

SAMSUNG® ML-2165W (MLT-D101S) TONER CARTRIDGE REMANUFACTURING INSTRUCTIONS



SAMSUNG MLT-D101S TONER CARTRIDGE

REMANUFACTURING THE SAMSUNG ML-2165W (MLT-D101S) TONER CARTRIDGE

By Enrique Stura, Daniel Reyes, Mike Josiah, and the Technical Staff at UniNet

TECHNICAL TIP: HOW TO CIRCUMVENT SAMSUNG'S ML-2160/2165 CARTRIDGE REPLACEMENT LIMITATION

UniNet offers solutions for optimal performance powered by our Award Winning Technical Team.

On this opportunity we will touch on the Samsung ML-2160, 2165, SCX-3405 printers with cartridge part number MLT-D101S.

Samsung has built in a very devious cartridge replacement limitation on this printer series in which there is a maximum limitation of 250 cartridges per machine allowed.

There are two issues to consider with this system, one is that a testing bed can be rendered useless after testing 250 cartridges; the second is that an end users machine can be rendered useless (or dramatically reduced) if the final chip is used during testing.

- This means only 250 new cartridges (the OEM are included on the count) in total can be installed into the printer.

- Whenever you insert a new cartridge (to be recognized by chip serial number) to the printer, the printer will count "+1" for the replacement. At the same time, the total accumulated number will be recorded to both the printer and chip of the cartridge.

Now comes the sneaky part: If you take this recorded cartridge to another printer, the install count record in the chip will be written to the printer and of course "+1" will be counted, and so on...

In other words, if you take a cartridge from a machine that has run 240 cartridges and install it in a brand new machine, that new machine will have a total life left of nine cartridges (240+1)!

Once the replacement limitation of 250 has been reached, the printer will stop its functionality.

As a result, our technical team strongly recommends: "Do not test the toner cartridges with a new chip before delivery." Use an in-house testing chip (marked with bright paint) to run all the cartridge testing and then after it has passed, install a new chip on the cartridge.

Otherwise, customer printers would be counted up to the number on the cartridge (from your testing printer), and once changed, it is unrecoverable.

BASIC SAMSUNG ML-2165W PRINTER SPECIFICATIONS**Printing**

Speed (black):	21 ppm
First print out time:	Less than 8.5 seconds (black)
Print resolution:	1200 dpi
Emulation:	SPL (Samsung Printing Language)
Duplex printing:	Manual

Paper Handling

Paper input capacity:	150 sheets
Output capacity:	100 pages
Media sizes:	3 x 5 in – 8.5 x 14 in
Media types:	Plain, Envelope, Labels, Cardstock, Thick, Cotton, Color, Preprinted, Recycled, Bond, Archive

General

Display:	LED (toner/status)
Processor:	300MHz
Memory:	32MB
Interface:	Hi Speed USB 2.0, wireless 802.11 b/g/n
Noise level:	Less than 50 dBA while printing, less than 26 dBA (standby)
Monthly duty cycle:	10,000 pages
OS compatibility:	Windows 7, Vista, XP, 2008, 2003, 3200, Various Linux, Unix, Mac 10.4 and later
Power consumption:	Standby mode - less than 1.2W; Ready mode - less than 30W; Peak - less than 310W
Energy Star compliant:	Yes
Dimensions:	(W x D x H inches) 13" x 7" x 8.5"
Weight:	8.8 lbs.

TONER CARTRIDGE SPECIFICATIONS**Consumables**

Cartridge type:	One-piece toner	
Toner load:	Starter Cartridge:	55g (700 pgs)
	Replacement Cartridge:	70g (1,500 pgs)

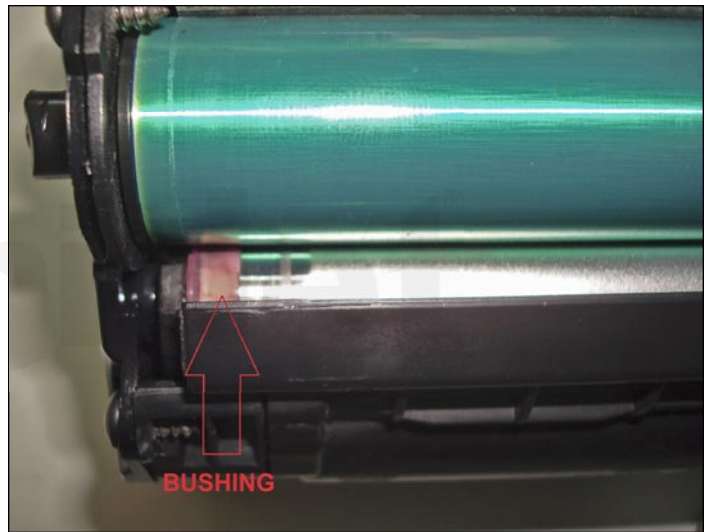
Consumable Yield

As stated by Samsung, the MLT-D101S cartridge, shipped with the machine (starter), will print 700 pages while the replacement cartridge will print 1,500 pages as per ISO/IEC 19752 specs.

