HP® COLOR LASERJET CP3525
CARTRIDGE REMANUFACTURING INSTRUCTIONS

HP CP3525 TONER & DRUM CARTRIDGE

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REMANUFACTURING THE HP CP3525 BLACK & COLOR TONER CARTRIDGES

By Mike Josiah and the Technical Staff at UniNet

First released in March 2009, the CP3525 series of color laser printers are based on a 30ppm black and color, 1200 x 600 dpi engine (3600 dpi with RET). The 3525 cartridges are an all in one type cartridge that consists of the toner supply, drum, and waste chamber. Unlike some of the other newer 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 new machine layout, we will take a moment and run through the printer theory before we get started. These cartridges are basically a rectangular shaped cartridge that comes with a toner seal and a snap-on drum cover across the bottom to protect the drum (see photo). These printers also have a separate waste bottle to collect the waste toner from the ITB belt. The cartridges also use chips that's should be replaced each cycle for the cartridges to have full functionality.

THE PRINTERS BASED ON THE CP3525 ENGINE ARE:
HP Color LaserJet CP3525
HP Color LaserJet CP3525n
HP Color LaserJet CP3525dn
**HP Color LaserJet CP3525x**

THE CARTRIDGES USED IN THESE MACHINES ARE:

CE250A (Black)	**5,000 pages**	**$115.99 List***
CE250X (Black HY)	**10,500 pages**	**$115.99 List***
CE251A (Cyan)	**7,000 pages**	**$114.99 List***
CE253A (Magenta)	**7,000 pages**	**$114.99 List***
CE252A (Yellow)	**7,000 pages**	**$114.99 List***
CE254A (Toner collection unit)		**$12.99 List***

*List pricing, in U.S. American dollars, current as of May 2009.

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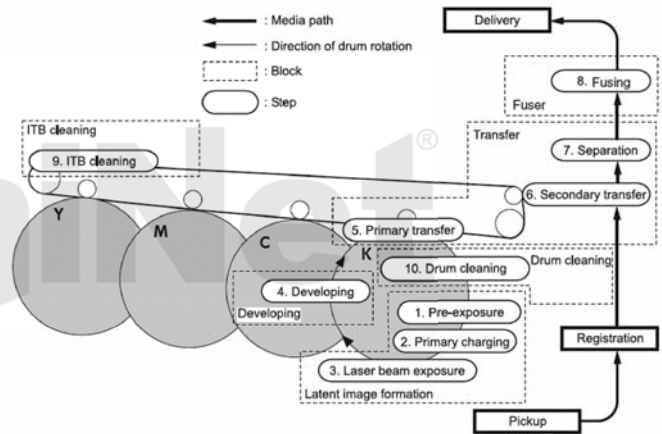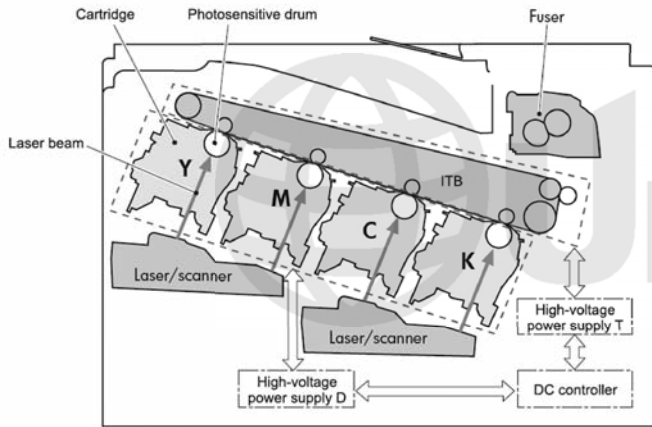
## HP CP3525 COLOR PRINTING THEORY

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. Shown (left) is a basic layout of the cartridges and how they relate to one-another and the printer. Note that while this is still a single-pass system, the layout is completely different from any previous Canon/HP machine. The laser units are on the bottom, the cartridges are at an angle and the ITB is on top. Shown (right) is the complete image formation process.
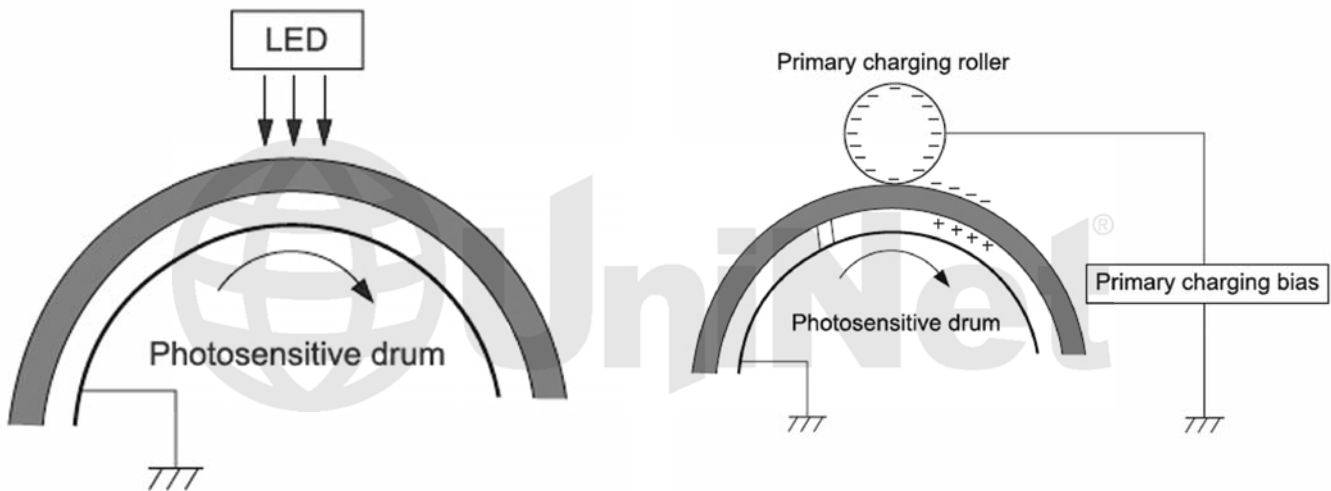

In the **first stage**, light from the pre-exposure LED strikes the drum to remove any residual charges from the drums surface. Then, the Primary Charge Roller (PCR) places a uniform negative DC voltage on the OPC drum surface. The amount of the negative DC voltage placed on the drum is controlled by the printer's intensity setting.

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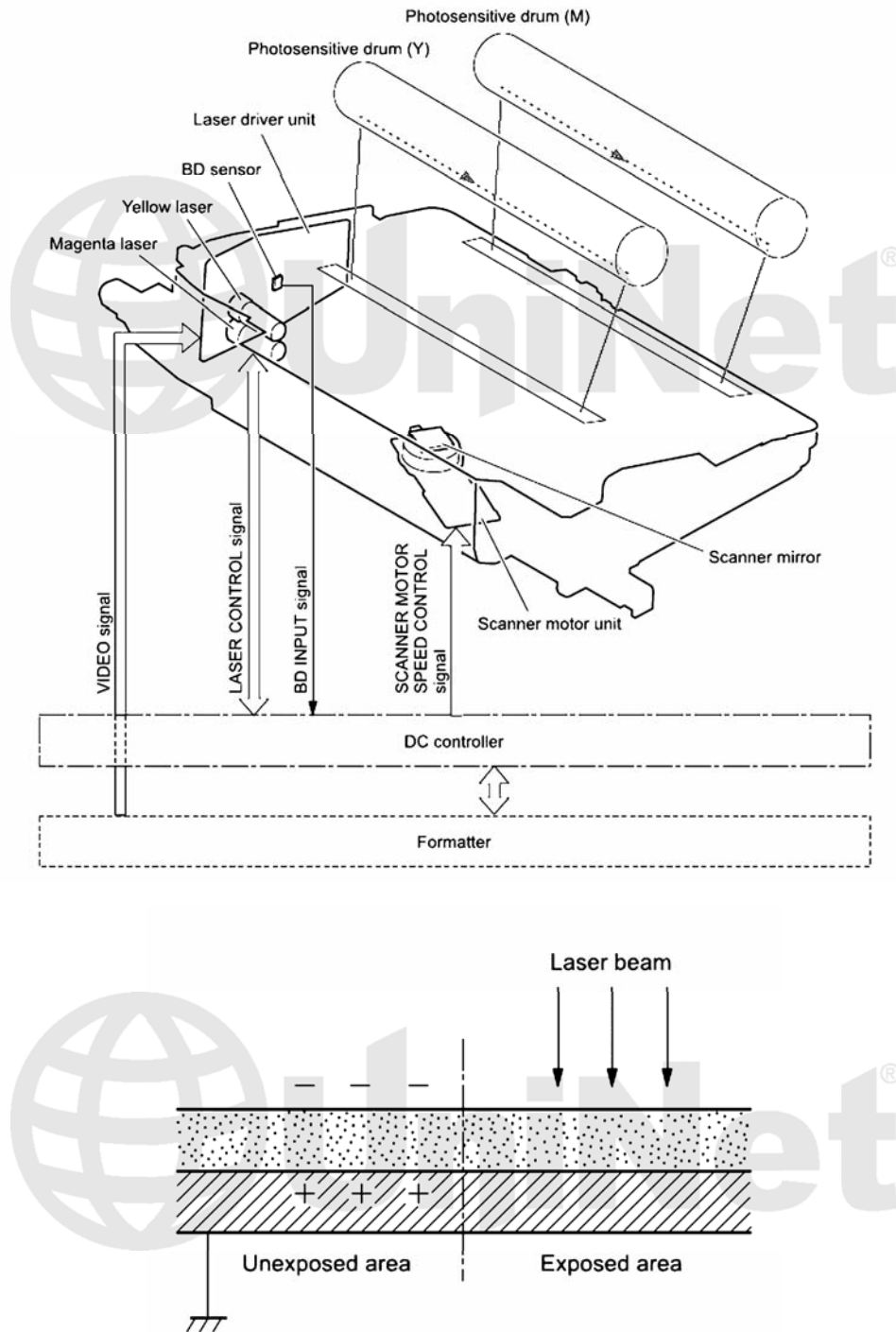
In the **second stage**, the laser beam is fired onto a rotating mirror (called the scanner). As the mirror rotates, the beam is reflected into a set of focusing lenses. The beam then strikes the drums surface, reducing the negative charge and leaving a latent electrostatic image on the drum. The areas where the laser did not strike the drum will retain the higher negative charge. While some previous printers had one scanner unit with four lasers, these machines have two separate laser/scanner units: one for Black and Cyan; one for Magenta and Yellow.

