

Chapter Three M A I N T E N A N C E / A D J U S T M E N T S

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Life expectancy of modules

The table below shows the nominal life expectancy for modules. Detailed part information for each module (except toner containers) can be found in *Parts Catalog*.

For refurbishment purpose, the modules are available as a kit after 350,000 pages have been printed. The contents of this kit is also shown in this table.

Kit	Module	Nominal life (pages)	Remarks
TK-30	Toner container	25,000	User-replaceable (20,000 for the initially supplied container)
DK-30	Drum unit	350,000	
DV-30	Developer unit	350,000	
FK-30	Fuser unit	350,000	
TR-30	Transfer roller	350,000	
MK-30	Refurbishment ("Maintenance") kit ¹	350,000	Includes a DK-30, a DV-30, a FK-30, a TR-30, and a waste toner conveyer.

¹ To install the kit, refer to the instruction manual included in the kit.

Toner container

The toner container is the only consumable that the printer requests (until it has printed 350,000 pages) to replace periodically during normal operation (user-replaceable). The following toner container is available for use with model FS-7000.

Model	Life in pages ²
TK-30	25,000 (1,100 g)

When to replace the toner container

The printer gives two steps of user attention for toner replacement as explained below:

Step 1—The toner is almost run out. The message display indicates:

Toner low TK-30 ... Clean printer

The printer will print approximately 2,500 pages (A4 or letter/5% coverage) until step 2. This is the earliest chance to replace the toner container and clean various parts inside the printer (See **Cleaning the printer** on page 3-7).

Step 2—The toner is run out. The printer halts printing and the message display indicates:

Replace Toner ... Clean printer

This instructs the user to install a new toner kit to bring the printer back in normal operation. Cleaning various parts inside must be also done in this occasion (See **Cleaning the printer** on page 3-7).

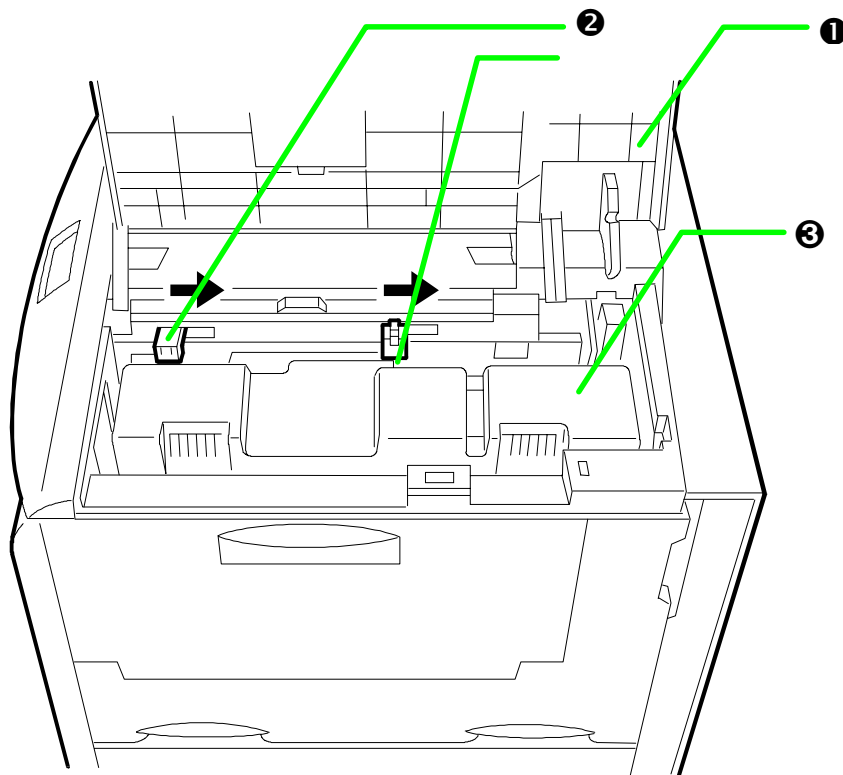
² Based on letter or A4 size paper; average print density of 5%.

