brother

LASER PRINTER
SERVICE MANUAL

MODEL:MFC-P2000 / HL-P2000

Aug., 1998
84U008EB0

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PREFACE

This service manual contains basic information required for after-sales service of the laser printer (hereinafter referred to as "this machine" or "the printer"). This information is vital to the service technician to maintain the high printing quality and performance of the printer.

This service manual covers the MFC-P2000 / HL-P2000 printer.

This manual consists of the following chapters:

CHAPTER I : FEATURES AND SPECIFICATIONS

Features, specifications, etc.

CHAPTER II : THEORY OF OPERATION

Basic operation of the mechanical system, the electrical system and the electrical circuits and their timing information.

CHAPTER III : DISASSEMBLY AND REASSEMBLY

Procedures for disassembling and reassembling the mechanical system.

CHAPTER IV : MAINTENANCE AND TROUBLESHOOTING

Reference values and adjustments, troubleshooting image defects, troubleshooting malfunctions, etc.

APPENDICES : SERIAL NO. DESCRIPTIONS, DRUM LIFE & PAGE COUNTER, DIAMETER / CIRCUMFERENCE OF ROLLERS, CONNECTION DIAGRAMS, PCB CIRCUIT DIAGRAMS, ETC.

Information in this manual is subject to change due to improvement or redesign of the product. All relevant information in such cases will be supplied in service information bulletins (Technical Information).

A thorough understanding of this printer, based on information in this service manual and service information bulletins, is required for maintaining its print quality performance and for improving the practical ability to find the cause of problems.

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CHAPTER I FEATURES AND SPECIFICATIONS

1. FEATURES

This printer has the following features:

Three Functions in One Printer

This printer provides two additional functions, copying and scanning besides the printing function. You no longer need a lot of peripherals and can save space in your office. This is helpful especially for SOHO users.

High Resolution and Fast Printing Speed

True 600 dots per inch (dpi) with microfine toner and 10 pages per minute (ppm) printing speed (A4 or Letter paper).

Enhanced Printing Performance and User-Friendly Operation for Windows

The dedicated printer driver and TrueType™-compatible fonts for Microsoft® Windows 3.1 and Windows 95/98 are available on the floppy disk and CD-ROM supplied with your printer. You can easily install them into your Windows system using our installer program. The driver supports our unique compression mode to enhance printing speed in Windows applications and allows you to set various printer settings including toner saving mode, custom paper size, sleep mode, gray scale adjustment, resolution and so forth. You can easily setup these print options in the graphic dialog boxes through the Printer Setup menu within the Windows Control Panel.

Printer Status Monitor with Bi-directional Parallel Interface

The printer driver can monitor your printer's status using bi-directional parallel communications. A high quality bi-directional parallel printer cable to the IEEE 1284 standard is recommended.

The printer status monitor program can show the current status of your printer. When printing, an animated dialog box appears on your computer screen to show the current printing process. If an error occurs, a dialog box will appear to let you know what to correct. For example: when your printer is out of paper, the dialog box will display "No Paper" and instructions for the corrective action to take.

Versatile Paper Handling

The printer has a multi-purpose sheet feeder and a straight paper path mechanism. Using this mechanism, you can load A4, letter, legal, B5, A5, A6, and executive sizes of paper, and various types of media including envelopes, organizer paper, or your custom paper size.

Easy Copier Operation

The copy function is easy to operate. All the operations and settings (scaling, mode, and number of copy settings) can be set on the scanner control panel.

Document Management Application 'Visioneer PaperPort® LE Software' (MFC-P2000)

Visioneer PaperPort® LE Software is a document management application which contains a viewer, editor and filing system and various links to other applications. Visioneer PaperPort® LE Software is a sophisticated application and has widespread industry acceptance and endorsements.

Sophisticated Viewer Software 'WordCraft Unimessage™ Viewer Software' (HL-P2000)

WordCraft Unimessage™ Viewer is a sophisticated viewer for displaying and editing graphic files. In addition to the usual image editing functions (object drawing, annotations, highlighting, etc.) you will also be able to use this software to view both color and monochrome images, create cover sheets for use with HL-P2000, display thumbnails of graphics files in any of your directories and set up a referencing system for your files using DIR (Document Indexing Retrieval).

TWAIN Compliant Scanner Driver

The scanner driver is TWAIN compliant which is a defacto standard. You can use the scanner from other TWAIN compliant applications as well as the PaperPort application or Unimessage™ viewer application.

Environment-Friendly

♦ Economy Printing Mode

This feature will cut your printing cost by saving toner. It is useful to obtain draft copies for proof-reading. You can select from two economy modes, 25% toner saving and 50% toner saving, through the Windows printer driver supplied with your printer.

♦ Sleep Mode (Power Save Mode)

Sleep mode automatically reduces power consumption when the printer is not in use. The printer consumes less than 13W when in sleep mode.

♦ Low Running Cost

The toner cartridge is separate from the drum unit. You need to replace only the toner cartridge after around 2,400 pages, which is cost effective and ecologically friendly.

The actual number of pages printed with each toner cartridge may vary depending on your average type of print job.

Enhanced Memory Management

The printer provides its own data compression technology in its printer hardware and the supplied printer driver software, which can automatically compress graphic data and font data efficiently into the printer's memory. You can avoid memory errors and print most full page 600 dpi graphic and text data, including large fonts, with the standard printer memory.

Remote Printer Console Program for DOS

The utility program, Remote Printer Console (RPC), is available on the floppy disk and CD-ROM supplied with your printer. When you operate your computer in the DOS (Disk Operating System) environment, this program allows you to easily change the default settings of the printer such as fonts, page setup, emulations and so on.

This program also provides a status monitor program, which is a Terminate-and-Stay Resident (TSR) program. It can monitor the printer status while running in the background and report the current status or errors on your computer screen.

Popular Printer Emulation Support

The printer supports the HP LaserJet IIP, Epson FX-850, and IBM Proprinter XL emulations.

When you use DOS application software or Windows version 3.0 or earlier, you can use any of these emulations to operate the printer in the 300 dpi resolution mode. The printer also supports Auto-emulation switching between HP and Epson or HP and IBM. If you want to set the emulation, you can do it using the Remote Printer Console Program.

2. PRINTER OVERVIEW

<Front View>

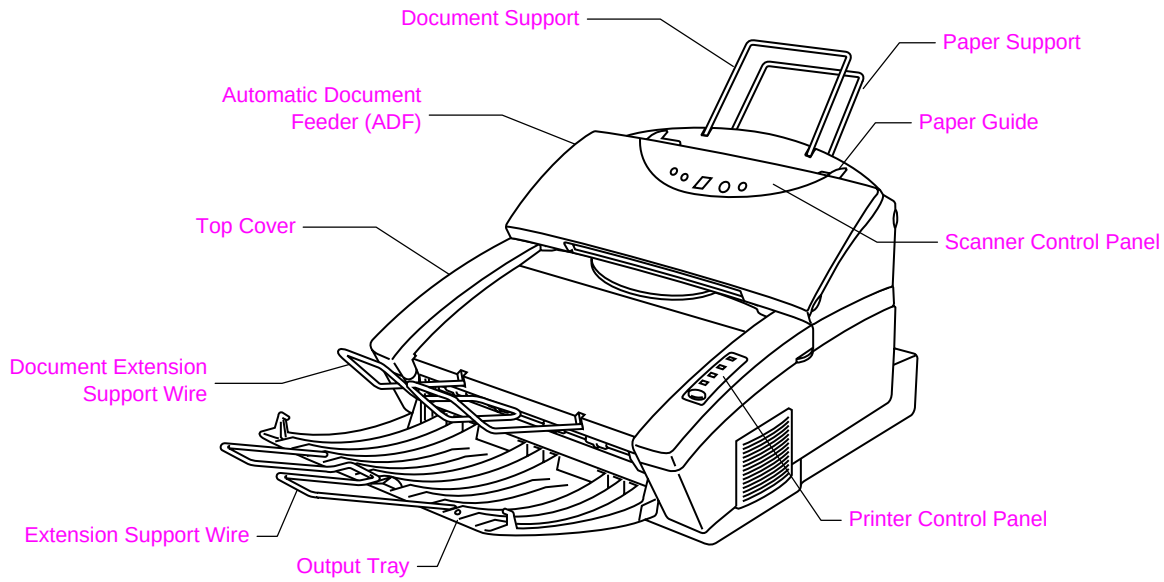


Fig. 1-1

<Rear View>

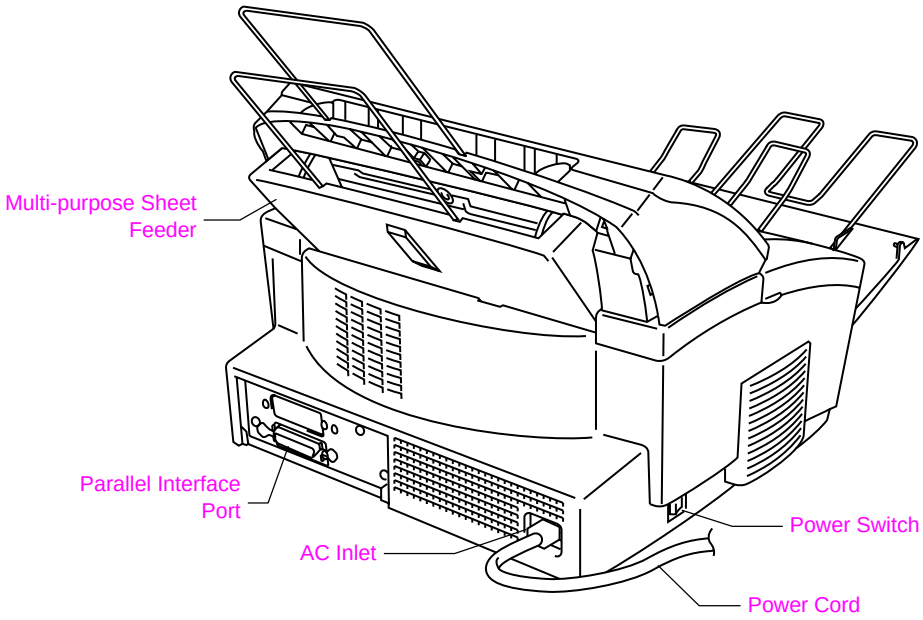


Fig. 1-2

3. SPECIFICATIONS

3.1 Printing

Print method	Electrophotography by semiconductor laser beam scanning
Laser	Wave length: 780 nm Output: 5 mW max.
Print resolution	600 x 600 dots/inch (dpi) (for Windows or DOS)
Print speed	Up to 10 pages/minute (ppm) (when loading A4 or Letter-size paper from the multipurpose sheet feeder)
Warm-up	Max. 30 seconds at 23°C (73.4°F)
First print	15 seconds (when loading Letter-size paper from the multipurpose sheet feeder)
Print media	Toner cartridge Life Expectancy: 2,400 pages/cartridge (when printing A4 or letter-size paper at 5% print coverage)
Developer	Drum unit, separated from toner cartridge Life Expectancy: 20,000 pages/drum unit at 20 pages per job 8,000 pages at 1 page per job (at 4% coverage)

3.2 Scanning

Scan method	CIS (Contact Image Sensor) system
Scan resolution	600 x 600 dpi class with 256 levels of gray
Scan speed	3 ppm
Effective scanning width	208 mm

3.3 Copying

Scaling	Enlargement / Reduction ratio For U.S.: 150%, 120%, 78%, 50% For Europe: 200%, 141%, 71%, 50%
Copy resolution	300 x 600 dpi class
Copy speed	1 copy: 20 second (3 ppm) 2 copies or more: 6 second (10 ppm)
Document setting	Up to 10 sheets
Mode setting	Text mode, Photo mode

3.4 Functions

CPU	MC68EC000 16 Mhz
Emulation	Brother Printing Solution for Windows Automatic emulation selection among HP LaserJet IIP (PCL level 4), EPSON FX-850, and IBM Proprinter XL
Printer driver	Windows™ 3.1/3.11, Windows 95/98 and Windows NT 4.0 driver, supporting Brother Native Compression mode and bi-directional capability.
Printer Interface	Bi-directional parallel interface
Scanner Interface	TWAIN 1.6 compatible
Memory	2.0 Mbytes
Viewer	For U.S.: Visioneer PaperPort® LE Software For Europe: WordCraft Unimessage™ Viewer
OCR software	Text Bridge (Xerox)
Printer Control Panel	1 switch and 4 lamps
Scanner Control Panel	4 keys, 5 lamps, and 1 seven-segment LED
Diagnostics	Self-diagnostic program

3.5 Electrical and Mechanical

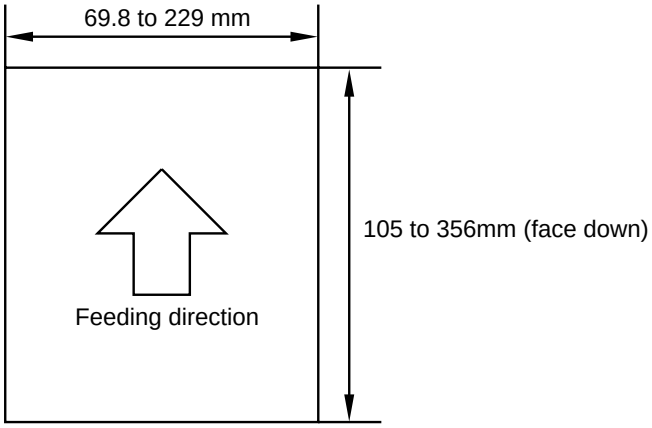
Power source	U.S.A. and Canada:	AC 110 to 120V, 50Hz/60Hz
	Europe and Australia:	AC 220 to 240V, 50Hz/60Hz
Power consumption	Printing (peak):	820W or less
	Printing (average):	280W or less
	Copying:	180W or less
	Standing by:	60W or less
	Sleep:	13W or less
Noise	Printing:	49dB A or less
	Standing by:	33dB A or less
Temperature	Operating:	10 to 32.5°C (50 to 90.5°F)
	Storage:	0 to 40°C (38 to 104°F)
Humidity	Operating:	20 to 80% (non condensing)
	Storage:	10 to 85% (non condensing)
Dimensions (W x D x H)	390 x 371 x 283 mm (15.4 x 14.6 x 11.1 inches) (when the output tray is closed.)	
Weight	Approx. 8.5 kg (18.7lb.) including the drum unit and toner cartridge	

Note:

- *The peak figure of power consumption is worked out when the halogen heater lamp is turned ON.*
- *The peak figure of power consumption is worked out excluding inrush current value.*
- *Be sure that the peak figure of power consumption is reference value and should be used inside the Brother offices only.*

3.6 Paper Loading

Paper size: A4, Letter, Legal, B5, A5, A6, and Executive.
Other sizes of media that can be handled by the feed mechanism can be loaded into the multi-purpose sheet feeder. (Refer to Fig. 1-1.)



Feedable paper weight: 60 (16 lb.) to 157 (42 lb.) g/m^2

Maximum load height : 22 mm (200 sheets of 80g/m^2 paper) letter or A4 size

Setting method: Pull the MP sheet feeder cover toward you, insert the stack of paper into the feeder, aligning the top edge of the sheets, then push the cover back to its original position.

Cautions:
- *Before loading paper with holes such as organizer sheets, be sure to fan the stack well.*
- *When printing on the back of pre-printed paper, be sure to straighten the paper as much as possible.*

3.7 Print Delivery

(1) With the output tray opened
Tray capacity: Maximum 100 sheets (80g/m^2), face-down only

(2) With the output tray closed
1 sheet (80g/m^2), face-down only

Note:
- *Face down: Deliver the printed face of the paper downward.*
- *Environment : 23°C*

3.8 Print Paper

(1) Paper type

(a) Normal paper (60 to 157 g/m^2, specified types of high-quality paper)

- A4 size
- Letter size
- Legal size
- B5 (JIS ISO) size
- A5 size
- A6 size
- Executive size

* The recommended types of plain paper are as follows:
Letter : Xerox 4200 (75g/m^2)
A4 : Xerox 80 Premier Paper (80g/m^2)

(b) Special paper (specified types)

- Labels
- Envelopes (DL, C5, COM-10, Monarch)
- Organizers (K, L, and J sizes of DAY-TIMERS)

(C) Other detailed specifications

	Cut Sheet	Envelope
Basis Weight	60 to 157 g/m^2 (16 to 42 lb.)	75 to 90 g/m^2 (20 to 24 lb.) single thickness
Caliper	±0.03 to ±0.08 in. (0.08 to 0.2 mm)	0.0033 to 0.0058 in. (0.084 to 0.14 mm) single thickness
Moisture Content	4% to 6% by weight	4% to 6% by weight

Caution:

- *It is recommended to use long-grained paper for the best print quality. If short-grained paper is being used, it might be the cause of paper jams.*
- *Use neutral paper. Do not use acid paper to avoid any damage to the printer drum unit.*

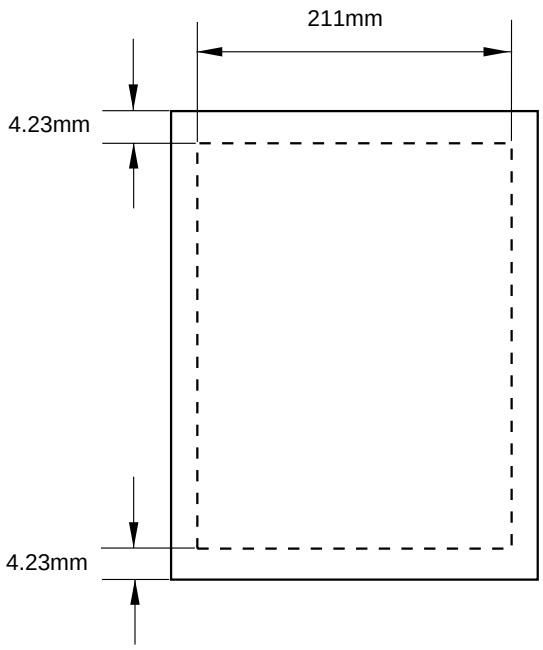
(2) Paper feed conditions

Type	Name	Feeder	Number of sheets
Normal paper (cut sheet)	60 to 80 g/m^2	○	200 sheets
	80 g/m^2 paper (Legal)	○	100 sheets
	157 g/m^2	○	30 sheets
Special paper (cut sheet)	Labels	○	50 sheets
	Envelopes	○	10 sheets
	Organizers	○	10 sheets

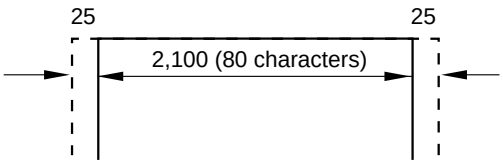
3.9 Printing Area

(1) Effective printing area

(a) Supported by the engine



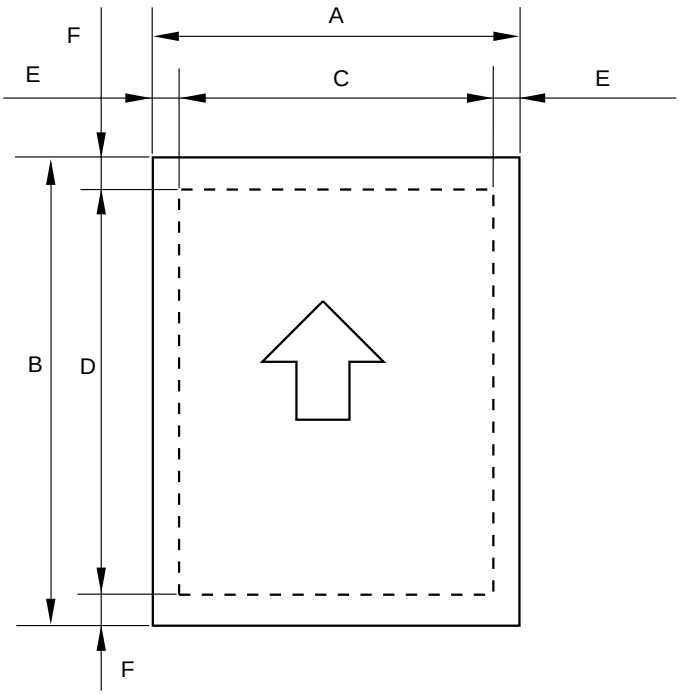
(b) Supported by the emulation



Note:
- *The units in the above figure are dot size based on 300 dpi resolution.*
- *25 dots at both sides is for italic characters.*

The effective printing area means the area within which the printing of all the data received without any omissions can be guaranteed.

(2) Print guaranteed area



The table below shows the print guaranteed areas for each paper size.

Size	A	B	C	D	E	F
A 4	210.0 mm 8.27” (2,480 dots)	297.0 mm 11.69” (3,507 dots)	203.2 mm 8.0” (2,400 dots)	288.5 mm 11.36” (3,407 dots)	3.4 mm 0.13” (40 dots)	4.23 mm 0.17” (50 dots)
Letter	215.9 mm 8.5” (2,550 dots)	279.4 mm 11.0” (3,300 dots)	203.2 mm 8.0” (2,400 dots)	270.9 mm 10.67” (3,200 dots)	6.35 mm 0.25” (75 dots)	↑
Legal	215.9 mm 8.5” (2,550 dots)	355.6 mm 14.0” (4,200 dots)	203.2 mm 8.0” (2,400 dots)	347.1 mm 13.67” (4,100 dots)	↑	↑
B 5 (JIS)	182.0 mm 7.16” (2,149 dots)	257.0 mm 10.12” (3,035 dots)	173.5 mm 6.83” (2,007 dots)	248.5 mm 9.78” (2,935 dots)	6.01 mm 0.24” (71 dots)	↑
B 5 (ISO)	176.0 mm 6.93” (2,078 dots)	250.0 mm 9.84” (2,952 dots)	164.0 mm 6.46” (1,936 dots)	241.5 mm 9.5” (2,852 dots)	↑	↑
Executive	184.15 mm 7.25” (2,175 dots)	266.7 mm 10.5” (3,150 dots)	175.7 mm 6.92” (2,025 dots)	258.2 mm 10.17” (3,050 dots)	6.35 mm 0.25” (75 dots)	↑
A 5	148.5 mm 5.85” (1,754 dots)	210.0 mm 8.27” (2,480 dots)	136.5 mm 5.37” (1,612 dots)	201.5 mm 7.93” (2,380 dots)	6.01 mm 0.24” (71 dots)	↑
A6	105.0 mm 4.13” (1,240 dots)	148.5 mm 5.85” (1,754 dots)	93.0 mm 3.66” (1,098 dots)	140.0 mm 5.51” (1,654 dots)	↑	↑
Organizer (J size)	69.85 mm 2.75” (825 dots)	127.0 mm 5.0” (1,500 dots)	56.2 mm 2.21” (675 dots)	118.5 mm 4.66” (1,400 dots)	6.35 mm 0.25” (75 dots)	↑
Organizer (K size)	95.25 mm 3.75” (1,125 dots)	171.45 mm 6.75” (2,025 dots)	86.78 mm 3.42” (975 dots)	162.98 mm 6.42” (1,925 dots)	↑	↑
Organizer (L size)	139.7 mm 5.5” (1,650 dots)	215.9 mm 8.5” (2,550 dots)	131.23 mm 5.17” (1,500 dots)	207.43 mm 8.17” (2,450 dots)	↑	↑
COM-10	104.78 mm 4.125” (1,237 dots)	241.3 mm 9.5” (2,850 dots)	92.11 mm 3.63” (1,087 dots)	232.8 mm 9.16” (2,750 dots)	↑	↑
MONARCH	98.43 mm 3.875” (1,162 dots)	190.5 mm 7.5” (2,250 dots)	85.7 mm 3.37” (1,012 dots)	182.0 mm 7.16” (2,150 dots)	↑	↑
C 5	162 mm 6.38” (1,913 dots)	229 mm 9.01” (2,704 dots)	150.0 mm 5.9” (1,771 dots)	220.5 mm 8.68” (2,604 dots)	6.01 mm 0.24” (71 dots)	↑
DL	110 mm 4.33” (1,299 dots)	220 mm 8.66” (2,598 dots)	98.0 mm 3.86” (1,157 dots)	211.5 mm 8.33” (2,498 dots)	↑	↑

(Note that the paper sizes indicated here should conform to the nominal dimensions specified by JIS.)

- A4 paper must accommodate 80 characters printed in pica pitch (203.2 mm).
- The dot size is based on 300 dpi resolution.
- Organizer is not supported by any printer emulations (commands).

3.10 Document Loading

Documents with the specification below should be loaded into the automatic document feeder (ADF). (Refer to Fig. 1-1.)

(1) Feedable document size / thickness / weight

Size	70 - 216 x 100 - 360 mm	
Thickness	ADF:	0.08 - 0.12 mm
	One page:	0.07 - 0.20 mm
Weight	ADF:	64 - 90 g/m^2
	One page:	52 - 158 g/m^2

(2) Maximum load

10 sheets

(3) Document type

Normal paper

(4) Setting

Face down

3.11 Document Delivery

(1) Method

600 dpi/step by clockwise rotation of the scanning stepper motor

(2) Document output tray

- On the top cover
- On the document extension wire (when it is opened)

(3) Document output capacity (on the document extension wire)

10 sheets

(Document alignment cannot be guaranteed.)

4. SAFETY INFORMATION

4.1 Laser Safety (110 - 120V Model only)

This printer is certified as a Class 1 laser product under the US Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within the protective housings and external covers, the laser beam cannot escape from the printer during any phase of user operation.

4.2 FDA Regulations (110 - 120V Model only)

The US Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. One of the following labels on the back of the printer indicates compliance with the FDA regulations and must be attached to laser products marketed in the United States.

The label for Japanese manufactured products

MANUFACTURED: K BROTHER INDUSTRIES, LTD. 15-1, Naeshiro-cho, Mizuho-ku, Nagoya 467-8561, Japan. This product complies with FDA radiation performance standards, 21 CFR Subchapter J.

The label for Chinese manufactured products

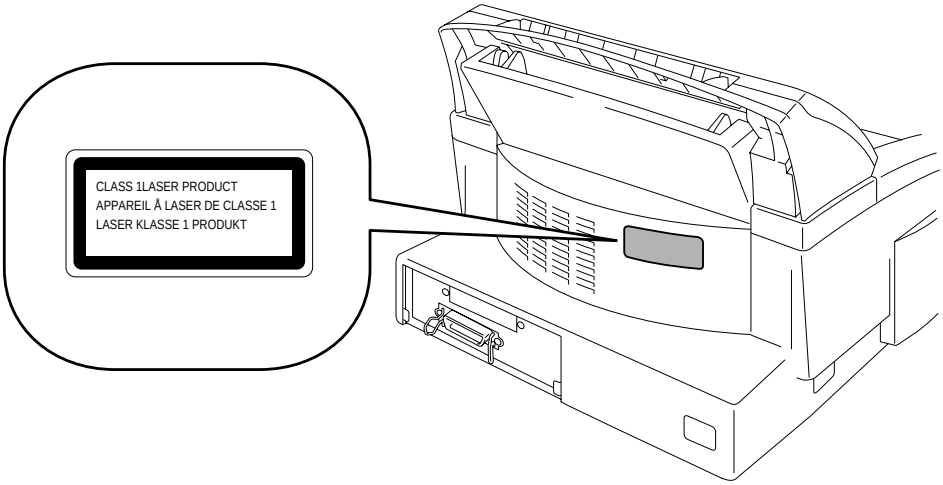
MANUFACTURED : C BROTHER Corporation (Asia) Ltd. Shenzen Buji Nan Ling Factory Gold Garden Ind., Nan Ling Village, Buji, Rong Gang, Shenzhen, CHINA This product complies with FDA radiation performance standards, 21 CFR Subchapter J.

Caution

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

4.3 IEC 825 (220-240V model only)

This printer is a Class 1 laser product as defined in IEC 825 specifications. The label shown below is attached in countries where required.



This printer has a Class 3B Laser Diode which emits invisible laser radiation in the Laser Unit. The Laser Unit should not be opened under any circumstances.

Caution
Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

The following caution label is attached near the laser unit.

For Finland and Sweden
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

Varoitus! Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

Varning – Om apparaten används på annat sätt än i denna Bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

4.4 Additional Information

When servicing or adjusting the optical system of the printer, be careful not to place a screwdriver or other reflective object in the path of the laser beam. Be sure to take off any personal accessories such as watches and rings before working on the printer. A reflected beam, though invisible, can permanently damage the eyes.

4.5 Caution for Laser Product (Warnhinweis für Laserdrucker)

CAUTION: When the machine during servicing is operated with the cover open, the regulations of VBG 93 and the performance instructions for VBG 93 are valid.

CAUTION: In case of any trouble with the laser unit, replace the laser unit itself. To prevent direct exposure to the laser beam, do not try to open the enclosure of the laser unit.

ACHTUNG: Im Falle von Störungen der Lasereinheit muß diese ersetzt werden. Das Gehäuse der Lasereinheit darf nicht geöffnet werden, da sonst Laserstrahlen austreten können.

<Location of the laser beam window>

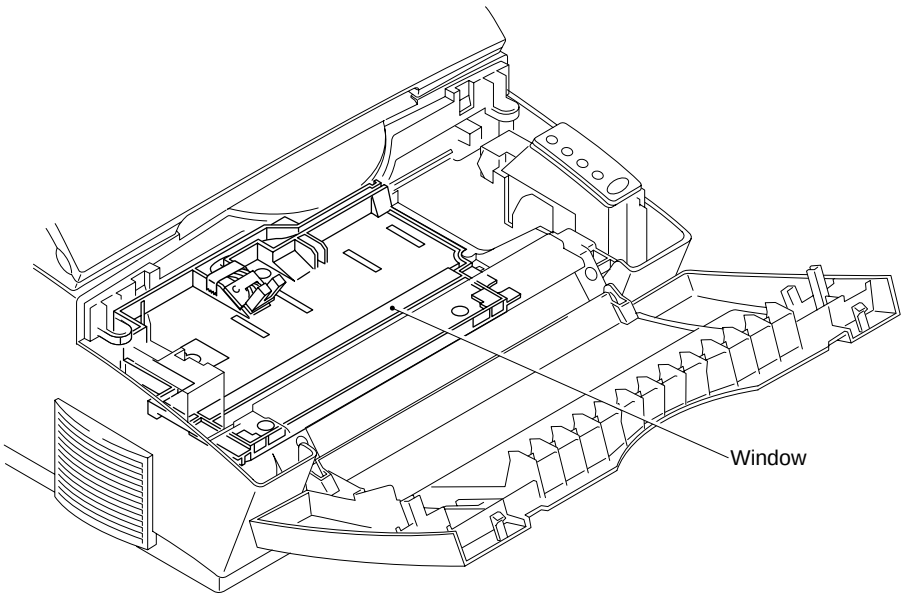


Fig. 1-3

CHAPTER II THEORY OF OPERATION

1. ELECTRONICS

1.1 General Block Diagram

Fig. 2-1 shows a general block diagram of the MFC-P2000 / HL-P2000 printer.

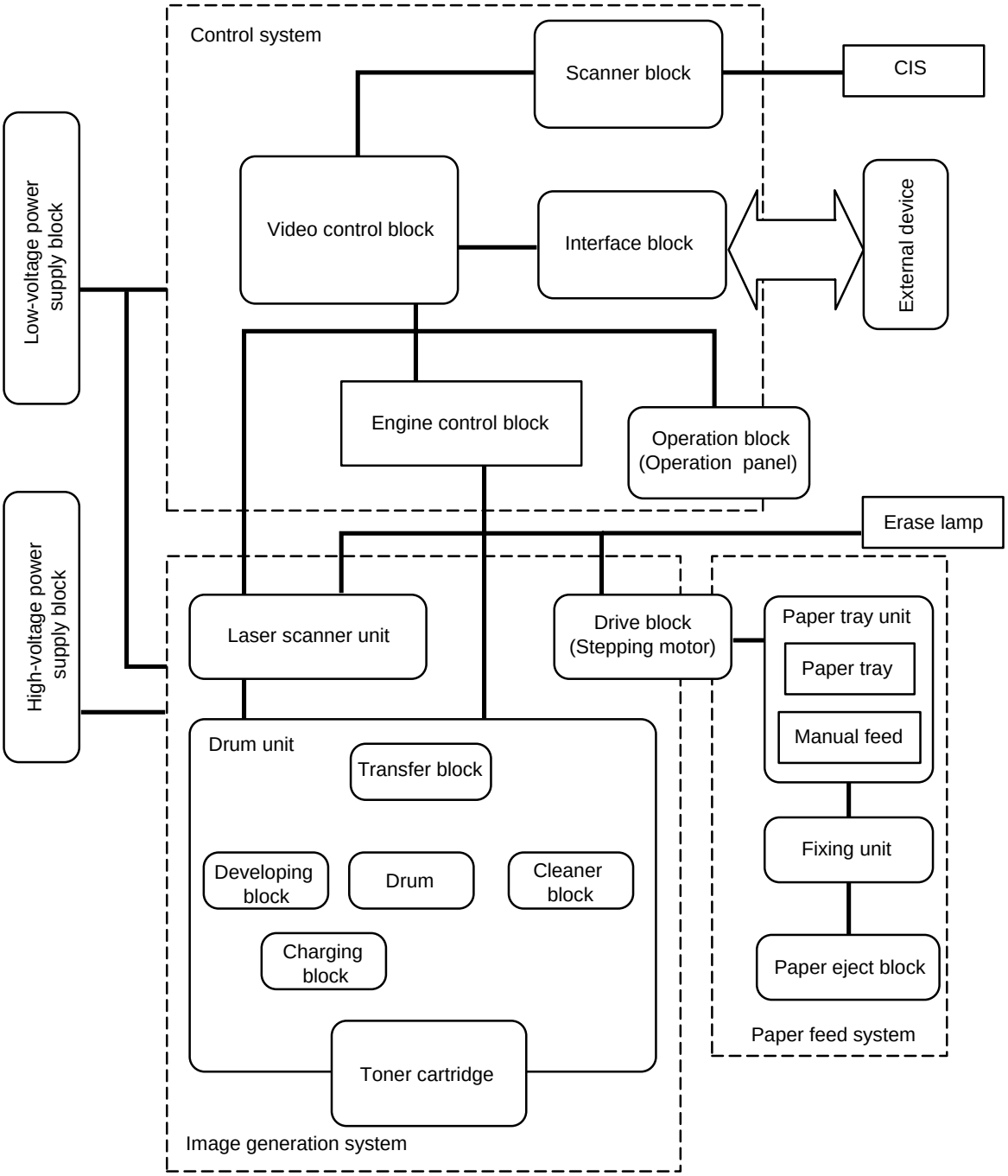


Fig. 2-1

1.2 Main PCB Block Diagram

Fig. 2-2 shows the block diagram of the main PCB.

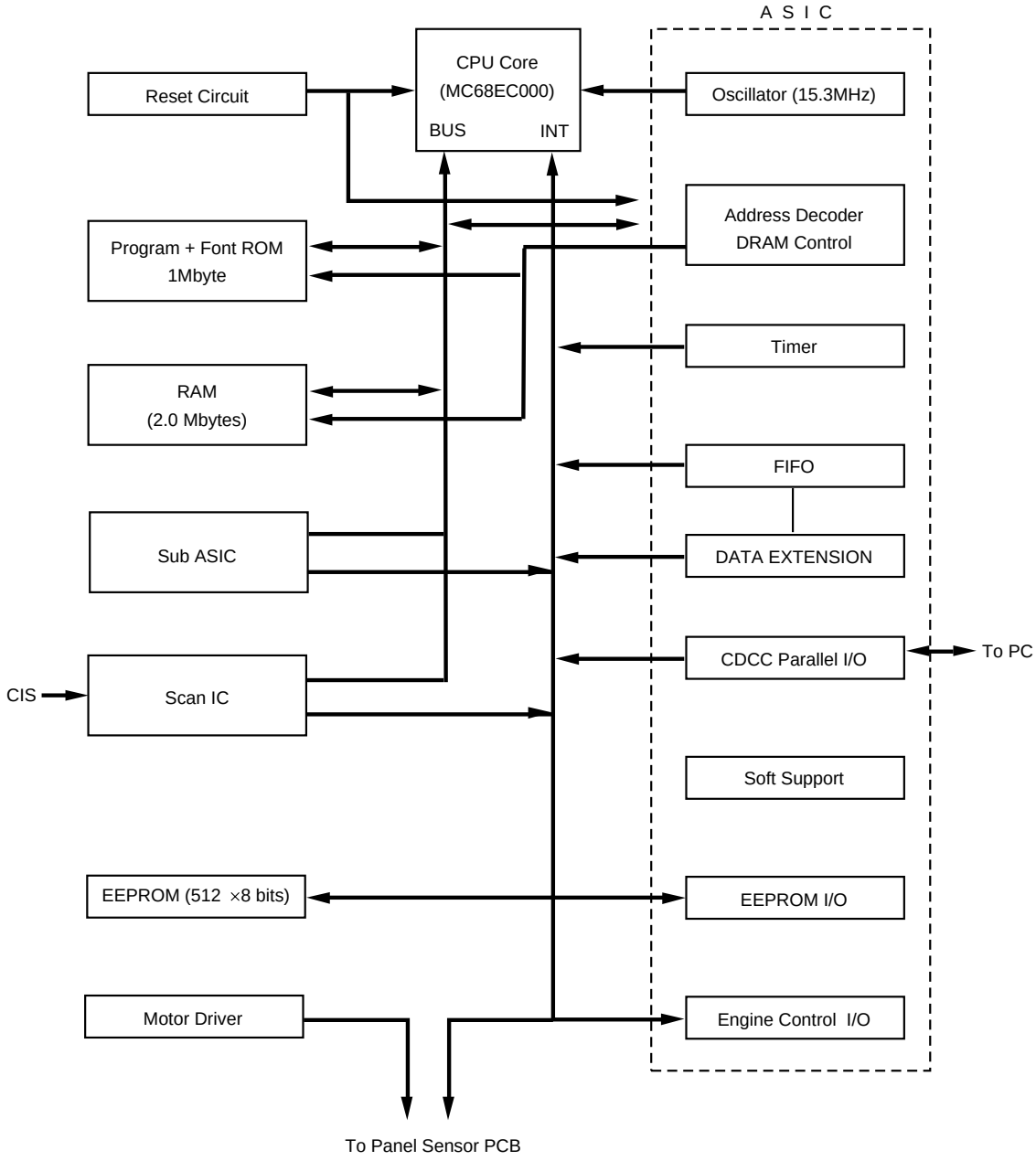


Fig. 2-2

1.3 Main PCB

1.3.1 CPU Core

Fig. 2-3 shows the CPU circuit block on the main PCB.

The CPU is a Motorola MC68EC000FN16 which is driven at a clock frequency of 15.3 MHz. This clock frequency is made by dividing the source clock of 30.67 MHz by two.

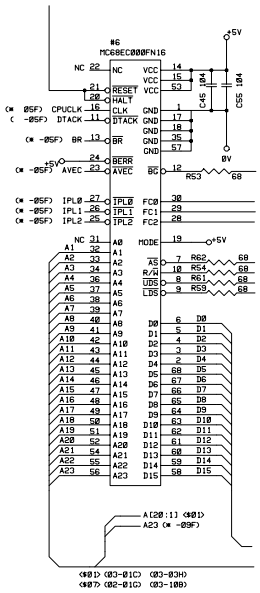


Fig. 2-3

1.3.2 ASIC

The ASIC is composed of a Cell Based IC that contains the following functional blocks.

(1) Oscillator circuit

Generates the main clock for the CPU by dividing the source clock frequency by two.

(2) Address decoder

Generates the CS for each device.

(3) DRAM control

Generates the $\overline{RAS}$, $\overline{CAS}$, $\overline{WE}$, $\overline{OE}$ and MA signals for the DRAM and controls refresh processing (CAS before RAS self-refreshing method).

(4) Interrupt control

Interrupt levels:

Priority	High	7	NMI
		6	FIFO
		5	SCANINT
		4	BD / Timer 1
		3	SCANINT
		2	CDCC / BOISE / DATA EXTENSION
	Low	1	Timer 2

(5) Timers

The following timers are incorporated:

Timer 1	16-bit timer
Timer 2	10-bit timer
Timer 3	Watch-dog timer

(6) FIFO

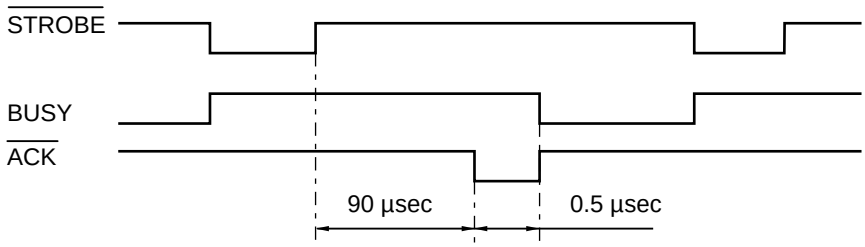
A 5,120-bit FIFO is incorporated. Data for one raster scan is transferred from the RAM to the FIFO by DMA transmission and is output as serial video data. The data cycle rate is 10.22 MHz.

(7) CDCC parallel I/O

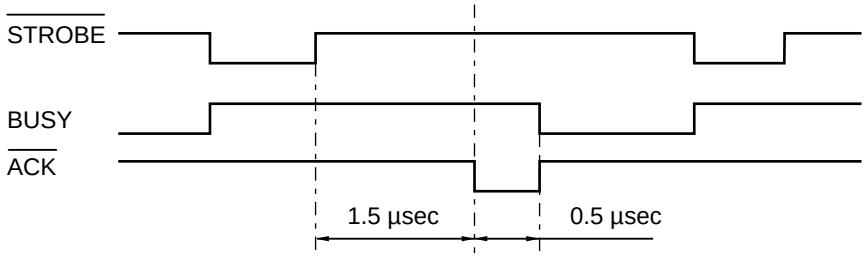
<Data receiving>

There are two modes in this unit. One is the CPU receiving mode and the other is the DMA receiving mode. In the CPU receiving mode the CPU receives the command data from the PC, and after the CPU is switched to the DMA mode, it receives the image data and writes to the DRAM directly.

CPU Receive Mode



DMA Receive Mode



BUSY goes HIGH at the falling edge of STROBE. The data (8 bits) from the PC is latched in the data buffer at the rising edge of STROBE. The pulse width of ACK differs according to the speed MODE as shown above. BUSY goes LOW at the rising edge of ACK.

<IEEE1284 support>

This supports the IEEE1284 data transfer with the following modes.

Nibble mode
Byte mode

(8) Data expansion

This circuit expands the compressed image data received from the PC, and writes the bit map data to the FIFO.

(9) Software support

Supports 16 x 16 rotation, bit expansion and bit search.

(10) EEPROM I/O

One output port and one I/O port are assigned.

(11) Engine control I/O

This I/O is used for the connection to the panel sensor PCB. It controls the main motor, solenoid, sensors, etc.

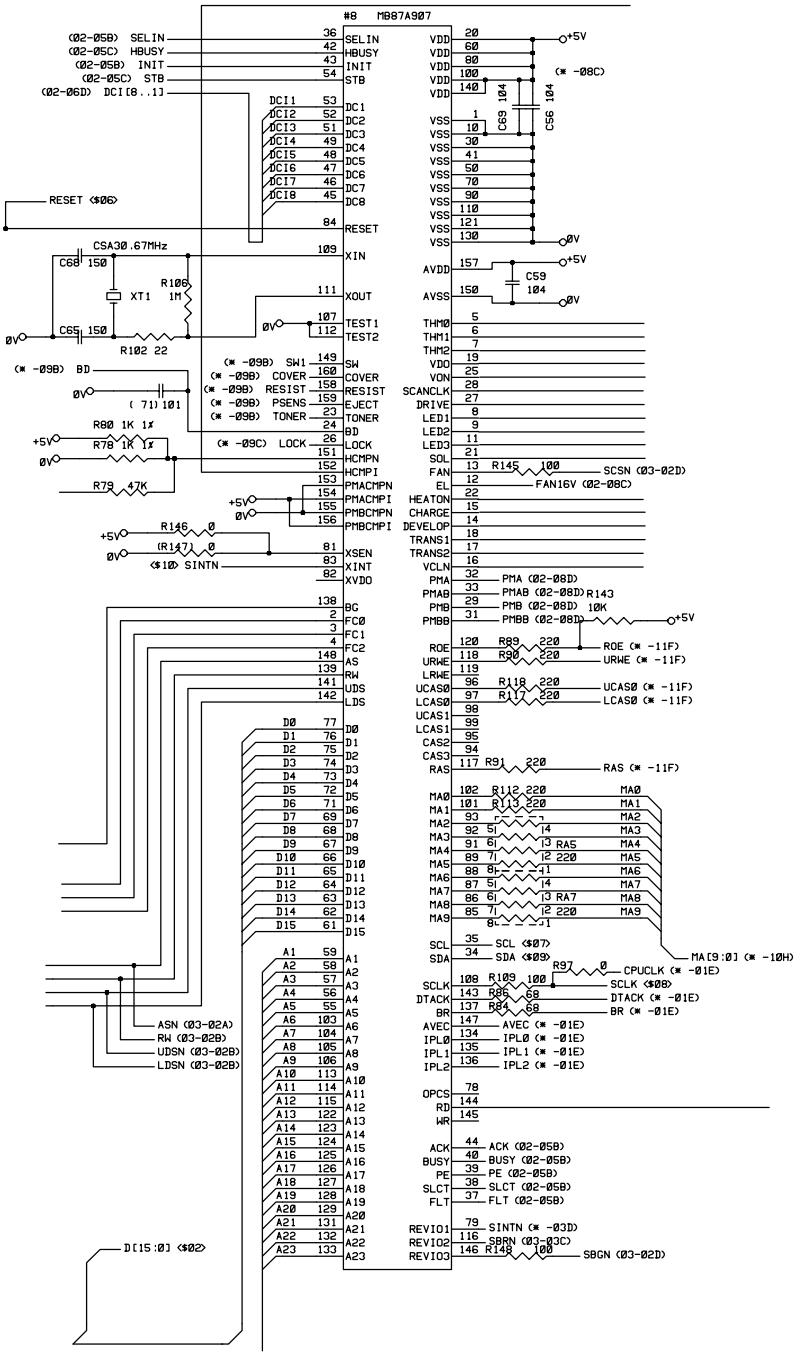


Fig. 2-4

1.3.3 ROM

A program file of 1 Mbyte and the font data are stored in the ROM.

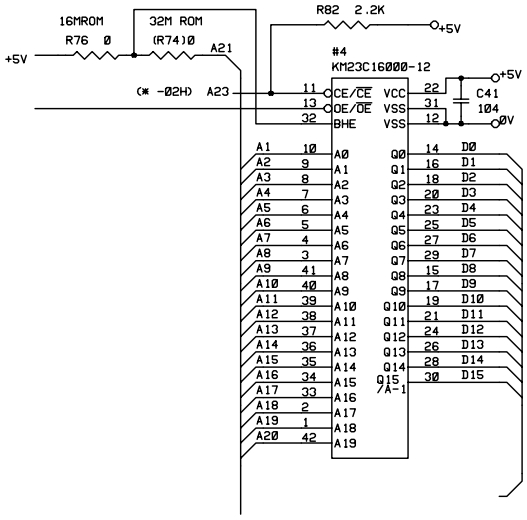


Fig. 2-5

1.3.4 DRAM

A 16M-bit DRAM (x 16 bits) is used as the RAM.

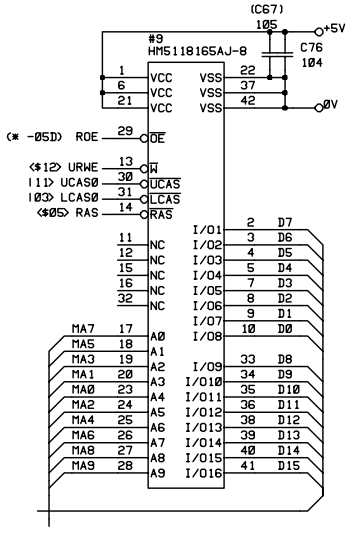


Fig. 2-6

1.3.5 EEPROM

The EEPROM is an X24C04 type of two-wire method with a 512 x 8 bits configuration.

M62320FP is an IC which transfers the data received from the serial I/O to the parallel I/O.

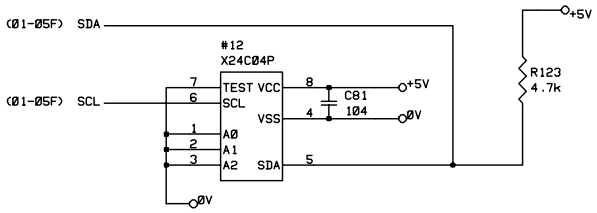


Fig. 2-7

1.3.6 Reset Circuit

The reset IC is a PST598DNR. The reset voltage is 4.2V (typ.) and the LOW period of reset is 200ms (typ.).

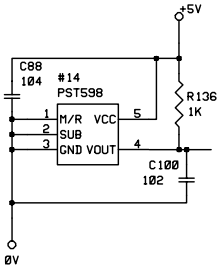


Fig. 2-8

1.3.7 CDCC I/O

Fig. 2-9 shows the CDCC interface circuit.

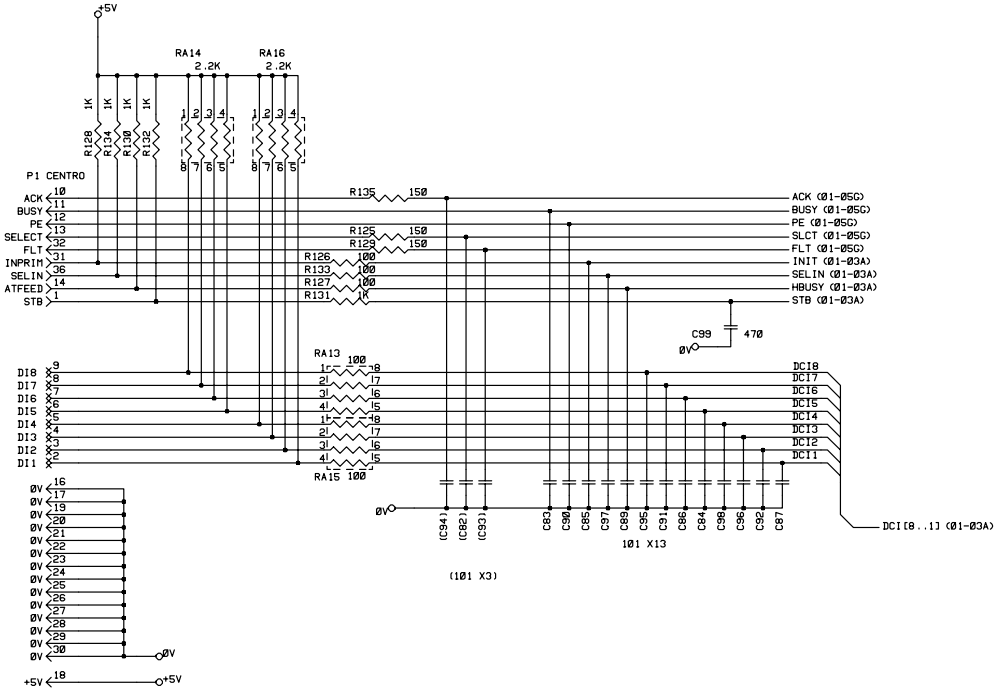


Fig. 2-9

1.3.8 Engine I/O

Fig. 2-10 shows the engine interface circuit.

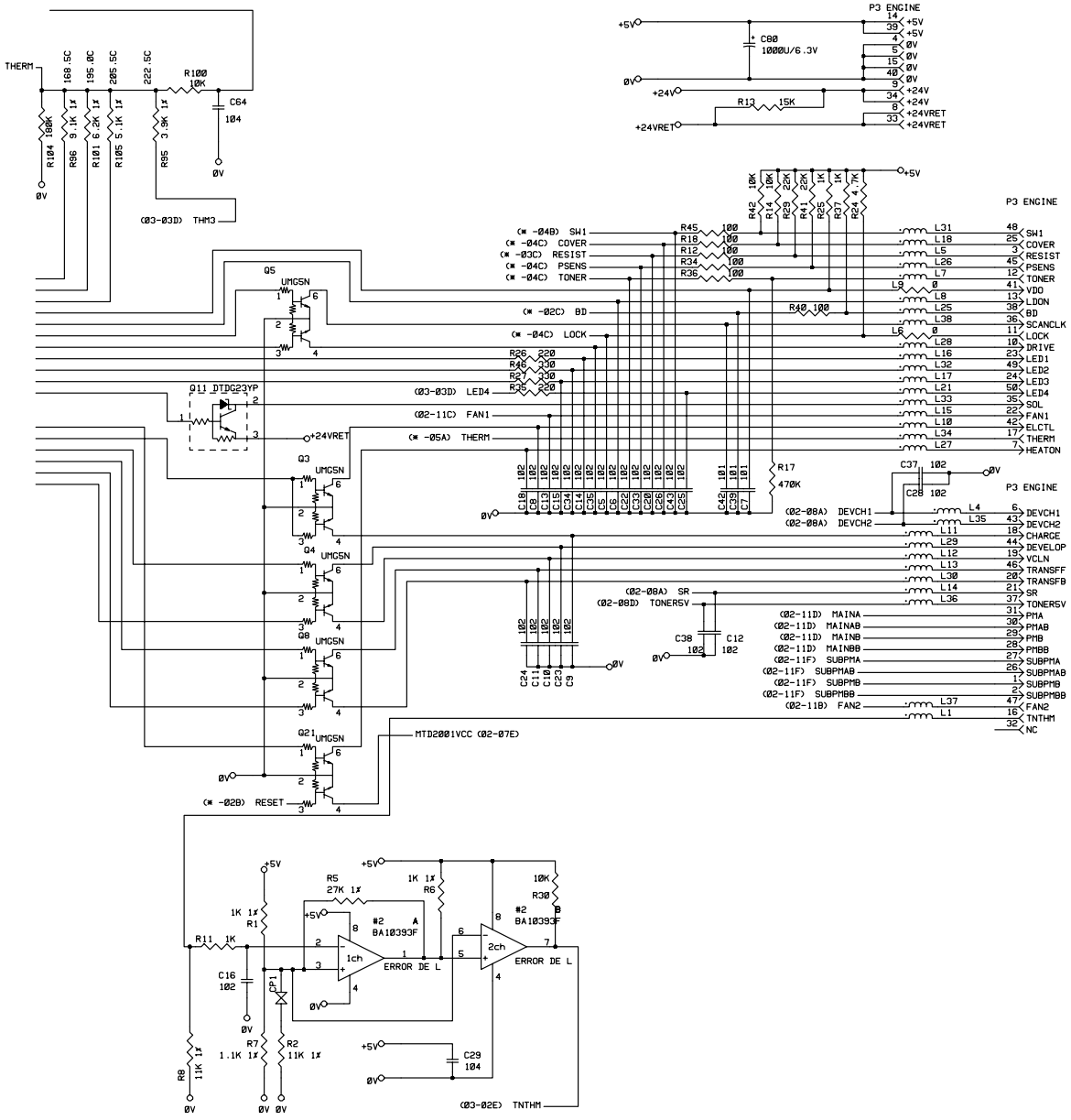


Fig. 2-10

1.3.9 Paper Feed Motor Drive Circuit

The paper feed motor driver is a TR array. The excitation method is 2-2 phase excitation with a bipolar drive.

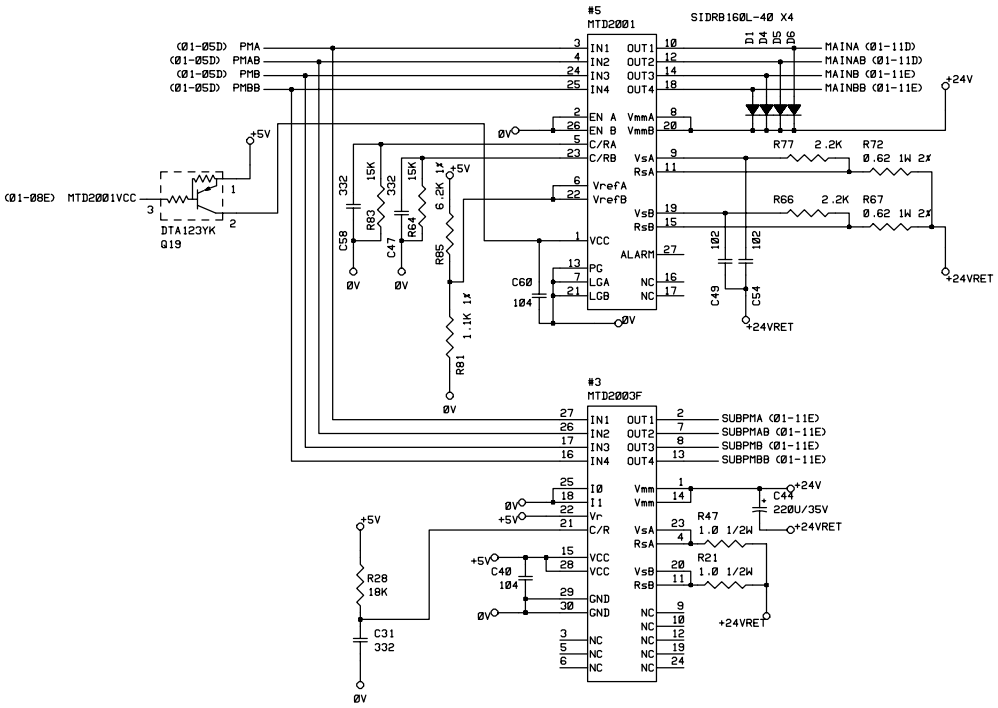


Fig. 2-11

1.3.10 Document Scanner Circuit

The image processing LSI, SANYO LC82103 transfers the analog signal from the CIS into a digital signal. The gate array, NEC μPD65646 stores the digital signal in DRAM with DMA (direct memory access).

The document scanner circuit also provides the motor drive pulse generating circuit, PWM (pulse width modulation) circuit for CIS current adjustment and general purpose I/O.

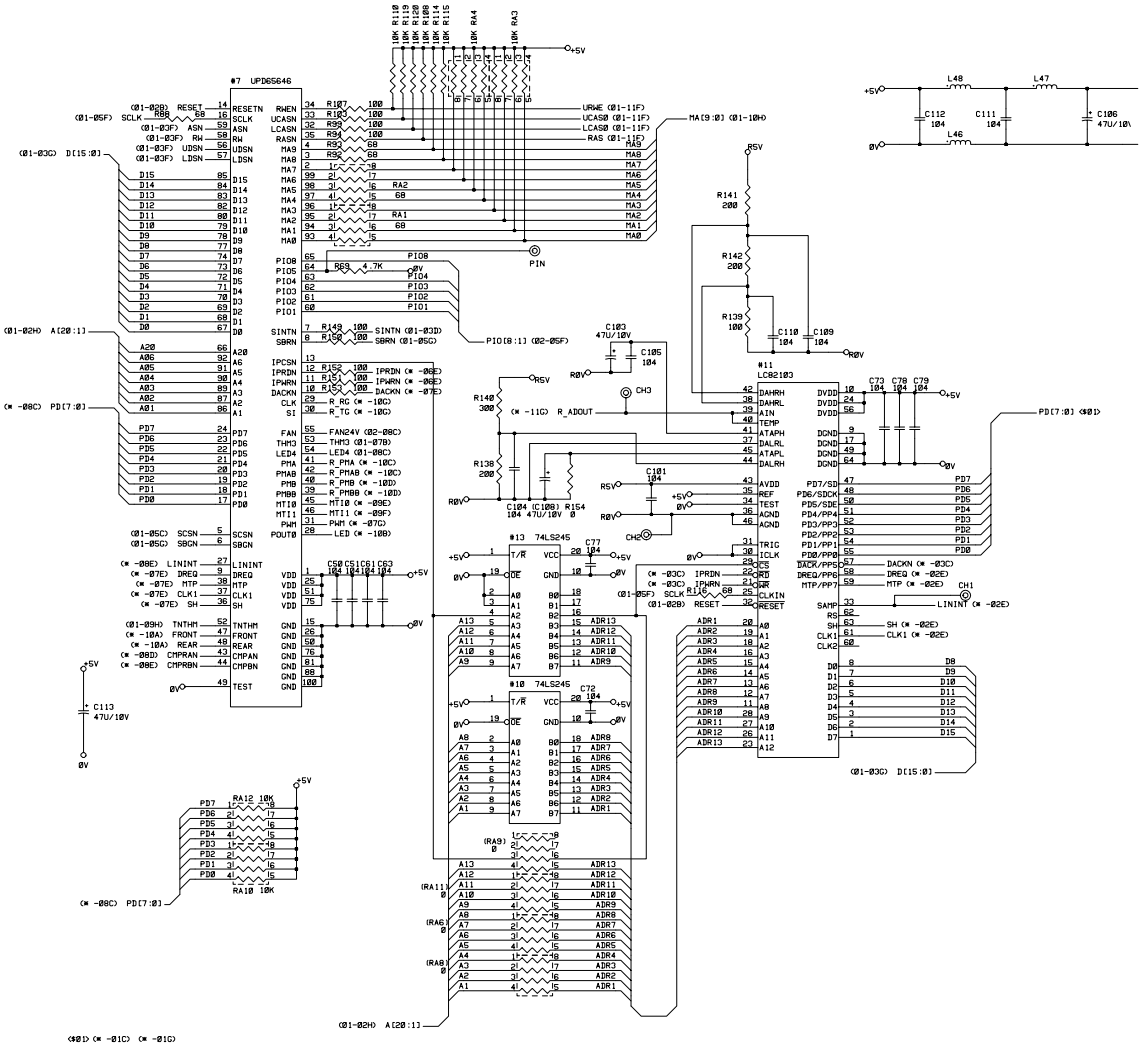


Fig. 2-12

1.3.11 Scanner Panel I/F

The scanner panel interface is a serial interface. The front sensor and rear sensor are directly connected to the NEC μPD65646.

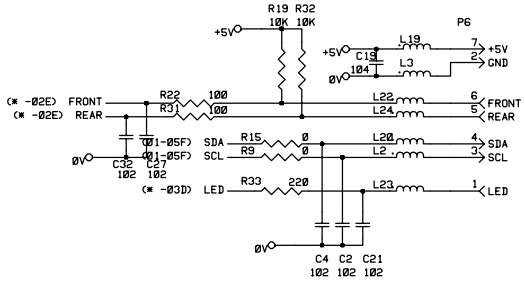


Fig. 2-13

1.3.12 Scanner Motor Drive Circuit

The scanner motor is controlled by unipolar constant current control. The combination of the current flow and the phase excitation method is changed by the scanner motor speed.

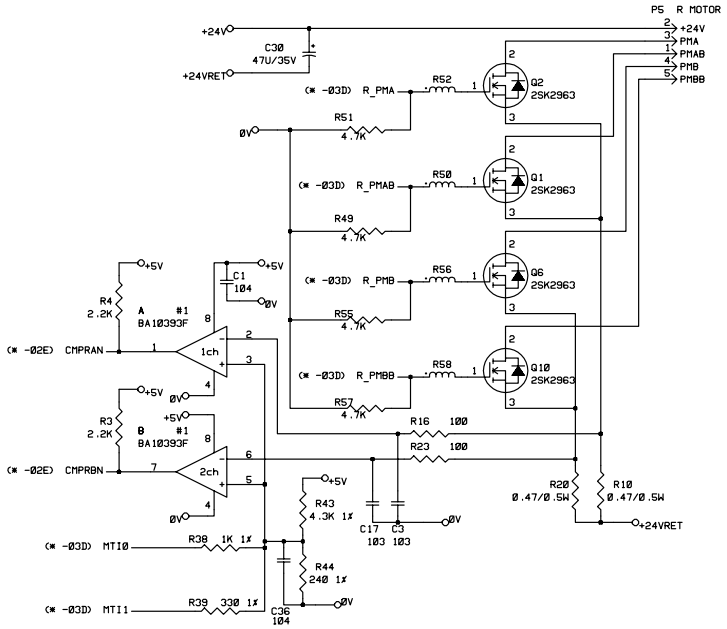


Fig. 2-14

1.3.13 CIS Drive Circuit

The current to the CIS LED is controlled by PWM. The analog signal from the CIS is input into the LC82103.

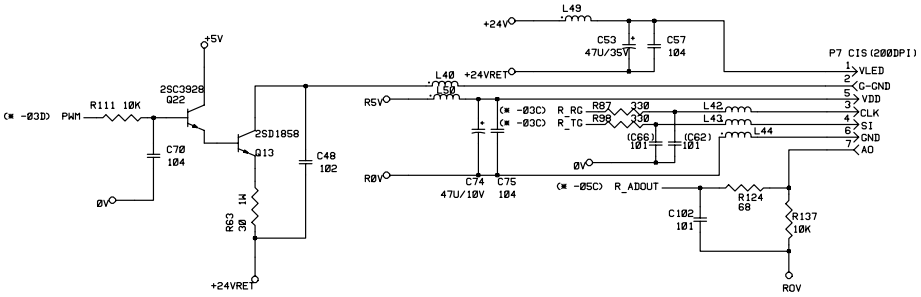


Fig. 2-15

1.4 Panel Sensor PCB

The following parts are on the printer panel sensor PCB.

- Control panel .....1 switch, 4 lamps
- Connector .....low-voltage, high-voltage, solenoid, main motor, toner sensor, laser, polygon motor, connector for main PCB
- Registration sensor

1.5 Scanner Sensor PCB / Scanner Panel PCB

The following parts are on the scanner sensor PCB and scanner panel PCB.

- Control panel .....4 keys, 5 lamps, 1 seven-segment LED
- Document front sensor
- Document rear sensor

1.6 Power Supply

1.6.1 Low-voltage Power Supply

The low-voltage power supply uses a switching regulation system to generate the regulated DC power (+5V and +24V), which are converted from the AC line.

The regulated output and the production code of each power supply are listed below;

Regulated Output	Production Code
+5V / 1.2A +24V / 2.0A	100V: MPW1550 200V: MPW1450

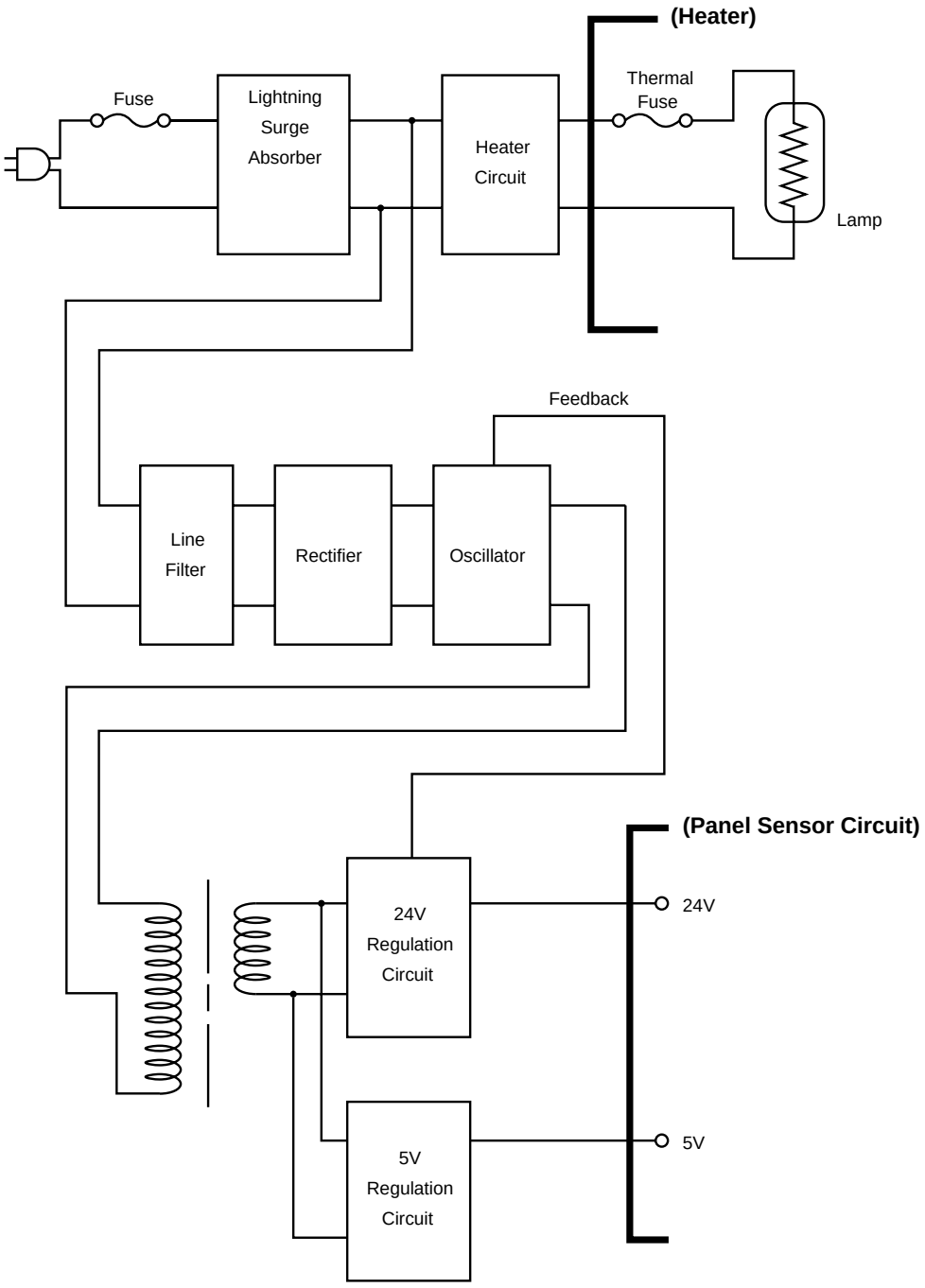


Fig. 2-16

1.6.2 High-voltage Power Supply

The high-voltage power supply generates and outputs the voltages and currents for the charging, development and transfer functions.

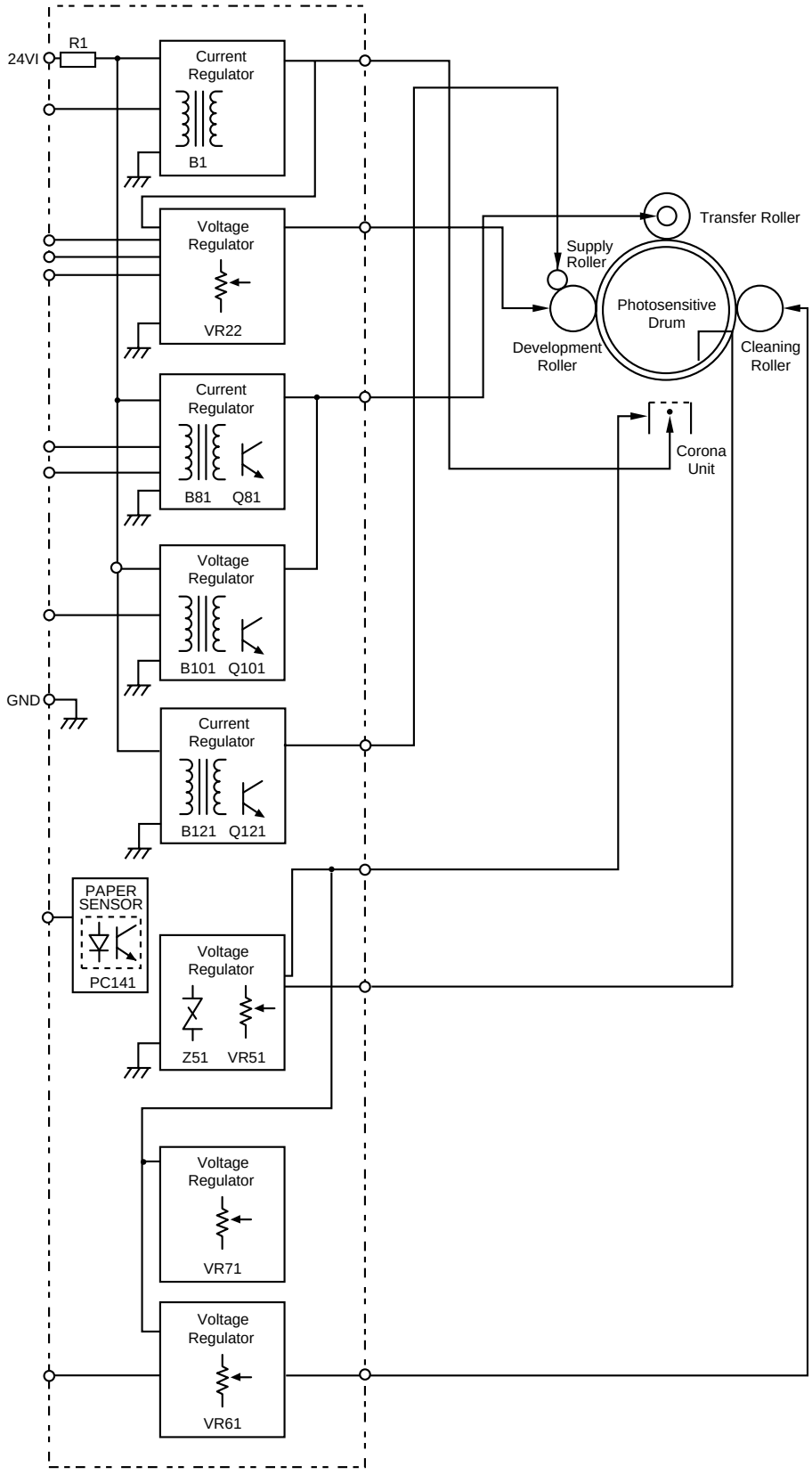


Fig. 2-17

2. MECHANICS

2.1 General Overview of Mechanism

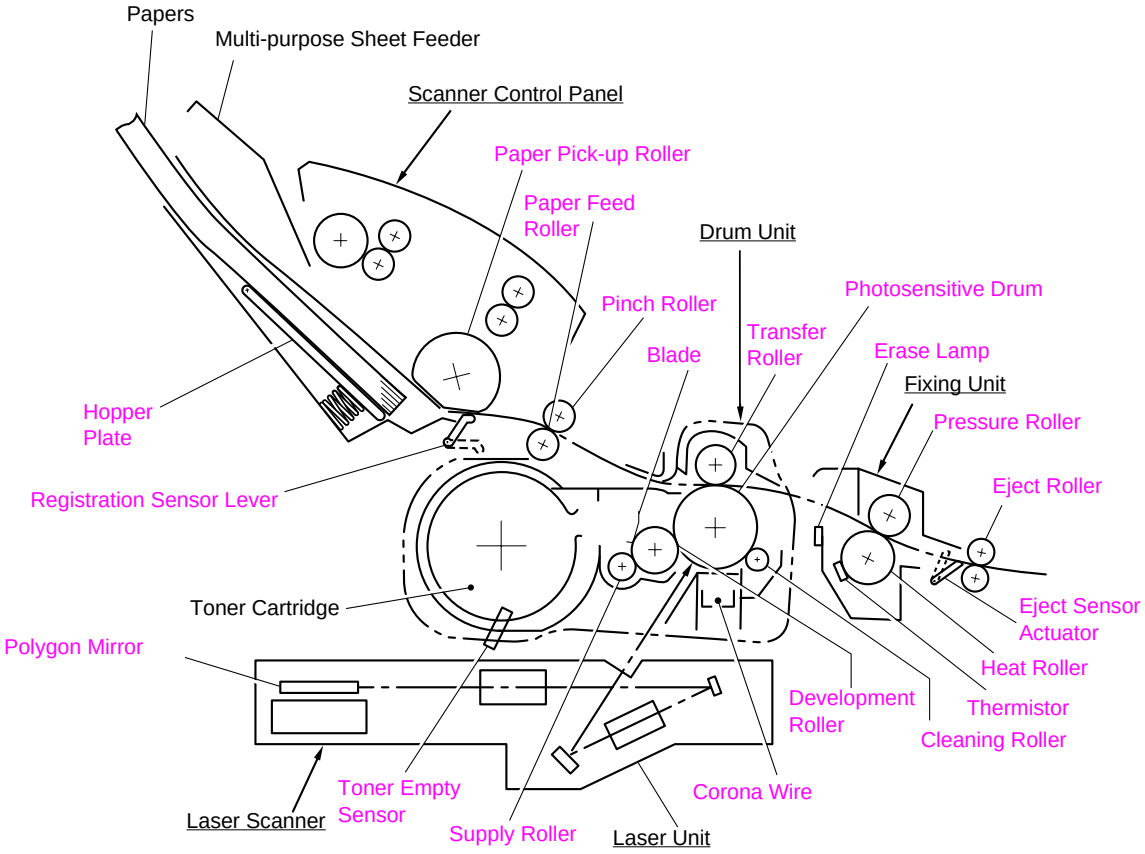


Fig. 2-18

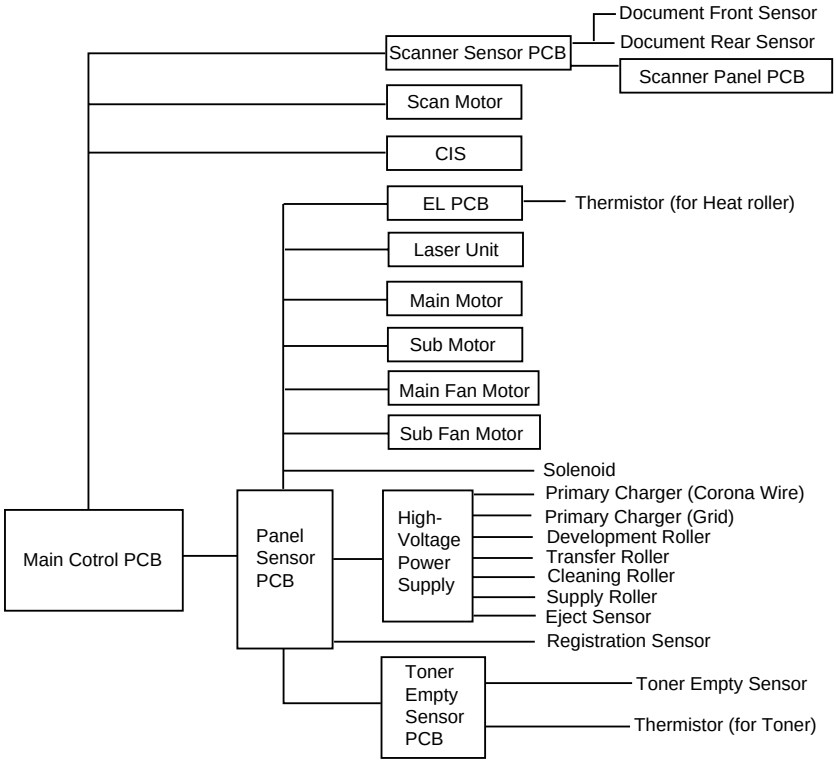


Fig. 2-19

2.2 Printer Mechanism

2.2.1 Paper Transfer

1) Paper Supply

The paper pick-up roller picks up one sheet of paper from the paper feeder every time it is rotated and feeds it to the paper feed roller.

