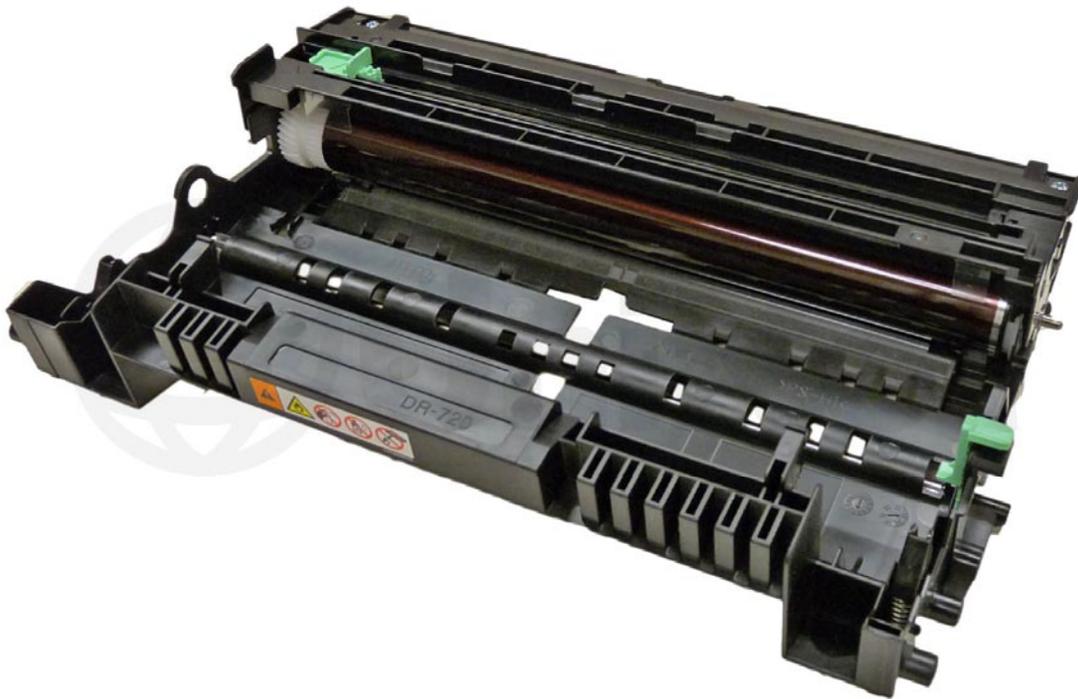


BROTHER® HL-6180 DR720

OPC CARTRIDGE REMANUFACTURING INSTRUCTIONS



BROTHER DR720 DRUM UNIT

REMANUFACTURING THE BROTHER HL-6180 DR720 OPC CARTRIDGE

By Mike Josiah and the Technical Staff at UniNet

Released in August 2012, the Brother HL-6180 printer engine is based on a new 40-42ppm, 1200 DPI laser engine. These machines have a first-page out in less than 8.5 seconds, and come standard with 64MB of memory depending on the machine. The HL-6180 series also have duplexing built in.

There are three different toner cartridges available for these machines: the TN720 is rated for 3,000 pages, the TN750 is rated for 8,000 pages, and the TN780 is rated for 12,000 pages. The TN780 will only fit into the HL-6180 and MFC-8950 machines.

The drum unit is rated for 30,000 pages. There are different part numbers for these cartridges depending on your region. They are as follows:

Region	Standard	High Yield	Super High Yield	Drum
North/South America	TN720	TN750	TN780	DR720
Europe	TN3330	TN3380	TN3390	DR3300
Asia/ Middle East/Africa	TN3320	TN3350	TN3370	DR3355
Oceania	TN3310	TN3340	TN3360	DR3325