The starter cartridge shipped with the machine can only be identified by its serial number and the word "Initial" printed in its label. The aspects of the cartridge are rapidly recognized as a Samsung product, however as with prior releases, the presence of plastic rivets instead of classic screws to secure end plates, does create the need to carefully drill all seven positions and replace the rivets with standard self-tapping cartridge screws for proper removing, remanufacturing and assembling.

In the following figures, we can see the relevant details in both end covers.

The real surprise is inside the cartridge as soon as it is removed and separated into its two sections. First, we find that the developer roller is no longer made of controllably conductive urethane as with prior models but replaced by a aluminum sleeve set at a particular non-contact distance marked by the presence of bushings at each end of the roller. This metal roller is treated at a given rugosity and does not have any resistant coating as we find in a cartridge working with magnetic toner, except that in this case the toner is non-magnetic and there is no magnet inside the roller.



The separation between the roller and the surface of the OPC is about 0.14mm, meaning in effect there is a jump of the toner from the roller surface to the OPC surface in the moment of development of the latent image in the photoreceptor. The surprise does not end there and we see that the doctor blade working at a tangential position is made of stainless steel instead of polyurethane. This metal to metal contact with toner as intermediate can only mean severe degrading or wear of the surface with use, particularly if a non-specific toner is used, such as the "Universal" being offered by suppliers.

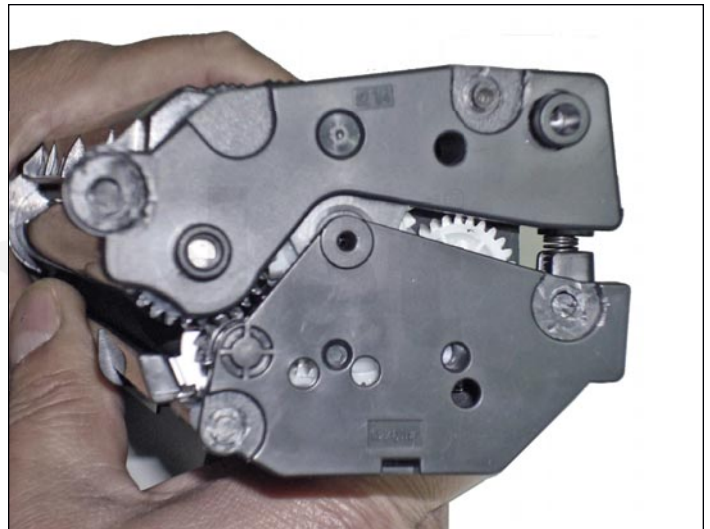
Our lab tests have shown that the actual MLT-D101S toner is of a new design and might not be exactly as in previous models. The use of a non-specific toner could accelerate the wear of the developer roller surface treatment and a rapid decay of the print quality offered by the cartridge.

REQUIRED TOOLS

1. Toner approved vacuum
2. Small common screwdriver
3. Phillips head screwdriver #3
4. Needle nose pliers
5. Chisel blade X-Acto style knife
6. Small drill bit 5/64" (to match self-tapping screws) and small electric drill

REQUIRED SUPPLIES

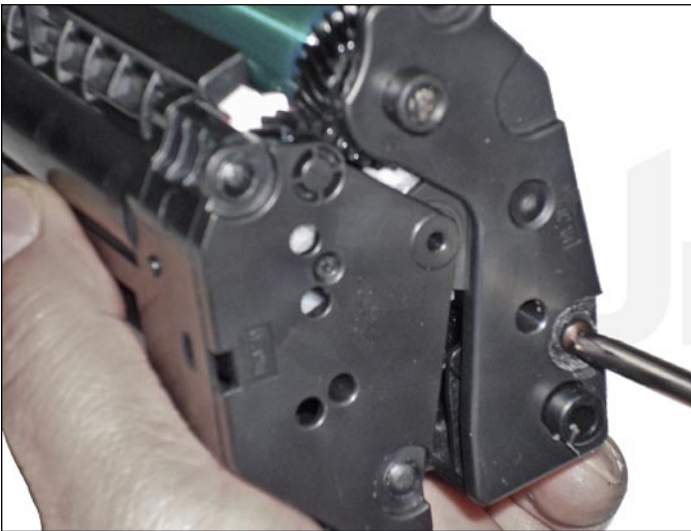
1. New replacement toner for use in Samsung ML-2165W / MLT-D101S
2. New replacement chip for use in ML-2165W to match region
3. New OPC drum (optional)
4. New developer roller (optional)
5. New PCR (optional)
6. New doctor blade (optional)
7. Self-tapping cartridge screws 1/8" x 1/4" (7 pieces)
8. Conductive grease
9. 99% isopropyl alcohol
10. Wiper blade lubricating powder



