

# LEXMARK® MS/MX SERIES

## TONER & DRUM CARTRIDGE REMANUFACTURING INSTRUCTIONS



LEXMARK MS/MX TONER & DRUM UNIT

# REMANUFACTURING THE LEXMARK MS/MX SERIES TONER & DRUM CARTRIDGES

**By Mike Josiah and the Technical Staff at UniNet**

First introduced in October 2012, the Lexmark MS/MX series is based on a new 35-70 ppm (depending on the model) Lexmark 1200 dpi engine. These engines for the first time in their larger printers use a two-cartridge system. The toner hopper is basically a tube with a chip. The drum unit contains the drum, waste chamber, developer roller, PCR, wiper blade, and doctor blade. The basic design is similar to the T650 all-in-one cartridge, but is broken into two cartridges.

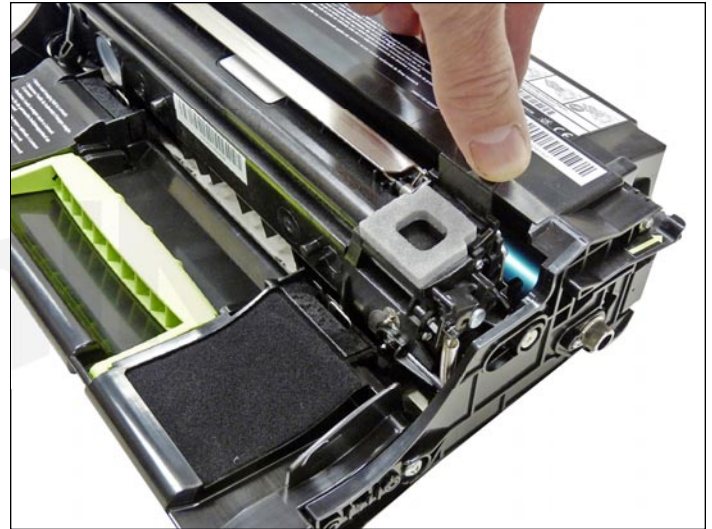
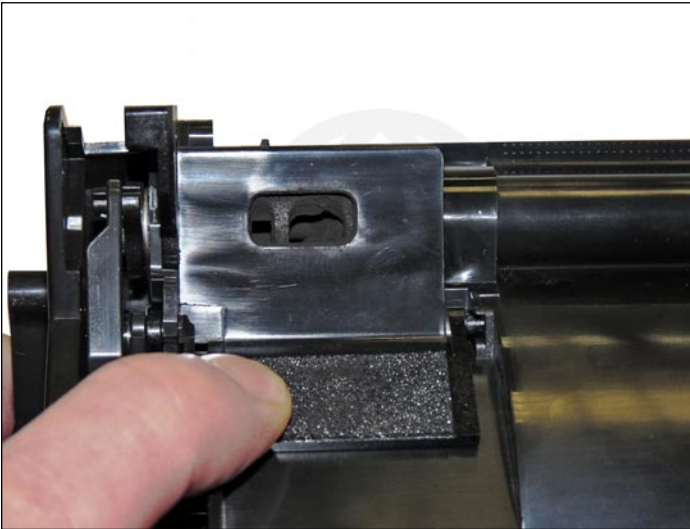
Due to the speed, fuser characteristics and transfer efficiency, the toner is completely different and unique to this series. When choosing a toner for these machines make sure the transfer efficiency is high so the waste does not overflow. If your replacement toner runs at more than 2.5g of waste per 1,000 pages, you run the risk of overflowing the drum unit waste hopper. The smaller drum unit can hold up to 160g of waste toner and the larger drum unit can hold up to 220g. OEM and UniNet X Generation® toners run at less than 1.5g per 1,000 pages.

Lexmark calls their new toner system "Unison." This toner has a lower melting point (thus saving energy on fusing temperatures), a high-transfer efficiency, and a "shake-free" design for the toner cartridge.



There are quite a few machines based on these engines and also quite a few cartridges. Lexmark made this cartridge as complicated as they could. Basically there are physically two different toner cartridges and two different drum units. The MS/MX 310, 410, 510 and 610 series all use the smaller toner cartridge and drum unit. The MS/MX 710, 711, 810, 812 series all use the larger toner cartridge and drum units.





The toner cartridges feed the toner to the drum units through a small toner port.

The drum units are either rated for 60,000 pages (small version) or 100,000 pages (large version).

With drum units selling new for as low as \$45.00USD, there is not much demand for remanufacturing them. That being said, if you're selling MICR toner cartridges, you must also supply MICR drum units. Both types of drum units come pre-charged with toner so you need to know how to take a new drum unit and clean it out. When rebuilding them it's important to put in 50-60g of toner so they are pre-charged properly. Because of that we have included the instructions for both cartridges here. The toner cartridges as stated above are basically a tube with a chip. They are very easy to remanufacture, and have very high profit margins.

#### MACHINES CURRENTLY AVAILABLE BASED ON THE LEXMARK MS/MX ENGINE

<b>MS310 Series: MS310d, 310dn</b>	<b>(35 ppm)</b>
<b>MS410 Series: MS410d, 410dn</b>	<b>(40 ppm)</b>
<b>MS510 Series: MS510d, 510dn</b>	<b>(45 ppm)</b>
<b>MS610 Series: MS610dn, 610de, 610dte, 610dtn</b>	<b>(50 ppm)</b>
<b>MS710 Series: MS710d, 710dn</b>	<b>(50 ppm)</b>
<b>MS711 Series: MS711d, 711dn</b>	<b>(55 ppm)</b>
<b>MS810 Series: MS810d, 810de, 810dtn, 810dtv</b>	<b>(55 ppm)</b>
<b>MS811 Series: MS811n, 811dn, 811dtn</b>	<b>(63 ppm)</b>
<b>MS812 Series: MS812de, 812dn, 812dtn</b>	<b>(70 ppm)</b>
<b>MX310 Series: MX310d, 310dn</b>	<b>(35 ppm)</b>
<b>MX410 Series: MX410de</b>	<b>(40 ppm)</b>
<b>MX510 Series: MX510dhe, 510dthe</b>	<b>(45 ppm)</b>
<b>MX610 Series: MX610de</b>	<b>(50 ppm)</b>
<b>MX611 Series: MX611de, 611dhe, 611dte</b>	<b>(50 ppm)</b>
<b>MX710 Series: MX710de</b>	<b>(63 ppm)</b>
<b>MX711 Series: MX711de, 711dhe, 711dthe</b>	<b>(70 ppm)</b>
<b>MX810 Series: MX810de, 810dfe, 810dme, 810dte, 810dtfe, 810dtme, 810dxe, 810dxfe, 810dxme</b>	<b>(55 ppm)</b>
<b>MX811 Series: MX811de, 811dfe, 811dme, 811dte, 811dtfe, 811dtme, 811dxe, 811dxfe, 811dxme</b>	<b>(63 ppm)</b>
<b>MX812 Series: MX812de, 812dfe, 812dme, 812dte, 812dtfe, 812dtme, 812dxe, 812dxfe, 812dxme</b>	<b>(70 ppm)</b>

The following Lexmark machines (1145 & 3150) were released in 10/2012 but there is little to no information on the Lexmark website for them. They use the MS/MX style cartridges, but the chips will be different...

