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Lexmark® E210/Samsung® ML-1210

also ML-1010/1020M/1250/1430/IZZI Laser Plus II

Remanufacturing Instructions



Lexmark®
E210



Samsung®
ML-1210

About the Printers

The Lexmark® E210

The E210 was introduced in July 2001 as Lexmark's first sub-\$200 monochrome laser printer. Not meant to replace any printer existing at the time, it was the first in a new line of limited functionality, low cost machines available through office superstores such as Office Max, Staples and Walmart, as well as Lexmark authorized solution providers. The base model was the only configuration offered.

With resolutions of 300 and 600 dpi, a print speed of 12ppm and first page out time of less than 13 seconds, the E210 offered students, home users and small businesses fast turnaround and laser quality prints at an affordable price.

The E210's engine is based on the ML-1210, first introduced three months earlier in Samsung's \$287 ML-1210 printer.

The Samsung® ML-1210

Released in April 2001, the ML-1210 prints at 12ppm, has a resolution of 600x600dpi, and a first-page-out time of under 13 seconds, all the same as the E210. At first glance it appears to be a mirror image of the Lexmark model.

The Samsung® ML-1250

Released in September 2001, the ML-1250 is based on the same engine as the 1210, and is identical except for its compatibility. Where the 1210 is a GDI printer, the 1250 provides PCL6 emulation.

The Samsung® ML-1430

June 2002 saw the introduction of the ML-1430, the 15ppm replacement for the 1210.

About the Cartridges

The Lexmark® E210 ships with a 1,000 page starter cartridge that differs little from the replacement cartridge. The only physical difference, other than toner load, is a tab secured with a tamper-proof screw that blocks the toner cap of the replacement cartridge. This is not present on the starter cartridge.

Early versions of the cartridge have a metal brace beneath the cover that is not present on later versions. The exact date code of the change is unknown at this time.

The E210's single-element replacement cartridge has an OEM stated yield of 2,000 pages at 5% coverage and retails for less than \$80*. It does not contain an encoder wheel or chip.

The Samsung® ML-1210 cartridges also ship with a sheet of paper wrapped around the unit rather than utilizing a drum shutter. No metal brace, security screws or hopper cap blocking tab has been found in either the starter or replacement cartridges.

The ML-1210 and E210 cartridges utilize the same internal components, and both are keyed to prevent them from being switched between printer brands. The ML-1210 cartridge has a recess molded into the hopper that may reduce its toner capacity, in comparison to that of the E210. Both units have a raised identification mark ("L" or "S") molded into a recess on the top of the cartridge, but these recesses differ in size and location on the cartridge housings. The printers can be altered to accept either cartridge by removing a tab located beneath the laser unit, but be aware that doing so would void the manufacturer's warranty on the printer.

Continued on page 2

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Continued from page 1

The 1210 cartridges are compatible with ML-1010, ML-1020M, ML-1220M, ML-1250, ML-1430 and IZZI Laser Plus II machines. The E210 cartridge is not compatible with any other Lexmark model as of the date of this printing.

* Prices as of January 2003

Key Points

- All components are easily accessible by removing the top cover, metal brace (if present), and the end caps.
- The OPC drum has a helical drive gear (31 teeth) and a spur gear (40 teeth).
- The doctor blade design is an L-shaped stainless steel blade attached to a metal stamping.
- There is no true wiper blade. There is, however, a polyurethane blade attached to the PCR cleaning assembly stamping that performs a function similar to that of a wiper blade.
- The PCR cleaning assembly is a brush/foam-on-metal stamping configuration, made up of a urethane backing, foam and cleaning fiber strip.
- The PCR has a straight gear that mates with the drum spur gear.
- A foam toner adder roller is utilized.

Tools and Supplies You Will Need

Items Recommended for Basic Remanufacturing:

- Phillips Screwdriver
- One (1) Standard Cartridge Screw (.5mm x 10mm)
- Small Flat-blade Screwdriver
- 91-99% Isopropyl Alcohol FCPLIER
- Flush-cutting pliers FCPLIER
- Pin Removal Tool (81PRTOOL-2)
OR Needlenose Pliers or Vise grips
- Ionized Compressed Air for Cleaning AIRGUNSET
- Cotton-Tipped Applicator Q-TIP
- Lint-free Cleaning Cloth LFCCLOTH
- Cartridge Lubricant CLUBE
- Conductive Cartridge Lubricant CONCLUBE
- Odyssey® OPC Drum (with gears) LE210DRGR
- Toner qualified for the E210*:
60g Bottle LE210-60B

*Use in Samsung systems being tested. This document will be updated when results are confirmed.

For more information about other replacement components available for these cartridges, contact a member of your Static Support Team, or visit our Web site at www.scc-inc.com/imaging/Imaging.htm

- The developer roller is the normal Lexmark® soft urethane style, with a helical gear on the drive shaft. At this time it is recommended that the roller be cleaned in place and not removed from the cartridge.
- The cartridge does not utilize a toner seal. Instead, foam rails are located around the toner hopper and end foams are attached to the end plates.
- There is a tamper-proof (security) screw located on the top of the E210 replacement cartridge. Flush-cutting pliers can be used to remove the outer cowling to allow access to the screw, which can then be removed with SCC's HP8100 Pin Removal Tool (81PRTOOL-2), needlenose pliers or vise grips. It is recommended that the screws not be re-used, but replaced with standard cartridge screws (Phillips). This will allow for easier cartridge disassembly during subsequent remanufacturing.
- The cartridges have no drum shutter. The OEM ships with a sheet of heavy-weight paper taped to and wrapped around the cartridge. A similar means of protection is recommended after remanufacturing.
- Access to the E210 toner hopper cap is blocked by a tab, which is held in place with another security screw. However, filling the hopper is easily accomplished before securing the top cover of the cartridge, eliminating the need to remove the tab or hopper cap. Since the Samsung's hopper cap is not blocked, filling can be accomplished by which ever method the operator prefers. To prevent possible damage and toner leakage, it is recommended that the hopper cap not be removed.