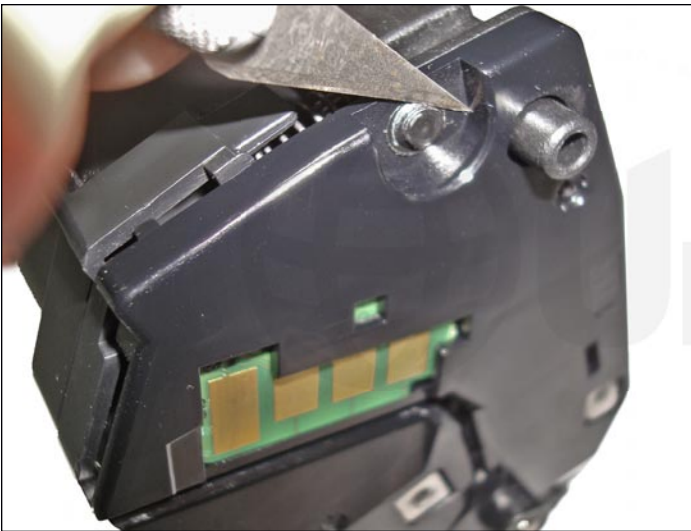
1. Place the cartridge in position, and with the chisel blade section, the head of each plastic rivet holding the left end cover.



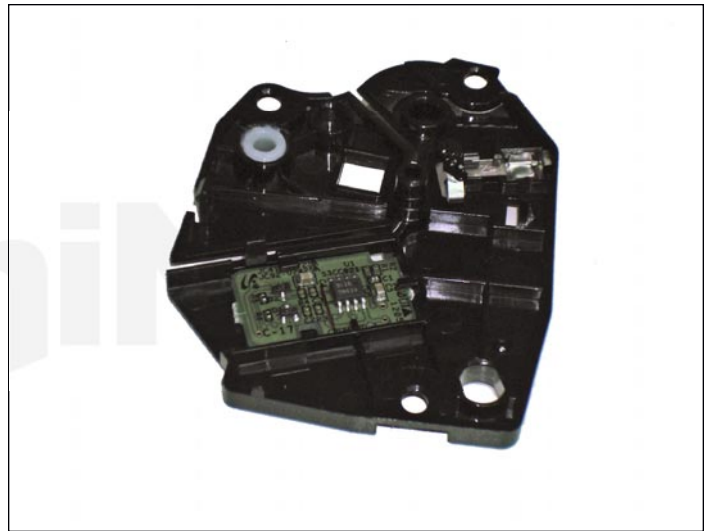
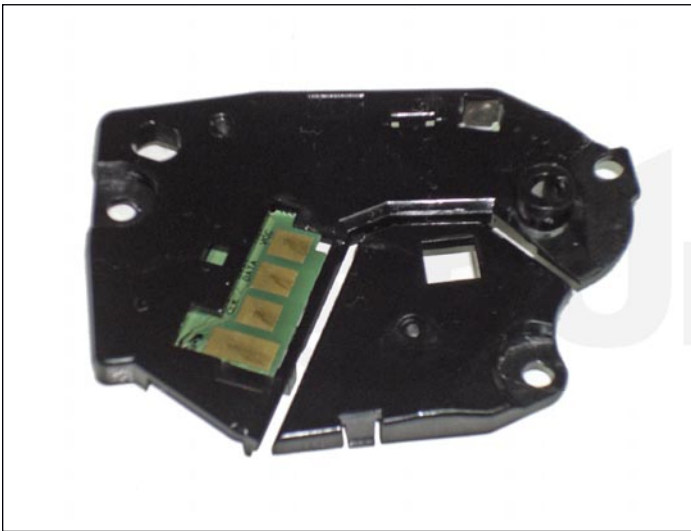
2. Mark the center of each cut and drill a hole with the small drill bit no deeper than 3/16".



3. Tap the four screws into position.



4. Repeat the work sectioning the heads of the rivets on the opposite end cover (marking the center of the rivets, drilling and tapping the three screws).



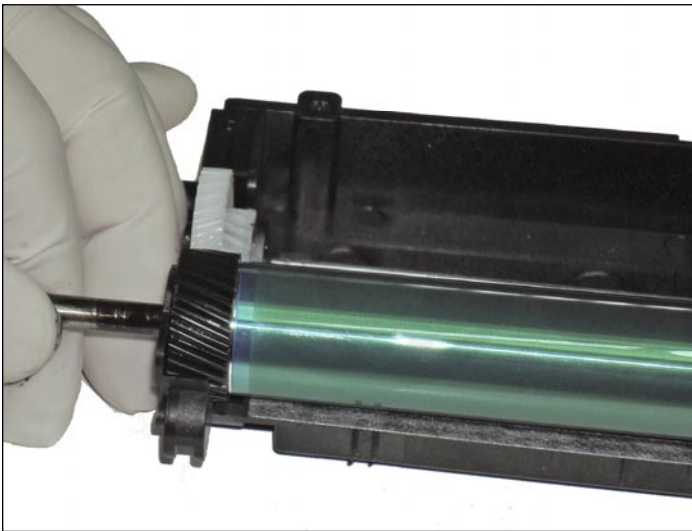
5. Proceed now to remove the screws of the end cover on the right (contact side) and pry open with the small screwdriver at different consecutive points until separation is accomplished. Even though the cover seems to be formed by two sections, it is a unit with a rather thin centerpiece. Worth noting also the way the chip is internally held and the need to be replaced prior to reinstalling the cover.