#### **LEXMARK 1145 & 3150**

**M1145/XM1145**

**(45 ppm)**

**M3150/XM3150**

**(50 ppm)**

#### **DELL VERSIONS**

**B2360 Series: B2360d, 2360dn**

**B3460 Series: B3460dn**

**B3465 Series: B3465dnf**

**B5460 Series: B5460dn**

**B5465 series: B5465dnf**

#### **KONICA MINOLTA VERSIONS**

**Bizhub 3300P**

**Bizhub 3320**

**Bizhub 4000P**

**Bizhub 4020**

**Bizhub 4050**

**Bizhub 4700P**

**Bizhub 4750**

#### **SOURCE TECHNOLOGIES VERSIONS (MICR)**

**ST9712**

**ST9720**

**ST9722**

**ST9730**

As with all Lexmark cartridges, the "Return Program" cartridges have killer-type chips installed that will not allow the cartridge to be used again until the chipboard is replaced. The standard cartridges will work without replacing the chips. Replacement chips are available for the toner cartridges. If drum unit chips are ever developed, it remains to be seen.

Lexmark has also released cartridges for different areas of the world. The Americas are one region; Europe, the Middle East and Africa are another (EMEA); Latin America, and the Asia Pacific region is the last. As in the past, the only difference in the cartridges besides the part numbers is the chips.

In the smaller series, a "starter" or low yield cartridge can be made into a high yield (20K) if the machine accepts that yield. The same goes for the larger toner cartridges. They can be made into a 45K cartridge but the machine must accept that yield.

There are quite a few different cartridges, all with different chips. They are all included below in the least confusing way. The Americas Lexmark part numbers for these cartridges are as follows...

### SMALL MS SERIES CARTRIDGES

"Return Program" 1.5K* toner cartridge: (501) 50F1000	List \$64.99**	MS 310/410/510/610
"Return Program" 5K* toner cartridge: (501H) 50F1H00	List \$149.99**	MS 310/410/510/610
"Return Program" 10K* toner cartridge: (501X) 50F1X00	List \$225.99**	MS 410/510/610
"Return Program" 20K* toner cartridge: (501U) 50F1U00	List \$330.99**	MS 510/610
"Return Program" 60K* drum cartridge: (500Z) 50F0Z00A	List \$44.99**	All 300/400/500/600 MS/MX machines
Standard 5K* cartridge: (500HA) 50F0HA0	List \$195.99**	MS 310/410/510/610
Standard 10K* cartridge: (500XA) 50F0XA0	List \$271.99**	MS 410/510/610
Standard 20K* cartridge: (500UA) 50F0UA0	List \$377.99**	MS 510/610
Standard 60K* drum cartridge: (500ZA) 50F0ZA0	List \$70.99**	All 300/400/500/600 MS/MX machines

### LARGE MS SERIES CARTRIDGES

"Return Program" 6K* toner cartridge: (521) 52D1000	List \$141.99**	MS 710/711/810/811/812
"Return Program" 25K* toner cartridge: (521H) 52D1H00	List \$419.99**	MS 810/811/812
"Return Program" 45K* toner cartridge: (521X) 52D1X00	List \$519.99**	MS 410/510/610
"Return Program" 100K* drum cartridge: (520Z) 50F0Z00A	List \$47.99**	All 710/711/810/811/812 MS/MX machines
Standard 25K* cartridge: (520HA) 52D0HA0	List \$496.99**	MS 810/811/812
Standard 45K* cartridge: (520UA) 52D0XA0	List \$596.99**	MS 811/812
Standard 100K* drum cartridge: (520ZA) 52D0ZA0	List \$73.99**	All 710/711/810/811/812 MS/MX machines

### SMALL MX SERIES CARTRIDGES

"Return Program" 2.5K* toner cartridge: (601) 60F1000	List \$89.99**	MX310/410/510/511/610/611
"Return Program" 10K* toner cartridge: (601H) 60F1H00	List \$149.99**	MX310/410/510/511/610/611
"Return Program" 20K* toner cartridge: (601X) 60F1X00	List \$330.99**	MX510/511/610/611
"Return Program" 60K* drum cartridge: (500Z) 50F0Z00A	List \$44.99**	All 300/400/500/600 MS/MX machines
Standard 10K* cartridge: (600HA) 60F0HA0	List \$294.99**	MX310/410
Standard 20K* cartridge: (600XA) 60F0XA0	List \$399.99**	MX510/511/610/611
Standard 60K* drum cartridge: (500ZA) 50F0ZA0	List \$70.99**	All 300/400/500/600 MS/MX machines

### LARGE MX SERIES CARTRIDGES

"Return Program" 6K* toner cartridge: (621) 62D1000	List \$141.99**	MX710/711/810/811/812
"Return Program" 25K* toner cartridge: (621H) 62D1H00	List \$331.99**	MX710/711/810/811/812
"Return Program" 45K* toner cartridge: (621X) 62D1X00	List \$519.99**	MX711/810/811/812
"Return Program" 100K* drum cartridge: (520Z) 50F0Z00A	List \$47.99**	All 710/711/810/811/812 MS/MX machines
Standard 25K* cartridge: (620HA) 62D0HA0	List \$409.99**	MX710
Standard 45K* cartridge: (620XA) 62D0XA0	List \$596.99**	MX711/810/811/812
Standard 100K* drum cartridge: (520ZA) 52D0ZA0	List \$73.99**	All 710/711/810/811/812 MS/MX machines

M1145/XM1145 toner: 24B6035; 16K	List \$184.63
M3150/XM3150 toner: 24B6186; 16K	List \$190.95
M1145/M3150 drum unit: 24B6040; 60K	List \$94.95

\*Yield based on ISO/IEC 19752. \*\*List prices (in U.S. American Dollars) current as of March 2014.

As you can see there are quite a few cartridges out there for these machines. Thankfully though as stated above there are only two physically different toner cartridges (small and large) and two physically different drum units (small and large). What you need to know is which machine your cartridge is going to be used in, and the required yield. By knowing that, you can choose the correct chip and toner load.

#### **REQUIRED TOOLS**

1. Toner approved vacuum
2. Small screwdriver (common style)
3. Phillips head screwdriver (#1)
4. Needle-nose pliers

#### **REQUIRED SUPPLIES**

1. Replacement Toner for Lexmark MS (use correct load for your chip)
2. Replacement Toner cartridge chip
3. Drum padding powder
4. Cotton Swabs
5. Isopropyl Alcohol
6. Cotton Pads

**NOTE:** For the purposes of these instructions we have used the small versions of the toner and drum cartridges. The larger versions are slightly different physically, but the same steps apply.



