Rebuilding Xerox® C123 style Drum Cartridges

(**C123CRK**): Xerox® CopyCentre® C118, C123/128/133 & WorkCentre M118/118i, M123/128/133, Pro123/128/133 (013R00589), and WC-5225/5230/5235 (101R00435),
(**5500CRK**): Phaser® 5500/5550 (113R00670), &
(**5325CRK**): WC-5325/5330/5335 (013R00591)

C123 style Drum Ctg.

There are plenty of the C123 style machines out there, both in the hands of the Dealerships and in the aftermarket as well for the older families in this "style". They're reported as performing very well in the field. They don't break down all that much from what I'm told, so that makes servicing the cartridges and modules that much more important. This is another example of one of those "win-win" situations. You can rebuild a cartridge, save your customer money, while making a healthier profit for yourself… all while keeping the used cartridge out of a landfill. I'll start with a bit of an introduction to the cartridges along with some details about them and then get into the disassembly procedure highlighting any tricks or possible pitfalls to avoid.

Like many of other models, the C123 family and the WC-5225 family (and also the Phaser 5500 family) machines employed RF (Radio Frequency) CRUMs (Customer Replaceable Unit Monitor chips). This type of chip does not make any physical or electrical contact with the machine at all. Instead a radio emitter / reader board waits for the CRUM on the cartridge to slide into close proximity. That board can read the chip's type and copy count, and then write to the chip to update the copy count (the count is kept on the cartridge's CRUM). The newest members of this "style" are the 5325 family. Here they abandoned the RF CRUMs and these have the CRUM in the front end of the unit where it does make physical contact.

When you start taking one of these Drum Cartridges apart, you'll find that it has two halves… The lower half is the Developer Unit with its augers and magnetic roller. The machine is dual component, so there is developer material in there. The upper half houses the Charge Roll, Drum and Cleaning Blade.

The original cartridge's reorder number is 13R589 (013R00589): for CopyCentre C118, C123, C128, C133, WorkCentre M118, M118i, M123, M128, M133, Pro123, Pro128, Pro133. Good for "up to" 60,000 pages (I will explain below), these cartridges sell for around $230.- retail. For some reason, if you run short runs of 1 or two pages at a time, the yield is a lot lower (as low as 32K). The 60K stated yield is based on running 6 pages on average each time the machine is used… if you were to run very long runs (500 to 1000 pages per run), the yield supposedly climbs up to nearly double the stated yield.
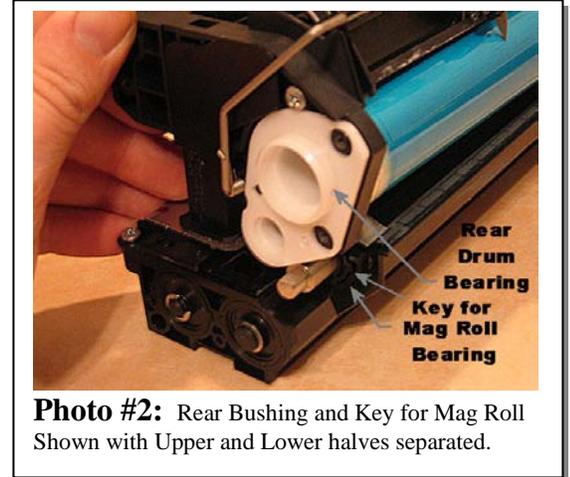
A cousin, the Phaser 5500's cartridge (113R670, retails for around $280.-) it is the same as far as procedure goes. Same is true for the WC-5225/5230/5235 (101R00423). Each has a unique CRUM chip, so they are not interchangeable. The newest models: 5325/5330/5335 use a new part number 13R591 (013R00591)… here the difference is the CRUM chip as was mentioned earlier. At the end of the procedure you'll see how to replace the CRUM chips in each of these families.

The procedure for disassembling / cleaning and reassembling a C123 Drum Cartridge has a few tricks to it. I did like that they used the same size and type of screw throughout the cartridge (Phillips head)… that was nice of 'em. It's a fairly easy cartridge to get into but the reassembly requires paying attention to a few details.