Observe the following cautions when replacing the toner container:

- Do not attempt to disassemble the toner container and reuse the waste toner inside.
- Keep magnetic media such as floppy disks away from the toner container.
- Be sure to clean the parts as instructed in this section at the same timing of replacing toner container.
- Use of the Kyocera toner kit TK-30 is highly recommended for the optimum operation of the printer.

Toner container replacement

To replace the toner container, open the top cover ❶. Pull the toner container release levers ❷ to the right position as shown. Lift and pull out the toner container ❸.



Then, refer to section **Installing toner** in chapter 2 to install the new toner container. After installing the new toner container, several parts in the printer must be cleaned as instructed in section **Cleaning the printer** on page 3-7.

If the toner container has been replaced when the message

Replace Toner ... Clean printer

was displayed, then, the message

Clean printer ... press CONTINUE

will be displayed after replacement. After cleaning the inside of the printer following the procedure shown below, press the **CONTINUE** key; the message will disappear and the printer will be ready for printing.

Toner saver mode (*EcoPrint*)

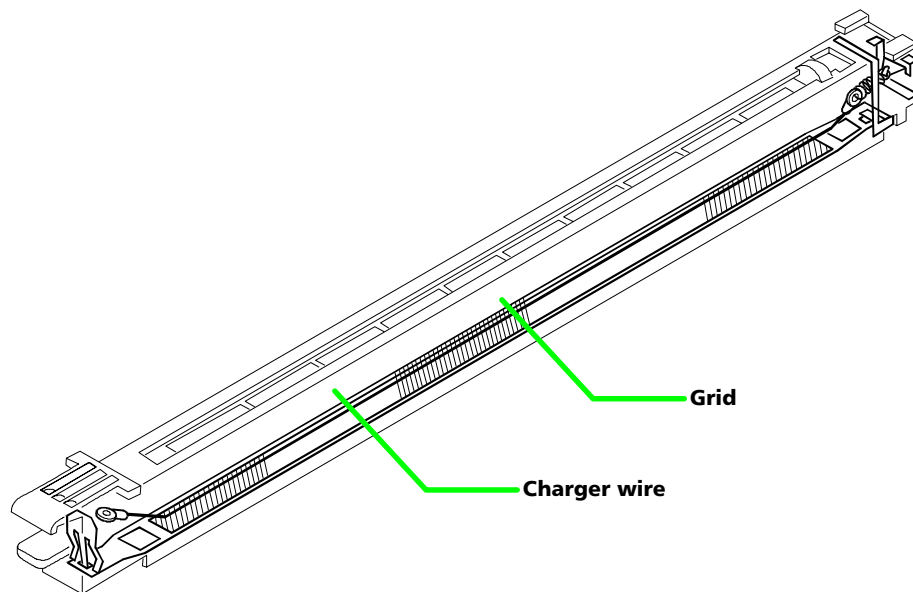
The *EcoPrint* enables to reduce the amount of toner consumed on the page so as to save printing costs by drastically extending the toner container life. EcoPrint mode is factory-set to off and turned on by the printer's front control panel (also accessible through the application software with the assistance of the printer driver). See details in the printer's user's manual.

Cleaning the printer

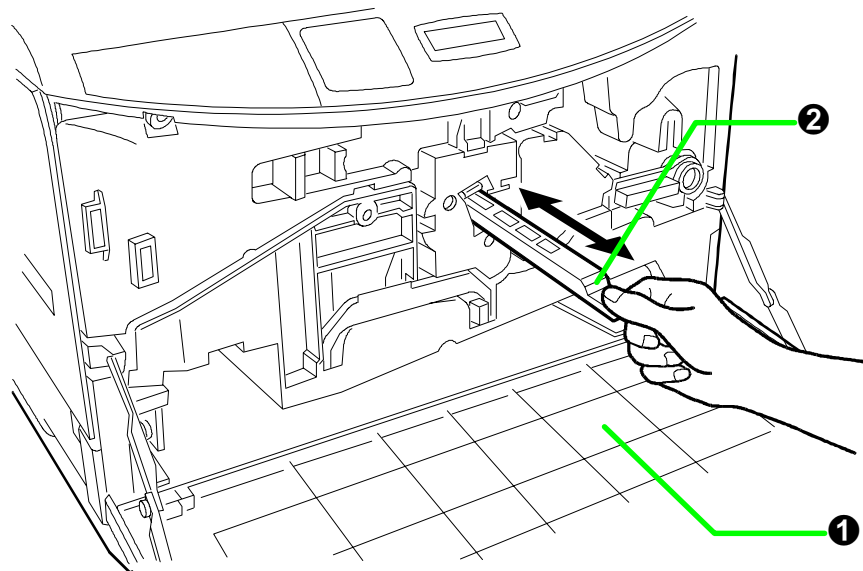
To avoid print quality problems, the following printer parts must be cleaned with every toner container replacement.