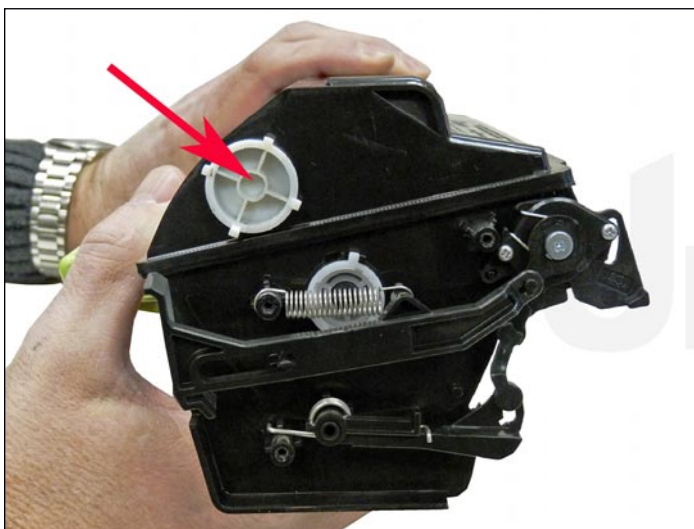
### TONER CARTRIDGE INSTRUCTIONS



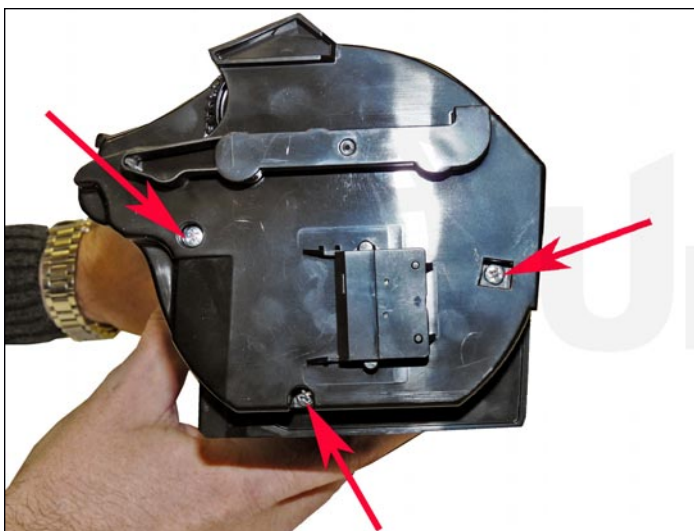
1. Remove the three screws on the right (gear) side end cap.

Remove the end cap.

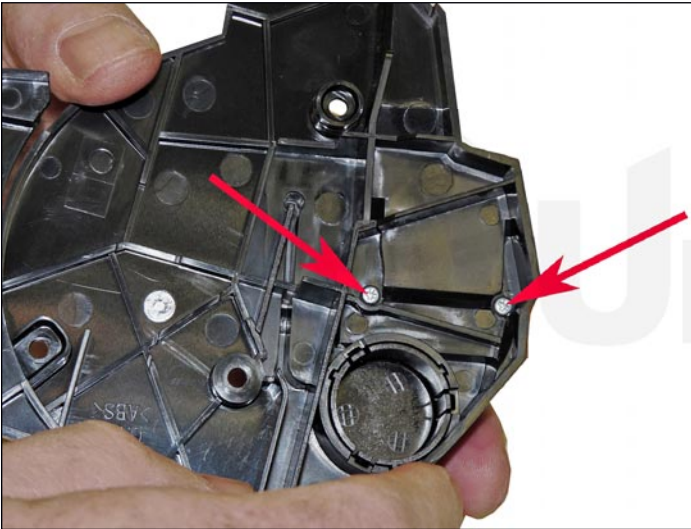




2. Remove the fill plug and clean out all remaining toner from the hopper. Be careful not to disturb the toner port mechanism.



3. For the **large toner cartridge only**: remove the three screws and end cap on the opposite side.



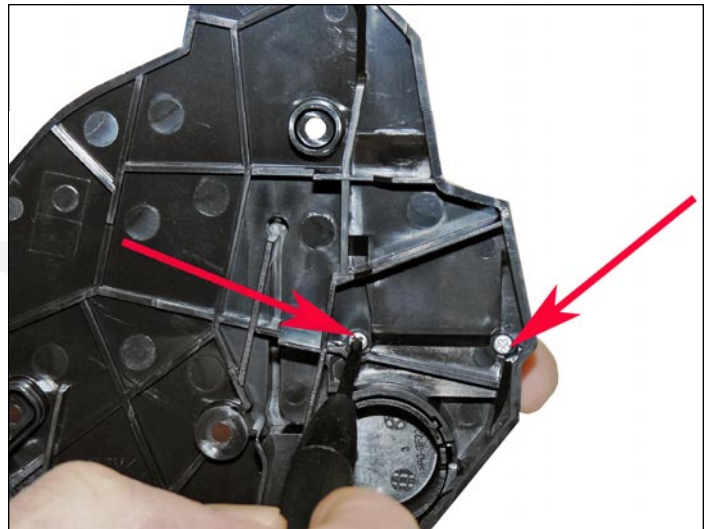
4. Remove the two small screws on the inside of the end cap.



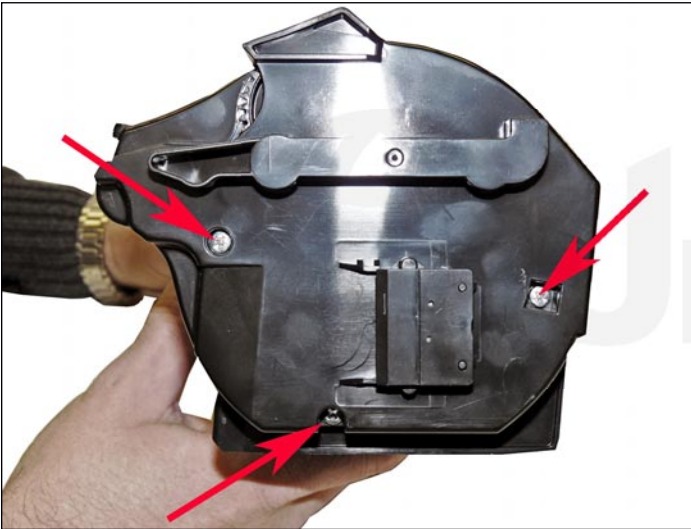
5. Remove chip holder and chip.



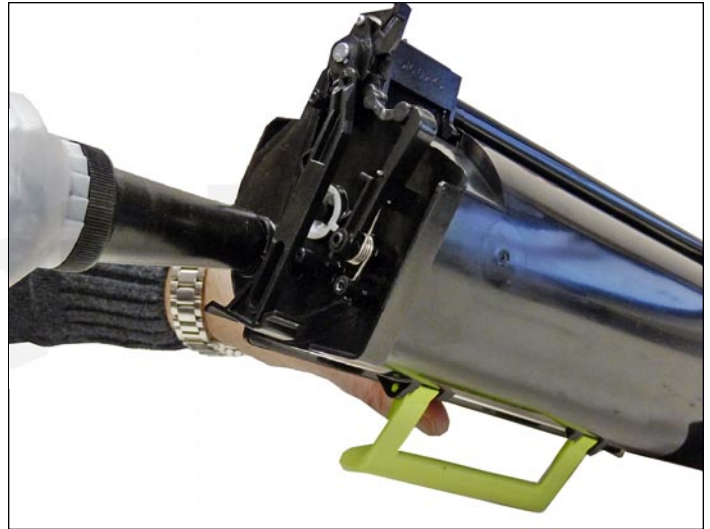
6. Replace the chip in the chip holder.



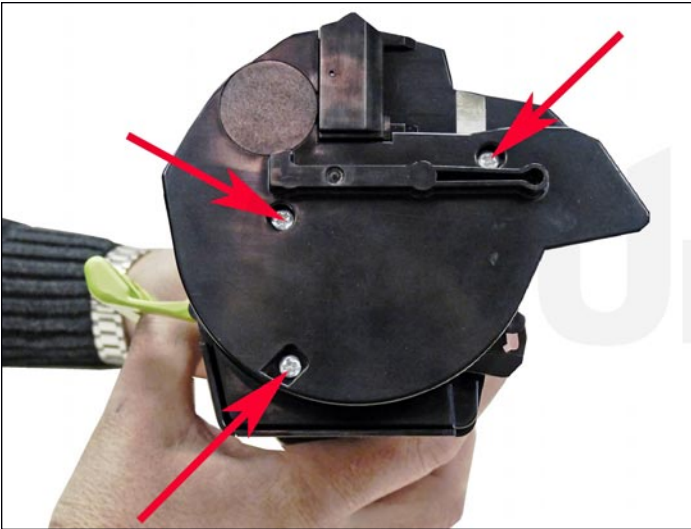
7. Install the chip holder and two screws.



