ExpressCard 2000

Instant Issuance Card Personalization System
Preventive Maintenance Procedure

Table 0.1 - Revisions

Rev Number	Date	Notes
1.01	01/14/2014	Initial release derived from 99875607-2.01-DRAFT
2.01	06/27/2014	General updates to tipper heater replacement
22	02/06/2015	Fix Roll to Printer button name in roller cleaning
23	04/08/2016	Add steps to lubricate and test embosser hammer pin and knuckle during preventive maintenance (section **3.12**)
24	03/09/2017	Minor clarification and structural fixes
25	11/06/2017	Update section **3.5** to specify updating firmware if MagTek Support Services has supplied a .CAB file; Update section **4** to specify direct handoff of consumables; Retrofit standardized Caution, Warning, Notice tables throughout

SAFETY

This product has been evaluated by multiple safety certification agencies, including Underwriters Laboratories (UL) and the United States Federal Communications Commission (FCC Class A and Class B), and is designed to protect both the user and the device. This document is written specifically to work in conjunction with these safety and integrity features to protect the user and the device. It is very important to follow all steps in the product documentation carefully, in the order in which they are described, and at the recommended times. Failure to do so could result in personal injury, and / or cause damage to the device, and / or void the product warranty.

The information within this manual has been prepared for use by trained professional service personnel and is not intended for general use. To maintain the safety and integrity of the machine, follow the procedures described in this manual carefully.

For your personal safety and to prevent damage to the device, disconnect power from the device before you connect or disconnect any cable, electronic board, or assembly.

SAFETY REQUIREMENTS

⚠ **WARNING**
Never do any of the following: • DO NOT use a ground adapter plug to connect equipment to a power socket-outlet that lacks a ground connection terminal. • DO NOT attempt any maintenance function that is not specifically described in this manual or in other ExpressCard 2000 instructional documents published by MagTek. • DO NOT remove any of the covers or guards that are fastened with screws. There are no user-serviceable areas within these covers. • DO NOT override or "cheat" electrical or mechanical interlock devices. • DO NOT use EC2000 supplies or cleaning materials for other than their intended purposes. • DO NOT operate the equipment if you or anyone else have noticed unusual noises or odors. **Consider the following before operating the ExpressCard 2000:** • Connect the EC2000 to a properly grounded AC power socket-outlet. If in doubt, have the socket-outlet checked by a qualified electrician. Improper connection of the device's grounding conductor creates a risk of electric shock. • Place the EC2000 on a solid surface that can safely support the device's weight plus the weight of a person leaning against it (such as a service technician). • Be careful when moving or relocating the device. Use proper lifting techniques. **Use materials and supplies specifically designed for MagTek devices. Using unsuitable materials may result in poor performance, and in some cases may be hazardous.**

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1 Required Tools, Materials, and Documents

1.1 Required Tools

Part Number	Quantity	Description
33011008	1 ea.	ASM TOOL KIT,FIELD SERVICE,EC2000
67800019 or equiv.	1 ea.	Small USB keyboard with touchpad mouse
N/A	1 ea.	Small diagonal side cutters
N/A	1 ea.	USB thumb drive with required software and documentation

1.2 Suggested Tools

Part Number	Quantity	Description
N/A	1 ea.	Laptop with available Ethernet port
22350302 or equiv.	1 ea.	10 ft. Ethernet cable (COM ETHERNET CAT5E BLK 10')
N/A	1 ea.	Flashlight

1.3 Required Materials

Part Number	Quantity	Description
97200153	1 ea.	ASM KIT,PREVENTIVE MAINTENANCE,EC2000

1.4 Suggested Materials

Part Number	Quantity	Description
33011009	1 ea.	ASM KIT,STARTER,SPARE,FIELD SERVICE,EC2000
93400047	1 ea.	PRI RIBBON, COLOR YMCKOK EV (R3314)
33070896	1 ea.	ASM RIBBON ASSY,TIP FOIL,SILVER
33070621	1 ea.	AAY ASSY,INDENT CARTRIDGE

1.5 Required Software and Documents

MagTek recommends loading the following required software and documents on the USB thumb drive or service laptop before visiting the customer site.

Part Number	Quantity	Description
99875600	1 ea.	MNL USER INSTALL & OPERATION MANUAL,EC2000
99875607	1 ea.	MNL HARDWARE SERVICE MANUAL,EC2000
99875651	1 ea.	REF PROCEDURE,PREVENTIVE MAINTENANCE,EC2000
99875646	1 ea.	REF CHECKLIST,PREVENTIVE MAINTENANCE,EC2000
N/A	1 ea.	Passwords and factory defaults for the device being serviced
VARIOUS	0 or more	EC2000 software patch **.CAB** files provided by MagTek Support Services, loaded onto USB thumb drive or service laptop

2 Introduction

This document contains the preventive maintenance procedure for the ExpressCard 2000 (EC2000), extracted from *D99875607 ExpressCard 2000 Hardware Service Manual*. It assumes the reader is familiar with basic operation of the ExpressCard 2000's user and maintenance functions, so many of the cross-references to deeper "how-to" procedures from that manual have been removed for brevity. For details about performing any procedure described in this document, see that manual and *D99875600 ExpressCard 2000 User Installation and Operation Manual*.

⚠ CAUTION
The information in this document is intended for use by trained professional service personnel only. It is not intended for general use. To maintain the safety and integrity of the device, it is important to follow the procedures laid out in this document as-written and in the order provided.

⚠ WARNING
For your personal safety, and to prevent damage to the device, disconnect power from the ExpressCard 2000 before you connect or disconnect any cable, electronic board, or assembly.

