

HP® ENTERPRISE 700 COLOR MFP M775 SERIES TONER CARTRIDGE REMANUFACTURING INSTRUCTIONS



HP CE340A (BLACK) TONER CARTRIDGE

REMANUFACTURING THE HP ENTERPRISE 700 COLOR MFP M775 SERIES BLACK AND COLOR TONER CARTRIDGES

By Mike Josiah and the Technical Staff at UniNet



First released in January 2013, the M775 series of color laser printers are based on a 30 ppm black and color Wide format (A3) 600 x 600 Dpi engine, 3600 DPI with RET. These are massive machines that can print copy scan and fax. The engine has a maximum duty cycle of 120,000 pages per month, comes standard with 1.5Gb RAM, and has an option to have paper trays that can hold up to 4,350 pages! In addition the also have ePrint and AirPrint mobile printing built-in.

The M775 cartridges are an all-in-one type cartridge that consists of the toner supply, drum, and waste chamber. They are similar to but different from the HP CP5225 cartridges. Like a most of the other high volume HP Color laser printers, the cartridges in this series do not fit into a pull out tray. All four cartridges are stacked in line front to back and fit directly into the printer. Note also that the drum faces up not down when placed in the printer. Because of this machine layout, we will take a moment and run through the printer theory before we get started.

These cartridges are basically rectangular-shaped that comes with a toner seal and a snap-on drum cover across the bottom to protect the drum (see above image). This cover also separates the developer roller from the drum so that when the cartridge is stored, the developer roller does not become flattened.

These printers also have a separate waste bottle to collect the waste toner from the image transfer belt or ITB.

In reading through the user manual, almost all parts that are field-replaceable must be replaced by the user if they fail while under warranty. This includes the usual items like the fuser, feed rollers etc, but in this series also includes items like the formatter, control panel and fax card. The last items come in replacement kits. That's a bit unusual but these parts are now more easily replaceable and it seems HP is trying to cut their costs.

PRINTERS BASED ON THE M775 ENGINE

HP LaserJet Enterprise 700 color MFP M775dn
HP LaserJet Enterprise 700 color MFP M775f
HP LaserJet Enterprise 700 color MFP M775z
HP LaserJet Enterprise 700 color MFP M775z+

CARTRIDGES USED IN THESE MACHINES

CE340A (black)	13,500 pages	\$171.99 List*
CE341A (cyan)	16,000 pages	\$432.99 List*
CE343A (magenta)	16,000 pages	\$432.99 List*
CE342A (yellow)	16,000 pages	\$432.99 List*
CE7980A (toner collection unit)		\$ 24.99 List*

*Pricing in U.S. American Dollars, current as of March 2013.

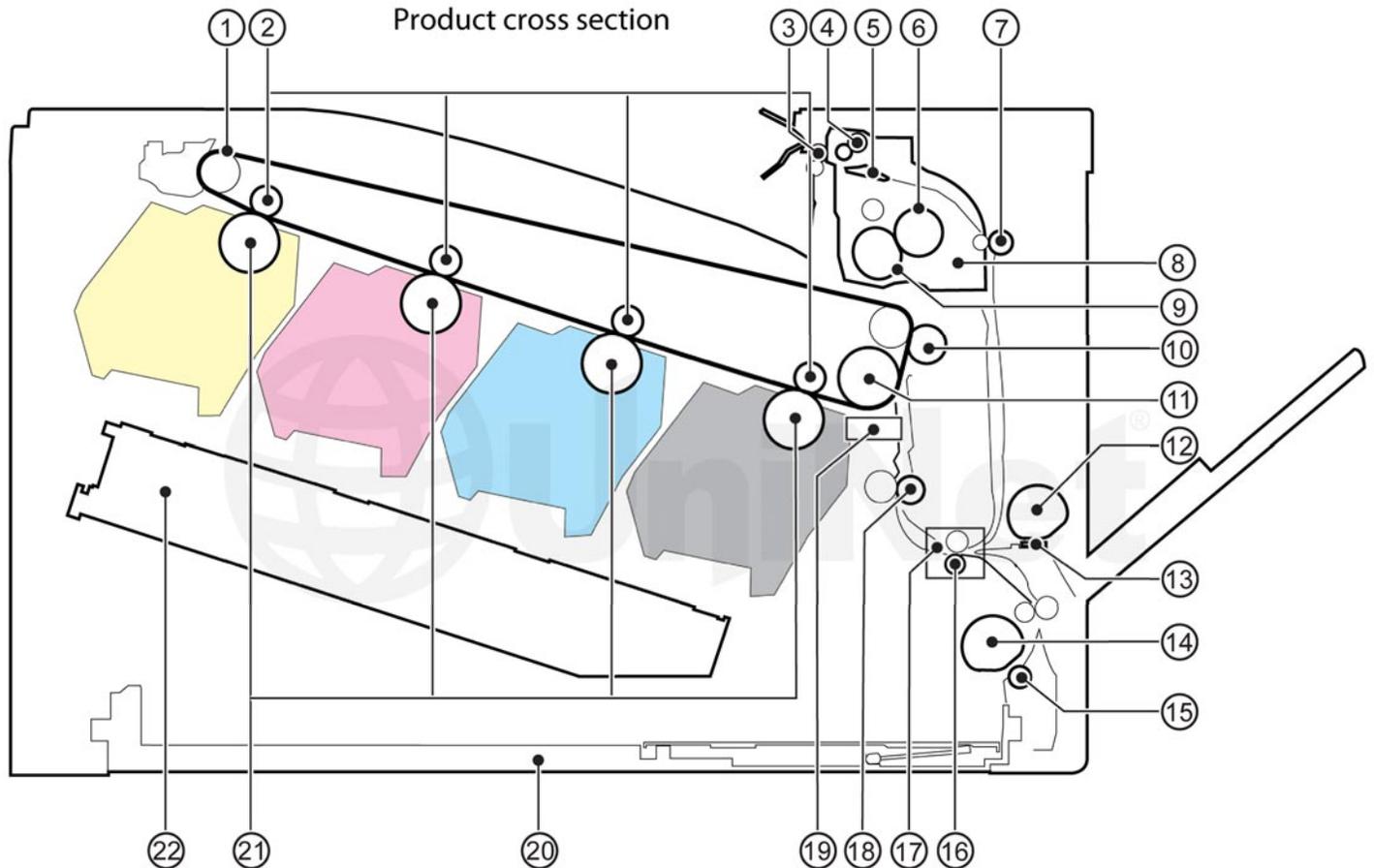
All the toner cartridges are considered part of the 651A series. For this series of machines full load cartridges come with the machines when new. No starter cartridges are used.

These cartridges use chips that need to be replaced each cycle.

HP M775 COLOR PRINTING THEORY

The color toner cartridge printing process happens in a series of stages or steps. For the purpose of this article, we will call them stages.

The following figure shows the basic layout of the cartridges and how they relate to one-another and the printer. The laser units are on the bottom, the cartridges are at an angle, and the ITB is on top...



Item Description

- 1. ITB**
- 2. Primary transfer roller**
- 3. Delivery roller**
- 4. Duplex reverse roller (duplex models only)**
- 5. Duplex flapper (duplex models only)**
- 6. Pressure roller**
- 7. Duplex feed roller (duplex models only)**
- 8. Fuser**
- 9. Fuser sleeve**
- 10. Secondary transfer roller**
- 11. ITB drive roller**

Item Description

- 12. MP tray pickup roller**
- 13. MP tray separation pad**
- 14. Cassette pickup roller**
- 15. Cassette separation roller**
- 16. Feed roller**
- 17. Media sensor**
- 18. Registration roller**
- 19. Registration density sensor**
- 20. Cassette**
- 21. Photosensitive drum**
- 22. Laser/scanner assembly**

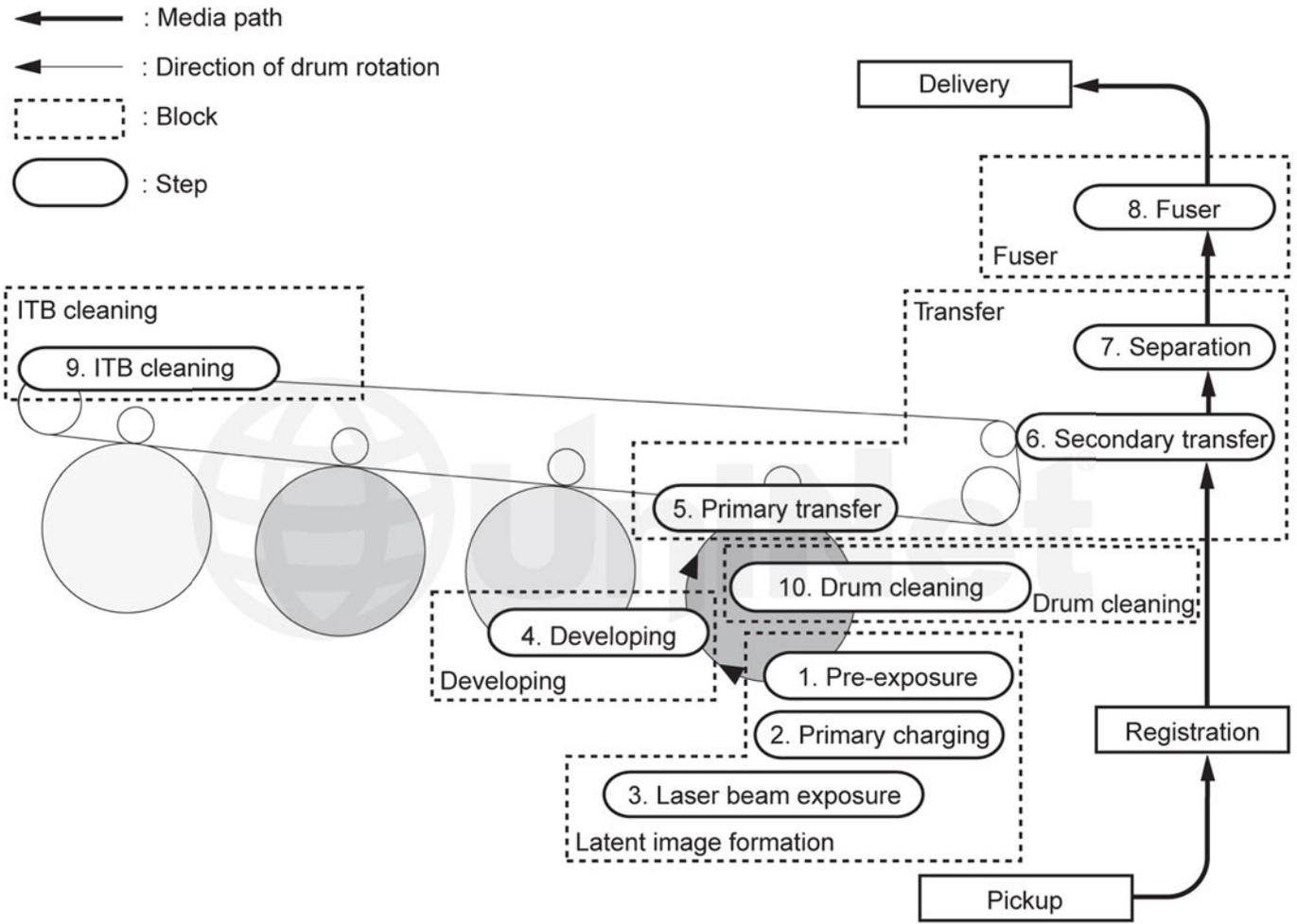
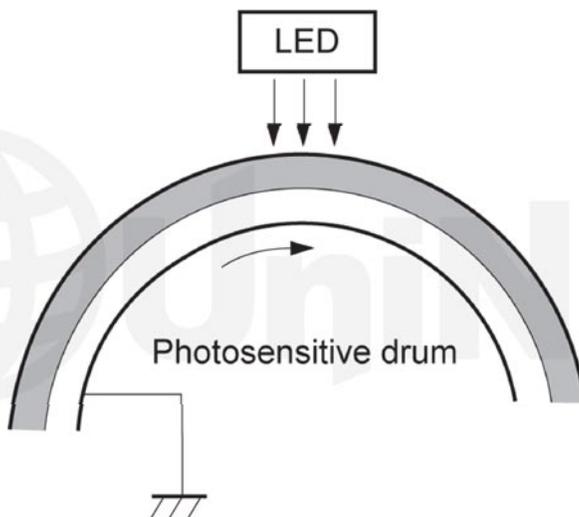
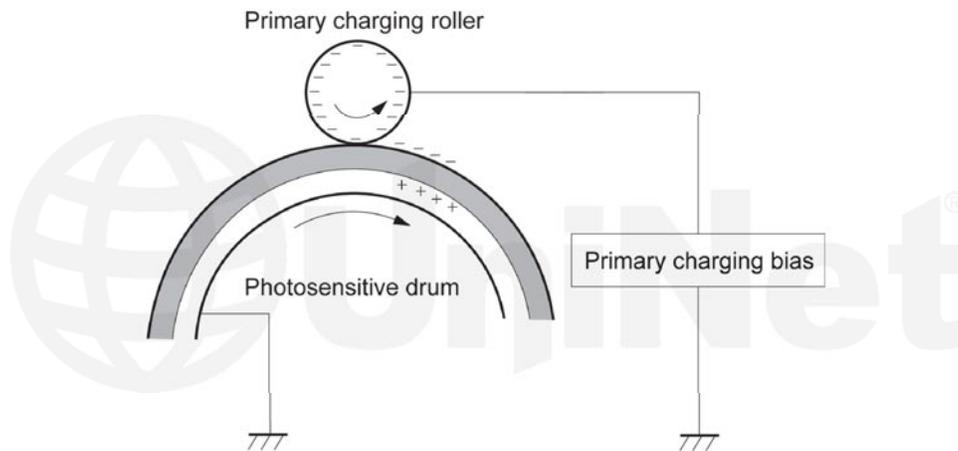


Figure shows the complete image formation process.

