

TOSHIBA THE 60TH SERIES ANALOG COPIERS – THE DISPUTABLE TOSHIBA 1550 COPIER

Following the Toshiba 1360/70 copier, reviewed in the previous article, comes the Toshiba 1550 copier. As mentioned in the title, this is a much disputed model – some technicians love it, others hate it. But nevertheless this is one of the most common copiers in East Europe (in Bulgaria for sure). This model is situated in the upper segment of the lower class copiers and so is designated for small to middle offices and **not** for copy and print centers. So the problem with this model arises when users try to overwork it. In my practice as a service technician I have had both good and bad experience with this model.



There are users that never had any issues with the copier, other than the usual maintenance and periodical replacements of parts. These users' monthly copy-volume never exceeds 5000 to 10 000 copies. The only other issue with such machines is the dusty environment they often operate in, which causes periodical cleaning to be performed twice as often as the normal interval of 60 000 copies. So the conclusion is that if users don't overwork their machines and provide them with regular maintenance, they will serve them longer, causing less trouble to the service technician that maintains them. Even more – given the proper maintenance the consumable replacement parts such as drums, heat rollers etc. can "live" up to twice the copy count given by the manufacturer. This is the case with the happy technicians mentioned above.

However there are cases when everything that can go wrong with this model does. This is the case with machines often overworked and poorly maintained. Such machines often operate in poor conditions (dust, humidity etc.) and are used in copy centers. They age very quickly and the mechanical parts wear very quickly too. Given the fact that many of the parts in the machine are made of plastic (a negative tendency fully developed in later e-Studio models), all these issues are a "recipe for disaster".

The good news is that if one knows the weak points of the machine and the most common places to search for wear and clean during periodical maintenance, the copier will work reliably and you will come to like this controversial model. The most common weak spots and failures of the model will be discussed in the articles to come. But first let me once more emphasize the importance of periodical maintenance and the preventive inspection check – this is the main goal of this article.

PERIODICAL MAINTENANCE – USEFUL PRACTICES

The manufacturer recommends the periodical maintenance to be performed at 60 000 copies, which is also the recommended service-life of most of the consumable parts in the copier:

Inspection every 60,000 copies

(1) Preparation

- 1) Ask the key operator about the present machine conditions and note them down.
- 2) Before starting the maintenance work, make and retain a few sample copies for later comparison.
- 3) Turn off the power switch and disconnect the power cord plug.

(2) The period inspection should be conducted in accordance with the PERIODIC INSPECTION CHECK LIST shown below. Perform the inspection by referring to the figures, as well as to the explanations in the Service Manual of the machine when necessary.

- (3) After the inspection has been completed, plug in the machine and turn the power switch on, and confirm the general operation of the machine by making a few copies and comparing them to those made previously.

Inspection and over-haul every 180,000 copies

(1) Replace all the consumables.

- (2) Check to see if there is any damage to parts of the drive section (gear, pulley, timing belt, etc.). Replace parts on principle if damaged.
- (3) Check to see if there is any damage or peeling of adhered parts (tape, Mylar, etc.). Replace any affected parts.
- (4) Check to see if all the switches and sensors operate properly. Replace them if they are not operating properly.
- (5) Clean the inside of the machine thoroughly.

Symbols used in the Periodic Inspection Check List:

Cleaning	Lubrication	Replacement	Date	
(A) Cleaning with alcohol	(V) Vacuoline	(20) Every 20,000 copies	Customer's Name	
(D) Cleaning with a slightly damp cloth	(H) Heavy-medium oil	(40) Every 40,000 copies	Machine No.	
(P) Cleaning with Pit Clean (RC60)	(L) Laune 40	(60) Every 60,000 copies	Inspector	
	Application	Same thereafter	Remarks	
⊙ Cleaning with soft pad, cloth, or cleaner (vacuum cleaner)	(SI) Silicone oil	(Δ) Replace in event of deformation or other damage		
	(M) Molytherm			
	(W) White grease (Molycoat)			