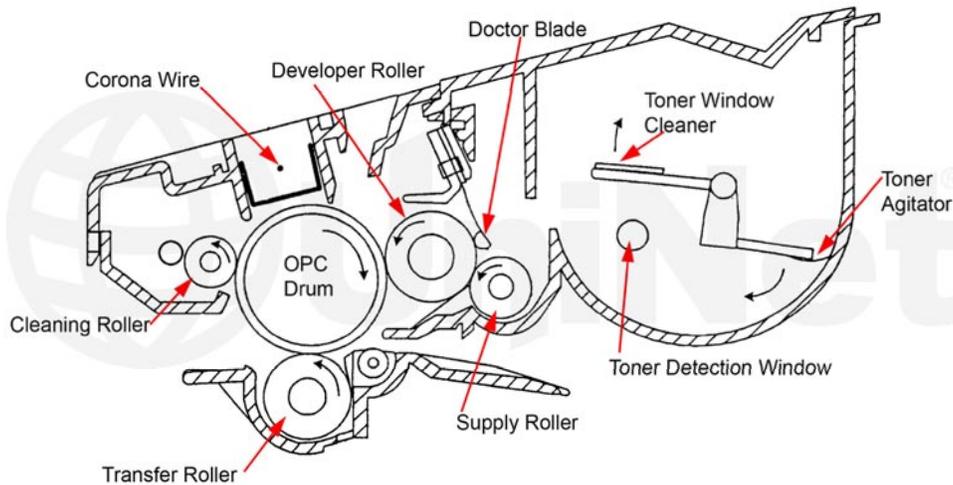
CURRENT MACHINES RELEASED SO FAR FOR THIS SERIES

HL-5440D
HL-5450DN
HL-5450DNT
HL-5470DW
HL-5470DWT
HL-6180DW
HL-6180DWT
DCP-8110DN
DCP-8150DN
DCP-8155DN
DCP-8250DN
MFC-8510DN
MFC-8520DN
MFC-8710DW
MFC-8810DW
MFC-8910DW
MFC-8950DW

IMPORTANT!!! There have again been some major changes in the way the toner cartridge AND the drum cartridge works in this series. Because of this we are covering the theory again...

NEW BROTHER PRINT THEORY

As with previous Brother cartridges, the waste toner is repelled off of the drum to be transferred to the toner unit, but the method of how this works is now very different.



Shown is a general layout of the component locations.

The waste toner still is transferred to the supply chamber, and this remaining toner still **MUST** be completely removed from the supply chamber before adding new toner. Failure to do this will cause backgrounding. In addition to contaminating the toner cartridge, this may also contaminate the cleaning section of the drum cartridge, which in turn will contaminate the toner cartridge again. The reasons for this are explained in the following cartridge theory section.

The first new item in this engine is there is now a paper-cleaning roller in the printer itself. This roller cleans off any extra paper dust before the printing process even starts. It is located just after the paper feed rollers.

The cleaning section of the drum cartridge no longer consists of a "cleaning brush" it is now a paired system of the cleaning roller assembly and the transfer roller but these rollers only play a minor part. The developer roller now has two jobs. In addition to transferring the good toner to the OPC for printing, it also now cleans off the majority of the waste toner off the drum. This is done by a very complicated series of different electrical charges and a series of directional changes on the drum and developer rollers. The developer roller and drum change direction and charge four times per full drum rotation. This is such a complicated process that the printers actually have a rotation controller PCB with a microcomputer on it to control it all.

The cleaning roller cleans off any remaining toner that the developer roller did not remove. The transfer roller basically self-cleans itself of any residual toner or paper dust that might have accumulated in the printing process.

When the drum is cleaned by the transfer roller the surface potential of the drum is dropped (from 900V to about 200V). At this point the transfer roller and cleaning roller will release the waste toner to the drum. This waste toner is actually then charged by the corona wire so that the developer roller can pick it up and bring it back into the toner hopper. Both rollers release the waste toner at the same time. This was done to keep the print speed high, the power supply smaller and the cost on the two rollers and cartridges down.

The drum unit also now has a small waste chamber next to the cleaning roller. The reason for this waste area is for things like paper dust that do not transfer well. Since there is a paper-cleaning roller before the cartridges in the printer this area in theory should stay fairly empty. The metal roller next to the cleaning roller helps keep the cleaning roller free of anything that does not transfer.

Since the developer roller now does most of the cleaning work, the condition of the roller while always important, is now much more so. If the roller has any contamination on it from the toner additives (OEM or aftermarket), it will interfere with the cleaning cycle and ghosting/backgrounding will result. If the cleaning roller gets contaminated and is not cleaned properly, the same thing will result. The main culprit for this used to be the charge felt. It is now the developer roller. It is very important that the developer roller be cleaned with a dedicated developer roller cleaner. Never use alcohol of any type, as this will strip the conductive coating off the roller.