6. Repeat the removal of the left end covers in its two parts, starting with the top one and then the lower one.

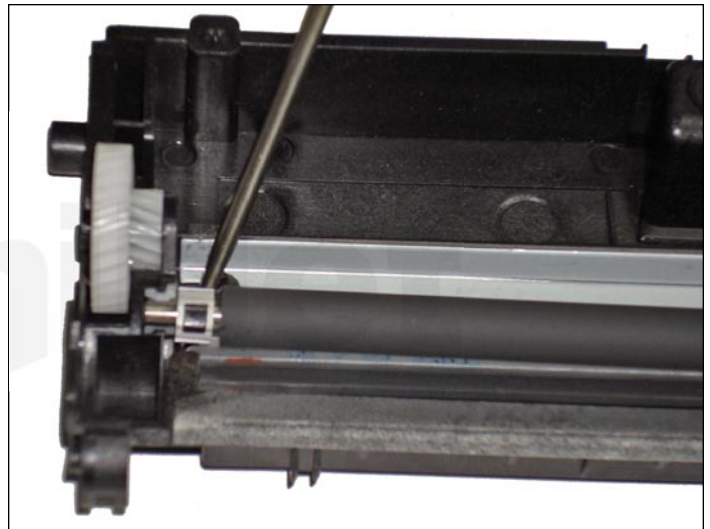
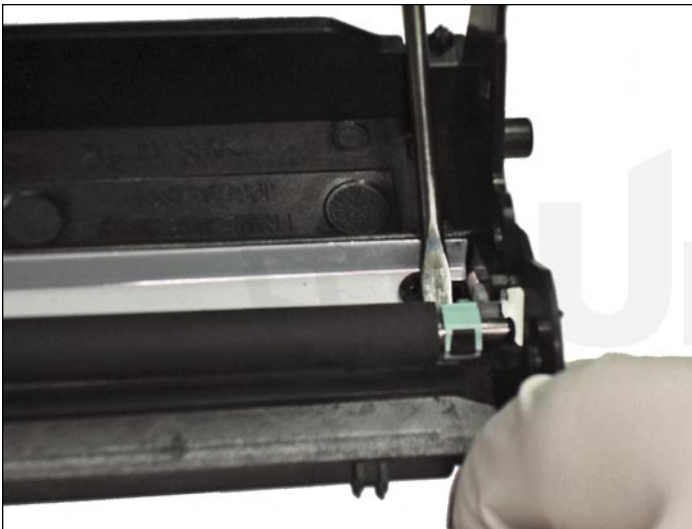
This will allow separation of the cartridge in two sections.

Begin working in the image section.

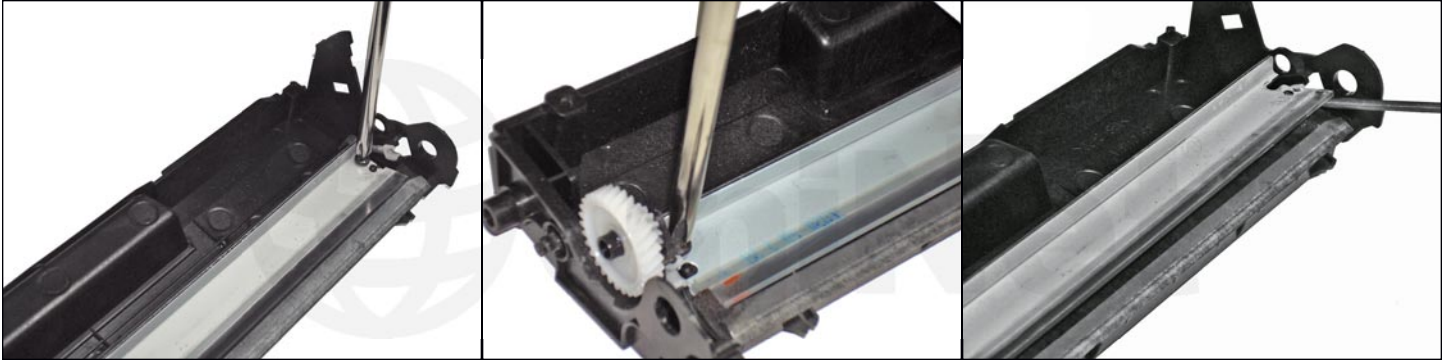


7. Slide the OPC drum axle out just enough to allow the opposite end of the drum to be lifted out of position and remove it.