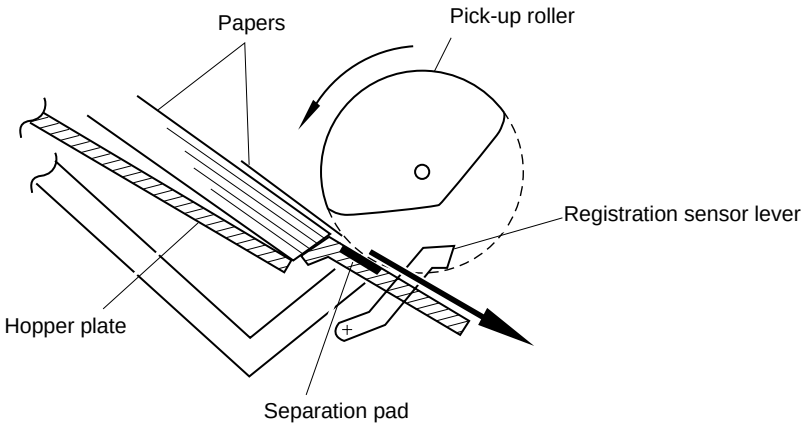


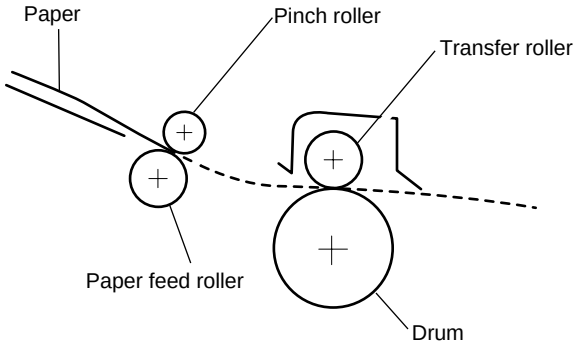
Fig. 2-20

The paper is gripped between the pick-up roller and the separation pad and separated into individual sheets.

The pick-up roller is directly connected to the sector gear, whose rotation is forcibly stopped by the gear stopper. When the pick-up solenoid is activated, the clutch mechanism is engaged by the solenoid action and the sector gear is driven; when it has completed one full turn its rotation is stopped again by the gear stopper. The paper drawn out by the pick-up roller pushes against the top of form sensor lever and the paper top position/absence of paper is detected by sensing the motion of the lever.

2) Paper Registration

When paper picked up from the multi-purpose sheet feeder pushes against the top of form sensor actuator, the registration sensor lever is caused to turn, and the photo sensor detects this motion. When this signal from the sensor is detected the paper feed roller is stopped temporarily by the clutch. The paper is fed to the nip point between the paper feed roller and the pinch roller in the multi-purpose sheet feeder, and the skew of the paper is corrected by pushing the leading edge of the paper against the nip point. When the paper feed roller starts to be rotated again when it is released by the clutch, paper, with the leading edge correctly aligned, is fed by the paper feed roller and is transported to the transfer roller.



Clutch mechanism (engaged/released by the solenoid assembly)
Released when the solenoid is ON and engaged when the solenoid is OFF.

Fig. 2-21

3) Paper Eject

The completion of paper eject is detected in the following manner:

(a) When the leading edge of the paper pushes down the eject sensor actuator located in the fixing unit, the photo sensor (photo interrupter) is opened and detects the start of paper eject.

(b) When the trailing edge of the paper has passed through the paper eject sensor actuator, the photo sensor is closed and the completion of paper eject is recognized.

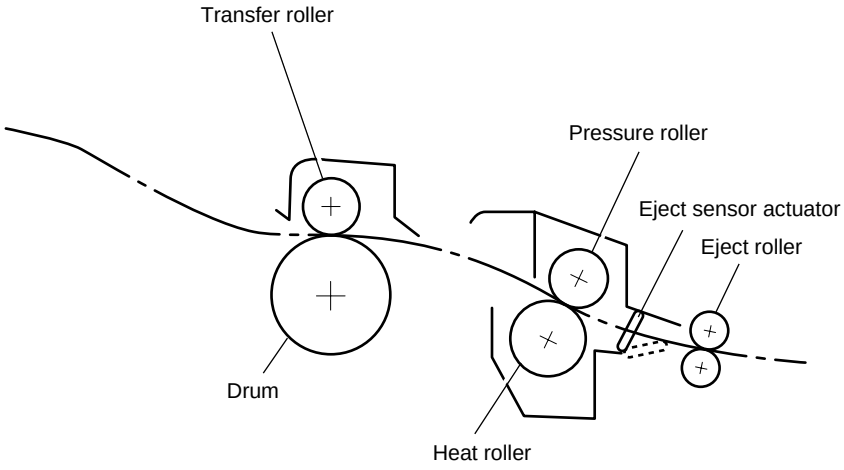


Fig. 2-22

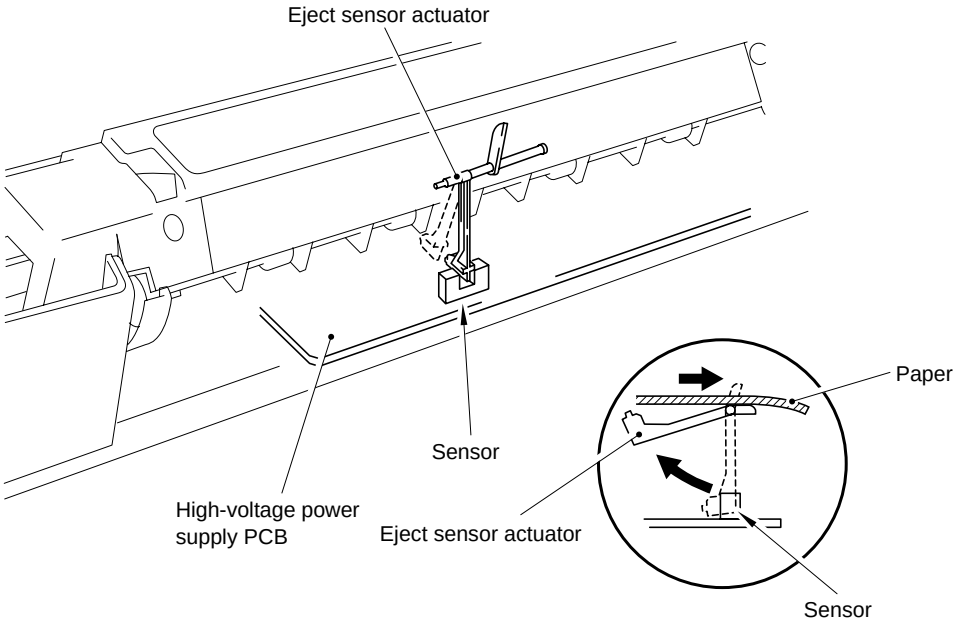


Fig. 2-23

2.2.2 Sensors

1) Cover Sensor

Detects opening and closing of the top cover.

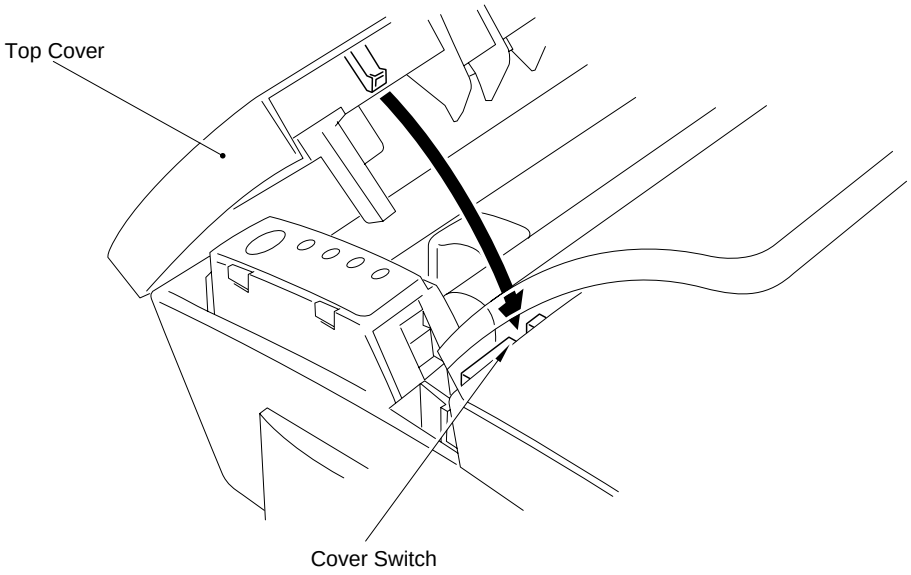


Fig. 2-24

2) Toner Empty Sensor

Detects if there is toner in the toner cartridge. It also detects whether or not the drum unit is installed. (The toner cartridge is installed in the drum unit).

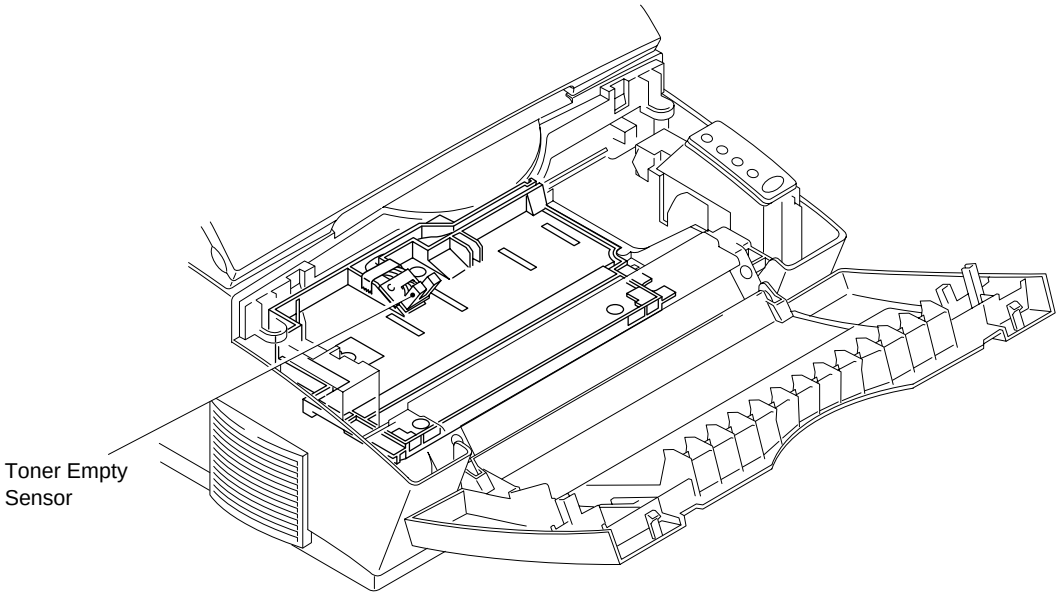


Fig. 2-25

2.2.3 Drum Unit

1) Photosensitive Drum

Generates the latent electrostatic image and develops the image on the drum surface.

2) Primary Charger

Forms a uniform charge on the drum surface.

(a) Corona wire

Generates the ion charge on the drum.

(b) Grid

Spreads the ion charge evenly over the drum surface.

3) Development Roller

Develops the latent electrostatic image on the drum surface by the addition of the toner.

4) Transfer Roller

Transfers the toner image to the paper from the drum surface.

5) Cleaning Roller

Removes and recycles the toner remaining on the drum surface.

6) Erase Lamp

Discharges the electrostatic latent image on the drum.

2.2.4 Print Process

1) Charging

The drum is charged to approx. +1150V by an ion charge which is generated by the primary charger. The charge is generated by ionization of the corona wire, which has a DC bias from the high-voltage power supply applied to it. The flow of the ion charge is controlled by the grid to ensure it is distributed evenly on the drum surface. The drum sleeve is regulated to approx. 280V by the voltage regulator.

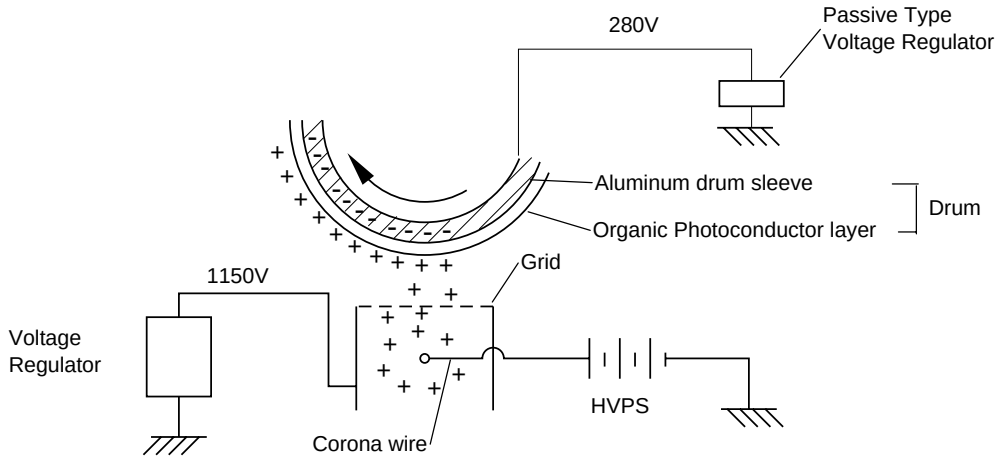


Fig. 2-26

The primary charge uses a corona wire, but since the drum is positively charged, only less than 1/10 of the usual quantity of ozone is generated compared with the negatively charged drum. The level of ozone expelled from the printer is therefore not harmful to the human body. Applicable safety standards have been complied with.

2) Exposure Stage

After the drum is positively charged, it is exposed to the light emitted from the laser unit.

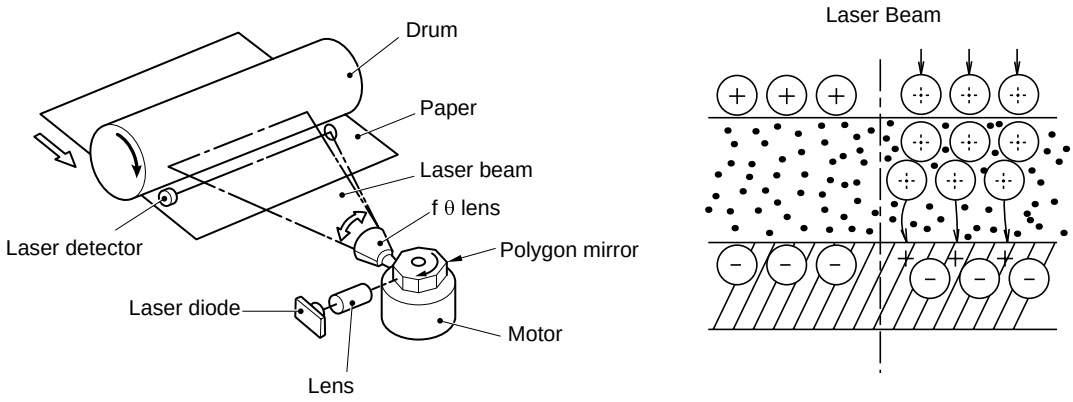
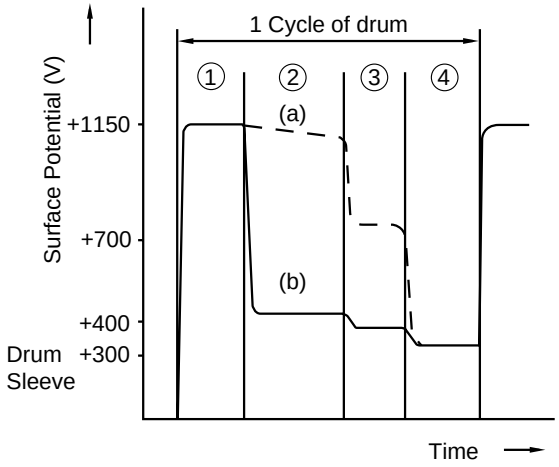


Fig. 2-27

The area exposed to the laser beam is the image to be printed. The surface potential of the exposed area is reduced, forming the electrostatic image to be printed.



① Primary charging

② Laser beam exposure and developing
(a) Unexposed area
(Non image area)
(b) Exposed area
(Image area)

③ Transfer the image to paper

④ Erase the residual potential

Fig. 2-28

3) Developing

Developing causes the toner to be attracted to the electrostatic image on the drum so as to transform it into a visible image.

The developer consists of a non-magnetic toner. The development roller is made of conductive rubber and the supply roller (which is also made of conductive sponge) rotate against each other. The toner is charged and carried from the supply roller to the development roller. The toner adheres to the development roller and is conveyed to the drum at an even thickness controlled by the blade. The toner is nipped between the development roller and the drum and developed onto the latent image on the drum. The electrostatic field between the drum and the development roller, which is DC-biased from the high-voltage power supply, creates the electrostatic potential to attract toner particles from the development roller to the latent image area on the drum surface.

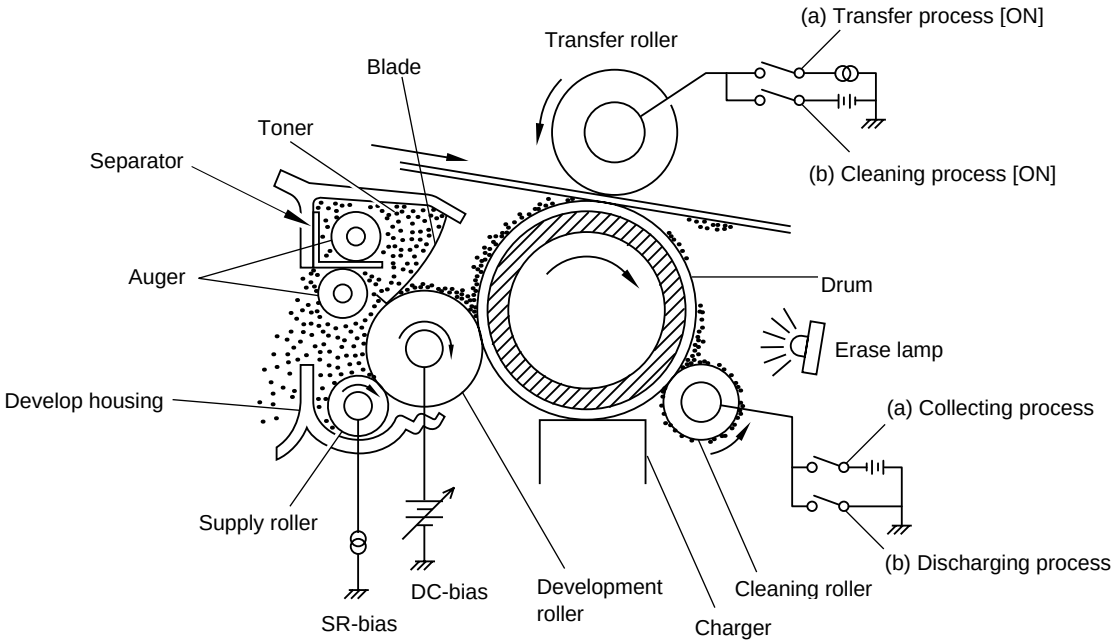


Fig. 2-29

4) Transfer

(a) Transfer process

After the drum has been charged and exposed, and has received a developed image, the toner image formed on the drum is transferred onto the paper by applying a negative charge to the back of the paper. The negative charge applied to the paper causes the positively charged toner to leave the drum and adhere to the paper. As a result, the image is visible on the paper.

(b) Cleaning process of transfer roller

If the toner is not transferred onto the paper perfectly, it is possible that there may be residual toner on the drum which will adhere to the transfer roller. The transfer voltage changes to a positive voltage during non-printing rotation of the drum. Therefore the transfer roller is cleaned by returning the positively charged toner adhering to the transfer roller onto the photo-conductive drum.

5) Drum Cleaning Stage

In the image transfer stage, not all the toner on the photosensitive drum is transferred onto the paper but some remains on the drum. In the drum cleaning stage, the drum surface is cleaned by the cleaning roller, so that residual toner on the drum surface is removed and collected on the cleaning roller itself. The residual toner on the cleaning roller will be discharged to the drum during starting or non-printing time. The toner will be collected by the developing roller and reused (for further developing).

6) Erasing Stage

Before the cleaning stage, the drum surface is exposed to the light emitted from the erase lamp (LED lamp). This stage prepares the drum by decreasing its surface voltage uniformly, ready to receive a uniform charge in the primary charging stage.

7) Fixing Stage

The image transferred to the paper by static electricity is fixed by heat and pressure when passing through the heat roller and the pressure roller in the fixing unit. The thermistor ASSY keeps the surface temperature of the heat roller constant by detecting the surface temperature of the heat roller and turning on or off the halogen heater lamp.

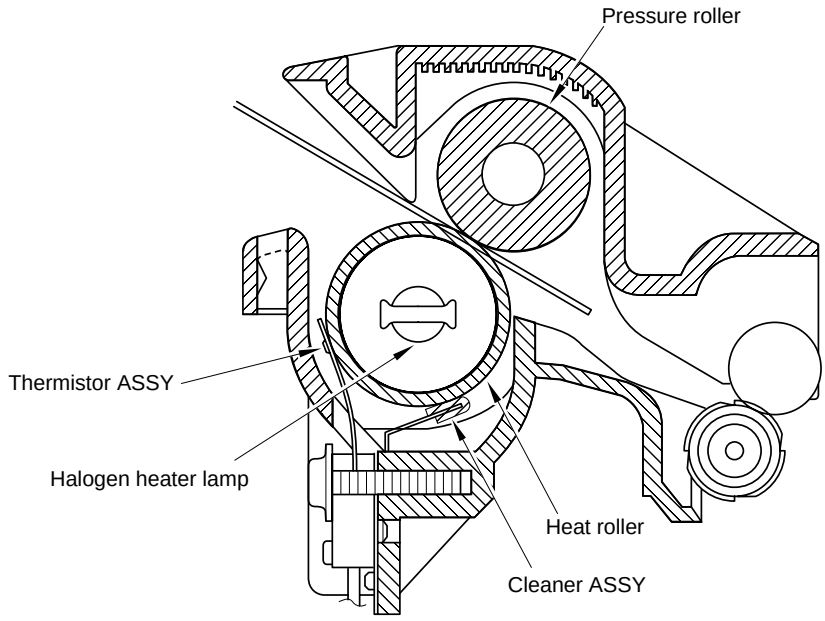


Fig. 2-30

2.3 Scanner Mechanism

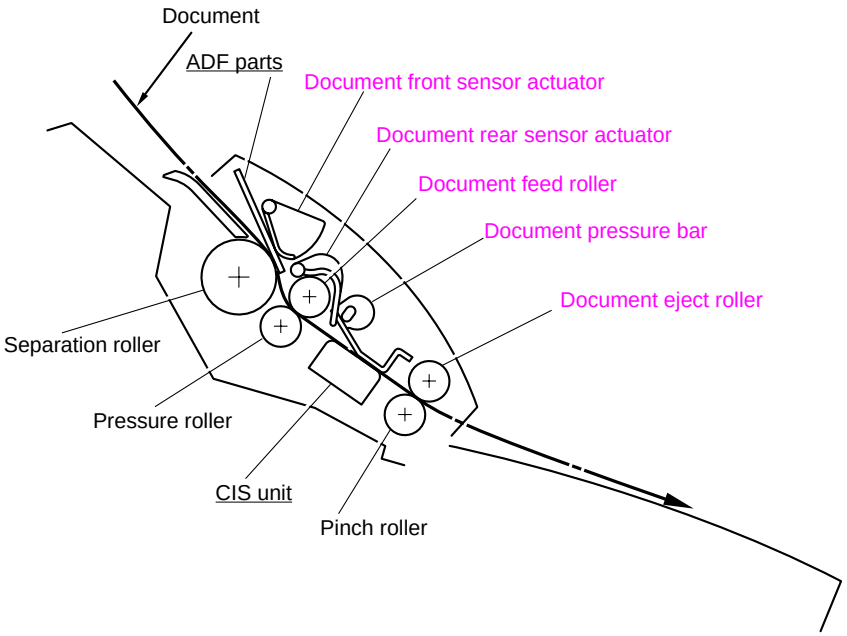


Fig. 2-31

2.3.1 Document Transfer (Feed and Eject)

This mechanism consists of the document stacker, automatic document feeder (ADF), document eject roller ASSY and two document sensors (document front sensor, document rear sensor).

If documents are set face down on the document stacker to start the scanning operation, the document front sensor detects the document, then the scanner motor rotates so that the ADF (which consists of the separation roller and ADF parts) feeds those documents into the equipment, starting from the bottom sheet to the top, page by page. Each document is advanced by the document feed roller ASSY to the scanner, and it is fed out of the equipment with the document eject roller ASSY. The document rear sensor detects that the document is fed out without any paper jam.

2.3.2 Scanner

The scanner uses a contact image sensor (CIS) unit which consists of an LED array to illuminate the document, a self-focus lens array to collect the reflected light, a CIS to carry out photoelectric conversion to output picture element data and a cover glass on which the document advances. When the document passes between the document pressure bar and the cover glass, it is scanned.

CHAPTER III DISASSEMBLY AND REASSEMBLY

1. SAFETY PRECAUTIONS

To avoid creating secondary problems by mishandling, be careful to follow the following precautions during maintenance work.

(1) Always turn off the power switch and unplug the power cord from the power outlet before accessing any parts inside the printer.

(2) Be careful not to lose screws, washers or other parts removed.

(3) Be sure to apply grease to the gears and applicable positions specified in this chapter.

(4) When using soldering irons or other heat-generating tools, take care not to accidentally damage parts such as wires, PCBs and covers.

(5) Before handling any PCBs, touch a metal portion of the equipment to discharge any static electricity charge on your body, or the electronic parts or components may be damaged.

(6) When transporting PCBs, be sure to wrap them in the correct protective packaging.

(7) Be sure to replace self-tapping screws correctly, if removed. Unless otherwise specified, tighten screws to the following torque values.

TAPTITE, BIND or CUP B
- M3x6: 4kgf • cm
- M3x8: 7kgf • cm
- M4 : 9kgf • cm

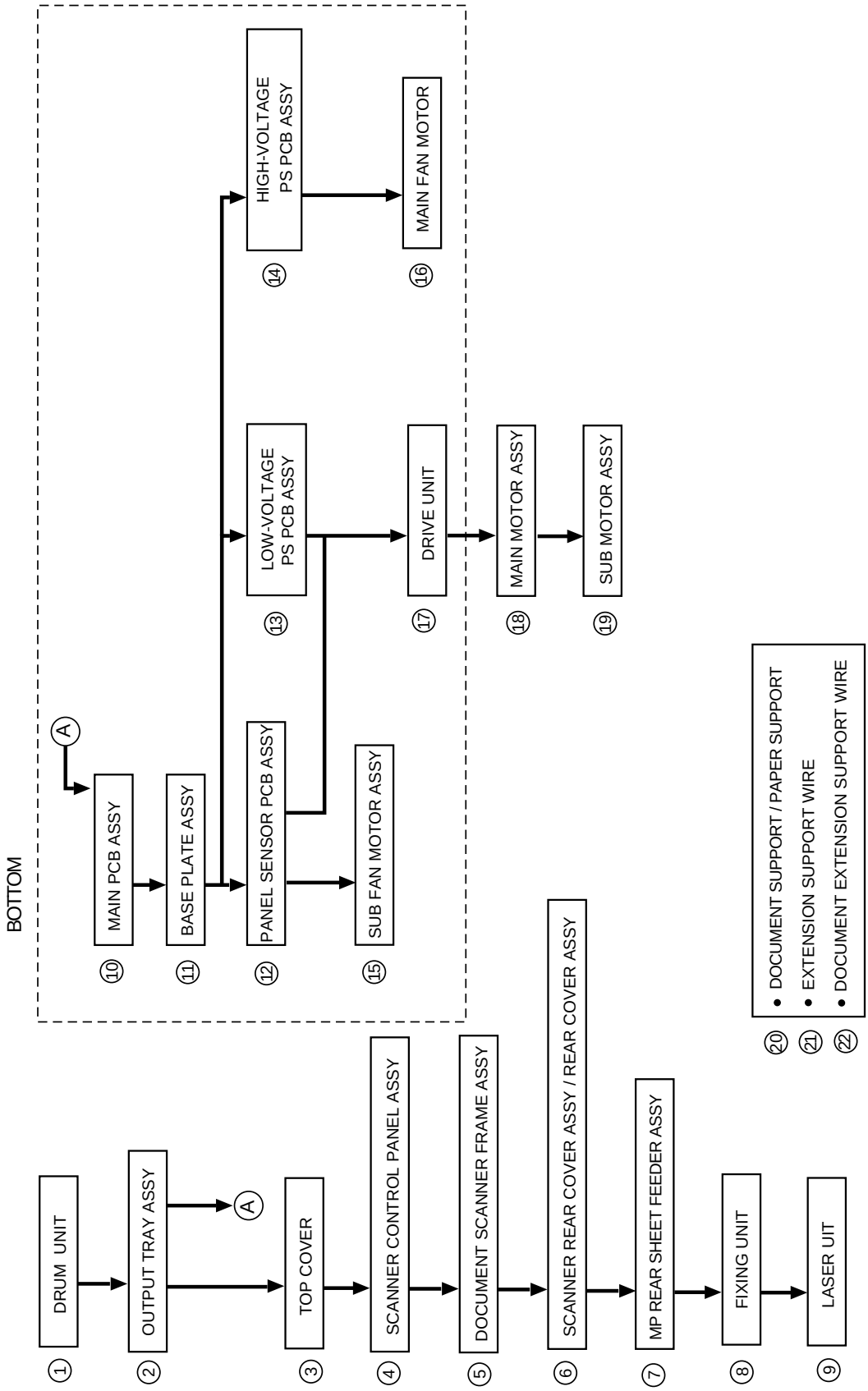
TAPTITE, CUP S
- M3 : 8kgf • cm

SCREW
- M3 : 7kgf • cm
- M4 : 8kgf • cm

(8) When connecting or disconnecting cable connectors, hold the connector body, not the cables. If the connector has a lock, release the connector lock first to release it.

(9) After a repair, check not only the repaired portion but also all connectors. Also check that other related portions are functioning properly before operational checks.

2. DISASSEMBLY FLOW



3. DISASSEMBLY PROCEDURE

3.1 Drum Unit

(1) Open the top cover.

(2) Lift out the drum unit.

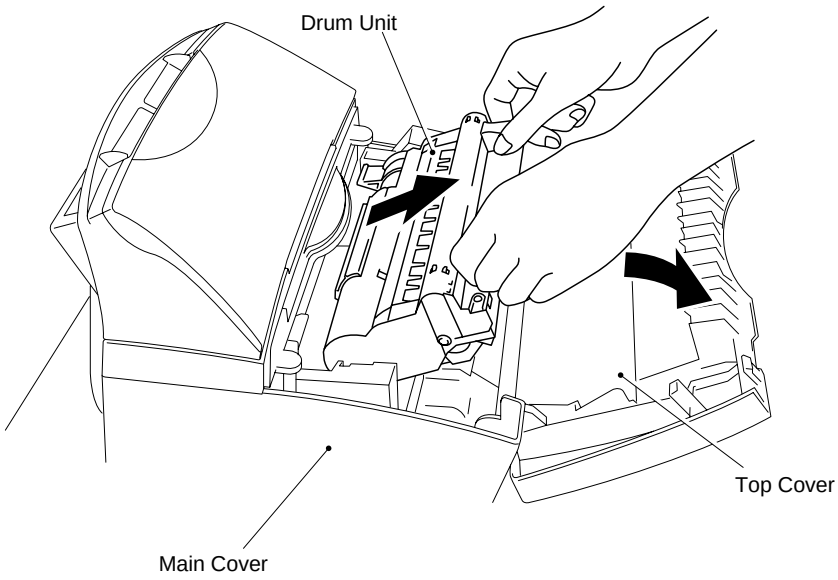


Fig. 3-1

3.2 Output Tray ASSY

(1) Open the output tray toward you.

(2) Press the hinges at the left and right sides of the output tray inwards to release the output tray from the main cover.

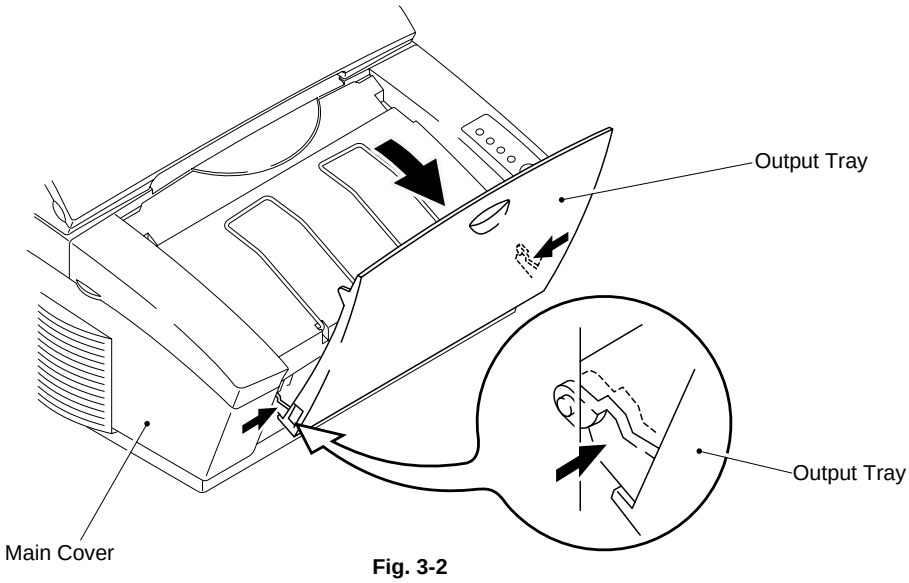


Fig. 3-2

3.3 Top Cover

(1) Open the top cover.

(2) Press the hinges at the left and right sides of the top cover inwards to release the top cover from the main cover.

Note:
It is recommended for easy removal to press the side of the top cover (①) while pulling the side of the main cover (②).

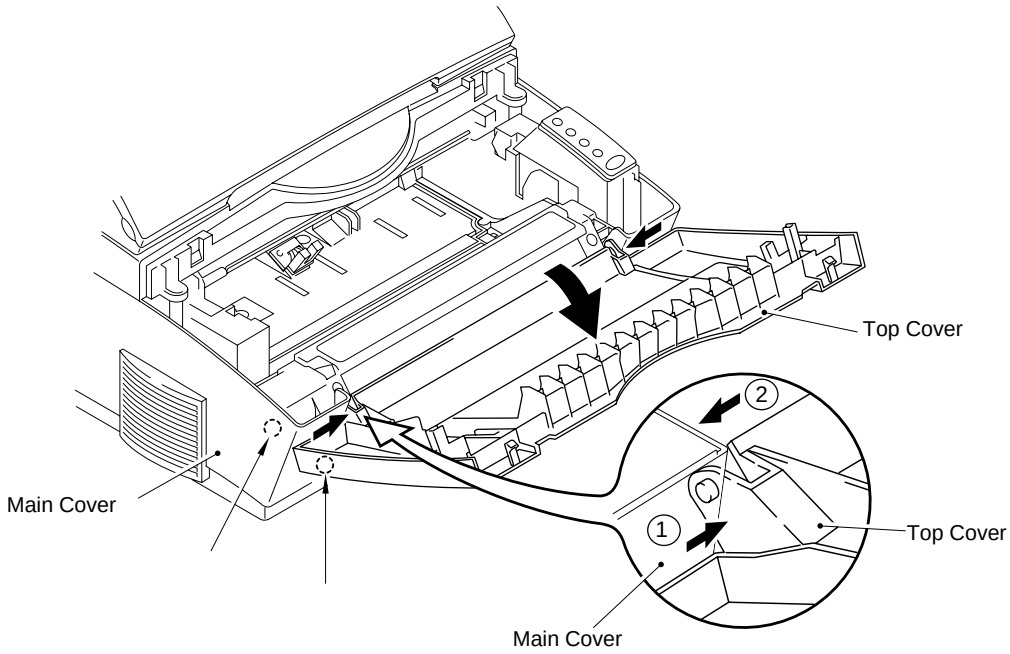


Fig. 3-3

3.4 Scanner Control Panel ASSY

(1) Open the scanner control panel ASSY toward you.

(2) Pull the hinges at the left and right sides of the document scanner frame ASSY outwards to release the two hooks of the scanner control panel ASSY.

(3) Disconnect the sensor harness on the right hand side.

(4) Remove the scanner control panel ASSY from the scanner frame.

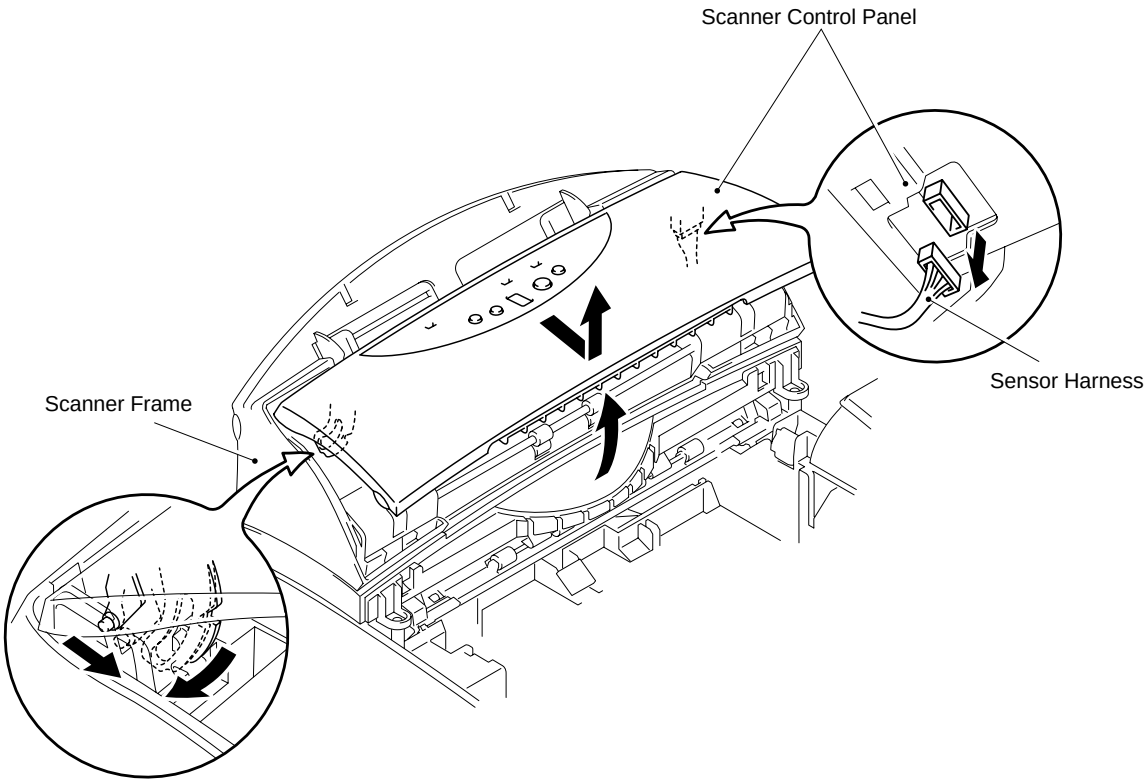


Fig. 3-4

Note:
When replacing/reassembling the scanner control panel ASSY, remove the old grease and apply a suitable amount of grease to the points on both the scanner control panel and scanner frame as shown ;

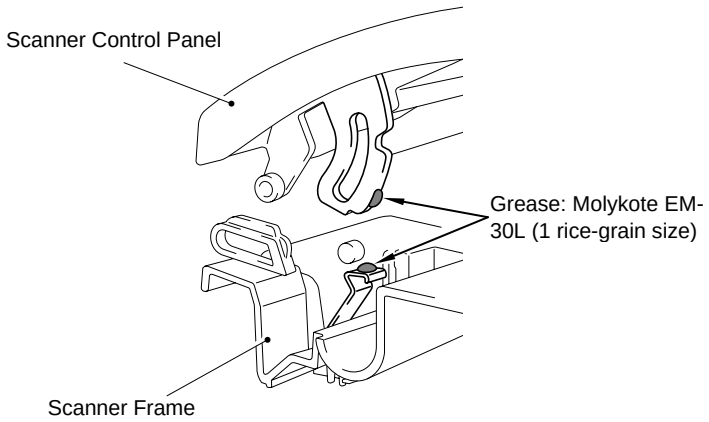


Fig. 3-5

(5) Remove the M3x6 pan tapping screw securing the front spring plate, washer, separation rubber and ADF spring plate, then remove all of them. Note that the vibration proof rubber is attached to the back of the ADF spring plate.

(6) Press one side of the document pressure bar inwards to remove it. The spring will be released and should also be removed.

(7) Remove the document rear sensor actuator .

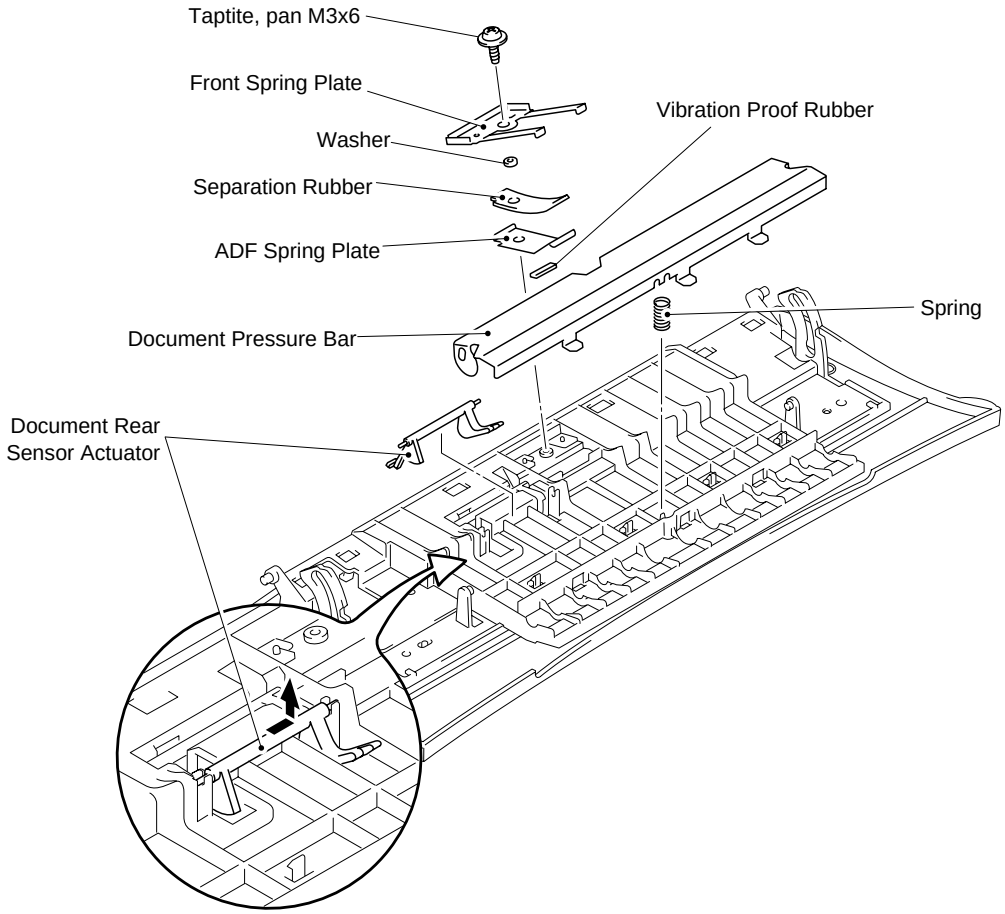


Fig. 3-6

(8) Remove the six M3x8 tapping screws from the panel rear cover.

(9) Release the four hooks to remove the panel rear cover.

(10) Remove the document front sensor actuator with the helical torsion spring .

Note:

- *Do not lose the helical torsion spring when disassembling the document front sensor actuator. The spring easily comes off from the actuator.*
- *When reassembling the helical torsion spring to the document front sensor actuator, ensure that the direction of the spring is correct.*
- *Assemble the document front sensor actuator while lightly pressing it. Then check that the document front sensor works correctly by turning ON/OFF the sensor with the actuator.*

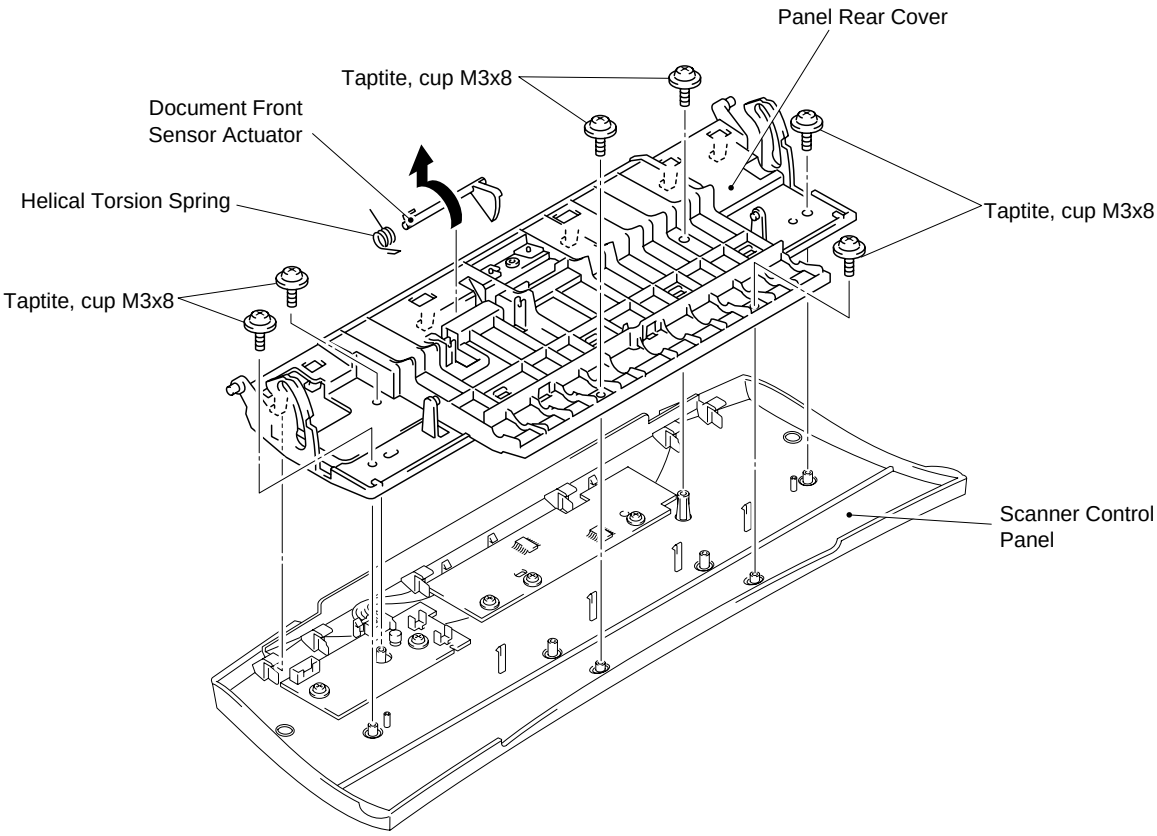


Fig. 3-7a

(11) Remove the three M3x6 tapping screws to remove the scanner panel PCB, then remove the two M3x6 tapping screws to remove the scanner sensor PCB.

(12) Disconnect the scanner panel harness ASSY connected between the scanner panel PCB and the scanner sensor PCB.

(13) Remove the four keys from the scanner control panel .

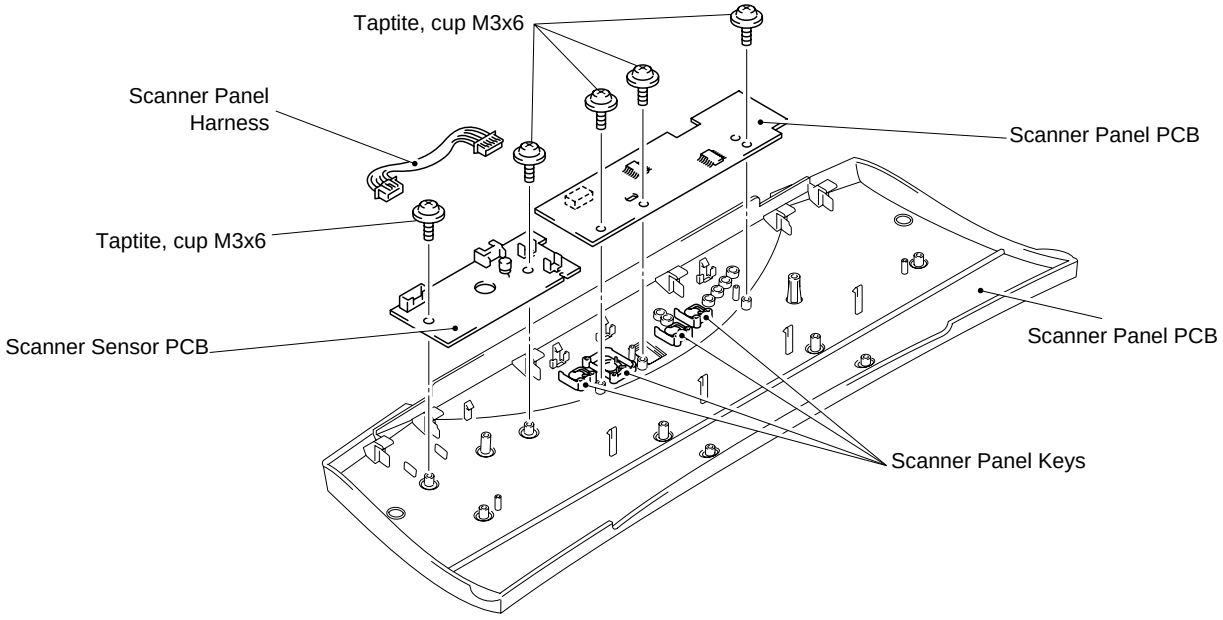


Fig. 3-8

3.5 Document Scanner Frame ASSY

(1) Remove the four M3x8 tapping screws.

(2) Release the three hooks, then disconnect the R motor harness at the right hand side and the CIS harness at the left hand side.

(3) Remove the M3x6 screw to disconnect the motor frame FG harness.

(4) Remove the document scanner frame ASSY.

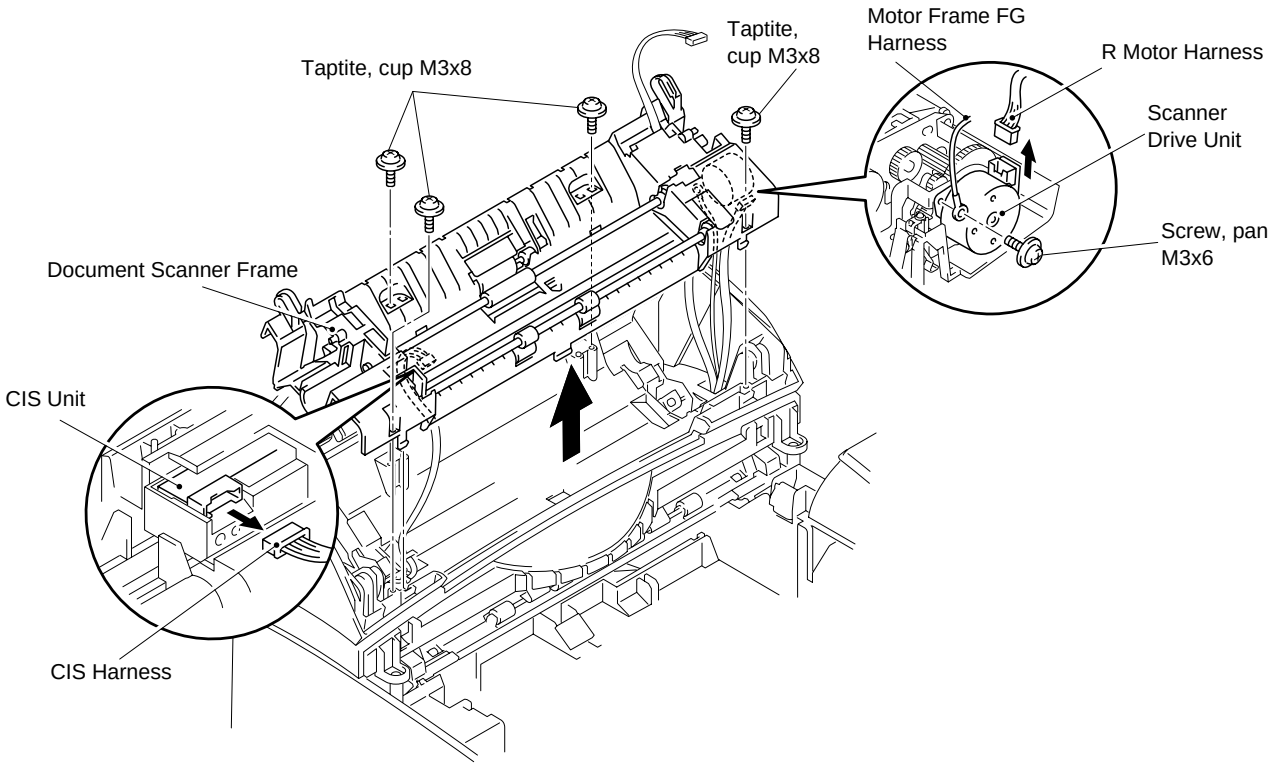


Fig. 3-9

Note:
When replacing/reassembling the document scanner frame ASSY, remove the old grease and apply a suitable amount of grease to the point shown below ;

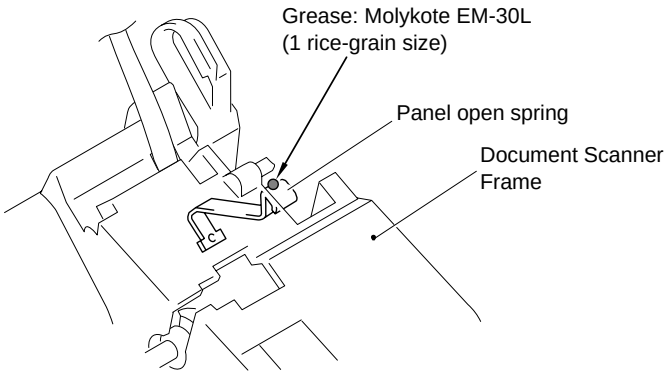


Fig. 3-10

(5) Remove the document feed roller ASSY and the document eject roller ASSY from the scanner frame. It is recommended for easy removal to release the hook retaining the shaft from the groove of the shaft and slide the shaft towards the gear side.

(6) Remove the CIS film and gear shield film from the scanner frame.

Caution:
- *Once you remove the CIS film and gear shield film, they will become unusable. You must fit new ones.*
- *Do not touch or damage the surface of the CIS unit when disassembling the rollers or CIS film.*

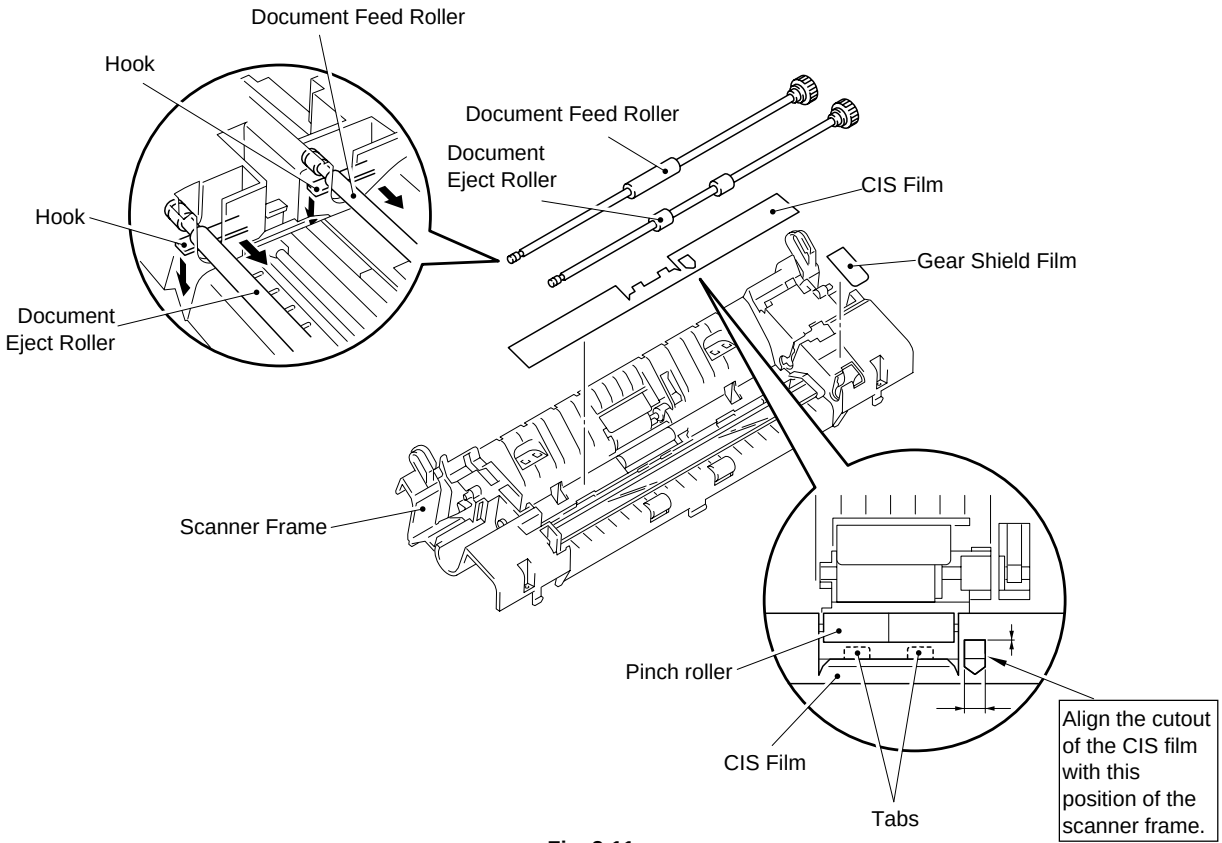


Fig. 3-11

(7) Slightly lift the arm, move the CIS unit to the left, then remove it.

(8) Remove the two CIS back-up springs.

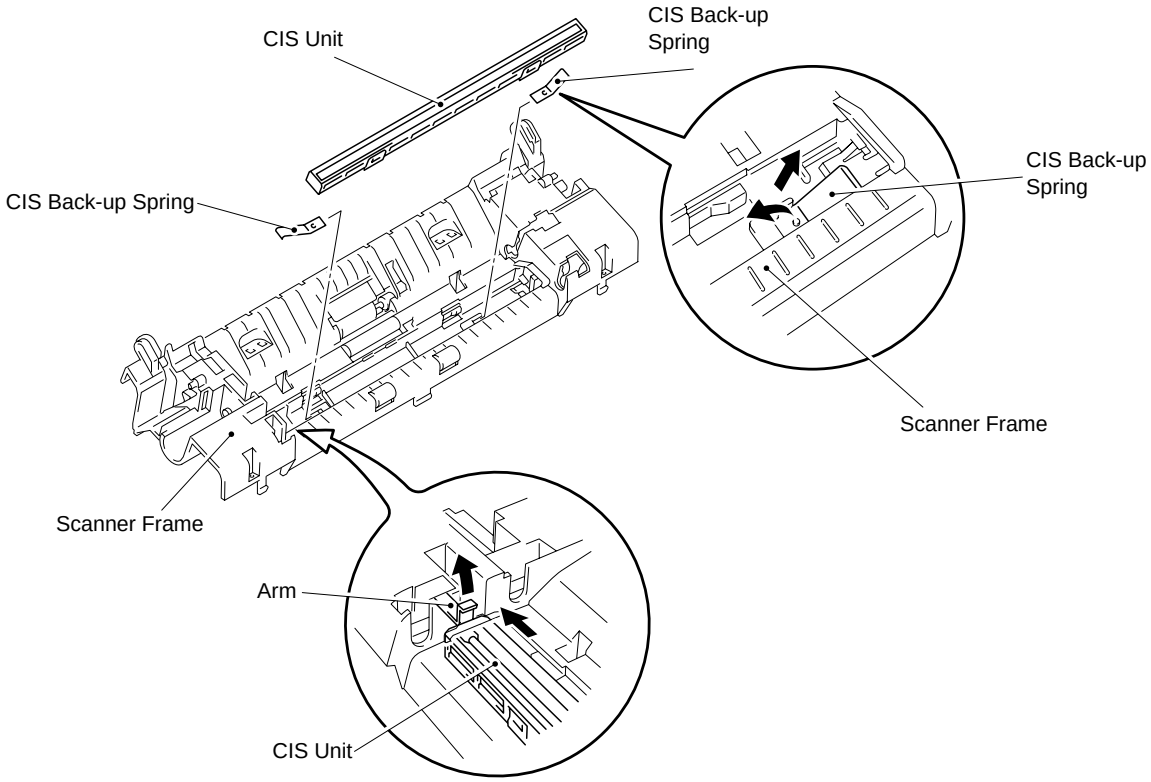


Fig. 3-12

Note:
When replacing/reassembling the document feed roller ASSY and the document eject roller ASSY , remove the old grease and apply a suitable amount of grease to the points shown below ;

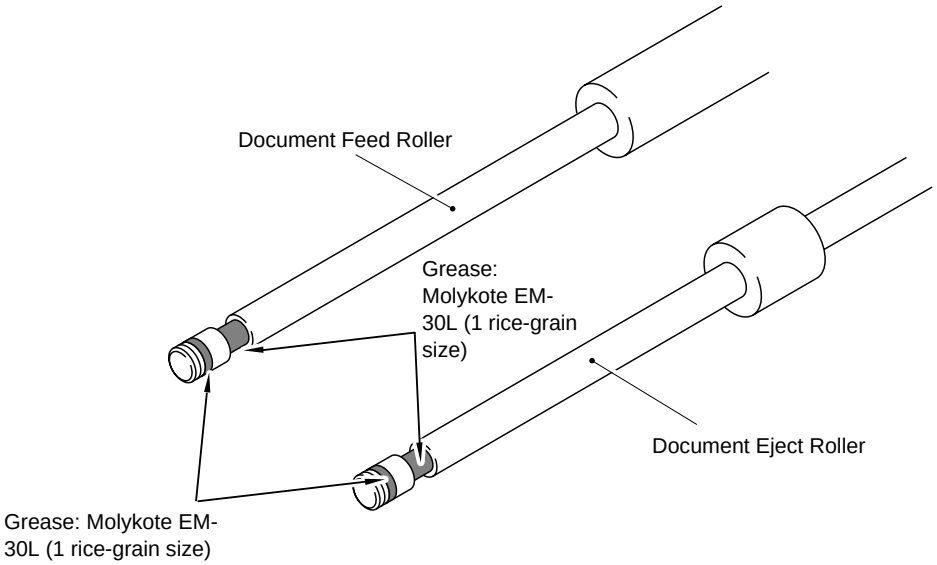


Fig. 3-13

(9) Turn the scanner frame ASSY upside down.

(10) Remove the two M3x8 tapping screws.

(11) Remove the separation roller from the scanner frame by pressing the hook retaining the plastic shaft between the ADF gear and the separation roller.

(12) Remove the scanner drive unit .

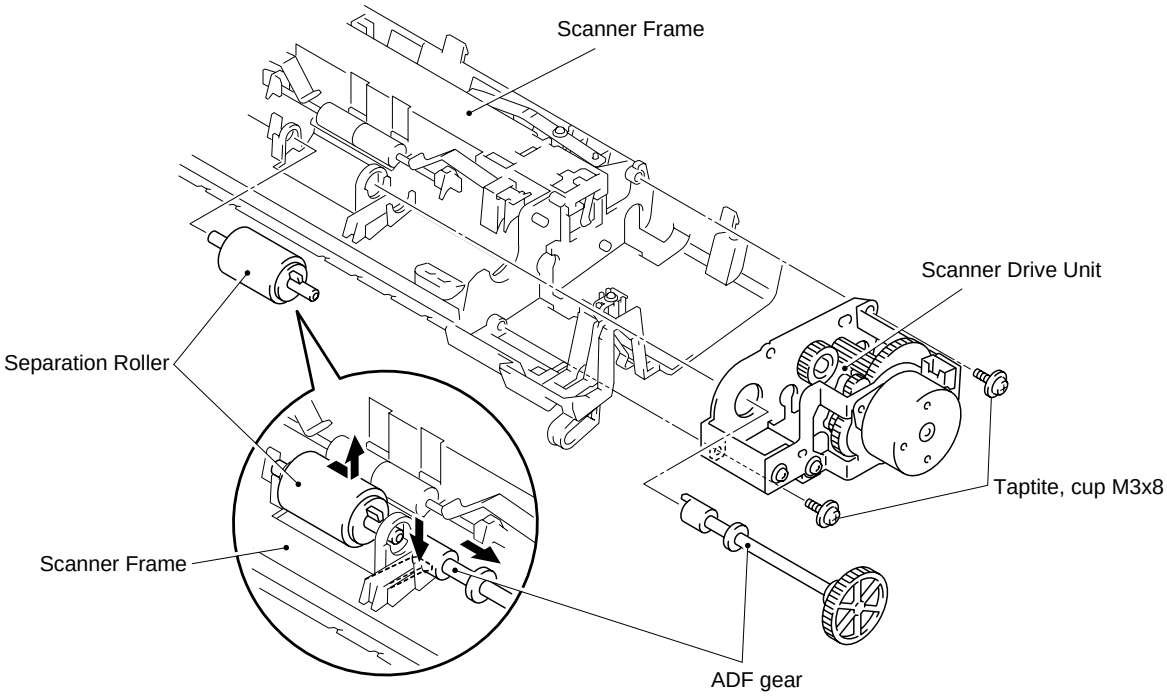


Fig. 3-14

3.6 Scanner Rear Cover ASSY / Rear Cover ASSY

(1) Remove the two M4x12 tapping screws.

(2) Remove the CIS harness from the two hooks.

(3) Remove the scanner rear cover ASSY with the rear cover ASSY.

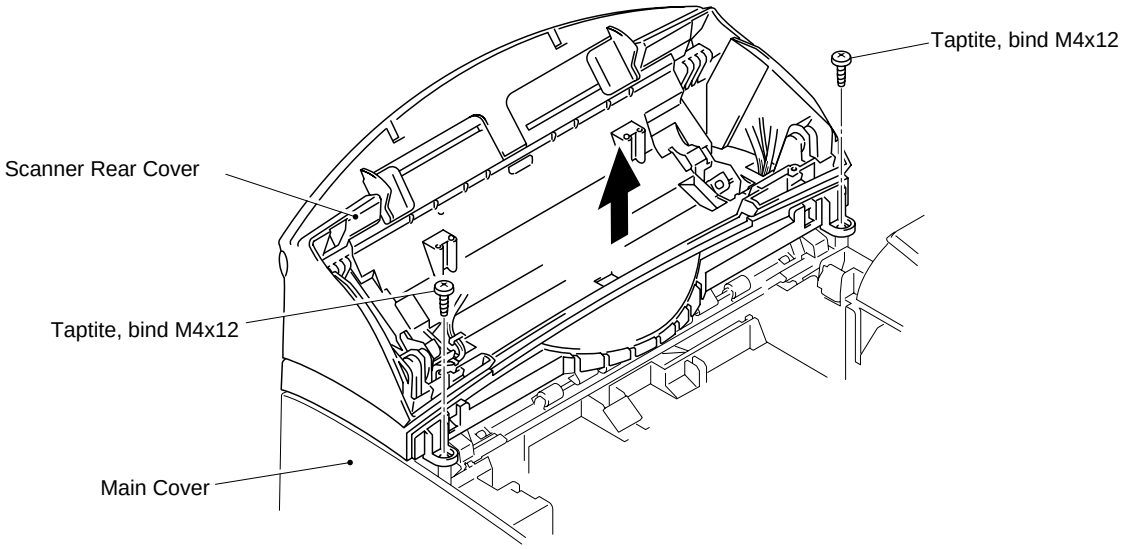


Fig. 3-15

(4) Press the hinges at the right and left sides outwards to release the scanner rear cover from the rear cover.

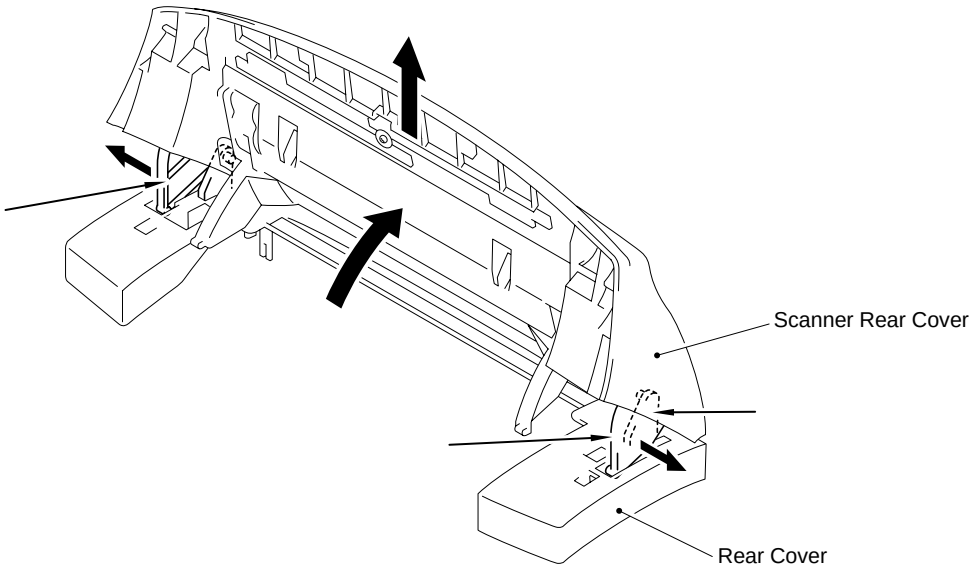


Fig. 3-16

Note:

- *When reassembling the scanner rear cover and the rear cover onto the printer, hook the two hooks at the right and left hand sides (rear), then secure the two screws.*
- *When replacing/reassembling the rear cover, remove the old grease and apply a suitable amount of grease to the points shown in the figure below;*

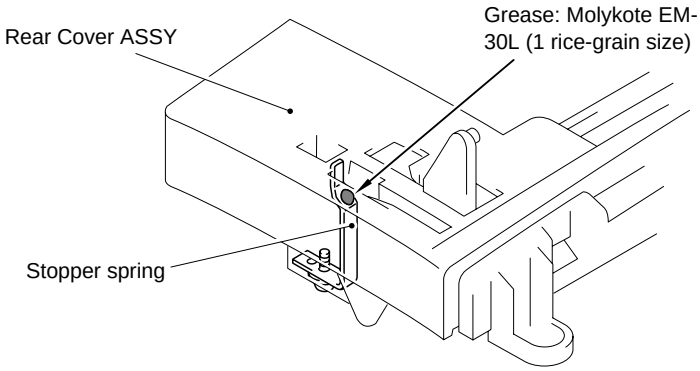


Fig. 3-17

3.7 MP Rear Sheet Feeder ASSY

Caution:
When disassembling the MP rear sheet feeder ASSY, if you get grease on your fingers, take care not to touch the separation pad or the paper pick-up roller, the grease will spread to the paper and the drum unit. It might cause black spots to appear on the printed page.

(1) Push the left rib outwards and pull out the MP rear sheet feeder. It is not necessary to release the right rib.

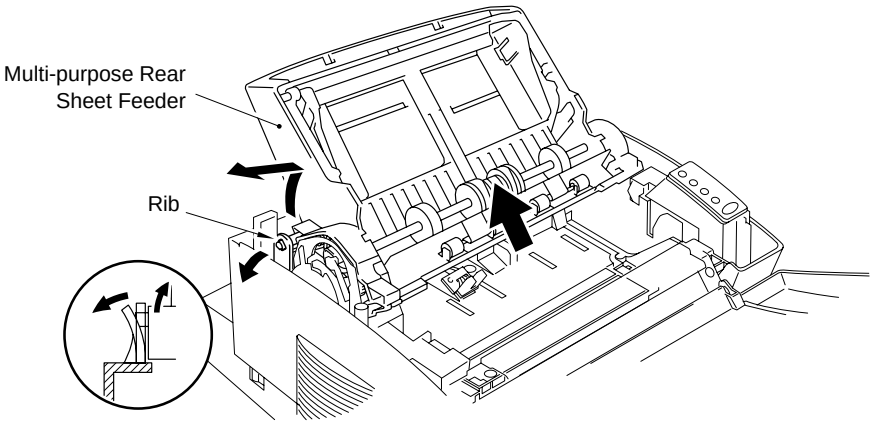


Fig. 3-18

Note:
When reassembling the MP rear sheet feeder, remove the old grease and apply a suitable amount of grease (2 rice-grain size) between the heat sink of the motor and the ground leaf spring. (Refer to the figure below.)

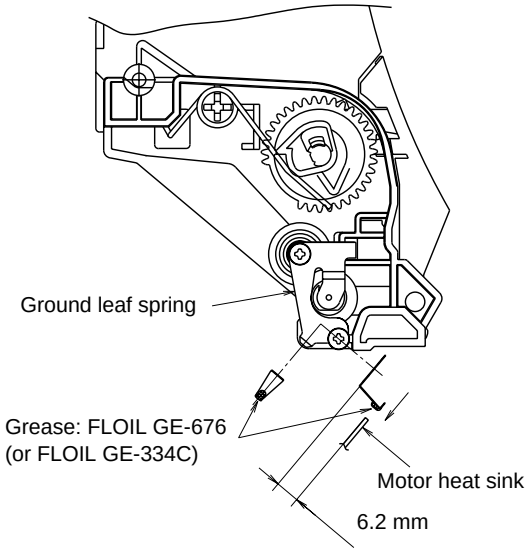


Fig. 3-19

3.8 Fixing Unit

(1) Remove the two M4x16 tapping screws.

(2) Lifting the fixing unit, disconnect the thermistor connector on the EL PCB first, then the two heater harness connectors.

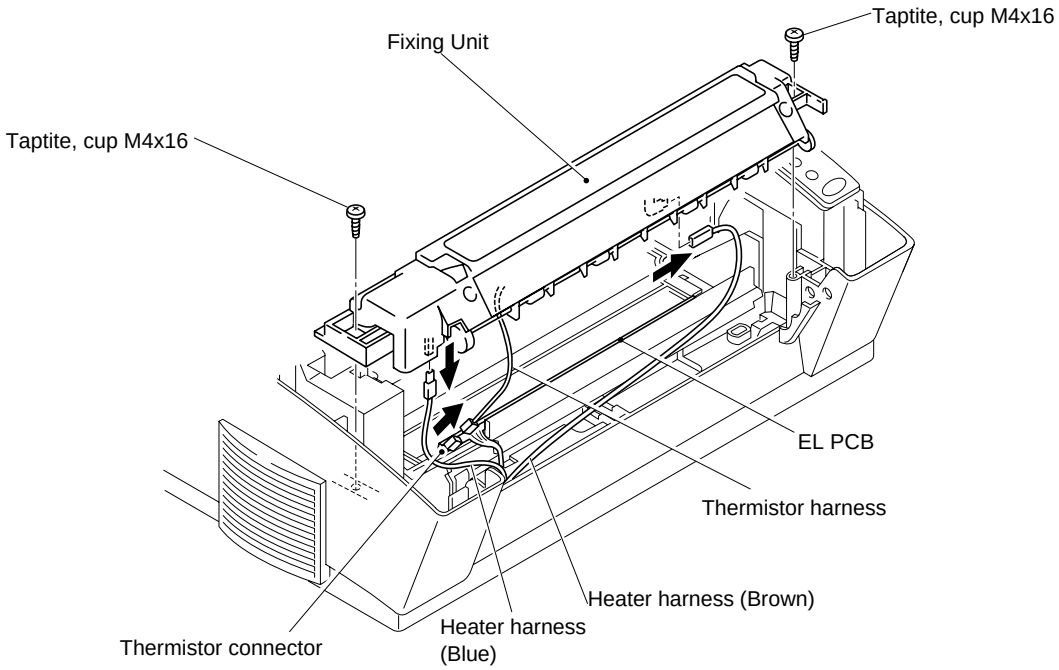


Fig. 3-20

Note:
The eject sensor actuator may also be removed when removing the fixing unit. In this case be sure to re-assemble the eject sensor actuator when re-assembling the fixing unit.

(3) Remove the two M3x12 tapping screws.

(4) Open the fixing unit cover along the open side of the fixing unit cover.