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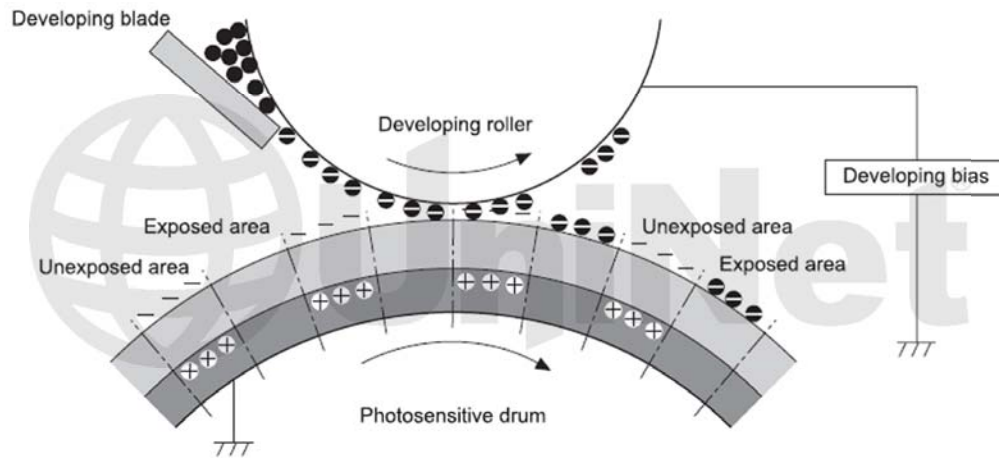
The **third** or **developing stage** is where the toner is developed on the drum by the developing section (or supply chamber), which contains the toner particles. The development stage is actually made up of two steps: toner charging, and the actual development. In the toner charging stage, the toner 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.
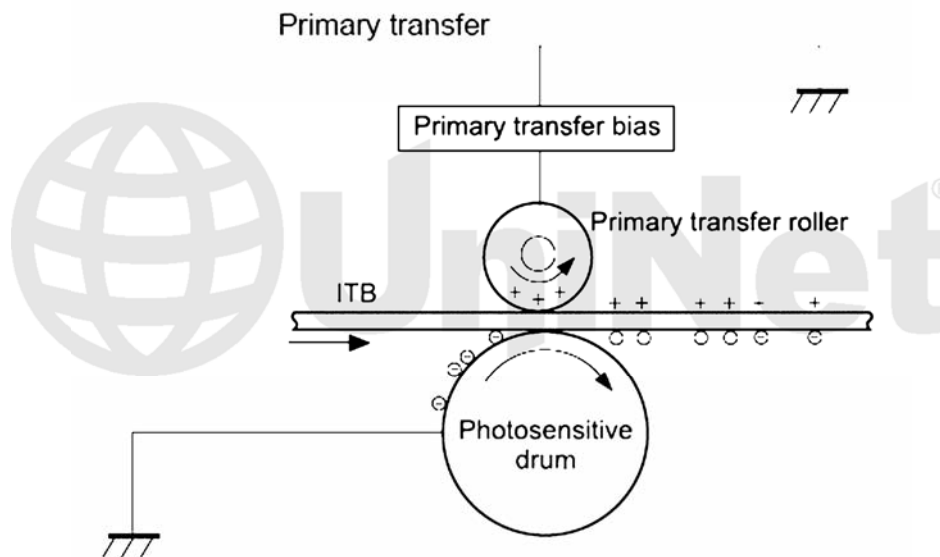

The **fourth stage** is the transfer stage. This is where there are some large differences from monochrome printers and also from other color lasers. In the Primary transfer stage the transfer roller which is located directly opposite each OPC drum, places a positive DC bias charge on the back of the ITB or 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 all previous HP engines. The ITB and transfer rollers are on top of the OPC drum, not underneath it.

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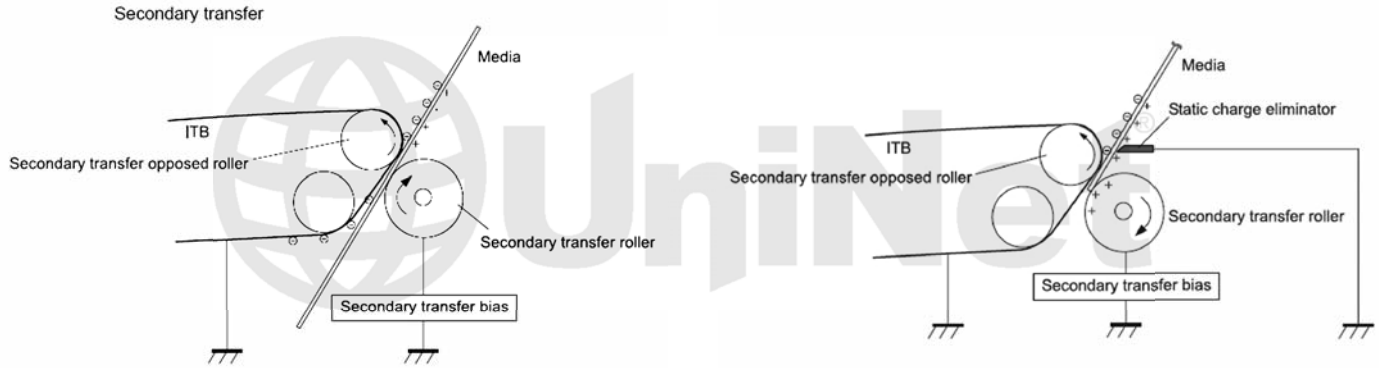
The paper separates from the ITB belt as the belt reaches the top of its path and turns back down to start the process again. The static charge on the back of the paper is decreased with static charge eliminator. This helps stabilize the paper feed, and also prevents toner flares (spots) under low temperature and low humidity conditions.
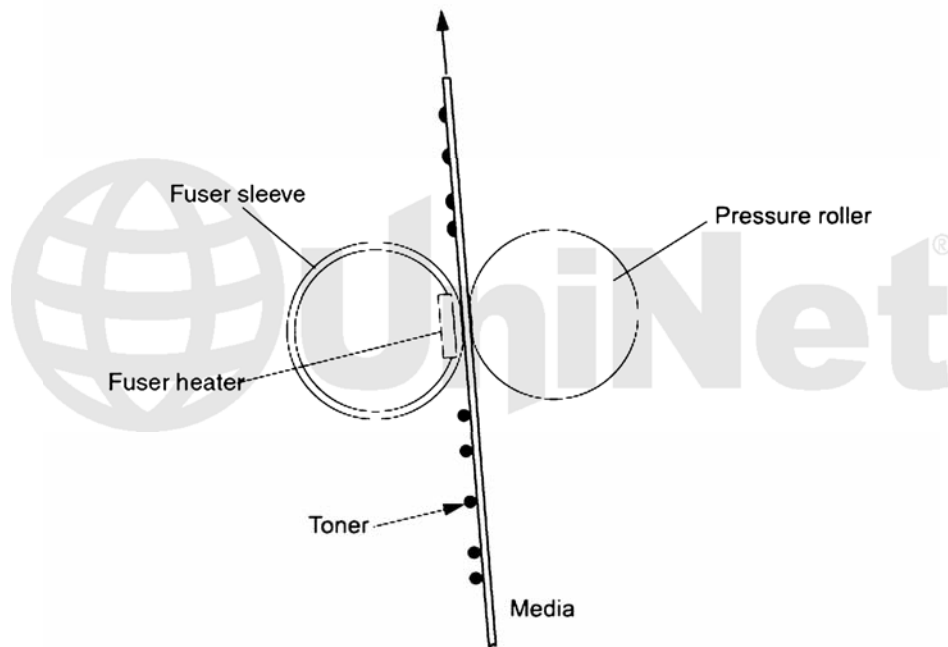
In the **fifth stage**, the image is then fused onto the paper by the fuser assembly. The fuser Assembly is comprised of the upper heating assembly and lower pressure roller. The lower pressure roller presses the page up into the upper heating assembly which then melts the toner into the paper. This 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.

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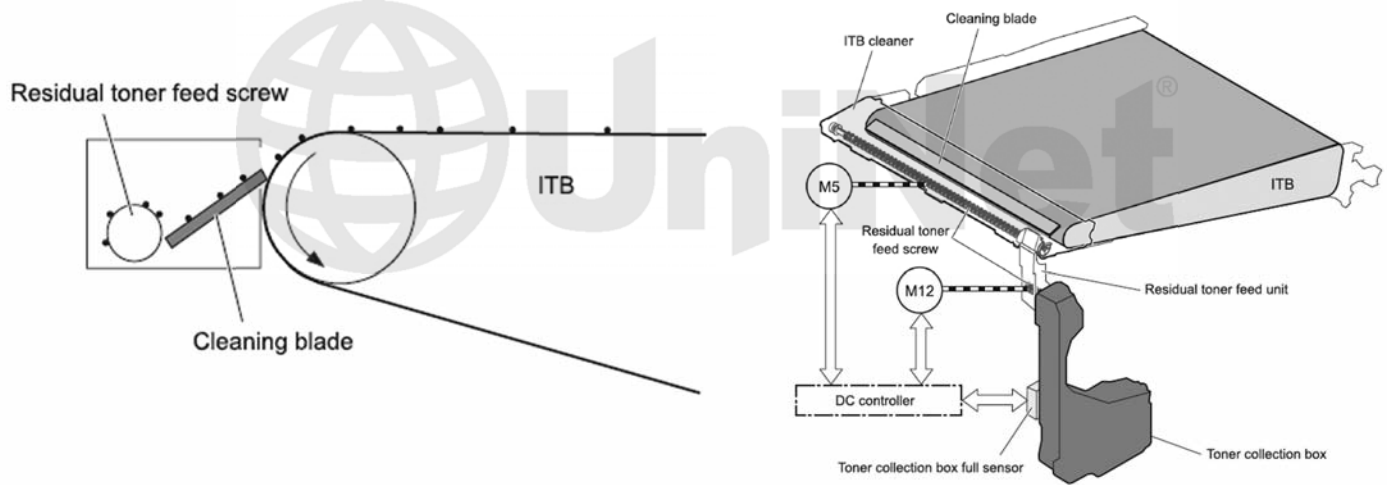
ITB CLEANING

The 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.
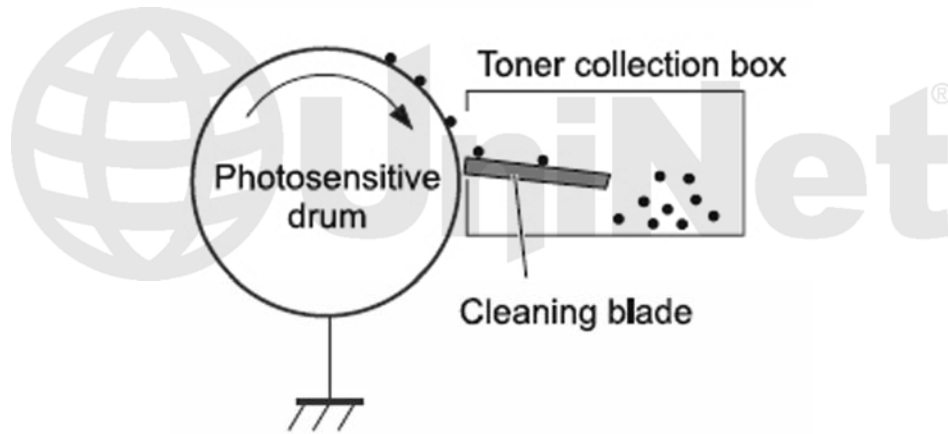
OPC DRUM CLEANING

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.