3   Preventive Maintenance Procedure

3.1   Prepare the Device for Preventive Maintenance

To prepare the device for service, follow these steps in accordance with standard safety practices:

1) Offer the customer the opportunity to remove any proprietary or security-sensitive consumables from the device, including card stock, image printer ribbons, indent cartridges, and tipper foils. Some consumables contain negative imprints of cardholder data and must be handled securely.

2) Make sure the device is powered up and connected to the network.

3) Park the hopper shuttle at the front of the device by following these steps:

    a) From the touchscreen, press the **Menu** button.

    b) Press the **Maintenance** button to open the **Maintenance Menu** page.

    c) Press the **Remove Hopper** button and wait for the hopper shuttle to finish moving.

4) Open the top access door (see *D99875600 EC2000 Installation and Operation Manual*).

5) Open the two side access doors.

6) Inspect the device for any items that do not belong inside the cover, and remove them (examples include loose mechanical parts, cards, insect or animal leavings, or jewelry).

7) Inspect the mechanical parts inside the device and inside the image printer, paying special attention to belts, cables, and plastic gears to see if there are signs of wear or damage.

3.2   Clean the Card Path

Clean the card path using a cleaning card by following these steps:

1) Obtain a cleaning card from the kit.

2) Remove the cleaning card from its package and **let it dry for one minute**.

3) Remove the image printer ribbon and set it aside in a secure location, or offer it to the customer for temporary storage or secure disposal.

4) Using the touchscreen, navigate to **Menu** > **Maintenance** to open the **Maintenance Menu** page.

5) Press the **Clean Printer…** button to launch the **Printer Utility** page.

6) Press the **Clean Printer (Manual Feed)** button to begin the cleaning process. The EC2000 will show a popup dialog box. Leave it there for now.

7) Insert the cleaning card into the manual feed slot on the front of the device and press **OK** to close the dialog box. The EC2000 will run the cleaning card through the card path and eject it into the card output hopper when done.

8) If the cleaning card sticks in the manual feed slot, let it dry for one more minute and try again.

9) Remove and dispose of the cleaning card.

3.3 Clean All Transport Rollers

Follow these steps to clean the rollers on the hopper transport, XY transport, and exit transport. Use the **white** cleaning cards:

1) Remove hoppers 1 and 2.

2) Remove the tipper foil cartridge and set it aside in a secure location, or offer it to the customer for temporary storage or secure disposal.

3) On the touchscreen, navigate to **Menu** > **Settings** > **Service** > **MCP Cmds** to open the **Controller Commands** page.

4) Use the **white** cleaning card and **do not let the rollers take it out of your hand** as you clean each set of rollers as follows:

   a) Feed the card partly into the hopper transport and press the **Roll to Printer** button. Hold the card there until the rollers stop moving.
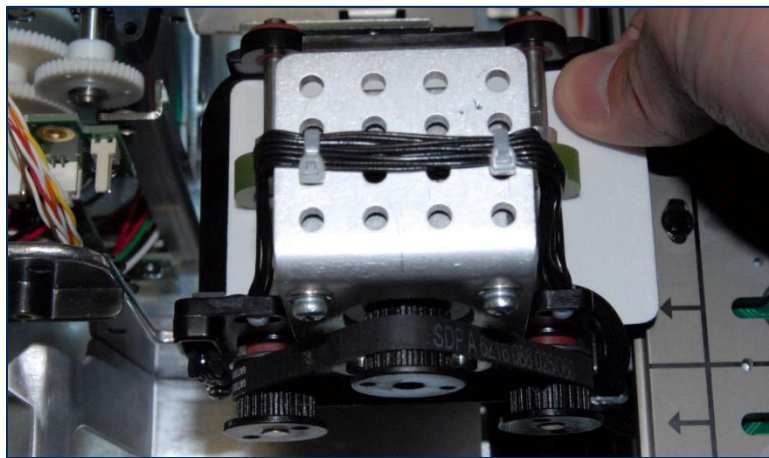

Figure 3-1 - Cleaning the Hopper Transport Rollers (TOP VIEW FROM FRONT)

   b) Feed the card partly into the **left** side of the exit transport and press the **Exit Eject** button. Hold the card there until the rollers stop moving.
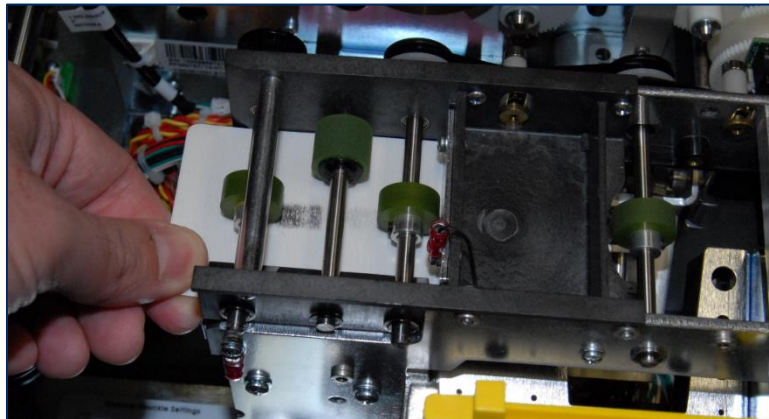