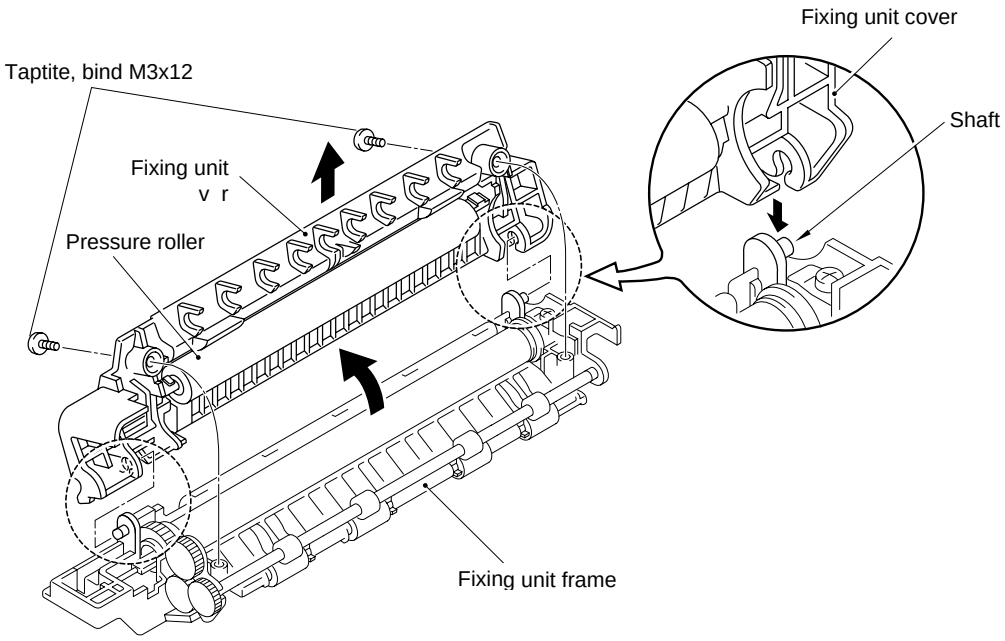


Fig. 3-21

(5) Release the right side of the paper eject roller shaft.

(6) Remove the four eject pinch rollers and the pinch springs from the fixing unit frame. Then, remove the pinch spring from each pinch roller.

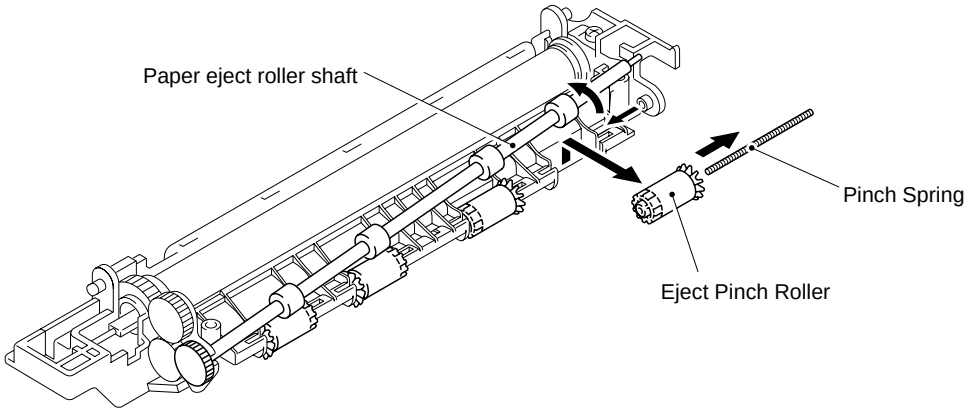


Fig. 3-21a

(7) Remove the M3x10 self tapping screw securing the connector plate.

(8) Remove the connector plate from the fixing unit frame and loosen the other M3x10 tapping screw securing the fixing unit cover.

(9) Remove the idle gear 16 from the fixing unit frame.

(10) Remove the heat roller gear, retaining ring, heat roller washer and heat roller bearing. Then, remove the halogen heater lamp from the heat roller.

Caution :
Never touch the surface of the halogen heater lamp and the heat roller.

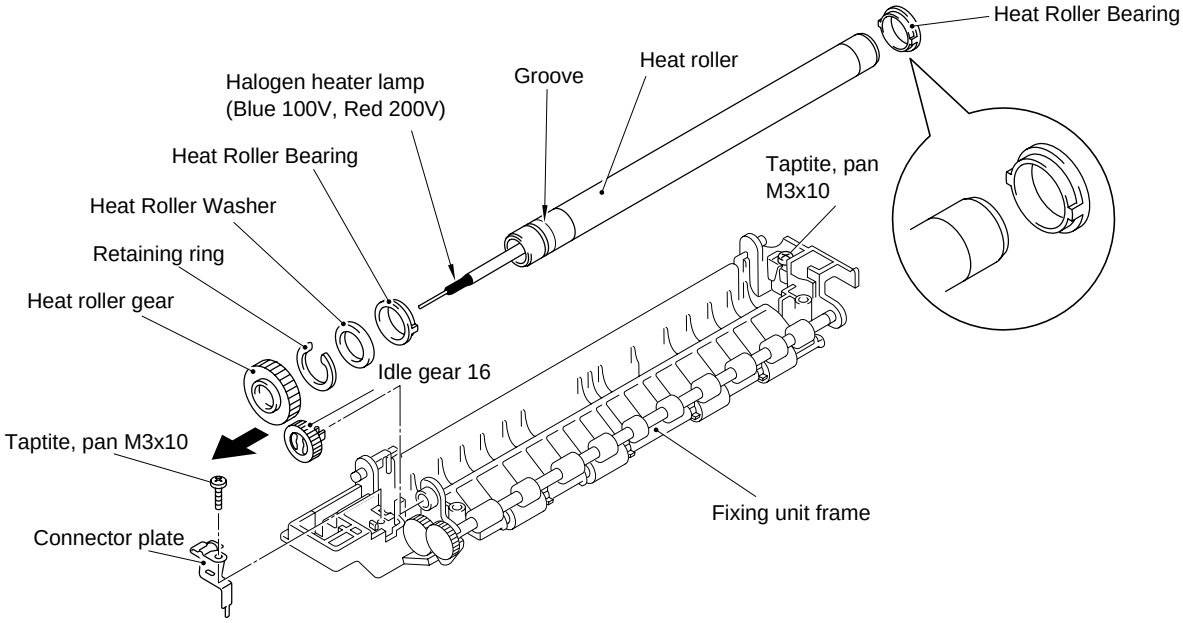


Fig. 3-22

Note:

- *When reassembling the heat roller bearings, ensure that the direction of the bearing is correct referring to Fig. 3-22.*
- *The heat roller itself is very similar to the one for HL-1060/1070 printers. The heat roller for the MFC-P2000 / HL-P2000 printer can be distinguished by the groove on the edge of the roller. (Refer to Fig. 3-22.)*
- *When replacing the heat roller cleaner with a new one, attach the cleaner referring to the figure below;*

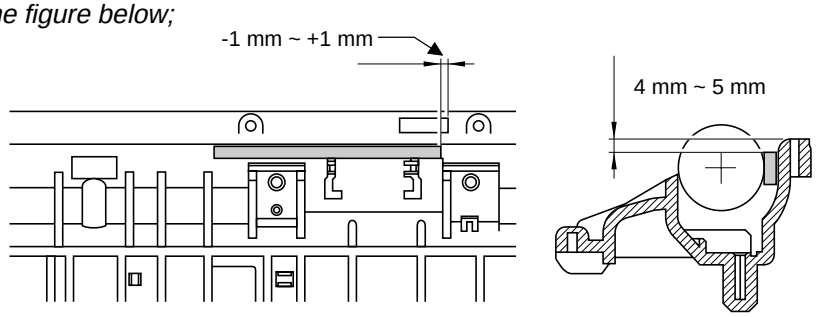


Fig. 3-23

- *Follow the instructions below when installing the thermistor in the fixing unit.*
  i) Place the cleaner felt of the cleaner ASSY for the thermistor under the heat roller.
  ii) Place the end of the thermistor on the heat roller.
  iii) Insert boss1 of the thermistor into the hole of the fixing unit frame.
  iv) Do no place the thermistor on boss2 of the fixing unit frame.

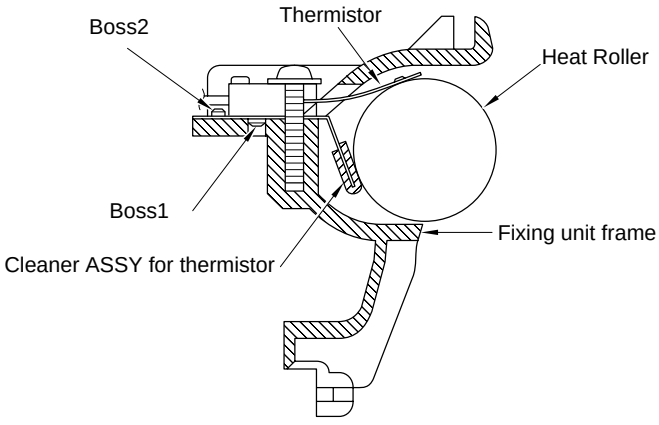


Fig. 3-24

3.9 Laser Unit

(1) Remove the three M4x12 tapping screws.

(2) Lift out the laser unit.

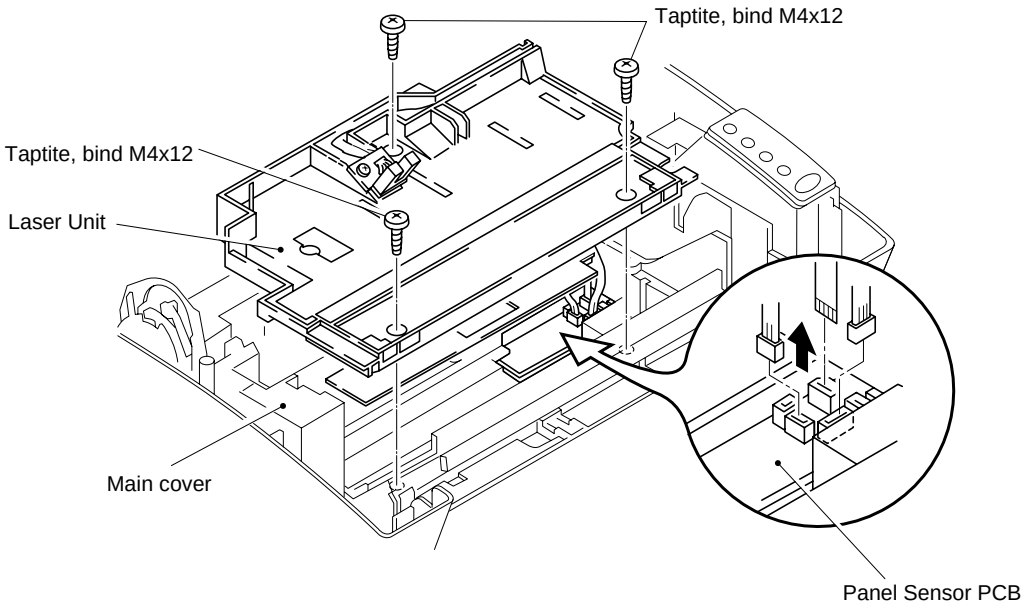


Fig. 3-25

Note:
When replacing the laser unit, be sure to assemble the ferrite core using the cable binder as follows;

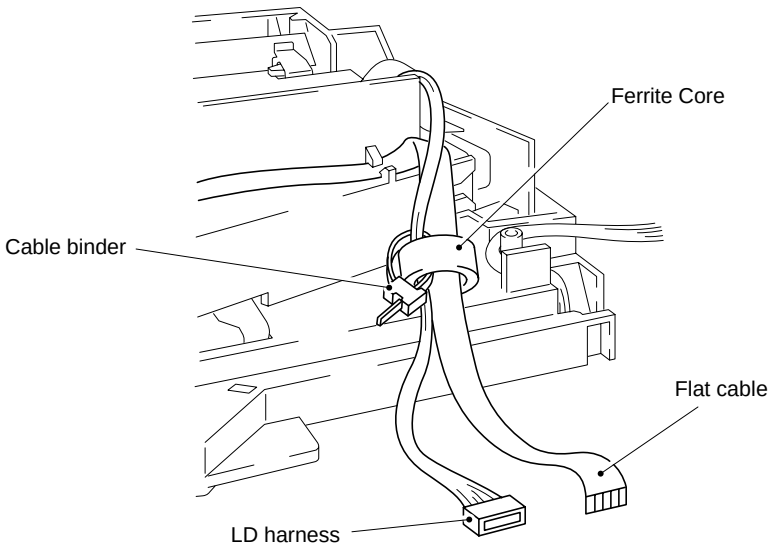


Fig. 3-26

(3) Disconnect the three connectors from the panel sensor PCB.

(4) Remove the M3x8 tapping screw, and lift the toner sensor PCB from the laser unit.

Caution:

- *Do not open the enclosure of the laser unit.*
- *Never touch the inside of the laser unit or the mirror when disassembling or reassembling. If there is any dirt or dust on the mirror, blow it off.*

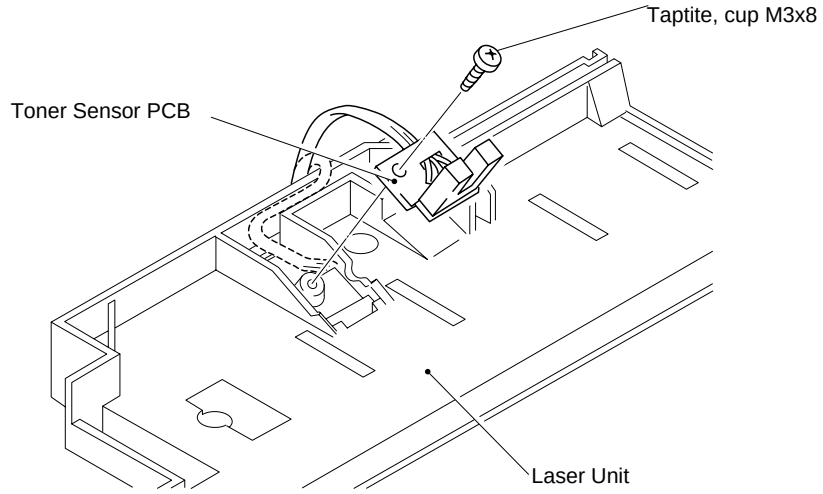


Fig. 3-25

3.10 Main PCB ASSY

(1) Remove the three M4x6 screws.

(2) Hold the hooks at the left and right of the mounting frame to pull out the main PCB ASSY slightly, and disconnect the three harnesses (R motor, sensor and CIS harnesses).

(3) Remove the main PCB ASSY.

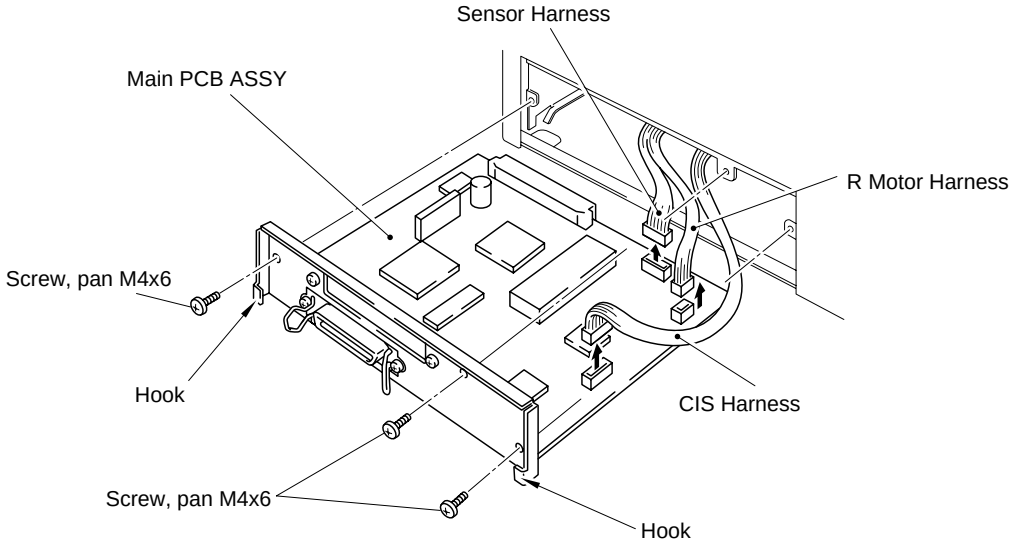


Fig. 3-28

Caution:

*When replacing the main PCB, be sure to implement the **maintenance copy test**. For detailed operation of the test, see '9. Scanner Inspection Mode - A-3 Maintenance Copy Test' in Chapter IV.*

3.11 Base Plate ASSY

> ***Caution:***
> *Prior to turning the printer upside-down, ensure that the drum unit has been removed from the printer.*

(1) Turn the printer upside down.

(2) Remove the eight M4 and five M3 self tapping screws.

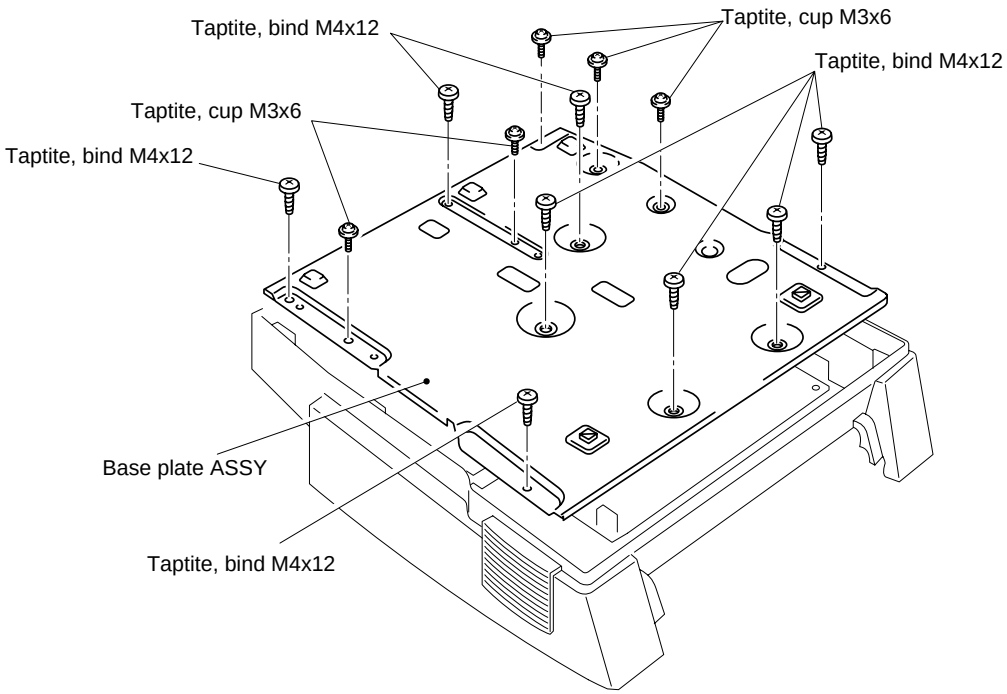


Fig. 3-29

(3) Lift the base plate ASSY and remove the grounding screw.

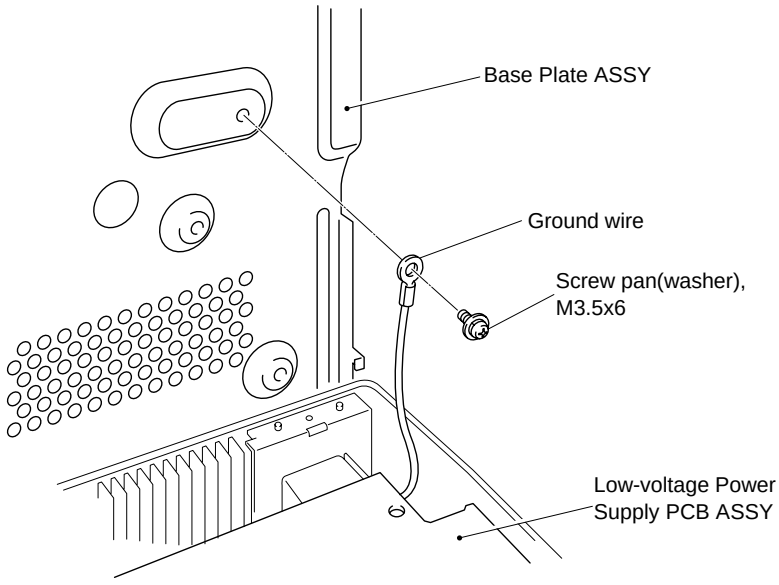


Fig. 3-30

3.12 Panel Sensor PCB ASSY

(1) Remove the main shield.

(2) Remove the M4x12 screw securing the panel sensor PCB ASSY.

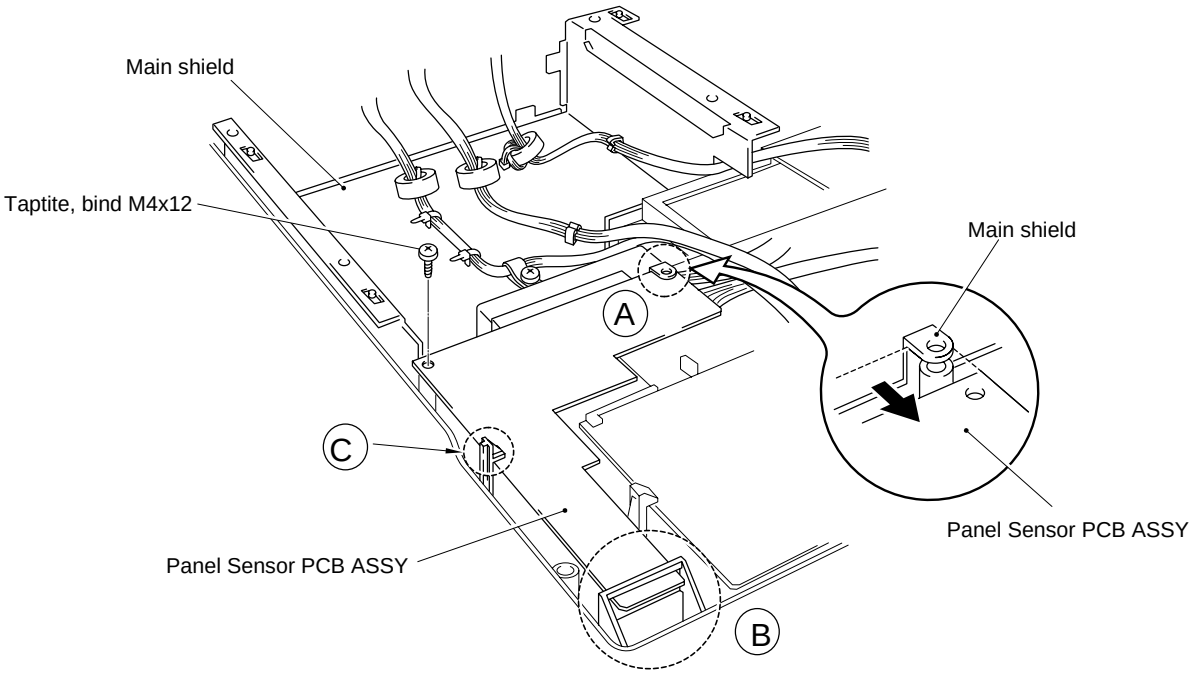


Fig. 3-31

Note:

- *When reassembling the panel sensor PCB, ensure that you slide PCB (A) underneath the main shield.*
- *When reassembling the panel sensor PCB, ensure that you fit the PCB into hook (B) and hook (C) first. Then fit the two bosses to the PCB and secure the screw.*
- *Ensure that the three clamps fix the motor harness, panel harness and CIS harness on the back of the main shield. Refer to the figure below;*

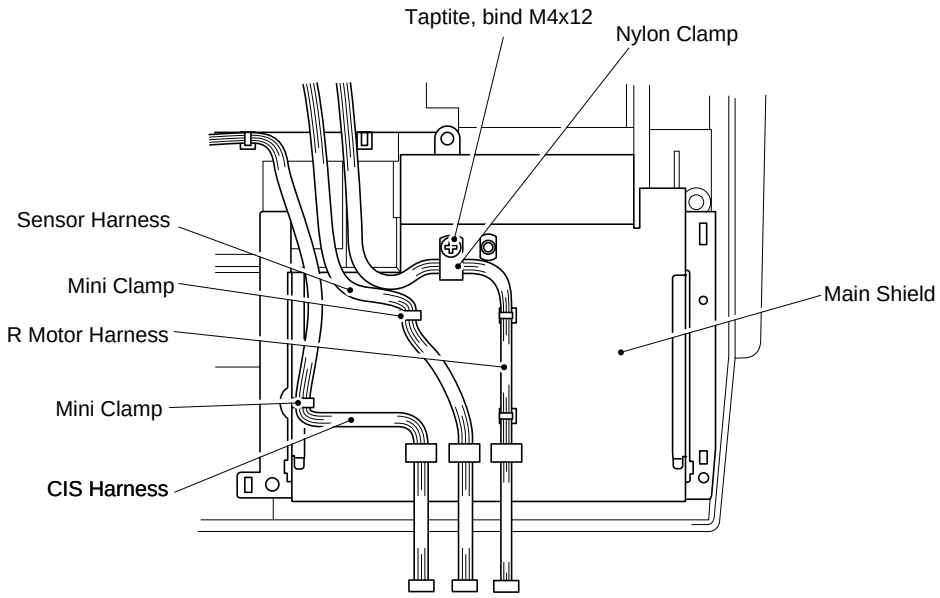
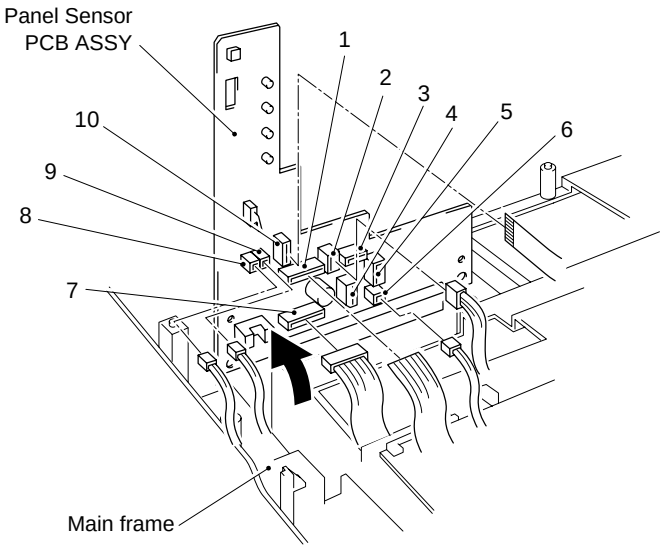


Fig. 3-32

(3) Disconnect the eight connectors from the PCB. (Three connectors have already been disconnected when removing the laser unit.)



(Name of the Harnesses)
1. Low-voltage harness
2. Erase lamp harness
3. Toner harness
4. Scan motor flat cable
5. Laser harness
6. Solenoid harness
7. Main / sub motor connector
8. Fan motor 1 harness
9. Fan motor 2 harness
10. High-voltage flat cable

Fig. 3-33

Note:
- *When re-assembling, the cable connectors must be inserted securely into the PCB connectors and the PCB must not be stressed by the harnesses.*
- *The connectors should be inserted by matching the housing color and the number of pins.*

3.13 Low-voltage Power Supply PCB ASSY

(1) Remove the one M4x12 tapping screw securing the low-voltage power supply PCB ASSY.

(2) Disconnect the two connectors for the heater harness and the LV harness from the PCB.

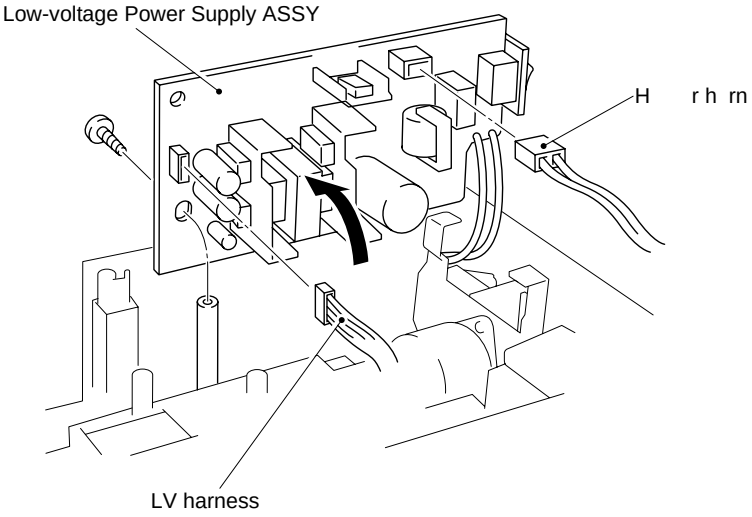


Fig. 3-34

(3) Remove the one M4x12 screw to remove the inlet holder. Then, remove the AC inlet and the PCB.

Note:
When re-assembling the inlet holder and AC inlet, be sure to insert part (A) of the holder into the hole of the ferrite core.

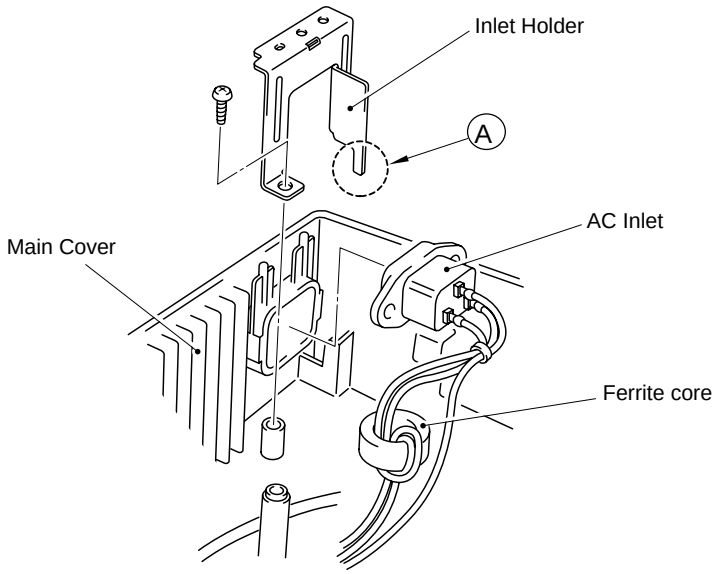


Fig. 3-35

3.14 High-voltage Power Supply PCB ASSY

(1) Remove the one M4x12 screw securing the high-voltage power supply PCB ASSY.

(2) Remove the film covering the PCB.

(2) Disconnect the HV flat cable from the PCB.

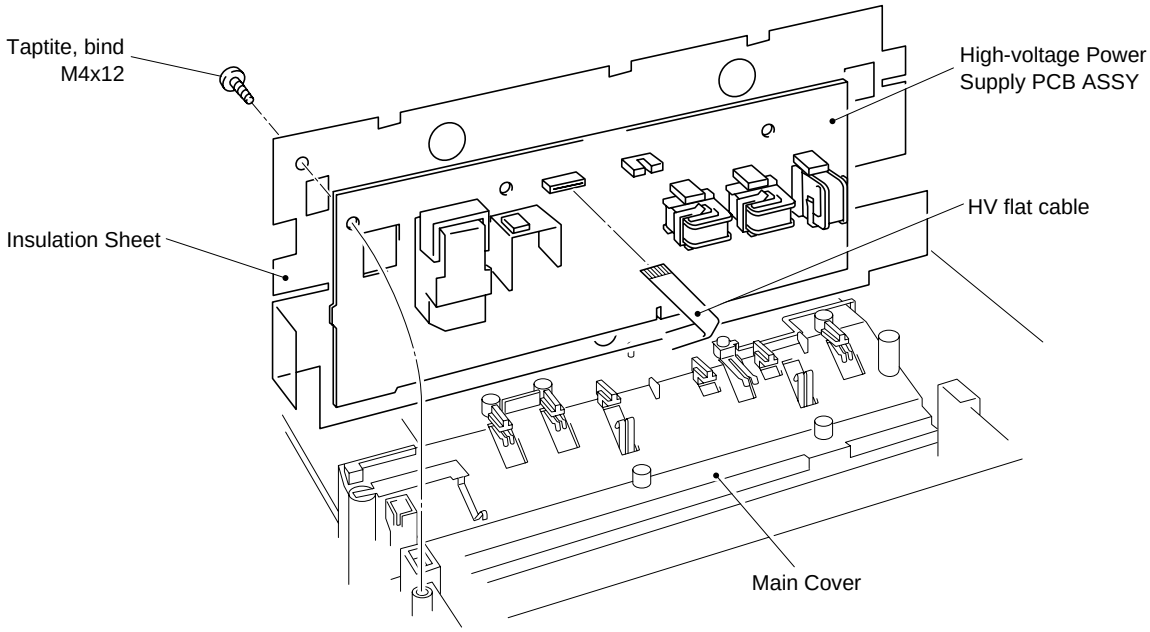


Fig. 3-36

3.15 Sub Fan Motor ASSY

(1) Slide the sub fan motor ASSY upwards .

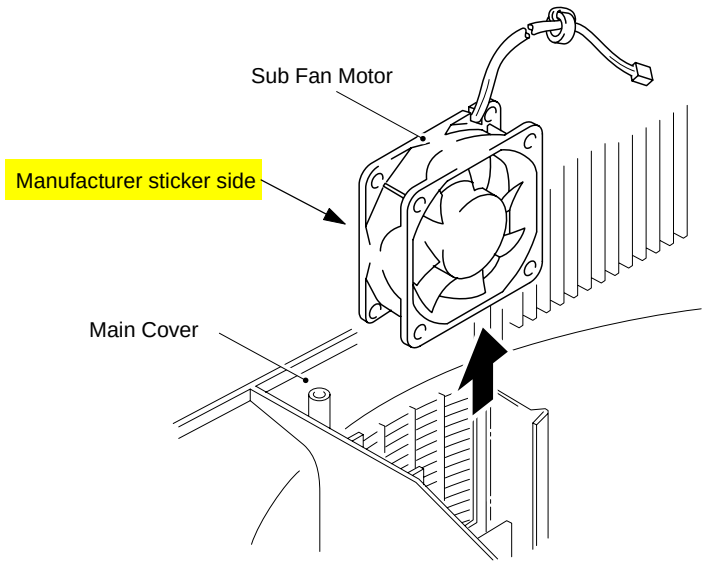


Fig. 3-37

Note:
When re-assembling the sub fan motor, ensure that the side on which the manufacturers sticker is attached is facing the main frame.

3.16 Main Fan Motor ASSY

(1) Remove the two M4x12 screws securing the fan motor holder.

(2) Remove the fan motor holder from the printer.

(3) Remove the main fan motor ASSY from the fan motor holder.

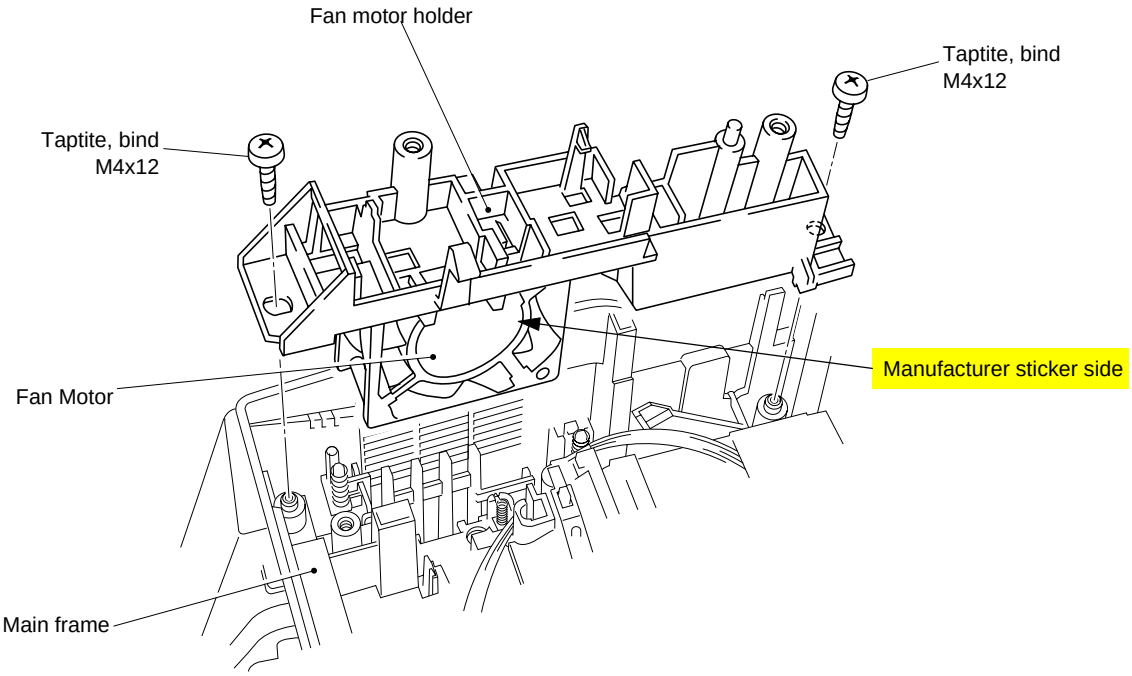


Fig. 3-38

Note:
When reassembling the fan motor into the holder, refer to the figure on the right.

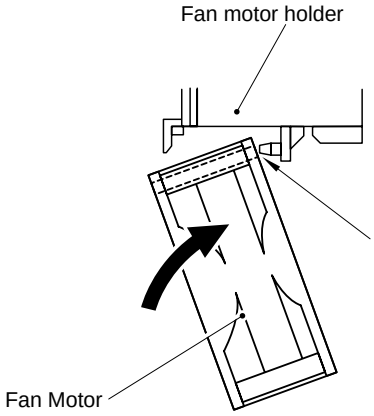


Fig. 3-39

3.17 Drive Unit

(1) Unhook the heater harness from the drive unit.

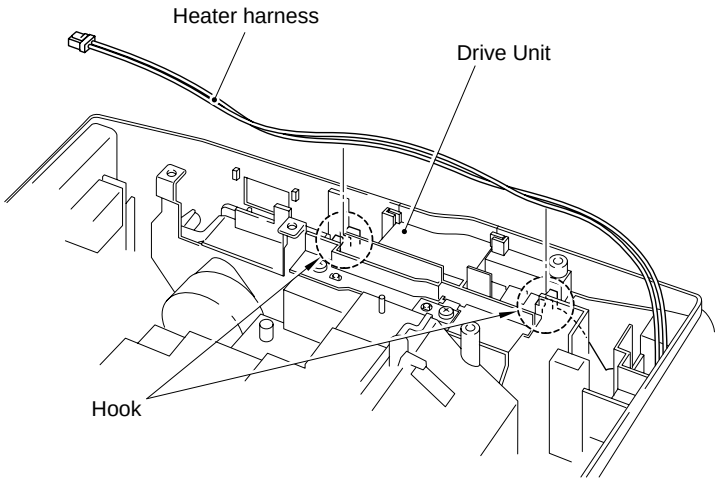


Fig. 3-40

(2) Remove the three M4x20 and one M4x12 screws securing the drive unit.

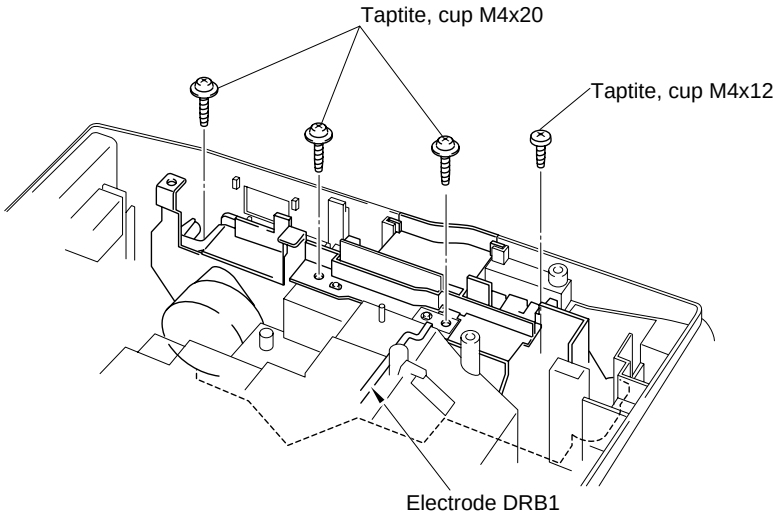


Fig. 3-41

Note:
When reassembling the drive unit, ensure you fit the drive unit underneath the electrode DRB1.

3.18 Main Motor ASSY

(1) Remove the two M3x6 screws securing the main motor.

(2) Remove the main motor ASSY.

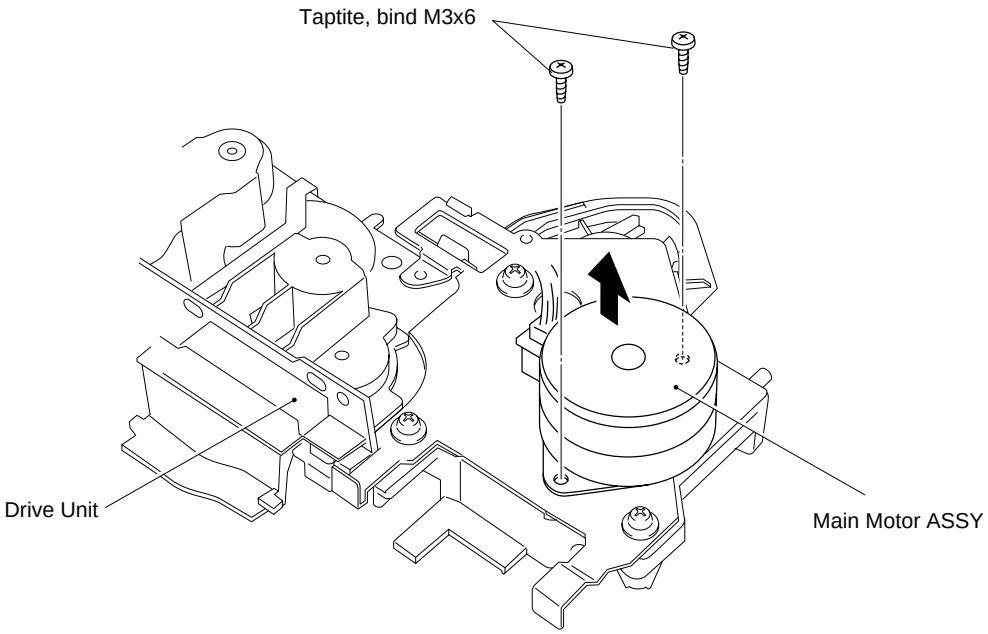


Fig. 3-42

3.19 Sub Motor ASSY

(1) Remove the two M3x6 screws securing the sub motor.

(2) Remove the sub motor ASSY.

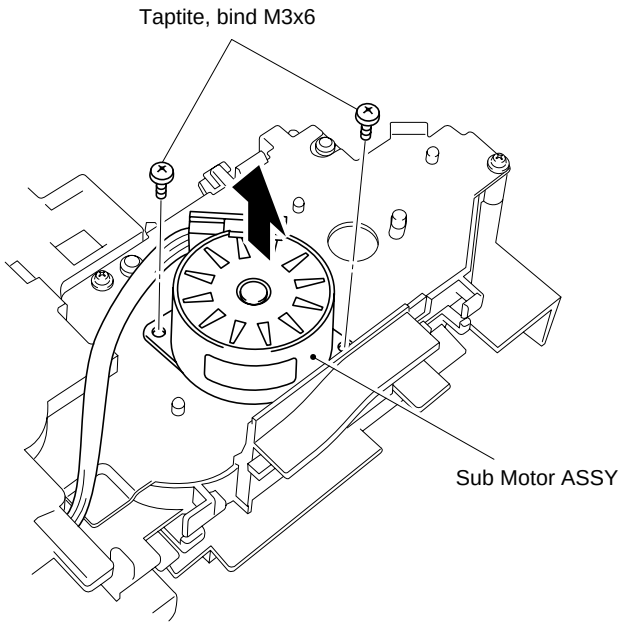


Fig. 3-43

3.20 Document Support / Paper Support

(1) Pull the document support down toward you and pull both legs outwards to release it.

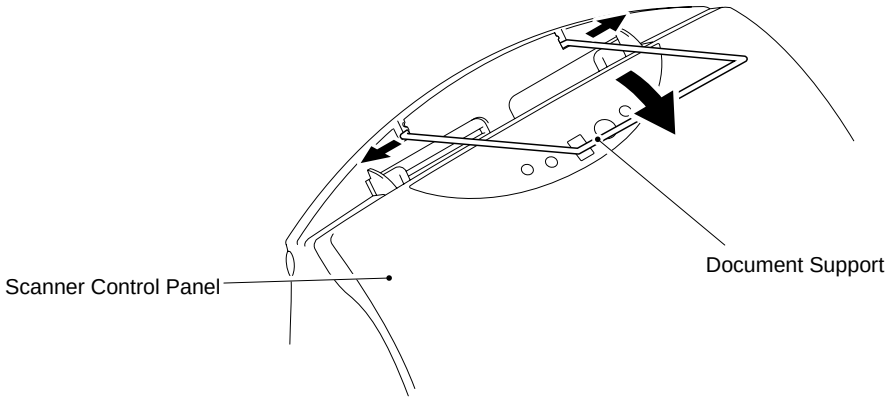


Fig. 3-44

(2) Pull the paper support down toward you and pull both legs outwards to release it.

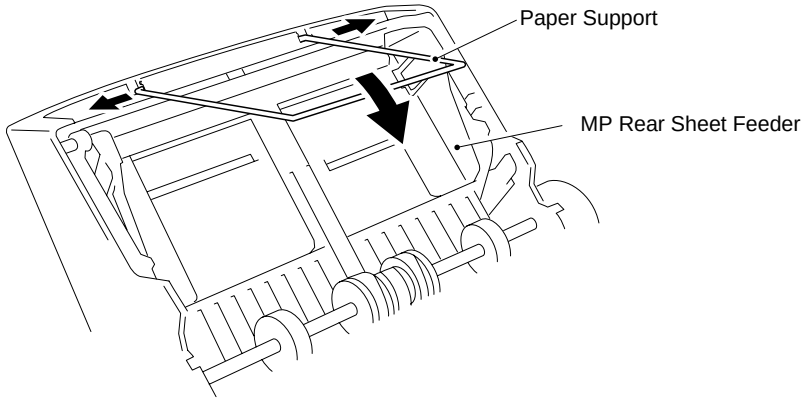


Fig. 3-45

3.21 Extension Support Wire

(1) Raise the extension support wire toward you and press both legs inward to release it.

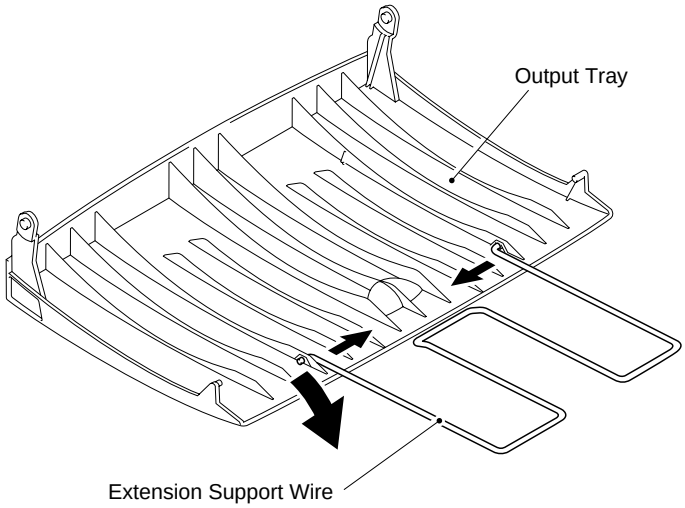


Fig. 3-46

3.22 Document Extension Support Wire

(1) Raise the document extension support wire toward you and press both legs inward to release it.

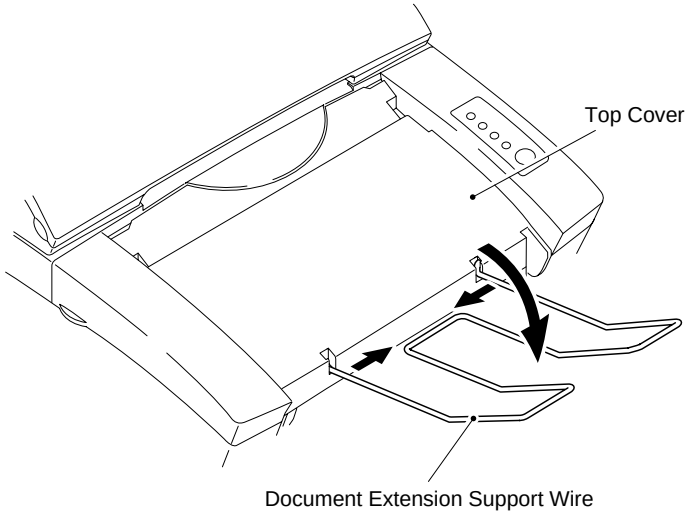


Fig. 3-47

4. PACKING

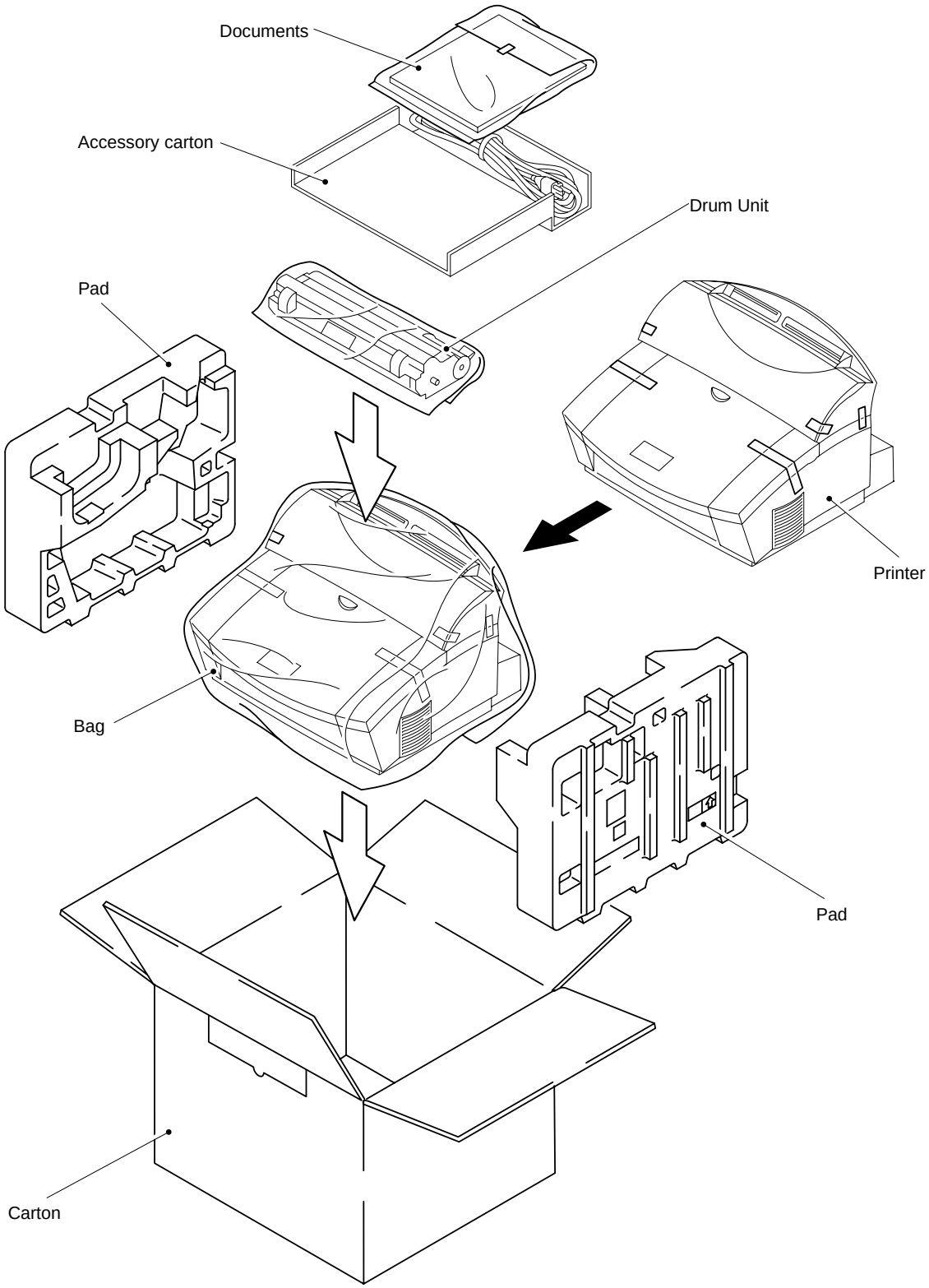


Fig. 3-48

CHAPTER IV MAINTENANCE AND TROUBLESHOOTING

1. INTRODUCTION

1.1 Initial Check

(1) Operating environment

Check if :

- The source voltage stays within ±10% from the rated voltage shown on the rating plate.
- The printer is installed on a solid, level surface.
- The room temperature is maintained between 10°C and 32.5°C. The relative humidity is maintained between 20% and 80%.
- The printer is not located in a dusty place.
- The printer is not exposed to ammonia fumes or other harmful gases.
- The printer is not located in a hot or humid area (such as near water or a humidifier).
- The printer is not exposed to direct sunlight.
- The room is well-ventilated.
- The printer is not placed where the ventilation hole of the printer is blocked.

(2) Print paper

Check if :

- A recommended type of print paper is being used. [If the paper is too thick or too thin, or tends to curl, paper jams or paper feed problems may occur, or printed images may be blurred.]
- The print paper is damped. [If so, use fresh paper, and check whether the print quality improves or not.]
- The print paper is short-grained paper or acid paper. [If so, print quality problems may occur. For further information, refer to paper specifications in Chapter II.]

(3) Consumable parts

Check if :

- The Toner lamp is not lit on the printer control panel when a toner cartridge is installed in the printer. [If the lamp is lit, replace the cartridge with a new one. If blank spots occur on printouts, take out the drum unit and slowly rock it to redistribute the toner evenly.]

(4) Others

Condensation:

When the printer is moved from a cold room into a warm room in cold weather, condensation may occur inside the printer, causing various problems as listed below:

- Condensation on the optical surfaces such as the scanning mirror, lenses, the reflection mirror and the protection glass may cause the print image to be light.
- If the photosensitive drum is cold, the electrical resistance of the photosensitive layer is increased, making it impossible to obtain the correct contrast when printing.

- Condensation on the corona unit may cause corona charge leakage.
- Condensation on the hopper gate and separation pad may cause paper feed troubles.

If condensation has occurred, wipe the effected units or parts with a dry cloth or leave the printer for 2 hours to allow it to reach room temperature.

If the drum unit is unpacked soon after it is moved from a cold room to a warm room, condensation may occur inside the unit, which may cause incorrect images. Instruct the user to allow the unit to come to room temperature before unpacking it. This will take one or two hours.

1.2 Basic Procedure

If a malfunction or incorrect print appears, make an initial check following the basic procedure below:

(1) Check the error lamps following the inspection procedure described later in this chapter. If no error lamps are lit, see Section 4 for troubleshooting information.

(2) If any defective image output is found, follow the image defect fault descriptions in this chapter.

2. MTBF / MTTR

The meantime between failure (MTBF) and the meantime to repair (MTTR) for this printer are as follows;

MTBF:	Up to 4,000 hours
MTTR:	Average 30 minutes

3. CONSUMABLE PARTS

3.1 Drum Unit

The Drum lamp is on when the drum unit is nearly at the end of its life.

Life expectancy: 20,000 pages at 20 pages per job
8,000 pages at 1 page per job

Note:
There are many factors that determine the actual drum life, such as temperature, humidity, type of paper and toner that you use, the number of pages per print job, etc..

3.2 Toner Cartridge

Toner low: The Data and Alarm lamps blink once every five seconds.

Toner empty: The Data and Alarm lamps blink once a second.

Life expectancy: 2,400 pages/new toner cartridge
(when printing A4- or letter-size paper at 5% print coverage)

Note:
Toner cartridge life expectancy will vary depending on the type of average print job printed.

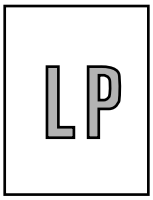
3.3 Periodical Replacement Parts

No.	Description	Part No.	Qty	Service Life(page)	Remarks
1	Fixing Unit	UL8750001	1	50,000	120V
	Fixing Unit	UL8751001	1	50,000	230V
2	Laser Unit	UL8748001	1	50,000 or more	
3	MP rear sheet feeder ASSY	UH3899001	1	50,000 or more	
4	Separation Roller	UU7031001	1	50,000	
5	Separation Rubber	UU7104001	1	50,000	

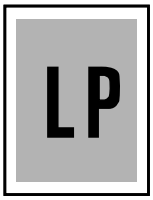
Note:
The above table shows only estimated values. They are subject to change without prior notice.

4. IMAGE DEFECTS

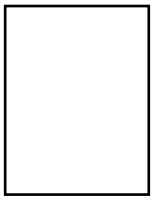
4.1 Image Defect Examples



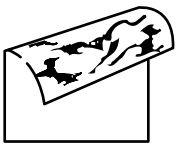
I-1 Light

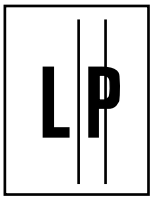


I-2 Dark


I-3 Completely blank


I-4 All black

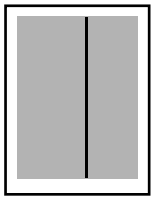

I-5 Dirt on back of paper

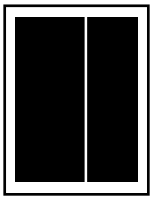


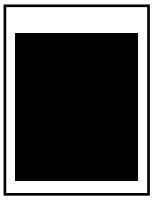
I-6 Black vertical streaks

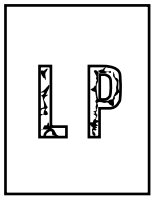
I-6 Black vertical streaks

I-7 Black horizontal stripes

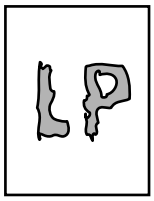

I-8 Black vertical streaks


I-9 White vertical streaks

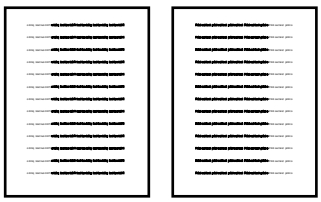

I-10 Faulty registration

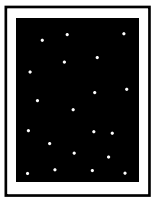


I-11 Poor fixing

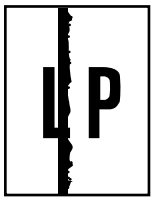


I-12 Image distortion


I-13 Faint print


I-14 White spots

I-15 Black spots

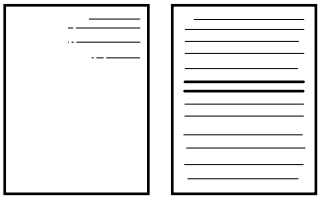


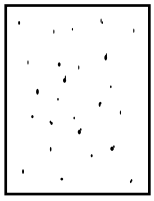
I-16 Black band

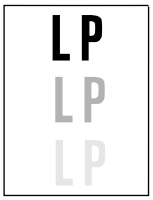
I-17 Gray background

I-18 Hollow print


I-19 Downward fogging of solid black


I-20 Horizontal lines


I-21 Light rain



I-22 Ghost

Fig. 4-1

4.2 Troubleshooting Image Defects

The following procedures should be followed in the event of specific image defects.

Before you can establish the cause of an image defect you need to identify whether the image defect you have got comes from the scanning side or the printing side to take the appropriate action.

Implement both direct copying and printing from the printer itself (ex. test print), and find which causes the defect referring to the table below;

Cause	Copying result	Printing result
Scanning side	X	❍
Printing side	X	X

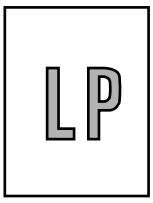
X = No good ❍ = OK

Also, see subsection 3.3 and 3.4 for information about the location of the high-voltage contacts and grounding contacts.

Caution:
Print quality cannot be guaranteed in the following cases;

- *When using the printer for a special job, such as printing of name cards.*
- *When printing much narrower paper than the printable paper width.*
- *When printing on one area of the paper continuously even though Letter or A4 size paper is used.*

I-1	Light



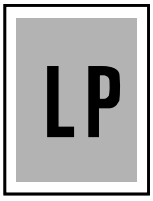
<Scanning >

Possible cause	Step	Check	Result	Remedy
Main PCB failure	1	Is the problem solved after the main PCB is replaced?	Yes	Replace the main PCB.
Laser unit failure	2	Is the problem solved after the laser unit is replaced?	Yes	Replace the laser unit.

<Printing>

Possible cause	Step	Check	Result	Remedy	GND contacts (Fig.4-5)
Toner sensing failure (printer side)	1	Can printing be started with the drum unit removed?	Yes	Toner sensor failure. Check if the toner sensor needs cleaning and check the toner sensor connection.	
Toner sensing failure (toner cartridge side)	2	Is the problem solved when 4 or 5 pages are printed after the toner cartridge is replaced with a full one?	Yes	The wiper of the toner cartridge is defective, or replace the toner cartridge.	
Drum connection failure	3	Are all the contacts (HV, GND) connected when the drum unit is installed?	No	Clean contact electrodes both in the printer body and on the drum unit.	①
High-voltage power supply PCB failure	4	Check the harness connection between the high-voltage power supply PCB and the panel sensor PCB.	No	If the connection is normal, replace the high-voltage power supply PCB.	
Panel sensor PCB or main PCB failure	5	Perform the same check as step 4 above and also between the panel sensor PCB and the main PCB.	No	Replace the panel sensor PCB or the main PCB.	
Laser unit failure	6	Is the problem solved by replacing the laser unit?	Yes	Replace the laser unit.	

I-2	Dark



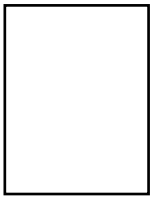
<Scanning>

Possible cause	Step	Check	Result	Remedy
Main PCB failure	1	Is the problem solved after the main PCB is replaced?	Yes	Replace the main PCB.
Laser unit failure	2	Is the problem solved after the laser unit is replaced?	Yes	Replace the laser unit.

<Printing>

Possible cause	Step	Check	Result	Remedy	GND contacts (Fig.4-5)
Corona failure (soiled wire)	1	Is the corona wire dirty?	Yes	Clean the corona wire by using the wire cleaner.	⑧
Corona failure (contact failure)	2	Are the corona electrodes between the printer body and drum unit dirty?	No	Clean both electrodes.	⑥
Drum unit failure	3	Is the problem solved when the drum unit is replaced?	Yes	Replace the drum unit with a new one.	
High-voltage power supply PCB	4	Are there any disconnected connectors?	No	Replace the high-voltage power supply PCB.	
Main PCB	5	Are there any disconnected connectors?	No	Replace the main PCB.	
Panel sensor PCB	6	Are there any disconnected connectors?	No	Replace the panel sensor PCB.	

I-3	Completely blank



<Scanning>

Possible cause	Step	Check	Result	Remedy
CIS harness connection	1	Is the CIS harness connected securely?	No	Reconnect the CIS harness.
CIS unit failure	2	Is the problem solved after the CIS unit is replaced?	Yes	Replace the CIS unit.
Sensor harness connection	3	Is the sensor harness connected between the main PCB and the scanner sensor PCB securely?	No	Reconnect the sensor harness.
Main PCB failure	4	Is the problem solved after the main PCB is replaced?	Yes	Replace the main PCB.

<Printing>

Possible cause	Step	Check	Result	Remedy	GND contacts (Fig.4-5)
Developing bias contact failure	1	Are the developing bias contacts between the printer body and drum unit dirty?	Yes	Clean the electrodes at both sides.	⑦
Drum unit	2	Are the drum shaft and drum electrode of the printer body connected correctly?	Yes	Clean the shaft and the electrode.	①
			No	Check the connection between the shaft and the electrode.	①
Drum unit failure	3	Is the problem solved after the drum unit is replaced?	Yes	Replace the drum unit.	
Scanner harness connection failure	4	Is the scanner harness connected securely? Is there any play in the connection?	No	Reconnect the connector properly.	
Main / Panel sensor PCB connection failure	5	Are printing signals being input to the scanner? Is the problem solved after the main PCB or the panel sensor PCB replaced?	Yes	Replace the main PCB or the panel sensor PCB.	
Laser unit failure	6	Laser interlock lever damaged.	Yes	Replace the laser unit.	
		Laser mirror is broken or loose.	No	Replace the high-voltage power supply PCB.	

I-4	All black

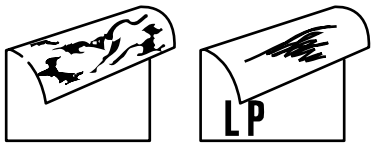
<Scanning>

Possible cause	Step	Check	Result	Remedy
CIS harness connection	1	Is the CIS harness connected securely?	No	Reconnect the CIS harness.
CIS unit failure	2	Is the problem solved after the CIS unit is replaced?	Yes	Replace the CIS unit.
Sensor harness connection	3	Is the sensor harness connected between the main PCB and the scanner sensor PCB securely?	No	Reconnect the sensor harness.
Main PCB failure	4	Is the problem solved after the main PCB is replaced?	Yes	Replace the main PCB.

<Printing>

Possible cause	Step	Check	Result	Remedy	GND contacts (Fig.4-5)
Corona failure	1	Is the corona wire of the drum unit broken?	Yes	Replace the drum unit.	
	2	Are the electric terminal springs in the printer body and the electrode on the bottom face of the drum unit dirty?	Yes	Clean the terminals in the printer and on the drum.	⑥
Harness connection	3	Is the laser unit connected with the panel sensor PCB correctly?	No	Check the harness connection between the laser unit and the panel sensor PCB.	
High-voltage power supply PCB	4	Is the problem solved after high-voltage power supply PCB replaced?	Yes	Replace the high-voltage power supply PCB.	
Ditto	5	Perform the same check as in step 3.	Yes	Replace the panel sensor PCB.	
Main PCB	6	Is the problem solved after main PCB is replaced?	Yes	Replace the main PCB.	
Panel sensor PCB	7	Is the problem solved after the panel sensor PCB is replaced?	Yes	Replace the panel sensor PCB.	

I-5	Dirt on the back of paper



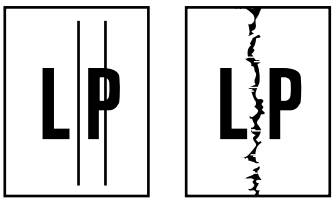
<Printing>

Possible cause	Step	Check	Result	Remedy
Fixing unit	1	Is the pressure roller dirty? Is any other area in the printer dirty?	Yes	Clean the pressure roller. (See the following note.)
Dirt in the drum unit	2	Is the transfer roller dirty? Is the problem solved after the drum unit is replaced?	Yes	Replace the drum unit
			No	Replace the high-voltage power supply PCB.

Note: Clean the pressure roller as follows;

(1) Set three or more sheets of paper in the MP sheet feeder.
(2) Open the top cover.
(3) Turn on the power switch while holding down the switch on the printer control panel.
(4) Release the panel switch when the Drum lamp is on.
(5) Close the top cover.
(6) Hold down the panel switch until the Ready lamp is on, then release the switch.
(7) Print three patterns; grid, zip and solid black.
(8) Turn off the power switch with the top cover closed.
(9) Set paper in the manual slot with the solid black side up.
(10) Turn on the power switch while holding down the switch on the control panel.
(11) Release the panel switch when the Drum lamp is on.
(12) Press the panel switch again and release it immediately.
(13) Print a page of test pattern while cleaning the pressure roller.

I-6	Black and blurred vertical streaks



<Scanning>

Possible cause	Step	Check	Result	Remedy
Stains on the CIS window	1	Are there any stains on the CIS window?	Yes	Clean the CIS window.
Dirt on the document pressure bar	2	Is the document pressure bar dirty?	Yes	Clean the document pressure bar.
Scratch on the document pressure bar	3	Are there any scratches on the document pressure bar?	Yes	Replace the document pressure bar.

<Printing>

Possible cause	Step	Check	Result	Remedy	GND contacts (Fig.4-5)
Corona failure	1	Is the corona wire dirty?	Yes	Clean the corona wire with the wire cleaner.	⑧
Corona failure	2	Is the vertical block streak about 10 mm wide? Is the corona wire cleaner not in its home position?	Yes	Return the wire cleaner to its home position.	
Dirt in the paper feed system	3	Is the paper tray or feed system on the drum unit soiled with toner?	Yes	Clean the toner off.	
Scratch on the drum	4	Is the drum surface scratched?	Yes	Replace the drum unit.	
Cleaning failure	5	Is the drum surface dirty with toner in streaks?	Yes	Replace the drum unit.	
Scratch on the heat roller	6	Is the surface of the heat roller scratched?	Yes	Replace the fixing unit.	

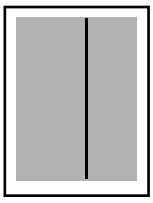
Note:
If you print the same pattern continuously, the drum will be worn and black vertical streaks will appear on the paper.

I-7	Black and blurred horizontal stripes

<Printing>

Possible cause	Step	Check	Result	Remedy
Scratch on the drum	1	Are the horizontal stripes at 94 mm (photosensitive drum) intervals?	Yes	Replace the drum unit.
Toner stuck on the developer roller	2	Are the horizontal stripes at 25 mm (developer roller) intervals?	Yes	Print several sheet and see what happens. The problem will disappear after a while. If not, replace the drum unit.
Scratch on the fixing roller	3	Are the horizontal streaks at 63 mm (heat roller) intervals?	Yes	Replace the fixing unit.
High-voltage power supply PCB	4	Is the problem solved after the high-voltage power supply PCB is replaced?	Yes	Replace the high-voltage power supply PCB.

I-8	Black vertical streaks (in a gray background)



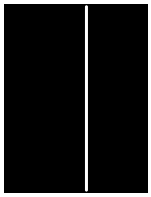
<Scanning>

Possible cause	Step	Check	Result	Remedy
Stains on the CIS window	1	Are there any stains on the CIS window?	Yes	Clean the CIS window.
CIS unit failure	2	Is the problem solved after the CIS unit is replaced?	Yes	Replace the CIS unit.

<Printing>

Possible cause	Step	Check	Result	Remedy
Translucent stain on the laser scanner window	1	Are there any stains on the laser scanner window?	Yes	Clean the laser scanner window. If it is not effective, replace the laser unit.

I-9	White vertical streaks



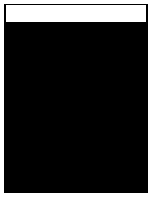
<Scanning>

Possible cause	Step	Check	Result	Remedy
Stains on the CIS window	1	Are there any stains on the CIS window?	Yes	Clean the CIS window.
CIS unit failure	2	Is the problem solved after the CIS unit is replaced?	Yes	Replace the CIS unit.
Dirt on the document pressure bar	3	Are there any dirt on the document pressure bar?	Yes	Clean the document pressure bar.
Scratch on the document pressure bar	4	Are there any scratches on the document pressure bar?	Yes	Replace the document pressure bar.

<Printing>

Possible cause	Step	Check	Result	Remedy
Laser scanner window dirty	1	Is the scanner window dirty?	Yes	Clean the scanner window with a dry tissue.
Transfer failure	2	Is the transfer roller scratched?	Yes	Replace the drum unit.

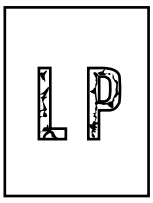
I-10	Faulty registration



<Printing>

Possible cause	Step	Check	Result	Remedy
Excessive paper load	1	Is the paper loaded in the paper feeder more than 22 mm deep?	Yes	Instruct the user to keep paper loads below 22 mm in depth.
Print paper	2	Is the specified weight of the recommended paper being used?	No	Instruct the user to use the recommended types of paper.
Ditto	3	Is the first printing position within ±1 mm of the tolerance specification?	Yes	Adjust the Y offset by using the utility software supplied.
Paper registration sensor position incorrect	4	Is the position of the paper registration sensor normal?	No	Reposition the sensor to the correct position.

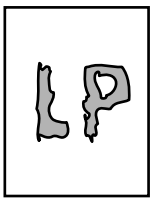
I-11	Poor fixing



<Printing>

Possible cause	Step	Check	Result	Remedy
Printing paper	1	Is thick paper of more than 42 lb. weight in use?	Yes	Instruct the user to use paper of the recommended weight and thickness.
Toner sensing failure	2	Is the problem solved by replacing the drum unit or the toner cartridge? (When printing is faint.)	Yes	Toner is empty. The toner sensing is defective, clean the toner sensor. If the wiper in the toner cartridge is broken, replace the toner cartridge with a new one.
Thermistor failure	3	Is the thermistor fitted correctly?	No	Fit the thermistor correctly.
Low-voltage power supply PCB failure	4	Is the problem solved by replacing the low-voltage power supply PCB?	Yes	Replace the low-voltage power supply PCB.

I-12	Image distortion



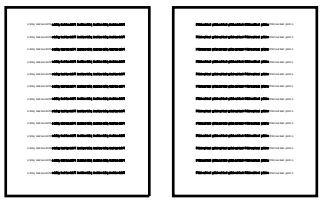
<Scanning side>

Possible cause	Step	Check	Result	Remedy
Separation roller failure	1	Do the separation roller and its related sections work correctly?	No	Replace the separation roller or its related parts.
Document feed roller failure	2	Do the document feed roller and their related gears work correctly?	No	Replace the document feed rollers or their related gears.
Scanner motor failure	3	Does the scanner motor work correctly? Is the scanner motor harness connected securely?	No	Replace the scanner motor, or reconnect the scanner motor harness correctly.
Main PCB failure	4	Is the problem solved after the main PCB is replaced?	Yes	Replace the main PCB.

<Printing>

Possible cause	Step	Check	Result	Remedy
Laser unit	1	Is the laser unit secured to the frame incorrectly? Is there any play?	Yes	Secure the unit correctly and tighten the screws.
LD emission failure Laser motor rotation failure	2	Is the laser diode or the laser scanner motor defective?	Yes	Replace the laser unit.
Laser scanner connection failure	3	Is the scanner harness connected properly? Is it coming loose?	Yes	Connect the harness correctly.

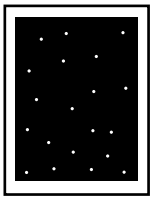
I-13	Faint print



<Printing>

Possible cause	Step	Check	Result	Remedy
Printer not level	1	Is the printer placed horizontally?	No	Place the printer on a flat surface.
Drum unit	2	Does the problem happened immediately after replacing the drum unit with a new one?	Yes	Remove and carefully shake the drum unit horizontally.
Laser scanner window dirty	3	Is the window of the laser scanner dirty?	Yes	Clean the window with a dry tissue.
Laser unit failure	4	Is the problem solved by replacing the laser unit?	Yes	Replace the laser unit.

I-14	White spots



<Printing>

Possible cause	Step	Check	Result	Remedy
Toner cartridge	1	Is the toner in the toner cartridge almost empty?	Yes	Shake the drum unit horizontally. Replace the toner cartridge with a new one.
			No	Replace the drum unit.
Print paper	2	Is the problem solved after change to specified of fresh unpacked paper?	Yes	Recommend the user to change the paper. (Damp (wet) paper might be used.)
Environment	3	Check if the problem still appears after the printing has warmed up.	Yes	Replace the drum unit. Advise the user of the specified print environment.

I-15	Black spots

<Printing>

Possible cause	Step	Check	Result	Remedy
Drum unit	1	Are the spots at 94 mm intervals? The problem is not solved after printing a few pages.	Yes	If toner remains stuck, wipe it off gently with a cotton swab. Replace the drum unit if the photosensitive drum is scratched or deteriorated (exposed). (Refer to the following note.)
Fixing unit	2	Are the spots at 63 mm intervals? The problem is not solved after printing a few pages.	Yes	Check and clean the heat roller with a cloth dampened with alcohol. Replace the fixing unit.
High-voltage power supply PCB	3	Is the problem solved after the high-voltage power supply PCB is replaced?	Yes	Replace the high-voltage power supply PCB.

Note: Clean the drum unit as follows:

(1) Place the printing samples in front of the process unit, and find the exact position of the image defect.

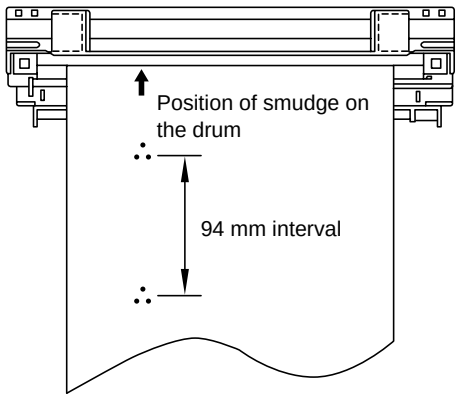


Fig. 4-2

(2) Turn the drum gear by hand while looking at the surface of the photosensitive drum.

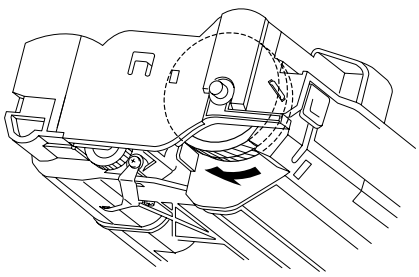


Fig. 4-3

(3) Wipe the surface of the photosensitive drum with a cotton swab until the dust or paper powder on the surface comes off.

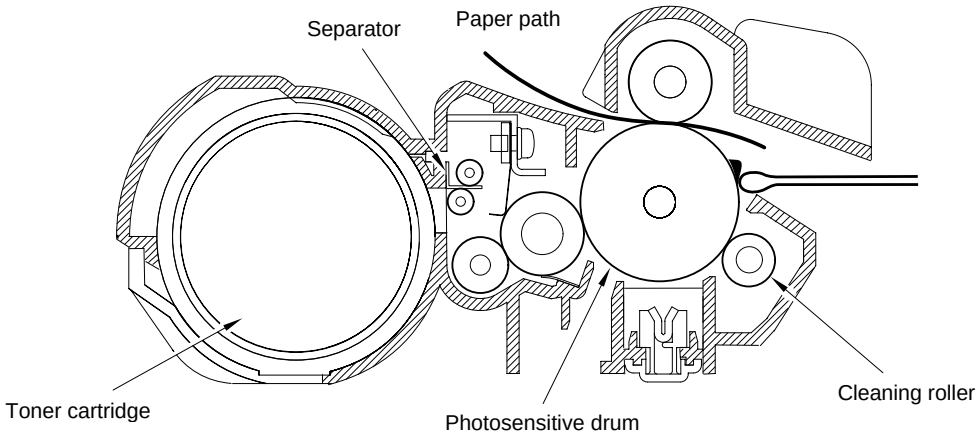
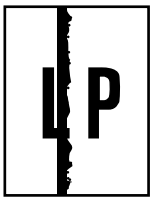


Fig. 4-4

Caution:

- *Do not wipe the surface of the photosensitive drum with something sharp. (ball-point pen etc.)*
- *Use cleaning liquid which is a 50-50 mixture of ethyl alcohol and pure water.*

I-16	Black band



<Printing>

Possible cause	Step	Check	Result	Remedy
Drum unit	1	Is the wire cleaner positioned at its home position?	No	Return the wire cleaner to its home position.
Ditto	2	Is the corona wire dirty?	Yes	Clean the corona wire. If the problem still appears after cleaning, replace the drum unit.