Since the waste toner is transferred back into the supply of the toner cartridge. Once you print with a bad toner cartridge, the drum unit will become contaminated. Even when you change out the toner with a good properly recycled or new OEM cartridge, the drum unit will transfer some of the bad toner back into the good toner cartridge, which will again cause backgrounding. Both cartridges will be contaminated again. It can be a vicious circle.

The remaining "toner" in the toner cartridge when toner low is reached is just below the bare minimum that can maintain the proper charge level. When the change toner light comes on, the toner will not charge up to the proper level and will cause the backgrounding. As the toner cartridge reaches the end of its useful life, the printer senses the low charge level in the toner supply and will try to keep the charge level up. This constant charging keeps an almost "empty" cartridge from backgrounding. Once the printer cannot get the remaining toner up to the minimum charge, the change toner light comes on. The cartridge at this point will still be printing properly. If you were to take that same cartridge out of the machine for a few days, and then put it back in the printer without doing anything to it, the cartridge will background. This will happen because the charge level that the printer was trying so hard to keep up has dissipated out and the materials left can no longer accept a proper charge.

WHAT DOES THIS ALL MEAN?

1. Make sure that your cartridge technicians thoroughly clean out the supply chamber of the toner cartridge.
2. Clean the developer roller with an approved developer roller cleaner, NOT alcohol! That will strip the conductive coating off.
3. In the event that they forget, and you have a backgrounding cartridge. The toner must be completely cleaned out again (do not use the toner over!), and NEW fresh toner MUST be installed.
4. Clean the developer roller (again) with an approved developer roller cleaner, NOT alcohol!
5. The drum unit then has to be taken apart and cleaned out with emphasis on the cleaning roller and transfer roller. This is a very simple process but very necessary once it is contaminated.

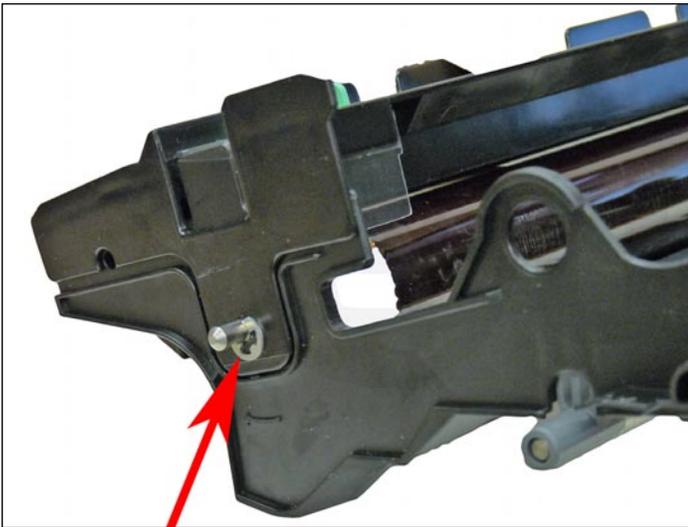
According to our tests, there will be approximately 60g of toner remaining when the cartridge is spent; this is normal. The remaining toner however, as stated above, is waste toner/paper dust only and must be thrown out or there will be backgrounding issues.

REQUIRED TOOLS

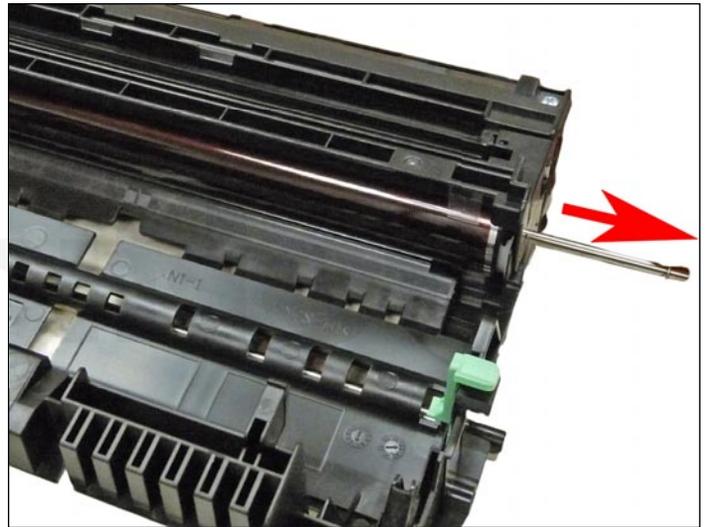
1. Replacement drum for DR720
2. Cotton swabs
3. Isopropyl alcohol
4. Drum padding powder