Figure 3-2 - Cleaning the Left Side of the Exit Transport (TOP VIEW FROM FRONT)

   c) Feed the card partly into the **right** side of the exit transport and press the **Exit Reject** button. Push inward to keep the card from being pushed out until the rollers stop moving.
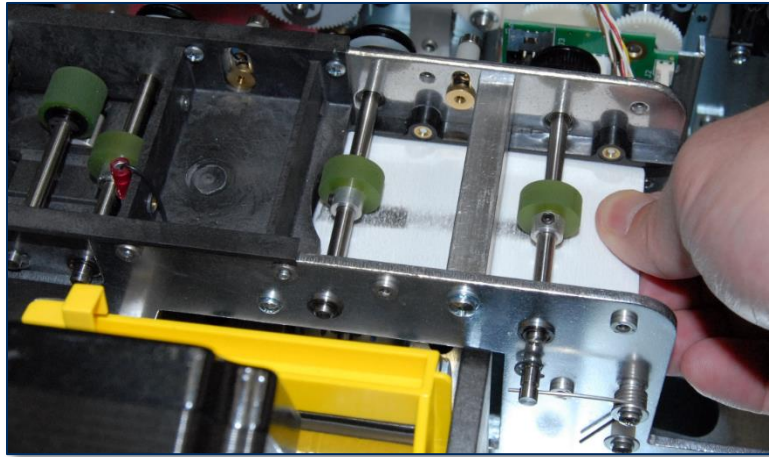
Figure 3-3 - Cleaning the Right Side of the Exit Transport (TOP VIEW FROM FRONT)

d) Feed the card partly under the exit ramp rollers and press the **Exit Eject** button. Hold the card there until the rollers stop moving.
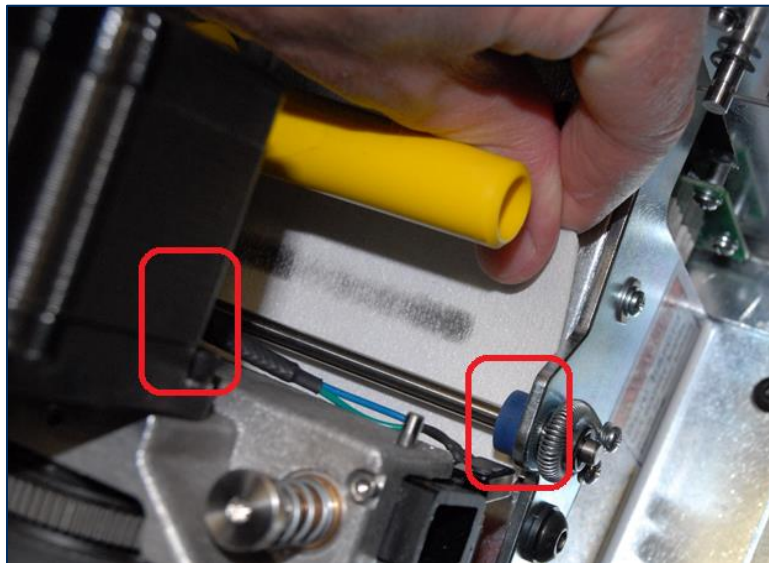

Figure 3-4 - Cleaning the Exit Ramp Rollers (TOP VIEW FROM FRONT)

5) Press the **Status** button to return to the **Status** page.
6) Re-install the tipper foil spool assembly with the original tipper foil roll, or obtain and install a new one from the customer.
7) Re-install hoppers 1 and 2.

3.4   Update the Software

If MagTek Support Services has supplied .CAB files to apply EC2000 software patches, follow these steps to install them:

1) Use the Ethernet cable to connect the service laptop to the EC2000. If necessary, you may instead use the customer's instant issuance workstation, provided it has Microsoft Internet Explorer and a USB port with security settings that allow you to read from the USB thumb drive.

2) Launch the Internet Explorer web browser and navigate to **https://ec-xxxxxxx**, where xxxxxxx is the device's serial number. The browser should show an **ExpressCard 2000** web interface page.

3) Open the **Software Upload** link on the left side of the page to display a **File to Upload** page.

4) Press the **Browse…** button to launch the **Choose File to Upload** dialog box.

5) Navigate to the folder that contains the .CAB files you want to apply (such as the field service laptop's hard drive or the USB thumb drive).

6) Select the .CAB file you want to apply, and press the **Open** button to return to the **File to Upload** page.

7) Press the **Send** button to upload the .CAB file to the device. The browser will display a status message telling you when the patch will be applied (for example, "File Copied Successfully. Update will be performed during next reboot."). The device's touchscreen may also go blank.

8) Restart the device by powering it off, then powering it on. Wait until the touchscreen once again displays the ExpressCard 2000 **Status** page.

9) In the web browser, open the **Upload Status** link on the left side of the page. If the browser reports "SUCCESS," repeat these steps for any additional patch .CAB files you need to apply, or continue to the next section.

3.5   Update the Firmware

If MagTek Support Services has supplied .CAB files to apply EC2000 firmware patches, follow the steps in this section to determine whether the EC2000 firmware needs to be updated, and to update it if necessary.

3.5.1   Check Firmware Revision Numbers

To check whether the EC2000 has the latest main logic board (MLB) and image printer firmware installed, follow these steps:

1) Install any software updates MagTek Support Services has provided, using the instructions in section **3.4 Update the Software**. This is a very important first step, because new revisions of firmware files are distributed to the EC2000 via software updates.

2) From the EC2000 touchscreen, press the Help button to open the Help page.

3) In the Version Information list, note the **Controller Firmware** and **Printer Firmware** entries.
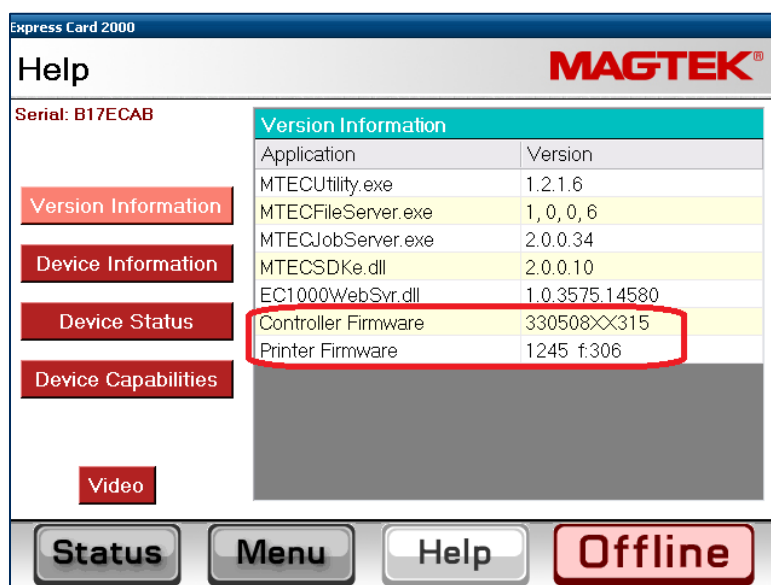
4) Press the Menu button to launch the Main Menu page.