Especially there are tricks to the Lower Half (Developer station). Let's tackle the procedure…

PROCEDURE (Part 1) – Separating the Top and Bottom Halves:
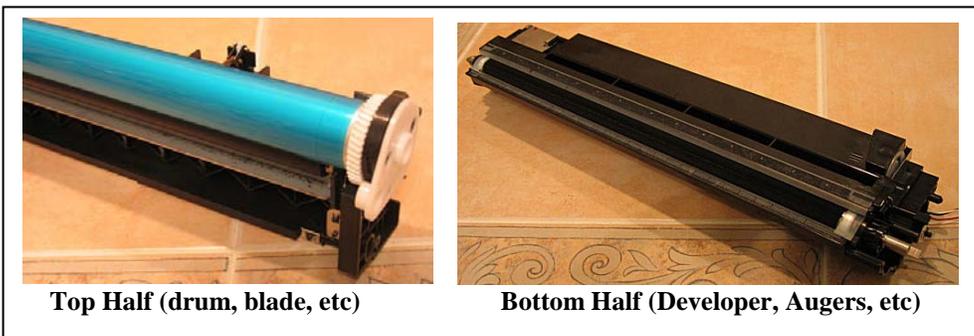
1.   Remove the Front Cover *(2 screws)* and disconnect the connector for the Toner Sensor.

2.   Remove the Rear End Cover *(3 screw, see Photo #1)*. The white coupling for the mag roll drive will now fall right off for you.

Photo #1: Rear End Cover (3 screws)

Photo #2: Rear Bushing and Key for Mag Roll Shown with Upper and Lower halves separated.

3.   Extract the rear white Drum / Mag Roll Bushing from the end of the drum (it is what joins the upper and lower halves at this point). This will allow you to separate the upper and lower halves of the rear end. Gently lift the upper half with the drum up a bit till you can re-insert the Drum Collar / Bushing into the drum while making it so that it remains liberated from the mag roll on the lower half *(See Photo #2).*
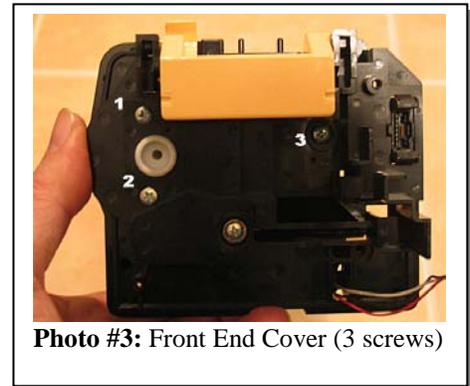
4.   Remove the Inner Front Cover from the front *(3 screws… see Photo #3).*

5.   Release the Front Drum Bearing's Ground Contact (1 screw) and gently remove the contact from the front end of the D'-Shaped Mag Roll shaft. Then you can slide the front drum hub off . Lift the entire upper assembly up and re-insert the front Drum Hub to keep the drum secured. Be careful as both the front and rear Drum Hubs are now loosely inserted. (see Photo #4)

Photo #3: Front End Cover (3 screws)

Top Half (drum, blade, etc)

Bottom Half (Developer, Augers, etc)

Photo #4: Front Drum Hub & Mag Roll contact

Drawn from an Article first published in ENX Magazine (www.enxmag.com)

Now that you have the two halves of the cartridge separated, you'll want to work on the bottom half (Developer and Pull-Seal) before you rebuild the top half (new Drum, Blade, Charge Roller, and CRUM chip). This is because the top half has the drum which is delicate and also light sensitive, so it's better to leave it till last.

Installing a Developer Pull-Seal will makes it possible to ship the rebuilt units when you're done. Before the developer and seals were available, you could only rebuild the top half, and you would be forced to hand-deliver the cartridge. This was because turning the unit over with the developer free in the mixing area, and on the mag roll, could allow developer material to get out of the lower half. It could get into the drum, blade and charge roll area, and ruin your good work. It was also less than ideal not to be able to replace the developer material because the developer would eventually wear out sometime after the 2nd cycle.

