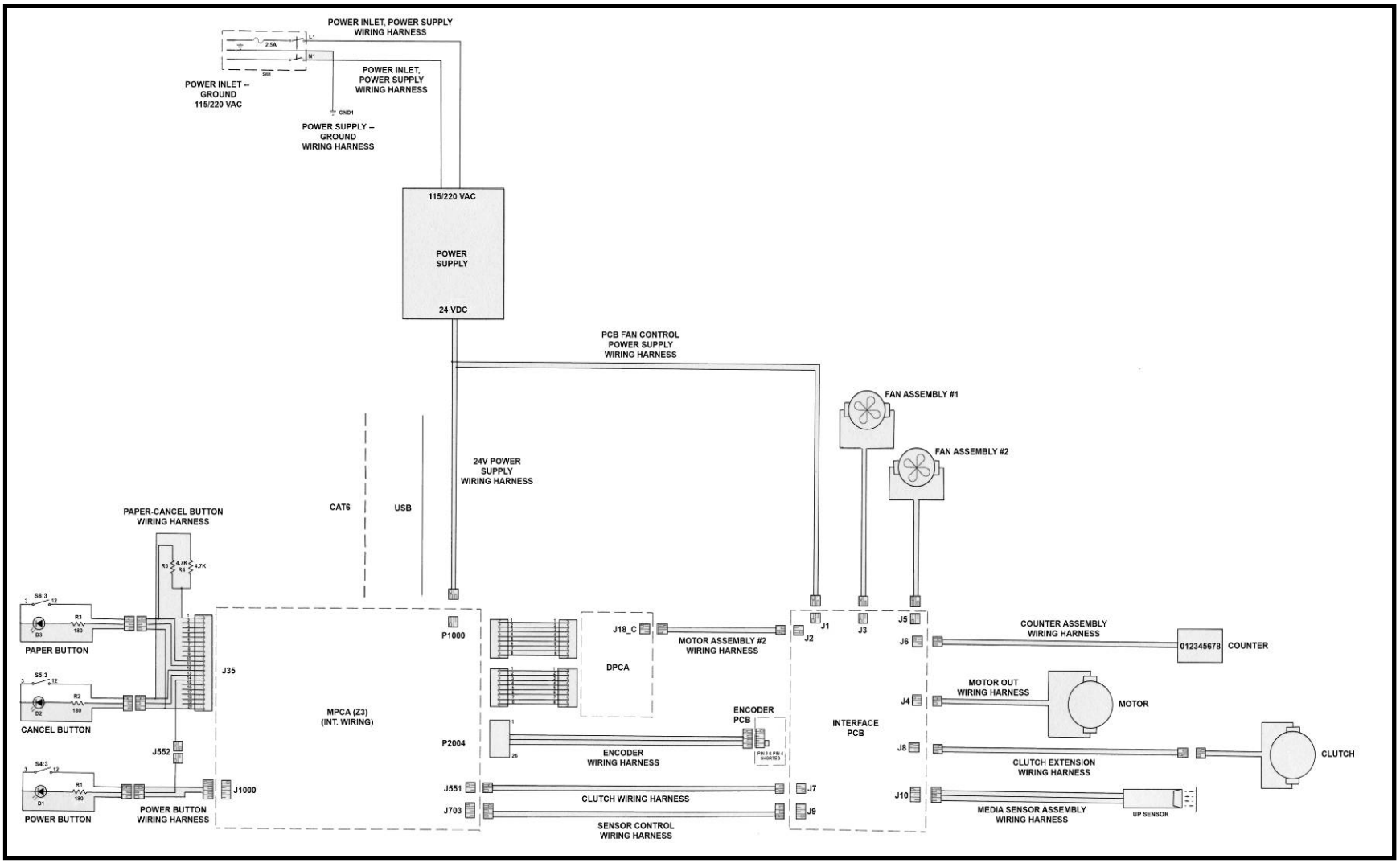
- Forces ink out of nozzles.
- Helps clear nozzles of debris and air.
- Only occurs during priming process.