I-17	Gray background

Note:
This problem may appear on the first 10 to 20 pages immediately after replacing the toner cartridge.

<Printing>

Possible cause	Step	Check	Result	Remedy
Print paper	1	Does the paper being used meet the paper specification (weight, etc.)?	No	Recommend to change the paper to a specified type of the paper.
			Yes	Recommend to change the paper to a fresh pack paper.
Drum unit	2	Is the problem solved after replacing the drum unit?	Yes	Replace the drum unit.
			No	Replace the high-voltage power supply PCB.

Note: The following cases increase the possibility of this problem.

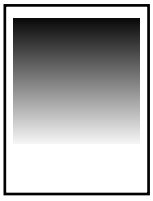
1) The drum unit is at the end of its life.
2) There is dust or paper powder.
3) A large amount of paper whose width is narrower than A4 is printed.
4) Acid paper is being used.

I-18	Hollow print

<Printing>

Possible cause	Step	Check	Result	Remedy
Print paper	1	Is thick paper of more than 42 lb. being used or extremely rough surface paper?	Yes	Recommend to use the specified type of paper.
			No	Refer and compare with I-14.

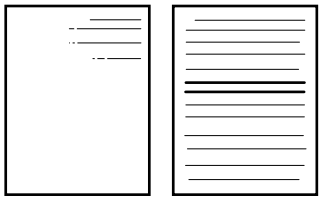
I-19	Downward fogging of solid black



<Printing>

Possible cause	Step	Check	Result	Remedy
Drum unit	1	Is the problem solved after replacing the drum unit?	Yes	Replace the drum unit.
High-voltage power supply PCB	2	Is the problem solved after replacing the high-voltage power supply PCB?	Yes	Replace the high-voltage power supply PCB.

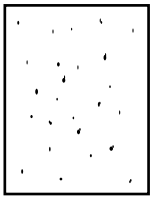
I-20	Horizontal lines



<Printing>

Possible cause	Step	Check	Result	Remedy	GND contacts (Fig.4-5, 4-7)
SR electrode	1	Are the SR electrodes between the printer body and the drum unit dirty?	Yes	Clean both electrodes.	⑨
SR connection failure	2	Are the SR electrodes between the printer body and the drum unit connected correctly?	No	Check the SR connection.	
Feed roller	3	Are the feed roller shaft and the ground contact connected correctly?	No	Check the connection between the shaft and the ground contact.	⑩

I-21	Light rain



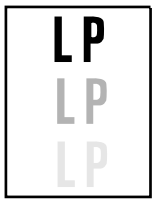
<Printing>

Possible cause	Step	Check	Result	Remedy
Drum unit failure	1	Is the problem solved after replacing the drum unit with one that does not contain a starter sheet**?	Yes	Replace the drum unit.
High-voltage power supply PCB failure	2	Is the problem solved after replacing the high-voltage power supply PCB?	Yes	Replace the high-voltage power supply PCB.

***Note:*

Make sure to use a used drum unit which has already ejected the starter sheet. It is not possible to find a drum unit failure if you use a new drum unit with a starter sheet in it.

I-22	Ghost



<Printing>

Possible cause	Step	Check	Result	Remedy
Driver setting	1	Is thin paper such as 64g/m^2 used under the thick paper mode?	Yes	Change the current mode to the normal mode from the driver setting. Print 5 or 6 blank pages if this problem occurs.

4.3 Location of High-voltage Contacts and Grounding Contacts

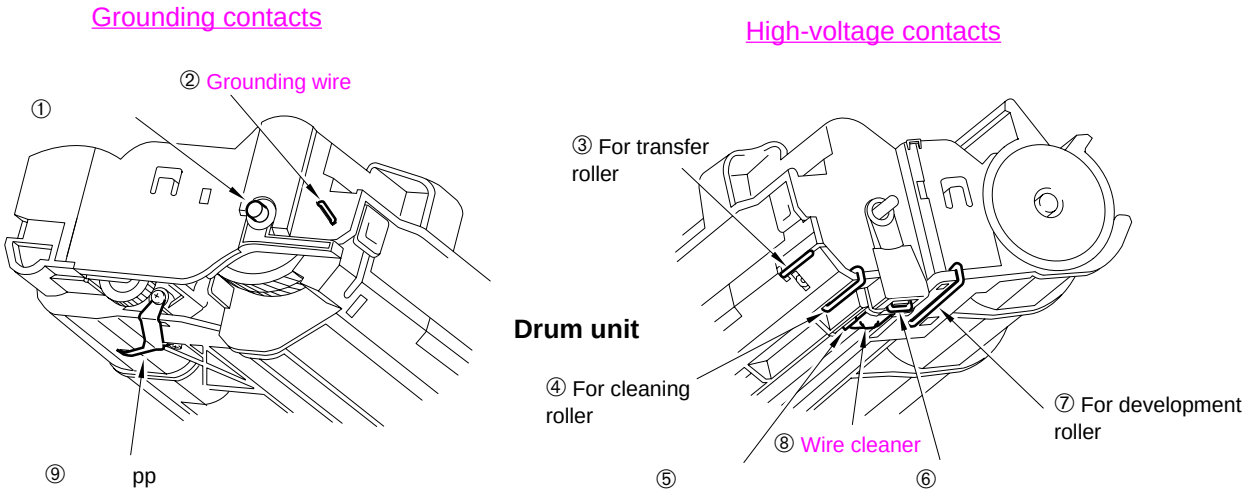


Fig. 4-5

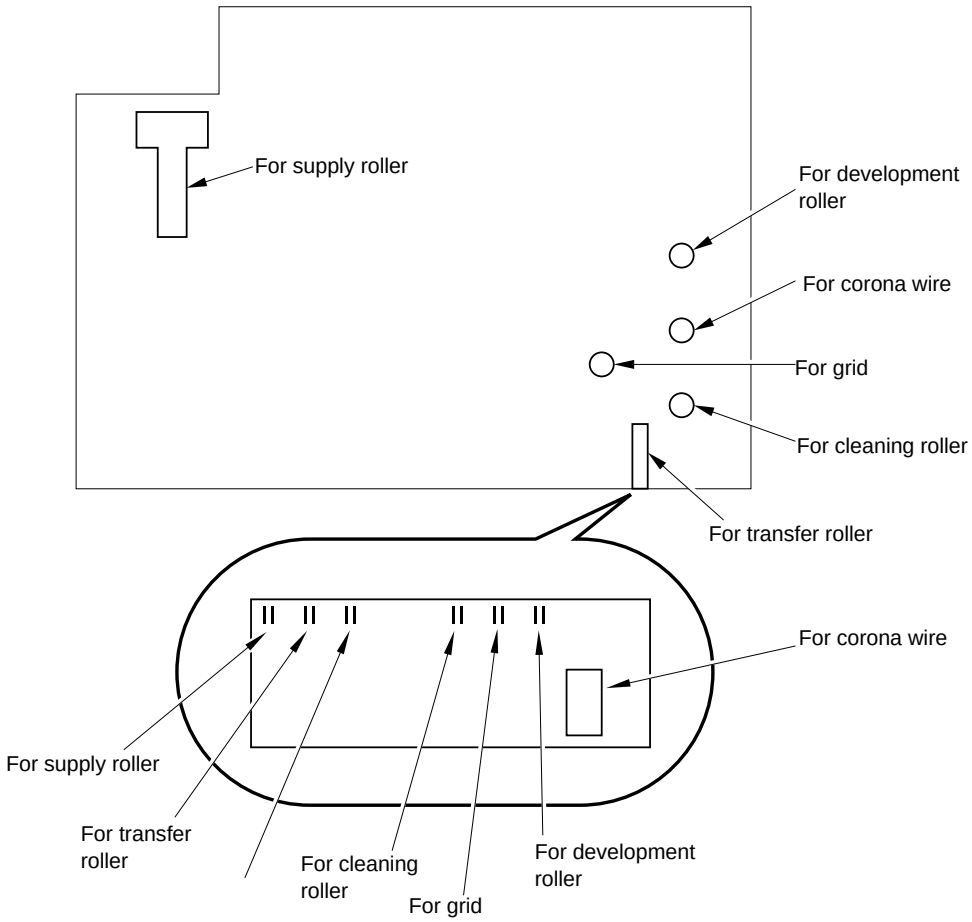


Fig. 4-6

4.4 Location of Feed Roller Shaft and Grounding Contacts

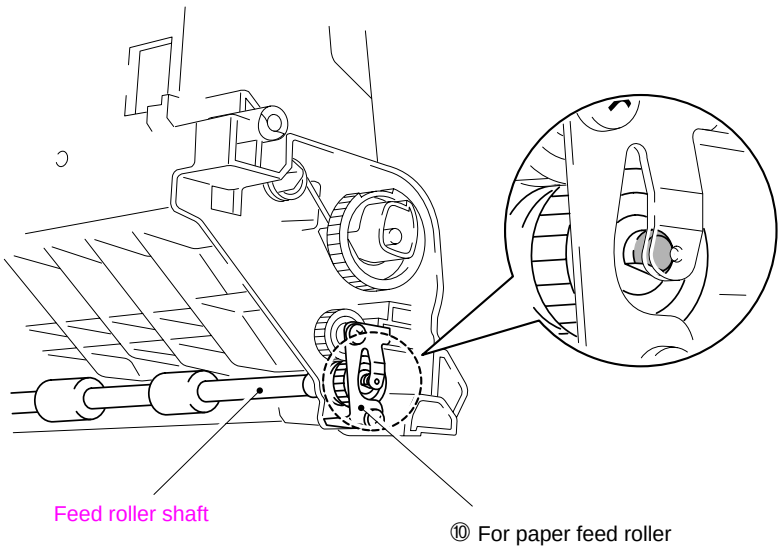


Fig. 4-7

5. DOCUMENT FEEDING PROBLEM

> ***Caution:***
> *When a document jam occurs, pressing the Stop key will eject the jammed document. If the document is not ejected, open the scanner panel cover to remove it.*

Problem	Possible cause	Check	Result	Remedy
'1' is indicated on the LED although no documents are set. Or, '1' is not indicated on the LED although documents are set.	Scanner sensor failure	Check the sensor works correctly by using the factory inspection program mode.	No	Replace the scanner sensor PCB.
	Document front/rear sensor actuators failure	Do the document front/rear sensor actuators work correctly?	No	Replace the document front/rear sensor actuators.
	Main PCB failure	Is the problem solved after the main PCB is replaced?	Yes	Replace the main PCB.
Documents are not fed.	ADF failure	Does the ADF and its related parts (especially the separation rubber) work correctly?	No	Replace the defective ADF related parts.
	Scanner motor failure	Does the scanner motor work correctly? Is the scanner motor harness connected securely?	No	Replace the scanner motor or reconnect the scanner motor harness securely.
	Document feed roller failure	Do the document feed rollers and their related gears work correctly?	No	Replace the defective document feed roller or gear.
	Main PCB failure	Is the problem solved after the main PCB is replaced?	Yes	Replace the main PCB.
	Document thickness	Does the document meet the document specification (thickness, etc.)? Are more documents than the maximum number set in the ADF?	Yes	Set the specified type and number of documents.
Documents are double-fed.	ADF parts failure	Do the ADF feed parts (especially the separation rubber) work correctly?	No	Replace the defective ADF parts.
	Scanner panel cover	Is a document set with the panel cover opened?	Yes	Re-set the document with the panel cover closed.

Problem	Possible cause	Check	Result	Remedy
Recording paper is not fed.	MP rear sheet feeder failure	Does the MP rear sheet feeder work correctly?	No	Replace the MP rear sheet feeder.
	Drum unit failure	Is the problem solved after the drum unit is replaced?	Yes	Replace the drum unit.
	Fixing unit failure	Is the problem solved after the fixing unit is replaced?	Yes	Replace the fixing unit.
	Drive unit failure	Is the problem solved after the drive unit is replaced?	Yes	Replace the drive unit.
	Main PCB failure	Is the problem solved after the main PCB is replaced?	Yes	Replace the main PCB.

6. PAPER JAM

Problem	Type of jam	Cause	Temp measure
Jam at power on	Paper stuck	Paper feed sensor or paper eject sensor is turned on.	Remove the paper inside the printer. If there is no paper, check the suspect sensors referring to the note below and clear the problem.
Top of paper stopped at 20 mm from the fixing unit. Paper feed roller rotated twice.	No paper	Paper feed sensor is not turned on.	Check paper feed sensor motion referring to the note below and clear the problem.
Top of paper stopped at 250 mm from the fixing unit. Next paper is not fed.	Jam caused by paper length detected as longer than 400 mm (16 inches).	Paper feed sensor is not returning properly, and is not turned off.	Check paper feed sensor motion referring to the note below and clear the problem.
Top paper stopped at the paper feed roller.	Jam caused by paper length detected as shorter than 80 mm.	Paper feed sensor was turned off early. Malfunction of actuator or hardware noise.	Check sensors referring to the note below and clear the cause of the problem.
Paper was fed approx. 20 mm from the transfer roller.	Jam caused by a paper feed delay.	Due to paper dust or wear of the rubber paper feed roller, paper was not fed in at the proper timing.	Remove the paper dust attached to the paper feed roller. If the rubber is worn out, replace it with new one.
Top of paper stopped at 17 mm from the contact point of the heat roller and pressure roller.	Jam caused by the paper sensed as not being ejected from the paper eject sensor.	Paper eject sensor does not work properly and is not turning off. (single printing)	Check the sensor motion referring to the note below and clear the problem.
Top of paper stopped at 35 mm from the contact point of the heat roller and pressure roller.	Jam caused by the paper sensed as not being ejected from the paper feed sensor.	Paper feed sensor is not turning on.	Check the sensor motion referring to the note below and clear the problem.
Jam occurred after ejecting paper.	Same as above.	Same as above. (continuous printing)	Same as above.
Top of paper stopped at 20 mm from the fixing unit.	1. Cover open 2. Bug	1. Cover is not closed properly. 2. Bug	1. Check if the drum unit is installed correctly. 2. Please inform BIL.

Note: How to check the sensors

(1) Open the cover.

(2) Turn on the printer power switch while pressing the panel switch.

(3) Release the panel switch.

(4) Press and release the panel switch.

Results:

**Alarm Lamp is ON = Paper feed sensor is turned ON*

**Drum Lamp is ON = Paper eject sensor is turned ON*

7. TROUBLESHOOTING MALFUNCTIONS

When carrying out countermeasures for malfunctions as described in this section, check connectors for contact failure before measuring the voltage at the specified connector pins.

7.1 Printer Malfunctions

M-1	No AC power supplied

Possible cause	Step	Check	Result	Remedy
Supply voltage	1	Is the correct voltage present at the outlet?	No	Inform the user that the correct voltage is not supplied at the outlet.
Power plug	2	Is the power cord securely plugged into the outlet?	No	Plug the power cord securely into the outlet.
Fuse (F1, F2)	3	Is the fuse blown?	Yes	If the fuse blows again immediately after replacing the low-voltage power supply PCB, check that there is not a short circuit somewhere in the AC power supply line.
Wiring	4	Unplug the power supply plug. Is there a broken wire between the AC input connector of the low-voltage power supply and the power plug?	Yes	Replace the AC power cord.

M-2	No DC power supplied

Possible cause	Step	Check	Result	Remedy
AC power supply	1	Is AC power supplied between connectors CN1-L and CN1-N when the power plug is plugged into the outlet?	No	Follow the same check procedure of M-1 “No AC power supplied”.
Wiring, DC load	2	Turn the power switch OFF and disconnect the P13 connector (panel sensor PCB). Turn the power switch ON again. Measure the voltages between the terminals. Do the measured voltage satisfy the prescribed value in the table below?	Yes	Turn the power switch OFF, reconnect the connector and turn the power switch ON again. If the protector circuit is activated, check the connector, the wiring from the connector, and the DC load.
Low-voltage power supply PCB			No	Replace the low-voltage power supply PCB.

PCB	+ lead pin	- lead pin	Voltage
Panel Sensor	P8-1	P8-4	Approx. 24V
	P8-2	P8-3	Approx. 5V

***Caution**:*

If you analyze malfunctions with the power plug inserted into the power outlet, special caution should be exercised even if the power switch is OFF because it is a single pole switch.

M-3	Main motor unrotated

Possible cause	Step	Check	Result	Remedy
Failure of connector	1	Is the connection of connector P9 on the panel sensor PCB correct?	No	Reconnect the connector.
Main motor (M1)	2	Disconnect connector P9 from the panel sensor PCB. Measure the resistance between the connector pins of the main motor by using a circuit tester. Do the measured resistances satisfy the prescribed values in the table below? P9-5 and P9-6: Approx.4.5 Ω P9-7 and P9-8: Approx.4.5 Ω	No	Replace the main motor.
Main PCB	3	Is the problem solved by replacing the main PCB?	Yes	Replace the main PCB.
Sub motor unrotated	4	Disconnect connector P9 from the panel sensor PCB. Measure the resistance between the connector pins of the main motor by using a circuit tester. Do the measured resistances satisfy the prescribed values in the table below? P9-1 and P9-2: Approx.9.1 Ω P9-3 and P9-4: Approx.9.1 Ω	No	Replace the sub motor.

M-4	No paper supplied

Possible cause	Step	Check	Result	Remedy
Connection failure	1	Is the contact of connector P3 on the panel sensor PCB good?	No	Reconnect the connector.
Panel sensor PCB circuit	2	Set paper in the paper feeder and make a test print by pressing the switch on the printer control panel.	No	Replace the panel sensor PCB.
Paper pick-up clutch solenoid		Does the voltage between pins 2 (SOLENOID) and 1 (24V) of the P3 connector on the panel sensor PCB change from approx. 24V DC to 0V within the specified time?	Yes	Replace the paper pick-up solenoid.
MP tray unit failure	3	Is the surface of the separation pad or the pick up roller stained or worn out?	Yes	Clean the surface or replace.
Main PCB	4	Is the problem solved by replacing the main PCB?	Yes	Replace the main PCB.

M-5	Insufficient output from high-voltage power supply unit

Possible cause	Step	Check	Result	Remedy
High-voltage contact	1	Do any of the terminals on the high-voltage contacts have dirt or contact burns?	Yes	Clean the high-voltage contact.
	2	Check the connections of the harness between the high-voltage power supply and the panel sensor PCB are secured correctly.	Yes	Replace the high-voltage power supply PCB.
			No	Reconnect the harness between the high-voltage power supply and the panel sensor PCB.

M-6	Fixing heater temperature failure

Possible cause	Step	Check	Result	Remedy
Poor thermistor harness contact	1	Are the connectors on the erase lamp PCB and the high-voltage power supply PCB secured correctly?	No	Connect the connectors securely.
Blown thermal fuse	2	Remove the fixing unit and measure the resistance between the input connectors. Is it open circuit?	Yes	Replace the fixing unit.
Thermistor failure	3	Is the thermistor installed properly?	Yes	Replace the fixing unit.
			No	Reinstall the thermistor properly.
Halogen heater lamp failure	4	Remove the fixing unit and measure the resistance of the fixing unit lamp. Is it open circuit?	Yes	Replace the halogen heater lamp.

M-7	BD failure

Possible cause	Step	Check	Result	Remedy
Harness connection failure	1	Is connector P2 on the panel sensor PCB secured correctly?	No	Connect it securely.

M-8	Laser unit failure

Possible cause	Step	Check	Result	Remedy
Harness connection failure	1	Is the connection of the scanner motor connector P5 on the panel sensor PCB secure?	No	Reconnect the connectors securely.
Power supply input	2	Is the voltage between pins 1 (+24VDC) and 2 (GND) of connector P5 on the panel sensor PCB 24VDC?	No	Check if +24VDC is supplied between pins 1 (+24VDC) and 4 (+24VRET) of connector P8 on the panel sensor PCB. If not, check the power supply output on the low-voltage power supply PCB.
			Yes	Replace the laser unit.

F-1	Double feeding

Possible cause	Step	Check	Result	Remedy
Paper	1	Is paper of a recommended type being used?	No	Instruct the user to use recommended types of paper.
Separation pad	2	Is the surface of the separation pad worn out?	Yes	Replace the MP sheet feeder.

F-2	Wrinkles

Possible cause	Step	Check	Result	Remedy
Paper	1	Is paper of a recommended type being used?	No	Instruct the user to use the recommended types of paper.
	2	Is the wrinkle problem solved if new paper is used?	Yes	Instruct the user how to store paper so that it does not absorb moisture.
Fixing unit entrance guide	3	Is the entrance guide dirty?	Yes	Clean the entrance guide.
Fixing unit	4	Is the pressure roller dirty?	Yes	Clean the pressure roller
			No	Replace the fixing unit.

8. PRINTER INSPECTION MODE

8.1 Incorporated Inspection Modes

The printer incorporates various printer inspection modes such as the factory inspection mode and the test print mode.

This printer supports a factory inspection mode, continuous grid pattern print mode, 3 patterns print mode and NV-RAM value dump mode.

The operation of the inspection mode is as follows.

(1) Turn off the power switch of the printer.

(2) With the top cover open, turn on the power switch while holding down the switch on the printer control panel.

When you enter this inspection mode, the Drum lamp is ON. Holding down the panel switch will cause the lamps to turn ON in the order Drum → Alarm → Ready → Data → Drum. When you release the switch, a mode is selected.

The mode selected is indicated by the lamp which is ON when you release the switch.

The inspection modes are assigned to the respective lamps as shown below.

Lamp	Type of inspection
Drum	Factory inspection mode
Alarm	Continuous grid pattern print mode
Ready	3 patterns print mode (grid, zip, black)
Data	NV-RAM value dump mode

Details of the factory inspection mode are as follows.

This mode is used to check if the sensors in the printer are functioning correctly. In the process of this inspection, the lamps and the switch on the printer control panel are also checked. On entering this mode, the lamps show the status of the respective sensors as follows;

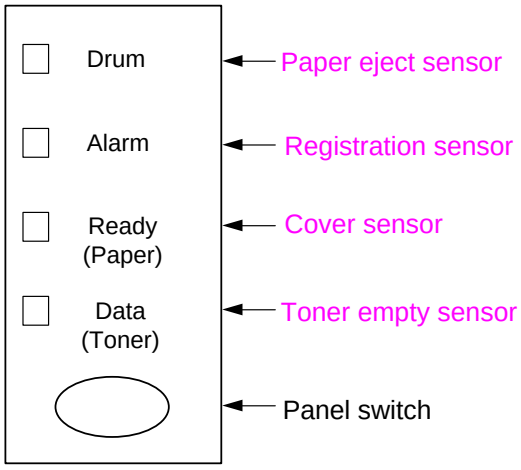


Fig. 4-8

Paper eject sensor	ON (Paper is detected.)	Drum lamp ON
	OFF (No paper is detected.)	Drum lamp OFF
Registration sensor	ON (Paper is detected.)	Alarm lamp ON
	OFF (No paper is detected.)	Alarm lamp OFF
Cover sensor	ON (The top cover is closed.)	Ready lamp OFF
	OFF (The top cover is open.)	Ready lamp ON
Toner empty sensor	ON (The toner cartridge is installed.)	Data lamp OFF
	OFF (No toner cartridge is installed.)	Data lamp ON

The procedure for the factory inspection mode is as follows.

(1) Turn off the power switch of the printer, open the top cover, and remove the drum unit.

(2) Turn on the power switch while holding down the printer control panel switch. The Drum lamp comes ON.

(3) Lightly press the panel switch again.

(4) Check that the Drum (paper eject sensor) and Alarm (registration sensor) lamps go OFF after all the lamps have been ON.

If the paper eject sensor is ON at this point, the Drum lamp stays ON (error).

If the registration sensor is ON at this point, the Alarm lamp stays ON (error).

(5) Install the drum unit.

Check that the Data lamp goes OFF.

(6) Lightly touch the registration sensor actuator.

Check that the Alarm lamp comes ON.

(7) Close the top cover.

Check that the Ready lamp goes OFF.

(8) Press the printer control panel switch.

(9) If all the sensors are correct, the printer goes back to the Ready status. If any error is detected, the corresponding lamp stays ON.

8.2 Error Codes

In the event of a printer failure, error codes will be indicated as shown below. All the lamps and the specific lamps are turned ON alternately. The specific combination of lamps that are ON indicates the type of the error.

Type of error	Data	Ready	Alarm	Drum
Fuser Malfunction				○
Laser BD Malfunction			○	
Laser Scanner Malfunction			○	○
ROM Error		○		
D-RAM Error		○		○
Service A *		○	○	
Service B *		○	○	○
Service C	○			
Service D	○			○
Service E0	○		○	
Service E1	○		○	○
Service P	○	○		
NV-RAM Error	○	○		○
CPU Runtime Error *	○	○	○	○

* Refer to the further description of the errors as follows;

- Service A: Address Error
- Service B: Bus Error
- CPU Runtime Error: A CPU error other than the above two defects, such as an Illegal Instruction or Operation Overflow

HOW THE LAMPS INDICATE AN ERROR

i.e. Fuser Malfunction

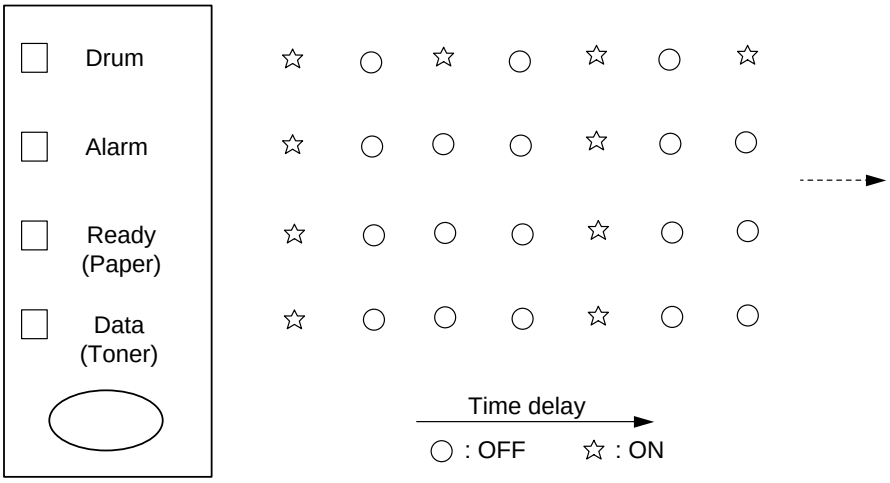


Fig. 4-9

9. SCANNER INSPECTION MODE

The printer incorporates a scanner inspection mode, the factory inspection program mode.

The factory inspection program mode provides two types of test mode, and then each test mode supports a few test programs. Refer to the table below;

<Test Mode A>	Scanner panel test
	Line-feeding test
	Maintenance copy test
<Test Mode B>	Continuous test mode (scanner panel test / line-feeding test / maintenance copy test)
	Maintenance copy test
	N/A

To enter the factory inspection program mode, you can choose one of the following;

A) Turn on the power switch of the printer while pressing the Stop and Enlarge keys.

B) Press the Stop and Enlarge keys after turning on the power switch of the printer.

Note:

- *Once you press any keys other than the Stop and Enlarge keys when the power is turned on, the printer cannot enter the factory inspection program mode any more unless power is turned off and the select sequence is repeated.*
- *The printer enters into Test Mode A immediately after entering the factory inspection program mode. If you want to switch between these two test modes, press the Stop key.*

The following sections describe the detailed operation of each test mode.

9.1 Test Mode A

When the printer enters into Test Mode A, 'A' is shown on the seven-segment LED. Then, press one of the keys to select the test program as follows;

- Enlarge: A-1 Scanner panel test
- Photo: A-2 Line-feeding test
- Copy: A-3 Maintenance copy test
- Stop: Switch to Test Mode B

A-1 Scanner Panel Test

The scanner panel test checks the four keys, five lamps and seven-segment LED on the scanner control panel and also the document front/rear sensors.

The operation of this test is as follows;

1) When the printer enters into this mode, all lamps on the scanner control panel are off.
2) When the Enlarge, Photo, Copy and Stop keys are pressed in order, each of the four Enlarge/Reduce lamps come on from left to right in order. When all of the keys are being pressed then all four lamps are ON.
3) When the four keys are recognized, the Photo lamp flashes, and each of the seven segments on the LED is turned on in sequence.

4) When the document front sensor is turned on during the test 3) status, the flashing Photo lamp comes on.

5) When the document front sensor is turned off during the test 4) status, the printer returns to the test 3) status.

6) When the document rear sensor is turned on during the test 3) status, all of the seven segments on the LED are ON (it indicates '8').

7) When the document rear sensor is turned off during the test 6) status, the printer returns to the test 3) status.

8) When the Stop key is pressed during the test 3) status, the printer returns to the initial status of Test Mode A ('A' is shown on the LED).

Note:
If even one of the four keys cannot be recognized, the printer does not return to the test 3) status.

A-2 Line-Feeding Test

The line-feeding test checks if there is no double-feeding or non-feeding and if the document front/rear sensors work correctly. The document is fed without being scanned in this test mode.

The operation of this test is as follows;

1) When the printer enters this test mode, 'L' is shown on the LED.

2) Set a multi page document into the ADF, then '0' is shown on the LED.

3) When the Copy key is pressed, '1' flashes on the LED, then the printer starts line-feeding.

4) After finishing line-feeding on the first page, '1' is shown without flashing.

5) The number on the LED is incremented after each page is line-fed. After finishing this test, the total number of pages line-fed is shown on the LED.

6) When the Stop key is pressed, the test mode is finished and returns to the initial status of the Test Mode A ('A' is shown on the LED).

Note:
- *The 10th to 15th pages are indicated using the hexadecimal value, such as 'A', 'b', 'C', 'd', 'E', 'F'. The 16th or later page is indicated as 'F'.*
- *If a feeding error such as a paper jam occurs, 'E' flashes on the LED.*
  If the Stop key is pressed to clear the error, 'L' is shown on the LED when there is no document in the ADF, or '0' is shown when there is document. After the document is removed from the ADF, 'L' is shown.
- *When a paper jam occurs during line-feeding, press the Stop key to stop line-feeding. Then, 'E' flashes on the LED.*

  When the Stop key is pressed while the document is on the document front sensor and the printer is stopping line-feeding, the printer ejects all documents in the ADF, then returns to the initial status of the line-feeding test mode ('L' is shown).

A-3 Maintenance Copy Test

When the printer enters into the maintenance copy test, first of all, it detects the maximum value of the light level for the scanner CIS LED and stores it in NVRAM. Then, the printer enters into the maintenance copy test.

1) When the printer enters into the maintenance copy test mode, the four Enlarge/Reduce lamps flash.
2) Set the document into the ADF. Then, the LED indication changes from '0' to '1'.
3) Press the Copy key to copy the data.

Note:

- *When the Stop and Enlarge keys are pressed in the maintenance copy mode, the printer returns to the normal copy mode. The four Enlarge/Reduce lamps are also turned OFF.*
- *Be sure to close the ADF cover during this test mode because the maximum value of the LED light level is created by scanning the white shield of the document pressure bar.*
- *When a document remains on the document front sensor, it should be removed before the maintenance copy.*

9.2 Test Mode B

When the printer enters into Test Mode B, 'B' is shown on the LED. Then, press one of the keys to select the test mode as follows;

- Enlarge: B-1 Continuous test mode (panel test / line-feeding test / maintenance copy test)
- Photo: B-2 Maintenance copy test
- Copy: N/A
- Stop: Switch to Test Mode A

B-1 Continuous Test Mode

When the printer enters into the continuous test mode, it starts the scanner panel test, line-feeding test and maintenance copy tests continuously.
To switch from the scanner panel test to line-feeding test or from line-feeding test to maintenance copy test, press the Stop key.

For each operation, refer to the '8.1 Test Mode A' section.

B-2 Maintenance Copy Test

The maintenance copy test is the same as test A-3 of Test Mode A. Refer to the '8.1 Test Mode A' section.

9.3 Scanner Error Indications

When an error occurs during scanning, the error indication is shown on the LED of the scanner control panel. Take an appropriate action referring to the table below;

Problem	LED Indication	Remedy
No document	Copy number and 'P' are displayed alternately	**1) Set the document.** The error is cleared automatically, and the copy number is indicated. The settings of the enlarge/reduce ratio and the Photo mode which were set before the error are remained (not returned to the default).
		2) Press the Stop key. The settings and indication are returned to the default.
Document is mis-picked.	'E'	**1) Re-set the document.** When the document is removed, the scanner settings and indication are returned to the default.
		2) Open the scanner cover. When the scanner cover is opened, the regist sensor and ADF sensor detect no document in the ADF, and the error is cleared.
		3) Press the Stop key. The scanner settings and indication are returned to the default. Since the document is being set in the ADF, '1' is indicated.
• Document jam • Longer document than the specified size is set. • Copying is stopped by the Stop key is pressed.	'E'	**1) Remove the document.** When the cover is opened, the regist sensor and ADF sensor detect no paper in the ADF, and the error is cleared. When the document is removed without the cover being opened, the regist sensor detects no paper, and the error is cleared. After that, the scanner settings are returned to the default.
		2) Press the Stop key. The document is ejected. After that, the scanner settings are returned to the default.
Press the Copy key during printing from PC	Ignore the key	**Wait until printing is finished.**
Press the Copy key during scanning	Ignore the key	**Wait until scanning is finished.**
No paper loaded	'E' / The Alarm lamp on the printer control panel is ON.	**1) Load the paper.** After that, press the button on the printer control panel. The error is cleared automatically, and the printer continues copying.
		2) Press the Stop key. The document is ejected, then the scanner settings are returned to the default. The printer does not continue printing.
Direct copy memory full	'E'	**Press the Stop key.** The document is ejected, then the scanner settings are returned to the default.

Problem	LED Indication	Remedy
Printer overrun	'E'	**Press the Stop key.** The document is ejected, then the scanner settings are returned to the default.
Print paper jam	'E'	**1) Remove the jammed paper and press any button on the printer control panel.** If a document jam occurs in the ADF, the error indication does not disappeared. (Document jam) If there is no document in the ADF, the error is cleared automatically. The printer does not continue printing.
		2) Press the Stop key. The document is ejected, then the scanner settings are returned to the default.
Printer cover open	'E'	**1) Close the printer cover.** If a document jam occurs in the ADF, the error indication does not disappeared. (Document jam) If there is no document in the ADF, the error is cleared automatically. The printer does not continue printing.
		2) Press the Stop key. The document is ejected, then the scanner settings are returned to the default.
Printer toner empty	'E'	**1) Open the printer cover and replace the toner cartridge.** If a document jam occurs in the ADF, the error indication does not disappeared. (Document jam) If there is no document in the ADF, the error is cleared automatically. The printer does not continues printing.
		2) Press the Stop key. The document is ejected, then the scanner settings are returned to the default.

9.4 Scanner Service Error

PR98221

Problem	LED Indication	Cause
Sub ASIC Error	'E' and '0' are displayed alternately.	Hardware error of the scanned data. When the pixel number per line is over the specified value, the error occurs. It will be caused by Sub ASIC and D-RAM malfunction.
Hi-Ref Adjustment Error	'E' and '1' are displayed alternately.	Error of hi-reference adjustment which is performed with using the document pressure bar when the direct copying or PC scanning is started. The error occurs in the following cases; • If the output from the CIS is less than 1V. • If the output from the CIS is low because the document pressure bar or the surface of the CIS is dirty. • If the hi-reference value cannot be changed due to the LC82103 malfunction. • If the CIS is connected correctly.
Light Level Adjustment Error	'E' and '2' are displayed alternately.	Error of light level adjustment which is performed with the document pressure bar and the document end. The error occurs in the following cases; • If the output from the CIS is too high even though the parameter is changed till the LED is OFF. • If the LED light level is still high due to the Sub ASIC or PWM malfunction even though the parameter is changed. • If the output is high due to the CIS malfunction. • If light level cannot be adjusted correctly due to the LC82103 malfunction.
White Distortion Adjustment Data Error	'E' and '2' are displayed alternately.	Error when creating the white distortion adjustment data, which is performed with using the document pressure bar when the direct copying or PC scanning is started. The error occurs in the following cases; • If there is the white level data whose value is smaller than the one of the black. • If some parts of the image sensor in the CIS are not normal. • If the document pressure bar or the surface of the CIS is dirty. • If D-RAM in the LC82103 is not normal.

<Remedy>

When the service error occurs, press the Stop key on the scanner control panel to clear the error.

If the service error often occurs, you need to repair or replace the main PCB and the scanner related parts such as CIS.

APPENDIX 1. SERIAL NO. DESCRIPTIONS

The descriptions below show how to read the labels on the printer and printer parts.

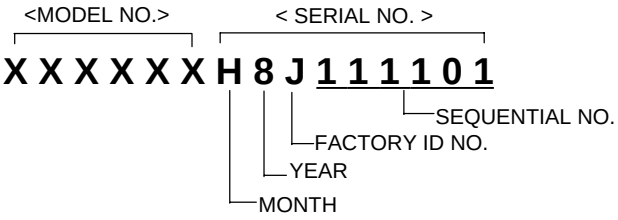
< ID for production month >

A:	January	B:	February	C:	March	D:	April
E:	May	F:	June	G:	July	H:	August
J:	September	K:	October	L:	November	M:	December

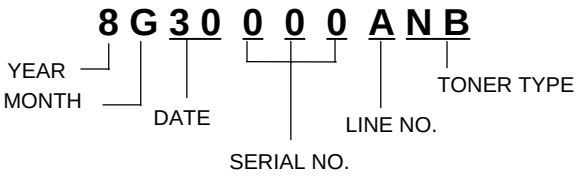
< ID for factory >

9:	Kariya Plant	A:	Mie Brother	C:	BIUK
J:	Buji Nan Ling Factory				

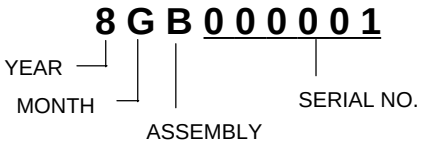
(1) Printer .....on the main body



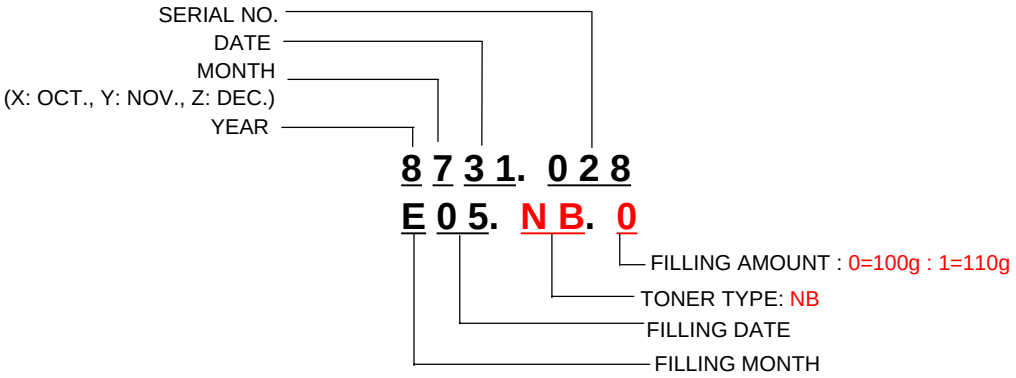
(2) Process unit .....on the package of the process unit
(Drum unit with toner cartridge)



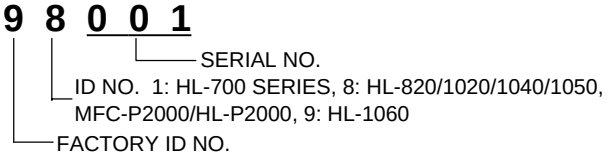
(3) Drum unit .....on the drum unit



(4) Toner cartridge .....on the toner cartridge



(5) Scanner unit .....on the scanner unit



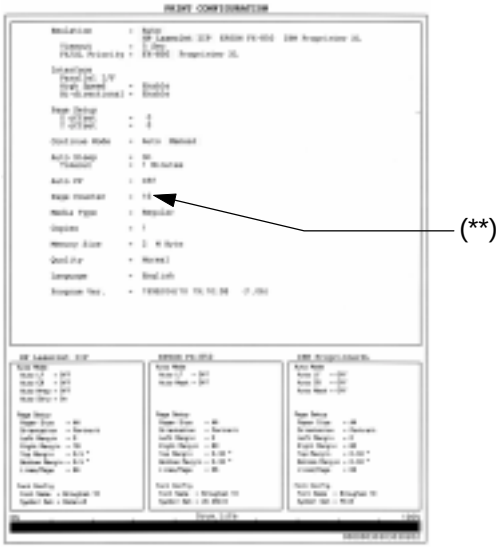
APPENDIX 2. HOW TO KNOW DRUM UNIT LIFE & PAGE COUNTER

If you want to know the drum unit life or the number of printed pages, you should print out the print configuration page.

Print Print Configuration

1) Turn on the power switch of the printer while pressing the printer control panel switch.
2) Release the panel switch when the Drum lamp comes on.
3) Press the panel switch and release it when the Alarm lamp comes on.
4) Print the page of Print Configuration.

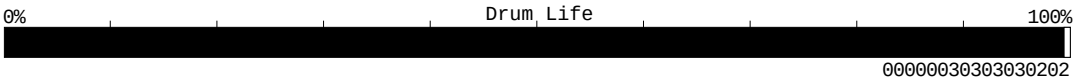
Note:
The ** mark in the figure below shows the page counter. It is not printed in some countries.



How to Read the Drum Life

The bar shown below is printed at the bottom of Print Configuration.

- It initially indicates 100% and gradually decreases.
- It indicates 0% when the Drum lamp is on.
- It stays at 0% even if further printing is done.



How to Read the Page Counter

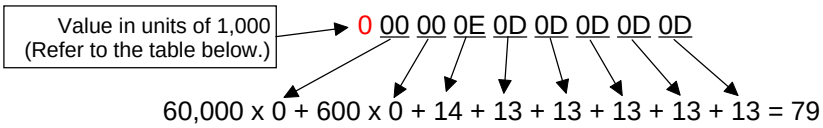
The page counter is not shown directly for some countries. (Refer to the note in the previous page.)

However, the values printed at the right below of the drum life bar, which are available in all countries, indicate the number of the printed pages in a unit of 1 and in a unit of 1,000.

- Value in a unit of 1

The hexadecimal value stored in NV-RAM is printed.

Example: 000000E0D0D0D0D0D



- Value in units of 1,000

Page counter indicated by units of 1,000 pages.

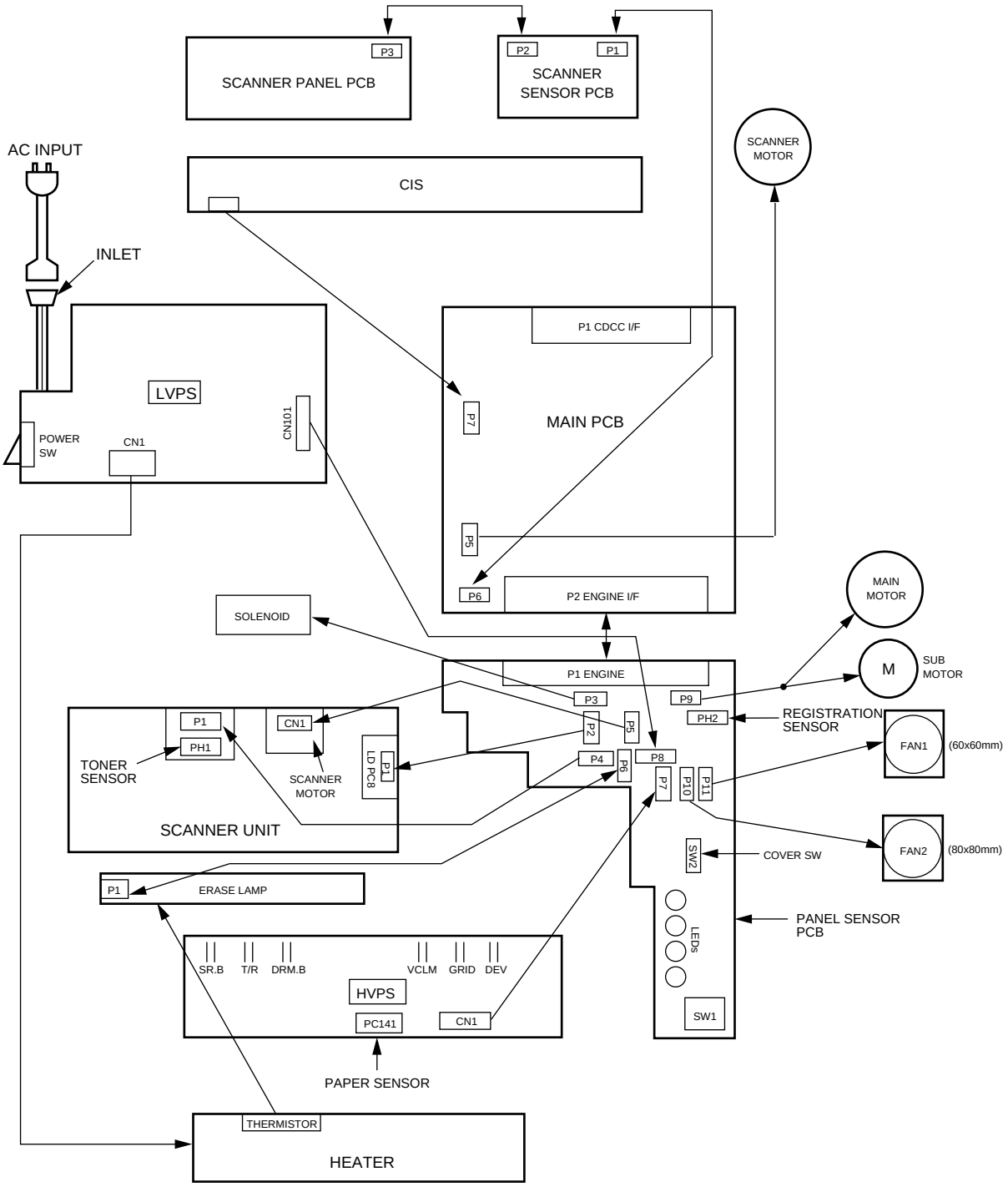
→ 0 - 99 pages	0	600 - 699 pages	6
100 - 199 pages	1	700 - 799 pages	7
200 - 299 pages	2	800 - 899 pages	8
300 - 399 pages	3	900 - 999 pages	9
400 - 499 pages	4	1,000 - 1,999 pages	A
500 - 599 pages	5	2,000 - 2,999 pages	B

APPENDIX 3. DIAMETER / CIRCUMFERENCE OF ROLLERS

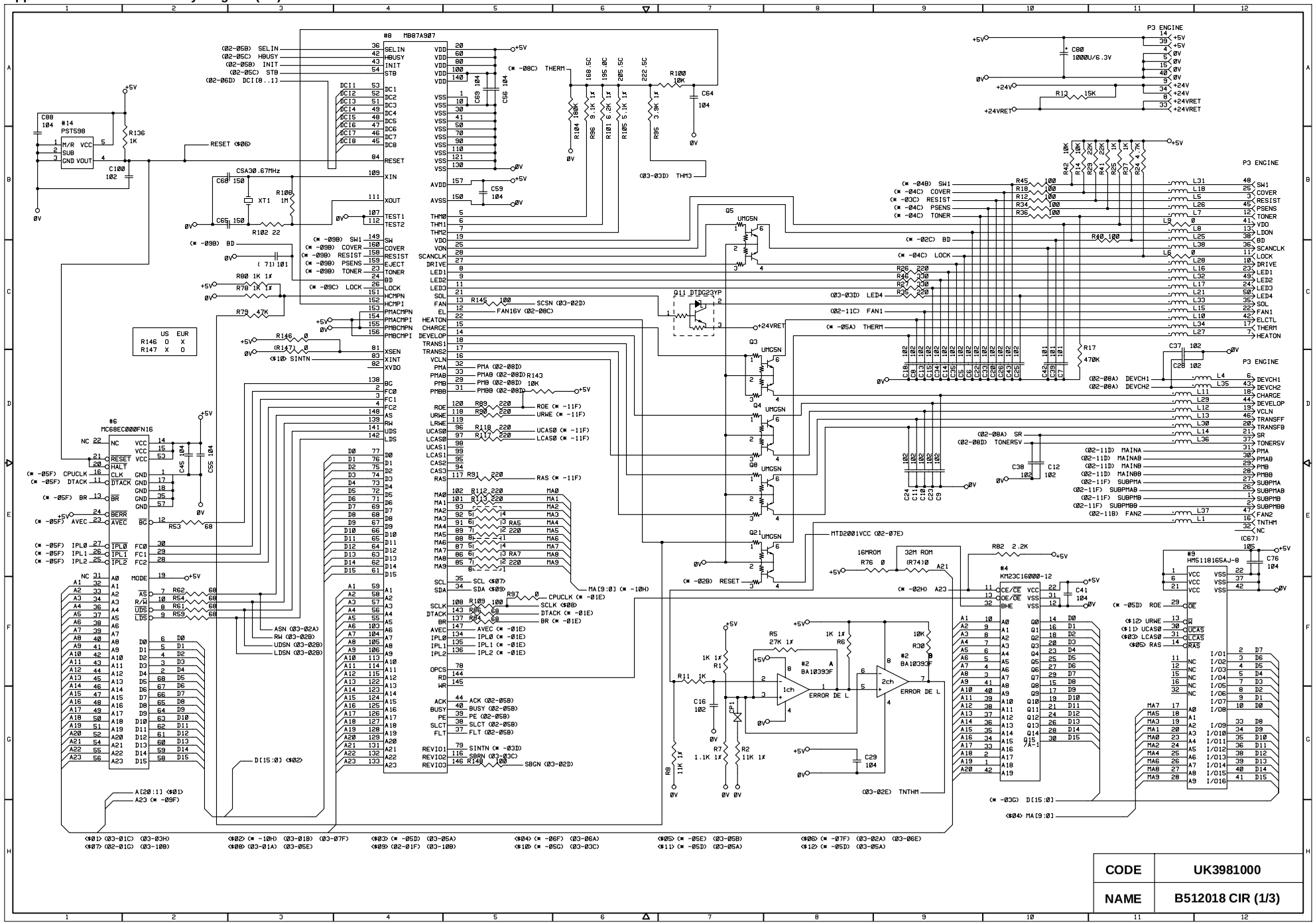
The diameter and circumference of each roller are listed below;

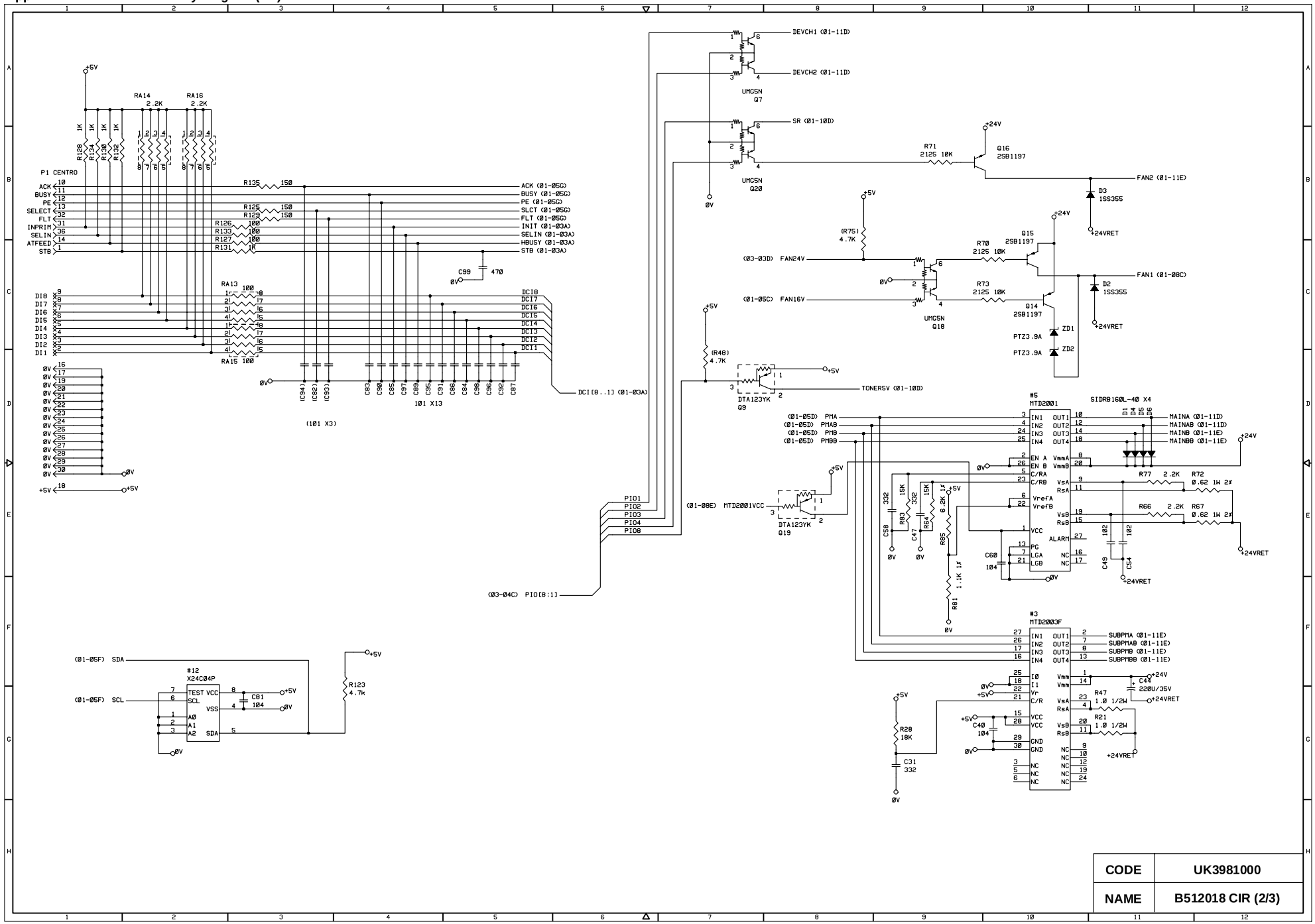
No.	Parts Name	Diameter (Circumference)
1	Paper Feed Roller	ϕ 11.97 mm (37.6 mm)
2	Transfer Roller	ϕ 16.90 mm (53.1 mm)
3	Photosensitive Drum	ϕ 29.97 mm (94.1 mm)
4	Heat Roller	ϕ 19.86 mm (62.4 mm)
5	Pressure Roller	ϕ 16.50 mm (51.8 mm)

Appendix 4. Connection Diagram

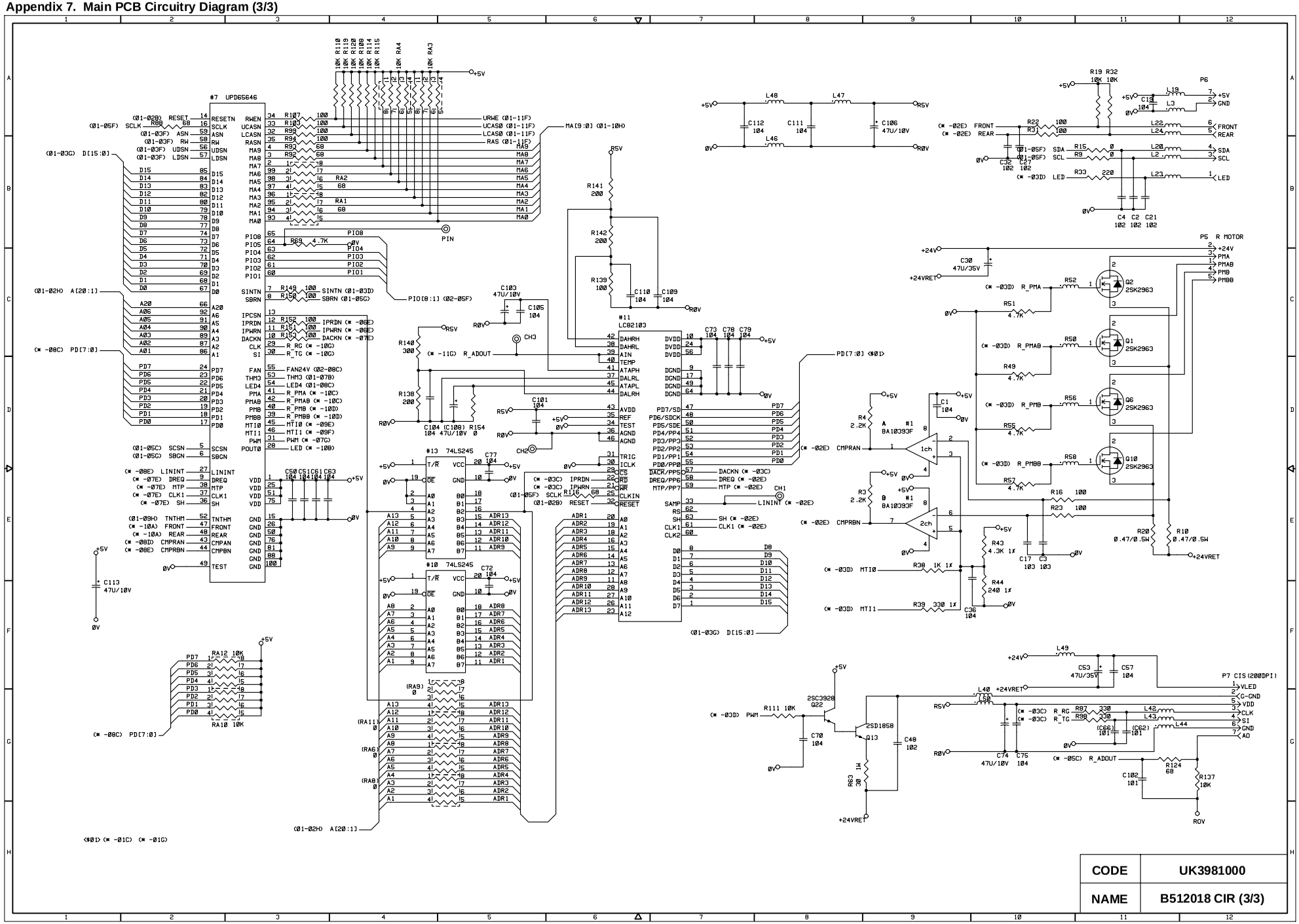


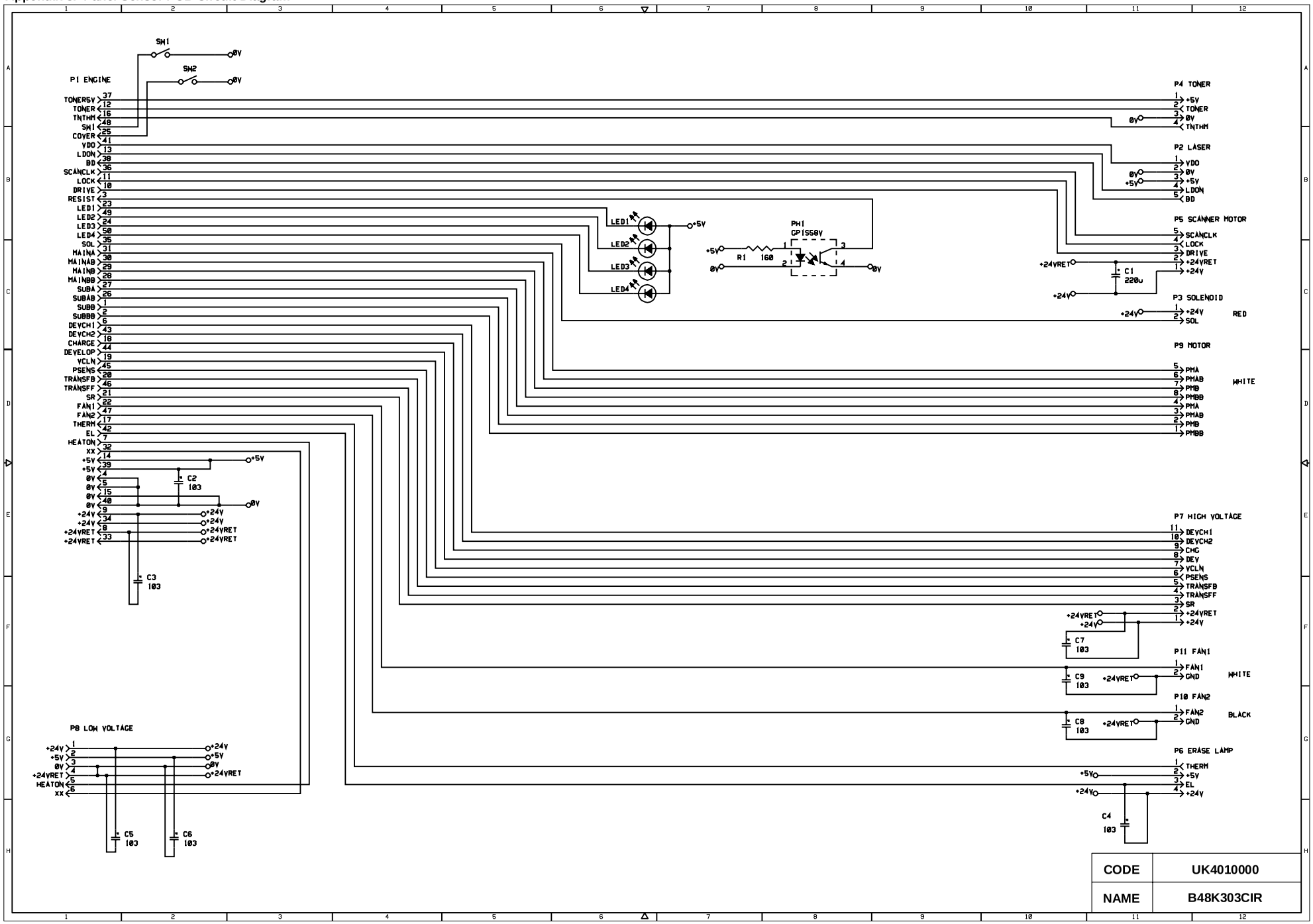
Appendix 5. Main PCB Circuitry Diagram (1/3)



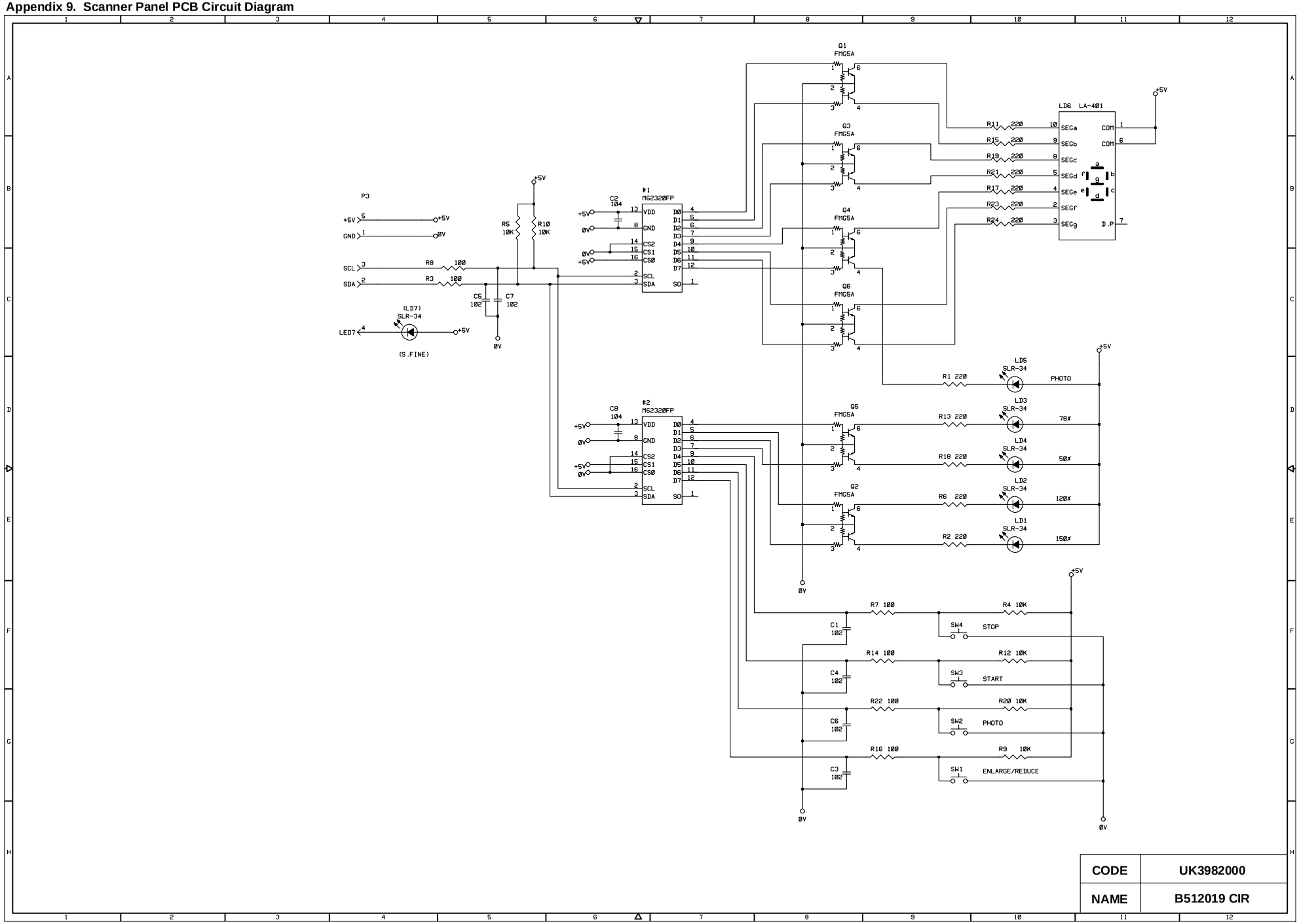


CODE	UK3981000
NAME	B512018 CIR (2/3)


#7 UPD65646
#11 LC82103
#13 74LS245
#10 74LS245
P5 R MOTOR
P6
P7 CIS (200DPI)
PIN
ROV
CODE
UK3981000
NAME
B512018 CIR (3/3)

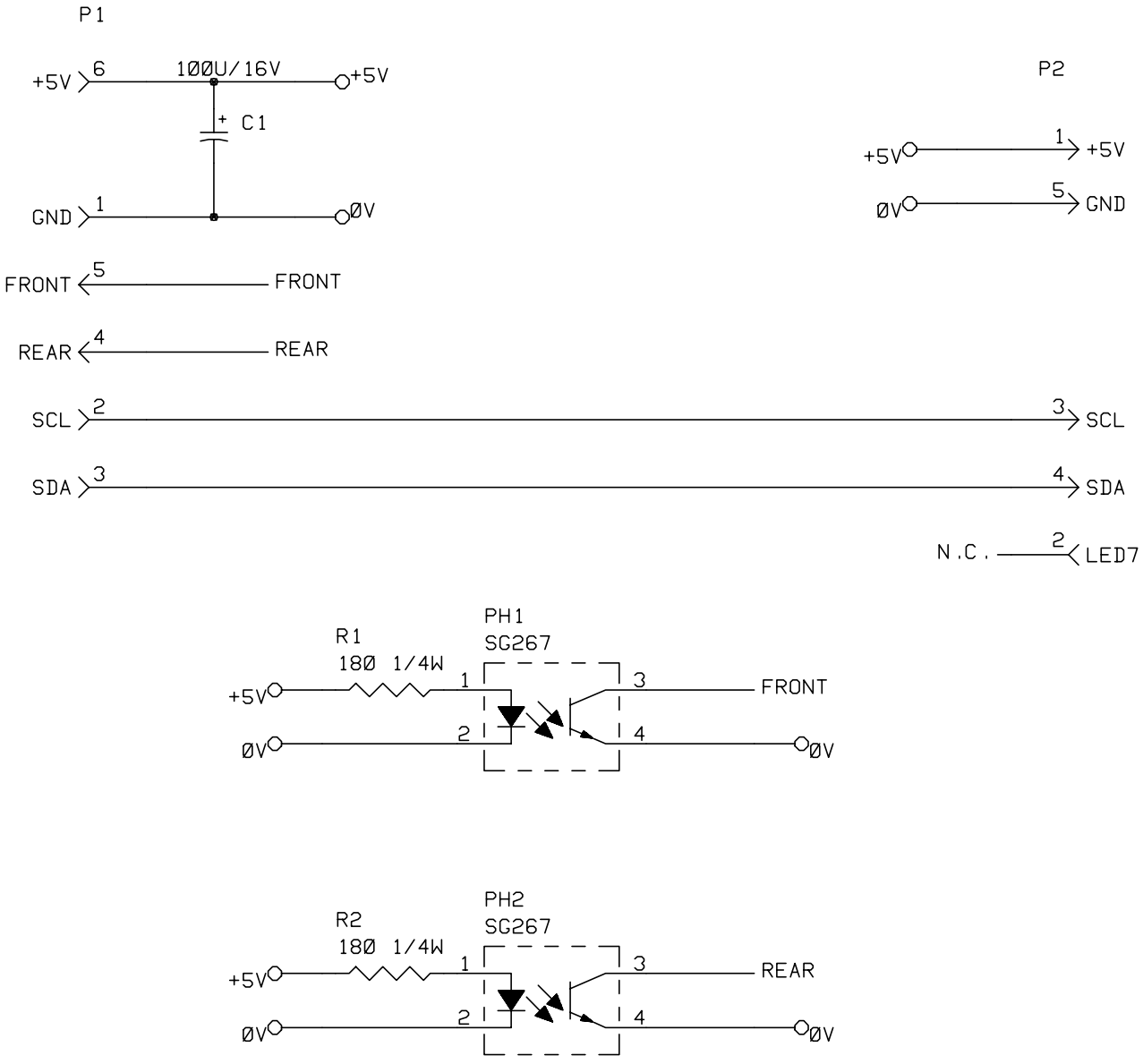

SW1
SW2
0V
P1 ENGINE
TONER5V 37
TONER 12
TNTHM 16
SW1 48
COVER 25
VDO 41
LDON 13
BD 38
SCANCLK 36
LOCK 11
DRIVE 10
RESIST 3
LED1 23
LED2 49
LED3 24
LED4 50
SOL 25
MAINA 31
MAINAB 30
MAINB 29
MAINBB 28
SUBA 27
SUBAB 26
SUBB 1
SUBBB 2
DEVCH1 6
DEVCH2 43
CHARGE 10
DEVELOP 44
VCLN 19
PSENS 45
TRANSFB 20
TRANSFF 46
SR 21
FAN1 22
FAN2 47
THERM 17
EL 42
HEATON 7
XX 32
+5V 14
+5V 39
0V 4
0V 5
0V 15
0V 40
+24V 9
+24V 34
+24VRET 8
+24VRET 33
C2 103
C3 103
LED1
LED2
LED3
LED4
+5V
PH1 GP1S58V
R1 160
P4 TONER
P2 LASER
P5 SCANNER MOTOR
P3 SOLENOID
RED
P9 MOTOR
WHITE
P7 HIGH VOLTAGE
C1 220u
C7 103
P11 FAN1
C9 103
P10 FAN2
BLACK
C8 103
P6 ERASE LAMP
C4 103
P8 LOW VOLTAGE
C5 103
C6 103
CODE
UK4010000
NAME
B48K303CIR

Appendix 9. Scanner Panel PCB Circuit Diagram



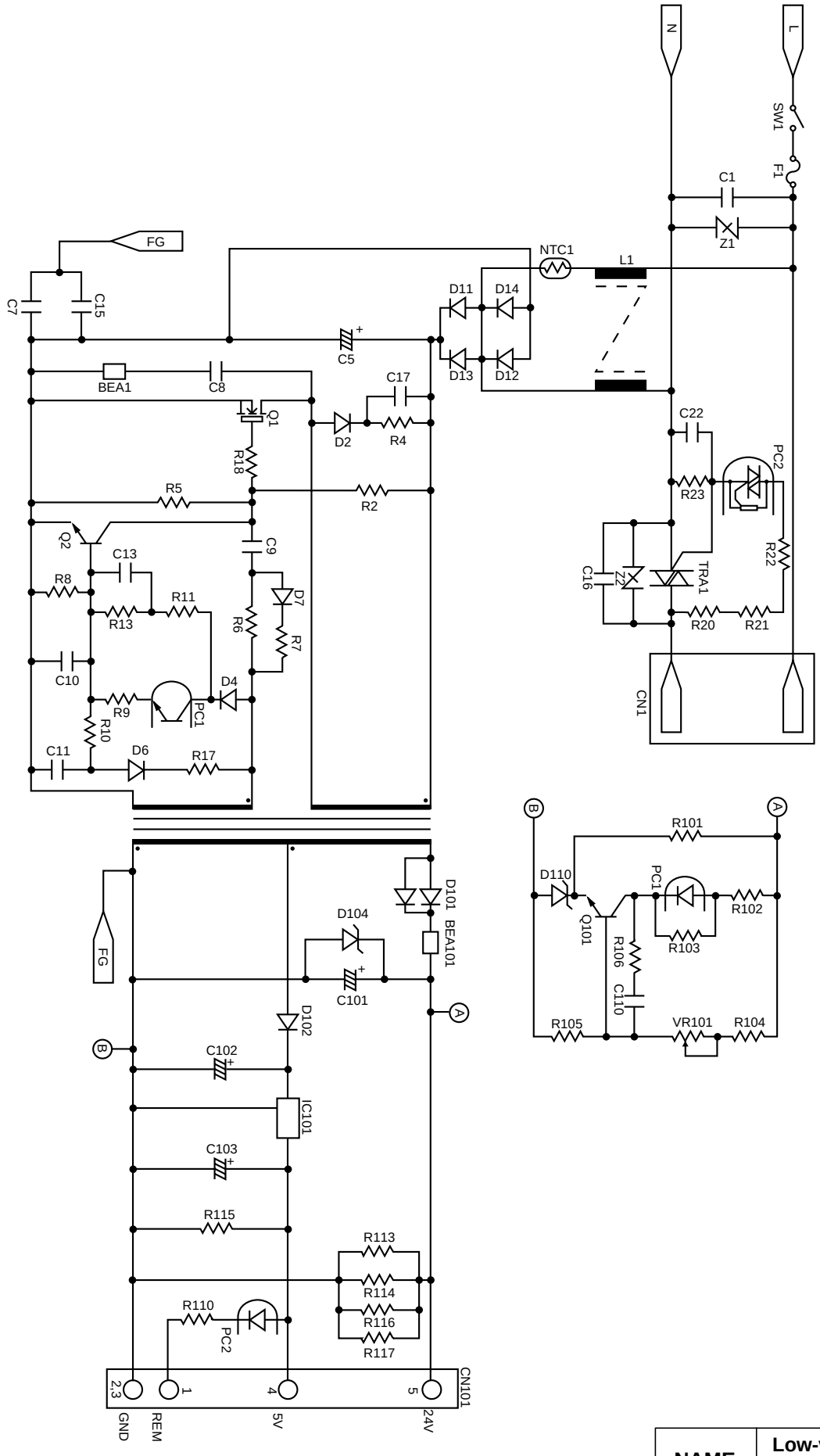
CODE	UK3982000
NAME	B512019 CIR

Appendix 10. Scanner Sensor PCB Circuit Diagram



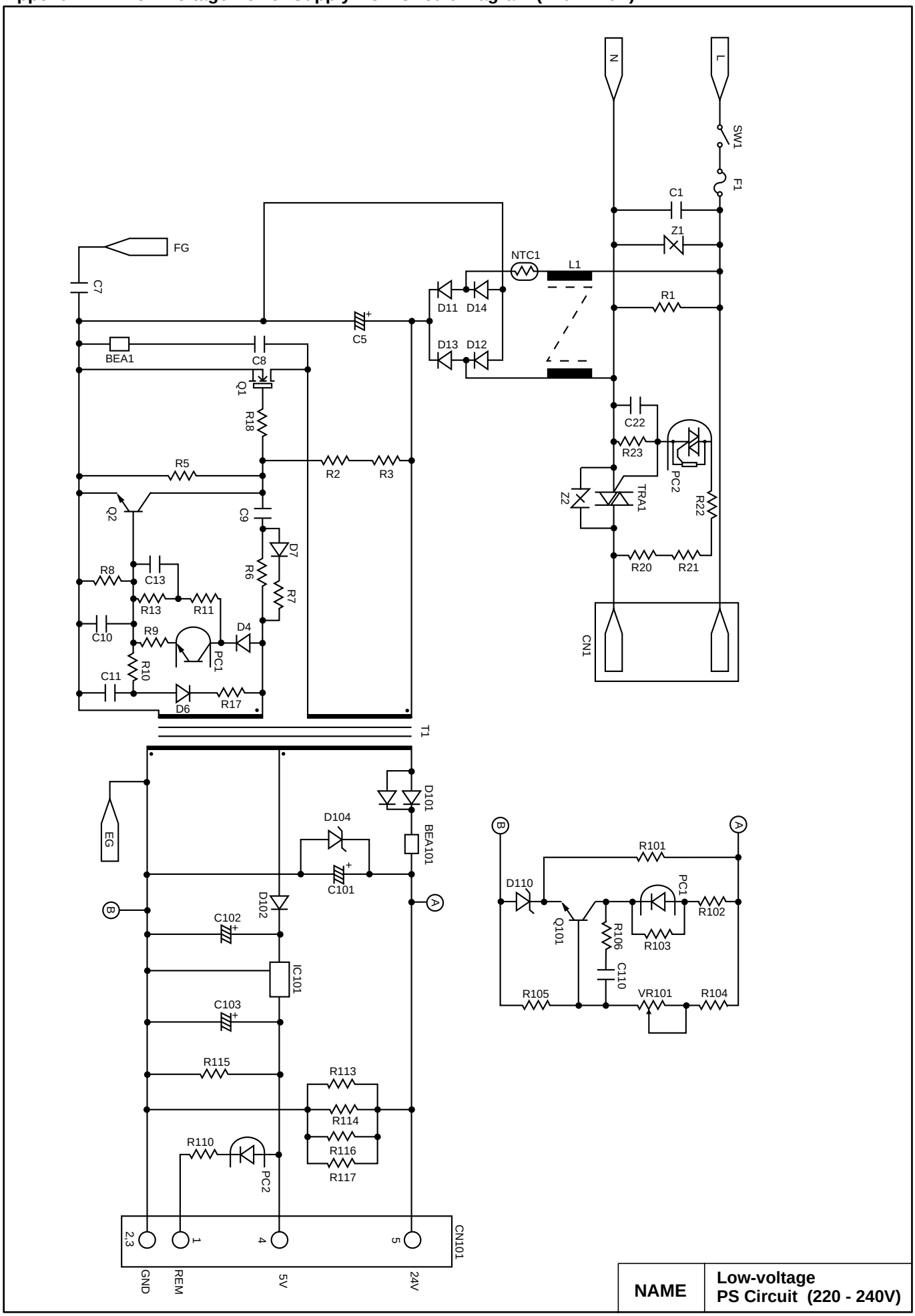
CODE	UK3983000
NAME	B512020 CIR

Appendix 11. Low-voltage Power Supply PCB Circuit Diagram (110 - 120V)

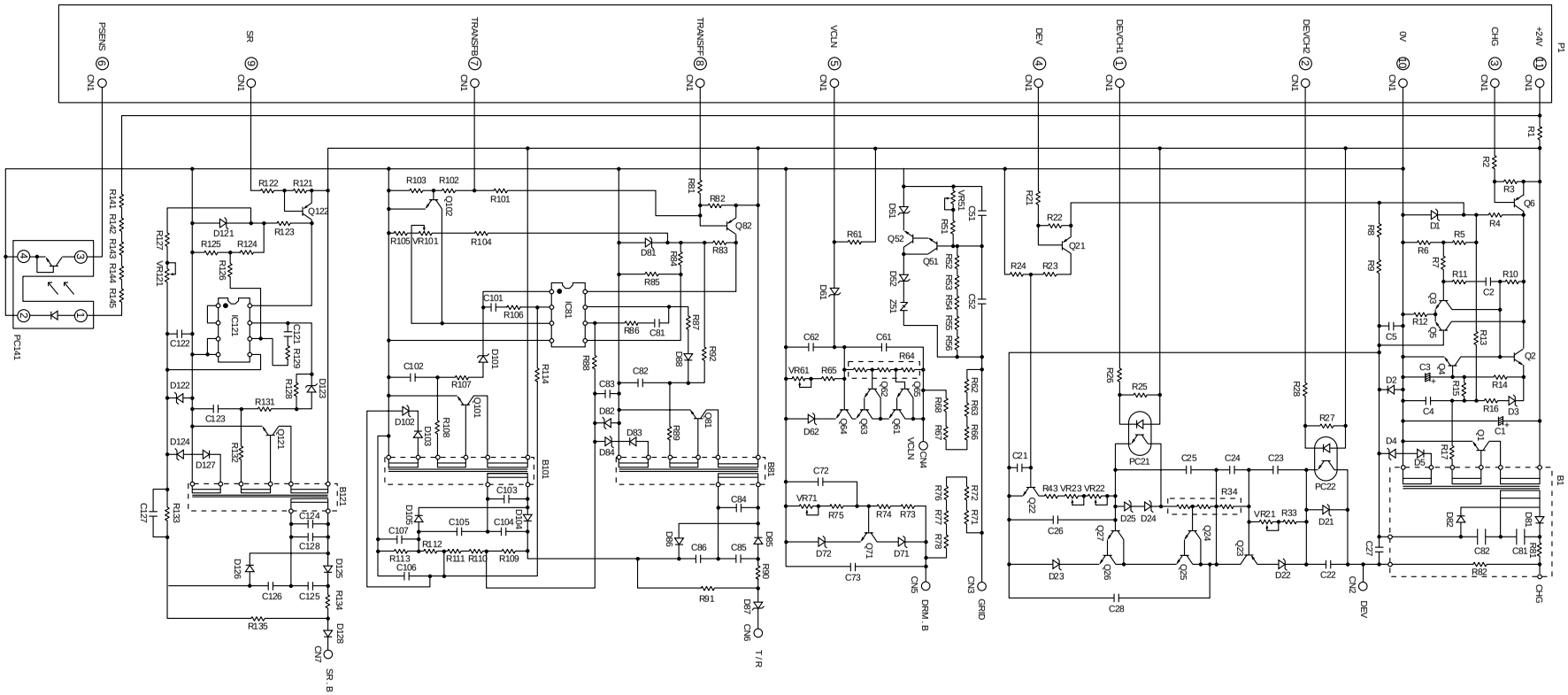


NAME	Low-voltage PS Circuit (110 - 120V)

Appendix 12. Low-voltage Power Supply PCB Circuit Diagram (220 - 240V)



NAME	Low-voltage PS Circuit (220 - 240V)



NAME	High-voltage PS Circuit

INDEX

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N

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R

S

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brother

Laser Printer / Scanner / Copier
MFC/HL-P2000

Quick Setup Guide

Read this guidebook first to set up your machine and prepare your computer for the machine.
Save all packing materials and outer carton. They are useful when shipping the machine.