REQUIRED SUPPLIES

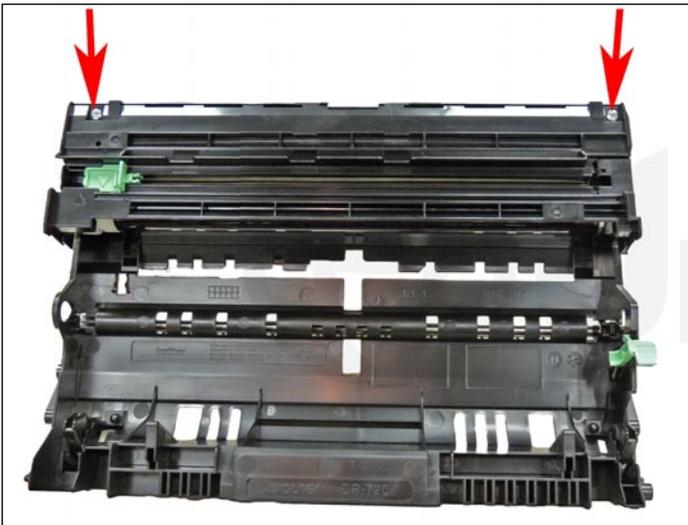
1. Small common (jewelers type) screwdriver
2. E-ring pliers
3. Vacuum approved for toner



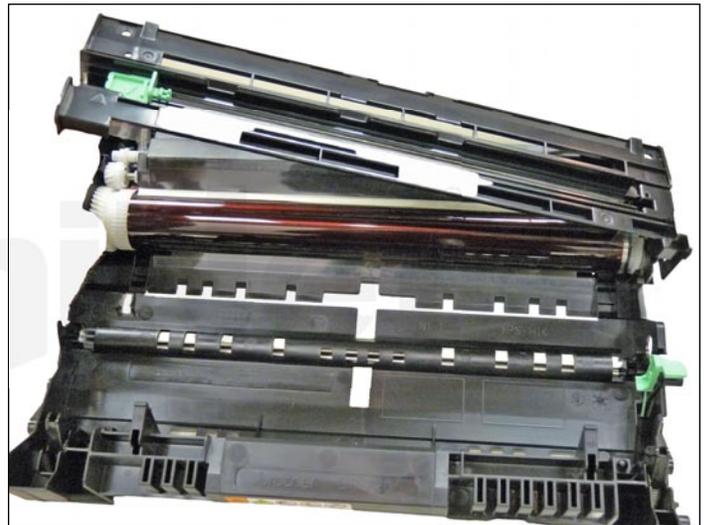
1. Remove the E-ring from the gear side of the drum axle shaft.



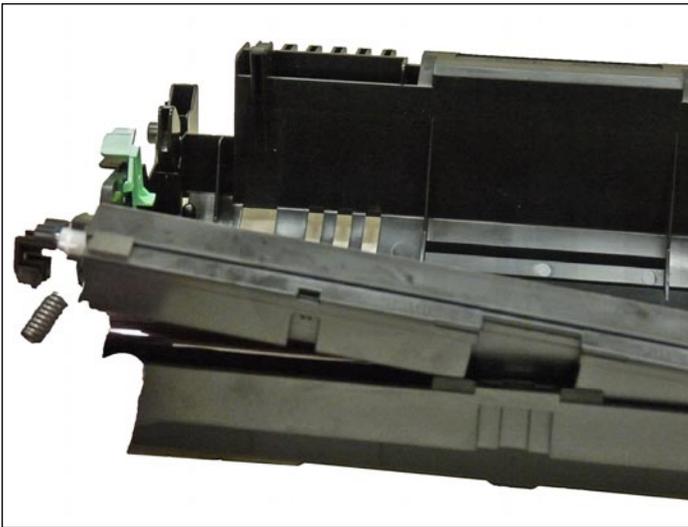
2. Remove the drum axle from the non-gear side of the drum. If you try to pull it out from the gear side, the shaft will jam up on the drum ground-contact, and damage the contact.