Static Control's Imaging Labs are in the process of qualifying the Lexmark-compatible replacement components for use in the Samsung units. The following remanufacturing instructions will be updated to reflect their findings as soon as testing has been completed.

For more information, contact your Static Support Team, or log onto www.scc-inc.com/imaging/Imaging.htm.

Printer Comparison - Samsung® ML-1210 Engine

	Lexmark® E210 (GDI)	Samsung® ML-1210 (GDI)	Samsung® ML-1250 (PCL6)	Samsung® ML-1430 (GDI)
Introductory Price (OEM):	\$199	\$199	\$249	\$199
Date of Printer Introduction:	July 2001	April 2001	Sept. 2001	June 2002
First Page Out:	<13 seconds	<13 seconds	<13 seconds	<12.5 seconds
Paper Input:	150 sheet tray	150 sheet tray	150 sheet tray	150 sheet tray
Processor:	66MHz	66MHz	66MHz	66MHz
Replaces:	None	None	None	Samsung ML-1210
Print Speed (pages per minute):	12ppm (letter)	12ppm (A4)	12ppm (A4)	15ppm
Duty Cycle (pages per month):	5,000	5,000	5,000	12,000
Print Resolution (dpi):	300/600	600x600	600/1200	600x600

Cartridge Information:

	Lexmark® Starter	Lexmark® Standard	Samsung® Starter	Samsung® Standard	Samsung® High Yield
Cartridge Part Number (OEM):	N/A	10S0150	N/A	ML-1210D3/XAA	ML-1210D3/XAR
Street Price*:	N/A	\$96	N/A	\$69	\$76
Wholesale Price*:	N/A	\$72	N/A	\$64	\$65
OEM Rated Page Yield:	1,000 @ 5%	2,000 @ 5%	1,000 @ 5%	2,500 @ 5%	3,000 @ 5%

*Prices as of January 2003

Cartridge Compatibility:**

Lexmark® E210	Samsung® ML-1210
Lexmark® E210	Samsung® ML-1010
	Samsung® ML-1020M
	Samsung® ML-1210
	Samsung® ML-1220M
	Samsung® ML-1250
	Samsung® ML-1430
	IZZI Laser Plus II

**Cartridge components are interchangeable between printer brands, cartridges are keyed to prevent cross-brand compatibility.

Use of Isopropyl Alcohol

For best results, we recommend using ONLY 91-99% for cleaning as directed in these instructions. 91% isopropyl alcohol is available at most major drug stores; 99% isopropyl alcohol is available through distributors of chemical products. Follow the alcohol manufacturer's safety instructions.

Use of Compressed Air

As of April 28, 1971, the Occupational Safety & Health Administration (OSHA) Standard, 29 CFR 1910.242 paragraphs a & b for general industry requires effective chip guarding and personal protective equipment (PPE) when using compressed air. When cleaning residual toner particles from cartridges using a compressed air system, you must use air nozzles meeting OSHA requirements. Air nozzles that regulate air pressure to a maximum of 30 psi comply with this standard. Refer to the OSHA publication for any updates or changes that have occurred since the date noted above.

Disassembly of the cartridge

NOTE There is no drum shutter on the E210 or ML-1210 cartridges.

1. Position the cartridge

Place the cartridge on your work surface with the top of the cartridge up, drum down (FIG 1).

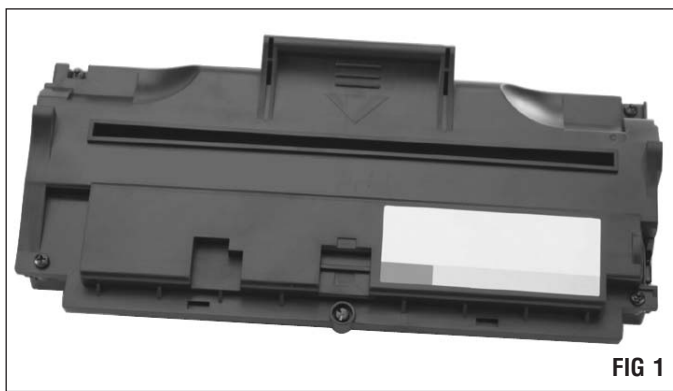


FIG 1

NOTE For best results, Static Control recommends replacing the OPC drum after the OEM cycle **and** after each remanufacturing cycle. A replacement drum with gears is available from Static Control.

If planning to reuse the existing drum, make sure to place the cartridge on a clean, soft surface to prevent damage to the OPC, and when removed, place it in an area where it will be protected from light and impact damage until re-installed.

2. Remove the cartridge cover

Using a Phillips screwdriver, remove the four screws that secure the cartridge cover (FIG 2).