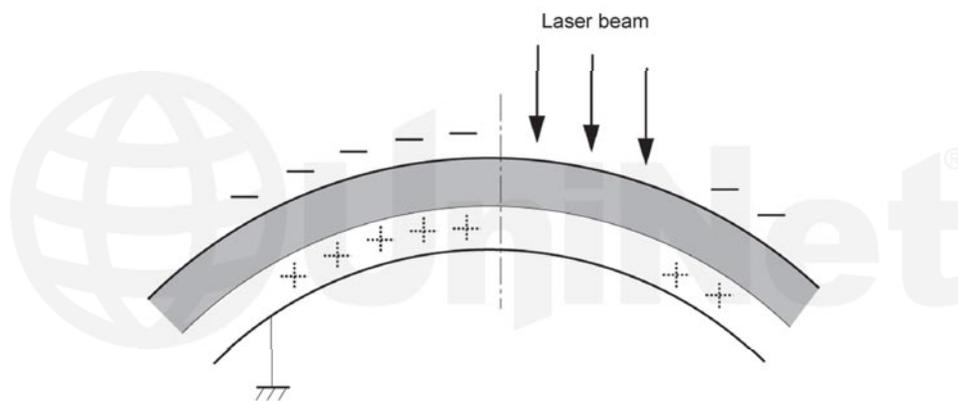


In the **first** stage, light from the pre-exposure LED strikes the drum to remove any residual charges from the drums surface.

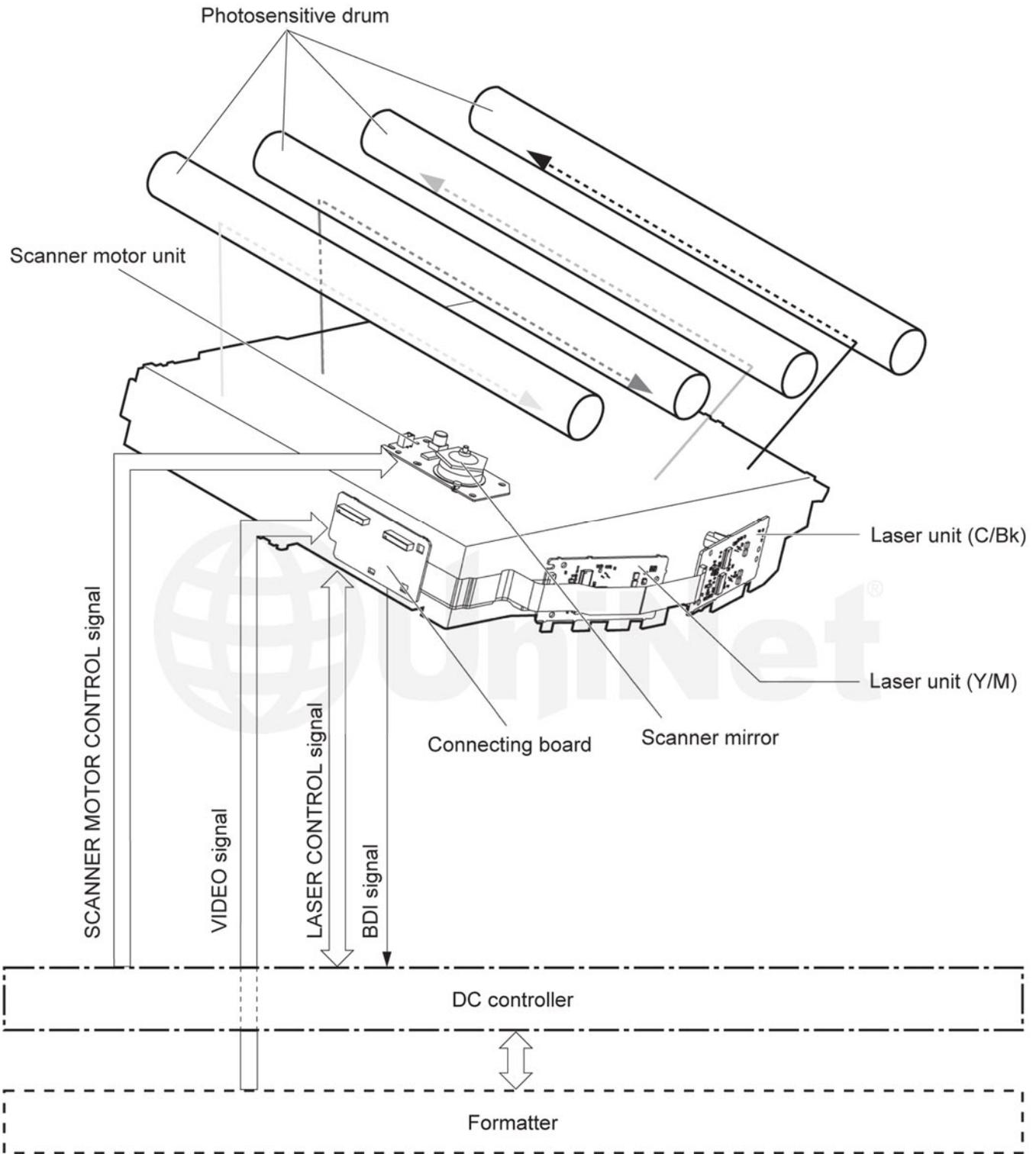


Then the primary charge roller (PCR) places a uniform negative DC voltage on the OPC drum surface.

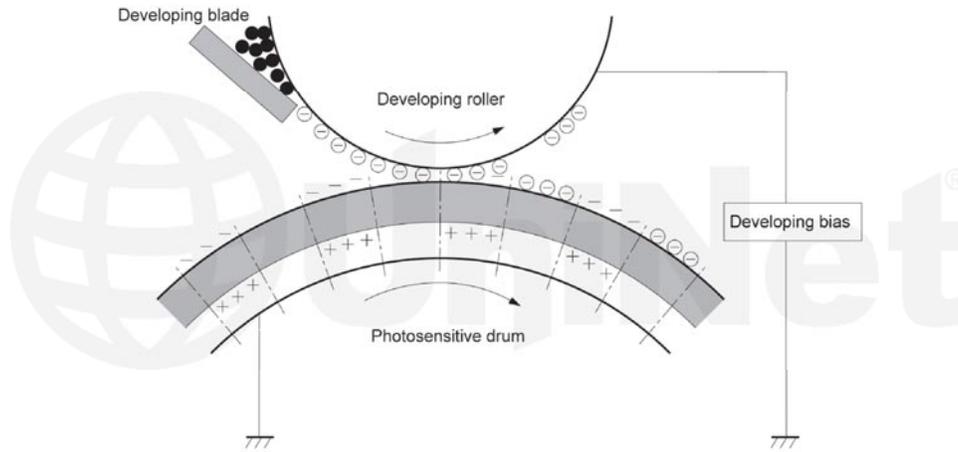
The amount of negative DC voltage placed on the drum is controlled by the printer's intensity setting.



In the **second** stage, a laser beam is fired onto a rotating mirror (called the scanner). As the mirror rotates, the beams are reflected into a set of focusing lenses. The beams then strike the drums surface, reducing the negative charge and leaving a latent electrostatic image on the drum. The areas where the lasers did not strike the drum will retain the higher negative charge.

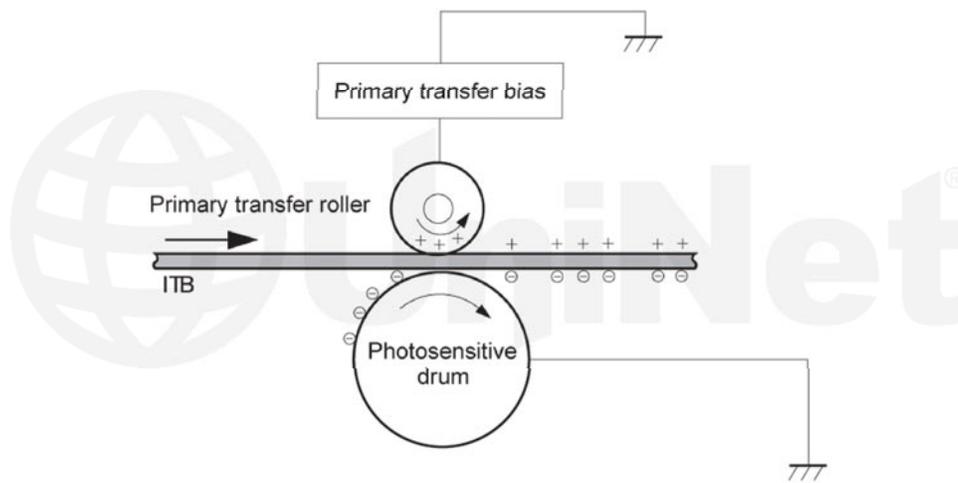


These machines have gone back to using just one laser/scanner unit for all four colors.

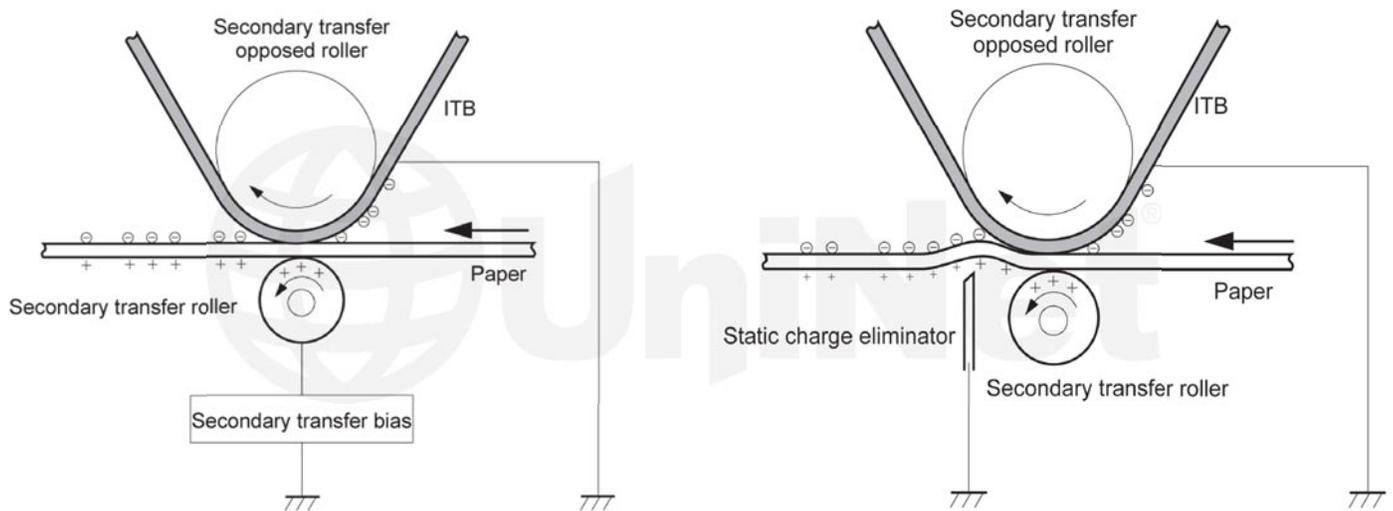


The **third** or developing stage is where the toner is developed on the drum by the developing section (or supply chamber), which contains the toner particles. The development stage is actually made up of two steps: toner charging, and the actual development. In the toner-charging stage, the toner-stirring blade turns inside the hopper. As it turns, friction causes a negative potential to develop on the toner. In addition, a foam feed-roller brings the toner to the developer roller and also places a negative charge on the toner. These two charges help ensure a uniform charge on the toner. Once the toner is properly charged, the toner will coat the developer roller. The toner is also held onto and attracted to the developer roller by another negative DC bias voltage. This voltage is controlled by the printer's intensity setting and causes either more or less toner to be attracted by the developer roller. This in turn will either increase or decrease the print density. The amount of toner on the developer roller is controlled by the doctor blade, which uses pressure to keep the amount of toner on the roller constant.

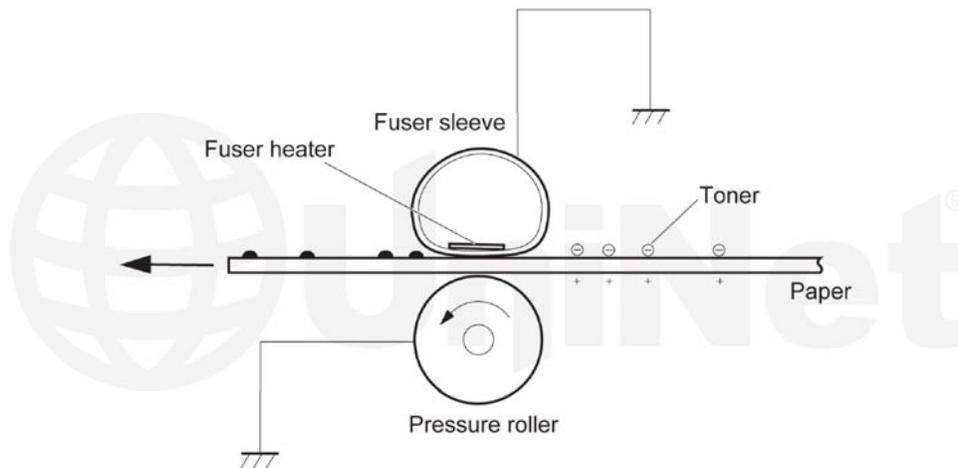
As the laser exposed areas of the OPC drum approach the developer roller, the toner particles are attracted to the drum's surface due to the opposite voltage potentials of the toner, and laser-exposed areas of the OPC drum.