Main charger unit

The main charger unit should be cleaned in its two parts—the charger wire and grid (See the picture below.)—whenever the toner container is changed. Cleaning of the main charger can be done without needing any tools thanks to its self-cleaning system.

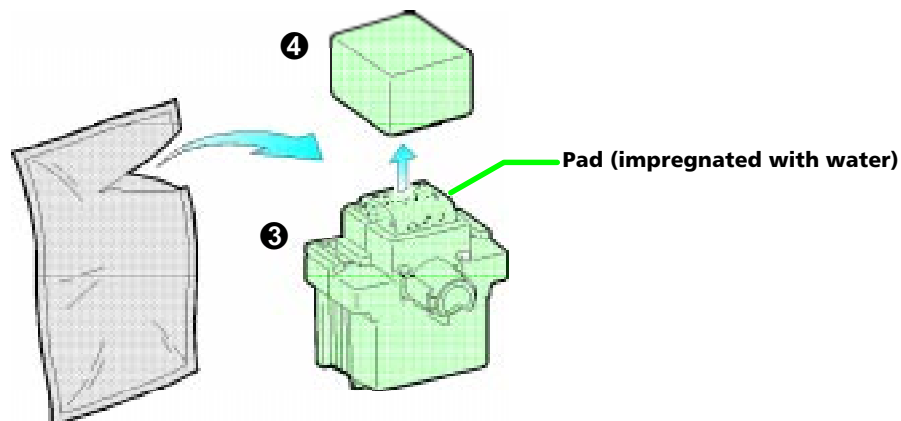


To clean the charger wire, first open the front cover **❶**. Pull the cleaning knob (green) **❷** slowly in and out a few times. This pulls a cleaning pad inside the drum unit along the wire.



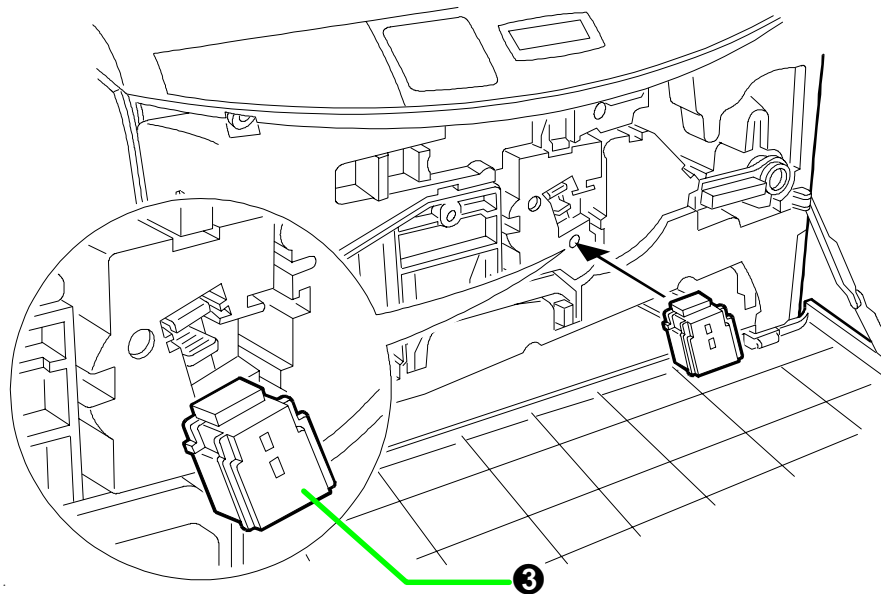
Then, clean the grid using the grid cleaner supplied with the toner kit.