PERIODIC INSPECTION CHECK LIST

*K=1,000

Section	Item to check	Clean at 60*K copies	Lubricate at 60*K copies	Replace at x *K copies	Check while ON	Remarks	
Cleaner	1 Entire Unit	○					
	2 Main blade	○		⊗	○	*1 (See page 2-6)	
	3 Toner bag			⊗		Key operator item	
	4 Recovery blade	○				*2	
	5 Drum bushings	○					
Drum	10 Drum shaft	○					
	11 Drum	○		⊗ or more		*3	
Original table	12 Glass	Ⓐ					
	13 Original cover	Ⓐ					
Optical system	20 Mirror 1	○ or Ⓐ					
	21 Mirror 2	○ or Ⓐ					
	22 Mirror 3	○ or Ⓐ					
	23 Mirror 4	○ or Ⓐ					
	24 Mirror 5	○ or Ⓐ					
	25 Mirror 6	○ or Ⓐ					
	26 Slit glass	○ or Ⓐ				(both sides)	
	27 Reflector	○ or Ⓐ					
	28 Lens	○ or Ⓐ					
	29 Exposure lamp				⊗	○	
	30 Auto exposure sensor	○				○	
	31 Reproduction ratio mechanism (mirrors)					○	
	32 Reproduction ratio mechanism (lens)					○	
	33 Sliding sheets (front/rear)	Ⓐ			⊗		
34 Air filter	○			⊗		Replace when heavily stained	
35 Ozone filter	○			⊗			
Chargers	40 Charger case	○		⊗			
	41 LED eraser array	○					
	42 Charger wire	○		⊗ ⊗	○		
	43 Terminal contact	○				Use sandpaper as required	
	44 Grid	Ⓐ			⊗		
Developer unit	50 Entire unit	○					
	51 Developer material			⊗		*4	
	52 Rubber seal	○		⊗			

*K=1,000

Section	Item to check	Clean at 60*K copies	Lubricate at 60*K copies	Replace at x *K copies	Check while ON	Remarks
Paper feeding section	60 Pick-up roller	Ⓐ		⊗		
	61 Paper feed roller	Ⓐ		⊗		
	62 Separation roller	Ⓐ		⊗		
	63 Aligning roller	Ⓐ	Ⓞ	⊗		*10
	64 Paper guide	○				
	65 Brush	○		⊗		
	66 Transport guide section	○				
	67 Transport roller (left)	Ⓐ	Ⓞ	⊗		MY-1004 *9
68 Transport roller (right)	Ⓐ	Ⓞ	⊗		MY-1004 *9	
Fuser unit	70 Teflon roller (upper)	Ⓟ		⊗		*5
	71 Heat roller entrance guide	Ⓟ				
	72 Rubber roller (lower)	Ⓟ		⊗		*6
	73 Cleaning felt roller			⊗		*7
	74 Thermistor	○ or Ⓟ		⊗		
	75 Scrapers (for heat rollers)	Ⓟ		⊗		*8
	76 Heat roller exit guide	Ⓟ				
	77 Exit roller	Ⓐ				
78 Cleaning blade	○					
Drive system	80 Drive gear (teeth)		Ⓞ			
	81 Stad of drive gear		Ⓞ			
Sorter kit	82 Shaft and bushing		Ⓞ			*11

1. Optical section cleaning

- 1.1 Remove screws A and the original glass retaining plate. Remove the original glass and clean it both sides with window cleaner. Note – do not remove screws B. They are used for correction of image skew and registration of the copy image.
- 1.2 Remove screw C and the L-shaped plate with it. Remove the lens cover D, carefully in the direction E, careful not to break the drive tooth belt of the lens assembly and the carriage drive wire. See figure 1.



- 1.3 Clean with dry lint free cloth mirrors 1, 2, 3, 4 and 5 as well as the expo-lamp reflector.
- 1.4 Clean with isopropyl alcohol the sliders A of the carriage 1 and 2. Note – be careful not to bend carriage 3, because it is mounted only to the rear side of the copier. Bending will result in copy image skew. See figure 2.



- 1.5 Inspect the ends A of the process unit holder that protrude from the optical unit bottom. If they are broken the process unit will move from side to side causing image distortion and excessive wear of the main drive gear assembly. See figure 3.