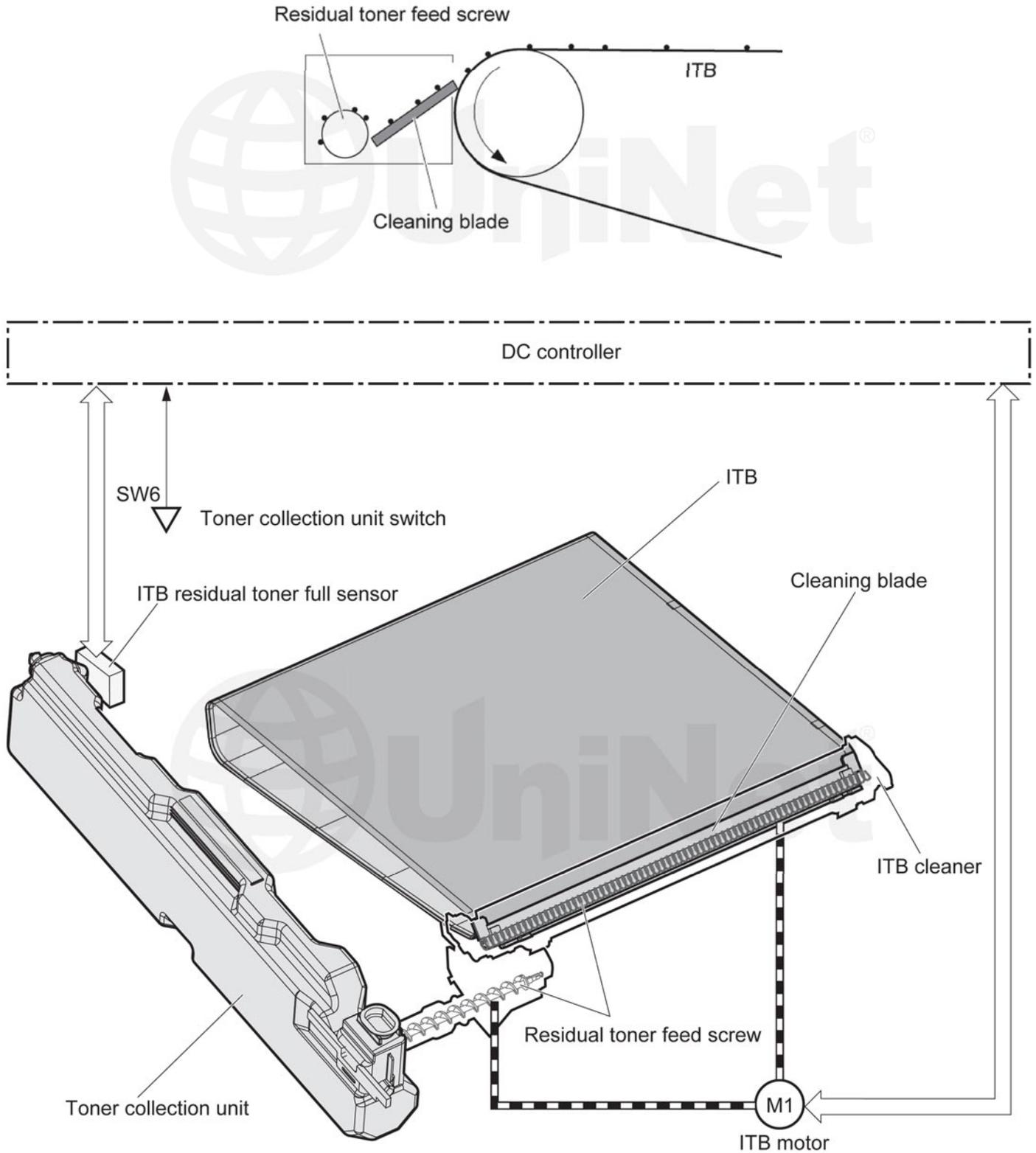
The **fourth** stage is the transfer stage. This is where there are some large differences from monochrome printers and also from other color lasers. In the primary transfer stage, the transfer roller, which is located directly opposite each OPC drum, places a positive DC bias charge on the back of the ITB (image transfer belt). Each toner cartridge has a separate transfer charge roller. The image is transferred from the drum directly to the ITB. This process is repeated for each color cartridge in the following order: Yellow, Magenta, Cyan, and Black. At the same time, the paper is moving between the secondary transfer roller and the ITB. As the ITB passes the secondary transfer roller, the positive charge is picked up, and draws the negatively charged toner off the belt and onto the paper. Note that this entire process is upside down from most previous HP engines. The ITB and transfer rollers are on top of the OPC drum, not underneath it.



The paper separates from the ITB belt as the belt turns back down to start the process again. The static charge on the back of the paper is decreased with static charge eliminator. This helps stabilize the paper feed, and also prevents toner flares (spots) under low-temperature and low-humidity conditions.



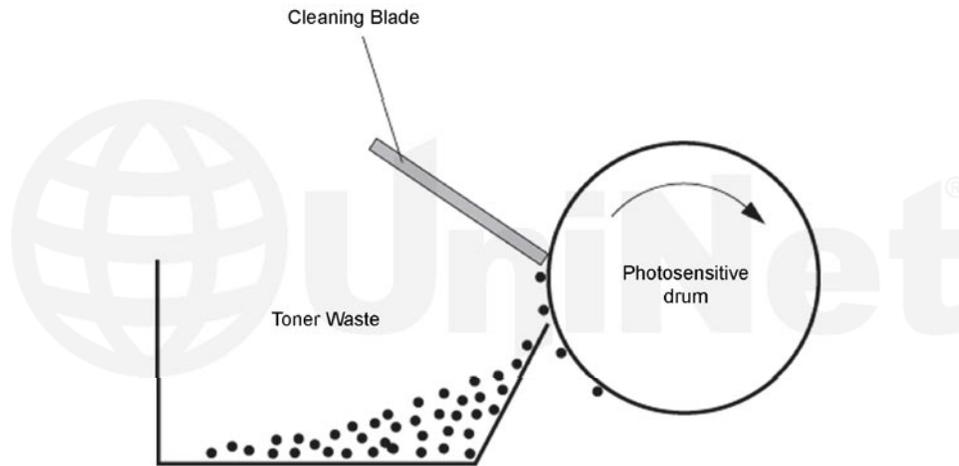
In the **fifth** stage, the image is then fused onto the paper by the fuser assembly. The fuser assembly is comprised of the upper heating assembly and lower pressure roller. The lower pressure roller presses the page up into the upper heating assembly, which then melts the toner into the paper. This heating assembly consists of a flexible sleeve with a ceramic heating coil inside. This type of fuser affords “instant on” fusing with little to no wait time, and low power consumption.



ITB CLEANING

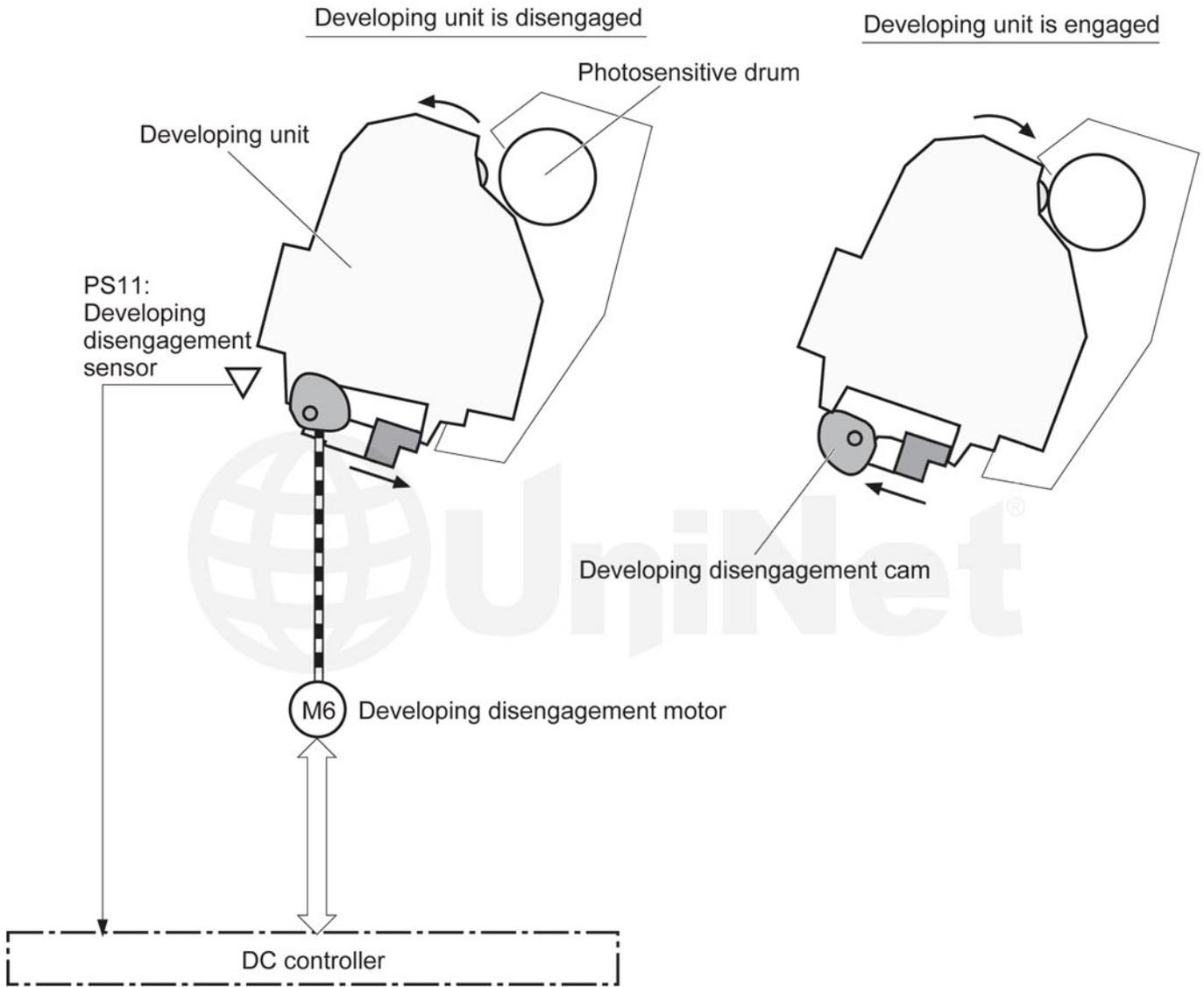
The image transfer belt (ITB) is cleaned by the ITB cleaning blade.

The ITB wiper blade scrapes off the residual toner and an auger moves the toner to the toner collection box.

