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## Canon AX Toner Cartridges

DOC-0191

### OVERVIEW



These instructions cover the disassembly of the EPA (AX style) toner cartridge, used in the HP 5L, 6L printers. The HP Part # for this cartridge is C3906A, it is rated for 2500 pages at 5% coverage. The HP-1100 Cartridge Part # C4092A is very similar to the AX, in fact many of the AX recharge supplies work perfectly in the 1100. The 1100 cartridge is also rated for 2500 pages at 5%.

The purpose of this disassembly is to vacuum out toner that will have spilled inside the cartridge during shipping and/or rough handling, to clean the debris cavity and to fill the toner supply housing with new toner. The disassembly can also be used to examine the internal parts of the cartridge for possible damage should the printing of the cartridge be poor and not correctable by other means.

This procedure should be read in it's entirety before proceeding with the actual recycling process.

### REQUIRED TOOLS



The tools needed to successfully and safely recharge toner cartridges are as follows:

- Toner approved vacuum. Some type of approved toner vacuuming system is important because toner consists of very fine particles that will pass right through a normal vacuum filter, and blow out the exhaust.
- A small screw driver (Common Style)
- A Phillips head screwdriver with removable tips
- Small flush cutting electronic type wire cutters
- Needle Nose Pliers

### SUPPLIES REQUIRED



Unless otherwise noted, all supplies will work in both the AX, and 1100 cartridges.

- Black Toner (AX or 1100) AX toner will work in the 1100 but only up to 600 DPI.
- Foil Bag
- 99% Isopropyl alcohol
- Cotton Swabs

- Lint free cotton pads
- Toner Cloths
- Kynar Drum Padding Powder
- Magnetic Roller Cleaner
- New replacement pins with mushroom type heads [AX ONLY]
- New Long Life Drum AS with the toner, AX drums will work in the 1100 up to 600DPI.
- New PCR [Optional]
- New Wiper Blade [Optional]
- New Doctor Blade [Optional]
- Sealing Strip [Optional]

## PREPARE WORK AREA



1. Before proceeding with the following procedure you should have a work area available with approximately 4' x 3' clear space. It should be covered with some disposable paper since toner will spill on this area. It is recommended that brown craft paper be used and taped to the work area. This will hold the paper in place when trying to vacuum toner from the paper.
2. A garbage can with a strong plastic liner should be adjacent to the work area to empty used toner. It should be at least 2' deep to prevent toner from clouding up and over the top of the bag during disposal.
3. Have a few rags available and some disposable paper towels. TM-1 Toner magnet cloths are ideal for this.
4. The work area should be capable of being ventilated, if by accident toner becomes dispersed into the air. An exhaust fan in one window is recommended for ventilation.

If the circulation of air in the work area room is combined with other rooms in the building, toner dust may be carried into the other rooms. A separate and isolated HVAC system is recommended for the work area room.

## DISASSEMBLY



1. Vacuum the exterior of the cartridge.
2. On each side of the of the cartridge there is a small metal pin that has a 1/16" Diameter and protrudes from the side of the cartridge approximately. 1/16". These pins serve as hinges for the Toner supply chamber.
3. On an AX cartridge, carefully pry these pins out using a small pair of sharp, flush-cutting electronic type wire cutters. Make sure you pry these pins out. If you try pull them out, you will strip the ends of the pins and they will never come out. If the Mounting Lug that these pins go through is broken (a common problem), it can be replaced with. This part will work in the AX, and Canon FX3 cartridges.
4. On the HP-1100 cartridge, the pins must be knocked in. Take a small screwdriver and hammer knock in the pins on both sides. You will have to hit the pins hard enough to break a small this plastic wall on the inside.
 

**NOTE:** If you are planning on re-using the drum, make sure you have the cartridge with the drum on top so that the pins don't fall on top of the drum and ruin it.
5. Remove the supply Chamber and put aside.