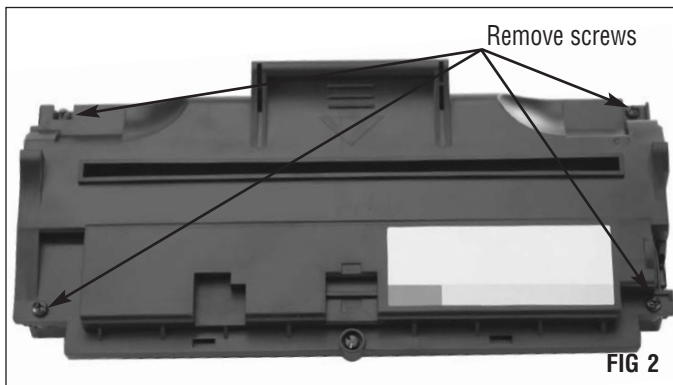


FIG 2

Carefully cut away the plastic cowling with a side-cutter. Be sure to make your cuts flush against the cartridge housing (FIG 3).

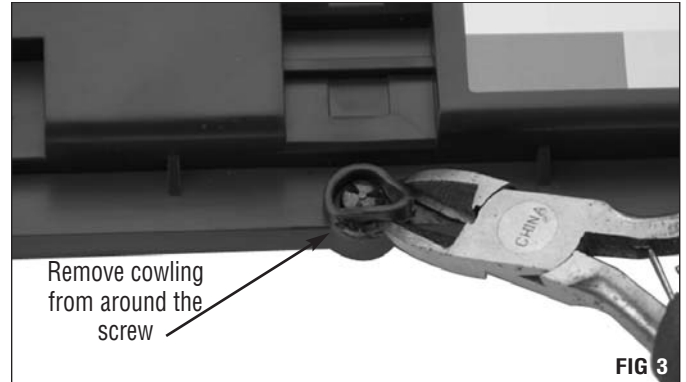


FIG 3

A SCC Pin Removal Tool (81PRTOOL-2) will easily grasp the screw head to allow you to back the screw out (FIG 4). If you do not have a pin removal tool, a pair of needlenose pliers or vise grips will also work, although grasping the screw head may be more difficult.

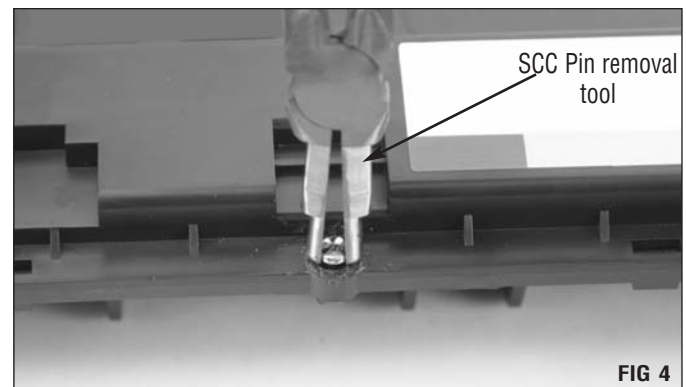
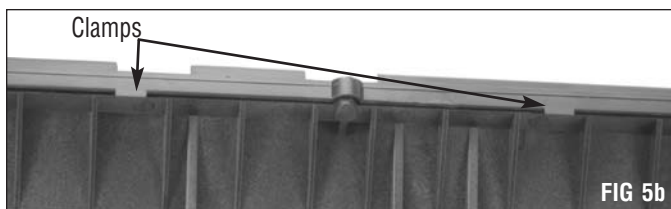
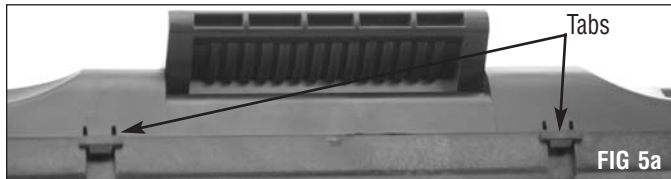
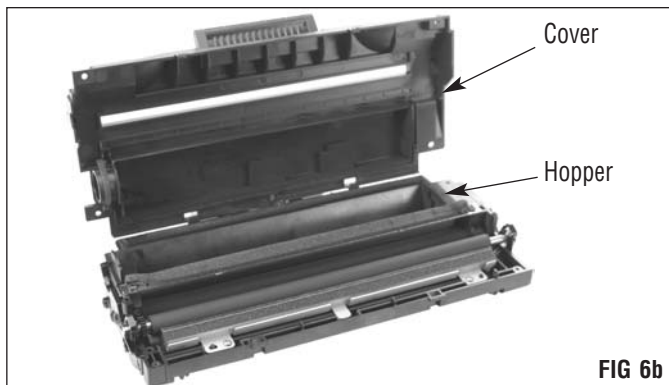
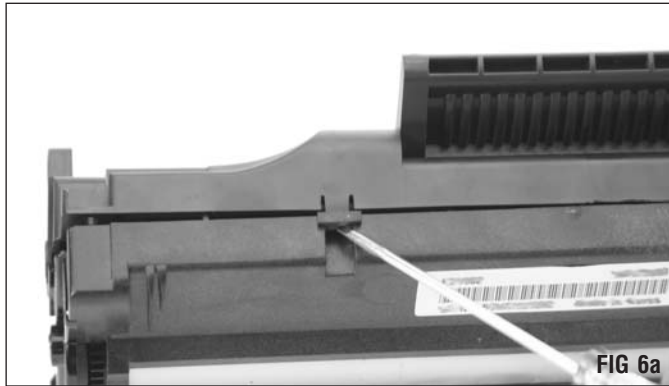


FIG 4

Locate the two locking tabs located near the cartridge handle (FIG 5a), and the two plastic clamps on the opposite side of the cartridge cover (FIG 5b).



