

HP® 2400 • 2420 • 2430

TONER CARTRIDGE REMANUFACTURING INSTRUCTIONS



HP 2400 TONER CARTRIDGES (Q6511A & Q6511X)

REMANUFACTURING THE HP LASERJET 2400 TONER CARTRIDGES

By Mike Josiah and the Technical Staff at UniNet

Released in October 2004, the HP LaserJet 2400 series of printers are based on a 1200 dpi, 30-35 ppm Canon engine. As with all the new HP cartridges, these cartridges use a chip to monitor toner low functions. The 2400 cartridge and chip are basically updated versions of the 2300 (Q2610A) cartridge. The cartridges for the 2400 are the Q6511A, rated for 6,000 pages at 5% coverage, and the Q6511X, rated for 12,000 pages at 5% coverage. Testing is ongoing to see what (if any) components from the 2300 cartridges will work.

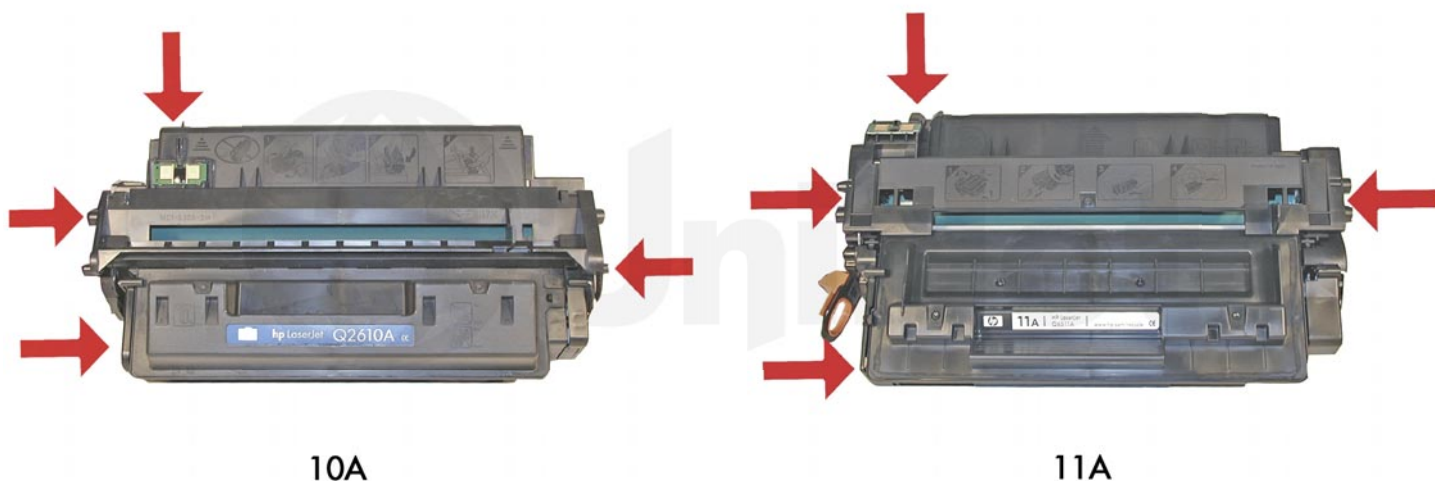
The LaserJet 2400 series of printers use a 400 MHz processor, and the most basic unit has 32 MB of DDR memory. The 2300 has a 266 MHz processor, so this is quite an upgrade. The 2420, 2420d and 2420dn all have a monthly duty cycle of 75,000 pages per month. The 2430tn and the 2430dtn have a monthly duty cycle of 100,000 pages per month. When compared to the 2300 that has a 30,000 page per month duty cycle. These machines are much more robust. HP has again packed a lot of power into a relatively small machine. The cartridges have list prices of \$179.30 USD* for the 11A, and \$301.40 USD* for the 11X (both prices as of November 2004, in U.S. American Dollars).

LASERJET 2400 SERIES PRINTERS

2420
2420d
2420dn
2430tn
2430dtn

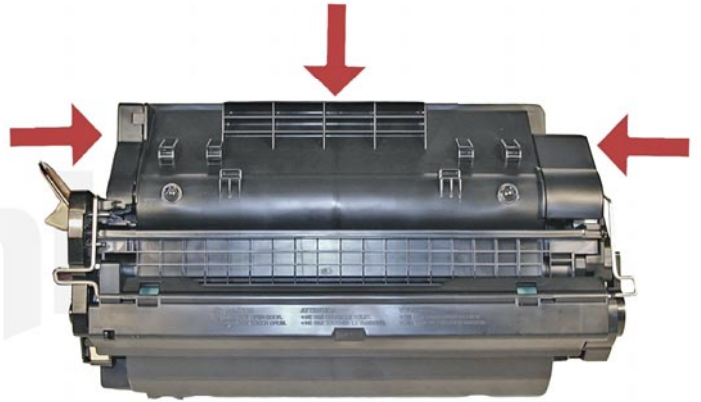
It should be noted that the 2420 machines are rated for 30 ppm, and the 2430 machines are rated for 35 ppm.

The following eight images show the differences (or similarities) between the **10A** (2300) cartridge and the **Q6511A** cartridges. The cartridges have been made so that they are not physically interchangeable...