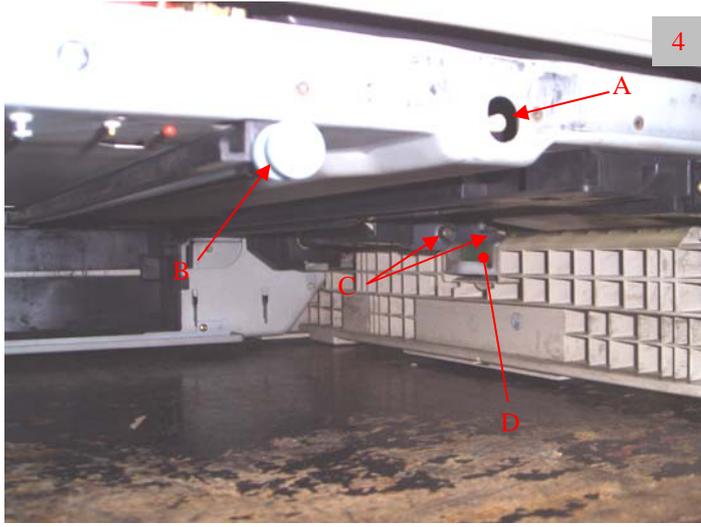
2. Remove the paper tray.

2.1 Remove the blue knob A of the transfer corotron cleaning rod.

2.2 Pull the knob B, remove and clean the waste toner container. Put it back into place.

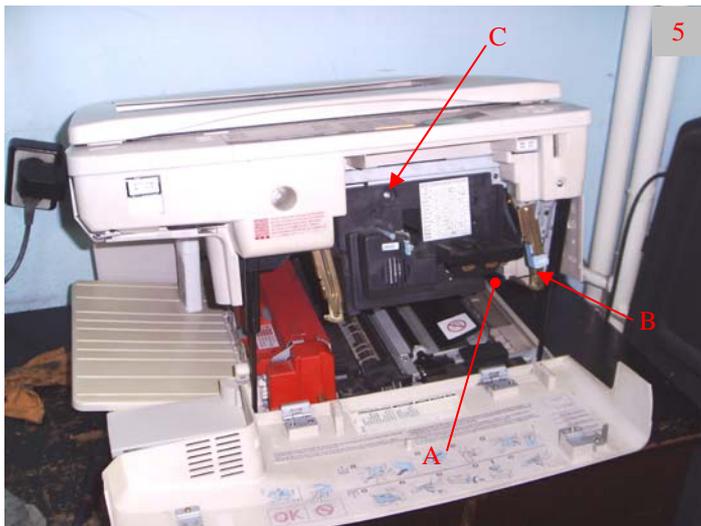
2.3 Remove the two plastic clips C, holding the pick up and feed rollers. Remove the rollers, clean them with rubber cleaning fluid from the accumulated paper dust and dirt and inspect the surface for wear. A normal surface should be rough, if not replace the rollers. Reassemble the rollers.

2.4 Inspect the color of the separation roller D. The color is an indicator of the age of the roller. A new roller should be blue. For some strange reason they tend to become green as they age. Note - if you have problems with double sheet feeding and the color is green, you know what to do. See figure 4.