5) Press the Settings button to launch the Settings Menu page.

6) Press the Load F/W button to launch the Firmware Download password page.

7) Use the on-screen keyboard to enter the password 1234567, then press the E key to launch the second Firmware Download password page.

8) Use the on-screen keyboard to enter the password 7654321, then press the E key to launch the Firmware Download page.

9) Note the revision numbers listed for each **.hex** file in the list. If any revision number does not match the revision numbers you found on the Help page, update the firmware for that component using the steps in the following sections.

3.5.2   Update the Main Logic Board (Controller) Firmware

To update the controller (main logic board / MLB) firmware, follow these steps:

1) From the Firmware Download page, select the **Controller** radio button.

2) In the list of .hex files, select the file that corresponds to the new revision.

3) Press the Download button to download the .hex file to the controller. The system will report "Loading the firmware. Please wait…."

4) Wait about 5 minutes for the firmware to finish downloading. **Do not power off the device**.

5) After the firmware update is complete, the device will make sounds as the MLB resets. Wait until the sounds stop and the touchscreen reports "Finished loading the firmware."

3.5.3   Update the Printer Firmware

To update the printer firmware, follow the steps from section **3.5.2**, but select the **Printer** radio button and select the .hex file appropriate to the revision of the image printer firmware you want to install, before pressing the Download button.

3.6 Service the Hopper Module

Follow these steps to service the hopper transport:

1) Use the MCP Commands page to move the hopper transport from the front to the rear of the device to verify the movement is smooth and there is no belt slippage.

2) Only if the hopper transport rods are dirty, wipe off the dirt with a soft, lint-free cloth.

3) Check the hopper transport drive belt for signs of damage. If it is damaged, contact MagTek Support Services for a replacement.

3.7   Service the XY Transport Module

Do not lubricate the EC2000's gears or bearings. They are made of self-lubricating powder metal, and lubricants can damage their surfaces.

Follow these steps to lubricate the one shaft that requires lubrication. **Do not use Tri-Flow lubricant on any shaft other than the one shown below.**

1) If there is dirt, dust, or debris on the XY transport rods, wipe it off using a soft, lint-free cloth.
2) Use the **MCP Commands** page to move the XY transport from the front to the rear of the device to verify the movement is smooth and there is no belt slippage. Leave the transport at the rear of the device.
3) Check the XY transport drive belt for any signs of damage. If it is damaged, contact MagTek Support Services for a replacement.
4) Stand at the front of the device and locate the XY transport shaft closest to the image printer. It is the only shaft that has a blue bearing around it (see **Figure 3-5**).
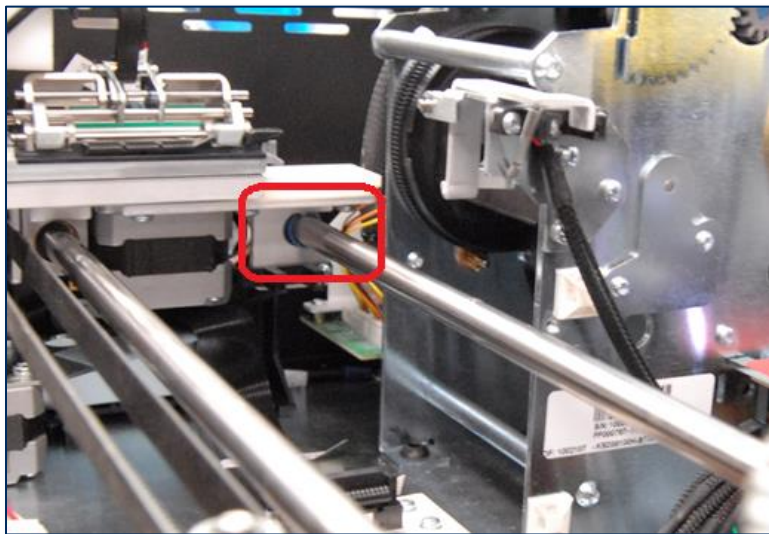

Figure 3-5 - Blue Bearing On XY Transport (FRONT LEFT VIEW)