## SEPARATE DEBRIS CAVITY AND DRUM



1. Remove the metal drum axle pin on the large gear side with the needle nose pliers.
2. Remove the Photo conductive Drum being extremely careful not to scratch it. Do not polish or wipe the drum with a dry cloth since this may scratch the drum. Blow off any remaining dust from the Drum using compressed clean air. If there is any matter on the drum that must be cleaned off, use 99% pure Isopropyl alcohol and a soft lint free cotton pad to lightly wipe the drum surface, then blow off the Drum using compressed clean air.

**CAUTION:** Be very careful not to tilt or shake the can while spraying, as the propellant may spray out and possibly ruin the drum.

3. Place the Photo conductive Drum in a soft lint free cloth and then into a dark colored bag or cover from bright light by some other suitable means. Again, do not rub or wipe the Photo conductive Drum with a dry cloth as this may scratch its surface.

If the OPC drum is worn or damaged, it should be replaced with a new long life drum.

## CLEANING THE DEBRIS CAVITY



The storage area of the debris cavity is the entire area under the label.

1. Carefully remove the Primary Charge Roller (PCR) located next to the Wiper Blade.

**WARNING:** Do not clean this roller with alcohol, as this will remove the conductive coating on the roller. This roller takes the place of the corona wire assembly and it is recommended that it be cleaned with a damp lint free cloth only. Place the PCR aside.

2. Remove the Wiper Blade (2 screws, lift up and out).
3. Gently shake the toner out of the debris cavity, and vacuum clean. **NOTE:** Be very careful not to bend or otherwise damage the small thin recovery blade located next to the Wiper Blade when vacuuming. If this blade is bent down lower than the height of the wiper blade, toner will accumulate on top of the blade and spill into the printer. If the blade does get bent, it should be replaced.
4. Clean the rubber Wiping blade using a lint free cloth. This blade removes excess toner from the drum and must be free of any foreign matter. If this blade is worn, or damaged in any way, it should be replaced with a new one. The Wiper Blade should also be replaced if you are replacing the OPC drum. Be careful not to damage this blade. Lightly coat this blade with Kynar Drum Padding Powder model. Do not use plain DPP (Zinc Sterate), as this will stick to the charge roller and cause print defects, (Small white voids in printed areas)
5. Replace the Wiper Blade, and two screws.

## CLEANING THE TONER SUPPLY HOUSING



The toner supply housing consists of the toner supply, magnetic roller and doctor blade which mounts directly next to the magnetic roller. The doctor blade consists of a metal bar that sits next to the Magnetic roller, with a rubber blade attached to it that rides under the roller. It is the pressure of this rubber blade against the magnetic roller that controls the amount of toner on the magnetic roller.

Before cleaning the toner supply, first rotate the magnetic roller by hand and observe the layer of toner applied to the magnetic roller. The toner should form an even consistent layer of toner with no clumps or lumps showing. Should the layer of toner be thicker in some areas the magnetic roller should be cleaned using a dedicated magnetic roller cleaner. Always remove the roller for cleaning and make sure it is completely dry before re-installing it. If there are small lines of no toner on the magnetic roller sleeve, the Doctor Blade must be either cleaned, or replaced.

1. On the non-gear side of the supply chamber, remove the screw, and end cap.
2. Remove the fill plug, dump out any remaining toner, and vacuum clean
3. At this point, the Magnetic Roller can be carefully lifted out.
4. Remove the large white plastic bushing and drive gear, vacuum any remaining toner, and clean with a clean, lint free cloth and a dedicated magnetic roller cleaner.
5. Remove the DR blade being careful not to damage the alignment pin on the left side.

Sealing Strips are now available that work in both the AX, and 1100 cartridges, the installation method is very similar to the LX, and BX cartridges. For detailed seal instructions see the document supplied with the AX seals. These cartridges are fairly tight, because of this if you are hand delivering a seal is not necessary.