PRINTER CALIBRATION

At the start of all this is the cartridge detection process, toner level detection, and then the calibration cycle. The printer will calibrate itself whenever the printer 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 ITB. As the printed areas get to the top of the belt, a sensor will detect them, measure the density and adjust the printer accordingly. All of the calibration time settings are user controllable.

Taking test prints, cartridge troubleshooting as well as minor printer troubleshooting will be covered at the end of this article.

REQUIRED TOOLS

1. Toner approved vacuum
2. A small screw driver (common style)
3. A Phillips head screwdriver
4. Needle nose pliers
5. 1.5mm gapping gauge (optional)

REQUIRED SUPPLIES

1. Dedicated color toner for use in HP CP3525
2. New replacement chip
3. New long-life drum for use in HP CP3525
4. New wiper blade
5. New toner feed roller (optional)
6. New PCR (optional)
7. New doctor blade (optional)
8. Doctor blade gapping shims
9. Drum cover
10. Lint-free cloths
11. Conductive grease

The pins in these cartridges are very similar to the HP 1320 cartridges. The best way to remove them without damaging the cartridge is to cut two small holes. Other than the location, it is basically the same procedure as the 1320.
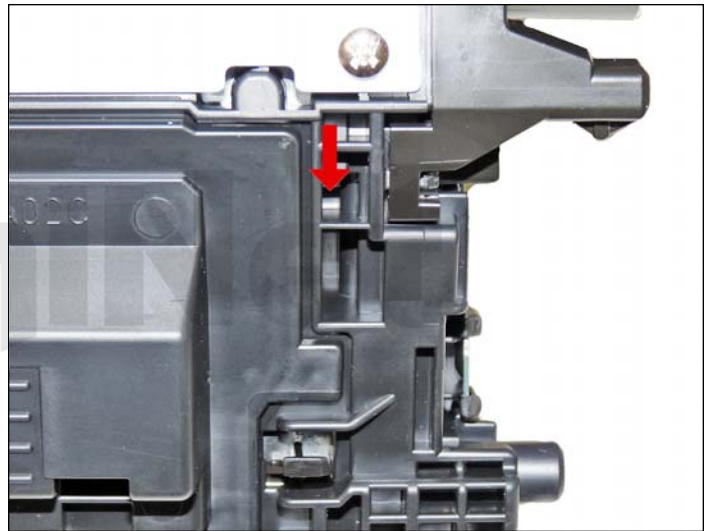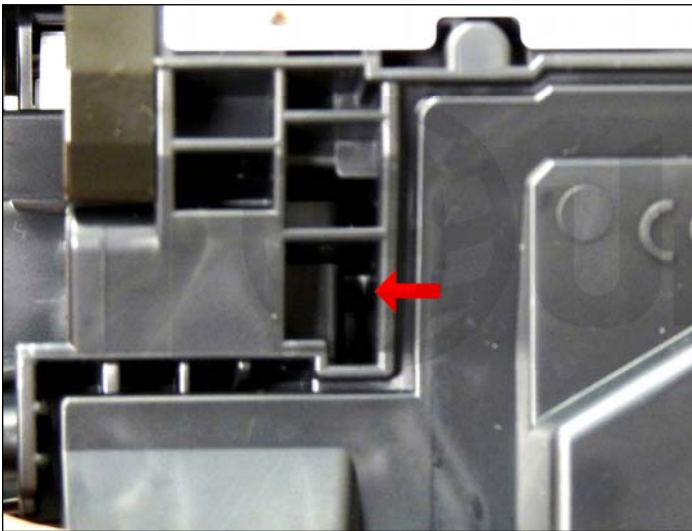

1. Remove the spring from the label side of the cartridge.

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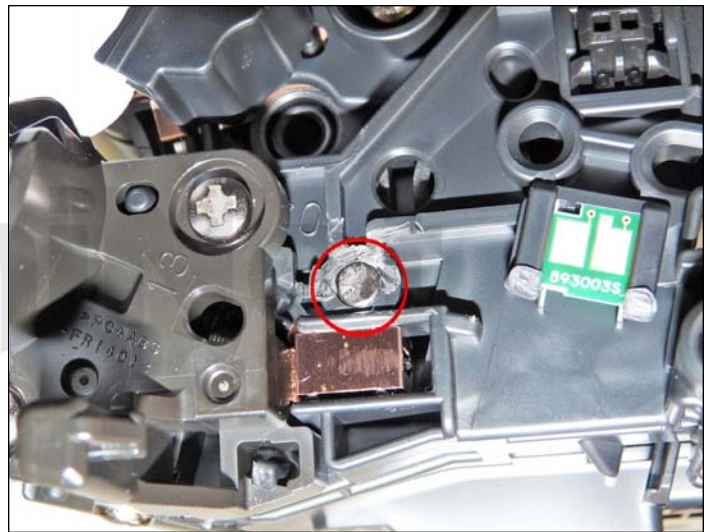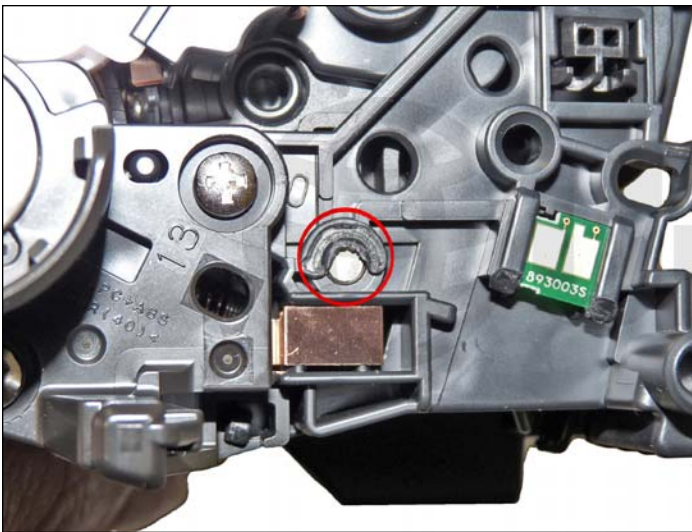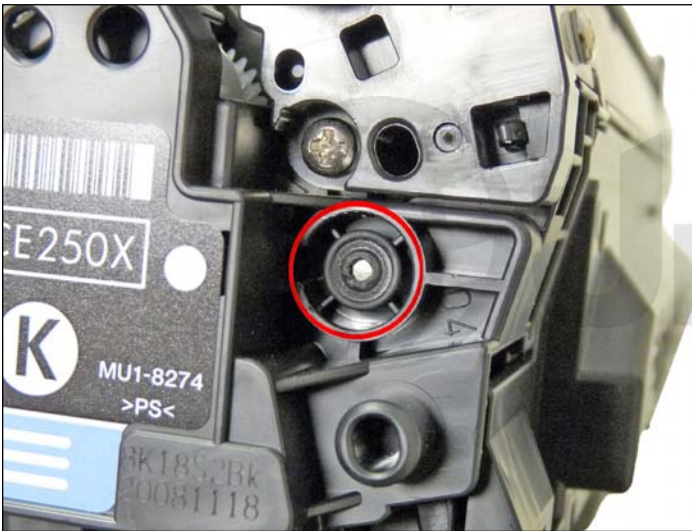
2. With a razor knife, carefully shave the plastic from the heads of the hinge pins.

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3. Position the cartridge so that the wide label is in front and the metal bar is on top.

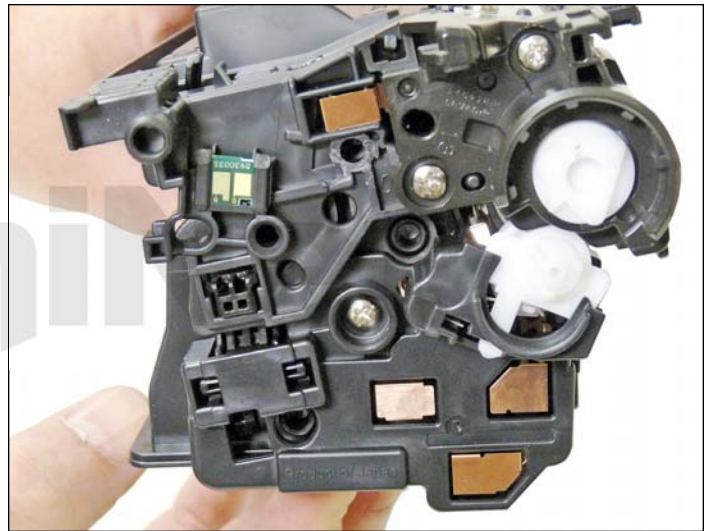Drill a shallow hole on each side of the cartridge as indicated.

Images above show holes <u>uncut</u>.

Holes <u>cut</u>.