When you buy a new cartridge, the developer is in a compartment above the mixing augers. When your customer installs the new cartridge and pulls the seal, the developer drops down into the mixing area where it can get over to coat the mag roll. You'll need to clean out the old developer, install the mylar peel-and-stick "Developer Pull-Seal, and pour the new shot of developer into the storage compartment.
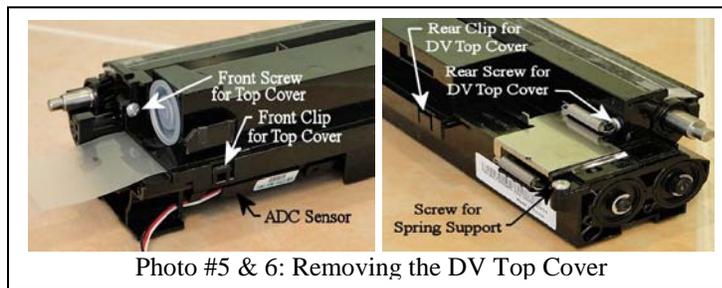

Photo #5 & 6: Removing the DV Top Cover

Photo #7: Spring Support

PROCEDURE (part 2) – Lower Half:

6. **Remove the metal toner feed shutter from the top of the rear end of the DV Unit.** There's one screw from the top which releases a spring support (see Photo #5 & 6). With the support off, you can remove the two springs and gently slide the shutter off toward the rear of the unit to remove it. Be very careful with the seal and mylar under the shutter.

Photo #8: DV seal and plug

7. **Next remove the Top Cover which includes the Developer Storage Compartment.** There are two screws from the right, one at either end of the unit (see Photo #5 & 6). Then with the screws out, you can pop the 3 clips along the right side of the top cover by prying upward. Lift the top cover off. Be extremely gentle with the mylar mag-roll seal blade, the two mylar end seals, & the foam gaskets on this top cover. You don't want to damage them or suck 'em into a vacuum on accident.
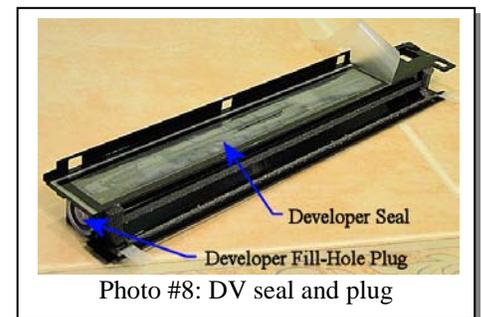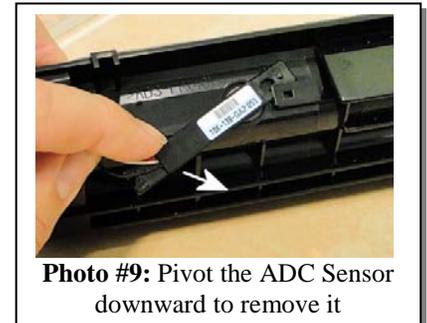

Photo #9: Pivot the ADC Sensor downward to remove it

Drawn from an Article first published in ENX Magazine (www.enxmag.com)

8. **Clean the top cover thoroughly and remove any residue where the old pull-seal was adhered to the Developer Storage Compartment.** Make sure the surface where the pull-seal goes is completely clean of any residue.

9. **Install the new pull-seal**. It has peel-and-stick adhesive on it. Be careful to make sure it is firmly adhered to the plastic without any wrinkles. (see Photo #8)

10. **Remove the plug from the front end of the Developer Storage Compartment, pour in the new developer material, and reinsert the plug.**

11. **Dump out the old developer from the mixing station and mag roll area, and then remove the ADC Sensor.** If you pivot the sensor downward at the front end till it clears the plastic clip at the rear end of the sensor, you can remove it from its sensing hole (see Photo #9). It's important to remove the sensor because it is static- sensitive and can be easily damaged by static generated during vacuuming or using forced air on the developer unit.

Photo #10: Plastic shims can be used to set the space between the Mag-Roll and Trimmer-Bar

12. **Before you remove the Mag Roller Trimmer Bar**… you will want to get a piece of plastic to use as a spacer (an old creditcard or store card works well here… just don't use a good creditcard because the magnetism on the mag roll will destroy the card's magnetic strip). Try it for fit (see Photo #10) before you remove the trimmer blade's two screws… you want to be able to return the trimmer blade to the same distance from the mag roll on either end when you reassemble the unit. Under the Trimmer Bar is a plastic float which lifts out.

Photo #11: "Pop" the front Mag Roll Gear off

13. **Now the Mag Roll can be removed.** You'll need to first remove the Mag Roll's Front Drive Gear (this transmits drive from the mag roll to the stirring augers in the unit). It is "snapped" on pretty solid but if you pry carefully it will pop off (see Photo #11). Once it is released you will have enough room to slide the front plastic bearing out of the frame. Slide both the front and rear plastic bearings out of the frame and lift the Mag Roll out of its cradle.

