TECHNICAL DOCUMENT

Samsung FS-5000, Xerox P8e Toner Cartridges

DOC-0272

OVERVIEW

The Xerox P8E, P8EX, Xerox Workcenter 385, and Lexmark Optra E310 printers are all based on the Samsung FS-5000 8 ppm, 600 dpi engine.

The various models listed all use the same supplies to recycle, however the cartridges are not interchangeable. The cartridge is an All in one type cartridge, (it houses the toner supply, OPC drum, and waste chamber). The standard cartridge comes new with 160g. toner, and is rated for 5,000 pages at 5% coverage. The Lexmark cartridge has a drum shutter located on the top of the cartridge.

The Xerox part # is 113R296

The Lexmark part # is 12A2202

At the time of this writing, Xerox has just released the WorkCentre 390 printer. This printer is a 10ppm, 600dpi machine that uses the 113R462 toner cartridge. This cartridge at first glance looks very similar to the P8E cartridge. The only difference seems to be that the new cartridge is rated for 3000 pages instead of 5,000. We are investigating this cartridge to see if the P8E supplies will work in it, and will keep you posted.

The end cap of all the cartridges houses a small 100ma fuse that must be replaced each cycle. If the fuse is not changed, the printer will not recognize it as a new cartridge.

The entire waste system in this cartridge is a little different. The waste chamber is very small and the wiper blade is very flimsy. This cartridge is listed as having a 100% transfer efficiency. Since there is a waste chamber and wiper blade present, that is clearly not the case, but from what we have seen, it is very close.

REQUIRED TOOLS

- Toner approved vacuum.
- A small Common screw driver
- A Phillips head screwdriver
- Needle nose pliers

DISASSEMBLY

1. Vacuum the exterior of the cartridge.
2. Place the cartridge with the handle facing up. Remove the top 2 screws. See Figure 1.
3. On the front of the cartridge there are 3 plastic tabs GENTLY pry the cover away from the tabs and lift off. See Figure 2

   CAUTION: The upper half of the toner hopper is being removed. If there is a lot of toner left in the hopper, it will dump out all over! Vacuum the hopper clean.
4. Remove the three screws on the left side end cap. Locate the drum cover arm and gently pry it off. Remove the end cap. See Figures 3 & 4

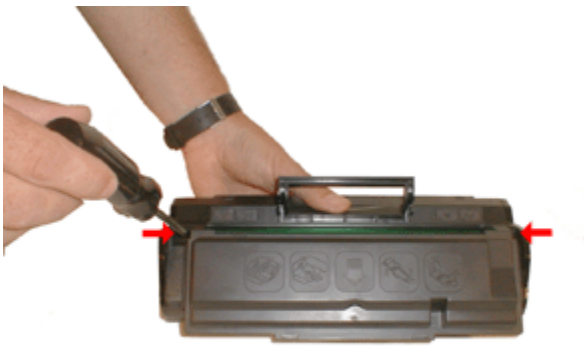

FIG. 1

FIGURE 1

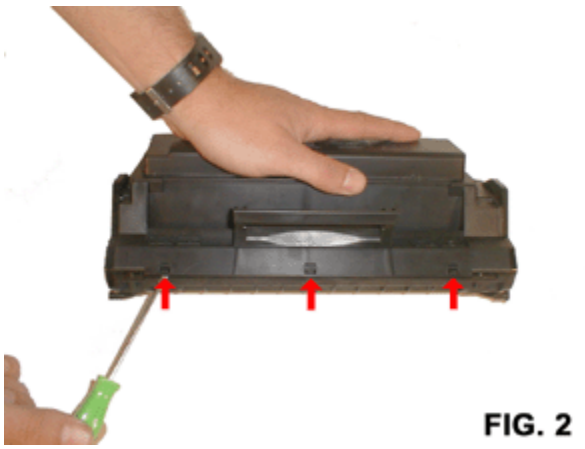

FIG. 2

FIGURE 2

FIG. 3

FIG. 4

FIGURE 3

FIGURE 4

5. Remove the three screws on the right side end cap. Do not try to remove the drum cover arm from this side, it will come off intact with the drum cover. Remove the end cap. See Figure 5 & 6

6. Also on the right side there is a series of gears under the end cap. Make a note of the location of each gear and remove them. The gears are located as follows: See Figure 7

   Top Left: Single Gear, Off white color
   Top Right: Double gear, Bright white color
   Top Center: Double Gear, Off white color
   Bottom Center: Single gear, Bright white color

   These gears will most likely fall off if not removed so it is best to remove them.