8. On the **large cartridge**: install the chip, end cap, and three screws.



9. Fill the hopper with the appropriate toner load to match the chip you installed. Replace the fill plug.

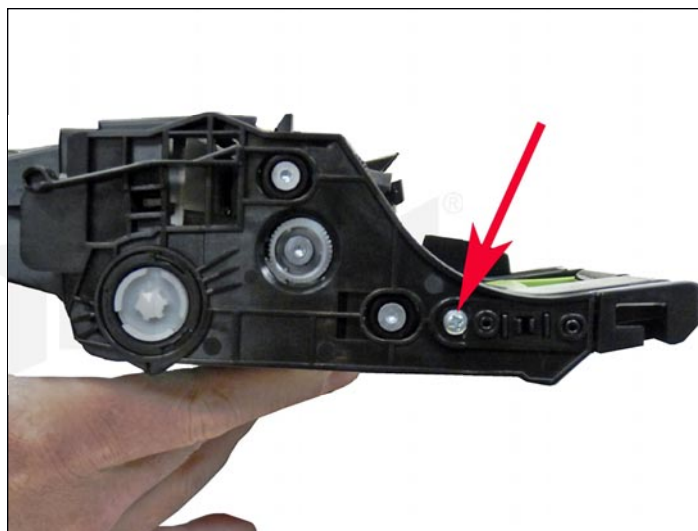
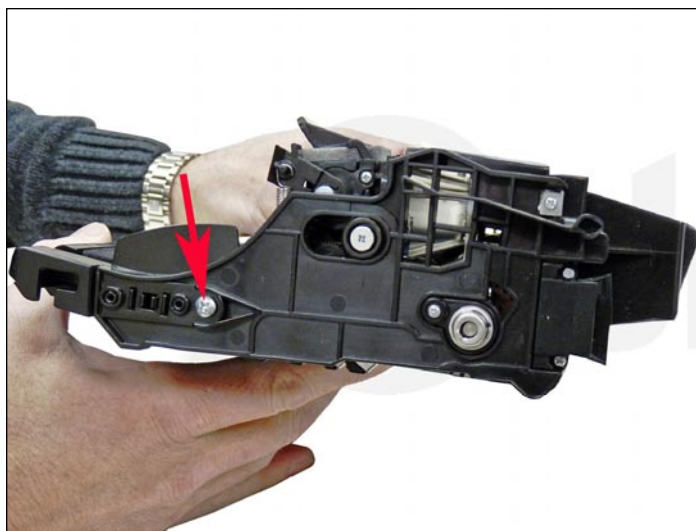


10. Install the end cap and three screws.





### OPC (DRUM) CARTRIDGE INSTRUCTIONS



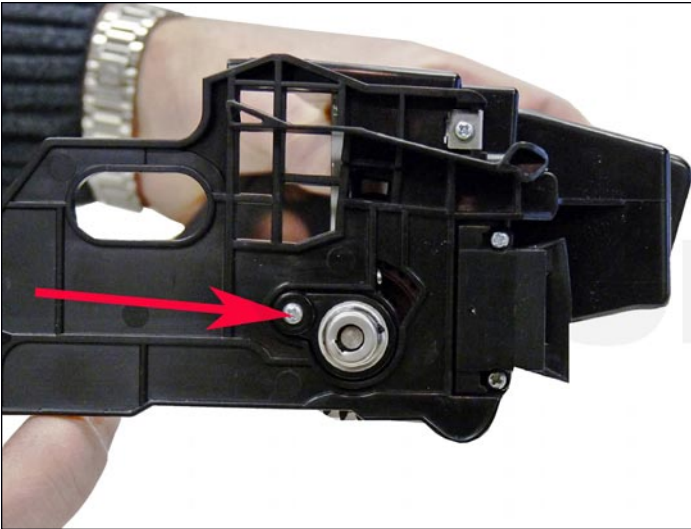
1. Remove the two screws from both sides of the handle.



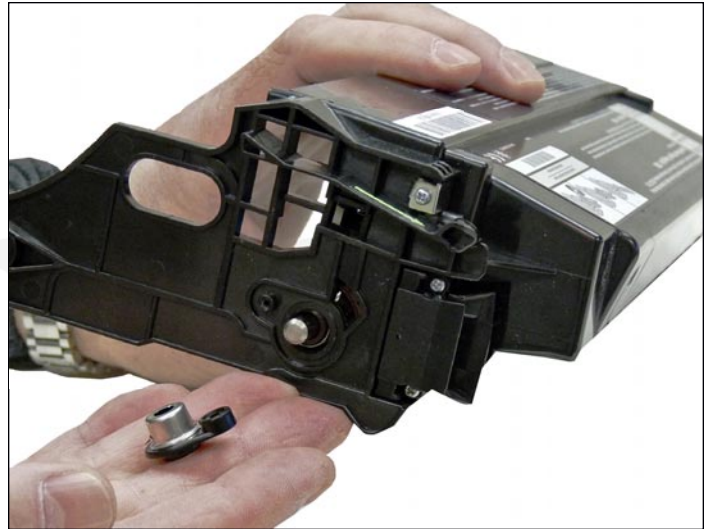
2. Pull the edge of the frame out slightly and remove the handle.