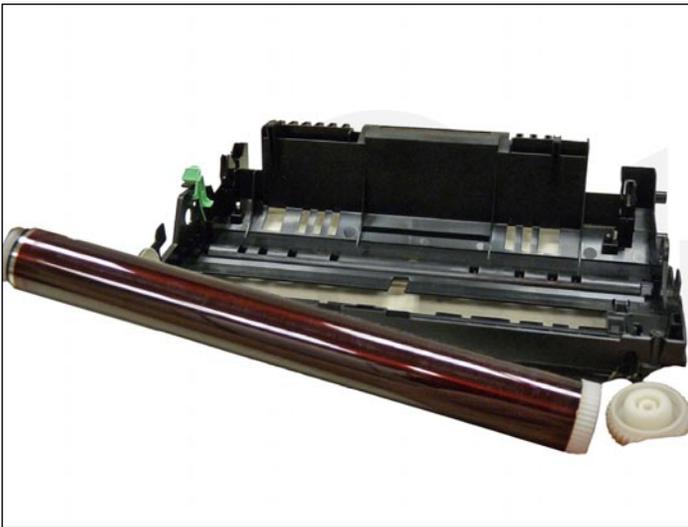
3. Remove the two screws from the top of the corona wire assembly.



4. Carefully pry up and lift off the top cover/corona wire assembly from the cartridge.

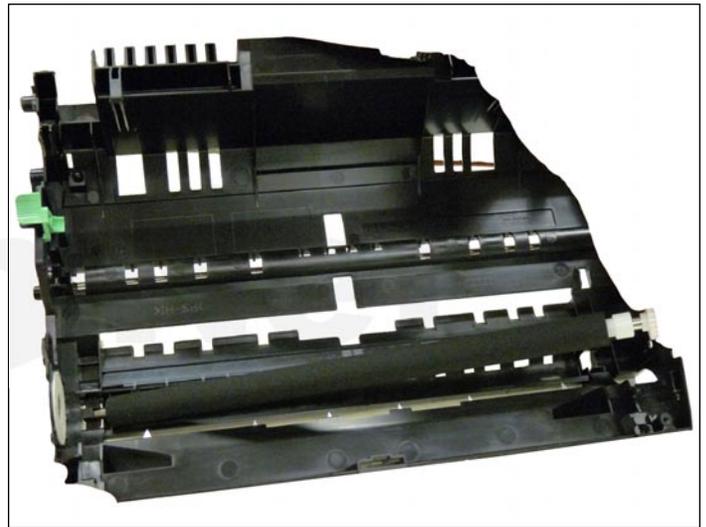


5. Remove the cleaning roller assembly by prying up on the two bottom tabs.



6. Carefully remove the drum.

The large drive gear will come loose.

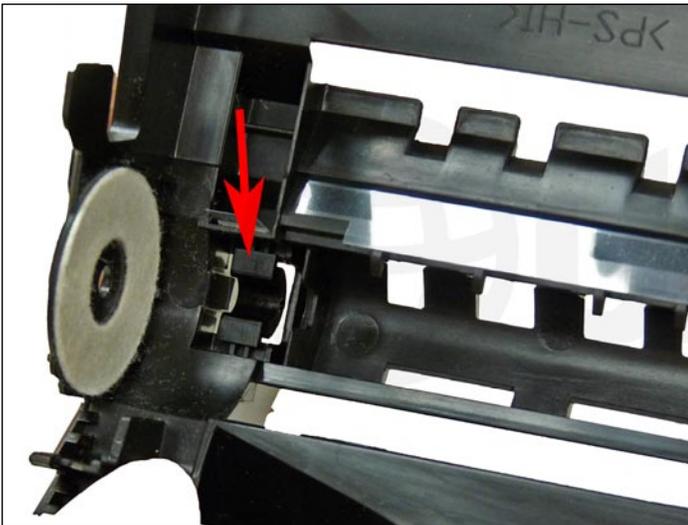


7. Carefully lift out the transfer roller from the gear side. Be very careful not to touch the roller with your skin. As with any transfer roller, the oils naturally present in your skin will be absorbed by the roller and interfere with the transfer process, causing light print.