Leave the drum axle inside the OPC.



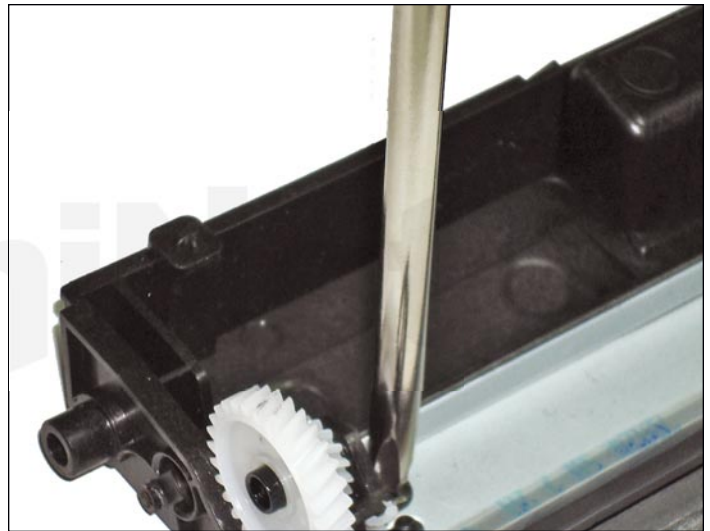
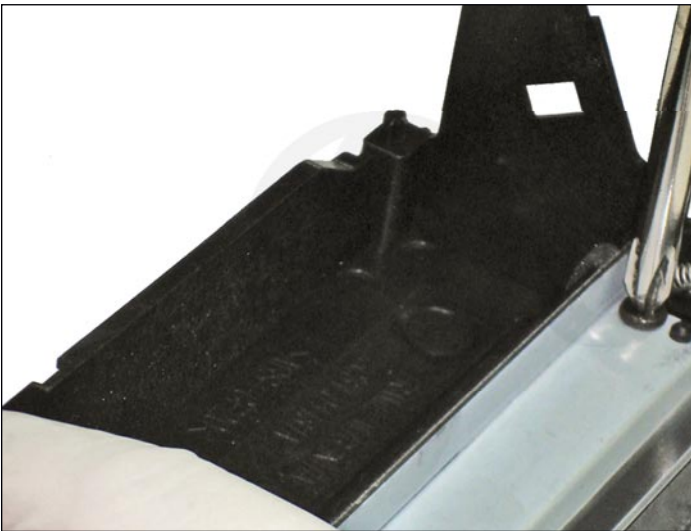
8. Remove the PCR, applying slight leverage to both holders with the small screwdriver.



9. Remove both Phillips screws and remove the wiper blade by prying it out.



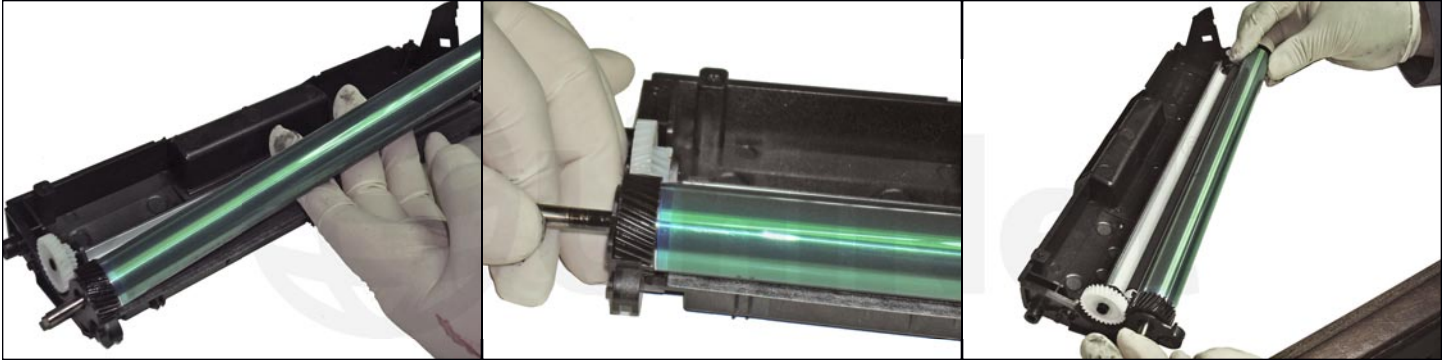
10. Vacuum the waste bin and surrounding areas. Inspect also the state of the wiper and the recovery blade seals.



