Courtesy of:

Densigraphix
Kopi Inc.

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The base unit of this printer (4500) was introduced in October of 1998. Currently only the 4550 is available. As of this writing, the 4600 has been introduced, so I don’t think that this model will be available much longer. Not to fear! There are heavy placements of the 4500/4550 out there, as well as the 8500/8550. With the experience that you’ll gain on this model, you’ll be able to sail right into the new models.

Polymerized or Pulverized?
The new color supplies are referred to as “chemical toner”. This is not to say that previous toners were not chemical, it simply refers to the manufacturing process. Polymerized toners are uniformly spherical, thereby improving transfer & fusing characteristics.

Quick note:
The HP 4500/4550 is also available from Canon® as the CLBP 460 PS. The HP 8500/8550 from Canon® is the Imageclass C 2100.

Supplies.
The following is a list of supplies for the printers. I’ve included an approximate retail value (in U.S. dollars).

4500/4550
Printer costs start at $2,200.00 and can go as high as $4,200.00 depending on options.
Toner cartridges;
- Black  C4191A  9,000  140.00
- Cyan  C4192A  6,000  189.00
- Magenta  C4193A  6,000  189.00
- Yellow  C4194A  6,000  189.00
- Drum  C4195A  25,000  80.00
- Transfer kit  C4196A  100,000  197.00
- Fuser  C4197A  100,000  220.00
NB: Drum, transfer kit & fuser yield will vary with use of color toner as much as 75% less!

8500/8550
Printer costs start at $3,750.00 and can go as high as $10,270.00 depending on options.
Toner cartridges;
- Black  C4149A  17,000  97.00
- Cyan  C4150A  8,500  160.00
- Magenta  C4151A  8,500  160.00
- Yellow  C4152A  8,500  160.00
- Drum  C4153A  50,000  150.00
- Transfer kit  C4154A  150,000  366.00
- Fuser  C4155A  100,000  320.00
NB: Drum, transfer kit & fuser yield will vary with use of color toner as much as 75% less!
O.K., let's get to the cartridge. Below I’ve assembled a list of some of the items that you’ll need to rebuild the unit. A couple of quick notes here. You really should split the hopper and reseal it. These hoppers leak badly, (especially the color hoppers) even with OEM toner. It’s just the way they’re built. Splitting is not hard, and special tools are not necessary.

**Tools & supplies**

- #2 Phillips screwdriver
- #00 Phillips screwdriver
- Small flat blade screwdriver
- Large flat blade screwdriver
- Long nose pliers
- Conductive grease
- Toner
- Seal
- Replacement parts as needed.

**Black or Color?**

Whether it’s a color or black cartridge, the procedure is almost identical. I’ve included some photos to show the difference.

In Fig. 1, color is the upper cartridge, black is the lower. The main difference here is the doctor blade. The color blade is multi-part, whereas the black blade is a traditional single part.

In Fig. 2, you can see the extra gear that turns the foam roller that is only in the color cartridge. More about these parts later.

**First things first!**

Fig. 3 shows the cartridge in the upright position, with the shutter closed. For most of the disassembly you will have the cartridge upside down, with the label facing you, as in Fig. 1.
Fig. 4 shows a rear view with the shutter closed. At this point I will assume that we will be splitting the hopper, therefore remove the hopper shutter film. Remove any glue residue before installation of the new film.

Fig. 5 is the shutter stopper, on the left side of the cartridge. Use a small flat screwdriver to quickly “pop” the stopper up & out of the retaining holes. I’ve been able to recoup these stoppers over and over again. So you won’t have to replace them every time.

Fig. 6 is the shutter pin, on the right side of the cartridge. Using long nose pliers, grab the pin firmly while resting the handles of the pliers on the edge of the cartridge. With a snap, the pin will release. This part can also be reused if not damaged.

Remove the shutter from the right side first (shutter pin side). Then lift over the gear housing on the left. Note the position of the color tab. Each color (including black) has its own position. Do not interchange the shutters, unless of course you’re reliving the 60’s! Seriously, you’ll get “Wrong Cartridge” errors.
**Charge bar**

Removal of the charge bar (color cartridge). The charge bar is used to charge the color toner since it is not magnetic you cannot use a “mag” roller as with the black toner. Both color & black rollers look alike, but are not. The color rollers have no magnetic core as does the black.