Photo #12: Important… check this every time you reassemble.

14. **Clean the augers and mixing area thoroughly** (be gentle with the foam gaskets and the mylar center seal between the two stirring augers).

15. **Reassemble the Lower Half (developer station)…**
    - VERY IMPORTANT : Pay attention to the "keys" on the plastic bearings for the mag roll to be sure that they seat all the way into the frame. **Check this every time you reassemble one of these cartridges. (see Photo #12)**

Drawn from an Article first published in ENX Magazine (www.enxmag.com)

- Make sure the Mag Roll Front Drive Gear is pushed all the way back into position as far in as it can go, so it makes good full contact with the tiny idler gear under it.
- Use plastic shims (or the old creditcard mentioned earlier in step 12, photo #10) as spacers to set the space between the trimmer bar and the Mag Roll at both ends.
- When you put the Top Half (Drum and Cleaning Unit) back on the Bottom Half (Developer Unit), turn the Mag Roll's white Coupling Drive Gear (the one on the mag roll) to make sure everything turns freely.

PROCEDURE (part 3) – Upper Half (drum, charge, and cleaning):

16. **Returning your attention now to the Upper Half of the cartridge. The Drum Shutter can easily be removed** at this point (pay attention to the two springs for the shutter to make sure you can reinstall them properly later).
17. **Carefully Remove the Drum with its front and rear Bushings.** Remember that the drum is sensitive to light and should only be exposed to office lights for a few minutes (try to limit that to around 5 minutes and never let sunlight hit a photoreceptor even for a second).
18. **The Charge Roller can now be removed from its cradle bearings.**
19. **Then remove the Drum Cleaning Blade** which is held on by 2 screws.
20. **Clean the Waste Auger and the Waste Chute**.
21. **Replace the CRUM chip.** For C123/128/133 – 13R589, or 5225/5230/5235 – 101R435, or Phaser 5500/5550 – 113R670, the CRUM is located on the right side of the Top Cover assembly closer to the rear (it hides inside the cover, See Photo #5). For 5325/5330/5335 – 13R591, you can see the CRUM when you remove the front end Cover (see Photo#s 6-8)
22. **When reassembling the unit:** pay special attention to the Mag Roll's inner rear bearing (the black one). Refer back to Photo #2 for the location of this inner bearing. It can walk out and it's keyed so that if it has moved out of place and you don't notice it, you'll run into difficulties (the Mag Roll Drive Coupling will not turn properly). Be careful with the drum and its bushings… I found it easiest to work on the front end first, then once the front Drum / Mag Roll Bushing is back in place, work on the rear end.

Photo #13: 5325 CRUM location.

Photo #14: CRUM holder unit.

5325/5330/5335 CRUM replacement:

The 5325/5330/5335 use part number 13R591 (013R00591) which have a stated yield of 96K pages. This newer type of cartridge is extremely similar to its predecessors. Fortunately, the drums, blades, and charge rolls are all interchangeable. The Drum Reset CRUMs are of course different.
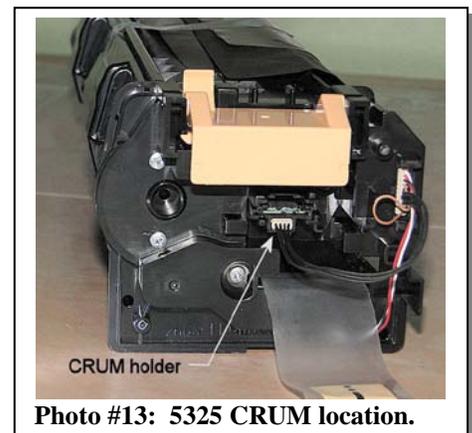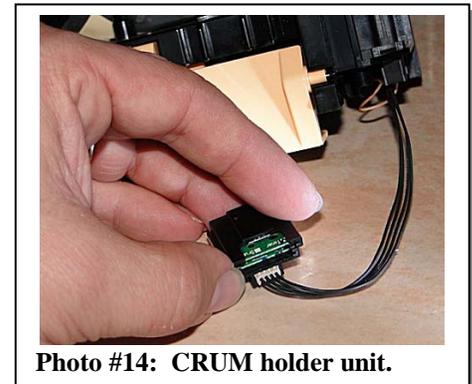
Instead of the RF CRUMs which were found in slots on the sides of the earlier C123 and 5225 cartridges, the new cartridges have CRUMs which are housed in the front end of the cartridges just behind the front cover. They slide into a little unit which has 4 spring contacts inside, and an intermediate board. Wires run to a rearward facing connector where contact is made with the machine (see Photo #13 & 14).