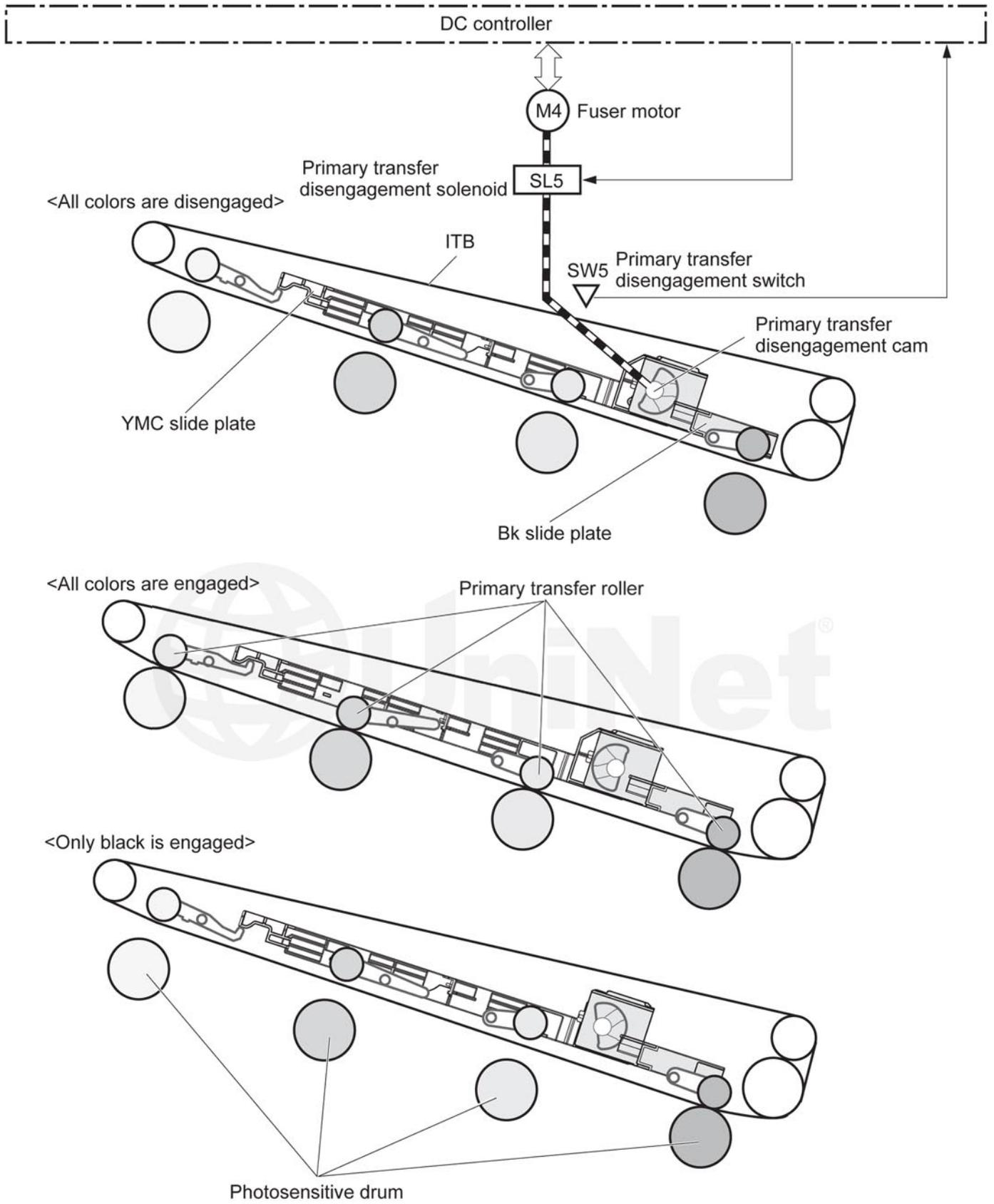


OPC DRUM CLEANING

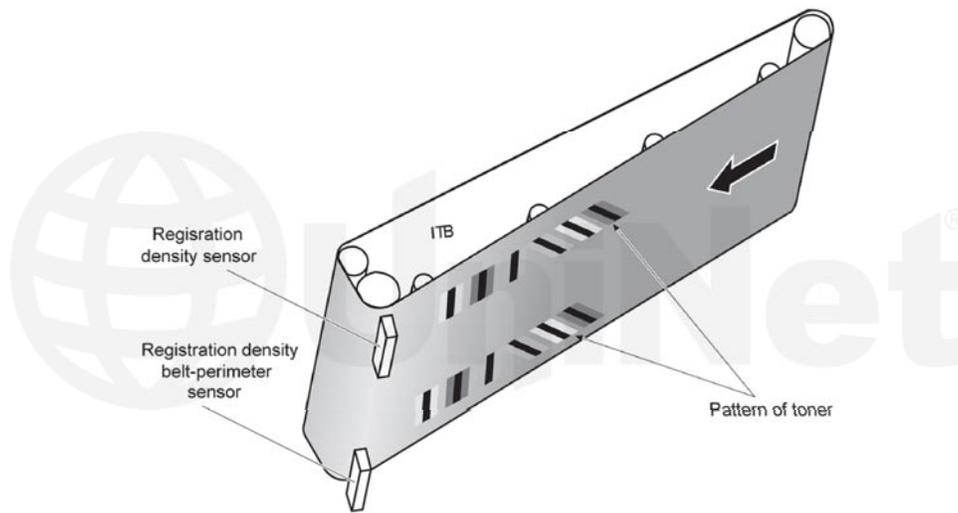
The drum is cleaned after the image is transferred to the paper by the wiper blade. This part is fairly standard; the wiper blade scrapes the toner off the drum, and the recovery blade guides it into the waste chamber.



These printers can print in full color, or in black-only modes. To print in the black only mode, the printer disengages the developer rollers in the cyan, magenta, and yellow cartridges. This process also takes place with the primary transfer rollers and the ITB belt.



This process also takes place with the primary transfer rollers and the ITB belt.



PRINTER CALIBRATION

At the start of all this is the cartridge detection process, toner level detection, and then the calibration cycle. The printer will self-calibrate whenever it is turned on (within 15 minutes), when a new toner cartridge is installed, and after 48 hours of run time. Calibration consists of a solid block and halftone of each color being printed to the image transfer belt. As the printed areas get to the top of the belt, a sensor will detect them, measure the density, and adjust the printer accordingly.

Running test prints and cartridge troubleshooting will be covered at the end of this article.

REQUIRED TOOLS

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

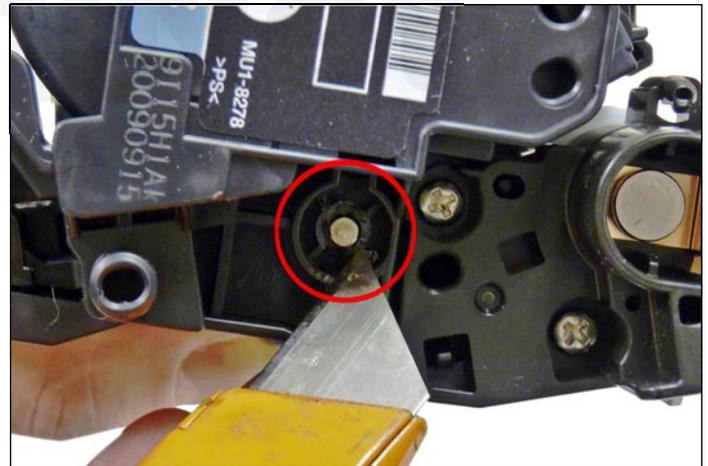
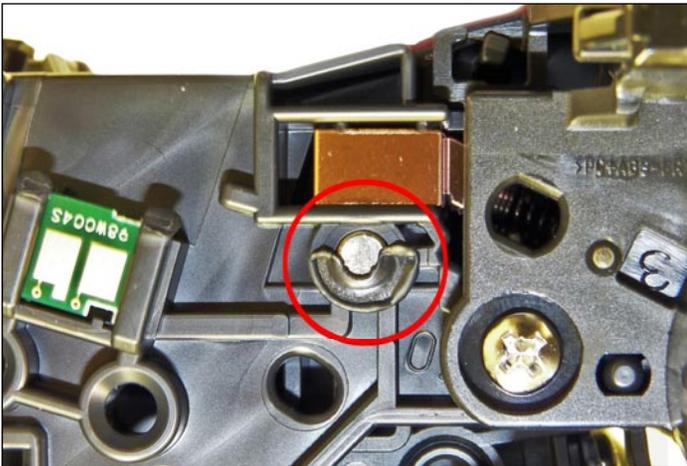
REQUIRED SUPPLIES

- Toner for use in the HP M775 cartridges
- New replacement chip
- New long-life drum
- New wiper blade
- New toner feed roller (optional)
- New primary charge roller (optional)
- New doctor blade (optional)
- Drum cover
- Lint-free cloths
- Conductive grease

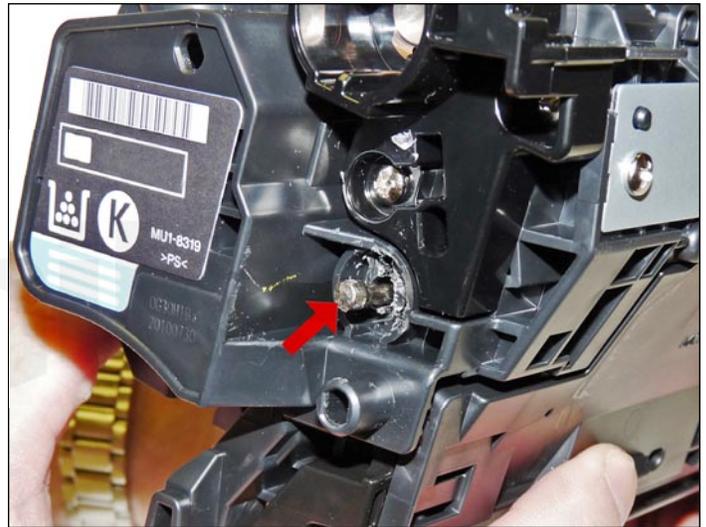
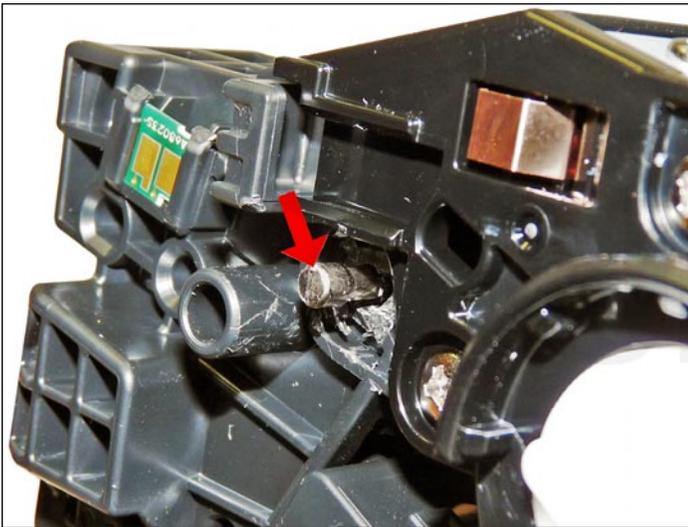


The pins in these cartridges are stepped. In other words the outside is thicker than the inside. To remove the pins, you must carefully shave the plastic away from the pins. The procedure is described as follows.

1. Remove the spring from the label side of the cartridge.



2. With a razor knife, carefully shave the plastic from the heads of the hinge pins on both sides of the cartridge.



3. Remove the pins with flush cutting wire cutters.

The smaller pin fits on the contact side of the cartridge, the long pin on the label or gear side.

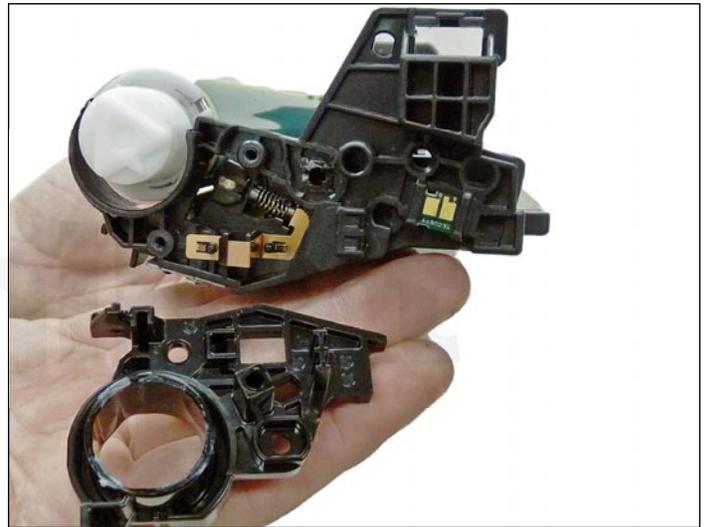
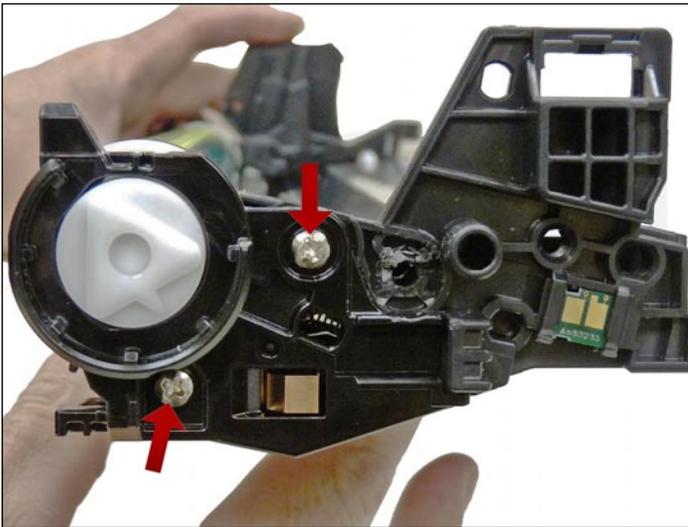


4. On the gear-side press in on the plastic locking mechanism.



5. On the opposite side lift up on the black lever.

Lift the two halves apart.



6. On the waste chamber, remove the two screws from the drum gear end cap.

Press in on the tab as shown and remove the end cap.

There is no need to remove the opposite side end cap.

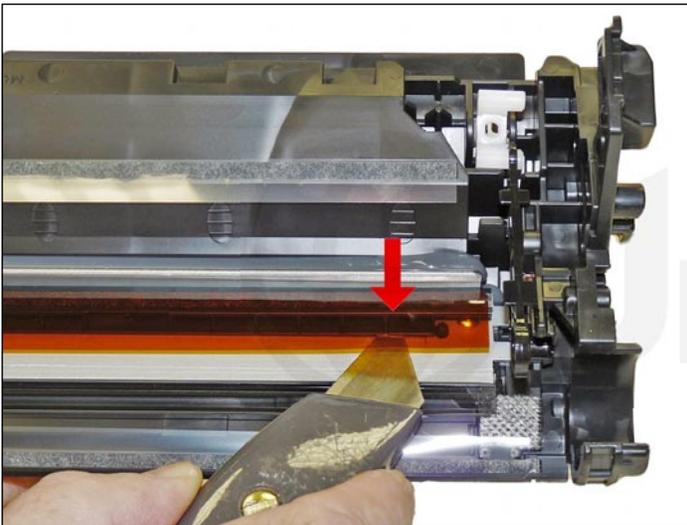


7. Remove the drum.



8. Remove the primary charge roller by lifting up on the black and white locking arms.

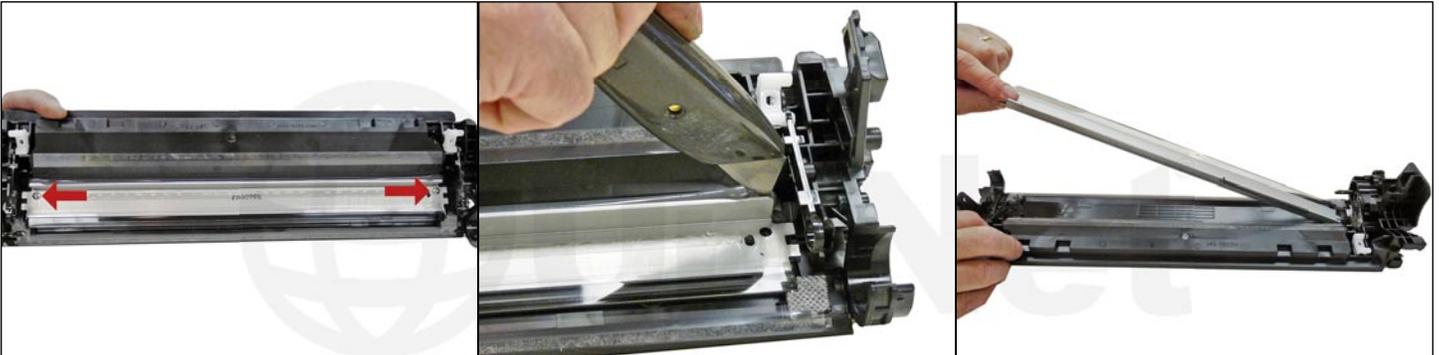
The arms will stay in place.