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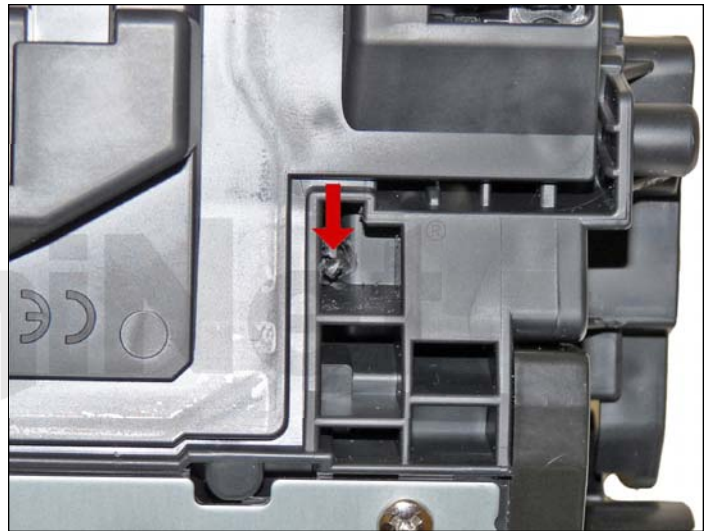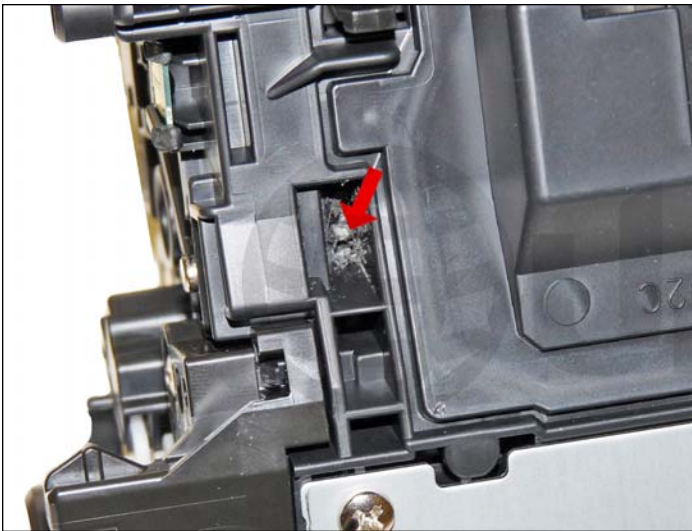
4. Push the pins out with a jeweler's screwdriver. With the hole in this location, by just pushing the screwdriver in, the pins will be pushed out. Remove the pins. The gear side has the smaller of the two pins.

5. On the gear side, press in on the plastic locking mechanism.

6. On the opposite side, lift up on the waste chamber until the two halves separate.

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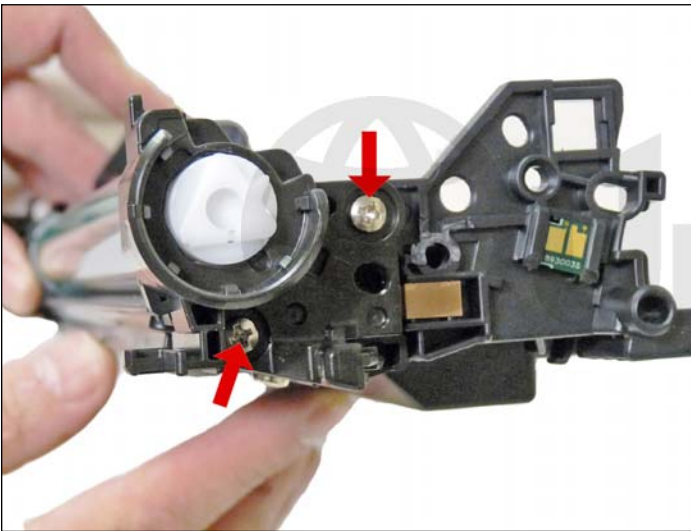
7. On the waste chamber, remove the two screws from the drum gear end cap.

Press in on the tab as shown and remove the end cap.
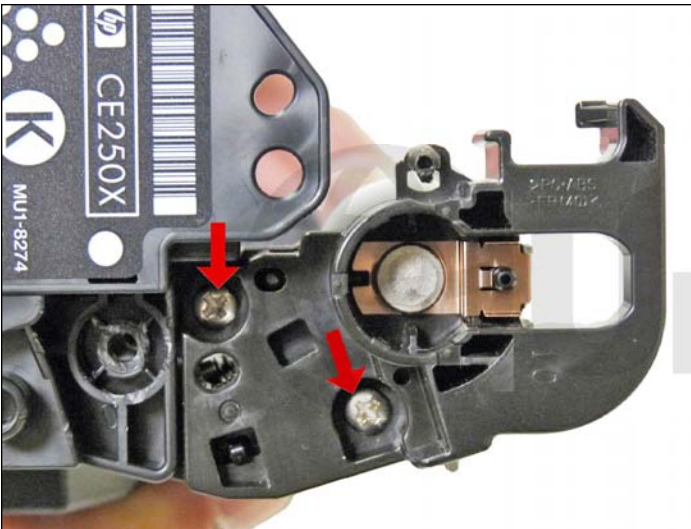
8. Remove the two screws from the contact side end cap.

Remove the end cap.

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9. Remove the drum.
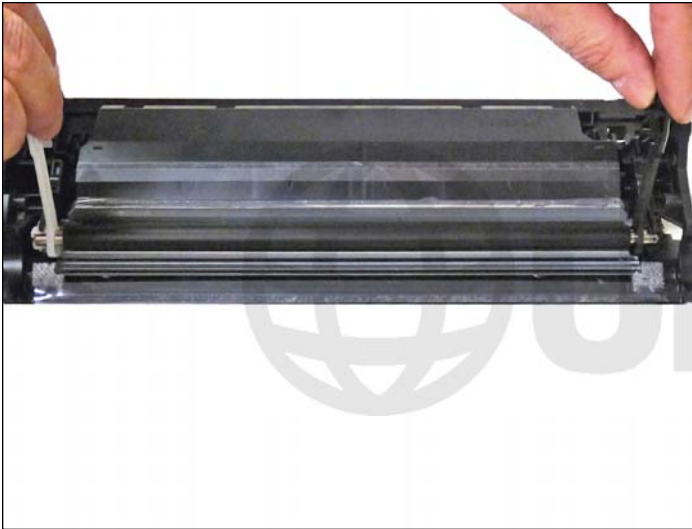
10. Remove the PCR by lifting up on the black and white PCR locking arms.

Remove the PCR Assembly.

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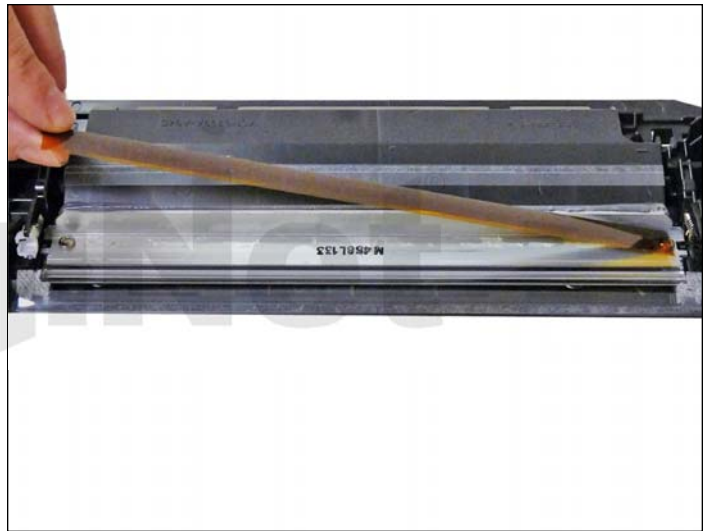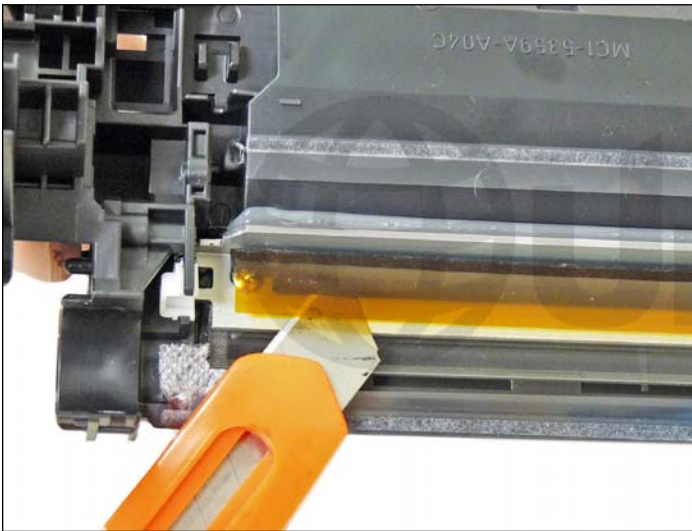
11. To remove the wiper blade, the amber film assembly needs to be removed.

Slide a razor knife under the plastic mounting bar and remove the assembly.
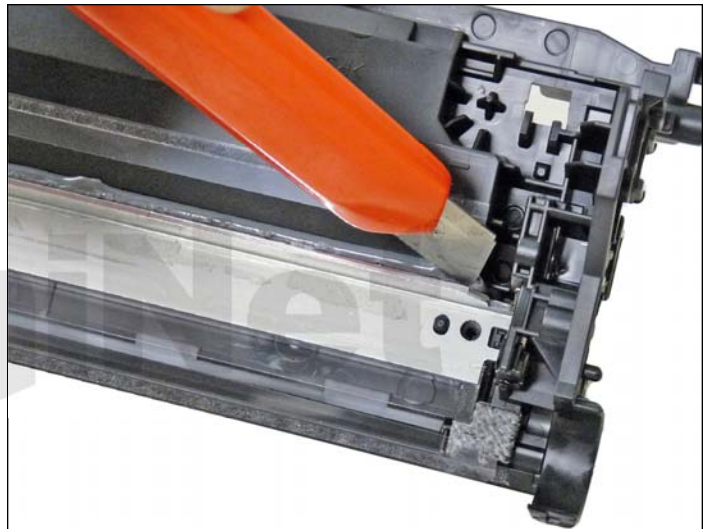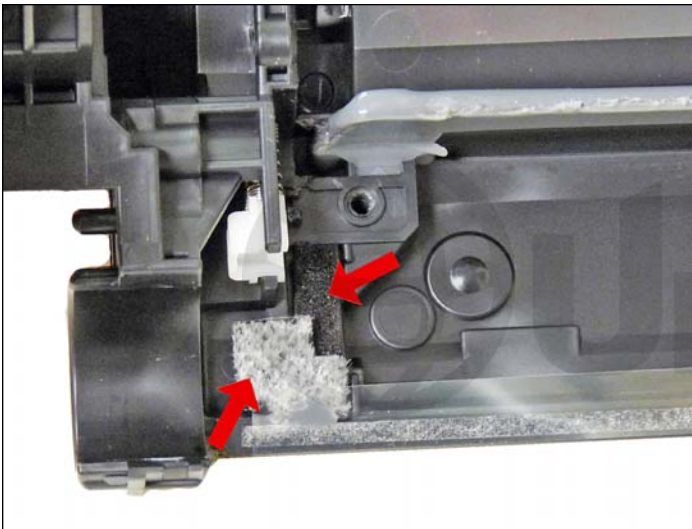
12. Remove the two screws from the wiper blade.