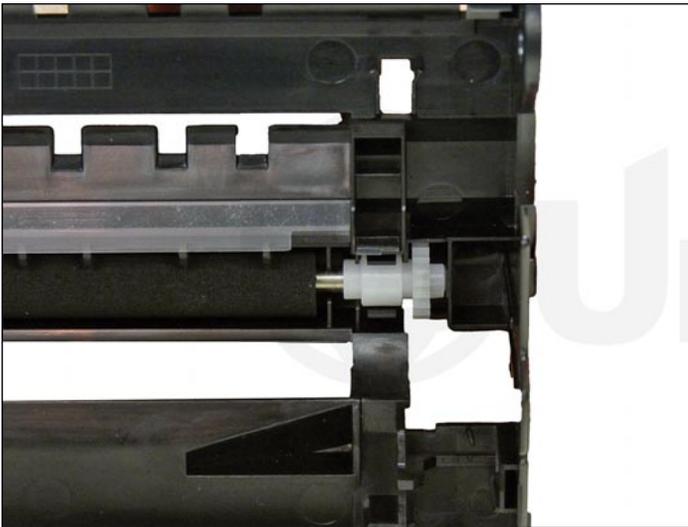
8. **IMPORTANT:** Note that there will be a small black bushing left in the cartridge. This bushing keeps the transfer roller from touching the electrical contacts on the left side of the cartridge. Be very careful not to lose this spacer! The cartridge will either print very light or 1/2 pages if it is missing. If the bushing does not come out with the transfer roller, it is best to remove the bushing while cleaning the cartridge.

9. With compressed air, blow off the transfer roller. Unless you have a statically grounded vacuum, do not vacuum this roller.

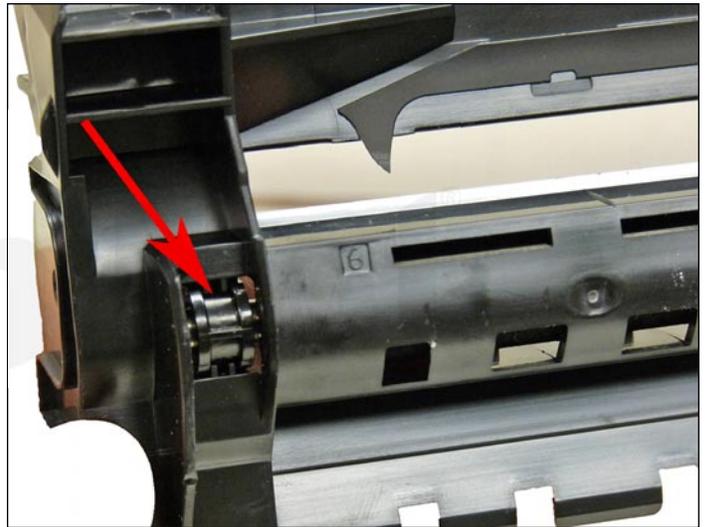


10. Reinstall the small black transfer roller bushing.

The groove in the bushing fits over the two thin rails.



11. Install the transfer roller. Make sure that both the white plastic bushing and gear is clean.



12. Check the outside of the cartridge to make sure that the small black bushing is correctly positioned.



13. On the cleaning roller assembly, pry up on the two tabs and lift off the cover.



14. Lift out the two rollers.

Be careful not to lose the two black conductive plastic contacts.

Two springs will come loose. Be careful not to lose them.



15. Clean out the waste chamber.



16. Blow off the cleaning roller using compressed air.



17. Install the rollers into the chamber.



18. Install the cover.

Lock the two tabs in place first then lock the two front tabs.

Make sure the cover is on flat!

