TECHNICAL DOCUMENT

Canon PC-330 (E-16, E-31) Copier Toner Cartridges

DOC-0234

OVERVIEW

These instructions cover the recharging of the Canon E-16, and E-31 toner cartridges used in the Canon PC-310, 330, 330L, 550 and the PC-770 Copiers.

The E-16 cartridge is stamped E-16 and takes one bottle of toner(80g). The E-31 can be stamped either E-31 or E-3. In either case they use two bottles of toner (160g).

This PC Copier engine takes a new direction for Cannon. The toner supply and waste chambers are not separated as in other cartridges, and the cartridge basically just snaps together. This is not to imply that its a very easy cartridge, because of these traits the opposite is true. This is also the first Canon PC Copier Cartridge that uses a PCR Charge Roller. This means that unlike all the other Canon PC Copier Cartridges that can be re-manufactured using the same PC toner, these cartridges take a special toner. Regular PC toner (CP Part # 9700I, 9057), will not work in these cartridges, you must use our part # 9330 only. Because of this Charge Roller technology, they also generate very little ozone, and do not need an Ozone Filter.

These copiers are designed for a very low copying volume, (from 0-500 copies/month), and should not be used for more than that. The 300 and 500 series copiers are very small machines, and the cartridges are almost toy like in appearance. The PC-700 series is built for heavier duty, but still uses these small cartridges.

The purpose of this disassembly procedure 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 clean and fill the supply chamber with new toner. This disassembly procedure should also be used to examine the internal parts of the cartridge for possible damage, or wear should the printing of the cartridge be poor and not correctable by any other means.

SUPPLIES REQUIRED

- 99% Isopropyl Alcohol (FR-8)
- Nu-Finish car polish
- Cotton Swabs (CT-100)
- Recovery Blade (Optional) (RB-EX)
- Lint Free Cotton Pads (PW-96)
- Doctor blade (Optional) (DB-PX)

- 9330 Toner 80 Grams (2 bottles for E-31)
- Wiper Blade (Optional) (WB-PX)
- SS-PXO Sealing Strip
- Can clean compressed air (CA-10)
- DPP-K (Kynar padding powder)
- Rubber Cement
- Foil Bag (FB-1)
- Drum-330GM
- Toner Magnet Cloths (TM-40)

TOOLS REQUIRED

- Small Phillips head screw driver.
- Small Common screw driver
- Needle Nose Pliers
- Razor Blade
- PCR Holder
- Safety goggles and breathing mask.
- Vacuum approved for toner

WARNING: Always wear safety goggles and breathing mask when working with or around toner. Do not disperse the toner into the air. Use approved toner vacuums and filters at all times.

Approved Vacuum systems:
Toner approved vacuum. The Atrix HCTV, or the Atrix AAA style toner Vac.

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.

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 Magnets are perfect 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.

DISASSEMBLY

1. With the cartridge upside down, turn the cartridge so that the drive gear is to your left. Locate the four small clips. Note: they are located just above four large notches.

   WARNING: Be very careful not to break these clips! There are no replacement parts for these cartridges, and these clips hold half of the cartridge together!

2. Using a small common screw driver, pry open the clips. Work each clip out a little at a time until the top section is loose. (It will not separate yet).

If any of the tabs do break, see section 6 for possible repair methods.

3. Turn the cartridge around so that the gear is on the right side and the debris cavity is facing you.

4. There are four hidden clips along the seam of the debris cavity. With a small common screw driver, pry up along the seam until the entire section is loose.

5. On either side of the OPC Drum is a small clip, black on the right, and white on the left. Pry these clips loose.

6. Fully open the OPC Drum cover, and separate the two halves. Be prepared, toner will spill every where! None of this toner is good anymore because the toner will spill from both the supply section, and the debris cavity. The two halves should separate easily, if they don't, go back and release the clips that are still attached. Once the two halves have separated, it is a good idea to vacuum up any loose toner in both sections.

REMOVE THE OPC DRUM

1. Turn the section with the OPC drum over so that the drum is facing away from you.

2. On the side opposite the Drum gear, there is a large white plastic piece held in by a small plastic tabs. Pry the tabs loose, and remove. Be very careful not to damage the metal contacts, these are the contacts for the Magnetic Roller, and OPC Drum.

3. Turn the cartridge back over so that the gear is to the right. Locate the wiping blade.

4. Remove the two screws and carefully pry up the blade.

   NOTE: In some cartridges that have not been recycled before, there is a piece of tape on the right side of the blade. Carefully cut this tape with a sharp razor knife.

5. Clean the Wiping blade, and lightly coat with DPP-K (Kynar).

6. Turn the cartridge so that the gear is facing you. In the center of the gear is a metal axle pin.

7. Pry and push the axle pin out of the cartridge. Be very careful with this and take your time. The pin has a very tight fit, and the cartridge can be easily damaged if too much force is used.

8. Carefully remove the OPC drum, being very careful not to scratch it. Vacuum any remaining toner and debris from the drum, being very careful not to come into 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 using a can of compressed clean air. Never use un-filtered compressed air for this as un-filtered air will have small dirt particles which blown at high speeds, will damage the drum.