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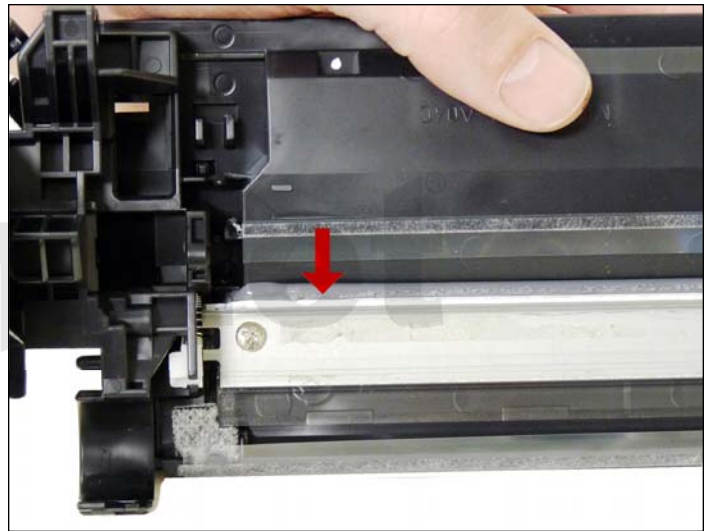
Remove the wiper blade.

13. Clean out all the waste toner from the chamber.

Try not to get any toner on the wiper blade seal if possible.
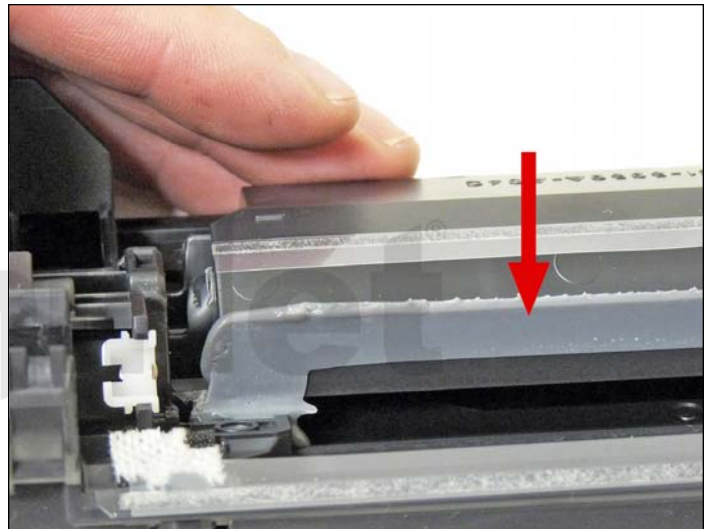
14. Clean the felt seals on each end of the wiper blade. If the wiper blade glue has toner on it, clean it off with alcohol and a foam swab. If it does not become sticky again, it needs to be removed and a good silicone caulk should be used to seal the blade off. GE 100% Silicone and Phenoseal are two good brands for this.

15. 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.

16. The amber film assembly is held in place with double-sided tape. If this is not sticking, remove the old one with alcohol and replace. Replace the film assembly.
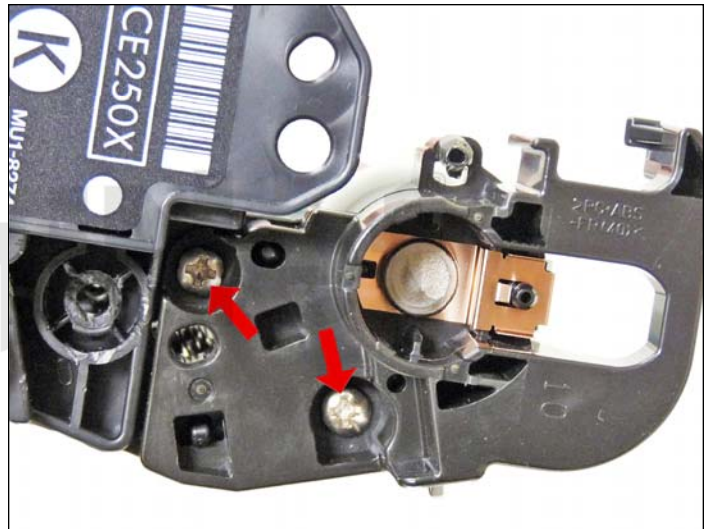
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17. Clean the PCR with your preferred cleaner and install in the cartridge.
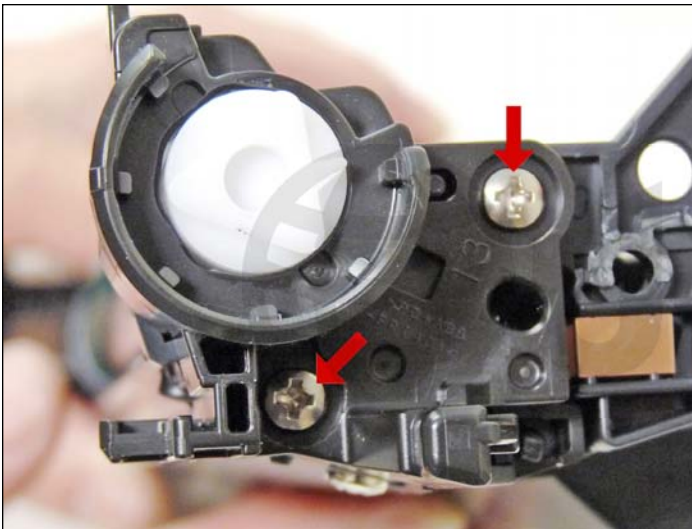
Make sure you lock the locking arms in place.

18. Install the drum, short-hub side, to the right or label side of the chamber.

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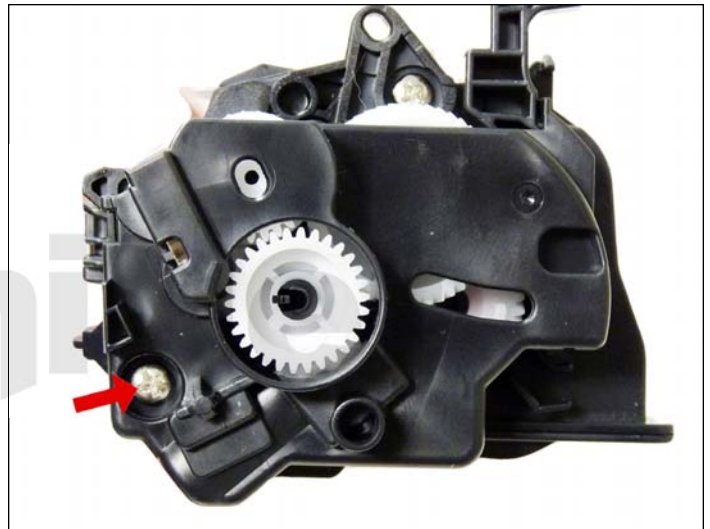19. Install the contact end cap on the right or label side of the chamber.

If the conductive grease is contaminated, clean it and replace it with fresh grease.

Install the two screws.

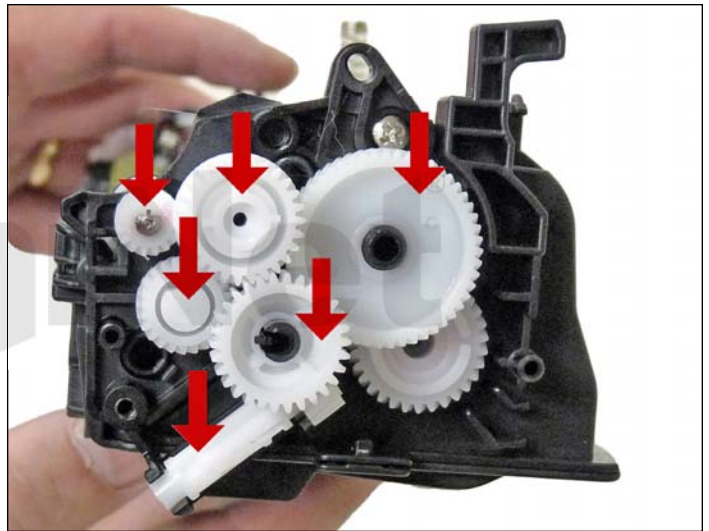20. Install the opposite side end cap and two screws.
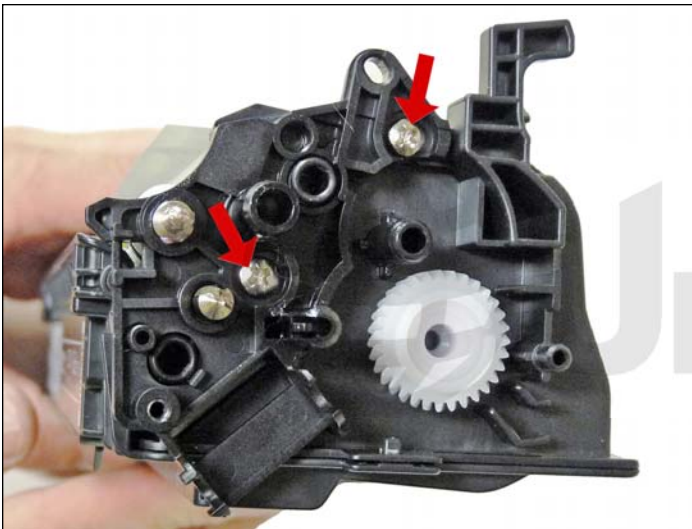
Place the waste chamber aside.

21. On the supply chamber, remove the outer screw from the gear side end cap.
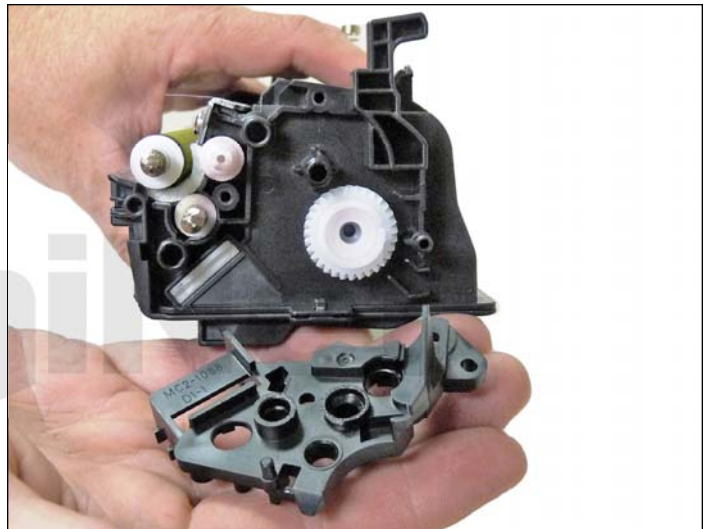
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22. Press in on the tab and remove the end cap.

