

brother®

**LASER PRINTER
SERVICE MANUAL**

MODEL:HL-820/1020/1040/1050

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PREFACE

This service manual contains basic information required for after-sales service of the laser printer (here- in-after 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 printers.

This service manual covers the HL-820, 1020, 1040 and 1050 laser printers. (Note that any figures for the printer body are based on the HL-1040 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, CONNECTION DIAGRAMS, PCB CIRCUIT DIAGRAMS.

Information in this manual is subject to change due to improvement or re-design 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:

High Resolution and Fast Printing Speed

<HL-820>

True 600 dots per inch (dpi) with microfine toner and 8 pages per minute (ppm) printing speed (A4 or Letter paper).

<HL-1040/1020>

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

<HL-1050>

True 600 dots per inch (dpi) and 1200 x 600 dpi for graphics 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 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.

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. The multi-purpose sheet feeder also allows manual paper loading, so you can also use labels and transparencies.

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 600dpi graphic and text data, including large fonts, with the standard printer memory.

Remote Printer Console Program for DOS (for HL-1040/1050 only)

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 (for HL-1040/1050 only)

These printers support the following printer emulation modes;

The HL-1040 supports HP LaserJet IIP, Epson FX-850, and IBM Proprinter XL

The HL-1050 supports HP LaserJet 6P/6L, 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 printer in the 300 dpi resolution mode. The printers also support Auto-emulation switching between HP and Epson or HP and IBM. If you want to set the printer emulation, you can do it using the Remote Printer Console Program.

USB Interface (for HL-1050 only)

The Universal Serial Bus Interface is an interface which allows the printer to connect to multiple peripheral devices.

High Resolution Control & Advanced Photoscale Technology (for HL-1050 only)

High resolution control (HRC) technology provides clear and crisp printouts. Use this function to get smooth text print quality.

Advanced Photoscale Technology enables the printer to print graphics in 256 grayscales, producing nearly photographic quality. Use this function when you want to print photographic images.

Optional Apple Macintosh® Interface (for HL-1040/1050 only)

An optional Apple Macintosh serial interface is available which allows your printer to be connected to Apple Macintosh computers. With this option, you can use your printer with both an IBM PC (or compatible) and an Apple Macintosh at the same time. This optional interface board can be used as an RS-422A interface for Macintosh or an RS-232C serial interface for an IBM PC or compatible.

2. SPECIFICATIONS

2.1 Printing

Print method	Electrophotography by semiconductor laser beam scanning	
Laser:	Wave length:	780nm
	Output:	5mW max
Resolution	HL-820/1020:	600 x 600dots/inch (for Windows)
	HL-1040:	600 x 600dots/inch (for Windows or DOS) 300 x 300dots/inch (under Apple Macintosh, DOS, or other operating system)
	HL-1050:	1200(H) x 600(V)dots/inch (for Windows DIB graphics) 600 x 600dots/inch (for Windows or DOS) 300 x 300dpi (under Apple Macintosh using optional RS-100M)
Print speed	HL-820:	Up to 8 pages/minute
	HL-1020/1040/1050:	Up to 10 pages/minute (when loading 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	

2.2 Functions

CPU	HL-820/1020/1040:	MC68EC000 16Mhz
	HL-1050:	MB86831 66Mhz
Emulation	HL-820/1020:	Brother Printing Solution for Windows
	HL-1040:	Brother Printing Solution for Windows Automatic emulation selection among HP LaserJet IIP (PCL level 4), EPSON FX-850, and IBM Proprinter XL
	HL-1050:	Brother Printing Solution for Windows Automatic emulation selection among HP LaserJet 6P (PCL level 6), EPSON FX-850, and 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. Optional Macintosh driver available for System 6.0.7 or higher (for HL- 1040/1050 only)	

Interface	Bi-directional parallel Universal Serial Bus (USB) (HL-1050 only) RS-422A/RS-232C serial (RS-100M) is optionally available. (HL-1040/1050 only)
Memory	HL-820/1020/1040: 2.0 Mbytes HL-1050: 4.0 Mbytes Expandable up to 36 Mbytes by installing an industry standard SIMM
Control panel	1 switch and 4 lamps
Diagnostics	Self-diagnostic program

2.3 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 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 365 x 245 mm (15.4 x 14.4 x 9.7 inches) (when the output tray is closed.)
Weight	Approx. 7.2kg (15.7lb.) including the drum unit and toner cartridge

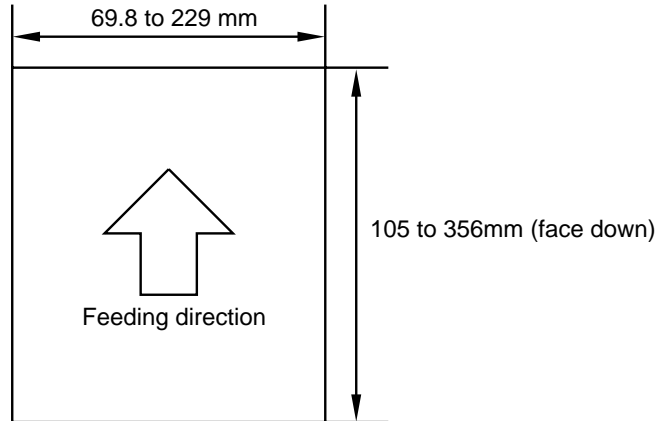
Note:

- *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.*

2.4 Paper Loading

(1) Multi-purpose sheet feeder 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.



Feedable paper weight: 60 (16lb.) to 158 (42lb.) g/m²

Maximum load height : 22mm (200 sheets of 80g/m² 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.

(2) Manual slot loading

Paper size: Same as in (1) for the multi-purpose sheet feeder.

Feedable paper weight: Same as in (1) for the multi-purpose sheet feeder.

Setting methods: Place the side of the paper to be printed on face down into the manual feed slot after selecting orientation. Align the paper at the center of the manual feed slot, and be sure to insert it fully into the feed slot. Move the paper guide of the manual feed slot to the paper width.

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.

2.5 Print Delivery

(1) With the output tray opened

Tray capacity: Maximum 100 sheets (80g/m²), face-down only

(2) With the output tray closed

Tray capacity: 1 sheet (80g/m²), face-down only

Note:

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

2.6 Paper

(1) Paper type

(a) Normal paper (60 to 157g/m², 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/m²)

A4 : Xerox 80 Premier Paper (80g/m²)

(b) Special paper (specified types)

- Labels
- Envelopes (DL, C4, C5, COM10, Monarch)
- Organizers (K, L, and J sizes of DAY-TIMERS)

(c) Other detailed specifications

	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)

Caution:

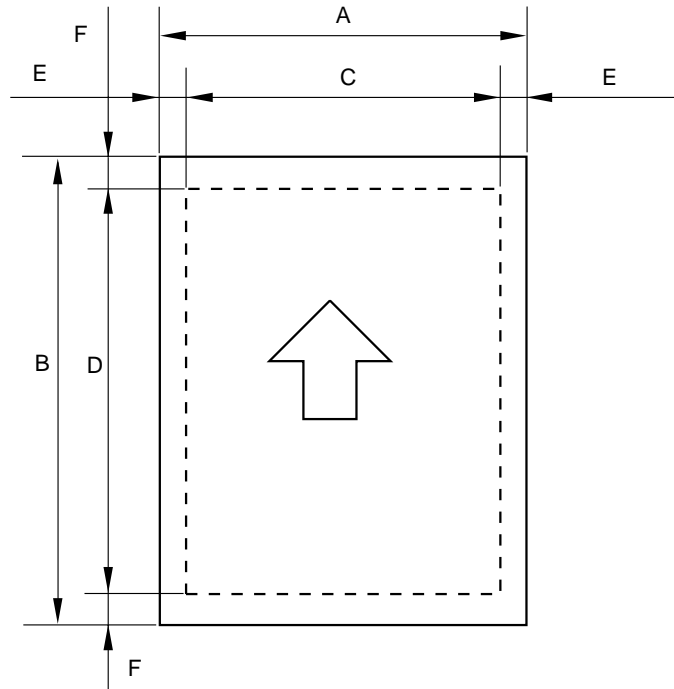
- *Although the printer can handle 9 inches (229mm) width paper such as the C4 size envelope, you may get stains on the paper outside 8.5 inches width or on the back of the paper.*
- *It is recommended to use long-grained paper for the best print quality. If short-grained paper is being used, it might 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	Manual feed
Normal paper (cut sheet)	60 to 80 g/m ²	○ (200 sheets)	○
	80 g/m ² paper (Legal)	○ (100 sheets)	○
	158 g/m ²	○ (30 sheets)	○
Special paper (cut sheet)	Labels	○ (50 sheets)	○
	Envelopes	○ (10 sheets)	○
	Organizers	○ (10 sheets)	○

2.7 Effective Printing Area

Printable area



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

The table below shows the effective printing areas.

Size	A	B	C	D	E	F
A 4	210.0mm 8.27" (2,480 dots)	297.0mm 11.69" (3,507 dots)	203.2mm 8.0" (2,400 dots)	288.5mm 11.36" (3,407 dots)	3.4mm 0.13" (40 dots)	4.23mm 0.17" (50 dots)
Letter	215.9mm 8.5" (2,550 dots)	279.4mm 11.0" (3,300 dots)	203.2mm 8.0" (2,400 dots)	270.9mm 10.67" (3,200 dots)	6.35mm 0.25" (75 dots)	○
Legal	215.9mm 8.5" (2,550 dots)	355.6mm 14.0" (4,200 dots)	203.2mm 8.0" (2,400 dots)	347.1mm 13.67" (4,100 dots)	○	○
B 5 (JIS)	182.0mm 7.16" (2,149 dots)	257.0mm 10.12" (3,035 dots)	173.5mm 6.83" (2,007 dots)	248.5mm 9.78" (2,935 dots)	6.01mm 0.24" (71 dots)	○
B 5 (ISO)	176.0mm 6.93" (2,078 dots)	250.0mm 9.84" (2,952 dots)	164.0mm 6.46" (1,936 dots)	241.5mm 9.5" (2,852 dots)	○	○
Executive	184.15mm 7.25" (2,175 dots)	266.7mm 10.5" (3,150 dots)	175.7mm 6.92" (2,025 dots)	258.2mm 10.17" (3,050 dots)	6.35mm 0.25" (75 dots)	○
A 5	148.5mm 5.85" (1,754 dots)	210.0mm 8.27" (2,480 dots)	136.5mm 5.37" (1,612 dots)	201.5mm 7.93" (2,380 dots)	6.01mm 0.24" (71 dots)	○
A6	105.0mm 4.13" (1,240 dots)	148.5mm 5.85" (1,754 dots)	93.0mm 3.66" (1,098 dots)	140.0mm 5.51" (1,654 dots)	○	○
Organizer (J size)	69.85mm 2.75" (825 dots)	127.0mm 5.0" (1,500 dots)	56.2mm 2.21" (675 dots)	118.5mm 4.66" (1,400 dots)	6.35mm 0.25" (75 dots)	○
Organizer (K size)	95.25mm 3.75" (1,125 dots)	171.45mm 6.75" (2,025 dots)	86.78mm 3.42" (975 dots)	162.98mm 6.42" (1,925 dots)	○	○
Organizer (L size)	139.7mm 5.5" (1,650 dots)	215.9mm 8.5" (2,550 dots)	131.23mm 5.17" (1,500 dots)	207.43mm 8.17" (2,450 dots)	○	○
COM-10	104.78mm 4.125" (1,237 dots)	241.3mm 9.5" (2,850 dots)	92.11mm 3.63" (1,087 dots)	232.8mm 9.16" (2,750 dots)	○	○
MONARCH	98.43mm 3.875" (1,162 dots)	190.5mm 7.5" (2,250 dots)	85.7mm 3.37" (1,012 dots)	182.0mm 7.16" (2,150 dots)	○	○
C 4	228.6mm 9.0" (2,700 dots)	304.8mm 12.0" (3,600 dots)	203.2mm 8.0" (2,400 dots)	296.3mm 11.66" (3,500 dots)	12.7mm 0.5" (150 dots)	○
C 5	162mm 6.38" (1,913 dots)	229mm 9.01" (2,704 dots)	150.0mm 5.9" (1,771 dots)	220.5mm 8.68" (2,604 dots)	6.01mm 0.24" (71 dots)	○
DL	110mm 4.33" (1,299 dots)	220mm 8.66" (2,598 dots)	98.0mm 3.86" (1,157 dots)	211.5mm 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. SAFETY INFORMATION

3.1 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 machine during any phase of user operation.

3.2 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: BROTHER INDUSTRIES, LTD.	K
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 : 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.	C
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3.3 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.

(1) Location of the laser beam window.

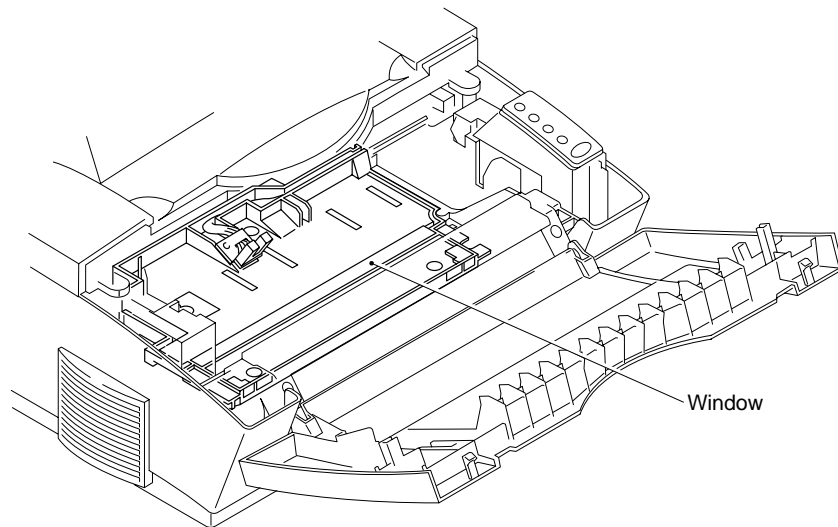


Fig. 1-1

(2) Location of Caution Label for Laser Product. (200V only)

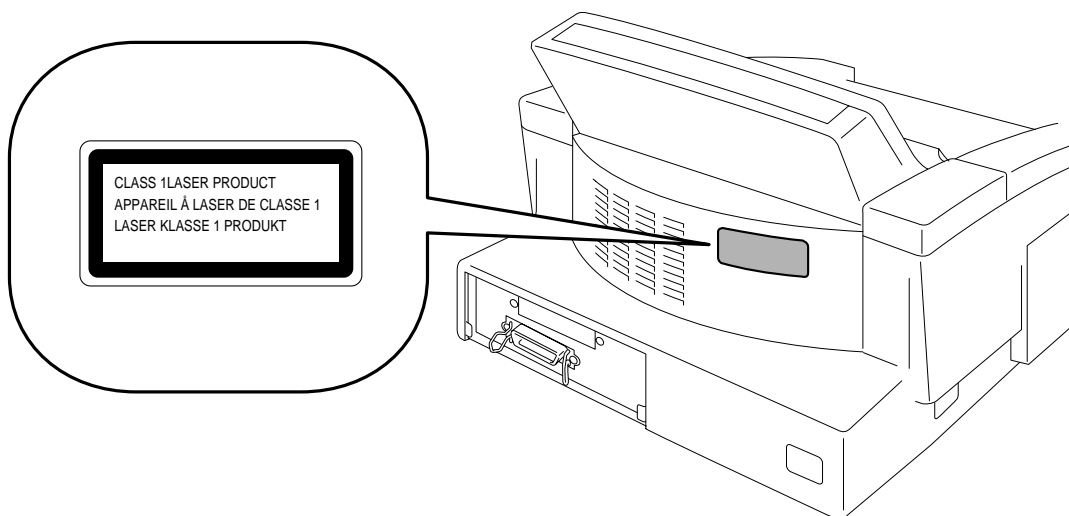


Fig. 1-2

CHAPTER II THEORY OF OPERATION

1. ELECTRONICS

1.1 General Block Diagram

HL-820/1020

Fig. 2-1 shows a general block diagram of the HL-820/1020 printer.

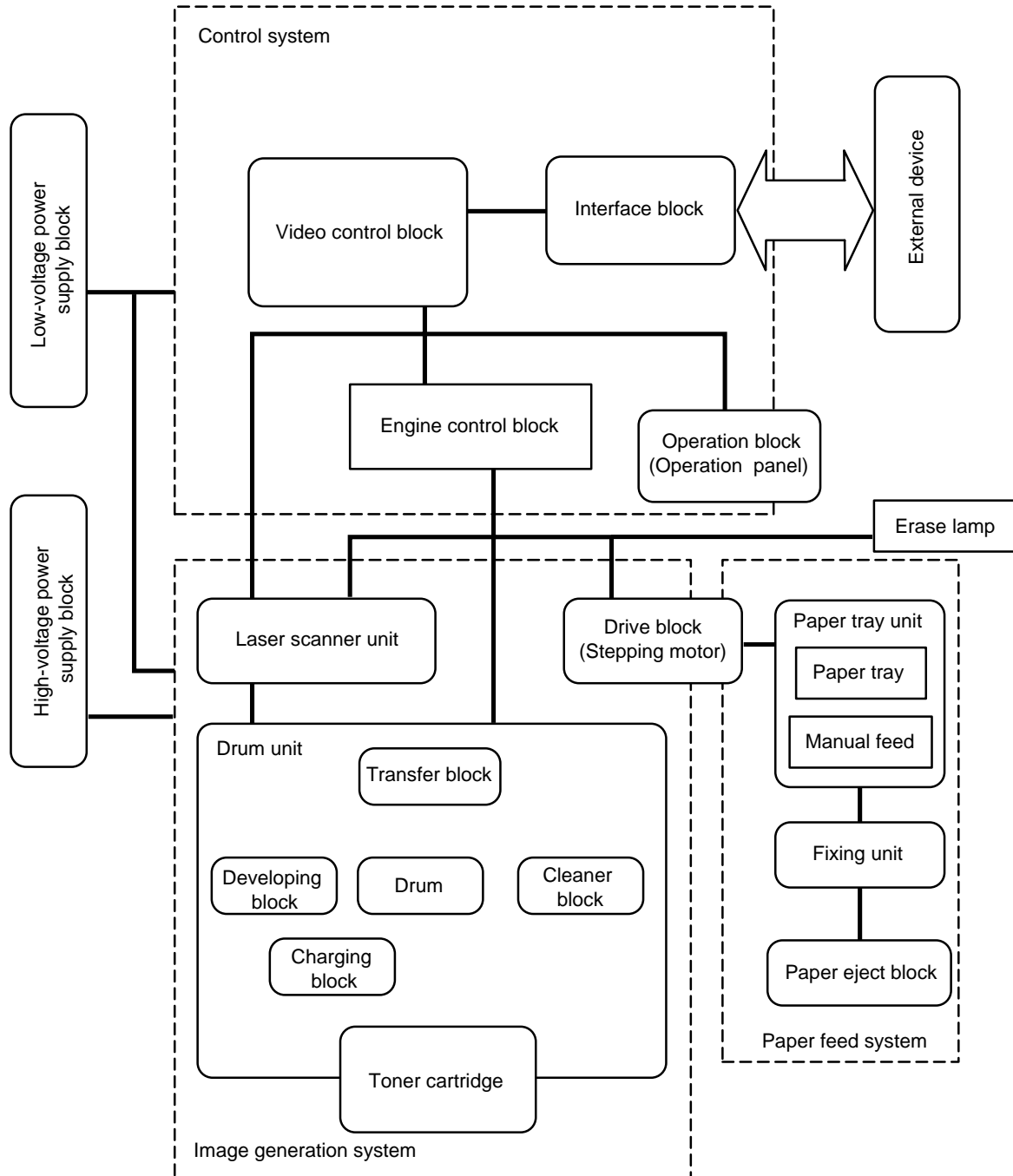


Fig. 2-1

HL-1040

Fig. 2-2 shows a general block diagram of the HL-1040 printer.

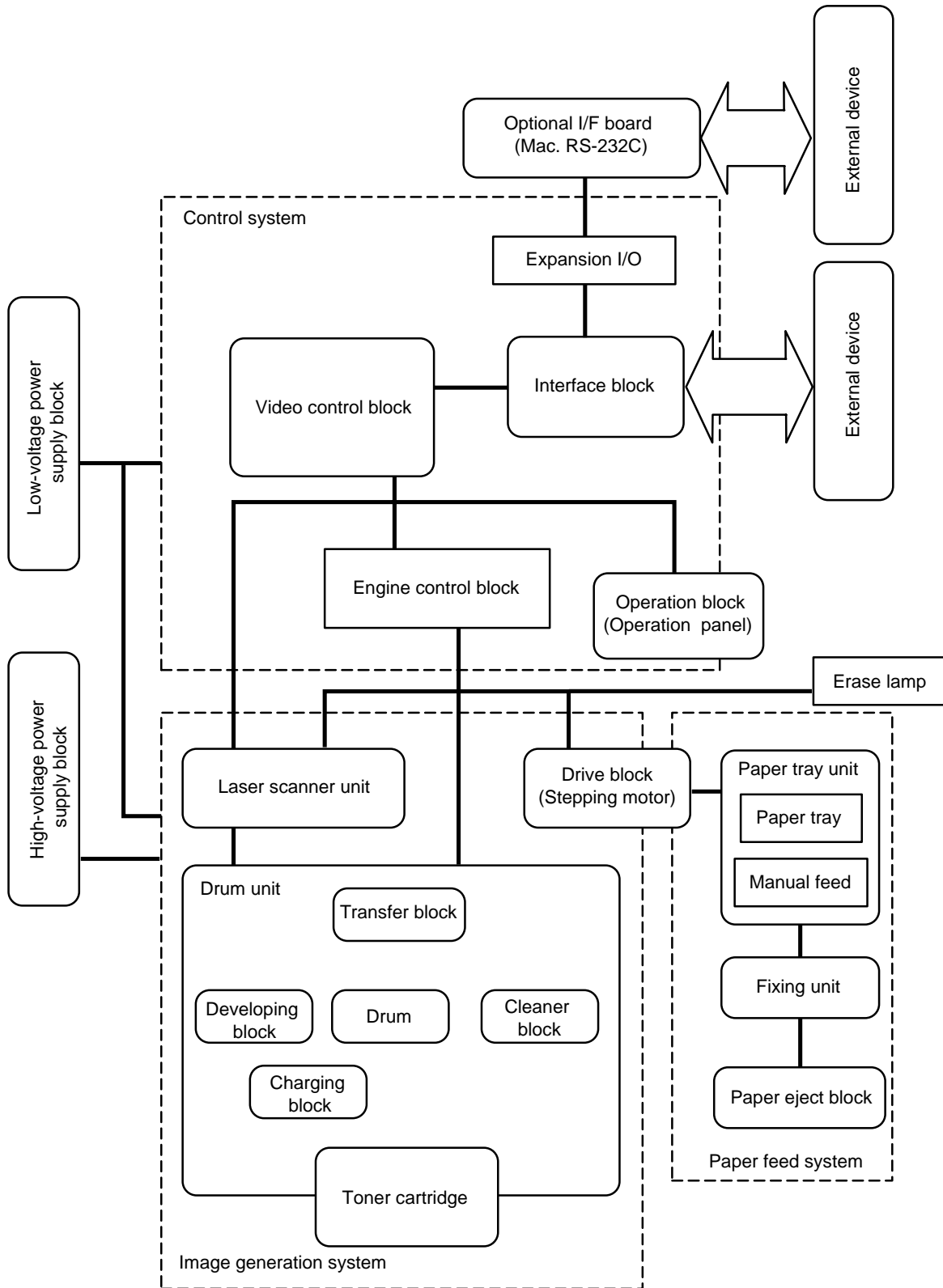


Fig. 2-2

HL-1050

Fig. 2-3 shows a general block diagram of the HL-1050 printer.

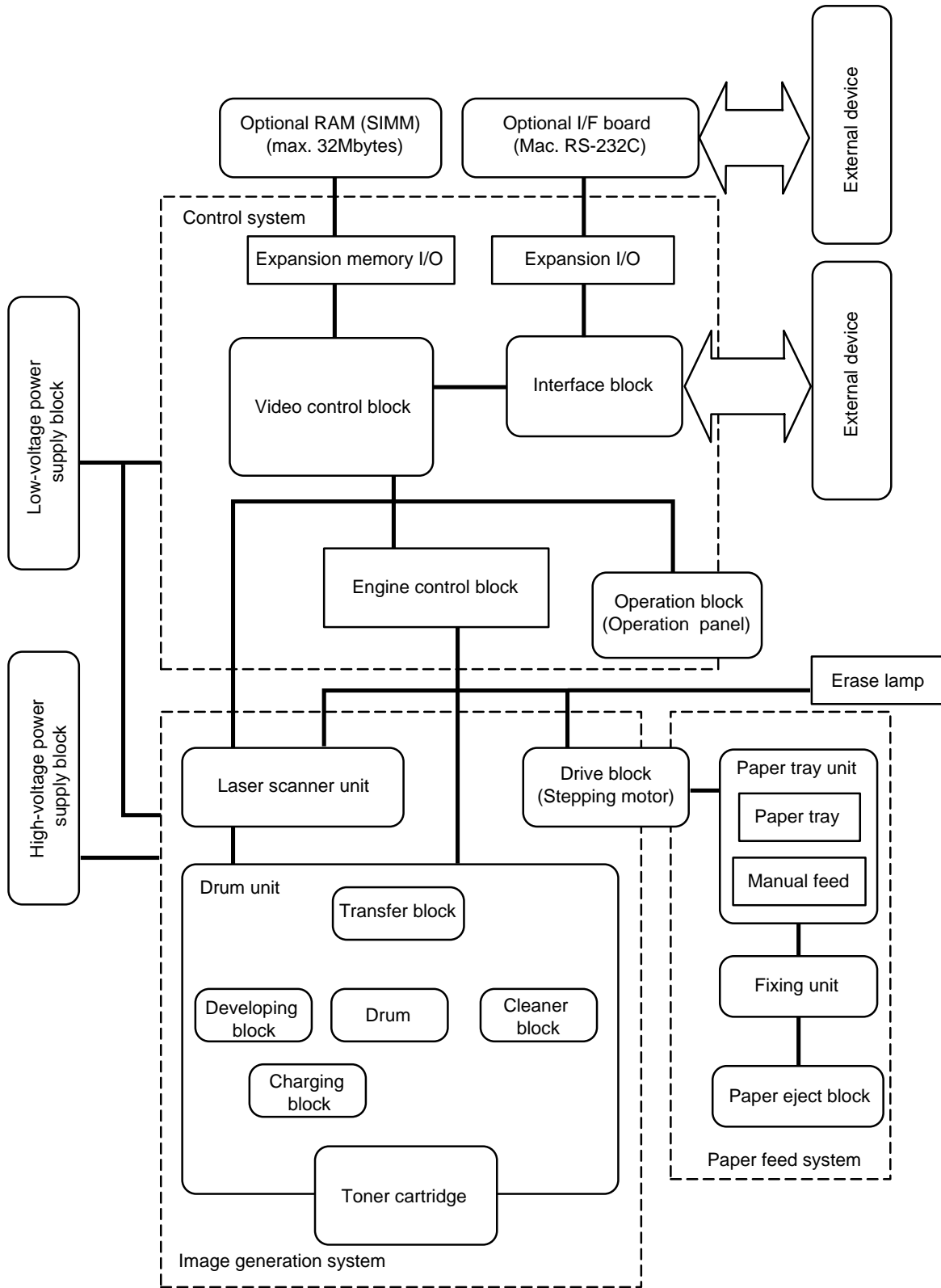


Fig. 2-3

1.2 Main PCB Block Diagram

HL-820/1020

Fig. 2-4 shows the block diagram of the main PCB.

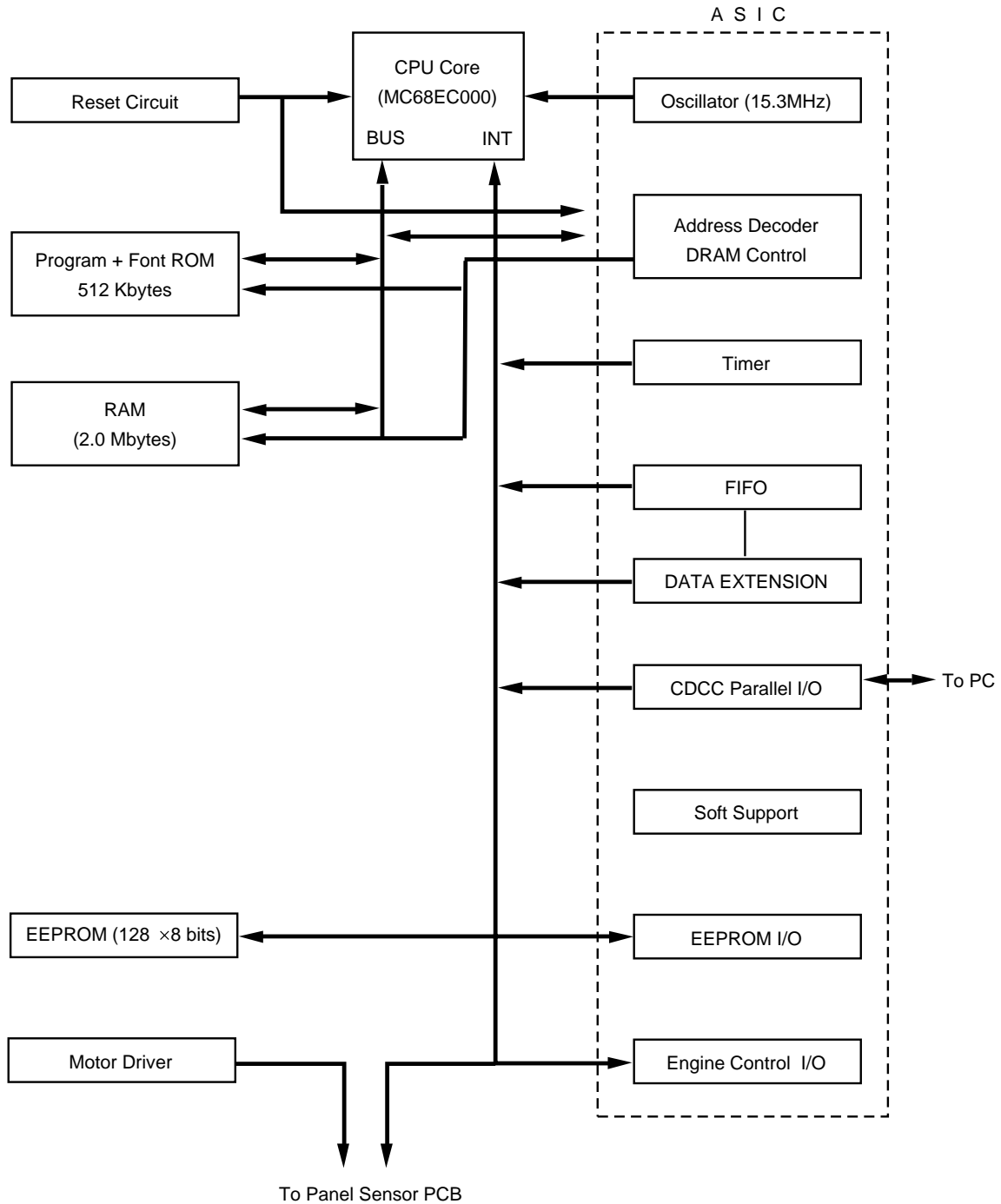


Fig. 2-4

Fig. 2-5 shows the block diagram of the main PCB.

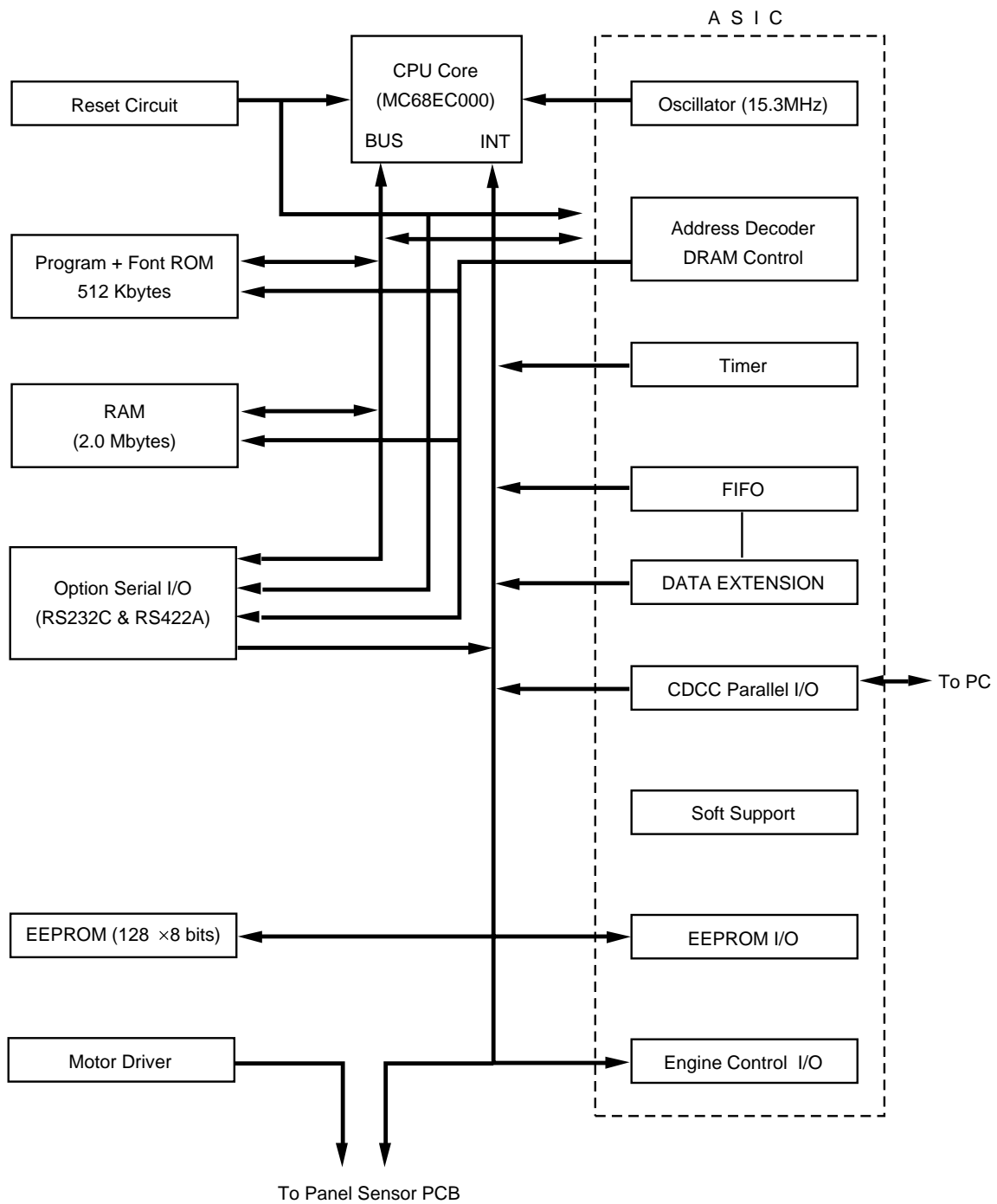


Fig. 2-5

HL-1050

Fig. 2-6 shows the block diagram of the main PCB.

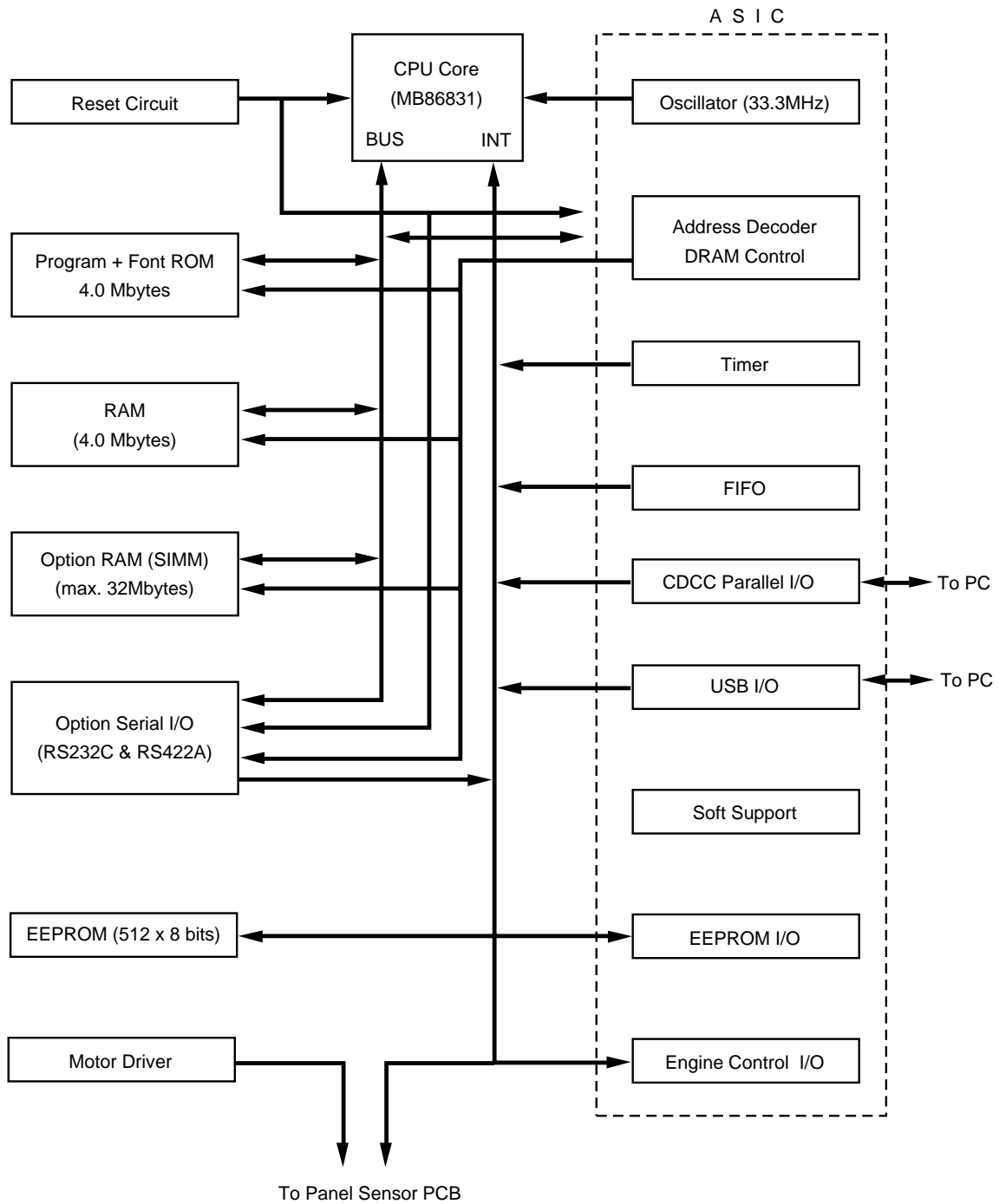


Fig. 2-6

1.3 Main PCB

1.3.1 CPU Core

HL-820/1020/1040

Fig. 2-7 shows the CPU circuit block on the main PCB.

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

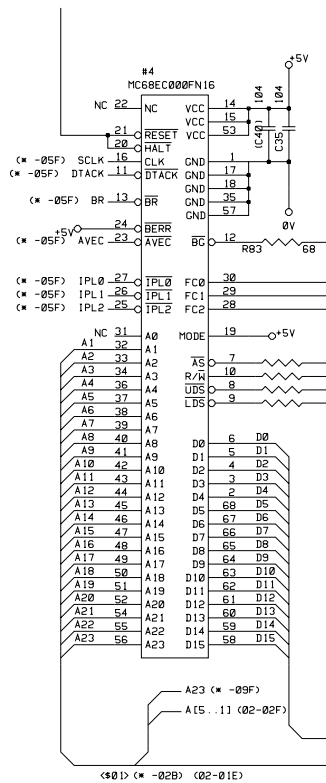


Fig. 2-7

HL-1050

Fig. 2-8 shows the CPU circuit block on the main PCB.

The CPU is a Motorola MB86831 which is driven with a clock frequency of 33MHz. The CPU itself runs at 66MHz.

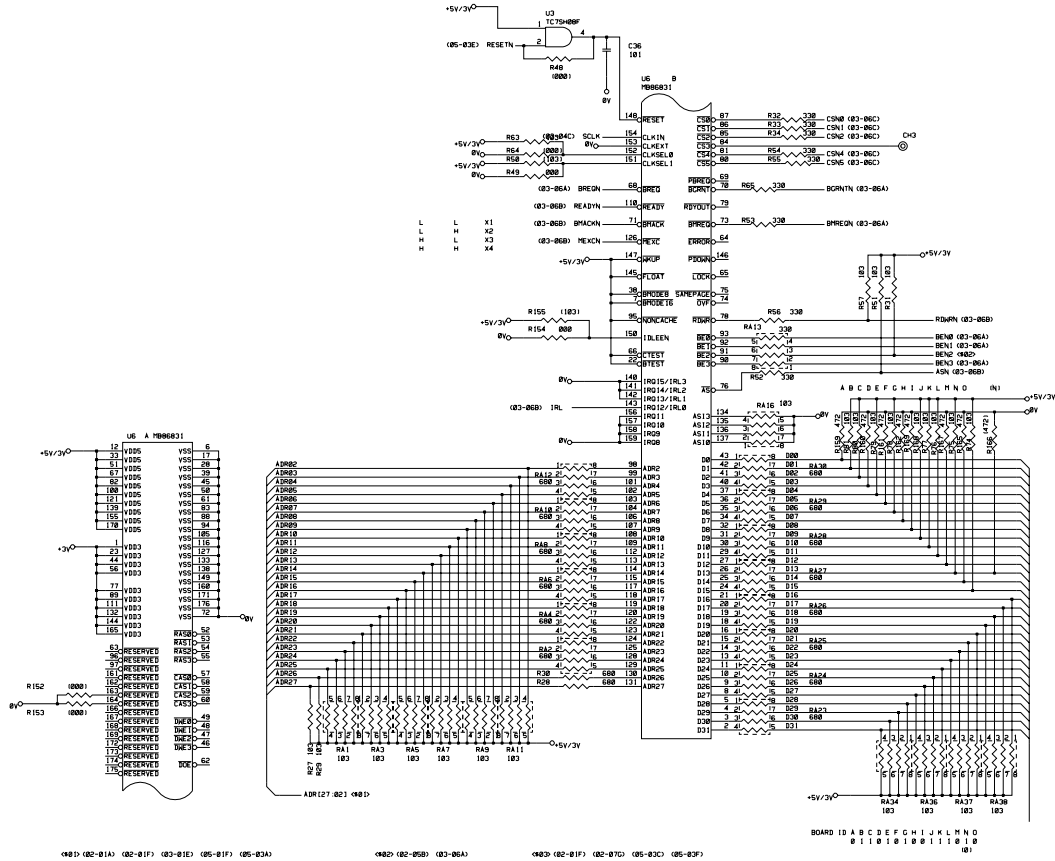


Fig. 2-8

1.3.2 ASIC

HL-820/1020/1040

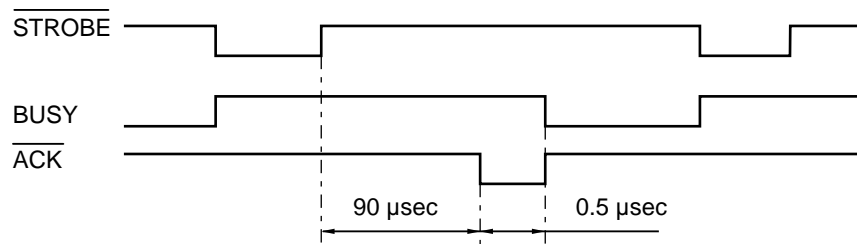
The ASIC is composed of a Cell Based IC that contains the following functional blocks.

- (1) Oscillator circuit
Generates the main clock for the CPU by dividing the source clock frequency into two.
- (2) Address decoder
Generates the CS for each device.
- (3) DRAM control
Generates the $\overline{\text{RAS}}$, $\overline{\text{CAS}}$, $\overline{\text{WE}}$, $\overline{\text{OE}}$ and MA signals for the DRAM and controls refresh processing (CAS before RAS self-refreshing method).
- (4) Interrupt control
Interrupt levels:

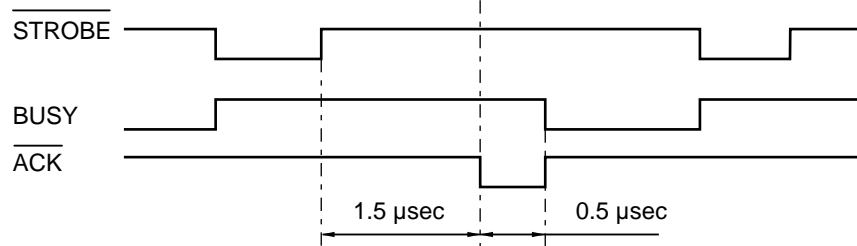
Priority	High	7	NMI
		6	FIFO
		5	EXINT(Option Serial I/O)
		4	BD / Timer 1
		3	SCANINT
		2	CDCC / BOISE / DATA EXTENSION
	Low	1	Timer 2
- (5) Timers
The following timers are incorporated:

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 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.

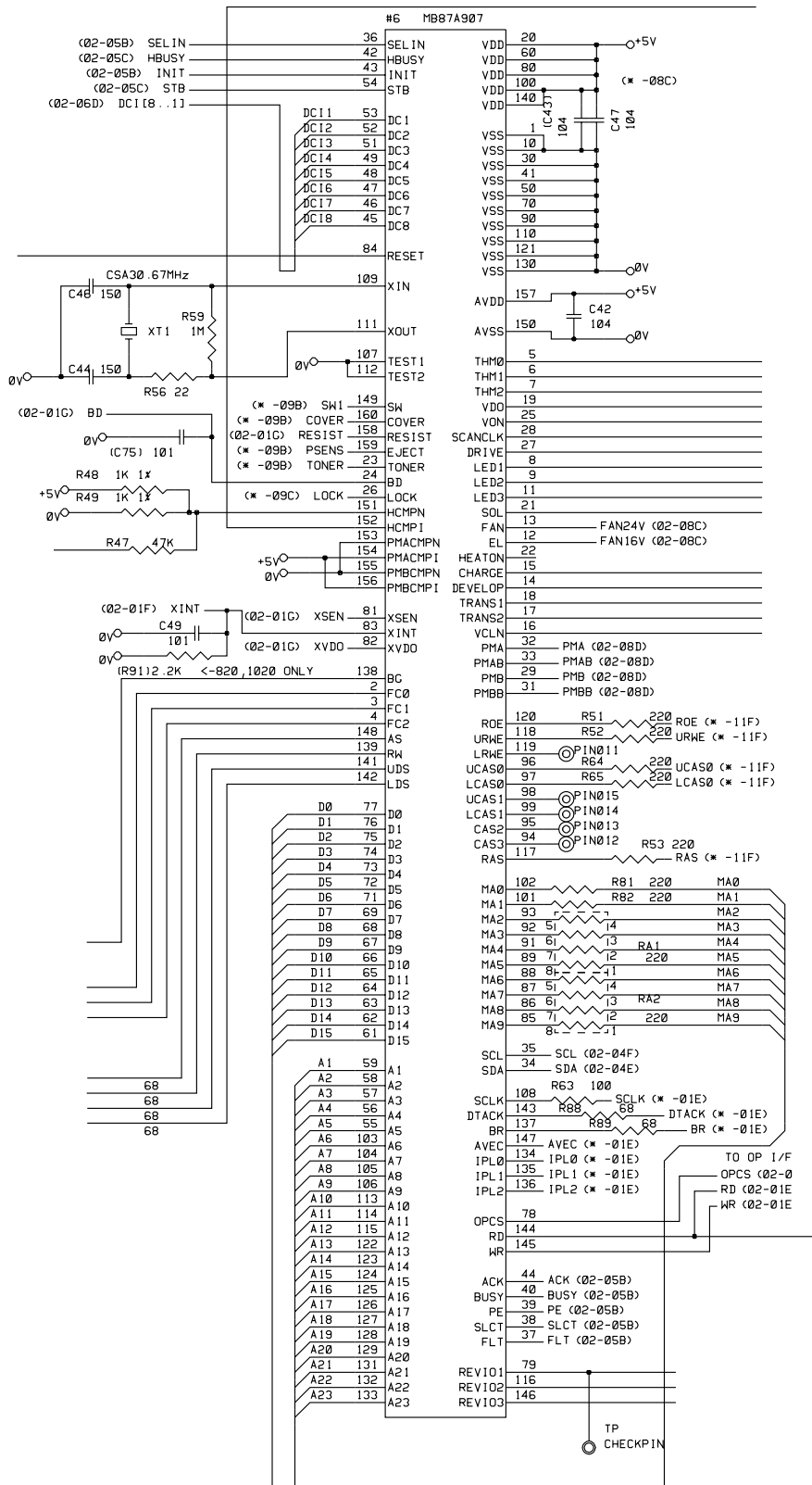


Fig. 2-9

HL-1050

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.
- (2) Address decoder
Generates the CS for each device.
- (3) DRAM control
Generates the $\overline{\text{RAS}}$, $\overline{\text{CAS}}$, $\overline{\text{WE}}$, $\overline{\text{OE}}$ and MA signals for the DRAM and controls refresh processing (CAS before RAS self-refreshing method).
- (4) Interrupt control
Interrupt levels:

Priority	High	10	Reserve interrupt 1 (for debug)
		9	Watch Dog Timer
		8	LSB EMPTY (for VDO FIFO)
		7	Timer 1
		6	USB
		5	XIO interrupt (RS-100M) or MIO interrupt
		4	BD (for engine check)
		3	Reserve interrupt 2
		2	CDCC
	Low	1	Timer 2

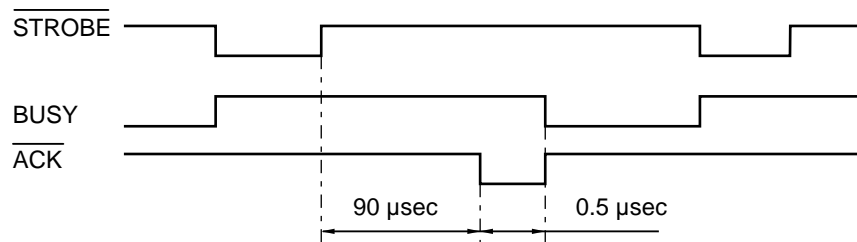
Note:

- All the interrupts can be masked.
- The priority of levels 7, 6, and 5 are changeable from the program.

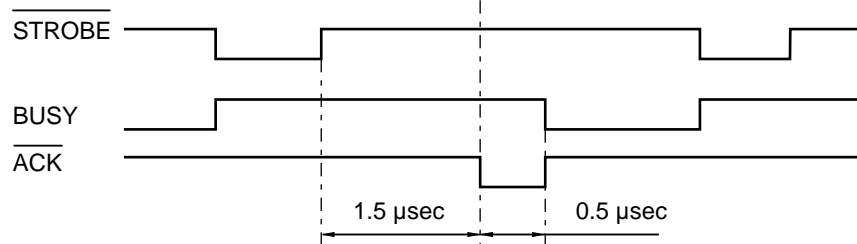
- (5) Timers
The following timers are incorporated:

Timer 1	32-bit timer
Timer 2	32-bit timer
Timer 3	Watch-dog timer
- (6) FIFO
A 10Kbit FIFO is included. 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 is 10.43MHz.
- (7) Parallel I/O
<Data receive Mode>
There are two modes in this unit. One is the CPU receive mode and the other is the DMA receive mode. In the CPU receive 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 it to the DRAM directly.

CPU Receive Mode



DMA Receive Mode



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

<IEEE1284 support>

This supports the IEEE1284 data transfer with the following mode.

Nibble	mode
Byte	mode
ECP	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, bit search, and decimal point conversion.
- (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.

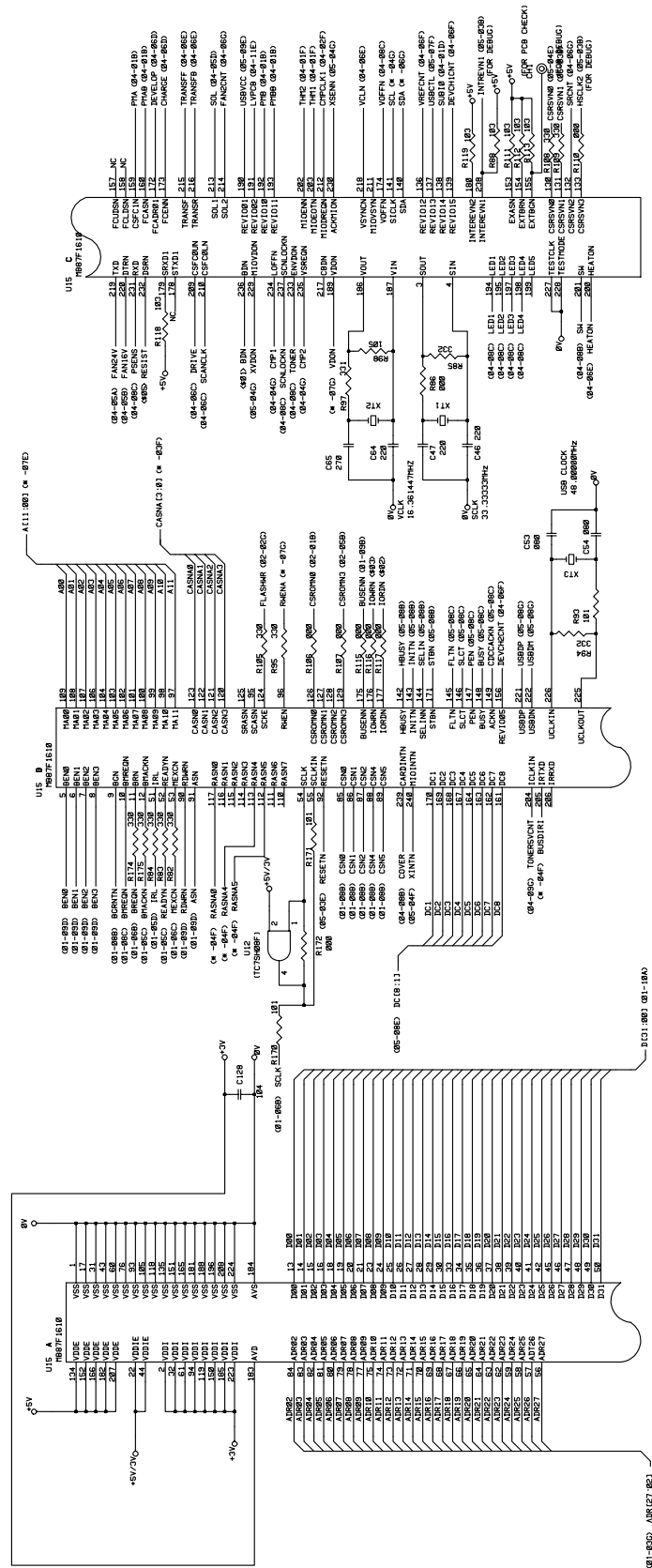


Fig. 2-10

1.3.3 ROM

HL-820/1020/1040

A program file of 512 Kbytes and the font data are stored in the ROM. A 42-pin IC socket is provided: a 16 Mbits ROM (42-pin) is mounted into this socket normally, but a 4 Mbits ROM (40-pin) can be mounted by leaving the 1st and 42nd pins of the socket open circuit.

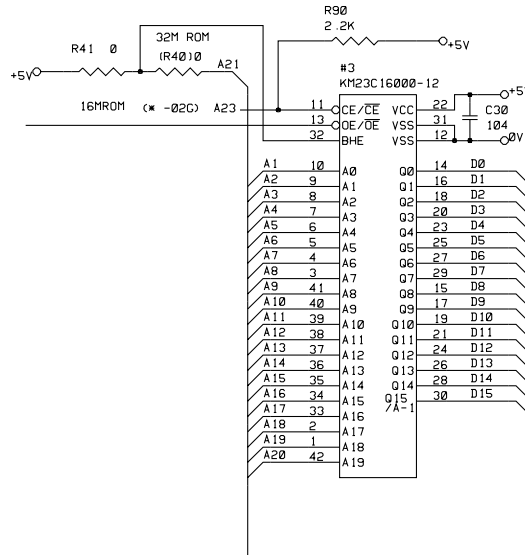


Fig. 2-11

HL-1050

A program file of 4.0 Mbytes and the font data are stored in the ROM. Two 42-pin IC sockets are provided: two 16 Mbits ROMs (42-pin) can be mounted into these sockets.

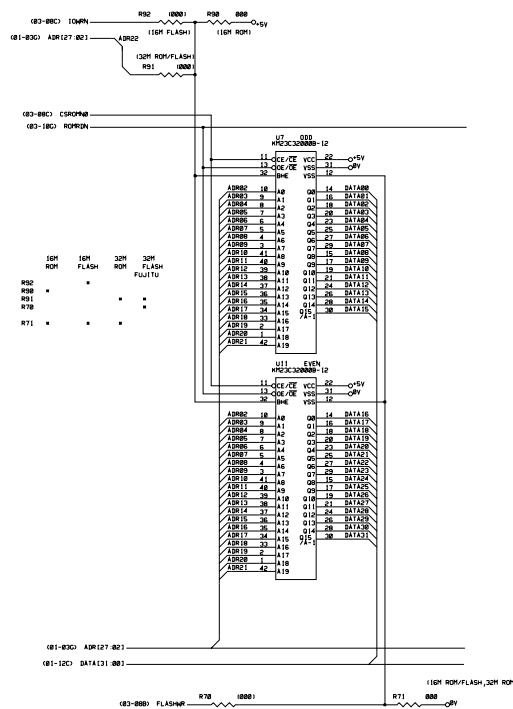


Fig. 2-12

1.3.4 DRAM

HL-820/1020/1040

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

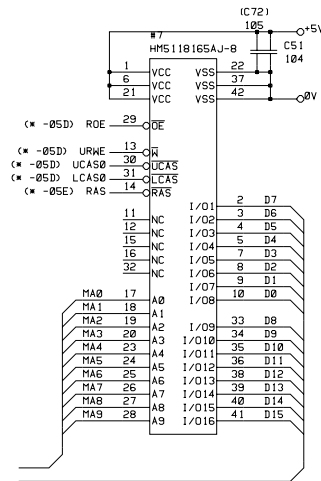


Fig. 2-13

HL-1050

Two 16M-bit DRAMs (x 16bits) are used as the RAM.