9. To remove the wiper blade, the amber film assembly needs to be removed. Slide a razor knife under the plastic mounting bar, and remove the assembly.

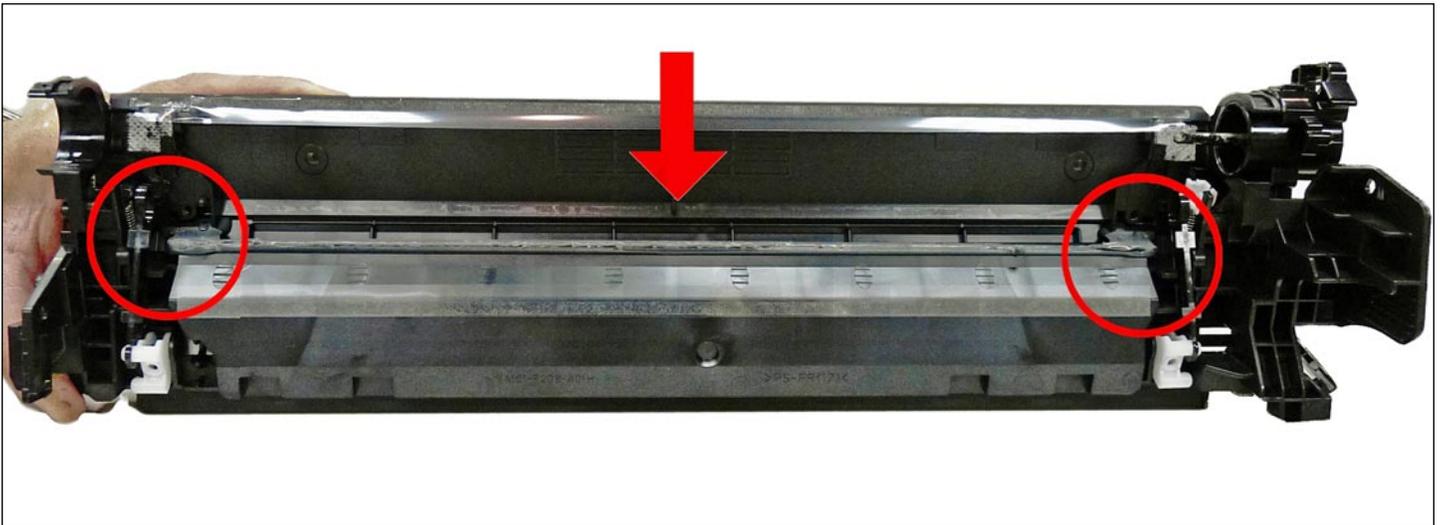


Film assembly removed.

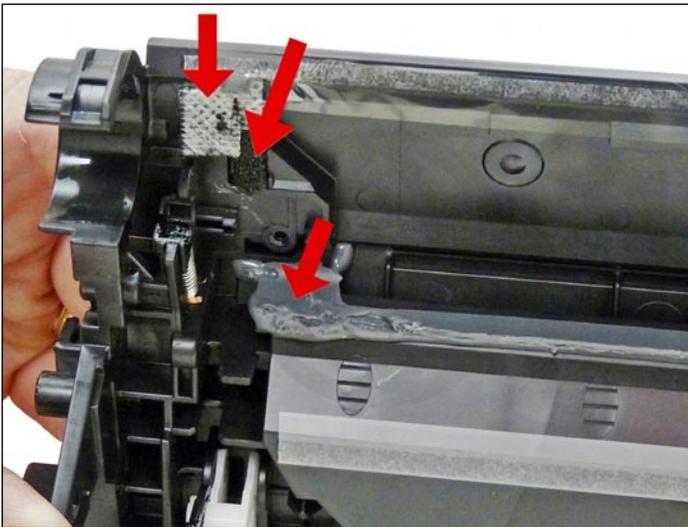


10. Remove the two screws from the wiper blade. Slide the razor knife along the back edge of the blade to release it from the glue. Remove the wiper blade.

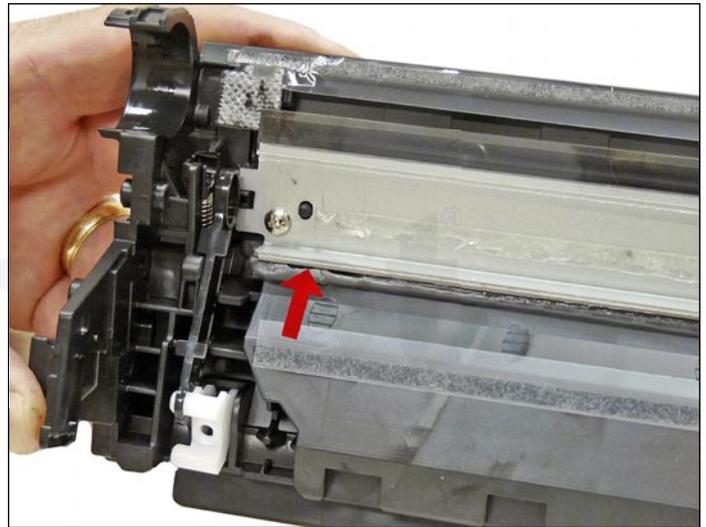
11. Clean out all the waste toner from the chamber. Try not to get any toner on the wiper blade seal if possible.



12. Clean the felt seals on each end of the wiper blade.



If the wiper blade glue has toner on it, clean it off with alcohol and a foam swab. If it does not become sticky again, it needs to be removed and a good silicone caulk used to seal the blade off. GE 100% Silicone and Phenoseal are two good brands for this.



13. Install the new wiper blade and two screws.

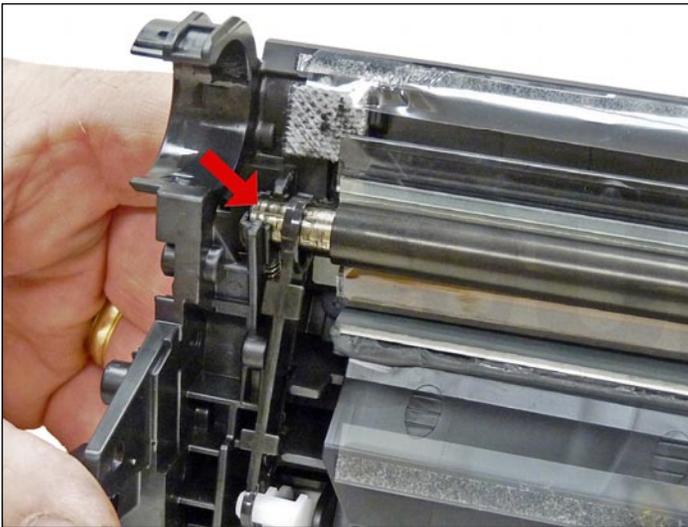
If you removed the wiper blade glue, seal the back edge of the blade with the silicone now.



14. The amber film assembly is held in place with double-sided tape. If this is not sticking or a new wiper blade is being used, replace the tape. Replace the film assembly.



15. Clean the primary charge roller (PCR) with your preferred cleaner and install in the cartridge with the PCR holders. Make sure you lock the locking arms in place.



16. Place conductive grease on the black holder side of the shaft.

REPLACING THE DRUM

If you are replacing the drum, the gears will need to be changed over from the OEM to the new. There are two methods of removing the gears from OPC drums. The first and easiest method is to place the drum in a metal vice approximately 2" back from the gear, and slowly tighten the vice.

The gear should pop out easily. This is the only method you can use on the OPC drums, which have a weighted slug in the center. If you use this method go on to step #3.

The other method is as follows...

REQUIRED TOOLS AND MATERIALS

1. 1/4" x 15" metal rod
2. 1" x 15" wooden dowel
3. Tube of super glue
4. Small piece of Emory-cloth or sand paper

Step #1: Removal of the drive gear

The drive gear is the gear that has no metal electrical contacts in it. These gears are usually larger than the contact gear.

- A. Carefully insert the 1/4" metal rod into the center of the gear that has the contacts, or the contact gear.
- B. Angle the rod so that the rod presses against the edge of the opposite gear. The rod should be touching both the inside of the OPC drum and the edge of the gear.
- C. Tap the end of the rod with a hammer, working the rod around the entire edge of the gear, until the gear comes loose.

NOTE: Gently heating the ends of the drum with a hair dryer or heat gun on low may cause the glue to soften and ease in the removal process. Just be careful not to use too much heat and melt the gear!

Step #2: Removal of the "contact" gear

- A. Insert the 1" wooden dowel into the gearless end of the drum.
- B. Tap the dowel with a hammer until the gear comes loose.

Step #3: Remove any old adhesive from the gears; straighten out any damage done to the contact gears' metal contacts.

- A. Removing the adhesive can be done with a small sharp common screwdriver. The glue comes off easily.

Step #4: Install the gears on the new drum

- A. Inspect the metal contacts on the contact gear. Make sure that the contacts will make proper contact with the inside of the OPC drum.

- B. Locate the side of the drum on which you are going to place the contact gear. On some OPC drums, this is critical (see individual instructions for more information).

- C. Lightly sand the INSIDE of the OPC where the metal parts of the contact gear will meet. This will insure a good electrical contact.

- D. "Dry fit" the contact gear in the OPC drum and check for a good contact with an Ohmmeter. The reading should be a direct short, or no more than 1 or 2 Ohms.

NOTE: When checking the contact, place one lead on the drum axle contact and the other on the edge of the drum. This way, you will not have to pierce the coating that is on the OPC surface. Radio Shack carries cheap Ohmmeters for less than \$10, and the sales people will normally be glad to show you how to use it.

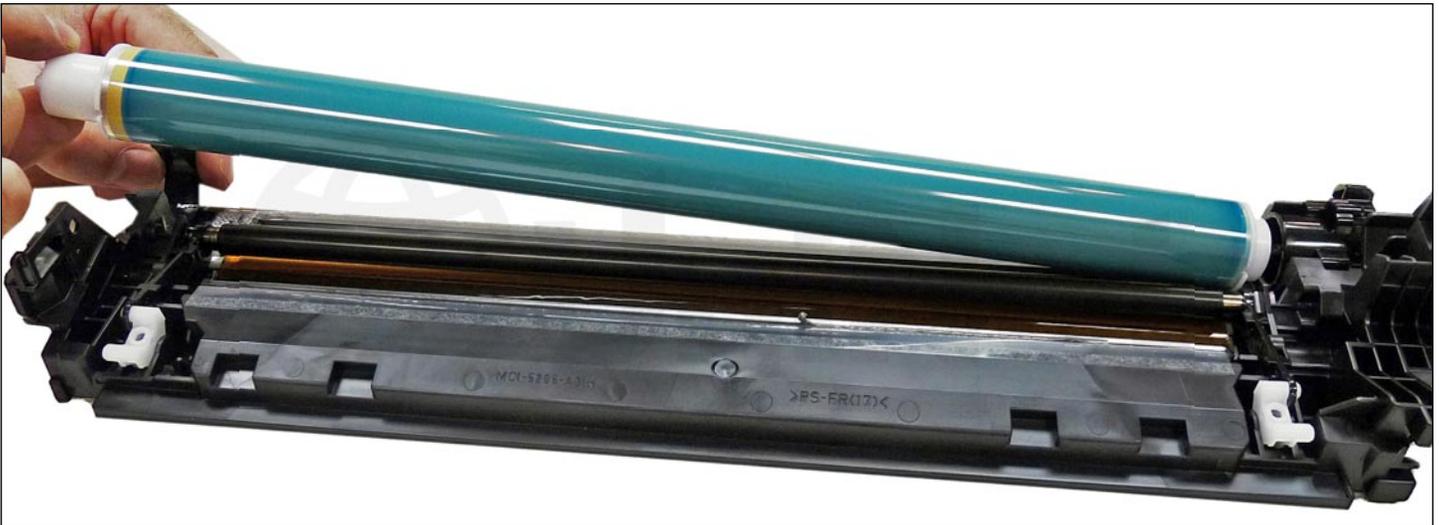
- E. Using the super glue, place a few (3-4) small drops of glue strategically around the inside edge of the OPC drum. Make sure you leave a blank area for the metal contacts!

- F. Insert the contact Gear.

- G. Check for continuity again with the Ohmmeter.

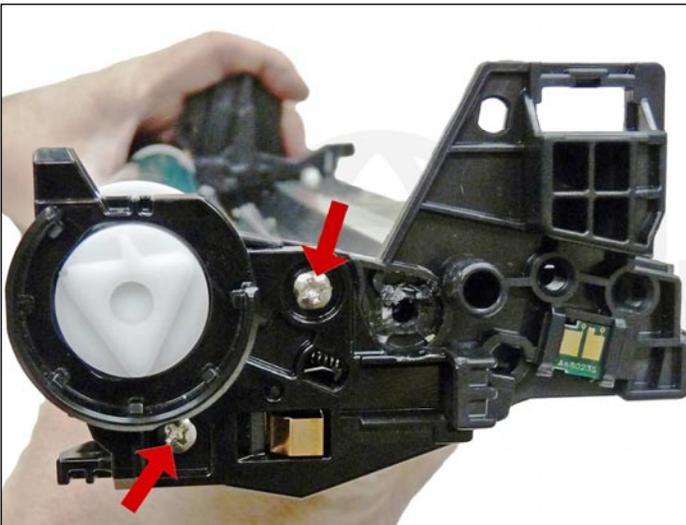
- H. Repeat steps E and F for the drive gear.