23. Remove all the gears as shown except for the mixing blade gear. This is attached to the mixing blade. It is very difficult to re-attach properly.
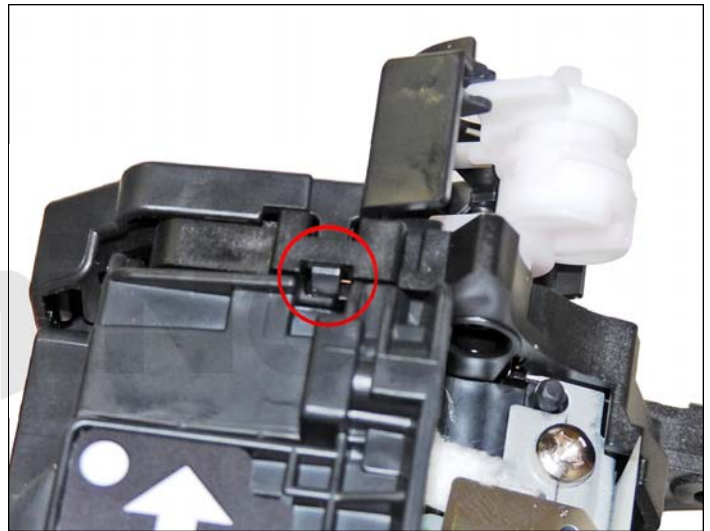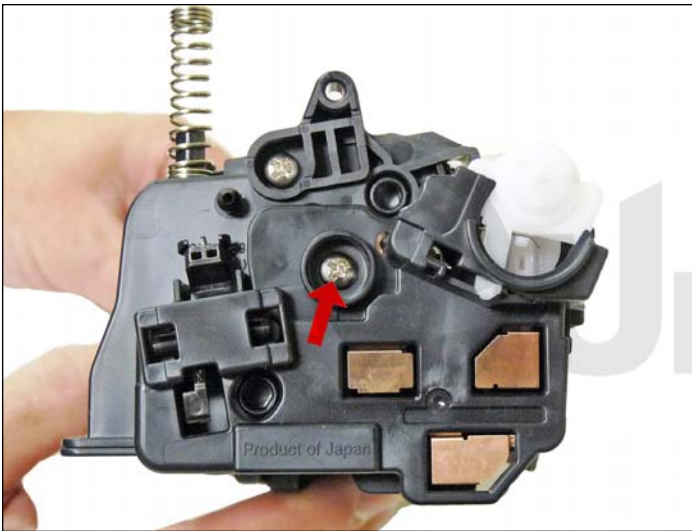

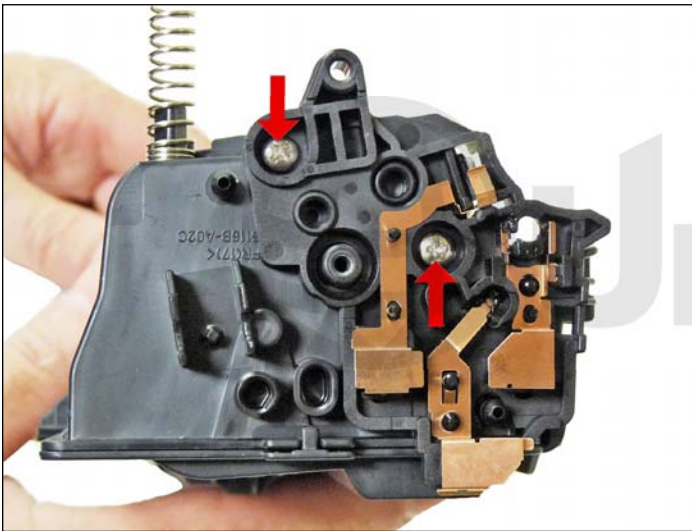24. Remove the two inner screws and inner gear end cap.

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25. Remove the developer roller.

26. On the opposite side end cap remove the single screw and press in on the tab to release it.
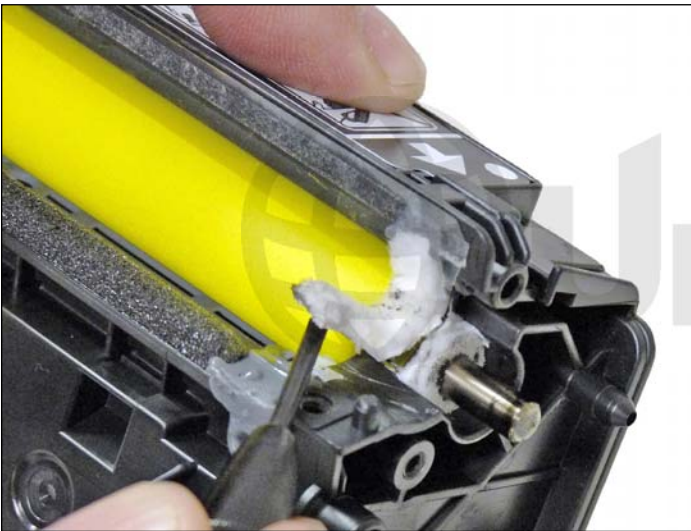
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27. Remove the two screws and contact side end cap.

28. Remove the two screws from the doctor blade and start to lift the blade up.
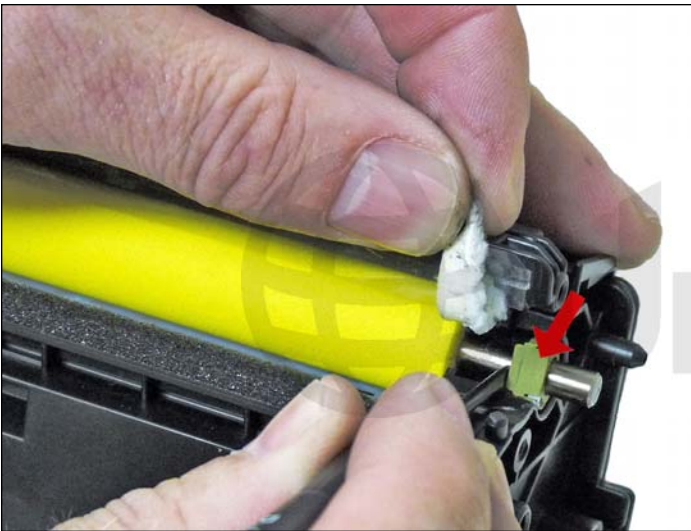
There is glue on either end of the blade.

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

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

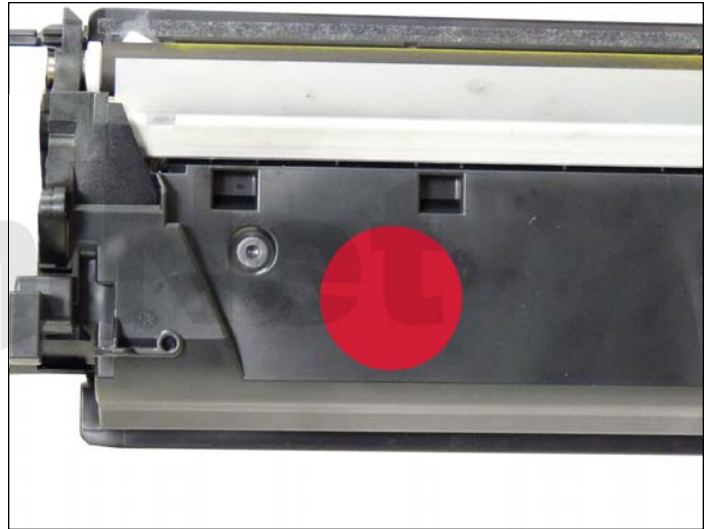30. Remove the white felt washers from both sides of the developer roller.

31. Pry out the feed roller bushing from the right side.

32. Remove the feed roller.

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33. Clean out the remaining toner and fill with new dedicated toner for use in HP CP3525.

If you wish to make it easier to seal, a hole can be cut in the flat side of the chamber. Install the seal, and then fill through the hole. Make sure you cover the hole with a good quality seal.

34. Install the seal onto the seal rails. Pull the release tape off one inch at a time and press the seal in place as you go.
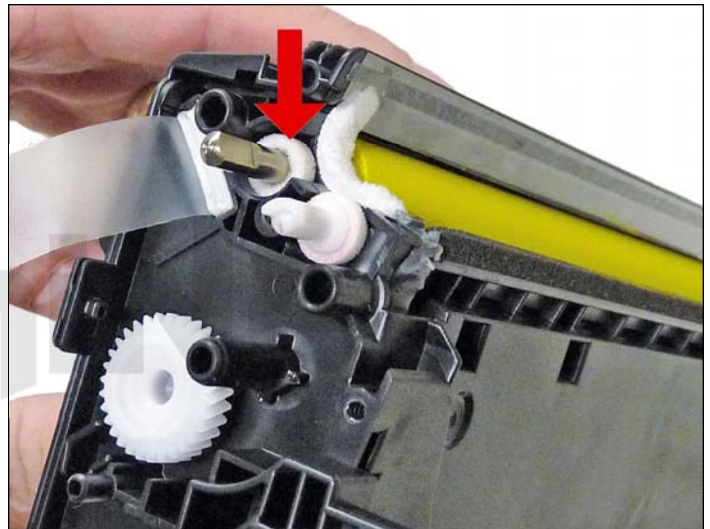
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35. Remove the seal port and slide the seal pull tab through the slot.
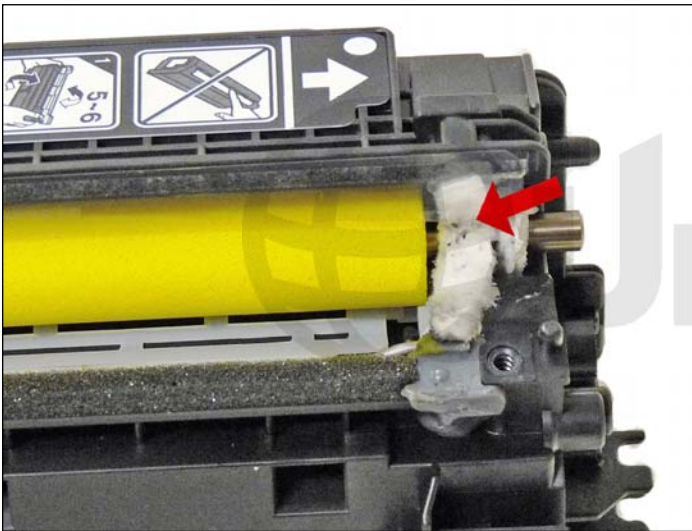
Install the seal port.