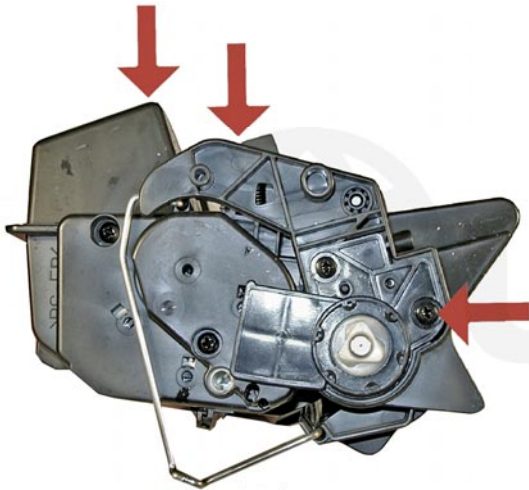




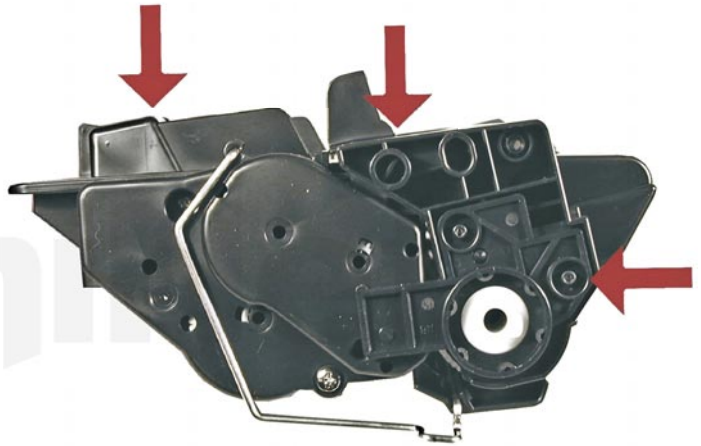
10A



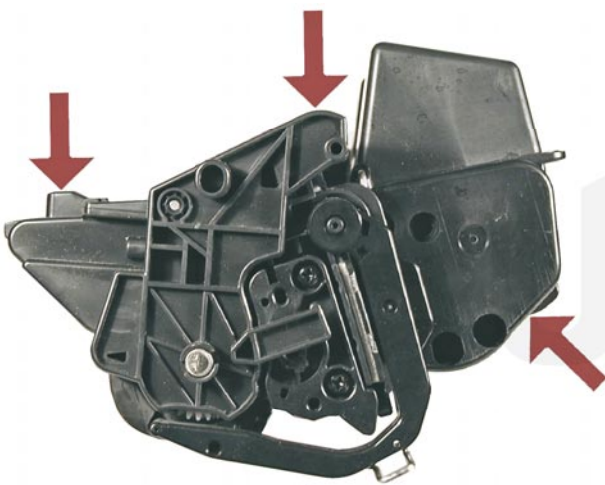
11A



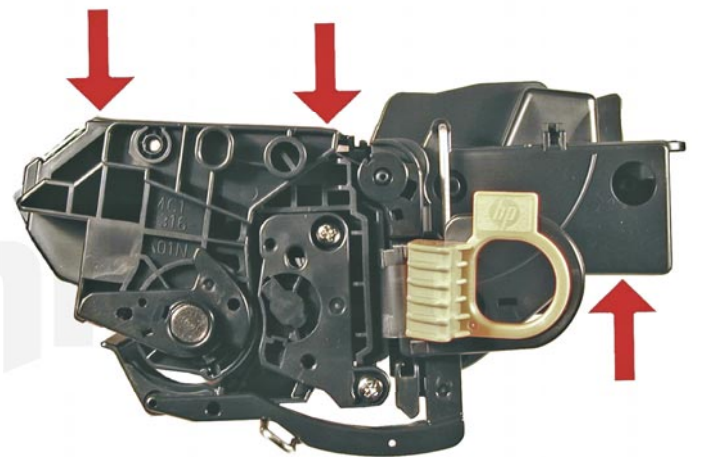
10A



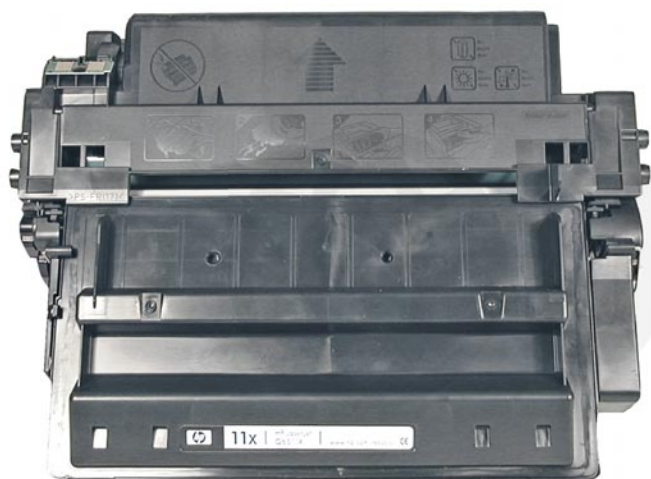
11A



10A



11A



11X



11X



11X

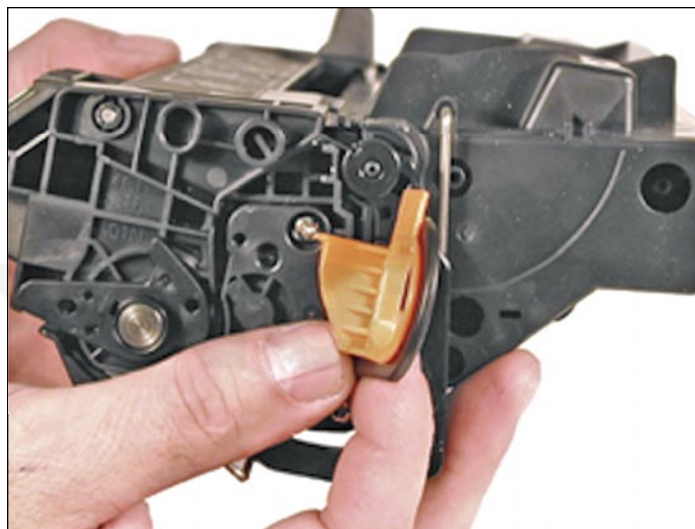


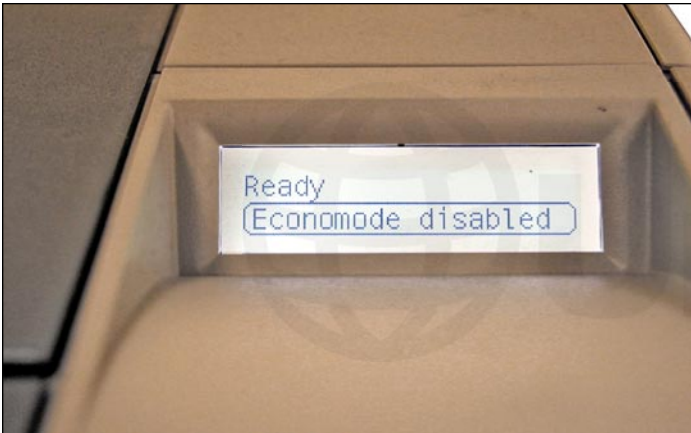
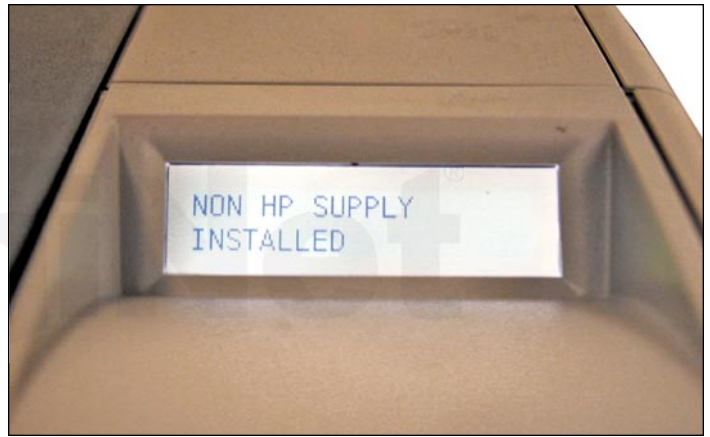
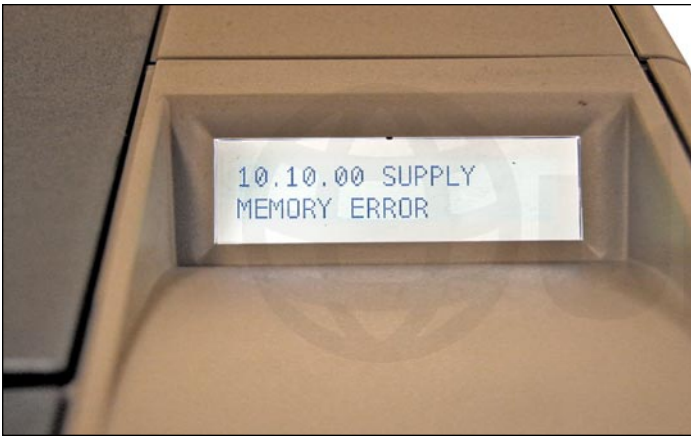
11X

The four images above show the **Q6511X** cartridges.

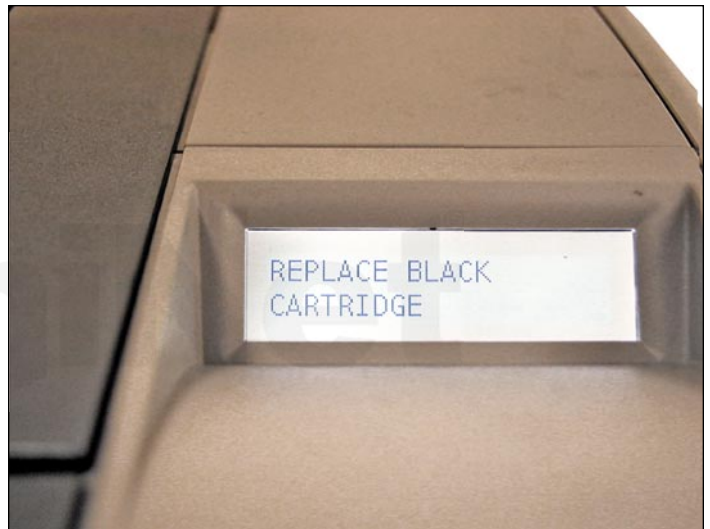
Shown to the right, is the new **pull tab** for the seal. This tab prevents the cartridge from being installed unless the seal has been pulled (unless the tab has been separated from the seal of course).

If you look at the boxes, HP is trying to use the last three characters of the part number as the name of the cartridge. Since these cartridges will be the 11A, 11X; and the new 1160/1320 cartridges will be the 49A, 49X; it has now become important when your customers order a cartridge to verify if they want a toner or ink cartridge.