6. Replace the DR blade, Install the drive gear into its slot, and place the white bushing on the left side of the magnetic roller. Take the magnetic roller assembly, and slide it into the hopper. Make sure that the keyed end fits properly into the left bushing.
7. Install the end cap. Make sure that the roller turns freely
8. While holding the shiny end of the magnetic roller in place, shake the bottle of toner, carefully pour the toner into the chamber through the fill plug, and re-install the fill plug. Remember, AX toner will work in the 1100 cartridge, but only at 600 DPI or less. If your customer prints at 1200 DPI, a dedicated 1100 toner must be used.
9. Place the small white bushing on the right end of the magnetic roller, and install the end cap. (Make sure that the keyed end of the magnetic roller fits into its slot.

## RE-ASSEMBLE TONER SUPPLY HOUSING, OPC DRUM AND DEBRIS CAVITY



1. Before re-installing the old OPC drum in the cartridge, it must be cleaned, inspected for damage, and coated with Kynar DPP to help lubricate it against the wiper blade. Do not use Zinc Sterate as this product will stick to the PCR and cause print defects.
2. Remove the OPC drum from storage, and clean with a soft, clean cloth and 99% pure Isopropyl alcohol.

**NOTE:** The AX drum will work in the 1100 cartridge. If your customer will be printing at 1200 DPI, we recommend that a dedicated 1100 drum be used.

3. Visually inspect the drum for any physical defects such as small chips, or deep scratches, coat the drum with Kynar DPP, and install it into the waste chamber. If the drum is worn or damaged, it should be replaced with a new long life drum.
4. Spin the drum manually counter clockwise, to make sure that it is properly lubricated.
5. Remove the OPC drum and install the PCR.
6. Re-install the OPC drum, and drum axle pin. By installing the above items in this order, you will keep from contaminating the PCR with any excess Kynar
7. Re-assemble the cartridge, spin the OPC drum manually again to check that the gears all mesh properly. Making sure that the two springs fit over their respective alignment posts.

**NOTE: FOR AX CARTRIDGES ONLY:** If you wish you can use replacement pins instead of the OEM pins. These pins have a mushroom type head which makes them easier to remove. Make sure that they are inserted all the way in, or the cartridge may not install in the printer correctly.

8. Inspect the electrical contacts on the outside of the cartridge.
9. Test the cartridge in the printer, and inspect the test prints once again
10. Wipe the entire cartridge down with the toner magnet cloths and package it in the box with the appropriate directions.

## PRINTER MAINTENANCE AND TEST PRINTS



Before taking any test prints, there are a few items in the printer that should be checked to ensure optimum print quality. If these items are not maintained, they could cause print defects that may be incorrectly blamed on the toner cartridge.

Located in the base of the front lid, is the Transfer Charge Roller. This is a foam roller that must be kept clean. Be very careful not to touch this roller with any part of your skin. The oils naturally present in your skin, paper dust, and/or toner dust, can contaminate the roller, causing light print and/or small white voids in the text. This roller should have no cuts, or areas of missing foam, and should be a medium gray color. If the roller appears dirty, it should be vacuumed clean. If the roller is damaged it should be replaced.

The anti-static teeth are located just next to the Transfer Charge Roller. These teeth dissipate the static charge applied by the transfer charge roller to the paper. This helps prevent the paper from sticking to any of the rollers and causing a paper jam. If these teeth are dirty they should be vacuumed clean, or carefully blown off with a can of clean compressed air. Unlike most other printers, these printers do not come equipped with a brush to clean the teeth.

Although this next part does not relate to print defects, it is a new and unusual feature for HP & Canon AX printers, and we would like to point it out to you. On the left side of the printer there is a paper release lever. This lever allows you to release the tension on the paper, and remove it if there is a paper jam. This feature is not present on the 1100 series.

Since the most important part of the toner cartridge is the OPC drum, special attention should be taken with this part. To help determine the condition of the OPC Drum, a test print should be taken with the printer's intensity set to 5 which is the darkest setting.