3. Main body of the machine

3.1 Remove the wire A by squeezing it in B. Remove screw C and pull out the process unit. See figure 5.

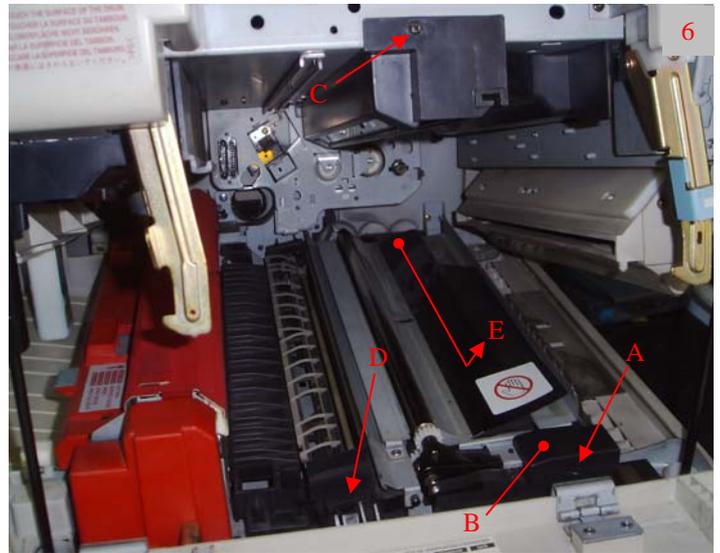


3.2 Remove screw A and the cover B of the registration assembly. Underneath unplug one connector and remove a screw.

3.3 Remove screw C and pull out the 6th mirror cover. Clean it with window cleaner as well as the mirror itself.

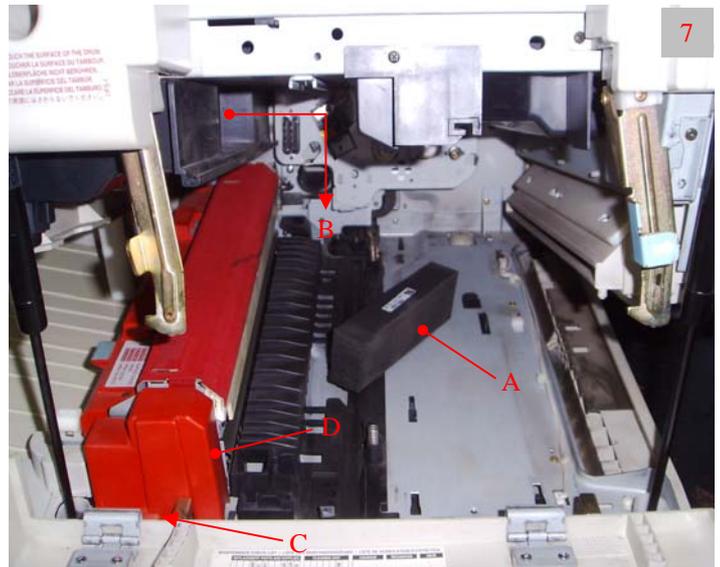
3.4 Push gently the tab D and carefully remove the transfer/separation corotron assembly.

3.5 Remove the registration assembly by pulling it out in direction E. See figure 6.



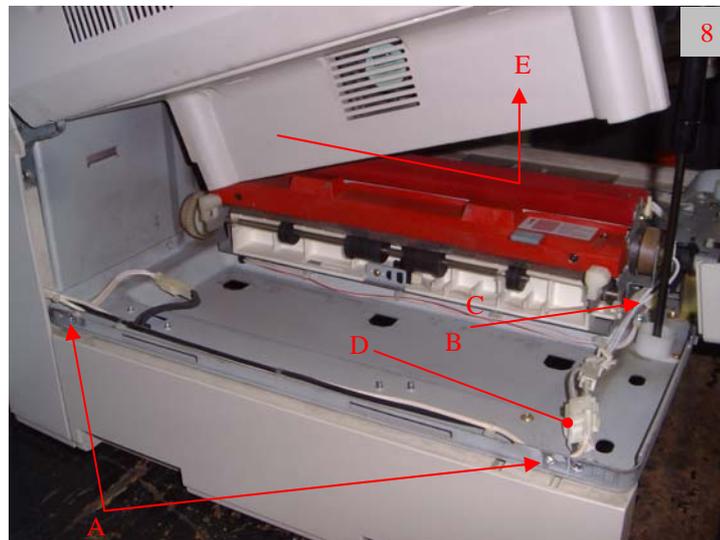
3.6 Gently remove the ozone filter A in the direction B and clean it with vacuum cleaner.

3.7 Remove screw C, remove the cover D and remove the screw underneath. Note – note the hole the screw is fitted in (there are two holes – a round one and a prolonged one the right is the round). See figure 7.

