

TECHNICAL DOCUMENT

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Canon PC-Mini Style Toner Cartridges

DOC-0210

OVERVIEW



These instructions cover the disassembly of the PC-Mini style toner cartridges. These cartridges are marked with either **A-15** or **A-30**. These instructions also apply to the **Ricoh LR-1**, and the Panasonic **FP-820** Copier cartridges. Although these cartridges can't be tested in a Canon copier, (unless they are modified), they are made by Canon, and are re-manufactured the same way.

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 its 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. The Atrix HCTV canister type toner vac, OR the Atrix AAA portable style 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, creating a real mess.

- A small screw driver (Common Style)
- A Phillips head screwdriver with removable tips
- Pin Pulling Pliers (PP-3) or (PP-900) Screw Starter
- Needle Nose Pliers

REQUIRED SUPPLIES



- Black Toner (97001)
- Sealing Strip (SS-SX, SS-SXOP)
- Seal insertion tool (IT-2) Only necessary if using the SS-SXOP seal
- Foil Bag (FB-2,2Z)
- Felt, or felt wand (Felt-PC3, or FW-PC3)

NOTE: Panasonic FP-820 uses Felt-1305, or FW-820

- Wiper Blade (WB-SX) [Optional]
- Long Life OPC Drum (Drum-PC3GF) [Optional]
- Recovery Blade (RB-PCMini) [Optional] (pin-SX)
- Replacement Case Pins [Optional]
- Plug-PC Replacement fill plug [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. An empty 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. Toner Magnet cloths 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.

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. Place the cartridge upside down. Remove the four (4) plastic pins. Two pins are on either end of the cartridge. The pins can be removed by either screwing the PP-900 Screw Extractor into the center of the pin and pulling the pin out with a slight twisting motion, or by using the PP-3 Pin Pulling Pliers
3. Whichever tool you use, continuously twist your hand in a clockwise direction as you pull the pin out. This will help prevent the pins from being damaged. 3.3) Gently pry off the triangular shaped plastic piece on the end of the cartridge which is adjacent to the **Red-green Indicating Wheel**. This triangular piece of plastic is located right where the sealing tab is pulled out from on a new cartridge.
4. Turn the cartridge label side up with the label facing away from yourself. You will see two small interlocking tabs on the flat surface right below a 12" long metal bar. Pry the plastic housing up in front of these clips using a small screw driver. Squeeze the clips slightly if necessary. Do not force the clips as they will break very easily. Once these clips are free you will be able to remove the outer shell which contains the label and metal bar.

The plastic section with the two clips is called the **Debris Cavity**. The **debris cavity** collects used toner which is not transferred to the paper. The **Photoconductive Drum** is attached to the debris cavity. The other plastic section with the clear cap on the end is called the **Toner Supply Area**. This area houses new toner and should presently be empty if you have used up all the toner.

5. Remove the entire assembly consisting of the **Debris Cavity, Photoconductive Drum and Toner Supply Area** in one piece from the **Housing Shell**. Vacuum the shell and hold to the side for later re-assembly.

SEPARATE DEBRIS CAVITY, DRUM AND TONER SUPPLY



1. Remove the **Red-green Indicating Wheel** assembly by pulling straight out by the small gear to the left of the large wheel. There is one small clip to be released on the inside.
2. Next remove the two springs, one on either end of the assembly. Take notice that one spring is longer than the other.
3. Remove the **plastic pivot pin** on the side of the assembly located directly above the longer spring just removed. This is the same side with the **Red-green Indicating Wheel** and directly adjacent to the wheel. This pin can easily be removed by screwing either the PP-900 screw starter or inserting the PP-3 Pin Pulling Pliers into the center of the pin and then pulling it out.

4. Hold the assembly off the table with left and right hands, left hand on **Debris Cavity** and right hand on **Toner Supply Area**. Twist and pivot down and separate into two pieces. 1) **Debris Cavity + Drum** 2) **Toner Supply Area**. The two pieces are held together with interlocking and pivoting tabs only.

REMOVE PHOTOCONDUCTIVE DRUM



1. Place Debris Cavity + Drum section face down with drum dust cover facing up. Remove the one Phillips head screw and the white plastic pivot pin which was held in by the screw.
2. Remove the Photoconductive Drum by sliding it towards the end where the pin was just removed. If the drum is a long life and is to be re-used, be extremely careful not to scratch the drum. 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.
3. 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. If there is any matter on the drum that must be cleaned off, use 99 % pure Isopropyl Alcohol, and soft lint free cotton pad to lightly clean the drum surface. Vacuum and then blow off the Drum using compressed clean air. Always handle the Photoconductive Drum with the utmost caution, since if damaged it is costly to replace. It is not recommended that you re-use the OEM drum, as the print quality is usually very poor.