As with all other black HP cartridges, the chips on these cartridges do not shut down the entire cartridge, they disable the “toner low” features. The cartridge will run if the chip is removed, but the error message must be cleared first. As with past HP chips, the toner low function is disabled if a used chip is installed. Shown above is the display panel when a cartridge is inserted in the printer with a no chip.



Shown here is the display panel when a cartridge is inserted with a used chip.

hp LaserJet 2420 printers

supplies status page

1

■ Black Cartridge
Order HP Part: Q6511X

Estimated Pages Remaining: 6000

(Based on page coverage with this supply of 4.9%)

Low Reached: NO

Out Reached: NO

Serial Number: 5317221

Pages printed with this supply: 0

Page Count by Paper Size:

Legal 0

A4/Letter 0

A5/B5/Executive: 0

Custom/Other: 0

Number of Jobs Processed: 0

First Install Date: 20041118

Last Used Date: NOT AVAILABLE



Ordering Information

Hewlett-Packard supplies can be ordered on the internet, on-line through your printer software, or by calling an authorized reseller. Refer to your User Guide for instructions

Return & Recycling

Please return your genuine HP supplies for recycling to Hewlett-Packard. For more information, please visit us at <http://www.hp.com/gp/recycle>

Shown is the Supplies Status Page in the following states:

1. New cartridge



www.uninetimaging.com

hp LaserJet 2420 printers

supplies status page

1

■ Black Cartridge
Order HP Part: Q6511X

Estimated Pages Remaining: 0

(Based on page coverage with this supply of 4.9%)

Low Reached: YES

Out Reached: YES

Serial Number: 5325425

Pages printed with this supply: 12076

Page Count by Paper Size:

Legal 0

A4/Letter 12076

A5/B5/Executive: 0

Custom/Other: 0

Number of Jobs Processed: 33

First Install Date: 20041111

Last Used Date: 20041118



Ordering Information

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2. Full used chip

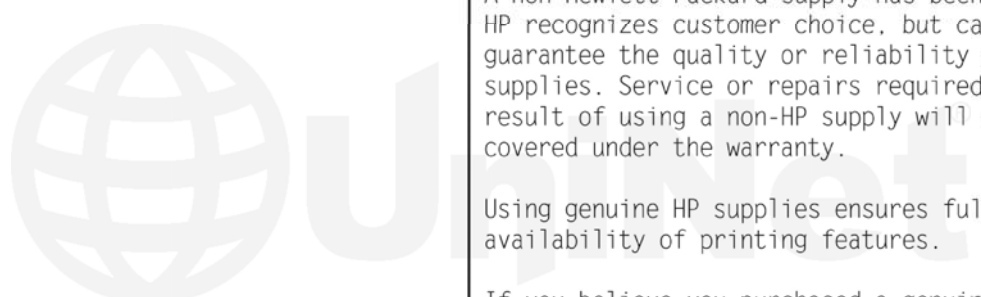
hp LaserJet 2420 printers

supplies status page

■ Non-HP Black Cartridge*
Order HP Part: Q6511A

ATTENTION: A non Hewlett-Packard supply has been installed. To ensure full availability of printing features (such as remaining supply status), use genuine HP supplies

*(See Warranty Note)



A non Hewlett-Packard supply has been installed. HP recognizes customer choice, but cannot guarantee the quality or reliability of non-HP supplies. Service or repairs required as a result of using a non-HP supply will not be covered under the warranty.

Using genuine HP supplies ensures full availability of printing features.

If you believe you purchased a genuine HP supply, visit us at
<http://www.hp.com/go/anticounterfeit>

Ordering Information

Hewlett-Packard supplies can be ordered on the internet, on-line through your printer software, or by calling an authorized reseller. Refer to your User Guide for instructions

Return & Recycling

Please return your genuine HP supplies for recycling to Hewlett-Packard. For more information, please visit us at
<http://www.hp.com/gp/recycle>

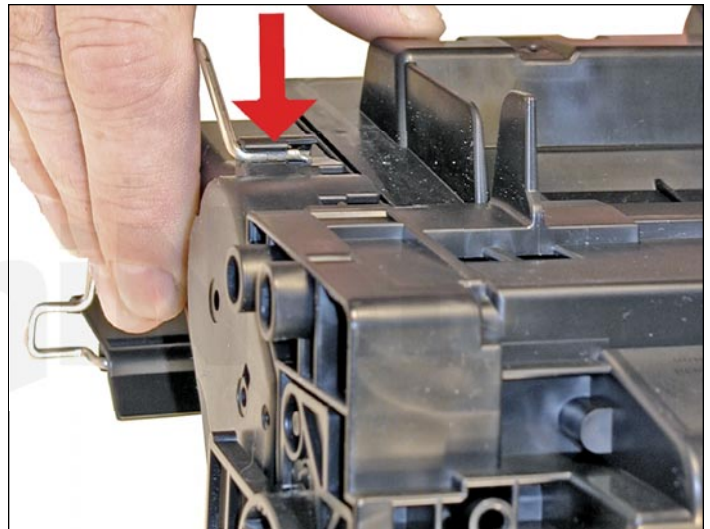
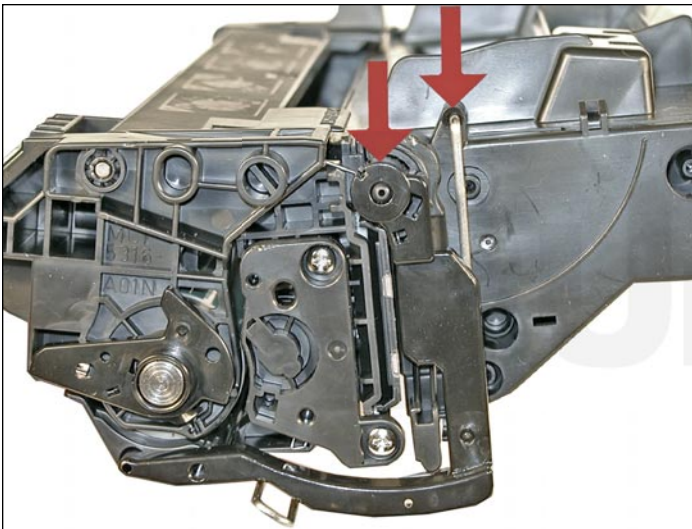
3. Full no chip

REQUIRED TOOLS

1. Toner approved vacuum
2. Small common screwdriver
3. Phillips head screwdriver
4. Needle nose pliers
5. Wire cutters
6. 1/16 inch or smaller punch
7. X-Acto knife with chisel blade (see text and picture)