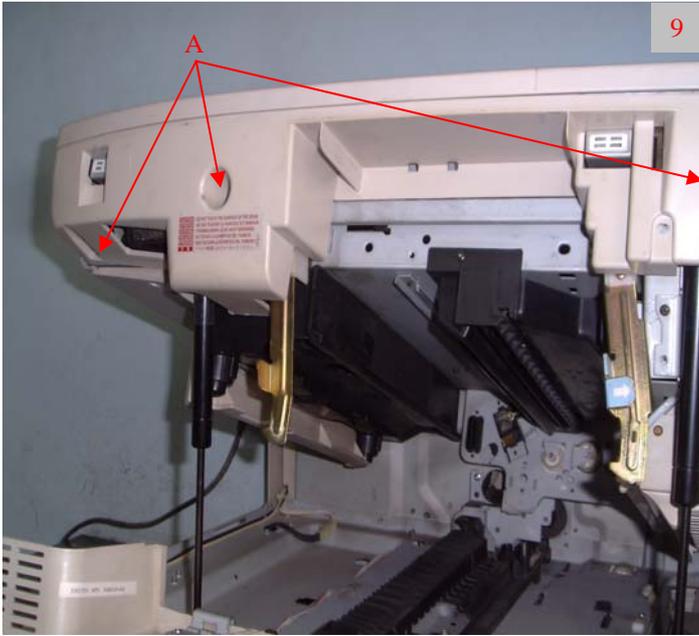


3.8 Remove screws A and the exit/fuser cover.

3.9 Unplug connectors B, C and D and remove the fuser unit by pulling it out in direction E. See figure 8.



3.10 Remove 3 screws and the cover A. See figure 9.

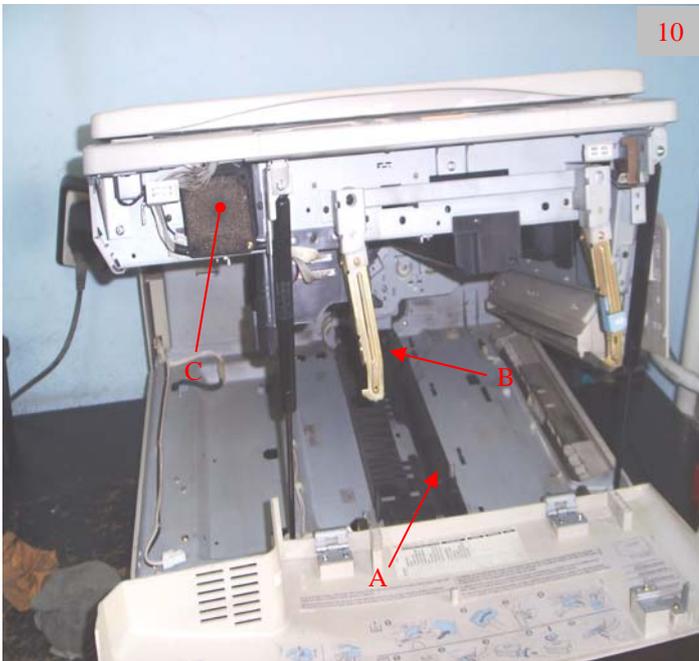


3.11 Remove corotron assembly spring A.

3.12 Clean the inside of the machine with vacuum cleaner. Note – clean thoroughly the transfer corotron assembly terminal B from dust and toner.

3.13 Inspect the inside of the machine around the lower and upper drive assemblies. Look for broken teeth by hand cranking the assemblies.

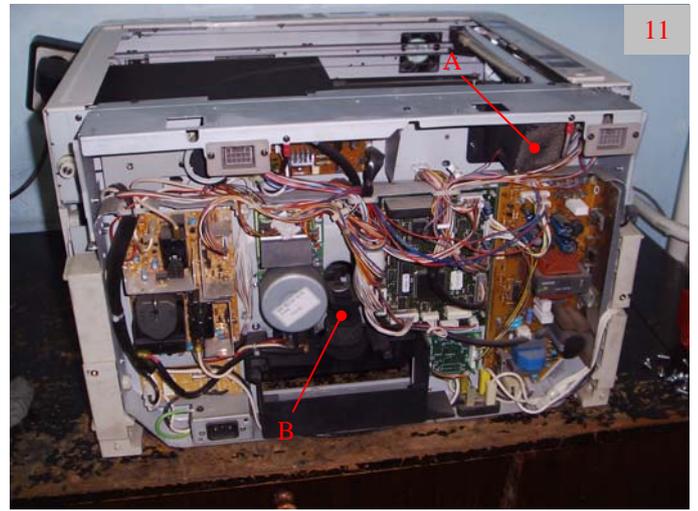
3.14 Clean the filter C of the optical fan with vacuum cleaner as you hold it with hand, because it is loosely attached. See figure 10.



3.15 Rotate the machine and remove two screws to detach the rear cover.

3.16 Clean the rear optical fan filter A the same way as the front one.

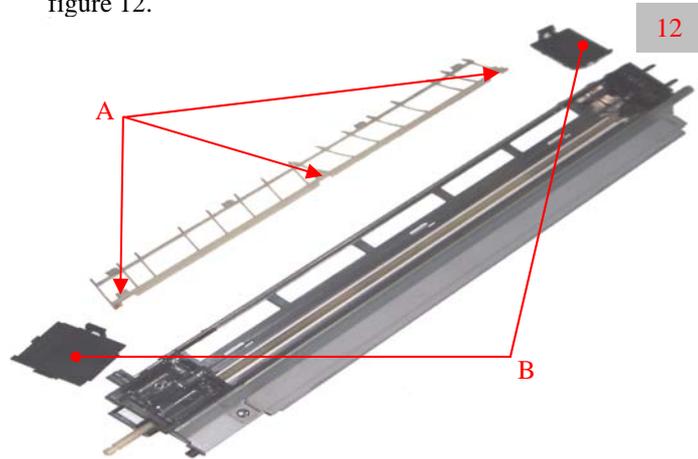
3.17 Clean the rear side of the machine from toner and dust with vacuum cleaner, especially around the waste toner discharge assembly B. See figure 11.