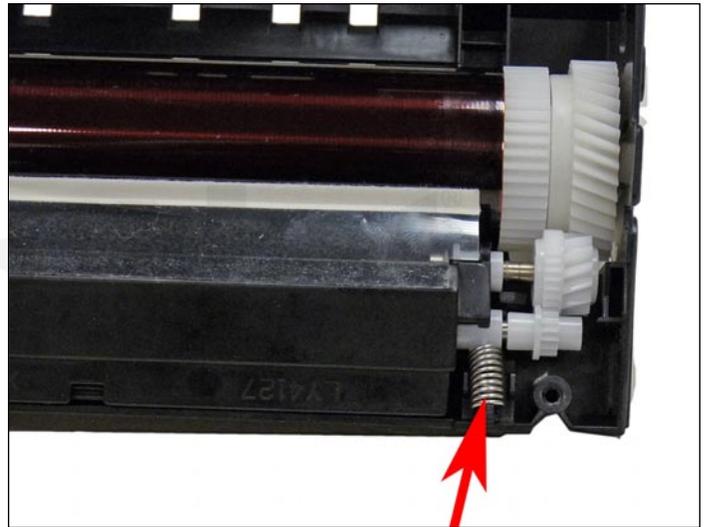
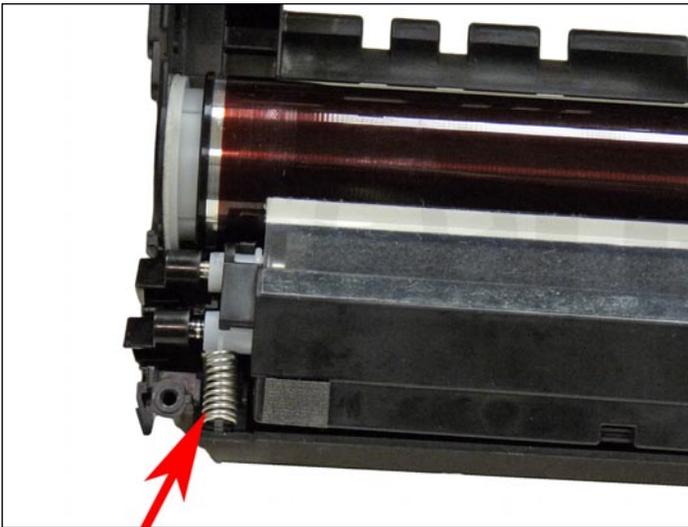


19. Install the drum, hub side first. You will have to compress the hub spring slightly for the drum to fit properly.

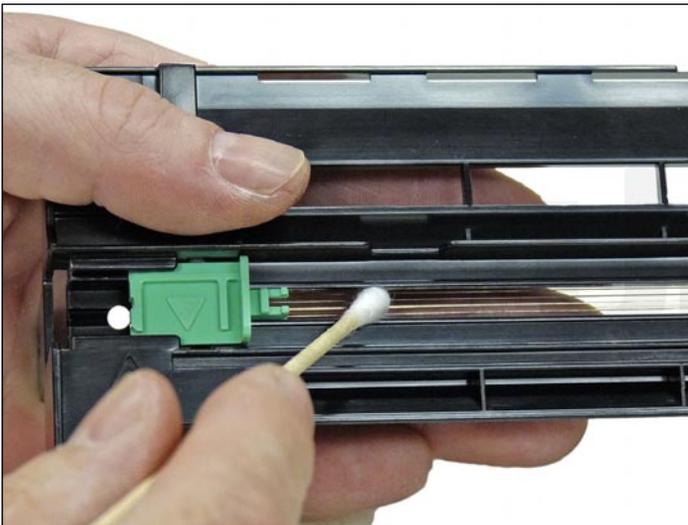


20. Install the cleaning roller assembly into the cartridge.

Make sure the two conductive plastic contacts fit into their slots.



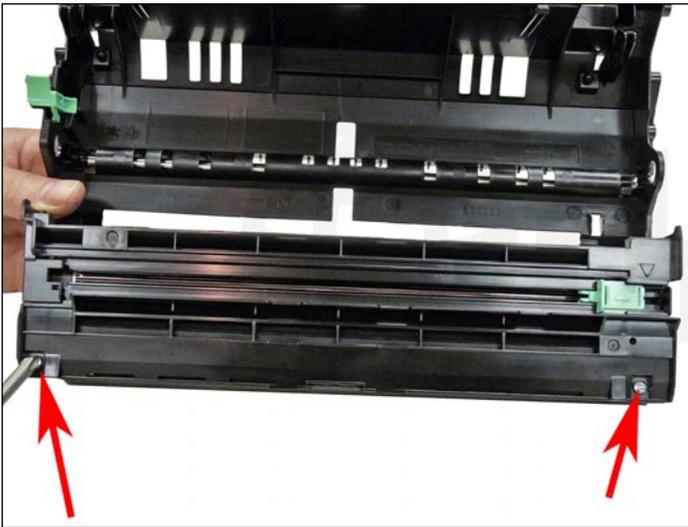
21. Install the two springs on each side of the cleaning roller assembly.