5) Shake the bottle of Tri-Flow lubricant and remove the cap.
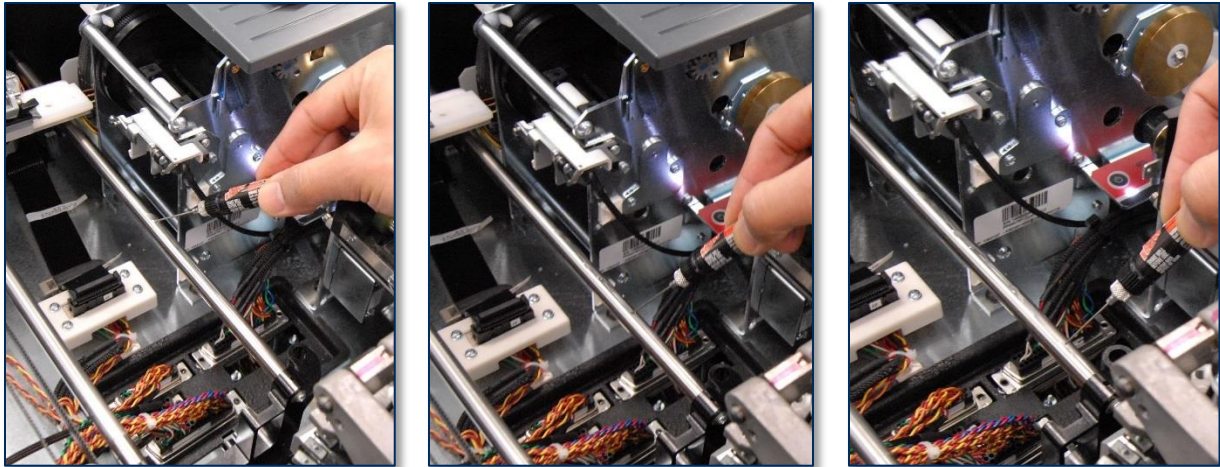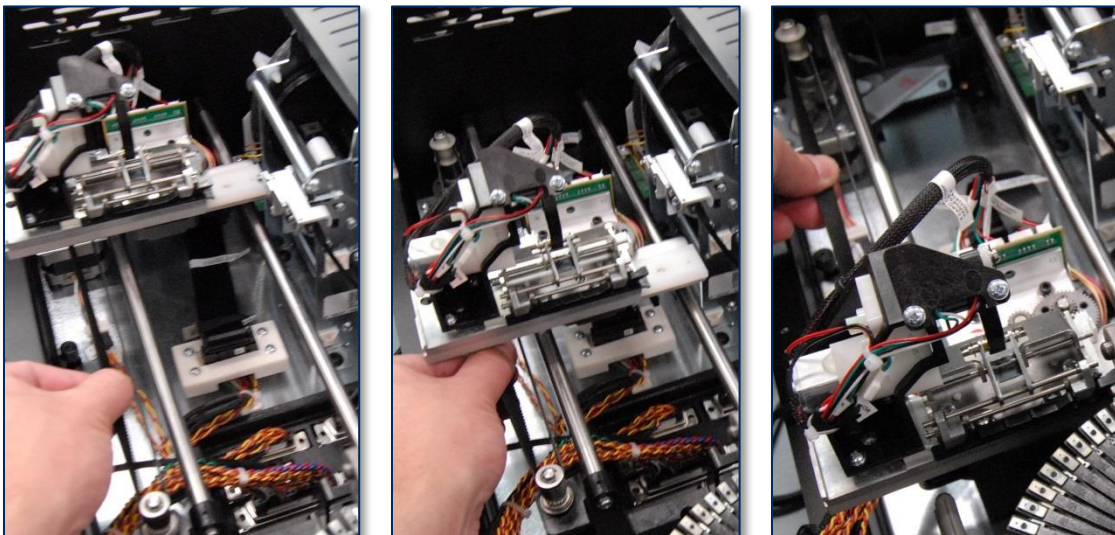6) Run a thin 3-4 inch long bead of Tri-Flow along the top of that one shaft.

Figure 3-6 - Run a Thin Bead of Tri-Flow Along the Top of the Shaft (TOP LEFT VIEW)

7) Use the drive belt to move the XY transport to the front of the device, then to the rear again to spread the Tri-Flow along the length of the shaft.

8) If you have applied too much Tri-Flow to the shaft, some may drip off the shaft. If this happens, dab off the excess with a clean, lint free cloth.

3.8   Power Down the Device / Cool the Tipper Heater

1) Navigate to **Menu** > **Settings** > **Tipper** to open the **Tipper** page.

2) Press the **Set Heater OFF** button to turn off the tipper heater.

3) Note the value under Current Tipper Temp. **If the tipper temperature is 50 degrees Centigrade or hotter, the tipper heater is not safe to touch.**

4) Take note of the current time, and plan your work to allow enough time for the tipper heater to cool, which can take up to 15 minutes. You may be able to use compressed air to cool it more quickly.

5) Power down the device.

3.9   Clean Inside the Device

Caution: Do not use alcohol wipes, liquids, or chemicals on the touchscreen.

Clean the device in phases to avoid blowing dirt, dust, or debris into sensitive components:

1) Remove all remaining consumables from the device (stock cards, image printer ribbon, indent cartridge[s], tipper foil, etc.) and set them aside in a secure location or give them to the customer for temporary storage or secure disposal.

2) If there is a large, visible amount of dirt, dust, or debris in the device, wipe the worst of it out with a clean, dry cloth.

3) Wipe remaining dirt, dust, and debris off the base plate and main components with alcohol wipes.

4) Used compressed air to blow out any remaining dirt, dust, or debris from between components and re-wipe as necessary.