Keep this manual in a convenient place for quick and easy reference at all times.

(For USA & CANADA Only)

For technical and operational assistance, please call:
In USA 1-877-284-3238 (outside California) / 949-859-9700 Ext. 329 (within California)
In CANADA 1-800-853-6660 / 514-685-6464 (within Montreal)

If you have comments or suggestions, please write us at:
In USA Printer Customer Support - Brother International Corporation
15 Musick, Irvine, CA 92718
In CANADA Brother International Corporation (Canada), Ltd. - Marketing Dept.
1, rue Hôtel de Ville Dollard-des-Ormeaux, PQ, Canada H9B 3H6

BBS: For downloading drivers from our Bulletin Board Service, call:
In USA: 1-888-298-3616 / In CANADA : 1-514-685-2040
Please log on to our BBS with your first name, last name and a four digit number for your password. Our BBS supports modem speeds up to 14,400, 8 bits no parity, 1 stop bit.

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Brother Customer Service has installed an easy to use Fax-Back System so you can get instant answers to common technical questions and product information for all Brother products. This is available 24 hours a day, 7 days a week. You can use the system to send the information to any fax machine, not just the one you are calling from. Please call 1-800-521-2846 (USA) or 1-800-681-9838 (Canada) and follow the voice prompts to receive faxed instructions on how to use the system and your index of Fax-Back subjects.

DEALERS/SERVICE CENTERS (USA only)
For the name of an authorized dealer or service center, call 1-800-284-4357.

SERVICE CENTERS (Canada only)
For service center addresses in Canada, call 1-800-853-6660

INTERNET ADDRESS
For technical questions and downloading drivers: **http://www.brother.com**

Definitions of Warnings, Cautions, and Notes

The following conventions are used in this User's Guide:

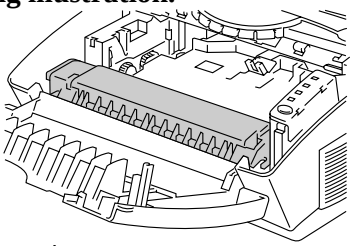
Warning
Indicates warnings that must be observed to prevent possible personal injury.

Caution
Indicates cautions that must be observed to use the machine properly or prevent damage to the machine.

Note
Indicates notes and useful tips to remember when using the machine.

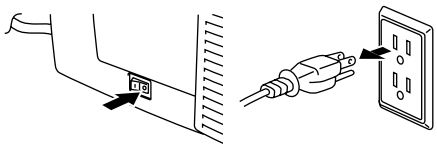
To Use the Machine Safely

Warning
After you have just used the machine, some internal parts are extremely hot. When you open the machine top cover, never touch the shaded parts shown in the following illustration.



High Temperature
Inside the Machine

Warning
There are high voltage electrodes inside the machine. Before cleaning the machine, make sure you turn off the power switch and unplug the power cord from the power outlet.



Turning off the Switch and Unplugging the Machine

Table of Contents

Trademarks

Compilation and Publication Notice

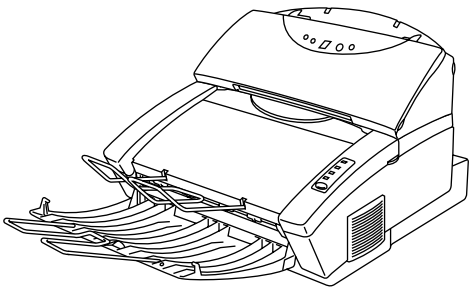
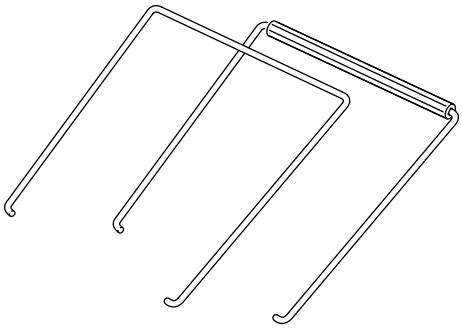
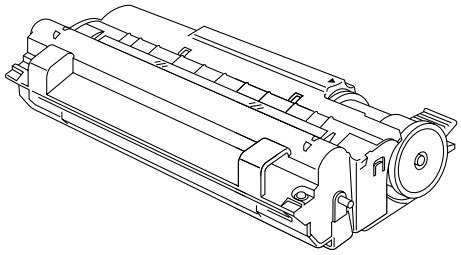
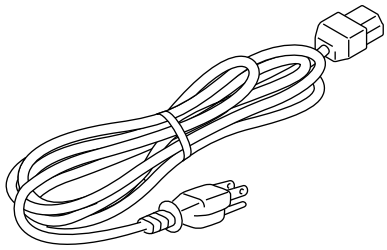
Under the supervision of Brother Industries Ltd., this manual has been compiled and published, covering the latest product's descriptions and specifications.

The contents of this manual and the specifications of this product are subject to change without notice.

Brother reserves the right to make changes without notice in the specifications and materials contained herein and shall not be responsible for any damages (including consequential) caused by reliance on the materials presented, including but not limited to typographical and other errors relating to the publication.

Action 1: Check the Supplied Items

After taking the printer out of the carton and removing the packing materials, make sure that the following items are not damaged and none are missing:

<table>
<tr>
<td>• Machine
  </td>
<td>• Paper support and Document support
  </td>
</tr>
<tr>
<td>• Drum unit assembly (with Toner cartridge included)
  </td>
<td>• AC Cord
  </td>
</tr>
</table>

- 3.5” floppy disks for Windows® printer driver and fonts
- Quick setup guide (this guidebook)
- Plastic Bag
- CD-ROM

NOTE

You may have additional parts not listed above depending on which country you live in.

NOTE

You will need to purchase an interface cable that matches the bi-directional IEEE 1284 compliant interface of your computer. If you do not know what cable you need, consult your dealer.

Action 2: Position the Machine

Please take note of the following before using the machine.

Power Supply

- Use the machine within the specified power range.
  AC power: ±10% of the rated power voltage in your country
  Frequency: 50 Hz (220 V– 240 V) or 50/60 Hz (110–120 V)
- The power cord, including extensions, should not exceed 5 meters (16.5 feet).
- Do not share the same power circuit with other high-power appliances, particularly an air conditioner, copier, shredder and so on. If it is unavoidable that you must use the machine with these appliances, it is recommended that you use an isolation transformer or a high-frequency noise filter.
- Use a voltage regulator if the power source is not stable.

Environment

- The machine should be installed near a power outlet which is easily accessible.
- Use the machine only within the following ranges of temperature and humidity.
  Ambient temperature: 10°C to 32.5°C (50°F to 90.5°F)
  Ambient humidity: 20% to 80% (without condensation)
- The machine should be used in a well ventilation room.
- Place the machine on a flat, horizontal surface.
- Keep the machine clean. Do not place the machine in a dusty place.
- Do not place the machine where the ventilation hole of the machine can be blocked.
- Do not place the machine where it is exposed to direct sunlight. Use a blind or a heavy curtain to protect the machine from direct sunlight when it is unavoidably set up near a window.
- Do not place the machine near devices that contain magnets or generate magnetic fields.
- Do not subject the machine to strong physical shocks or vibrations.
- Do not expose the machine to open flames or salty or corrosive gasses.
- Do not place objects on top of the machine.
- Do not place the machine near an air conditioner.
- Keep the machine horizontal when carrying.
- Do not cover the slots in the top cover.

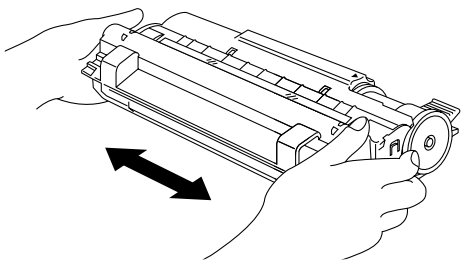
System Requirements for the Brother Printing Solution for Windows

Check the following system requirements to setup and operate the machine in Brother Printing Solution for Windows:

- IBM PC or compatible with 80486 SX or higher microprocessor
- Parallel interface (or printer port)
- 8 MB or more of memory (for Windows® 95/98, 3.1/3.11),
  16MB or more of memory (for Windows NT®4.0)
- 10 MB of space available on your hard disk for the printer driver and all fonts
- 20 MB of space available on your hard disk for Visioneer PaperPort® LE Software
- Microsoft Windows® 95,98, 3.1/3.11 or Windows NT®4.0

Action 3: Install the Toner Cartridge/Drum Unit

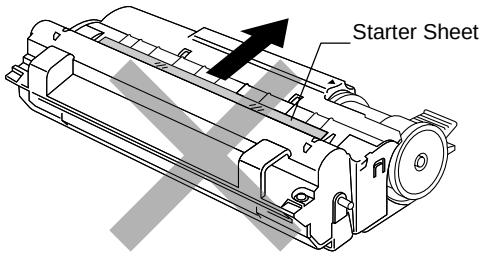
1



Unpack the drum unit assembly with the toner cartridge included. Gently shake it from side to side five or six times.

Caution

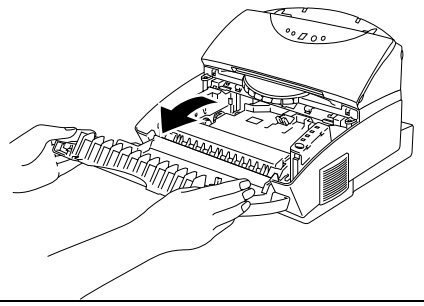
Do not expose the drum unit to light for longer than a few minutes, as this will damage the drum.



Caution

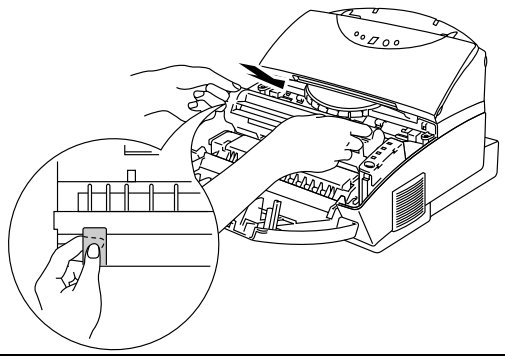
Do not remove the starter sheet.
This sheet will be ejected while the machine is warming-up after installing a new drum unit. (See Action 6 Illustration 4)

2



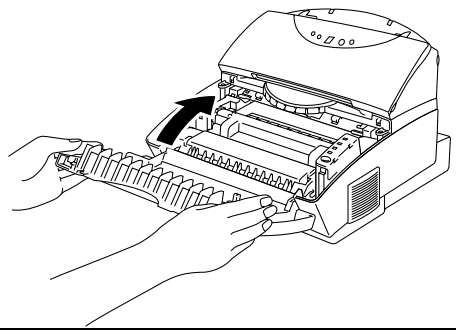
Open the top cover of the machine by holding both sides of it.

3



Holding the drum by its handles, install it into the machine.

4



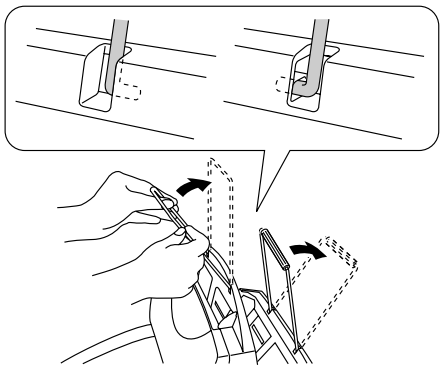
Close the top cover.

See “CHAPTER 6 MAINTENANCE” in the On-line User’s Guide for more information about replacement of the toner cartridge.

Action 4: Load Paper into Your Machine

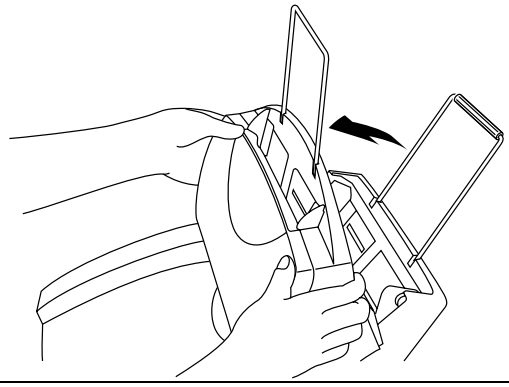
Before loading paper, make sure that the paper meets the specification described in the On-line User's Guide Chapter 2. Using unsuitable paper might reduce the print quality.

1



Install the paper support (with a tube on it) onto the multi-purpose sheet feeder. And install document support onto the document feeder.

2

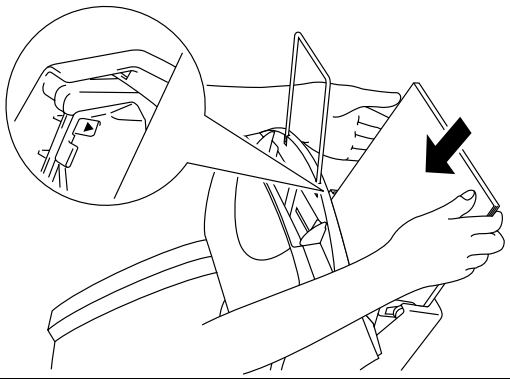


Open the multi-purpose sheet feeder cover.

CAUTION

Be sure to open the sheet feeder cover whenever you insert paper into the sheet feeder otherwise you may get paper mis-feeding or paper jam errors.

3

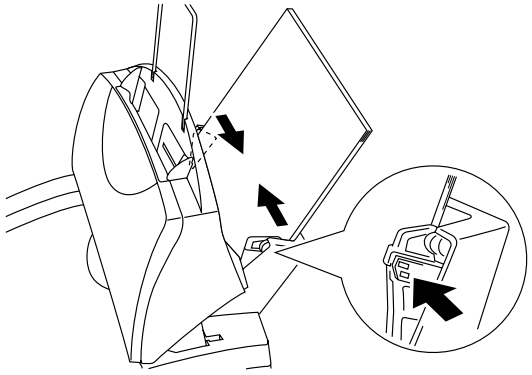


Load paper in the multi-purpose sheet feeder.

NOTE

The feeder can hold up to 200 sheets of plain paper or up to 10 envelopes. Excessive sheets may cause paper jams. Make sure that the paper is stacked below the ▲ mark.

4

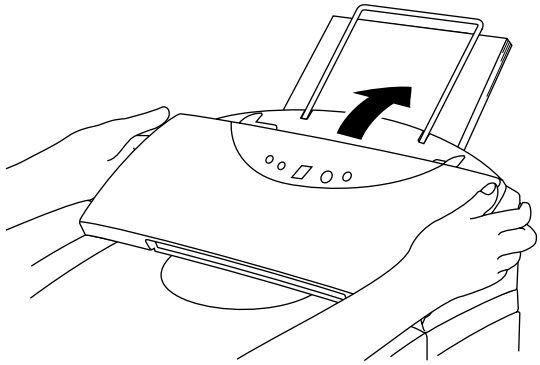


Hold the tab of the right hand paper guide and press the catch to release the guide lock. Move the paper guide to fit the paper width.

Caution

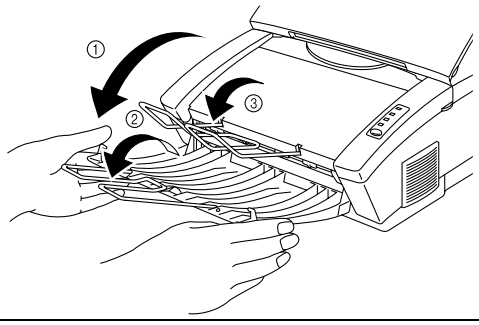
Failure to set the paper guide to the paper width may cause paper skew and jam.

5



Close the multi-purpose sheet feeder cover.

6



Open the output tray. (①)
Extend the extension support wire. (②)
Extend the extension document support wire. (③)

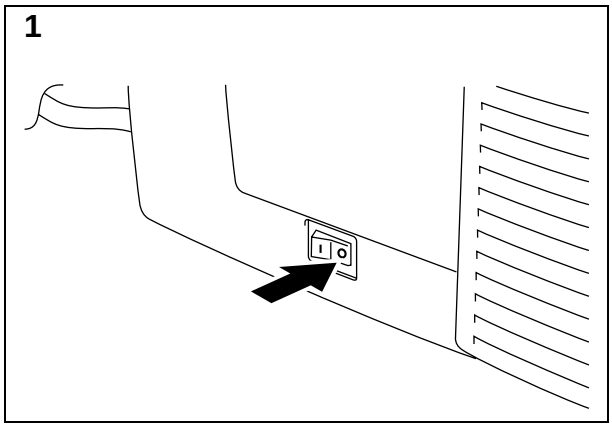
The machine can handle paper within the following specifications:

Paper Type	Paper Size
Cut sheets	A4, Letter, Legal, B5(JIS/ISO), A5, A6, 3”x 5”, Executive, Custom size (70-216 x 127-356 mm)
Envelopes	DL, C5, COM-10, Monarch, 9” x 12”
Organizer	Day-Timer® J, K, L, 70-216 x 127-356 mm
Labels and Transparencies	A4, Letter 70-216 x 127-356 mm

See “CHAPTER 2 PAPER HANDLING” in the On-line User’s Guide for more information.

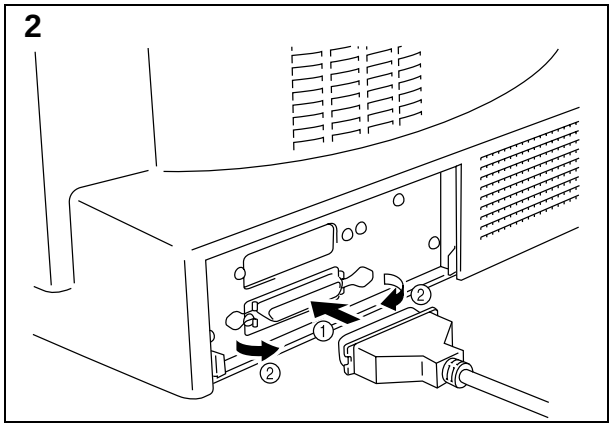
Action 5: Connect Your Machine to Your Computers' Parallel Interface

You must connect the machine to your computer with a suitable interface cable. In most cases, a bi-directional IEEE 1284 compliant parallel cable is used for this connection.



Make sure that the machine **power** switch is off before connecting or disconnecting the interface cable.

Also, make sure that the computer is turned off.



Connect the parallel interface cable to the parallel interface port of the machine. (①)

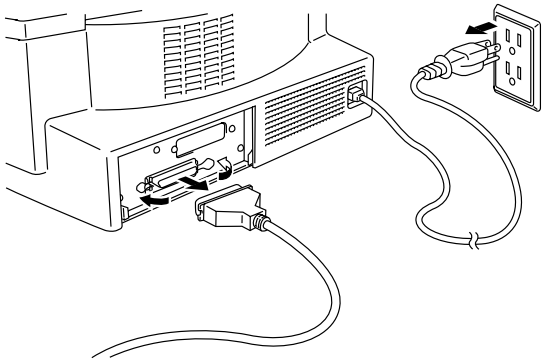
Secure the connection with the wire clips. (②)

Connect the interface cable to the printer port of the computer.

For the location of your computers parallel printer port, refer to the Users Guide of your computer.

Action 6: Plug in and Turn on Your Machine

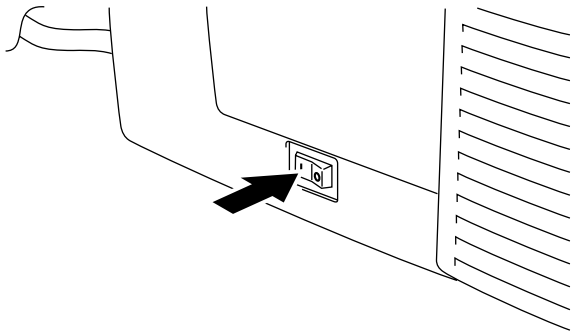
1



Plug the power cord into the AC power outlet and the machine power inlet.

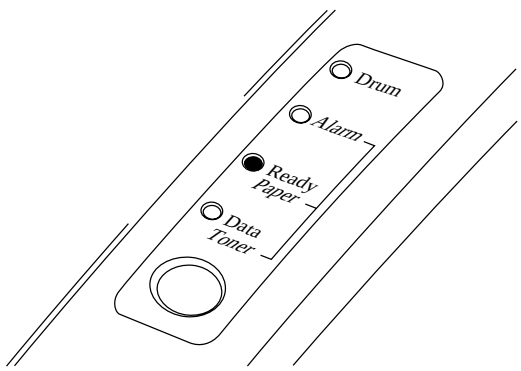
Note
The shape of the power cord varies according to the country of destination.

2



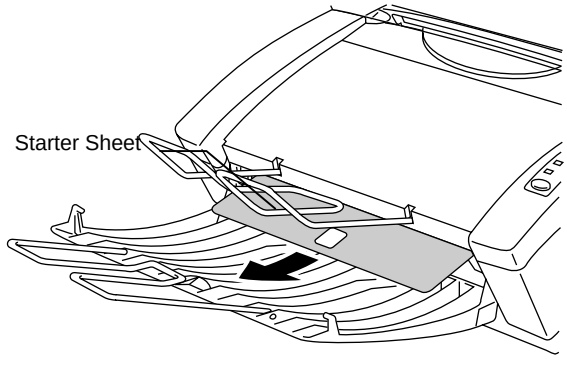
Turn on the **power** switch that is located on the left side of your machine.

3



Make sure that the **Ready** lamp is lit after the machine has warmed up (approximately 30 seconds).

4



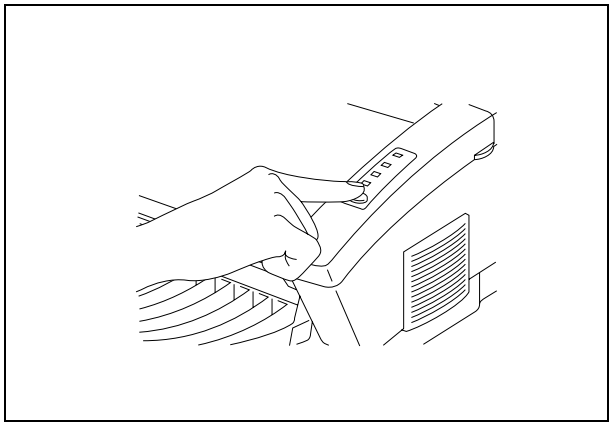
Make sure that the machine automatically ejects the starter sheet while the machine is warming-up immediately after installing a new drum unit.

Printing a Test Sample Page

We recommend that you print a test page. Refer to the instructions below.

Note

- The following test page operation will be invalid after the machine has received any data from your computer.
- The test sample page can be printed by using the “Test Print Mode” procedure in Chapter 3 of the On-line User’s Guide.



Press the control panel **switch**.
The machine will start printing a test sample page.

Note

The machine can also print settings, fonts, and hexadecimal values of received data. For more information, see “Test Print Mode” in Chapter 3 of the On-line User’s Guide.

Note

If the machine does not print a test sample page, see “CHAPTER 7 TROUBLESHOOTING, Q & A” of the On-line Users Guide. If you are still unable to print a test sample page after reviewing the information in the Users Guide, consult your dealer.

After printing the test sample page, you are ready to prepare your computer to work with the machine. The software setup varies depending upon your computer and operating system. Refer to the relevant following section:

Action 7-1: Installation from CD-ROM
Action 7-2: Prepare the Printer Driver and the Scanner Driver for the Machine
Action 7-3: Prepare DOS for the Machine from floppy disk

Action 7-1: Installation from CD-ROM

The supplied CD-ROM contains the following items.

- **Printer Driver & TrueType™ fonts -**
  You need to configure your PC for the machine by installing the printer driver and TrueType™-compatible fonts.
- **Soft PCL 5e -**
  To print documents at 600 dpi from the Windows DOS box you need to install this utility.
- **TWAIN Driver -**
  To use the scanner function of this machine, you need to install this driver. This scanner driver is TWAIN compliant which is a defacto standard.
- **Visioneer PaperPort® LE Software (MFC-P2000), WordCraft Unimessage™ Viewer software (HL-P2000 - Windows® 95/98/NT users only) -**
  This software is a document management application which contains a viewer, editor and filing system and calls links to other applications.
- **Other useful utilities -**
  Several other useful utility software programs are available on the CD-ROM.
- **Documentation -**
  This Setup guide, the User's Guide and an instructional video are available on the CD-ROM. You can view the On-Line guides with the Adobe Acrobat reader software included on the CD-ROM. The instruction video shows how to replace the consumables etc.

If your PC does not have a CD-ROM drive, you can install the printer driver, scanner driver or RPC from the supplied floppy disks. For the other software that is supplied on the CD-ROM, it is possible to make disk sets from the CD-ROM if you can get access temporarily to a PC with CD-ROM and Floppy disk drives.

For Windows® 95/98/NT 4.0

1. Close all the applications running on your PC.
2. Insert the supplied compact disc into the CD-ROM drive.

NOTE

Depending on the computer configuration, the installation program may automatically start. In this case, skip the following steps 3 to 5.

3. Click **Start**.
4. Choose **Run**.
5. Type `D:\START32` (or the appropriate drive and directory letter) in the command line box and click **OK**.

After the installer starts, simply follow the instructions that appear on the screen.

For Windows® 3.1/3.11

1. Close all the applications running on your PC.
2. Insert the supplied compact disc into the CD-ROM drive.
3. In the **Windows® Program Manager** screen, click the **File** menu.
4. Choose **Run**.
5. Type `D:\START16` (or the appropriate drive and directory letter) in the command line box and click **OK**.

After the installer starts, simply follow the instructions that appear on the screen.

Action 7-2: Prepare the Printer Driver and the Scanner Driver for the Machine

For Windows® 3.1

You need to configure Windows®3.1 for the machine by installing the scanner driver from the supplied disk into Windows®3.1.

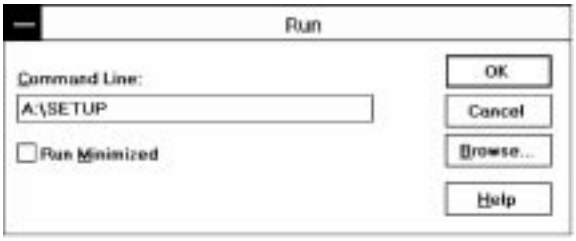
Because the supplied scanner driver is compressed on the disk, be sure to use the supplied installer program to install it. These instructions assume you will install the driver and fonts from the disk drive A.

1. Start Windows® 3.1.

2. Insert the supplied disk for Windows® into your floppy disk drive.

3. Choose **Run** from the **File** menu in the *Program Manager*.

4. Type the drive name where you inserted the supplied disk and "SETUP" in the box: for example, A:\SETUP. Click the **OK** button or press the **Enter** key.



5. The installer program will begin. Follow the instructions on the computer screen. (Be sure to restart Windows when the installation process is completed.)

For Windows® 95 / 98

You need to configure Windows® 95/98 for the machine by installing the scanner driver from the supplied disk into Windows® 95/98.

1. Insert the supplied floppy disk labeled "disk1" into your floppy disk drive.
2. Click the **Start** button and select **Run**.
3. Select "Setup.exe" and follow the instructions on the computer screen.

Action 7-3: Prepare DOS for the Machine

How to Use the Machine in your DOS Application Software (without using the Windows system)

Before working with application software that runs in DOS, if you do not already have a suitable driver installed, you will need to install a printer driver that matches one of the following supported emulations:
HP LaserJet IIP, EPSON FX-850 or IBM Proprinter XL printers

The following table shows combinations of printer drivers and printer emulation modes. To get the most out of this machine, you should install an HP printer driver in your application software.

Printer driver supported in your application software	Emulation mode to be selected with the remote printer console program
HP LaserJet IIP™	HP LaserJet IIP emulation mode
HP LaserJet II™	Auto emulation selection
Epson® FX-850™	Epson FX-850 emulation mode
Epson FX-80™	Auto emulation selection
IBM® Proprinter® XL	IBM Proprinter XL emulation mode
IBM Proprinter	Auto emulation selection

Note

- The best or recommended printer driver is indicated in bold.
- Be sure to choose the correct printer driver in your application software. Failure to do so may cause poor or inconsistent results.
- Ensure that the printing resolution is set to 300 dpi in your DOS application software.

What Does Remote Printer Console Do?

The Remote Printer Console (RPC) is a utility program which runs in the DOS environment and comprises the following two programs:

- **Remote Printer Console Main Program**
  This program allows you to change various machine settings such as emulation, print quality, fonts, page setup and so on from your computer screen. Since most DOS applications have a machine settings menu which overrides the settings made by the RPC, you may not need to use this utility program. This utility program is useful for application software which does not control the machine's settings and features.

- **Machine Status Monitor Program**
  This utility program can monitor your machine's status using bi-directional parallel communications. If your machine has no paper, this utility program displays "*Paper Empty*" error status and instructions for corrective action on your computer screen. This utility program stays resident in your computer memory (Terminate-and-Stay Resident program) and runs in the background.

Installing the Remote Printer Console

Before you install the program, make sure that you have the following hardware and software:

DOS	Version 3.3 or later
Monitor	EGA/VGA or compatible
Option	Mouse; the mouse driver must be installed. (You can also operate the program with the keyboard.)

Follow these steps to install the remote printer console program:

1. Make sure your machine is connected to your computer and is ready (On-line).

2. Start your computer. If you are in Windows, exit and return to the DOS prompt. You must be in the DOS prompt to proceed with installation.

3. Insert the supplied disk into your floppy disk drive (A: or B:).

4. Select drive A or B to be used by typing `A:` or `B:` after the DOS prompt and pressing the **Enter** key.

```
C:\>A:
```

5. Type `RPCSETUP` and press the **Enter** key.

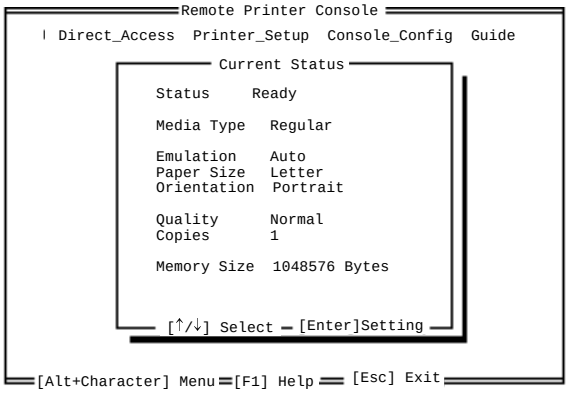
```
A:\>RPCSETUP
```

6. Follow the instructions on the screen.

Using the Remote Printer Console Main Program

Type `C:\RPCX>RPCX` and press the **Enter** key to start the Remote Printer Console main program.

The Main Screen will appear on your computer screen as shown on the right.



The RPC gets the current settings information from your machine when it starts if bi-directional communication is enabled between your computer and machine. Otherwise, the RPC shows its default settings. If you want to change settings, move the cursor to the desired item and select the desired setting by using the **Enter** and **cursor** keys. Then, press the **Enter** key to make the selected setting valid. If you use a mouse, click the desired item to change the setting.

Additionally, there are four sub-menus as shown in the table below. Select a sub-menu by clicking the desired sub-menu with the mouse, by using the **cursor** key and the **Enter** key, or by using the keys shown below to switch the screen to the sub menus.

Menu	Press the keys	Functions
Direct Access	Alt + D	You can directly control printer functions such as Print Form, Self Print, Reset Printer, Sleep Control.
Machine Setup	Alt + P	You can enter the setting mode to change further machine settings, such as, margin settings, continue mode, reprint function, font, and sleep mode.
Console Config	Alt + C	You can change the environment settings for the RPC program: color, Status Monitor configuration, etc.
Guide	Alt + G	You can get into the Guide mode.
Help	F1	You can get On-Line help about the current highlighted item by pressing F1.

Using the Machine Status Monitor Program

Type `C:\RPCX>STMX` and press the **Enter** key to make the Machine Status Monitor Program stay resident in your computer memory. If there are any changes to the machine status, it displays a message on your computer screen.

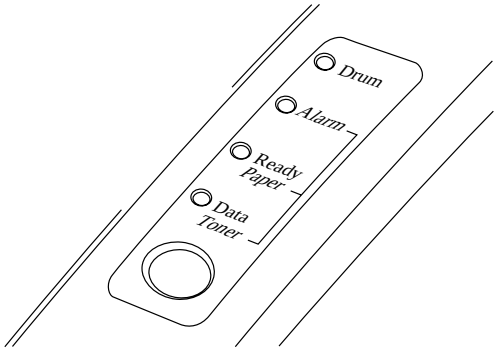
If the machine status monitor program stays resident in your computer, you can monitor the machine status on your computer screen immediately using the hot-key sequence (**Ctrl**+**Alt**+**R**).

To remove the Machine Status Monitor program from your computer memory, type `C:\RPCX>STMX/R` and press the **Enter** key.

- ❏ The RPC works in the environment where your machine is directly connected to your computer. If you are using any printer buffer switches which do not support bi-directional communication between the machine and computer, the program works only in the PC to machine direction and cannot receive machine status information.
- ❏ The program does not work with printers on a network.
- ❏ If the RPC conflicts with some application software, exit your application software and then run the RPC.
- ❏ The RPC may work in the DOS-compatible box screen mode of Windows, however, it is recommended that you completely exit from Windows to the DOS prompt before using the RPC.
- ❏ The Machine Status Monitor and some other Terminate-and-Stay programs cannot coexist in the computer's memory. If they do not work properly together, use them one at a time. You can suspend the Machine Status monitor with any of the following methods or commands.
  - Type `C:\RPCX>STMX/R` and press the **Enter** key.
  - Hold the space bar down while executing the `AUTOEXEC.BAT` file at DOS startup to prevent the status monitor being loaded as a TSR program.

LAMPS AND SWITCH FOR THE PRINTING FUNCTION

This section refers to the following lamps and switch on the machine control panel.



Note
When the **power** switch is off or the machine is in sleep mode, all lamps including the **Ready** lamp are off.

Ready (Paper) Lamp

The **Ready** lamp indicates the current status of the machine.

Lamp	Machine status
Off ❍	The **power** switch is off or the machine is in sleep mode. If the machine is in sleep mode, it will wake up automatically when it receives data or you press the control panel switch.
Blinking ❍↔●	The machine is warming up. (Blinking at 1 second intervals)
Blinking ❍↔●	The machine is cooling down and has stopped printing until the machines internal temperature lowers. (Blinking at 2 seconds intervals)
On ●	The machine is ready to print.

This lamp also works as the **Paper** lamp with the **Alarm** lamp. They blink simultaneously to indicate a paper error. See “Operator Calls” section of this manual.

Data (Toner) Lamp

The **Data** lamp indicates the current status of the print data process.

Lamp	Machine status
Off ❍	The machine has no print data.
Blinking ❍↔●	The machine is receiving data from the computer or the machine is processing data in memory.
On ●	Print data remains in the machine memory. If the **Data** lamp is on for a long period of time and nothing has printed, you need to press the switch to print the remaining data.

This lamp also works as the **Toner** lamp with the **Alarm** lamp. They blink simultaneously to indicate a toner error. See “REPLACING THE TONER CARTRIDGE” in Chapter 6 of the On-line manual and “Operator Calls” section in this manual.

Drum Lamp

The **Drum** lamp indicates the drum unit is nearly at the end of its life.

Lamp	Machine status
Off ❍	The drum unit can be used.
On ●	The drum unit is nearly at the end of its life. Installing a new drum unit turns off this lamp. See “REPLACING THE DRUM UNIT” in Chapter 6 of the On-line manual.

Alarm Lamp

The **Alarm** lamp blinks to indicate a machine error status such as “Cover Open” and “Memory Full.” If any other error occurs, the machine indicates the error by blinking the **Alarm** lamp with another lamp or by printing an error report.

Note
The **Ready**, **Data** and **Drum** lamps are used to indicate machine errors with the **Alarm** lamp. See “ALARM INDICATIONS AT A GLANCE” in this manual and take corrective action for the error.

Switch

This switch will be used for the following purposes depending on the situation.

Cancel printing
If you press the **switch** during printing, the machine immediately stops printing and ejects the paper.
Wake-up
If the machine is in sleep mode, pressing the **switch** wakes it up into the ready state.
Form Feed
If the **Data** lamp is on, press the **switch**. The machine prints any data remaining in the machine memory: this operation is called “Form Feed.”
Error Recovery
If an error occurs, the machine will recover from some errors automatically. If the error does not clear automatically, press the **switch** to clear the error and continue machine operation.

Other Control Features

Sleep Mode
When the machine does not receive data for a certain period of time (time-out), it enters sleep mode. Sleep mode acts as though the machine was turned off. The default time-out is 5 minutes. While the machine is in sleep mode, all the **lamps** are off and it is as if it was turned off, but the machine can still receive data from the computer. Receiving a print file or document automatically wakes up the machine to start printing. Pressing the **switch** also wakes up the machine.

Note

- When the machine goes into sleep mode, the fan will not stop until the print engine has cooled down.
- Sleep mode allows the print engine to cool, so the temperature of your room and how long the machine has been in sleep mode affects the warm-up time. This warm-up time can take up to 30 seconds. The **Ready** lamp blinks to indicate that the machine is warming up.
- You can change the timeout for sleep mode with the supplied machine driver or Remote Printer Console program . Refer to the Help section in the printer driver or RPC program for more information about the sleep mode setting.

Test Print Mode
The machine has the following test print mode. Follow these steps:

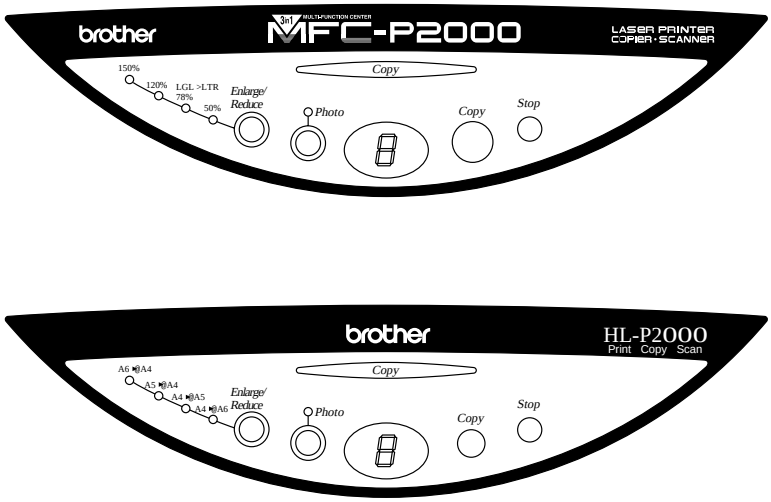
1. Make sure that the top cover is closed.
2. Hold down the switch and turn on the **power** switch. Keep the switch depressed until the **Drum** lamp comes on.
   The **Drum** lamp lights to indicate that the machine is in the test print mode.
3. Press the switch again to execute the test print or hold down the switch to select another option and release the switch to execute the selected option.
   The test print modes are as follows:

Lamp Lit	Choice	Function
Drum	Test sample page	The machine prints a test sample page. The machine returns to the ready status after printing.
Alarm	Print Config & Print Fonts I	The machine prints the current configuration of the machine and a list of the internal fonts. The machine returns to the ready status after printing.
Ready	Factory Reset	The machine is restored to the factory setting and permanent fonts and macros are cleared. The machine returns to the ready status after printing.
Data	Hex Dump Print	The machine can print data as hexadecimal values, so that you can check data errors and problems. To exit from this mode, you have to turn off the machine.

COPYING FUNCTION

The machine allows you to make high-quality photocopies. Always make sure that paper is loaded in the Sheet Feeder before making copies.

This section refers to the following lamps and switch on the machine control panel.



Copying in Standard Mode

1. Insert the original document face down in the Document Feeder.
2. Press the **Copy** button.

To stop copying, press the **Stop** button. The machie shows “E” on the display. Press the **Stop** button again to eject the original document.

To Make Settings for Each Copy

You can make various settings. These settings are effective only for the next copy and after that the settings are cleared. The number of copies should be set after Enlarge/Reduce and Quality settings.

- **Enlarge/Reduce** - Enlargement / Reduction ratio
- **Photo/Text** -Copy output mode
- **Copies** - the number of copies

Photo / Text Button

Select the copy mode from Photo or Text

1. Insert the original document face down in the Document Feeder. When you select Photo mode, the **Photo** lamp comes on.
2. Press the **Copy** button to start copying.

Enlarge/Reduce Button

You can make an enlarged or reduced size of copy from 50% to 150% (for USA and Canada), 50% to 200% (for other countries).

1. Insert the original document face down in the Document Feeder.
2. Press the **Enlarge/Reduce** button.
   For USA and Canada: 50%, 78%, 120% and 150%
   For other countries : 50%, 71%, 141% and 200%
   When Enlarge/Reduce is 100%, all the lamps are off.
3. Press the **Copy** button to start the copy.

Note
If the enlarged size is bigger than the copy paper, you may lost some portion of the original document. In that case, reduce the enlargement ratio.

The Number of Copies

You can make multiple copies.
1. Insert the original document face down in the Document Feeder.
2. Press the **Copy** button.
3. Press the **Copy** button again within one second if you want to increase the number of copies.

Note
The maximum number of copies is 9.

Error

If an error ocurrs, the machine shows “E” on the display.

To clear the error, press the **Stop** button.

Errors occur when the following happens;
*When the document causes a paper jam in the document feeder when the machine is feeding the document.
*When the machine is busy. (When the machine is used as a scanner or printer.)
*When there is no paper in the sheet feeder.
*When memory full happens and the machine prints out an error message.

When there is no document in the Document Feeder when you try to copying, the machine shows the number of copies and the letter “P” alternately on the display. When you see this, insert the document in the Document Feeder.

Note

When memory full error is likely to happen, the machine change the vertical reslotion from 600 dpi to 300 dpi and copy a document automatically. In this case, the machine displays “F” on the display.

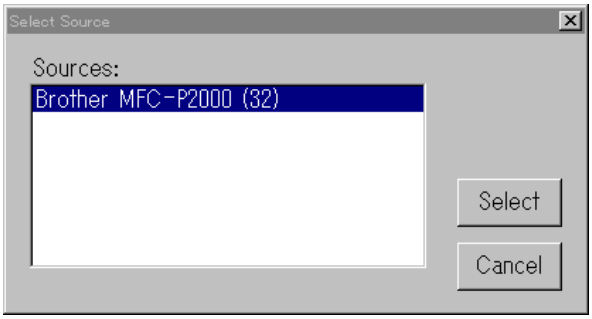
SCANNING FUNCTION

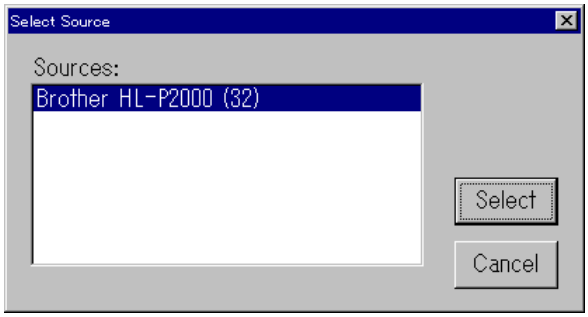
The machine provides you with a TWAIN compliant scanner driver. This allows you to use the machine as scanner from any TWAIN compliant application such as Adobe Photoshop.

Scanning from TWAIN compliant applications

1. Launch the application you use.

2. Select the ‘Select Source’ menu.





3. Select the “Brother MFC-P2000” or “Brother HL-P2000” and click Select.

4. Select the “Acquire” menu.

5. Make the appropriate settings such as; Scanning Resolution, Text/Photo, Scannning Area, etc.....

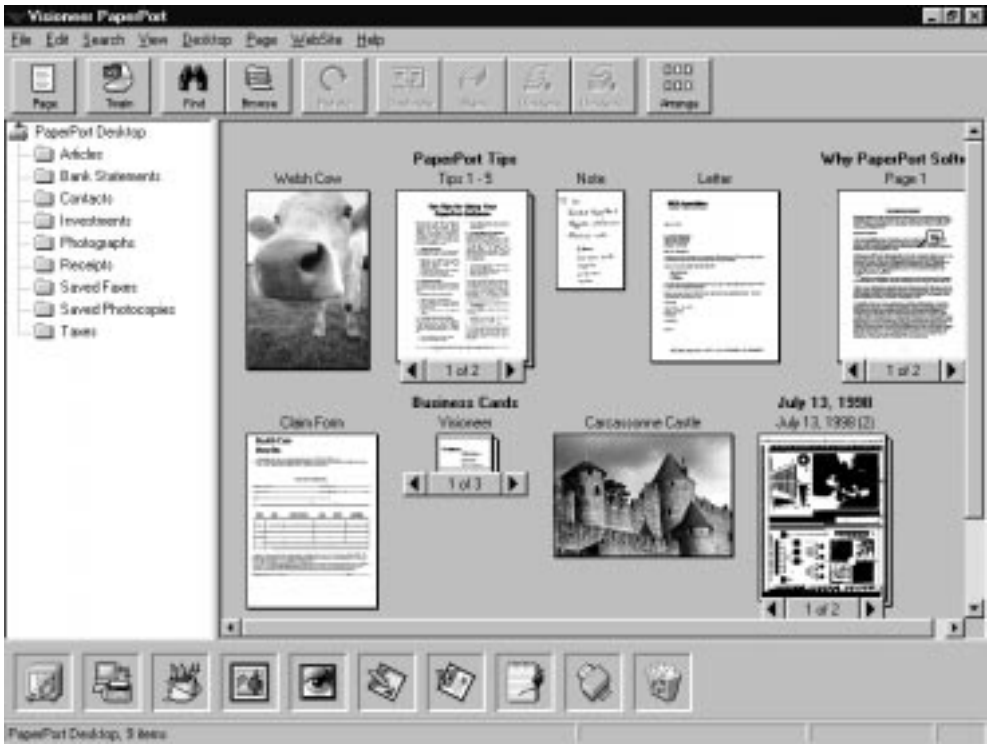
6. Click the Start button.

Note

- Selecting the scanning area exactly reduces the scanning data so that you can save transfer time and memory.
- Generally, scanning resolution is set according to the final output device. For example, when the output device is a monitor screen, 150 dpi scanning is enough. If a higher resolution is chosen, the displayed output may not have any particular improvement.

Scanning from the VISIONEER PaperPort® LE Software (MFC-P2000)

1. Launch the Visioneer PaperPort® LE application.



2. Click the Scan icon.
   The scanner driver dialog is launched.

3. Make the necessary settings.

4. Press the Start button.

The scanned image will be shown on the desktop with the name ‘Untitled-x.’

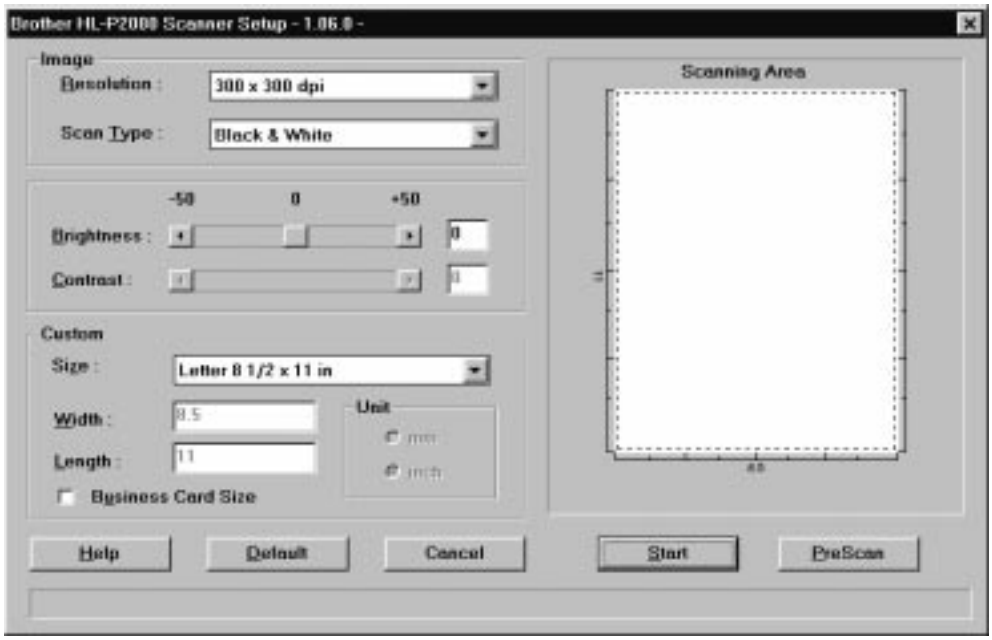
For further information about ‘PaperPort’, refer to the On-line Help in the application.

Scanning from the Unimessage™ Viewer Software (HL-P2000 - Windows® 95/98/NT users)

1. Launch the Unimessage™ Viewer application.

2. Select “Scan”.

3. After inserting the original document in the document feeder, click the “Start” button.



4. After the document has scanned completely, the “Collate Dialog” appears. Select the data you have just scanned and press “Add” button.

5. Click the “OK” button.

The scanned image will be shown on the desktop.

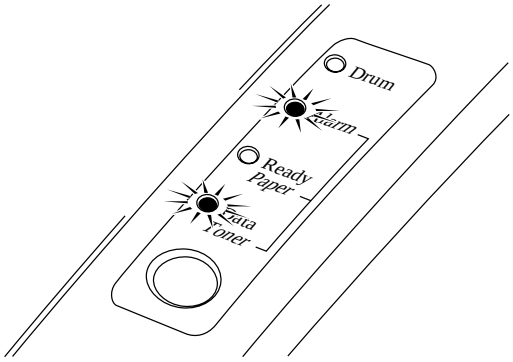
For further informtion about ‘Unimessage™ Viewer’, refer to the On-line Help in the application.

REPLACING THE TONER CARTRIDGE

The machine can print approximately 2,400 pages (5% coverage: A4/Letter) with one toner cartridge. When the toner cartridge is running low, the **Alarm** and **Data** (Toner) lamps blink once every 5 seconds to indicate toner low. **Initially, some models are supplied with a starter toner cartridge which must be replaced after 1,000 pages.**

Note

- Actual page count will vary depending on your average document type. (i.e.: standard letter, detailed graphics, etc.)
- It is recommended that you always keep a new toner cartridge ready for use for when you get the toner low warning.
- Discard the used toner cartridge according to local regulations. If you are not sure of them, consult your local dealer. Be sure to seal up the toner cartridge tightly so that toner powder does not spill out of the cartridge. Do not discard used toner cartridges together with domestic rubbish.
- It is recommended that you clean the machine when you replace the toner cartridge.



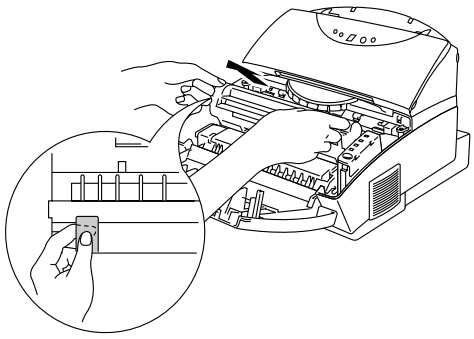
Toner Low and Empty Indication

Caution

- You may print approximately 100 pages after the first toner low indication. Both **Alarm** and **Data** (Toner) lamps will blink continuously to indicate that the toner is empty. Once this indication appears, your machine cannot resume printing until you have installed a new toner cartridge.
- **Keep the drum unit level after removing the toner cartridge, to avoid possible toner spill or scatter.**

Follow these steps to replace the toner cartridge:

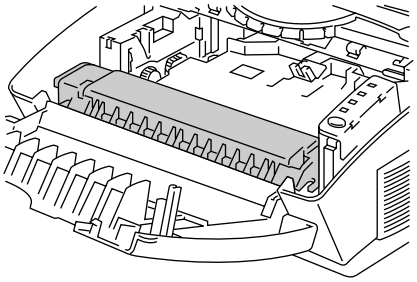
1



Open the top cover towards you. Remove the drum unit by holding each side of the drum and gently lifting the drum forwards towards you.

Note

It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.

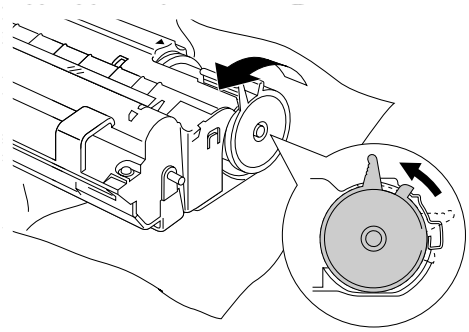


⚠ High Temperature

⚠ Warning

After you have just used the machine, some internal parts of the machine are extremely hot. When you open the top cover, never touch the shaded parts shown in the illustration.

2

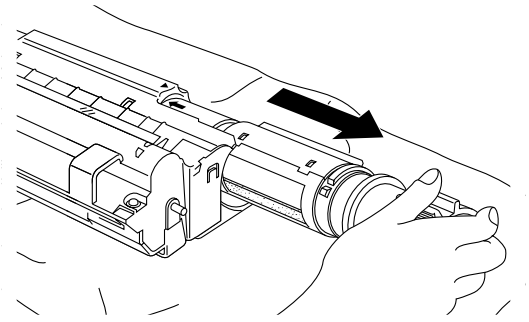


Gently turn the lever on the toner cartridge forward until it stops.

Note

The toner cartridge cannot be removed unless the shutter is completely closed by turning the lever fully to the front.

3

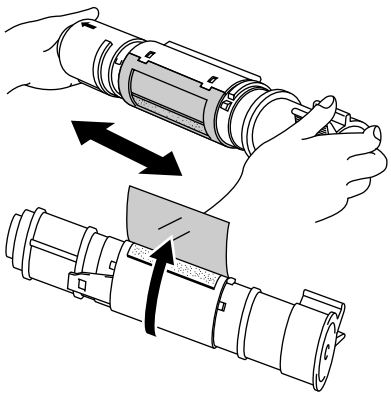


Remove the old toner cartridge from the drum unit by pulling it out gently.

Caution

Handle the toner cartridge carefully. If toner scatters on your hands or clothes, wipe or wash it off with cold water immediately.

4

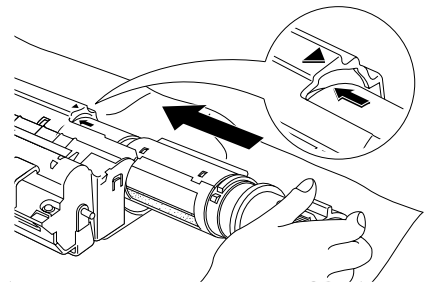


Unpack the new toner cartridge, gently shake it five or six times and then remove the protective part.

Caution

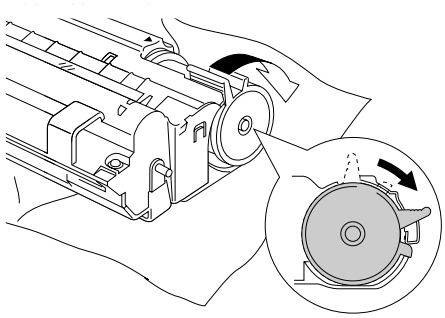
- Only unpack the toner cartridge immediately before installing it into the machine. If toner cartridges are left unpacked for a long period of time, the toner life is shortened.
- **You can only use a Brother genuine toner cartridge (TN-300 series) which is specially formulated to ensure top print quality. Damage caused by using toner cartridges other than Brother original is not covered under any warranty or service agreement.**

5



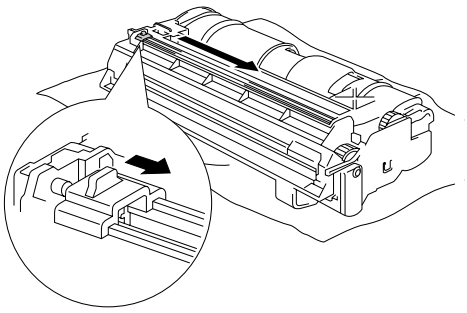
Install the new toner cartridge into the right hand side of the drum unit. Make sure that the toner cartridge guide bar is exactly aligned with the guide slot in the drum unit and pushed fully home into the drum unit to ensure that the toner cartridge and the drum unit fit together correctly.

6



Gently turn the lever on the toner cartridge backward until it stops.

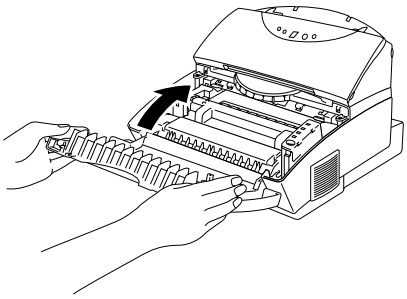
7



Turn the drum unit upside down gently.

Clean the primary corona wire inside the drum unit by gently sliding the blue tab to the right and left several times.

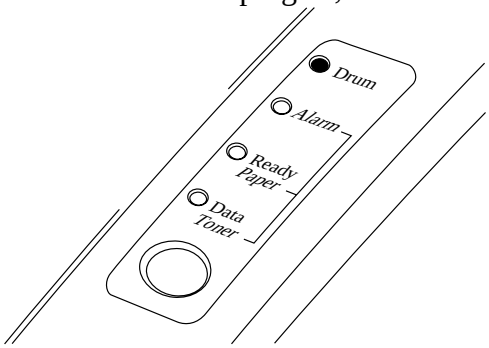
8



Re-install the drum unit into the machine and close the top cover.

REPLACING THE DRUM UNIT

The machine uses a drum unit to create the print images on paper. If the **Drum** lamp is on, it indicates the drum unit is nearly at the end of its life. We recommend you prepare a new drum unit to replace the current one. Even if the **Drum** lamp is on, you may be able to continue to print without replacing the drum unit for a while. If there is a noticeable deterioration in the output print quality even before the **Drum** lamp lights, then the drum unit should be replaced.



Caution

- When removing the drum unit, handle it carefully as it may contain toner.
- You should clean the machine when you replace the drum unit.

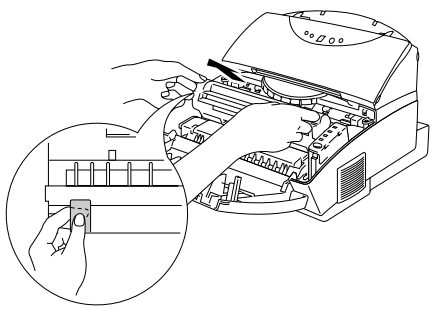
Note

The drum unit is a consumable, and it is necessary to replace it periodically.
There are many factors that determine the actual drum life, such as temperature, humidity, type of paper and toner that you use, the number of pages per print job, etc..
The drum life is estimated at approximately 20,000 pages at 20 pages per job and 8,000 pages at 1 page per job. The actual number of pages that your drum will print may be significantly less than these estimates. Because we have no control over the many factors that determine the actual drum life, we cannot guarantee a minimum number of pages that will be printed by your drum.

For best performance, use only genuine Brother toner. The machine should only be used in a clean, dust-free environment with adequate ventilation.

Follow these steps to replace the drum unit:

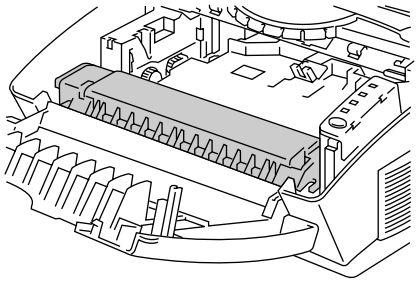
1



Open the top cover towards you. Remove the drum unit by holding each side of the drum and gently lifting the drum forwards towards you.

Note

It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.

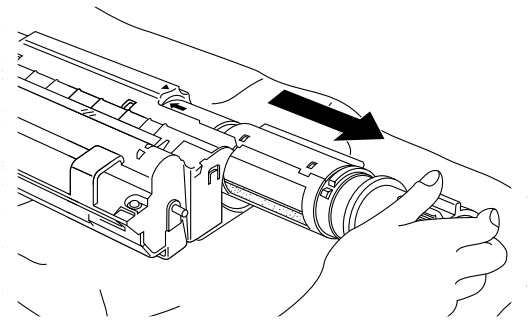


⚠ High Temperature

⚠ Warning

After you have just used the machine, some internal parts of the machine are extremely hot. When you open the top cover, never touch the shaded parts shown in the illustration.

2

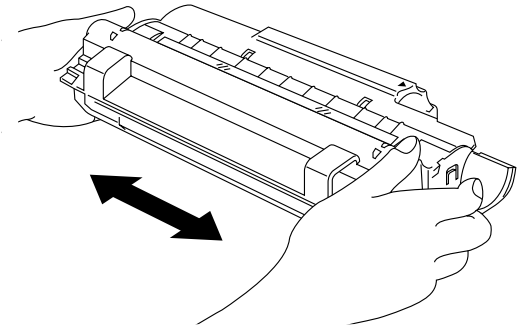


Remove the toner cartridge from the drum unit and keep it in a safe place.

Note

- Discard the used drum unit according to local regulations. If you are not sure of them, consult your local dealer/retailer. Be sure to seal up the drum unit tightly so that toner powder does not spill out of the unit. Do not discard used drum units together with domestic rubbish.
- It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.

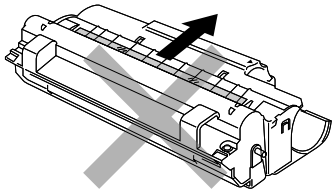
3



Unpack the drum unit and gently shake it five or six times horizontally.

Caution

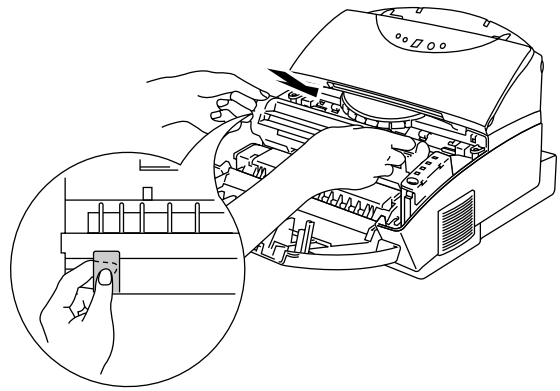
- Only unpack a drum unit immediately before installing it into the machine. If an unpacked drum unit is subjected to excessive direct sunlight or room light, the unit may be damaged.
- Handle the toner cartridge and the drum unit carefully as it contains toner. If toner scatters and your hands or clothes get dirty, wipe or wash it off with cold water immediately**.**



Caution

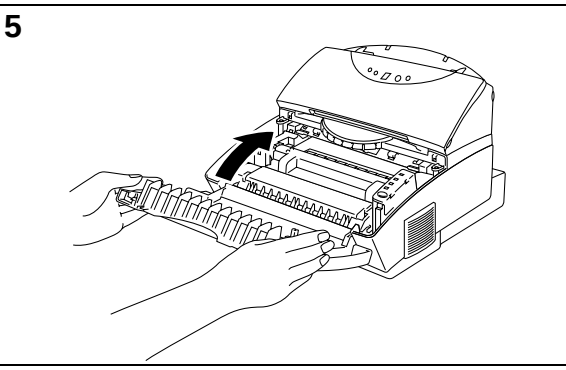
Do not remove the starter sheet.

4



Install the toner cartridge into the new drum unit.
Install the new drum unit into the machine.

5



Close the top cover.
The machine automatically ejects the starter sheet. Ejecting this sheet resets the drum life alarm.

ALARM INDICATIONS AT A GLANCE

Operator Calls for Printing Function

If a recoverable error occurs, the machine indicates an 'operator call' by blinking the **Alarm** lamp and any of the following lamps.

Find the error and take the proper action to correct it. The machine automatically recovers from most errors, but you may need to reset the machine with the panel switch as described below.

Blinking Lamp	Error	Action
Paper ❍↔● **Alarm**❍↔●	Paper jam	Clear the paper jam referring to the "PAPER JAMS" section of the On-line user's guide and press the panel **switch** if the machine does not automatically resume printing.
	Paper empty	Load paper in the machine referring to the On-Line user's guide Chapter 2 and press the panel **switch**.
	Misfeed	Reinstall the paper and press the panel **switch**.
Toner ❍↔● **Alarm**❍↔● (every 5 seconds)	Toner low	Indicates that the machine has approximately 100 pages of printing left before the toner cartridge is empty. Prepare a new toner cartridge.
Toner ❍↔● **Alarm**❍↔● (Fast blinking)	Toner Empty	Replace the toner cartridge with a new one referring to the On-line user's guide Chapter 6.

For errors shown below, the machine indicates an operator call by blinking the **Alarm** lamp. If you use the machine with the supplied Windows driver, the status monitor will appear to indicate the error on your computer screen. The machine also prints some error messages on paper.

Error	Action
Cover Open	Close the top cover of the machine.
Print Overrun	• Press the panel **switch** to print the data remaining in the machine. • If you use the supplied Windows® driver, try again after turning on Error Recovery in the PRINT menu of your application software, (Refer to Help section in the Windows® printer driver for the details.) • If this does not clear the error, reduce the complexity of your document or reduce the print resolution.
Memory Full This error can occur only when using DOS or Macintosh.	• Press the panel **switch** to print the data remaining in the machine. • Reduce the print resolution or reduce the complexity of your document.
Parallel Interface Line Error	• Press the panel **switch** to resume printing. • Check that the connection between your computer and machine is secure and correct, and check the interface cable.

Note

If the machine does not operate as you expect it to, it is recommended that you turn off the power switch, wait a few seconds and then turn it on again. If you still have problems, consult your dealer or our authorized service representative.

Operator Calls for Copying and Scanning Functions

If a recoverable error occurs, the machine shows “E” on the display.

To clear the error, press the Stop Button.
When there is no document in the feeder, inserting a document in the document feeder clears the error.

Errors occur when the following happens;
* When the document causes a paper jam in the document feeder while the mahine is feeding the document.
* When the machine is busy. (When the machine is being used as a scanner.)
* When there is no paper in the sheet feeder.
*When memory full happens. (The mahine will prints out an error message.)

Service Calls for the Printing Function

If an unrecoverable error occurs, the machine indicates the need for a service call by lighting all the lamps and then the following combination of lamps alternately:

Service Call	Fuser malfunction	Laser BD malfunction	Scanner malfunction	ROM error	D-RAM error
Drum	●	❍	●	❍	●
Alarm	❍	●	●	❍	❍
Ready	❍	❍	❍	●	●
Data	❍	❍	❍	❍	❍

Service Call	Service A	Service B	Service C	Service D	Service E0
Drum	❍	●	❍	●	❍
Alarm	●	●	❍	❍	●
Ready	●	●	❍	❍	❍
Data	❍	❍	●	●	●

Service Call	Service E1	Service P	NV-RAM error	CPU runtime error	
Drum	●	❍	●	●	
Alarm	●	❍	❍	●	
Ready	❍	●	●	●	❍ OFF
Data	●	●	●	●	● ON

If you see any of these service call indications, turn off the power switch, wait a few seconds and then turn it on again and try to print again.

If you cannot clear the error and see the same service call indication after turning on the machine, consult your dealer or our authorized service representative. Report the error status and situation referring to the above table.

Note
Be sure that the top cover and the main controller board are firmly installed.

Note
If you have any problems other than described in this section, see “CHAPTER 7 TROUBLESHOOTING, Q & A” of the On-line Users Guide. If you are still unable to clear the problem after reviewing the information in the Users Guide, consult your dealer.

Service Calls for Copying and Scanning Functions

If an unrecoverable error occurs, the machine shows “E” and “0”, “1” or “2” on the display alternately. When this happens, turn off the power switch, wait a few seconds and then turn it on again and try again.

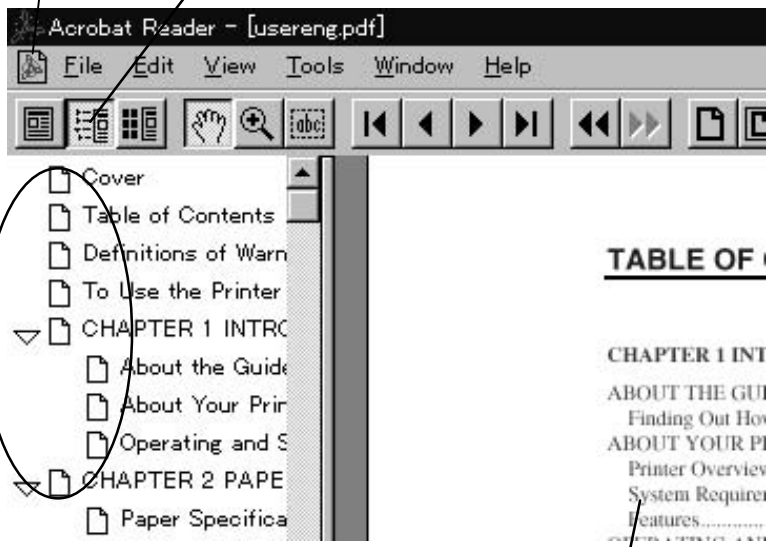
If you cannot clear the error and see the same service call indication after turning on the machine, consult your dealer or our authorized service representative.

HOW TO VIEW THE ON-LINE SETUP GUIDE & USER GUIDE

The Quick Setup guide and User guide for this printer are prepared as PDF files. You need to install the 'Adobe® Acrobat® Reader software to view these manuals.
Click the **Open** button in the '**View Setup Guide**' or '**View User Guide**' menu on the CD-ROM and 'Adobe® Acrobat® Reader' will be automatically installed first if your Windows® does not have it installed. Thereafter, the On-line manual will be opened automatically as illustrated below.

Select 'Close' from this menu to close the file.

Click this button to display the bookmarks on the left of the document list.



- Bookmarks -

These bookmarks contain the titles of each section. To go to the destination specified by a bookmark, click the bookmark text or double- click the page icon to the left of the bookmark name.

Text marked with purple color have links to the related pages. The shape the of cursor pointer changes to a 'finger' when positioned over a link. To go to the destination specified by these links, click on it.

MACHINE SPECIFICATIONS

Printing

Print Method	Electrophotography by semiconductor laser beam scanning
Laser	Wavelength: 780 nm / Output: 5 mW max.
Resolution	600 dots/inch (under Brother Printing Solution for Windows® / under Brother Software PCL5e for DOS box in Windows®) 300 dots/inch (under DOS operating system)
Print Quality	Normal printing mode Economy printing mode (up to 25% and 50% toner saving)
Print Speed	Up to 10 pages/minute (when loading A4 or letter-size paper from the multi-purpose sheet feeder) **NOTE**: Maximum print speed is obtained by printing several copies of the same page. Print speed may vary depending on interface type, emulation, processing power of the computer, memory allocated to the print job, paper size and graphic quality.
Warm-Up	Max. 30 seconds at 23°C (73.4°F) (The warm up time depends on the ambient temperature and humidity.)
First Print	15 seconds (when loading A4 or letter-size paper from the multi-purpose sheet feeder)
Print Media	Toner cartridge: Life Expectancy: 2,400 pages/new toner cartridge 1,000 pages/starter toner cartridge (when printing A4- or letter-size paper at 5% print coverage) **NOTE**: Toner life expectancy will vary depending on the type of average print job printed. Drum Unit: Life Expectancy: 20,000 pages at 20 pages per job 8,000 pages at 1 page per job **NOTE**: There are many factors that determine the actual drum life, such as temperature, humidity, type of paper and toner that you use, the number of pages per print job, etc..

Copying

Type	Auto Document Feeder
Resolution	300 x 300 dpi class : Photo mode , 200 x 600 dpi : Text mode
Enlarge/Reduce	For USA and Canada :50%, 78%, 120%, 150% For other countries :50%, 71%, 141%, 200%
Input	10 documents
Multi-copy	yes

Scanning

Scanner Resolution	600 x 600 dpi class with 256 levels of gray
Software	TWAIN driver Visioneer PaperPort LE® Software WordCraft Unimessage™ Viewer

Functions

TrueType Fonts on disks	TrueType-compatible soft-fonts for Windows® on the supplied disk
Emulation	Brother Printing Solution for Windows® / Automatic emulation selection among HP LaserJet IIP (PCL level 4), EPSON FX-850, or IBM Proprinter XL
Printer Driver	Windows® 3.1/3.11, Windows® 95/98 and Windows NT® 4.0 driver, supporting Brother Native Compression mode and bi-directional capability
Interface	Bi-directional parallel
Memory	2 MB
Diagnostics	Self-diagnostic program

Electrical and Mechanical

Power Source	U.S.A. and Canada:AC 110 to 120 V, 50 / 60 Hz Europe and Australia:AC 220 to 240 V, 50 /60 Hz
Power Consumption	Printing: 280 W or less Stand-by: 60 W or less Sleep: 13 W or less Copying: 180W or less
Noise	Printing: 49 dB A or less Sleep: 33 dB A or less
Temperature	Operating: 10 to 32.5°C (50 to 90.5°F) Storage: 0 to 40°C (38 to 104°F)
Humidity	Operating: 20 to 80% (without condensation) Storage: 20 to 80% (without condensation)
Dimensions (W x H x D)	390 x 282 x 371 mm (14.4 x 11 x 14.5 inches) (when the output tray is closed.)
Weight	Approx. 8.5 kg (18.7 lb.) including the drum unit

REGULATIONS

Federal Communications Commission Compliance Notice (For USA Only)

Responsible party: Brother International Corporation
100 Somerset Corporate Boulevard
Bridgewater, NJ 08807-0911, USA
TEL: (908) 704-1700
declares, that the products

Product Name : Brother Laser Printer / Scanner / Copier
MFC-P2000, MC-P2000
Product Options: ALL

complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interface, and (2) this device must accept any interface received, includung interface that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ❏ Reorient or relocate the receiving antenna.
- ❏ Increase the separation between the equipment and receiver.
- ❏ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ❏ Consult the dealer or an experienced radio/TV technician for help.