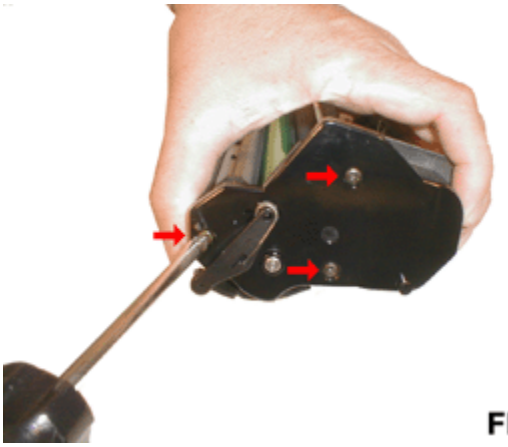

FIG. 5

FIGURE 5

FIG. 6

FIGURE 6

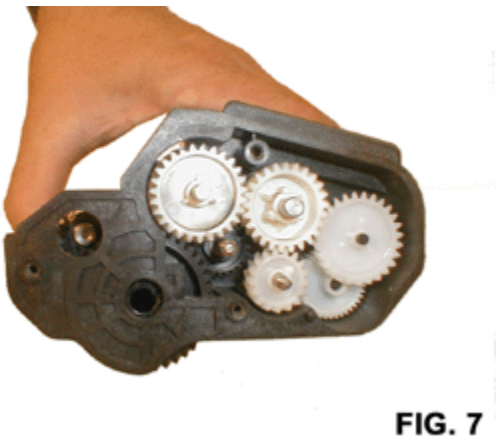

FIG. 7

FIGURE 7

7. On either side of the PCR there are clips held in by screws. Remove both screws. Slide off the clip from the right side, lift out the PCR/Clip/gear from the left side as 1 unit. Figure 8 & 9

8. Clean the PCR.

   WARNING: Do not clean the OEM PCR with alcohol as this will remove the conductive coating on the roller. IF the PCR is an after market, follow the cleaning methods recommended by the manufacturer. If the PCR is an OEM, we recommended it be cleaned with your standard PCR cleaner

9. There are 3 screws on the Wiper Blade. Remove them and gently pry the blade up. Be very careful not to break off the alignment tabs. We have found it best to lift up from both sides when removing this blade. See Figure 10

   NOTE: As stated in the beginning of this document, the Wiper Blade in this cartridge is very flimsy. It actually looks more like a doctor blade than a wiper blade! Since the transfer efficiency of this cartridge is very high. The wiper blade does not work as hard as in a normal cartridge. Since it is so delicate, we recommend that it be changed each cycle.

   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.