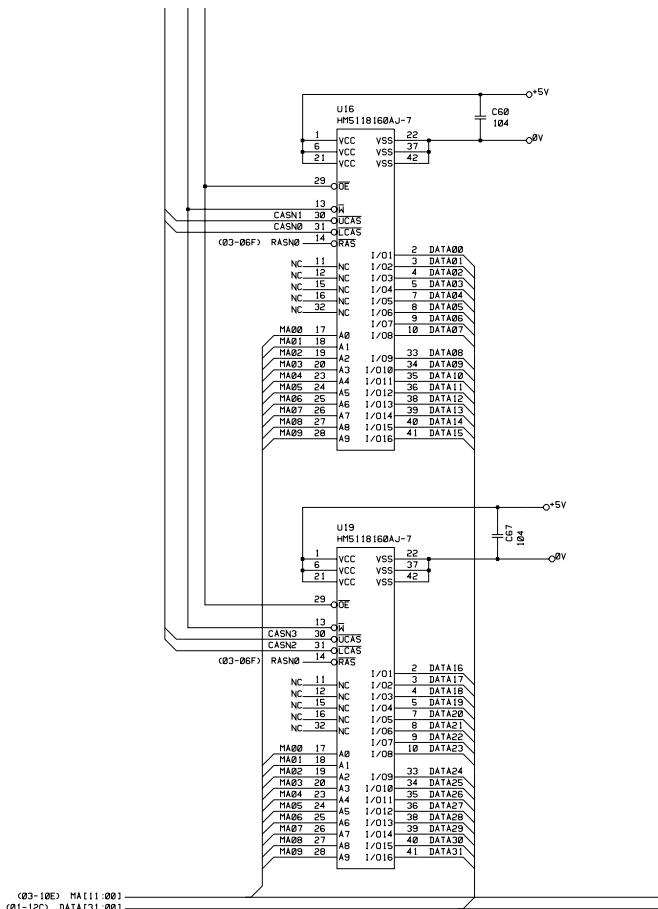


Fig. 2-14

1.3.5 Optional RAM

HL-1050

A 32bit (72 pin) SIMM can be fitted as optional RAM. The main PCB has one slot and the capacity of SIMM can be from 1 Mbyte to 32 Mbytes.

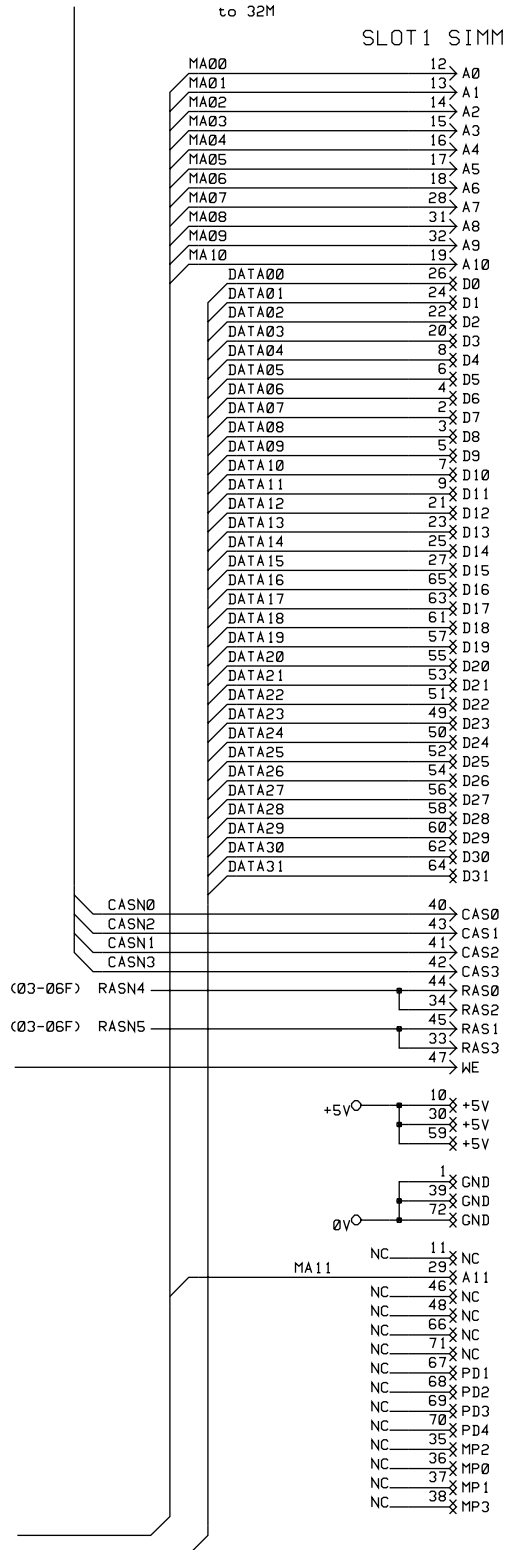


Fig. 2-15

1.3.6 Optional Serial I/O

HL-1040/1050

The interrupt of the serial I/O is input to the EXINT terminal of the ASIC, and is recognized by the CPU. A 32-byte register is provided for this I/O, which is read and written to by the CPU.

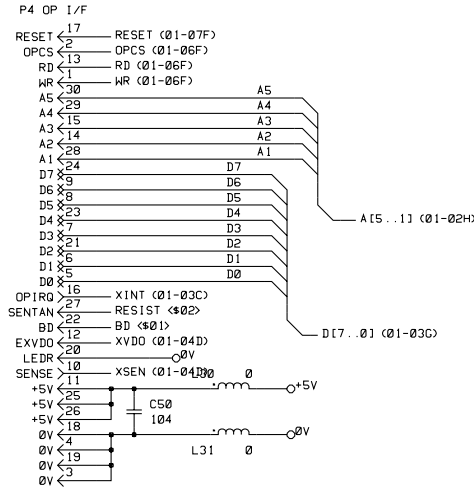


Fig. 2-16

1.3.7 EEPROM

HL-820/1020/1040

The EEPROM is an XL24C01AF type of two-wire method with a 128 x 8 bits configuration.

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

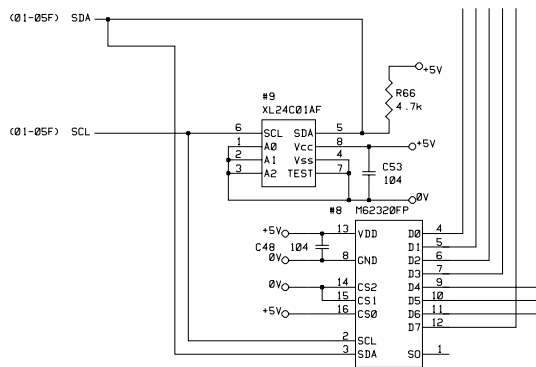


Fig. 2-17

HL-1050

The EEPROM is XL24C04AF type of two-wire method with a 512 x 8 bits configuration.

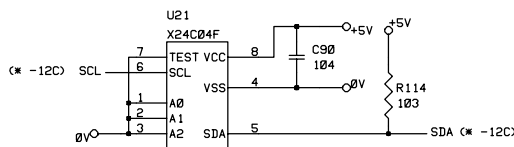


Fig. 2-18

1.3.8 Reset Circuit

HL-820/1020/1040

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

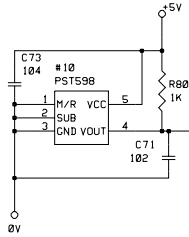


Fig. 2-19

HL-1050

The reset IC is a PST596DNR. The reset voltage is 4.2V (typ.) and the LOW period of reset is 50ms (typ).

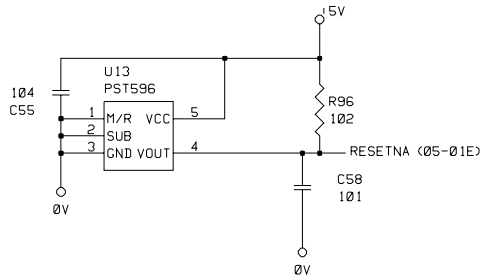


Fig. 2-20

1.3.9 CDCC I/O

HL-820/1020/1040

Fig. 2-21 shows the CDCC interface circuit.

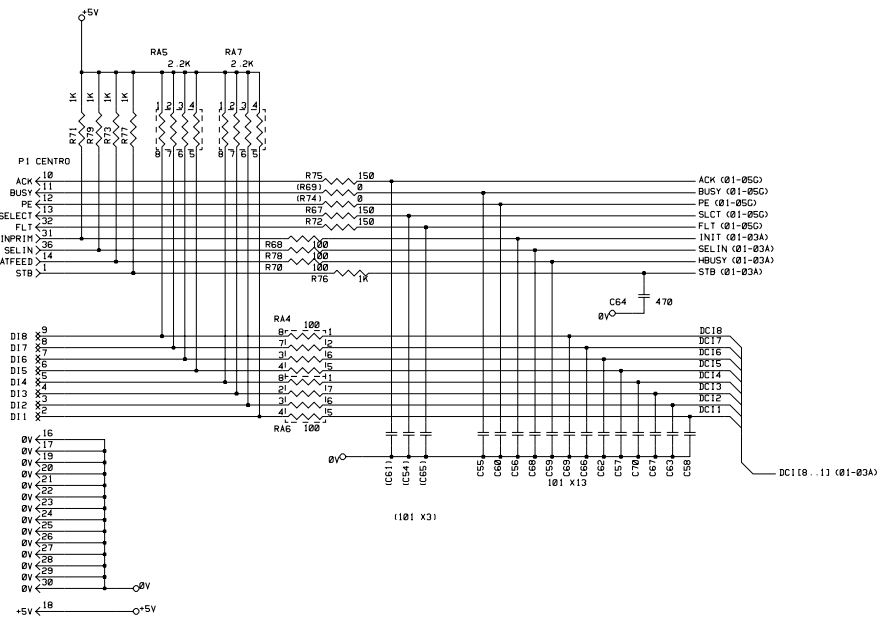


Fig. 2-21

HL-1050

Fig. 2-22 shows the CDCC interface circuit.

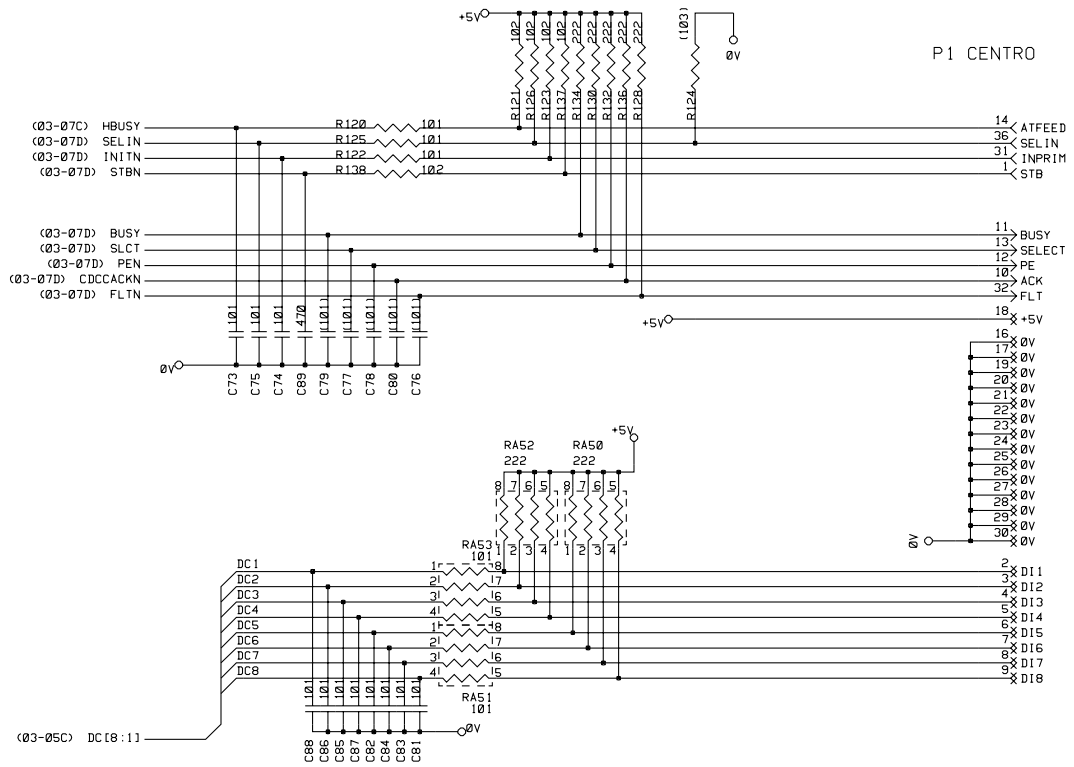


Fig. 2-22

1.3.10 Engine I/O

HL-820/1020/1040

Fig. 2-23 shows the engine interface circuit.

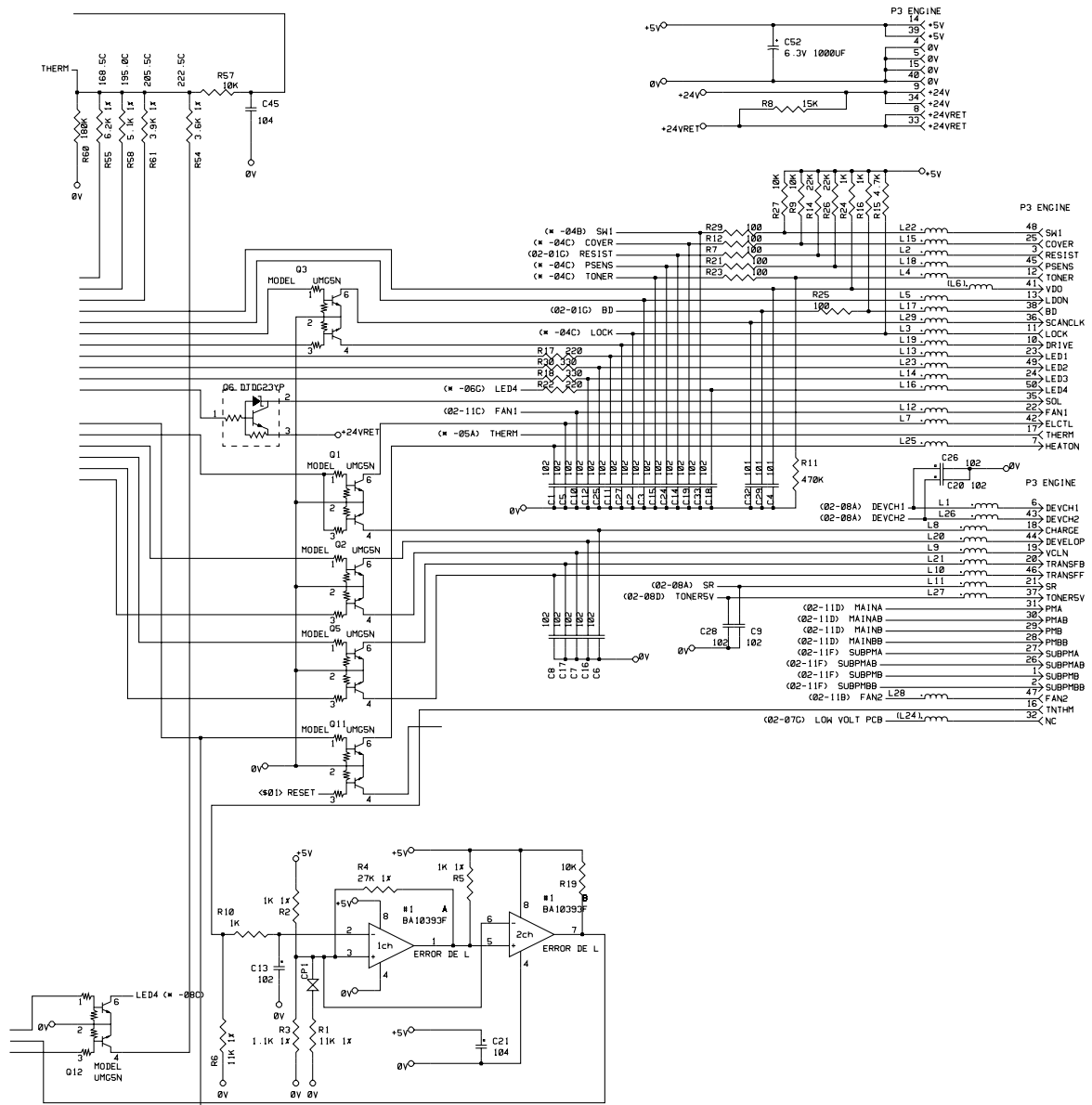


Fig. 2-23

HL-1050

Fig. 2-24 shows the engine interface circuit.

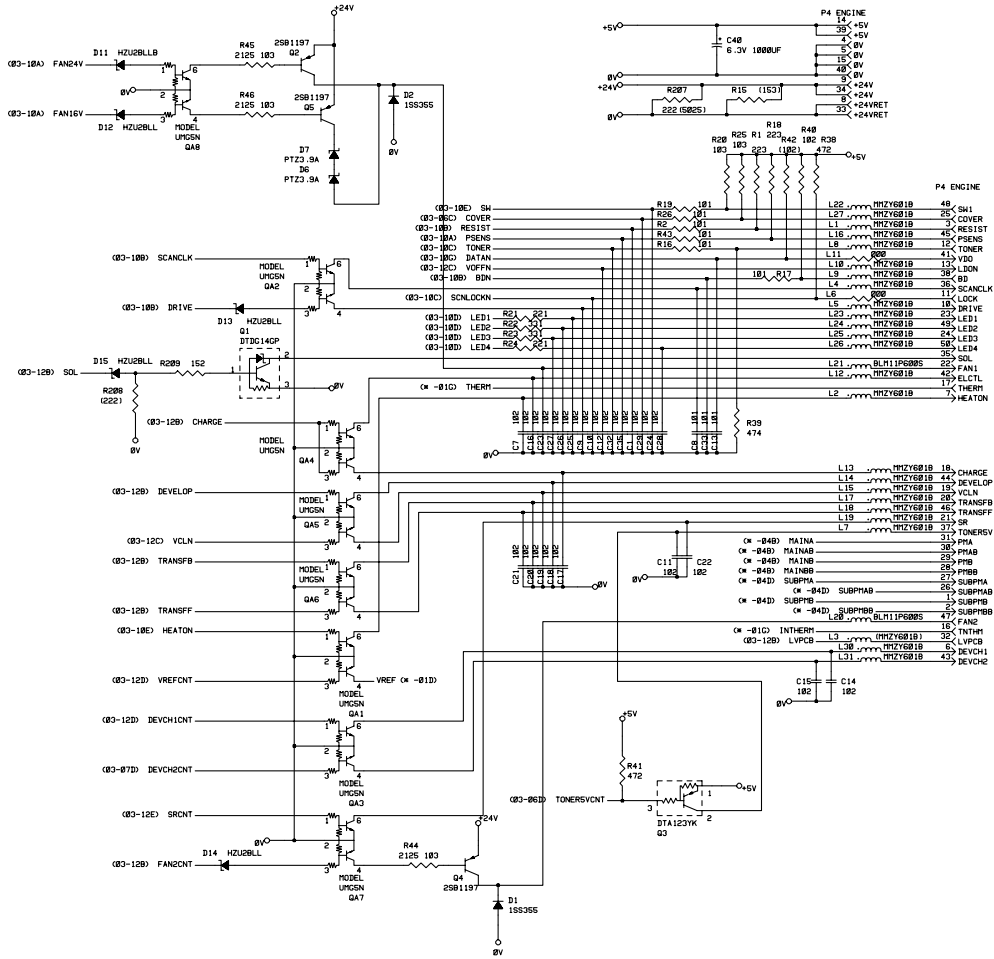


Fig. 2-24

1.3.11 Paper Feed Motor Drive Circuit

HL-820/1020/1040

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

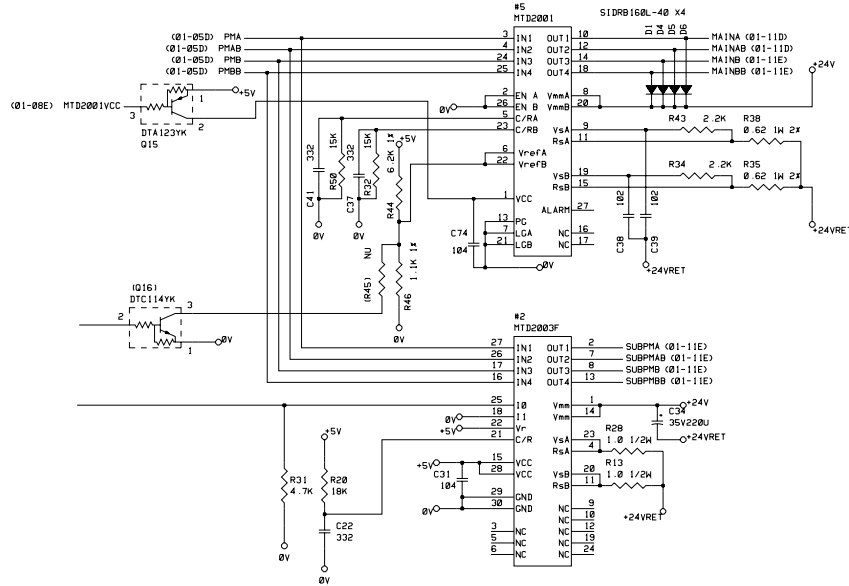


Fig. 2-25

HL-1050

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

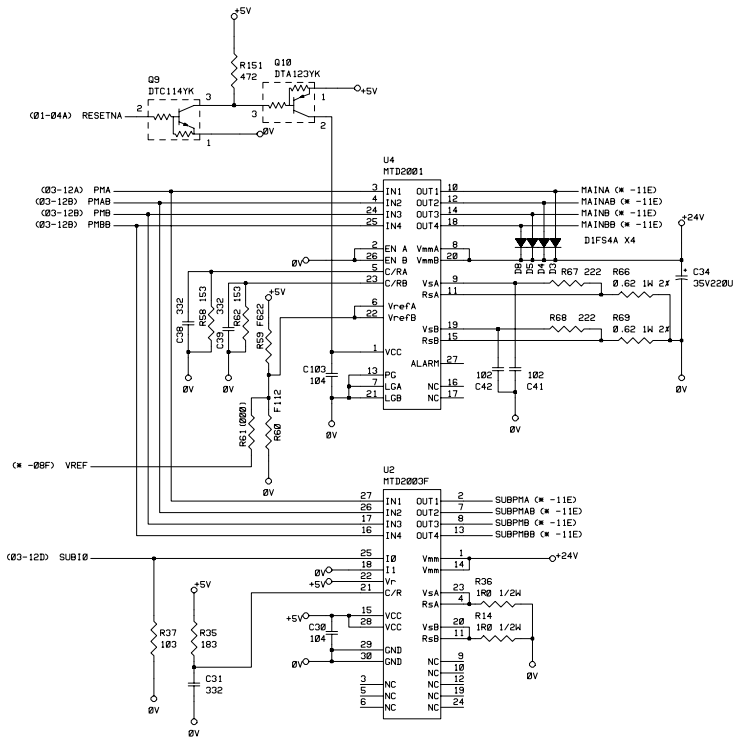


Fig. 2-26

1.4 Panel Sensor PCB

The following parts are on the panel sensor.

- 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 Power Supply

1.5.1 Low-voltage Power Supply

The 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 vary depending on the printer model as listed below;

Model	Regulated Output	Production Code
HL-820/1020/1040	+5V / 0.6 A +24V / 2.0 A	100V: MPW1547 200V: MPW1447
HL-1050	+5V / 1.2A +24V / 2.0A	100V: MPW1550 200V: MPW1450

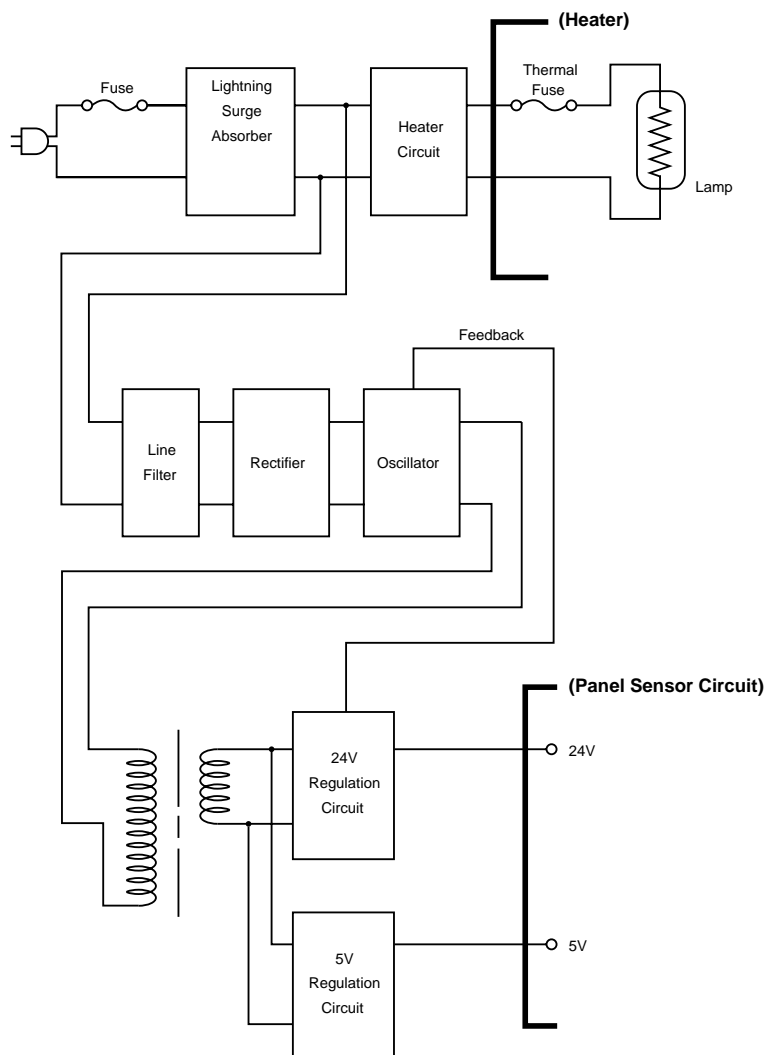


Fig. 2-27

1.5.2 High-voltage Power Supply

This generates and outputs the voltages and currents for the charging, development and transfer functions.

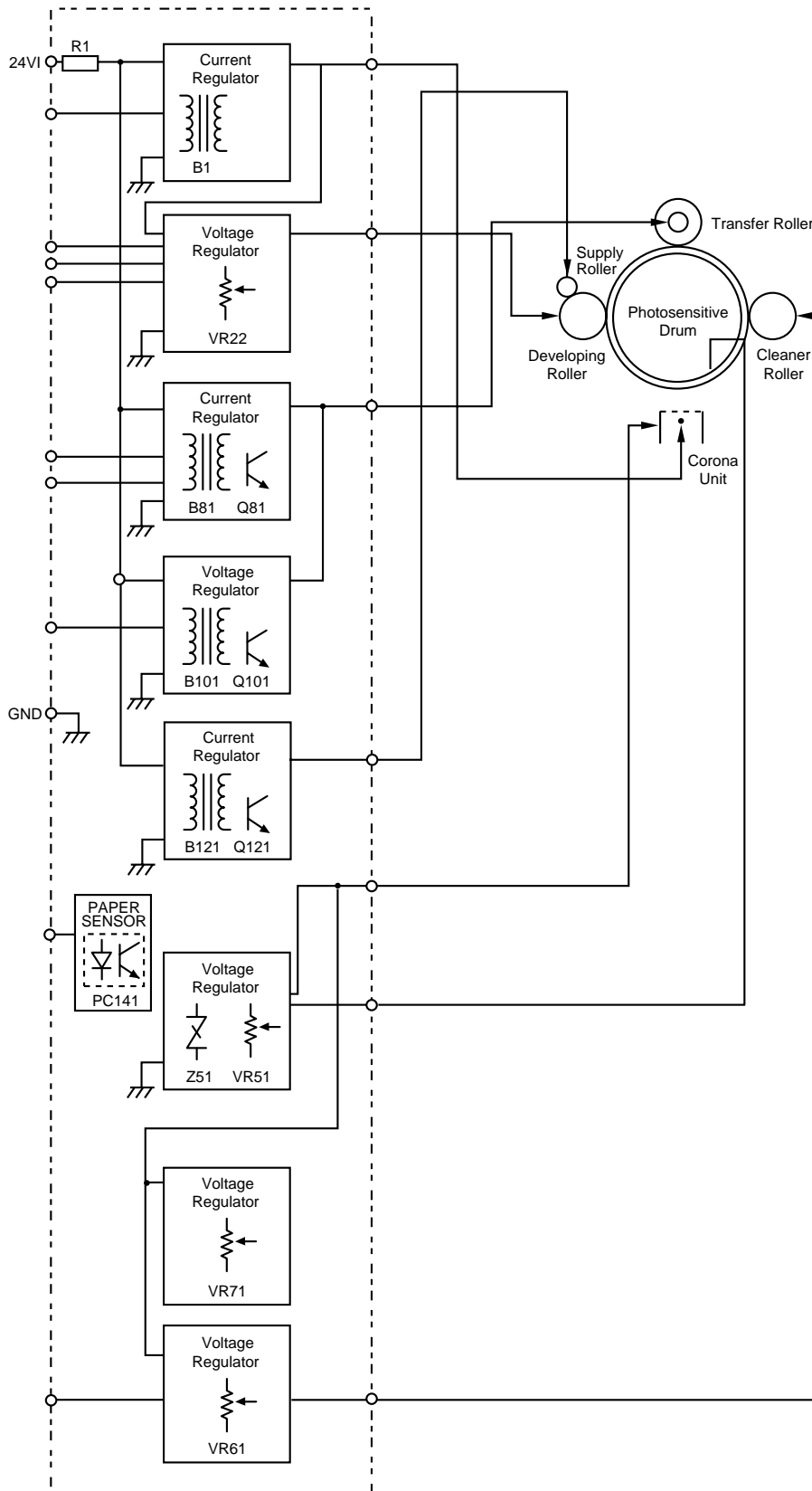


Fig. 2-28

2. MECHANICS

2.1 Overview of Printing Mechanism

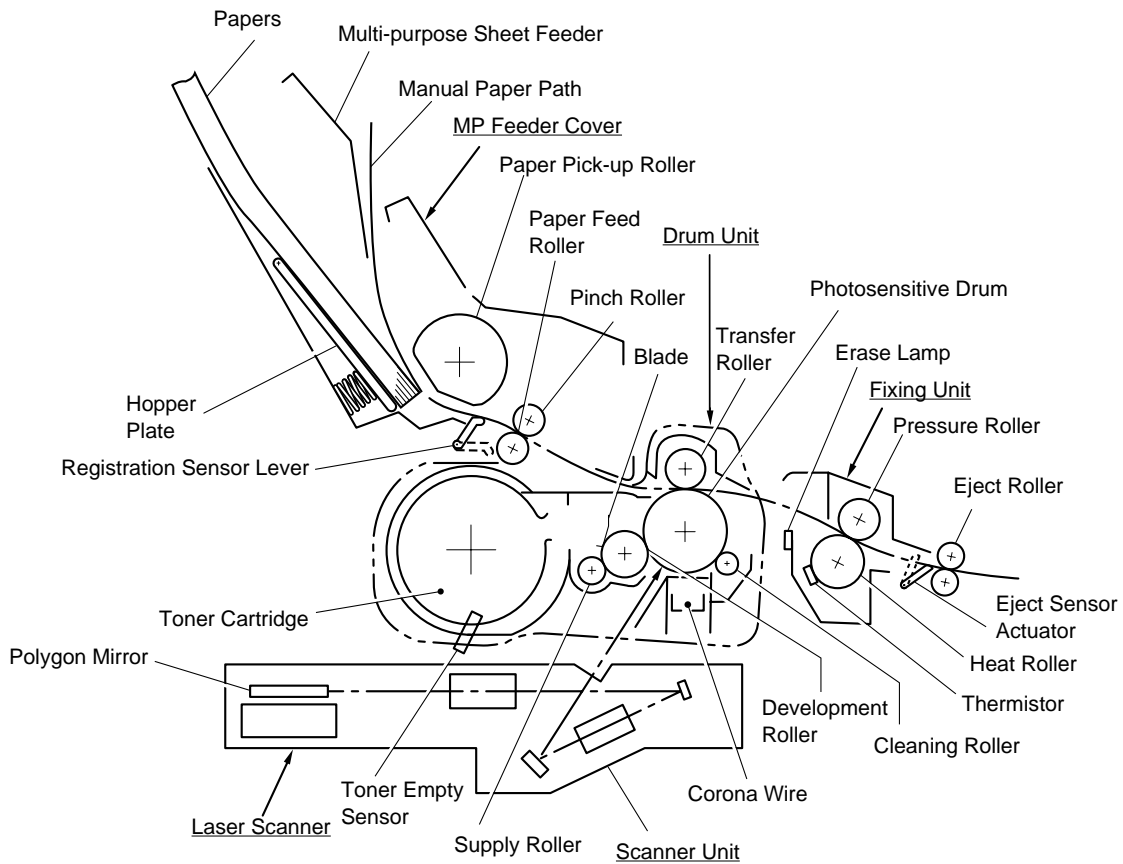


Fig. 2-29

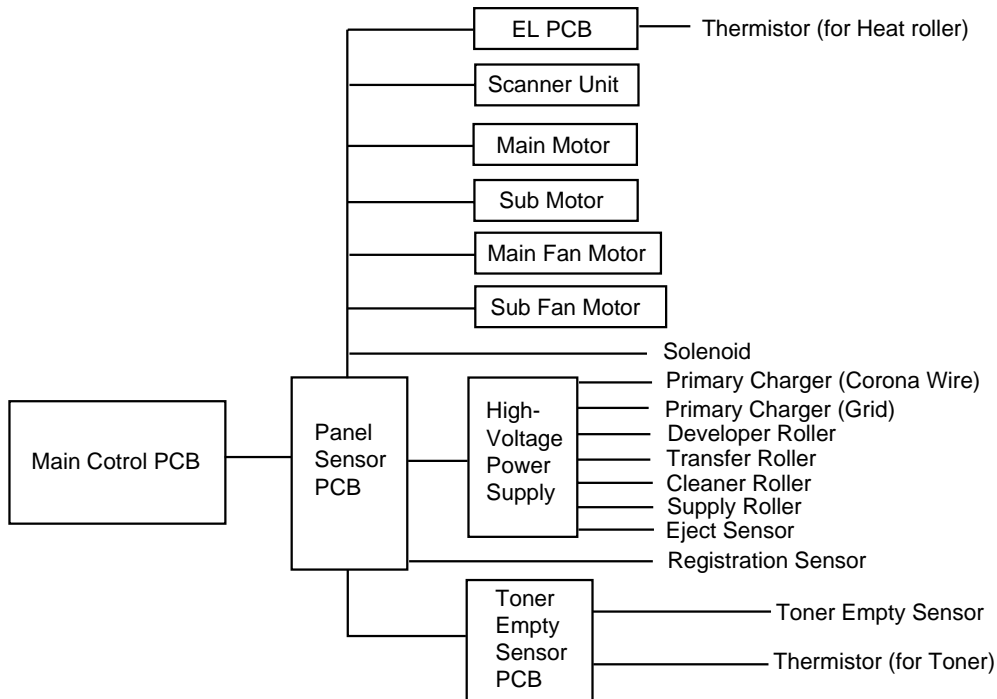


Fig. 2-30

2.2 Paper Transfer

2.2.1 Paper Supply

The 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.

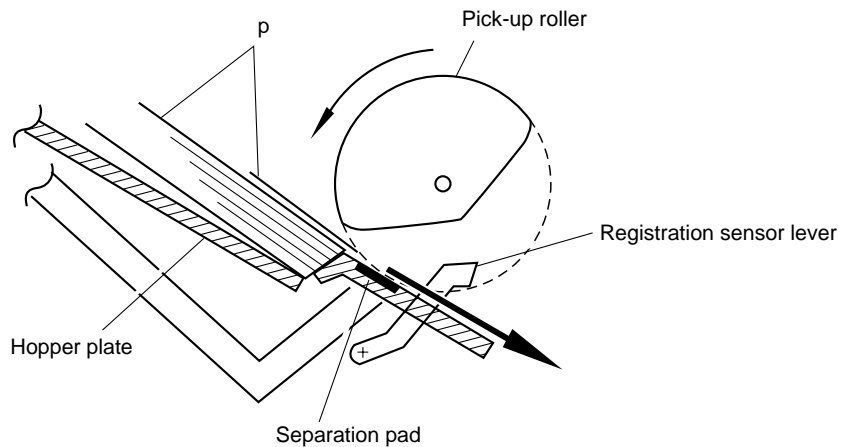


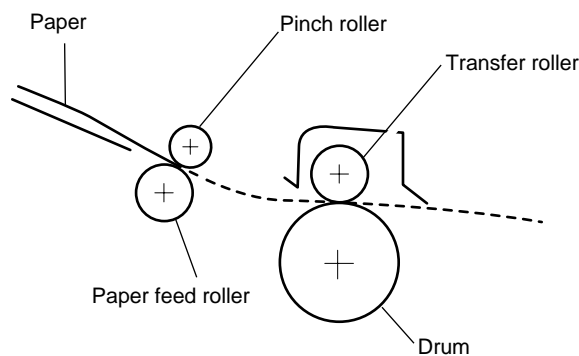
Fig. 2-31

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.

2.2.2 Paper Registration

When paper picked up from the multi-purpose sheet feeder (MPF) 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. 2-32

2.2.3 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.

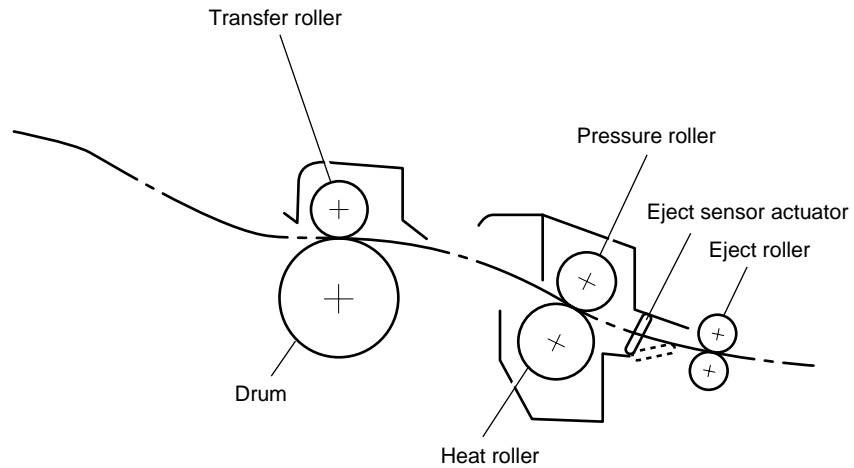


Fig. 2-33

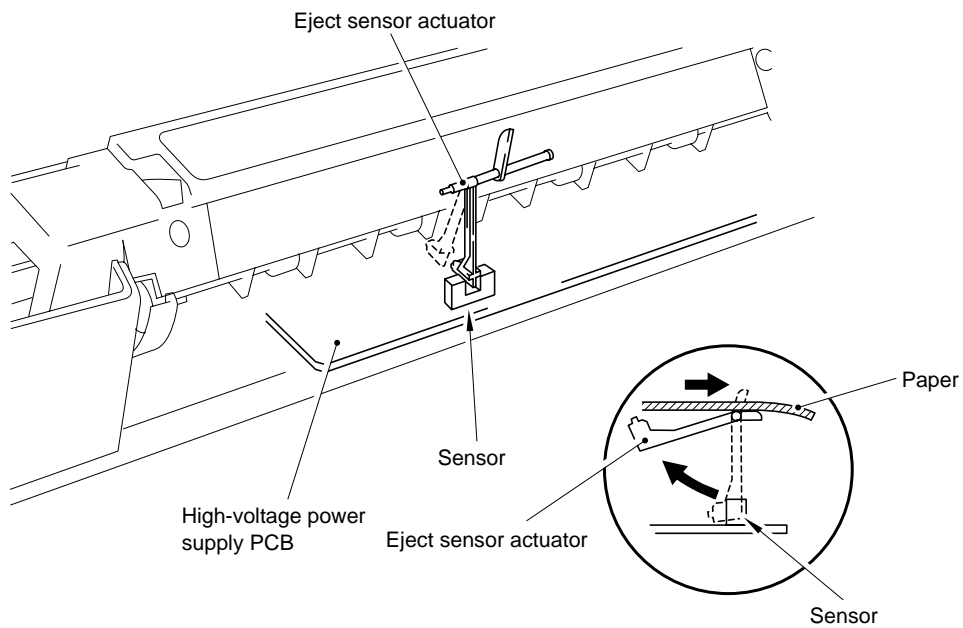


Fig. 2-34

2.3 Sensors

2.3.1 Cover Sensor

Detects opening and closing of the top cover.

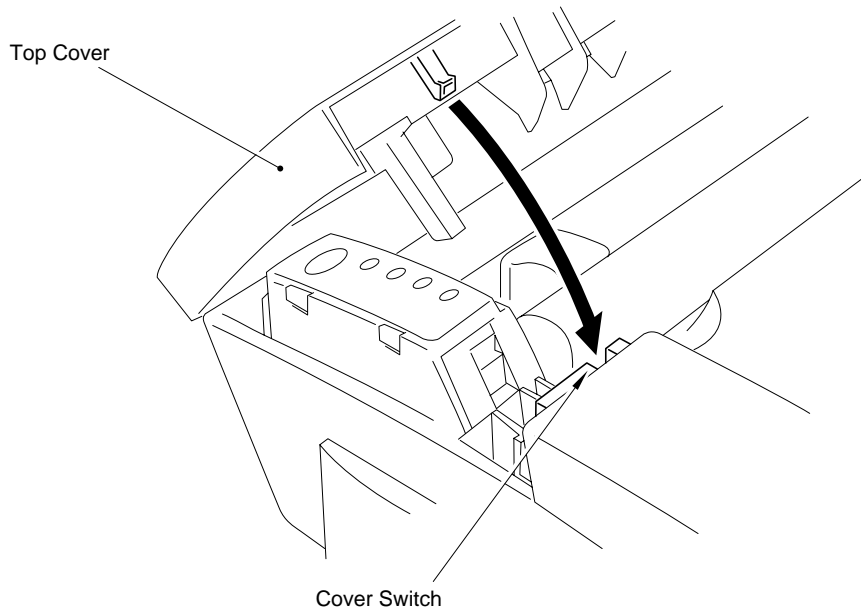


Fig. 2-35

2.3.2 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).

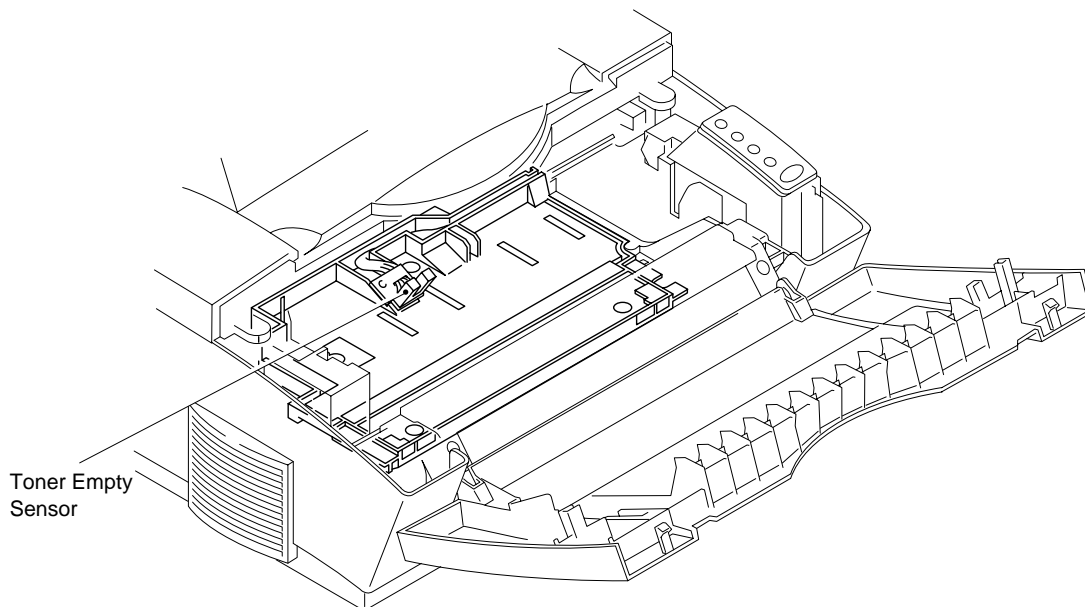


Fig. 2-36

2.4 Drum Unit

2.4.1 Photosensitive Drum

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

2.4.2 Primary Charger

Forms a uniform charge on the drum surface.

- (1) Corona wire
Generates the ion charge on the drum.
- (2) Grid
Spreads the ion charge evenly over the drum surface.

2.4.3 Development Roller

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

2.4.4 Transfer Roller

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

2.4.5 Cleaner Roller

Removes and recycles the toner remaining on the drum surface.

2.4.6 Erase Lamp

Discharges the electrostatic latent image on the drum.

2.5 Print Process

2.5.1 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.

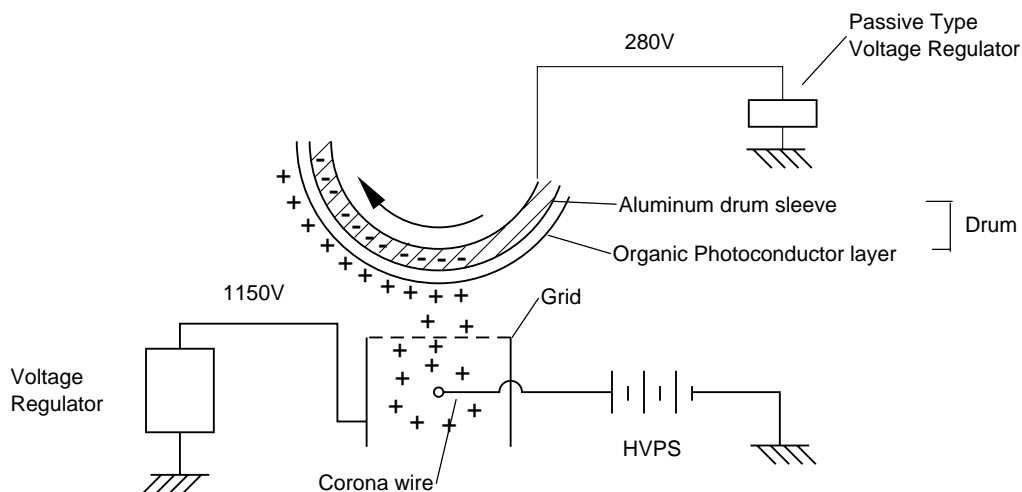


Fig. 2-37

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.

2.5.2 Exposure Stage

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

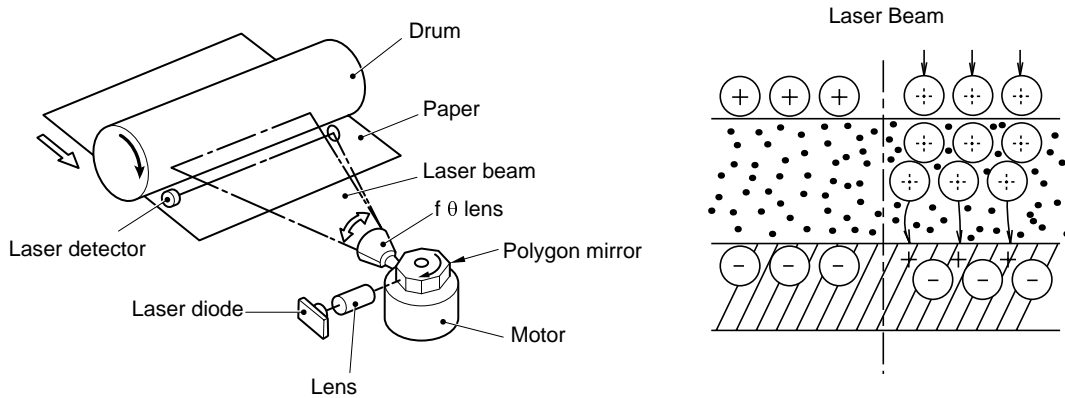


Fig. 2-38

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.

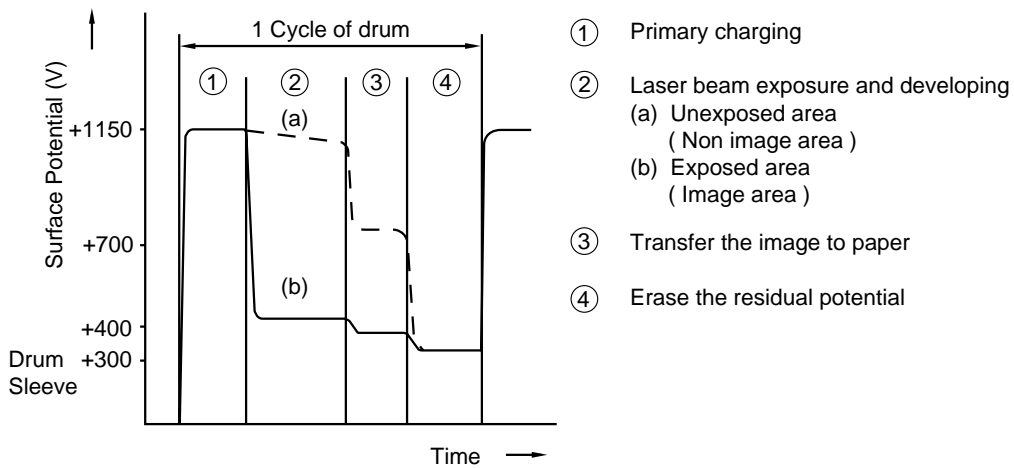


Fig. 2-39

2.5.3 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.

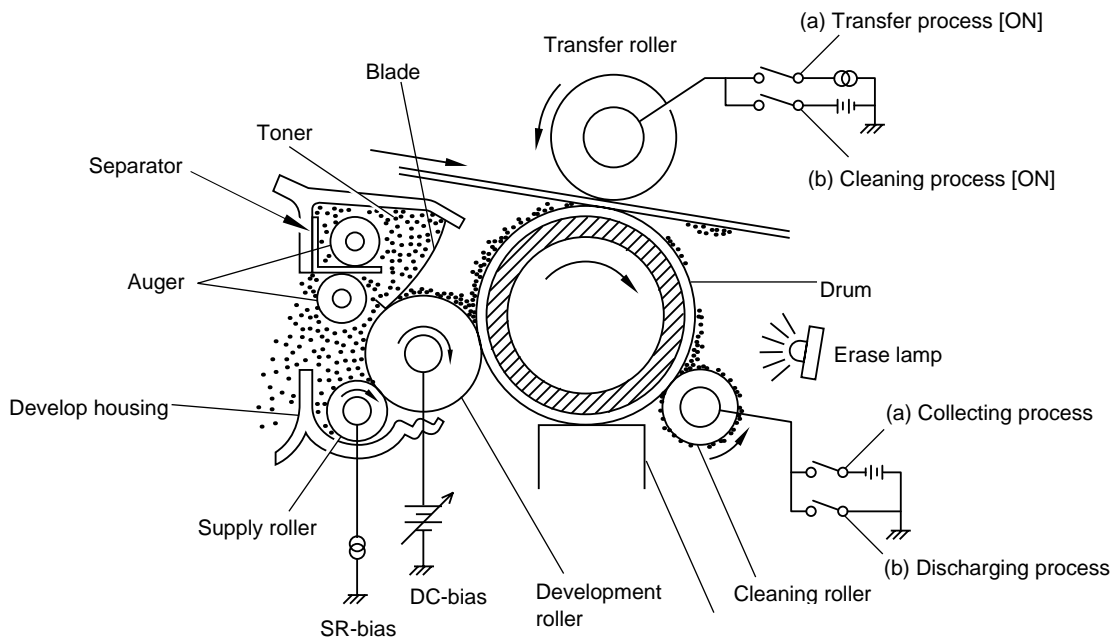


Fig. 2-40

2.5.4 Transfer

(a) Transfer process

After the drum has been charged and exposed, and has received a developed image, the toner formed 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.

2.5.5 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).

2.5.6 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.

2.5.7 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.

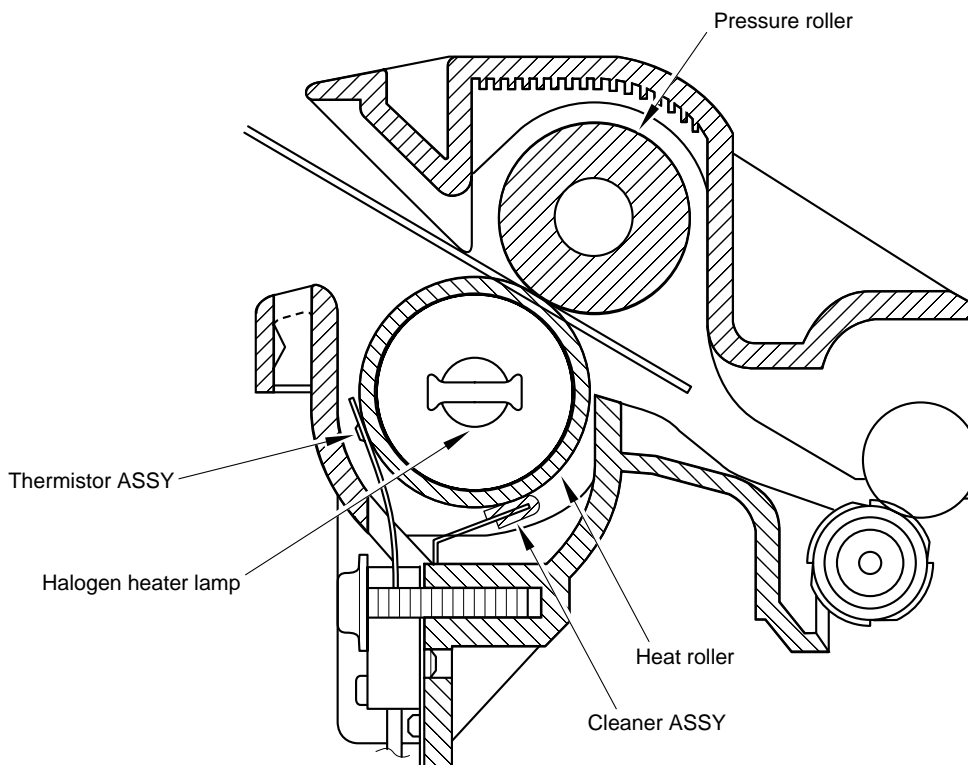


Fig. 2-41

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

M3 : 7kgf • cm

M4 : 10kgf • cm

TAPTITE, CUP S

M3 : 8kgf • cm

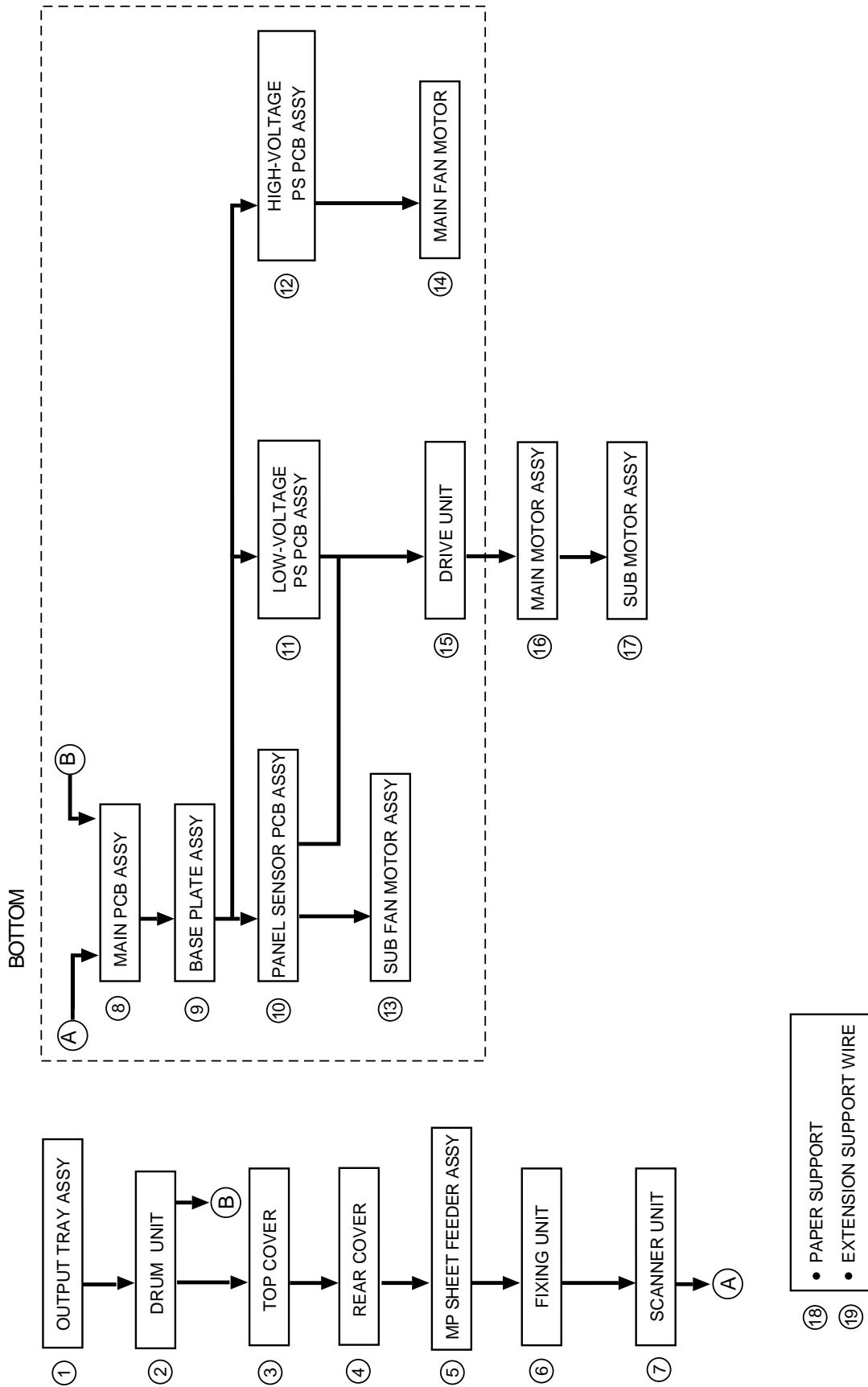
SCREW

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 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.