4. Cleaning the modules of the machine

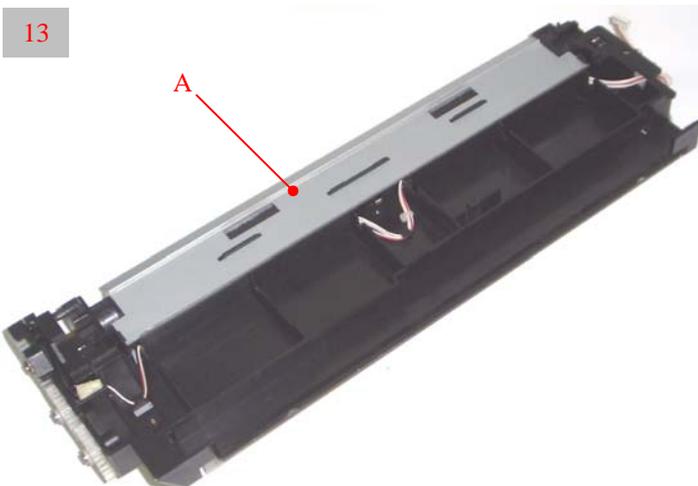
4.1 Push three tabs A and remove the separation charger grid. Remove the covers B. Clean with vacuum cleaner the terminals of the corotron assembly.

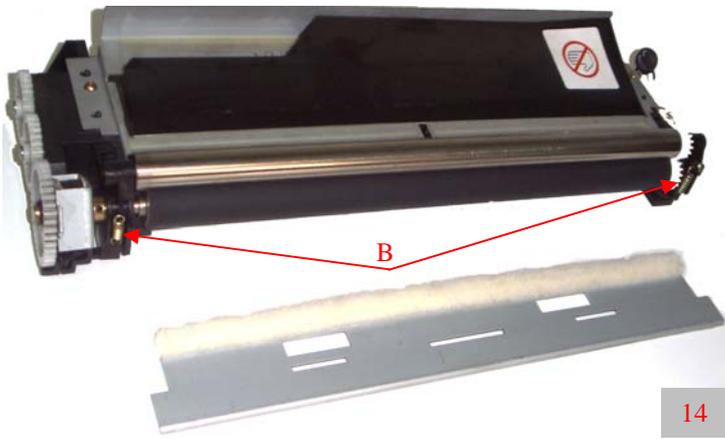
4.2 Using cotton swabs moistened with window cleaner, wipe the corotron housing as well as the wires themselves. See figure 12.



4.3 Turn the registration assembly upside down and remove the cleaning brush A. Clean it with vacuum cleaner. Inspect the hooks B of the registration roller springs, if they are broken, that will lead to defects which will be described in the articles to follow.

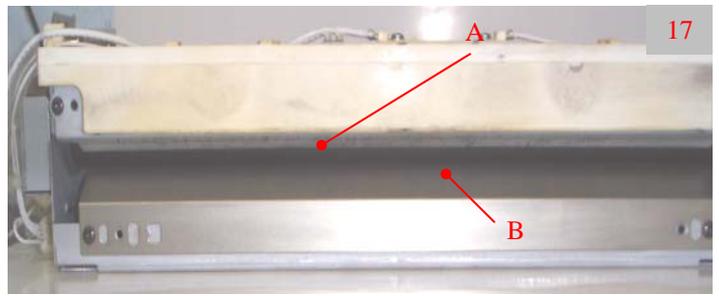
4.4 Clean the rubber registration roller with rubber cleaning fluid. This is important for the correct aligning of the original to copy beginning. See figure 13 and 14.





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4.5 Remove screws A and B and pull out the fuser cleaning roller cover and the upper heat roller separation fingers assembly. See figure 15.