In this printer, there is not a physical intensity control, it has to be changed with the software that came with the printer and your computer.

To run a test print, verify that the Ready light is on, and press the front panel button. One page of both text and graphics will print out. This is true for both the AX, and 1100 printers.

Once you have the print out's, they need to be examined to determine possible cartridge defects. In general, any marks on the paper that shouldn't be there indicate a problem. You should also examine print areas for abnormalities such as light print, poor black fills and print inconsistencies.

Some of the more common toner cartridge problems are:

- **A Dirty Primary Charge Roller (PCR):** The primary charge roller is located inside the cartridge, and if dirty will show on the test print as vertical gray streaks down the page, or as a gray background throughout the page.
- **A Dirty PCR Connection** will result in dark black horizontal bars across the page, or as shading throughout the page.

- **A Scratched Drum** will show up as a very thin, perfectly straight line that runs from the top to the bottom of the test page.
- **A Chipped Drum** will result in a dot or series of dots that repeat 4 times per page. Any drum defects will repeat 4 times per page
- **A Light Damaged Drum** will show up as a shaded area on the test print that should be white. Again this will repeat 4 times per page.
- **A Bad Wiper Blade** will result in vertical gray lines down the page, or as shading across the entire page. In either case there will be a film of toner on the drum surface.

## CARTRIDGE PRINTING THEORY



The toner cartridge printing process is best explained as a series of steps, or stages. (See the following diagram)

In the first stage, the Primary Charge roller (PCR) places a uniform negative DC voltage on the OPC drum surface. This process is called conditioning.

In the second stage, (also called the imaging section), the laser beam will discharge this DC voltage to ground wherever it strikes the OPC's surface, leaving a latent electrostatic image on the drum.

The third stage is where the toner image is developed on the drum by the developing section, (or supply chamber), which contains the toner particles. The toner is held to the magnetic roller sleeve by the stationary magnet inside the sleeve, and a variable DC bias voltage supplied by the high voltage power supply. This variable DC bias voltage is controlled by the printer's intensity setting. The amount of toner on the magnetic roller sleeve is controlled by the rubber Doctor blade, which uses pressure to keep the amount of toner on the magnetic roller sleeve constant. This blade also causes a static charge to build up on the toner which helps keep the coating of toner even, and allows easy transfer to the OPC drum.

At the same time an AC signal is also placed on the magnetic roller sleeve. This signal decreases the attraction of the toner to the Magnetic Roller sleeve, and increases the repelling action of toner against the areas of the drum that were not exposed to the laser beam. This AC potential improves the density, and contrast of the toner on the printed page.

As the laser exposed areas of the OPC drum approach the magnetic roller, the toner particles are attracted to the drums surface due to the opposite voltage potentials of the toner, and laser exposed surface of the OPC drum.