3. Remove the developer assembly.

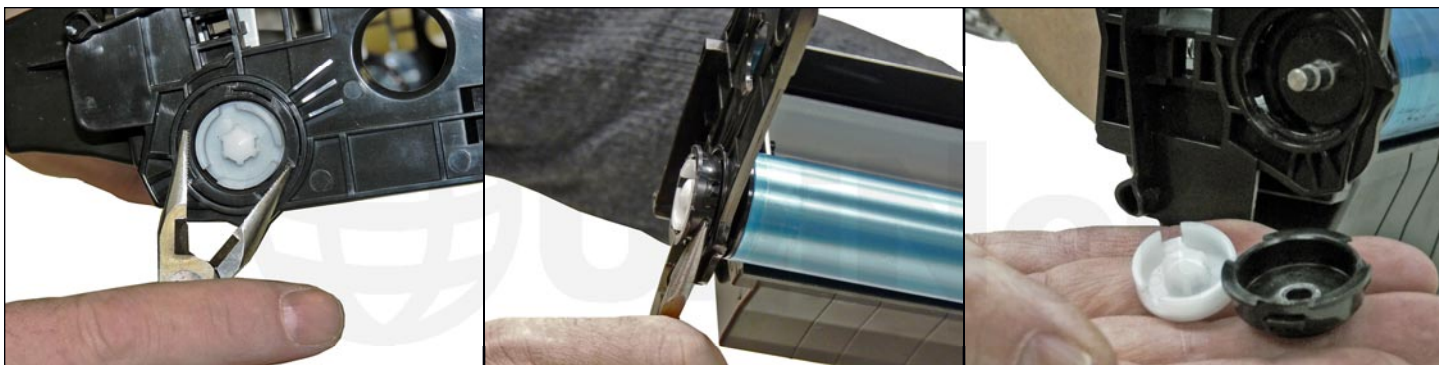


4. With a small Phillips jeweler's screwdriver, remove the drum axle pin screw.



5. Remove the axle pin.



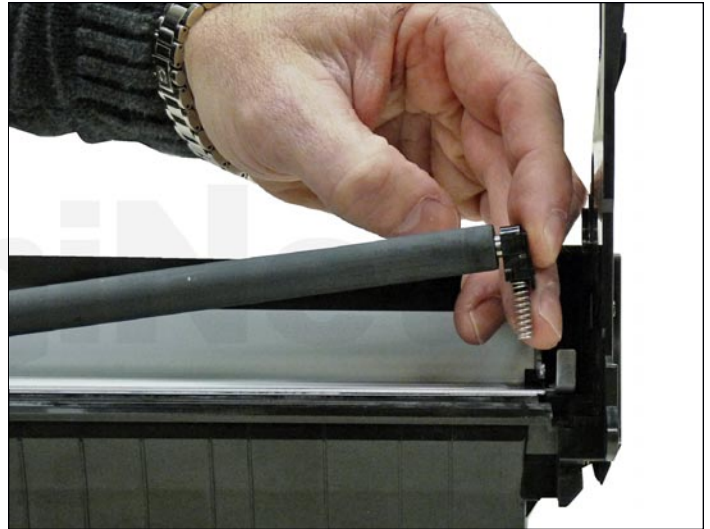


6. With a small pair of needle nose pliers, turn the locking ring until loose.

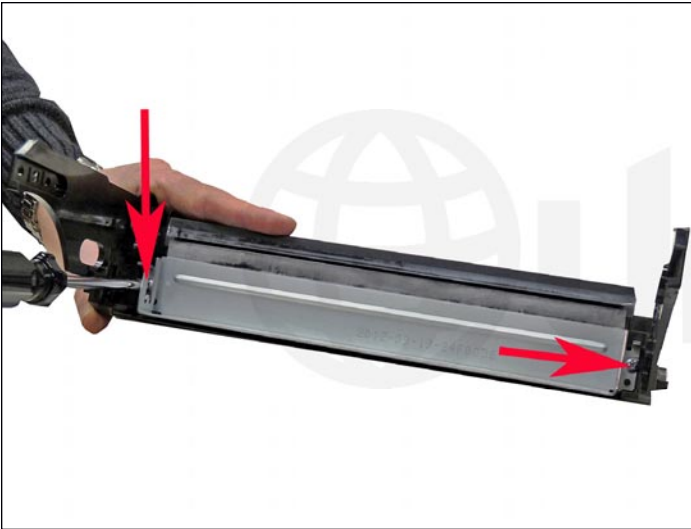
Pry the drive gear and ring from the drum axle shaft.



7. Remove the drum.

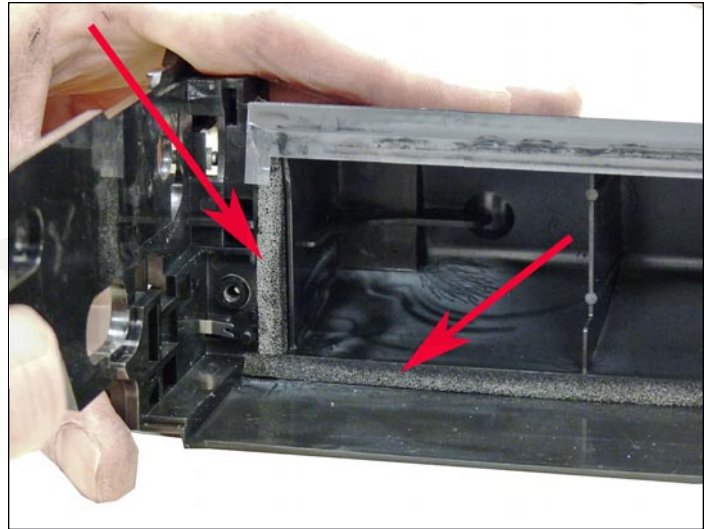


8. Remove the PCR and both PCR holders.



9. Remove the two screws and the wiper blade.

Clean out any toner from the waste chamber.



10. Clean the wiper blade sealing foam. Make sure the foam is not damaged during cleaning and that it is positioned in its proper location when done.



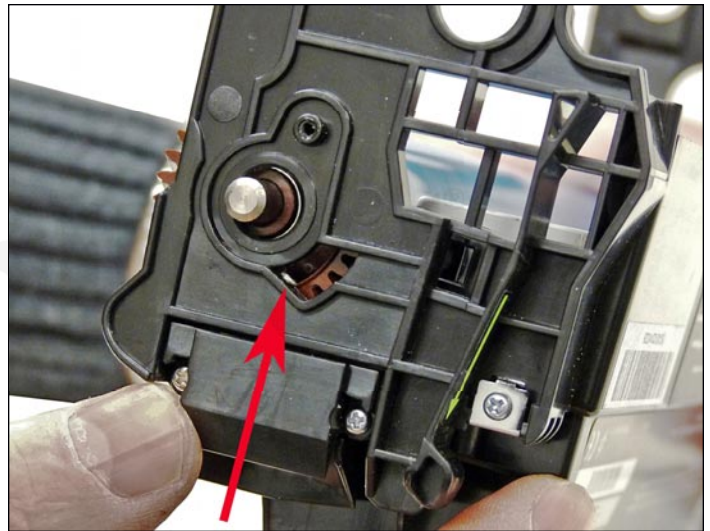
11. Pad the new wiper blade with your preferred wiper blade lubricant. Replace the blade and two screws into the cartridge.



12. Clean the PCR.

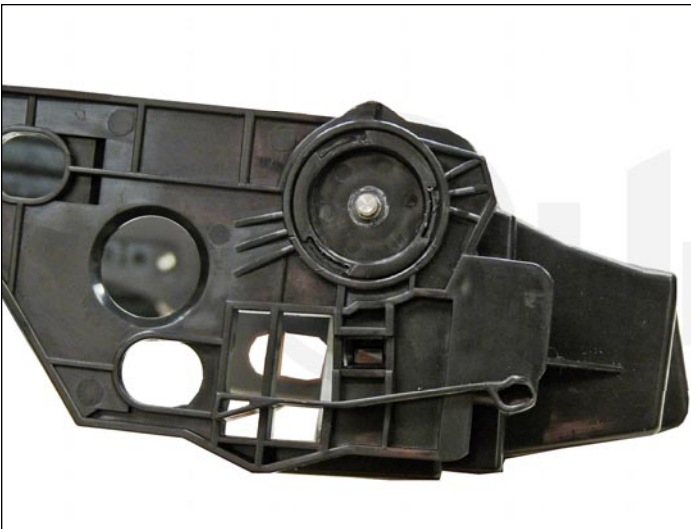
Install the two PCR holders, and then install the PCR.





13. Install the cleaned drum.

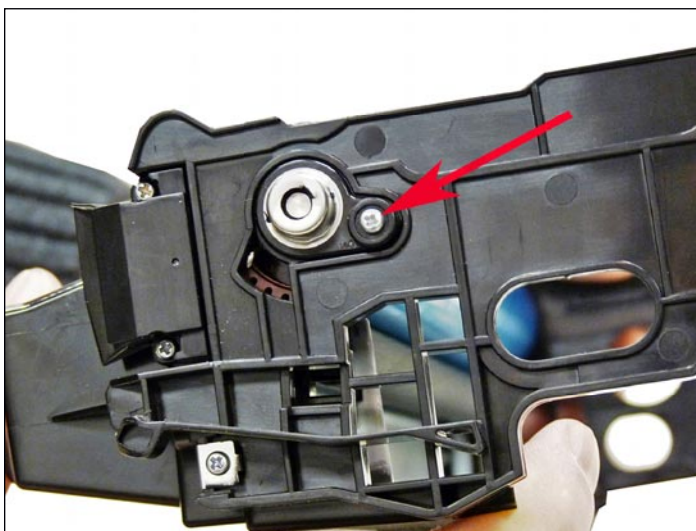
Place the spring on the drum axle so that it fits into the slot.