Remove the two (Fig. 8) tiny black screws located at both ends of the charge bar. Do not remove the doctor blade just yet. For this you will need a #00 Phillips screwdriver. Carefully pry up the bar at each end, until it is released from the doctor blade assembly. Take care not to lose the two small springs at each end of the bar. Clean the roller with light compressed air. The rubber rollers should only be dry cleaned, do not use any liquids.

**End caps**

Remove the two screws from each end cap. These screws are standard self tapping #2 Phillips type. Note that in each of the end caps, there are a number of contact plates, as well as resistors & capacitors. Care must be taken in cleaning and greasing the contact points.

Fig. 10 shows the inside of the right end cap. On the top left corner you can see one of the capacitors. The large center slot is for the seal end, or pull tab to pass through.

The circle is around one of the developer roller shaft bushings. These bushings are “keyed”. Note the position when reinstalling.
At least this mess is Cyan!

Figs. 11 & 12 show the ends of the cartridge without the end caps. Note the sleeve bushing in Fig. 12, it’s the same as the long (15 mm) SX type mag sleeve bushing.

You can remove the gears now. Reinstalling them later will be no problem, there’s only one way that they fit.

Now a quick word on Mag & Developer rollers. They’re both the same! The only difference is the Mag sleeve needs to have a mag core. The developer roller works with non-magnetic toner so it will not have anything in the middle. The top photo has the small journal end already installed. The lower photo, the journal end has yet to be installed.

In Fig. 13, the arrow is pointing to the toner adder roller drive gear, this may be removed as well as the developer roller. The larger gear at the bottom cannot be removed. This is the drive for the agitator in the hopper. The two red circles are showing the two screws holding the left side inner cover. Remove these now but don’t remove the cover until after the doctor blade is off.
Now the doctor blade.

Remove the two screws that hold in the doctor blade. Notice that the left screw is chrome colored & threaded top to bottom. The right screw is a shoulder screw with a wave washer. Do not interchange these screws.

The bottom of Fig. 14 is the three parts of the color doctor blade. In the middle is the actual blade (which is replaceable) above and below it are the frame parts. These are shown in the order they would go in (top to bottom).

Before moving on to removing the toner adder roller (foam roller). Let's look at the ground film or developer shield. This is a thin aluminum plate, with a adhesive backing. The primary function is to keep down any dusting from the hopper. These plates will “wear out”, heavy scratching and gouges will appear. It’s best to replace this part each rebuild.

Strip the plate from the cartridge, then remove any glue residue. Notice the arrow pointing to the tiny “ear” in Fig. 15. This ear must be folded over the edge of the cartridge on the right side. If you examine the right end cap, you will see a contact point for the ear to press against. Make sure that this area is clean and free from any toner residue.

Fig. 16 shows the left side of the toner adder roller. The item on the end of the roller shaft is a rubber plug that seals the hopper from the gear housing. This plug is located under the developer roller felt, which will be shown on the next page.
At the right are developer roller felt seals. Unlike the felt seals in the black cartridge, which are straight (same as SX) these are cut at specific angles. You will have to remove the left one in order to push the toner adder roller plug out.

Fig. 18 shows the toner adder roller felts. These help keep toner within the hopper. Both must be removed in order to remove the adder roller.

In Fig. 19 I’m attempting to show the two styles of OEM adder rollers. The upper roller is a smooth surface foam, whereas the lower version has “ribs”. While it is possible to leave the ribbed version in the cartridge, I have found when you really look closely at the print, you can see a difference. If the cartridge you have has a roller like the top one, leave it. The bottom style, replace.
**Last lap**

Remove the fill plug, as in Fig. 20. Use pliers to pull gently on the center ribs of the cap. This will cause less harm than trying to pry the lip up with a screwdriver, which is another cause of leaking. Dump the toner from the hopper. You don’t need to get all of it now, if you are splitting it.