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

9. Place the OPC 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 OPC Drum with a dry cloth as this may scratch its surface. If there is any matter left on the drum that must be cleaned off, use 99% pure Isopropyl Alcohol (FR-8), and a soft lint free cotton pad (PW-96) to lightly wipe the drum surface. Vacuum and then blow off the Drum using the Compressed Air. Always handle the OPC drum with the utmost caution, since if damaged it is costly to replace.

10. Carefully vacuum the Magnetic roller clean.

CLEANING THE DEBRIS / SUPPLY CAVITY

1. Take the debris/toner section and vacuum clean.

2. Take a cotton swab dipped in alcohol, and soak the remainder of the old seal. Take the razor blade, and while keeping the blade at 90 degrees to the seal rail, scrape the old seal off. Continue until all of the old seal has been removed.

3. Vacuum up any scrapings

4. Remove the adhesive backing and place the SS-PXO sealing strip over the toner supply section, make sure that the pull tab end of the seal will end up on the side opposite the gears.

   Fill with 9330 toner, one bottle for the E-16, two bottles for the E-31,(E-3) cartridge. If you are going to test the cartridge, save a cap full of toner, and sprinkle it across the magnetic roller. This will be enough to run a few test pages.

   NOTE: Be very careful not to bend or otherwise damage the small thin recovery blade located next to the Wiper Blade. 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 is recommended that it be replaced with a new blade. Installing the new blade is easier with our insertion tool (RB-IT).

5. Remove the Charge Roller and clean with NU-Finish Car polish. To clean the roller, take a small amount of polish on a clean, dry, lint free cloth, and rub it into the roller. Continue to rub the roller until the roller shines. If there are any dull spots left, they should be cleaned again.

6. Clean both contact ends of the roller and the "U"-shaped holders with 99% pure alcohol.

RE-ASSEMBLE THE CARTRIDGE

1. The cartridge should be re-assembled by reversing section 4, but basically it just snaps back together. When re-assembling the cartridge, please pay special attention to the following:

2. Install the Kynar coated (DPP-K) OPC Drum in the cartridge and manually spin it in its proper direction,(towards the drum cover). Since the OPC drum and PCR are located in two different sections, this is all that is necessary to do so that the PCR does not become contaminated with the DPP-K.

3. If some of the plastic tabs were broken during the disassembly, we recommend using small, self-tapping screws (#4 x 1/4") to hold the cartridge together. If any of the 4 visible clips were broken on the supply chamber, you can insert a screw in the hole next to each clip. If any of the 4 hidden clips from the debris cavity are broken, 1 screw can be inserted through the flat area on each corner. If either of the two center, hidden clips are broken, black electrical tape can be used along the seam to hold the cartridge together. If screws or tape are necessary to repair the cartridge, we recommend that they be black or gray in color so that they blend in with the cartridge.

4. Once the cartridge is fully assembled, it is a good idea to either place a label over the Canon label, or remove it so that there can be no mistake that the cartridge has been re-manufactured. By doing this you will avoid any miss-interpretation that this is a new OEM cartridge. This is also a perfect place for your company name and phone number.

No felt wand is used in this cartridge.

TROUBLE SHOOTING

There are a few items in the copier that should be checked to ensure optimum print quality. If these items in the copier are not maintained, they could cause print defects that may be incorrectly blamed on the toner cartridge.

Copier Glass; Any dirt that is on the Copier Glass will show up as a mark in the same spot on every page. This glass should be periodically cleaned with a glass cleaner. **Transfer Charge Roller;** In the base of the copier, 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, 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.

Anti Static Teeth; 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 out with a can of clean compressed air. .

Slit Glass The Slit Glass is located just above the cartridge in the cartridge bay. If this glass becomes dirty, all of the printed pages will have a shaded area which will correspond with the dirt on the glass.

Copy Board Foam: If the copy board foam has any dark marks, such as pen ink, it is possible that they may show through the paper you are copying. If this happens, the marks will appear in the same spot on every page .

Now that your sure that the copier has been properly maintained, we will go through some of the more common toner cartridge problems:

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. This will occur at all intensity settings.

A **Dirty PCR Connection** will result in dark black horizontal bars across the page, or as shading throughout the page. Again, this will occur at all intensity settings.

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 based on the drum circumference of 2.95".

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.

PRINTING THEORY

Please refer to the cartridge diagram located on the last page of this instruction manual as you read this section.

The toner 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 voltage on the OPC drum surface. This process is called conditioning.

In the second stage, (also called the imaging section), the light from the exposure lamp is reflected through a series of mirrors and lenses to the OPC drum, where it will discharge this DC voltage to ground. The areas that are NOT discharged, will leave a latent electrostatic image on the drum. In other words, the image area remains charged, and the background area is discharged.

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 copiers 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 light. This AC potential improves the density, and contrast of the toner on the printed page.

As the light 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 the light 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 charge on the back of the paper. This charge is stronger than the charge on the drum, and causes the toner on the drums surface to be attracted to the page. Any residual static charges on the paper are removed by the static charge eliminator. The image is then fused on to the paper by the fuser assembly, which is comprised of a heated film strip, and lower fuser roller. The lower fuser roller presses the page up into the heated film strip which then melts the toner into the paper.

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 copiers. 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.

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