NOTE: Be very careful not to place the metal contacts in direct contact with the glue, as this will interfere with the proper grounding of the drum, and the cartridge will not print properly, (solid black pages). It is also very important to NOT put any glue on the gear, as the chances of it dripping out onto the drum surface and ruining it are high. Placing the glue inside the drum tube works much better.



17. Install the drum, short hub side onto the long drum ground/axle pin.

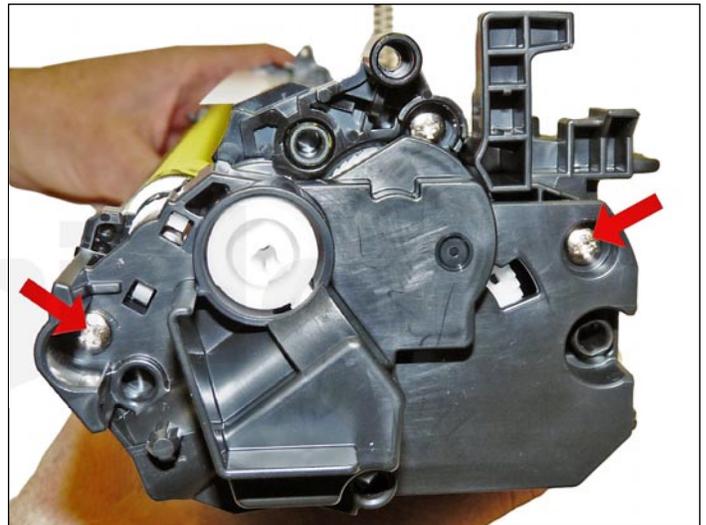
Make sure there is conductive grease on the drum ground/axle pin.



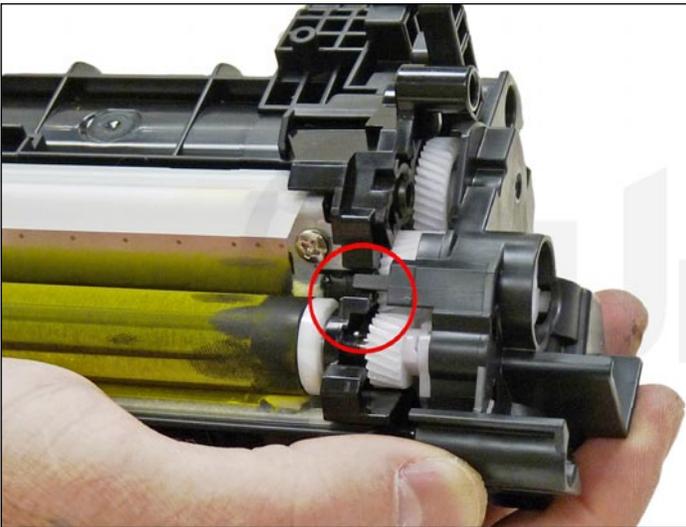
18. Install the end cap and two screws.

Place a small amount of white lithium grease on the drum hub.

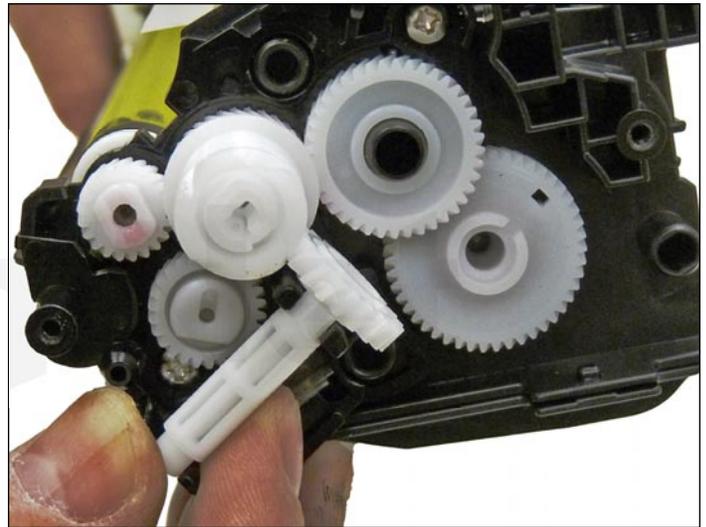
19. Place the waste chamber aside.



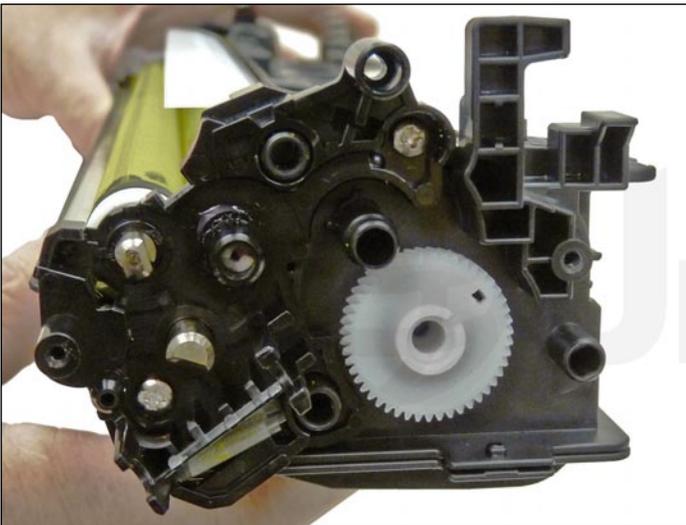
20. On the supply chamber, remove the two screws from the gear side end cap.



21. Pry up on the small tab and remove the end cap.

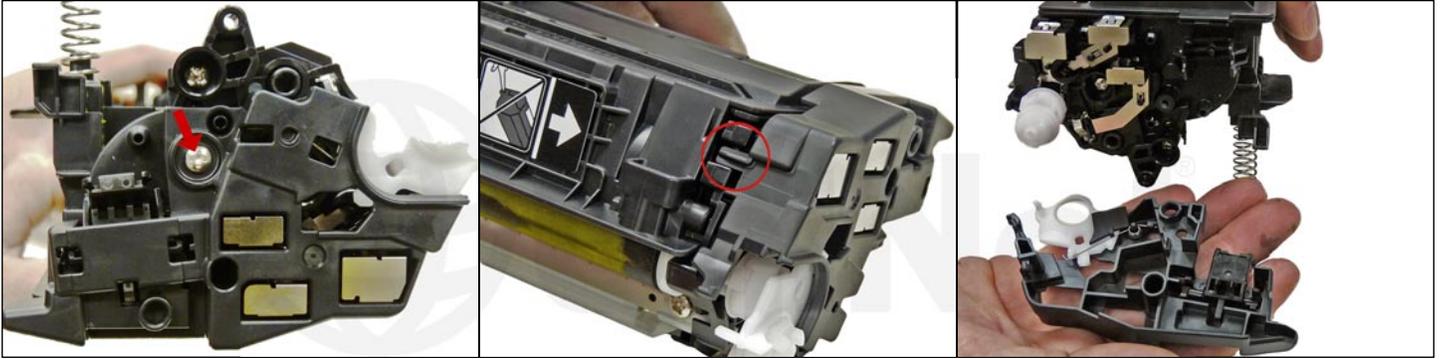


22. Remove the seal take-up gear.



23. Remove all the gears as shown, except for the mixing blade gear and the sealing strip gear. The mixing blade gear is attached to the mixing blade inside the hopper and is very difficult to re-attach properly.

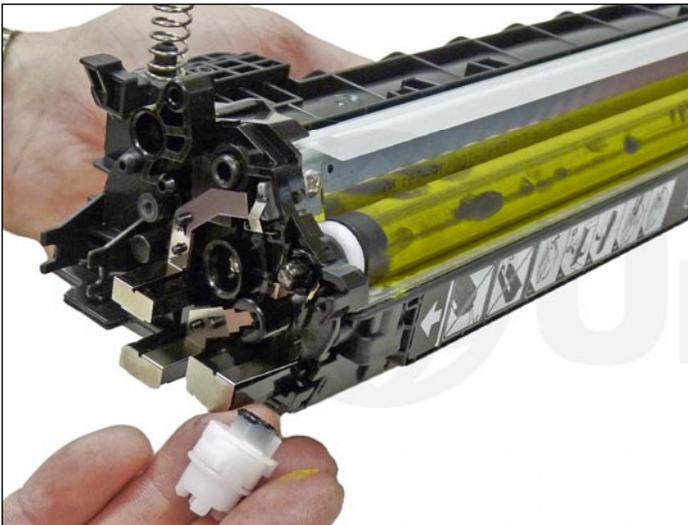
UniNet®



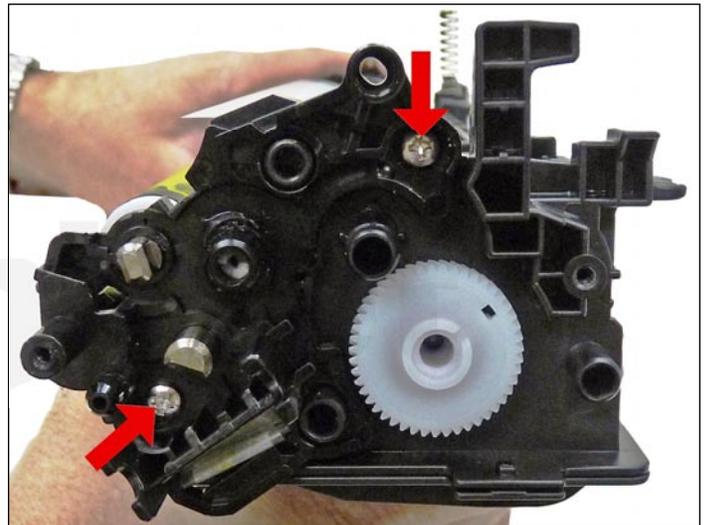
24. On the contact side, remove the screw, pry up on the small tab and remove the end cap.

Watch out for the developer gear assembly.

This is a three-piece gear set that may come with the end cap.



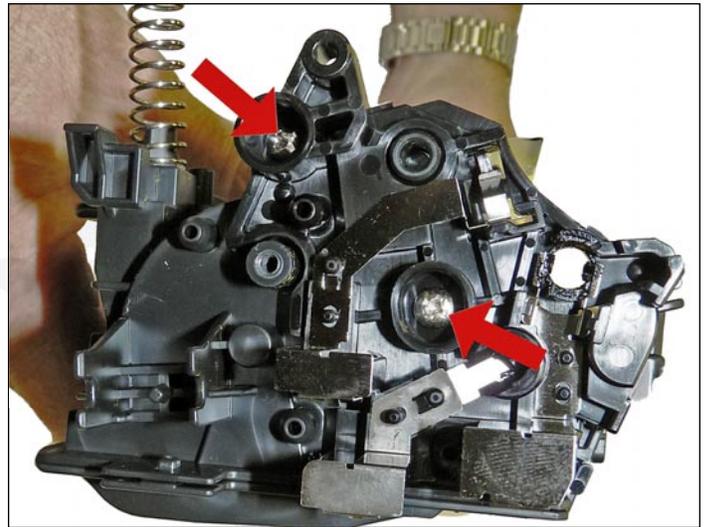
25. Remove the triple developer roller drive gear(s).



26. On the gear side inner end cap, remove the two screws and end cap.



27. Remove the developer roller.



28. Remove single screw and contact-side inner end cap.



29. Remove the two screws from the doctor blade and start to lift the blade up.

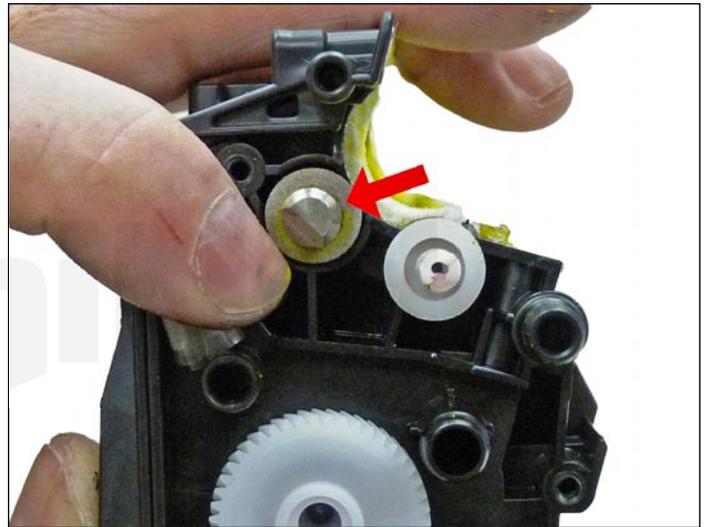
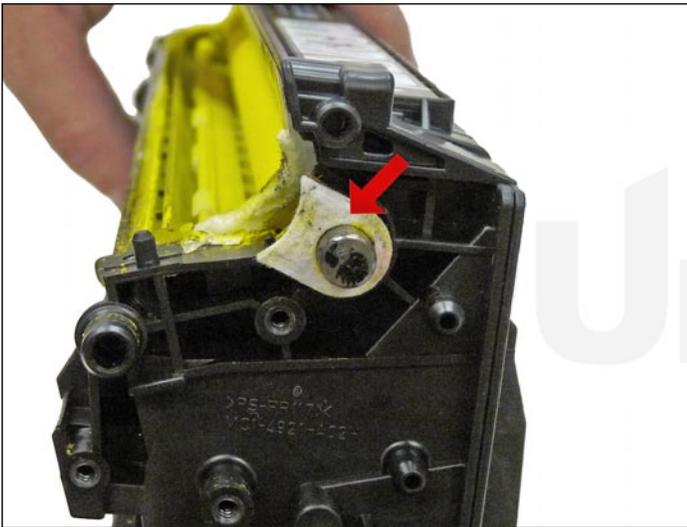


There is glue on either end of the blade.