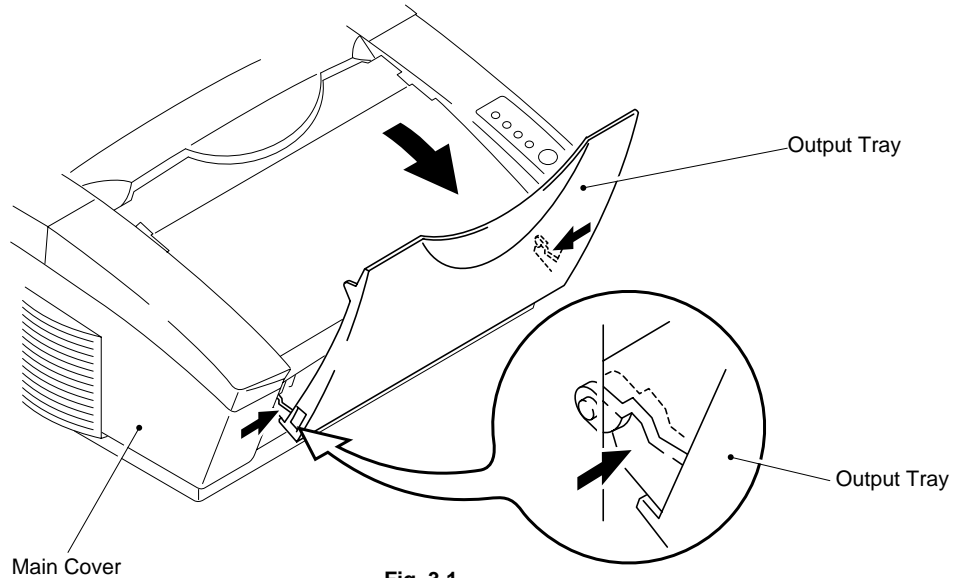


Fig. 3.1

3.2 Drum Unit

- (1) Open the top cover.
- (2) Lift out the drum unit.

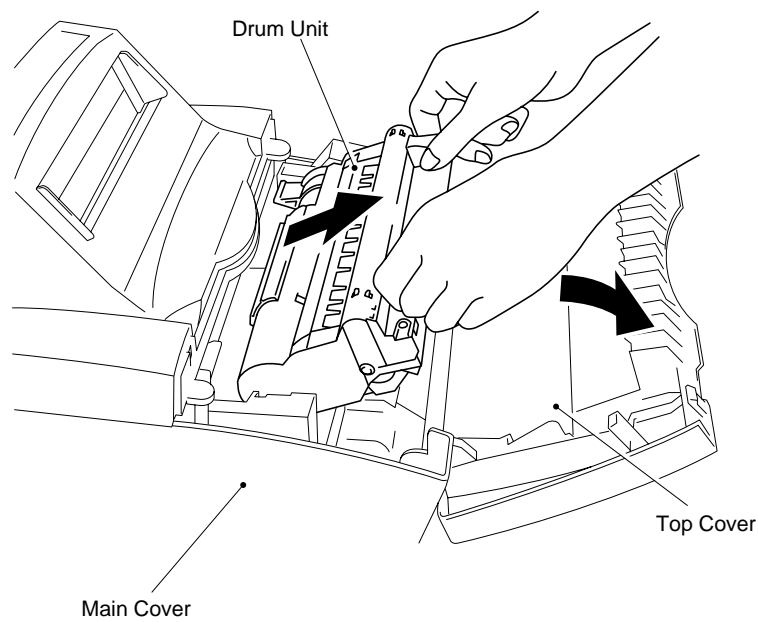


Fig. 3.2

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).

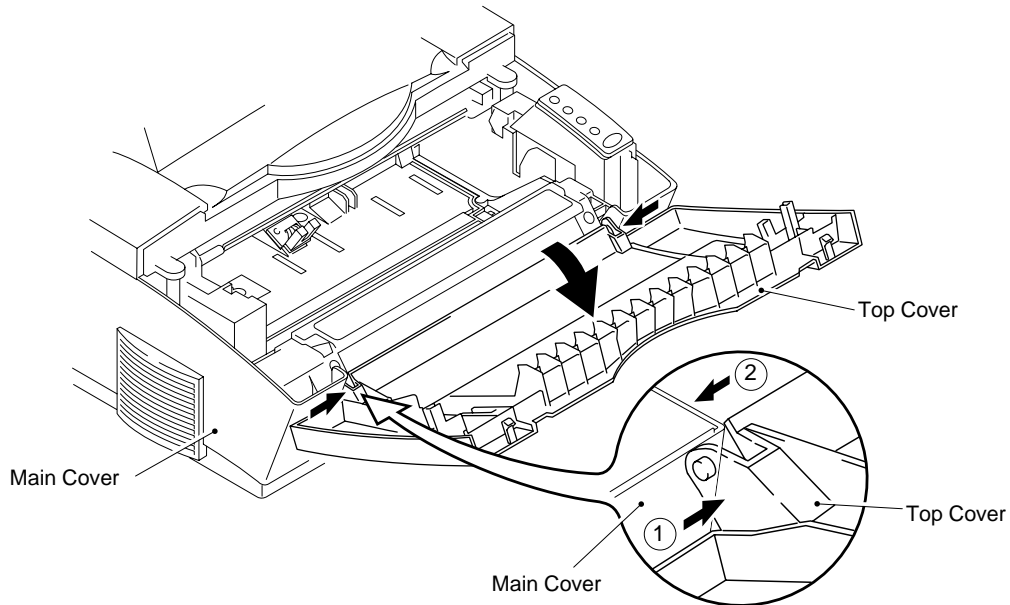


Fig. 3-3

3.4 Rear Cover

- (1) Remove the two M4x12 tapping screws.
- (2) Remove the rear cover.

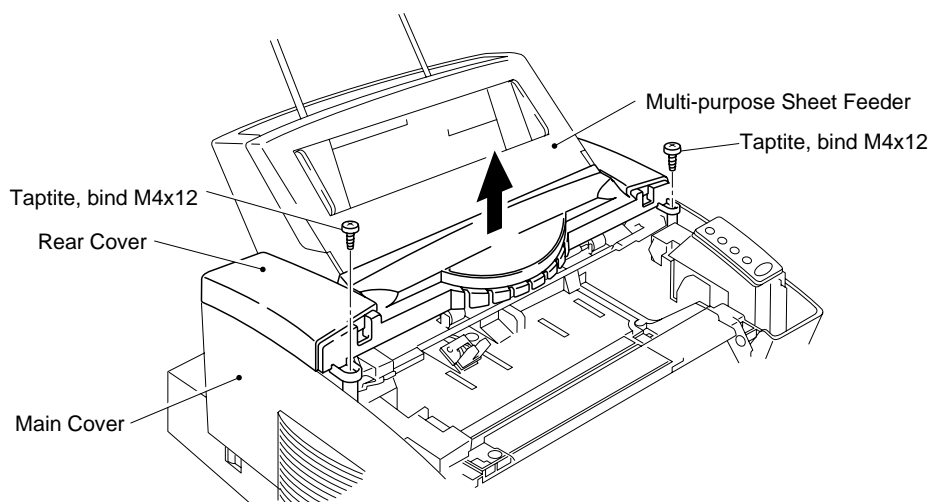


Fig. 3-4

Note:

When re-assembling the rear cover, hook the two hooks at the right and left hand side (rear), then secure the two screws.

3.5 MP Sheet Feeder ASSY

Caution:

When disassembling the MP sheet feeder ASSY, if you get the grease on your fingers, take care not to touch the separation pad or the paper pick-up roller, the grease 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 sheet feeder. It is not necessary to release the right rib.

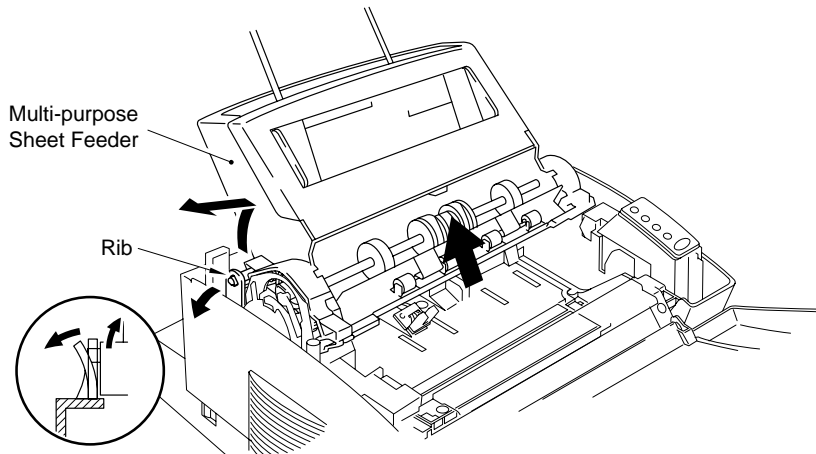


Fig. 3-5

Note:

When re-assembling, apply a suitable amount of grease (2 rice-grain size) between the heat sink of the motor and the ground leaf spring in case of grease shortage. (Refer to the figure below.)

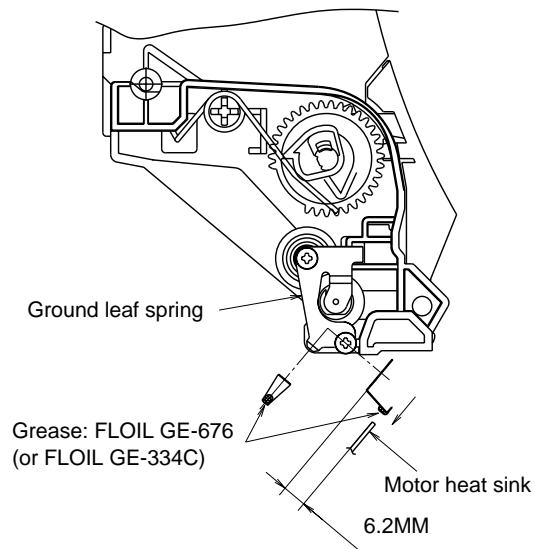


Fig. 3-6

3.6 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 harnesses.

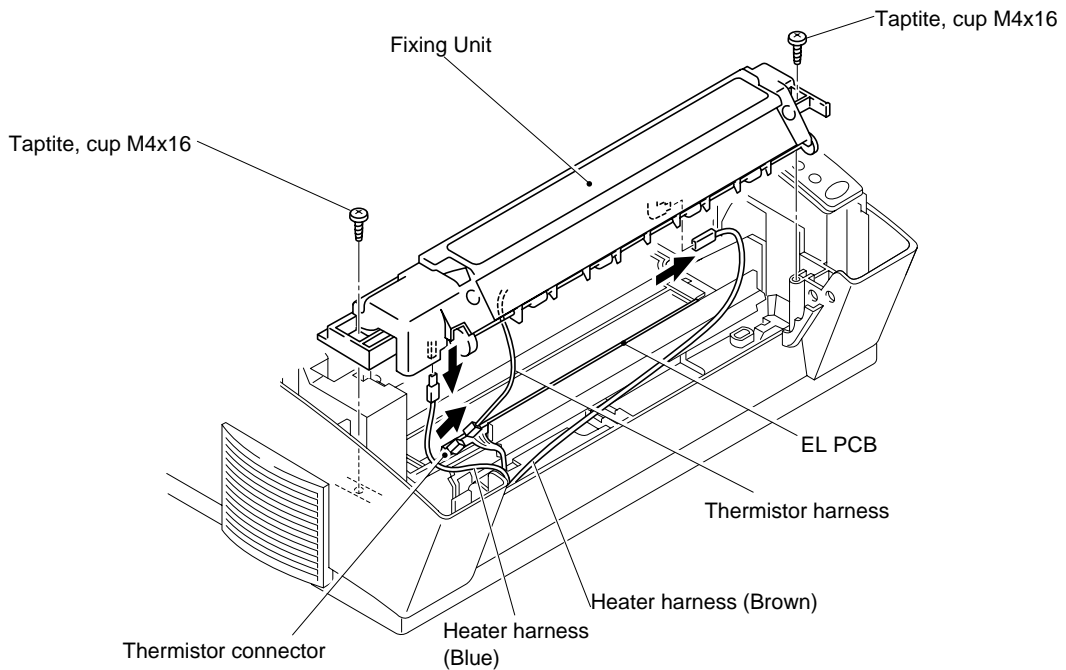


Fig. 3-7

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.

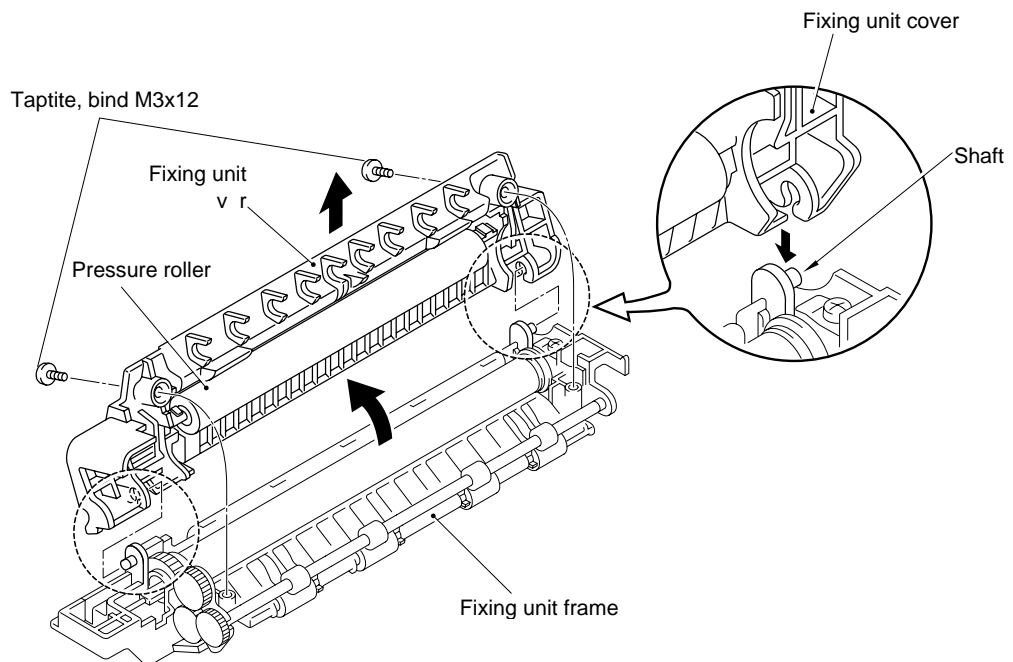


Fig. 3-8

- (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.

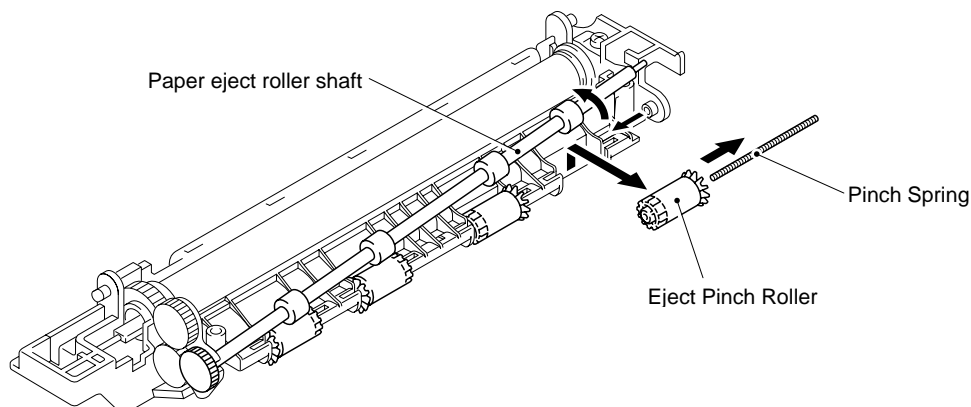


Fig. 3-8a

- (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 to remove the heat roller. Then, remove the halogen heater lamp from the heat roller.

Caution :

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

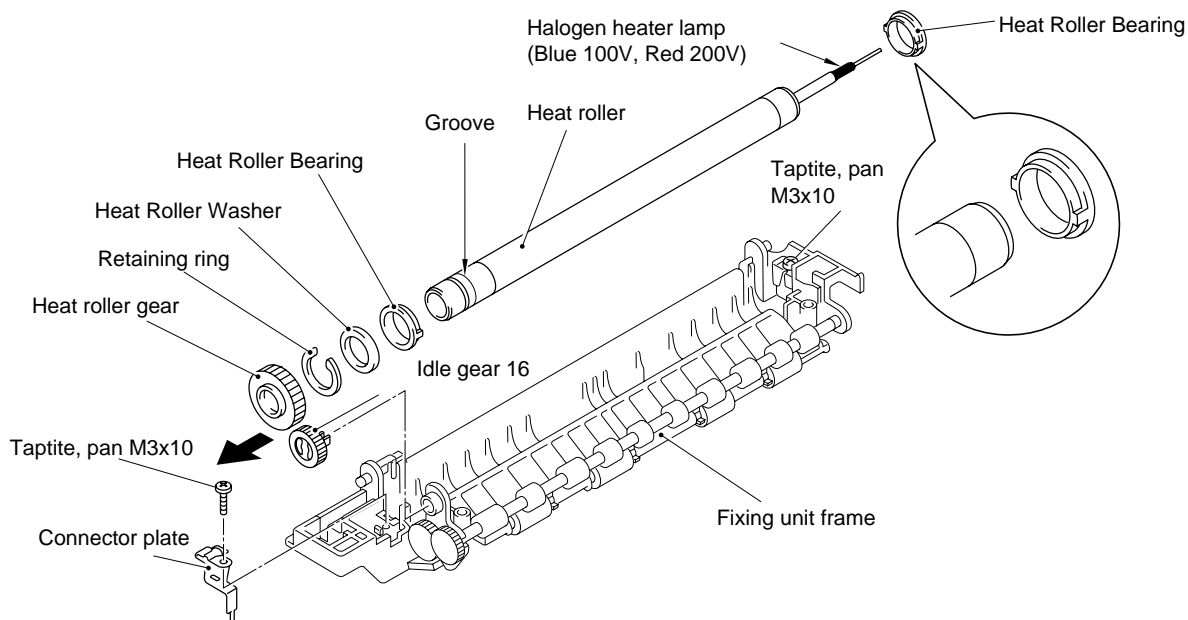


Fig. 3-9

Note:

- When re-assembling the bearing at the both ends of the heat roller, ensure that the direction of the bearing is correct referring to the above figure.
- The heat roller itself is very similar to the one for HL-1060/1070 printers. The heat roller for the HL-820/1020/1040/1050 printers can be distinguished by the groove on the edge of the roller. (Refer to the above figure.)

- When replacing the heat roller cleaner with a new one, attach the cleaner referring to the figure below;

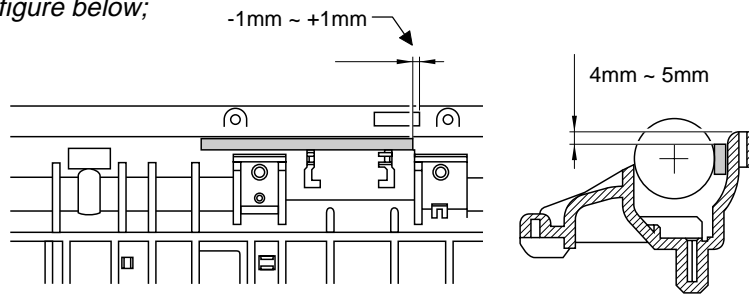


Fig. 3-10

- Follow the instructions below when installing the thermistor in the fixing unit.
 - Place the cleaner felt of the cleaner ASSY for the thermistor under the heat roller.
 - Place the end of the thermistor on the heat roller.
 - Insert boss1 of the thermistor into the hole of the fixing unit frame.
 - Do not place the thermistor on boss2 of the fixing unit frame.

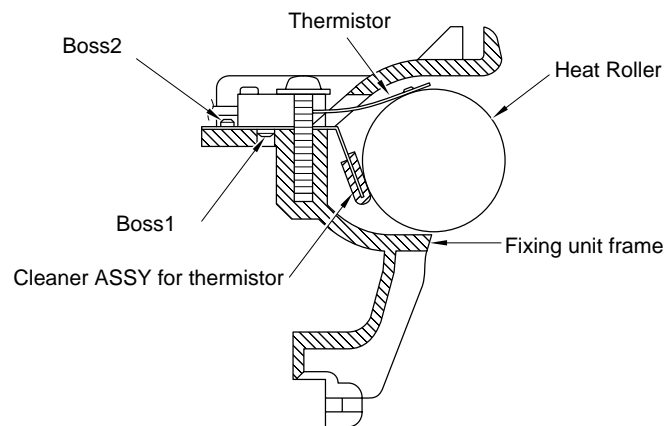


Fig. 3-11

3.7 Scanner Unit

- Remove the three M4x12 tapping screws.
- Lift out the scanner unit.

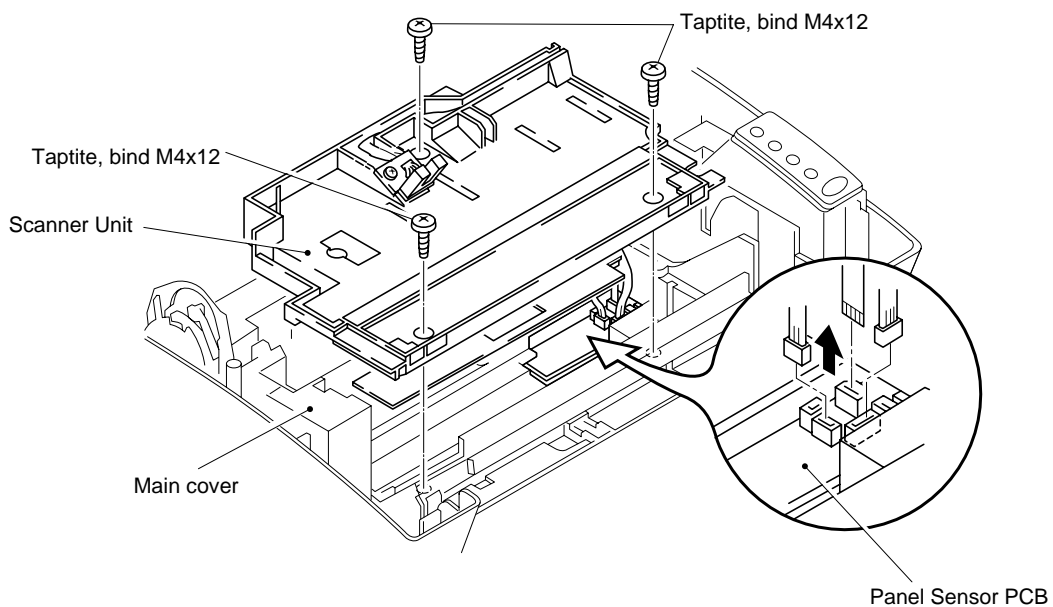


Fig. 3-12

Note:

When replacing the scanner unit, ensure to assemble the ferrite core using the cable binder as follows;

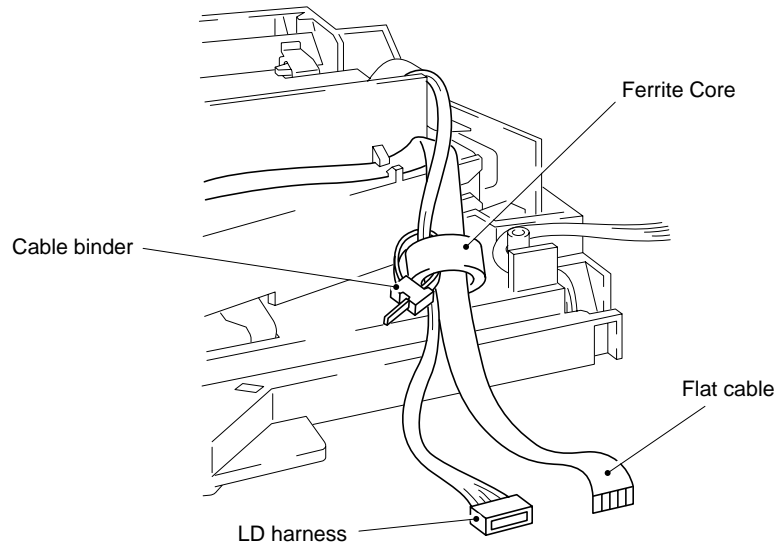


Fig. 3-13

- (3) Disconnect the three connectors from the panel sensor PCB.
- (4) Remove the M3x8 tapping screw, and lift the toner sensor PCB from the scanner unit.

Caution:

Never touch the inside of the scanner unit or the mirror when disassembling or reassembling. If there is any dirt or dust on the mirror, blow it off.

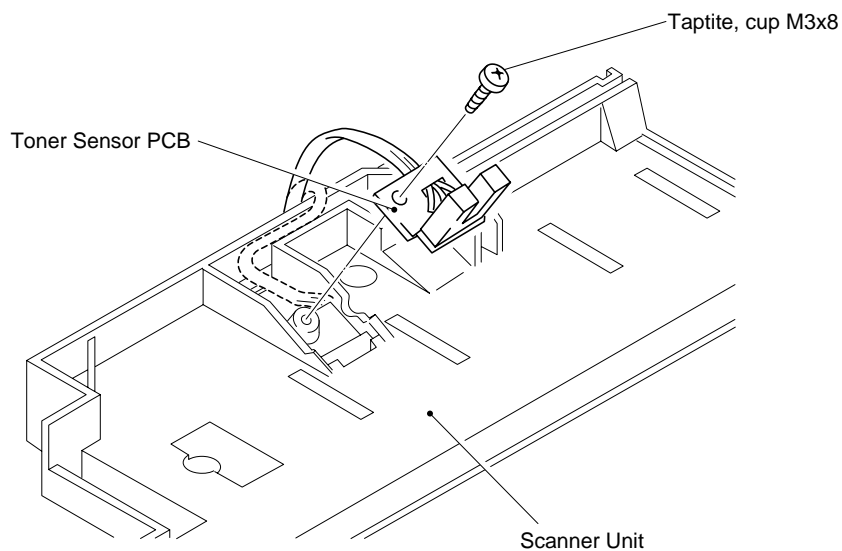


Fig. 3-14

3.8 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.

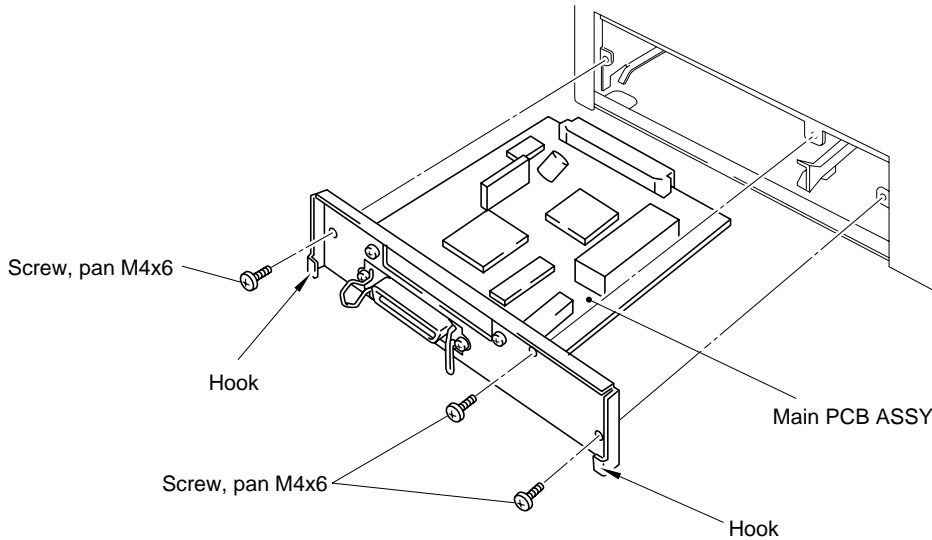


Fig. 3-15

3.9 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.

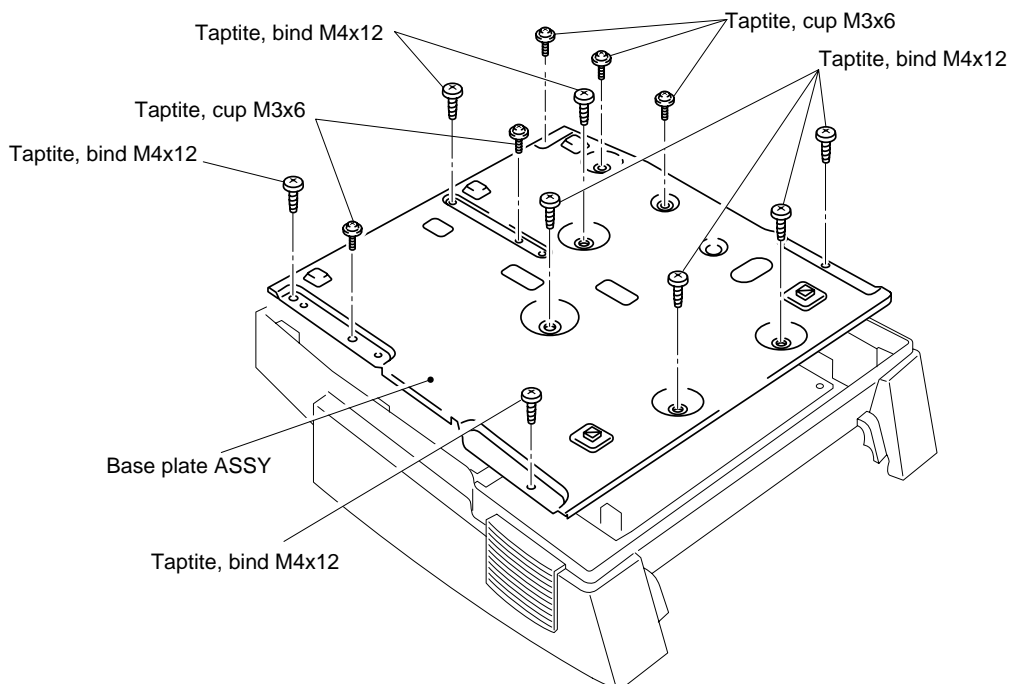


Fig. 3-16

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

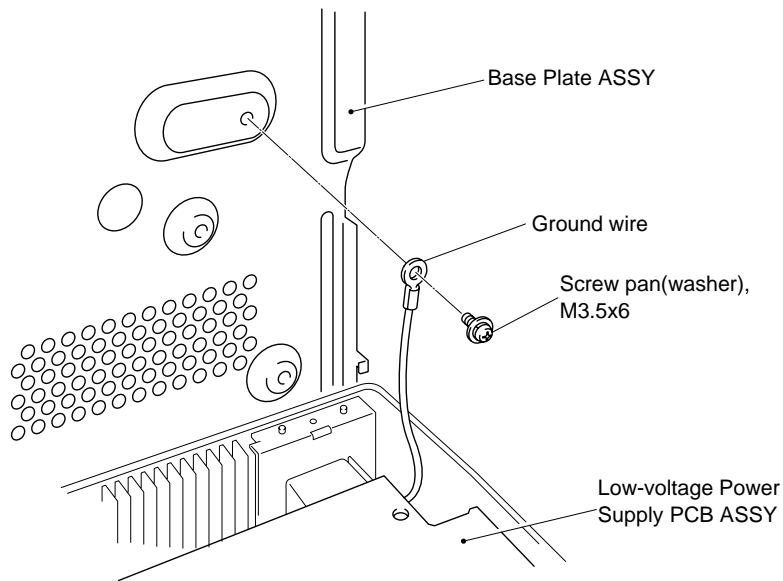


Fig. 3-17

3.10 Panel Sensor PCB ASSY

- (1) Remove the main shield.
- (2) Remove the M4x12 screw securing the panel sensor PCB ASSY.

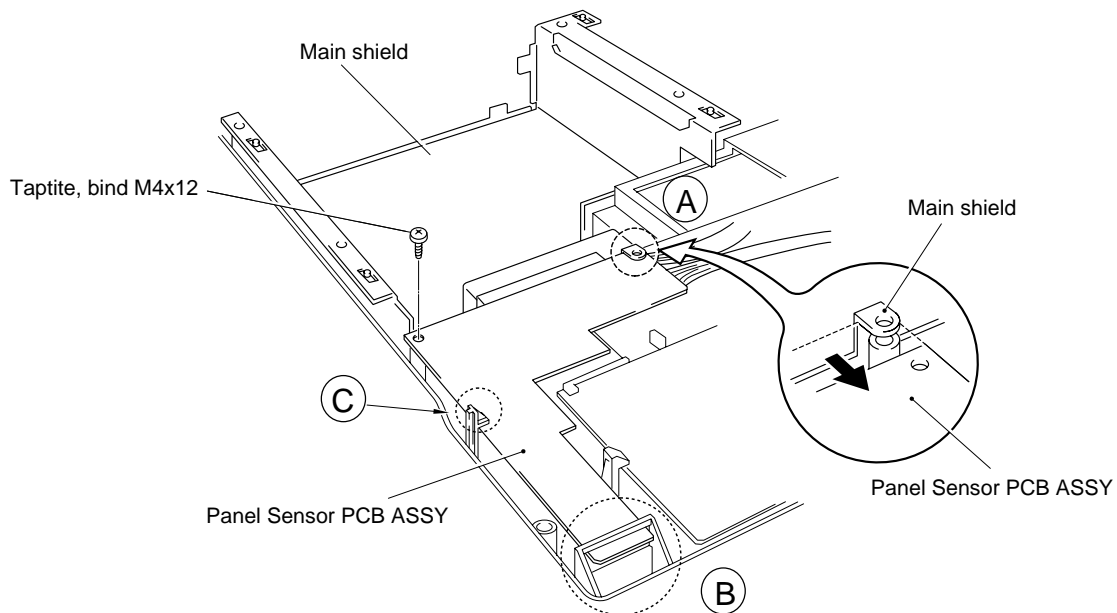


Fig. 3-18

Note:

- When re-assembling the main shield, ensure that you fit PCB (A) to underneath the main shield.
- When re-assembling 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.

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

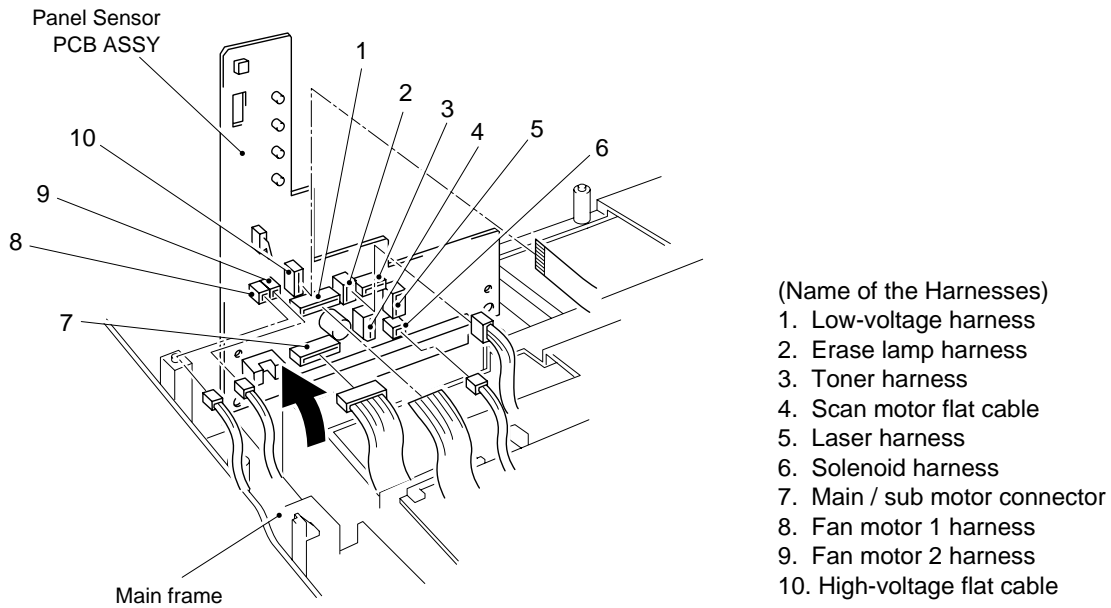


Fig. 3-19

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.

3.11 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.

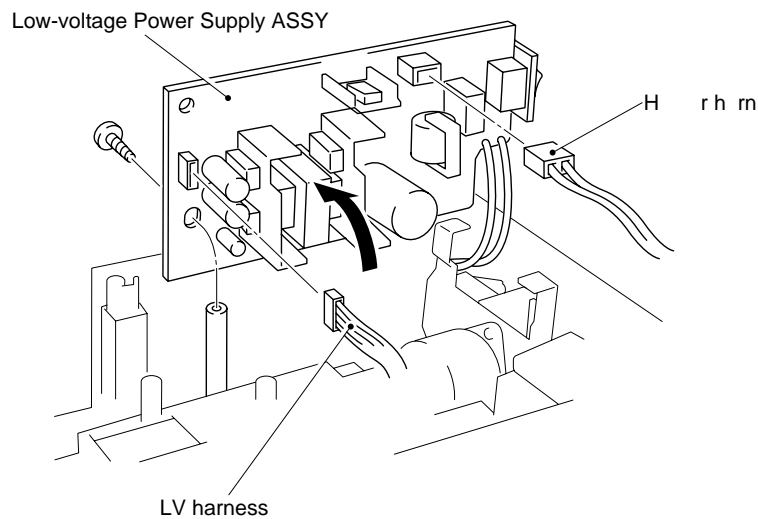


Fig. 3-20

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

Note:

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

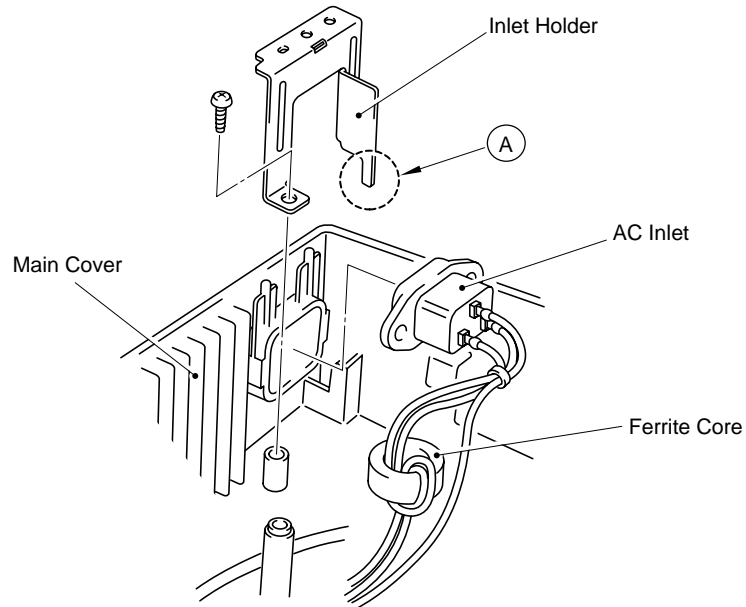


Fig. 3-21

3.12 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.

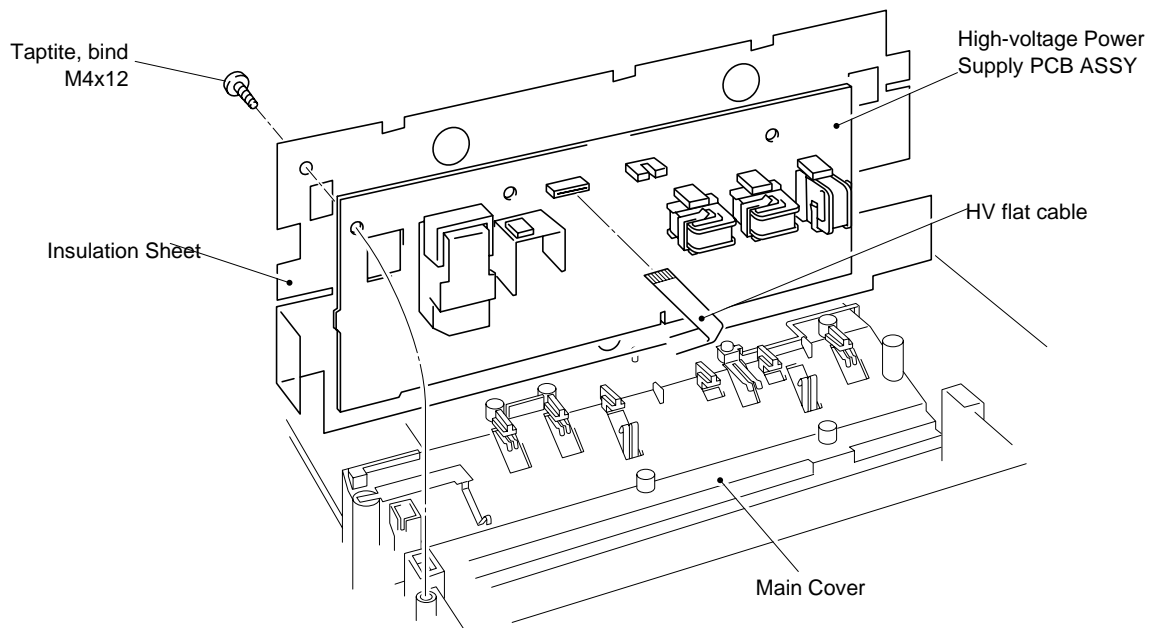


Fig. 3-22

3.13 Sub Fan Motor ASSY

- (1) Slide the sub fan motor ASSY upwards.

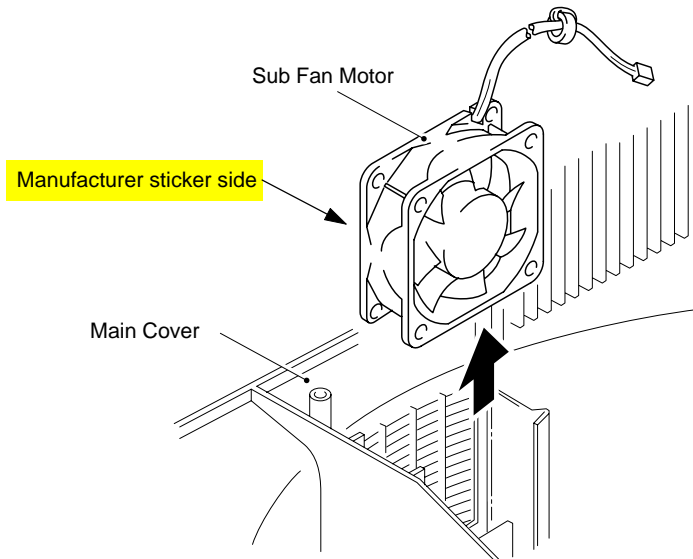


Fig. 3-23

Note:

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

3.14 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 from the fan motor holder.

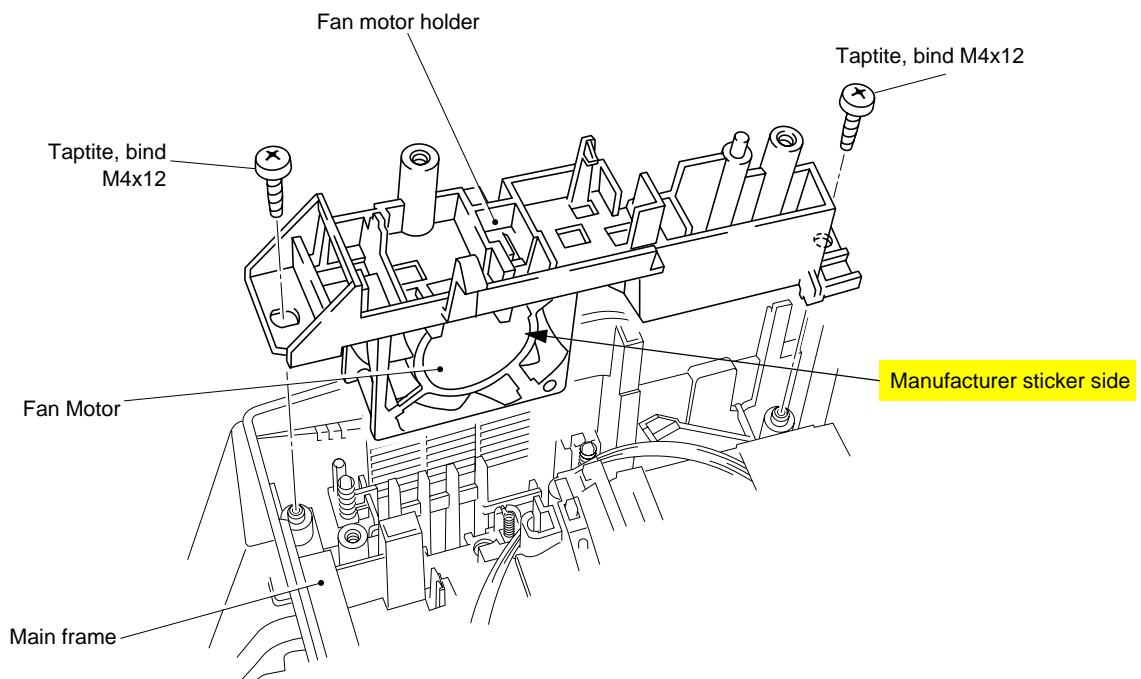


Fig. 3-24

Note:
 When re-assembling the fan motor into the holder, refer to the figure on the right.

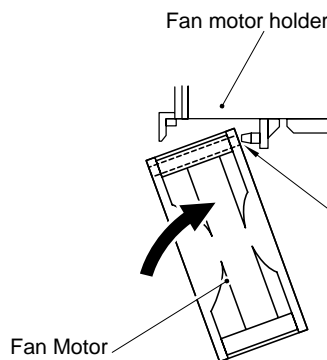


Fig. 3-25

3.15 Drive Unit

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

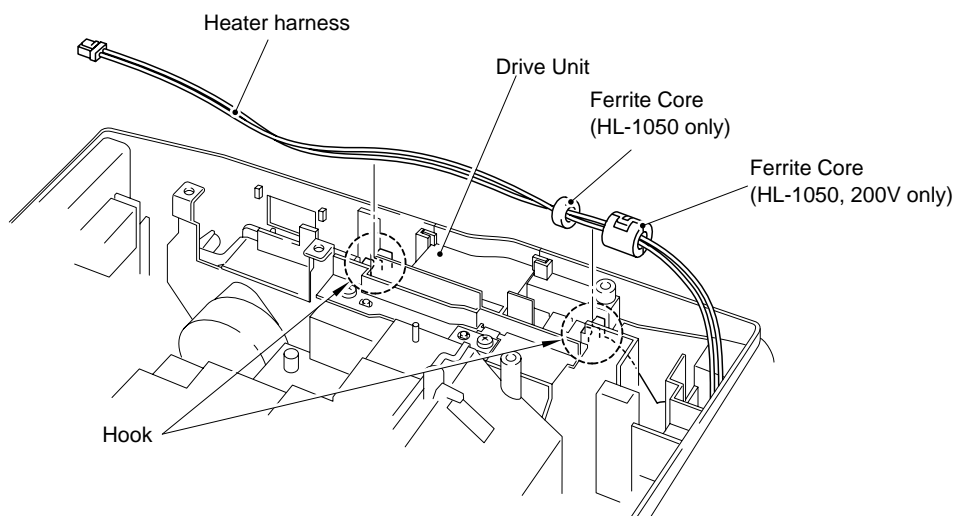


Fig. 3-26

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

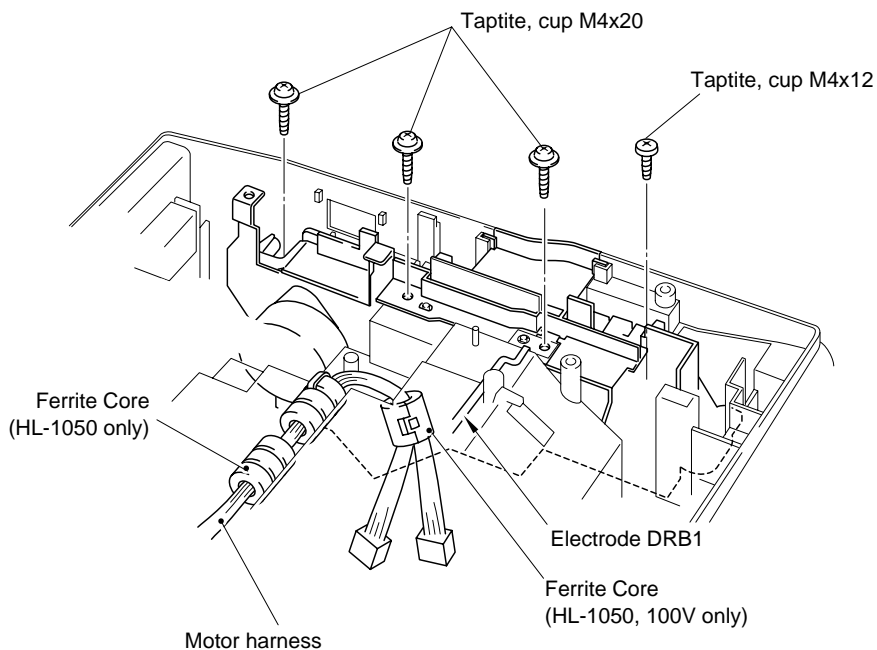


Fig. 3-27

Note:

- When re-assembling the drive unit, ensure that you fit the drive unit underneath the electrode DRB1.
- When disassembling the drive unit, be sure to remove the eight ferrite cores of two types on the heater harness and the motor harness. (Refer to the figures in the previous page, Fig. 3-26 and Fig. 3-27.) The place where the bigger core should be assembled varies depending on the model.

3.16 Main Motor ASSY

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

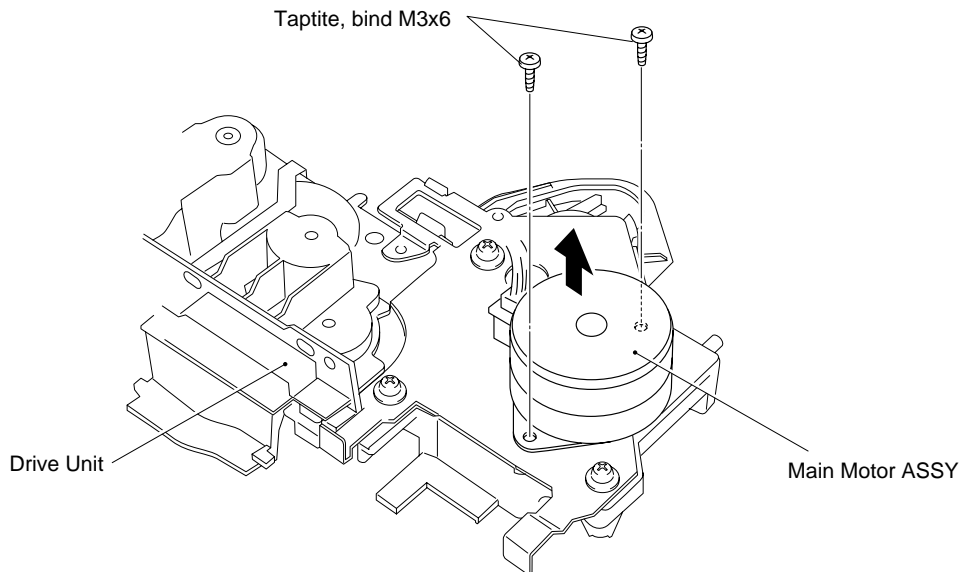


Fig. 3-28

3.17 Sub Motor ASSY

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

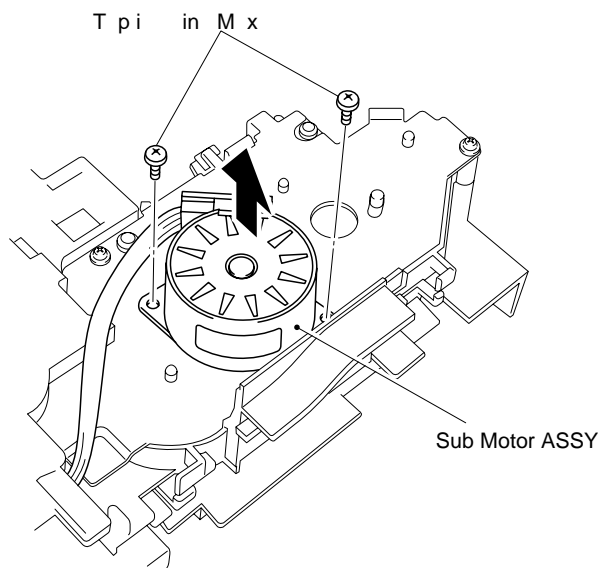


Fig. 3-29

3.18 Paper Support

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

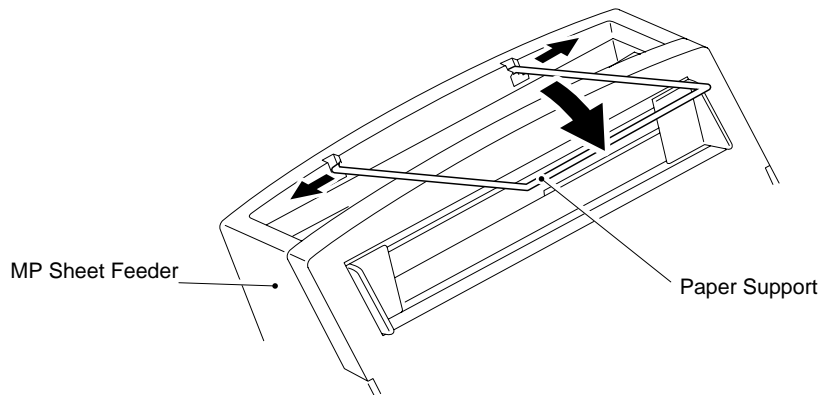


Fig. 3-30

3.19 Extension Support Wire

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

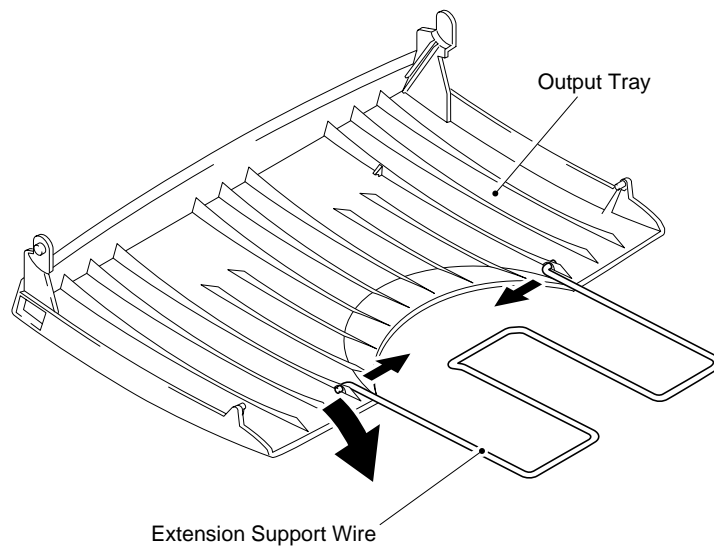


Fig. 3-31

4. PACKING

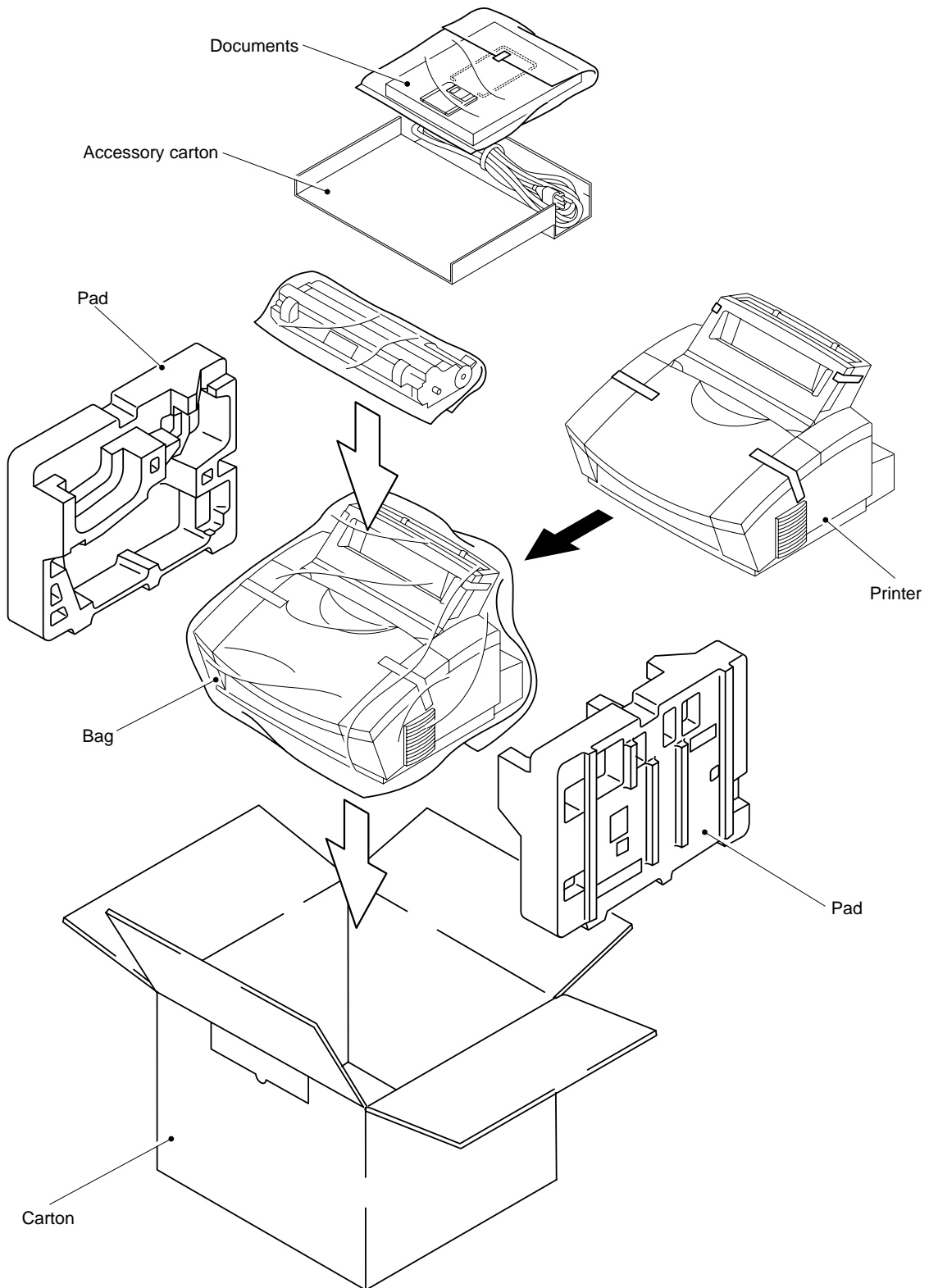


Fig. 3-32

CHAPTER IV MAINTENANCE AND TROUBLESHOOTING

1. INTRODUCTION

1.1 Initial Check

(1) Operating environment

Check if :

- The source voltage stays within $\pm 10\%$ 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 dampened. [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) Consumables

Check if :

- The Toner lamp is not lit on the 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.