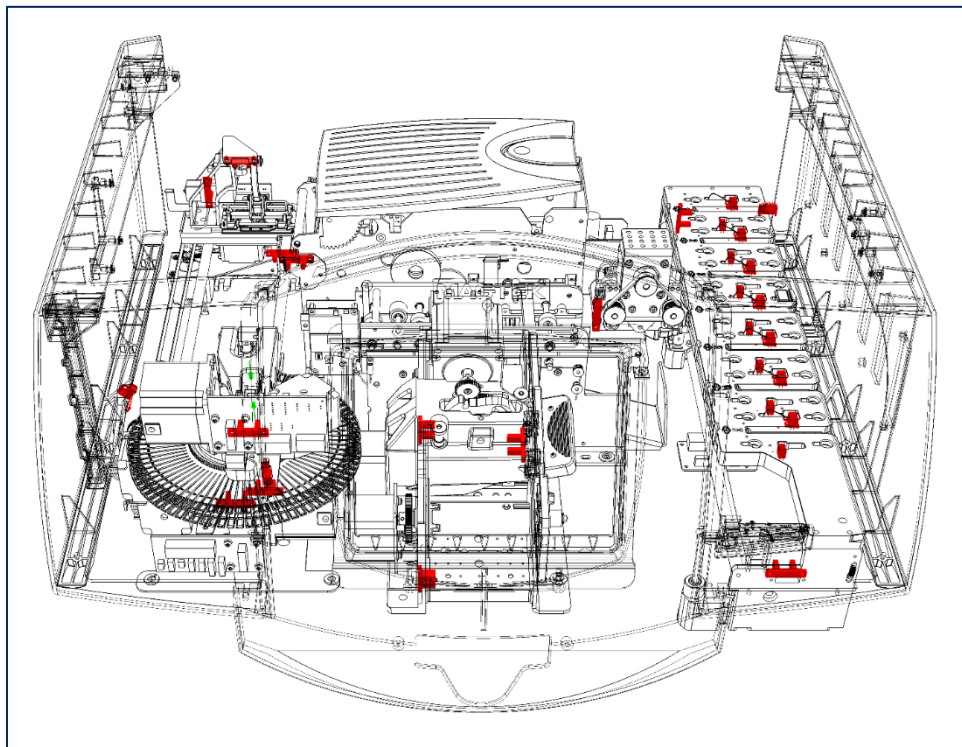5) Use compressed air to clean each of the sensors (see **Figure 3-7**).

Figure 3-7 – All EC2000 Sensors Shown In Red (FRONT VIEW)

6) Use compressed air to clean out the electronics in the bottom between the side access doors, with special attention paid to the power supply in the rear left corner.

3.10 Clean the Card Cleaning Roller

Clean the card cleaning roller by following these steps:

1) Remove any jewelry or accessories that could touch the print head during cleaning.
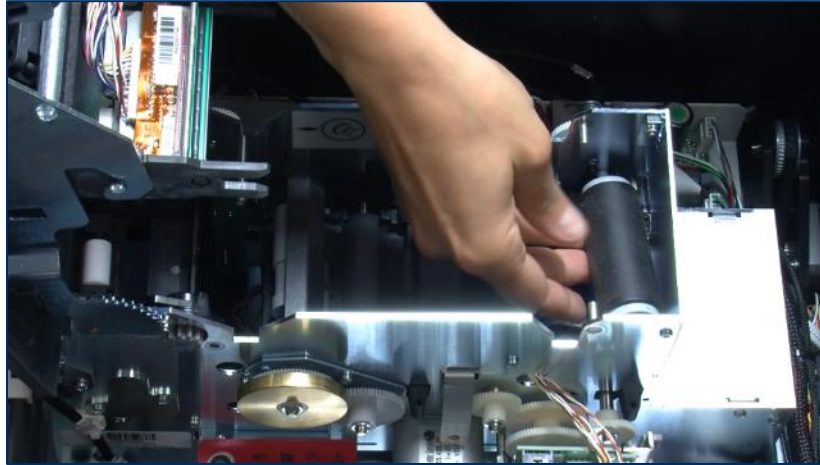2) Open the image printer.

Figure 3-8 - Removing the Card Cleaning Roller

3) Remove the cleaning roller (see **Figure 3-8**).
4) Unwrap the roller wipe from the kit and rub it gently over the entire surface of the roller. Pay special attention to spots that feel uneven, which may be dirt or dust stuck to the roller. If there are any uneven or rough spots you can not wipe off, contact MagTek Support Services for assistance.
5) When the card cleaning roller has dried, re-install it into the image printer.

3.11 Clean the Image Print Head

Be cautious when following the steps in this section:
- **Avoid contact between the print head and any metal, sharp, or rough objects.**
- **Avoid touching the print head directly with your fingers, as it could affect print quality or permanently damage the print head.**

Clean the image print head by following these steps:

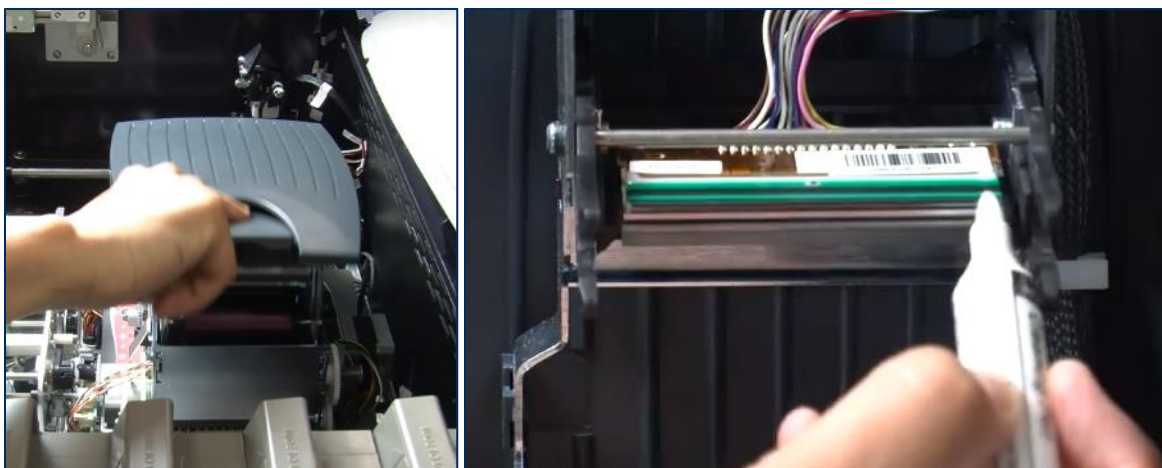1) Obtain a print head cleaning pen from the kit.

Figure 3-9 - Cleaning the Image Print Head

2) Locate the print head (see **Figure 3-9**). The area you want to clean is the front face of the thin brown glass layer closest to the ceiling.