11. Lubricate the wiper blade with lubricating powder and install with the two Phillips screws.



12. Wipe the PCR surface with a soft cloth to remove all traces of toner, and if need be, use a PCR cleaning liquid. Most marks and even fingerprints can be removed with a damp cloth containing a few drops of neutral detergent and fractioning the surface with axial strokes. Then, use a damp cloth to remove the rest of detergent and dry completely before installing the PCR. Clean the PCR saddles with isopropyl alcohol and apply a slight coating of conductive grease to both ends. Continue to install the PCR observing the proper location of each saddle. The green end to the right saddle and the white end to the left saddle.



13. Clean the OPC surface and proceed to install it in the cartridge, moving the shaft inside just enough to seat the OPC drum properly. Cover the drum section away from light and set aside. Begin work on the developer section.



14. Remove the black gear from the developer roller, using the small screwdriver as leverage.



15. At the opposite end, remove the screw holding the contact end plate. It must be noted that there is NO conductive spring or blade doing the electrical work. Instead, a conductive plastic tip at the plate can be found. This is further confirmed by the use of fair amount of conductive grease both at this bearing and the inside of the metal developer roller.



16. Slide the developer roller out and be particularly careful with both plastic bushings acting as separators at each end of the roller. Clean the roller with a soft cloth and use isopropyl alcohol if needed, to remove all traces of dirt and grease from the surface. Replenish with conductive grease as needed.



17. Vacuum the area carefully, and avoid touching the doctor blade.

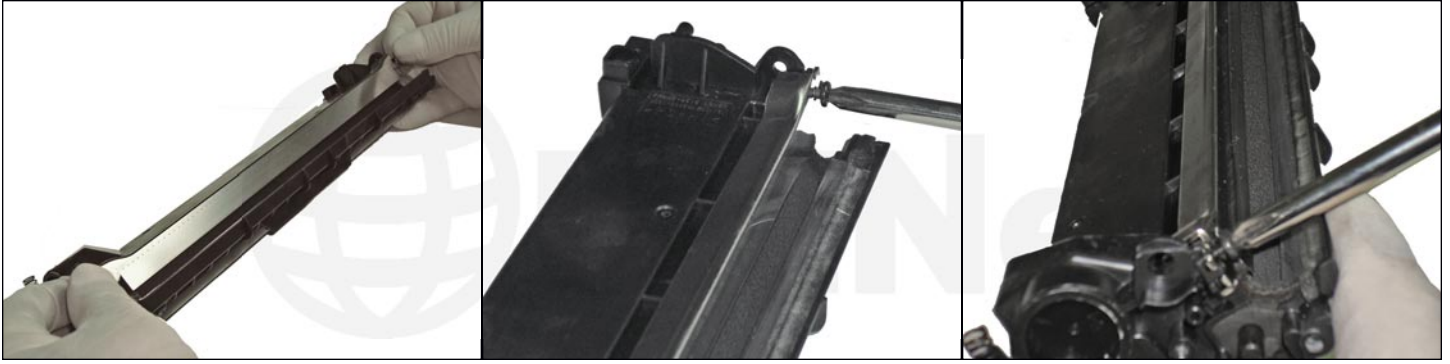


18. Remove the two Phillips screws and doctor blade from its place, then clean with a soft cloth.



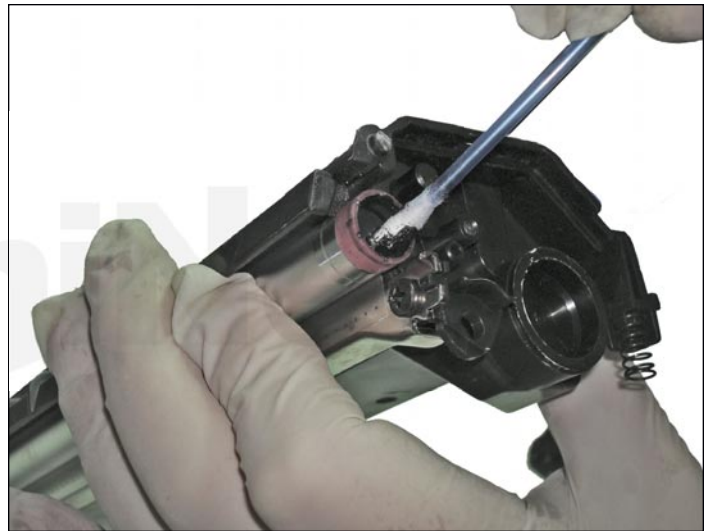
19. Vacuum the hopper completely, including the feed roller, and remove the fill plug to facilitate the work.

Inspect the seals for the developer roller and the blade.