Important

A shielded interface cable should be used in order to ensure compliance with the limits for a Class B digital device. Changes or modifications not expressly approved by Brother Industries, Ltd. could void the user's authority to operate the equipment.

FDA Regulations (For 110-120 V Model Only)

U.S. Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. One of the following labels on the back of the printer indicates compliance with the FDA regulations and must be attached to laser products marketed in the United States.

MANUFACTURED:
Brother Corporation (Asia) Ltd. Brother Buji Nan Ling Factory
Gold Garden Ind., Nan Ling Village, Buji, Rong Gang, Shenzhen, CHINA
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

MANUFACTURED:
BROTHER INDUSTRIES (USA) INC.
2950 Brother Blvd., Bartlett, TN 38133, U.S.A.
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

MANUFACTURED:
BROTHER INDUSTRIES LTD.
15-1 Naeshiro-cho Mizuho-ku Nagoya, 467 Japan
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

Industry Canada Compliance Statement (For Canada Only)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

International Energy Star Compliance Statement

The purpose of the International Energy Star Program is to promote the development and popularization of energy-efficient office equipments, which includes computers, monitors, printers, facsimile receivers and copy machines world-wide.
As an International ENERGY STAR partner, Brother Industries, Ltd. has decided that this product meets the guideline of the program.

Laser Safety (For 110–120 V Model Only)

This machine is certified as a Class I laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the machine does not produce hazardous laser radiation.

Since radiation emitted inside the machine is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

Caution

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

Radio Interference (220-240 V Model Only)

This machine complies with EN55022(CISPR Publication 22)/Class B.

Before this product is used, ensure that you use a double-shielded interface cable with twisted-pair conductors and that it is marked "IEEE 1284 compliant". The cable must not exceed 1.8 metres in length.

Declaration of Conformity (For Europe)

We, Brother International Europe Ltd.,
Brother House 1 Tame Street, Guide Bridge,
Audenshaw, Manchester M34 5JE, UK.
declare that this product is in conformity with the following normative documents.

Safety:	EN 60950,	EN 60825
EMC:	EN 55022 Class B,	EN 50082-1

following the provisions of the Low Voltage Directive 73/23/EEC and the Electromagnetic Compatibility Directive 89/336/EEC (as amended by 91/263/EEC and 92/31/EEC).

Issued by:
Brother International Europe Ltd.
European Technical Services Division

IEC 825 Specification (For 220–240 V Model Only)

This machine is a Class 1 laser product as defined in IEC 825 specifications. The label shown below is attached in countries where required.

This machine has a Class 3B Laser Diode which emits invisible laser radiation in the Scanner Unit. The Scanner Unit should not be opened under any circumstances.

Caution

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

The following caution label is attached near the scanner unit.

For Finland and Sweden

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

Varoitus! Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.
Varning – Om apparaten används på annat sätt än i denna Bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass1.

Geräuschemission / Acoustic Noise Emission (For Germany Only)

Lpa < 70 dB (A) DIN 45635-19-01-KL2

This product is designed for use in a professional environment.

IMPORTANT - For Your Safety

To ensure safe operation the three-pin electrical plug supplied must be inserted only into a standard three-pin power point which is properly grounded through normal household wiring.

Extension cords used with the equipment must be three-pin plug type and correctly wired to provide proper grounding. Incorrectly wired extension cords may cause personal injury and equipment damage.

The fact that the equipment operates satisfactorily does not imply that the power is grounded and that the installation is completely safe. For your safety, if in any doubt about the effective grounding of the power, consult a qualified electrician.

Disconnect device

This machine must be installed near a power outlet, which is easily accessible. In case of emergencies, you must disconnect the power cord from the power outlet in order to shut off power completely.

IMPORTANT - Wiring Information (For U.K. only)

If the power cord supplied with this machine is not suitable for your electrical outlet, remove the plug from the mains cord and fit an appropriate three pin plug. If the replacement plug is intended to take a fuse then fit the same fuse as the original.

If a moulded plug is severed from the power cord then it should be destroyed because a plug with cut wires is dangerous if plugged into a live socket outlet. Do not leave it where a child might find it.

In the event of replacing the plug fuse, fit a fuse approved by ASTA to BS1362 with the same rating as the original fuse. Always replace the fuse cover. Never use a plug with the cover omitted.

WARNING - THIS MACHINE MUST BE PROPERLY EARTHED.
The wires in the mains cord are coloured in accordance with the following code:

Green and yellow:	Ground
Blue:	Neutral
Brown:	Live

The colours of the wiring in the power lead of this machine may not correspond with the markings which identify the terminals in your plug. If you need to fit a different plug, proceed as follows.

Remove a length of the cord outer sheath, taking care not to damage the coloured insulation of the wires inside.

Cut each of the three wires to the appropriate length. If the construction of the plug permits, leave the green and yellow wire longer than the others so that, in the event that the cord is pulled out of the plug, the green and yellow wire will be the last to disconnect.

Remove a short section of the coloured insulation to expose the wires.

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter “E” or by the earth symbol or coloured green or green and yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter “N” or coloured black or blue.

The wire which is coloured brown must be connected to the terminal which is marked with the letter “L” or coloured red or brown.

The outer sheath of the cord must be secured inside the plug. The coloured wires should not hang out of the plug.

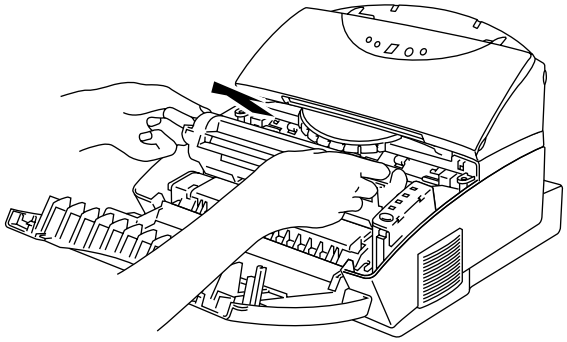
Shipment of the Machine

If for any reason you must ship your Machine, carefully package the Machine to avoid any damage during transit. It is recommended that you save and use the original packaging. The Machine should also be adequately insured with the carrier.

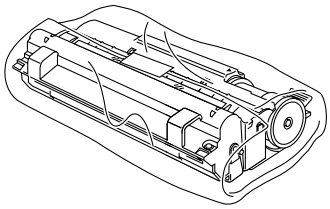
Warning

When shipping the Machine, the DRUM UNIT assembly including the TONER CARTRIDGE must be removed from the Machine and placed in the plastic bag. **Failure to remove and place it in the plastic bag during shipping will cause severe damage to the Machine and will VOID THE WARRANTY.**

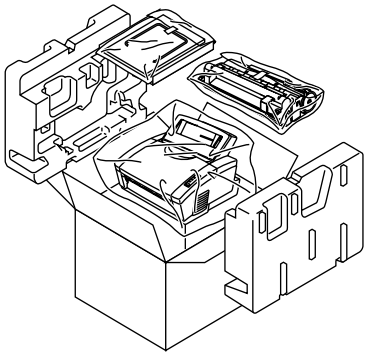
1 Remove the drum unit.



2 Place it in the plastic bag and seal the bag completely.



3 Remove the AC cord, the paper tray extension wire and the document support from the machine.
Re-pack the machine.

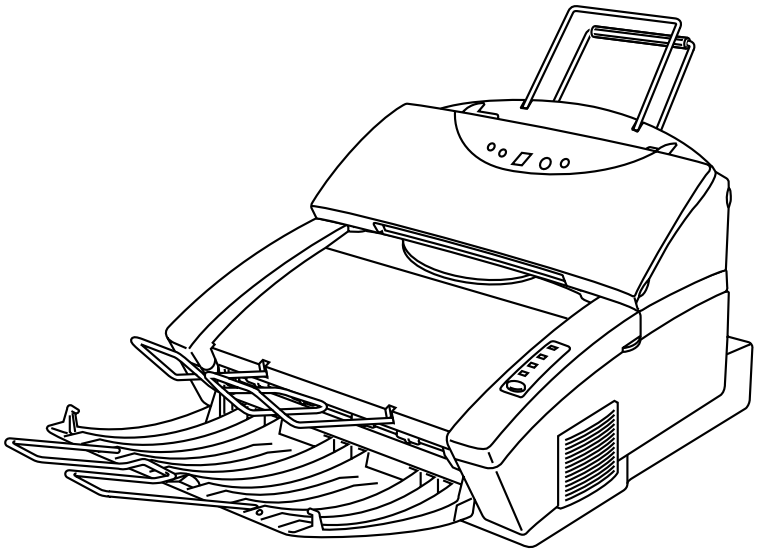


Please read this manual thoroughly before using the machine.

Brother Laser Printer / Scanner / Copier

MFC/HL-P2000

User's Guide



Keep this manual in a convenient place for quick and easy reference at all times.

TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION

CHAPTER 2 PAPER HANDLING

CHAPTER 3 PRINT

CHAPTER 4 COPY

CHAPTER 5 SCAN

CHAPTER 6 MAINTENANCE

CHAPTER 7 TROUBLESHOOTING

APPENDIX

INDEX

Definitions of Warnings, Cautions, and Notes

The following conventions are used in this User's Guide:

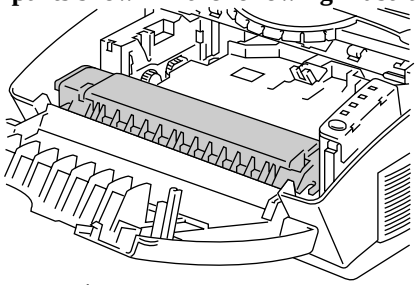
> **⚠ Warning**
> **Indicates warnings that must be observed to prevent possible personal injury.**

> **Caution**
> Indicates cautions that must be observed to use the machine properly or prevent damage to the machine.

> **Note**
> Indicates notes and useful tips to remember when using the machine.

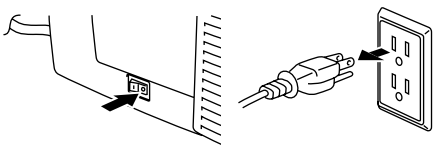
To Use the Machine Safely

> **⚠ Warning**
> **After you have just used the machine, some internal parts of the machine are extremely hot. When you open the top cover, never touch the shaded parts shown in the following illustration.**



High Temperature
Inside the Machine

> **⚠ Warning**
> **There are high voltage electrodes inside the machine. Before cleaning the machine, make sure to turn off the power switch and unplug the power cord from the power outlet.**



Turning off the Switch and Unplugging the Machine

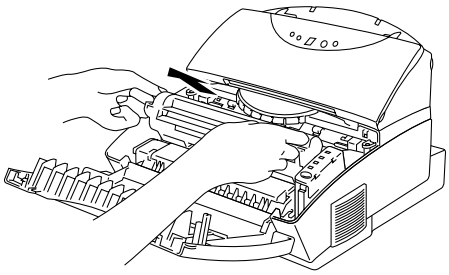
Shipment of the Machine

If for any reason you must ship your Machine, carefully package the Machine to avoid any damage during transit. It is recommended that you save and use the original packaging. The Machine should also be adequately insured with the carrier.

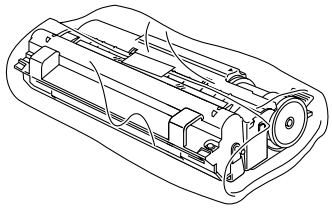
Warning

When shipping the Machine, the DRUM UNIT assembly including the TONER CARTRIDGE must be removed from the Machine and placed in the plastic bag. **Failure to remove and place it in the plastic bag during shipping will cause severe damage to the Machine and will VOID THE WARRANTY.**

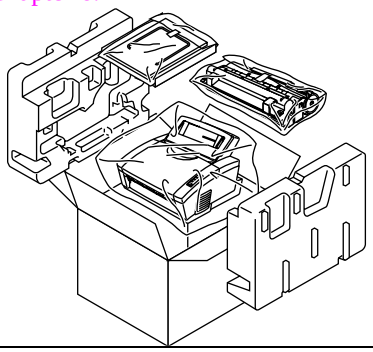
1 Remove the drum unit.



2 Place it in the plastic bag and seal the bag completely.



3 Remove the AC cord, the extention wire of the paper tray and the document support from the machine. Re-pack the machine. See "REPACKING THE MACHINE" in Chapter 6.



(For USA & CANADA Only)

For technical and operational assistance, please call:

In USA	1-877-284-3238	(outside California)
	949-859-9700 Ext. 329	(within California)
In CANADA	1-800-853-6660	
	514-685-6464	(within Montreal)

If you have comments or suggestions, please write us at:

In USA	Printer Customer Support Brother International Corporation 15 Musick Irvine, CA 92718
In CANADA	Brother International Corporation (Canada), Ltd. - Marketing Dept. 1, rue Hôtel de Ville Dollard-des-Ormeaux, PQ, Canada H9B 3H6

BBS
For downloading drivers from our Bulletin Board Service, call:

In USA	1-888-298-3616
In CANADA	1-514-685-2040

Please log on to our BBS with your first name, last name and a four digit number for your password. Our BBS supports modem speeds up to 14,400, 8 bits no parity, 1 stop bit.

Fax-Back System
Brother Customer Service has installed an easy to use Fax-Back System so you can get instant answers to common technical questions and product information for all Brother products. This is available 24 hours a day, 7 days a week. You can use the system to send the information to any fax machine, not just the one you are calling from.
Please call 1-800-521-2846 (USA) or 1-800-681-9838 (Canada) and follow the voice prompts to receive faxed instructions on how to use the system and your index of Fax-Back subjects.

DEALERS/SERVICE CENTERS (USA only)
For the name of an authorized dealer or service center, call 1-800-284-4357.

SERVICE CENTERS (Canada only)
For service center addresses in Canada, call 1-800-853-6660

INTERNET ADDRESS
For technical questions and downloading drivers: **http://www.brother.com**

CHAPTER 1
INTRODUCTION

ABOUT THE GUIDEBOOKS

Finding Out How to Use the Machine

You have two guidebooks for this machine. Read each guidebook in the following order:

1. Read the Quick Setup Guide to set up your machine and to ensure proper connection with your computer. It also contains information for installing the printer driver, fonts and Remote Printer Console Program.

2. Read this On-line User's Guide to get information about the following.

   - Features and operating environment requirements of your machine – Chapter 1
   - Paper Handling – Chapter 2
   - Print – Chapter 3
   - Copy – Chapter 4
   - Scan – Chapter 5
   - Maintenance – Chapter 6
   - Troubleshooting – Chapter 7
   - Specifications – Appendix
   - Index

ABOUT YOUR MACHINE

Machine Overview

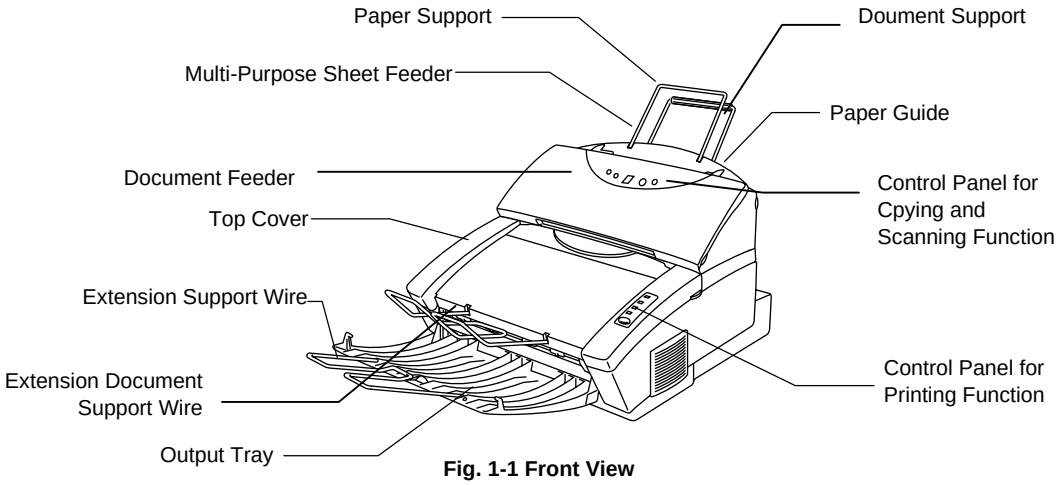


Fig. 1-1 Front View

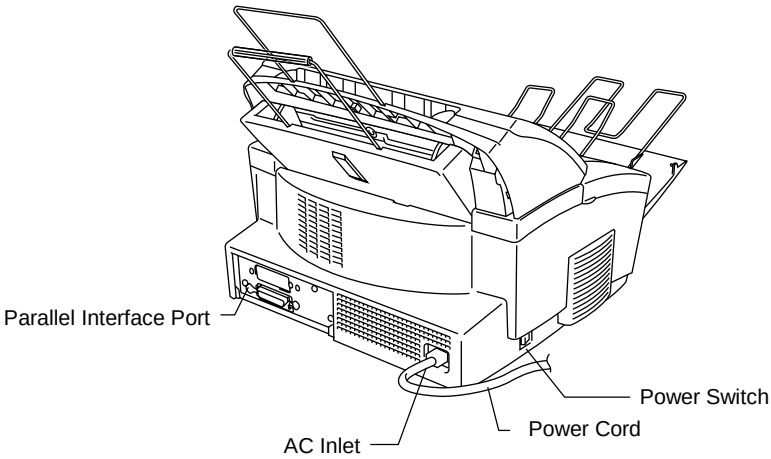


Fig. 1-2 Rear View

System Requirements in Brother Printing Solution for Windows®

Check the following system requirements to setup and operate the machine in Brother Printing Solution for Windows:

- IBM PC or compatible with 80486 SX or higher microprocessor
- Parallel interface (or printer port)
- 8 MB or more of memory (for Windows® 3.1/3.11)
  16 MB or more of memory (for Windows® 95/98/NT)
- 10 MB of space available on your hard disk for the printer driver and all fonts
- 20 MB of space available on your hard disk for Visioneer PaperPort® LE Software
- Microsoft Windows® 95/98, 3.1/3.11 or Windows® NT 4.0

Features

This machine has the following features:

❏ **High Resolution and Fast Printing Speed**
True 600 dots per inch (dpi) with microfine toner and up to 10 pages per minute (ppm) printing speed (A4 or Letter paper).

❏ **Versatile Paper Handling**
The machine has a multi-purpose sheet feeder and straight paper path mechanism. Using this mechanism, you can load A4, letter, legal, B5, A5, A6 and executive sizes of paper, and various types of paper including envelopes, organizer paper and your custom paper size. The multi-purpose sheet feeder also allows manual paper loading, so you can also use labels and transparencies.

❏ **Copier**
You can easily copy at a comfortable speed with only one push of a button. You can also enlarge or reduce the copying size.

❏ **Document Management Application 'Visioneer PaperPort® LE Software' (MFC-P2000)**
Visioneer PaperPort® LE Software is a document management application which contains a viewer, editor and filing system and various links to other applications. Visioneer PaperPort® LE Software is a sophisticated application and has widespread industry acceptance and endorsements.

❏ **A Sofisticated Viewer Software 'WordCraft Unimessage™ Viewer Software' (HL-P2000)**
WordCraft Unimessage™ Viewer is a sophisticated viewer for displaying and editing graphic files. In addition to the usual image editing functions (object drawing, annotations, highlighting, etc.) you will also be able to use this software to view both colour and monochrome images, create cover sheets for use with HL-P2000, display thumbnails of graphics files in any of your directories and set up a referencing system for your files using DIR (Document Indexing Retrieval).

- **TWAIN Compliant Scanner Driver**
  The scanner driver is TWAIN compliant which is a defacto standard. You can use the scanner from other TWAIN compliant applications as well as the PaperPort application or Unimessage™ viewer application.

- **Enhanced Printing Performance and User-Friendly Operation for Windows®**
  The dedicated printer driver and TrueType™-compatible fonts for Microsoft® Windows 95/98 and Windows 3.1 are available on the floppy disk and CD-ROM supplied with your machine. You can easily install them into your Windows system using our installer program. The driver supports our unique compression mode to enhance printing speed in Windows applications and allows you to choose various machine settings including toner saving mode, custom paper size, sleep mode, gray scale adjustment, resolution and so forth. You can easily set these print options through the Machine Setup Menu within the Windows Control Panel.

- **Remote Printer Console Program for DOS**
  The utility program, Remote Printer Console (RPC), is available on a floppy disk supplied with your machine. When you operate your computer in the DOS (Disk Operating System) environment, this program allows you to easily change the default settings of the machine such as fonts, page setup, emulations and so on.
  This program also provides a status monitor program, which is a Terminate-and-Stay Resident (TSR) program. It can monitor the machine status while running in the background and report the current status or errors on your computer screen.

- **Popular Printer Emulation Support**
  This machine supports the following popular printer emulation modes: HP LaserJet IIP, Epson FX-850 and IBM Proprinter XL. When you use DOS application software or Windows version 3.0 or earlier, you can use any of these emulations to operate the machine. The machine also supports auto-emulation switching between HP and Epson or HP and IBM. If you want to select the printer emulation, you can do it using the Remote Printer Console Program.

❑ **Machine Status Monitor with Bi-directional Parallel Interface**
The printer driver can monitor your machines status using bi-directional parallel communications. A high quality bi-directional parallel printer cable is recommended.

The machine status monitor program can show the current status of your machine. When printing, the animated dialog box appears on your computer screen to show the current printing process. If an error occurs, a dialog box will appear to let you know what to correct. For example: when your machine is out of paper, the dialog box will display “No Paper” and instructions for the proper corrective action.

❑ **Enhanced Memory Management**
The machine provides its own data compression technology in the machine hardware and the supplied printer driver software, which can automatically compress graphic data and font data efficiently into the machine’s memory. You can avoid memory errors and print most full page 600 dpi graphic and text data, including larger fonts, with the machine’s standard memory.

❑ **Environment-Friendly**
Economy Printing Mode
This feature will cut your printing cost by saving toner. It is useful to obtain draft copies for proof-reading. You can select from two economy modes—25% toner saving and 50% toner saving—through the Windows printer driver supplied with your machine.

Sleep Mode (Power Save Mode)
When the machine is not used for a certain amount of time, sleep mode automatically reduces power consumption. The machine consumes less than 13 W when in sleep mode.

Low Running Cost
Since the toner cartridge is separate from the drum unit, you need to replace only the toner cartridge after approximately 2,400 pages, which is cost effective and ecologically friendly. **(Some models are supplied with a starter toner cartridge which must be replaced after 1,000 pages.)**
The actual number of pages printed with each toner cartridge may vary depending on your average type of print job.

OPERATING AND STORAGE ENVIRONMENT

Please take note of the following before using the machine.

Power Supply

Use the machine within the specified power range.

AC power:	±10% of the rated power voltage in your country
Frequency:	50/60 Hz (220 V– 240 V) or 50/60 Hz (110–120 V)

The power cord, including extensions, should not exceed 5 meters (16.5 feet).

Do not share the same power circuit with other high-power appliances, particularly an air conditioner, copier, shredder and so on. If it is unavoidable that you must use the machine with these appliances, it is recommended that you use an isolation transformer or a high-frequency noise filter.

Use a voltage regulator if the power source is not stable.

Environment

The machine should be installed near a power outlet which is easily accessible.

Use the machine only within the following ranges of temperature and humidity.

Ambient temperature:	10°C to 32.5°C (50°F to 90.5°F)
Ambient humidity:	20% to 80% (without condensation)

The machine should be used in a well ventilation room.

Place the machine on a flat, horizontal surface.

Keep the machine clean. Do not place the machine in a dusty place.

Do not place the machine where the ventilation hole of the machine can be blocked.

Do not place the machine where it is exposed to direct sunlight. Use a blind or a heavy curtain to protect the machine from direct sunlight when the machine is unavoidably set up near a window.

Do not place the machine near devices that contain magnets or generate magnetic fields.

Do not subject the machine to strong physical shocks or vibrations.

Do not expose the machine to open flames or salty or corrosive gasses.

Do not place objects on top of the machine.

Do not place the machine near an air conditioner.

Keep the machine horizontal when carrying it.

Do not cover the slots in the top cover.

CHAPTER2
PAPER HANDLING

PAPER SPECIFICATIONS

The machine can handle paper that has the following specifications.

Paper Type	Paper Size
Cut sheet	A4, Letter, Legal, B5(JIS/ISO), A5, A6, Executive, Custom size (70-216 x 127-356 mm, 2.75-8.5 x 5-14 inches)
Envelopes	DL, C5, COM-10, Monarch, 9” x 12”
Organizer	Day-Timer® J, K, L (70-216 x 127-356 mm, 2.75-8.5 x 5-11 inches)
Labels and Transparencies	A4, Letter (70-216 x 127-356 mm, 2.75-8.5 x 5-14 inches)

Paper Capacity in Feeder

Multi-purpose Sheet Feeder:

A4/Letter paper: Up to 22 mm (0.87 inch) in height (up to the mark)
Approx. 200 sheets of 75 g/m^2 (20 lb.)
30 sheets of 158 g/m^2 (42 lb.) A4/Letter paper

Legal paper: 100 sheets

Envelopes, Organizer: 10 sheets

Output Tray: Approx. 100 sheets of 75 g/m^2 (20 lb.) A4/Letter paper

	Cut Sheet	Envelope
Basis Weight	60 to 158 g/m^2 (16 to 42 lb.)	75 to 90 g/m^2 (20 to 24 lb.) single thickness
Caliper	±0.03 to ±0.08 in. (0.08 to 0.2 mm)	0.0033 to 0.0058 in. (0.084 to 0.14 mm) single thickness
Moisture Content	4% to 6% by weight	4% to 6% by weight
Smoothness	100 to 250 (Sheffield)	100 to 250 (Sheffield)

Recommended paper

Cut sheet: Xerox 4200 (in USA) / Xerox 80 Premier Paper (in Europe) or equivalent

Label: Avery laser label or equivalent

Transparency: 3M CG3300 or equivalent

Remarks

It is recommended that you test paper, especially special sizes and types of paper and heavy paper, on this machine before purchasing large quantities.

Avoid using coated paper, such as vinyl coated paper.

Avoid using preprinted or highly textured paper.

Use a recommended type of paper, especially plain paper and transparencies, for optimum printing. For more information on paper specifications, consult your nearest authorized sales representative or the place you purchased your machine.

If the paper has problems feeding from the multi-purpose sheet feeder, use the manual feed slot and try again.

Use neutral paper. Do not use acid paper to avoid any damage to the machine drum unit.

You can use recycled paper in this machine.

Make sure you select the appropriate media type in the printer driver for optimum printing.

The print quality might be degraded or the life of drum unit might be shortened with the following usage.

- Using paper with narrower width than A4/Letter continuously
- Printing only a certain range of paper widths continuously
- Using the machine for a special job (i.e. printing of name cards etc.)

Cut Sheet

We recommend you use long-grained paper for the best print quality. If you are using short-grained paper, it could be the cause of paper jams.

Labels / Transparencies

Avoid feeding labels with carrier sheets exposed, or your machine will be damaged.

We recommend you use label or transparencies which are designed for use in laser printers.

Special Paper

Before using paper with holes such as organizer sheets, you must fan the stack well to avoid paper jams and misfeeds.

Do not use organizer sheets that are stuck together. The paste used might cause damage to the machine.

Before using any paper, make sure that it is not curled. If it is, you should straighten the paper as much as possible. Feeding curled paper can cause paper jams and misfeeds.

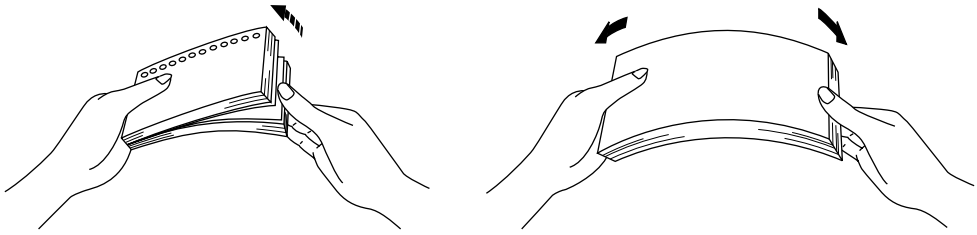


Fig. 2-1 Fan the Paper and Straighten the Paper

The machine can handle 9” width paper. However, you may get stains on the paper outside 8.5” width or on the back of the paper.

If different types of paper are loaded at the same time in the feeder, it may cause paper jams or mis-feeds.

Envelopes

The following types of envelopes are not recommended for use.

- Damaged, curled, wrinkled, or irregularly shaped envelopes
- Extremely shiny or highly textured envelopes
- Envelopes with clasps
- Envelopes with self-adhesive closures
- Envelopes of baggy construction
- Envelopes not sharply creased
- Embossed envelopes
- Envelopes already printed by a laser printer
- Envelopes pre-printed on the inside
- Envelopes that cannot be arranged uniformly when placed in a pile

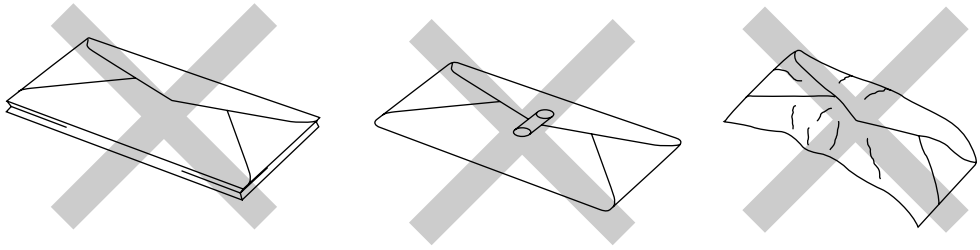
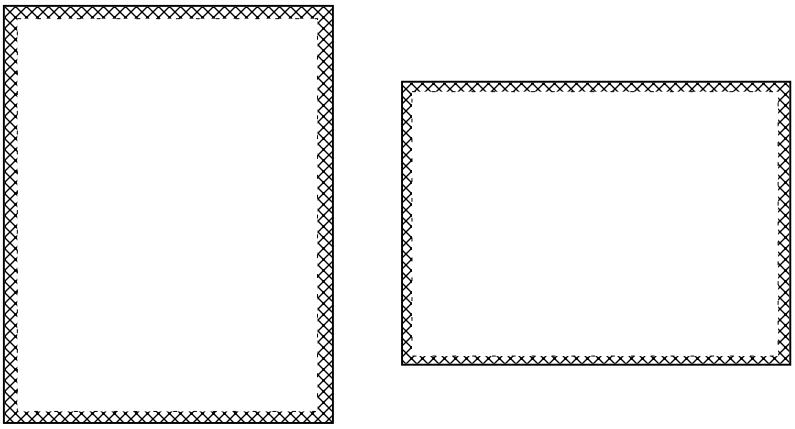


Fig. 2-2 Envelopes

Printable Area The figure below shows the physically printable area. (Except 9"x12" envelope)



Unprintable area
Approximately 4 mm(0.16 inch) for any sizes of paper

Fig. 2-3 Printable Area

DOCUMENT SPECIFICATIONS

The machine can handle documents that have the following specifications.

Document Size	70-216mm wide, 100-360mm long
Document Basis Weight	52 to 90 g/m^2 (13.9 to 24 lb.)
Document Thickness	0.06mm to 0.12mm

Paper Capacity in Document Feeder
A4/Letter paper: Approx. 10 sheets of 75 g/m^2 (20 lb.)
Envelopes, Organizer: 10 sheets

Caution
- Do not load labels in the document feeder.
- Do not load transparencies in the document feeder.

Note
- When loading multiple documents in the document feeder, load the same size and type of document.
- When loading multiple documents in the document feeder, fan the documents before loading.
- Documents printed in color might stain the scanning unit. If this happens, clean the scanning unit.

Scannable Area The figure below shows the physically scannable area. The scannable area of your machine begins at approximately 3mm (0.12”) from the edge of the document.

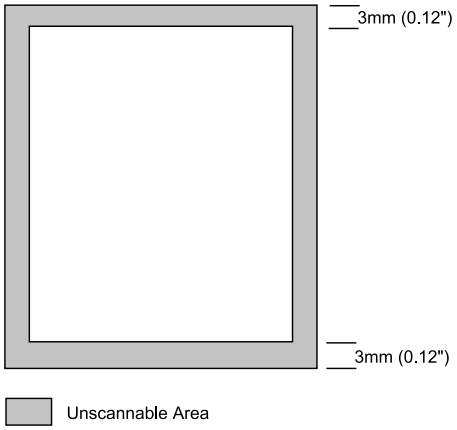


Fig. 2-4 Scannable Area

MULTI-PURPOSE SHEET FEEDER FOR PRINTING

The machine has a multi-purpose sheet feeder that can feed plain paper, envelopes, transparencies and organizer paper.

To use the multi-purpose sheet feeder, follow these steps:

1. Make sure that you have selected the proper paper source, paper size, media type and orientation.

> **Note**
> - You may select the proper paper source, paper size and orientation in your application software.
> - If your application software does not support your custom paper size, select the next paper size up that is closest but larger than the custom size. Then adjust the print area by changing the right and left margins in your application software.

2. Make sure that the multi-purpose sheet feeder contains the selected size of paper in the selected orientation. If necessary, change the paper in the feeder.

3. Send your file or document to the machine.

   When the machine receives data, it begins the print process by loading paper from the multi-purpose sheet feeder. If the machine is in sleep mode when it receives data, it will wake up and start the printing process automatically.

Loading Paper into the Feeder

To load paper into the feeder, follow these steps.

1. Open the multi-purpose sheet feeder by gently pulling the lid forward towards you. (①).

2. Load paper into the multi-purpose sheet feeder with the printing surface face down. (②)

Caution

- The feeder can hold up to 200 sheets of plain paper (75 g/m^2, 20 lb.). If you load too many sheets, paper jams could occur.
- Make sure that the paper is stacked below the ▼ mark.
- If there is still some paper in the feeder, you must first remove it, put it together with the new paper and then insert the stack in the feeder.

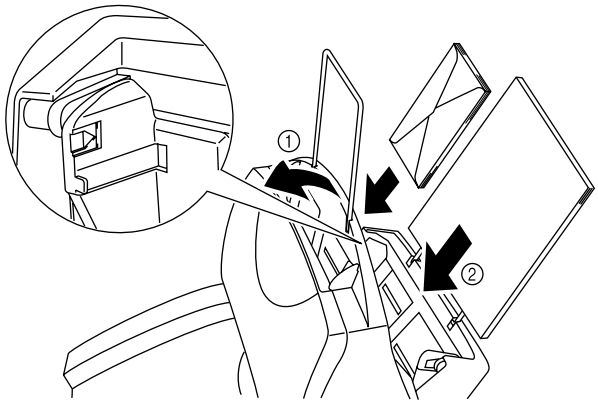


Fig. 2-5 Opening the Feeder and Loading Paper or Envelopes in the Feeder

Note

If you load envelopes in the feeder, make sure they are inserted in the direction shown above.

3. Move the paper guide to the paper width. (①)

> **Caution**
> Failure to set the paper guide to the paper size may cause paper skew or jams.

4. Close the multi-purpose sheet feeder. (②)

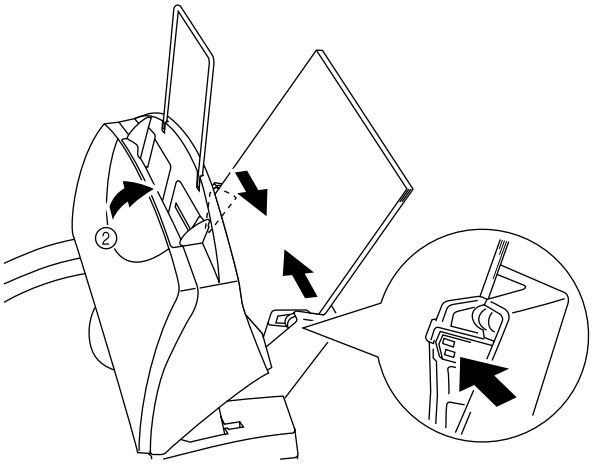


Fig. 2-6 Moving the Paper Guide and Closing the Feeder

> **Note**
> If the multi-purpose sheet feeder runs out of paper when you try to print, the **Alarm** and **Paper** lamps blink to alert you to a paper empty error. You have to load paper in the feeder and push the panel switch to cancel the alarm and continue printing. If paper jams in the machine, the **Alarm** and **Paper** lamps also blink. If the error is a paper jam, clear it referring to "PAPER JAMS" in Chapter 7.

Two Side Printing (Manual Duplexing)

The supplied printer driver for Windows 95,98 or Windows 3.1 enables manual duplex printing. For more information about settings, see the help text in the printer driver.

The machine prints all the even numbered pages on one side of the paper first, and then prints all the odd pages on the reverse side of the paper.

When you have finished printing the even numbered sides of the paper, the driver instructs you to re-insert the paper by a pop-up message on the computer screen. Follow the instructions on how to reinsert the paper.

Note

- Before re-inserting the sheets, you have to straighten them, or you will get paper errors.
- The use of very thin or very thick paper is not recommended.
- If you encounter a double feeding error, we recommend that you hold all sheets of paper except the front sheet while the paper is feeding.

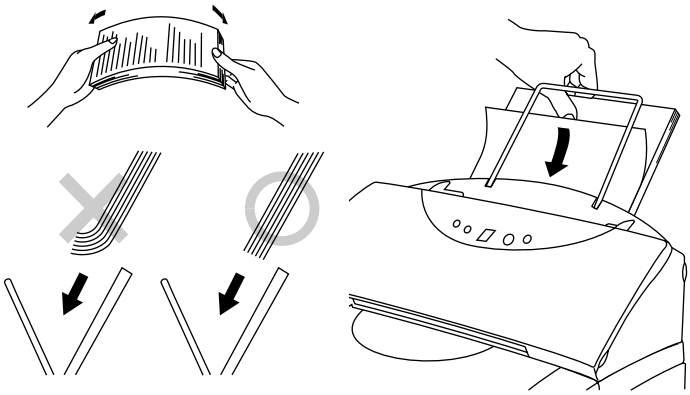


Fig. 2-7 Notes for Manual Duplexing

Note

When you use the Manual Duplex function, it is possible that paper jams may occur or print quality might not be satisfactory.

OUTPUT TRAY AND PAPER SUPPORT WIRE

The machine ejects paper with printed surfaces face down into the output tray at the front of the machine.

When the output tray is closed, the ejected paper comes out sheet by sheet through the slit at the front. When you open the tray, sheets can be stacked on the tray.

Follow these steps to open the output tray:

1. Pull the top of the tray down (①).

2. Extend the extension support wire (②), and extend the extension document support wire.(③)

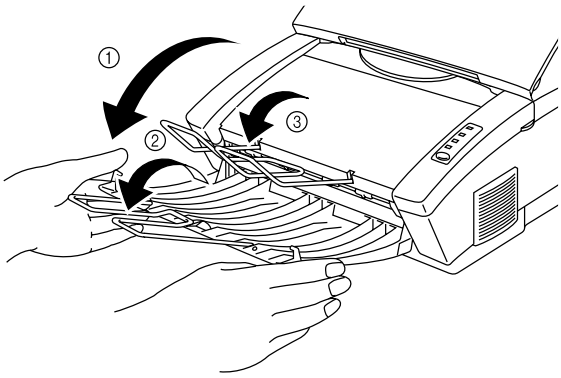


Fig. 2-8 Opening the Output Tray and Extending the Extension Support Wire

You can stack up to 100 sheets in the output tray.

Caution

- When you use transparencies, remove each sheet immediately after printing. Stacking sheets may cause paper curled or paper jam.
- Continuous printing with the output tray closed may cause condensation inside the output tray.

CHAPTER 3
PRINT

LAMPS AND SWITCH

This section refers to the following lamps and switch on the machine control panel.

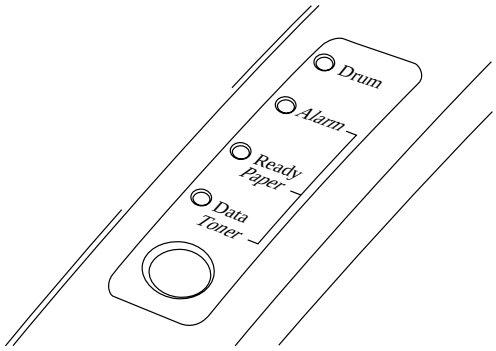


Fig. 3-1 Lamps and Switch on Control Panel

> **Note**
> When the **power** switch is off or the machine is in sleep mode, all lamps including the **Ready** lamp are off.

Ready (Paper) Lamp

The **Ready** lamp indicates the current status of the machine.

Lamp	Machine status
Off ❍	The **power** switch is off or the machine is in sleep mode. If the machine is in sleep mode, it will wake up automatically when it receives data or you press the control panel switch.
Blinking ❍↔●	The machine is warming up. (Blinking at 1 second intervals)
Blinking ❍↔●	The machine is cooling down and stops printing until the internal temperature lowers. (Blinking at 2 seconds intervals)
On ●	The machine is ready to print.

This lamp also works as the **Paper** lamp with the **Alarm** lamp. They blink simultaneously to indicate a paper error. See “Operator Calls” Chapter 7.

Data (Toner) Lamp

The **Data** lamp indicates the current status of the print data process.

Lamp	Machine status
Off ❍	The machine has no print data.
Blinking ❍↔●	The machine is receiving data from the computer or is processing data in memory.
On ●	Print data remains in the machine memory. If the **Data** lamp is on for a long period of time and nothing has printed, you need to press the **switch** to print the remaining data.

This lamp also works as the **Toner** lamp with the **Alarm** lamp. They blink simultaneously to indicate a toner error. See "REPLACING THE TONER CARTRIDGE" in Chapter 6 and "Operator Calls" in Chapter 7.

Drum Lamp

The **Drum** lamp indicates the drum unit is nearly at the end of its life.

Lamp	Machine status
Off ❍	The drum unit can be used.
On ●	The drum unit is nearly at the end of its life. Installing a new drum unit turns off this lamp. See "REPLACING THE DRUM UNIT" in Chapter 6.

Alarm Lamp

The **Alarm** lamp blinks to indicate a machine error status such as "`COVER OPEN`" and "`MEMORY FULL`." If any other error occurs, the machine indicates the error by blinking the **Alarm** lamp with another lamp or by printing an error report.

> **Note**
> The **Ready**, **Data** and **Drum** lamps are used to indicate machine errors with the **Alarm** lamp. See "ALARM INDICATIONS AT A GLANCE" in Chapter 7 and take corrective action for the error.

Switch

This **switch** will be used for the following purpose depending on the situation.

Cancel printing
If you press the **switch** during printing, the machine immediately stops printing and ejects the paper.

Wake-up
If the machine is in sleep mode, pressing the **switch** wakes it up into the ready state.

Form Feed
If the **Data** lamp is on, press the **switch**. The machine prints any data remaining in memory: this operation is called "Form Feed."

Error Recovery
If an error occurs, the machine will recover from some errors automatically. If the error does not clear automatically, press the **switch** to clear the error and continue machine operation.

Other Control Features

The machine has the following useful features:

Sleep Mode

When the machine does not receive data for a certain period of time (time-out), it enters sleep mode. Sleep mode acts as though the machine was turned off. The default time-out is 5 minutes. While the machine is in sleep mode, all the **lamps** are off and it is as if it was turned off, but the machine can still receive data from the computer. Receiving a print file or document automatically wakes up the machine to start printing. Pressing the **switch** also wakes up the machine.

> **Note**
> - When the machine goes into sleep mode, the fan will not stop until the machine engine has cooled down.
> - Sleep mode allows the print engine to cool, so the temperature of your room and how long the machine has been in sleep mode affects the warm-up time. This warm-up time can take up to 30 seconds. The **Ready** lamp blinks to indicate that the machine is warming up.
> - You can change the time out for the sleep mode with the supplied printer driver or Remote Printer Console program. Refer to the Help section in the printer driver or RPC program for more information about the sleep mode setting.

Test Print Mode

The machine has the following test print mode. Follow these steps:

1. Make sure that the top cover is closed.

2. Hold down the switch and turn on the **power** switch. Keep the **switch** depressed until the **Drum** lamp comes on.

   The **Drum** lamp lights to indicate that the machine is in the test print mode.

3. Press the **switch** again to execute the test print or hold down the **switch** to select another option and release the **switch** to execute the selected option.

   The test print modes are listed below:

Lamp Lit	Choice	Function
Drum	Test sample page	The machine prints a test sample page. The machine returns to the ready status after printing.
Alarm	Print Config & Print Fonts I	The machine prints the current configuration of the machine and a list of the internal fonts. The machine returns to the ready status after printing.
Ready	Factory Reset	The machine is restored to the factory setting and permanent fonts and macros are cleared. The machine returns to the ready status after printing.
Data	Hex Dump Print	The machine can print data as hexadecimal values, so that you can check data errors and problems. To exit from this mode, you have to turn off the machine.

CHAPTER 4
COPY

The machine allows you to make high-quality photocopies. Always make sure that paper is loaded in the Sheet Feeder before making copies.

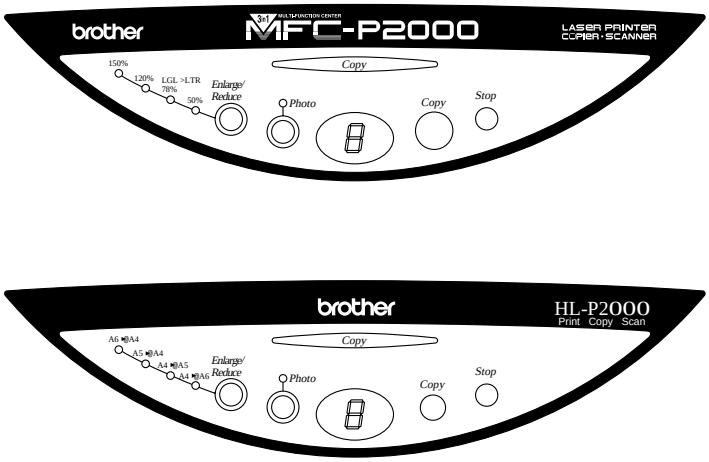


Fig. 4-1 Control Panel for Copying and Scanning Functions

COPYING IN STANDARD MODE

1. Insert the original document face down in the Document Feeder.

2. Press the **Copy** button.

To stop copying, press the **Stop** button. The machine shows “E” on the display. Press the **Stop** button again to eject the original document.

TO MAKE SETTINGS FOR EACH COPY

You can make various settings. These settings are effective only for the next copy and after that the settings are cleared. The number of copies should be set after Enlarge/Reduce and Quality settings have been made.

- **Enlarge/Reduce** - Enlargement / Reduction ratio
- **Photo/Text** -Copy output mode
- **Copies** - the number of copies

Photo/Text

Select the copy mode from Text or Photo

1. Insert the original document face down in the Document Feeder.

2. Press the **Photo** button to select photo mode.
   When you select Photo mode, the **Photo** lamp comes on.

3 . Press the **Copy** button to start copying.

Enlarge/Reduce

You can make an enlarged or reduced size of copy from 50% to 150% (for USA and Canada), 50% to 200% (for other countries).

1. Insert the original document face down in the Document Feeder.

2. Press the **Enlarge/Reduce** button and select the Enlarge/Reduce ratio.

   <For USA and Canada>
   * You can reduce to 78 or 50% of the original size.
   ---- OR ----
   * You can enlarge to 120% or 150%

   <For other countries>
   * You can reduce to 71 or 50% of the original size.
   ---- OR ----
   * You can enlarge to 141% or 200%

   When Enlarge/Reduce is 100%, all the LEDs are off.

3. Press the **Copy** button to start the copy.

> **Note**
> If the enlarged size is bigger than the copy paper, you may lose some portion of the original document. In that case, reduce the enlargement ratio.

The Enlarge/Reduce function works as shown in the figure below.

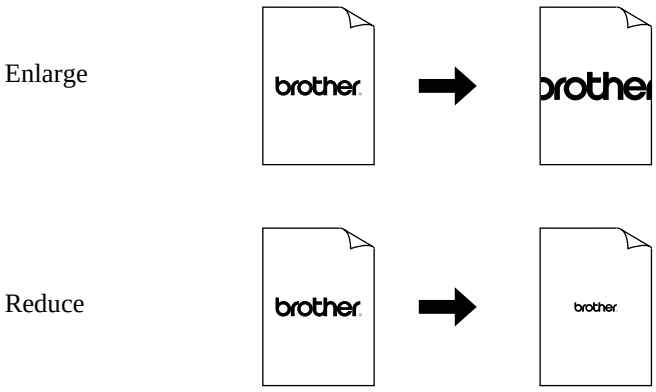


Fig. 4-2 Enlarge and Reduce

The Number of Copies

You can make multiple copies.

1. Insert the original document face down in the Document Feeder.
2. Press the **Copy** button.
3. Press the **Copy** button again within one second if you want to increase the number of copies.

> **Note**
> The maximum number of copies is 9.

Error

If an error ocurrs, the machine shows "E" on the display.

To clear the error, press the **Stop** button.

An error will occur when the following happens;
*When the document causes a paper jam in the document feeder while the machine is feeding the document.
*When the machine is busy. (When the machine is being used as a scanner or printer.)
*When there is no paper in the sheet feeder.
*When memory full happens and the machine prints out an error message.

When there is no document in the Document Feeder when you try to copying, the machine shows the number of copies and the letter "P" alternately on the display. When you see this, insert a document in the Document Feeder.

> **Note**
> When a memory full error is likely to happen, the machine changes the vertical resolution from 600 dpi to 300 dpi and copies the document automatically. In this case, the machine displays "F" on the display.

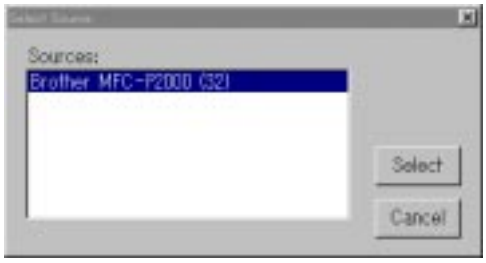
CHAPTER 5
SCAN

The machine provides you with a TWAIN compliant scanner driver. This allows you to use the machine as scanner from any TWAIN compliant application such as Adobe Photoshop.

SCANNING FROM TWAIN COMPLIANT APPLICATIONS

1. Launch the application you wish to use.

2. Select the 'Select Source' menu.



3. Select the "Brother MFC-P2000" or "Brother HL-P2000" and click Select.
4. Select the "Acquire" menu.
5. Make the appropriate settings such as;
   - Scanning Resolution
   - Photo, Text
   - Scanning Area

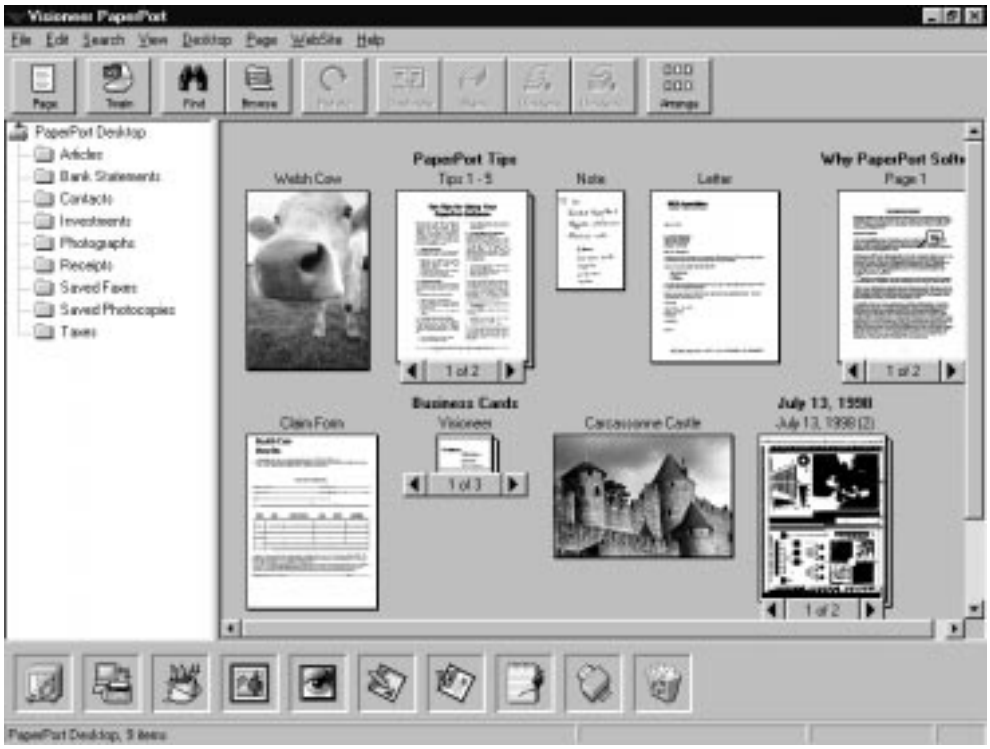
   etc.....
6. Click the Start button.

Note

- Selecting the scanning area exactly reduces the scanning data so that you can save transfer time and memory.
- Generally, the scanning resolution should be set according to the final output device. For example, when the output device is a monitor screen, 150 dpi scanning is enough. If a higher resolution is chosen, the displayed output may not have any particular improvement.

SCANNING FROM THE VISIONEER PaperPort® LE SOFTWARE (MFC-P2000)

1. Launch the Visioneer PaperPort® LE application.



2. Click the Scan icon.
   The scanner driver dialog is launched.

3. Make the necessary settings.

4. Press the Start button.

The scanned image will be shown on the desktop with the name 'Untitled-x.'

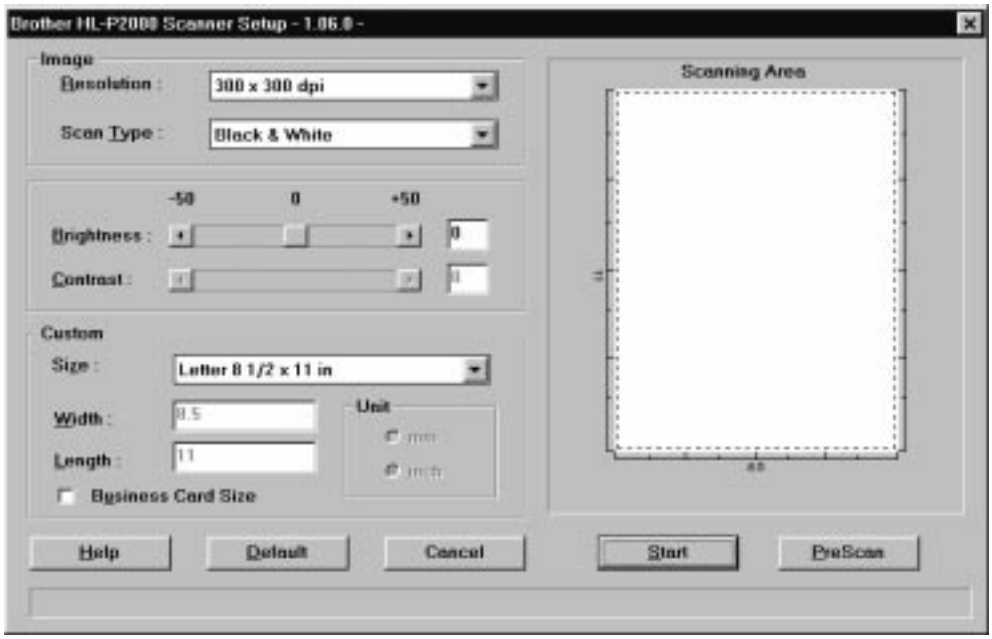
For further information about 'PaperPort', refer to the On-line Help in the application.

Scanning from the Unimessage™ Viewer Software (HL-P2000 - Windows® 95/98/NT users)

1. Launch the Unimessage™ Viewer application.

2. Select “Scan”.

3. After inserting the original document in the document feeder, click the “Start” button.



4. After the document has scanned completely, the “Collate Dialog” appears. Select the data you have just scanned and press “Add” button.

5. Click the “OK” button.

The scanned image will be shown on the desktop.

For further informtion about ‘Unimessage™ Viewer’, refer to the On-line Help in the application.

CHAPTER 6
MAINTENANCE

REPLACING THE TONER CARTRIDGE

The machine can print approximately 2,400 pages (5% coverage: A4/Letter) with one toner cartridge. When the toner cartridge is running low, the **Alarm** and **Data** (Toner) lamps blink once every 5 seconds to indicate toner low. **Initially, some models are supplied with a starter toner cartridge which must be replaced after 1,000 pages.**

Note

- Actual page count will vary depending on your average document type. (i.e.: standard letter, detailed graphics, etc.)
- It is recommended that you always keep a new toner cartridge ready for use for when you get the toner low warning.
- Discard the used toner cartridge according to local regulations. If you are not sure of them, consult your local dealer. Be sure to seal up the toner cartridge tightly so that toner powder does not spill out of the cartridge. Do not discard used toner cartridges together with domestic rubbish.
- It is recommended that you clean the machine when you replace the toner cartridge. See “CLEANING THE MACHINE” in this chapter.

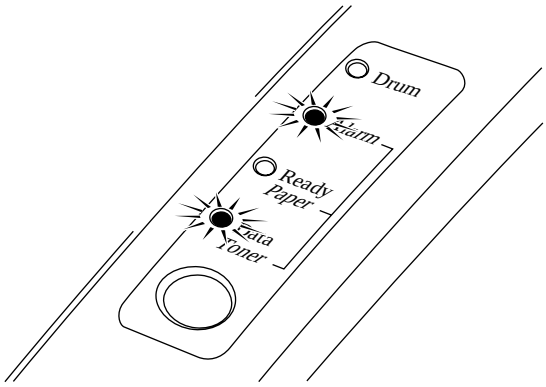


Fig. 6-1 Toner Low and Empty Indication

Caution

You may print approximately 100 pages after the first toner low indication. Both **Alarm** and **Data** (Toner) lamps will blink continuously to indicate that the toner is empty. Once this indication appears, your machine cannot resume printing until you have installed a new toner cartridge.

Caution

Keep the drum unit level after removing the toner cartridge, to avoid possible toner spill or scatter.

Follow these steps to replace the toner cartridge:

1. Open the top cover towards you. Remove the drum unit by holding each side of the drum and gently lifting the drum forwards towards you.

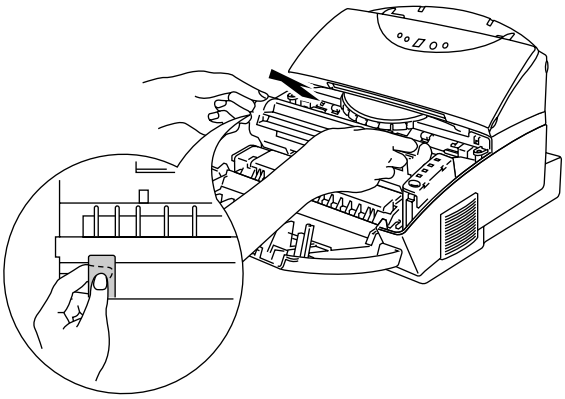


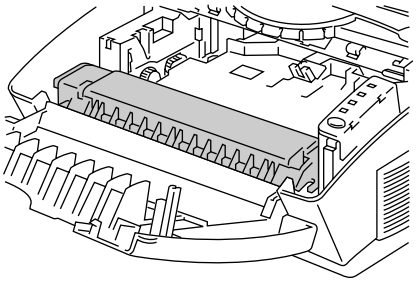
Fig. 6-2 Removing the Drum Unit

Note

It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.

⚠ Warning

After you have just used the machine, some internal parts of the machine are extremely hot. When you open the top cover of the machine, never touch the shaded parts shown in the following illustration.



⚠ High Temperature

Fig. 6-3 Inside the Machine

2. Gently turn the lever on the toner cartridge forward until it stops.

Note

The toner cartridge cannot be removed unless the shutter is completely closed by turning the lever fully to the front.

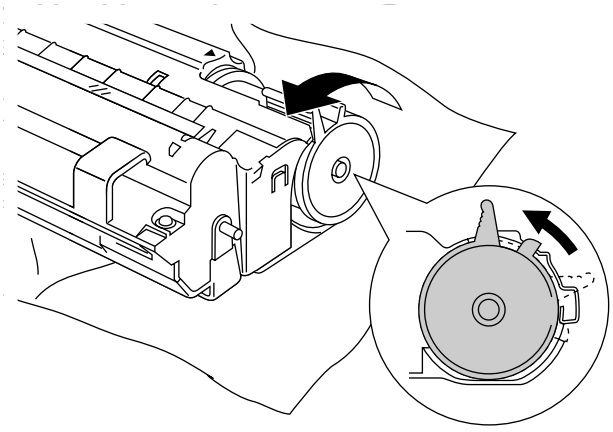


Fig. 6-4 Turning the Lever to Close the Shutter

3. Remove the old toner cartridge from the drum unit by pulling it out gently.

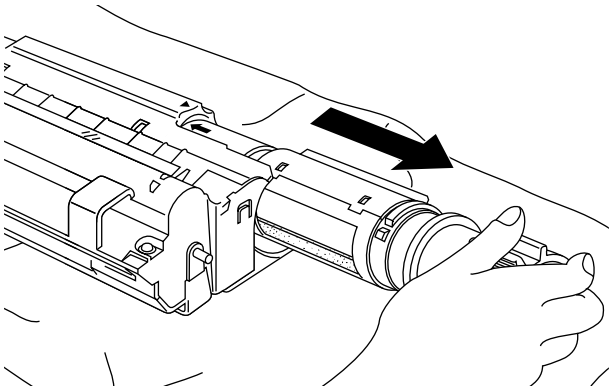


Fig. 6-5 Removing the Old Toner Cartridge

> **Caution**
> Handle the toner cartridge carefully. If toner scatters on your hands or clothes, wipe or wash it off with cold water immediately.

4. Unpack the new toner cartridge, gently shake it five or six times and then remove the protective part.

> **Caution**
> - Only unpack the toner cartridge immediately before installing it into the machine. If toner cartridges are left unpacked for a long period of time, the toner life is shortened.
> - **You can only use a Brother genuine toner cartridge (TN-300 series) which is specially formulated to ensure top print quality. Damage caused by using toner cartridges other than those supplied by Brother is not covered under any warranty or service agreement.**

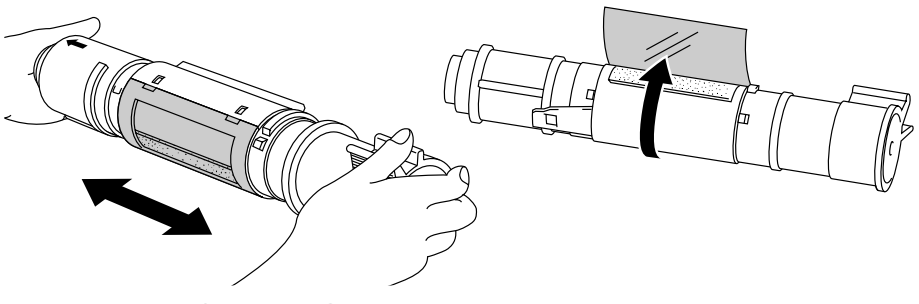


Fig. 6-6 Shaking the Toner Cartridge and Remove the Protective Part

5. Install the new toner cartridge into the right hand side of the drum unit. Make sure that the toner cartridge guide bar is exactly aligned with the guide slot in the drum unit and pushed fully home into the drum unit to ensure that the toner cartridge and the drum unit fit together correctly.

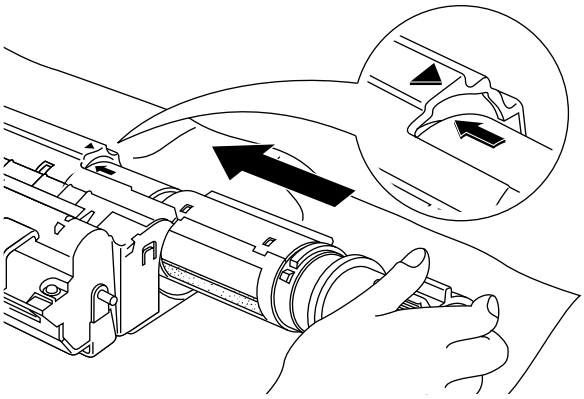


Fig. 6-7 Installing the Toner Cartridge into the Drum Unit

6. Gently turn the lever on the toner cartridge backward until it stops.

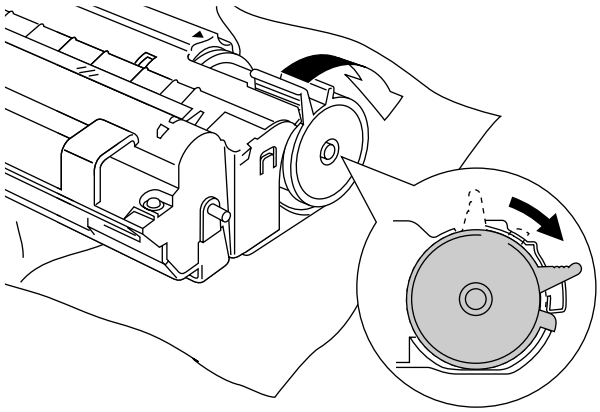


Fig. 6-8 Turning the Lever to Open the Shutter

7. Turn the drum unit upside down gently.

8. Clean the primary corona wire inside the drum unit by gently sliding the blue tab to the right and left several times.

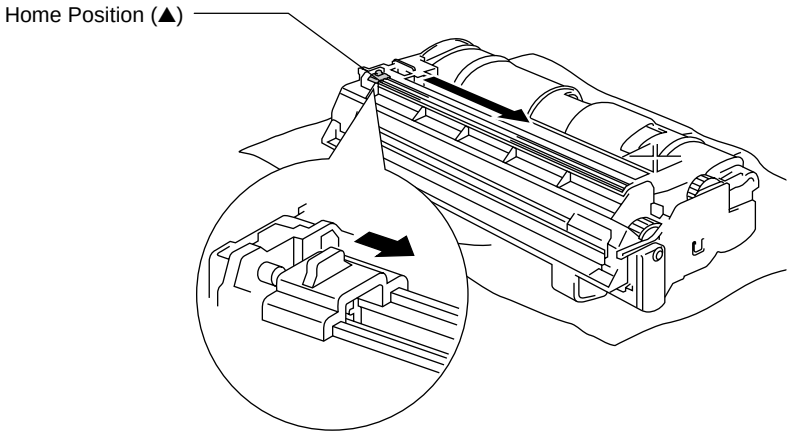


Fig. 6-9 Cleaning the Primary Corona Wire

9. Re-install the drum unit into the machine and close the top cover.

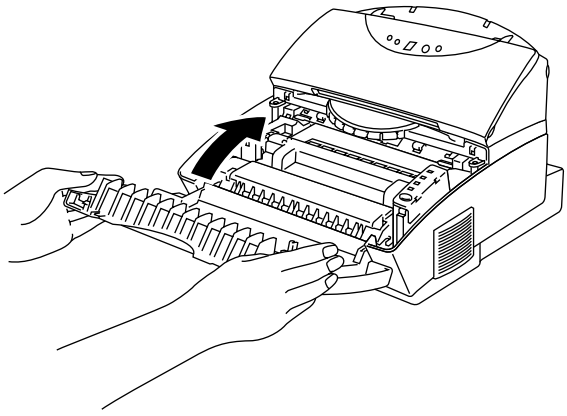


Fig. 6-10 Close the top cover

REPLACING THE DRUM UNIT

The machine uses a drum unit to create the print images on paper. If the **Drum** lamp is on, it indicates the drum unit is nearly at the end of its life. We recommend you prepare a new drum unit to replace the current one. Even if the **Drum** lamp is on, you may be able to continue to print without replacing the drum unit for a while. If there is a noticeable deterioration in the output print quality even before the **Drum** lamp lights, then the drum unit should be replaced.

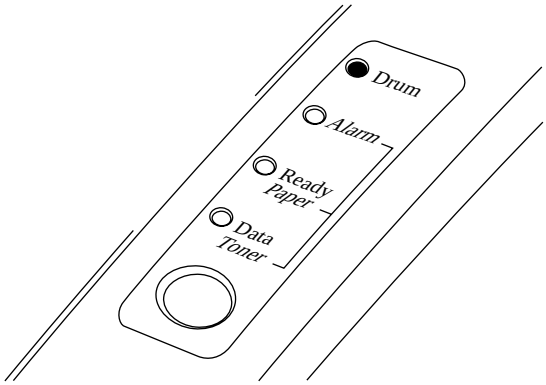


Fig. 6-11 Drum Unit Nearly at the End of its Life

Caution

- When removing the drum unit, handle it carefully as it contains toner.
- You should clean the machine when you replace the drum unit. See "CLEANING THE MACHINE" in this chapter.

Note

The drum unit is a consumable, and it is necessary to replace it periodically.
There are many factors that determine the actual drum life, such as temperature, humidity, type of paper and toner that you use, the number of pages per print job, etc.. The drum life is estimated at approximately 20,000 pages at 20 pages per job and 8,000 pages at 1 page per job. The actual number of pages that your drum will print may be significantly less than these estimates. Because we have no control over the many factors that determine the actual drum life, we cannot guarantee a minimum number of pages that will be printed by your drum.

For best performance, use only genuine Brother toner and use the product in a clean, dust-free environment with adequate ventilation.

Follow these steps to replace the drum unit:

1. Open the top cover towards you. Remove the old drum unit.

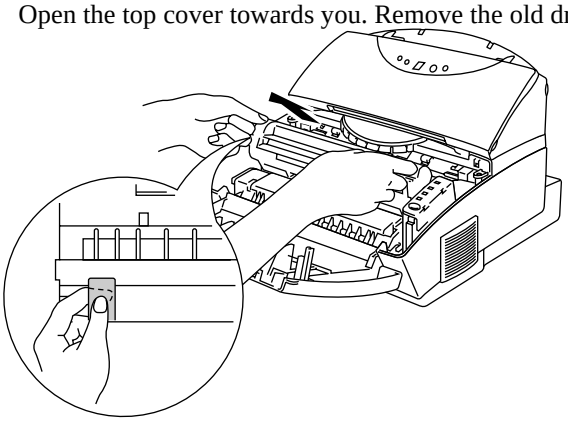
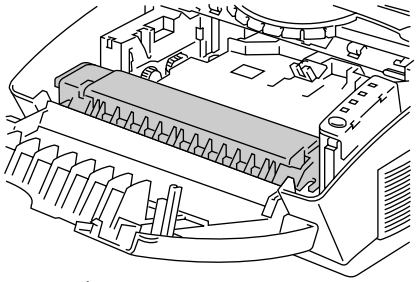


Fig. 6-12 Removing the Drum Unit

⚠ Warning

After you have just used the machine, some internal parts of the machine are extremely hot. When you open the top cover of the machine, never touch the shaded parts shown in the following illustration.



⚠ High Temperature

Fig. 6-13 Inside the Machine

2. Remove the toner cartridge from the drum unit and keep it in a safe place. For more information, see "REPLACING THE TONER CARTRIDGE" in this chapter.

Note

- Discard the used drum unit according to local regulations. If you are not sure of them, consult your local dealer/retailer. Be sure to seal up the drum unit tightly so that toner powder does not spill out of the unit. Do not discard used drum units together with domestic rubbish.
- It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.

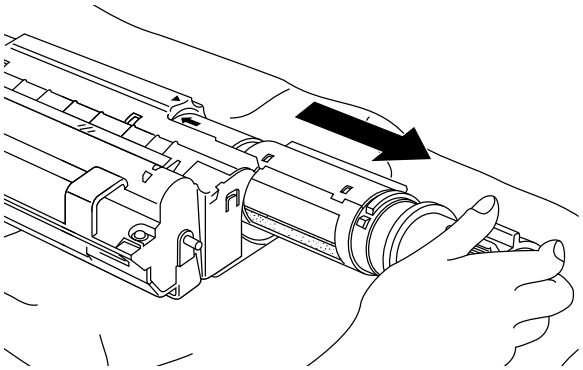


Fig. 6-14 Removing the Toner Cartridge

3. Unpack the drum unit and gently shake it five or six times horizontally.

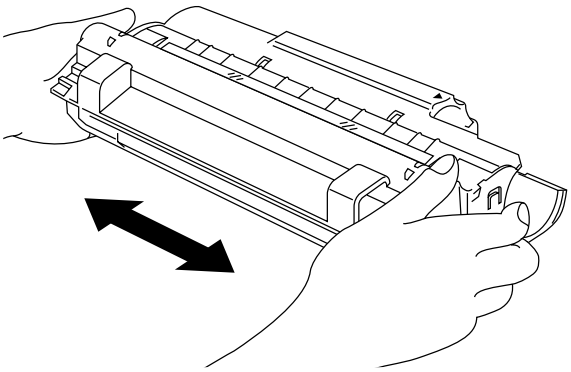


Fig. 6-15 Shaking the Drum Unit

Caution

- **Do not remove the starter sheet.**

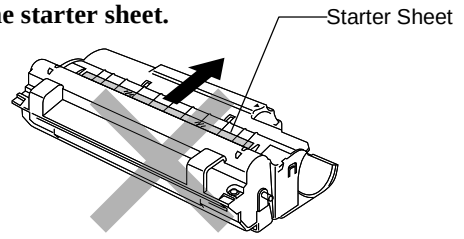


Fig. 6-16 Do Not Remove the Starter Sheet

- Only unpack a drum unit immediately before installing it into the machine. If an unpacked drum unit is subjected to excessive direct sunlight or room light, the unit may be damaged.
- Handle the toner cartridge and the drum unit carefully as it contains toner. If toner scatters and your hands or clothes get dirty, wipe or wash it off with cold water immediately.

4. Install the toner cartridge into the new drum unit. For more information, see "REPLACING THE TONER CARTRIDGE" in this chapter.

5. Install the new drum unit into the machine.

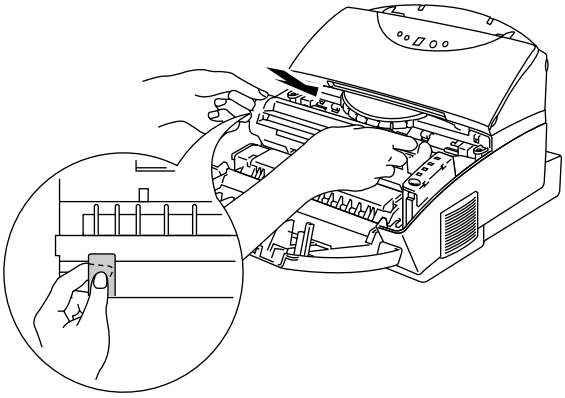


Fig. 6-17 Installing the Drum Unit

6. Close the top cover.

7. The machine automatically ejects the starter sheet. Ejecting this sheet resets the drum life alarm.

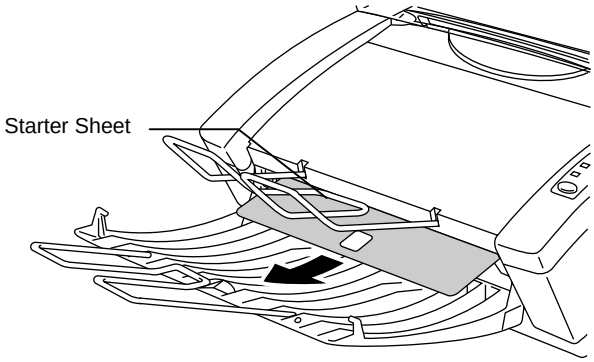


Fig. 6-18 Ejecting the Starter Sheet

CLEANING THE MACHINE

Clean the machine exterior and interior periodically. If printed pages get stained with toner, clean the machine interior and drum unit.

Cleaning the Machine Exterior

Clean the machine exterior as follows:

1. Turn off the **power** switch and unplug the power cord.

> **⚠ Warning**
> **There are high voltage electrodes inside the machine. Before cleaning the machine, make sure to turn off the power switch and unplug the power cord from the power outlet**

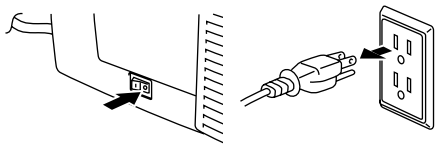


Fig. 6-19 Turning off the Switch and Unplugging

2. Remove the paper in the multi-purpose sheet feeder.

3. Use a damp cloth for cleaning.

> **Caution**
> Use water or neutral detergents for cleaning. Cleaning with volatile liquids such as thinners or benzene will damage the surface of the machine.

4. Wipe dirt and dust away from the machine exterior and feeder with a cloth.

5. Load paper into the multi-purpose sheet feeder, and plug in the power cord.

Cleaning the Machine Interior and Drum Unit

Clean the machine interior and the drum unit as follows:

1. Turn off the **power** switch and unplug the power cord.

⚠ Warning

There are high voltage electrodes inside the machine. Before cleaning the machine, make sure to turn off the power switch and unplug the power cord from the outlet

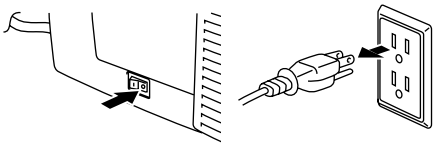


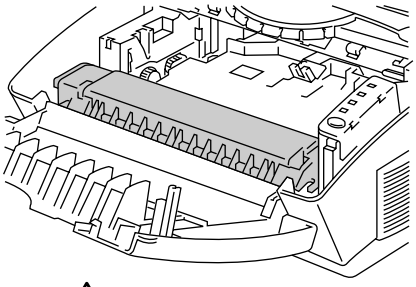
Fig. 6-20 Turning off the Switch and Unplugging

2. Open the top cover of the machine.

3. Take the drum unit out of the machine and put it aside.

⚠ Warning

After you have just used the machine, some internal parts of the machine are extremely hot. When you open the top cover of the machine, never touch the shaded parts shown in the following illustration.