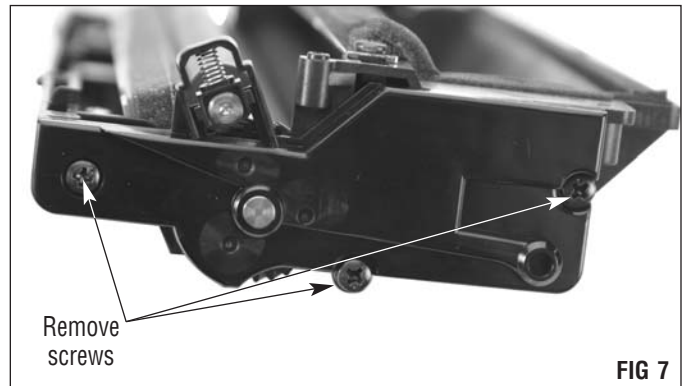
Using a small flat-blade screwdriver, carefully press the tabs in and up (FIG 6a). The cartridge cover should lift up and back, freeing the clamps from the lip of the cartridge body (FIG 6b).



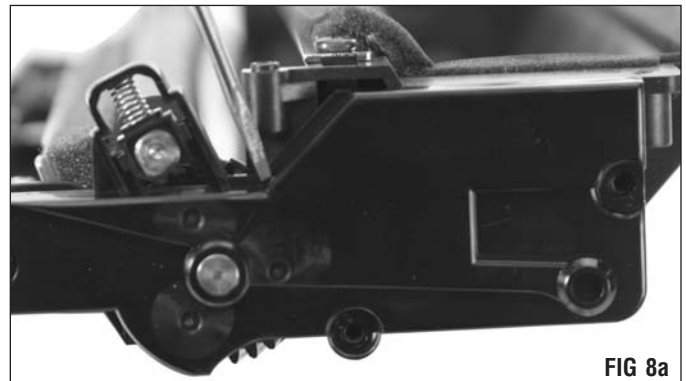
Set the cover aside and dump any remaining toner from the hopper.

3. Remove drive gear end plate

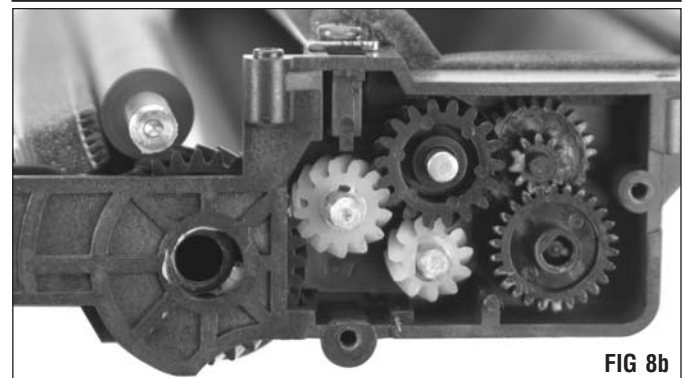
Using a Phillips screwdriver, remove the three screws that secure the end plate located on the drive gear (drum helical gear) side of the cartridge (FIG 7).



Using a small flat-blade screwdriver, gently pry the end plate away from the cartridge housing (FIG 8a).

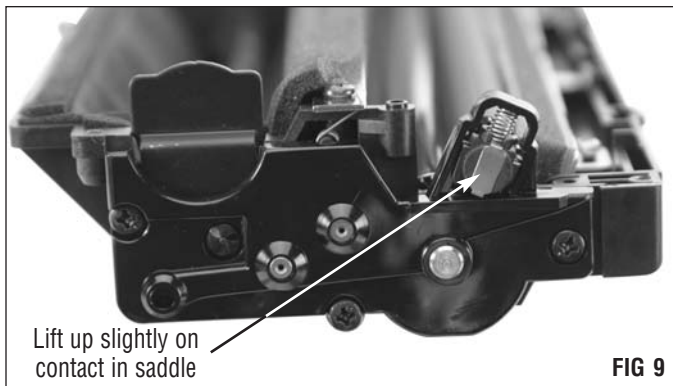


NOTE The drive gears are well seated, and should not fall off easily. However, you should note the position of each gear so that they can be replaced in the event they do become dislodged (FIG 8b).



4. Remove the PCR

While slowly lifting the PCR saddle (contact end) slightly (FIG 9), grasp the free end of the PCR shaft and lift the PCR up and out of the housing. Do not touch the surface of the PCR.



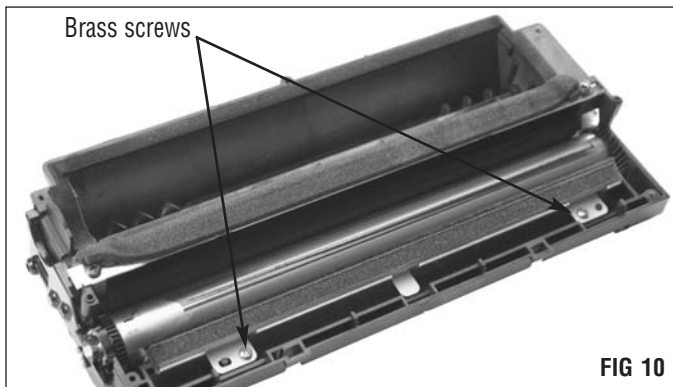
NOTE If the contact in the PCR saddle is raised too far, the PCR saddle spring can pop off. This spring is necessary for proper cartridge operation.

Clean the PCR using a lint-free cloth dampened with water and set it aside for later re-use.