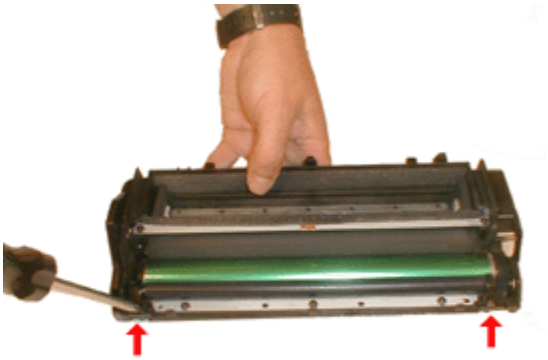

FIG. 8

FIGURE 8

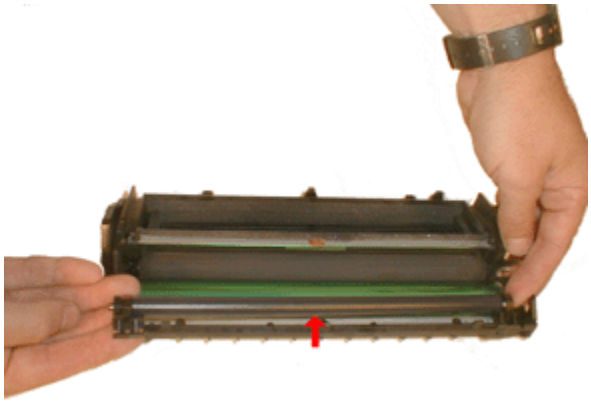

FIG. 9

FIGURE 9

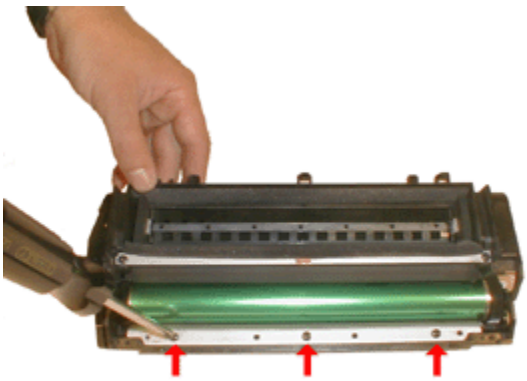

FIG. 10

FIGURE 10

REMOVE OPC DRUM

1. With the Wiper Blade removed the drum can easily be removed by lifting it out. See Figure 11

FIG. 11

FIGURE 11

2. Remove the OPC Drum being extremely careful not to scratch it. If the drum is in good shape and you plan to re-use 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 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 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.

CLEANING THE TONER SUPPLY HOUSING

1. To clean the doctor blade (Highly recommended), remove the two screws on the blade. Gently pry up the blade, the foam on the back of the blade may keep the blade attached to the cartridge. Gently separate them. Wipe the metal blade down with a clean cloth. If a heavy build up is present, clean it with alcohol. See Figure 12

2. To remove the static roller, first remove the remaining black (static Roller) gear, and the white (foam toner feed roller) gear from the right side. See Figures 13 & 14

3. In the bottom center of the hopper you will see a small rectangular hole with a clip in it. Pry the clip up and remove the plastic end cap. The Static roller can now be removed. Clean the roller with a clean dry cloth. Do not use any chemicals on this roller. Vacuum the toner feed roller and hopper clean. See Figure 15

   NOTE: The static roller has two spacers/washers similar the ones use by Lexmark. The first spacer is Teflon, and the second is white plastic. The Teflon spacer goes

to the outside of the roller.

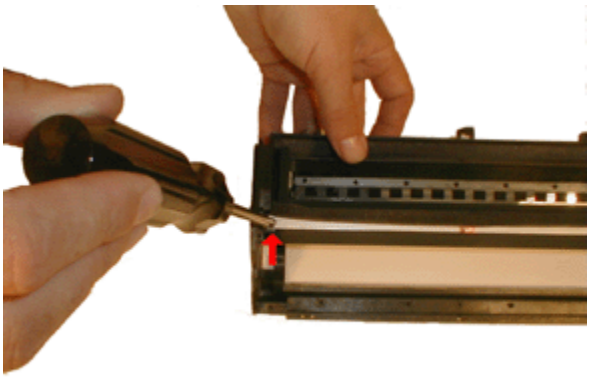

FIG. 12

FIGURE 12

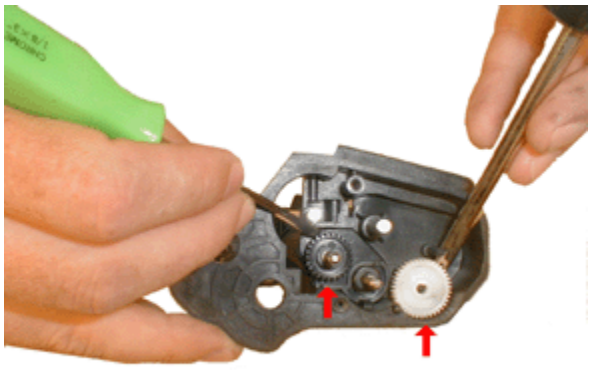

FIG. 13

FIGURE 13

FIG. 14

FIGURE 14

FIG. 15

FIGURE 15

Filling The Hopper

1. Replace the Static roller, and doctor blade. Make sure that the static roller end cap is clipped in place.
2. Place the seal across the upper hopper opening making sure that the frame does not cover the open area. See Figure 16
3. Remove the fill plug, and fill the hopper with the correct toner. See Figure 17
4. Re-install the fill plug. This plug is made with a hard plastic, if it gets damaged, put a small bead of silicon around the lip to seal the cavity.