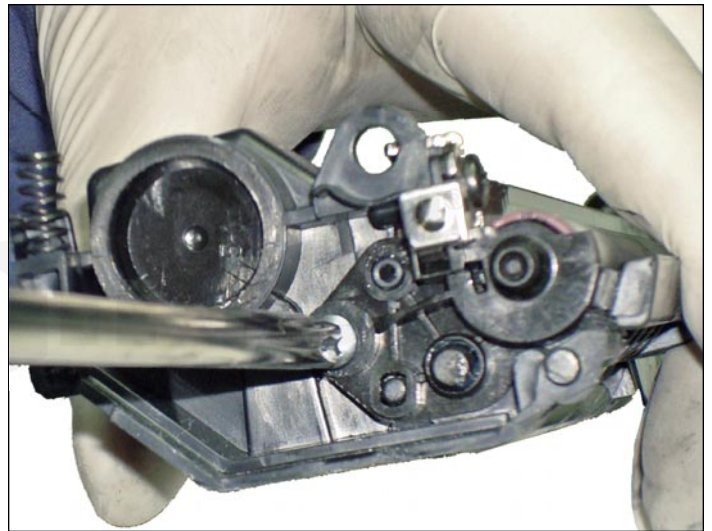
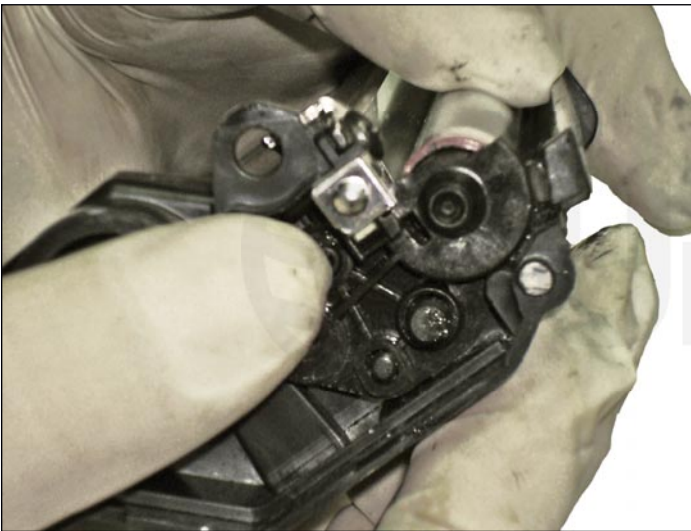
20. Install the doctor blade in its place, securing it with the proper screws.

The figure show the plate for the gears removed, but normally this is not required.



21. Install the developer roller, ensuring the positioning of the red plastic bushing first.

Apply conductive grease if not done before.



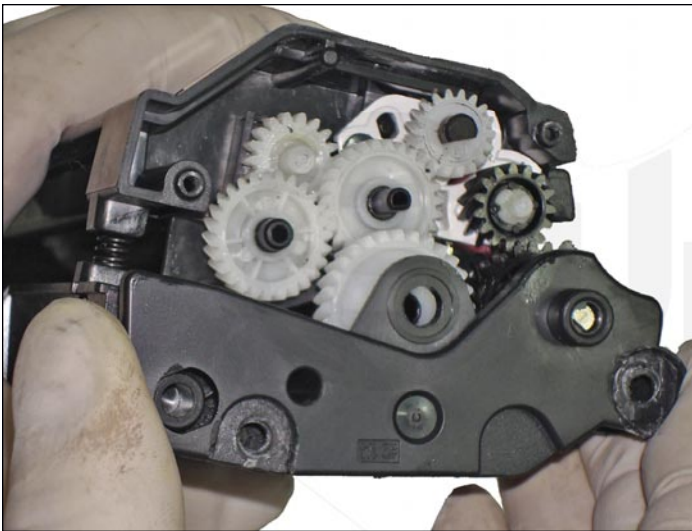
22. On the other end, install the bushing and the contact plate, securing it with the corresponding Phillips screw.



