

TECHNICAL DOCUMENT

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Minolta SP-6 Toner Cartridge

DOC-0229

OVERVIEW



These instructions cover the recharging of the Minolta SP-6 toner cartridge used in the Epson Action Laser 1000,1500, and other printers using the Minolta SP-6 Laser Engine.

The SP-6 engine is a 6ppm printer engine that runs at 300 dpi. The toner cartridge is rated for 6000 pages at 5% coverage. More than 200g will fit into the Toner Supply housing, but the waste chamber will fill up and leak if this is done.

The Drum-101 will work in this cartridge, the gears must be transferred from the old drum to the new.

This cartridge also uses a new method of charging the OPC Drum. Instead of using a Corona Wire or rubber Charge Roller, it uses what is considered to be a conductive felt strip. This strip can be used up to two times before it fails, to ensure a quality cartridge- it is recommended that the cartridge be tested before remanufacturing. If the test print shows vertical light grey streaks - the felt strip is probably bad and the cart should not be remanufactured.

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.

The following procedure should be read entirely before proceeding.

REQUIRED TOOLS



- 99% Isopropyl Alcohol (FR-8)
- Cotton Swabs (CT-100)
- Lint Free Cotton Pads (PW-96)
- Black Toner 200 Grams
- Sealing Strip (Optional, see text) (SS-LXO)

- Long Life Drum -Optional
- Padding powder (DPP-K)
- Wiper Blade (WB-SP6) -Optional
- Drum Cover (DC-SP6) -Optional

REQUIRED SUPPLIES



- Phillips head screw driver.
- Small Common screw driver
- Needle Nose Pliers
- Safety goggles and breathing mask.
- Vacuum approved for toner
- Small wire cutters (Optional, see text)
- Soldering Iron 35 Watt (Optional, see text)

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 canister style toner Vac, or our Atrix AAA Portable toner 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.

If you do not have a toner approved vacuum, do not use any vacuum at all, just carefully dump the old toner into an empty, lined garbage pail.

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-40 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.

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.

These instructions should be read in their entirety before proceeding with the recharge.

DISASSEMBLY INSTRUCTIONS



1. Place the cartridge flat side down, so that the label is facing away from you. Remove the two Phillips head screws from either side of the Toner Supply. Newer style cartridges have plastic tabs, not screws.

NOTE: These screws are located on the bottom of the cartridge, not the side.

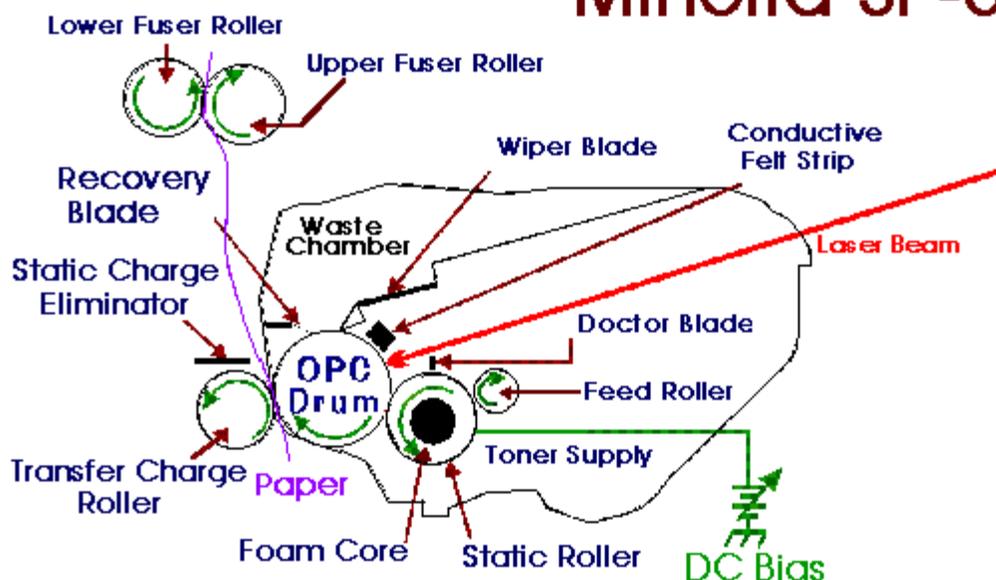
2. With a small jewelers Phillips head screwdriver, remove the two small screws on each of the drum axle pins.
3. Carefully pull out approximately 1/2 way each of the drum axle pins. Do not remove them all the way.
4. Remove the toner hopper and place aside.
5. Completely remove the drum axle pins.