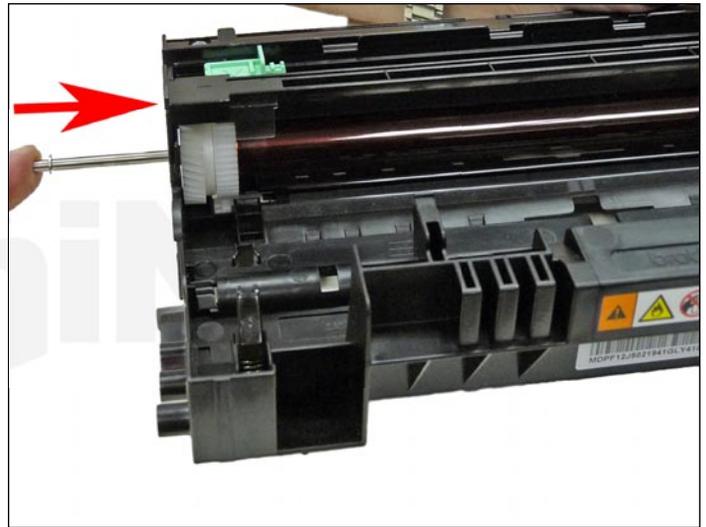
22. Clean the primary corona wire and grid with a cotton swab and alcohol.



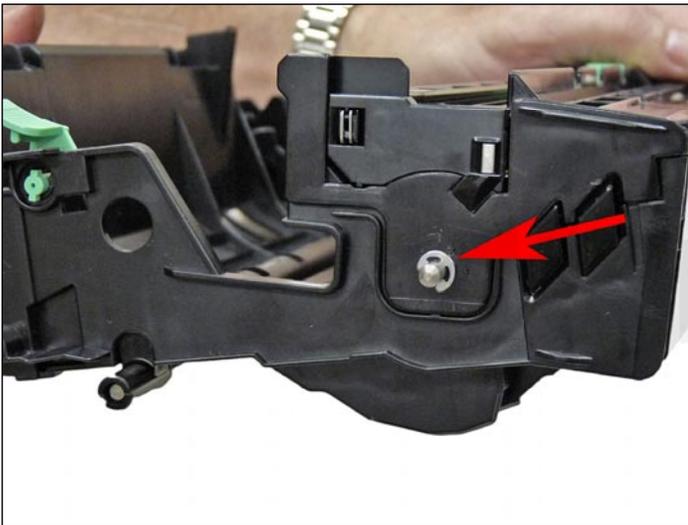
23. Install the top cover pressing down so it snaps in place.



24. Install the two screws on the top of the cover.



25. Install the drum axle from the drum gear side of the cartridge.



26. Install the e-ring on non-gear side of the drum axle shaft. Press the sidewall in slightly so that the e-ring slot is accessible.

RESET PROCEDURES

If the machine is saying to change the drum unit, do the following. If the drum unit was cleaned because of contamination, the reset is not necessary...

For the HL-54xx Units:

1. After replacing the drum unit, keep the front cover open (make sure the power is on).
2. Press and hold the "GO" button for about four seconds until all the LEDs light up.
3. Once all six LEDs are lit up, release the "GO" button.
4. Close the front cover.
5. The counter is reset!

For the HL-6180 Units:

1. After replacing the drum unit, keep the front cover open (make sure the power is on).
2. Press and hold the "GO" button until "DRUM CLEAR" shows on the display.
3. Close the front cover.
4. The counter is reset!

For the MFC-XXXX and DCP-XXXX Machines:

1. Open the front cover and press "CLEAR."
2. The display will show "REPLACE DRUM?" Select "#1-YES."
3. When the screen shows "ACCEPTED" close the front cover.
4. The counter is reset!

TEST PAGES

1. Take the machine offline by pressing any of the arrows, "OK" or "BACK" buttons.
2. Press the up or down arrows until you see "MACHINE INFO."
3. Press "OK" or "GO."
4. Press the up or down arrows until you see either Demo Print or Test Page.
5. Press "OK" or "GO."
6. The page selected will print.

REPLACE DRUM MESSAGES

There are three different "Replace Drum" messages you might see...

1. Drum Error: This can be caused by a dirty corona wire. Use the built-in corona wire cleaner to clean it. If this does not clear the error, the drum unit needs to be replaced.
2. Replace Parts (Drum): The drum unit has exceeded its rated life.
3. Drum Stop: Print quality will most likely be diminished at this point if the unit is not replaced.