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 section. 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 section.

2. CONSUMABLE PARTS

2.1 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..

2.2 Toner Cartridge

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

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

Life expectancy: 2,400 pages/new 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.

2.3 Periodical Replacement Parts

No.	Description	Part No.	Qty	service life (number of prints)	Remarks
1	Fixing Unit	UL8750001	1	(50,000)	120V
	Fixing Unit	UL8751001	1	(50,000)	230V
2	Scanner Unit	UL8748001	1	(50,000 or more)	
3	MP sheet feeder ASSY	UL8749001	1	(50,000 or more)	

Note:

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

3. IMAGE DEFECTS

3.1 Image Defect Examples

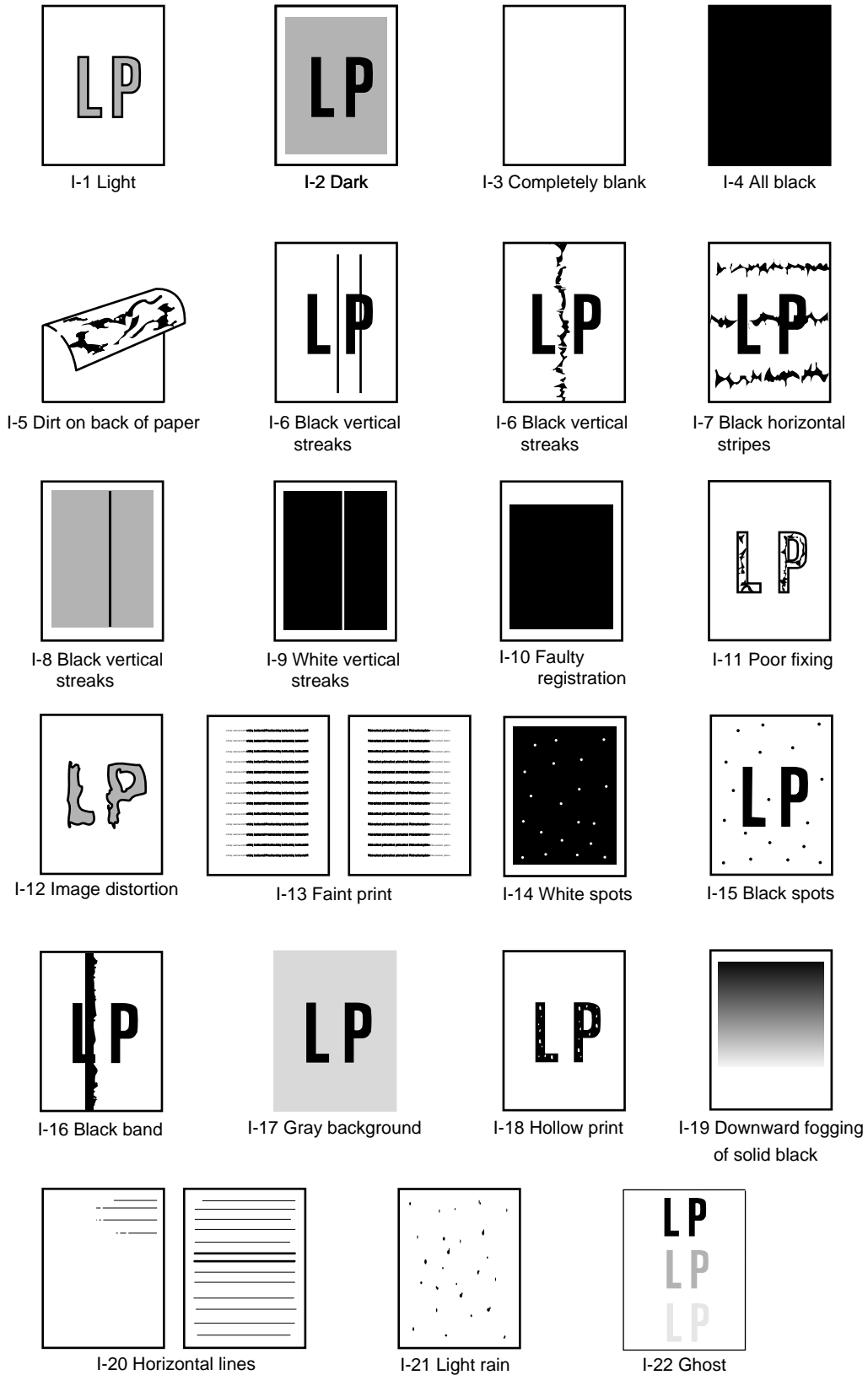


Fig. 4.1

3.2 Troubleshooting Image Defects

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

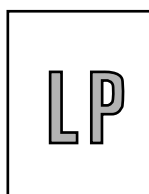
See subsection 3.3 for information about the location of the high-voltage contacts and grounding contacts.

Caution:

Print quality can not 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 printable paper width.*
- *When printing on one area of the paper continuously even though Letter or A4-size paper is used.*

I-1	Light
-----	-------



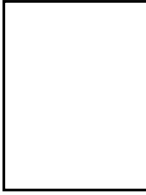
Possible cause	Step	Check	Result	Remedy	HV.GND contacts (Fig.4-5)
Toner sensing failure (printer side)	1	Can printing be started with the drum unit removed?	Yes	Toner sensor failure. Check if the toner sensor needs cleaning and check the toner sensor connection.	
Toner sensing failure (toner cartridge 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. 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.	
Scanner unit failure	6	Is the problem solved by replacing the scanner unit?	Yes	Replace the scanner unit.	

I-2	Dark
-----	------



Possible cause	Step	Check	Result	Remedy	HV.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
-----	------------------



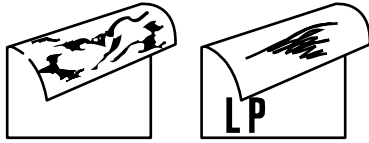
Possible cause	Step	Check	Result	Remedy	HV.GND contacts (Fig.4-5)
Developing bias contact failure	1	Are the developing bias contacts between the printer body and drum unit dirty?	Yes	Clean the electrodes at both sides.	⑦
Drum unit	2	Are the drum shaft and drum electrode of the printer body connected 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.	
Scanner unit failure	6	Scanner interlock lever damaged. Scanner mirror is broken or loose.	Yes	Replace the scanner unit.	
			No	Replace the high-voltage power supply PCB.	

I-4	All black
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Possible cause	Step	Check	Result	Remedy	HV.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 scanner unit connected with the panel sensor PCB correctly?	No	Check the harness connection between the scanner 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
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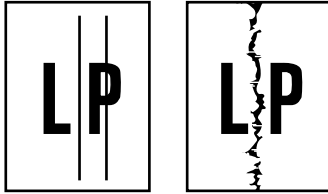


Possible cause	Step	Check	Result	Remedy
Fixing unit	1	Is the pressure roller dirty? Is any other area in the printer dirty?	Yes	Clean the pressure roller. (See the following note.)
Dirt in the drum unit	2	Is the transfer roller dirty? Is the problem solved after the drum unit is replaced?	Yes	Replace 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 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
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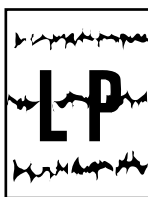


Possible cause	Step	Check	Result	Remedy	HV.GND contacts (Fig.4-5)
Corona failure	1	Is the corona wire dirty?	Yes	Clean the corona wire with the wire cleaner.	⑧
Corona failure	2	Is the vertical block streak about 10mm wide? Is the corona wire cleaner not in its home position?	Yes	Return the wire cleaner 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:

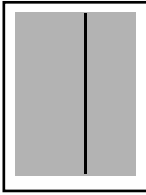
If you print the same pattern continuously, the drum will be worn and black vertical streaks will appear on the paper.

I-7	Black and blurred horizontal stripes
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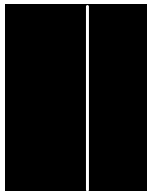
Possible cause	Step	Check	Result	Remedy
Scratch on the drum	1	Are the horizontal stripes at 94mm (OPC drum) intervals?	Yes	Replace the drum unit.
Toner stuck on the developer roller	2	Are the horizontal stripes at 25mm (developer roller) intervals?	Yes	Print several sheet and see what happens. The problem will disappear after a while. If not, replace the drum unit.
Scratch on the fixing roller	3	Are the horizontal streaks at 63mm (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)
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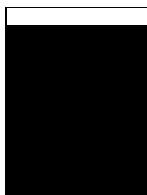
Possible cause	Step	Check	Result	Remedy
Translucent stain on the scanner window	1	Are there any stains on the scanner window?	Yes	Clean the scanner window. If it is not effective, replace the scanner unit.

I-9	White vertical streaks
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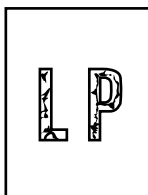
Possible cause	Step	Check	Result	Remedy
Scanner window dirty	1	Is the scanner window dirty?	Yes	Clean the scanner window with a dry tissue.
Transfer failure	2	Is the transfer roller scratched?	Yes	Replace the drum unit.

I-10	Faulty registration
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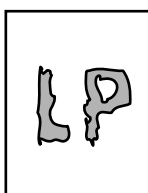
Possible cause	Step	Check	Result	Remedy
Excessive paper load	1	Is the paper loaded in the paper feeder more than 22mm deep?	Yes	Instruct the user to keep paper loads below 22mm in depth.
Print paper	2	Is the specified weight of the recommended paper being used?	No	Instruct the user to use the recommended 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 resist sensor position incorrect	4	Is the position of the paper resist sensor normal?	No	Reposition the sensor to the correct position.

I-11	Poor fixing
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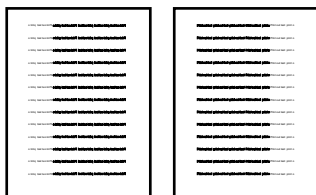
Possible cause	Step	Check	Result	Remedy
Printing paper	1	Is thick paper more than 42lb weight in use?	Yes	Instruct the user to use paper of the recommended weight and thickness.
Toner sensing failure	2	Is the problem solved by replacing the drum unit or the toner cartridge? (When printing is faint.)	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
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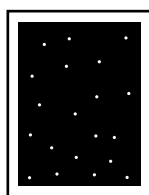
Possible cause	Step	Check	Result	Remedy
Scanner	1	Is the scanner unit secured to the frame incorrectly? Is there any play?	Yes	Secure the unit correctly and tighten the screws.
Scanner LD emission failure Scanner motor rotation failure	2	Is the laser diode or the laser scanner motor defective?	Yes	Replace the scanner unit.
Scanner connection failure	3	Is the scanner harness connected properly? Is it coming loose?	Yes	Connect the harness correctly.

I-13	Faint print
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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.
Scanner window dirty	3	Is the window of the laser scanner dirty?	Yes	Clean the scanner window with a dry tissue.
Scanner unit failure	4	Is the problem solved by replacing the scanner unit?	Yes	Replace the scanner unit.

I-14	White spots
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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 freshly 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 printer has warmed up.	Yes	Replace the drum unit. Advise the user of the specified print environment.

I-15	Black spots
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Possible cause	Step	Check	Result	Remedy
Drum unit	1	Are the spots at 94mm 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 OPC drum is scratched or deteriorated (exposed). (Refer to the following note.)
Fixing unit	2	Are the spots at 63mm 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.*

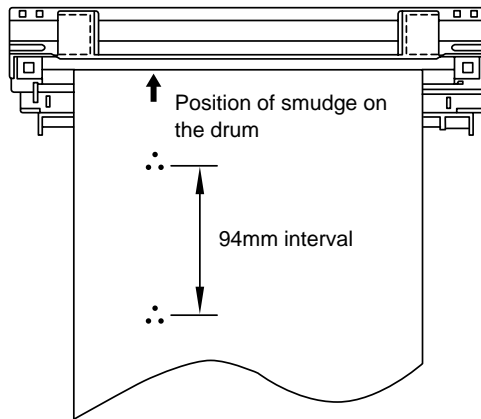


Fig. 4-2

- (2) *Turn the drum gear by hand while looking at the surface of the OPC drum.*

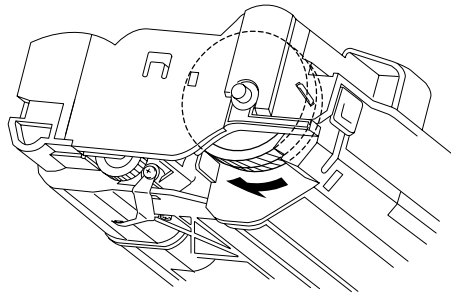


Fig. 4-3

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

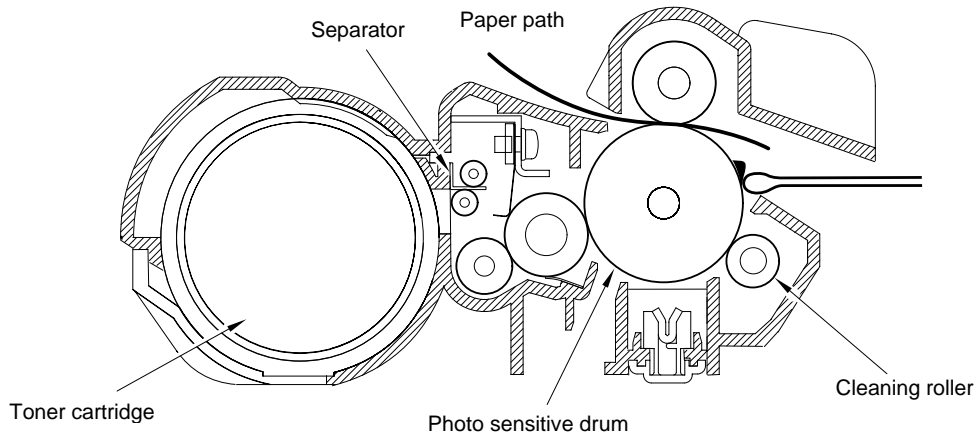
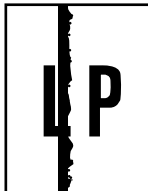


Fig. 4-4

Caution:

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

I-16	Black band
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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
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Note:

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

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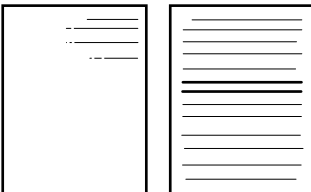
Possible cause	Step	Check	Result	Remedy
Print paper	1	Is thick paper of more than 42lb being used or extremely rough surface paper?	Yes	Recommend to use the specified type of paper.
			No	Refer and compare with I-14.

I-19	Downward fogging of solid black
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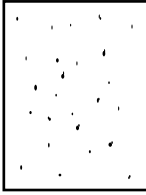
Possible cause	Step	Check	Result	Remedy
Drum unit	1	Is the problem solved after replacing the drum unit?	Yes	Replace the drum unit.
High-voltage power supply PCB	2	Is the problem solved after replacing the high-voltage power supply PCB?	Yes	Replace the high-voltage power supply PCB.

I-20	Horizontal lines
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Possible cause	Step	Check	Result	Remedy	HV.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
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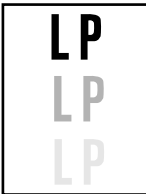


Possible cause	Step	Check	Result	Remedy
Drum unit failure	1	Is the problem solved after replacing the drum unit with one that does not contain a starter sheet**?	Yes	Replace the drum unit.
High-voltage power supply PCB failure	2	Is the problem solved after replacing the high-voltage power supply PCB?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

I-22	Ghost
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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.

3.3 Location of High-voltage Contacts and Grounding Contacts

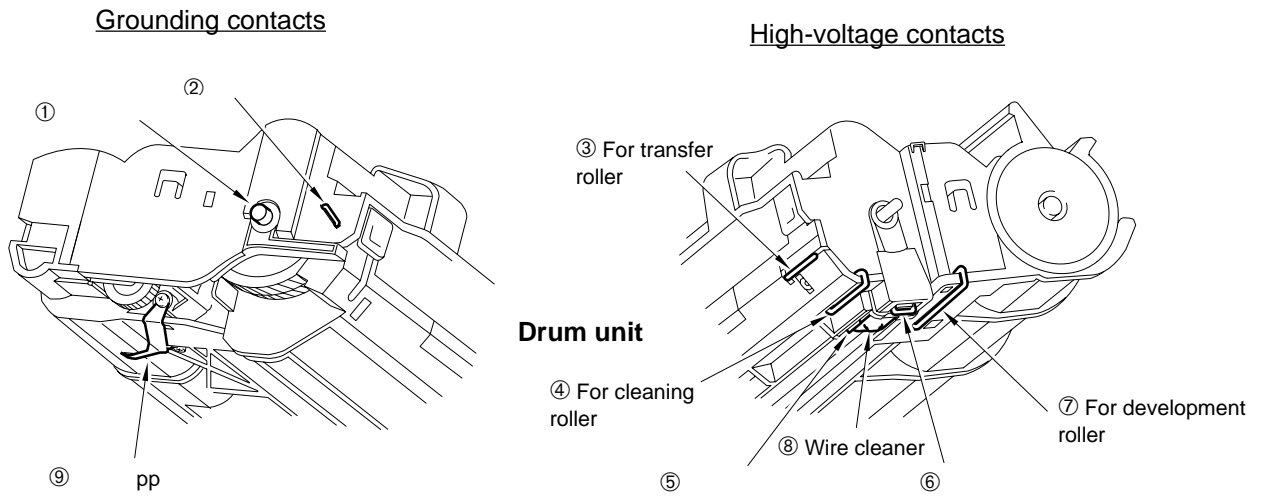


Fig. 4-5

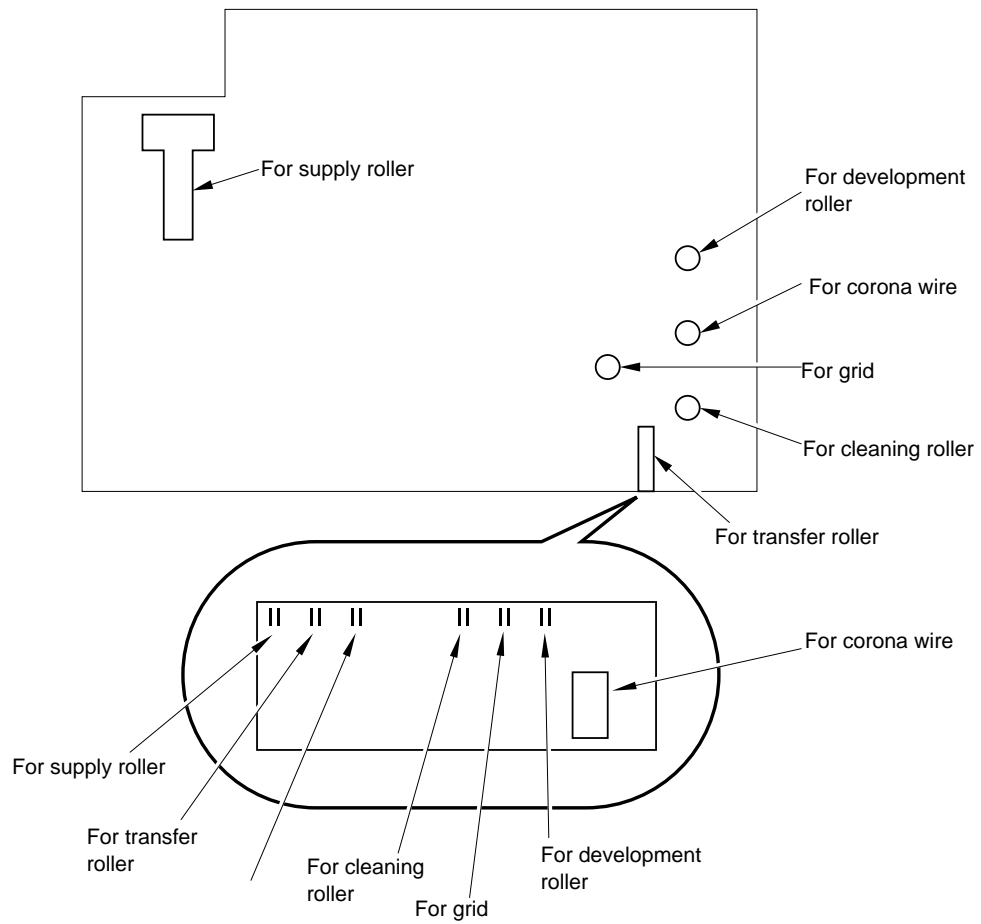


Fig. 4-6

3.4 Location of Feed Roller Shaft and Grounding Contacts

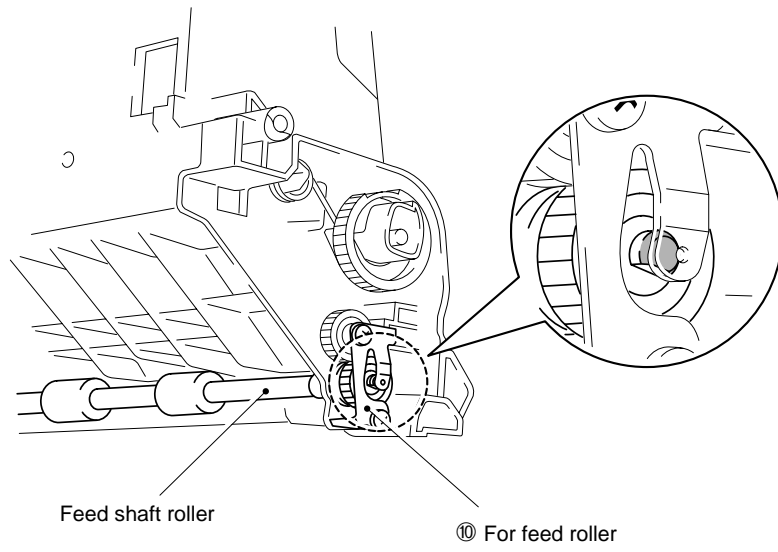


Fig. 4-7

4. 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 note and clear the problem.
Top of paper stopped at 20mm 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 note and clear the problem.
Top of paper stopped at 250mm from the fixing unit. Next paper is not fed.	Jam caused by paper length detected as longer than 400mm (16 inches).	Paper feed sensor is not returning properly, and is not turned off.	Check paper feed sensor motion referring to note and clear the problem.
Top paper stopped between the paper feed roller and the pick-up roller.	Jam caused by paper length detected as shorter than 80mm.	Paper feed sensor was turned off early. Malfunction of actuator or hardware noise.	Check sensors referring to note and clear the cause of the problem.
Paper was fed approx. 20mm from the pick-up roller.	Jam caused by a paper feed delay.	Due to paper dust or rubber of the pick-up roller wear, paper was not fed in at the proper timing.	Remove the paper dust attached to the pick-up roller. If the rubber is worn out, replace it with new one.
Top of paper stopped at 17mm 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 turned off. (single printing)	Check the sensor motion referring to note 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 20mm 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) Power on the printer 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*

5. 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.

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		<table border="1"> <thead> <tr> <th>PCB</th> <th>+ lead pin</th> <th>- lead pin</th> <th>Voltage</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Panel Sensor</td> <td>P8-1</td> <td>P8-4</td> <td>Approx. 24V</td> </tr> <tr> <td>P8-2</td> <td>P8-3</td> <td>Approx. 5V</td> </tr> </tbody> </table>	PCB	+ lead pin	- lead pin	Voltage	Panel Sensor	P8-1	P8-4	Approx. 24V	P8-2	P8-3	Approx. 5V	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
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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? <table border="1"> <tr> <td>P9-5 and P9-6</td> <td>Approx.4.5 Ω</td> </tr> <tr> <td>P9-7 and P9-8</td> <td>Approx.4.5 Ω</td> </tr> </table>	P9-5 and P9-6	Approx.4.5 Ω	P9-7 and P9-8	Approx.4.5 Ω	No	Replace the main motor.
P9-5 and P9-6	Approx.4.5 Ω							
P9-7 and P9-8	Approx.4.5 Ω							
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? <table border="1"> <tr> <td>P9-1 and P9-2</td> <td>Approx.9.1 Ω</td> </tr> <tr> <td>P9-3 and P9-4</td> <td>Approx.9.1 Ω</td> </tr> </table>	P9-1 and P9-2	Approx.9.1 Ω	P9-3 and P9-4	Approx.9.1 Ω	No	Replace the sub motor.
P9-1 and P9-2	Approx.9.1 Ω							
P9-3 and P9-4	Approx.9.1 Ω							

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 manual paper slot and make a test print by pressing the switch on the 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.
High-voltage power supply PCB	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
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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	Scanner 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 secured?	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 scanner 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.

6. INSPECTION MODE

6.1 Incorporated Inspection Modes

The printer incorporates various inspection modes such as the factory inspection mode and the test print mode. The inspection mode varies depending on the model of the printer.

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 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
Drum + Alarm *	ROM code reprogramming mode (only when flash memory is fitted)
Alarm + Ready *	RAM check
Ready + Data *	4% density pattern print mode

* Note: For the HL-1050 printer only.

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 control panel are also checked. On entering this mode, the lamps show the status of the respective sensors as follows;

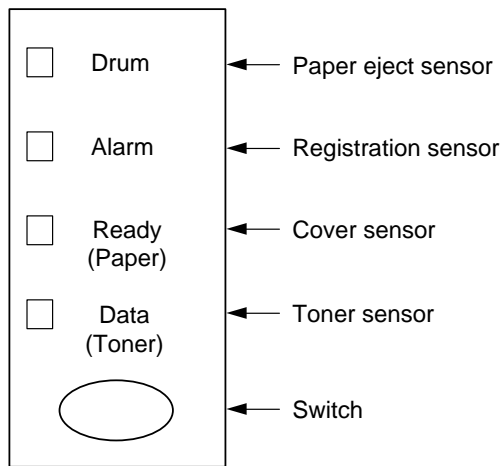


Fig. 4.8

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 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 the printer power switch OFF, open the top cover, and remove the drum unit.
- (2) Turn the printer power switch ON while holding down the 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 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.

6.2 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			○	
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 these 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

FUSER MALFUNCTION

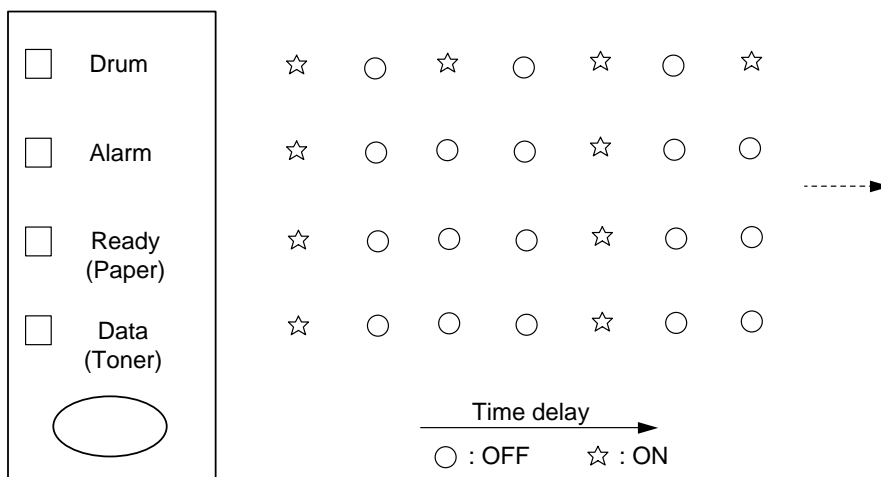


Fig. 4-9

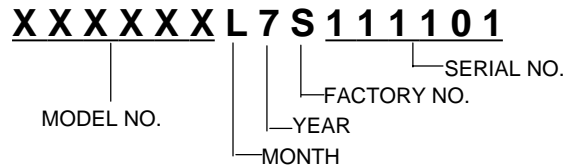
APPENDIX 1. SERIAL NO. DESCRIPTIONS

The descriptions below show how to read labels on each printer and part.

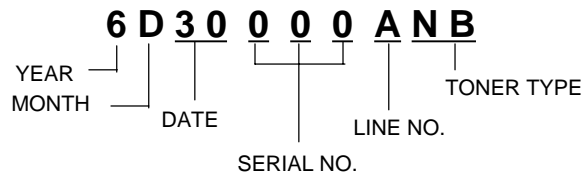
< ID for production month >

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

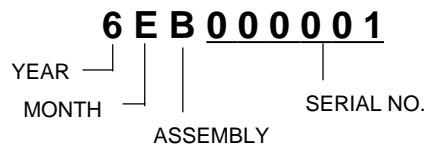
(1) Printeron the main body



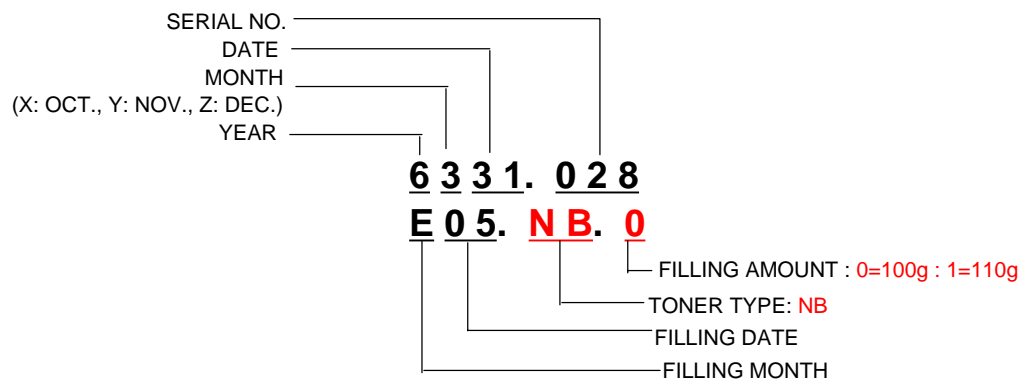
(2) Process uniton the package of the process unit
(Drum unit with toner cartridge)



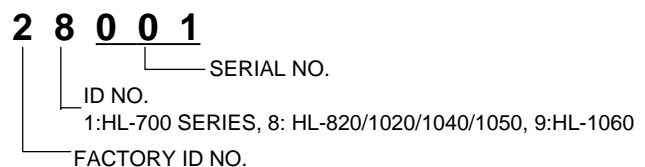
(3) Drum uniton the drum unit



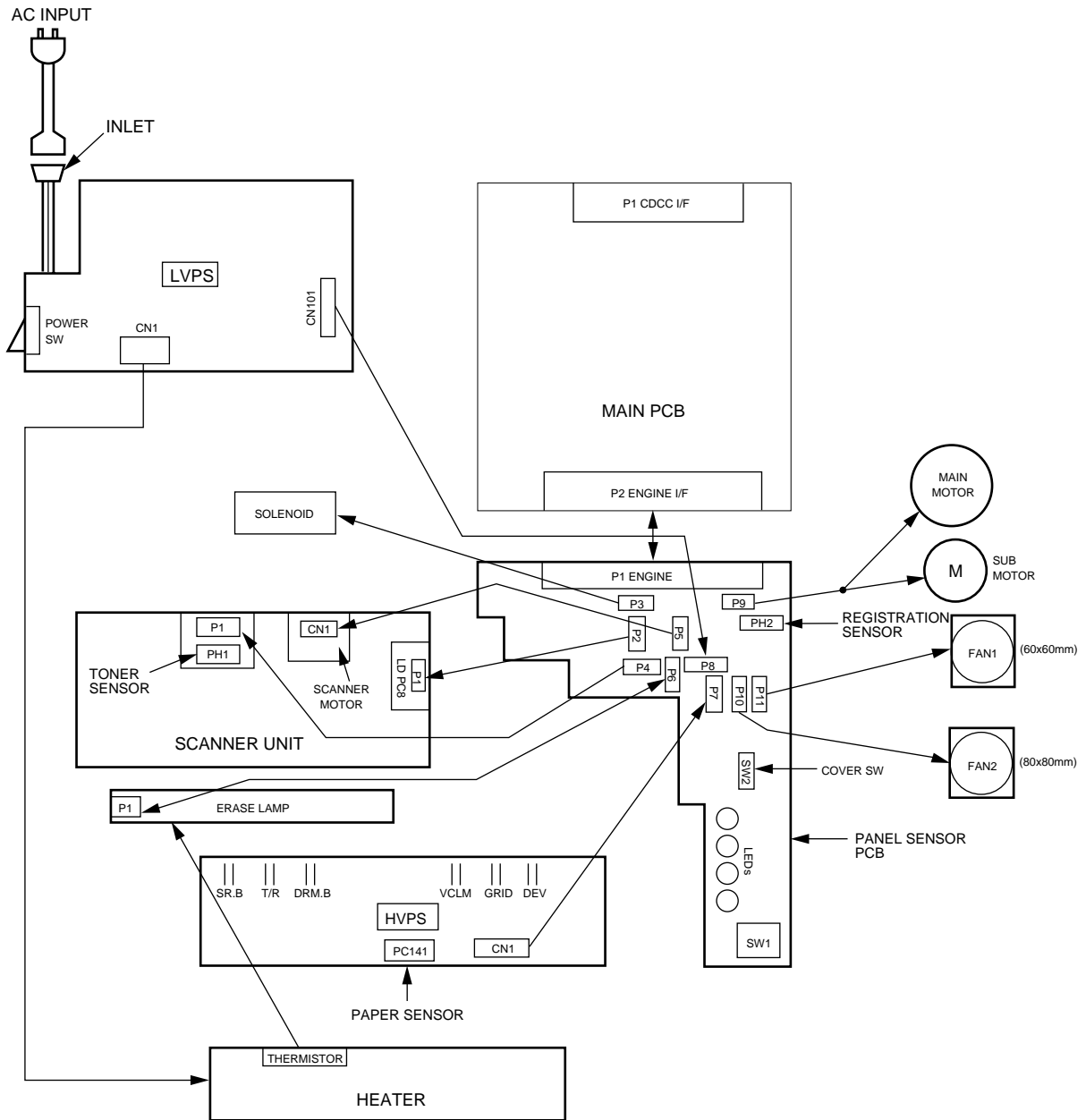
(4) Toner cartridgeon the toner cartridge



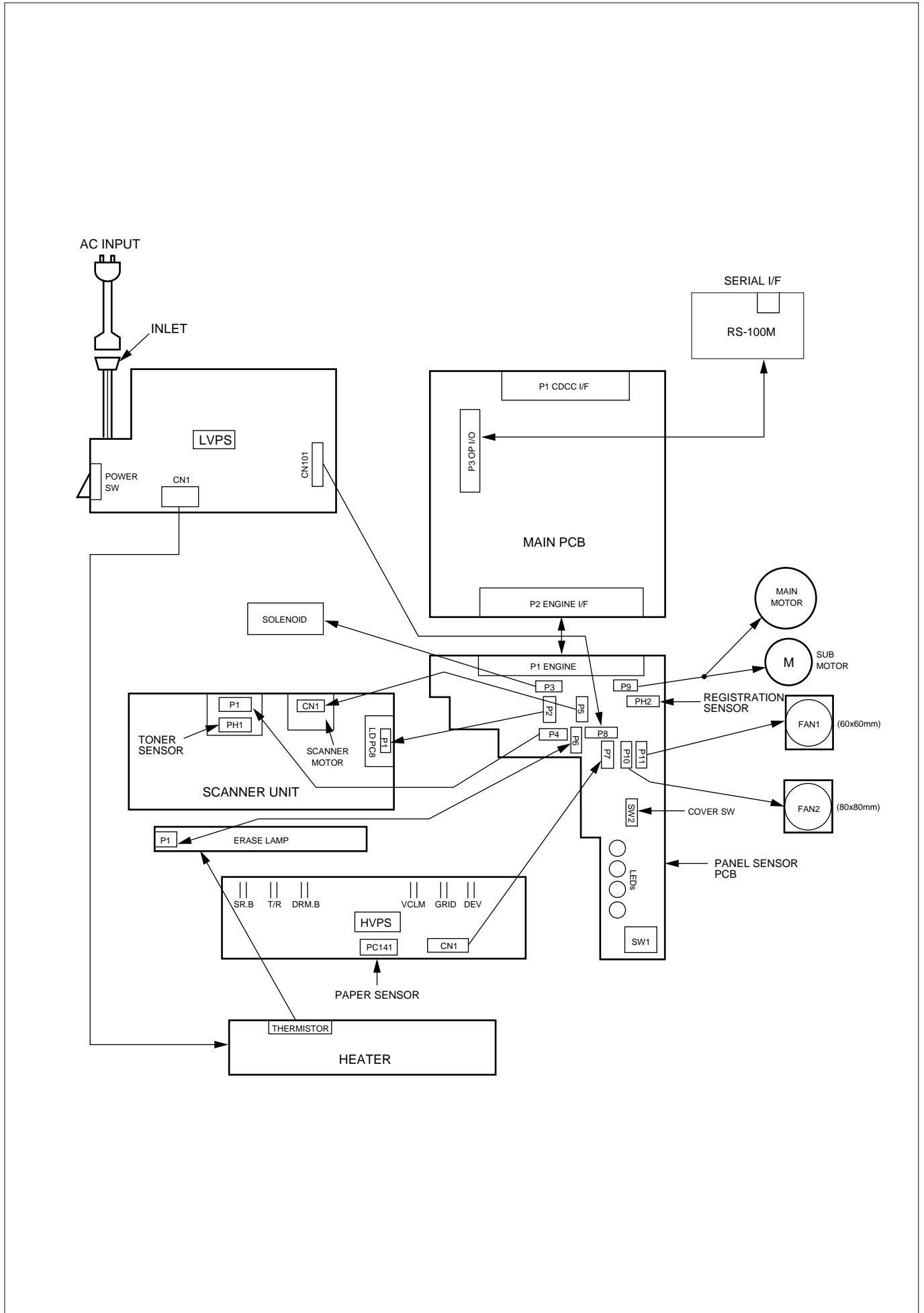
(5) Scanner uniton the scanner unit



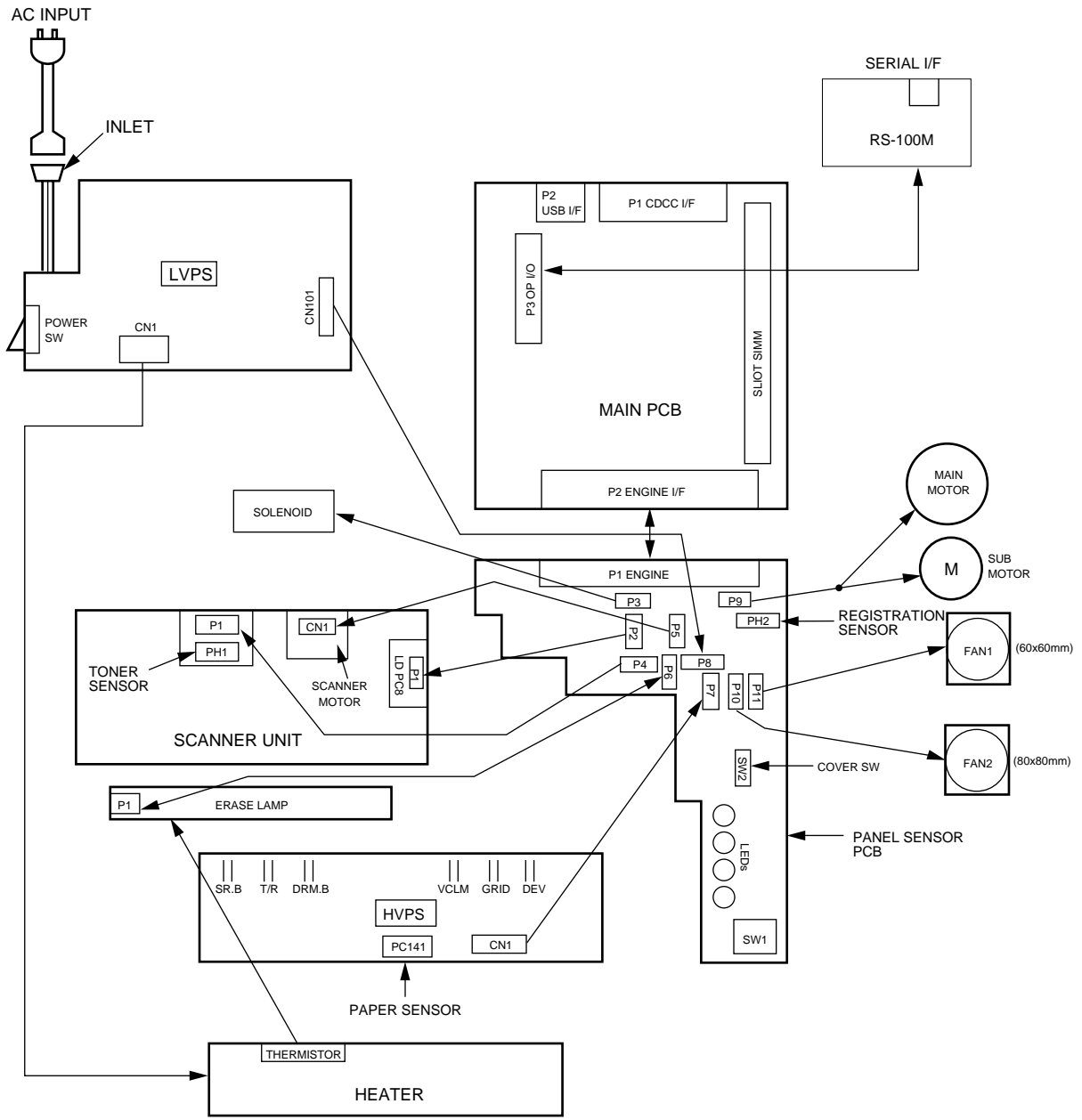
Appendix 2. Connection Diagram, HL-820/1020



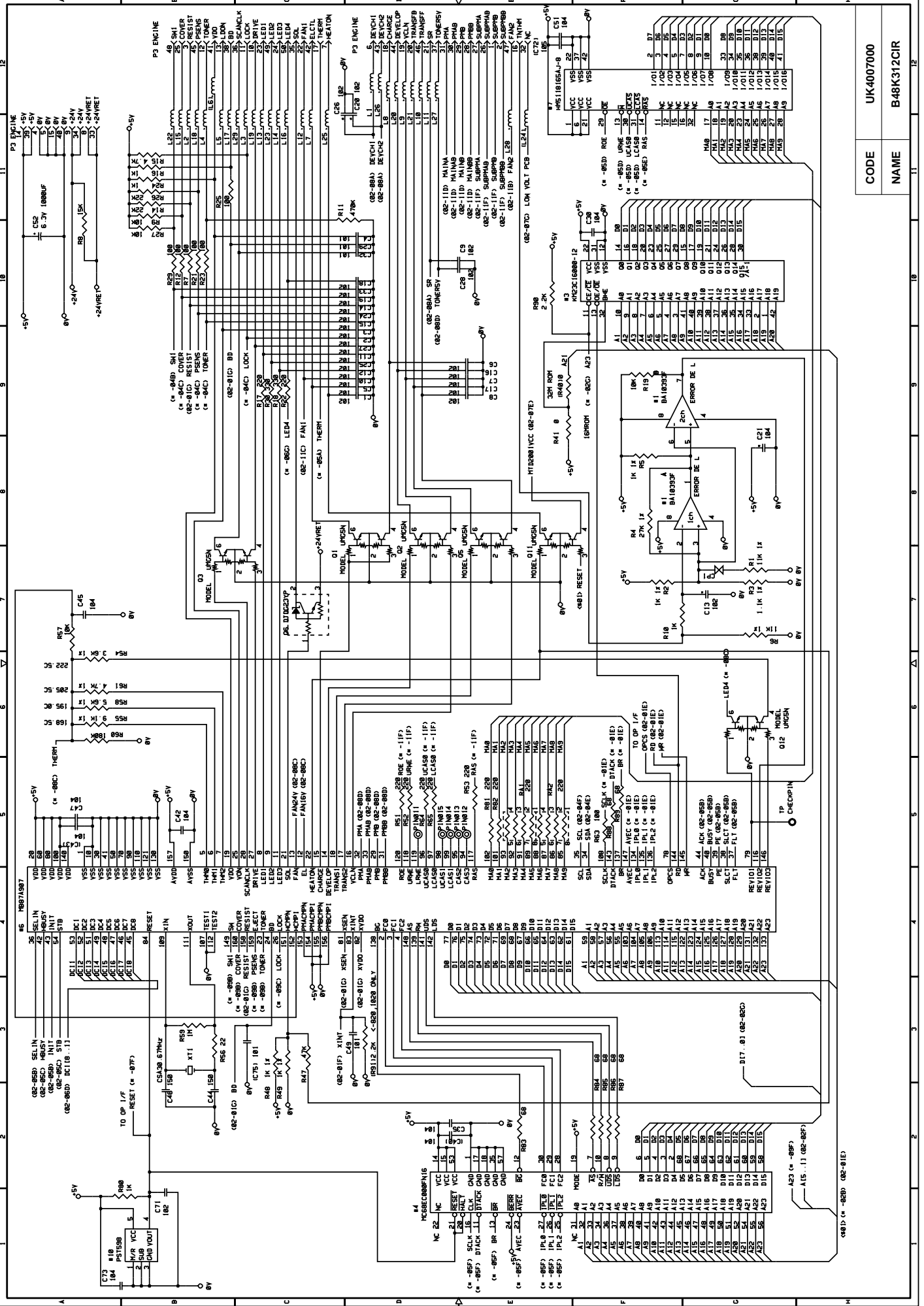
Appendix 3. Connection Diagram, HL-1040



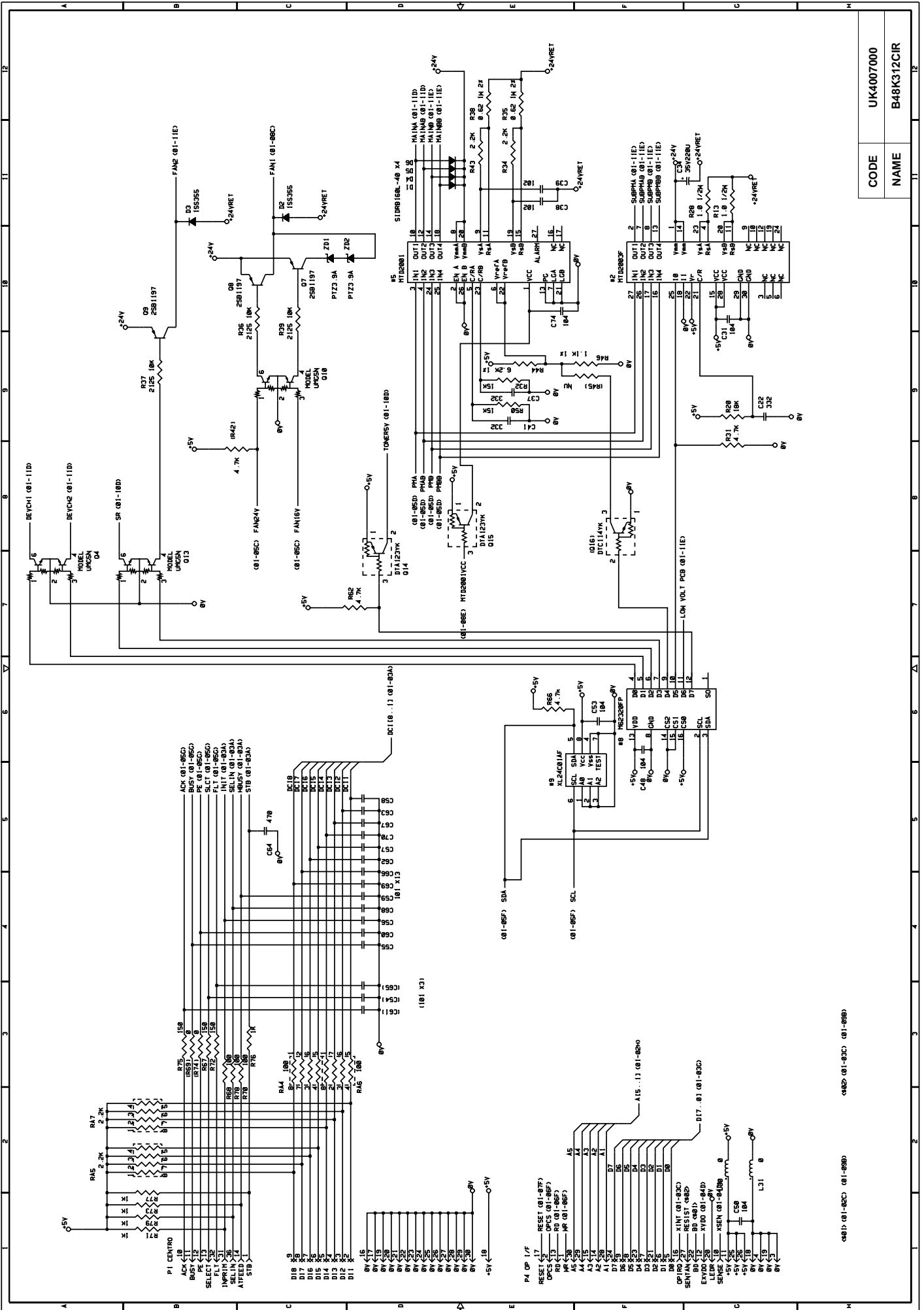
Appendix 4. Connection Diagram, HL-1050



Appendix 5. Main PCB Circuit Diagram, (HL-820/1020/1040), (1/2)

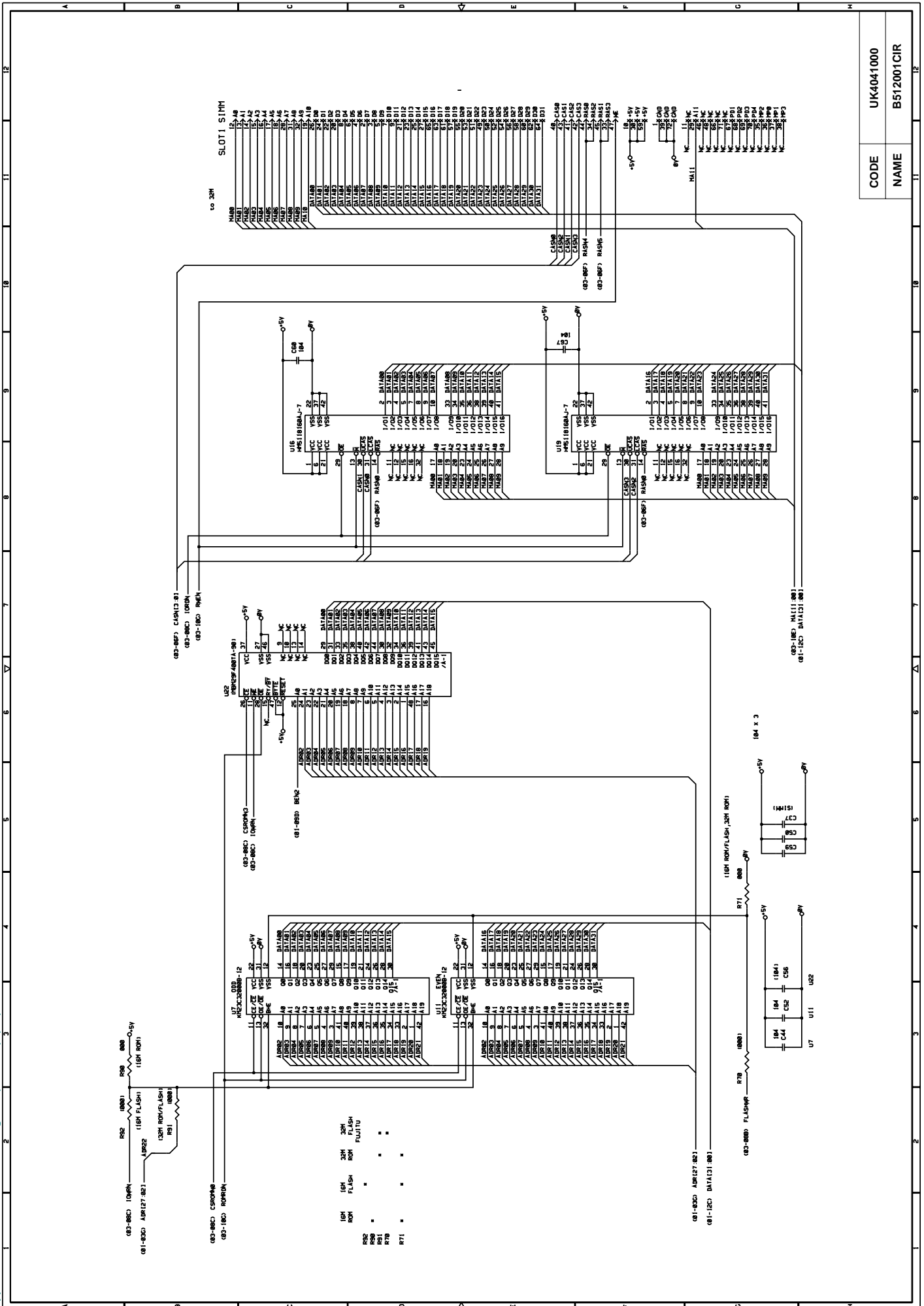


CODE	UK4007000
NAME	B48K312CIR



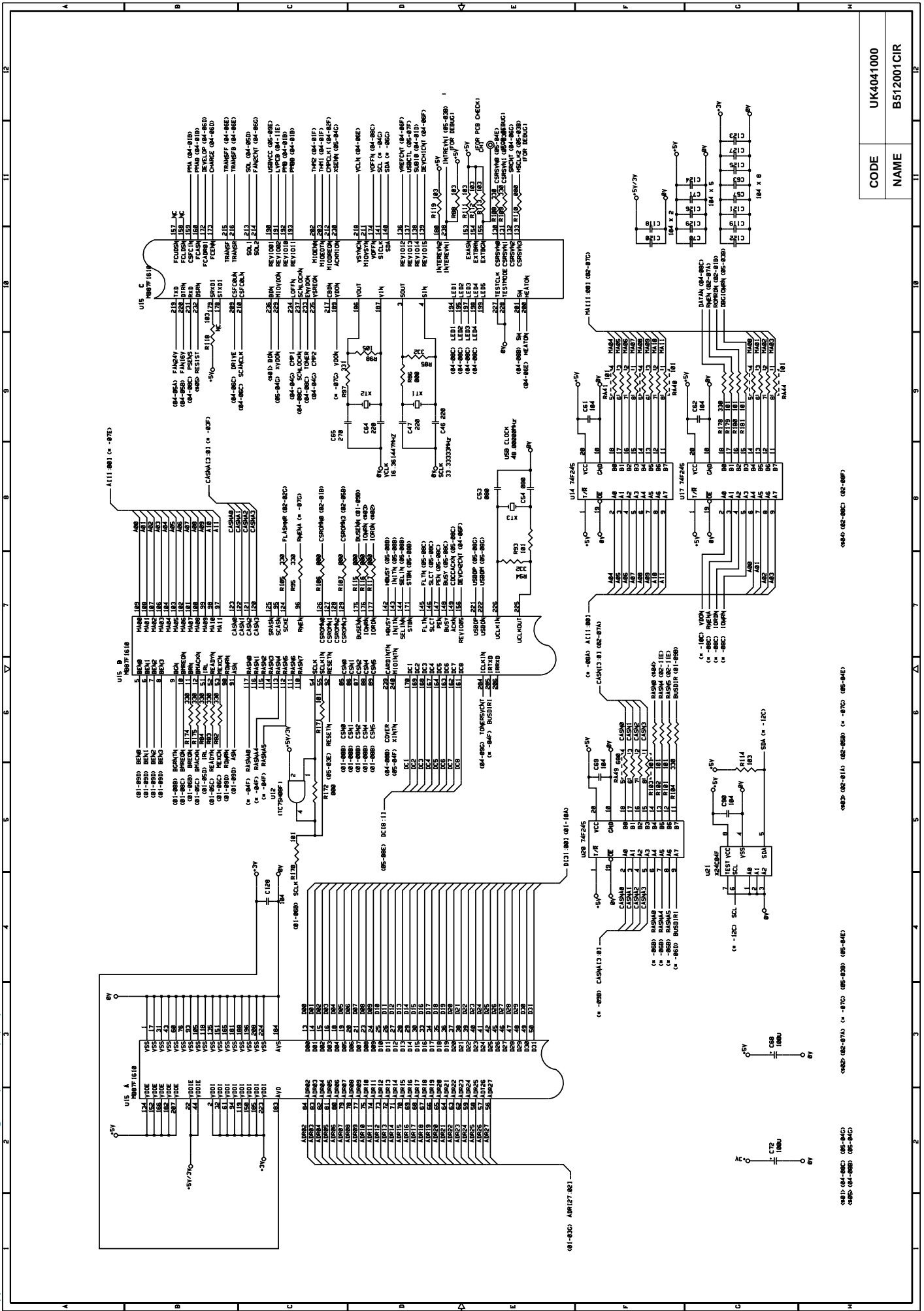
CODE	UK4007000
NAME	B48K312CIR

Appendix 8. Main PCB Circuit Diagram, (HL-1050), (2/5)

