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## Canon LBP-WX (EP-W) Toner Cartridges

DOC-0192

### OVERVIEW



The HP-5Si, and 5Si MX printers are based on the Canon LBP-WX Engine, which is a 24 ppm, 600 DPI engine that prints on 11 x 17" paper. The cartridge is an "All in one" type cartridge, (it houses the toner supply, OPC drum, and waste chamber). The WX cartridge comes new with 850gm. of microfine toner, and is rated for 15,000 pages at 5% coverage. The HP part number for this cartridge is C3909A. Basically this cartridge is a very large EX cartridge.

These instructions cover the disassembly of the WX style toner cartridges. 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.

### REQUIRED TOOLS



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

1. Toner approved vacuum. The Atrix HCTV shop vac style toner vac, or the Atrix AAA portable toner.

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

2. A small Common screw driver
3. A Phillips head screwdriver
4. PCR Holder
5. 1/4" punch

### REQUIRED SUPPLIES



1. Toner 700gm (9790 ) 2 Bottles
2. Foil Bag (FB-3Z)
3. 99% Isopropyl Alcohol (FR-8)
4. Lint Free cotton Pads (PW-96)
5. Kynar Padding Powder (DPP-K)
6. Nu-Finish car Polish (Optional)

7. Can of compressed clean air
8. Magnetic Roller Cleaner (MRS-16)

## 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 wiping up toner dust.
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 is combined with other rooms in the building, toner dust may be carried into these rooms. A separate and isolated HVAC system is recommended for the work area room.

## DISASSEMBLY



1. Vacuum the exterior of the cartridge.
2. The first step in recharging the cartridge is to remove the spring loaded pins. Remove them by inserting a narrow, thin common screwdriver next to the locking piece in line with the three holes next to the laser opening and pry up.
3. Be careful not to break the tabs on the clips. If they do break, you can drill a small hole in the post and attach them just like an EX clip.
4. Separate the cartridge into two sections.

## REMOVE OPC DRUM



1. Take the punch and tap out the drum axle from the big gear end about 1".
2. Put aside the small white spacer.
3. Pull the axle rod out completely
4. Remove the Photoconductive Drum being extremely careful not to scratch it. Vacuum any toner and debris from drum being careful not to let the vacuum hose come in contact with the drum surface. 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 (FR-8 Film Remover) and a soft lint free cotton pad (PW-96) 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.

Always handle the Photoconductive Drum with the utmost caution, since if damaged it is costly to replace.

5. Place the Photoconductive 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 Photoconductive Drum with a dry cloth as this may scratch its surface.

## CLEANING THE DEBRIS CAVITY



1. Carefully remove the Primary Charge Roller (PCR), located next to the Wiping blade, by gently prying it out of the clips on either end.

**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 Nu-Finish car polish. 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. For best results, we recommend that the roller be allowed to dry overnight before using.

2. Remove the Wiper Blade and gently shake the toner out of the debris cavity through the opening. When most of the used toner has been removed vacuum the rest out using either the 38 or 43m/m funnel on the end of the vacuum hose to get into the tight spots.

**Note:** Be very careful not to damage or distort the thin mylar Recovery Blade next to the wiping blade

3. Clean the rubber Wiping blade using a lint free cloth (PW-96) or a TM-1 Toner Magnet This blade removes excess toner from the drum and must be free of any foreign matter. Be careful not to damage this blade. Lightly coat this blade with Kynar drum padding powder CP part # (DPP-K). 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.

## 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 charge and 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 MRS-16 Magnetic Roller Cleaner. Always remove the roller for cleaning and make sure it is completely dry before re-installing it.

**NOTE:** The magnetic roller *MUST BE REMOVED* in order to refill this cartridge. The original fill plug is not accessible.

1. Remove the two screws that hold the gear housing cover on the non-gear side of the cartridge. When removing the cover, note the position of the beige rectangular bushing. (The flat side is away from the toner Hopper, oblong hole towards the Dr. Blade.)
2. Remove the gear side end cap, pry up the metal contact. Remove the four largest gears.  
**NOTE:** It is recommended that you draw a picture of the gear layout before removing them.
3. Carefully lift the roller out of the cartridge, while pulling to the right. Be very careful not to damage the roller or to damage the wire contact at the opposite end of the roller. Clean the roller with MRS-16 Magnetic roller cleaner.
4. Remove the doctor blade by removing the two screws and lifting it out. Be careful not to damage the alignment pins.

## CLEAN AND REFILL THE TONER SUPPLY



1. Vacuum the Toner Supply Chamber thoroughly and refill with 2 bottles of (9790) WX Toner (850gm. total). Vacuum up any toner that may have spilled into the rectangular grids on the hopper.

**NOTE:** Once a seal becomes available, it should be inserted at this time.

2. Replace the DR Blade, magnetic roller and gears by reversing steps 6.1 to 6.3, being very careful not to damage the roller or any of the blades.
3. Rotate the beige bushings until the flattest side faces up.
4. Install the non-gear end cap first, putting the alignment pins through the beige bushings.
5. On the opposite side, install the smallest white gear first, gear side down. Next install the helical gear, the main mixing blade gear (Flat side down), and lastly, slide the large gear with the large gear side up.
6. Install the end cap, align all of the pins into the cap. Place the metal bias connector back in its position.