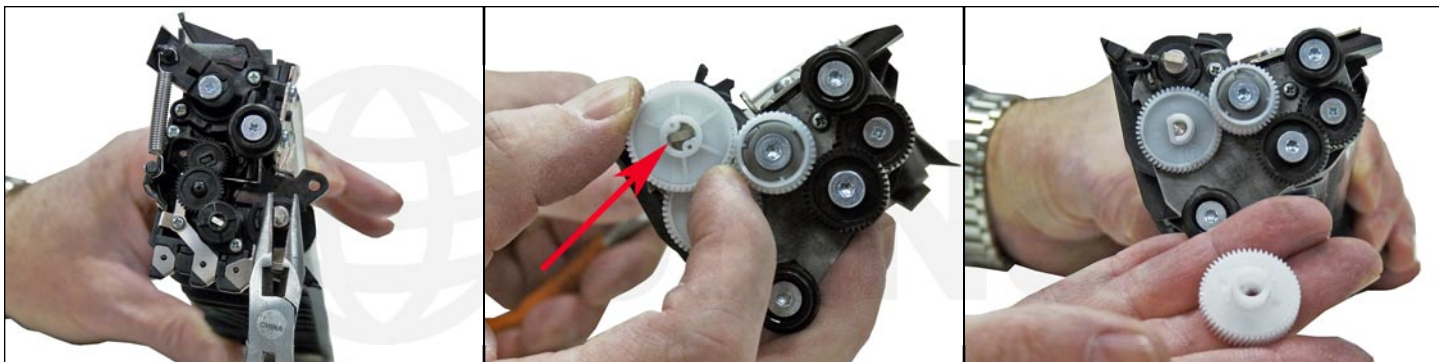
14. Press the locking ring onto the drum shaft and turn to lock.



15. Install the drum drive gear.



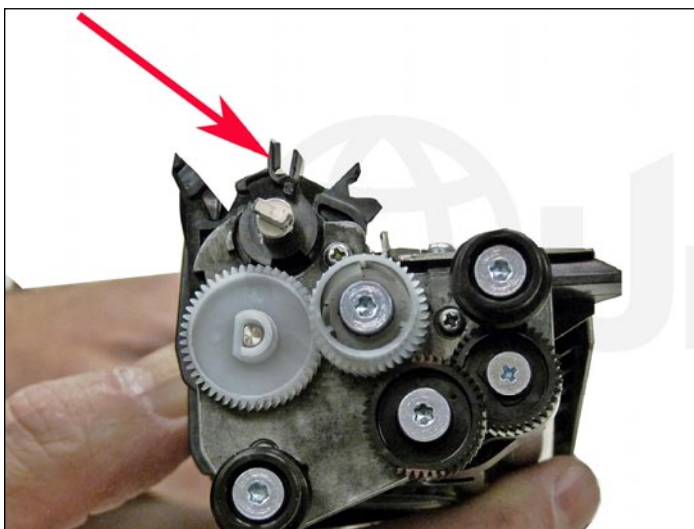
16. Install the drum axle pin and screw.



17. On the developer unit, grasp the keyed shaft of the developer roller with a pair of needle nose pliers.

Turn the opposite-side white gear, so that it unlocks. Remove the gear.





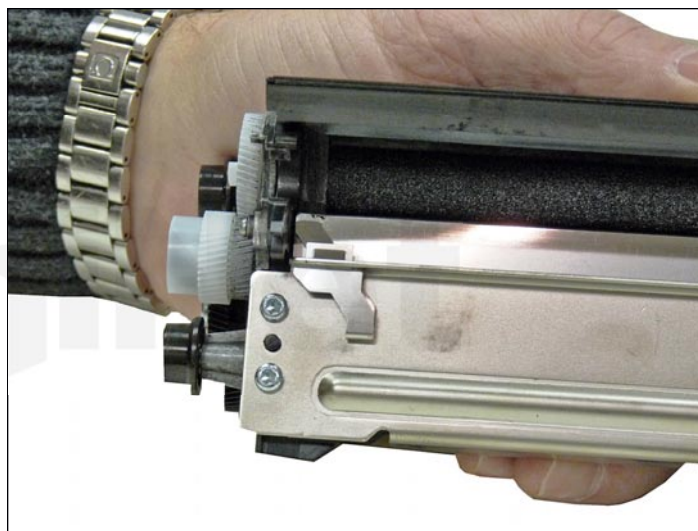
18. Turn up the lock on the gear side of the developer roller.