⚠ High Temperature

Fig. 6-21 Inside the Machine

4. Gently wipe the scanner window with a soft dry cloth.

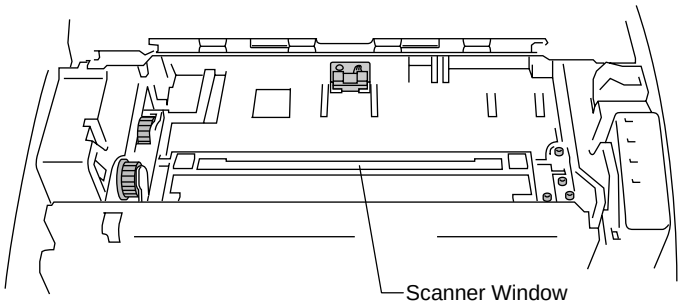


Fig. 6-22 Cleaning the Scanner Window

Caution

- Do not touch the scanner window with your fingers.
- Do not wipe the scanner window with cleaning alcohol.

5. Turn the drum unit upside down carefully.

Caution

Handle the drum unit carefully as it contains toner. If toner scatters and your hands or cloths get dirty, wipe or wash it off with cold water immediately.

Note

It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.

6. Clean the primary corona wire inside the drum unit by gently sliding the tab to the right and left several times.

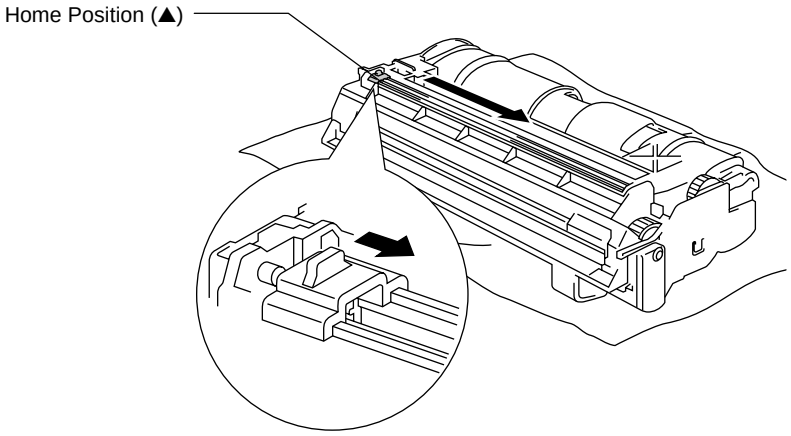


Fig. 6-23 Cleaning the Primary Corona Wire

7. Return the tab to the home position (▲ mark position) before reinstalling the drum unit.

> **Caution**
> Be sure to position the tab at the home position, or printed pages may have vertical stripes.

8. Install the drum unit into the machine.
See the section "REPLACING THE DRUM UNIT" in this chapter.

9. Close the top cover.

10. Plug in the power cord and turn on the **power** switch.

Cleaning the Scanning Unit

Clean the scanning unit when you get stains on your copied document.

1. Turn off the **power** switch and unplug the power cord.

2. Open the document feeder.

3. Clean the flat white pressure bar and the glass strip under the bar with a dry cloth.

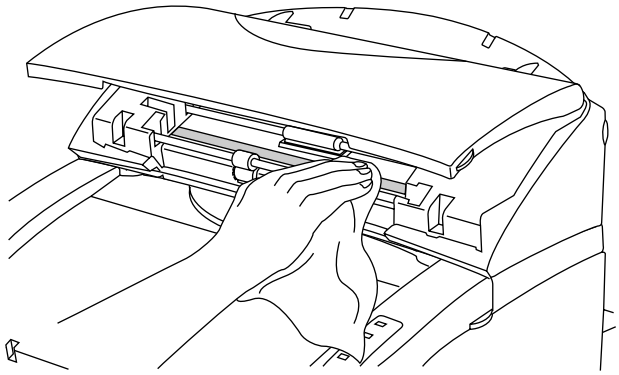


Fig. 6-24 Cleaning the Scanning Unit

4. Close the document feeder.

5. Plug in the power cord and turn on the **power** switch.

RE-PACKING THE MACHINE

Caution

Whenever you transport the machine, use the packing materials which are provided with your machine. Also, follow the steps below to re-pack the machine, or it may be damaged which will void the machine warranty.

1. Turn off the **power** switch and unplug the machine from the AC outlet. Remove the AC cord and the extention wire of the paper tray from the machine.

2. Open the top cover.

3. Remove the drum unit assembly, referring to the previous section.

Note

Remove the drum unit assembly with the toner cartridge included.

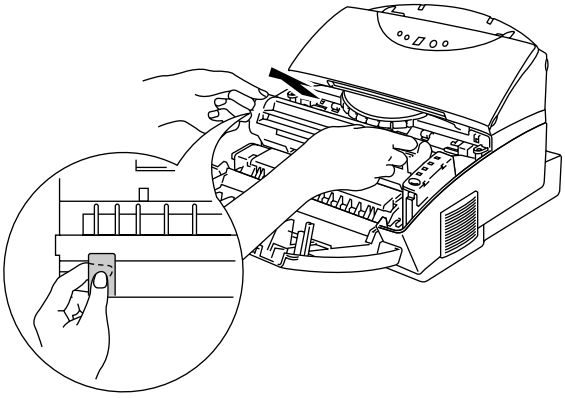


Fig. 6-25 Removing the Drum Unit Assembly

4. Place the drum unit assembly in the plastic bag and seal the bag completely.

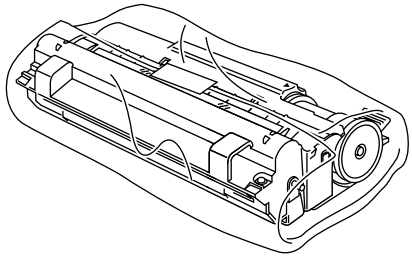


Fig. 6-26 Placing the Drum Unit in the Plastic Bag

5. Close the top cover, the extension wire, and the output tray.

6. Remove the document support from the machine.

7. Wrap the machine in the plastic bag and place it in the original carton box with the original Styrofoam packing material.

8. Place any documents (manual and any documentation describing the reason for repacking the machine) and the drum unit assembly in the carton box as shown below.

9. Close the carton box and tape it.

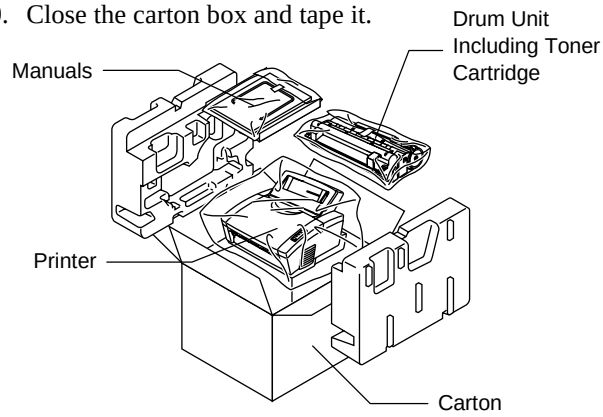


Fig. 6-27 Repacking the Machine

CHAPTER 7
TROUBLESHOOTING

ALARM INDICATIONS AT A GLANCE

Operator Calls for the Printing Function

If a recoverable error occurs, the machine indicates an 'operator call' by blinking the **Alarm** lamp and any of the following lamps.

Find the error and take the proper action to correct it. The machine automatically recovers from most errors, but you may need to reset the machine with the panel switch as described below.

Blinking Lamp	Error	Action
Paper ❍↔● **Alarm**❍↔●	Paper jam	Clear the paper jam referring to the next section "PAPER JAMS" and press the panel **switch** if the machine does not automatically resume printing.
	Paper empty	Load paper in the machine referring to Chapter 2 and press the panel **switch**.
	Misfeed	Reinstall the paper and press the panel **switch**.
Toner ❍↔● **Alarm**❍↔● (every 5 seconds)	Toner low	Indicates that the machine has approximately 100 pages of printing left before the toner cartridge is empty. Prepare a new toner cartridge.
Toner ❍↔● **Alarm**❍↔● (Fast blinking)	Toner Empty	Replace the toner cartridge with a new one referring to Chapter 6.

For errors shown below, the machine indicates an operator call by blinking the **Alarm** lamp. If you use the machine with the supplied Windows driver, the status monitor will appear to indicate the error on your computer screen. The machine also prints some error messages on paper.

Error	Action
COVER OPEN	Close the top cover of the machine.
PRINT OVERRUN	• Press the panel **switch** to print the data remaining in the machine. • If you use the supplied Windows® driver, try again after turning on Error Recovery in the PRINT menu of your application software, (Refer to the Help section in the Windows® machine driver for the details.) • If this does not clear the error, reduce the complexity of your document or reduce the print resolution.
MEMORY FULL This error can only occur when using DOS.	• Press the panel **switch** to print the data remaining in the machine. • Reduce the print resolution or reduce the complexity of your document. •
Parallel Interface Line Error	• Press the panel **switch** to resume printing. • Check that the connection between your computer and machine is secure and correct, and check the interface cable.

> **Note**
> If the machine does not operate as you expect it to, it is recommended that you turn off the **power** switch, wait a few seconds and then turn it on again. If you still have problems, consult your dealer or our authorized service representative.

Operator Calls for the Copying and Scanning Functions

If a recoverable error occurs, the machine shows “E” on the display.

To clear the error, press the Stop Button.

An error will occur when the following happens;
* When the document causes a paper jam in the document feeder while the machine is feeding the document.
* When the machine is busy. (When the machine is being used as a scanner or printer.)
* When there is no paper in the sheet feeder.
*When memory full happens.

Service Calls for the Printing Function

If an unrecoverable error occurs, the machine indicates the need for a service call by lighting **all the lamps** and then the following combination of lamps alternately:

Service Call	Fuser malfunction	Laser BD malfunction	Scanner malfunction	ROM error
Drum	●	❍	●	❍
Alarm	❍	●	●	❍
Ready	❍	❍	❍	●
Data	❍	❍	❍	❍

Service Call	D-RAM error	Service A	Service B	Service C
Drum	●	❍	●	❍
Alarm	❍	●	●	❍
Ready	●	●	●	❍
Data	❍	❍	❍	●

Service Call	Service D	Service E0	Service E1	Service P
Drum	●	❍	●	❍
Alarm	❍	●	●	❍
Ready	❍	❍	❍	●
Data	●	●	●	●

Service Call	NV-RAM error	CPU Runtime error
Drum	●	●
Alarm	❍	●
Ready	●	●
Data	●	●

● ON ❍ OFF

If you see any of these service call indications, turn off the **power** switch, wait a few seconds and then turn it on again and try to print again.

If you cannot clear the error and see the same service call indication after turning on the machine, consult your dealer or our authorized service representative. Report the error status and situation referring to the above table.

> **Note**
> Be sure that the top cover and the main controller board are firmly installed.

Service Calls for the Copying and Scanning Functions

If an unrecoverable error occurs, the machine shows “E” and “0”, “1” or “2” on the display alternately. When this happens, turn off the power switch, wait a few seconds and then turn it on again and try again.

If you cannot clear the error and see the same service call indication after turning on the machine, consult your dealer or our authorized service representative. Report the error status and situation referring to the above information.

PAPER JAMS

Before you can clear a paper jam error, you need to find the location of the paper jams. Locate the position referring to the following figure.

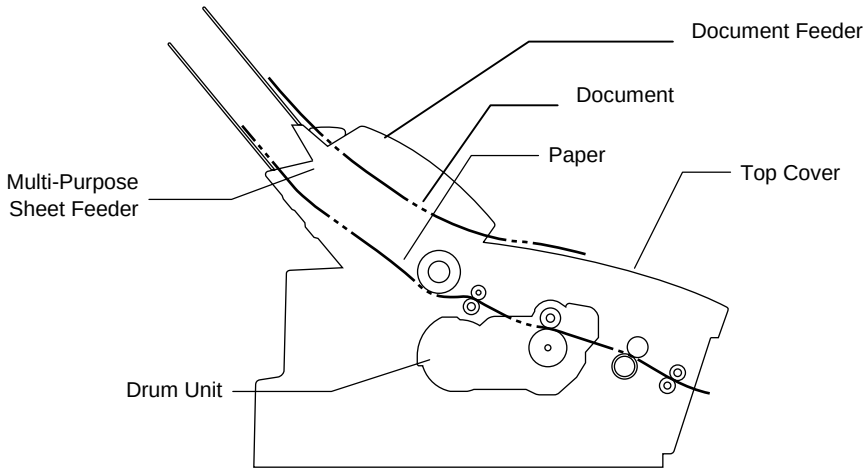
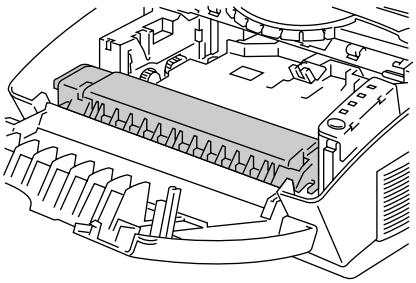


Fig. 7-1 Locating Paper Jam Position

After locating the position, clear the jammed paper referring to the following descriptions. If the jammed paper is removed completely and the top cover is closed, the machine may resume printing automatically. If the machine does not resume printing, press the control panel **switch**.

⚠ Warning

After you have just used the machine, some internal parts of the machine are extremely hot. When you open the top cover of the machine, never touch the shaded parts shown in the following diagram.



⚠ High Temperature

Fig. 7-2 Inside the Machine

Caution

Do not pull jammed paper from the output tray. Be sure to open the top cover to remove the jam, or the fuser may get dirty with toner powder and may result in toner scatter on the next printed page or pages.

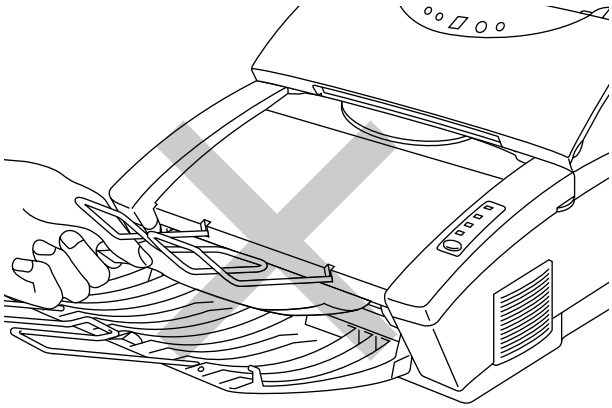


Fig. 7-3 Do not pull the Jammed Paper from the Output Tray

❑ Paper Jam in the Multi-Purpose Sheet Feeder

If a paper jam has occurred inside the multi-purpose sheet feeder, open the multi-purpose sheet feeder to pull the jammed paper upward out of the feeder; then close the multi-purpose sheet feeder. Also, open the top cover and check that a torn piece of paper does not remain inside the machine referring to the next section.

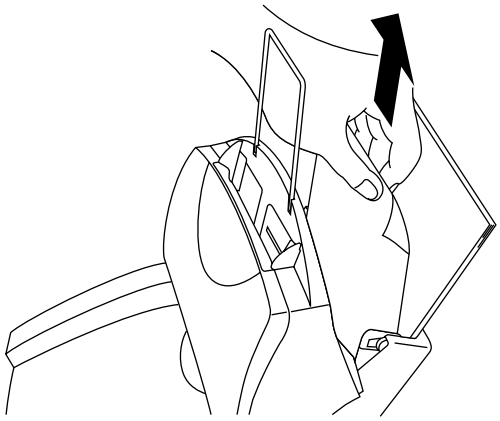


Fig. 7-4 Paper Jam in the Feeder

If the paper cannot be pulled up, see the next section “Paper Jam near the Drum Unit.”

❑ Paper Jam near the Drum Unit or at the Paper Output Tray

If a paper jam has occurred near the drum unit, open the top cover and remove the drum unit. Then, pull the jammed paper upwards and out of the machine. Install the drum unit and close the top cover.

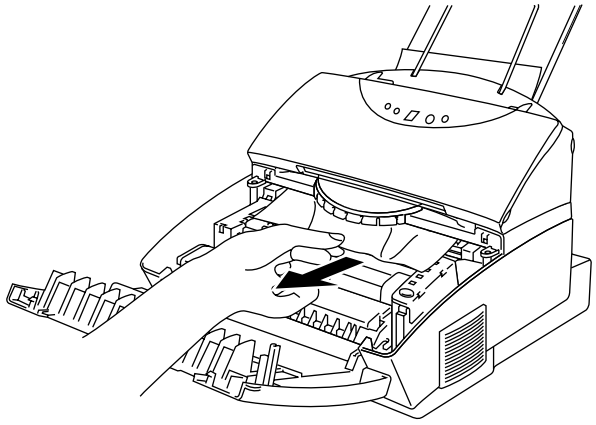


Fig. 7-5 Paper Jam near the Drum Unit

❑ Paper Jam in the Fuser Unit

If a paper jam has occurred in the fuser unit, open the top cover and remove the drum unit. Then, pull the jammed paper out of the fuser. Install the drum unit and close the top cover.

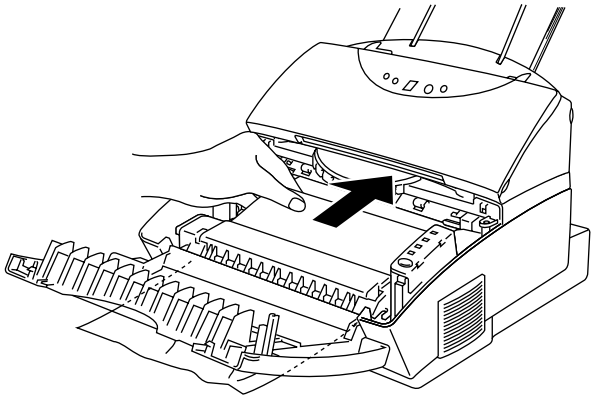


Fig. 7-6 Paper Jam Inside the Machine

❑ Paper Jam in the Document Feeder

If a paper jam has occurred in the document feeder, open the document feeder cover. Pull the jammed paper out of the document feeder towards you. After removing the document, close the document feeder.

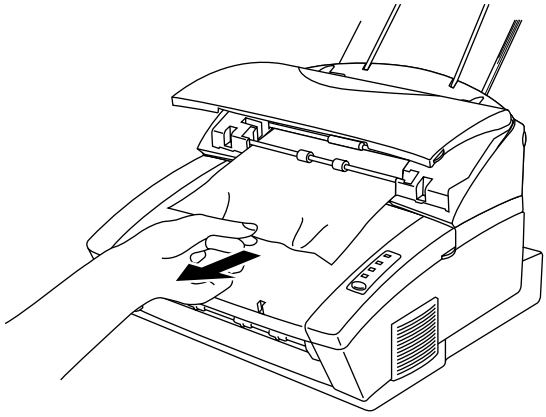


Fig. 7-7 Paper Jam in the Document Feeder

Q & A

This section contains questions and answers for using your machine. If you have encountered a problem, find the question relating to your problem and take the steps recommended to correct the problem.

Setting Up the Machine Hardware

Question	Recommendation
The machine does not work. All lamps are off.	The machine may be in sleep mode. Press the panel **switch** to wake up the machine. Check to see if the machine is plugged into a live power source and the **power switch** is on.
The machine does not print.	Check the following: • The machine is turned on. • All of the protective parts have been removed. • The toner cartridge and drum unit are installed properly. • The interface cable is securely connected between the machine and computer. • Check to see if the **Alarm** lamp is blinking. If the lamp is blinking, refer to the Operator Call section of this manual. • Check to see if the **Ready** lamp is blinking. If the lamp is blinking fast, the machine might be cooling down to lower the machines internal temperature. Open the top cover of the machine to lower the temperature.

Setting Up the Machine for Windows

Question	Recommendation
I cannot print from my application software.	Make sure the supplied Windows printer driver is installed and selected with your application software.
Sometimes I get a Memory Full message. How can I correct this?	Reduce the print resolution or reduce the complexity of your document and try again.
Sometimes I get a Print Overrun error when printing certain documents from Windows.	• If you are using the supplied Windows driver, turn error recovery on in the Setup dialog box and try again. Reduce the print resolution or reduce the complexity of your document and try again.

Setting Up the Machine for DOS

Question	Recommendation
I cannot print from my application software.	• Check if the DOS application software interface settings match that of your machine: for example, if you are using a parallel printer cable, you would most likely set your DOS software printer port to LPT1. • Check if the machine has any alarms active. Check if the appropriate printer is selected in your application software.
The machine prints, but it prints incorrect information. Sometimes it prints a couple of characters and then ejects the page, etc.	This is an indication that your application machine emulation setting and the machines emulation do not match. Check in your application software which printer you have selected to make sure the machine is set up correctly. Remember the machine emulates three widely used printer selections: HP LaserJet IIP, Epson FX-850, and IBM Proprinter XL. Try setting the printer into HP emulation and then select the HP LaserJet IIP printer in your application software.
The machine does not print when I press the Print Screen Key. (**Data** lamp On)	Press the panel **switch**. The data has been sent to the machine but the machine did not receive the Page Eject command: print screens do not send this command.
The machine prints the first part of my document but does not print the last page. (**Data** lamp On)	This was a common problem with database software and spreadsheet software when not correctly set up. The data has been sent to the machine but the machine did not receive the Page Eject command. Press the panel **switch** to eject the page. Then check with your software supplier on how to add a Page Eject (or Form Feed) command to the end of your print job.
How can I change the User settings or default settings of the machine?	Use the remote printer console (RPC) program.

Paper Handling

Question	Recommendation
The machine does not load paper.	• Check to see if the "PAPER EMPTY" message appears on your computer screen or the **Alarm** and **Paper** lamps are blinking on the machine control panel. If so, the multi-purpose sheet feeder may be out of paper or not properly installed. If it is empty, load a new stack of paper into the feeder. • If there is paper in the multi-purpose sheet feeder, make sure it is straight. If the paper is curled, you should straighten it before printing. Sometimes it is helpful to remove the paper, turn the stack over and put it back into the paper tray. • Reduce the amount of paper in the multi-purpose sheet feeder, then try again.
How can I load envelopes?	You can load envelopes from either the multi-purpose sheet feeder or the manual feed slot. Your application software must be set up correctly to print on the envelope size you are using. This is usually done in the page setup or document setup menu of your software. Refer to your application manual.
What paper can I use?	You can use plain paper, envelopes, transparencies, labels, and organizer paper. For information on loading paper, see "Paper Handling" in Chapter 2.
How can I clear paper jams?	See "PAPER JAMS" in this chapter.

Printing

Question	Recommendation
The machine prints unexpectedly or it prints garbage.	• Turn the machine off and on again to reset the machine. • Make sure your application software is correctly set up to use this machine by checking the machine settings in your application software. Check the machine emulation settings. If you can use the supplied RPC program, use it to change the settings as required. Also, you can print the current setting list from the RPC program or Machine Control Panel.
The machine cannot print full pages of a document. An error message "PRINT OVERRUN" occurs.	The machine received a very complex print job and could not process part of the page. This may be solved by the following ways. • If you are using Windows 95 or Windows 3.1 with the supplied printer driver, see the "Setting up the Machine for Windows" section. • Try to reduce the complexity of your document or reduce the print resolution.
The machine cannot print full pages of a document. A "MEMORY FULL" error message occurs.	• Reduce the graphic quality or the number of font sizes within your application software. • Reduce the print resolution. • Reduce the complexity of your document and try again.
The machine cannot print full pages of a document. A "MEMORY FULL" error message occurs.	• Reduce the print resolution. • Reduce the complexity of your document and try again. • Reduce the graphic quality or the number of font sizes within your application software.
My headers or footers appear when I view my document on screen but do not show up when I print them.	Most laser printerss have a restricted area that cannot be printed on. Usually the first two lines and last two lines of text cannot print (leaving 62 printable lines). Adjust the top and bottom margins in your document to allow for this.

Copy

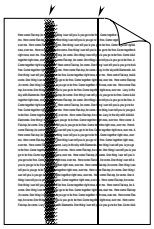
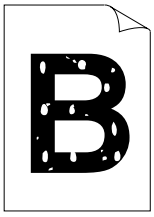
Question	Recommendation
The machine does not copy.	Check the following; • The machine is turned on. • All of the protective parts have been removed. • The top cover is closed. • The **Alarm** LED is blinking. If the LED is blinking, refer to the Operator Calls section of this manual.
The machine copies, but nothing is printed on the copy.	check if; • Original documents are inserted face down in the document feeder. • The toner cartridge is not empty.
Copy has a vertical line.	Clean the scanning unit refering to 'Cleaning the Scanning Unit' section in Chapter 6.
Some portion of the image is missing on the copy.	• The machine has unscannable and unprintable areas. Check the areas in Chapter 2. • If the image is larger than the paper size, it may be lost.
Memory full error.	• A DOS application is using download fonts and the memory is almost full. • After a memory full error occurs, the machine clears any downloaded fonts automatically.

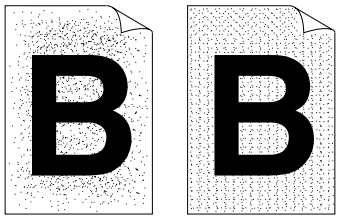
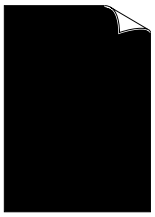
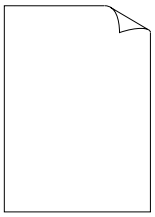
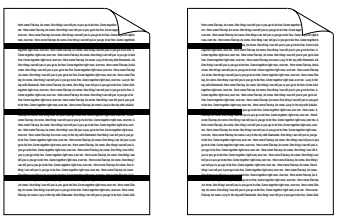
Scan

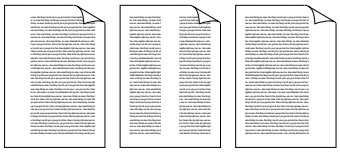
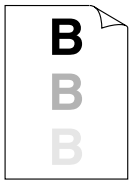
Question	Recommendation
The machine does not scan	Check the following; • The machine is turned on. • All of the protective parts have been removed. • The top cover is closed.
Computer indicates an error message other than above.	Check the following; • The machine is connected directly to the computer. • The computer can work in bi-directional mode. • The scanner port is correctly set on your computer. • The Scanner driver is correctly selected in your application. • A recommended interface cable is being used.(IEEE 1284 compliant)
Scanned image has vertical white or black line.	Clean the scanning unit.

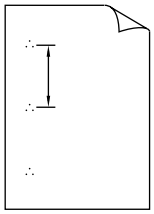
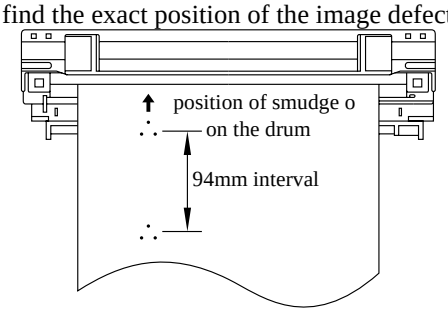
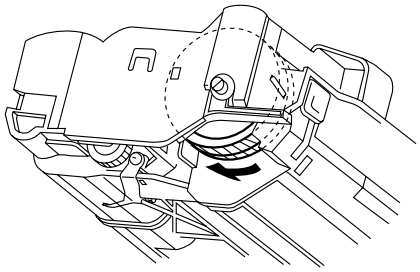
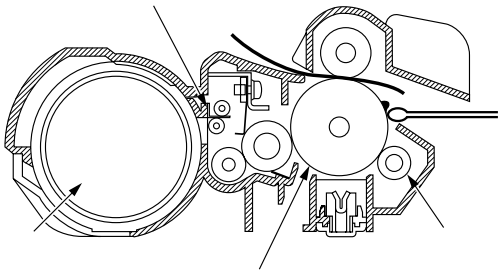
Print Quality

> **Caution**
> You will clear a print quality problem by replacing the drum unit with a new one **if the Drum lamp is on**. The drum unit is at the end of its life.

Question	Recommendation
Printed pages contain white stripes.  **Fig. 7-8 White Stripes or Faint Images**	You may clear the problem by wiping the scanner windows with a soft cloth. (See "Cleaning the machine interior and Drum unit." in Chapter 6.) If the same problem occurs and the **Drum** lamp is still on after cleaning, replace the drum unit with a new one.
Printed pages are stained with toner or have vertical stripes.  **Fig. 7-9 Dark Stripes or Toner Stains**	• Clean the machine interior and the primary corona wire of the drum unit. See "Cleaning the Machine Interior and Drum Unit" in Chapter 6. • Make sure that the tab of the corona wire is at the home position. If the same print problem occurs and the **Drum** lamp is still on after cleaning, replace the drum unit with a new one.
Printed pages have white spots in black text and graphics area.  **Fig. 7-10 White Spots**	Make sure that you use paper that meets the specifications. Rough surface or thick media can cause the problem. If you still have the same problem and the **Drum** lamp is on, replace the drum unit with a new one.

Question	Recommendation
Toner scatters and stains the printed page.  **Fig. 7-11 Scattering Toner**	Clean the machine interior. See "Cleaning the Machine Interior and Drum Unit" in Chapter 6. Make sure that you use paper that meets specifications. After the new toner cartridge is installed, the first 10 - 20 pages may be stained with toner. This problem will be cleared after the first 10-20 pages with the new toner cartridge. If you still have the same problem and the **Drum** lamp is on, replace the drum unit with a new one.
The whole page is printed in black.  **Fig. 7-12 Black Page**	If the same problem occurs and the **Drum** lamp is still on after cleaning, replace the drum unit with a new one.
Nothing is printed on the page.  **Fig. 7-13 White Page**	• Make sure that the toner cartridge is not empty. • Make sure that a torn piece of paper does not remain on the scanner window.
Printed pages are marked at regular intervals.  **Fig. 7-14 Example of Regular Marking**	The problem may disappear by itself. Try printing multiple pages to clear this problem especially if the machine has not been used for a long time. If the surface of the drum has been scratched, replace the drum unit with a new one. If the problem does not disappear, it may be that the drum has been marked or damaged due to excessive exposure to light. In this case, replace the drum unit with a new one.

Question	Recommendation
Printed pages are blurred at the center or either edge.  **Fig. 7-15 Blurred Page**	Certain environmental conditions such as humidity, high temperatures, etc. may cause this situation to occur. • Make sure that the machine is placed on a flat, horizontal surface. • Remove the drum unit with the toner cartridge installed. Try shaking them from side to side. • You may clear the problem by wiping the scanner window with a soft cloth. (See "Cleaning the Machine Interior and Drum Unit.") If the same problem occurs after cleaning and **Drum** lamp is still on, replace the drum unit with a new one.
Ghost images show up on printed pages.  **Fig. 7-16 Ghost Images**	• Make sure that you use paper that meets the specifications. Rough surface or thick media can cause the problem. • Make sure that you select the appropriate media type in the printer driver.

Question	Recommendation
Black spots appears on the printed paper at 94mm intervals.  **Fig. 7-17 Black Spots**	If toner remains stuck on the drum, wipe it off gently with a cotton swab. Replace the drum unit if the drum is scratched or deteriorated. Clean the drum unit as follows; 1. Place a printed page in front of the process unit, and find the exact position of the image defect.  **Fig. 7-18** 2. Turn the drum gear by hand while looking at the surface of the drum until you find the cause of the problem.  **Fig. 7-19** 3. Wipe the surface of the photosensitive drum with a cotton swab until the dust or paper on the surface of the drum comes off.  **Fig. 7-20** Do not wipe the surface of the photosensitive drum with something sharp. (ball-point pen etc.)

Note
The drum unit is a consumable, and it is necessary to replace it periodically.

APPENDIX

PRINTER SPECIFICATIONS

Printing

Print Method	Electrophotography by semiconductor laser beam scanning
Laser	Wavelength: 780 nm Output: 5 mW max
Resolution	600 dots/inch (under Brother Printing Solution for Windows® / under Brother Software PCL5e for DOS box in Windows®) 300 dots/inch (under DOS)
Print Quality	Normal printing mode Economy printing mode (up to 25% and 50% toner saving)
Print Speed	Up to 10 pages/minute (when loading A4 or letter-size paper from the multi-purpose sheet feeder) **NOTE**: Maximum print speed is obtained by printing several copies of the same page. Print speed may vary depending on interface type, emulation, processing power of the computer, memory allocated to the print job, paper size and graphic quality.
Warm-Up	Max. 30 seconds at 23°C (73.4°F) (The warm up time depends on the ambient temperature and humidity.)

First Print	15 seconds (when loading A4 or letter-size paper from the multi-purpose sheet feeder)
Print Media	Toner cartridge: Life Expectancy: 2,400 pages/new toner cartridge 1,000 pages/starter toner cartridge (when printing A4- or letter-size paper at 5% print coverage) **NOTE**: Toner life expectancy will vary depending on the type of average print job printed. Drum Unit: Life Expectancy: 20,000 pages at 20 pages per job 8,000 pages at 1 page per job **NOTE**: There are many factors that determine the actual drum life, such as temperature, humidity, type of paper and toner that you use, the number of pages per print job, etc..

Copying

Type	Auto Document Feeder
Resolution	300 x 300 dpi class: Photo mode, 200 x 600 dpi: Text mode
Enlarge/Reduce	For USA and Canada: 50%, 78%, 120% and 150% For other countries: 50%, 71%, 141% and 200%
Input	10 documents
Multi-copy	Yes

Scanning

Resolution	600 x 600 dpi class with 256 levels of gray
Software	TWAIN driver Visioneer PaperPort® LE Software WordCraft Unimessage™ Viewer

Functions

TrueType Fonts on disks	TrueType-compatible soft-fonts for Windows on the supplied disk
Emulation	Brother Printing Solution for Windows Automatic emulation selection among HP LaserJet IIP (PCL level 4), EPSON FX-850, or IBM Proprinter XL
Printer Driver	Windows® 3.1/3.11, Windows® 95 and Windows NT® 4.0 driver, supporting Brother Native Compression mode and bi-directional capability
Interface	Bi-directional parallel
Memory	2 MB
Diagnostics	Self-diagnostic program

Electrical and Mechanical

Power Source	U.S.A. and Canada:	AC 110 to 120 V, 50 / 60 Hz
	Europe and Australia:	AC 220 to 240 V, 50 /60 Hz
Power Consumption	Printing:	280 W or less
	Stand-by:	60 W or less
	Sleep:	13 W or less
	Copying:	180W or less
Noise	Printing:	49 dB A or less
	Sleep:	33 dB A or less
Temperature	Operating:	10 to 32.5°C (50 to 90.5°F)
	Storage:	0 to 40°C (38 to 104°F)
Humidity	Operating:	20 to 80% (without condensation)
	Storage:	20 to 80% (without condensation)
Dimensions (W x H x D)	390 x 282 x 371 mm (14.4 x 11 x 14.5 inches) (when the output tray is closed.)	
Weight	Approx. 8.5 kg (18.7 lb.) including the drum unit	

PARALLEL INTERFACE SPECIFICATIONS

> **Note**
> To ensure best quality performance use an IEEE 1284 compliant parallel cable between the printer and your computer. Only IEEE 1284 cables support all of the advanced printing capabilities, like bi-directional communication. These cables will be clearly marked with "IEEE-1284".

Interface Connector Printer Side: Amphenol FCN-685J036-L/X or equivalent
A shielded cable should be used.

Pin Assignment

Pin No.	Signal	Direction	Pin No.	Signal	Direction
1	$\overline{\text{DATA STROBE}}$	Input	19	0V (S.G.)	–
2	DATA 1	Input/output	20	0V (S.G.)	–
3	DATA 2	Input/output	21	0V (S.G.)	–
4	DATA 3	Input/output	22	0V (S.G.)	–
5	DATA 4	Input/output	23	0V (S.G.)	–
6	DATA 5	Input/output	24	0V (S.G.)	–
7	DATA 6	Input/output	25	0V (S.G.)	–
8	DATA 7	Input/output	26	0V (S.G.)	–
9	DATA 8	Input/output	27	0V (S.G.)	–
10	$\overline{\text{ACKNLG}}$	Output	28	0V (S.G.)	–
11	BUSY	Output	29	0V (S.G.)	–
12	PE	Output	30	0V (S.G.)	–
13	SLCT	Output	31	$\overline{\text{INPUT PRIME}}$	Input
14	$\overline{\text{AUTO FEED}}$	Input	32	$\overline{\text{FAULT}}$	Output
15	N.C.	–	33	N.C.	–
16	0V (S.G.)	–	34	N.C.	–
17	0V (S.G.)	–	35	N.C.	–
18	+5V	–	36	$\overline{\text{SLCT IN}}$	Input

Note
To use bi-directional communication, an interface cable which has the pin connections above must be used.

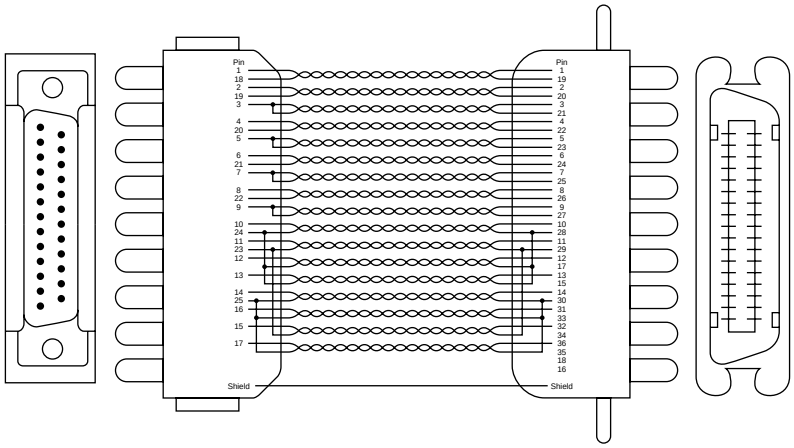


Fig. A-1 Parallel Interface Cable

RESIDENT FONTS

The following bitmapped fonts are resident in this printer.

Bitmapped Fonts

Brougham 10 (12 point)	upright/normal
	upright/bold
	italic/normal
	italic/bold
Brougham 12 (10 point)	upright/normal
	upright/bold
	italic/normal
	italic/bold
Letter Gothic 16.66 (8.5 point)	upright/normal
	upright/bold
	italic/normal
	italic/bold

(Portrait and Landscape are available for the above.)

SYMBOL SETS/CHARACTER SETS

HP LaserJet IIP Mode

- ISO14 JIS ASCII
- ISO57 Chinese
- ISO11 Swedish
- HP Spanish
- ISO17 Spanish
- ISO10 Swedish
- ISO16 Portuguese
- ISO84 Portuguese
- ISO85 Spanish
- PC-8
- PC-8 D/N
- PC-8 Turkish
- PC-850
- PC-852
- PC-860
- PC-863
- PC-865
- Roman 8
- ISO Latin 1 (ECMA-94)
- ISO60 Norwegian 1
- ISO61 Norwegian 2
- ISO4 UK
- ISO25 French
- ISO69 French
- HP German
- ISO21 German
- ISO15 Italian
- ISO6 ASCII
- Legal
- ISO2 IRV

EPSON Mode

- US ASCII
- PC-8
- PC-8 D/N
- PC-850
- PC-852
- PC-860
- PC-863
- PC-865
- PC-8 Turkish
- German
- UK ASCII I
- French I
- Danish I
- Italy
- Spanish
- Swedish
- Japanese
- Norwegian
- Danish II
- UK ASCII II
- French II
- Dutch
- South African

IBM Mode

- PC-8
- PC-8 D/N
- PC-850
- PC-852
- PC-860
- PC-863
- PC-865
- PC-8 Turkish

> **Note**
> If you want to know what characters are in each symbol/character set, print the CHARSETS.PRN file from the “Print form” option in the Direct Access Menu of the Remote Printer Console Program.

❑ HP LaserJet IIP

Roman 8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				¯	â	Å	Á	Þ
1			!	1	A	Q	a	q				À	Ý	ê	î	Ã	þ
2			"	2	B	R	b	r				Â	ý	ô	Ø	ã	·
3			#	3	C	S	c	s				È	°	û	Æ	Đ	µ
4			$	4	D	T	d	t				Ê	Ç	á	å	ð	¶
5			%	5	E	U	e	u				Ë	ç	é	í	Í	¾
6			&	6	F	V	f	v				Î	Ñ	ó	ø	Ì	-
7			'	7	G	W	g	w				Ï	ñ	ú	æ	Ó	¼
8			(	8	H	X	h	x				´	¡	à	Ä	Ò	½
9			)	9	I	Y	i	y				`	¿	è	ì	Õ	ª
A			*	:	J	Z	j	z				^	¤	ò	Ö	õ	º
B			+	;	K	[	k	{				¨	£	ù	Ü	Š	«
C			,	<	L	\	l	|				~	¥	ä	É	š	■
D			-	=	M	]	m	}				Ù	§	ë	ï	Ú	»
E			.	>	N	^	n	~				Û	ƒ	ö	ß	Ÿ	±
F			/	?	O	_	o	▒				£	¢	ü	Ô	ÿ	

ISO Latin1

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Ð	à	ð
1			!	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r			¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|		¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}				½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o	▒			¯	¿	Ï	ß	ï	ÿ

The following table shows characters available only in the corresponding character set. The numbers at the top of the table are code values with which characters are to be replaced in the Roman 8 character set. For other characters, see the character set of Roman 8.

SYMBOL SET	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
ISO2 IRV	#	¤	@	[	\	]	^	`	{	|	}	¯
ISO4 UK	£	$	@	[	\	]	^	`	{	|	}	¯
ISO6 ASCII	#	$	@	[	\	]	^	'	{	|	}	~
ISO10 Swedish	#	¤	@	Ä	Ö	Å	^	`	ä	ö	å	¯
ISO11 Swedish	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ISO14 JIS ASCII	#	$	@	[	¥	]	^	`	{	|	}	¯
ISO15 Italian	£	$	§	°	ç	é	^	ù	à	ò	è	ì
ISO16 Portuguese	#	$	§	Ã	Ç	Õ	^	`	ã	ç	õ	°
ISO17 Spanish	£	$	§	¡	Ñ	¿	^	`	°	ñ	ç	~
ISO21 German	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
ISO25 French	£	$	à	°	ç	§	^	`	é	ù	è	¨
ISO57 Chinese	#	¥	@	[	\	]	^	`	{	|	}	¯
ISO60 Norwegian1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	¯
ISO61 Norwegian2	§	$	@	Æ	Ø	Å	^	`	æ	ø	å	|
ISO69 French	£	$	à	°	ç	§	^	µ	é	ù	è	¨
ISO84 Portuguese	#	$	´	Ã	Ç	Õ	^	`	ã	ç	õ	~
ISO85 Spanish	#	$	·	¡	Ñ	Ç	¿	`	´	ñ	ç	¨
HP German	£	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
HP Spanish	#	$	@	¡	Ñ	¿	°	`	{	ñ	}	~

❑ HP LaserJet IIP, EPSON FX-850, IBM Propritner XL

PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		▸		0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	☺	◂	!	1	A	Q	a	q	ü	æ	í	▓	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▚	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	·
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	╧	▀	∩	

PC-850

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		▸		0	@	P	`	p	Ç	É	á	▒	└	ð	Ó	-
1	☺	◂	!	1	A	Q	a	q	ü	æ	í	▓	┴	Ð	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▚	┬	Ê	Ô	‗
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ò	¾
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	È	õ	¶
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	┼	ı	Õ	§
6	♠	▬	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	Þ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Û	·
B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	█	Ù	¹
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	ý	³
D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	¢	═	▌	Ý	²
E	♫	▲	.	>	N	^	n	~	Ä	×	«	¥	╬	▐	Ì	·
F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	¤	▀	´	

❑ EPSON FX-850

US ASCII

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				*0*	*@*	*P*	*`*	*p*
1			!	1	A	Q	a	q				*!*	*1*	*A*	*Q*	*a*	*q*
2			"	2	B	R	b	r				*"*	*2*	*B*	*R*	*b*	*r*
3			#	3	C	S	c	s				*#*	*3*	*C*	*S*	*c*	*s*
4			$	4	D	T	d	t				*$*	*4*	*D*	*T*	*d*	*t*
5			%	5	E	U	e	u				*%*	*5*	*E*	*U*	*e*	*u*
6			&	6	F	V	f	v				*&*	*6*	*F*	*V*	*f*	*v*
7			'	7	G	W	g	w				*'*	*7*	*G*	*W*	*g*	*w*
8			(	8	H	X	h	x				*(*	*8*	*H*	*X*	*h*	*x*
9			)	9	I	Y	i	y				*)*	*9*	*I*	*Y*	*i*	*y*
A			*	:	J	Z	j	z				***	*:*	*J*	*Z*	*j*	*z*
B			+	;	K	[	k	{				*+*	*;*	*K*	*[*	*k*	*{*
C			,	<	L	\	l	|				*,*	*<*	*L*	**	*l*	*/*
D			-	=	M	]	m	}				*-*	*=*	*M*	*]*	*m*	*}*
E			.	>	N	^	n	~				*.*	*>*	*N*	*^*	*n*	*~*
F			/	?	O	_	o					*/*	*?*	*O*	*_*	*o*	

The following table shows characters available only in the corresponding character set. The numbers at the top of the table are code values with which characters are to be replaced in the US ASCII character set. For other characters, see the character set of US ASCII.

SYMBOL SET	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
German	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
UK ASCII I	£	$	@	[	\	]	^	`	{	|	}	~
French I	#	$	à	°	ç	§	^	`	é	ù	è	¨
Danish I	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
Spanish	₧	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
Swedish	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Japanese	#	$	@	[	¥	]	^	`	{	|	}	~
Norwegian	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Danish II	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
UK ASCII II	#	£	@	[	\	]	^	`	{	|	}	~
French II	#	â	à	î	ç	ê	û	ô	é	ú	è	ï
Dutch	#	$	@	[	]	ƒ	^	`	é	ij	è	¨
South African	#	ê	É	Ê	Ö	è	Ü	é	ë	ö	ô	ü

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The contents of this manual and the specifications of this product are subject to change without notice.

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REGULATIONS

This product is designed for use in a professional environment.

Federal Communications Commission Compliance Notice (For USA Only)

Responsible Party : Brother International Corporation
100 Somerset Corporate Boulevard
Bridgewater, NJ 08807-0911, USA
TEL: (908) 704-1700

declaires, that the products

Product Name: Brother Laser Printer/Scanner/Copier MFC-P200, MC-P2000
Product Options: ALL

complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ❏ Reorient or relocate the receiving antenna.
- ❏ Increase the separation between the equipment and receiver.
- ❏ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ❏ Consult the dealer or an experienced radio/TV technician for help.

Important

A shielded interface cable should be used in order to ensure compliance with the limits for a Class B digital device.
Changes or modifications not expressly approved by Brother Industries, Ltd. could void the user's authority to operate the equipment.

Industry Canada Compliance Statement (For Canada Only)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

International Energy Star Compliance Statement

The purpose of the International Energy Star Program is to promote the development and popularization of energy-efficient office equipments, which includes computers, monitors, printers, facsimile receivers and copy machines world-wide.
As an International Energy Star partner, Brother Industries, Ltd. has decided that this product meets the guideline of the program.

Radio Interference (220-240 V Model Only)

This printer complies with EN55022(CISPR Publication 22)/Class B.

Before this product is used, ensure that you use a double-shielded interface cable with twisted-pair conductors and that it is marked “IEEE 1284 compliant”. The cable must not exceed 1.8 metres in length.

Laser Safety (For 110–120 V Model Only)

This printer is certified as a Class I laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

FDA Regulations (For 110-120 V Model Only)

U.S. Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. One of the following labels on the back of the printer indicates compliance with the FDA regulations and must be attached to laser products marketed in the United States.

MANUFACTURED:
Brother Corporation (Asia) Ltd. Brother Buji Nan Ling Factory
Gold Garden Ind., Nan Ling Village, Buji, Rong Gang, Shenzhen, CHINA
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

MANUFACTURED:
BROTHER INDUSTRIES (USA) INC.
2950 Brother Blvd., Bartlett, TN 38133, U.S.A.
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

MANUFACTURED:
BROTHER INDUSTRIES LTD.
15-1 Naeshiro-cho Mizuho-ku Nagoya, 467 Japan
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

Caution

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

Declaration of Conformity (For Europe)

We, Brother International Europe Ltd.,
Brother House 1 Tame Street, Guide Bridge, Audenshaw, Manchester M34 5JE, UK.

declare that this product is in conformity with the following normative documents.

Safety:	EN 60950,	EN 60825
EMC:	EN 55022 Class B,	EN 50082-1

following the provisions of the Low Voltage Directive 73/23/EEC and the Electromagnetic Compatibility Directive 89/336/EEC (as amended by 91/263/EEC and 92/31/EEC).

Issued by:
Brother International Europe Ltd.
European Technical Services Division

IEC 825 Specification (For 220–240 V Model Only)

This printer is a Class 1 laser product as defined in IEC 825 specifications. The label shown below is attached in countries where required.

This printer has a Class 3B Laser Diode which emits invisible laser radiation in the Scanner Unit. The Scanner Unit should not be opened under any circumstances.

Caution

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

The following caution label is attached near the scanner unit.

For Finland and Sweden
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

Varoitus! Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

Varning – Om apparaten används på annat sätt än i denna Bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

IMPORTANT - For Your Safety

To ensure safe operation the three-pin electrical plug supplied must be inserted only into a standard three-pin power point which is properly grounded through normal household wiring.

Extension cords used with the equipment must be three-pin plug type and correctly wired to provide proper grounding. Incorrectly wired extension cords may cause personal injury and equipment damage.

The fact that the equipment operates satisfactorily does not imply that the power is grounded and that the installation is completely safe. For your safety, if in any doubt about the effective grounding of the power, consult a qualified electrician.

Disconnect device

This printer must be installed near a power outlet, which is easily accessible. In case of emergencies, you must disconnect the power cord from the power outlet in order to shut off power completely.

Geräuschemission / Acoustic Noise Emission (For Germany Only)

Lpa < 70 dB (A) DIN 45635-19-01-KL2

IMPORTANT - Wiring Information (For U.K. only)

If the power cord supplied with this printer is not suitable for your electrical outlet, remove the plug from the mains cord and fit an appropriate three pin plug. If the replacement plug is intended to take a fuse then fit the same fuse as the original.

If a moulded plug is severed from the power cord then it should be destroyed because a plug with cut wires is dangerous if plugged into a live socket outlet. Do not leave it where a child might find it.

In the event of replacing the plug fuse, fit a fuse approved by ASTA to BS1362 with the same rating as the original fuse.

Always replace the fuse cover. Never use a plug with the cover omitted.

WARNING - THIS PRINTER MUST BE PROPERLY EARTHED.

The wires in the mains cord are coloured in accordance with the following code:

Green and yellow:	Ground
Blue:	Neutral
Brown:	Live

The colours of the wiring in the power lead of this printer may not correspond with the markings which identify the terminals in your plug. If you need to fit a different plug, proceed as follows.

Remove a length of the cord outer sheath, taking care not to damage the coloured insulation of the wires inside.

Cut each of the three wires to the appropriate length. If the construction of the plug permits, leave the green and yellow wire longer than the others so that, in the event that the cord is pulled out of the plug, the green and yellow wire will be the last to disconnect.

Remove a short section of the coloured insulation to expose the wires.

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter “E” or by the earth symbol or coloured green or green and yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter “N” or coloured black or blue.

The wire which is coloured brown must be connected to the terminal which is marked with the letter “L” or coloured red or brown.

The outer sheath of the cord must be secured inside the plug. The coloured wires should not hang out of the plug.

INDEX

—R—

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—V—

—W—

brother

LASER PRINTER
PARTS REFERENCE LIST

MODEL:MFC-P2000/HL-P2000

MECHANISMS & ELECTRONICS

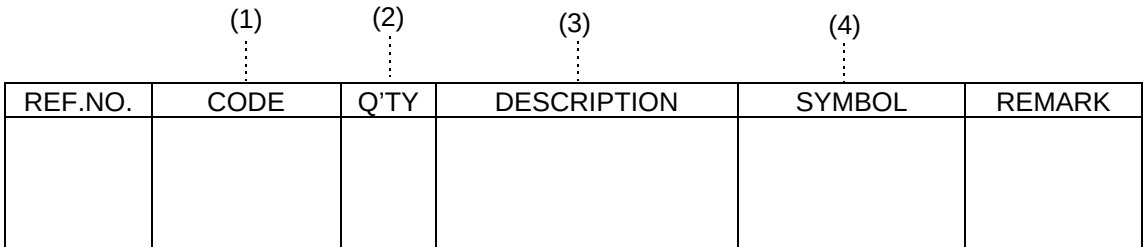
Aug., '98
84U007BE0

NOTE FOR USING THIS PARTS REFERENCE LIST

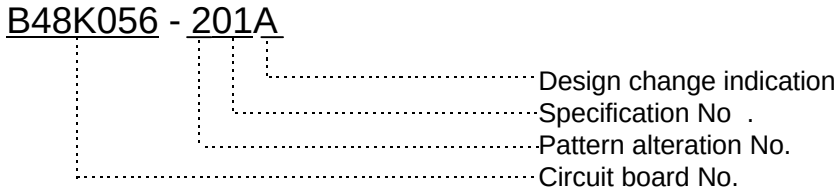
1. In the case of ordering parts, it needs mentioning the following items:
   (1) Code
   (2) Q'ty
   (3) Description
   (4) Symbol (PCB No., Revision , and Parts location mounted on the PCB.)

   Note : No orders without Parts Code or Tool No. can be accepted.

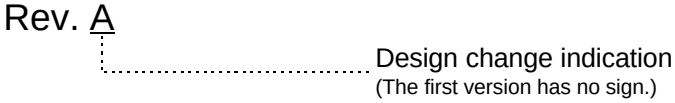
< Example >



Revision No.: marked on the main printed circuit board.



Revision No.: marked on the power supply printed circuit board.



2. Design-changed parts :
   If the parts are changed, any one of the following symbols is indicated in the REMARKS column.

   #A : compatible between old and new
   #B : replaceable from old to new
   #D : incompatible
   # : newly established

3. The original of this list was made based on the information available in August, 1998.

4. Parts are subject to change in design without prior notice.

CONTENTS

1. DRIVE UNIT

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UL8747001	1	DRIVE UNIT ASSY (SP)	
2	087412016	3	TAPTITE, CUP B M4X20	
3	085411215	1	TAPTITE, BIND B M4X12	
4	UL7964001	1	MAIN MOTOR ASSY	
5	UL7968001	1	SUB MOTOR ASSY	
6	085320616	4	TAPTITE, BIND S M3X6	

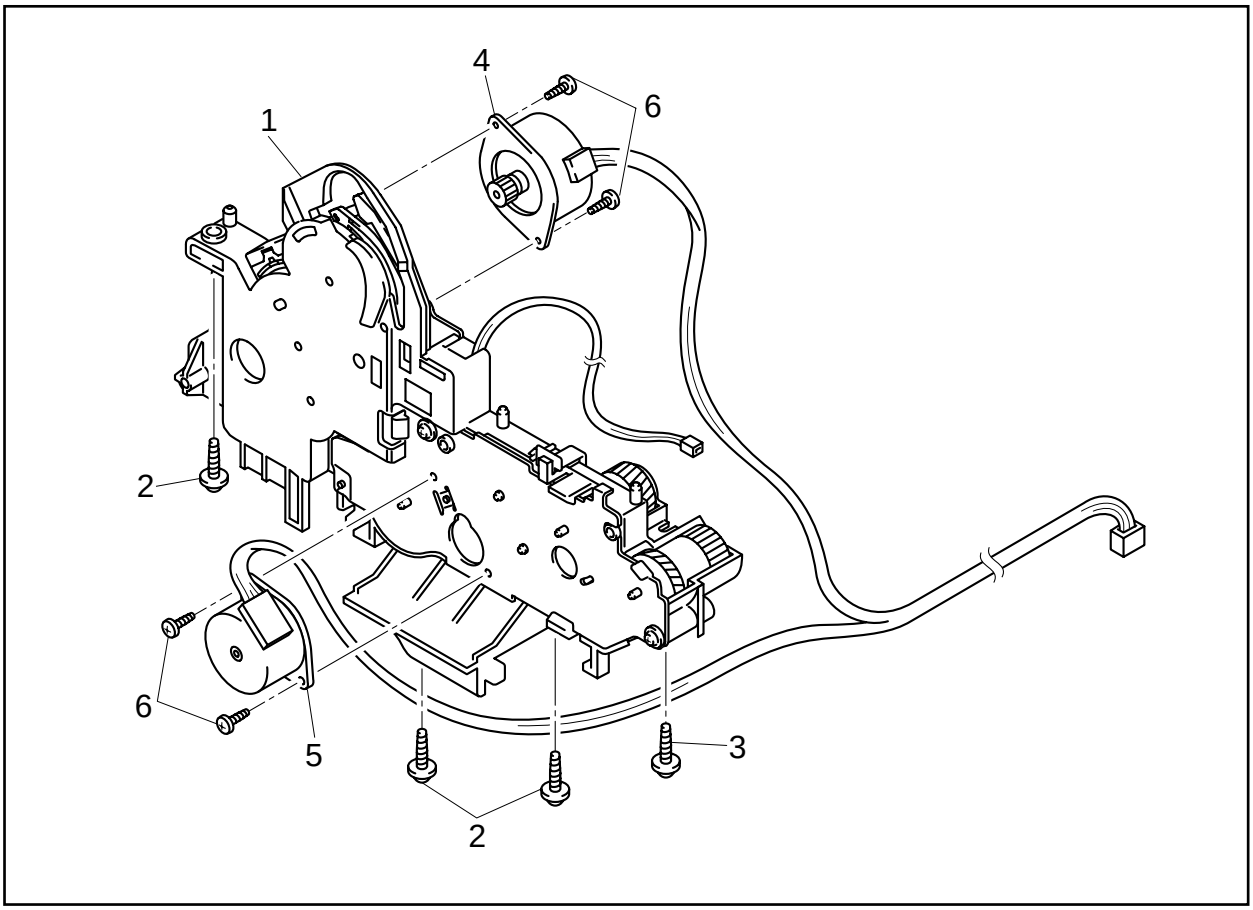
MODEL MFC-P2000/HL-P2000 84U-901-010

2. DOCUMENT SCANNER UNIT

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1-4	UH3809001	1	SCANNER FRAME ASSY		
1	UH3811001	1	SCANNER DRIVE UNIT ASSY		
2	0A4300605	1	SCREW PAN(S/P WASHER), M3X6		
3	087310815	2	TAPTITE, CUP B M3X8		
4	UU7031001	1	SEPARATION ROLLER		
5	UG4601001	1	CIS98 YL2		
6	UU7035001	2	CIS BACK-UP SPRING		
7	UU7036001	1	CIS FILM		
8	UH3893001	1	LF ROLLER ASSY		
9	UH3894001	1	DOCUMENT EJECT ROLLER ASSY		
10	UF7187001	1	GEAR SHIELD FILM		
11	087310815	4	TAPTITE, CUP B M3X8		
12	UK4161001	1	MOTOR FRAME FG HARNESS ASSY		

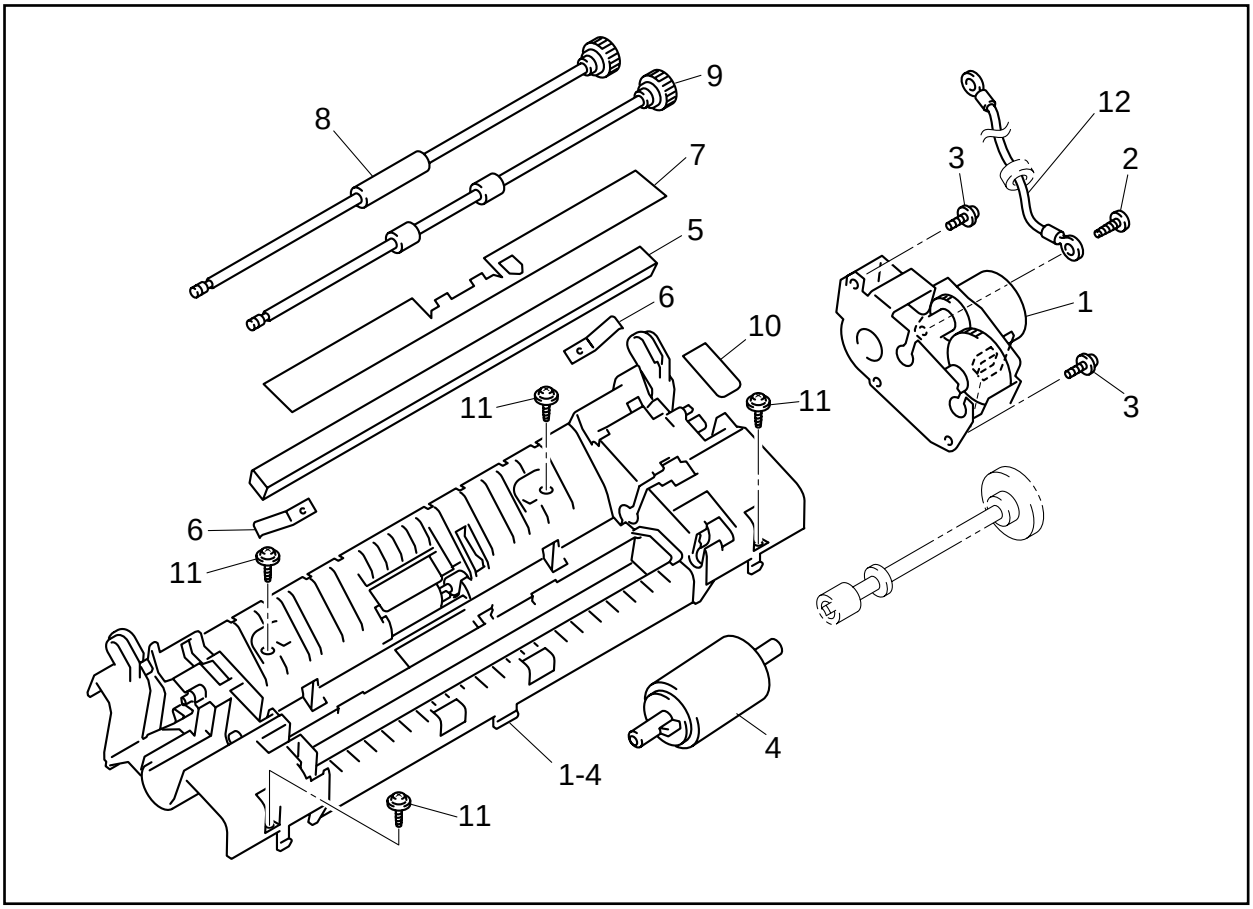
MODEL MFC-P2000/HL-P2000 84U-901-015

1. DRIVE UNIT



MODEL MFC-P2000/HL-P2000 84U-901-010

2. DOCUMENT SCANNER UNIT

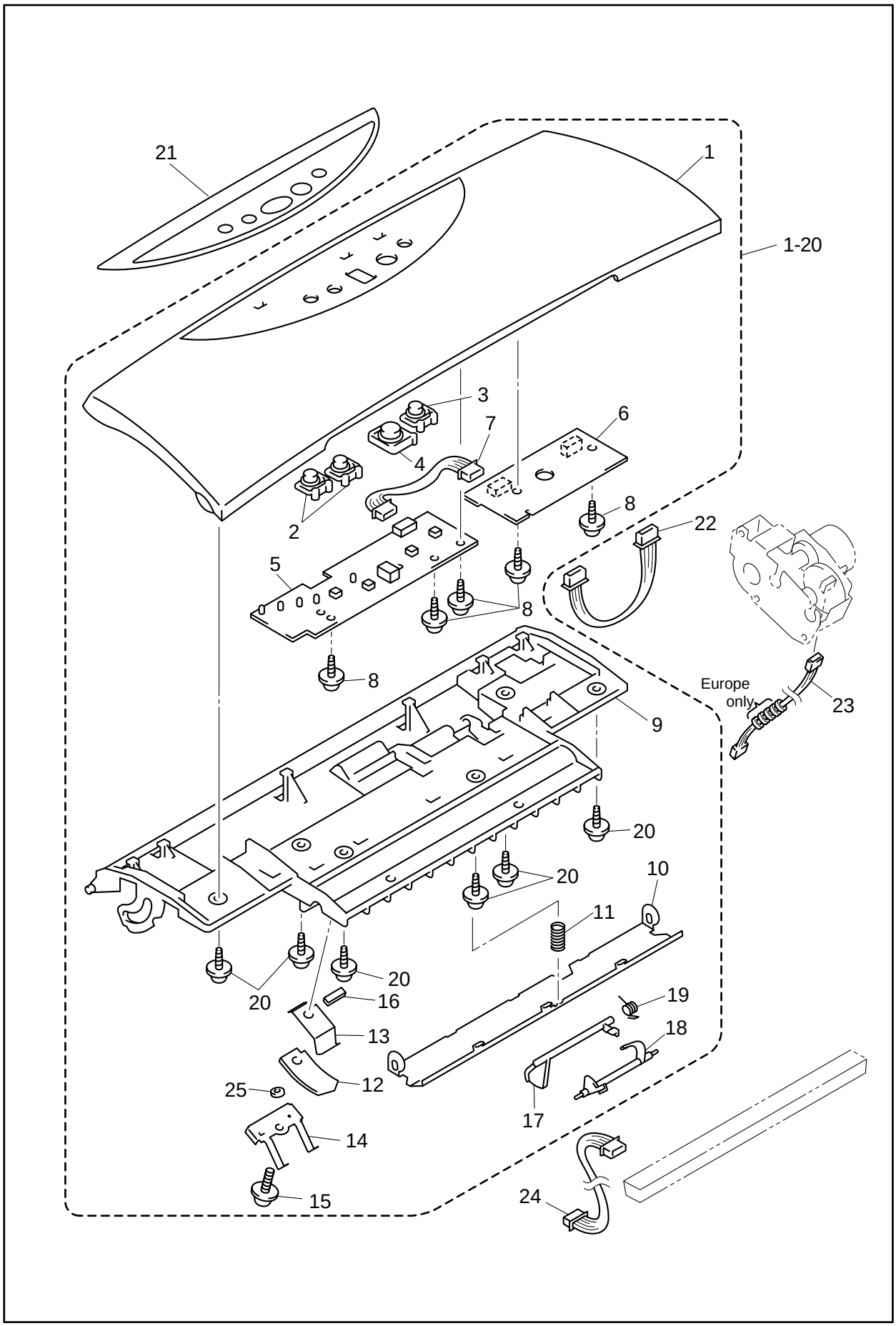


MODEL MFC-P2000/HL-P2000 84U-901-015

3. SCANNER PANEL UNIT

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1-20	UH3900001	1	SCANNER PANEL UNIT ASSY (SP)		
1	UH3820001	1	SCANNER PANEL		
2	UH3823001	2	KEY TOP (GRAY)		
3	UH3823002	1	KEY TOP (ORANGE)		
4	UH3822001	1	START KEY (BLUE)		
5	UK4258001	1	SCANNER PANEL PCB ASSY (SP)	B512019	
6	UK4257001	1	SCANNER SENSOR PCB ASSY (SP)	B512020	
7	UK3989001	1	SCANNER PANEL HARNESS ASSY		
8	087310616	5	TAPTITE, CUP B M3X6		
9	UH3824001	1	SCANNER PANEL REAR COVER		
10	UH3779001	1	DOCUMENT PRESSURE BAR ASSY (SP)		
11	UU7147001	1	DOCUMENT PRESSURE BAR SPRING		
12	UH3767001	1	SEPARATION RUBBER ML ASSY		
13	UU7105001	1	ADF SPRING PLATE		
14	UU7106001	1	FRONT SPRING PLATE		
15	UF5034001	1	TAPTITE, PAN B M3X6		
16	UU7285001	1	VIBRATION-PROOF RUBBER		
17	UU7107001	1	ACTUATOR F		
18	UU7108001	1	ACTUATOR R		
19	UH3897001	1	HELICAL TORSION SPRING		
20	087310815	6	TAPTITE, CUP B M3X8		
21	UH3821001	1	PANEL SHEET, US		
21	UH3848001	1	PANEL SHEET, EU		
21	UH3754001	1	PANEL SHEET, CANADA DX		
21	UH4002001	1	PANEL SHEET, LEG		
22	UH3853001	1	SENSOR HARNESS ASSY		
23	UK4264001	1	R MOTOR HARNESS ASSY		
23	UK4321001	1	R MOTOR HARNESS ASSY EU		
24	UH3855001	1	CIS HARNESS ASSY		
25	026030135	1	WASHER, PLAIN S3		

3. SCANNER PANEL UNIT



MODEL MFC-P2000/HL-P2000 84U-901-016

T/I No. PR98227 / PR98242

4. LASER UNIT

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UL8748001	1	LASER UNIT Y (SP)	(B48K226)	
2	085411215	3	TAPTITE, BIND B M4X12		
3	UL8759001	1	TONER SENSOR PCB ASSY	B48K231	
3	UK4326001	1	TONER SENSOR PCB ASSY EU	B48K231	
3	UL8810001	1	TONER SENSOR PCB ASSY LEG	B512028	
4	087310815	1	TAPTITE, CUP B M3X8		
4	084311015	1	TAPTITE, SARA B M3X10 (LEGEND)		
5	UH3064001	1	S SEAL SPONGE 4		

MODEL MFC-P2000/HL-P2000 84U-901/902-020

T/I NO. PR98228 / PR98303

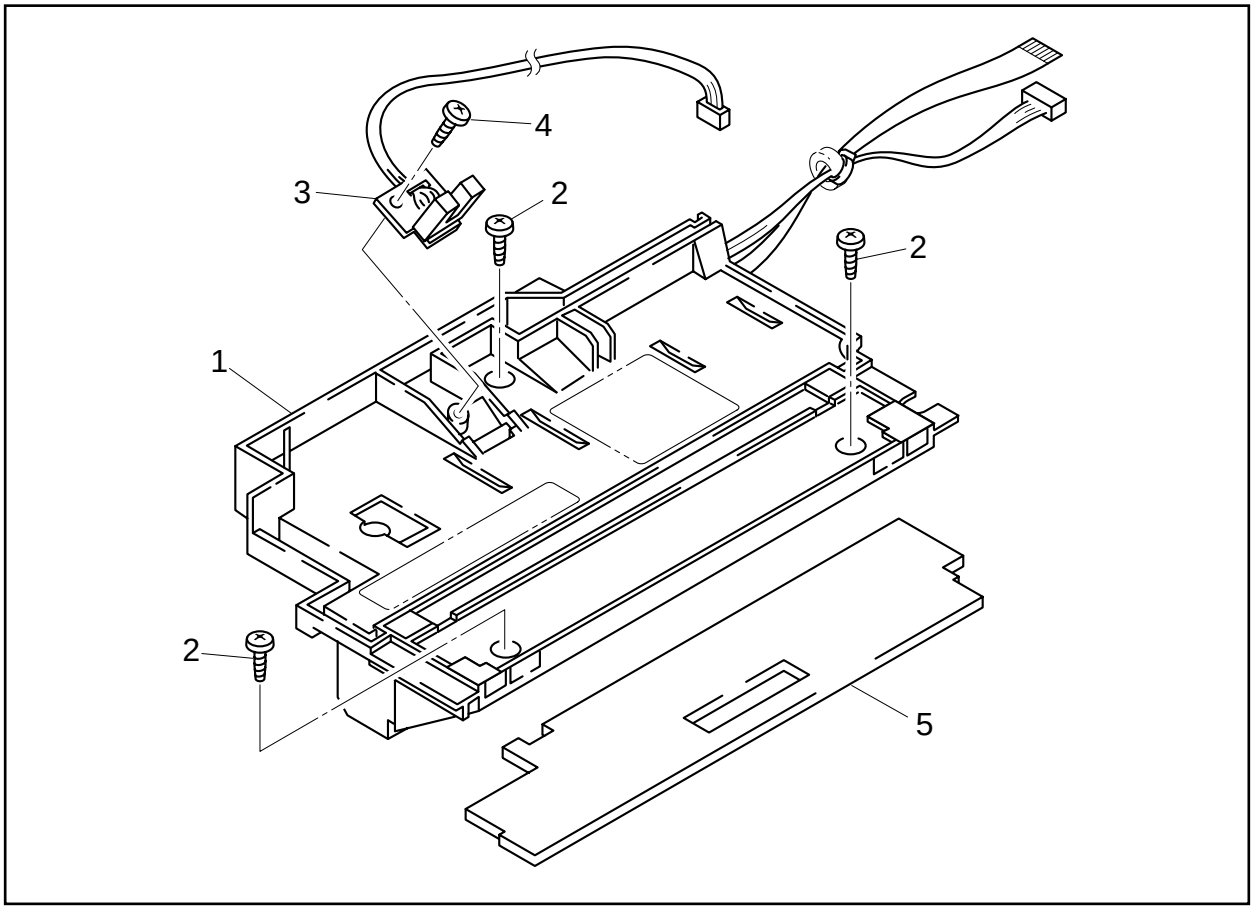
5. MP SHEET FEEDER

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UH3899001	1	MP REAR SHEET FEEDER ASSY (SP)	
1	UH4013001	1	MP REAR SHEET FEEDER ASSY LEG(SP)	

MODEL MFC-P2000/HL-P2000 84U-901/902-040

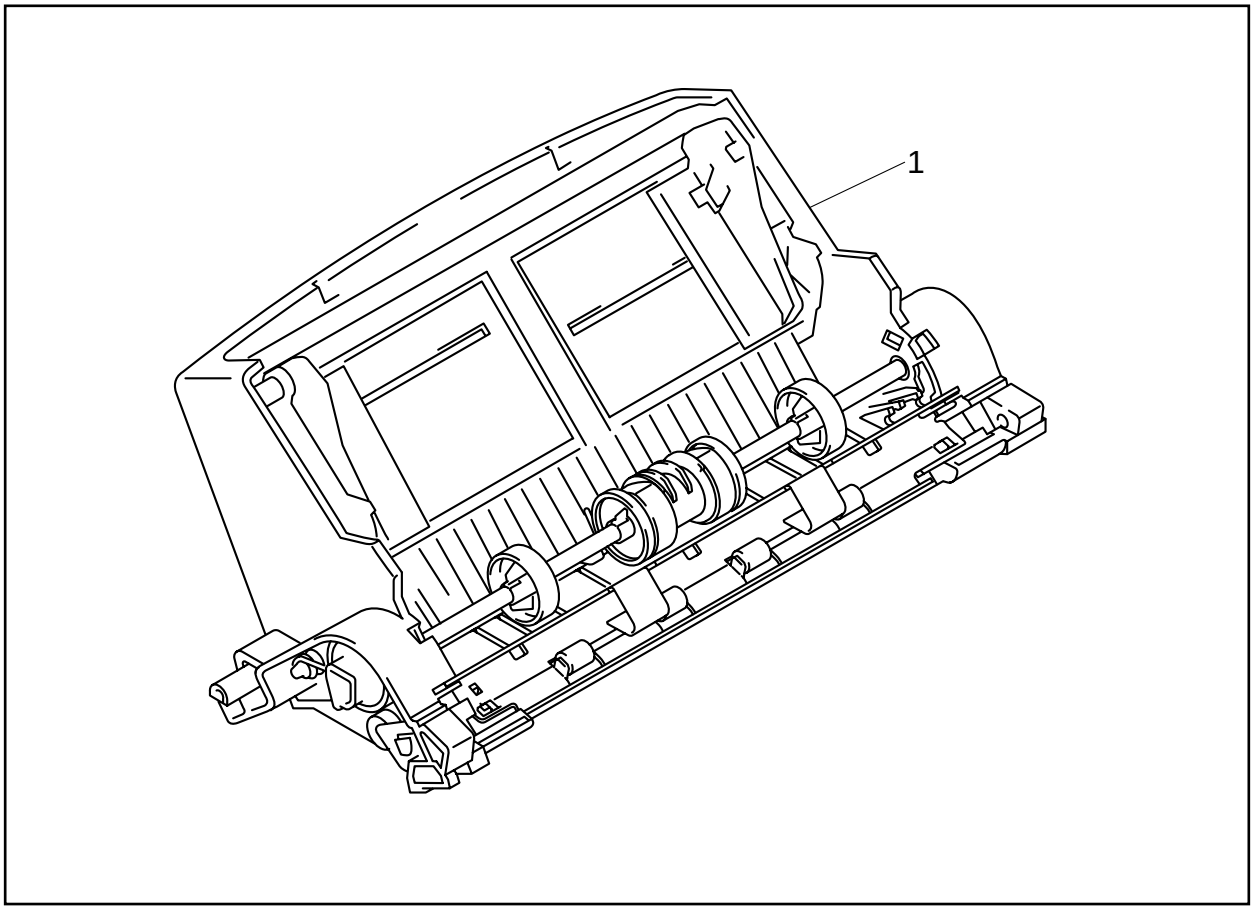
T/I NO. PR98303

4. LASER UNIT



MODEL MFC-P2000/HL-P2000 84U-901-020

5. MP SHEET FEEDER



MODEL MFC-P2000/HL-P2000 84U-901-040

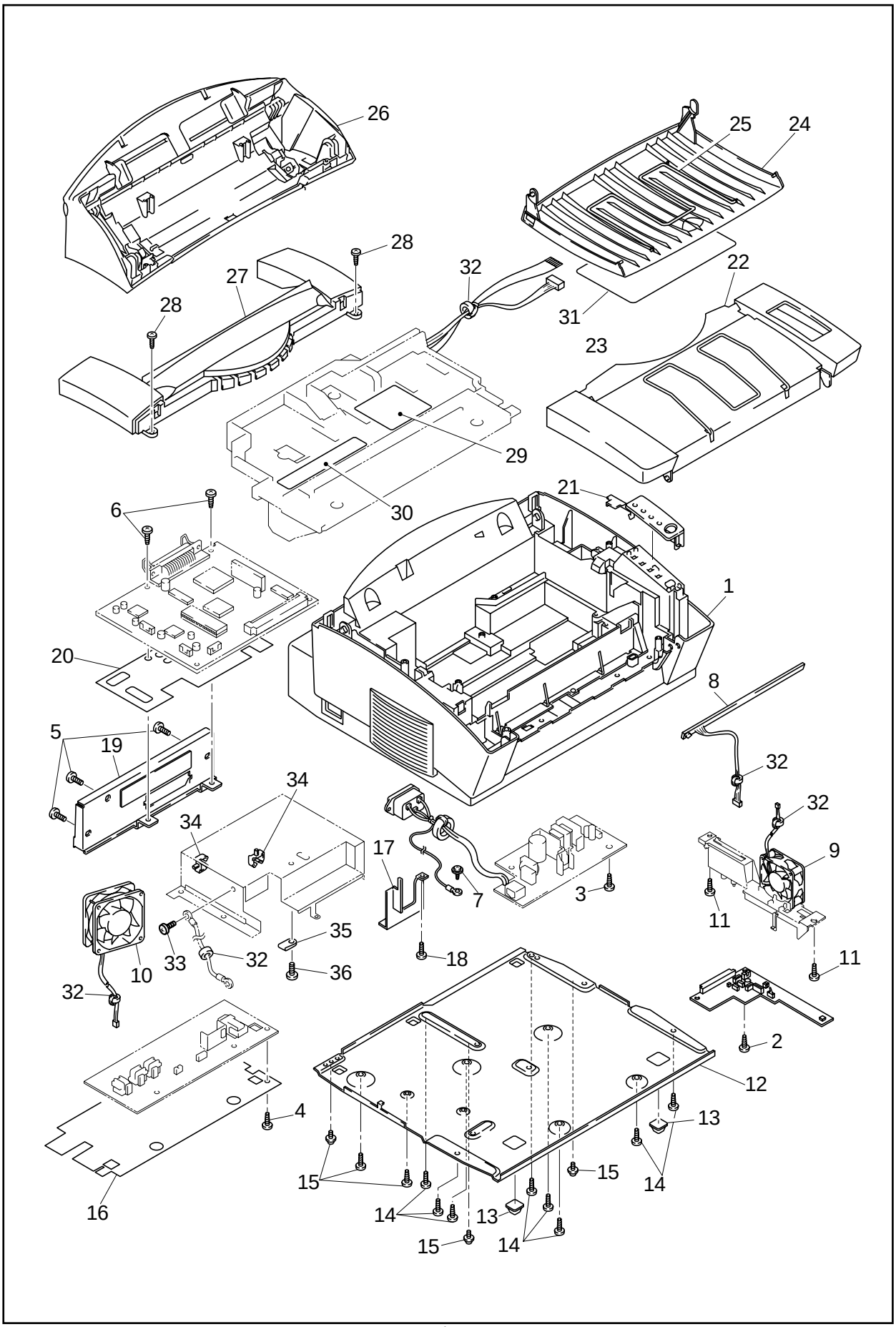
7. COVERS

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UL7983001	1	MAIN COVER ASSY		
2	085411215	1	TAPTITE, BIND B M4X12		
3	085411215	1	TAPTITE, BIND B M4X12		
4	085411215	1	TAPTITE, BIND B M4X12		
5	002400616	3	SCREW PAN M4X6		
6	087320616	2	TAPTITE, CUP S M3X6		
7	0A5350605	1	SCREW PAN(WASHER), M3.5X6		
8	UL8659001	1	EL PCB UNIT	B48K304	
9	UL8753001	1	MAIN FAN MOTOR		
10	UL8509001	1	SUB FAN MOTOR		
11	085411215	2	TAPTITE, BIND B M4X12		
12	UL8601001	1	BASE PLATE		
13	UL8507001	2	RUBBER FOOT		
14	085411215	8	TAPTITE, BIND B M4X12		
15	087320616	5	TAPTITE, CUP S M3X6		
16	UL8508001	1	INSULATION SHEET		
17	UL8512001	1	INLET HOLDER		
18	085411215	1	TAPTITE, BIND B M4X12		
19	UL8510001	1	I/F SHIELD ASSY		
20	UH3828001	1	SHIELD SHEET, P2000		
21	UH3850001	1	PANEL COVER, GRAY1227		
22	UH3852001	1	TOP COVER ASSY		
23	UH3826001	1	DOCUMENT EXTENSION SUPPORT WIRE		
24	UH3825001	1	OUTPUT TRAY		
25	UL8516001	1	EXTENSION SUPPORT WIRE		
26	UH3801001	1	SCANNER REAR COVER ASSY		
27	UH3805001	1	REAR COVER ASSY		
28	085411215	2	TAPTITE, BIND B M4X12		
29	UL6740001	1	LASER CAUTION LABEL		
29	UL7931001	1	LASER CAUTION LABEL, LEG		
30	UL6741001	1	TONER WARNING LABEL		
31	UH3838001	1	MYLAR LABEL, MFC-P2000 (US)		
31	UH3839001	1	MYLAR LABEL, MFC-P2000 (CANADA)		
31	UH3840001	1	MYLAR LABEL, HL-P2000 (EUR)		
32	UG3005000	5	FERRITE CORE		
33	087320616	1	TAPTITE, CUP S M3X6		
34	UH3751001	2	MINI CLAMP		
35	UH3752001	1	NYLON CLAMP		
36	085411215	1	TAPTITE, BIND B M4X12		