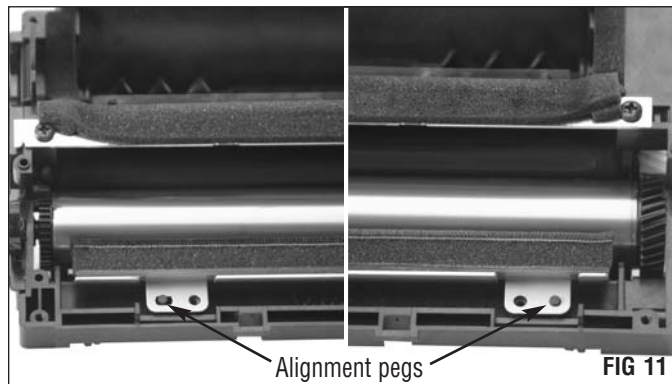
NOTE Do not stack PCRs, lay anything on top of them, wrap them with rubber bands or touch the surface of the PCR with your bare fingers.

5. Remove the PCR Cleaning Assembly

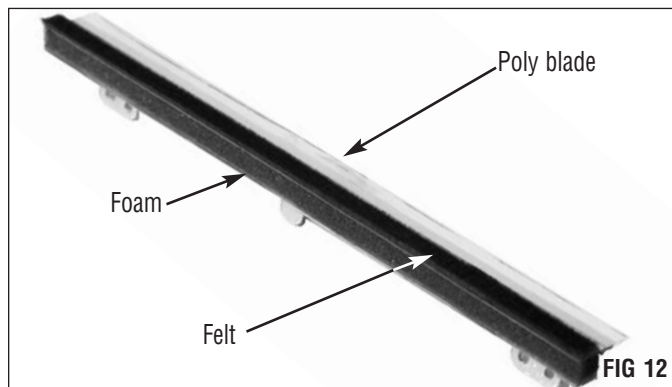
Remove the two brass screws using a Phillips screwdriver (FIG 10).



Lift the assembly out of the cartridge, being careful not to damage the alignment pegs (FIG 11).

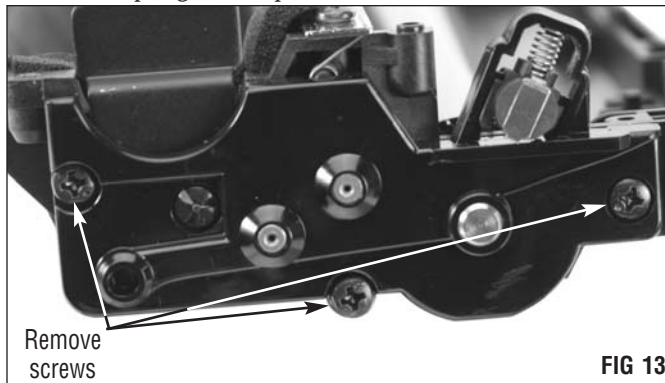


Inspect the assembly for damage and clean the assembly felt and foam with ionized, dry, filtered, compressed air. The cleaning assembly poly blade should be cleaned only with air and a lint-free cloth (FIG 12). **Do not** use any cleaning agents, including alcohol, on the poly blade, and take care not to damage the felt, foam or blade.



6. Remove the second end plate

Using a Phillips screwdriver, remove the three screws that secure the spur gear end plate (FIG 13).



Using a small flat-blade screwdriver, carefully pry the end plate away from the cartridge housing (FIG 14).

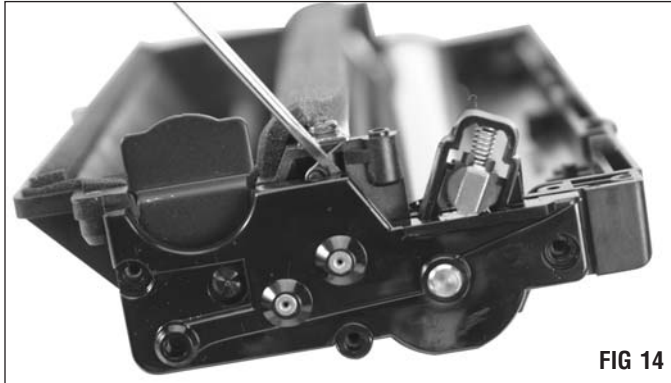
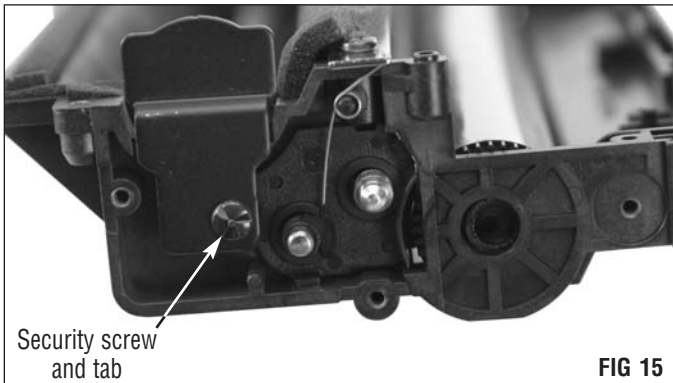


FIG 14

NOTE A security screw holds a plastic tab in place over the toner hopper cap, blocking access to the cap. It is not necessary to remove the cap to fill the hopper. It is recommended that this tab be left in place (FIG 15).