REQUIRED SUPPLIES

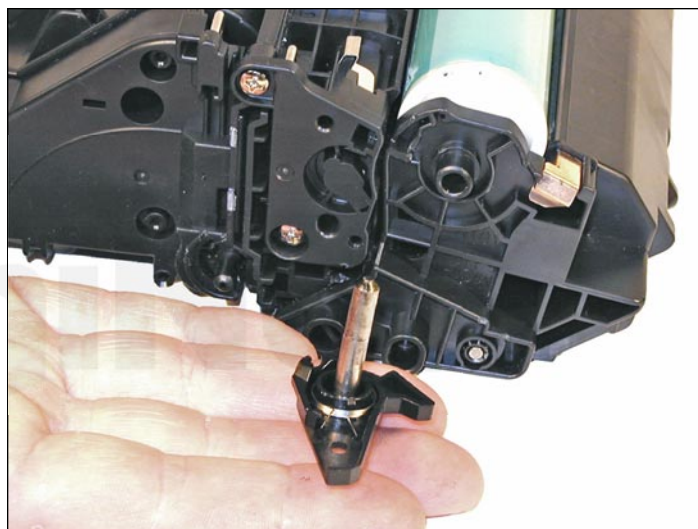
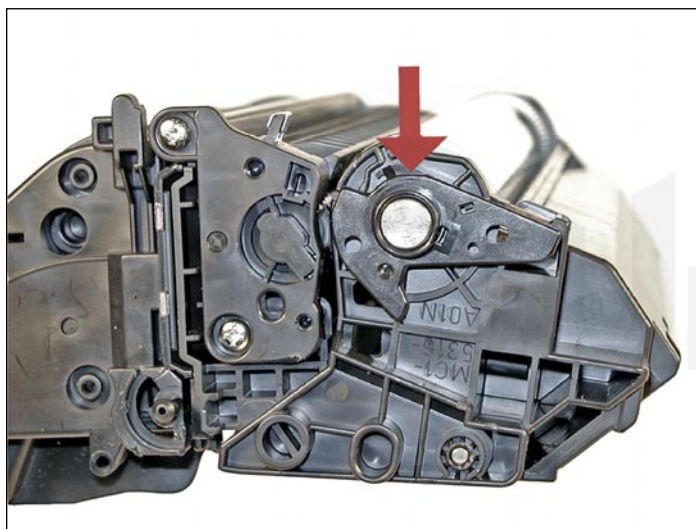
1. Toner for use in HP 2400 (590 grams for 11X; 290 grams for 11A)
2. New OPC drum
3. New wiper blade
4. New PCR (optional)
5. 99% isopropyl alcohol
6. Magnetic roller cleaner
7. Kynar padding powder
8. Nu-Finish car polish
9. Conductive grease



1. Remove the drum cover by prying the spring-loaded arm, and then carefully pry off the two metal bars out of their holders.

The cover must be in the closed position in order to pry off the spring-loaded arm.

Be careful not to lose the spring!

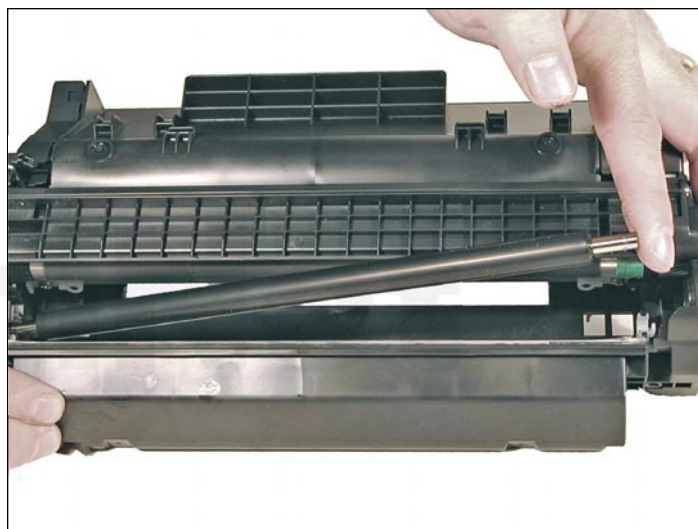


2. Place the cartridge with the drum side up. Note on each end of the cartridge, there are small silver pins. To separate the two halves, these pins must be removed. Like the 96A/10A cartridges, these pins cannot be pulled out, or pushed in from the outside of the cartridge (the wiper blade is in the way). The only way to disassemble the cartridge without damaging it is to push the pins out from the inside. To do this, both the OPC drum and PCR must first be removed. Replacement pins are available that can be removed from the outside.

With the pair of needle nose pliers, remove the metal axle pin/spring-loaded cover located on the right side of the cartridge. This is a new type of drum axle pin configuration. It comes out easily enough, but be careful as it seems somewhat fragile. The opposite side now has plastic rivets, so it is not necessary to remove it.



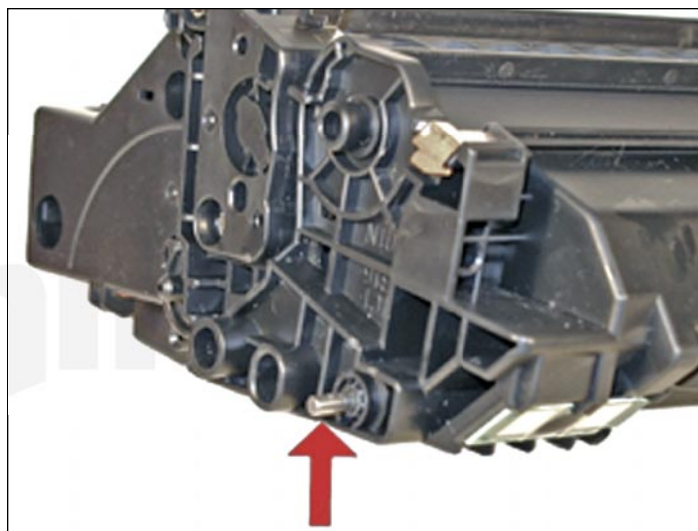
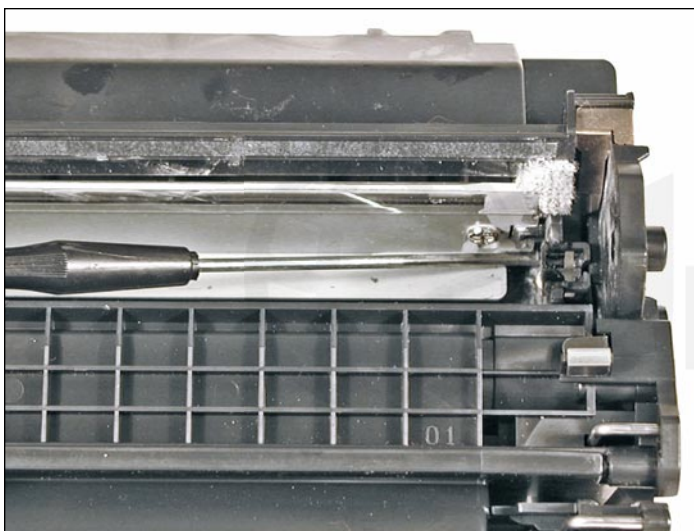
3. Hold the two halves slightly apart and remove the photoconductive drum being extremely careful not to scratch it. If the drum is in good shape and you plan to reuse it, blow off any toner and debris from drum, being careful not to let the air gun come in contact with the drum surface. Do not polish or wipe the drum with a dry cloth, since this may scratch the drum.