Take the grid cleaner **❸** from protective bag in the new toner kit, and remove the cap **❹**.



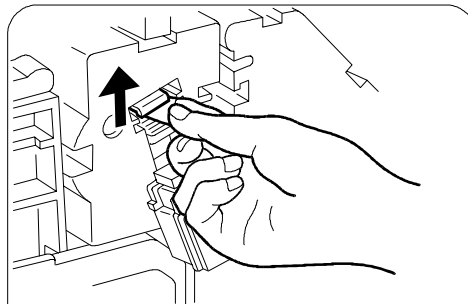
The grid cleaner pad is impregnated with water. Perform the following cleaning procedure before the pad dries.

Attach the grid cleaner ❸ to the drum unit as shown in the diagram below. Insert the fixture pin on the cleaner into the hole on the drum unit with the pad facing up.

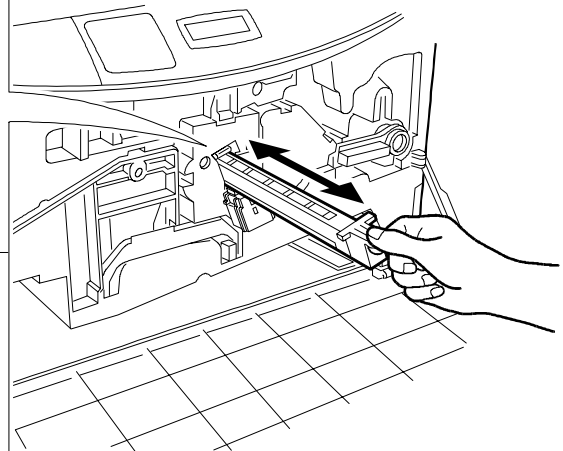
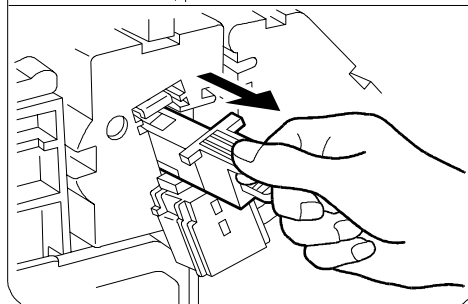


Hold and pull up the main charger, then draw it out until it stops. Then, push it all the way in. Repeat this procedure for 5 times or more.

**To release the
main charger
unit for pulling,
first pull it up...**



**Then, pull it
horizontally
out.**



After cleaning is done, pull the main charger unit in place using the reverse manner of the above. Close the front cover.