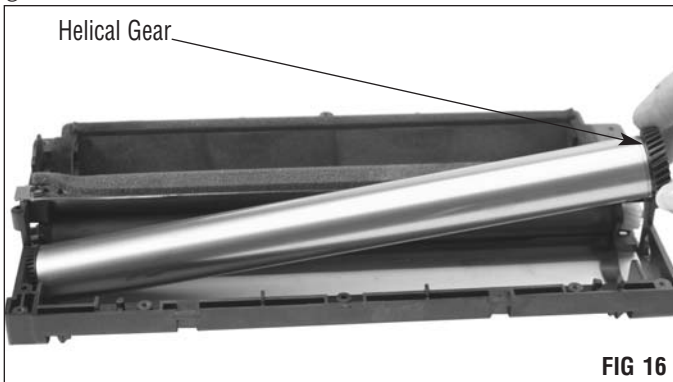


Security screw and tab

FIG 15

7. Remove the OPC drum

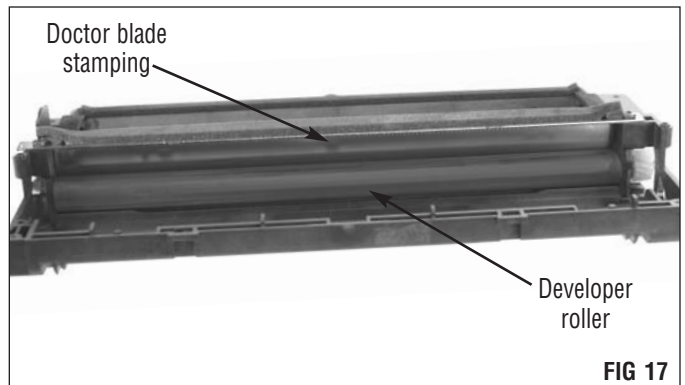
Place a finger beneath the cartridge housing on the drum helical gear side. Press up on the gear so that it clears the housing. Lift the drum up and out of the housing by the helical gear (FIG 16).



Helical Gear

FIG 16

NOTE At this time it is recommended that the doctor blade and developer roller be left in place (FIG 17).



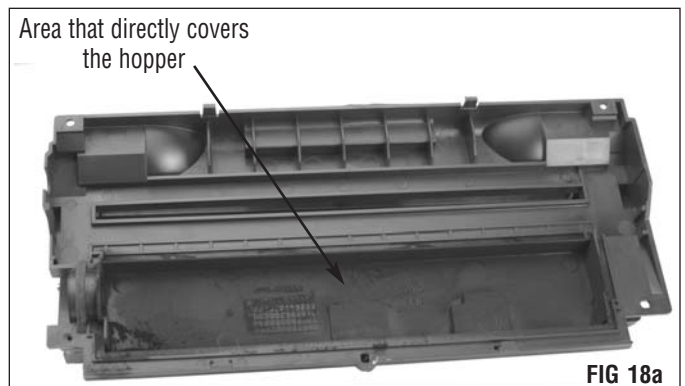
Doctor blade stamping

Developer roller

FIG 17

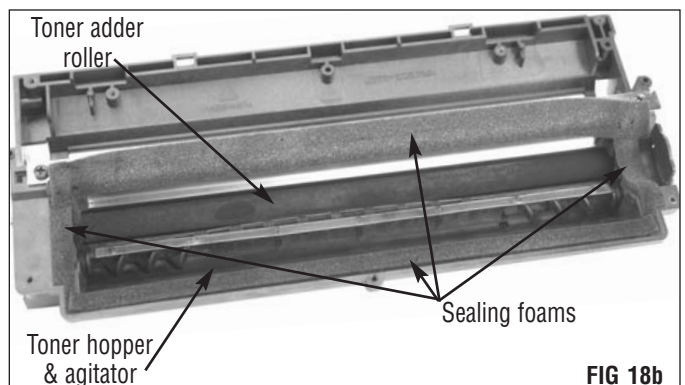
8. Clean the cartridge and components

Using ionized, dry, filtered, compressed air, clean the inside of the cartridge cover (FIG 18a), toner hopper, toner agitator, hopper sealing foams, toner adder roller, developer roller, and doctor blade thoroughly (FIG 18b).



Area that directly covers the hopper

FIG 18a



Toner adder roller

Toner hopper & agitator

Sealing foams

FIG 18b

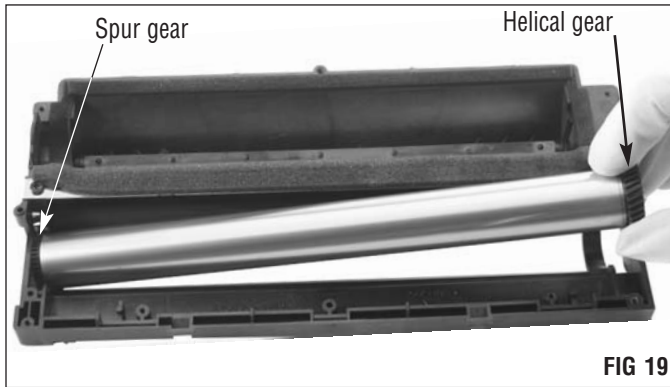
Reassembly of the cartridge

NOTE For best results, Static Control recommends replacing the OPC drum after the OEM cycle **and** after each remanufacturing cycle. A replacement drum with gears is available from Static Control.

1. Install the OPC drum

NOTE Wear gloves or use other protective materials. Always handle the drum by the gears only.