1. Replace the cleaned Primary charge roller.

**NOTE:** proper care of this roller entails cleaning with Nu-Finish car polish. Clean the silver contact ends along with the U-shaped contacts with the Isopropyl Alcohol. These are electrical contacts and must be clean in order for the cartridge to print correctly.

2. Coat the drum with Kynar, and install it into the waste chamber, with the large gear on the PCR contact side.
3. Take the drum axle, small side first, and slide it in from the small gear end. Work it past the drum ground, and into the large gear. press through the hole in the waste chamber, and install the white retaining ring.
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.

By installing the above items in this order, you will keep from contaminating the PCR with any excess Kynar. OR you can wipe the PCR down with a clean dry lint free cloth to remove any DPP-K that may have stuck to it.

7. Re-assemble the cartridge, spin the OPC drum manually again to check that the gears all mesh properly.
8. If the clips are broken, drill a small hole into the post, and install screws to hold it in place.

## TEST PRINTS AND PRINTER MAINTENANCE



There are a few items in the printer that should be maintained 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.

**Transfer Charge Roller;** In the base of the printer, there 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, or toner dust, can contaminate the roller, causing light print and/or small white voids in the text. **Anti-Static Teeth;** On the top, right side of the printer, there is a small cleaning brush. This brush is used to clean the small saw tooth blade or Anti-Static Teeth just behind the transfer charge roller assembly. This blade dissipates the static charge applied by the Transfer charge roller from the paper. This helps prevent the paper from sticking to any of the rollers and causing a paper jam.

Because of the lower voltage required by the PCR, this printer does not generate ozone, so ozone filters are not required. The Fuser Assembly is designed to be self-cleaning and does not use a felt wand.

The fuser assembly, transfer charge roller, separation pad, and the paper feed rollers are designed to be replaced every 350,000 pages. All of these items just covered, as well as the condition of the toner Cartridge effect the print quality, and should be checked before taking test prints.

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. The intensity can be changed by using the printer keypad. There is not a manual dial, or slide switch as in other laser printer models.

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First turn the printer Off-line. press the menu button five times until PRINT QUALITY MENU appears on the display. Press the Item button four times until PRINT DENSITY= appears on the display. Press the + key until the density = 5, press the SELECT key, and the on line key. Having the intensity set to the darkest setting will help to show up any OPC Drum flaws that may not show up with the intensity set to the normal setting of 3.

When the printer is not used for 1 hour it will go into a "Power Save mode", and the LED ready light will go out. As soon as one of the menu buttons is pressed or a file is received from the computer, the printer will immediately power up and be ready to run.

To run a test print, verify that the printer is off line, and press the MENU button three times, until TEST MENU appears on the display. At this point you have a few options as to which test print to select. If you press the ITEM button one time, PRINT PCL CONFIGURATION will appear on the display. This is a mostly text printout that also gives you the page count of the printer. If you press the ITEM button 2 times PRINT PCL FONT TEST will appear. This is a 2 page printout of the internal fonts. If you press the ITEM button 3 times PRINT DEMO will appear on the display. This is a DEMO page that combines both text and graphics. This is the test we recommend for testing the cartridge. By pressing the ITEM button 4 times PRINT ERROR LOG will appear. This page lists all of the printer errors that have occurred during printing such as paper jams etc. Once you have chosen the test print you want, press the SELECT button one time, and the printer will print the test page(s) you selected. We recommend that 3-4 pages be run so that any defect patterns will be easily visible. Notice that the paper is ejected sideways from the printer, which matches how the paper is stored in the paper tray.

Once you have the print outs, 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 as follows:

A Dirty Primary Charge Roller (PCR); located Inside the cartridge, this will show on the test print as vertical gray streaks down the page, or as a gray background throughout the page. 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.

Light Damaged Drum; This will show up as a shaded area on the test print that should be white. Again this will repeat 3 times per page.

Bad Wiper Blade; This will show as either a gray line approximately 1/8" thick, 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 cartridge printing process is best explained as a series of steps or stages.

In the first stage, the Primary Charge roller (PCR) places a uniform negative DC Bias voltage on the OPC drum surface. The amount of the negative DC Bias placed on the drum is controlled by the printers intensity setting. 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 DC bias voltage supplied by the high voltage power supply. This DC bias voltage is controlled by the printer's intensity setting, and causes either more or less toner to be attracted to the drum. This in turn will either increase or decrease the print density. Both the Primary Charge Roller, and Magnetic roller DC Bias voltages are controlled by the printers 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. The small diameter of the drum, combined with the stiffness of the paper causes the paper to peel away from the drum. The static charge eliminator weakens the attractive forces between the negatively charged drum surface, and the positively charged paper. Without this help, thin paper may wrap itself around the drum.

The image is then fused on to the paper by the fuser assembly, which is comprised of the upper and lower fuser rollers. The lower rubber roller presses the page up into the upper roller which then melts the toner into the paper. The upper roller is a hard Teflon coated, heated roller. 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 using the negative DC bias voltage, 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.



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 0x2684 DBC 0x8437024 Jet'.

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