Cleaning the paper feed unit

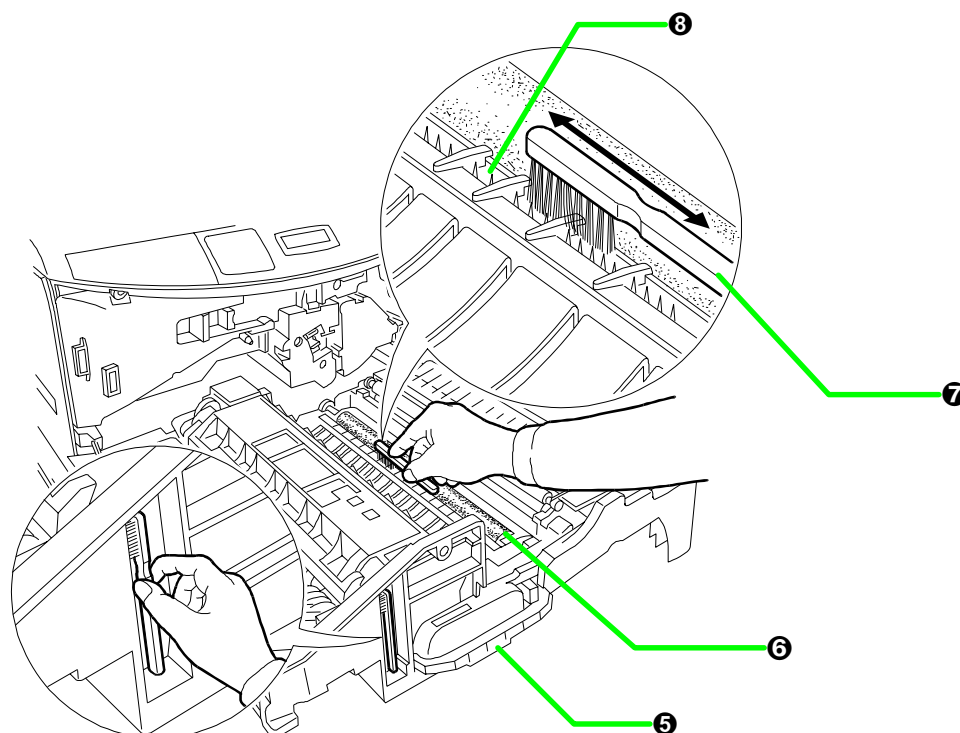
The paper feed unit must be cleaned of paper dust whenever the toner container is replaced. To gain access to the paper feed unit, first, open the front cover. Draw out the paper feed unit by the handle (green) ⑤ on its front side.

Cleaning the paper feed unit should be done on several parts—the separation charger, registration rollers, paper ramp, etc. as follows.



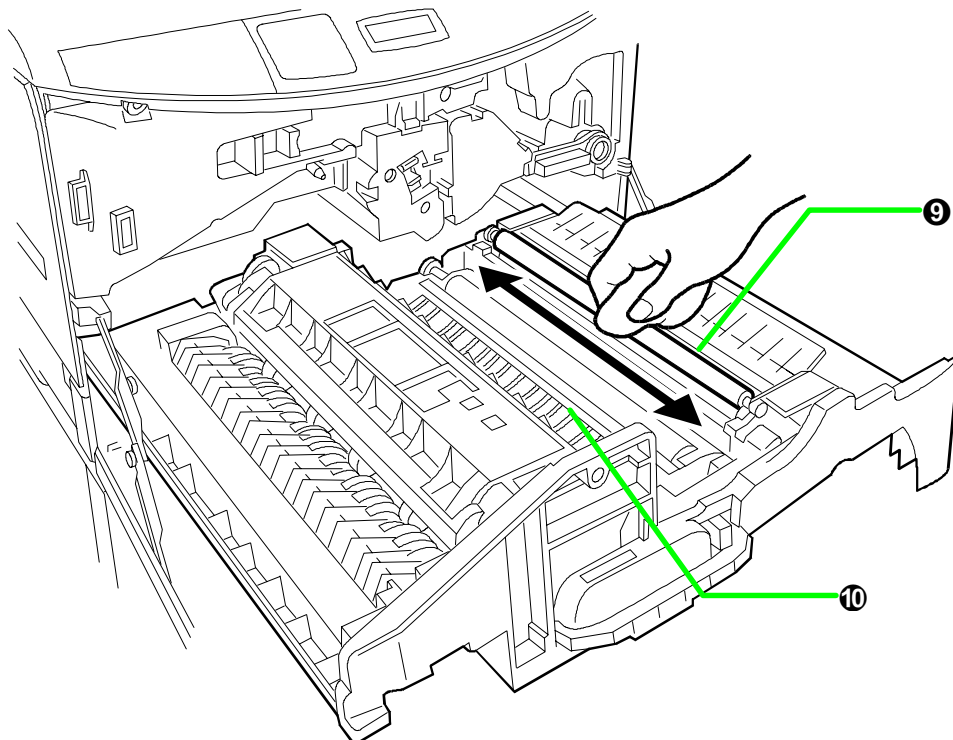
Caution—Do not touch the transfer roller (black sponge roller) ③ during the cleaning procedure.