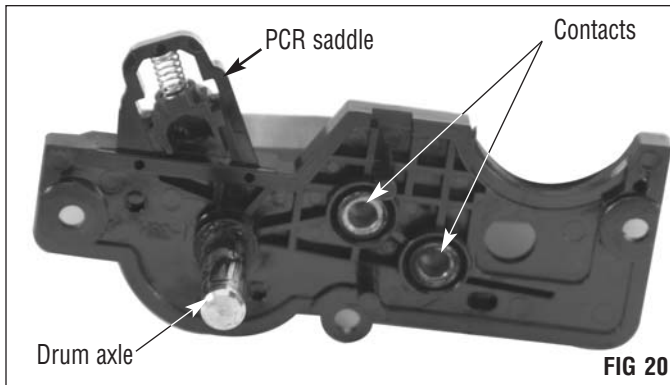
Holding the drum by the gears, position the drum in place with the helical gear on the drive side of the cartridge (FIG 19).



2. Replace the spur gear end cap

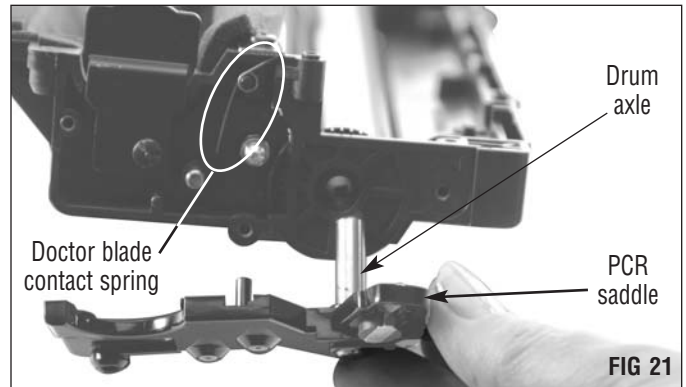
By replacing the spur gear end cap with the PCR saddle attached, the drum will be held in place during the remaining steps.

Clean the PCR saddle and all electrical contacts located on the end cap with a cotton-tipped applicator and 91 to 99% isopropyl alcohol (FIG 20).



Using the wooden end of the applicator, apply a small amount of conductive cartridge lubricant (CONCLUBE) to the PCR saddle and all electrical contacts located on the end cap.

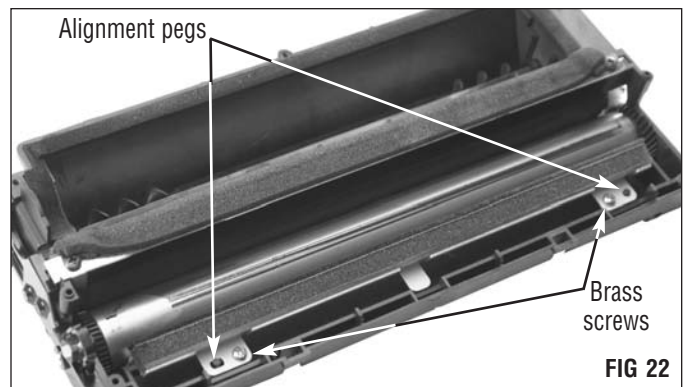
Align the drum axle and contacts, and seat the end plate. Make sure the PCR saddle is present on the end plate and the doctor blade contact spring is in place on the cartridge (FIG 21).



Secure the end plate with three Phillips screws.

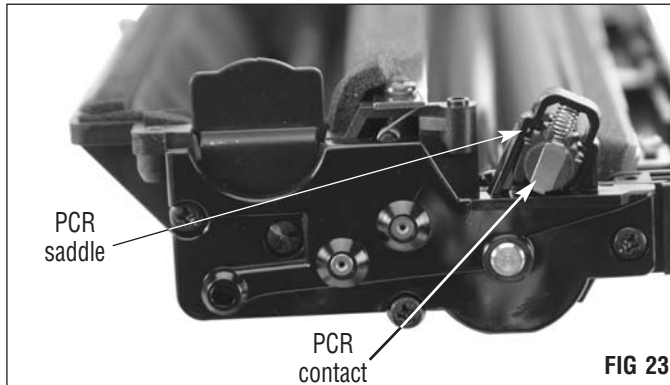
3. Replace the PCR cleaning assembly

Position the metal stamping over the two alignment pegs and secure the assembly with the two brass screws (FIG 22).

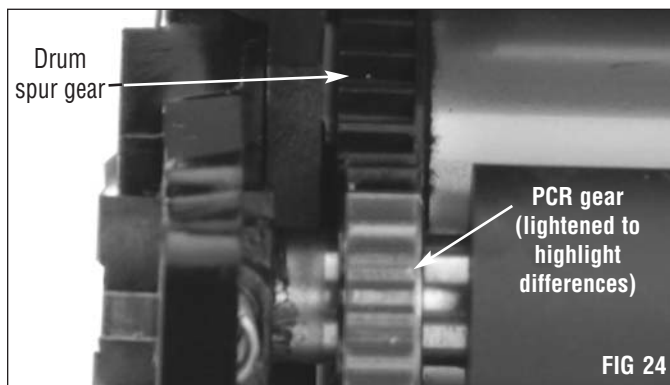


4. Replace the PCR

Lift up slightly on the PCR saddle, taking care not to remove it from the end plate (FIG 23).