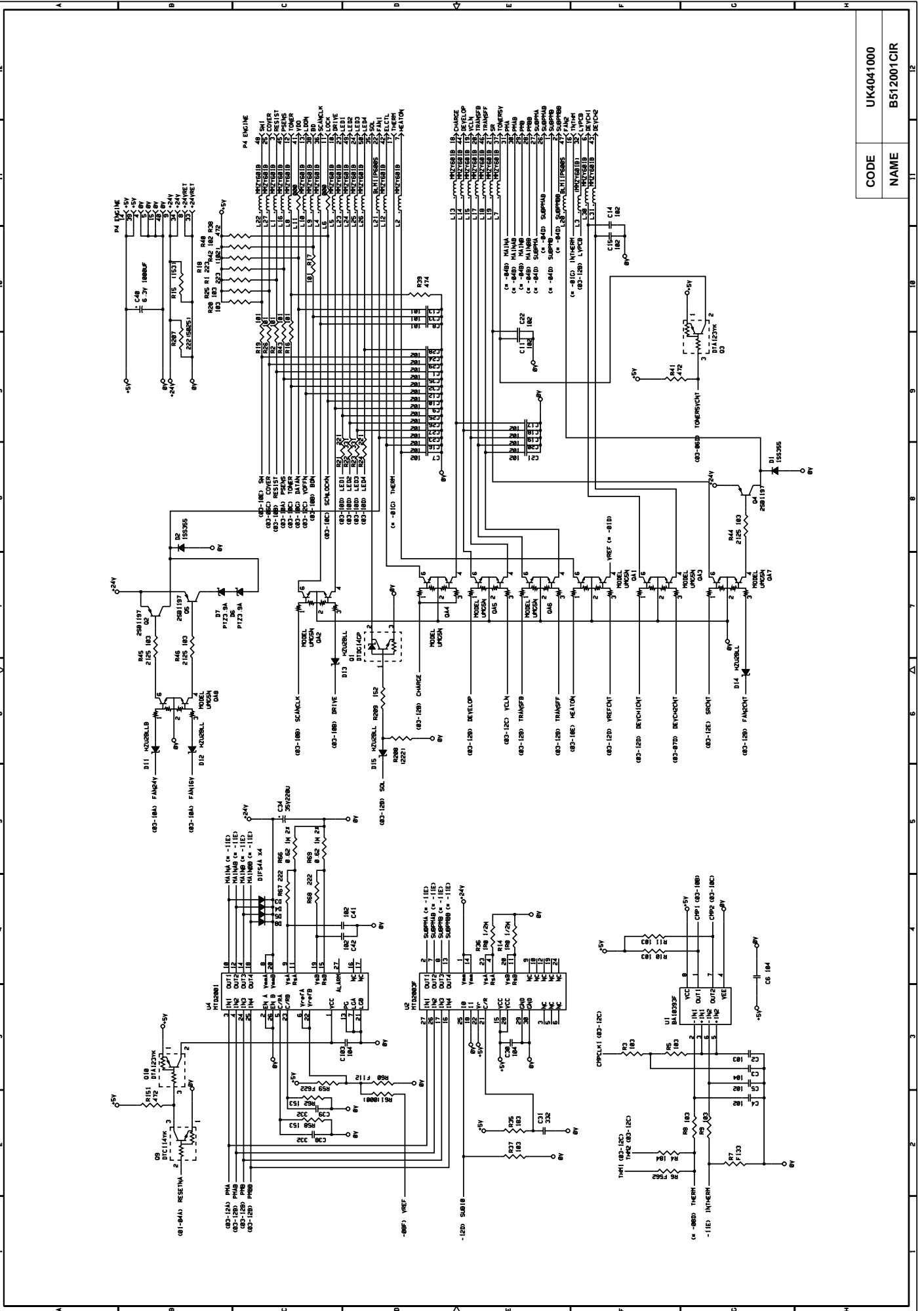


CODE	UK4041000
NAME	B512001CIR

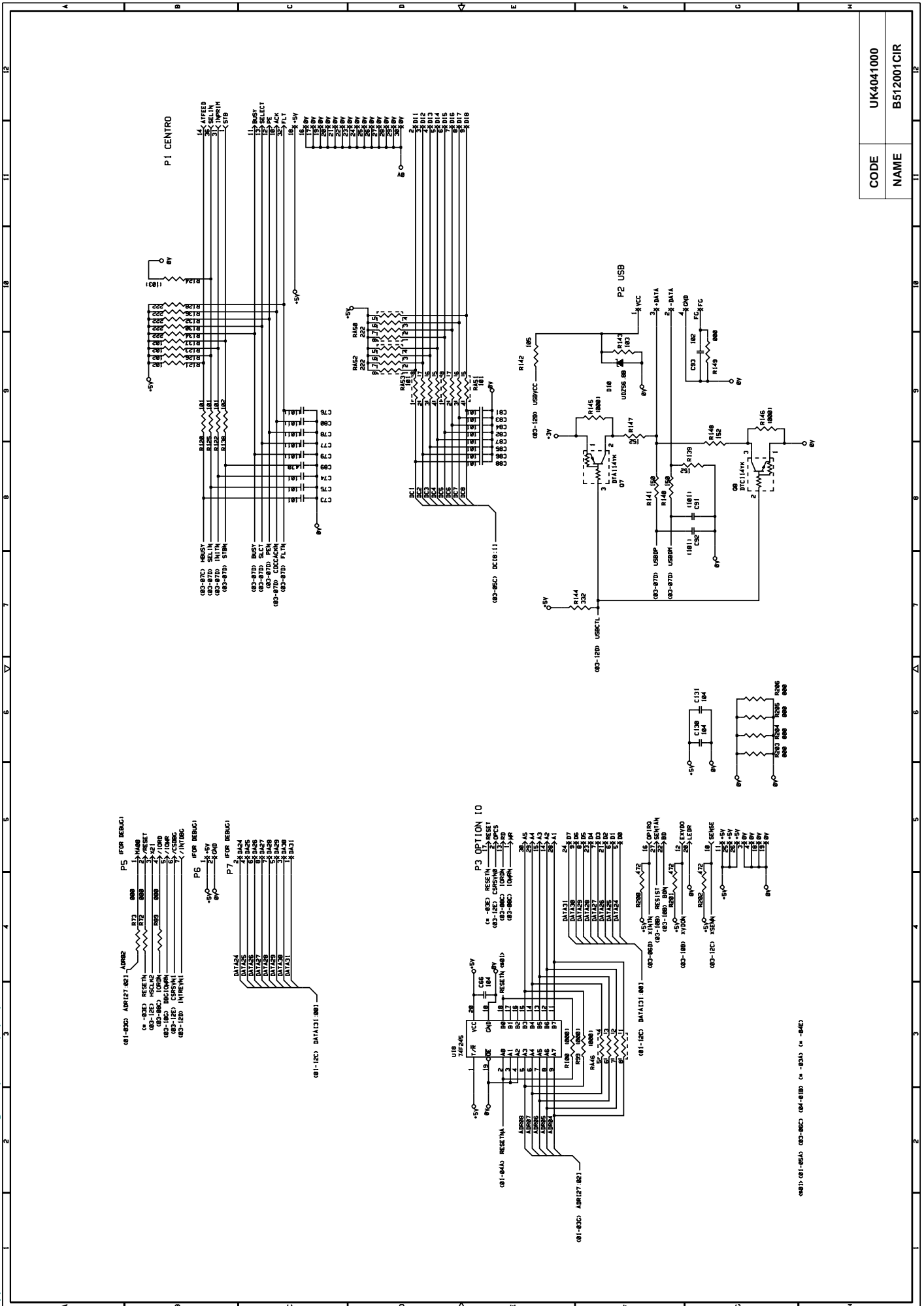
Appendix 9. Main PCB Circuit Diagram, (HL-1050), (3/5)



CODE	NAME
UK4041000	B512001CIR

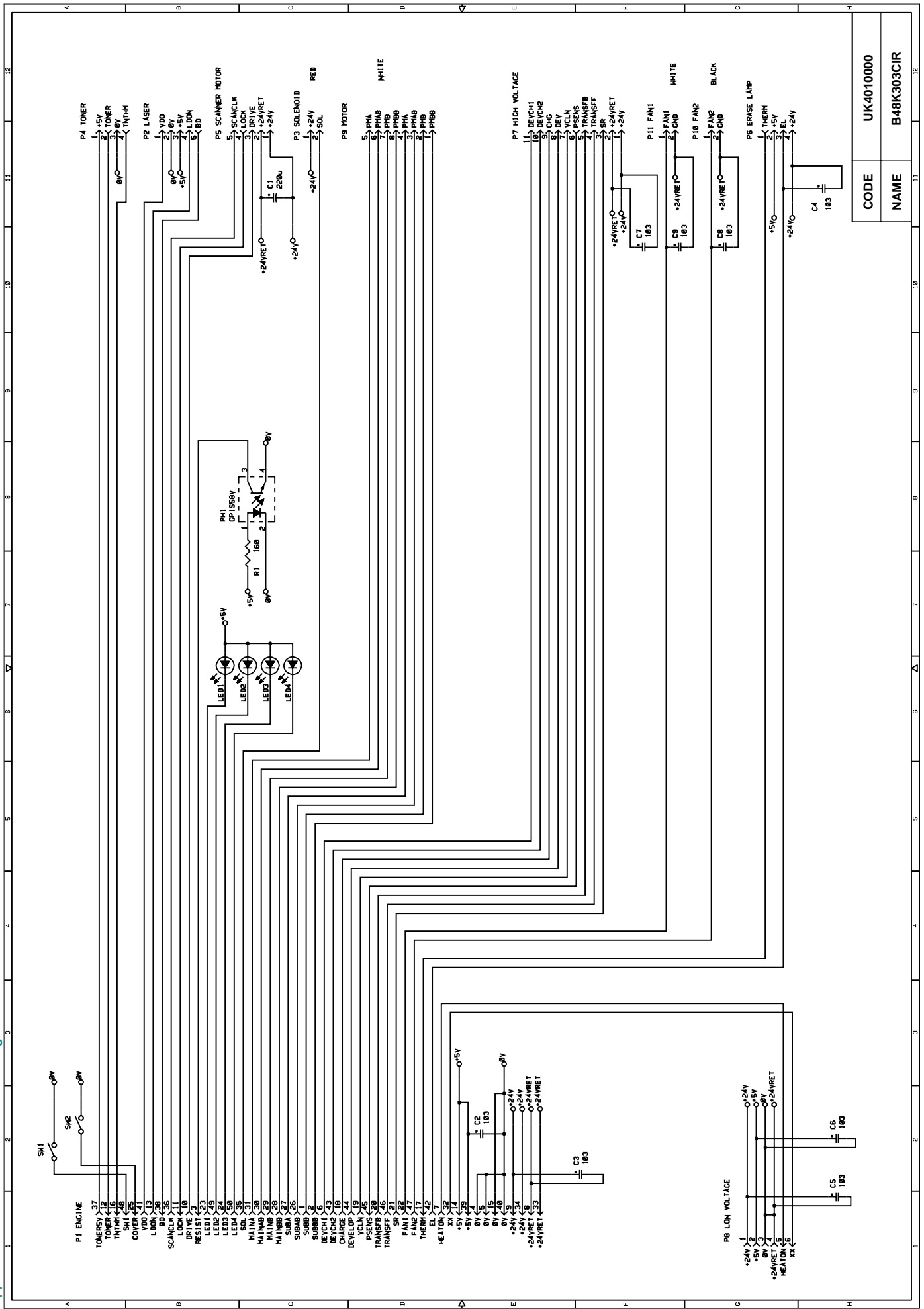


CODE	UK4041000
NAME	B512001CIR



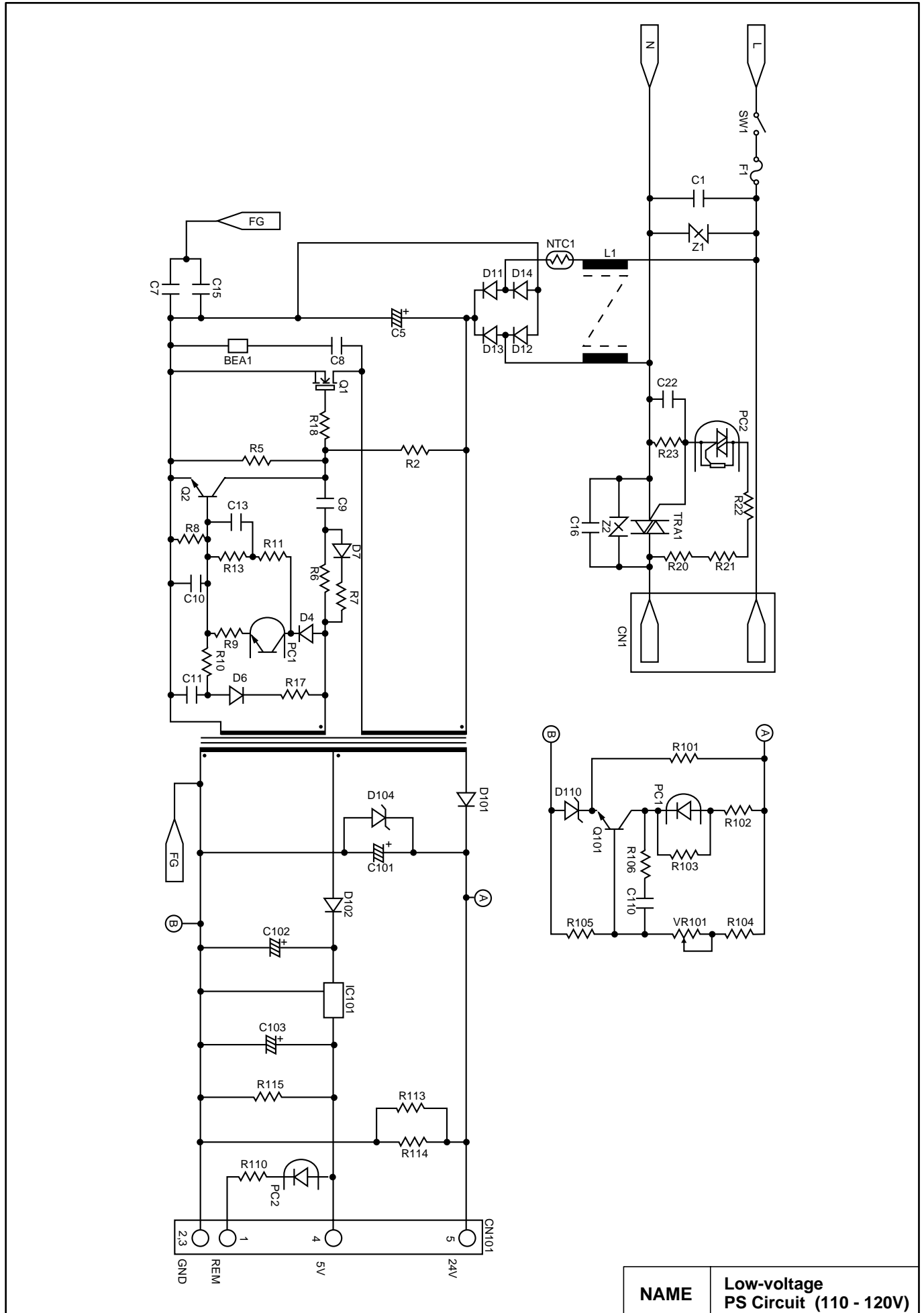
CODE	UK4041000
NAME	B512001CIR

Appendix 12. Panel Sensor PCB Circuit Diagram



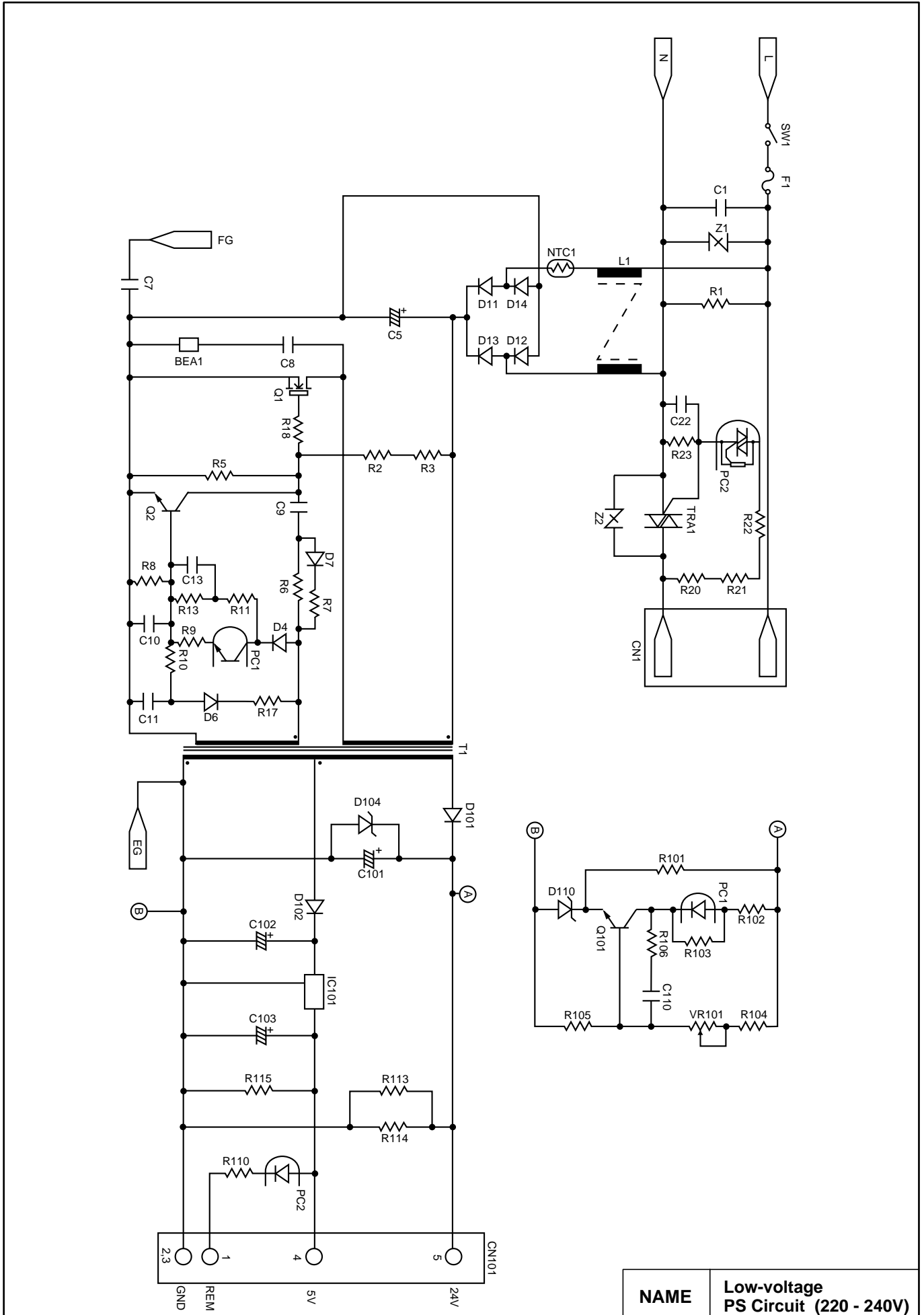
CODE	UK4010000
NAME	B48K303CIR

Appendix 13. Low-voltage Power Supply PCB Circuit Diagram, HL-820/1020/1040 (110 - 120V)



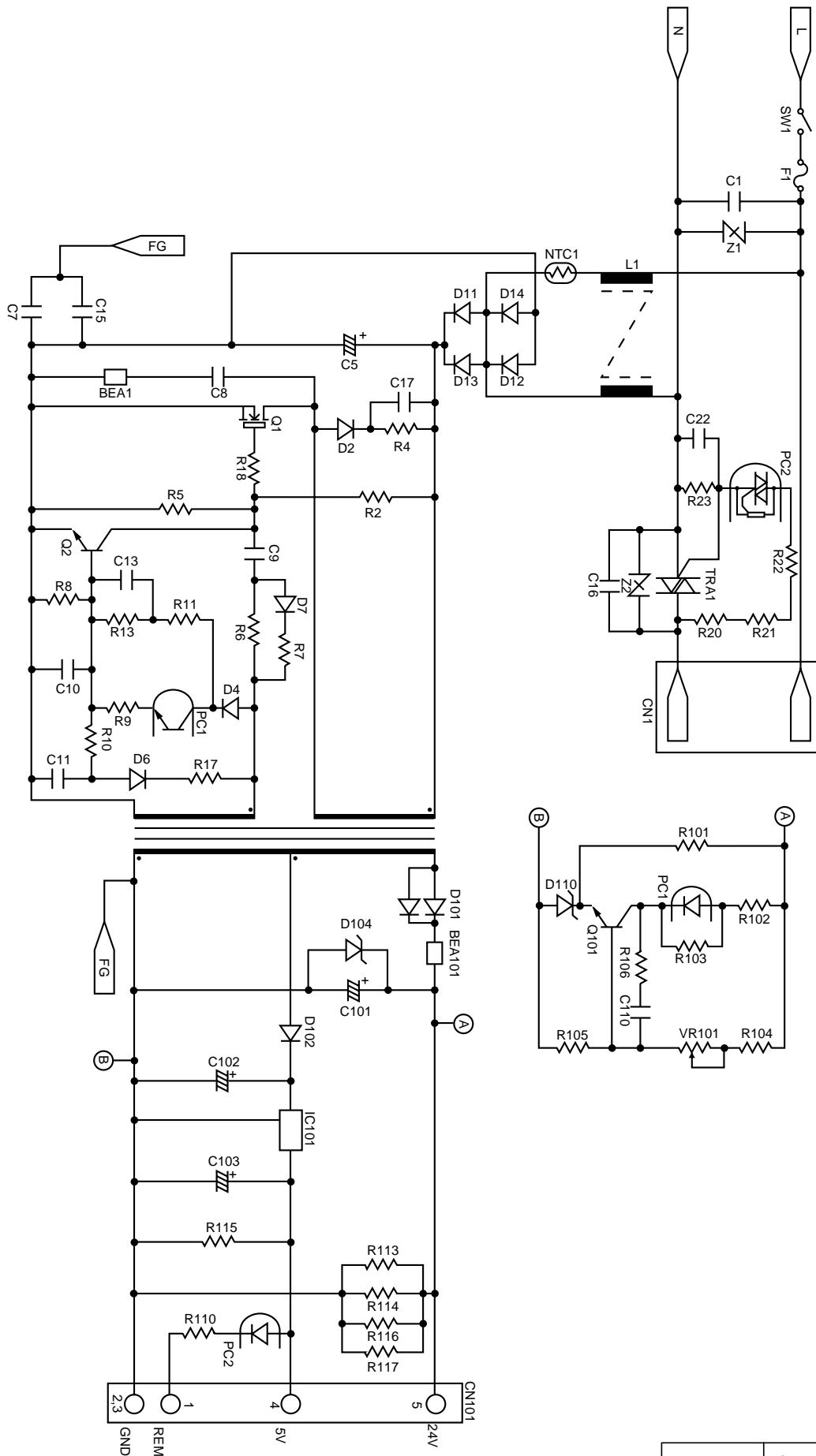
NAME	Low-voltage PS Circuit (110 - 120V)
-------------	--

Appendix 14. Low-voltage Power Supply PCB Circuit Diagram, HL-820/1020/1040 (220 - 240V)



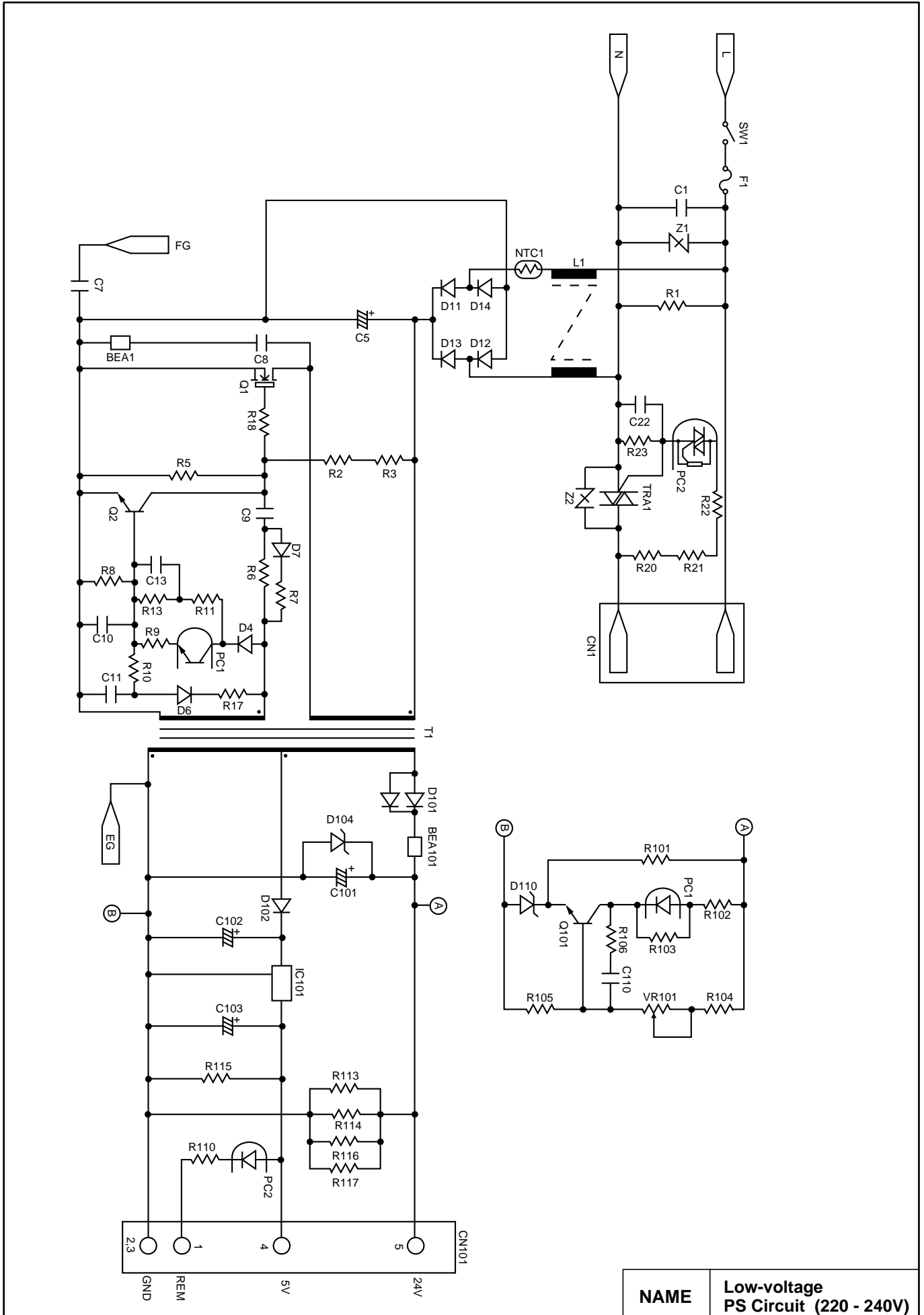
NAME	Low-voltage PS Circuit (220 - 240V)
------	-------------------------------------

Appendix 15. Low-voltage Power Supply PCB Circuit Diagram, HL-1050 (110 - 120V)

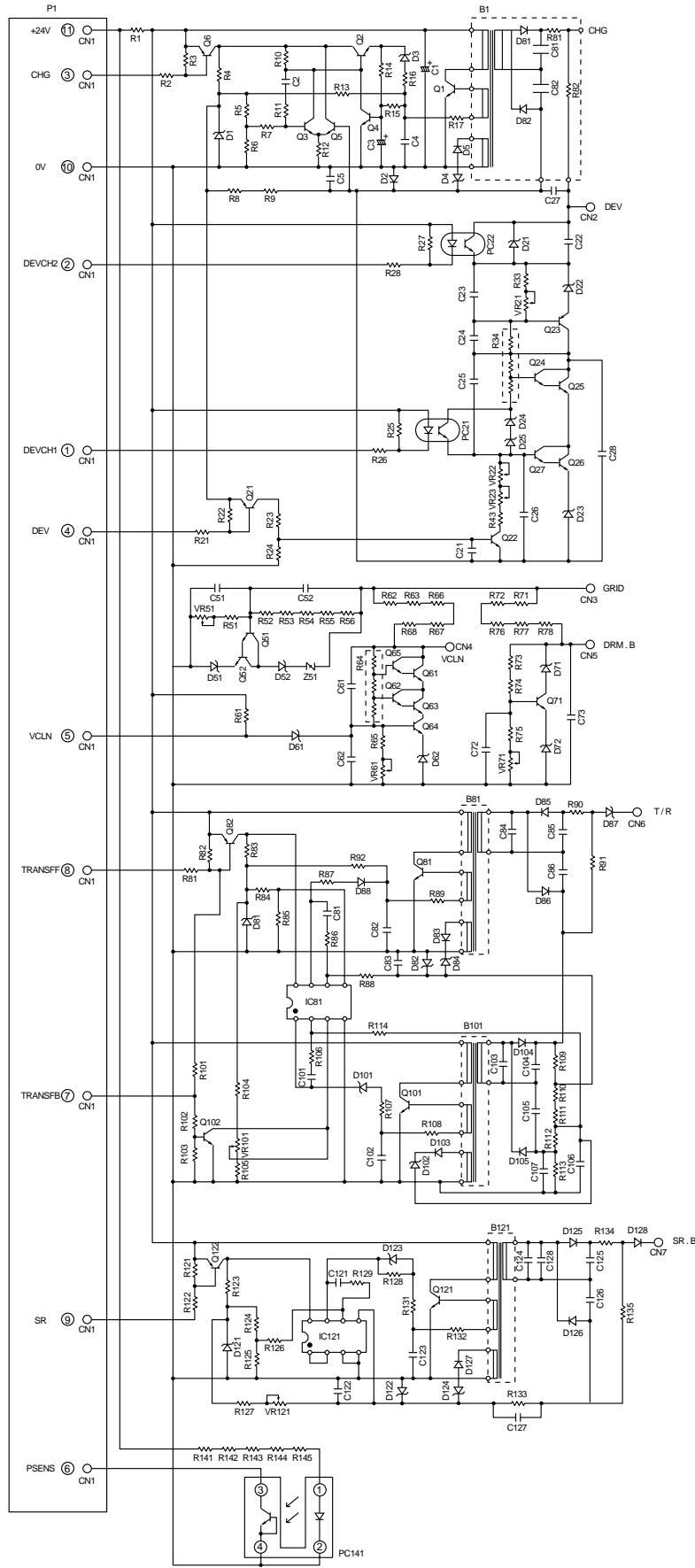


NAME	Low-voltage PS Circuit (110 - 120V)
------	-------------------------------------

Appendix 16. Low-voltage Power Supply PCB Circuit Diagram, HL-1050 (220 - 240V)



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



NAME	High-voltage PS Circuit
------	-------------------------

APPENDIX 18. 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 test print page (for HL-820/1020) or the print configuration page(s) (HL-1040/1050).

Print Test Print or Print Configuration

- 1) Turn on the power switch of the printer while pressing the 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(s) of Test Print or Print Configuration.

Note:

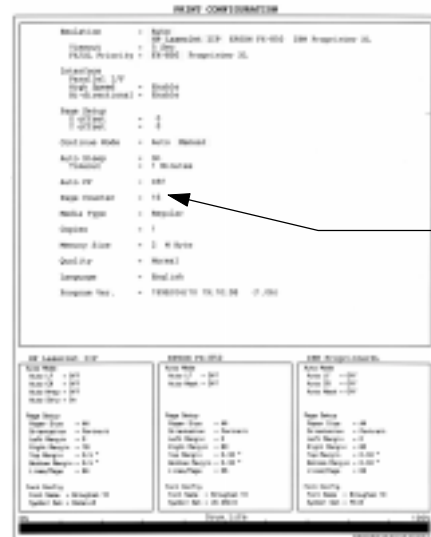
- The design of Test Print and Print Configuration vary depending on the printer model. Refer to the figures below;
- **The ** marks in the figures show the page counter. They are not printed in some countries.**

<HL-820/1020>



(**)

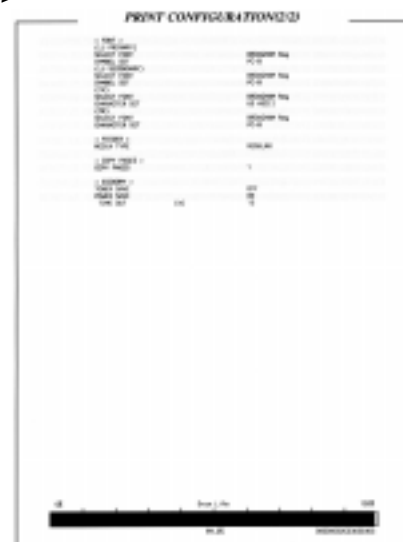
<HL-1040>



(**)

<HL-1050>

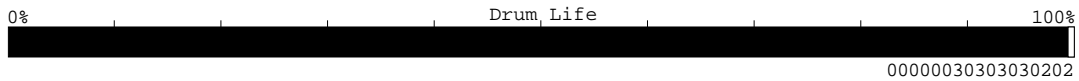
(**)



How to Read the Drum Life

The bar shown below is printed at the bottom of Test Print / 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

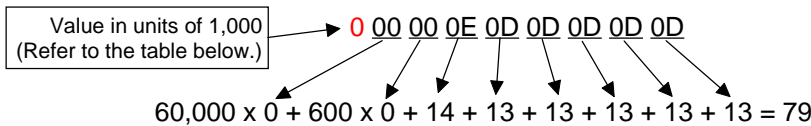
The page counter is not shown directly for some countries. (Refer to the note in the previous page.)

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 19. 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	OPC 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)



**LASER PRINTER
PARTS REFERENCE LIST**

MODEL:HL-820/1020/1040/1050

MECHANISMS & ELECTRONICS

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.)

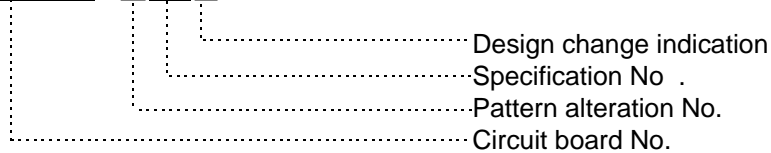
Note : No orders without Parts Code or Tool No. can be accepted.

< Example >

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK

Revision No.: marked on the printed circuit board.

B48K056 - 201A



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

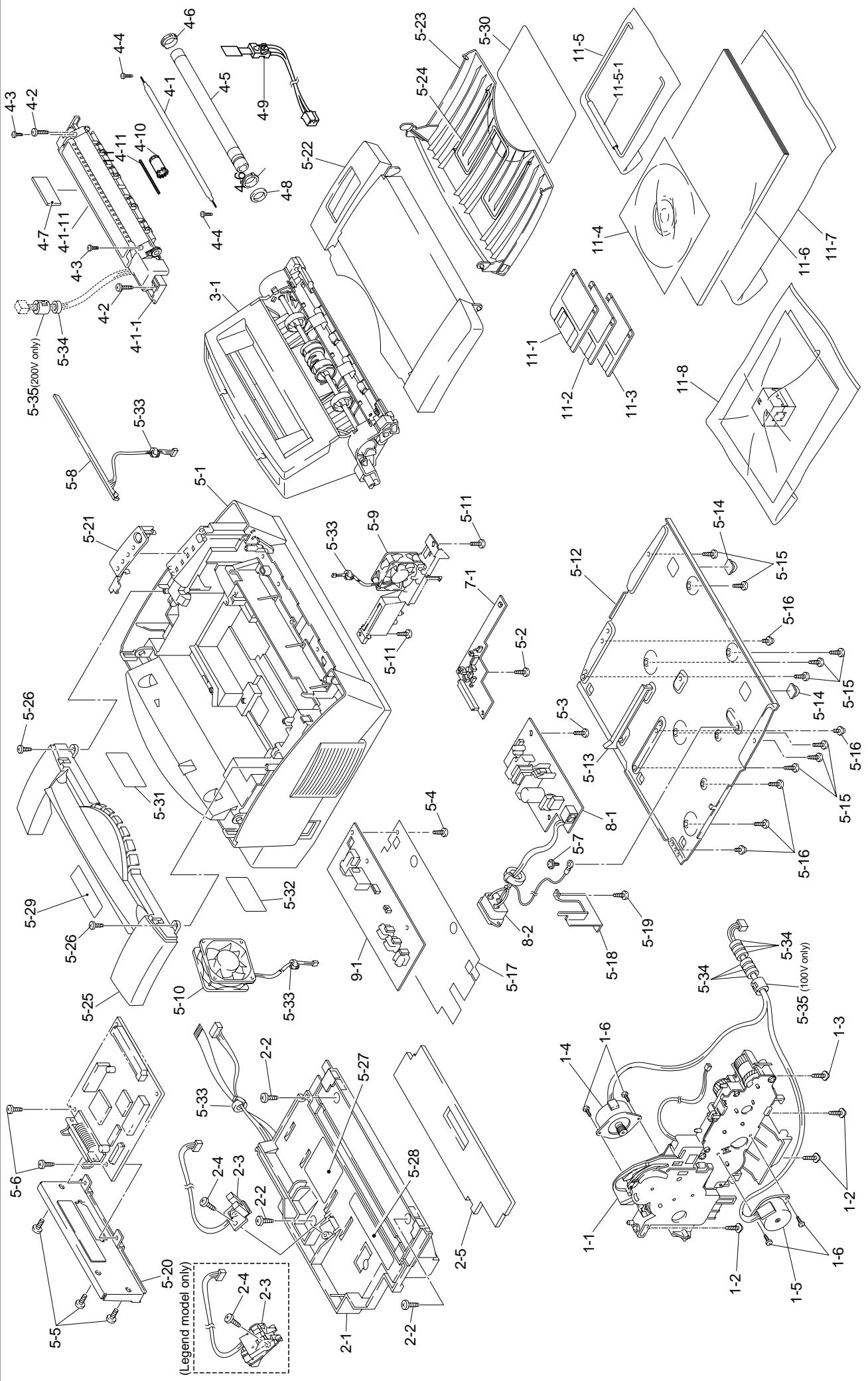
3. The original of this list was made based on the information available in April, 1998.

4. Parts are subject to change in design without prior notice.

CONTENTS

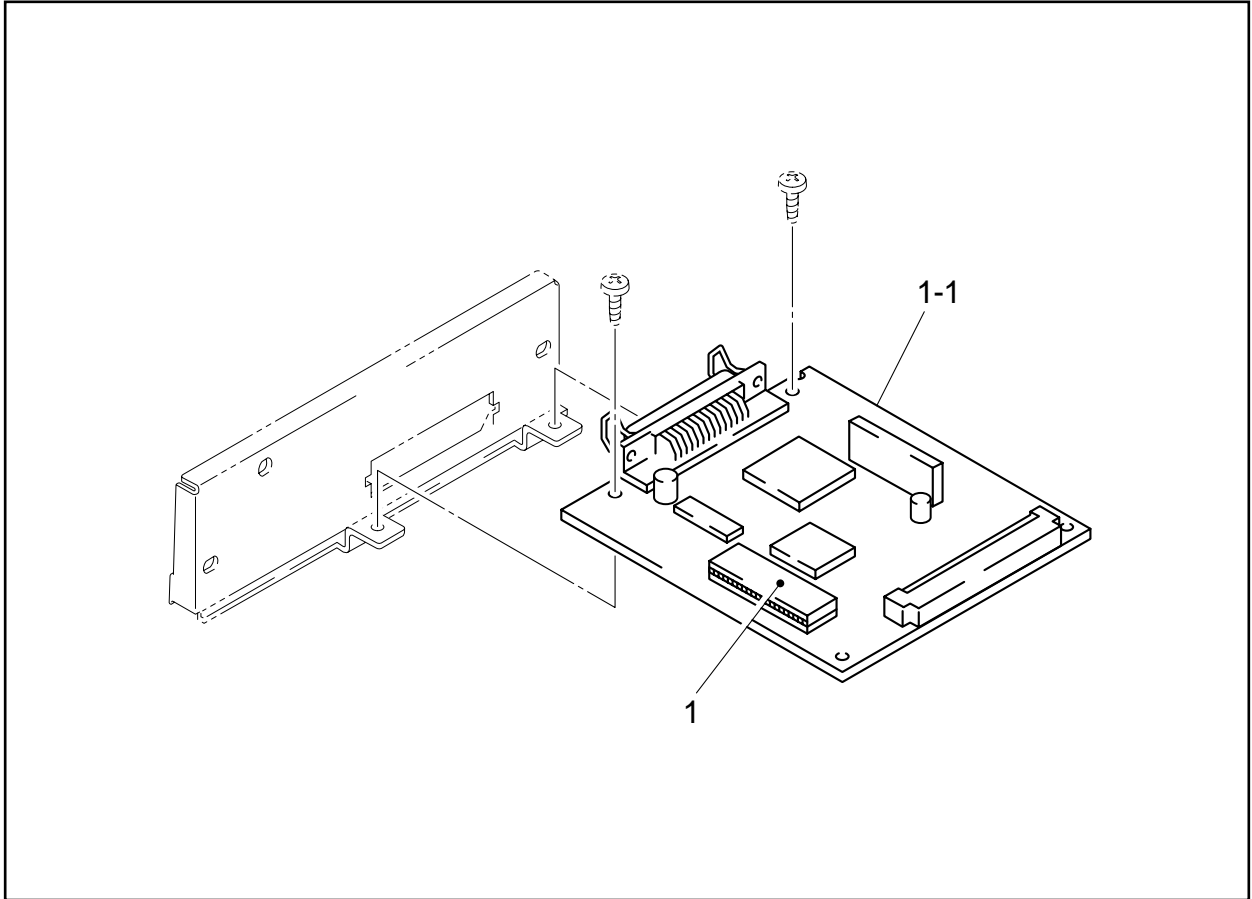
GENERAL DRAWING	1
MAIN PCB DRAWING (HL-820/1020/1040)	2
MAIN PCB DRAWING (HL-1050)	3
AC CORD / PACKING MATERIAL DRAWING	4
1. DRIVE UNIT	5
2. SCANNER UNIT	5
3. MP SHEET FEEDER	6
4. FIXING UNIT	6
5. COVERS	7
6-1. MAIN PCB <HL-820/1020>	8
6-2. MAIN PCB <HL-1040 OTHERS>	8
6-3. MAIN PCB <HL-1040 ISRAEL>	8
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7. PANEL SENSOR PCB	10
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9. HIGH VOLTAGE POWER SUPPLY	11
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GENERAL DRAWING



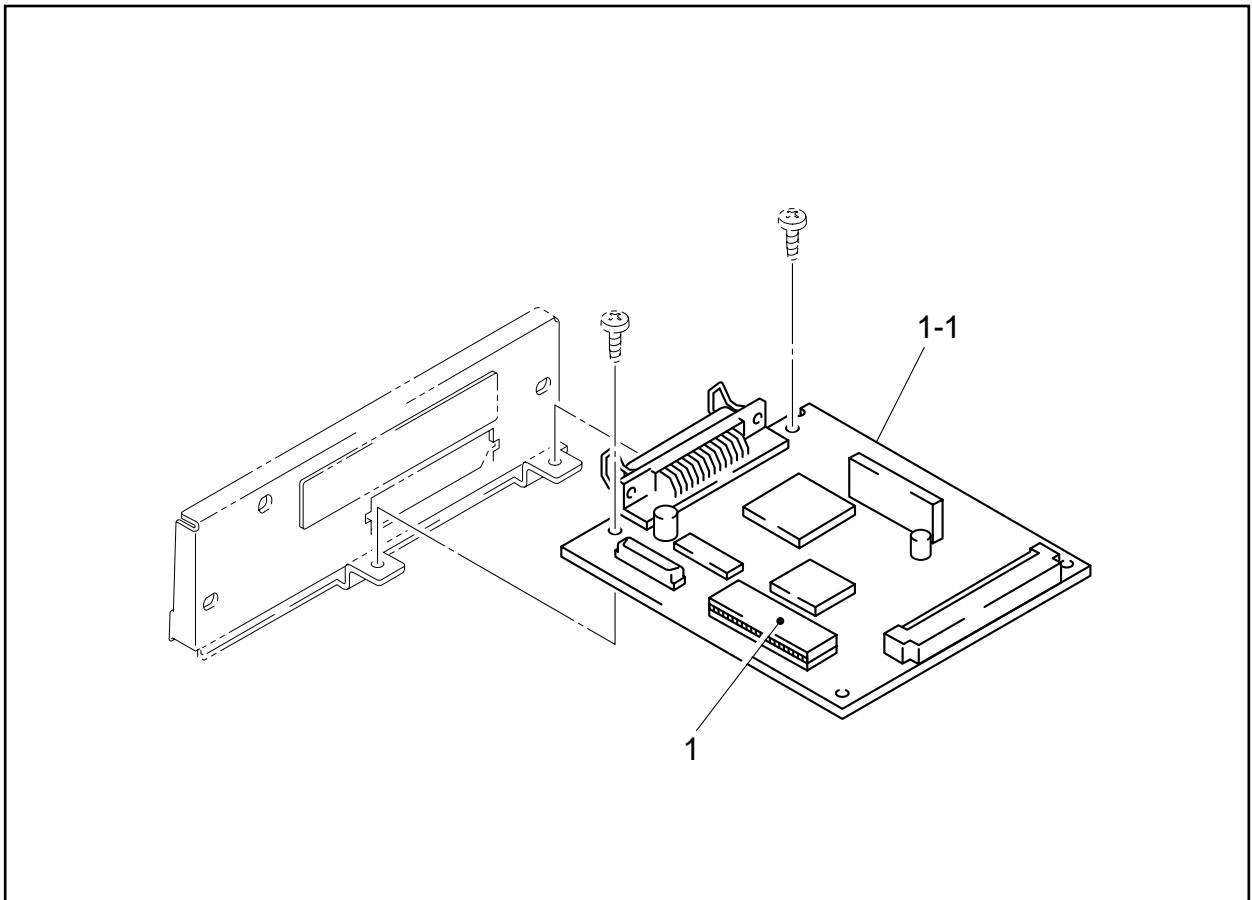
T/I NO. PR98096 / PR98100 / PR98176 / PR98235 / PR98271 / PR98292 MODEL HL-820/1020/1040/1050 84U821/831/832/861/862

6-1. MAIN PCB <HL-820/1020>



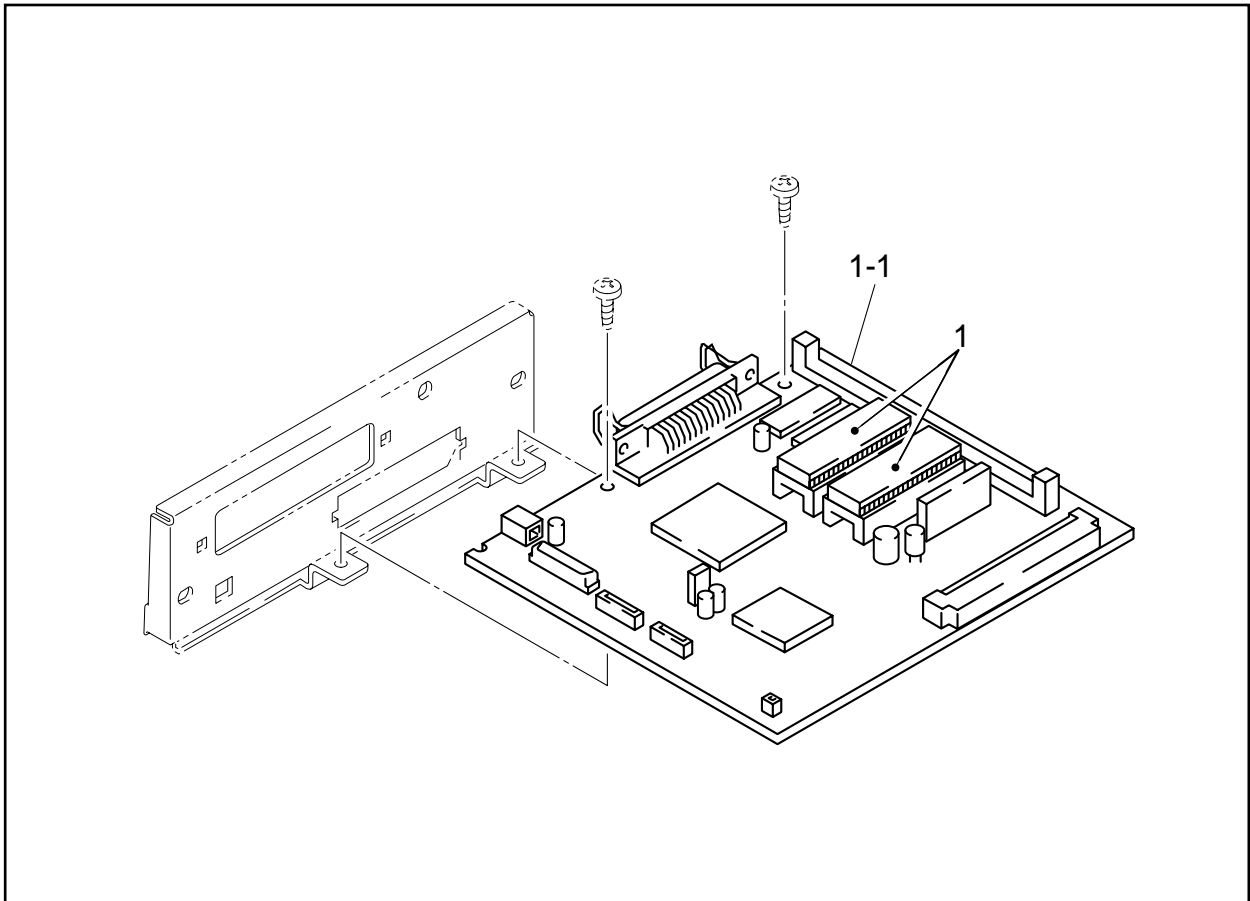
MODEL HL-820/1020 84U-821-101/104

6-2/3. MAIN PCB <HL-1040 OTHERS/ISRAEL>



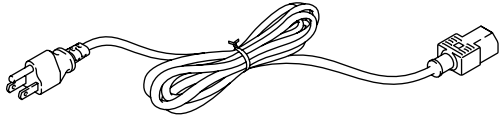
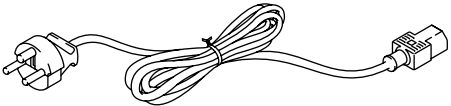
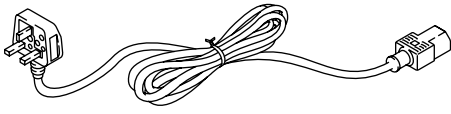
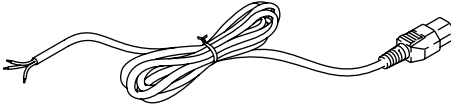
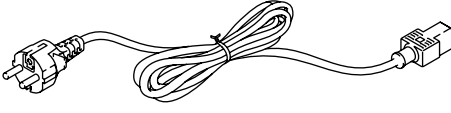
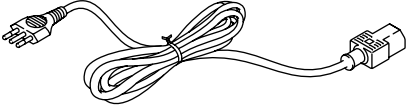
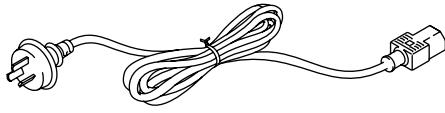
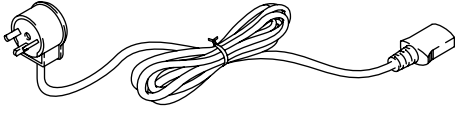
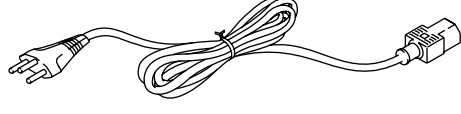
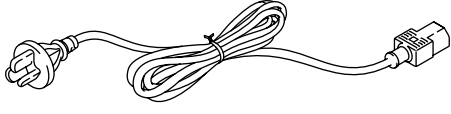
MODEL HL-1040 84U-831-101/103, 84U-832-101

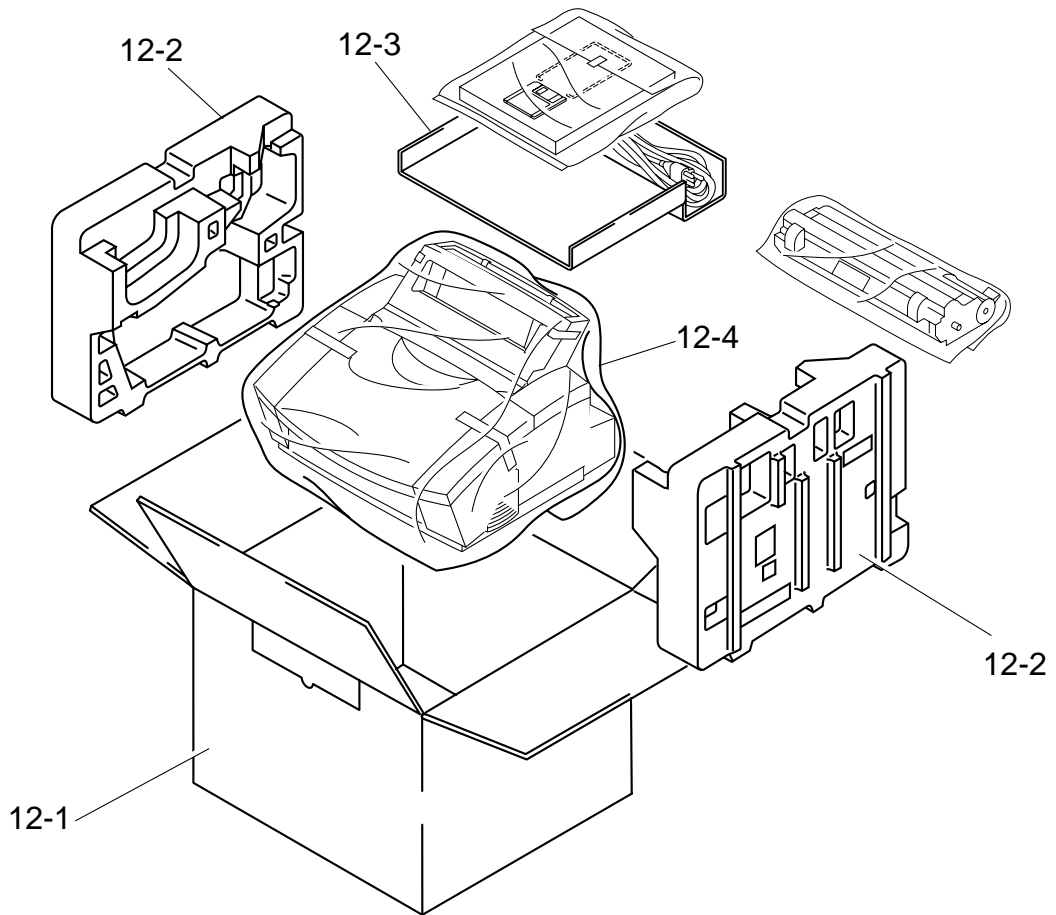
6-4/5. MAIN PCB <HL-1050 OTHERS/ISRAEL>



MODEL HL-1050 84U-861-101/103/104, 84U-862-106

POWER CORDS & PACKING DRAWING

10-			
1A		1F	
1B		1G	
1C		1H	
1D		1I	
1E		1J	



T/I NO. PR98176

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-230/930

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 HL-820/1020/1040/1050 84U-821/831/832/861/862-010

2. SCANNER UNIT

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UL8748001	1	SCANNER UNIT Y (SP)	(B48K226)	
2	085411215	3	TAPTITE, BIND B M4X12		
3	UL8759001	1	TONER SENSOR PCB ASSY	B48K231	
3	UL8810001	1	TONER SENSOR PCB ASSY (LEGEND)	B512028	
4	087310815	1	TAPTITE, CUP B M3X8		
4	084311015	1	TAPTITE, SARA B M3X10 (LEGEND)		
5	UH3064001	1	S SEAL SPONGE 4		

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-020

T/I NO. PR98176

3. MP SHEET FEEDER

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	UH3196001	1	THERMISTOR Y ASSY	
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

5. 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	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		
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

6-1. MAIN PCB <HL-820/1020>

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1-1	UK4202001	1	MAIN PCB ASSY, HL-820 (SP)	B48K312-350E	
1-1	UK4229001	1	MAIN PCB ASSY, HL-1020 (SP)	B48K312-360E	
1	UK4245000	1	MROM HL1040	#3	

MODEL HL-820/1020 84U-821-101/104

T/I NO. PR98172 / PR98182

6-2. MAIN PCB <HL-1040 OTHERS>

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1-1	UK4200001	1	MAIN PCB ASSY, HL-1040 (SP)	B48K312-300F	
1-1	UK4165001	1	MAIN PCB ASSY, HL-1040 (LEGEND) (SP)	B48K312-303F	
1	UK4245000	1	MROM HL1040	#3	

MODEL HL-1040 84U-831/832-101

T/I NO. PR98172 / PR98176 / PR98182

6-3. MAIN PCB <HL-1040 ISRAEL>

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1-1	UK4201001	1	MAIN PCB ASSY, HL-1040 HEB (SP)	B48K312-301B	
1	UK3995000	1	MROM HL1040H	#3	

MODEL HL-1040 84U-831-103

T/I NO. PR98172

6-4. MAIN PCB <HL-1050 OTHERS>

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1-1	UK4203001	1	MAIN PCB ASSY, HL-1050 100V (SP)	B512001-200C	
1-1	UK4167001	1	MAIN PCB ASSY, HL-1050 200V (SP)	B512030-140A	
1-1	UK4174001	1	MAIN PCB ASSY, HL-1050 LEGEND (SP)	B512030-143A	
1	UK4168000	1	MROM1050-EVEN	#11	
2	UK4169000	1	MROM1050-ODD	#7	

MODEL HL-1050 84U-861-101/104 84U-862-106

T/I NO. PR98109 / PR98176 / PR98177 / PR98183 / PR98186

6-5. MAIN PCB <HL-1050 ISRAEL>

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1-1	UK4204001	1	MAIN PCB ASSY, HL-1050 (SP)	B512030-141C	
1	UK3998000	1	MROM1050H-EVEN	#11	
2	UK3999000	1	MROM1050H-ODD	#7	

MODEL HL-1050 84U-861-103

T/I NO. PR98109 / PR98177 / PR98183 / PR98186

7. PANEL SENSOR PCB

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UK4205001	1	PANEL SENSOR PCB ASSY (SP)	B48K303	

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-151

8. POWER SUPPLY PCB

REF.NO.	CODE	Q'TY	DESCRIPTION	SYMBOL	REMARK
1	UK4118001	1	LOW-VOLTAGE PS ASSY, 115V HL-820/1020/1040 (SP)	REV. B	
1	UK4120001	1	LOW-VOLTAGE PS ASSY, 115V HL-1050 (SP)		
1	UK4119001	1	LOW-VOLTAGE PS ASSY, 230V HL-820/1020/1040 (SP)	REV. D	
1	UK4121001	1	LOW-VOLTAGE PS ASSY, 230V HL-1050 (SP)		
2	UK3836001	1	AC INLET ASSY, 115V		
2	UK3843001	1	AC INLET ASSY, 230V		

MODEL HL-820/1020/1040/1050 84U-821/831/861-200/201 84U-832/862-201

T/I NO. PR98112 / PR98207 / PR98251

9. HIGH VOLTAGE POWER SUPPLY

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UK4122001	1	HIGH-VOLTAGE PS ASSY (SP)	

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-220

10. 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 HL-820/1020/1040/1050 84U-821/831/832/861/862-230

T/I NO. PR98176

11. ACCESSORIES

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UK4090001	1	PR DRIVER DISK ASSY1, 820 (WINDOWS)	
1	UK4193001	1	PR DRIVER DISK ASSY1, 1020 (WINDOWS)	
1	UK3875001	1	PR DRIVER DISK ASSY1, 1040 (WINDOWS)	
1	UK4183001	1	PR DRIVER DISK ASSY 1, 1040LEG(WINDOWS)	
1	UK3895001	1	PR DRIVER DISK ASSY1, 1050 (WINDOWS)	
1	UK4179001	1	PR DRIVER DISK ASSY 1, 1050HEB(WINDOWS)	
1	UK4233001	1	PR DRIVER DISK ASSY 1, 1050LEG(WINDOWS)	
2	UK4092001	1	PR DRIVER DISK ASSY2, 820 (TRUETYPE)	
2	UK4195001	1	PR DRIVER DISK ASSY2, 1020 (TRUETYPE)	
2	UK3877001	1	PR DRIVER DISK ASSY2, 1040 (TRUETYPE)	
2	UK4185001	1	PR DRIVER DISK ASSY2, 1040LEG(TRUETYPE)	
2	UK3897001	1	PR DRIVER DISK ASSY2, 1050 (TRUETYPE)	
2	UK4181001	1	PR DRIVER DISK ASSY2, 1050HEB(TRUETYPE)	
2	UK4235001	1	PR DRIVER DISK ASSY2, 1050LEG(TRUETYPE)	
3	UK4197001	1	PR DRIVER DISK ASSY6, 1050 ARABIC	
3	UK4339001	1	PR DRIVER DISK ASSY 3, LEG	
4	UK4199001	1	CD-ROM ASSY	
5	UE2188001	1	PAPER SUPPORT ASSY	
5-1	UL7158001	1	TE TUBE	
6	UL8529001	1	SET GUIDE, US	
6	UL8550001	1	SET GUIDE, FRA	
6	UL8534001	1	SET GUIDE, GER	
6	UL8557001	1	SET GUIDE, NOR	
6	UL8560001	1	SET GUIDE, NL	
6	UL8565001	1	SET GUIDE, DEN	
6	UL8568001	1	SET GUIDE, ITA	
6	UL8571001	1	SET GUIDE, SWE	
6	UL8739001	1	SET GUIDE, SPA	
7	UE2014001	1	BAG, 215X350H	
8	UK4156001	1	CORE NF-13 ASSY (HL1050)	

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-920

T/I NO. PR98100 / PR98110 / PR98176 / PR98235 / PR98265

12. PACKING MATERIALS

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UE2233001	1	CARTON, EUR HL-820	
1	UE2236001	1	CARTON, CAN HL-1020	
1	UE2239001	1	CARTON, USA HL-1040	
1	UE2240001	1	CARTON, CAN HL-1040	
1	UE2222001	1	CARTON, EUR HL-1040	
1	UE2237001	1	CARTON, CAN HL-1040DX	
1	UE2245001	1	CARTON, LEGEND HL-1040	
1	UE2241001	1	CARTON, USA HL-1050	
1	UE2230001	1	CARTON, EUR HL-1050	
1	UE2238001	1	CARTON, CAN HL-1050DX	
1	UE2242001	1	CARTON, CAN HL-1050	
1	UE2248001	1	CARTON, LEGEND HL-1050	
2	UE2223001	1	STYROFOAM PAD ASSY	
3	UE2226001	1	CARTON, ACCESORRIES	
4	UE2126001	1	BAG, 700X800 (BODY)	

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-930

T/I NO. PR98087 / PR98110 / PR98176



**Lower Tray Unit for HL-2400C
Color Laser Printer
PARTS REFERENCE LIST**

MODEL: LT-24CL

Feb., 1999
54S003BE0

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

Note : No orders without Parts Code can be accepted.