Take out the cleaning brush ⑦ recessed in the front of the paper feed unit. Cleaning the separation charger (saw-toothed) ⑧ by sweeping with the brush.



The printer can get ready for printing approximately 15 seconds after replacing the toner container.

Obtain the cleaning cloth (Locate in a new toner kit or contact Kyocera). Wipe the registration rollers ⑨ and paper ramp ⑩ as shown below.



When cleaning is done, set the paper feed unit back in place by pushing on the handle. Make sure that the paper feed unit has been correctly seated, close the front cover.

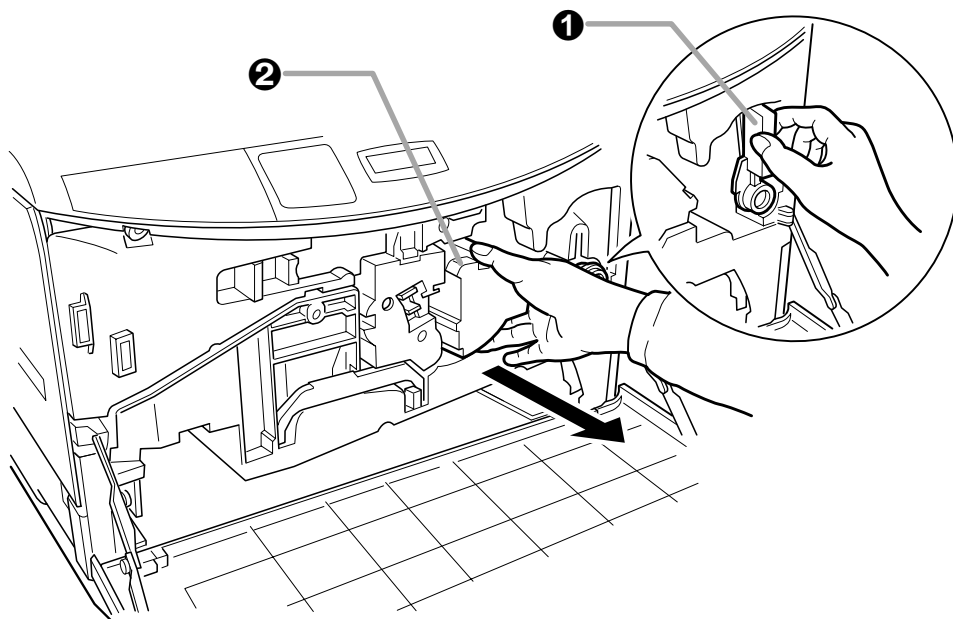
Replacing the developer unit

In case that the developer unit is to be removed from the printer for shipment or replacing to a new one, it should be handled following the instructions below.

Also, a new developer unit, after installing, needs a special treatment that replenishes the developer with toner for printing. This can be done by using the front control panel (See section **Feeding toner into the new developer** on page 3-15).

Replacement

To replace the developer unit currently installed in the printer, first turn the printer power off. Open the toner container access door. Refer to section **Toner container replacement** on page 3-5 and remove the toner container. Open the front cover. Locate the developer unit release lever ❶ and turn it clockwise to the upper position. Grasp the developer's front end as shown below and slowly draw the developer ❷ out from the printer.

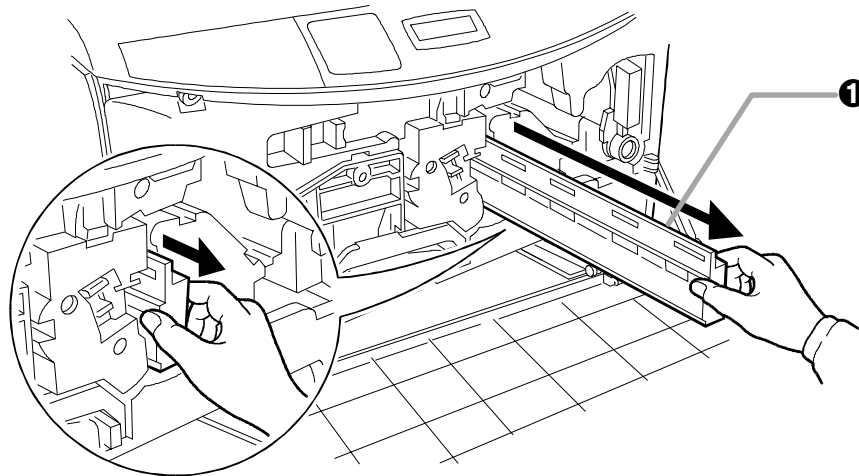


Caution—If you ship the developer unit removed from the printer for repair, etc., pack the developer in the container package designed for this purpose.