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

CLEANING THE DEBRIS CAVITY



The easiest way to clean out the **Debris Cavity** is to first remove the **corona wire assembly**.

1. Place the **Debris Cavity** upside down with the remaining spring on the left, and the white plastic part of the **corona wire assembly** to the right. Gently press the white end of the assembly to the left until a small white pin becomes visible. Pull the right side out, and gently work the left side out by pulling it straight out from the three small pins. Be very careful not to break any of these pins especially the black one, which is very fragile. An easier way to remove it is to press in on the side opposite the white pin, while pulling out on the plastic frame. the corona assy. should come free. Be careful of the small black pins as they are very fragile.
2. Remove the two screws holding the wiper blade down, and carefully pry up the **wiper blade**. Dump any toner into the garbage and Vacuum thoroughly. Clean the **Wiper Blade** off with a TM-1 cloth, coat the edge lightly with a small amount of new PC toner, and replace the blade on the **Debris Cavity**. It is not recommended that any type of padding powder be used in PC cartridges, as it can react with the toner, and cause the toner to stick to the OPC drum. An easy way to coat the edge of the blade is to use a cotton swab dipped in toner.

NOTE: Be very careful not to bend the small, thin **Recovery Blade** next to the **Wiper Blade**. If this blade becomes bent lower than the height of the Wiper Blade, toner will leak out of the cartridge, and into the printer. If the blade does become bent, carefully bend it back up to a level slightly higher than the **Wiper Blade**. If the blade cannot be repaired, replace it with part # RB-PCMINI.

3. The **corona wire** should be cleaned by using FR-8 Film Remover and a CT-100 Cotton Swab carefully running it along the wire and wire guide, being very careful not to break this fragile wire. Then a can of clean air should be used to blow any dust or toner left on the wire. Be certain to blow away from yourself and only after all heavy signs of toner have been removed. Always wear and use Eye and Breathing protective apparatus. Replace the corona wire assembly by reversing step 6.1 .

CLEANING THE TONER SUPPLY HOUSING



The Toner Supply Housing consists of the toner supply, magnetic roller and doctor blade which mounts directly above the magnetic roller. The space between the magnetic roller and doctor blade is a precise 0.010" and controls the thickness of the toner applied to the roller. The doctor blade has a set of white nylon spacers at each end of the blade which insure a proper gap setting. If this blade is removed and then re-installed the nylon spacers must be held in contact with the magnetic roller when tightening the screws holding the doctor blade in place. If these spacers are worn or missing, use a plastic or brass Gapping Gauge to set the proper gapping distance (0.010"). NOTE: Proper Gapping is crucial for optimum printing.

NOTE: The magnetic roller if being re-used, should be cleaned with a dedicated magnetic roller cleaner. We highly recommend that the roller be replaced each cycle either with a re-coated roller, or an SX roller from a Virgin cartridge. In our testing, Virgin SX rollers produce the best results. We have tried new SX rollers, and although they work, they do not have the same quality that the Virgin SX rollers do.

1. Remove the 1" fill plug on the end of the Toner Supply Housing. This housing contains the magnetic metal roller and the toner supply area. Dump the toner out of this housing . Vacuum the outside of the housing and the magnetic roller. Turn the metal roller a few times to vacuum all sides of the roller. Inserting the vacuum end up to the 1" fill hole while turning the magnetic roller aids in complete toner removal. Be careful not to scratch the magnetic roller with the vacuum hose.

NOTE: Placing the toner fill funnel on the end of the vacuum hose greatly enhances the cleaning process.

2. Remove and replace the Magnetic roller. If you are replacing the OEM with a Virgin SX roller, make sure that you also swap the gear on the end of the roller. If you don't, the cartridge will jam up.
3. Insert the plastic sealing strip into the end of the Toner Supply Housing. Push the strip all the way in up to the line on the silk screened end.

Hint: For easy insertion of the sealing strip, first dip the end of the strip into a little PC toner. This toner will act as a lubricant between the foam pad and sealing strip.
The sealing strip should seat approximately 1/4" into the far end of the housing.