To replace the 5325 version of the CRUM you need to first unseat the CRUM holder unit (it has two clips which keep it in place). Then you need to release the CRUM itself from its holder unit using your fingernail (or a small tool… be gentle) to pry the catch till you can slide the CRUM off. You may find it helpful to use the end of a paper clip to push the CRUM out (there is a small "CRUM push hole" at the far edge). Take note of how the CRUM is oriented… the 4 metal contacts need to be facing the other board and the 4 spring contacts inside the holder unit. It slides in with the end with the contacts sliding in first (see Photo # 15-17).
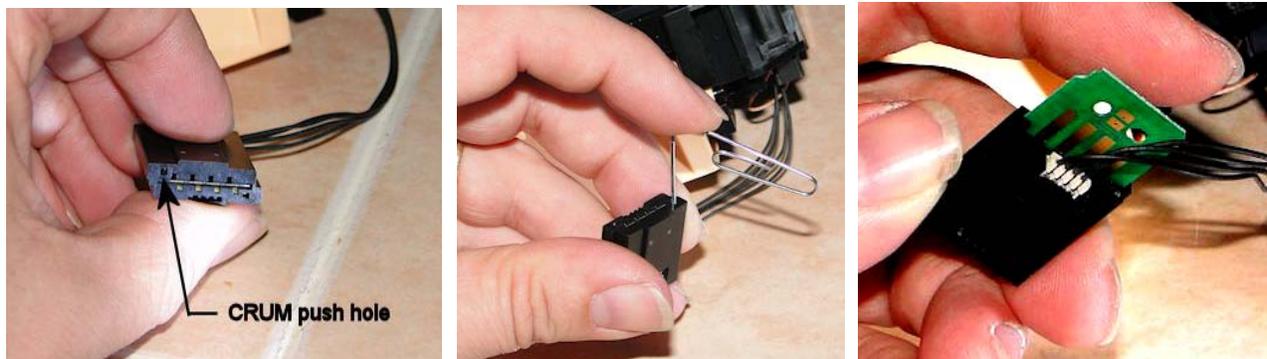

Photo #15-17: More 5325 version CRUM replacement photos.

As you can see, on the newest cartridges (the 5325 version), the CRUM chip can be replaced relatively easily by removing the front end cover. On the C123 and WC-5225 versions of the ctgs, if you ever need to replace the CRUM Chip, and don't plan to go any deeper into the unit, you will need to create some room for it to slide out of its alcove. You can do so by releasing the rear Drum / Mag Roll Bushing, lift the rear up a little bit and reinstall the Drum Bushing to help protect the drum. The Chip will then have enough clearance to slide out all the way. The side of the chip which has the electronic components mounted on it should be facing inward. Be very careful not to touch or damage the components on the CRUM chips… they are very fragile and damaged CRUM components lead to a vast majority of problems in these cartridges.

<u>Drum Cartridge Rebuild Kits (includes drum, blade, charge roll, Developer, DV Pull-Seal, & CRUM chip):</u>
- C123CRK (for 013R00589 – C118, M118, M118i, C123/128/133, M123/128/133, Pro123/128/133)
- 5225CRK (for 101R00435 – WC-5225/5330/5335)
- 5325CRK (for 013R00591 – WC-5325/5330/5335)

<u>Parts are also sold individually:</u>
- Drum (C123DR)
- Cleaning Blade (C123DB)
- Drum Reset CRUM Chip (C123CN, 5225CN, or 5325CN)

Here are a few of the Status Codes which relate to the Drum Cartridges…

Code	Description
091-401	Drum is near end of life (the count is about to expire on the CRUM)
091-912	Drum Cartridge is not present (or not seated properly)
091-913	Drum Cartridge end of life (time to replace the cartridge or at least the CRUM)
091-914	Drum Cartridge CRUM communication failure
091-915	The machine failed to write to the Drum Cartridge CRUM
091-916	Wrong Drum Cartridge type was detected (for example if you installed a European cartridge in a US machine)
092-910	ATC (Automatic Toner Concentration) Sensor Failure

I hope this is the start of something excellent for your business.   These cartridges will likely become an important staple in your copier repair diet in the years to come. Repair and Enjoy!