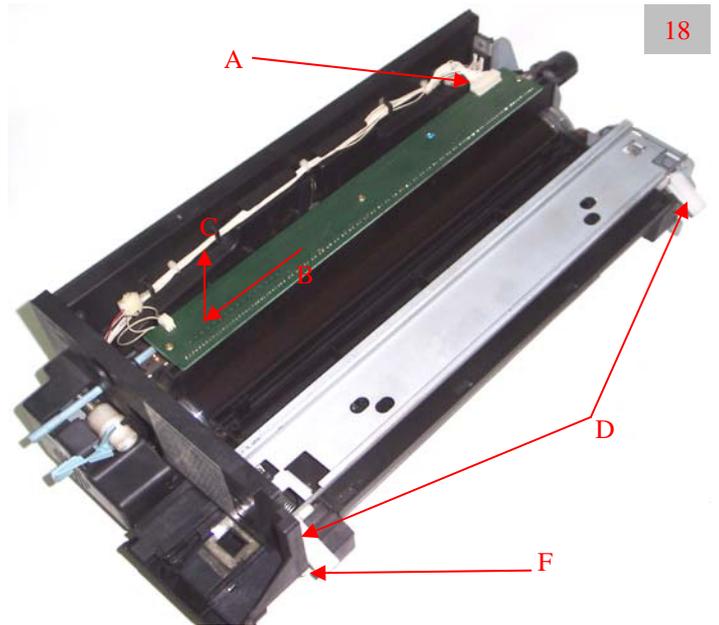


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5. Image process unit maintenance

5.1 Unplug the connector A. First push the main charger in the direction B and the lift it careful not to scratch the OPC Drum. Pull out the assembly in direction C.

5.2 Lift the tabs D and unplug connector E. Pull out the developer unit in direction F. See figure 18.



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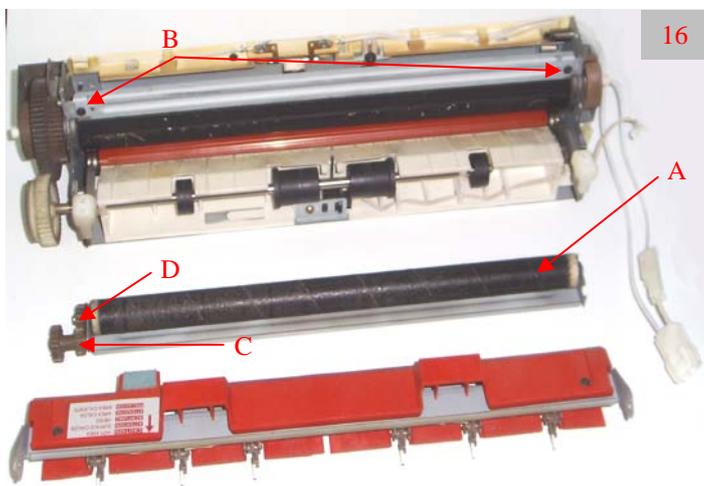


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4.6 Clean the tips of the separation fingers with acetone. Remove the cleaning roller assembly A and remove the roller itself. Make sure not to loose the two bushings. Clean the roller with vacuum cleaner by applying moderate force to the roller. Note – be careful when you clean the ends of the roller not to unwrap the cleaning felt wound around the roller. If there is so much toner you can't clean with vacuum cleaner moisten a cloth with acetone and rub the roller. Apply moderate amount of silicone oil to the roller felt.

4.7 Remove screws B and remove the fuser roller cleaning blade. Clean the tip of it with acetone.

4.8 Remove gears C and D, clean the teeth with brush and using a cotton stab with acetone clean the gear C shaft and the hole of the gear itself. Note – do not apply any lubricant to the gear's shaft. See figure 16.

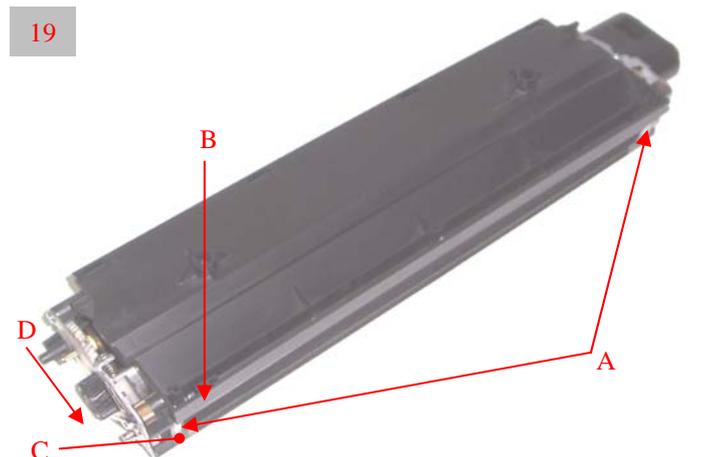


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4.9 Clean with acetone the upper A and lower B guide plates of the fuser unit. See figure 17.