As you lift the blade up, slice the glue away from the blade with the razor knife.

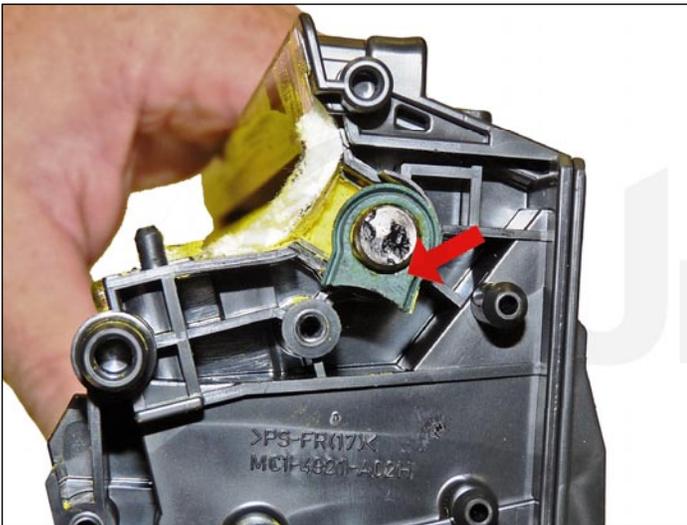


30. On the right side of the chamber, lift up the developer-roller felt seal. Lift it from the front side and lay it over the back.



31. Remove the felt washers from both sides of the feed roller.

There is a gray felt washer on the gear side, and a white felt washer on the contact side.



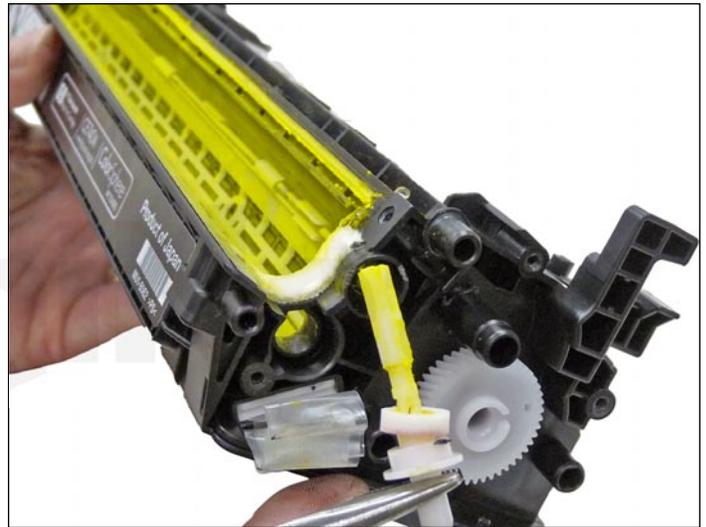
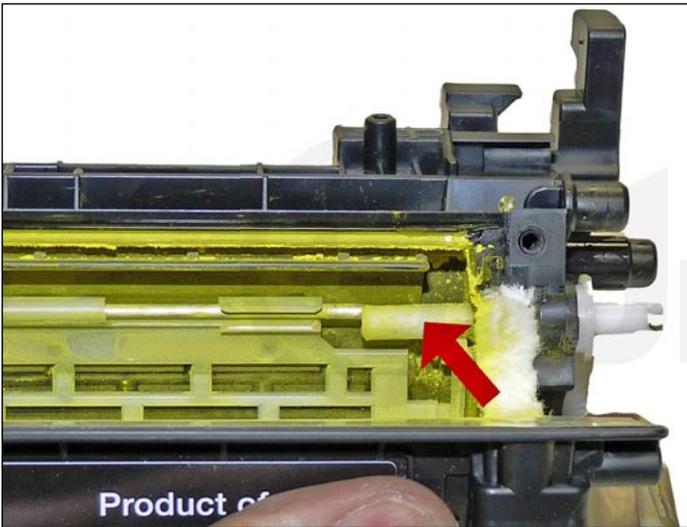
32. Pry out the rubber feed-roller bushing from the right side.



33. Remove the feed roller.



34. Clean out the remaining toner and fill with the correct color of toner for use in the HP M775 cartridge.

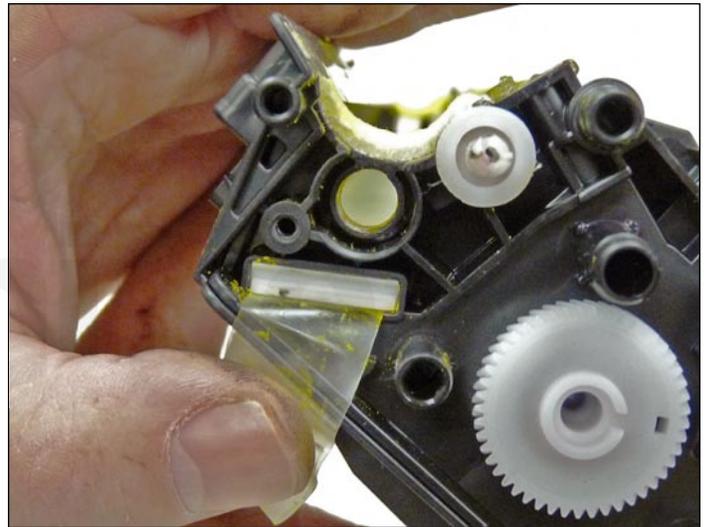
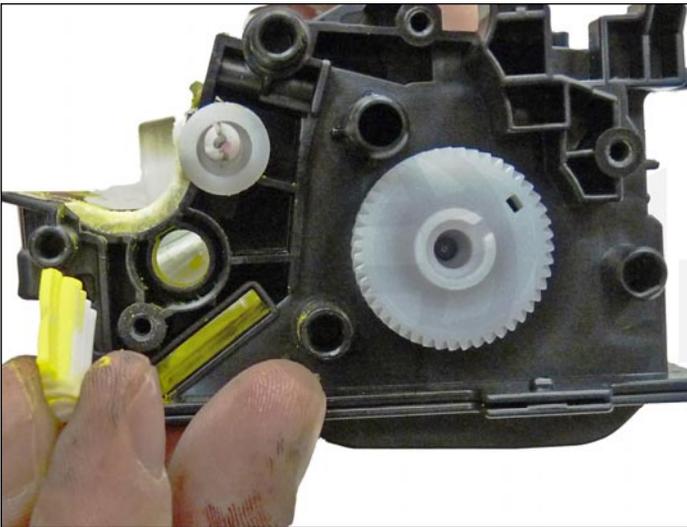


35. When a seal is available, you will first need to remove the auger drive gear, and then remove the auger, so that you have access to the seal area.



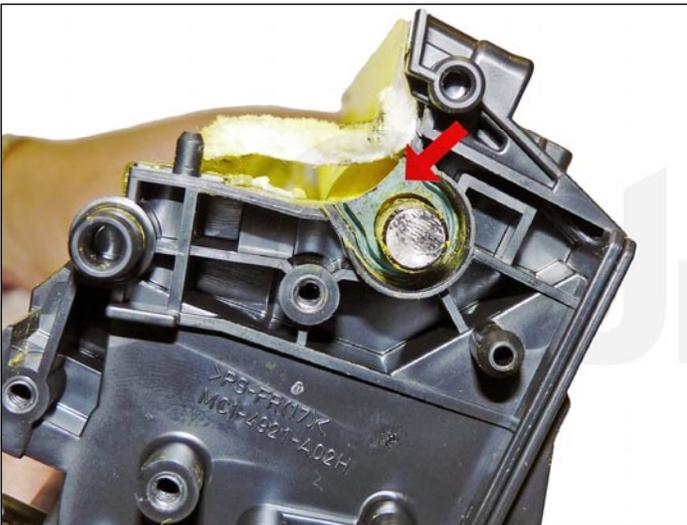
Install the seal onto the seal rails. Pull the release tape off 1" at a time and press the seal in place as you go.

Install the auger and auger drive gear. Make sure the drive gear is positioned as shown.



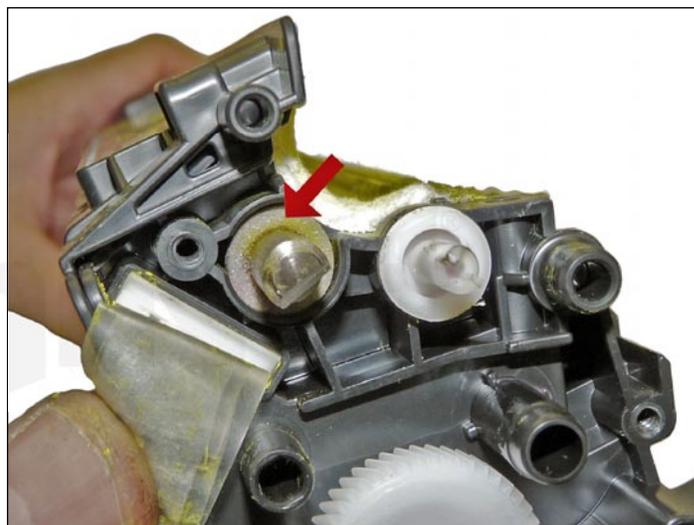
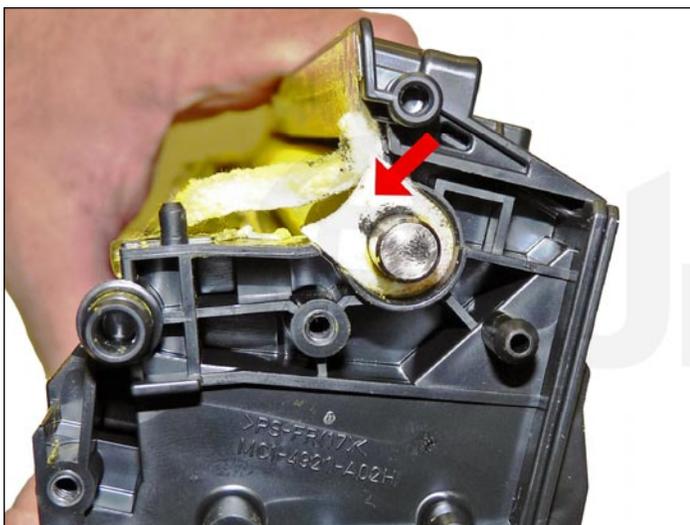
36. Remove the seal port and slide the seal pull-tab through the slot.

Install the seal port.



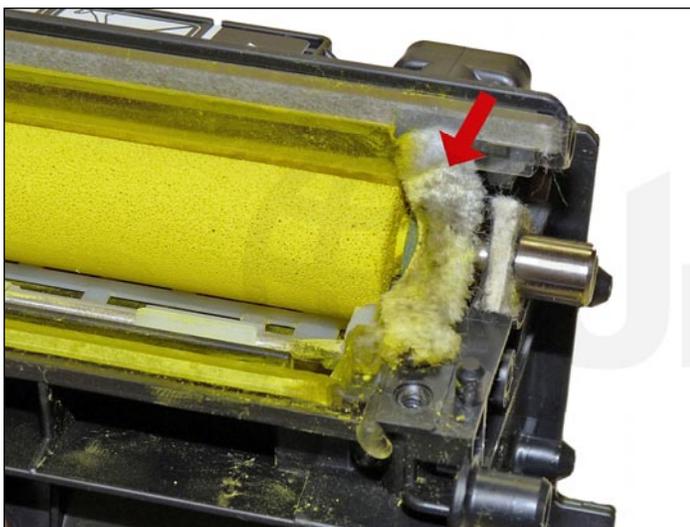
37. Install the feed roller and rubber bushing, keyed end to the gear side.

UniNet®



38. Install the feed-roller felt washers.

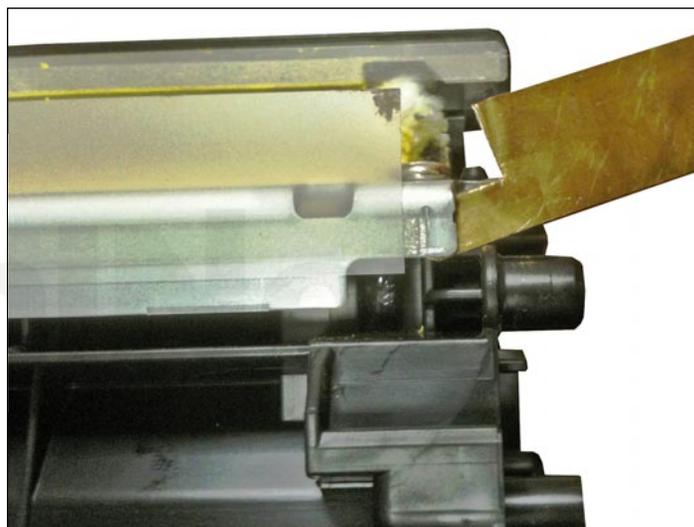
Place the gray seal to the gear side, white to the contact side.



39. Press the developer-roller felt seal back in place. Make sure it fits under the retaining blade.

If the glue is not sticking, place a very small bead of 100% adhesive silicon to lock it in place. DO NOT get the silicon on the top of the felt!

This felt has a tendency to curve when re-installed. The picture shown is NOT the correct way. Make sure the felt is straight or it will leak.