36. Install the feed roller and bushing.

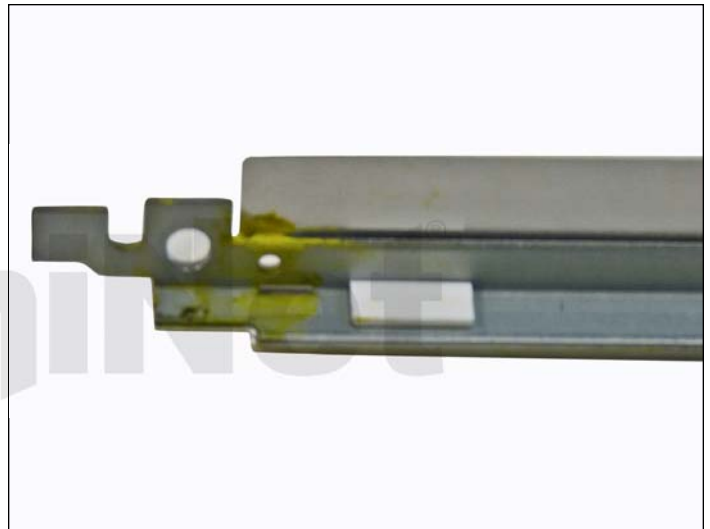37. Install the feed roller felt washers.

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38. Press the developer roller seal back in place.

If needed, clean the adhesive with alcohol and a foam swab.

39. Install the doctor blade by first installing the plastic shims in the underside of the doctor blade (see picture). Install the doctor blade onto the cartridge and press down ward while tightening the screw to hold the doctor blade in the correct position (must repeat on both ends). For alternative installation without shims, please refer to step 40.

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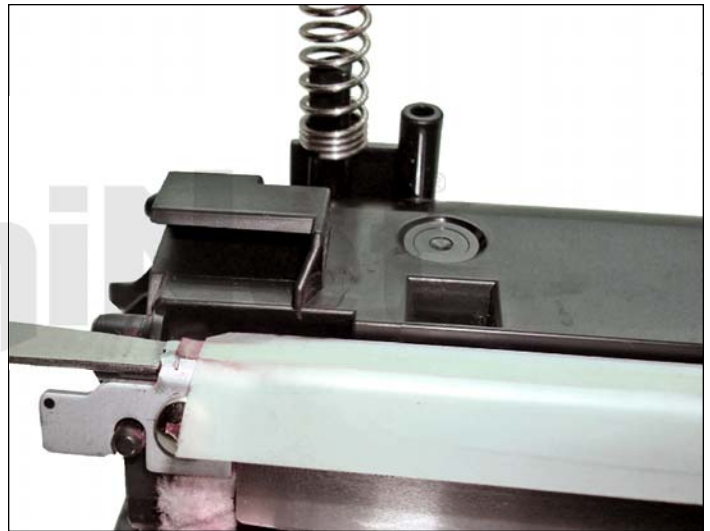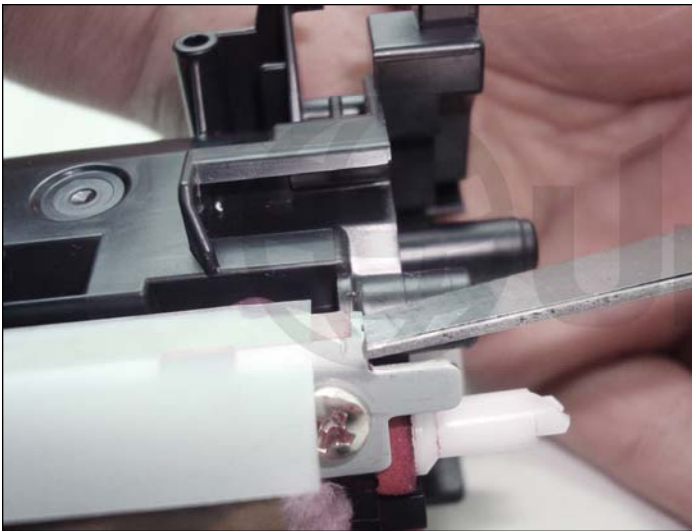
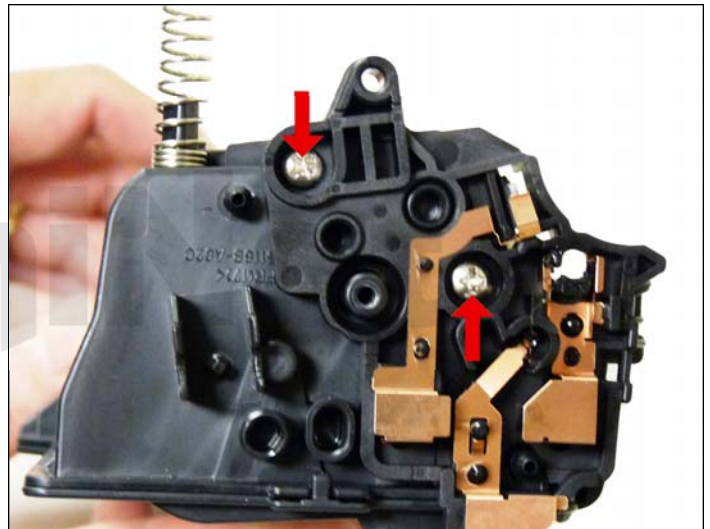40. Install the doctor blade by first using a gapping tool with a measurement of 1.5 mm. Insert the gapping tool between the doctor blade substrate and the top of the toner cartridge. Then tighten the screw to hold the doctor blade in the correct position (must repeat on both ends).
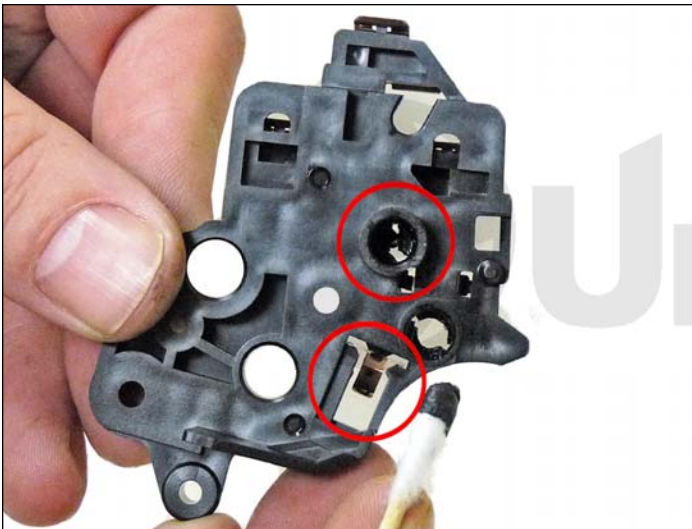
41. Clean the contacts and replace the conductive grease on the contact end cap.

42. Install the contact end cap and two screws.

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43. Install the cleaned developer roller (do not use any chemicals to clean this; a lint free cloth works fine).
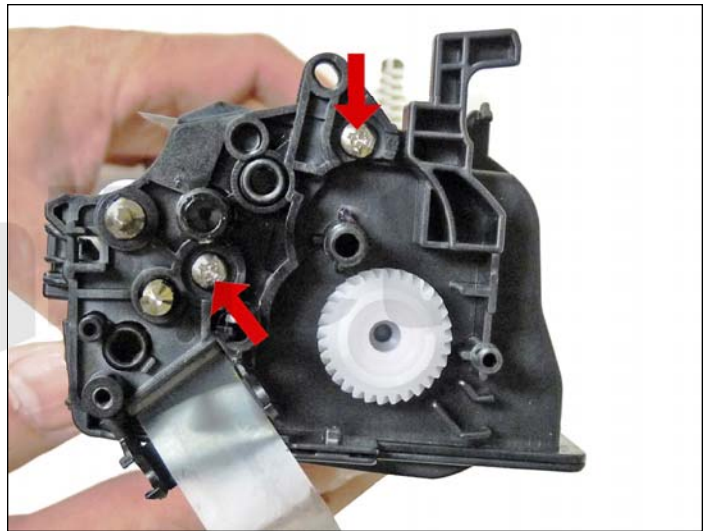
44. Install the inner gear end cap and two screws.
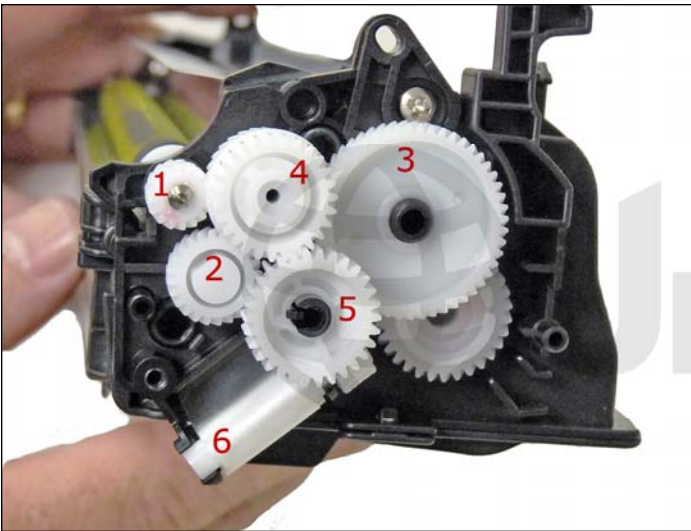
45. Install the gears in the order shown. If you installed a seal, slide the seal end through the take-up gear and wrap the loose tail tight on the roller.
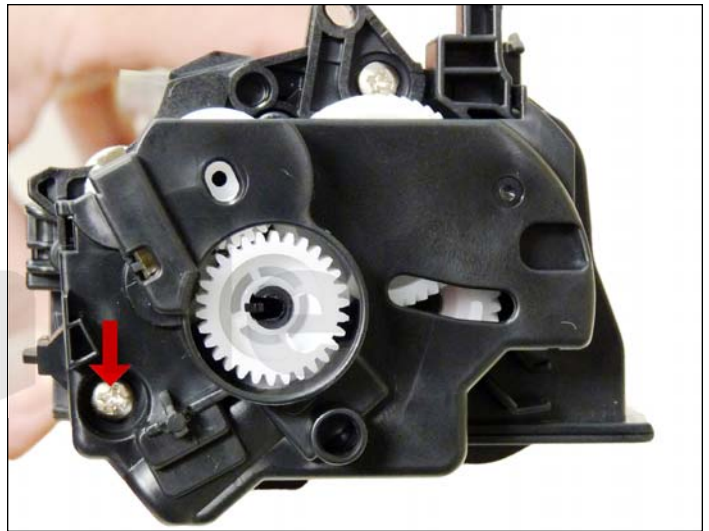
46. Install the gear cover end cap and screw.