If you are splitting the hopper (Best Method) follow your usual techniques.

4. Pour the new toner into the fill hole, and replace the fill hole plug. Make sure that the plug is fully seated, and that there are no leaks. If the plug was damaged during removal, replace it with a new Plug.

RE-ASSEMBLE TONER SUPPLY HOUSING, PHOTOCONDUCTIVE DRUM AND DEBRIS CAVITY



1. Replace the drum into the debris cavity being extremely careful not to scratch or damage the drum. Insert the plastic pivot pin and Phillips head screw. Be certain the gears between the drum and cavity are meshed properly.

At this point it is a good idea to manually spin the OPC drum a 5+ turns to ensure that the Wiper Blade is properly lubricated with toner, (With your thumb on the large gear, turn it towards the drum cover). The OPC drum should turn freely. If it does not, remove the OPC drum and re-coat the edge of the Wiper Blade with PC toner.

2. Re-assemble the two halves as reverse of step 4.3. Replace the plastic pin and the two springs. The longer spring goes on the end with the pivot pin.
3. Re-set the Red-Green indicating wheel assembly by spinning it backwards, and replace. Hold the assy. In your left hand, with the gears also to the left. With your right hand, pull the wheel out slightly, and spin it backwards until you hit the stop. The counter is reset!

REPLACE ASSEMBLY INTO HOUSING SHELL



1. Insert the Debris Cavity, Drum, Toner Supply Housing assembly into the housing shell.
2. Insert the 4 plastic pins, two on either end of the cartridge. Replace the triangular shaped plastic end piece.
3. Place the cartridge in a light proof bag, (Foil bag), this will help protect the OPC drum from light damage.

NON-CANON BRAND CARTRIDGES



1. The Panasonic FP-820/830 felt wand is different from the Canon and Ricoh. New wands are currently available, but the used wand can be re-felted using the felt from a TEC-1305 toner cart..
2. Canon cartridges can be made to work in both the Ricoh, and Panasonic copiers by cutting the plastic posts off of the left side of the cartridge shell. Cut the post off flush with shell wall and they will work fine in any of the copiers!

TROUBLE SHOOTING



Before taking any test prints, 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 Corona Wire; In the base of the copier, there is the Transfer Corona Wire. The Corona wire is a very thin wire that runs straight across from left to right. This wire should be cleaned with a cotton swab, slightly dampened with alcohol. If this wire is dirty, the print outs will either be shaded, or have black vertical stripes.

Fuser Assembly; Towards the left side of the copier is the Fuser Assembly. This assembly has a felt wand that is used to keep the upper fuser roller clean. this wand should be replaced (or re-felted) every time the toner cartridge is replaced. The exception to this is in the PC-1, and PC-2, they use a heated film strip that does not use a felt wand.

Ozone Filter; The ozone filter should be checked periodically to make sure that it is not clogged, and that the air can flow through it.

Anti Static Teeth; The anti-Static teeth are located just next to the Transfer Corona wire. 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 .

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.

This copier has both manual and automatic intensity settings, and there are adjustments for both. The intensity is normally in the automatic mode, or if in manual, set towards the middle of the range. If you experience background shading in the automatic mode, set the three position switch to the next lighter setting. If you are experiencing shading in the manual mode, the intensity should be set to the lightest setting, and copies made. This procedure should be repeated moving the intensity up until the background re-appears. The intensity should be set back to the last good setting, and the copies taken for inspection. For the test sheet, never use colored paper, as this will affect the intensity setting of the machine. This test sheet should have a text area, shaded areas. and a dark black area, all printed on clean white paper

To make the copies, verify that the intensity is set to the proper setting, and press the start button.

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.

Some of the more common toner cartridge problems are:

- A **Dirty Primary Corona wire:** The primary corona wire is located Inside the cartridge, and if dirty will show on the test print as vertical white streaks down the page. 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 3 times per page. Any drum defects will repeat 3 times per page based on the drum circumference of 3.66".
- A **Light damaged drum** will show up as a shaded area on the test print that should be white. Again this will repeat 3 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.
- A **Bad drum contact** will result in solid black pages. This is usually caused by the contact inside the OPC drum not making contact with the copier.
- A **Bad Primary Corona wire contact** will result in totally blank pages. This is usually caused by bent or damaged contacts in the cartridge, or in the copier.