4. Carefully remove the primary charge roller (PCR), by gently prying it out of the clips on either end. Be careful as the PCR holders come loose easily! Place the PCR aside.



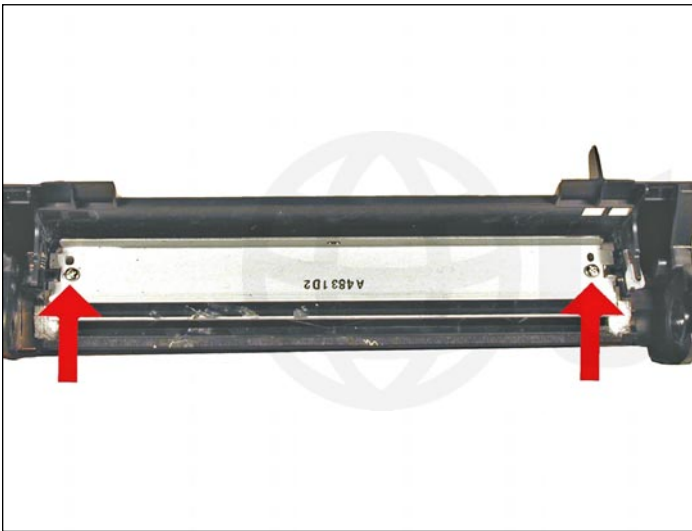
5. Take the X-Acto knife with the chisel blade and cut the pin cover off by slicing it at the side wall of the cartridge.



6. This will give you access to the pins where you can take the small punch or a small screwdriver, and gently press both of the metal pins out from the inside of the cartridge. To make this process easier, push the pins out halfway, and pull them out from the outside with needle nose pliers or wire cutters. The pins will move out enough to grab them with pliers from the outside.

Separate the two halves, remove, and clean the PCR. Clean the PCR holders as well with alcohol.

WARNING: Do not clean the OEM PCR with alcohol, as this will remove the conductive coating on the roller. If the PCR is an aftermarket, follow the cleaning methods recommended by the manufacturer. If the PCR is an OEM, we recommended that it be cleaned with a PCR cleaner. We have been using Nu-Finish car polish on our OEM PCR's for years with no problems. To clean the roller with the Nu-Finish car polish, apply a small amount and buff with a clean lint free cloth until the roller is clean and shines. If the roller is damaged or worn out, it should be replaced with a new roller.



7. Remove the two screws and the wiper blade. Clean the toner out of the waste chamber.

NOTE: Be very careful not to damage or distort the thin mylar recovery blade next to the wiper blade. If this blade is bent or damaged in any way, it should be replaced.

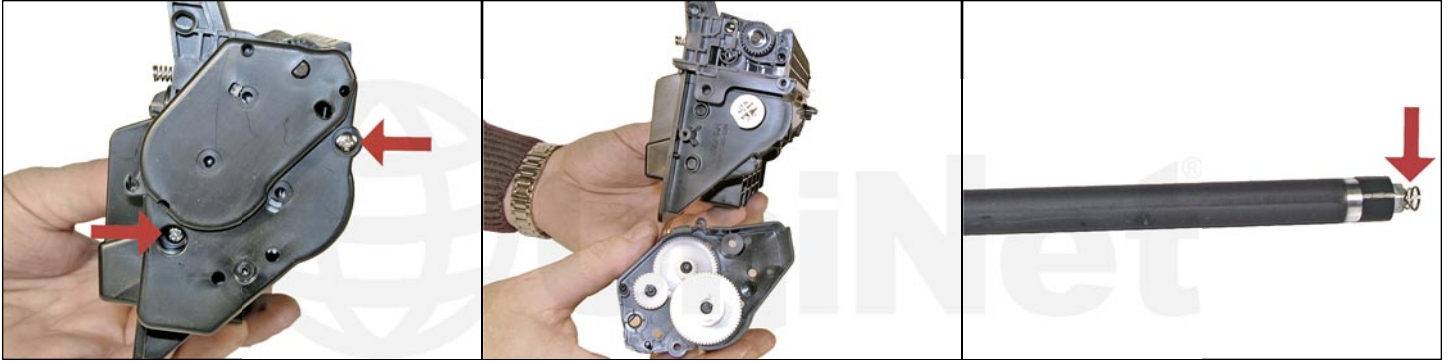


8. Due to the aggressive nature of the toner used in these cartridges, we recommend that the wiper blade be replaced each cycle. Lightly coat the new blade with Kynar drum padding powder. Replace the wiper blade into the cartridge.