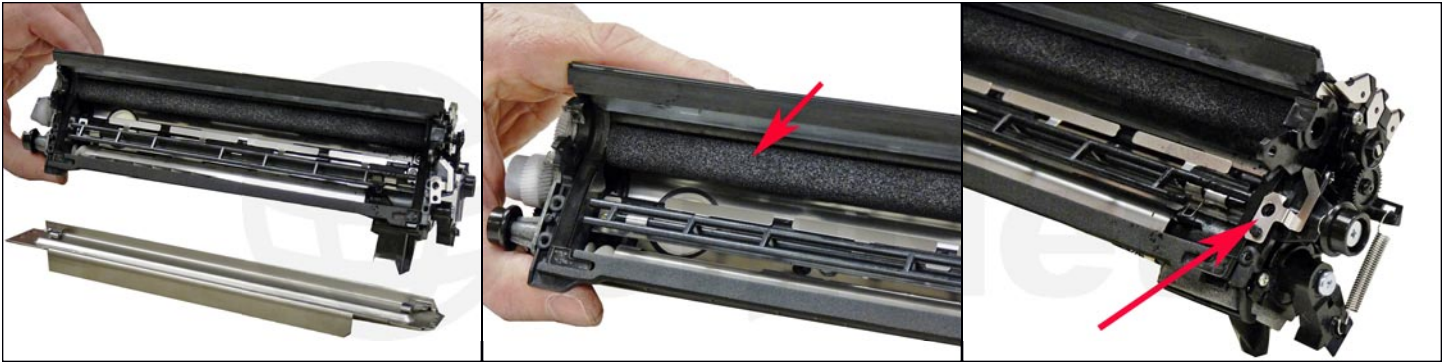


19. Remove the developer roller.



20. Using a size T-10 Torx screwdriver, remove the four screws from the doctor blade.

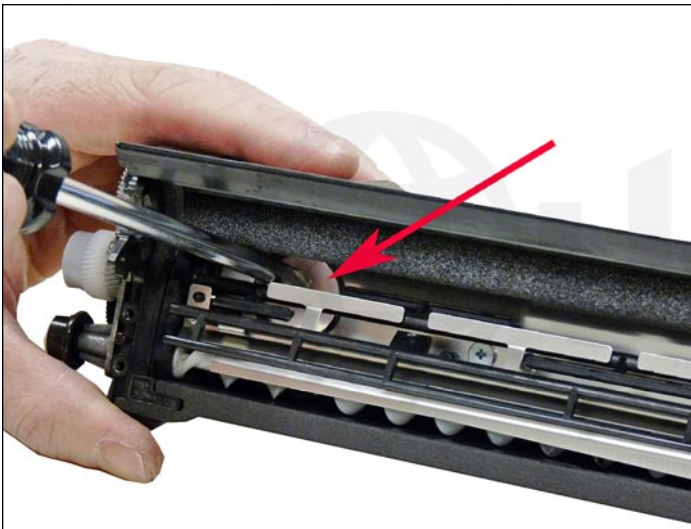




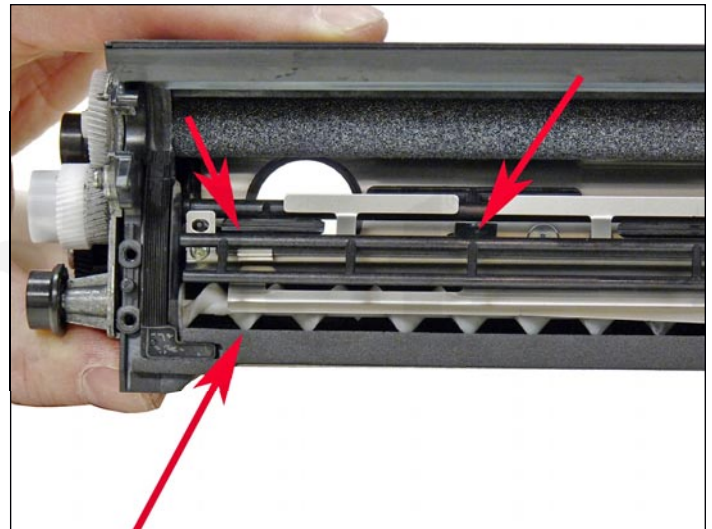
21. Remove the doctor blade.

Clean out the toner from the supply chamber and feed roller.

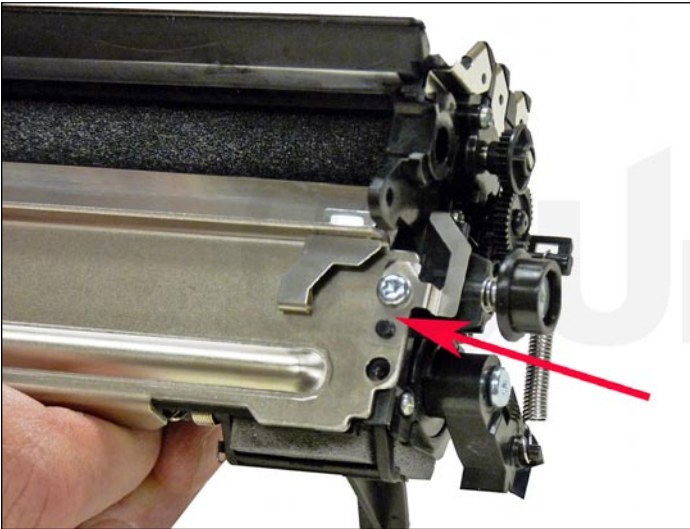
Be careful not to damage the feed roller or the two doctor blade contacts!



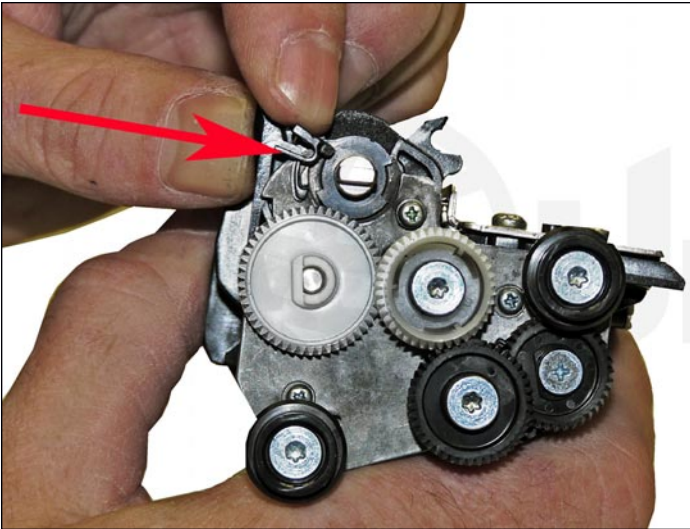
22. Press the fill plug out from the inside. Make sure all remaining toner has been removed from the chamber.



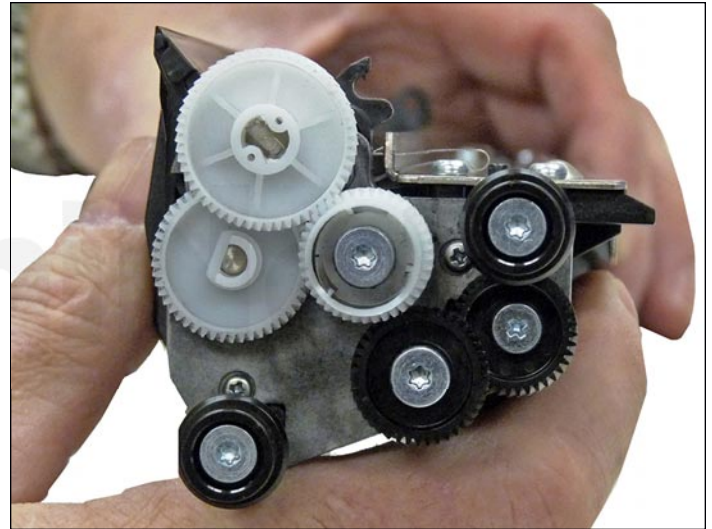
**NOTE:** Once clean, you can see how the toner is transported from the small feed hole through the entire developer unit. There is an auger system and mixing paddles that move the toner. If you want to see them work, hold the chamber so that the gears are on the left side. Turn the large white gear towards you.



23. Install the doctor blade and the four Torx screws. Make sure the contact on the right side (non-gear) is on top of the doctor blade, is screwed in place, and is making contact with the doctor blade.

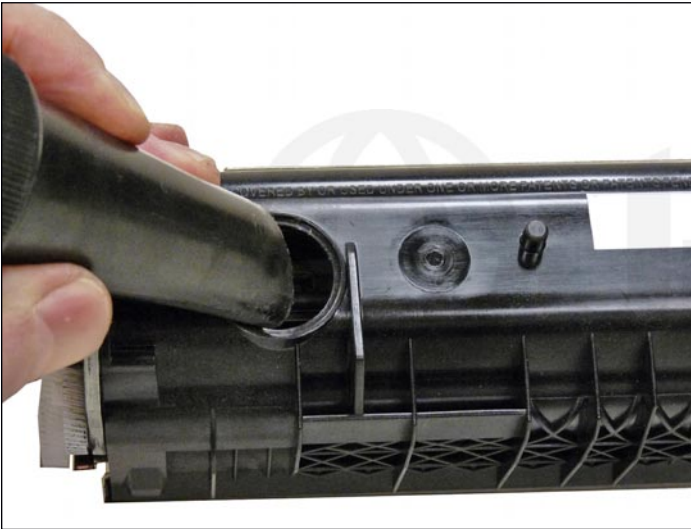


24. Clean the developer roller with a dedicated developer roller cleaner. (If used) install the developer roller, keyed end towards the gear side of the chamber. Turn the locking arm until it locks.