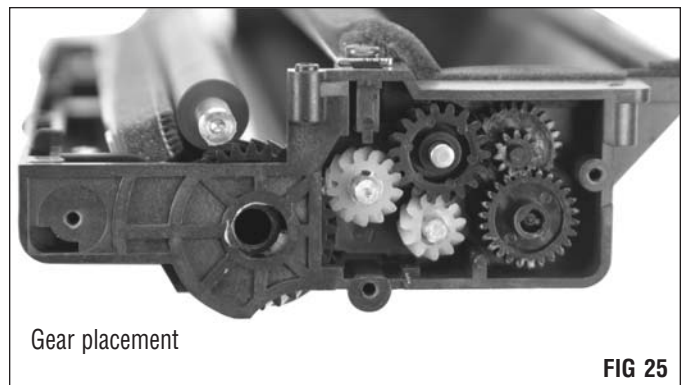


Insert the PCR shaft in the saddle and lower the PCR into place. Make sure that the PCR gear and drum spur gear mesh. If they do not, the cartridge cover will not seat properly (FIG 24).



Clean the drive gears and surrounding area with a cotton-tipped swab dampened with 91 to 99% isopropyl alcohol and lubricate each with non-conductive cartridge lubricant (CLUBE) (FIG 25).

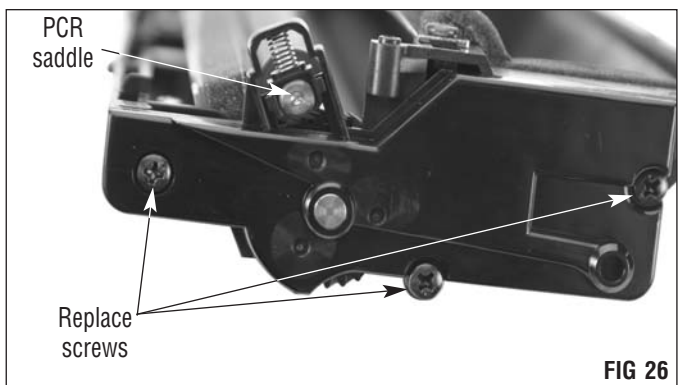
NOTE Proper positioning of the gears is crucial to the operation of the cartridge. It is recommended that they be removed, cleaned and replaced one-at-a-time to insure proper placement. The use of compressed air in this area may result in gears becoming dislodged.



5. Replace the drive gear end plate

Lift the PCR saddle slightly and insert the PCR shaft. Seat the end plate and secure with three screws (FIG 26).

NOTE If the contact in the PCR saddle is raised too far, the PCR saddle spring can pop off. This spring is necessary for proper cartridge operation.



6. Fill the hopper

Carefully fill the toner reservoir with system-qualified toner (FIG 27).

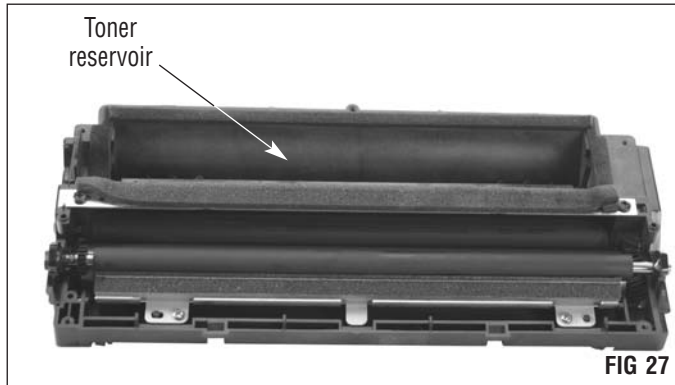


FIG 27

7. Replace the cartridge cover

Hook the clamps over the lip of the cartridge housing, lower the cover in place and snap the locking tabs into position (FIG 28).



FIG 28

Replace the four Phillips screws (FIG 29).

Use a standard cartridge screw to replace the OEM security screw (FIG 29).

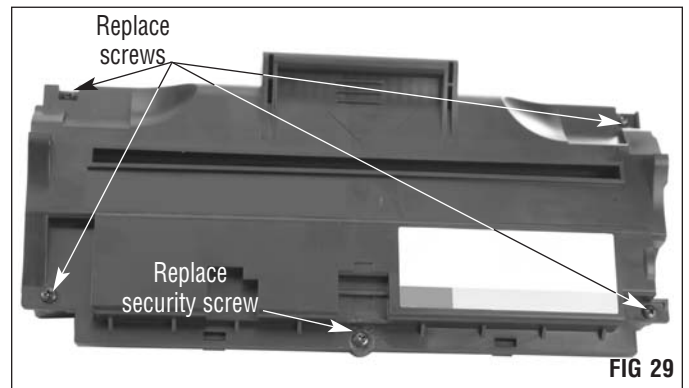


FIG 29

Your cartridge is now ready for post-testing in your printer.

NOTE Static Control recommends post-testing your cartridges after remanufacturing.

SAFEGUARDING YOUR CARTRIDGES These cartridges do not utilize a drum shutter. In order to protect the drum from light and impact damage during storage and shipping, it is strongly recommended that you wrap the cartridge with a sheet of heavy-weight paper or other protective material.



Notes



Technology and Support You Can Rely On!

We realize that the success of your business directly affects the success of Static Control. It's no longer a matter of keeping up with your competition, but surpassing them. That is why we invest so much time and effort in the technology necessary for your business to address new market opportunities quickly, and with confidence.

Where monochrome once ruled the industry, color is now emerging and taking a foothold. It is our pledge to you, our customer, to do all we can to help you move into this new opportunity and others, as quickly and effortlessly as possible. We will continue to support monochrome markets, while building a comprehensive color technology library for your reference, along with products to support your growing business. Together we can build a partnership for a successful future.



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