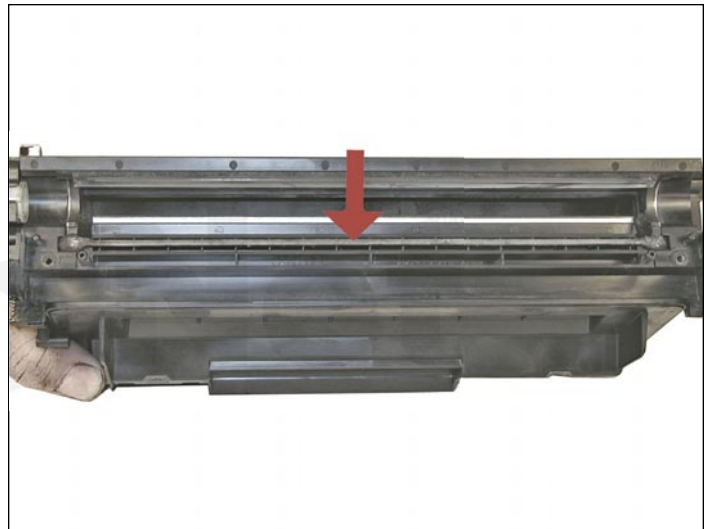
NOTE: We do not recommend using Zinc Sterate on this cartridge, as it will stick to the PCR and cause small white voids in the printed characters.



9. Place a small amount of conductive grease on the black PCR holder, and install the PCR. Place the waste chamber aside.



10. To remove the magnetic roller, first remove the right end cap by removing the two screws. Note the gears in the end cap are held in place. Carefully lift the roller out of the cartridge. Be very careful not to damage the wire contact at the opposite end of the roller.



11. Remove the doctor blade by removing the two screws and lifting it out straight up. When removing this blade, be very careful not to break the alignment pins. These pins keep the doctor blade at the proper distance from the magnetic roller. There is a thin bead on adhesive under the blade. Be sure to keep it clean so that it stays sticky.



12. Vacuum the toner supply chamber thoroughly. Fill the hopper with the appropriate amount of toner through the magnetic roller opening (590 grams for 11X; 290 grams for 11A).



13. Inspect the green and black end caps on the magnetic roller sleeve. Make sure they are not cracked. If they are cracked, they will tear the coating off of the OPC drum.



14. To change the magnetic roller sleeve, press the magnet from the gear side until the white bushing pops out from the other side. Slide the stationary magnet out from the old sleeve and into the new. Place the two end caps, bushing, and gear on the new sleeve (black on the contact side, green on the gear side). Note that the bushing end cap also has a smaller bushing that fits around the magnetic roller sleeve. These small bushings may cause a problem when the cartridge has been refilled multiple times. Clean the contact spring of the magnetic roller, and the contact-side end cap with the alcohol. Coat the contact side end cap with a small amount of conductive grease.



15. Install the new doctor blade. Make sure the adhesive seal has remained tacky. If not, clean it lightly with a small amount of alcohol. New replacement seals are being investigated.



16. Install the magnetic roller assembly, hub, gear, and large end cap. Spin the roller a few times in the proper direction to make sure all is aligned properly (make sure the spring contact is clean and not bent).



In the large bushing, there is a smaller u-shaped bushing. This bushing is similar to the ones used in the HP 4000 series, and may wear out just as quickly. Testing is ongoing to determine if this part will need to be replaced.



17. Install the large end cap and two screws.

Make sure the gears are clean.

DRUM GEAR CHANGE

UPDATE: 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 two inches 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. A 1/4" x 15" metal rod
2. A 1" x 15" wooden dowel
3. A tube of super glue
4. A small piece of emery-cloth or sand paper

Step #1: Removing 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: Removing 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: Removing any adhesive from the gears, straightening 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 replacement 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 \$10.00 USD, 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.



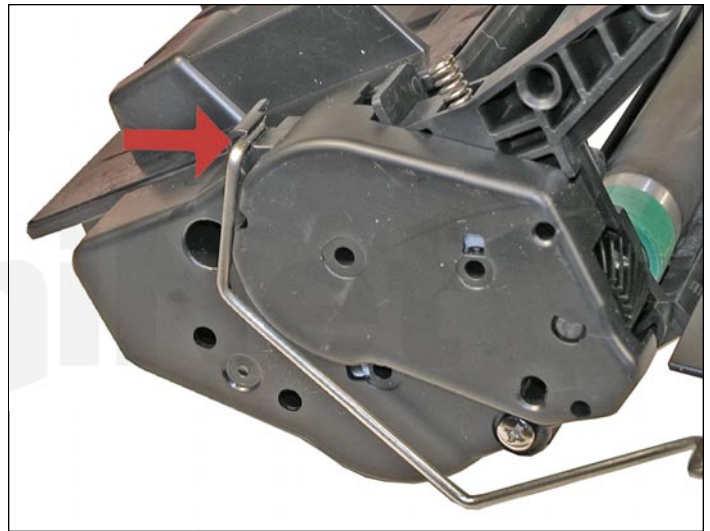
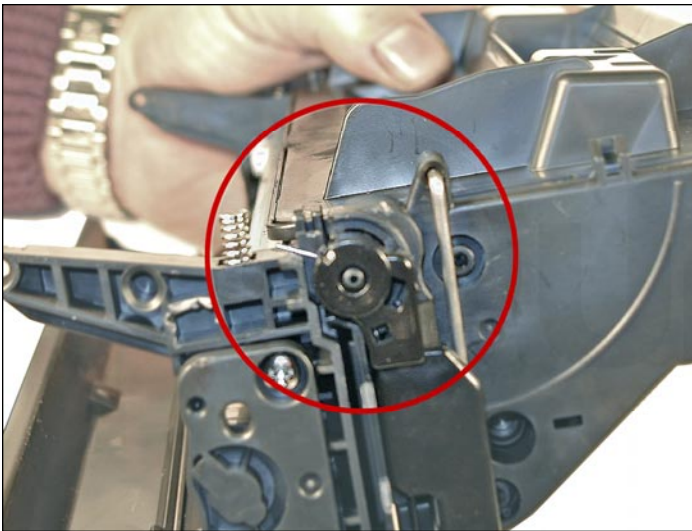
18. Coat the OPC drum with the Kynar.

Replace the OPC drum and spring-loaded metal axle assembly.