- 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

- 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 very expensive to replace. It is best to wait until you are ready to re-assemble the cartridge before cleaning the drum with alcohol.

Minolta SP-6



CLEANING THE WASTE CHAMBER

FOR GRAY COLORED CARTRIDGES

There are two ways to clean out the waste chamber. The first and easiest is to simply tap the chamber and vacuum until it is clean. We recommend this method. The second method is what some toner manufacturers recommend. Although we do not agree with this method, we have provided the procedure along with our comments for your information. This method requires you to remove the recovery blade, and vacuum the waste area clean. Although this method is probably more effective, it will reduce the life of the cartridge dramatically.

NOTE1: In either method, be careful not to damage the felt strip off the edge of the Waste Chamber. Be sure to blow off the conductive felt strip with clean compressed air. Be very careful with this Felt Strip as it serves the same function as the Corona Wire or Charge Roller found in other style cartridges. If you vacuum this strip clean you may leave a static field which can cause toner to stick to the felt and then leave tiny dots on the printed page.

NOTE2: 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 may be possible to carefully bend the blade up equal to or slightly higher than the Wiper Blade.

First Method:

- Turn the Waste Chamber upside down, and tap on a table vacuuming as you go. Note that there is a small gear on the right side of the cartridge that can come loose and fall off. It is best to remove the gear and place aside. Be very careful not to damage the Recovery Blade. There are no replacements available, and if damaged, the cartridge will either leak or have gray streaks.

Second Method:

2. Pry the Recovery Blade Assembly off the Waste Chamber. It may be necessary to clip off the top of the plastic retaining posts in order to remove it.
3. Vacuum the entire Waste Chamber clean, be careful not to lose the small gear on the right side of the cartridge.
4. Carefully replace the Recovery Blade Assembly, take a small Soldering Iron, and melt the top of each retaining post, so the assembly is held firmly in place.

NOTE: As you can see, by using the second method the life of the cartridge has been reduced. After only a few cycles, the retaining posts will be too short to effectively hold the Recovery Blade Assembly down.
5. For Black Cartridges Only: Remove the two screws on the wiper blade. Vacuum the waste chamber clean, being careful not to lose the small gear on the right side of the cartridge. If the wiper blade is worn or you are replacing the drum, replace the wiper blade.

CLEANING THE SUPPLY CHAMBER



1. Remove the Fill Plug, and vacuum the Assembly clean.

NOTE: If you are going to hand deliver this cartridge you can add the toner now, and replace the Fill Plug. If you are going to ship this cartridge, a seal is recommended. Although there is not a seal made for this cartridge yet, an SS-LXO can be made to work. However, the SS-LXO is NOT a perfect fit, and the opening left by the seal frame after the seal has been pulled, is half as much as the original opening.

If you decide to put a seal in, the following steps must be taken.

2. Remove the two springs (one on each side of the supply chamber).
3. Locate the two black plastic pieces that hold in the Magnetic Roller. On each piece, lift up the center tab, and slide it up and off the cartridge.
4. Remove the two end caps, and remove the Magnetic Roller. Place aside in a safe place.
5. Remove the Two Phillips head screws on either end of the Doctor Blade.
6. Remove the Doctor blade, along with the two metal end pieces, and the black plastic roller located under the Doctor Blade.
7. Lift up the foam strip, and remove the black plastic bar just underneath.
8. Remove the small black plastic strip located on the now opened side of the hopper.
9. Vacuum the entire inside area clean.
10. Place the SS-LXO seal over the opening. Make sure that you center the seal so that it covers the entire area. This is a very close fit, and extreme care must be taken here to prevent leaks. It is best to center the seal first, and then remove the adhesive backing pressing the seal down as you go.
11. With a small screwdriver, push the end of the seal pull strip through the opening on the left side, so that it comes out to the outside of the cartridge.

If you wish to post test the cartridge. Fill the cap from the toner bottle with toner and coat the magnetic roller. This will give you just enough toner to print a few pages.