CARTRIDGE PRINTING THEORY



A cartridge diagram is located on the next page to assist you in this section. The toner cartridge printing process is best explained as a series of steps, or stages. Please see the accompanying diagram

In the first stage, the Primary Corona wire places a uniform 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. This is opposite of how most laser printers work.

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 Doctor blade, which is gapped at 0.0010" to keep the amount of toner on the 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.

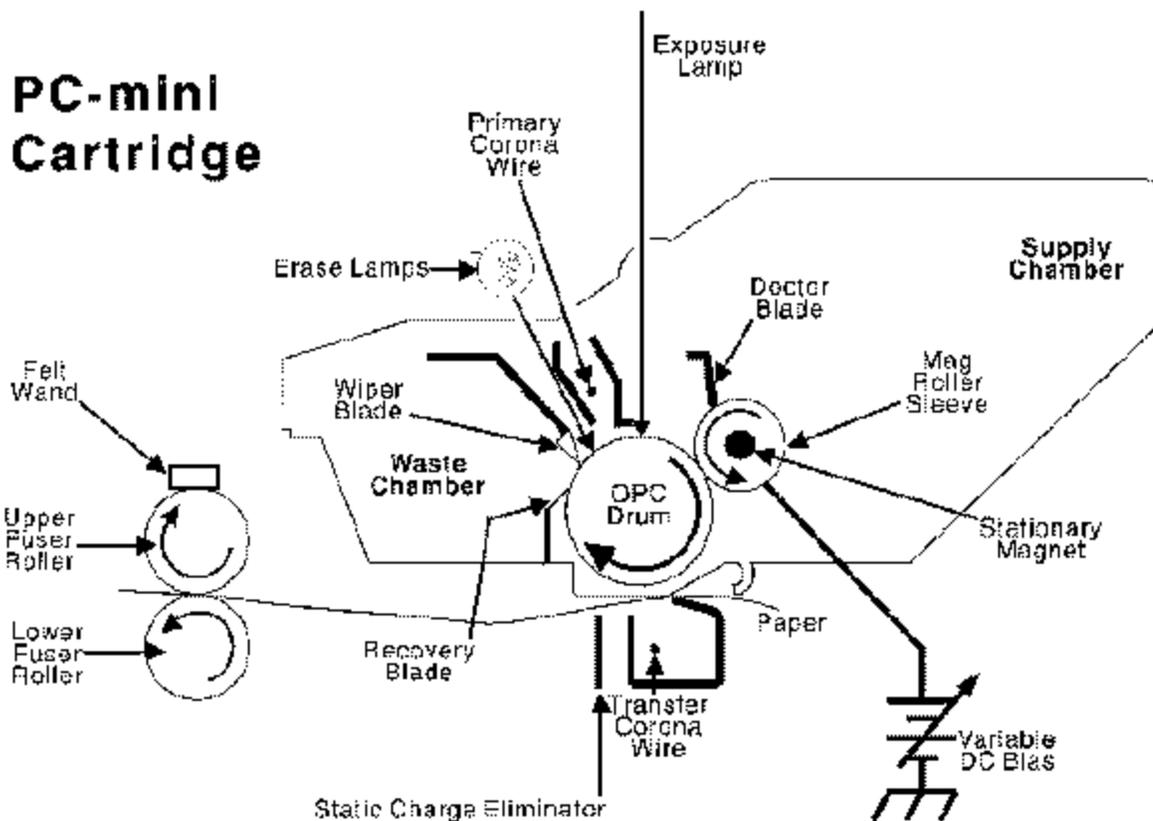
As the light exposed areas of the OPC drum approach the magnetic roller, the toner particles are attracted to the drums surface due to the opposite voltage potentials of the toner, and laser exposed surface of the OPC drum.

This image is then transferred to the paper as it passes below the drum by the transfer corona wire, 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 upper roller, and lower fuser roller. The lower rubber roller presses the page up into the upper heated roller which then melts the toner into the paper. In the PC1 & 2 copiers the upper roller has been replaced by a heated film strip. In all of the copiers other than the PC1 & 2, the upper roller is kept clean by a felt wand.

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 erase lamps in the copier bathe the OPC drum in a neutralizing red light that erases any residual charges left on the drum surface. The OPC drum is now ready to be Conditioned by the Primary Corona wire and start the print cycle again.



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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 0x3738 DBC 0x8437024 Jet'.

/script/catSearch.asp, line 58