< Example >

	(1) ⋮ CODE	(2) ⋮ Q'TY	(3) ⋮ DESCRIPTION	REMARK

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 Feb., 1999.

4. Parts are subject to change in design without prior notice.

CONTENTS

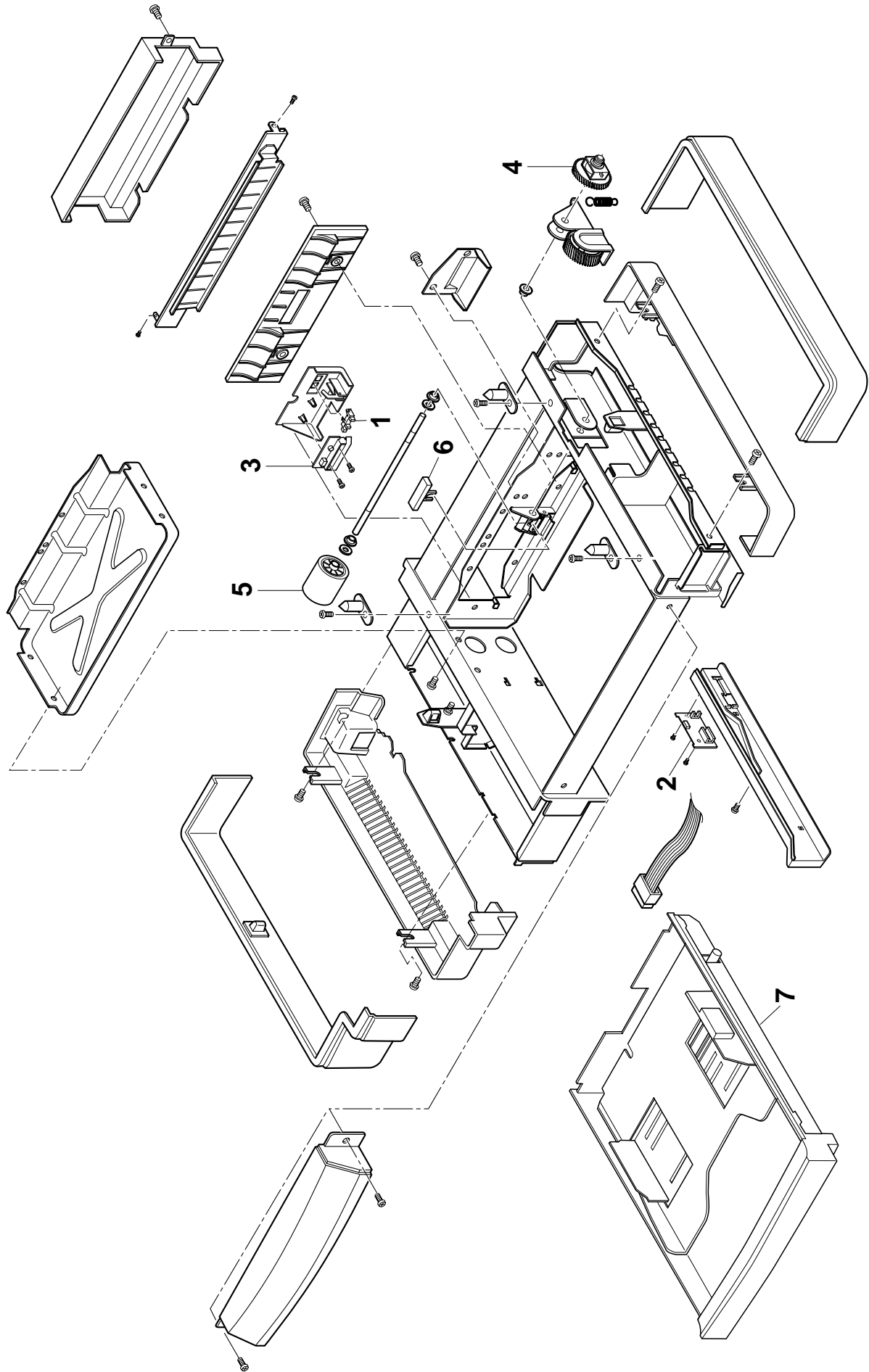
LOWER TRAY UNIT

List..... 1
Drawing..... 2

LOWER TRAY UNIT

REF.NO	CODE	Q'TY	DESCRIPTION	REMARK
1	UH1948001	1	PAPER SENSOR	
2	UH1947001	1	PAPER SIZE SENSOR	
3	UH1996001	1	OHP SENSOR	
4	UH3494001	1	PAPER FEEDING CLUTCH	
5	UH3485001	1	PAPER FEEDING ROLLER	
6	UH3486001	1	SEPARATOR PAD	
7	UH3493001	1	PAPER CASSETTE	

MODEL LT-24CL 54S-X06





**Lower Tray Unit for HL-2400C
Color Laser Printer
SERVICE MANUAL**

MODEL: LT-24CL

Feb., 1999
54S004BE0

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PREFACE

This service manual contains basic information required for after-sales service of the optional lower tray unit for color laser printer (here-in-after referred to as "the unit"). This information is vital to the service technician to maintain the high quality and performance of the printer and unit.

This service manual covers the LT-24CL lower tray unit.

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

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

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REGULATIONS

LASER SAFETY (FOR 110-120 V MODEL ONLY)

The printer, HL-2400C 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)

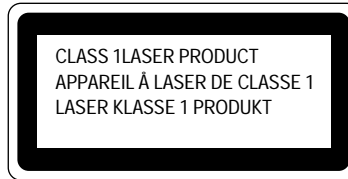
U.S. Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. One of the following labels on the back of the printer indicates compliance with the FDA regulations and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

Caution

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

IEC 825 SPECIFICATION (FOR 220-240 V MODEL ONLY)

The printer, HL-2400C is a Class 1 laser product as defined in IEC 825 specifications. The label shown below is attached in countries where required.

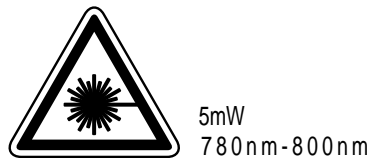


This printer has a Class 3B Laser Diode which emits invisible laser radiation in the Scanner Unit. The Scanner Unit should not be opened under any circumstances.

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.

SAFETY INSTRUCTIONS

SAFETY PRINCIPLE

- 1) Before starting any operations, read this manual thoroughly. Especially read the safety instructions in this section carefully and ensure that you understand the contents.
- 2) Perform all the operations by following the procedures described in this manual. Follow all the cautions and warnings set out in the procedures and on safety labels affixed to the machine. Failure to do so may result in human injury or equipment damage.
- 3) Perform only the procedures explained in this manual. Refrain from opening or touching any portions that are not related to your required operation(s).
- 4) Repair and replacement of parts should be performed by trained and qualified persons only. Operators should not attempt to do such repair or replacement work.
- 5) It must be appreciated that the above-mentioned cautions and warnings do not cover everything because it is impossible to evaluate all the circumstances of repair situations.

SPECIAL SAFETY INFORMATION

Introductory Information

Cautions and warnings are made clear by following the 'Safety Alert Symbols' or 'Signal Words' such as DANGER, WARNING and CAUTION.

<SAFETY ALERT SYMBOL>

This is the safety alert. When you find this symbol placed on the equipment or marked in this manual, be aware of the potential of human injuries. Follow the recommended precautions and safety operation practices.

<Understanding Signal Words>

DANGER is used to indicate the presence of a hazard which will cause severe human injuries or a fatal accident if the warning is ignored.

WARNING is used to indicate the presence of a hazard or unsafe practices which may cause severe human injuries or a fatal accident if the warning is ignored.

CAUTION is used to indicate the presence of a hazard or unsafe practices which may cause minor human injuries if the warning is ignored. CAUTION also calls your attention to safety messages in this manual.

<Follow Safely Instructions>

Carefully read all the safety messages set out in this manual and also in the safety warning signs placed on the equipment. In this manual, the safety instructions (safety alert symbols and signal words) are enclosed in a rectangular enclosure to bring them to your attention. Keep the safety signs on the equipment in good condition and ensure none are missing or damaged. Replace the safety signs if unreadable or damaged. Learn how to operate the equipment and how to use the controls properly. Do not let anyone operate this equipment without following the instructions. Keep the equipment in proper working condition. Unauthorized modification to the equipment may impair the function & safety and affect the life of the equipment.

Listed below are the various kinds of "WARNING" messages contained in this manual.

 **WARNING**

HAZARDOUS VOLTAGE

May cause serious injuries or fatal accidents. Voltage is now being supplied from the power supply of printer. There is a danger of electrical shock if you touch the active area inside the printer.

Be sure to turn the power supply switch OFF and pull the plug out from the power outlet before starting maintenance work on the printer.

 **WARNING**

HARMFUL OZONE GAS

Inhalation of an excessive amount of ozone gas may adversely affect the respiratory organs.

An Ozone Filter is fitted to this printer to reduce the exhausted ozone. This filter must be replaced with a new filter periodically in accordance with the manual supplied with the printer.

 **WARNING**

HOT SURFACE

The Fusing Unit reaches a temperature of approx. 160°C and adjacent parts are also very hot.

When you need to change the cleaning pad or remove jammed paper, wait about 20 minutes after opening the paper exit unit to allow the unit to cool down.

 **CAUTION**

ROTATING PARTS

Be aware of the potential danger of various rollers and take care not to get your fingers or hand caught into the machine, this can cause serious injuries. Note that the exit roller that ejects the printed paper is rotating while printing.

Be careful not to get your hair, fingers, hands, sleeve or necktie caught in the machine while operating the machine.

 **CAUTION****HAZARDOUS POWDER**

Toner is a fine powder which can cause a powder explosion if disposed of into a fire. Under no circumstances dispose of toner into a fire.

 **CAUTION****HAZARDOUS POWDER**

Toner is a fine powder which may cause irritation to the eyes and respiratory organs if inhaled.

Handle the toner cartridge, waste toner pack and developing unit carefully so as not to spill the toner.

 **CAUTION****POWER CORDS & PLUGS**

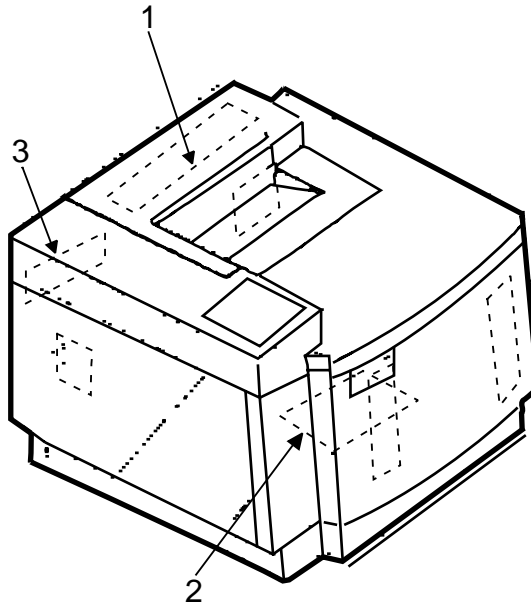
This printer is equipped with a 3-wire power cord fitted with a 3-pronged plug with an earth connection for the user's safety.

Use these power cords in conjunction with a properly grounded electrical outlet to avoid the possibility of an electrical shock.

 **CAUTION****SAFETY INTERLOCK**

The front cover, paper exit unit and transfer unit of this printer have electrical safety interlocks to turn the power off whenever they are opened. Do not attempt to circumvent these safety interlocks.

<Label Location>



1. Hot Caution Label

	WARNING Hot surface. Avoid contact.	WARNUNG Heiße oberfläche. Bei beseitigung.	AVERTISSEMENT Surface chaude. Eviter tout contact.	高圧注意 火傷の恐れがあります。 触れないでください。
--	--	---	---	--

2. Laser Caution Label



DANGER- INVISIBLE LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM.

VORSICHT- UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG
GEOFFNET UND SICHERHEITVERRIEGELUNG
ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN.

DANGER- RAYON LASER INVISIBLE LORS DE L'OUVERTURE.
EVITER L'EXPOSITION DIRECTE.

PELIGRO- RADIACION LASER INVISIBLE AL ABRIR. EVITAR
LA EXPOSICION DIRECTA AL HAZ.

危険 開けたときレーザー放射の危険有り。
ビームに直接当たらないように注意して下さい。 **MAS**

3. Rating Label

(For US)

<p>brother MODEL HL-C1 SER. NO.</p> <p>U 5 2 4 9 2 L 7 H 1 1 1 1 0 1</p> <p>120V - 50/60Hz 8.0A BROTHER INDUSTRIES, LTD. MADE IN JAPAN</p> <p>BROTHER PRINTER HL SERIES COVERED BY ONE OR MORE FOLLOWING PATENTS: USPA: 968, 159 USPS: 050, 228 USPS: 068, 805 USPS: 086, 481 USPS: 093, 904 USPS: 126, 788</p>	<p>CLASS 1 LASER PRODUCT APPAREIL À LASER DE CLASSE 1 LASER KLASSE 1 PRODUKT</p> <p>MANUFACTURED: NOVEMBER 1997 HTJ BROTHER INDUSTRIES, LTD. 15-1, Naoshino-cho, Mizuho-ku, Nagoya 467, Japan. This product complies with FCC radiation performance standards, 21 CFR Subchapter J.</p> <p>FCC ID: B30HLC1</p> <p>This device 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.</p>
---	---

(For Europe)

<p>brother MODEL HL-C1 SER. NO.</p> <p>E 5 2 6 1 9 L 7 H 1 1 1 1 0 1</p> <p>220V-240V - 50/60Hz 4.0A BROTHER INDUSTRIES, LTD.</p>	<p>CLASS 1 LASER PRODUCT APPAREIL À LASER DE CLASSE 1 LASER KLASSE 1 PRODUKT</p> <p>ACN 001 393 835 MADE IN JAPAN</p>
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1. PRODUCT OUTLINE

1.1 Parts Names & Functions

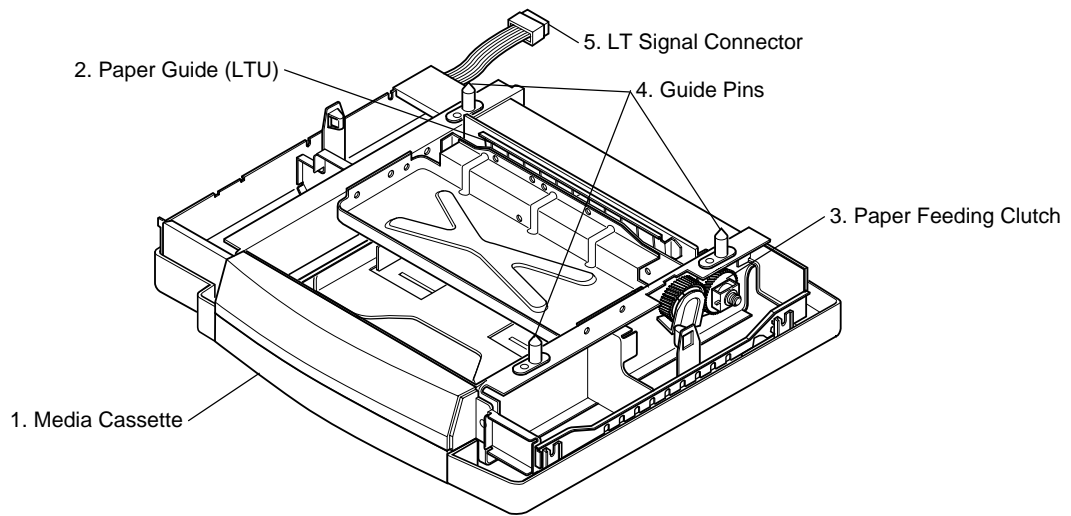


Fig. 1

No.	Parts Name	Outline of Function
1	Media Cassette	To feed paper automatically
2	Paper Guide (LTU)	To guide paper from the media cassette to the printer.
3	Paper Feeding Clutch	To transport paper from the media cassette.
4	Guide Pins	Guide pin to correctly locate the printer onto the lower tray unit.
5	LT Signal Connector	Connection to the printer to control the lower tray unit.

2. SPECIFICATIONS

No.	Item	Specification
1	Applicable Printer	Brother Color Laser Printer HL-2400C
2	Cassette Capacity	Normal paper: 250 sheets Transparency: 50 sheets
3	Feedable Paper Sizes	Letter, Legal, A4, Executive, B5, Transparency, Label
4	Dimensions (W x D x H)	500 x 484 x 116 mm (139 x 134.5 x 32.2 inch)
5	Weight	Approximately 8.0 kg (17.6 lb.)

3. INSTALLATION

3.1 Conditions Required for Installation

Installation conditions for the lower tray unit are the same as for the printer. Any laser beam printer is likely to be influenced by the environment of the set-up location. If the printer is set-up in an inappropriate location, the printer may not perform as expected. Therefore, the following factors should be taken into consideration before deciding where to set-up the printer.

3.1.1 Environmental conditions

The printer should not be set up in the locations referred to in the following items 1) through 4) which specify inappropriate locations for set-up.

- 1) Where it is likely to receive direct sunlight or similar light. (For example, next to a window)
- 2) Where it is likely to suffer a big difference in temperature and humidity between the maximum and minimum levels. (Normal operation environment is within 10°C ~ 32.5°C, 20 ~ 80%RH and without any condensation.)
- 3) Where it is likely to be in a draft of cold air from an air-conditioner or warm air from a heater, or to receive direct radiant heat.
- 4) Where it is likely to be excessively dusty or be subject to corrosive gases such as ammonia.
- 5) Users should select a location with good ventilation and set the printer on a flat surface.
- 6) Users should check that the maximum angle of the set-up location is horizontal to within $\pm 1^\circ$.

3.1.2 Basic layout of printer set-up location

Fig.2 shows the basic layout of the printer set-up location that is suitable for smooth operation and maintenance of the printer.

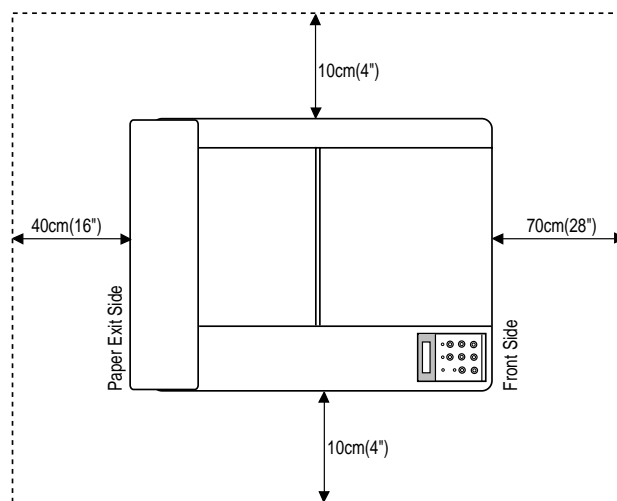


Fig. 2

- The space in front of the printer (70cm) is necessary to open the front cover.
- The space at back of the printer (40cm) is necessary to open / close the rear access cover.
- The space on both sides of the printer (10cm) is necessary for general access.

3.2 Unpacking

Follow the unpacking steps below referring to Fig.3.

- 1) Remove the binding tape from the top of the package.
- 2) Take the side covers R/L out of the box.
- 3) Remove the upper packing carton.
- 4) Take the lower tray unit (with media cassette and set-up guides R/L already installed) out of the box.

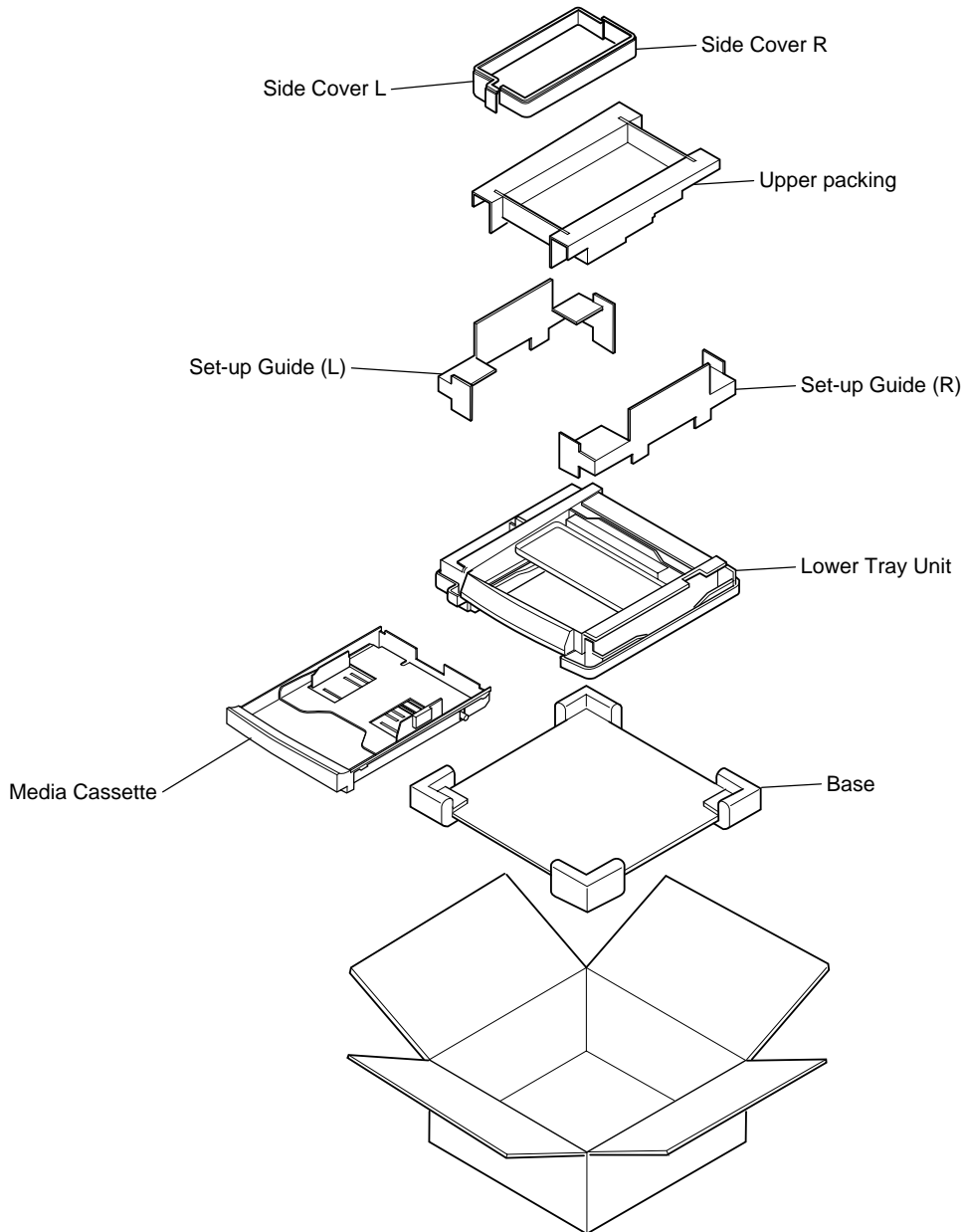


Fig. 3

3.3 Installation Procedures

3.3.1 Install the printer onto the lower tray unit

- 1) Place the lower tray unit on a solid, flat surface where the printer is to be installed ensuring that the conditions in sections 3.1.1 and 3.1.2 are complied with.
- 2) Check that the set-up guides R/L are fixed onto the lower tray unit.

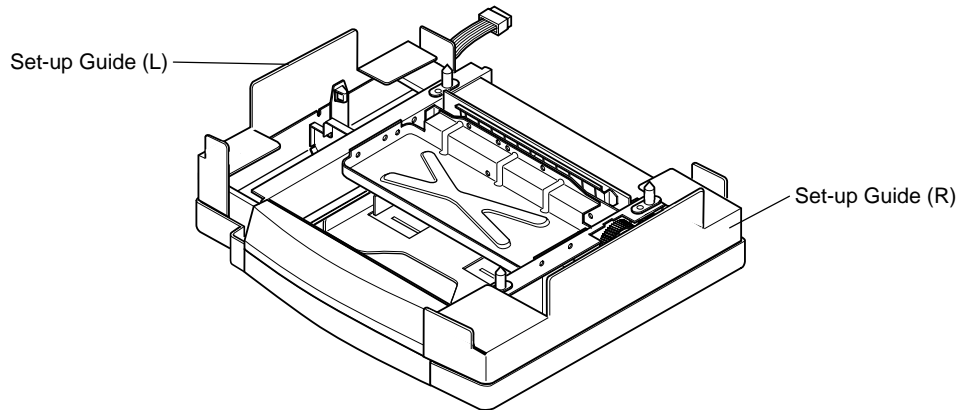


Fig. 4

- 3) Pull out the LT signal connector which is located at the rear left side of the unit, and remove the LT connector cover from the lower tray unit.

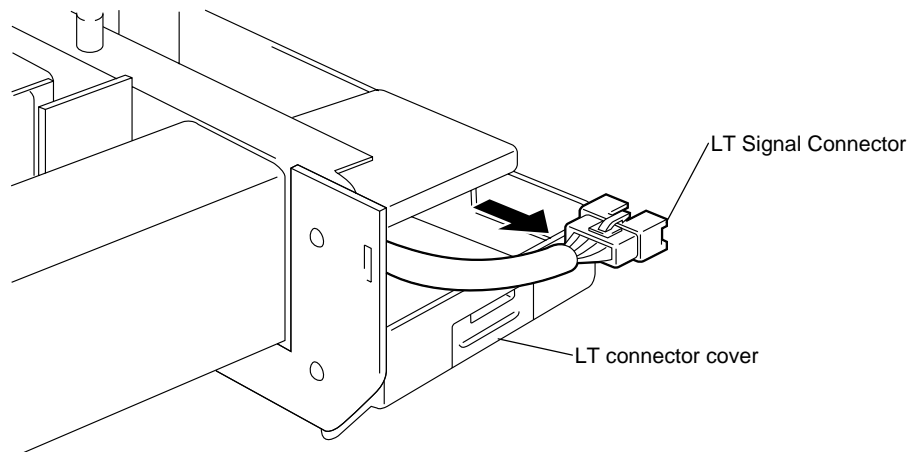


Fig. 5

- 4) Check the three alignment guide pins on the lower tray unit.

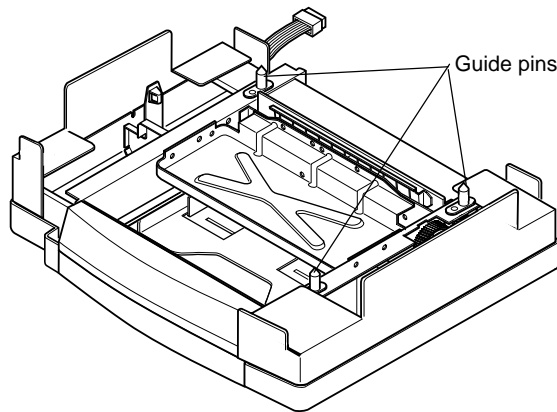


Fig. 6

- 5) Two people should be used to lift up the printer and place it onto the lower tray unit as shown in Figure 7.



WARNING

The printer weighs approximately 32kg, so it is too heavy for one person to carry. It needs two adults to move the printer. Since the printer is a precision machine, make sure that it is carried slowly with care so that no impact occurs to the printer while moving it.

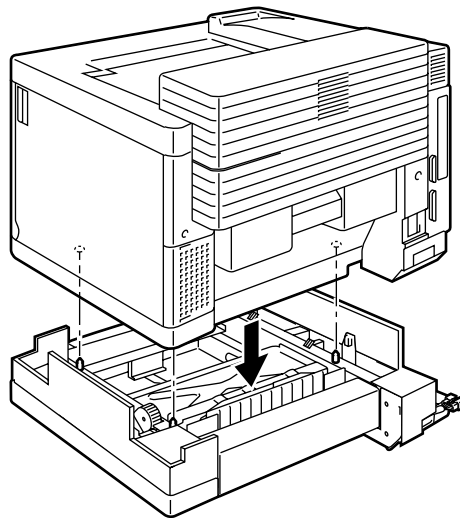


Fig. 7

NOTE:

- *Slowly lower the printer along the set-up guides provided at both sides of the unit so that the locating holes in the printer align correctly with the guide pins.*
- *After putting the printer onto the lower tray unit, ensure that the alignment pins are located correctly into the printer.*

6) Remove the set-up guides R/L from the unit.

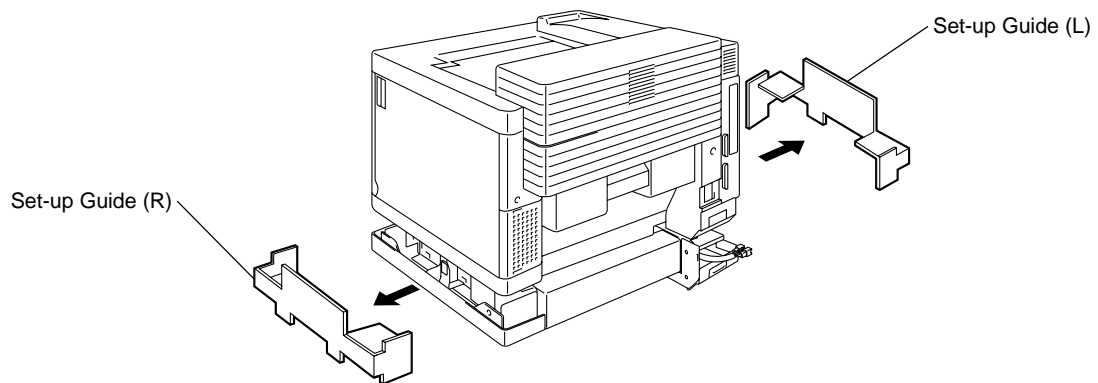


Fig. 8

7) Insert the metal fixtures into both sides of the lower tray unit from above.

8) Tighten the screws to secure the fixtures.

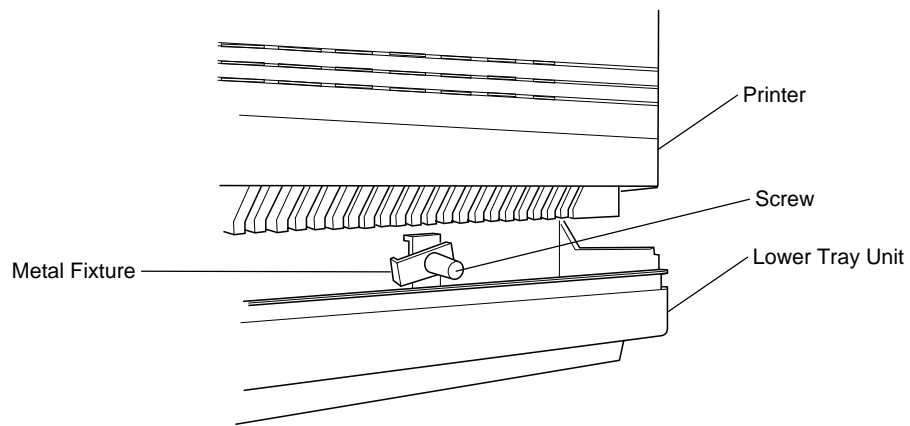


Fig. 9

NOTE:

Check that the two metal fixtures and the two screws were supplied with the lower tray unit.

3.3.2 Connect the LT signal connector into the printer

- 1) Remove the LT connector cover (U) from the printer.
- 2) Connect the LT signal connector into the connector of the printer.

NOTE:

Connect the LT signal connector into the printer connector correctly until it clicks as it locks into position.

- 3) Install the LT connector cover onto the printer.
- 4) Install the LT connector cover (U) onto the lower tray unit.

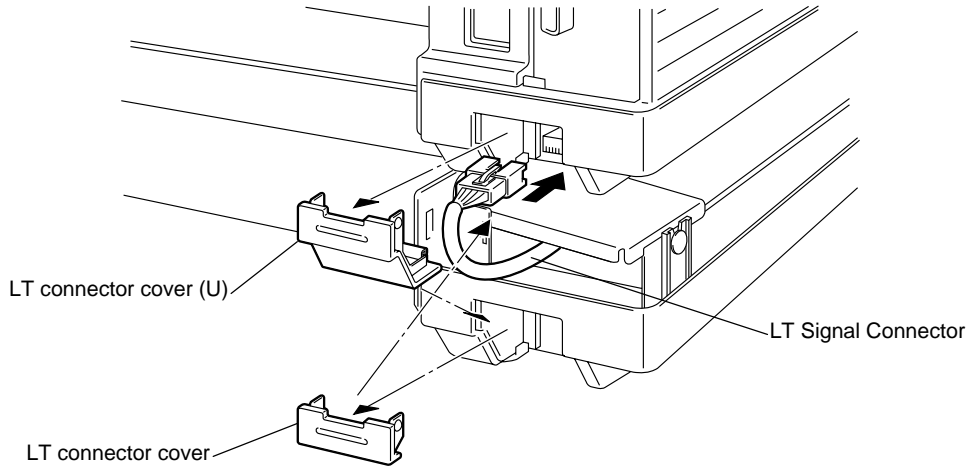


Fig. 10

3.3.3 Install the covers

- 1) Install the side covers R/L onto both sides of the lower tray unit.

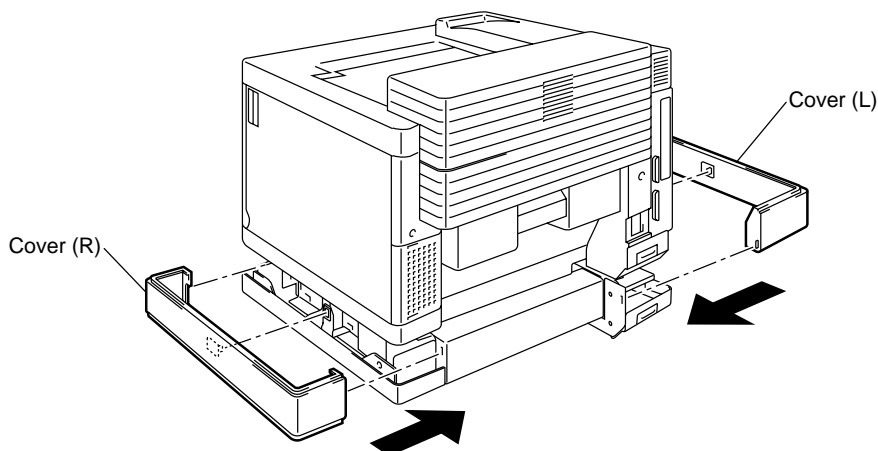


Fig. 11

3.3.4 Relocating the printer / Test print

- 1) If it is necessary to relocate the printer with the lower tray unit installed, hold it under the lower tray unit, it should only be moved by two adults and should be kept level at all times. Care should be taken to not subject the printer to any unnecessary shock during moving the printer.

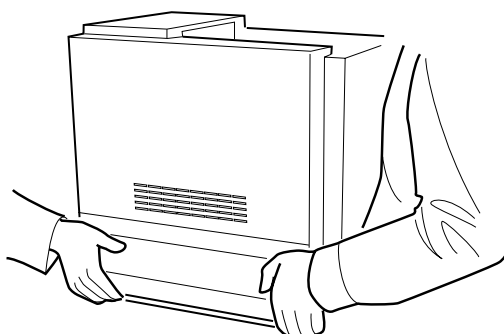


Fig. 12

CAUTION

- *The printer with the lower tray unit installed weighs approximately 40kg, so it is too heavy for one person to carry. It needs two adults to move the printer.*
- *If the printer and the lower tray unit are relocated separately, ensure that you disconnect the LT signal connector from the printer before lifting up the printer from the lower tray unit.*

- 2) After all the installation steps are finished, load paper only into the media cassette of the lower tray unit and implement the test print.

4. MAINTENANCE

4.1 Daily Maintenance

You need not daily maintenance for the lower tray unit such as cleaning.

4.2 Periodic Maintenance

You need not to replace any parts periodically. However, it is recommended for high performance of paper feeding that the following parts are replaced in accordance with the periodic replacement cycle of printer parts.

Description	Part No.	Replacement Cycle
Paper Feeding Roller	UH3485001	Every 120K print
Separation Pad	UH3486001	Every 120K print

5. DISASSEMBLY

When disassembling the lower tray unit, follow the instructions in the sections below referring to Figure 13;

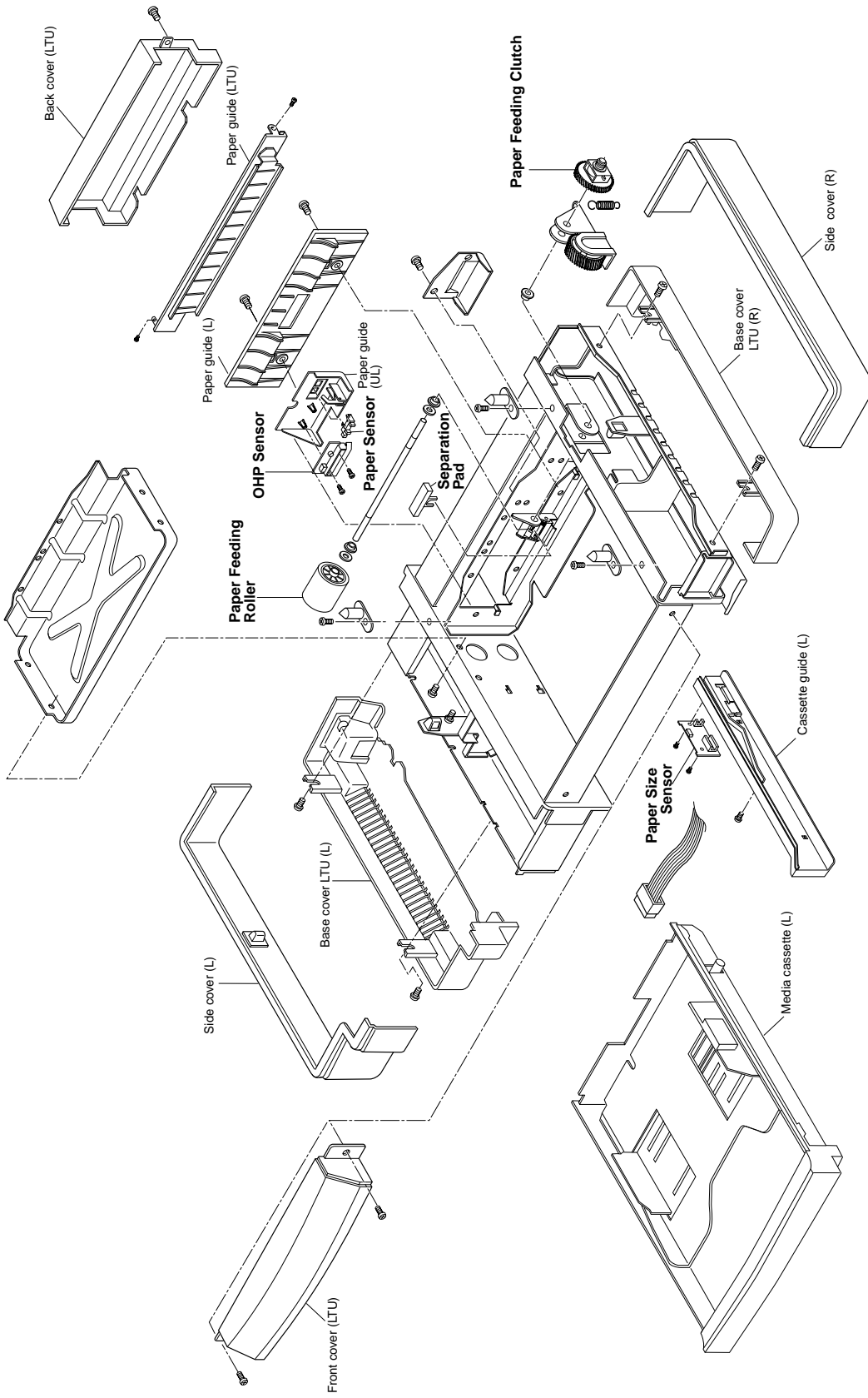


Fig. 13

5.1 Paper Sensor (PEL) / OHP Sensor (OHPL)

- 1) Remove the BT4x8 screw (1 pc.) to remove the back cover (LTU).
- 2) Remove the screws (2 pcs.) to remove the paper guide (LTU).
- 3) Remove the ST4x6 screws (2 pcs.) to remove the paper guide (L).
- 4) Remove the ST4x6 screws (2 pcs.) to remove the paper guide (UL) assembly.
- 5) Remove the paper sensor connector.
- 6) Remove the paper sensor from the paper guide (UL).
- 7) Remove the BT3x6 screws (2 pcs.) to remove the OHP sensor from the paper guide (UL).
- 8) Remove the OHP sensor harness connector.

5.2 Paper Size Sensor (PSU)

- 1) Remove the BT4x8 (2 pcs.) screws to remove the base cover LTU (L).
- 2) Remove the ST3x6 screws (2 pcs.) to remove the front cover (LTU).
- 3) Remove the BT3x8 screw of the cassette guide (L) assembly.
- 4) Pull the cassette guide (L) toward you while pushing the front catch to release the guide from the plastic catches.
- 5) Remove the connector of the paper size sensor.
- 6) Remove the cassette guide (L) assembly from the frame.
- 7) Remove the BT3x8 screws (2 pcs.) to remove the paper size sensor from the cassette guide (L).

5.3 Paper Feeding Clutch

- 1) Remove the BT4x8 screws (2 pcs.) to remove the base cover LTU (R).
- 2) Remove the BT4x8 screw (1 pc.) to remove the back cover (LTU).
- 3) Remove the harness connector of the paper feeding clutch.
- 4) Remove the ST3x6 screw (1 pc.) to remove the clutch cover.
- 5) Remove the stopper ring from the paper feeding clutch shaft.
- 6) Remove the paper feeding clutch from the shaft.

Note:

When removing the clutch cover, the spring installed onto the clutch cover comes off.

5.4 Paper Feeding Roller / Separation Pad

- 1) Remove the BT4x8 screw (1 pc.) to remove the back cover (LTU).
- 2) Remove the screws (2 pcs.) to remove the paper guide (LTU).
- 3) Remove the ST3x6 screws (2 pcs.) to remove the paper guide (L).
- 4) Remove the ST3x6 screws (2 pcs.) to remove the paper guide (UL).
- 5) Disconnect the harness from the paper guide (UL).
- 6) Remove the paper feeding roller by pushing it to the right viewed from the rear of the unit.
- 7) Pull up and remove the separation pad.



CAUTION

Do not touch the surface of the paper feeding roller and separation pad.

6. CLEARING PAPER JAMS

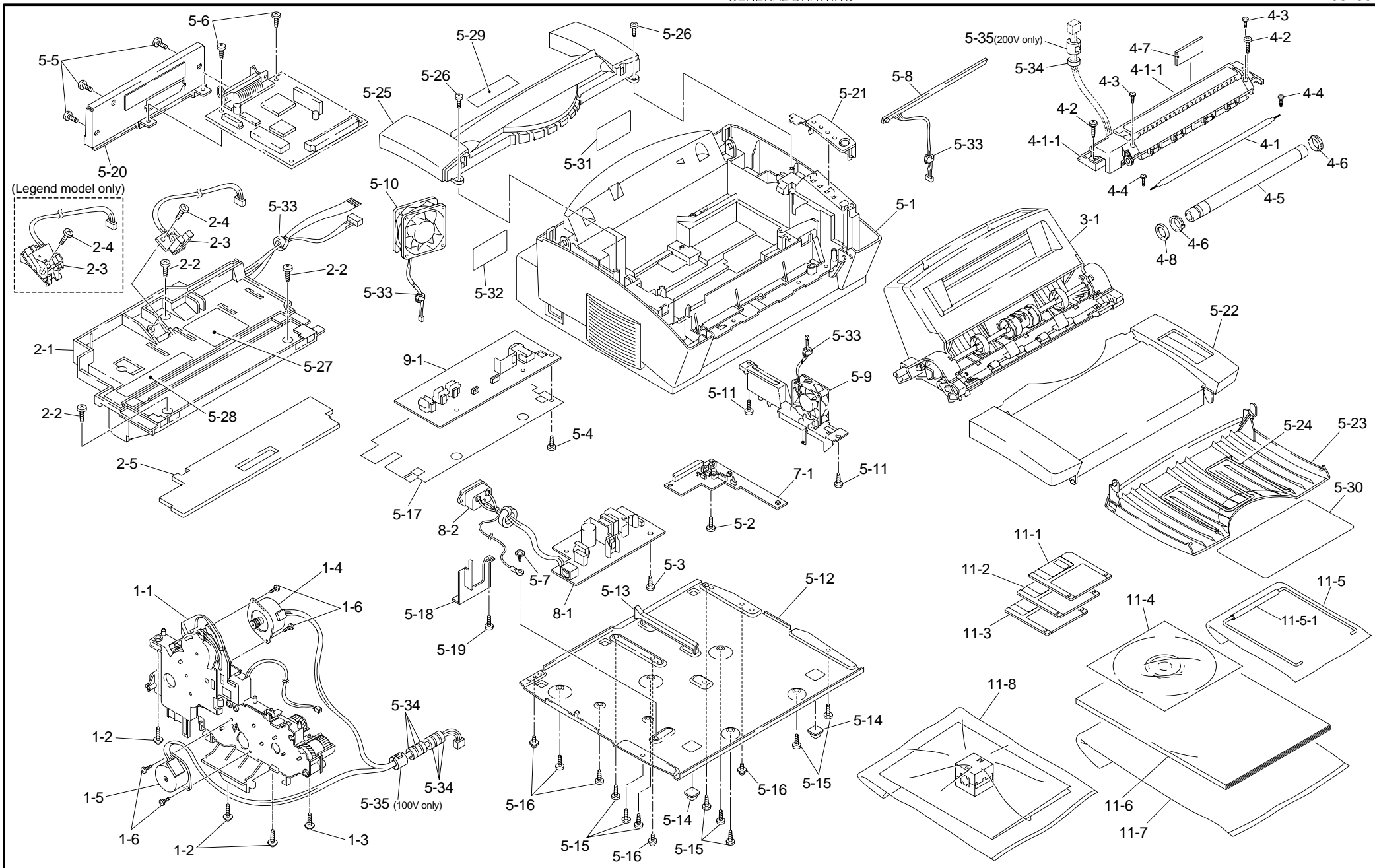
6.1 Paper Feeding Jam

- 1) Pull out the media cassette (L).
- 2) Remove the paper remaining inside the printer.
- 3) Open the rear cover to check no paper remains.
- 4) Close the rear cover.

6.2 Inner Jam / Outer Jam

Both inner jam and outer jam actually occur inside the printer.

Refer to Section 3.2 & 3.3 in Chapter VIII of the HL-2400C service manual.



11. ACCESSORIES

PR98235

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UK4090001	1	PR DRIVER DISK ASSY1, 820 (WINDOWS)	
1	UK4193001	1	PR DRIVER DISK ASSY1, 1020 (WINDOWS)	
1	UK3875001	1	PR DRIVER DISK ASSY1, 1040 (WINDOWS)	
1	UK4183001	1	PR DRIVER DISK ASSY 1, 1040LEG(WINDOWS)	
1	UK3895001	1	PR DRIVER DISK ASSY1, 1050 (WINDOWS)	
1	UK4179001	1	PR DRIVER DISK ASSY 1, 1050HEB(WINDOWS)	
1	UK4233001	1	PR DRIVER DISK ASSY 1, 1050LEG(WINDOWS)	
2	UK4092001	1	PR DRIVER DISK ASSY2, 820 (TRUETYPE)	
2	UK4195001	1	PR DRIVER DISK ASSY2, 1020 (TRUETYPE)	
2	UK3877001	1	PR DRIVER DISK ASSY2, 1040 (TRUETYPE)	
2	UK4185001	1	PR DRIVER DISK ASSY2, 1040LEG(TRUETYPE)	
2	UK3897001	1	PR DRIVER DISK ASSY2, 1050 (TRUETYPE)	
2	UK4181001	1	PR DRIVER DISK ASSY2, 1050HEB(TRUETYPE)	
2	UK4235001	1	PR DRIVER DISK ASSY2, 1050LEG(TRUETYPE)	
3	UK4197001	1	PR DRIVER DISK ASSY6, 1050 ARABIC	
4	UK4199001	1	CD-ROM ASSY	
5	UE2188001	1	PAPER SUPPORT ASSY	CHNG
5-1	UL7158001	1	TE TUBE	ADD
6	UL8529001	1	SET GUIDE, US	
6	UL8550001	1	SET GUIDE, FRA	
6	UL8534001	1	SET GUIDE, GER	
6	UL8557001	1	SET GUIDE, NOR	
6	UL8560001	1	SET GUIDE, NL	
6	UL8565001	1	SET GUIDE, DEN	
6	UL8568001	1	SET GUIDE, ITA	
6	UL8571001	1	SET GUIDE, SWE	
6	UL8739001	1	SET GUIDE, SPA	
7	UE2014001	1	BAG, 215X350H	
8	UK4156001	1	CORE NF-13 ASSY (HL1050)	

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-920

T/I NO. PR98100 / PR98110 / PR98176 / PR98235

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)	CHNG
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	
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)	CHNG
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	
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	QTY	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)	CHNG
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	
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

12. PACKING MATERIALS

PR99055

REF.NO.	CODE	Q'TY	DESCRIPTION	REMARK
1	UE2233001	1	CARTON, EUR HL-820	
1	UE2236001	1	CARTON, CAN HL-1020	
1	UE2239001	1	CARTON, USA HL-1040	
1	UE2240001	1	CARTON, CAN HL-1040	
1	UE2222001	1	CARTON, EUR HL-1040	
1	UE2237001	1	CARTON, CAN HL-1040DX	
1	UE2245001	1	CARTON, LEGEND HL-1040	
1	UE2241001	1	CARTON, USA HL-1050	
1	UE2230001	1	CARTON, EUR HL-1050	
1	UE2238001	1	CARTON, CAN HL-1050DX	
1	UE2242001	1	CARTON, CAN HL-1050	
1	UE2248001	1	CARTON, LEGEND HL-1050	
1	LJ4002001	1	CARTON, TWN&KOR HL-1040R	ADD
2	UE2223001	1	STYROFOAM PAD ASSY	
3	UE2226001	1	CARTON, ACCESORRIES	
4	UE2126001	1	BAG, 700X800 (BODY)	

MODEL HL-820/1020/1040/1050 84U-821/831/832/861/862-930

T/I NO. PR98087 / PR98110 / PR98176 / PR99055

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



Laser Printer HL-800/1000 Series

Quick Setup Guide

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

Keep this manual in a convenient place for quick and easy reference at all times. Refer to the On-Line manual by installing the CD-ROM into Windows.

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For technical and operational assistance, please call:

In USA 1-800-276-7746 (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 printer properly or prevent damage to the printer.

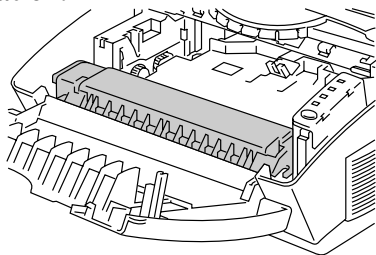
Note

Indicates notes and useful tips to remember when using the printer.

To Use the Printer Safely

Warning

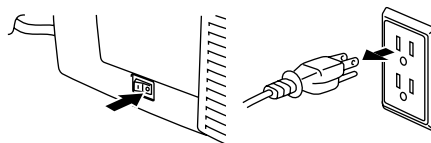
After you have just used the printer, some internal parts are extremely hot. When you open the printer top cover, never touch the shaded parts shown in the following illustration.



 **High Temperature**
Inside the Printer

Warning

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



Turning off the Switch and Unplugging the Printer

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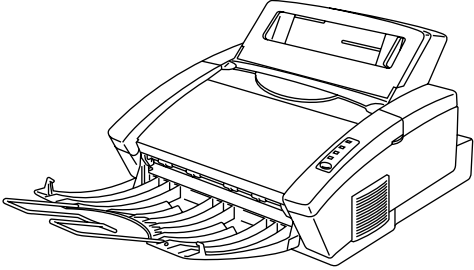
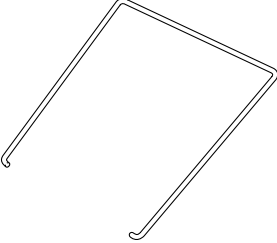
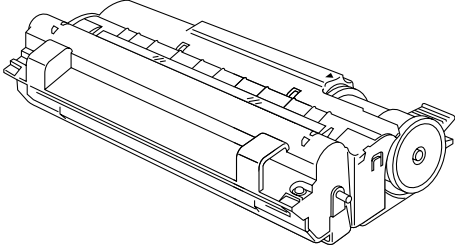
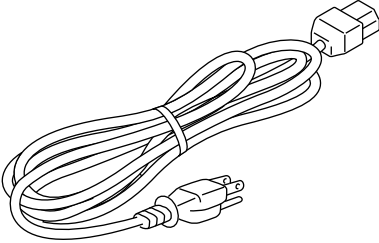
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Action 1: Check the Supplied Items

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:

<ul style="list-style-type: none">• Printer 	<ul style="list-style-type: none">• Paper support 
<ul style="list-style-type: none">• Drum unit assembly (with Toner cartridge included) 	<ul style="list-style-type: none">• AC Cord 

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

NOTE

The 3.5" floppy disks for the Macintosh printer driver may be included for some countries. 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: Place the printer

Please take note of the following before using the printer.