40. Gap the blade to 1.6mm.

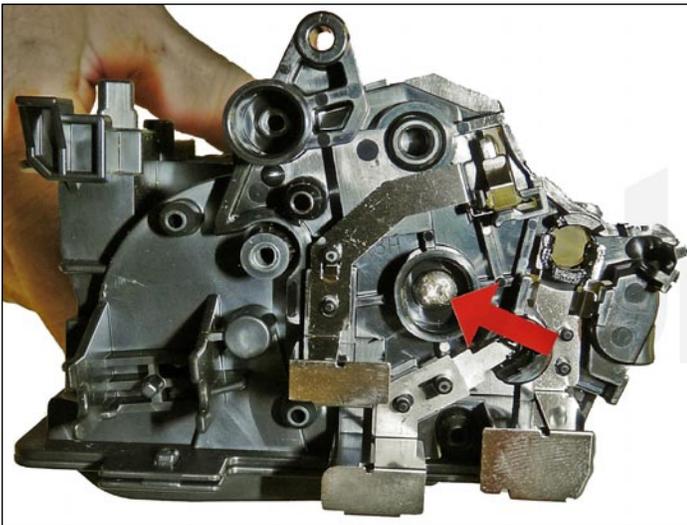
You may have to modify your gapping gauge to fit.



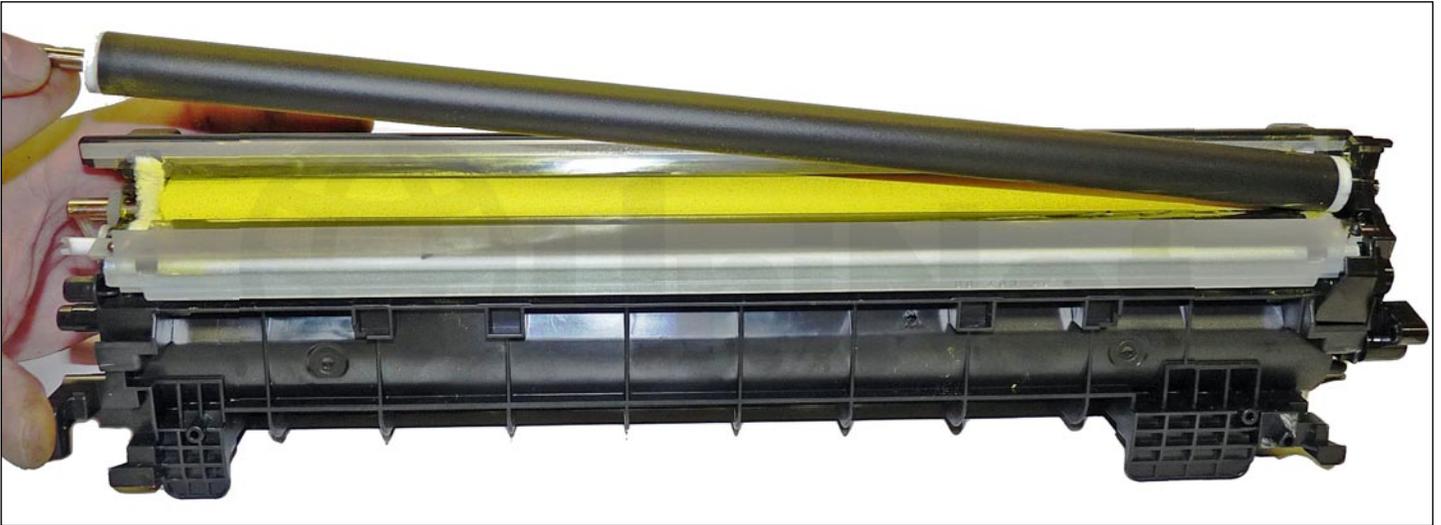
Install the doctor blade and two screws.

Make sure the sticky seals on either end of the blade seal correctly.

If the material is no longer sticky, clean it with alcohol or replace it with a small amount of silicon.



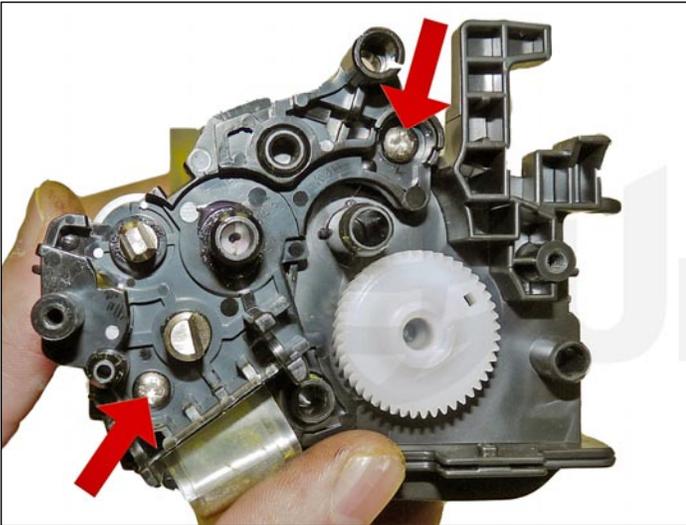
41. Clean the contacts and replace the conductive grease on the inner contact end cap. Install the inner contact end cap and screw.



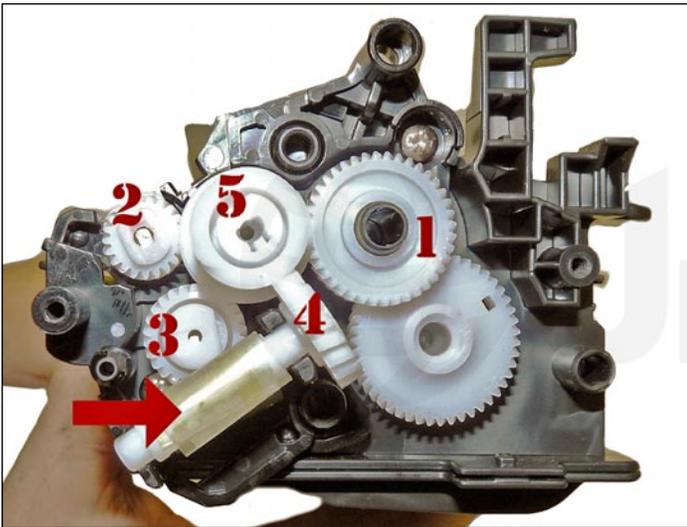
42. Install the cleaned developer roller.

Do NOT use any chemicals to clean this. A lint-free cloth works fine.

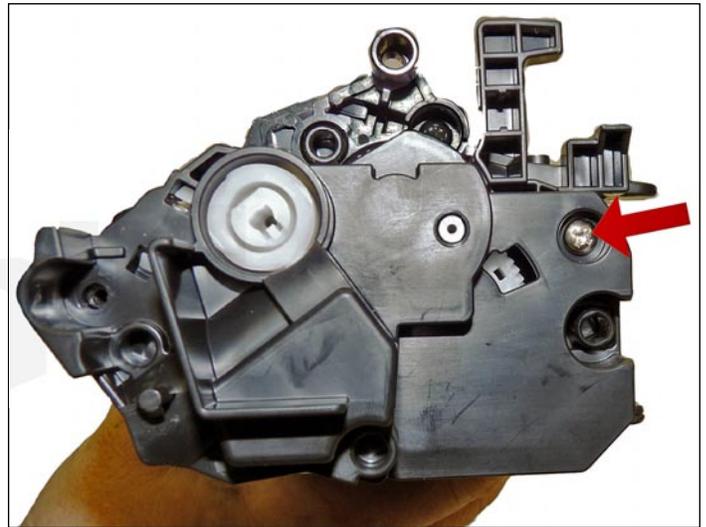
Place the keyed end to the gear side and conductive grease on the contact side.



43. Install the inner gear end cap and two screws.



44. Install the gears in the order shown. If you installed a seal, slide the seal end through the take up gear and wrap the loose tail tight on the roller.

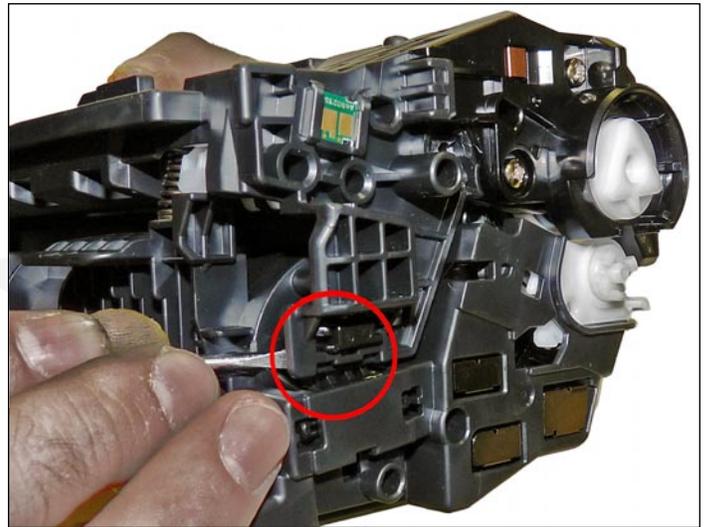
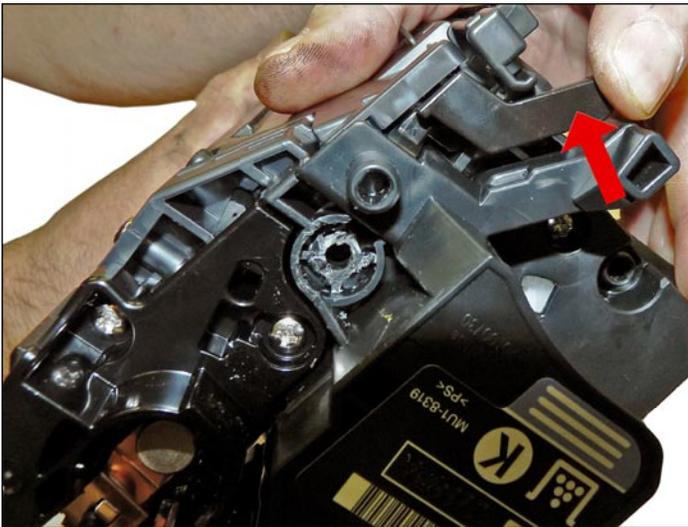


45. Install the outer gear end cap and screws.



46. Place the triple gear on the developer roller shaft and fit into the spring assembly on the end cap.

Install the end cap and install the two screws.



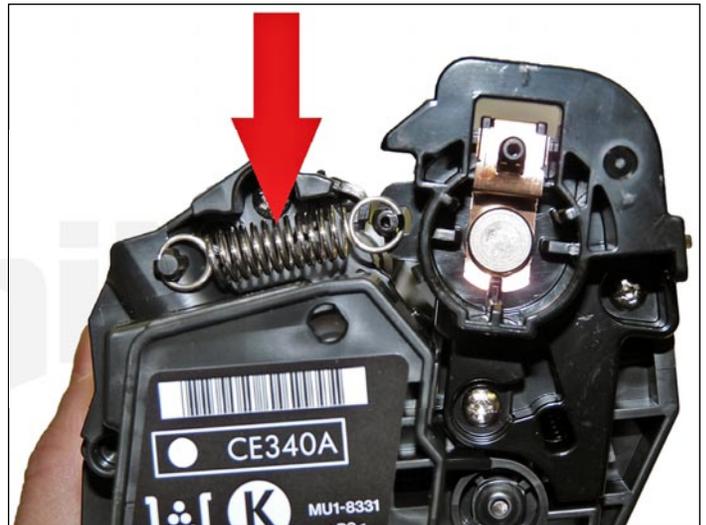
47. Place the two halves together, contact side first.

On the gear side, press the lever in place.

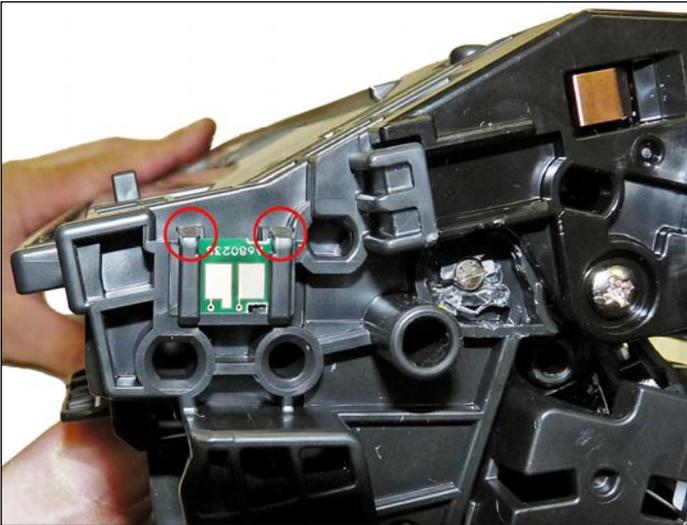
On the contact side, snap the lock up into the end cap.



48. Install the two pins, large pin to the label or gear side of the cartridge.



49. Install the spring.



50. Remove and replace the chip.



51. If the new replacement chip is loose in the slot.

Close off the top edges with small amounts of hot glue.



52. Install the drum cover onto the cartridge.

TAKING TEST PRINTS

Print Quality Troubleshooting Pages:

Quite a few test pages can be accessed through the menu.

1. From the Home screen, scroll down to the Administration button.
2. Open the Reports menu.
3. Pick the page you would like to print and touch the Print button.

Print Quality Test Page:

1. From the Home button, open the following menus: Administration / Troubleshooting / Print Quality Pages
2. Press the down arrow until "PQ Troubleshooting Page" appears on the display.
3. Press the Print button.

REPETITIVE DEFECT CHART

Primary charge roller:	35.0 mm
Developer roller sleeve:	42.0 mm
OPC drum:	94.0 mm

Normally we pull this info from the HP service manual, but as of the date of this writing, the manual is not available yet. The numbers below are a guess, and should be taken just as a guide to get you close to what an issue might be. When the service manual becomes available, we will update these numbers.

Primary transfer roller:	50.0 mm
Secondary transfer roller:	60.0 mm
Fuser sleeve:	76.0 mm
Fuser pressure roller:	79.0 mm