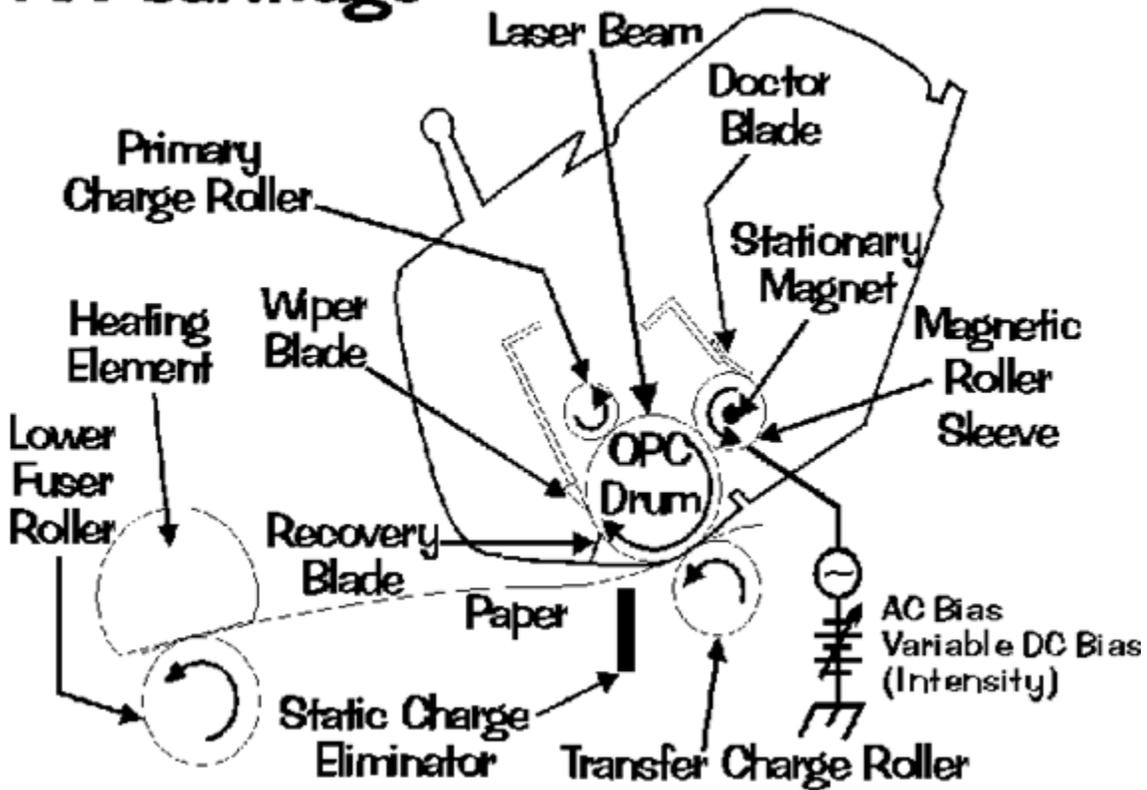
This image is then transferred to the paper as it passes below the drum by the transfer charge roller, which places a positive charge on the back of the paper. This positive charge causes the negatively charged toner on the drum's surface to be attracted to the page. Any residual static charges on the paper are then removed by the static charge eliminator, located in the fuser assembly. The image is then fused on to the paper by the fuser assembly, which is comprised of the upper film assembly and lower fuser rollers. The lower rubber fuser roller presses the page up into the upper fuser film which then melts the toner into the paper. The upper film utilizes Canon's new "Instant-On" technology. A thin flexible film is heated by a ceramic heating element. This film comes up to temperature almost instantly, which eliminates a warm-up time.

The fourth stage is where the OPC drum is cleaned. On average, approximately 90% of the toner is transferred to the paper during the print cycle. The remaining 10% remains on the OPC drum and is cleaned off the Drum by the wiper blade, guided into the waste chamber by the recovery blade, and stored in the waste chamber.

Once the print cycle has been completed, the Primary Charge Roller will then place an AC voltage across the drum surface that erases any residual charges left on the drum surface. The OPC drum is now ready to be Conditioned by the Primary Charge Roller and start the print cycle again.

The advantages of the Primary Charge Roller are that it operates at a lower voltage than the old style corona wire, does not generate ozone, and it replaces the erase lamps that were present in the older style laser printers. The draw back to this technology is that if this roller becomes dirty, or contaminated in any way, the printed pages will have the problems as previously shown on the test pages. Since the Primary Charge Roller is not accessible from the outside of the cartridge, it cannot be cleaned by the user as the Primary Corona Wires can in older style cartridges.

# AX Cartridge



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## RECOMMENDED SUPPLIES



Microsoft OLE DB Provider for ODBC Drivers error '80004005'

[Microsoft][ODBC Microsoft Access Driver]General error Unable to open registry key 'Temporary (volatile) Jet DSN for process 0x3464 Thread 0x231c DBC 0x8437024 Jet'.

/script/catSearch.asp, line 58