To rebuild the cartridge, reverse steps 2.1-5.4 keeping in mind the following points:

A. Before replacing the drum, make sure that the two small gears (1 black, 1 white) are replaced first. Especially the small black gear as after the drum is installed, you will not be able to install the gear. See Figure 13

B. Make sure you have the seal tab go through the slot in the cartridge side wall and End Cap (Left Side). See Figure 18

C. Don't forget to replace the fuse on the left End Cap. The printer will not

accept the cartridge if an old fuse is used. Starter cartridges come with a plastic dummy fuse in the slot. Remove it and replace with a 100ma 5x20mm fast acting fuse. See Figure 19

D. When replacing the gears on the right side End cap, Place the Top center gear in first followed by the top left, top right, and bottom center. This order allows easy installation of the gears. See Figure 7

E. Clean the grease off the contacts on the end caps. Replace the grease with new conductive grease to ensure a good connection. With conductive grease, more is NOT better. Only use enough to coat the contact, more than that will eventually become contaminated and cause problems.

FIGURE 16

FIGURE 17

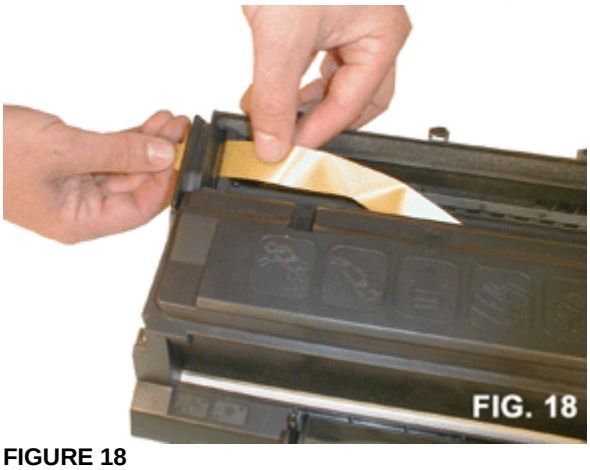

FIGURE 18

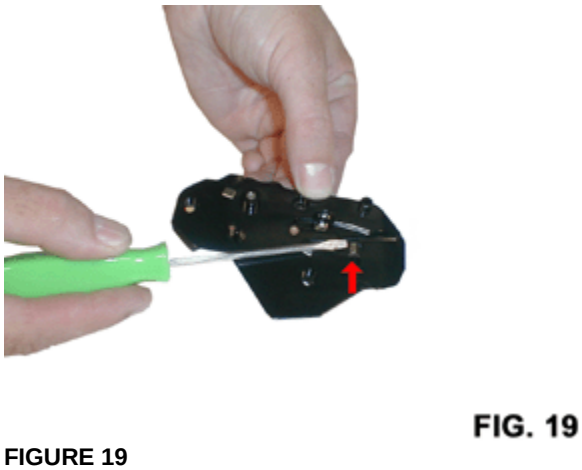

FIGURE 19

COMMON CARTRIDGE PROBLEMS

Some of the more common toner cartridge problems are:

A **Dirty or Bad Primary Charge Roller** (PCR); located Inside the cartridge, 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 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 printer's 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 OPC drum's

circumference is approximately 1/3 of a page and therefore makes three revolutions for each 11" printed page.

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 static roller by the 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 static roller DC Bias voltages are controlled by the

printer's intensity setting. The amount of toner on the static roller sleeve is controlled by the metal Doctor blade, which uses pressure to keep the amount of toner on the static 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.

As the laser exposed areas of the OPC drum approach the static 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 fourth stage is where the OPC drum is cleaned. For this engine approximately 99% of the toner is transferred to the paper during the print cycle. The remaining 1% 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 stated under common printer problems. 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 0xc5c Thread 0x290 DBC 0x85d684c Jet'.

/script/catSearch.asp, line 58