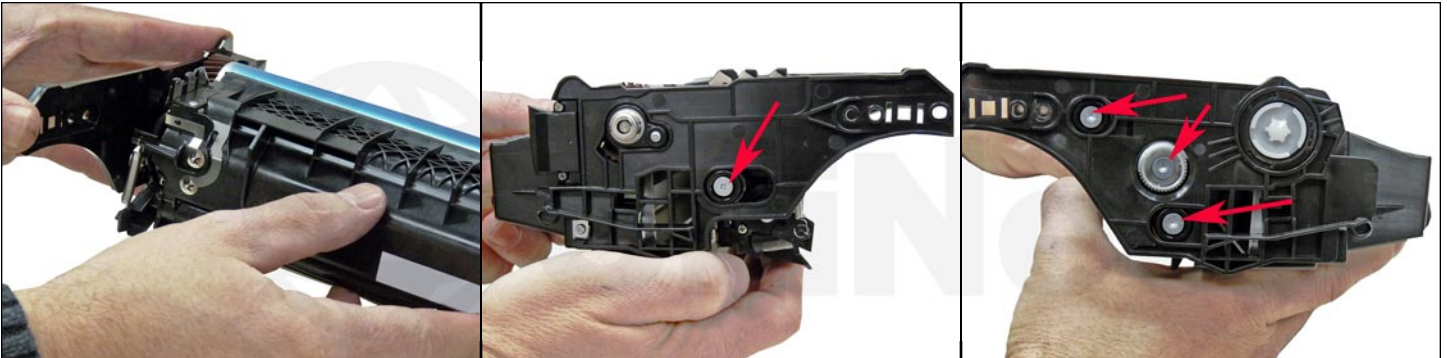


25. Press on the large white gear, using pliers on the opposite side of the developer roller. Turn the gear until locked.



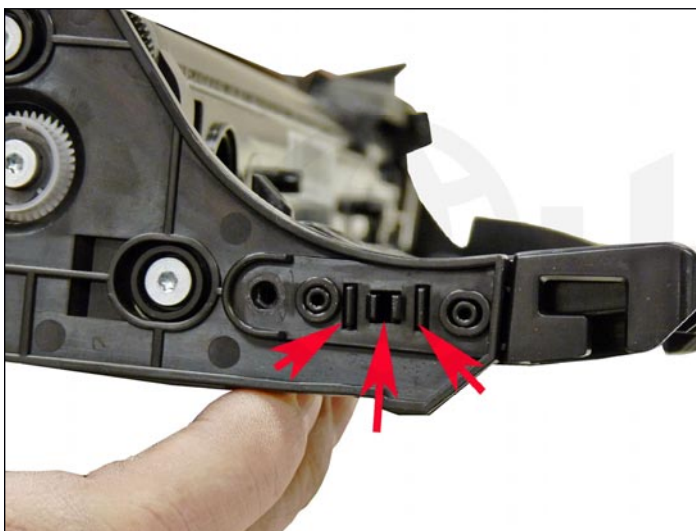


26. Fill the hopper with 50g of new replacement toner and replace the fill plug. If you are converting the drum unit to MICR, make sure you use the same MICR toner you are using for the toner cartridge!



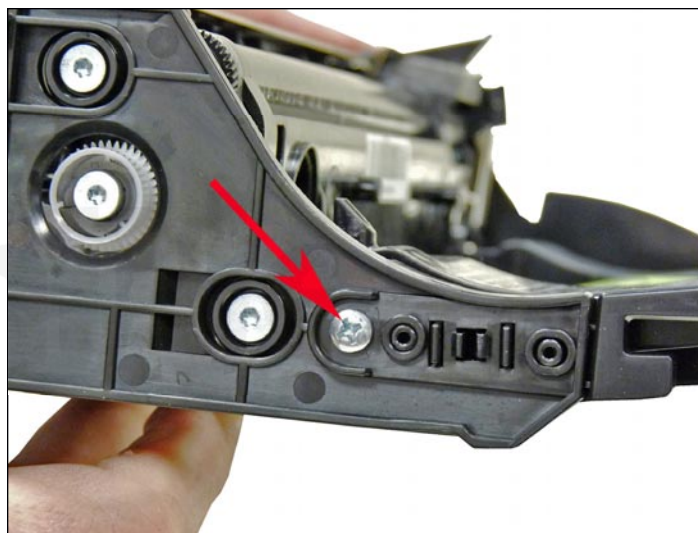
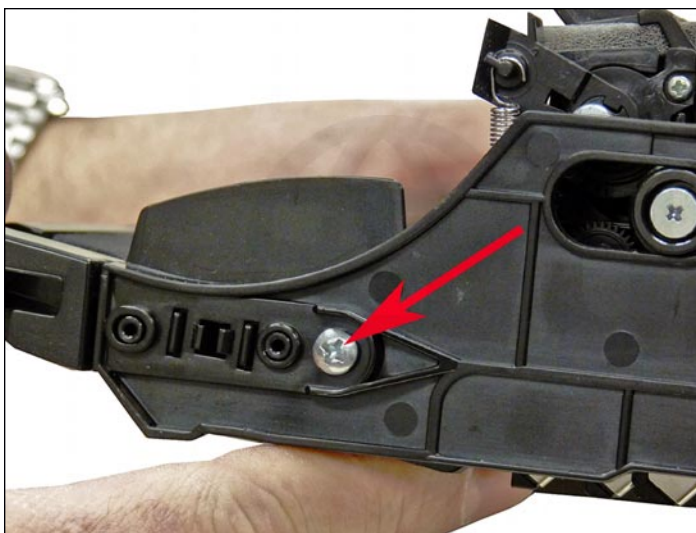
27. Hold the waste chamber walls out slightly and drop in the developer assembly.

Make sure the gears and bushings all fit in their slots properly.



28. Snap in the left side of the handle and then the right side.

Make sure the tabs lock!



29. Install the screws on each side of the handle.



**CARTRIDGE TROUBLESHOOTING****MS810 Cartridge Repetitive Defect Chart:**

<b>OPC drum:</b>	<b>96.8 mm</b>
<b>Developer roller:</b>	<b>47.8 mm</b>
<b>PCR:</b>	<b>28.5 mm</b>
<b>Upper fuser roller:</b>	<b>95.2 mm</b>
<b>Lower fuser roller:</b>	<b>94.25 mm</b>

**MS310 Cartridge Repetitive Defect Chart:**

<b>OPC drum:</b>	<b>97 mm</b>
<b>Developer roller:</b>	<b>47 mm</b>
<b>PCR:</b>	<b>38 mm</b>
<b>Upper fuser roller:</b>	<b>80 mm</b>
<b>Lower fuser roller:</b>	<b>80 mm</b>

**Machine Error Codes:**

Most of the error messages appear to be in text, and do not need an explanation. No numeric messages are listed in the user guide except for the following...

**42.xy = Cartridge region mismatch**

The **X** = the printer region, and the **Y** = the cartridge region. Both must match each other.

**Region Codes (see text at beginning of article):**

**0 = Global**

**1 = USA, Canada**

**2 = European economic Area (EEA) Switzerland region**

**3 = Asia Pacific, Australia, New Zealand region**

**4 = Latin America**

**5 = Africa, Middle East, rest of Europe**

**9 = Invalid region**

**TAKING TEST PRINTS****Printer Menu:**

1. Press the "MENU" key
2. Press the DOWN ARROW until "REPORTS" Shows on the display
3. Press the "Select" button"
4. Press the DOWN ARROW until the check mark is next to the page you wish to print
5. Press the "Select" button"
6. These pages include:
  - A. Menu Settings page
  - B. Device statistics
  - C. Network Setup page
  - D. Profiles List
  - E. Print Fonts
  - F. Print Directory
  - G. Asset report