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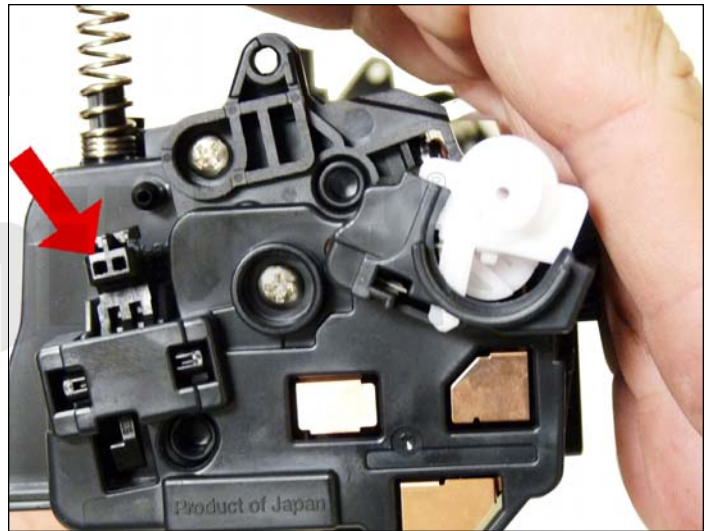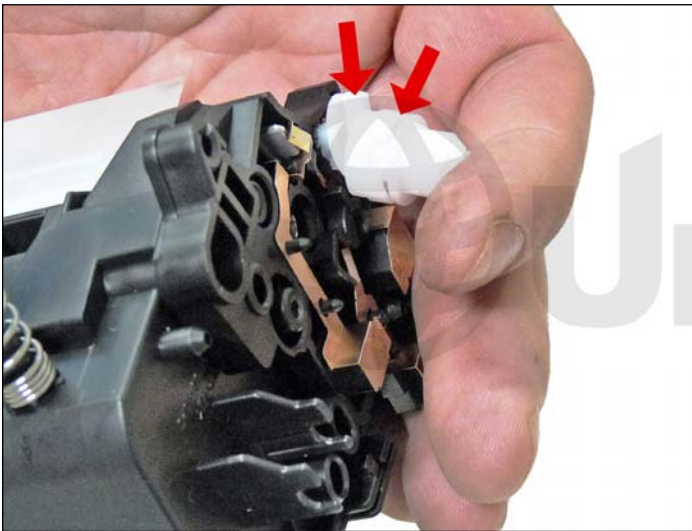
47. Install the opposite side end cap.

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

Install the screw.
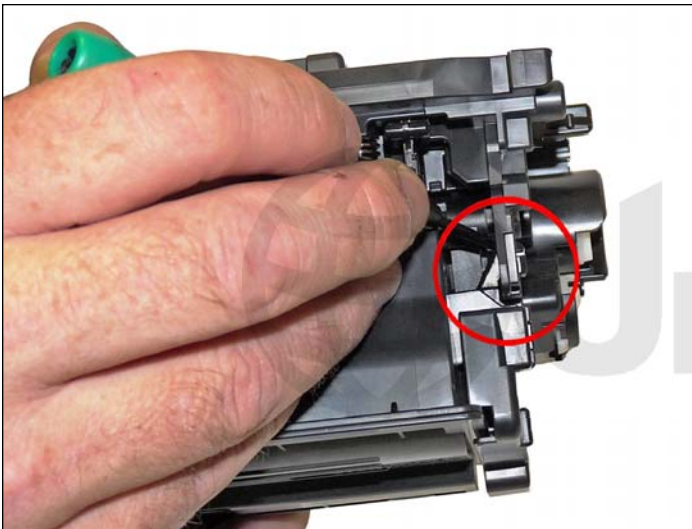
48. Place the two halves together contact side first.

On the gear side, snap the lock in place.
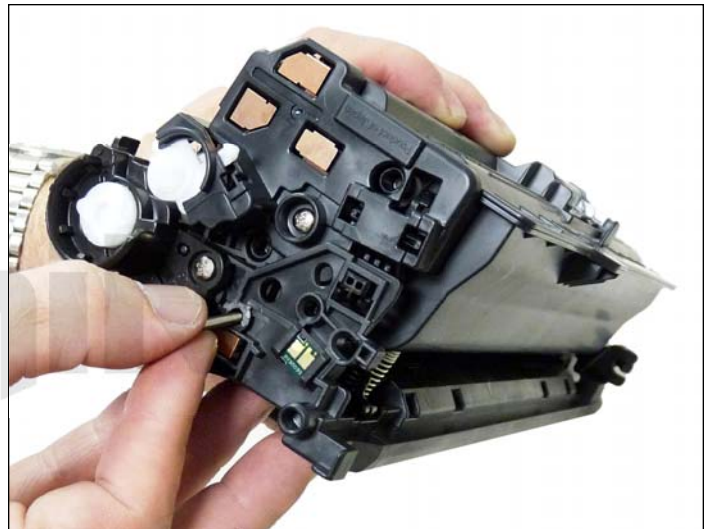
49. Install the two pins.

The small pin goes to the gear side of the cartridge.

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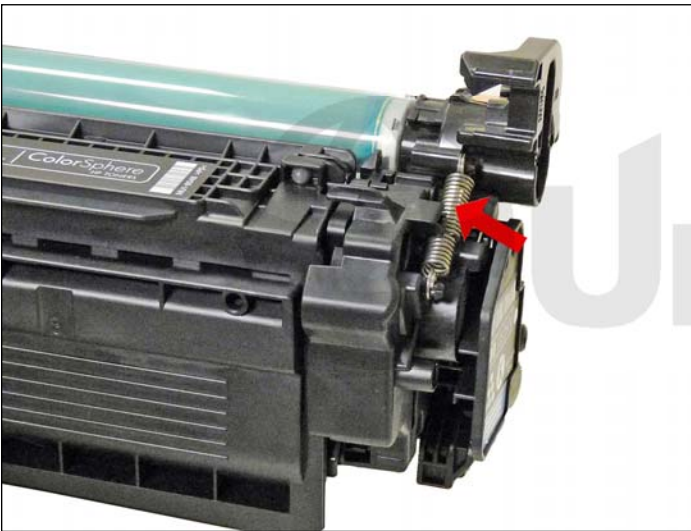
50. Install the spring.

51. Remove the chip by cutting the plastic off the edges of both side of the chip.
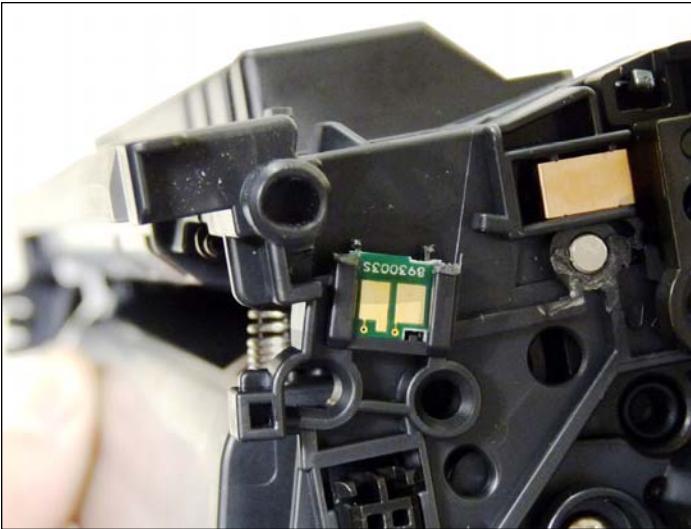
52. Remove and replace the chip. If the new replacement chip is loose in the slot, close off the top edges with small amounts of hot glue.

53. Install the drum cover on to the cartridge.

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TAKING TEST PRINTS

Configuration Page:
1. Press the MENU button.
2. Press the down arrow until INFORMATION appears on the display.
3. Press OK.
4. Press the down arrow until PRINT CONFIGURATION appears on the display.
5. Press OK.

Print Quality Test Pages:
1. Press the MENU button.
2. Press the down arrow until DIAGNOSTICS appears on the display.
3. Press OK.
4. Press the down arrow until PQ TROUBLESHOTING appears on the display.
5. Press OK.
6. A series of color troubleshooting pages will print out.

Cleaning Page:
1. Press the MENU button.
2. Press the down arrow until CONFIGURE DEVICE appears on the display.
3. Press OK.
4. Press the down arrow until PRINT QUALITY appears on the display.
5. Press OK.
6. Press the down arrow until CREATE CLEANING PAGE appears on the display.
7. Press OK.
8. Press the down arrow until PROCESS CLEANING PAGE appears on the display.
9. Press OK.

REPETITIVE DEFECT CHART

Primary Charge Roller	**27.0 mm**
Developer Roller Sleeve	**32.0 mm**
Primary Transfer Roller	**44.0 mm**
RS Roller	**49.0 mm**
Secondary Transfer Roller	**50.0 mm**
Secondary transfer backing roller	**63.0 mm**
OPC Drum	**75.5 mm**
ITB Drive roller	**76.0 mm**
Fuser Sleeve	**77.0 mm**
Fuser Pressure Roller	**78.0 mm**

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MOST COMMON PRINTER ERROR MESSAGES

Most of the error messages are in plain English, but some are numeric only. We have listed the more common ones here.
Most of the internal errors listed in the service manual just state something like "Internal hardware error."
They are not very helpful.

10.32.00	**Unauthorized Supply in use:**	**Cartridge is a non HP cartridge.**
10.90.XY	**Replace Color Cartridge:**	
XY	**Black**	**00**
	Cyan	**01**
	Magenta	**02**
	Yellow	**03**
	Missing Chip	**10**
10.92	**Cartridge not Engaged:**	**This can happen when the front door is opened.**
		Open and close the front door to clear.
10.XX.YY	**Supply Memory Error:**	**Cartridge/Chip is bad or missing.**
XX	**Memory Tag Error:**	**00**
	Memory tag Missing:	**10**
YY	**Black**	**00**
	Cyan	**01**
	Magenta	**02**
	Yellow	**03**

CALIBRATE NOW

Sometimes the only way to fix print quality issues is to force a calibration:
1. Press the MENU button.
2. Press the down arrow until CONFIGURE DEVICE appears on the display.
3. Press OK.
4. Press the down arrow until PRINT QUALITY appears on the display.
5. Press OK.
6. Press the down arrow until FULL CALIBRATE NOW appears on the display.
7. Press OK.

PRINT DENSITY SETTINGS

There are actually multiple sub settings that can be set under density.
As you can see, these settings can get a little intense and complicated:

Highlights: Highlights are colors that are nearly white.
To darken highlight colors, increase the Highlights setting.
This adjustment does not affect midtone or shadow colors.

Midtones: Midtones are colors that are halfway between a white and solid density.
To darken midtone colors, increase the midtone setting.
This adjustment does not affect highlight or shadow colors.

Shadows: Shadows are colors that are nearly a solid density.
To darken shadow colors, increase the shadows setting.
This adjustment does not affect highlight or midtone colors.

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