3) Take the cap off the cleaning pen.

4) Gently swipe the cleaning pen back and forth along the print head 10-15 times, until the head feels / looks clean. The print head is slightly textured, so if you are making proper contact you should feel a very slight vibration or "squeak" during each swipe.

5) Wipe the cleaning pen on a piece of clean paper, then put the cap back on the cleaning pen.

6) Wait until the print head has completely dried (approximately two minutes).

7) Close the image printer.

3.12 Service the Embosser Module

Service the embosser by following these steps. If you discover any issues you can not resolve, contact MagTek Support Services to procure a replacement embosser module.

1) Use compressed air to clean the embosser bridge (the metal block between the daisy wheels that supports the indent cartridge ribbon).

2) Inspect the top and bottom embosser daisy wheels for missing or worn characters and replace them if possible. After installing, make sure the tine is still intact and holds the character tightly.

3) Inspect the top and bottom embosser daisy wheels for missing, bent, or broken **tines**. Install any missing characters on other tines and re-map them after preventive maintenance is complete and the device is powered up.

4) Inspect the characters on the **top** embosser wheel to identify any broken or bent **cones**.

5) Use the inspection mirror and a flashlight to inspect the characters on the **bottom** embosser wheel to identify any broken or bent **cones** (see **Figure 3-10** and **Figure 3-11**).

Figure 3-10 - Using Inspection Mirror to Check Tine / Hammer Alignment (TOP VIEW FROM FRONT)
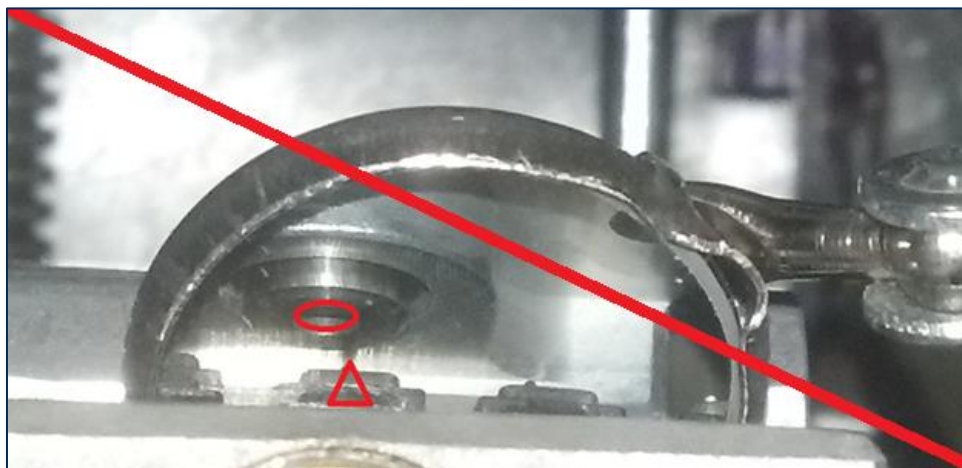

Figure 3-11 - Bad Embosser Wheel Alignment (Figure 3-10 MAGNIFIED)

6) If any cones are broken or bent, replace the characters in the same location if possible. If replacement is not feasible, cut off the top and bottom tines using the diagonal side cutters, remove the character from the tines, and install it to another set of tines, and re-map the character to another tine after preventive maintenance is complete and the device is powered up.

7) Check the daisy wheel alignment by standing in front of the device and looking straight down at the embosser. Use an inspection mirror as shown in **Figure 3-10** so you can see the cone on the bottom of the current character and the hole in the embosser hammer. **Figure 3-11** shows a cone and hole that are not properly aligned.

8) Check embossed character heights, and adjust them if necessary to account for normal wear. Pay special attention to any characters you have replaced or re-mapped.

9) Note the position of the top and bottom knuckles in case they move during the following steps.

10) Add 2 drops of Teflon lubricant to the left and right sides of the shaft that holds the top embosser knuckle, between the sides of the knuckle and the rocker arm.
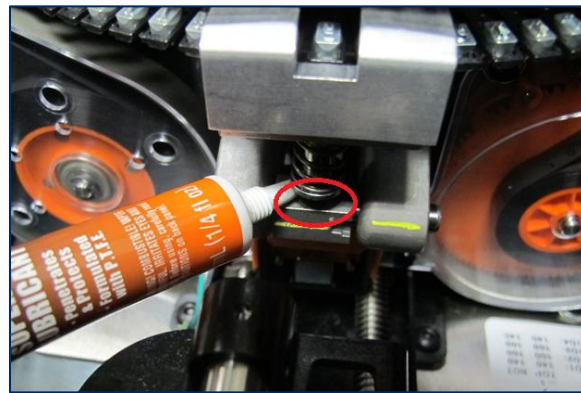

11) Move the hammer follower out of the way and add 2 drops of lubricant to the top and to the front of the top punch hammer.
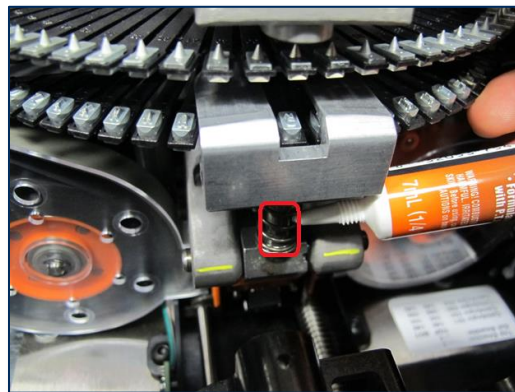