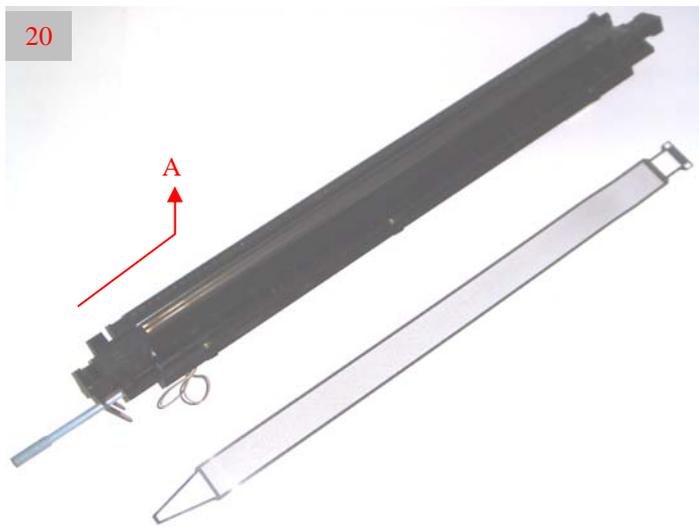
5.3 Inspect the developer unit. Check if the roller guides A are rotating freely. Check if the cover seal B is on top of the side seals of the developer roller. Clean with vacuum cleaner the accumulated toner under the magnetic roller as well as around the side seals C.

5.4 Check if the unit is mechanically sound by rotating the input gear D in the direction shown. If there is too much torque needed to turn it, this is an indicator that there are problems in the unit which will be discussed in following articles. See figure 19.



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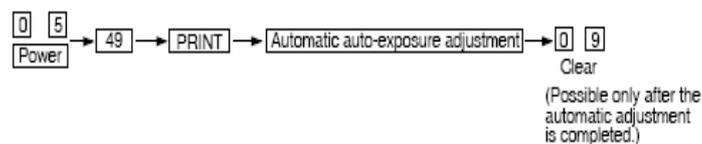
- 5.5 Remove the main charger grid by applying force in direction A. Clean the grid by washing it with window cleaner fluid. Note – when drying it watch for small particles remaining on the grid. Brush them off if necessary.
- 5.6 Using cotton swabs with window cleaner wipe the charger’s housing and the wire itself.
- 5.7 Clean with alcohol the LED eraser/discharge array. See figure 20.



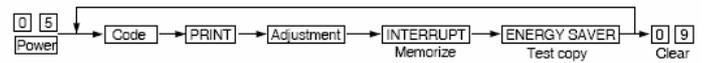
Reassemble the modules of the machine in reverse order and mount them back into the machine. Turn the machine on and make sure it enters into ready condition. Make a copy of the test target designed to adjust the copy density. Make copies in all exposure modes – Auto, Manual (middle position), Dark (max. right position), Light (max left position) and Photo. If the copy density is unsatisfactory you should make adjustments in the following order.

IMAGE DENSITY ADJUSTMENTS

1. Enter the adjustment mode AJ by holding together numerical buttons 0 and 5 and turning on the machine.
2. Begin with adjustment of the copy density in the middle position. Make a test copy by pressing the “Energy saver button”. Change the value of code 1 if the copy is too light or too dark (the higher the value the lighter the copy density). The procedure is the following: enter 1 and press the Start button. Change the value and store it by pressing the Interrupt button. Make a test copy and readjust if necessary.
3. Execute the auto exposure auto adjustment procedure – place a couple of white A3 sheets on the original glass and close the platen. Enter code 49 and press the start button. After completion make a test copy. If necessary change manually the auto exposure density by changing the value in code 5.



4. Adjust the density of darkest and lightest mode using the same procedure as in 2. The codes are respectively 10 and 9.
5. Adjust the density of the photo exposure – code 14.
6. Exit the AJ mode by pressing the 0 and 9 buttons or turn off the machine.



Adjustment sequence	Exposure mode	Reproduction ratio	Adjustment code
1	Manual exposure	100%	1
2	Automatic adjustment of automatic exposure	50 ~ 200%	49
*3	Light (max.)	100% or appropriate reproduction ratio	9
*4	Dark (min.)		10
5	Manual photo exposure	100%	14