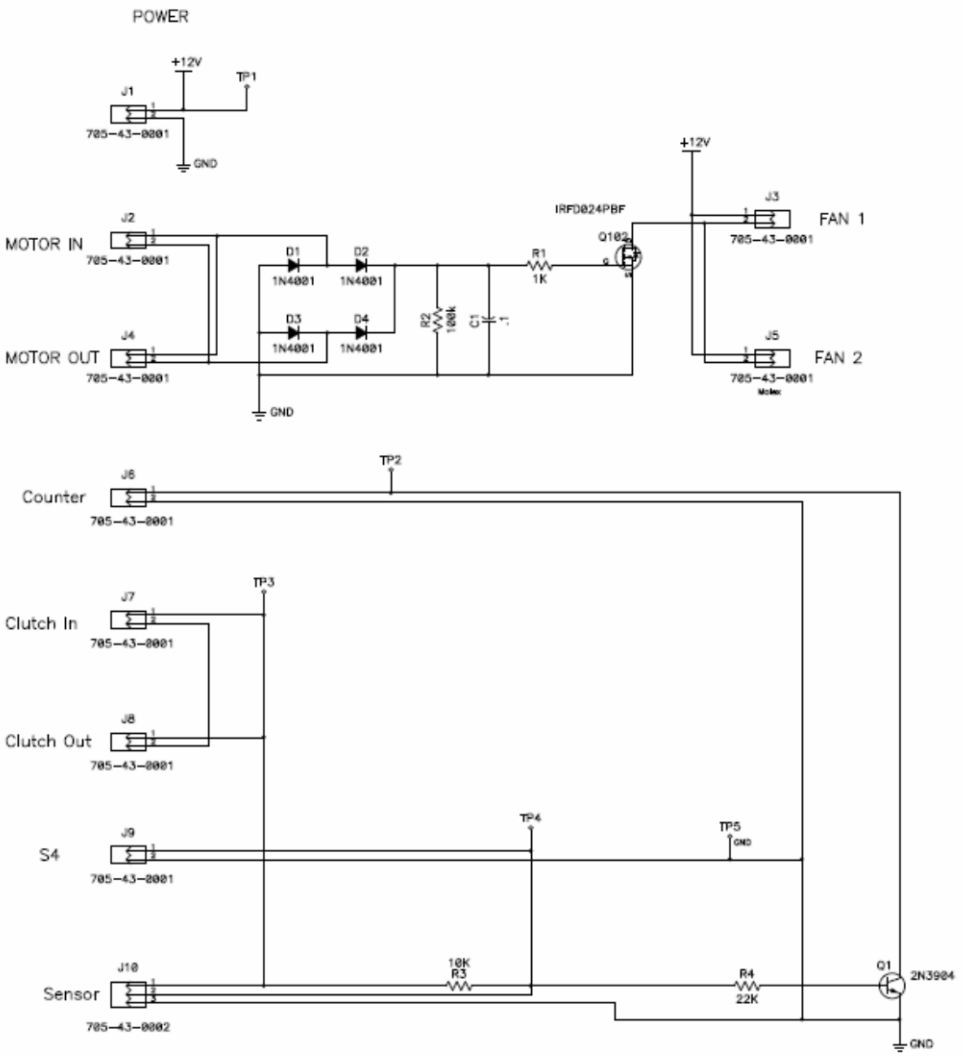
Appendix E – Z2i Wiring Diagram



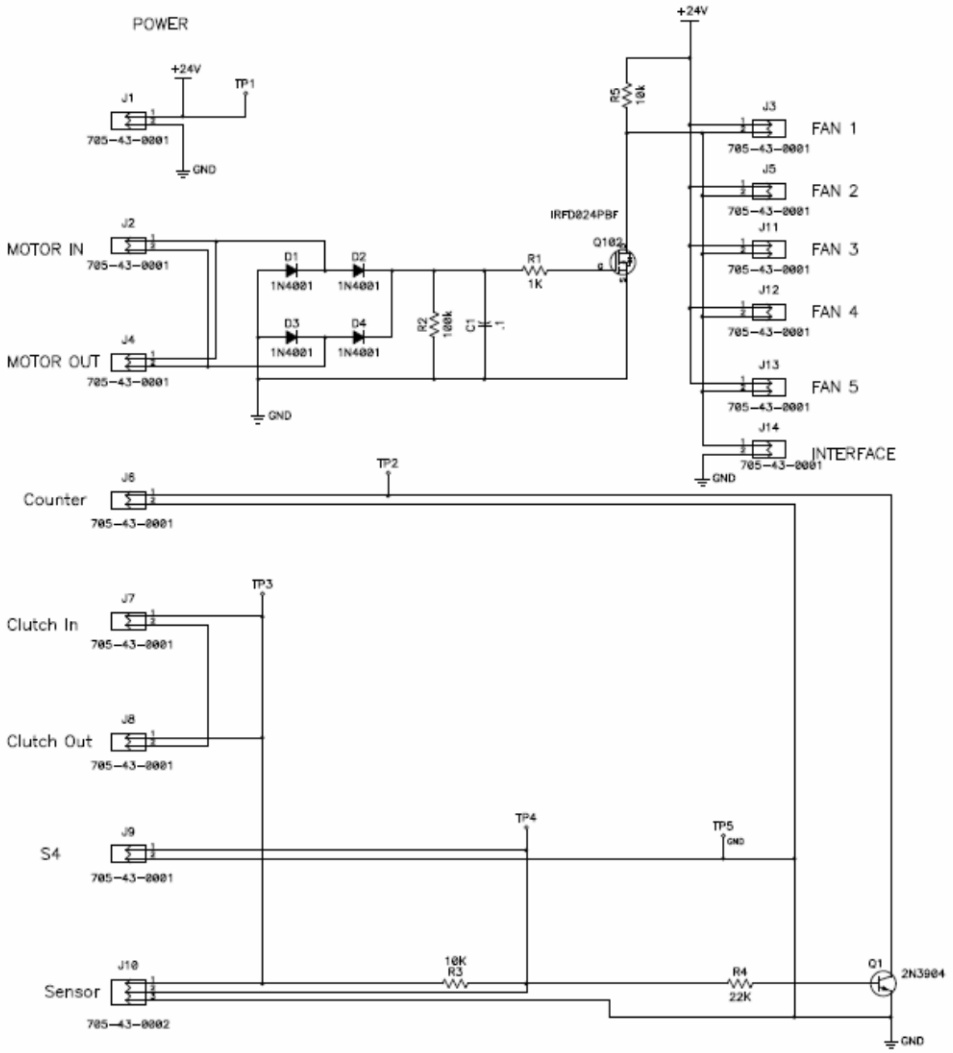
Appendix F – Z3/Z4/MR Wiring Diagram



Appendix G –Interface (I/O) Board (42-500-30) Schematic



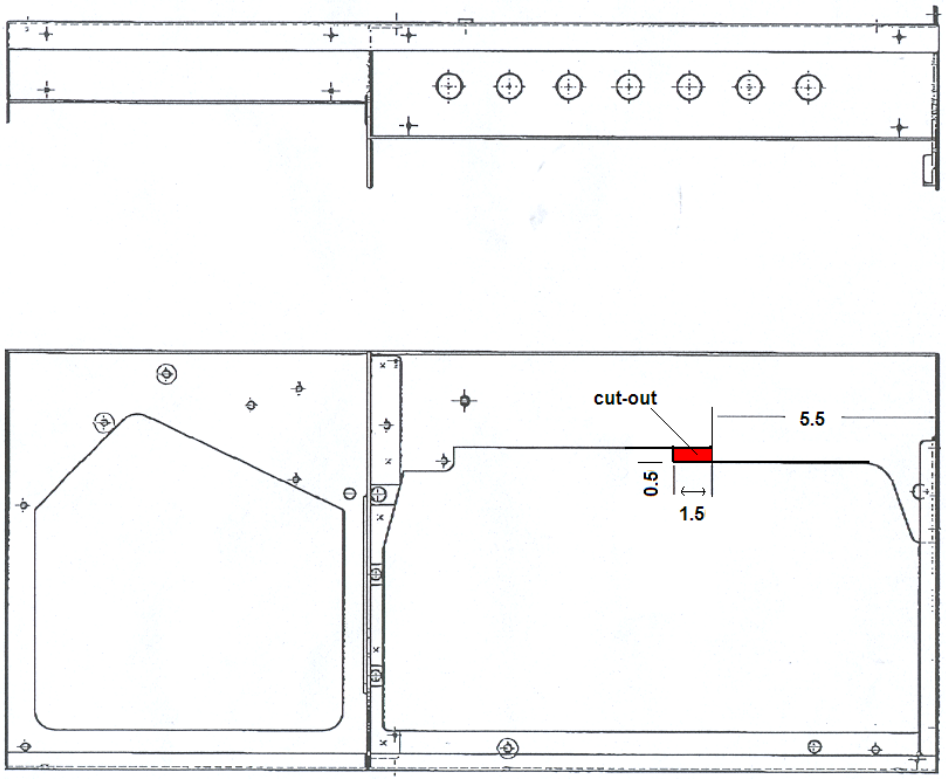
Appendix H –Interface (I/O) Board (42-500-30 Rev B) Schematic

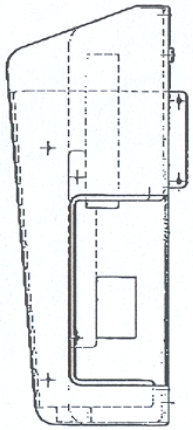


Appendix I –Side Frame Modification

To Accommodate the Z3/Z4/MR Print Engine in a printer that was built for the Z2i Print Engine. Valid for Printer S/N 100027598 or lower.

IMPORTANT: After installing a Z3/Z4/MR Print Engine into a printer that originally had a Z2i engine installed; please be sure to replace the too small (short) rubber feet with two large (tall) rubber feet (35-117-04 foot and screw), so that all the feet are the same size. Z3, Z4 and MR Print Engines do NOT require this built-in angle, which was previously created by the difference in the feet height at the entrance and exit end of the printer body. If the body of a printer, with a Z3/Z4/MR print engine installed, is left to sit at an angle this may cause the visible Ink Tank Level Sensors to see an early "out" condition.





As viewed from operator side of unit
Measurements are shown in inches.

MACH 5 FRONT SIDE FRAME MODIFICATION
Necessary to install Z3 or higher printengine into printer that originally had Z2i engine installed. Valid for S/N 100027598 or lower.

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