12) Add 2 drops of Teflon oil to the left and right sides of the shaft that holds the bottom embosser knuckle, between the sides of the knuckle and the rocker arm.
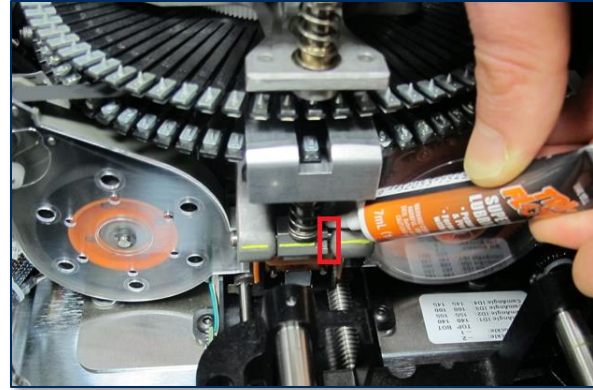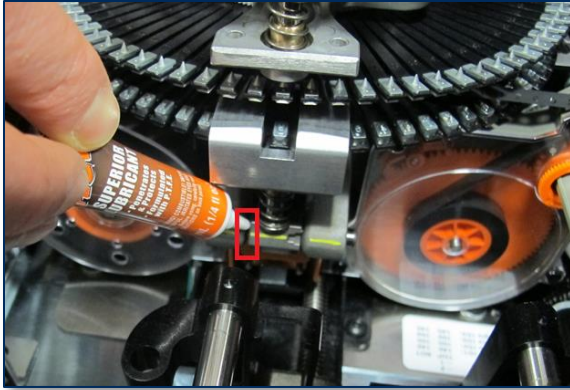
13) Add 2 drops of lubricant between bottom punch hammer and bottom hammer follower.


14) Add 2 drops of lubricant to the front of the bottom punch hammer.

15) Return the knuckles to the position they were in before lubricating.
16) Test to make sure the top knuckle slides smoothly across the punch hammer: Press the top rocker arm all the way down and make sure the top of the knuckle remains level and parallel to the floor at all points in the movement cycle. The knuckle should not rotate from its initial orientation.
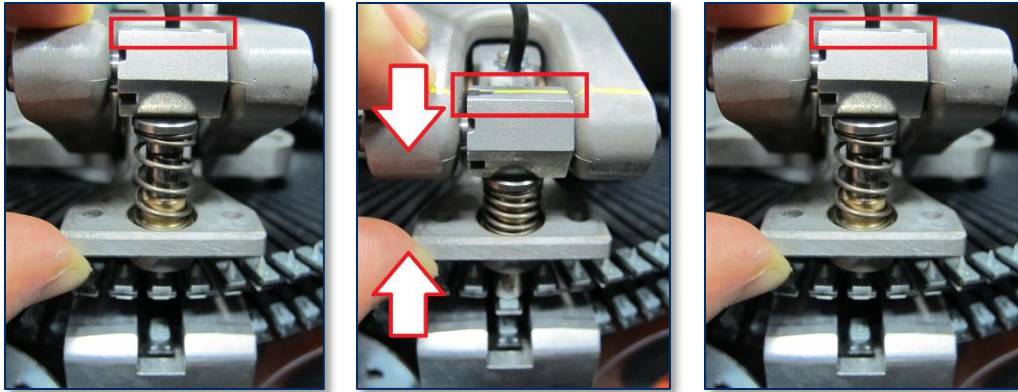
17) Test to make sure the bottom knuckle slides smoothly across the punch hammer: Press the bottom rocker arm all the way up and make sure the top of the knuckle remains level and parallel to the floor at all points in the movement cycle. The knuckle should not rotate from its initial orientation.
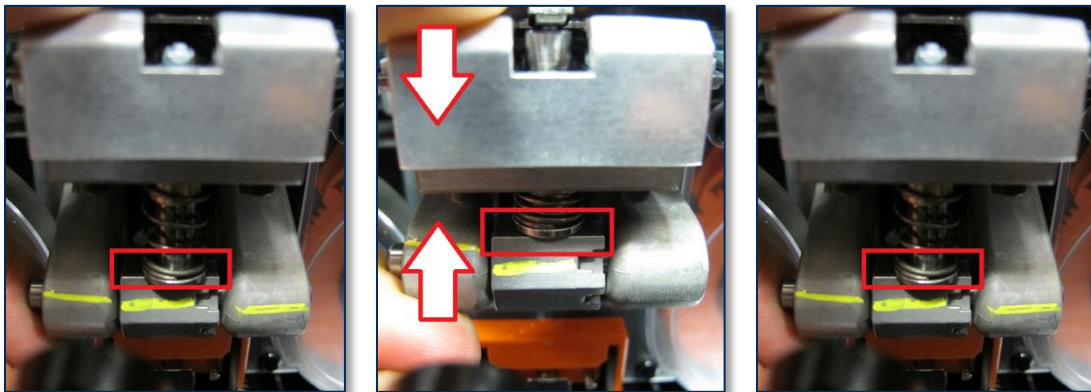
3.13 Service the Electronics
Visually inspect all wires and cables, checking for insulation breakage or wear on moving cables.

3.14 Service the Cover
After completing all other service, service the cover as follows:

1) Inspect the cover for damage.
2) Clean the black and gray portions of the outside of the cover with alcohol wipes.
3) Clean fingerprints off the touchscreen with a soft, clean, dry cloth.

4 Perform Final Tests

After completing preventive maintenance, follow these steps to test the device and restore it to its original state:

1) Re-connect the power and network cables.

2) Re-attach any security hardware.

3) Re-install consumables.

4) Close all open doors.

5) Power up the device.

6) Re-synchronize the image printer ribbon.

7) Create a sample card using customer card stock.

8) Check image print quality and embosser alignment, and adjust components as necessary.

9) Fill out the checklist included with the preventive maintenance kit, and return it and the tipper heater to MagTek.

NOTICE
Ensure any unused materials from the kit are personally handed off to a branch representative – most importantly, any used or unused print ribbons or embossing foils.