Power Supply

- Use the printer within the specified power range.
 - AC power: $\pm 10\%$ 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 printer 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 printer should be installed near a power outlet, which is easily accessible.
- Use the printer 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 printer should be used in a well ventilation room.
- Place the printer on a flat, horizontal surface.
- Keep the printer clean. Do not place the printer in a dusty place.
- Do not place the printer where the ventilation hole of the printer is blocked.
- Do not place the printer where it is exposed to direct sunlight. Use a blind or a heavy curtain to protect the printer from direct sunlight when the printer is unavoidably set up near a window.
- Do not place the printer near devices that contain magnets or generate magnetic fields.
- Do not subject the printer to strong physical shocks or vibrations.
- Do not expose the printer to open flames or salty or corrosive gasses.
- Do not place objects on top of the printer.
- Do not place the printer near an air conditioner.
- Keep the printer horizontal when carrying.
- Do not cover the slots in the top cover.

System Requirements for the Brother Printing Solution for Windows

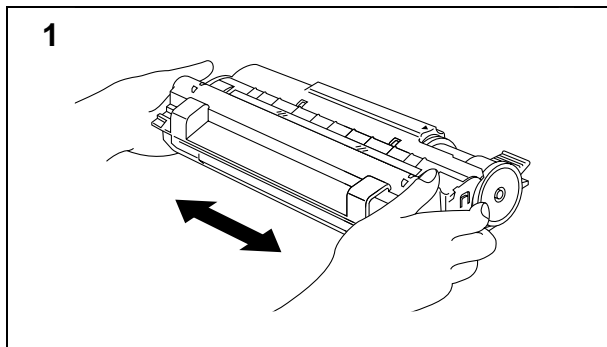
Check the following system requirements to setup and operate the printer in Brother Printing Solution for Windows:

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

Caution

The HL-820/1020 printer has been designed specifically for Windows 95/98, 3.1/3.11 and Windows NT4.0. It cannot work in a DOS environment such as MS-DOS.

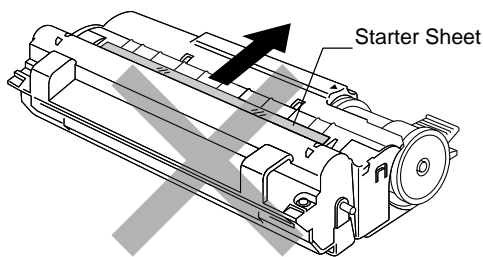
Action 3: Install the Toner Cartridge/Drum Unit



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

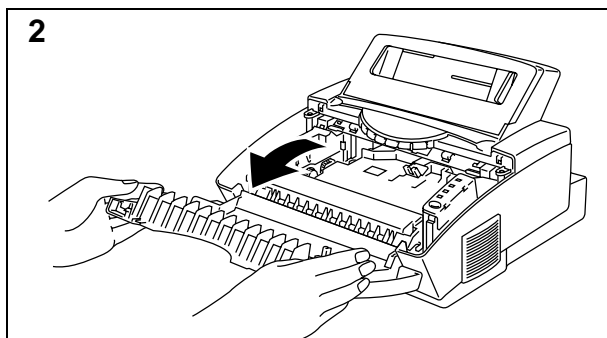
CAUTION

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

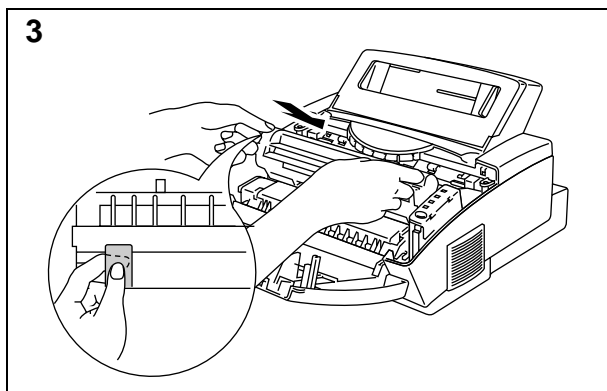


CAUTION

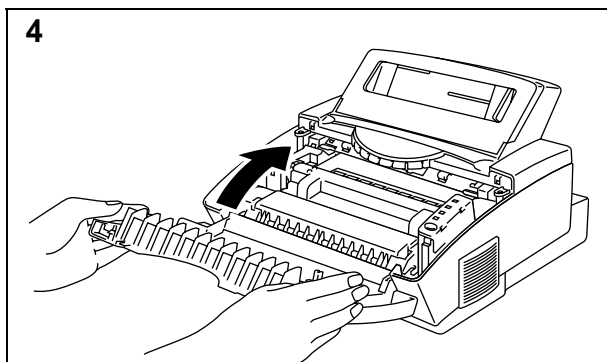
Do not remove the starter sheet. This sheet will be ejected while the printer is warming-up after installing a new drum unit. (See Action 5 Illustration 4)



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



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

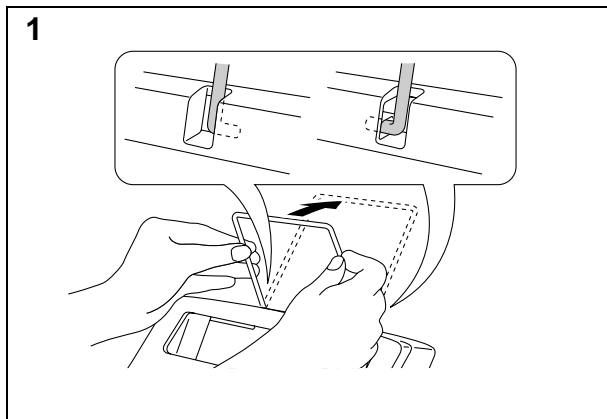


Close the top cover.

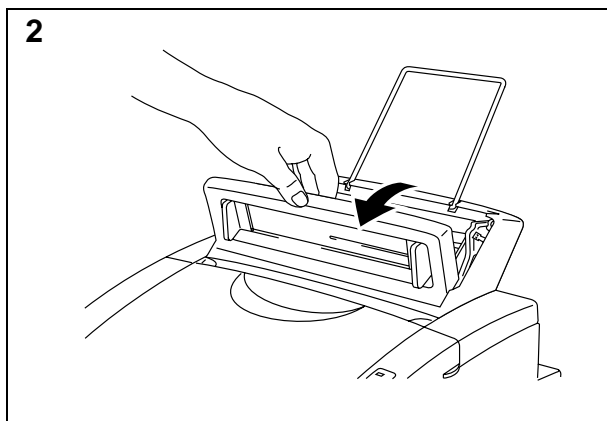
See "CHAPTER 5 MAINTENANCE" in the On-line User's Guide for more information about replacement of the toner cartridge.

Action 4: Load Paper into Your Printer

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.



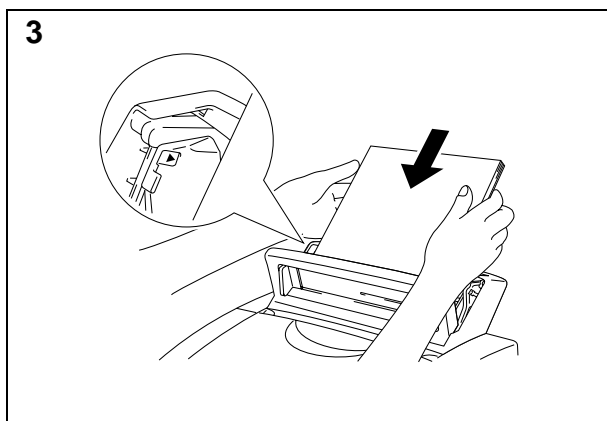
Install the paper support onto the multi-purpose sheet feeder.



Open the multi-purpose sheet feeder cover.

⚠ CAUTION

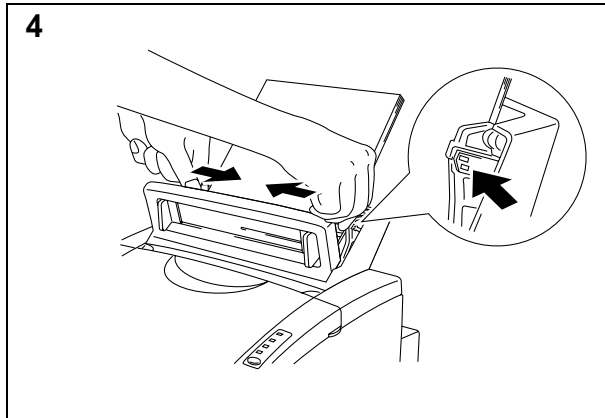
Be sure to open the sheet feeder cover whenever you insert paper into the sheet feeder otherwise you may get paper mis-feeding or paper jam errors.



Load paper in the multi-purpose sheet feeder.

✍ NOTE

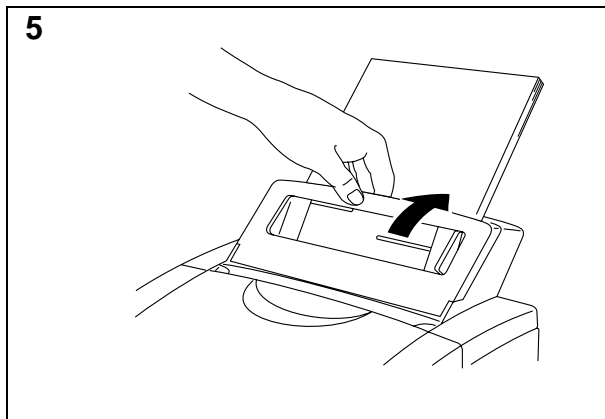
The feeder can hold up to 200 sheets of plain paper or up to 10 envelopes. Excessive sheets may cause paper jams. Make sure that the paper is stacked below the ▲ mark.



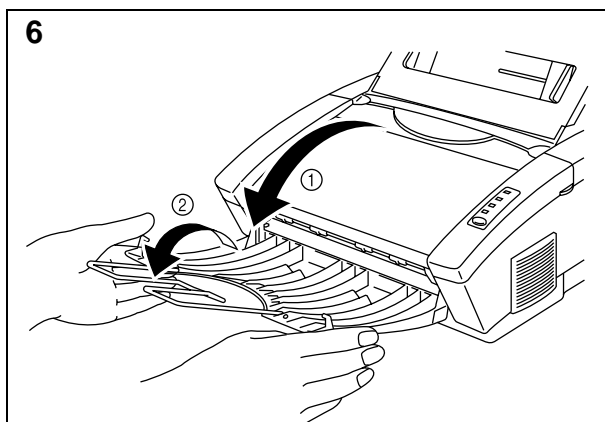
Hold the tab of the right hand paper guide and press the catch to release the guide lock. Move the paper guide to fit the paper width.

! CAUTION

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



Close the multi-purpose sheet feeder cover.



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

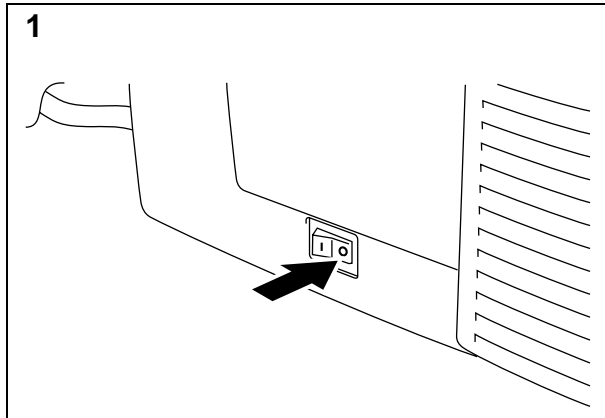
The printer can handle paper within the following specifications:

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.

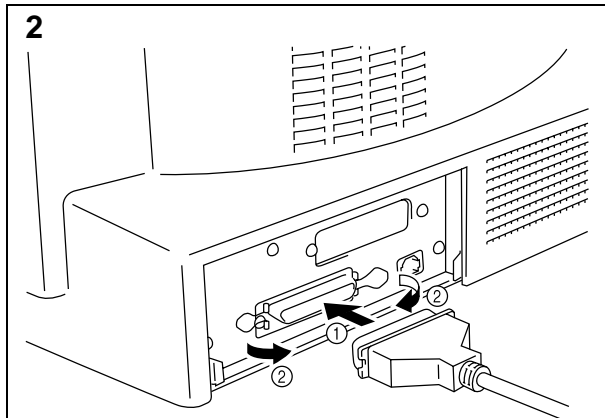
Action 5-1: Connect Your Printer to Your Computers parallel interface

You must connect the printer 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 printer **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 printer. (①)

Secure the connection with the wire clips. (②)

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

NOTE

The HL-1040/1050 printer can also operate with an RS-232C/RS-422A serial interface by installing the optional serial interface board. In some countries it might be pre-installed. For more information, see "CHAPTER 4 OPTIONS" in the On-line User's Guide.

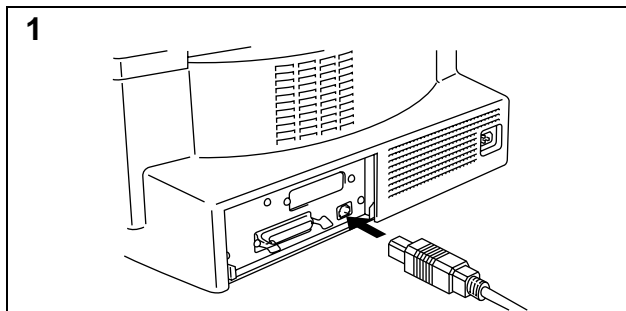
For the location of your computers parallel (or serial, if you are using the optional interface board) printer port, refer to the User's Guide of your computer.

Action 5-2: Connect Your Printer to Your Computers using the USB interface (Only for HL-1050 with Windows 98)

The Universal Serial Bus is an interface which allows the printer to be connected to multiple peripheral devices. If your PC has a USB port, you can connect the printer to your PC by using the USB interface as described in the following procedure.

NOTE

- We recommend that you use the USB interface with this printer on Microsoft Windows[®] 98. Although Microsoft Windows[®] 95 OSR2.1 supports the USB interface, some PCs do not work correctly with the USB interface.
- Only one Brother printer can be used in the same chain of the USB connection. If more than one Brother printer exists in the same chain of the USB connection, only one printer can be used.
- To obtain the latest driver, refer to the following page on our web site:
<http://www.brother.com/> **[Software]**



Turn the printer power off.

Connect your PC and HL-1050 with the USB interface cable.



Turn the printer **power** on.

The dialog shown above will appear on your PC.

Click the **Next** button.



Select “*Search for the best driver for your device.*”

Click the **Next** button.



Insert the supplied CD-ROM into the drive of your PC.

Select “*CD-ROM drive.*”

Click the **Next** button



Click the **Next** button.

The USB driver is installed.



When the dialog shown above appears on your PC, click the **Finish** button.

Be sure to restart Windows 98 so that the installed USB driver will be effective.

When the installation of the USB driver is complete, install the printer driver.

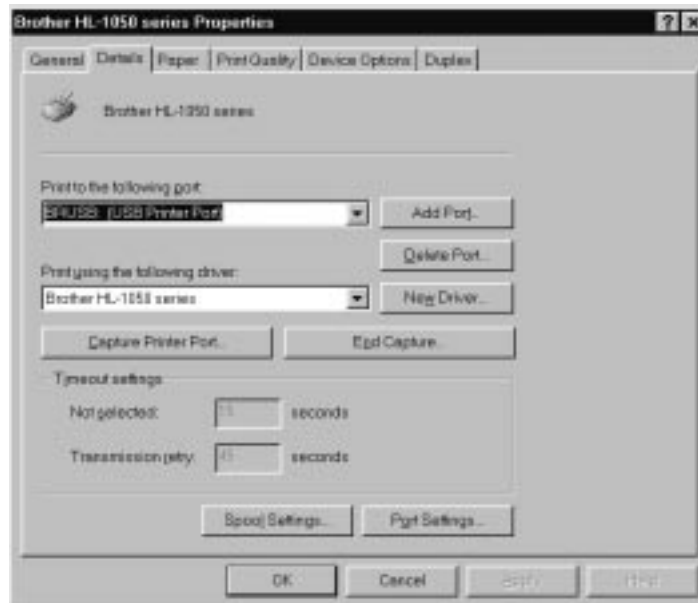
From CD-ROM: Run the CD-ROM program and go to the ‘Install driver’ menu.

From Floppy disk: Refer to the Software Quick Setup Guide.

Set the printer port to USB

After installing the USB driver and printer driver, the printer port has to be set to ‘USB port’.

1. Click the **Start** button and select **Printers** in **Settings**.
2. Select the HL-1050 icon in printers so that the HL-1050 icon is highlighted.
3. Select **Properties** from **File** menu.
4. Click **Details** tab.
5. Select **BRUSB:(USB Printer Port)** in the box for “Print to the following port”.
6. Click **OK** to close the properties dialog box.

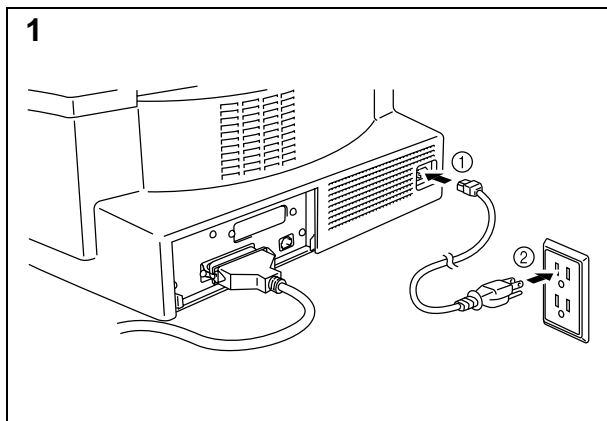


Troubleshooting

If the printer does not print from the USB port, try reinstalling the USB driver as follows;

1. Double-click the file 'DeinsUSB.exe' in the USB directory of the CD-ROM.
2. Turn the printer off and on again.
3. "Add New Hardware Wizard" is launched again, follow the instructions in the Wizard.

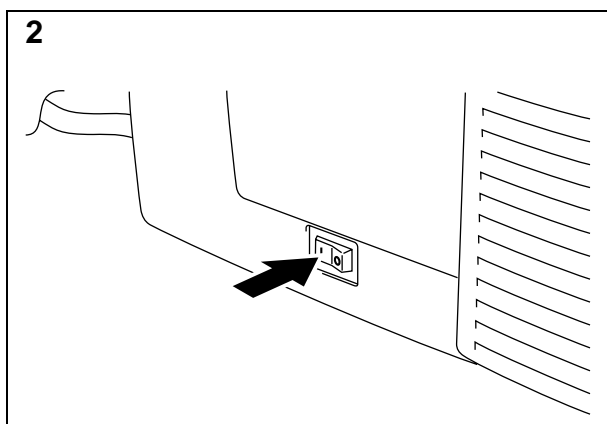
Action 6: Plug in and Turn on Your Printer



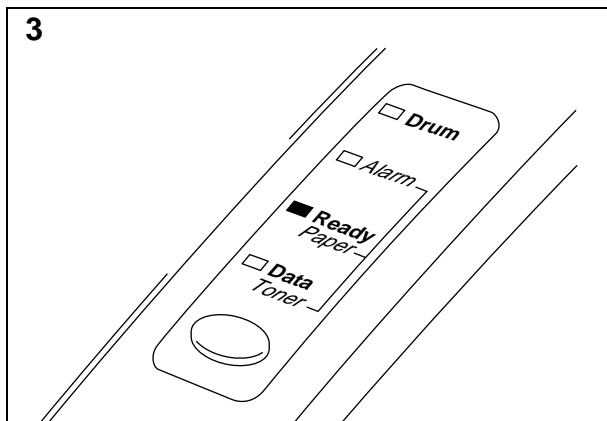
Plug the power cord into the AC power outlet and the printer power inlet.

NOTE

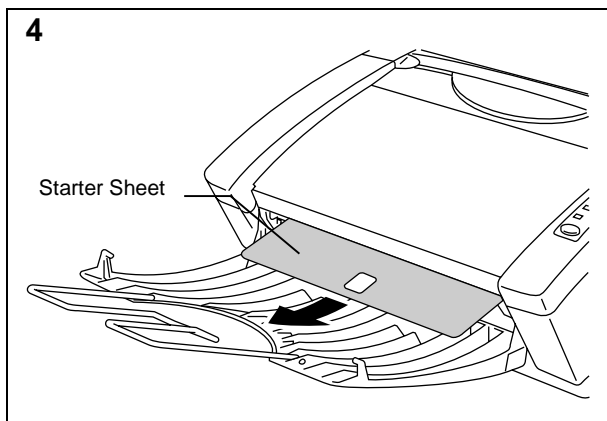
The shape of the power cord varies according to the country of destination.



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



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



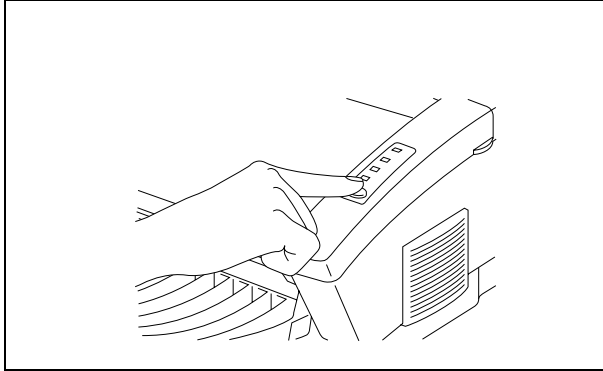
Make sure that the printer automatically ejects the starter sheet while the printer is warming-up immediately after installing a new drum unit.

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 printer has received any data from your computer.



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

NOTE

- If you have already sent data from your computer to the printer, you can print a self test using the following steps.
 1. Make sure 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.
 3. Press the switch again to execute the test print.The HL-1040/1050 printer 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.
- If the printer does not print a test sample page, see [“CHAPTER 6 TROUBLESHOOTING, Q & A”](#) of the On-line User’s Guide. If you are still unable to print a test sample page after reviewing the information in the User’s Guide, consult your dealer or Brother representative for support.
- **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.**

After printing the test sample page, you are ready to prepare your computer to work with the printer. 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 Windows 95/98 for the Printer from floppy disk

Action 7-3: Prepare Windows 3.1 for the Printer from floppy disk

Action 7-4: Prepare DOS for the Printer (Only for HL-1040/1050 Users) from floppy disk

Action 7-5: Prepare Macintosh for the Printer (Only for HL-1040/1050 Users)

Action 7-1: Installation from CD-ROM

The supplied CD-ROM contains the following materials.

- **Printer Driver & TrueType fonts -**
You need to configure your PC for the printer by installing the printer driver and TrueType-compatible fonts. Printer driver & TrueType fonts can be installed either from the CD-ROM or the floppy disks.
- **Soft PCL 5e (Only for HL-820/1020/1040) -**
To print the document at 600 dpi from the Windows DOS box you need to install this utility.
- **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 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 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

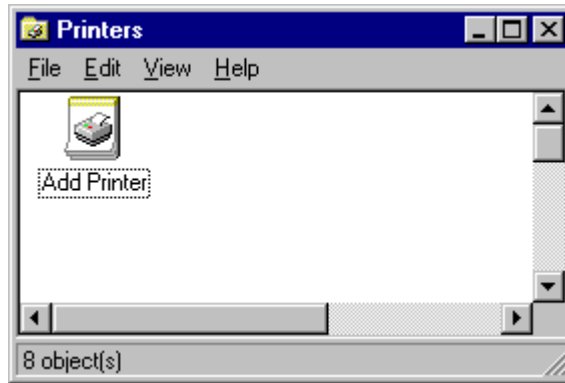
1. Close all the applications running on your PC.
2. Insert the supplied compact disc into the CD-ROM drive.
3. In the **Windows Program Manager** screen, click the **File** menu.
4. Choose **Run**.
5. Type D:\START16 (or the appropriate drive directory letter) in the command line box and click **OK**.

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

Action 7-2: Prepare Windows 95/98 for the Printer from floppy disks

You need to configure Windows 95/98 for the printer by installing the printer driver and TrueType™-compatible fonts 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 **Settings**.
3. Select **Printers** and double click the **Add Printer** icon.



4. Follow the instructions in Windows™ 95/98.

Action 7-3: Prepare Windows 3.1 for the Printer

You need to configure Windows 3.1 for the printer by installing the printer driver and TrueType™-compatible fonts from the supplied disk into Windows 3.1.

Because the supplied printer driver and fonts are compressed on the disk, be sure to use the supplied installer program to install them. 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.)

NOTE

- The installer automatically updates your SYSTEM.INI Windows file by adding DEVICE=bi-di.386 under the [386Enh] section. If any bi-directional parallel communications device driver has previously been installed, it will be deactivated by this new driver. If you want to use the driver that was previously installed, you should re-install your previous driver. However, re-installing the previous driver will make the HL-800/1000 series driver inactive.
- The installer makes the installed printer driver the Windows default.
- The installer automatically sets the printer port to the parallel interface, LPT1.
- During this installation, changes have been made to the SYSTEM.INI file. It is necessary to restart Windows so that the changes become effective and the installed bi-directional parallel communications device driver can take effect.

Action 7-4: Prepare DOS for the Printer (Only for HL-1040/1050 Users)

How to Use the Printer 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:

HL-1040 : HP LaserJet IIP, EPSON FX-850, or IBM Proprinter XL printers

HL-1050 : HP LaserJet 6P, EPSON FX-850, or IBM Proprinter XL printers

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

Printer Model	Printer driver supported in your application software	Emulation mode to be selected with the remote printer console program
HL-1040	HP LaserJet IIP™ HP LaserJet II™	HP LaserJet IIP emulation mode Auto emulation selection
HL-1050	HP LaserJet 6L/6P™ HP LaserJet 5L/5P™ HP LaserJet 4/4L/4P™ HP LaserJet III/IIIP™	HP LaserJet 6L/6P emulation mode Auto emulation selection
HL-1040/1050	Epson® FX-850™ Epson FX-80™	Epson FX-850 emulation mode Auto emulation selection
HL-1040/1050	IBM® Proprinter® XL IBM Proprinter	IBM Proprinter XL emulation mode 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 of the HL-1040 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 printer settings such as emulation, print quality, fonts, page setup and so on from your computer screen. Since most DOS applications have a printer 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 printer's settings and features.

❑ Printer Status Monitor Program

This utility program can monitor your printer's status using bi-directional parallel communications. If your printer 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 printer 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.

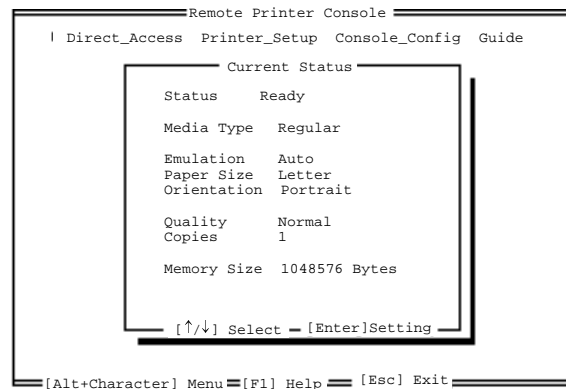
C:\>A:
5. Type RPCSETUP and press the **Enter** key.

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 printer when it starts if bi-directional communication is enabled between your computer and printer. Otherwise, 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.
Printer Setup	Alt + P	You can enter the setting mode to change further printer 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 Printer Status Monitor Program

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

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

To remove the Printer 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 printer is directly connected to your computer. If you are using any printer buffer switches which do not support bi-directional communication between the printer and computer, the program works only in the PC to printer direction and cannot receive printer 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 Printer 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 Printer 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.

Action 7-5: Prepare Macintosh for the Printer (Only for HL-1040/1050 Users)

You need to configure your computer for the printer by installing the printer driver and TrueType™-compatible fonts into the System Folder of your Macintosh computer, and select your printer.

NOTE

You must have Macintosh System software version 6.0.7 or above to use this printer driver. This printer driver only supports the 300 dpi mode when used with a Macintosh computer. When setting up the printer to work with your Macintosh computer, you will need to use the RS-422A serial interface. The serial interface board is an option, but comes standard in some countries. For information on options, consult your dealer or refer to the User's Guide for this printer.

A supplied high density floppy disk contains the printer driver and TrueType™-compatible fonts necessary for this printer to work with Macintosh computers.

Be sure to follow the steps below to install the printer driver by using the installer software:

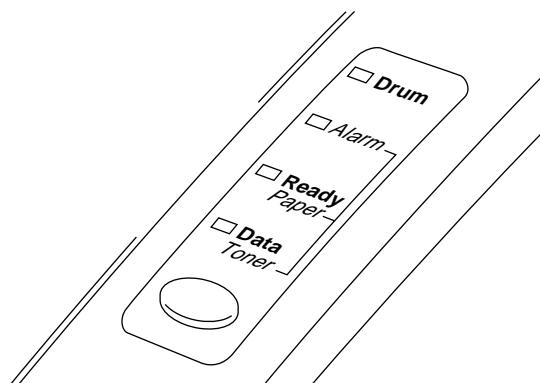
1. Start your Macintosh computer.
2. Insert the supplied disk for the Macintosh computer into the disk drive. If your computer does not support high density 1.4 MB diskettes, please contact your dealer or Brother Printer Support.
3. Double-click the disk icons to open your hard disk and the inserted disk.
4. Double-click the Installer icon.
5. The installer starts running. Follow the instructions on the computer screen.

NOTE

After you have installed the printer driver, you need to select your printer with the Chooser (which is located under the Apple menu) on the Macintosh computer.

LAMPS AND SWITCH

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



Note

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

Ready (Paper) Lamp

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

Lamp	Printer status
Off ○	The power switch is off or the printer is in sleep mode. If the printer is in sleep mode, it will wake up automatically when it receives data or you press the control panel switch.
Blinking ○↔●	The printer is warming up. (Blinking at 1 second intervals)
Blinking ○↔●	The printer is cooling down and has stopped printing until the printers internal temperature lowers. (Blinking at 2 seconds intervals)
On ●	The printer 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	Printer status
Off ○	The printer has no print data.
Blinking ○↔●	The printer is receiving data from the computer or the printer is processing data in memory.
On ●	Print data remains in the printer 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” 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	Printer 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”.

Alarm Lamp

The **Alarm** lamp blinks to indicate a printer error status such as “Cover Open” and “Memory Full.” If any other error occurs, the printer 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 printer 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 printer immediately stops printing and ejects the paper.

Wake-up

If the printer 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 printer prints any data remaining in the printer memory: this operation is called “Form Feed.”

Error Recovery

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

Other Control Features

Sleep Mode

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

Note

- When the printer goes into sleep mode, the fan will not stop until the printer engine has cooled down.
- Sleep mode allows the print engine to cool, so the temperature of your room and how long the printer 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 printer is warming up.
- You can change the time out for the sleep mode with the supplied printer driver (all models) or Remote Printer Console program (HL-1040/1050 only). Refer to the Help section in the printer driver or RPC program for more information about the sleep mode setting.

Test Print Mode

The printer 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 printer 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 mode varies depending upon the printer model as follows:

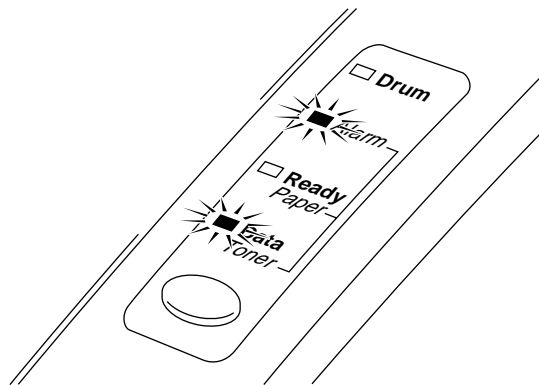
Lamp Lit	Choice	Function
Drum	Test sample page	The printer prints a test sample page. The printer returns to the ready status after printing.
Alarm	Print Config & Print Fonts I	The printer prints the current configuration of the printer and a list of the internal fonts. The printer returns to the ready status after printing.(HL-1040/1050 only)
Ready	Factory Reset	The printer is restored to the factory setting and permanent fonts and macros are cleared. The printer returns to the ready status after printing.(HL-1040/1050 only)
Data	Hex Dump Print	The printer 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 printer. (HL-1040/1050 only)

REPLACING THE TONER CARTRIDGE

The printer 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 printer when you replace the toner cartridge.

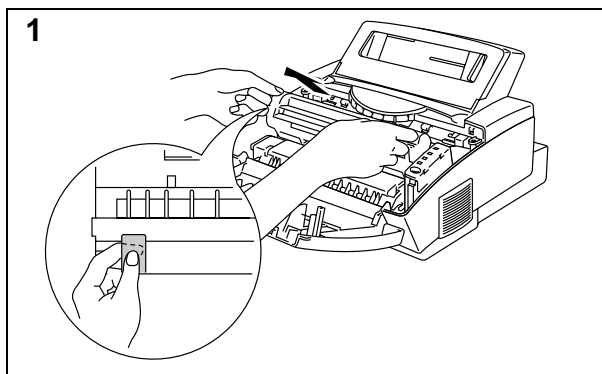


Toner Low and Empty Indication

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 printer 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.**

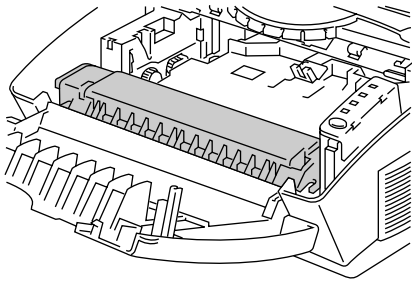
Follow these steps to replace the toner cartridge:



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

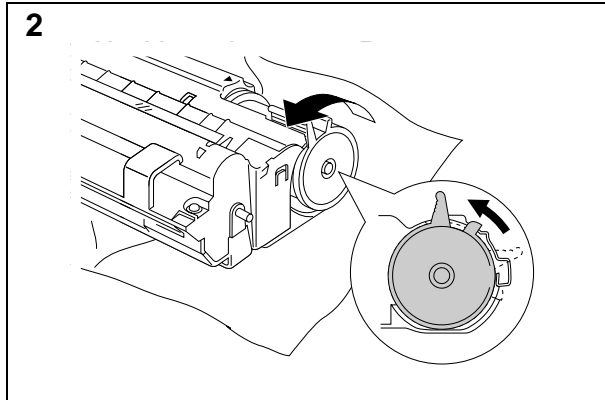
It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.



 **High Temperature**

 **Warning**

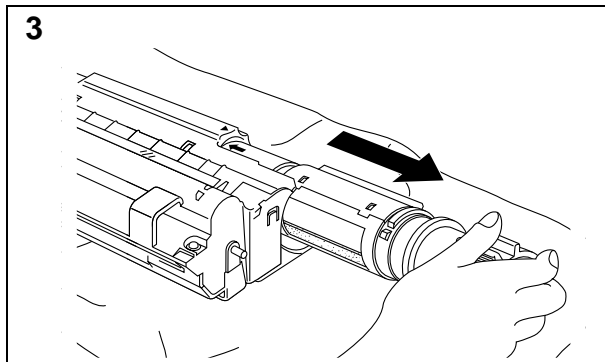
After you have just used the printer, some internal parts of the printer are extremely hot. When you open the top cover of the printer, never touch the shaded parts shown in the following illustration.



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

 **Note**

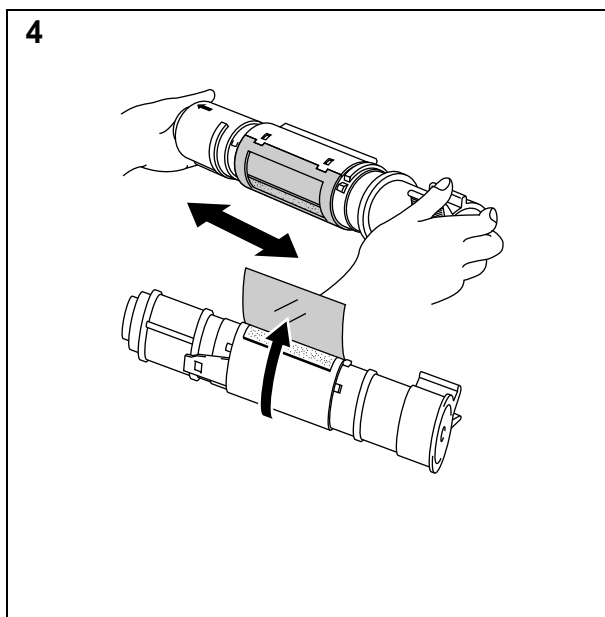
The toner cartridge cannot be removed unless the shutter is completely closed by turning the lever fully to the front.



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

 **Caution**

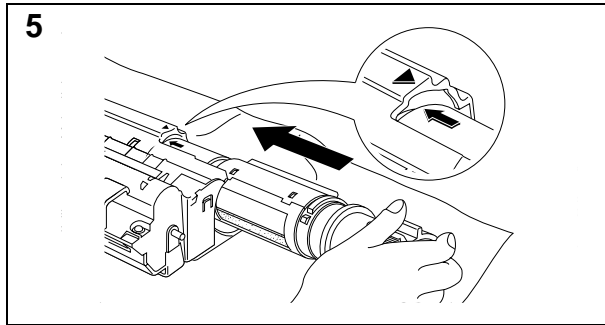
Handle the toner cartridge carefully. If toner scatters on your hands or clothes, wipe or wash it off with cold water immediately.



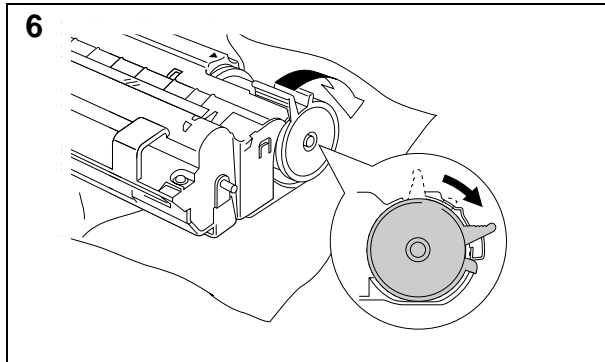
Unpack the new toner cartridge, gently shake it five or six times and then remove the protective part.

 **Caution**

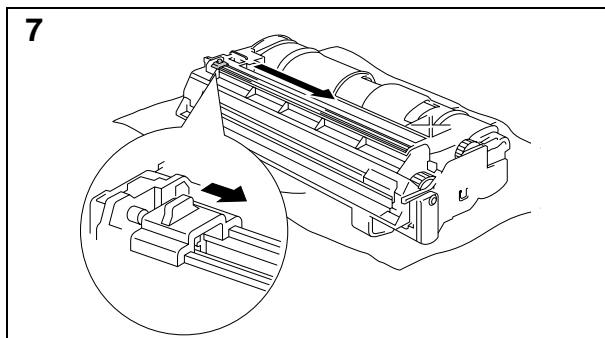
- Only unpack the toner cartridge immediately before installing it into the printer. If toner cartridges are left unpacked for a long period of time, the toner life is shortened.
- **You can only use a Brother genuine toner cartridge (TN-300 series) which is specially formulated to ensure top print quality. Using another brand of toner cartridge could void your printer's warranty.**



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.

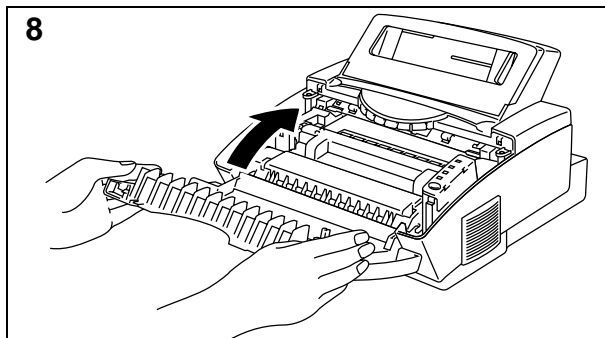


6 Gently turn the lever on the toner cartridge backward until it stops.



7 Turn the drum unit upside down gently.

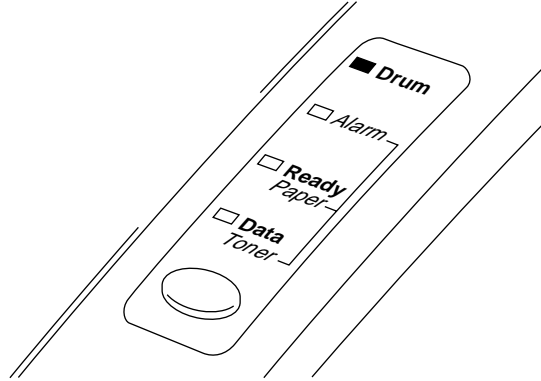
Clean the primary corona wire inside the drum unit by gently sliding the blue tab to the right and left several times.



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

REPLACING THE DRUM UNIT

The printer 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

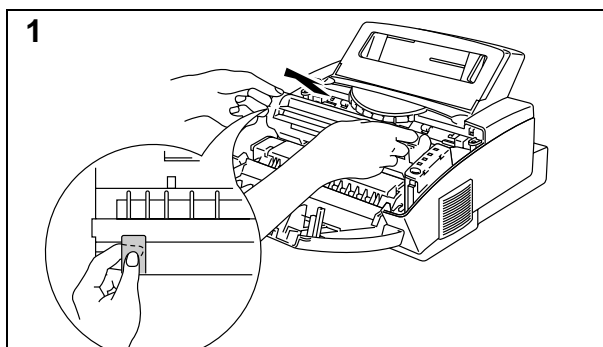
- When removing the drum unit, handle it carefully as it may contain toner.
- You should clean the printer when you replace the drum unit.

🔧 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, and the product should only be used in a clean, dust-free environment with adequate ventilation.

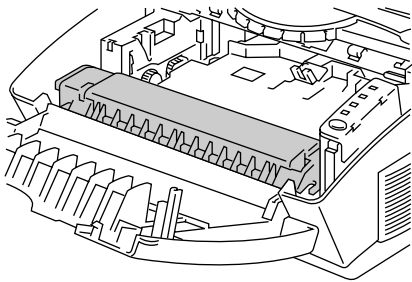
Follow these steps to replace the drum unit:



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

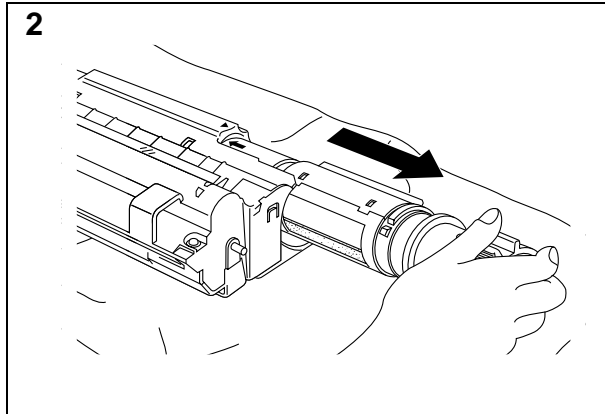
It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.



⚠ High Temperature

⚠ Warning

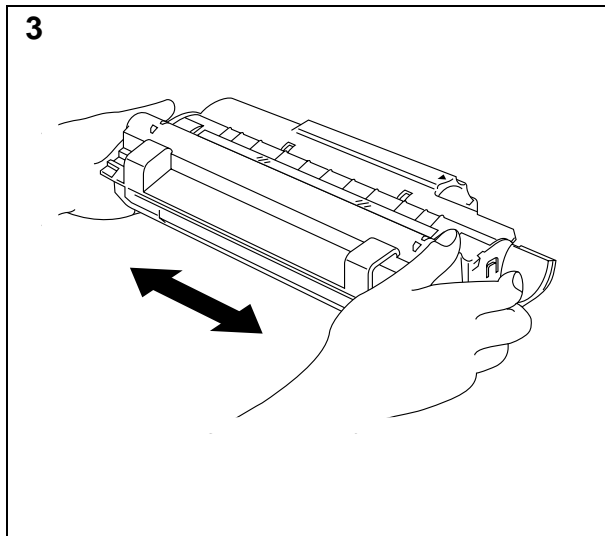
After you have just used the printer, some internal parts of the printer are extremely hot. When you open the top cover of the printer, never touch the shaded parts shown in the following illustration.



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.



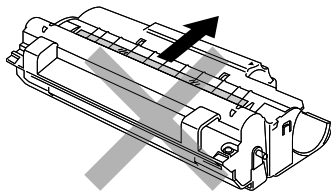
Unpack the drum unit and gently shake it five or six times horizontally.

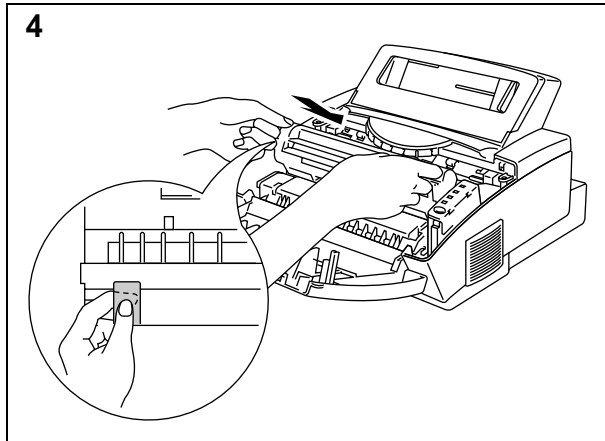
⚠ Caution

- Only unpack a drum unit immediately before installing it into the printer. 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.

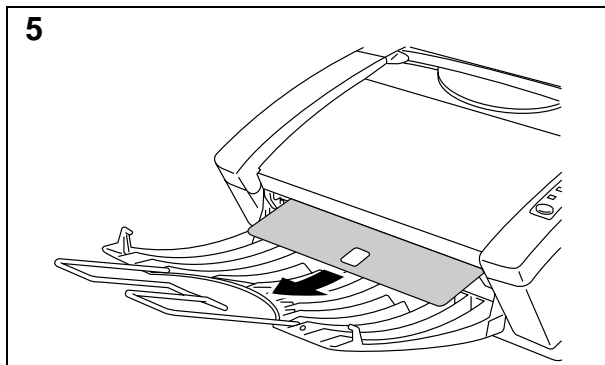
⚠ Caution

Do not remove the starter sheet.





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



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

ALARM INDICATIONS AT A GLANCE

Operator Calls

If a recoverable error occurs, the printer 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 printer automatically recovers from most errors, but you may need to reset the printer 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 printer does not automatically resume printing.
	Paper empty	Load paper in the printer 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 printer 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 5 .

For errors shown below, the printer indicates an operator call by blinking the **Alarm** lamp. If you use the printer with the supplied Windows driver, the status monitor will appear to indicate the error on your computer screen. The HL-1040/1050 printer also prints some error messages on paper.

Error	Action
Cover Open	Close the top cover of the printer.
Print Overrun	<ul style="list-style-type: none"> • Press the panel switch to print the data remaining in the printer. • 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 Windows printer driver for the details.) • (For HL-1050 only) Expand the printer memory with an optional memory board and set page protection to ON by using the supplied Windows driver or RPC program. • (For HL-1050 only) Change the following settings in the supplied Windows driver and try again. The best combination of the settings below will vary depending on your document. Graphics Mode TrueType mode Use Printer TrueType Fonts • If this does not clear the error, reduce the complexity of your document or reduce the print resolution.
Memory Full (For HL-1040/1050 Only) This error can occur only when using DOS or Macintosh.	<ul style="list-style-type: none"> • Press the panel switch to print the data remaining in the printer. • Reduce the print resolution or reduce the complexity of your document. • (For HL-1050 only) Expand the printer memory by adding a commercially available SIMM.
Parallel Interface Line Error	<ul style="list-style-type: none"> • Press the panel switch to resume printing. • Check that the connection between your computer and printer is secure and correct, and check the interface cable.
Serial Interface Framing Error (For HL-1040/1050 Only)	<ul style="list-style-type: none"> • Press the panel switch to resume printing. • Check the communication parameters such as baud rate and stop bit settings on both your computer and printer.
Serial Interface Parity Error (For HL-1040/1050 Only)	<ul style="list-style-type: none"> • Press the panel switch to resume printing. • Check the communication parameters such as bit length and parity settings on both your computer and printer.
Serial Interface Overrun Error (For HL-1040/1050 Only)	<ul style="list-style-type: none"> • Press the panel switch to resume printing. • The interface hardware may be damaged. Consult your dealer.

Error	Action
Serial Interface Input Buffer Overflow (For HL-1040/1050 Only)	<ul style="list-style-type: none"> • Press the panel switch to resume printing. • Check the communication parameters such as the handshake protocols on both your computer and printer. • If the error occurs again, the interface hardware may be damaged. Consult your dealer.

NOTE

If the printer 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.

Service Calls

If an unrecoverable error occurs, the printer 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 printer, 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 6 TROUBLESHOOTING, Q & A” of the On-line User’s Guide](#). If you are still unable to clear the problem after reviewing the information in the User’s Guide, consult your dealer.

Additional Memory (HL-1050 Only)

The **HL-820/1020/1040** printers have 2 Mbytes of standard memory and additional memory cannot be fitted.

The **HL-1050** printer has 4 Mbytes of standard memory and a slot for optional additional memory. The memory can be expanded up to 36 Mbytes total by installing a commercially available single in-line memory module (SIMM).

Note

The HL-820/1020/1040 machine memory cannot be expanded.

Additional memory is useful and may be necessary if you are using the Page Protection function.

Minimum Memory Recommendation (including resident memory)

Page Protect = AUTO or Off			Page Protect = Letter, A4, or Legal		
	300dpi	600dpi		300dpi	600dpi
Letter/A4	2 MB	2 MB	Letter/A4	2MB	6 MB
Legal	2 MB	2 MB	Legal	3 MB	6 MB

The following types of SIMM are recommended and can be installed:

- 1 Mbyte HITACHI HB56D25632B-6A, -7A
- 2 Mbytes HITACHI HB56D51232B-6A, -7A
- 4 Mbytes HITACHI HB56A132BV-7A, -7AL, -7B, -7BL
- 8 Mbytes HITACHI HB56A232BT-7A, -7AL, -7B, -7BL
- 16 Mbytes HITACHI HB56A432BR-6A, -7A
- 32 Mbytes HITACHI HB56A832BS-6A, -7A

This printer can accept memory SIMMS with the following specifications:

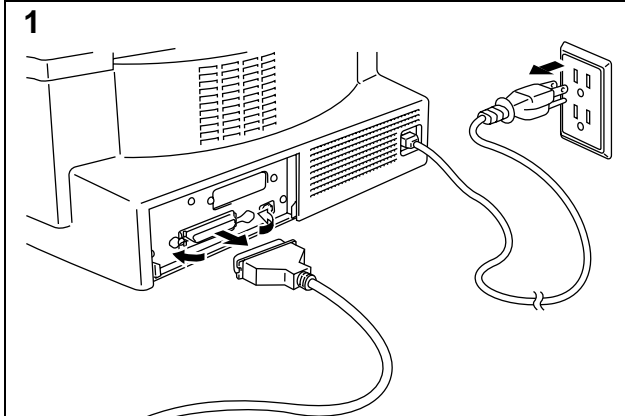
Speed	60 nsec - 80 nsec
Pin Type	72 pin
Height	35.00 mm (1.38") or less
Output	32 bit or 36 bit

Note

- The HL-1050 can also support DIB graphics with a resolution of 1200 x 600 dpi under Windows 95/98/Windows 3.1 with the supplied printer driver. We recommend to expand the printer memory to avoid any memory full errors.
- The printer has only one slot for a SIMM upgrade. If you want to increase your printer memory again after you have already installed a SIMM module into the slot, you will need to remove the previously installed SIMM first. For example if you had previously increased the printer memory from the standard 4MB to 12MB by adding an 8MB SIMM and you wish to increase your total memory to 20 MB, you need to remove the installed 8MB SIMM and install a new 16MB SIMM into the printer.

Installing the SIMM

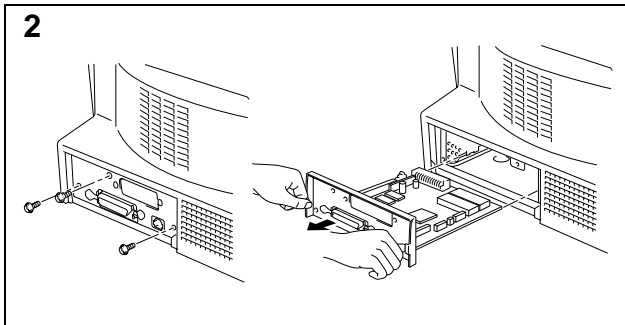
To install the SIMM, follow these steps:



Turn off the **power** switch and unplug the power cord from the AC outlet. Disconnect the interface cable (printer cable) from the printer.

⚠ Caution

Be sure to turn off the **power** switch and unplug the power cord to the printer before installing or removing the SIMM to/from the main controller board.

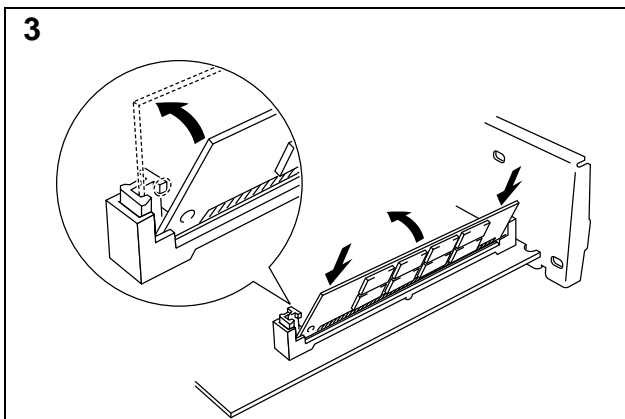


Unscrew the screws securing the rear plate of the main controller board to the printer and pull out the main controller board.

Unpack the SIMM and hold it by its edge.

⚠ Caution

SIMM boards may be damaged by even a small amount of static electricity. Do not touch the memory chips or the board surface. When handling the board and before installing or removing it, wear an antistatic wrist strap, or frequently touch the surface of the antistatic package or bare metal on the printer.



Install the SIMM into the slot and push it gently towards the vertical until it clicks into place.

4. Install the main controller board into the printer by sliding it into the guide rails.
5. Secure the main controller board with the four screws.
6. Reconnect the interface cable (printer cable) from your computer. Plug the power cord into the AC outlet and turn on the power switch.
7. To check that the SIMM is installed correctly, you may perform a Test Print "Print Configuration" which will print the current total memory size.

PRINTER SPECIFICATIONS

Printing

Print Method	Electrophotography by semiconductor laser beam scanning
Laser	Wavelength: 780 nm / Output: 5 mW max.
Resolution	HL-820 600 dots/inch (under Brother Printing Solution for /1020 Windows) HL-1040 600 dots/inch (under Brother Printing Solution for Windows / under Brother Software PCL5e for DOS box in Windows) 300 dots/inch (under DOS, Apple Macintosh and other operating system) HL-1050 1200 (H) x 600 (V) dots/inch (for Windows DIB graphics) 600 x 600 dots/inch (for Windows and DOS) 300 x 300 dots/inch (using Apple Macintosh with the optional RS-100M)
Print Quality	Normal printing mode Economy printing mode (up to 25% and 50% toner saving)
Print Speed	HL-820 : Up to 8 pages/minutes HL-1020/1040/1050: 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..

Functions

TrueType Fonts on disks	TrueType-compatible soft-fonts for Windows on the supplied disk
Emulation	HL-820/1020:Brother Printing Solution for Windows HL-1040: Brother Printing Solution for Windows / Automatic emulation selection among HP LaserJet IIP (PCL level 4), EPSON FX-850, or IBM Proprinter XL HL-1050: Brother Printing Solution for Windows / Automatic emulation selection among HP LaserJet 6P (PCL level 6), 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 Optional Macintosh driver available for System 6.0.7 or higher (For HL-1040/1050 Only)
Interface	Bi-directional parallel USB interface (HL-1050 only) RS-422A/RS-232C serial interface (RS-100M) is optionally available. (For HL-1040/1050 only)
Memory	HL-820/1020/1040 : 2 MB HL-1050: 4 MB (Expandable up to 36 MB by installing an industry standard SIMM)
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
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 245 x 365 mm (14.4 x 9.8 x 13.9 inches) (when the output tray is closed.)
Weight	Approx. 7.2 kg (14.3 lb.) including the drum unit

REGULATIONS

Federal Communications Commission(FCC) Declaration of Conformity (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 HL-820, HL-1020,
HL-1040, HL-1040DX, HL-1050, HL-1050DX
Model Numbers :HL-8L, HL-8h
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.

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)

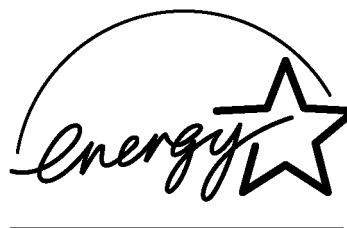
This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur la matériel brouilleur 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 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.

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.

Caution

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

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.

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.

This product is designed for use in a professional environment.

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).

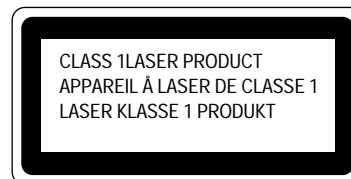
Issued by:

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.

Geräuschemission / Acoustic Noise Emission (For Germany Only)

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

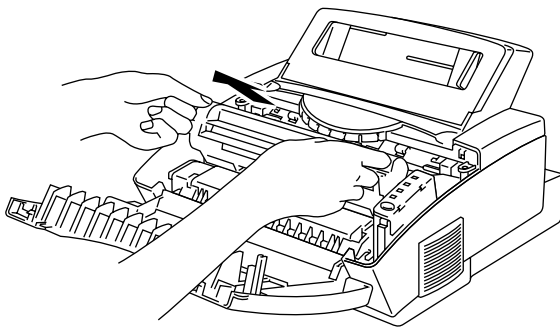
Shipment of the Printer

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

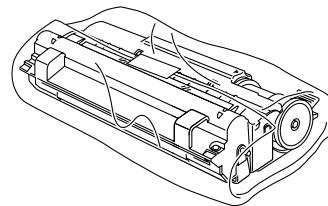
Warning

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

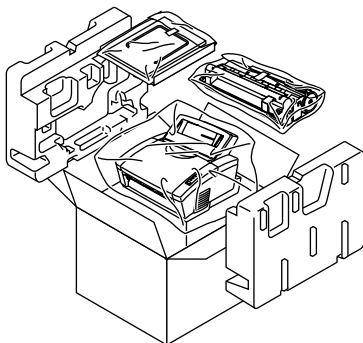
1 Remove the drum unit.