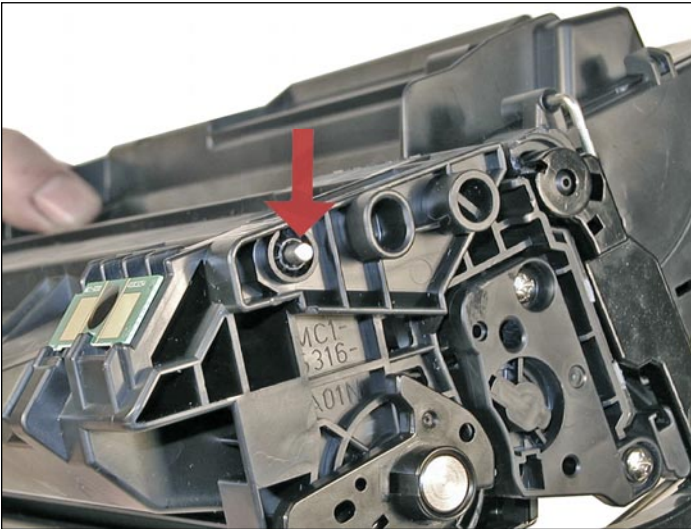
19. Install the drum cover onto the toner hopper.

Set the spring as shown.

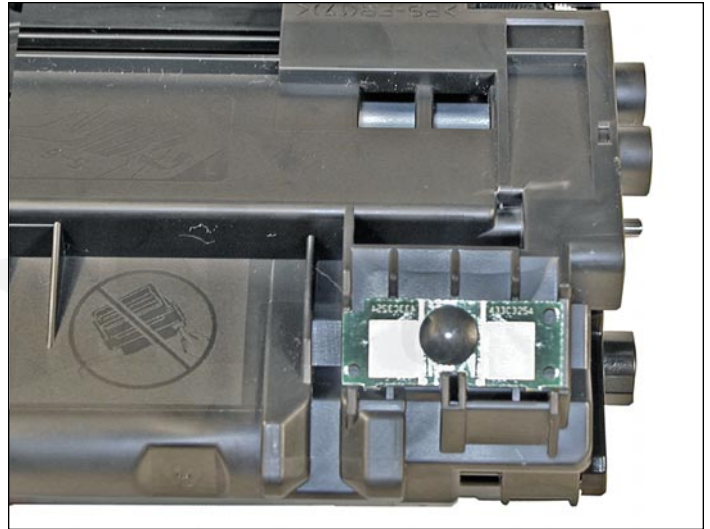


20. Install the metal bars on both sides.

Once installed, release the tail of the spring so that the cover closes properly.



21. Place the two halves together and insert the two silver pins.



22. Replace the chip.

RUNNING THE CLEANING PAGE

The cleaning page helps keep the fuser free of toner particles. HP recommends that it be run every time a new cartridge is installed.

1. Press the MENU button to open the menus.
2. Press the UP or DOWN arrows until CONFIGURE DEVICE appears on the display.
3. Press the SELECT button.
4. Press the UP or DOWN arrows until PRINT QUALITY appears on the display.
5. Press the SELECT button.
6. Press the UP or DOWN arrows until CREATE CLEANING PAGE appears on the display.
7. Press the SELECT button.
8. Follow the instructions on the cleaning page to complete the process.

CHANGING THE PRINTERS INTENSITY (DENSITY)

1. Press the SELECT button to open the menus.
2. Press the UP or DOWN arrows until PRINT QUALITY appears on the display.
3. Press the SELECT button.
4. Press the UP or DOWN arrows until TONER DENSITY appears on the display.
5. Press the SELECT button.
6. Press the UP or DOWN arrows until the desired setting (1-5) appears on the display. "3" is the default setting.

PRINTING TEST PRINTS

There are a number of test pages that can be run from the menu:

1. Menu Map
2. Configuration Page
3. Supplies Status Page
4. PS or PCL Font List

The **SUPPLIES STATUS PAGE** or the **CONFIGURATION PAGE** is the best to use; they have SOLID BLACK, GRAYSCALES and TEXT:

1. Press the SELECT button to open the menus.
2. Press the UP or DOWN arrows until INFORMATION appears on the display.
3. Press the SELECT button.
4. Press the UP or DOWN arrows until the page you wish to print appears on the display.
5. Press the SELECT button.

CARTRIDGE TROUBLESHOOTING

Although these cartridges are new, symptoms pertaining to the HP 2300 should apply as follows:

Repetitive Defect Chart:

OPC drum:	94 mm
Magnetic roller:	47 mm
PCR:	38 mm

Broken Top Fin: If the plastic fin on the top right side of the cartridge is broken, the display will read INSTALL CARTRIDGE.

Memory Supplies Error: This occurs when the chip is either missing or damaged. The machine will still work, but the SELECT (check) button must be pressed to clear the message.

Dirty or Bad Primary Charge Roller (PCR): This will show on the test print as vertical gray streaks down the page, as a gray background throughout the page, or as ghosting where part of a previously printed area is repeated.

Dirty PCR Connection: This will show as horizontal dark black bars across the page, or as shading throughout the page.

Scratched Drum: This is shown by a very thin, perfectly straight line that runs from the top to the bottom of the test page.

Chipped Drum: This will show as a dot or series of dots that repeat 3 times per page. Any drum defects will repeat three times per page based on the drum circumference of 94 mm.

Light Damaged Drum: This will show up as a shaded area on the test print that should be white. Again this will repeat three times per page.

Worn-Out Drum: This will usually show up as shading on the right side of the page. It will usually start right from the edge of the page, and work in towards the center. The pattern will normally look like tire tracks.

Bad Wiper Blade: This will show as either a gray line approximately 1/8 of an inch thick or as shading across the entire page. In either case there will be a film of toner on the drum surface that matches the defect.

Bad Small Magnetic Roller Bushing: When this u-shaped bushing wears out, grayscale pages and pages with heavy graphics will exhibit light and dark lines across the page.