Using a large flat blade screwdriver, insert the tip into the opening where the seal normally exits from (right side). Slide the screwdriver blade towards the rear weld (away from the label). Gently, using a twisting motion, pry the weld open. Some practice will be needed. Once the rear side is split, do the same on the front part of the cartridge. With practice the cartridge will come apart cleanly.

Vacuum, blow clean all the residue toner remaining on the two sections. The center photo shows the seal. Fig. 22 shows the seal in place with the tail on the left. Fold the tail over to the right side as in fig. 23. Match both sections together & use long clips to secure.

Add the correct toner, reassemble in reverse order. Clean, package & this section is ready to go!

On the following pages, I will introduce you to the drum section. While it is easy to do, I don’t know if there is a necessity due to the low replacement cost of the OEM part.
Drum unit - Really messy!
The drum unit from the 4500/4550 is a very simple device. It mainly comprises of:

- Drum
- PCR
- Drum cleaning blade
- Drum chip (counter/secret stuff!)
- Screws, screws & more screws!
- & a humongous waste hopper!

Fig. 24 is an overall view of the cartridge, with the drum shutter towards the front. The first thing to remove, is the shutter arm screw, located on the right side (Fig. 25) of the cartridge. Behind this screw is a spring, be careful not to lose it.

Once the shutter arm is removed, lift the shutter towards the top of the drum unit, and release the two pivot rods, as shown in Fig. 26.

Also shown in Fig. 26 is a plastic protrusion. This “finger” is part of the sensor system, that recognizes that a drum unit is installed in the printer. Without it, the drum unit will not function. I have seen many drum units return for recycling with this broken off.

Time to start removing screws! In Fig. 27, the right side there are seven (7) self-tapping screws to remove. Note, that when replacing all the drum units screws, do not over torque! The casing plastic is very soft & will strip easily.
In Fig. 28, with the screws removed, you can see how the drum shaft inserts.

Note the white hubs in the photo on the right. Take care not to let these drop out.

Fig. 29 is a view of the bottom, right side of the cartridge. The arrow indicates the plug that connects the chip to the printer. Once the right side cover is off, two gold colored screws are all that hold the chip in place.

Fig. 30 on the right is of the chip & its holder removed from the drum unit. The chip is just pressed into place & held by its legs. When replacing the chip, be sure to orientate it to the correct position. Look for a “D” cut on one end of the chip, this will line up with a “D” pin on the holder. When you install the holder with the chip in it back on the drum unit, it will only fit one way. Take care not to handle the chip too much, or rest it on a metal or carpeted table top.

The left side of the drum unit is held with six (6) screws as per Fig. 31.

The large blue gear\knob in the photo at the right, must be removed. Grab it firmly & pull straight off.
The first photo shows the left side exposed. This is the drive train, or transmission side of the drum unit.

The five small gears are all interchangeable.

I would not remove the remaining gears shown in Fig. 33. These gears rotate the sweeper bars used inside the waste hopper of the drum unit. The gears in conjunction with the hubs in Fig. 28, will fall out quite willingly! If they do fall out, you will need to do a balancing act to line up the ends of the sweeper shafts.

Fig. 34 shows the left side drum bearing removed. Once this is off, you can then remove the drum itself.
Lift the drum out. If you’re going to re-use it, store it in a light proof bag. I’ve found that some drums (OEM) can do a second cycle, although it’s not recommended.

The photo on the right is just some waste that came out while I was shooting this cartridge. If you’ve ever wondered what color the waste is, now you know, it’s gray-black. (Even in a black & white photo!)

In the center of the cover that goes over the PCR, you’ll find a small slot. Place a flat screwdriver into the slot and press back towards the cartridge body. This will disengage the clip that holds the cover on and give access to the PCR & drum cleaning blade.

Remove the PCR & cleaning blade. Carefully turn the sweeper gears while keeping the front of the cartridge down over a waste bin or vacuum system.

That’s it! After all the waste is out, reassemble the drum unit in reverse order, and don’t forget to install a new chip.

For more information on this & other products, please visit our booth (210-213) or contact us at:

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