MODEL MFC-P2000/HL-P2000 84U-901/902-060

T/I NO. PR98303

7. COVERS



MODEL MFC-P2000/HL-P2000 84U-901-060

6. FIXING UNIT

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1-11	UL8750001	1	FIXING UNIT, 120V (SP)	
1-11	UL8751001	1	FIXING UNIT, 230V (SP)	
1-11	UL8833001	1	FIXING UNIT, LEG 230V (SP)	
1	UH3306001	1	HALOGEN LAMP Y, 120V (SP)	
1	UH3307001	1	HALOGEN LAMP Y, 230V (SP)	
2	087411616	2	TAPTITE, CUP B M4X16	
3	085311216	2	TAPTITE, BIND B M3X12	
4	083311017	2	TAPTITE, PAN B M3X10	
5	UL8757001	1	HEAT ROLLER YS (SP)	
5	UL8834001	1	HEAT ROLLER, LEG (SP)	
6	UH3178000	2	H/R BEARING Y	
7	UL8758001	1	H/R CLEANER	
7	UL8855001	1	H/R CLEANER, LEG	
8	UL8754001	1	H/R WASHER	
9	UH3196001	1	THERMISTOR Y ASSY	
10	UH3323001	4	EJECT PINCH ROLLER ASSY	
11	UL6682001	4	PINCH SPRING	

MODEL MFC-P2000/HL-P2000 84U-901/902-050/051/052

T/I NO. PR98271 / PR98292 / PR98303

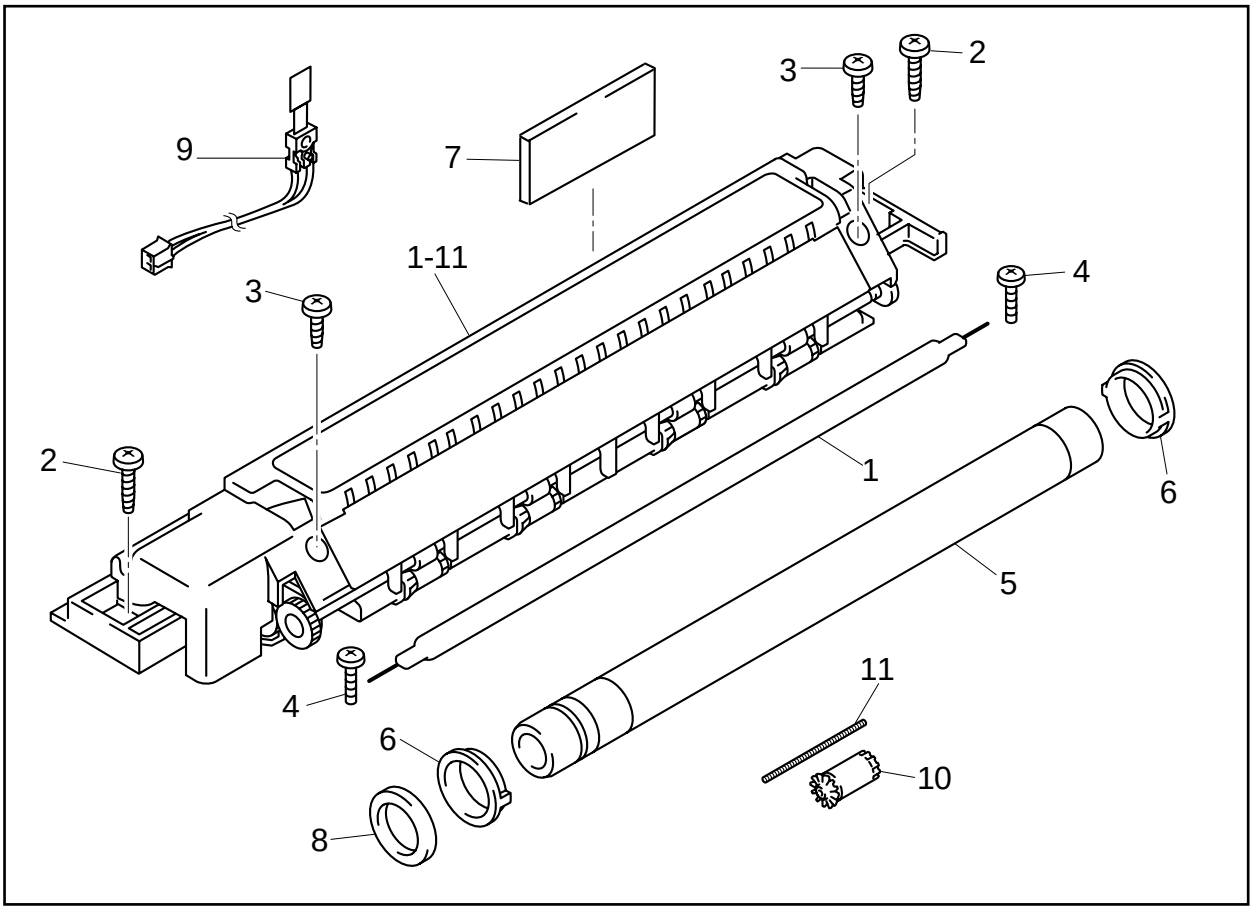
8. MAIN PCB

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1-1	UK4250001	1	MAIN PCB ASSY, US (SP)	B512018-100C	
1-1	UK4251001	1	MAIN PCB ASSY, EUR (SP)	B512018-101B	
1-1	UK4252001	1	MAIN PCB ASSY, HEB (SP)	B512018-102	
1	UK4328000	1	MROMP2000, US	#4	
1	UK4320000	1	MROMP2000, EUR	#4	
1	UK4160000	1	MROMP2000, HEB	#4	

MODEL MFC-P2000/HL-P2000 84U-901/902-101/102/103

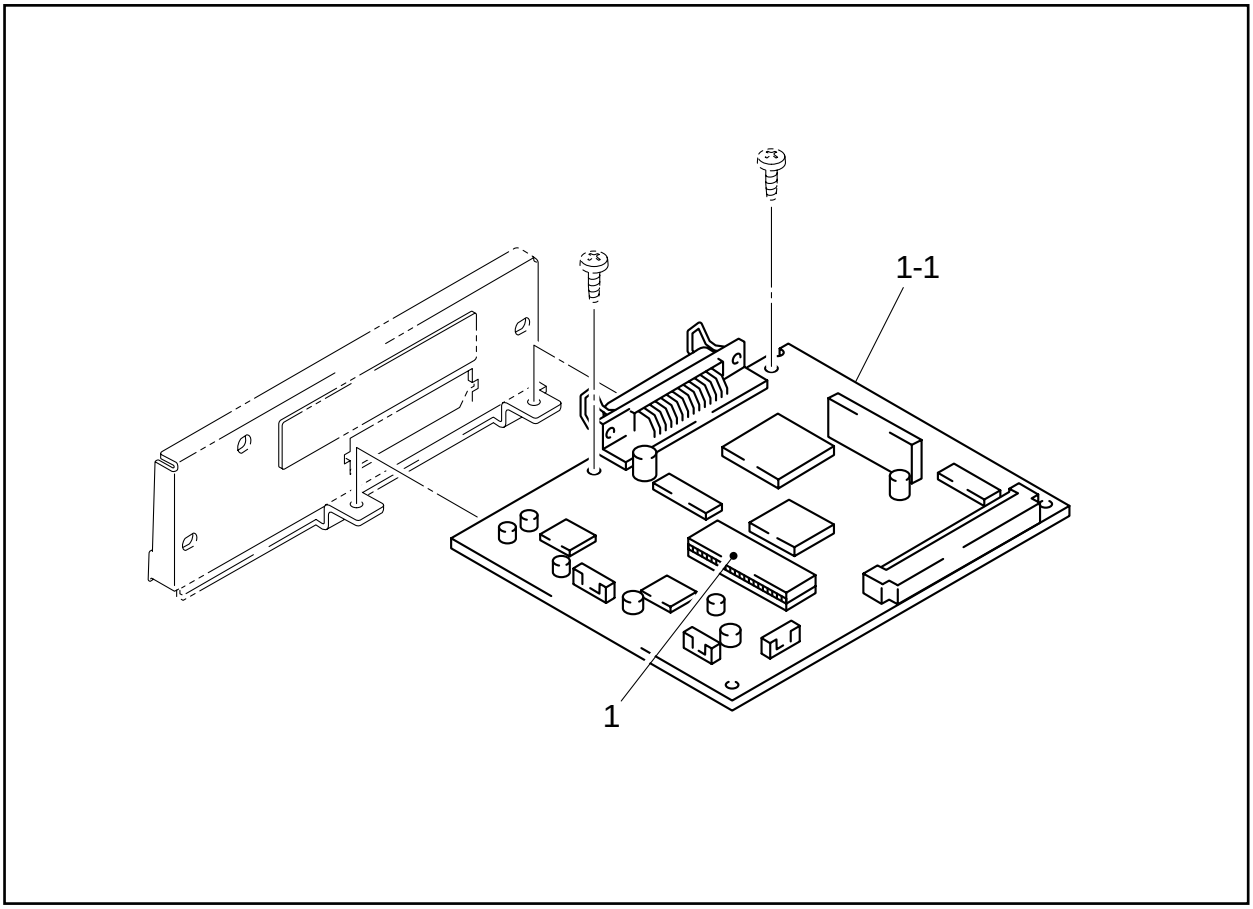
T/I NO. PR98260

6. FIXING UNIT



T/I NO. PR98271 / PR98292 MODEL MFC-P2000/HL-P2000 84U-901-050/051

8. MAIN PCB



MODEL MFC-P2000/HL-P2000 84U-901-101/102/103

9. PANEL SENSOR PCB

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UK4205001	1	PANEL SENSOR PCB ASSY (SP)	B48K303	

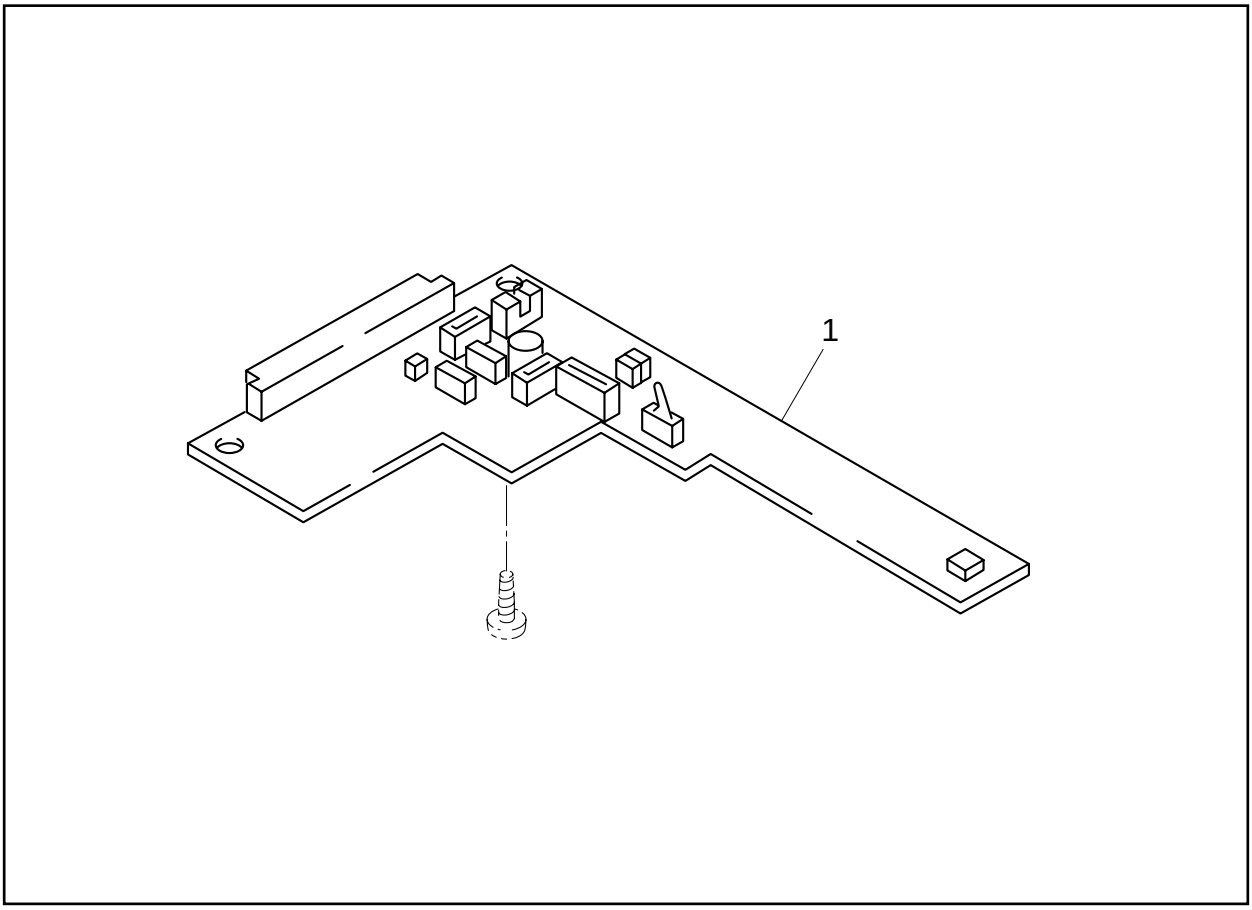
MODEL MFC-P2000/HL-P2000 84U-901-151

10. POWER SUPPLY PCB

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UK4120001	1	LOW-VOLTAGE PS ASSY, 115V (SP)	
1	UK4121001	1	LOW-VOLTAGE PS ASSY, 230V (SP)	
2	UK3836001	1	AC INLET ASSY, 115V	
2	UK3843001	1	AC INLET ASSY, 230V	

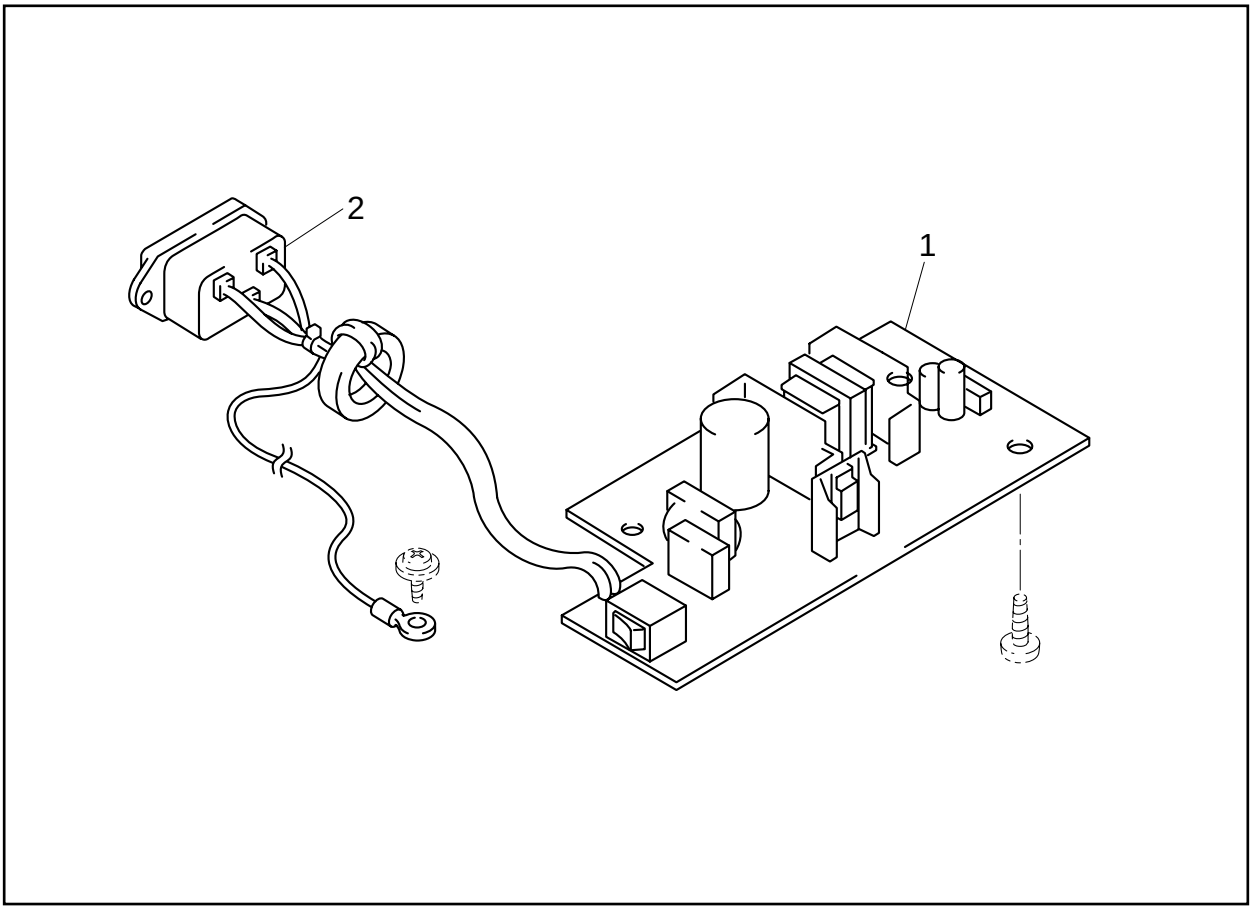
MODEL MFC-P2000/HL-P2000 84U-901-200/201

9. PANEL SENSOR PCB



MODEL MFC-P2000/HL-P2000 84U-901-151

10. POWER SUPPLY PCB



MODEL MFC-P2000/HL-P2000 84U-901-200/201

11. HIGH VOLTAGE POWER SUPPLY PCB

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UK4122001	1	HIGH-VOLTAGE PS ASSY (SP)		

MODEL MFC-P2000/HL-P2000 84U-901/902-220

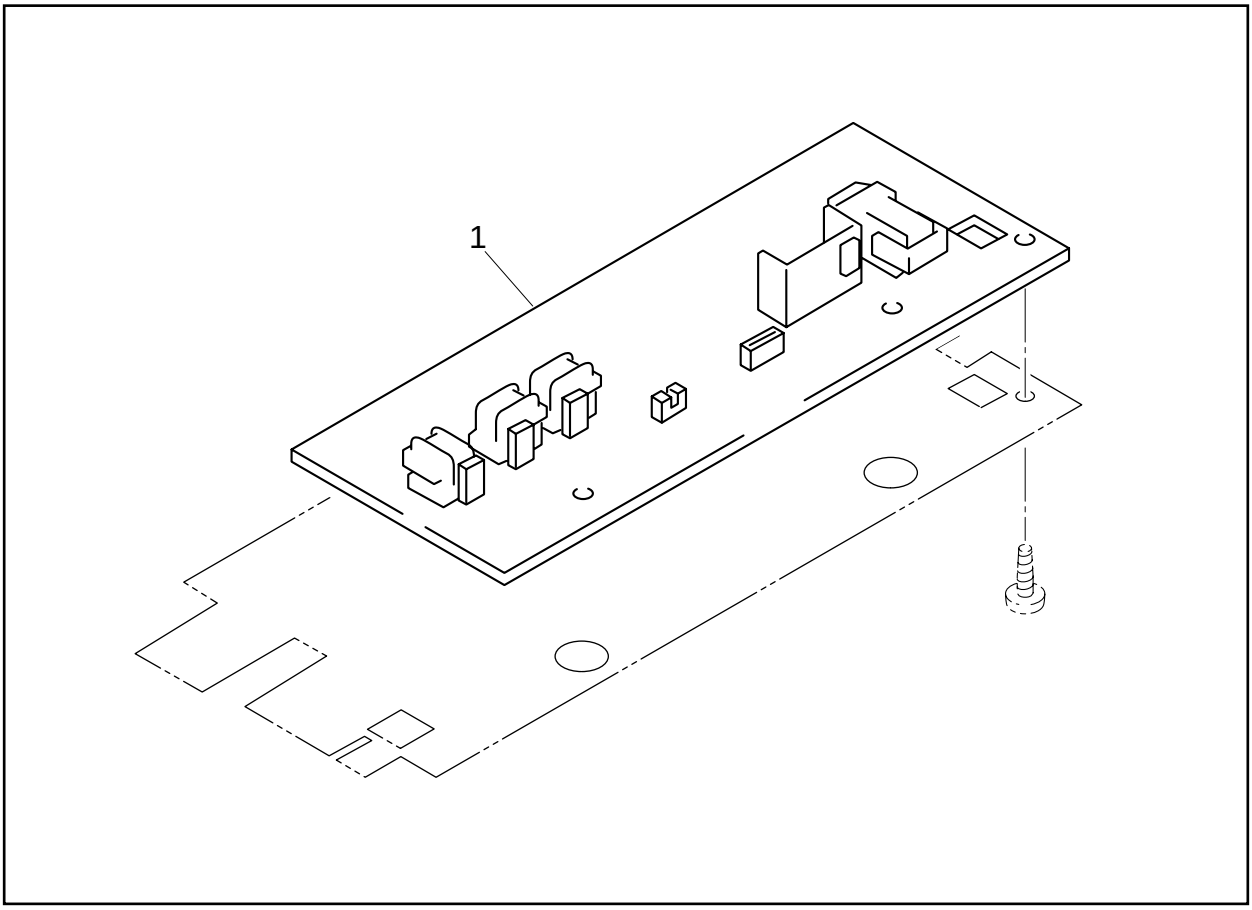
12. AC CORDS

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1A	UH1051001	1	AC CORD ASSY, UL/CSA	
1B	UH1054001	1	AC CORD ASSY, BS	
1C	UH1052001	1	AC CORD ASSY, VDE	
1D	UH1055001	1	AC CORD ASSY, SAA	
1E	UH1053001	1	AC CORD ASSY, SEV	
1F	UK4094001	1	AC CORD ASSY, DEMKO	
1G	U34320001	1	AC CORD ASSY, #4 (SAF)	
1H	UK4099001	1	AC CORD ASSY, CHLI	
1I	U34322001	1	AC CORD ASSY, #6 (ISRAEL)	
1J	UK3610001	1	AC CORD ASSY, CHN96	

MODEL MFC-P2000/HL-P2000 84U-901/902-230

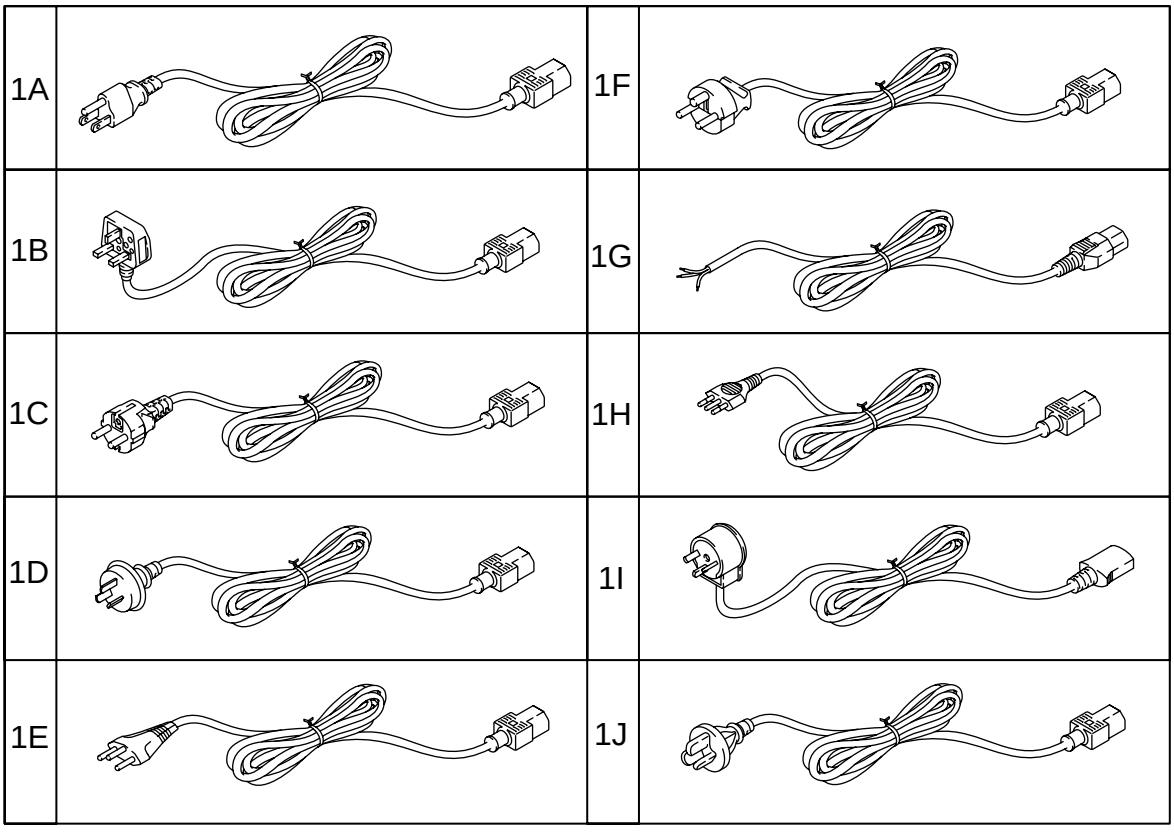
T/I NO. PR98303

11. HIGH VOLTAGE POWER SUPPLY PCB



MODEL MFC-P2000/HL-P2000 84U-901/902-220

12. AC CORD



MODEL MFC-P2000/HL-P2000 84U-901/902-230

T/I NO. PR98303

13. ACCESSORIES

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UK4223001	1	PR DRIVER DISK ASSY1 (MFC-P2000)	
1	UK4237001	1	PR DRIVER DISK ASSY1 (HL-P2000)	
1	UK4343001	1	PR DRIVER DISK ASSY1, LEG	
2	UK4225001	1	PR DRIVER DISK ASSY2 (MFC-P2000)	
2	UK4239001	1	PR DRIVER DISK ASSY2 (HL-P2000)	
2	UK4345001	1	PR DRIVER DISK ASSY2, LEG	
3	UK4253001	1	PR DRIVER DISK ASSY3 (MFC-P2000)	
3	UK4255001	1	PR DRIVER DISK ASSY3 (HL-P2000)	
3	UK4347001	1	PR DRIVER DISK ASSY3, LEG	
4	UK4227001	1	CD-ROM ASSY (MFC-P2000)	
4	UK4228001	1	CD-ROM ASSY (HL-P2000)	
5	UH3625001	1	EXTENSION WIRE ASSY, P2000	
5-1	UL7158001	1	TE TUBE	
6	UH3846001	1	SET GUIDE, US	
6	UH3871001	1	SET GUIDE, FRA	
6	UH3847001	1	SET GUIDE, GER	
6	UH3875001	1	SET GUIDE, NOR	
6	UH3877001	1	SET GUIDE, NL	
6	UH3882001	1	SET GUIDE, DEN	
6	UH3889001	1	SET GUIDE, SWE	
7	UE2014001	1	BAG, 215X350H	
8	UG4558001	1	I/F CABLE FE (US/LEG)	
9	UK4322001	1	CORE NF-135 ASSY	
10	UK4339001	1	PR DRIVER DISK ASSY #3, LEG	
10	UK4333001	1	PR DRIVER DISK ASSY4 (ISRAEL)	

MODEL MFC-P2000/HL-P2000 84U-901/902-920

T/I NO. PR98227 / PR98250 / PR98262 / PR98303

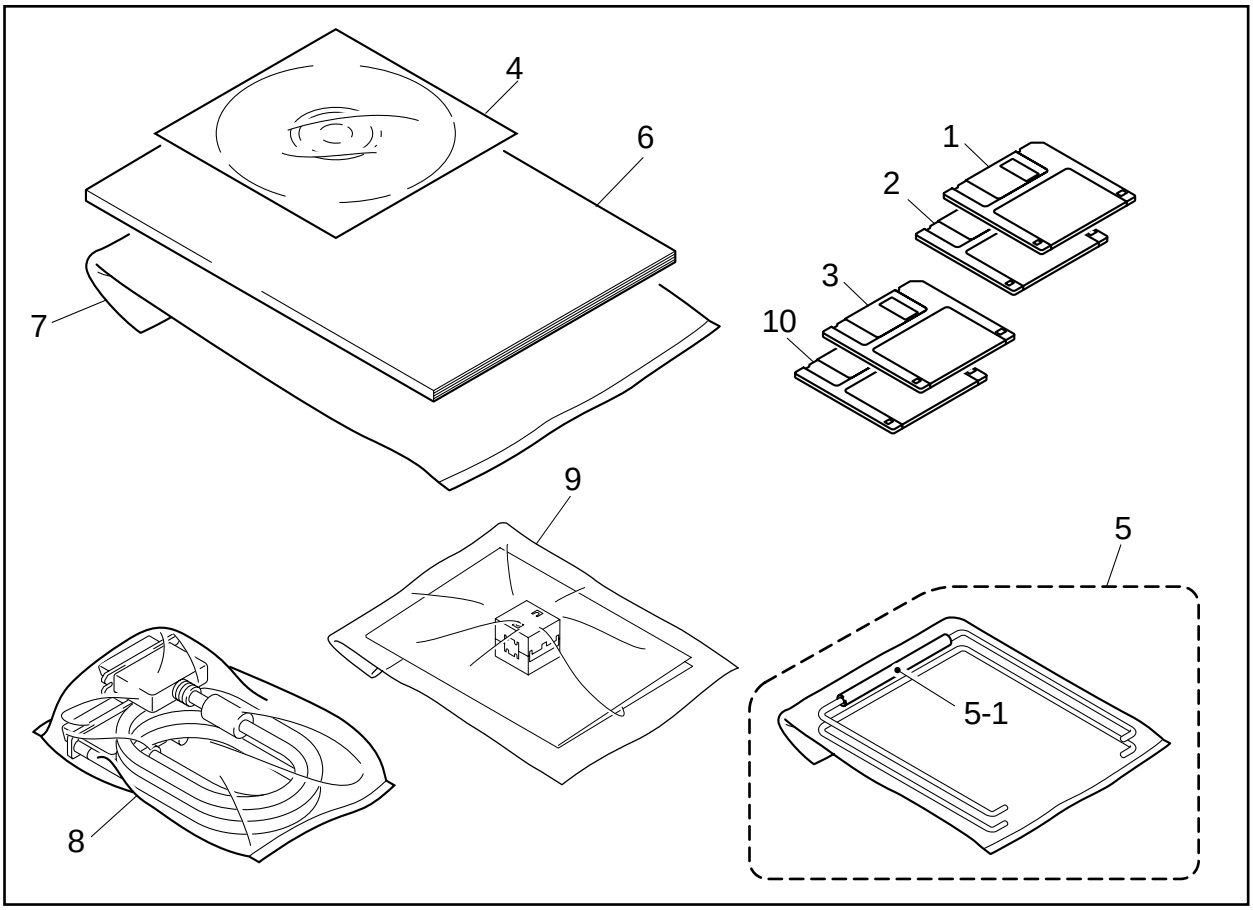
14. PACKING MATERIALS

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UE0752001	1	CARTON, USA	
1	UE0753001	1	CARTON, EUR	
1	UE0777001	1	CARTON, CANADA DX	
1	UE0781001	1	CARTON, CANADA	
1	UE0806001	1	CARTON, LEG	
2	UE0754001	1	STYROFOAM PAD ASSY	
3	UE0757001	1	CARTON, ACCESORRIES	
4	UE2126001	1	BAG, 700X800 (BODY)	

MODEL MFC-P2000/HL-P2000 84U-901/902-930

T/I NO. PR98303

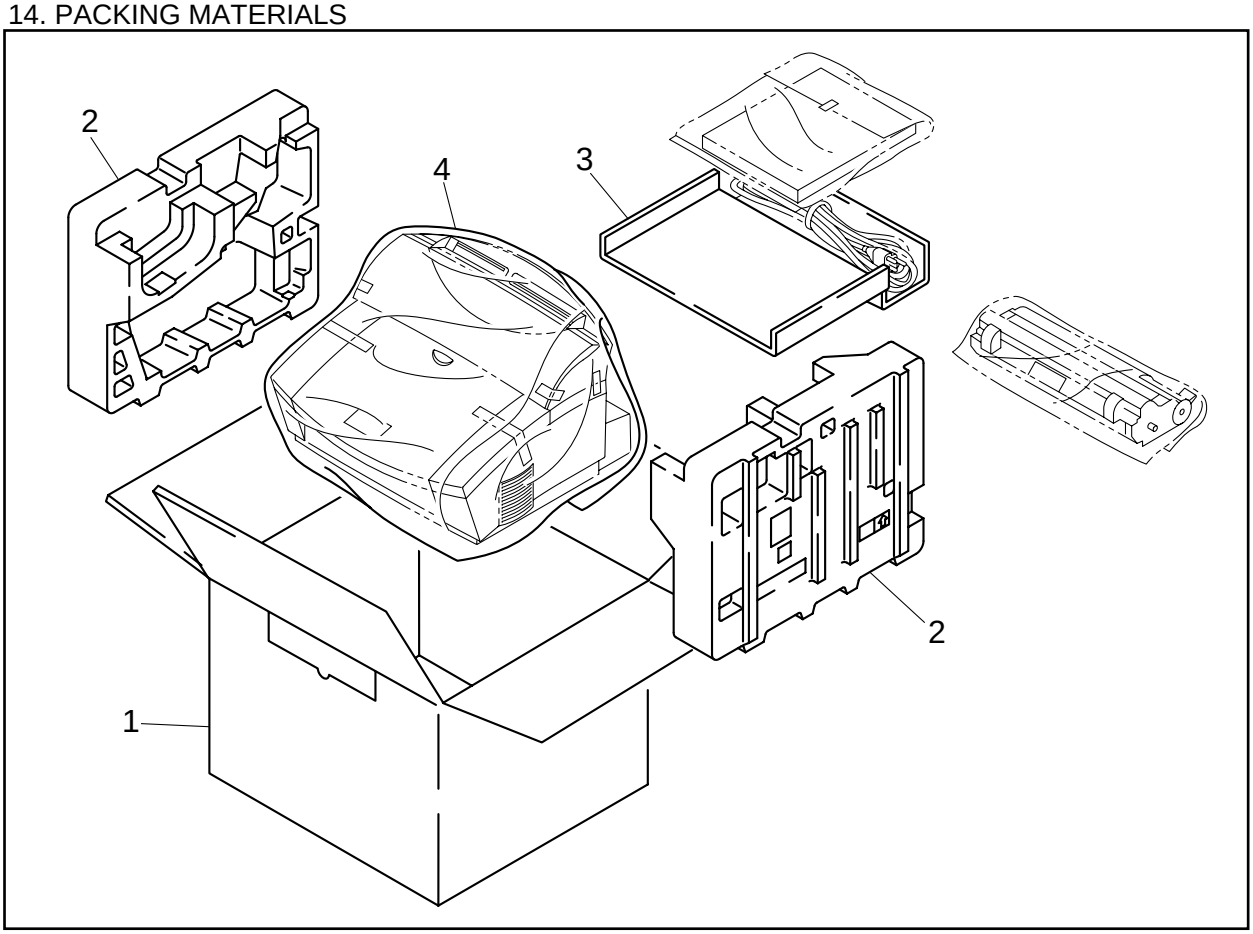
13. ACCESSORIES



MODEL MFC-P2000/HL-P2000 84U-901-920

T/I NO. PR98227 / PR98250

14. PACKING MATERIALS



MODEL MFC-P2000/HL-P2000 84U-901-930

9.3 Scanner Error Indications

When an error occurs during scanning, the error indication is shown on the LED of the scanner control panel. Take an appropriate action referring to the table below;

Problem	LED Indication	Remedy
No document	Copy number and 'P' are displayed alternately	**1) Set the document.** The error is cleared automatically, and the copy number is indicated. The settings of the enlarge/reduce ratio and the Photo mode which were set before the error are remained (not returned to the default).
		2) Press the Stop key. The settings and indication are returned to the default.
Document is mis-picked.	'E'	**1) Re-set the document.** When the document is removed, the scanner settings and indication are returned to the default.
		2) Open the scanner cover. When the scanner cover is opened, the regist sensor and ADF sensor detect no document in the ADF, and the error is cleared.
		3) Press the Stop key. The scanner settings and indication are returned to the default. Since the document is being set in the ADF, '1' is indicated.
• Document jam • Longer document than the specified size is set. • Copying is stopped by the Stop key is pressed.	'E'	**1) Remove the document.** When the cover is opened, the regist sensor and ADF sensor detect no paper in the ADF, and the error is cleared. When the document is removed without the cover being opened, the regist sensor detects no paper, and the error is cleared. After that, the scanner settings are returned to the default.
		2) Press the Stop key. The document is ejected. After that, the scanner settings are returned to the default.
Press the Copy key during printing from PC	Ignore the key	**Wait until printing is finished.**
Press the Copy key during scanning	Ignore the key	**Wait until scanning is finished.**
No paper loaded	'E' / The Alarm lamp on the printer control panel is ON.	**1) Load the paper.** After that, press the button on the printer control panel. The error is cleared automatically, and the printer continues copying.
		2) Press the Stop key. The document is ejected, then the scanner settings are returned to the default. The printer does not continue printing.
Direct copy memory full	'E'	**Press the Stop key.** The document is ejected, then the scanner settings are returned to the default.

Problem	LED Indication	Remedy
Printer overrun	'E'	**Press the Stop key.** The document is ejected, then the scanner settings are returned to the default.
Print paper jam	'E'	**1) Remove the jammed paper and press any button on the printer control panel.** If a document jam occurs in the ADF, the error indication does not disappeared. (Document jam) If there is no document in the ADF, the error is cleared automatically. The printer does not continue printing.
		2) Press the Stop key. The document is ejected, then the scanner settings are returned to the default.
Printer cover open	'E'	**1) Close the printer cover.** If a document jam occurs in the ADF, the error indication does not disappeared. (Document jam) If there is no document in the ADF, the error is cleared automatically. The printer does not continue printing.
		2) Press the Stop key. The document is ejected, then the scanner settings are returned to the default.
Printer toner empty	'E'	**1) Open the printer cover and replace the toner cartridge.** If a document jam occurs in the ADF, the error indication does not disappeared. (Document jam) If there is no document in the ADF, the error is cleared automatically. The printer does not continues printing.
		2) Press the Stop key. The document is ejected, then the scanner settings are returned to the default.

9.4 Scanner Service Error

PR98221

Problem	LED Indication	Cause
Sub ASIC Error	'E' and '0' are displayed alternately.	Hardware error of the scanned data. When the pixel number per line is over the specified value, the error occurs. It will be caused by Sub ASIC and D-RAM malfunction.
Hi-Ref Adjustment Error	'E' and '1' are displayed alternately.	Error of hi-reference adjustment which is performed with using the document pressure bar when the direct copying or PC scanning is started. The error occurs in the following cases; • If the output from the CIS is less than 1V. • If the output from the CIS is low because the document pressure bar or the surface of the CIS is dirty. • If the hi-reference value cannot be changed due to the LC82103 malfunction. • If the CIS is connected correctly.
Light Level Adjustment Error	'E' and '2' are displayed alternately.	Error of light level adjustment which is performed with the document pressure bar and the document end. The error occurs in the following cases; • If the output from the CIS is too high even though the parameter is changed till the LED is OFF. • If the LED light level is still high due to the Sub ASIC or PWM malfunction even though the parameter is changed. • If the output is high due to the CIS malfunction. • If light level cannot be adjusted correctly due to the LC82103 malfunction.
White Distortion Adjustment Data Error	'E' and '2' are displayed alternately.	Error when creating the white distortion adjustment data, which is performed with using the document pressure bar when the direct copying or PC scanning is started. The error occurs in the following cases; • If there is the white level data whose value is smaller than the one of the black. • If some parts of the image sensor in the CIS are not normal. • If the document pressure bar or the surface of the CIS is dirty. • If D-RAM in the LC82103 is not normal.

<Remedy>

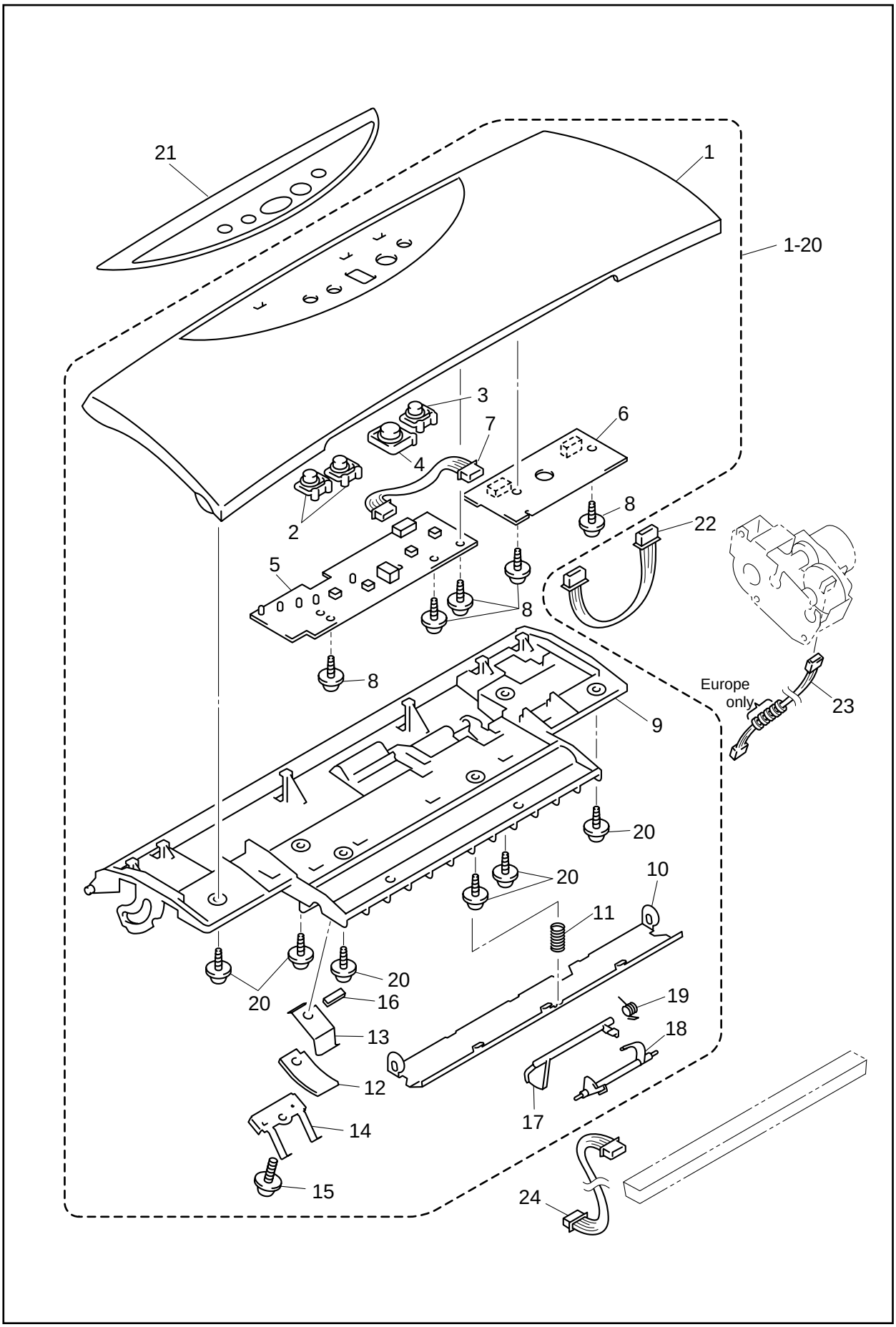
When the service error occurs, press the Stop key on the scanner control panel to clear the error.

If the service error often occurs, you need to repair or replace the main PCB and the scanner related parts such as CIS.

3. SCANNER PANEL UNIT

PR98227

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1-20	UH3900001	1	SCANNER PANEL UNIT ASSY (SP)		
1	UH3820001	1	SCANNER PANEL		
2	UH3823001	2	KEY TOP (GRAY)		
3	UH3823002	1	KEY TOP (ORANGE)		
4	UH3822001	1	START KEY (BLUE)		
5	UK4258001	1	SCANNER PANEL PCB ASSY (SP)	B512019	
6	UK4257001	1	SCANNER SENSOR PCB ASSY (SP)	B512020	
7	UK3989001	1	SCANNER PANEL HARNESS ASSY		
8	087310616	5	TAPTITE, CUP B M3X6		
9	UH3824001	1	SCANNER PANEL REAR COVER		
10	UH3779001	1	DOCUMENT PRESSURE BAR ASSY (SP)		
11	UU7147001	1	DOCUMENT PRESSURE BAR SPRING		
12	UU7104001	1	SEPARATION RUBBER		
13	UU7105001	1	ADF SPRING PLATE		
14	UU7106001	1	FRONT SPRING PLATE		
15	UF5034001	1	TAPTITE, PAN B M3X6		
16	UU7285001	1	VIBRATION-PROOF RUBBER		
17	UU7107001	1	ACTUATOR F		
18	UU7108001	1	ACTUATOR R		
19	UH3897001	1	HELICAL TORSION SPRING		
20	087310815	6	TAPTITE, CUP B M3X8		
21	UH3821001	1	PANEL SHEET, US		
21	UH3848001	1	PANEL SHEET, EU		
21	UH3754001	1	PANEL SHEET, CANADA DX		
22	UH3853001	1	SENSOR HARNESS ASSY		
23	UK4264001	1	R MOTOR HARNESS ASSY		
23	UK4321001	1	R MOTOR HARNESS ASSY EU		ADD
24	UH3855001	1	CIS HARNESS ASSY		



MODEL MFC-P2000/HL-P2000 84U-901-016

T/I No. PR98227

13. ACCESSORIES

PR98227

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UK4223001	1	PR DRIVER DISK ASSY1 (MFC-P2000)	
1	UK4237001	1	PR DRIVER DISK ASSY1 (HL-P2000)	
2	UK4225001	1	PR DRIVER DISK ASSY2 (MFC-P2000)	
2	UK4239001	1	PR DRIVER DISK ASSY2 (HL-P2000)	
3	UK4253001	1	PR DRIVER DISK ASSY3 (MFC-P2000)	
3	UK4255001	1	PR DRIVER DISK ASSY3 (HL-P2000)	
4	UK4227001	1	CD-ROM ASSY (MFC-P2000)	
4	UK4228001	1	CD-ROM ASSY (HL-P2000)	
5	UH3625001	1	EXTENSION WIRE ASSY, P2000	
5-1	UL7158001	1	TE TUBE	
6	UH3846001	1	SET GUIDE, US	
6	UH3871001	1	SET GUIDE, FRA	
6	UH3847001	1	SET GUIDE, GER	
6	UH3875001	1	SET GUIDE, NOR	
6	UH3877001	1	SET GUIDE, NL	
6	UH3882001	1	SET GUIDE, DEN	
6	UH3889001	1	SET GUIDE, SWE	
7	UE2014001	1	BAG, 215X350H	
8	UG4558001	1	I/F CABLE FE (US)	
9	UK4322001	1	CORE NF-135 ASSY	ADD

MODEL MFC-P2000/HL-P2000 84U-901-920

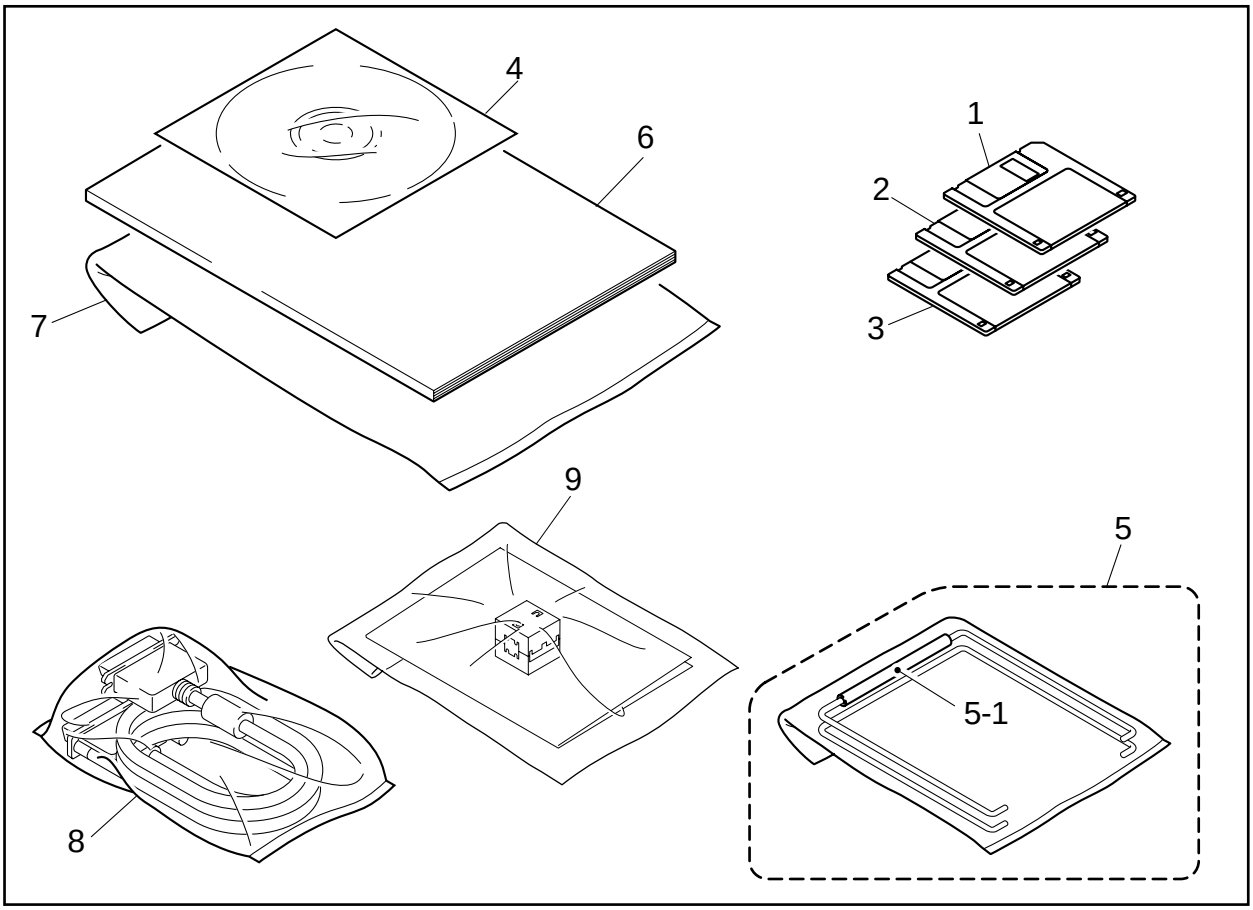
T/I NO. PR98227

14. PACKING MATERIALS

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UE0752001	1	CARTON, USA	
1	UE0753001	1	CARTON, EUR	
1	UE0777001	1	CARTON, CANADA DX	
1	UE0781001	1	CARTON, CANADA	
2	UE0754001	1	STYROFOAM PAD ASSY	
3	UE0757001	1	CARTON, ACCESORRIES	
4	UE2126001	1	BAG, 700X800 (BODY)	

MODEL MFC-P2000/HL-P2000 84U-901-930

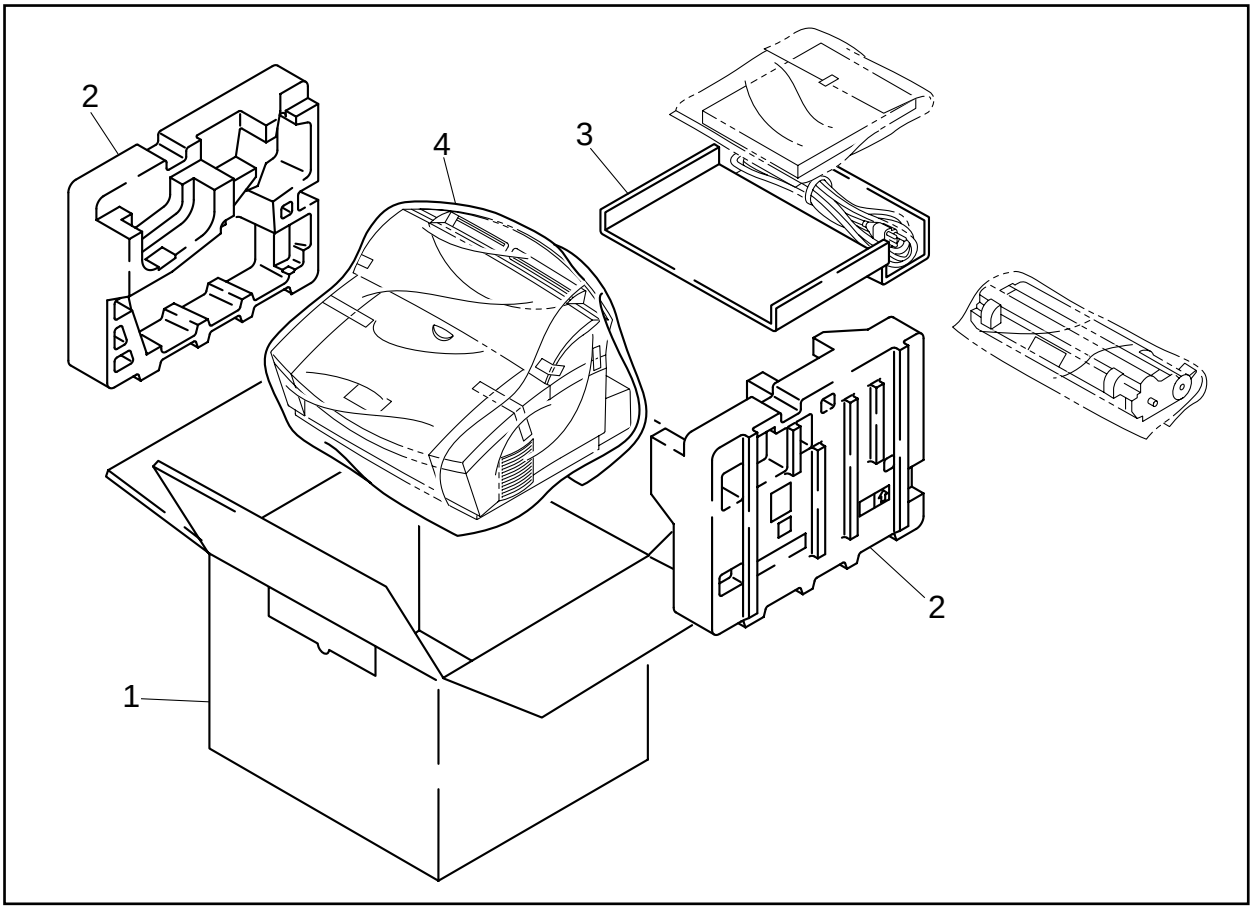
13. ACCESSORIES PR98227



MODEL MFC-P2000/HL-P2000 84U-901-920

T/I NO. PR98227

14. PACKING MATERIALS



MODEL MFC-P2000/HL-P2000 84U-901-930

4. LASER UNIT

PR98228

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UL8748001	1	LASER UNIT Y (SP)	(B48K226)	
2	085411215	3	TAPTITE, BIND B M4X12		
3	UL8759001	1	TONER SENSOR PCB ASSY	B48K231	
3	UK4326001	1	TONER SENSOR PCB ASSY EU	B48K231	ADD
4	087310815	1	TAPTITE, CUP B M3X8		
5	UH3064001	1	S SEAL SPONGE 4		

MODEL MFC-P2000/HL-P2000 84U-901-020

T/I NO. PR98228

5. MP SHEET FEEDER

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UH3899001	1	MP REAR SHEET FEEDER ASSY (SP)	

MODEL MFC-P2000/HL-P2000 84U-901-040

5. COVERS PR99041

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UL7983001	1	MAIN COVER ASSY		
2	085411215	1	TAPTITE, BIND B M4X12		
3	085411215	1	TAPTITE, BIND B M4X12		
4	085411215	1	TAPTITE, BIND B M4X12		
5	002400616	3	SCREW PAN M4X6		
6	087320616	2	TAPTITE, CUP S M3X6		
7	0A5350605	1	SCREW PAN(WASHER), M3.5X6		
8	UL8659001	1	EL PCB UNIT	B48K304	
9	UL8753001	1	MAIN FAN MOTOR		
10	UL8509001	1	SUB FAN MOTOR		
11	085411215	2	TAPTITE, BIND B M4X12		
12	UL8505001	1	BASE PLATE 820/1020/1040		
12	UL8601001	1	BASE PLATE 1050		
13	UL8506001	1	MAIN PCB GUIDE RAIL (820/1020/1040)		
14	LJ4047001	2	RUBBER FOOT		CHNG
15	085411215	8	TAPTITE, BIND B M4X12		
16	087320616	5	TAPTITE, CUP S M3X6		
17	UL8508001	1	INSULATION SHEET		
18	UL8512001	1	INLET HOLDER		
19	085411215	1	TAPTITE, BIND B M4X12		
20	UL8510001	1	I/F SHIELD ASSY 820/1020/1040		
20	UL8604001	1	I/F SHIELD ASSY 1050		
21	UL8518001	1	PANEL COVER, GRAY1227		
22	UL8745001	1	TOP COVER ASSY		
23	UL8515001	1	OUTPUT TRAY		
24	UL8516001	1	EXTENSION SUPPORT WIRE		
25	UL8746001	1	REAR COVER ASSY		
26	085411215	2	TAPTITE, BIND B M4X12		
27	UL6740001	1	LASER CAUTION LABEL		
27	UL7931001	1	LASER CAUTION LABEL (LEGEND)		
28	UL6741001	1	TONER WARNING LABEL		
29	UL8575001	1	MODEL PLATE, HL-820		
29	UL8639001	1	MODEL PLATE, HL-1020		
29	UL8519001	1	MODEL PLATE, HL-1040		
29	UL8641001	1	MODEL PLATE, HL-1040DX		
29	UL8686001	1	MODEL PLATE, HL-1040 (LEGEND)		
29	UL8611001	1	MODEL PLATE, HL-1050		
29	UL8645001	1	MODEL PLATE, HL-1050DX		
29	UL8820001	1	MODEL PLATE, HL-1050 (LEGEND)		
30	UL8640001	1	MYLAR LABEL, HL-1020 CAN		
30	UL8650001	1	MYLAR LABEL, HL-820 EUR		
30	UL8522001	1	MYLAR LABEL, HL-1040 US		
30	UL8547001	1	MYLAR LABEL, HL-1040 CAN		
30	UL8642001	1	MYLAR LABEL, HL-1040DX CAN		
30	UL8651001	1	MYLAR LABEL, HL-1040 EUR		
30	UL8612001	1	MYLAR LABEL, HL-1050 US		
30	UL8596001	1	MYLAR LABEL, HL-1050 CAN		
30	UL8646001	1	MYLAR LABEL, HL-1050DX CAN		
30	UL8652001	1	MYLAR LABEL, HL-1050 EUR		
31	UH3297001	1	C-TICK MARK LABEL		
32	UH0905001	1	US PATENT SEAL HL-10		
33	UG3005000	4	FERRITE CORE		
34	UG3005000	7	FERRITE CORE (HL1050)		
35	UK3617000	1	CORE, TFC-16813 (HL1050)		

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-060

T/I NO. PR98096 / PR98110 / PR98176 / PR99041

7. COVERS PR99041

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UL7983001	1	MAIN COVER ASSY		
2	085411215	1	TAPTITE, BIND B M4X12		
3	085411215	1	TAPTITE, BIND B M4X12		
4	085411215	1	TAPTITE, BIND B M4X12		
5	002400616	3	SCREW PAN M4X6		
6	087320616	2	TAPTITE, CUP S M3X6		
7	0A5350605	1	SCREW PAN(WASHER), M3.5X6		
8	UL8659001	1	EL PCB UNIT	B48K304	
9	UL8753001	1	MAIN FAN MOTOR		
10	UL8509001	1	SUB FAN MOTOR		
11	085411215	2	TAPTITE, BIND B M4X12		
12	UL8601001	1	BASE PLATE		
13	LJ4047001	2	RUBBER FOOT		CHNG
14	085411215	8	TAPTITE, BIND B M4X12		
15	087320616	5	TAPTITE, CUP S M3X6		
16	UL8508001	1	INSULATION SHEET		
17	UL8512001	1	INLET HOLDER		
18	085411215	1	TAPTITE, BIND B M4X12		
19	UL8510001	1	I/F SHIELD ASSY		
20	UH3828001	1	SHIELD SHEET, P2000		
21	UH3850001	1	PANEL COVER, GRAY1227		
22	UH3852001	1	TOP COVER ASSY		
23	UH3826001	1	DOCUMENT EXTENSION SUPPORT WIRE		
24	UH3825001	1	OUTPUT TRAY		
25	UL8516001	1	EXTENSION SUPPORT WIRE		
26	UH3801001	1	SCANNER REAR COVER ASSY		
27	UH3805001	1	REAR COVER ASSY		
28	085411215	2	TAPTITE, BIND B M4X12		
29	UL6740001	1	LASER CAUTION LABEL		
29	UL7931001	1	LASER CAUTION LABEL, LEG		
30	UL6741001	1	TONER WARNING LABEL		
31	UH3838001	1	MYLAR LABEL, MFC-P2000 (US)		
31	UH3839001	1	MYLAR LABEL, MFC-P2000 (CANADA)		
31	UH3840001	1	MYLAR LABEL, HL-P2000 (EUR)		
32	UG3005000	5	FERRITE CORE		
33	087320616	1	TAPTITE, CUP S M3X6		
34	UH3751001	2	MINI CLAMP		
35	UH3752001	1	NYLON CLAMP		
36	085411215	1	TAPTITE, BIND B M4X12		

MODEL MFC-P2000/HL-P2000 84U-901/902-060

T/I NO. PR98303 / PR99041

5. FIXING UNITS PR99042

REF.NO	CODE	Q'TY	DESCRIPTION	REMARK
1-9	UH3164001	1	FIXING UNIT Y, 120V (SP)	
1-9	UH3165001	1	FIXING UNIT Y, 230V (SP)	
1	UH3306001	1	HALOGEN LAMP Y, 120V (SP)	
1	UH3307001	1	HALOGEN LAMP Y, 230V (SP)	
2	087411616	2	TAPTITE, CUP B M4X16	
3	UL6667001	1	THERMISTOR ASSY	CHNG
4	UH3188001	1	CLEANER ASSY Y	
5	UH3178000	2	H/R BEARING Y	
6	UH3419001	1	HEAT ROLLER YS ASSY	
7	087311415	1	TAPTITE, CUP B 3X14	
8	UH3323001	4	EJECT PINCH ROLLER ASSY	
9	UL6682001	4	PINCH SPRING	

MODEL HL-1060 54U-S01-051

T/I NO. PR98040 / PR98292 / PR99042

7. MAIN PCB

REF.NO	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UK3439001	1	MAIN PCB ASSY, PCL5 2M(SP)	B48K246-300J	

MODEL HL-1060 54U-S01-101

T/I No. 97-P028 / 97-P043 / PR97161

5. FIXING UNITS

PR99042

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1-9	UH3164001	1	FIXING UNIT Y, 120V (SP)	
1-9	UH3165001	1	FIXING UNIT Y, 230V (SP)	
1	UH3306001	1	HALOGEN LAMP Y, 120V (SP)	
1	UH3307001	1	HALOGEN LAMP Y, 230V (SP)	
2	087411616	2	TAPTITE, CUP B M4X16	
3	UL6667001	1	THERMISTOR ASSY	CHNG
4	UH3188001	1	CLEANER ASSY Y	
5	UH3178000	2	H/R BEARING Y	
6	UH3419001	1	HEAT ROLLER YS ASSY (SP)	
7	087311415	1	TAPTITE, CUP B 3X14	
8	UH3323001	4	EJECT PINCH ROLLER ASSY	
9	UL6682001	4	PINCH SPRING	

MODEL HL-1070 54U-S03-050/051

T/I NO. PR98292 / PR99042

7. MAIN PCB

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UK3950001	1	MAIN PCB ASSY	B48K302-100C	
2	UH3542001	1	CONDUCTIVE TAPE		

MODEL HL-1070 54U-S03-101

T/I NO. PR98108

3. MP SHEET FEEDER

PR99042

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UL8749001	1	MP SHEET FEEDER ASSY (SP)	
1	UL8832001	1	MP SHEET FEEDER ASSY (LEGEND) (SP)	

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-040

T/I NO. PR98176

4. FIXING UNIT

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1-11	UL8750001	1	FIXING UNIT, 120V (SP)	
1-11	UL8751001	1	FIXING UNIT, 230V (SP)	
1-11	UL8833001	1	FIXING UNIT (LEGEND) (SP)	
1	UH3306001	1	HALOGEN LAMP Y, 120V (SP)	
1	UH3307001	1	HALOGEN LAMP Y, 230V (SP)	
2	087411616	2	TAPTITE, CUP B M4X16	
3	085311216	2	TAPTITE, BIND B M3X12	
4	083311017	2	TAPTITE, PAN B M3X10	
5	UL8757001	1	HEAT ROLLER YS (SP)	
5	UL8834001	1	HEAT ROLLER (LEGEND) (SP)	
6	UH3178000	2	H/R BEARING Y	
7	UL8758001	1	H/R CLEANER	
7	UL8855001	1	H/R CLEANER (LEGEND)	
8	UL8754001	1	H/R WASHER	
9	UL6667001	1	THERMISTOR ASSY	CHNG
10	UH3323001	4	EJECT PINCH ROLLER ASSY	
11	UL6682001	4	PINCH SPRING	

MODEL HL-820/1020/1040/1050 84U-821/831/861-050/051 84U-832/862-052

T/I NO. PR98116 / PR98176 / PR98271 / PR98292 / PR99042

6. FIXING UNIT

PR99042

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1-11	UL8750001	1	FIXING UNIT, 120V (SP)	
1-11	UL8751001	1	FIXING UNIT, 230V (SP)	
1-11	UL8833001	1	FIXING UNIT, LEG 230V (SP)	
1	UH3306001	1	HALOGEN LAMP Y, 120V (SP)	
1	UH3307001	1	HALOGEN LAMP Y, 230V (SP)	
2	087411616	2	TAPTITE, CUP B M4X16	
3	085311216	2	TAPTITE, BIND B M3X12	
4	083311017	2	TAPTITE, PAN B M3X10	
5	UL8757001	1	HEAT ROLLER YS (SP)	
5	UL8834001	1	HEAT ROLLER, LEG (SP)	
6	UH3178000	2	H/R BEARING Y	
7	UL8758001	1	H/R CLEANER	
7	UL8855001	1	H/R CLEANER, LEG	
8	UL8754001	1	H/R WASHER	
9	UL6667001	1	THERMISTOR ASSY	CHNG
10	UH3323001	4	EJECT PINCH ROLLER ASSY	
11	UL6682001	4	PINCH SPRING	

MODEL MFC-P2000/HL-P2000 84U-901/902-050/051/052

T/I NO. PR98271 / PR98292 / PR98303

8. MAIN PCB

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1-1	UK4250001	1	MAIN PCB ASSY, US (SP)	B512018-100C	
1-1	UK4251001	1	MAIN PCB ASSY, EUR (SP)	B512018-101B	
1-1	UK4252001	1	MAIN PCB ASSY, HEB (SP)	B512018-102	
1	UK4328000	1	MROMP2000, US	#4	
1	UK4320000	1	MROMP2000, EUR	#4	
1	UK4160000	1	MROMP2000, HEB	#4	

MODEL MFC-P2000/HL-P2000 84U-901/902-101/102/103

T/I NO. PR98260

5. COVERS PR99057

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UL7983001	1	MAIN COVER ASSY		
2	085411215	1	TAPTITE, BIND B M4X12		
3	085411215	1	TAPTITE, BIND B M4X12		
4	085411215	1	TAPTITE, BIND B M4X12		
5	002400616	3	SCREW PAN M4X6		
6	087320616	2	TAPTITE, CUP S M3X6		
7	0A5350605	1	SCREW PAN(WASHER), M3.5X6		
8	UL8659001	1	EL PCB UNIT	B48K304	
9	UL8753001	1	MAIN FAN MOTOR		
10	UL8509001	1	SUB FAN MOTOR		
11	085411215	2	TAPTITE, BIND B M4X12		
12	UL8505001	1	BASE PLATE 820/1020/1040		
12	UL8601001	1	BASE PLATE 1050		
13	UL8506001	1	MAIN PCB GUIDE RAIL (820/1020/1040)		
14	UL8507001	2	RUBBER FOOT		CHNG
15	085411215	8	TAPTITE, BIND B M4X12		
16	087320616	5	TAPTITE, CUP S M3X6		
17	UL8508001	1	INSULATION SHEET		
18	UL8512001	1	INLET HOLDER		
19	085411215	1	TAPTITE, BIND B M4X12		
20	UL8510001	1	I/F SHIELD ASSY 820/1020/1040		
20	UL8604001	1	I/F SHIELD ASSY 1050		
21	UL8518001	1	PANEL COVER, GRAY1227		
22	UL8745001	1	TOP COVER ASSY		
23	UL8515001	1	OUTPUT TRAY		
24	UL8516001	1	EXTENSION SUPPORT WIRE		
25	UL8746001	1	REAR COVER ASSY		
26	085411215	2	TAPTITE, BIND B M4X12		
27	UL6740001	1	LASER CAUTION LABEL		
27	UL7931001	1	LASER CAUTION LABEL (LEGEND)		
28	UL6741001	1	TONER WARNING LABEL		
29	UL8575001	1	MODEL PLATE, HL-820		
29	UL8639001	1	MODEL PLATE, HL-1020		
29	UL8519001	1	MODEL PLATE, HL-1040		
29	UL8641001	1	MODEL PLATE, HL-1040DX		
29	UL8686001	1	MODEL PLATE, HL-1040 (LEGEND)		
29	UL8611001	1	MODEL PLATE, HL-1050		
29	UL8645001	1	MODEL PLATE, HL-1050DX		
29	UL8820001	1	MODEL PLATE, HL-1050 (LEGEND)		
30	UL8640001	1	MYLAR LABEL, HL-1020 CAN		
30	UL8650001	1	MYLAR LABEL, HL-820 EUR		
30	UL8522001	1	MYLAR LABEL, HL-1040 US		
30	UL8547001	1	MYLAR LABEL, HL-1040 CAN		
30	UL8642001	1	MYLAR LABEL, HL-1040DX CAN		
30	UL8651001	1	MYLAR LABEL, HL-1040 EUR		
30	UL8612001	1	MYLAR LABEL, HL-1050 US		
30	UL8596001	1	MYLAR LABEL, HL-1050 CAN		
30	UL8646001	1	MYLAR LABEL, HL-1050DX CAN		
30	UL8652001	1	MYLAR LABEL, HL-1050 EUR		
31	UH3297001	1	C-TICK MARK LABEL		
32	UH0905001	1	US PATENT SEAL HL-10		
33	UG3005000	4	FERRITE CORE		
34	UG3005000	7	FERRITE CORE (HL1050)		
35	UK3617000	1	CORE, TFC-16813 (HL1050)		

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-060

T/I NO. PR98096 / PR98110 / PR98176 / PR99041 / PR99057

7. COVERS PR99057

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UL7983001	1	MAIN COVER ASSY		
2	085411215	1	TAPTITE, BIND B M4X12		
3	085411215	1	TAPTITE, BIND B M4X12		
4	085411215	1	TAPTITE, BIND B M4X12		
5	002400616	3	SCREW PAN M4X6		
6	087320616	2	TAPTITE, CUP S M3X6		
7	0A5350605	1	SCREW PAN(WASHER), M3.5X6		
8	UL8659001	1	EL PCB UNIT	B48K304	
9	UL8753001	1	MAIN FAN MOTOR		
10	UL8509001	1	SUB FAN MOTOR		
11	085411215	2	TAPTITE, BIND B M4X12		
12	UL8601001	1	BASE PLATE		
13	UL8507001	2	RUBBER FOOT		CHNG
14	085411215	8	TAPTITE, BIND B M4X12		
15	087320616	5	TAPTITE, CUP S M3X6		
16	UL8508001	1	INSULATION SHEET		
17	UL8512001	1	INLET HOLDER		
18	085411215	1	TAPTITE, BIND B M4X12		
19	UL8510001	1	I/F SHIELD ASSY		
20	UH3828001	1	SHIELD SHEET, P2000		
21	UH3850001	1	PANEL COVER, GRAY1227		
22	UH3852001	1	TOP COVER ASSY		
23	UH3826001	1	DOCUMENT EXTENSION SUPPORT WIRE		
24	UH3825001	1	OUTPUT TRAY		
25	UL8516001	1	EXTENSION SUPPORT WIRE		
26	UH3801001	1	SCANNER REAR COVER ASSY		
27	UH3805001	1	REAR COVER ASSY		
28	085411215	2	TAPTITE, BIND B M4X12		
29	UL6740001	1	LASER CAUTION LABEL		
29	UL7931001	1	LASER CAUTION LABEL, LEG		
30	UL6741001	1	TONER WARNING LABEL		
31	UH3838001	1	MYLAR LABEL, MFC-P2000 (US)		
31	UH3839001	1	MYLAR LABEL, MFC-P2000 (CANADA)		
31	UH3840001	1	MYLAR LABEL, HL-P2000 (EUR)		
32	UG3005000	5	FERRITE CORE		
33	087320616	1	TAPTITE, CUP S M3X6		
34	UH3751001	2	MINI CLAMP		
35	UH3752001	1	NYLON CLAMP		
36	085411215	1	TAPTITE, BIND B M4X12		

MODEL MFC-P2000/HL-P2000 84U-901/902-060

T/I NO. PR98303 / PR99041 / PR99057