RE-ASSEMBLE THE CARTRIDGE



The cartridge should be re-assembled by reversing sections 3-5. Remember to coat both the wiper blade, and the OPC Drum with DPP-K (Kynar).

If the OPC Drum is found to be bad, the drum can be replaced with the Drum-101. The gears from the original drum must be transferred to the new drum.

No felt wand is used in this printer.

PRINTER MAINTENANCE, AND TROUBLESHOOTING



1. Before taking any test prints, 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 cartridge.

Transfer Charge Roller; Located in the base of the front lid, 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.
2. Anti-Static Teeth; Located next to the transfer charge roller are the anti static teeth. These teeth dissipate the static charge applied by the transfer corona wire to the paper. This helps prevent the paper from sticking to the OPC drum and causing a paper jam. If these teeth are dirty, they should be vacuumed clean, or carefully blown off with a can of

clean compressed air.

3. Laser Glass: In the top lid of the printer, behind the hinged protective cover is the protective laser glass. This glass should be periodically cleaned with a clean soft lint free cloth. If this glass becomes dirty, all of the pages printed will be light in the areas of the dirt.
4. 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, the printer's intensity should be set to the darkest setting while taking a test print. 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 mid setting.
5. To set the intensity, Turn the printer OFF-LINE. Press the LEVEL 2 button. Press the down arrow button until DENSITY= appears on the display. Press the right arrow button, the word SET will appear. Press the Up arrow until 5 stars appear on the display. Press the right arrow button, the word SET will disappear. Press the ONLINE button 2X to return to the READY state.
6. To run a test print, turn the printer OFF-LINE. Press the LEVEL 2 button. Press the down arrow until FEATURE PRINT appears on the display. Press the right arrow button, the word PRINT will appear. Press the right arrow again, the entire display will flash, and 1 page will print out. press the ONLINE button 2X to return to the READY state.
7. Once you have the print out's, 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 problems such as light print, and poor black fills.
8. Some of the more common toner cartridge problems are:
Dirty Primary Charge Felt; Located inside the toner cartridge, this will show on the test page as small random small dots usually on the top 1/3 of the page. All cartridges (OEM or rebuilt) have a tendency to do this to some extent, but if the felt is dirty it will be very noticeable. Worn out primary charge felt will appear on the test pages as light vertical gray streaks - there is no fix for this, the cartridge should be disposed of.
9. Scratched drum; this is shown by a very thin, perfectly straight line that runs from the top to the bottom of the test page.
10. 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 based on the drum circumference of 3.68"
11. 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.
12. 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



1. The toner cartridge printing process is best explained as a series of steps or stages. (See the following diagram).
2. The first stage in the printing process is the conditioning stage. This is where the Conductive Felt Strip places a uniform negative DC voltage on the OPC drum surface. The amount of the negative DC voltage placed on the drum is controlled by the printers intensity setting.
3. In the second stage (also called the imaging section), the laser beam is fired onto the OPC drum surface. The laser beam dissipates the OPC drum charge to ground wherever it strikes the drum, leaving a latent electrostatic image. The OPC drums circumference is 3.68" and therefore makes approximately three revolutions for each printed page.
4. The third or developing stage is where the toner is developed on the drum by the developing section (or supply chamber), which contains the toner particles. Lets take a closer look at this section. The Static Roller in this cartridge is different from most in that it is a foil type sleeve fit around a foam core. The toner is held to the static roller by a DC voltage supplied by the high voltage power supply. This voltage is controlled by the printers intensity setting, and causes either more or less toner to be attracted by the static roller. This in turn will either increase or decrease the print density. The toner is first fed to the static roller by the feed roller. The amount of toner on the static roller is controlled by the metal doctor blade which is gapped to keep the amount of toner on the static roller constant.
5. As the laser exposed areas of the OPC Drum approach the static roller, the toner particles are attracted to the drum's surface due to the opposite voltage potentials of the toner, and laser exposed areas of the OPC drum.
6. 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.
7. 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.
8. 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.
The OPC Drum now ready to be Conditioned by the Primary Charge felt, and start the print cycle again.

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 0x3c30 Thread 0x3e7c DBC 0x840f024 Jet'.

/script/catSearch.asp, line 58