Installing a new developer

To install a new developer, use the reverse manner as above. Note that the new developer is shipped from the factory with a protective cover ❶ installed. Leave the protective cover installed with the developer until the developer has been installed in the printer.

When the developer has been installed in the printer, grasp and pull the protective cover all the way out, as shown below. Latch in the developer release lever.



Caution—Push in the developer unit slow and gently. If the developer contains toner, pushing in the developer unit rudely can cause the distribution of toner to become uneven in the far side of the developer. Also, it may risk damaging the connector at the far end of the developer (and the mating connector in the printer).

Feeding toner into the new developer

The new developer unit is shipped from the factory with no toner contained. The developer can be automatically replenished with toner when a toner container is installed onto it and the printer is turned on. However, because the toner reservoir in the developer has a large capacity, it requires a lengthy period of time until a substantial amount of toner has been fed to get the printer ready.

A great many seconds of time for this is greatly deducted by using the service menu in the printer's mode select routine as accessed by its front control panel. Follow these steps to use this feature, top to bottom (For details on using the front control panel keys, refer to the printer's user's manual.

Key to press:	Relevant display:
MODE	
+ (repeatedly)	Others>
▶	
+ (repeatedly)	>Service>
▶	>>Developer
ENTER	>>Developer?
ENTER	Turn printer power off, then on.

When printer power is turned on again, the printer continually engages in this mode for several minutes after which the printer reverts to the ready state.

Updating the firmware

The printer accepts update of the engine and system firmware as well as the front panel message data through the parallel interface. A PC that is connected to the printer's parallel interface and capable of running in DOS mode is required for this purpose.

Updating using these data is implemented by directly downloading the new firmware data for rewriting the flash memory chips in the printer. The printer must enter to the *supervisor* mode (See page 3-17) to update the engine firmware using Prescribe commands as explained in this section.

The engine firmware and controller (system) firmware must be updated separately. Kyocera supplies three types of data for updating the printer's firmware as follows:

- Engine firmware data
- Controller (system) firmware data
- Front panel message data

These data may be stored in a memory card for field use. To store (write) data in a memory card, and reread them into the printer through the slot, refer to the printer's *User's Manual*.

Each single data must be written on a memory card. Do not write more than one data on a memory card.

Firmware data format

The firmware data to be downloaded is identified using the following file specification:

de:02:30:.dat

① ② ③ ④

Identifies...

- | | |
|---|---|
| ① | <i>de</i> : Engine firmware data
<i>ds</i> : Controller (system) firmware data
<i>dm</i> : Front panel message data |
| ② | 01: FS-1700
02: FS-3700
03: FS-7000 |
| ③ | Version of data (2 to 4 digits) |
| ④ | <i>dat</i> : Engine/controller firmware data
<i>dan</i> : Panel message data for Danish
<i>swe</i> : Panel message data for Swedish
<i>ita</i> : Panel message data for Italian
<i>spa</i> : Panel message data for Spanish |

Downloading engine firmware data

To download engine firmware or panel message data, use Prescribe BOOT command.

Perform in sequence:	Relevant display
Turn printer power on. Make sure the printer is <i>Ready</i> .	Ready
At the DOS prompt, send the following command to the printer: !R! BOOT "SPR";	Supervisor mode
Note —Do not add an EXIT; command in the above. The display indicates Supervisor mode when the above command is sent to the printer.	
DOS COPY (/b) the data to download from the host computer. The display shows Downloading while downloading data.	Downloading
When downloading finishes, the display reverts to Supervisor mode . In this state, turn power off.	Supervisor mode

Turn power on again. Check the display shows Ready.