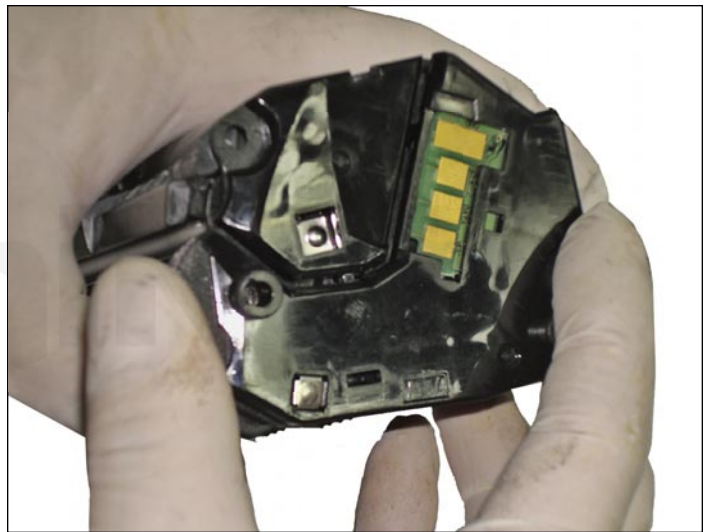
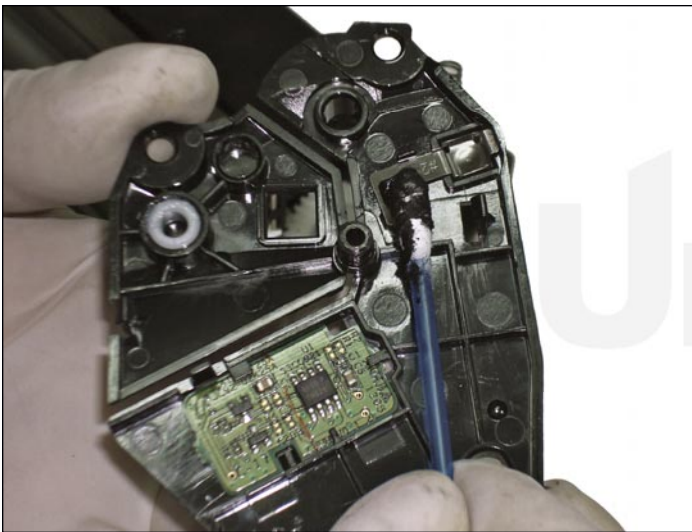
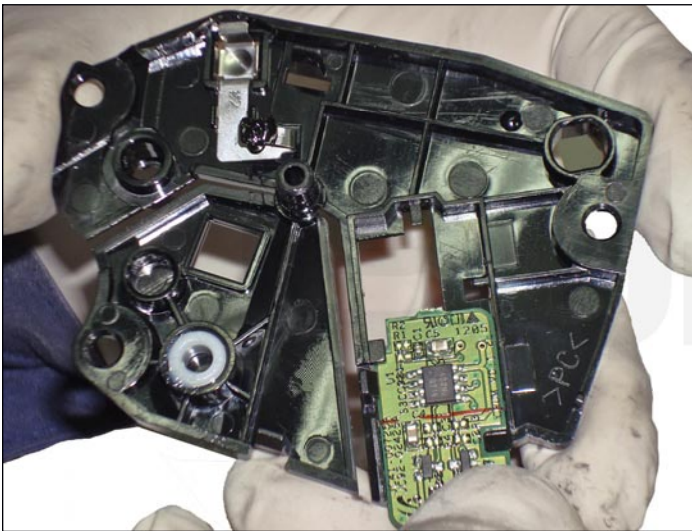
23. Fill the hopper with dedicated toner for use in MLT-D101, and place the filling plug back to close the hole. Check for leaks.



24. Now take the image section and place it on top of the developer section as shown, positioning the compression springs properly.

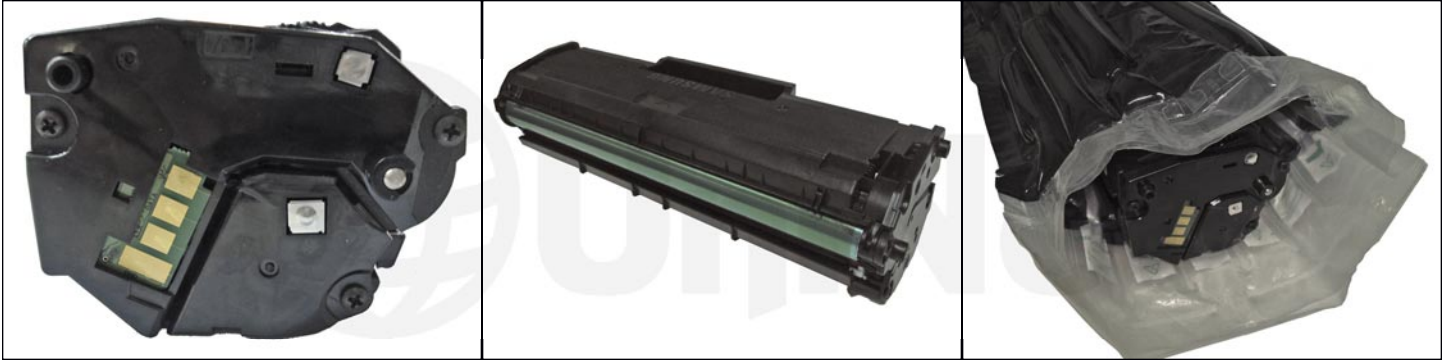


25. While holding both sections together, place the lower part of the end cover in place, matching the chamfered shaft of the OPC with the right hole. Screw the cover in place and proceed to install to larger cover in place.



26. Work on the opposite end by taking the end cover and lubricating all contact points, and replacing the chip as shown.

When installing the cover, ensure proper insertion of the metal contact point through the square hole of the cover.



27. Screw on the cover with the chip and proceed to check the cartridge in the machine.

For proper protection, use inflatable air bag packaging to transport this cartridge.

REPETITIVE DEFECT CHART

OPC	62.83 mm
PCR	25.45 mm
Developer Roller	37.70 mm