Ready



Caution—Do not turn off printer power while data are being downloaded (approximately one minute).

Confirm the status page shows the new engine version. If the message display indicates *Call service person Dn* ($n=0, 1, \dots$), refer to section *Errors during downloading* on page 3-19.

Downloading controller firmware data

To download controller firmware data, use Prescribe UPGR command as follows.

Perform in sequence:	Relevant display
Turn printer power on. Make sure the printer is <i>Ready</i> .	Ready
At the DOS prompt, send the following command to the printer: !R! UPGR "SYS"; Note —Do not add an EXIT; command in the above. The display should indicate Supervisor Mode when the above command is sent to the printer.	Supervisor mode
DOS COPY (/b) the data to download from the host computer. The display shows Downloading while downloading data.	Downloading
When downloading finishes, the display reverts to Supervisor mode. In this state, turn power off.	Supervisor mode
Turn power on again. Check the display shows Ready. If not, refer to section Errors during downloading on page 3-19.	Ready



Caution—Downloading controller firmware takes several minutes (depending on the processing speed of the computer used). Do not turn power off during downloading.

Confirm the status page shows the new firmware version (See *Appendix B*, page B-4). If the message display indicates *Call service person Dn* ($n=0, 1, \dots$), refer to section *Errors during downloading* on page 3-19.

Downloading data from a memory card

To download data written in a memory card to the printer, proceed as follows. Data in a memory card can be selectively downloaded when the Prescribe RWER command is used. Refer to the *Prescribe Command Reference Manual* in the CD-ROM purchased with the printer for details about the RWER command.

Perform in sequence:	Relevant display
Insert the memory card in the printer's memory card slot of the printer.	
Turn printer power on. The printer automatically reads data in the memory card, indicating Downloading on the message panel during downloading.	Downloading
When the data is successfully read, the message display indicates Supervisor mode .	Supervisor mode
Turn printer power off.	
Remove the memory card from the printer.	
Turn printer power on again. Check the display shows Ready .	Ready

Confirm the status page shows the new firmware version (See *Appendix B*, page B-4). If the message display indicates *Call service person Dn* ($n=0, 1, \dots$), refer to section *Errors during downloading* below.

Errors during downloading

The following messages may be indicated on the message display when an error occurred during downloading firmware data. Take the appropriate corrective action. If the corrective action does not terminate the error, contact Kyocera.

Error message	Meaning	Corrective action
Call service person D0 - Checksum error	Checksum error occurred during downloading. The engine ROM is empty.	Turn printer power off once, then on again. Try downloading again.
Call service person D1 - Machine compatibility error	The data to be downloaded is not compatible with the printer.	Obtain correct data for the printer model.
Call service person D2 - Version compatibility error	The version of the data does not match the current engine version.	Obtain the correct version of data.
Call service person D3 - Data error	The data to be downloaded is corrupted.	Obtain the correct data.

Adjusting the transfer bias

Printing on paper with extra thickness of 91 to 200 g/m², such as postcards, OHP, envelopes, etc., tend to result in faint printing because of insufficient penetration of transfer bias developer at the transfer roller. Whereas, for thin paper types, the regular transfer bias may be so strong that the paper cannot effectively leave the drum surface after transferring, causing paper jam.

For the satisfactory transferring process on different paper thickness, the transfer bias is user-switchable in three degrees between -1.7 kV and -3.4 kV.

To select the transfer bias for different paper thickness, perform the following steps.

Steps	Display
Press MODE key.	
Press + key repeatedly until Paper type/Normal is displayed.	<div>Paper type</div> <div>Normal</div>
Press ENTER key. The question mark begins flashing besides Normal .	<div>Paper type</div> <div>Normal ?</div>
Press + key. Press ENTER key to select the thick paper type.	<div>Paper type</div> <div>Thick ?</div>
Or, to select the thin paper type to press + key. Press ENTER to select the thin paper type.	<div>Paper type</div> <div>Thin ?</div>

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