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



3 Remove the AC cord and the paper tray extension wire from the printer.
Re-pack the printer.



brother[®]

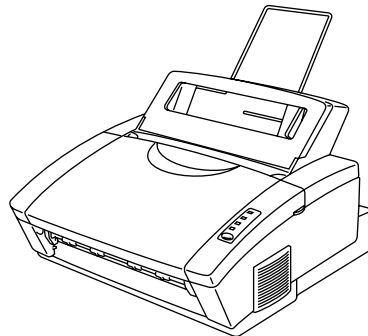
brother[®]

Please read this manual thoroughly before using the printer.

Brother Laser Printer

HL-800/1000 Series

User's Guide



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

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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 printer properly or prevent damage to the printer.

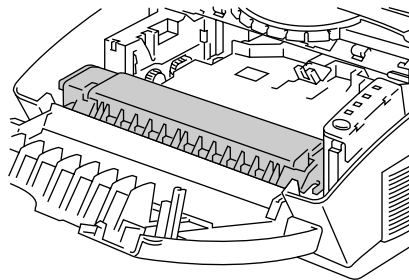
Note

Indicates notes and useful tips to remember when using the printer.

To Use the Printer Safely

Warning

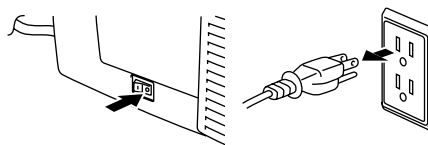
After you have just used the printer, some internal parts of the printer are extremely hot. When you open the top cover of the printer, never touch the shaded parts shown in the following illustration.



 **High Temperature**
Inside the Printer

Warning

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



Turning off the Switch and Unplugging the Printer

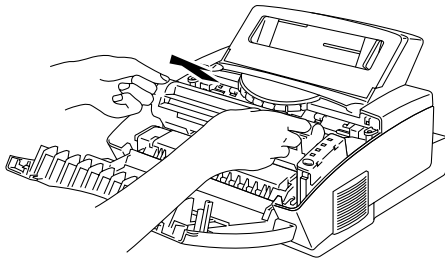
Shipment of the Printer

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

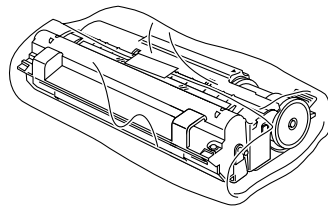
Warning

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

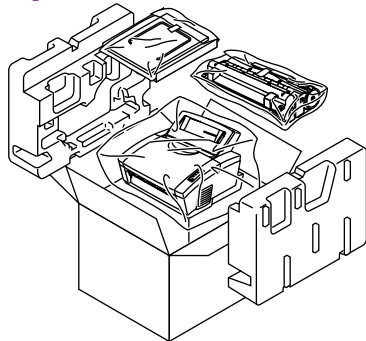
1 Remove the drum unit.



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



3 Remove the AC cord and the extension wire of the paper tray from the printer. Re-pack the printer. See [“REPACKING THE PRINTER”](#) in Chapter 5.



(For USA & CANADA Only)

For technical and operational assistance, please call:

In USA	1-800-276-7746	(outside California)
	714-859-9700 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 Printer

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

1. Read the Quick Setup Guide to set up your printer and to ensure proper connection with your computer. It also contains information for installing the printer driver, fonts and Remote Printer Console Program. (HL-1040/1050 only)
2. Read this On-line User's Guide to get information about the following.
 - Features and operating environment requirements of your printer – Chapter 1
 - Paper Handling – Chapter 2
 - Control Panel – Chapter 3
 - Options – Chapter 4
 - Maintenance – Chapter 5
 - Troubleshooting – Chapter 6
 - Specifications – Appendices
 - Index

ABOUT YOUR PRINTER

Printer Overview

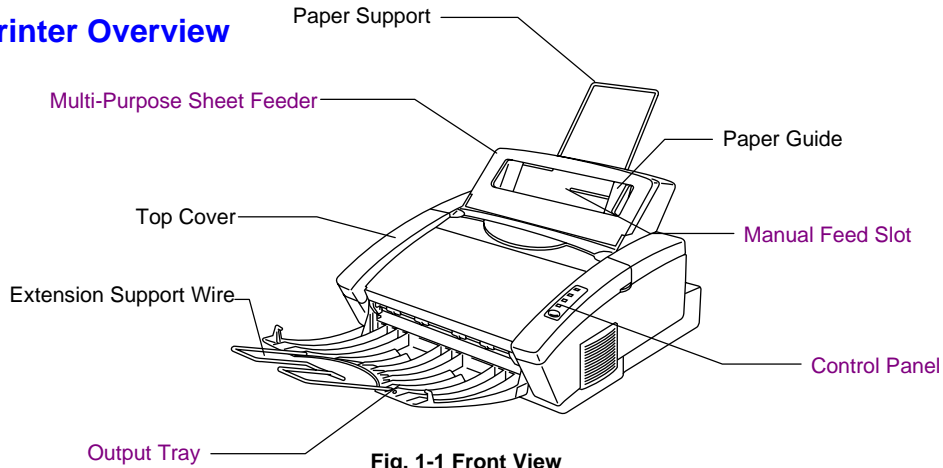


Fig. 1-1 Front View

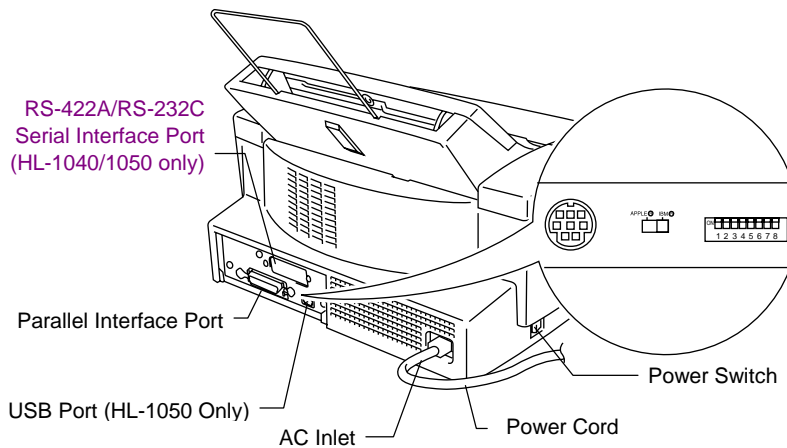


Fig. 1-2 Rear View

Note

An RS-422A/RS-232C Serial Interface Port, containing an RS-422A/RS-232C Slide Switch and DIP Switches for Serial setting is optionally available for the HL-1040/1050 series printers only. Some models may have this option pre-installed.

System Requirements in Brother Printing Solution for Windows

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

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

Caution

The HL-820/1020 printer has been designed specifically for Windows 95/98, 3.1/3.11 and Windows NT 4.0. It cannot work in a DOS environment such as MS-DOS.

Features

This printer has the following features:

High Resolution and Fast Printing Speed

HL-820 :

True 600 dots per inch (dpi) with microfine toner and up to 8 pages per minute (ppm) printing speed (A4 or Letter paper).

HL-1020 :

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

HL-1040 :

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

HL-1050 :

True 600 dots per inch (dpi) and 1200 x 600 dpi for graphics with microfine toner and up to 10 pages per minute (ppm) printing speed (A4 or Letter paper).

Versatile Paper Handling

The printer 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.

❑ **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 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 choose various printer 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 Printer Setup Menu within the Windows Control Panel.

❑ **(For HL-1040/1050 Only)**

Remote Printer Console Program for DOS

The utility program, Remote Printer Console (RPC), is available on a floppy disk 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.

❑ **(For HL-1040/1050 Only)**

Popular Printer Emulation Support

These printers support the following popular printer emulation modes. The HL-1040 supports HP LaserJet IIP, Epson FX-850, and IBM Proprinter XL.

The HL-1050 supports HP LaserJet 6P/6L, 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 printer. The printer 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.

❑ **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 is recommended.

The printer status monitor program can show the current status of your printer. 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 printer is out of paper, the dialog box will display "Paper Empty" and instructions for the proper corrective action.

❑ **(For HL-1050 Only)**

USB Interface

The Universal Serial Bus Interface is an interface which allows the printer to connect to multiple peripheral devices.

❑ **(For HL-1050 Only)**

High Resolution Control & Advanced Photoscale Technology

High resolution control (HRC) technology provides clear and crisp printouts. Use this function to get smooth text print quality.

Advanced Photoscale Technology enables the printer to print graphics in 256 grayscales, producing nearly photographic quality. Use this function when you want to print photographic images.

❑ **(For HL-1040/1050 Only)**

Optional Apple Macintosh® Interface

An optional Apple Macintosh serial interface is available, which allows your printer to be connected to Apple Macintosh computers. With this option, you can use your printer with both an IBM PC, or compatible, and an Apple Macintosh at the same time. This optional interface board can be used as an RS-422A interface for Macintosh or an RS-232C serial interface for an IBM PC or compatible.

❑ **Enhanced Memory Management**

The printer provides its own data compression technology in the 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 larger fonts, with the printer'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 printer.

Sleep Mode (Power Save Mode)

When the printer is not used for a certain amount of time, sleep mode automatically reduces power consumption. The printer 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 printer.

Power Supply

Use the printer within the specified power range.

AC power: $\pm 10\%$ 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 printer 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 printer should be installed near a power outlet, which is easily accessible.

Use the printer 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 printer should be used in a well ventilation room.

Place the printer on a flat, horizontal surface.

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

Do not place the printer where the ventilation hole of the printer is blocked.

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

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

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

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

Do not place objects on top of the printer.

Do not place the printer near an air conditioner.

Keep the printer horizontal when carrying.

Do not cover the slots in the top cover.

CHAPTER 2 PAPER HANDLING

PAPER SPECIFICATIONS

The printer 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/m² (20 lb.)
30 sheets of 157 g/m² (42 lb.) A4/Letter paper

Legal paper: 100 sheets

Envelopes, Organizer: 10 sheets

Output Tray: Approx. 100 sheets of 75 g/m² (20 lb.) A4/Letter paper

	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

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 printer 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 printer.

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 printer drum unit.

You can use recycled paper in this printer.

Make sure to 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
- Using the printer 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 printer 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 printer.

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.

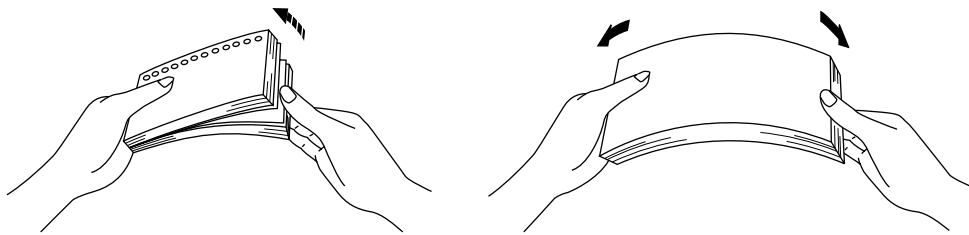


Fig. 2-1 Fan the Paper and Straighten the Paper

The printer 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

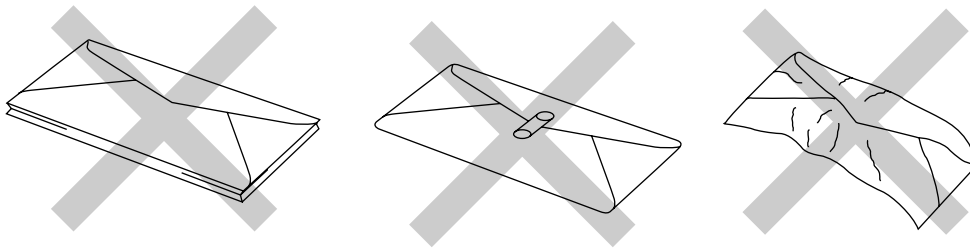
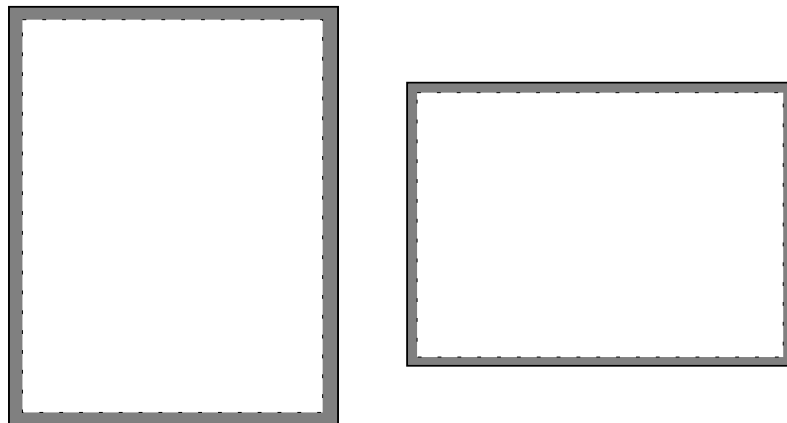


Fig. 2-2 Envelopes

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

MULTI-PURPOSE SHEET FEEDER

The printer 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 printer.

When the printer receives data, it begins the print process by loading paper from the multi-purpose sheet feeder. If the printer 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/m², 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.

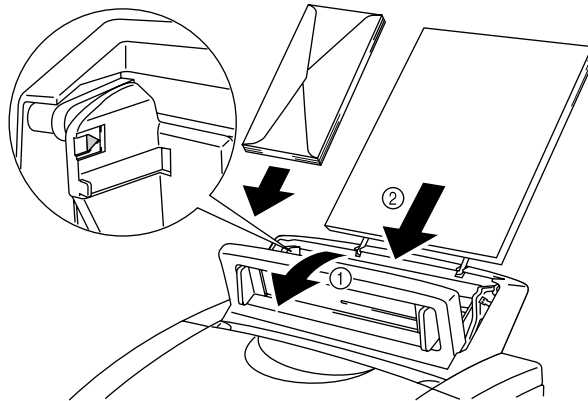


Fig. 2-4 Opening the Feeder and Loading Paper or Envelopes in the Feeder

🔧 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)

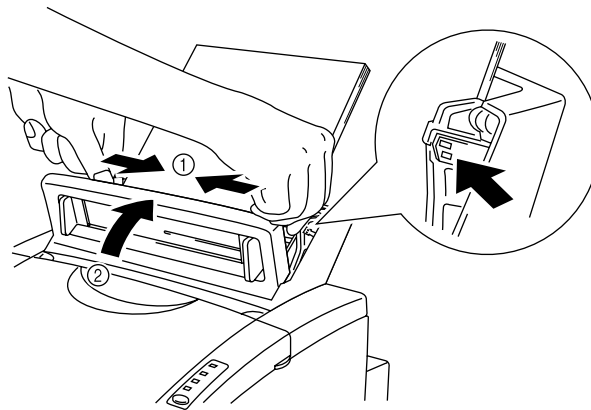


Fig. 2-5 Moving the Paper Guide and Closing the Feeder

✍ 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 printer, the **Alarm** and **Paper** lamps also blink. If the error is a paper jam, clear it referring to **"PAPER JAMS"** in Chapter 6.

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 printer 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.

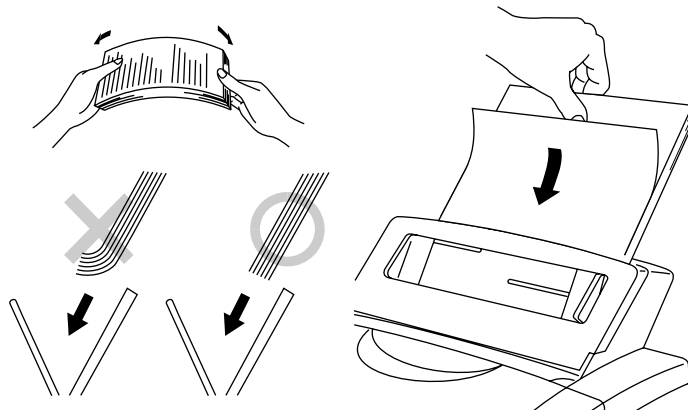


Fig. 2-6 Notes for Manual Duplexing

Note

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

MANUAL FEED SLOT

The multi-purpose sheet feeder also has a manual feed slot. You can manually load paper sheet by sheet from this slot. You do not need to remove paper from the multi-purpose sheet feeder when using the manual feed slot.

❑ **When you load one sheet of paper manually:**

You do not need to choose manual feed in the Setup dialog box of your printer driver. Holding the selected size of paper in the selected orientation (Portrait or Landscape), place the side of the paper you wish to print on face down into the manual feed slot. Align the paper at the center of the manual feed slot, and be sure to insert it all the way until the top edge of the paper (or envelope) strikes the bottom of the manual feed slot to avoid paper mis-feeding. (①) Move the paper guide of the manual feed slot to the paper width you are using. (②)

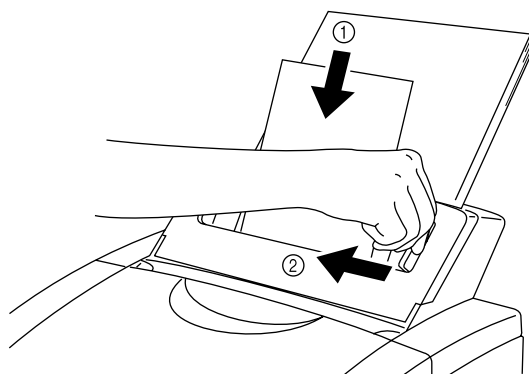


Fig. 2-7 Moving the Paper Guide

❑ **When you load more than one sheet of paper manually:**

Open the Setup dialog box of the supplied Windows printer driver and choose Manual Feed in the Paper Source section. Follow the above instructions to load the first page. The printer automatically starts printing. After the first page is printed, the dialog box appears and prompts you to load the next page. Load a sheet and choose **OK** to resume printing. Repeat these steps until you have finished printing all the pages.

! Caution

If bi-directional communication is not operational between the printer and the computer, such as when the printer is shared on a network, the dialog box will not appear to load the next page. Manual paper feeding is not recommended when your printer is attached to a network.

 **Note**

- Insert paper firmly into the manual feed slot.
- Be sure to load sheet by sheet when using the manual feed slot.

OUTPUT TRAY AND PAPER SUPPORT WIRE

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

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).

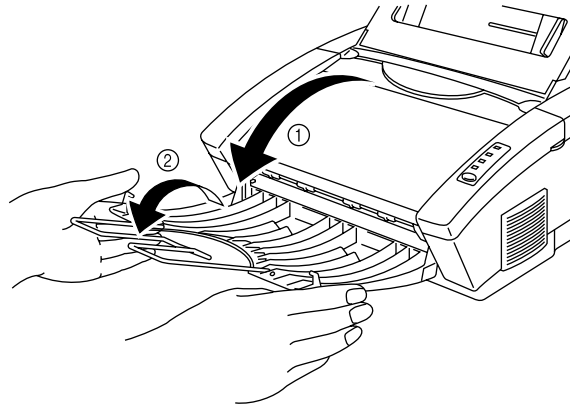


Fig. 2-8 Opening the Output Tray and Extending the Extension Support Wire

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 CONTROL PANEL

LAMPS AND SWITCH

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

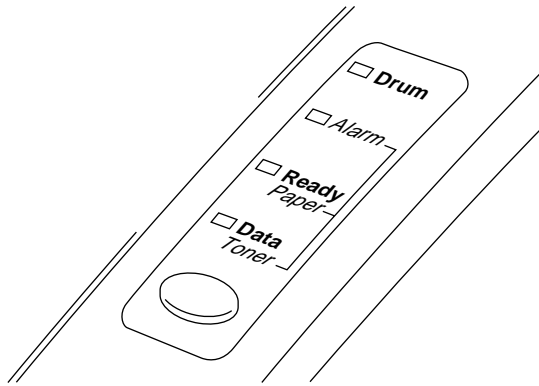


Fig. 3-1 Lamps and Switch on Control Panel

Note

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

Ready (Paper) Lamp

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

Lamp	Printer status
Off ○	The power switch is off or the printer is in sleep mode. If the printer is in sleep mode, it will wake up automatically when it receives data or you press the control panel switch.
Blinking ○↔●	The printer is warming up. (Blinking at 1 second intervals)
Blinking ○↔●	The printer is cooling down and stops printing until the printer's internal temperature lowers. (Blinking at 2 seconds intervals)
On ●	The printer 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 6.

Data (Toner) Lamp

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

Lamp	Printer status
Off ○	The printer has no print data.
Blinking ○↔●	The printer is receiving data from the computer or the printer is processing data in memory.
On ●	Print data remains in the printer 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 5 and [“Operator Calls”](#) in Chapter 6.

Drum Lamp

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

Lamp	Printer 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 5.

Alarm Lamp

The **Alarm** lamp blinks to indicate a printer error status such as “COVER OPEN” and “MEMORY FULL.” If any other error occurs, the printer 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 printer errors with the **Alarm** lamp. See [“ALARM INDICATIONS AT A GLANCE”](#) in Chapter 6 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 printer immediately stops printing and ejects the paper.

Wake-up

If the printer 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 printer prints any data remaining in the printer memory: this operation is called "Form Feed."

Error Recovery

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

Other Control Features

The printer has the following useful features:

Sleep Mode

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

Note

- When the printer goes into sleep mode, the fan will not stop until the printer engine has cooled down.
- Sleep mode allows the print engine to cool, so the temperature of your room and how long the printer 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 printer is warming up.
- You can change the time out for the sleep mode with the supplied printer driver (all models) or Remote Printer Console program (HL-1040/1050 only). Refer to the Help section in the printer driver or RPC program for more information about the sleep mode setting.

Test Print Mode

The printer 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 printer 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 mode varies depending upon the printer model as follows:

Lamp Lit	Choice	Function
Drum	Test sample page	The printer prints a test sample page. The printer returns to the ready status after printing.
Alarm	Print Config & Print Fonts I	The printer prints the current configuration of the printer and a list of the internal fonts. The printer returns to the ready status after printing. (HL-1040/1050 only)
Ready	Factory Reset	The printer is restored to the factory setting and permanent fonts and macros are cleared. The printer returns to the ready status after printing. (HL-1040/1050 only)
Data	Hex Dump Print	The printer 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 printer. (HL-1040/1050 only)

CHAPTER 4 OPTIONS

SERIAL INTERFACE BOARD RS-100M (For HL-1040/1050 Only)

To connect the printer to a DOS computer with a serial interface or to an Apple Macintosh computer, you need to install the optional serial interface board. When you have installed the serial interface board, you can share the printer between two computers (two IBM compatible PCs or one IBM compatible PC and one Apple Macintosh) using the parallel and serial interfaces at the same time. Automatic interface selection is a standard feature.

Note

- The serial interface board for this printer is optional, but in some countries the serial interface board may have been installed by either the factory or dealer.
- The serial interface for Apple Macintosh (RS-422A) will only print at 300 dpi.

The serial interface board is installed onto the main controller board inside the printer. For the details about installation, see the instruction guide which was provided with the serial interface board.

Selecting the RS-422A (Apple) or RS-232C (IBM) Serial Interface

Note

This section is only for printer models which have had the serial interface installed.

Caution

Be sure to select the serial interface type to match your computer as follows:

- For Apple Macintosh computers: you should not have to change any settings because the Apple (RS-422A) setting is factory selected (default).
- For IBM compatible PCs you should move the switch to the IBM (RS-232C) setting.
- If you are using an Apple Macintosh on the RS-422A port and an IBM compatible PC on the parallel port, it is not necessary to make any changes to the switch setting.

If necessary, select the interface type as follows:

1. Make sure that the printer is in the off-line state.
2. Select the RS-422A(Apple) or RS-232C(IBM) interface by changing the serial interface slide switch to the right for IBM(RS-232C) or to the left side for Apple(RS-422A).

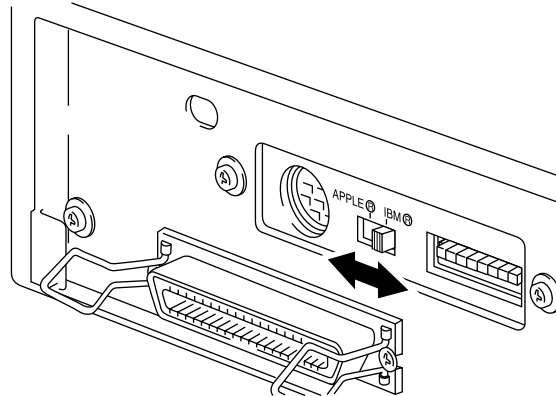


Fig. 4-1 Selecting the RS-422A (Apple) or RS-232C (IBM) Serial Interface

Setting the Serial Interface Parameters

Note

This section is only for printer models which have had the serial interface installed.

Caution

Be sure to set the parameters to match your computer as follows:

- Never change the RS-422A parameters for Apple Macintosh computers. Because the RS-422A parameters have been correctly set at the factory for Apple Macintosh computers, you do not need to change the settings. You may skip this section. If you change parameters for the RS-232C serial interface and you switch back to RS-422A for Apple Macintosh computers, be sure to restore the parameters to the factory settings.
- Set the RS-232C parameters to match your computer. You can set serial settings in several different places, within your DOS application, within the Windows Printer Icon (for Windows application software only), or within your AUTOEXEC.BAT file using MODE commands. For information on serial interface parameters, see the user's guide of your computer or software.

If necessary, set the serial interface parameters as follow:

1. Make sure that the printer is in the off-line state.
2. Set the serial interface parameters by moving up (on) or down (off) the selectors of the dual in-line package (DIP) switch.

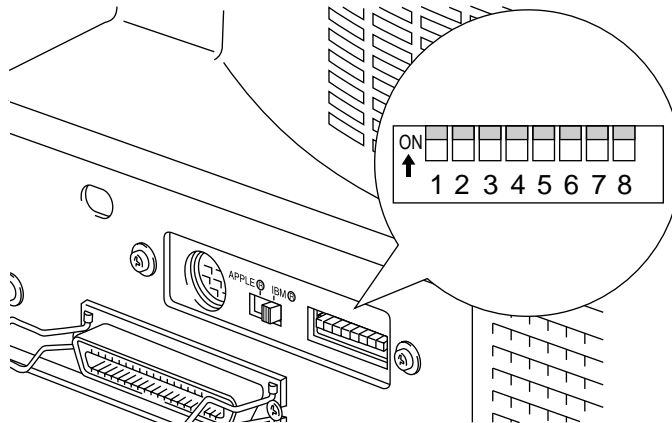


Fig. 4-2 Setting the Serial Interface Parameters

Table 1: Serial Interface Parameters Settings

Selector	Parameters	On (up)	Off (down)
1	Baud Rate	— See Table 2.	—
2	Baud Rate	— See Table 2.	—
3	Data Length	7 bits	8 bits
4	Stop Bit	2 bits	1 bit
5	Parity	— See Table 3.	—
6	Parity	— See Table 3.	—
7	Protocol	Xon/Xoff + DTR	DTR only
8	Robust Xon	On	Off

Table 2: Baud Rate Settings

Selector 1	Selector 2	For RS-422A	For RS-232C
Off	Off	57600	9600
On	Off	9600	4800
Off	On	1200	1200
On	On	19200	19200

Table 3: Parity Settings

Selector 5	Selector 6	Parity
On	On	Odd
On	Off	Even
Off	—	None

Note

- The factory settings are indicated in bold.
- If the robust Xon setting is turned on with selector 8, the printer sends Xon signals at one second intervals to the connected computer until it receives data. It is effective only if selector 7 is set to the On position for the Xon/Xoff plus DTR setting.

Connecting the Serial Interface Cable

Note

This section is only for printer models which have had the serial interface installed.

You need a serial interface cable with an 8-pin, DIN-type connector to connect your printer and computer.

Note

- Consult your dealer for a serial interface cable.
- If you are a Macintosh user, you can easily find the necessary cable at a local computer store. Look for Apple serial cables labeled as “Macintosh to ImageWriter II™” or “Macintosh to Personal LaserWriter™ 300” or the “Apple System Peripheral 8 Cable”. **Do not purchase a serial cable labeled as “Straight-through” or “LocalTalk.”**
- If you are a PC user, you need to purchase a special serial cable from your dealer. If you have a 9-pin connector on your computer, look for a cable labeled “IBM AT to ImageWriter II” cable. If you have a 25-pin connector, look for a cable labeled “DB25 to ImageWriter II.” These cables most likely would be found in the Apple Macintosh section at your computer dealer. For more information about the interface specification, consult your dealer.

You can connect a parallel and a serial interface cable at the same time. The auto interface selection function allows you to share the printer with two computers. To do this, connect the parallel interface cable and then connect the serial interface cable as follows:

1. Make sure that the **power** switch is turned off.

 **Caution**

Be sure to turn off the **power** switch before connecting or disconnecting the interface cables, or the printer may be damaged.

2. Insert and secure the parallel interface connector into the parallel interface port of your printer.
3. Insert and secure the serial interface connector into the serial interface port of your printer.
4. Turn on the **power** switch.

ADDITIONAL MEMORY (HL-1050 Only)

The HL-820/1020/1040 printers have 2 Mbyte of standard memory and additional memory cannot be fitted.

The HL-1050 printer has 4 Mbyte of standard memory and a slot for optional additional memory. The memory can be expanded up to 36 Mbytes total by installing a commercially available single in-line memory module (SIMM).

Note

The HL-820/1020/1040 machine memory cannot be expanded.

Additional memory is useful and may be necessary if you are using the Page Protection function.

Minimum Memory Recommendation (including resident memory)

Page Protect = AUTO or Off

	300 dpi	600 dpi
Letter/A4	2 MB	2 MB
Legal	2 MB	2 MB

Page Protect = Letter, A4, or Legal

	300 dpi	600 dpi
Letter/A4	2 MB	6 MB
Legal	3 MB	6 MB

The following types of SIMM are recommended and can be installed:

- 1 Mbyte HITACHI HB56D25632B-6A, -7A
- 2 Mbytes HITACHI HB56D51232B-6A, -7A
- 4 Mbytes HITACHI HB56A132BV-7A, -7AL, -7B, -7BL
- 8 Mbytes HITACHI HB56A232BT-7A, -7AL, -7B, -7BL
- 16 Mbytes HITACHI HB56A432BR-6A, -7A
- 32 Mbytes HITACHI HB56A832BS-6A, -7A

This printer can accept memory SIMMS with the following specifications:

Speed	60 nsec - 80 nsec
Pin Type	72 pin
Height	35.00 mm (1.38") or less
Output	32 bit or 36 bit

Note

The HL-1050 can also support DIB graphics with a resolution of 1200 x 600 dpi under Windows 95/98/3.1 with the supplied printer driver. We recommend to expand the printer memory to avoid any memory full error.

Note

The printer has only one slot for a SIMM upgrade. If you want to increase your printer memory again after you have already installed a SIMM module into the slot, you will need to remove the previously installed SIMM first. For example if you had previously increased the printer memory from the standard 4MB to 12MB by adding an 8MB SIMM and you wish to increase your total memory to 36 MB, you need to remove the installed 8MB SIMM and install a new 32MB SIMM into the printer.

Installing the SIMM

To install the SIMM, follow these steps:

1. Turn off the **power** switch and unplug the AC cord from the AC outlet. Disconnect the interface cable (printer cable) from the printer.

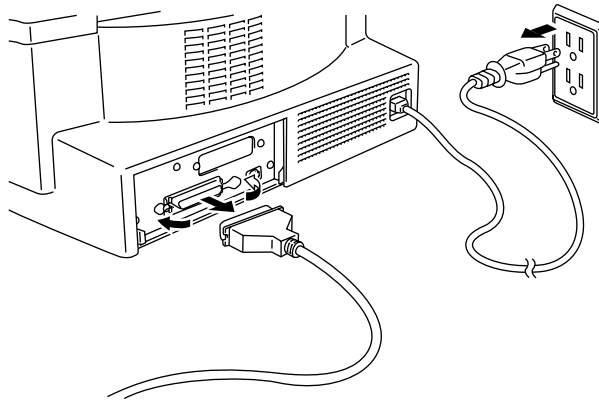


Fig. 4-3 Unplug the AC Cord and Disconnect the Interface Cable

Caution

Be sure to turn off the **power** switch and unplug the AC cord to the printer before installing or removing the SIMM to/from the main controller board.

2. Unscrew the screws securing the rear plate of the main controller board to the printer and pull out the main controller board.

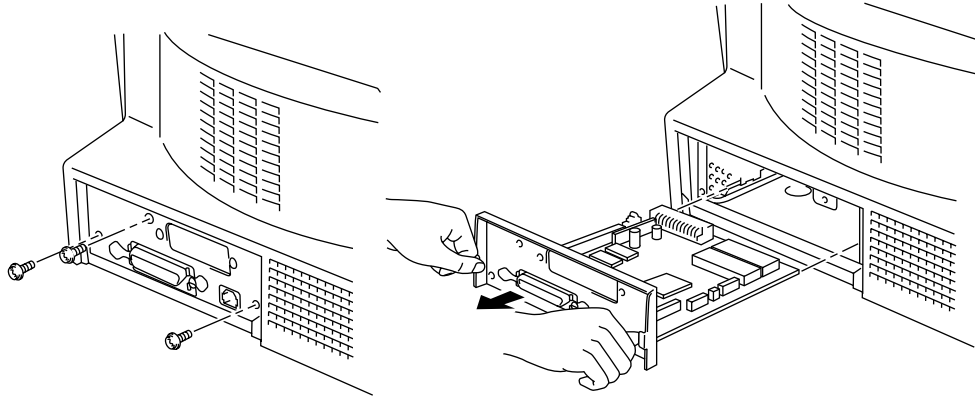


Fig. 4-4 Removing the Main Controller Board

3. Unpack the SIMM and hold it by its edge.

! Caution

SIMM boards may be damaged by even a small amount of static electricity. Do not touch the memory chips or the board surface. When handling the board and before installing or removing it, wear an antistatic wrist strap, or frequently touch the surface of the antistatic package or bare metal on the printer.

4. Install the SIMM into the slot and push it gently towards the vertical until it clicks into place.

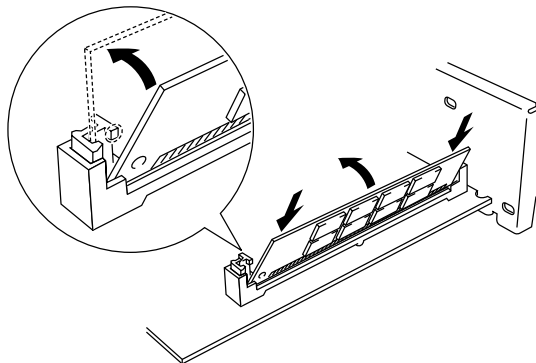


Fig. 4-5 Install the SIMM

5. Install the main controller board into the printer by sliding it into the guide rails.
6. Secure the main controller board with the four screws.
7. Reconnect the interface cable (printer cable) from your computer. Plug the power cord into the AC outlet and turn on the power switch.
8. To check that the SIMM is installed correctly, you may perform a Test Print "Print Configuration" which will print the current total memory size.

CHAPTER 5 MAINTENANCE

REPLACING THE TONER CARTRIDGE

The printer 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 printer when you replace the toner cartridge. See [“CLEANING THE PRINTER”](#) in this chapter.

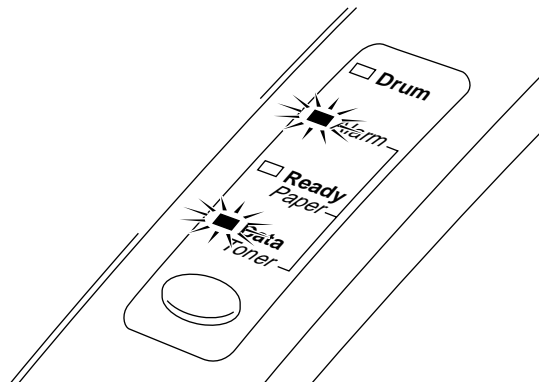


Fig. 5-1 Toner Low and Empty Indication

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 printer 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.

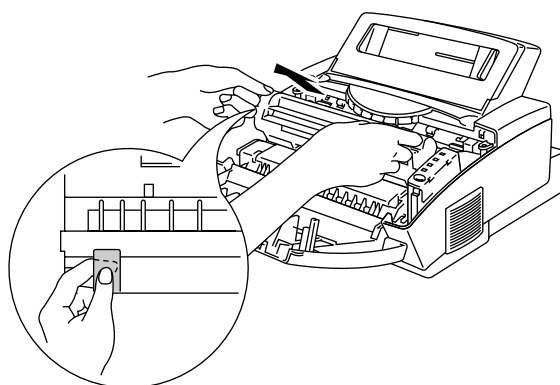


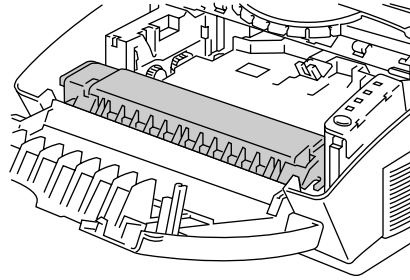
Fig. 5-2 Removing the Drum Unit

✍ 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 printer, some internal parts of the printer are extremely hot. When you open the top cover of the printer, never touch the shaded parts shown in the following illustration.



⚠ High Temperature

Fig. 5-3 Inside the Printer

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.

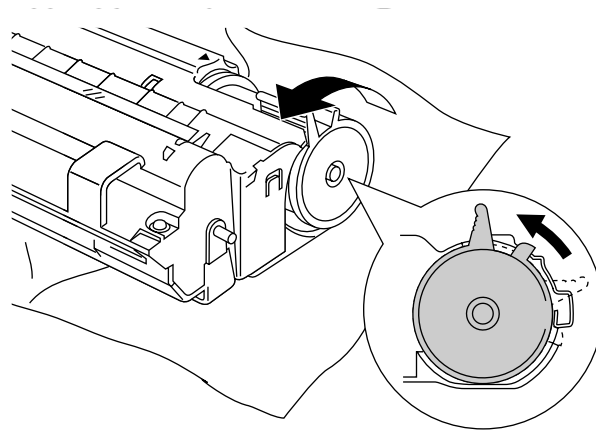


Fig. 5-4 Turning the Lever to Close the Shutter

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

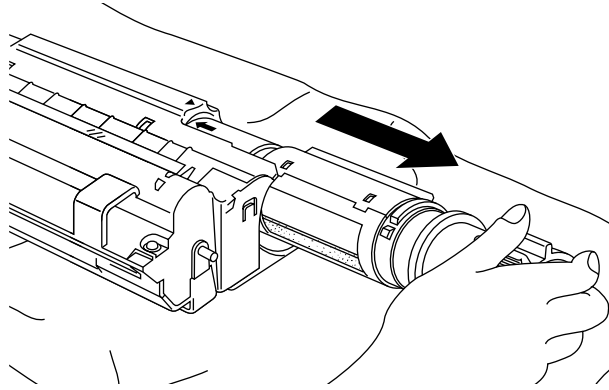


Fig. 5-5 Removing the Old Toner Cartridge

! 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 printer. 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. Using another brand of toner cartridge could void your printer's warranty.**

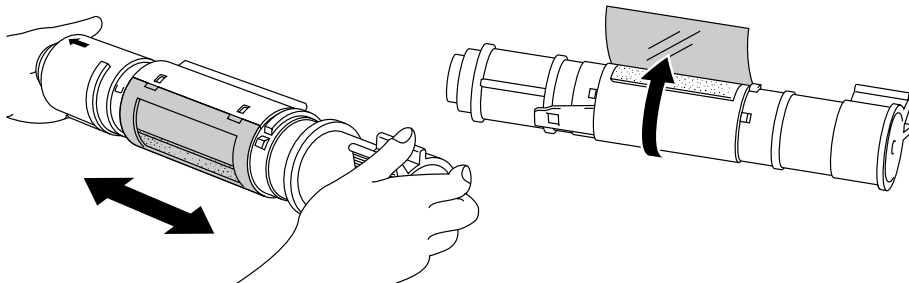


Fig. 5-6 Shaking the Toner Cartridge and Remove the Protective Part

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.

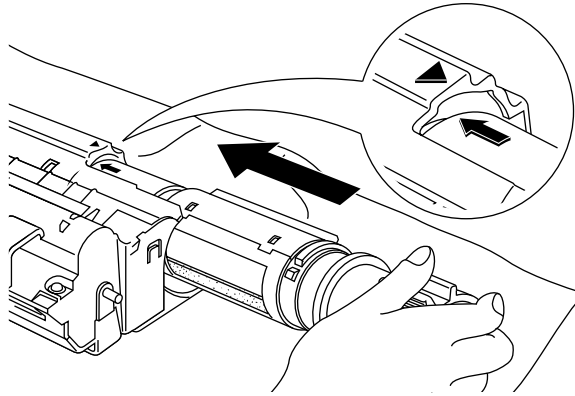


Fig. 5-7 Installing the Toner Cartridge into the Drum Unit

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

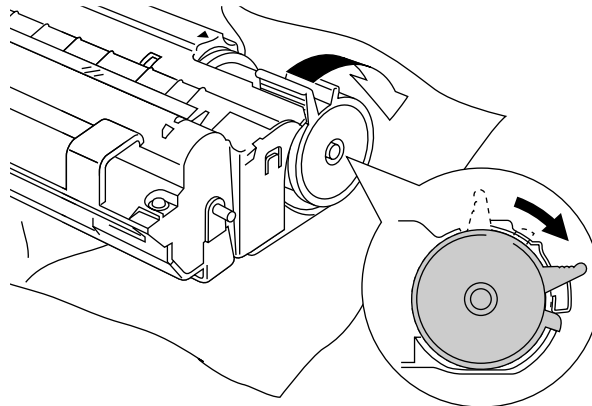


Fig. 5-8 Turning the Lever to Open the Shutter

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.

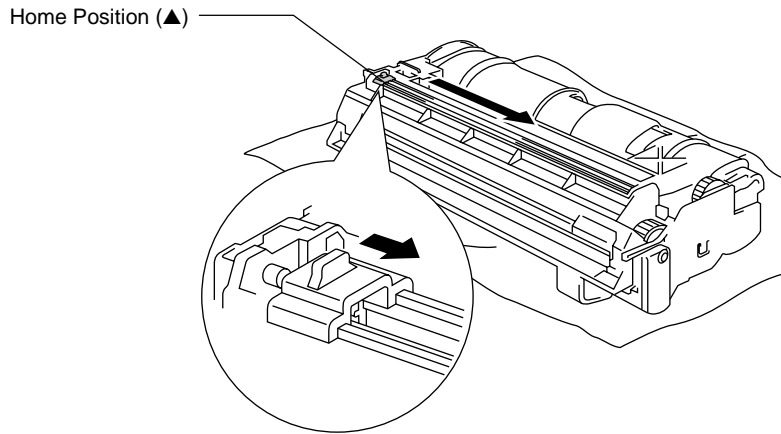


Fig. 5-9 Cleaning the Primary Corona Wire

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

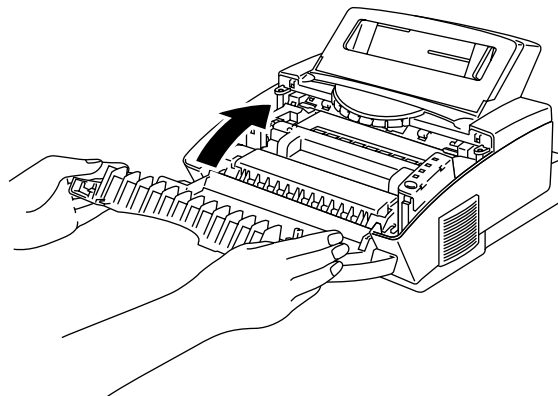


Fig. 5-10 Close the top cover

REPLACING THE DRUM UNIT

The printer 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.

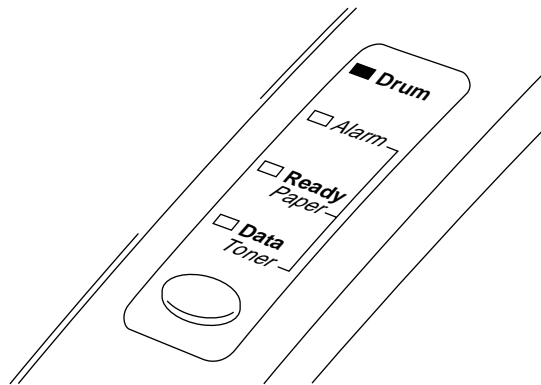


Fig. 5-11 Drum Unit Nearly at the End of its Life

⚠ Caution

- When removing the drum unit, handle it carefully as it may contain toner.
- You should clean the printer when you replace the drum unit. See [“CLEANING THE PRINTER” 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 the product 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 old drum unit.

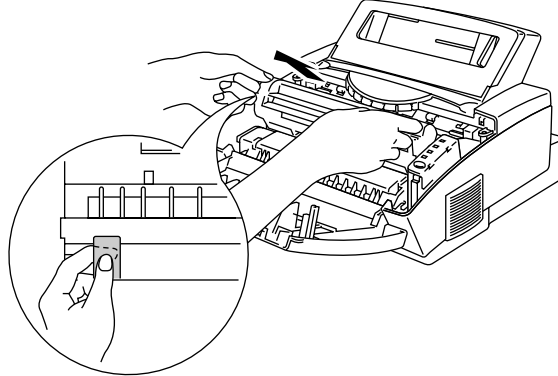
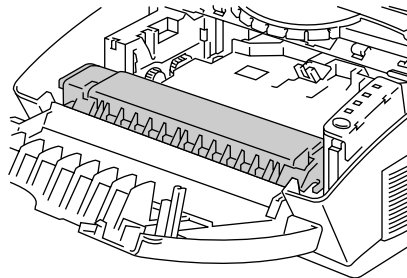


Fig. 5-12 Removing the Drum Unit

⚠ Warning

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



⚠ High Temperature

Fig. 5-13 Inside the Printer

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.

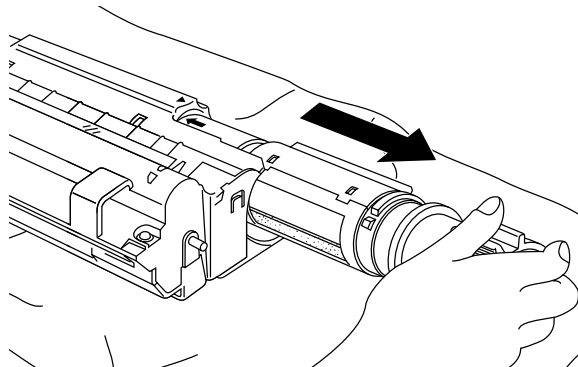


Fig. 5-14 Removing the Toner Cartridge

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

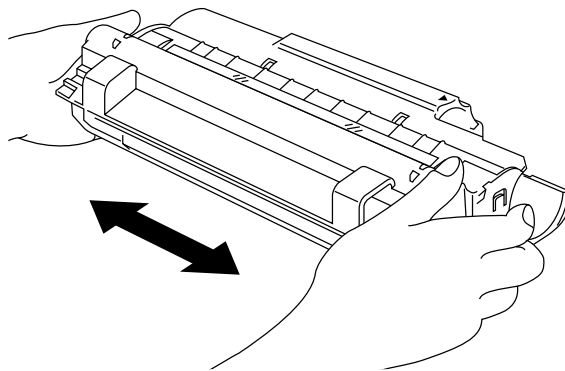


Fig. 5-15 Shaking the Drum Unit

⚠ Caution

- Do not remove the starter sheet.

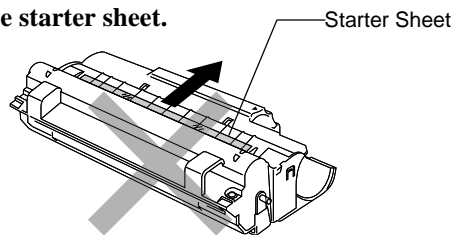


Fig. 5-16 Do Not Remove the Starter Sheet

- Only unpack a drum unit immediately before installing it into the printer. 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 printer.

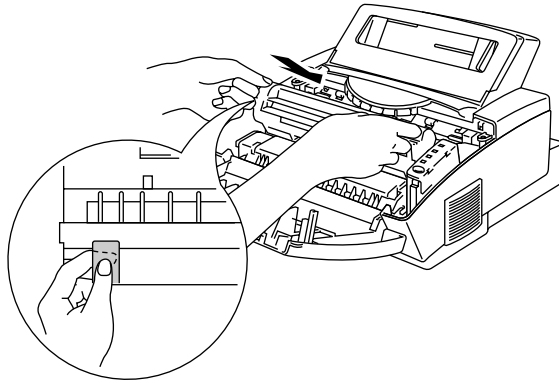


Fig. 5-17 Installing the Drum Unit

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

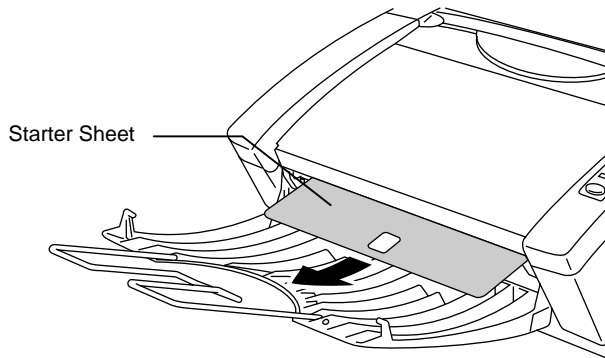


Fig. 5-18 Ejecting the Starter Sheet

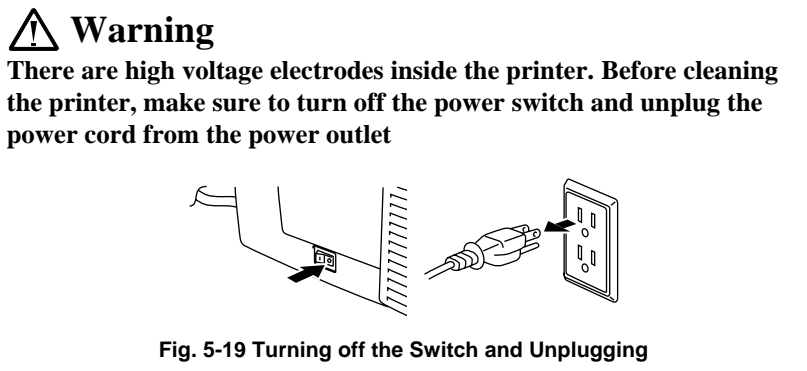
CLEANING THE PRINTER

Clean the printer exterior and interior periodically. If printed pages get stained with toner, clean the printer interior and drum unit.

Cleaning the Printer Exterior

Clean the printer exterior as follows:

1. Turn off the **power** switch and unplug the power cord.



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 printer.

4. Wipe dirt and dust away from the printer exterior and feeder with a cloth.
5. Load paper into the multi-purpose sheet feeder, and plug in the power cord.

Cleaning the Printer Interior and Drum Unit

Clean the printer 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 printer. Before cleaning the printer, make sure to turn off the power switch and unplug the power cord from the outlet.

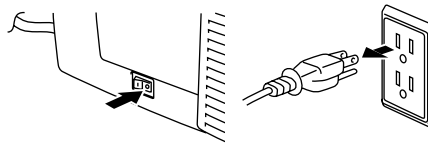
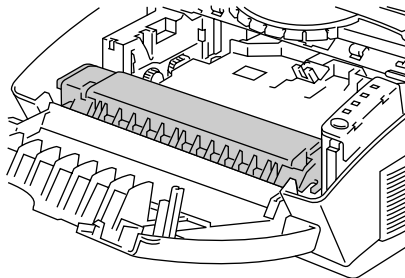


Fig. 5-20 Turning off the Switch and Unplugging

2. Open the top cover of the printer.
3. Take the drum unit out of the printer and put it aside.

Warning

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



High Temperature

Fig. 5-21 Inside the Printer

4. Gently wipe the scanner window with a soft dry cloth.

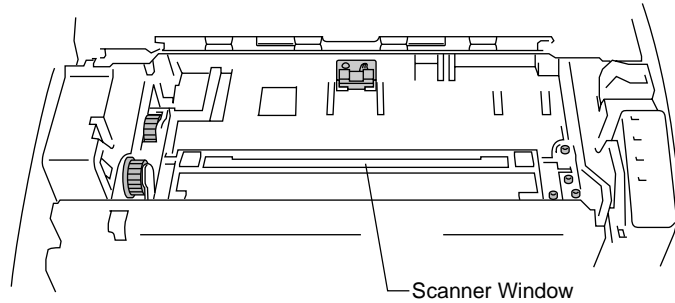


Fig. 5-22 Cleaning the Scanner Window

⚠ Caution

- Do not touch the scanner window with your fingers.
- Do not wipe the scanner window with cleaning alcohol (isopropyl).

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.

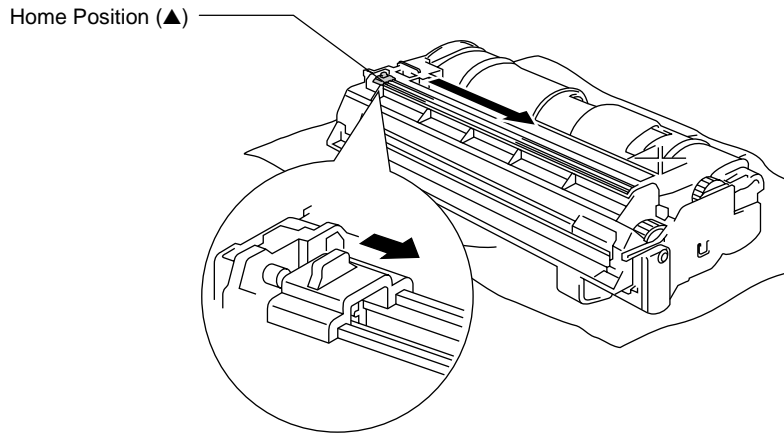


Fig. 5-23 Cleaning the Primary Corona Wire

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 printer.
See the section "REPLACING THE DRUM UNIT" in Chapter 5.
9. Close the top cover.
10. Plug in the power cord and turn on the **power** switch.

RE-PACKING THE PRINTER

⚠ Caution

Whenever you transport the printer, use the packing materials which are provided with your printer. Also, follow the steps below to re-pack the printer, or the printer may be damaged which will void the printer's warranty.

1. Turn off the **power** switch and unplug the printer from the AC outlet. Remove the AC cord and the extension wire of the paper tray from the printer.
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.

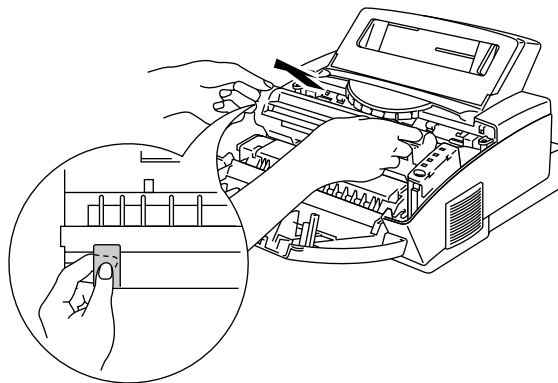


Fig. 5-24 Removing the Drum Unit Assembly

4. Place the drum unit assembly in the plastic bag and seal the bag completely.

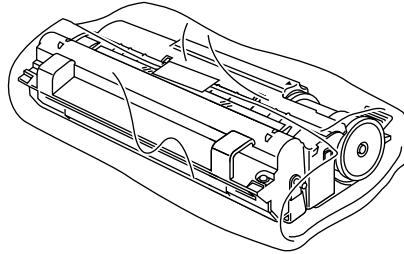


Fig. 5-25 Placing the Drum Unit in the Plastic Bag

5. Close the top cover, the extension wire, and the output tray.
6. Wrap the printer in the plastic bag and place it in the original carton box with the original Styrofoam packing material.
7. Place any documents (manual and any documentation describing the reason for repacking the printer) and the drum unit assembly in the carton box as shown below.
8. Close the carton box and tape it.

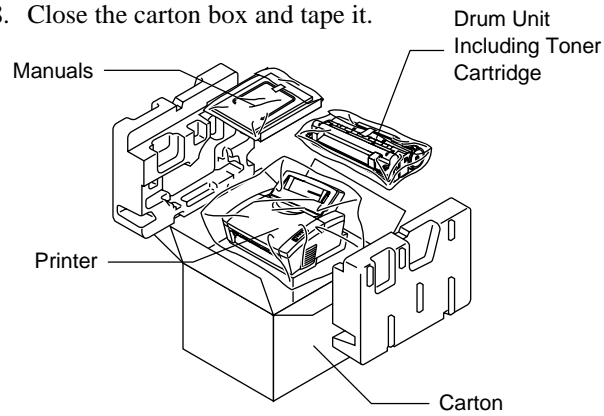


Fig. 5-26 Repacking the Printer

CHAPTER 6 TROUBLESHOOTING

ALARM INDICATIONS AT A GLANCE

Operator Calls

If a recoverable error occurs, the printer 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 printer automatically recovers from most errors, but you may need to reset the printer 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 printer does not automatically resume printing.
	Paper empty	Load paper in the printer 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 printer 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 5 .

For errors shown below, the printer indicates an operator call by blinking the **Alarm** lamp. If you use the printer with the supplied Windows driver, the status monitor will appear to indicate the error on your computer screen. The HL-1040/1050 printer also prints some error messages on paper.

Error	Action
COVER OPEN	Close the top cover of the printer.
PRINT OVERRUN	<ul style="list-style-type: none"> • Press the panel switch to print the data remaining in the printer. • 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 Windows printer driver for the details.) • For HL-1050 only Expand the printer memory with an optional memory board and set page protection to ON by using the supplied Windows driver or RPC program. • For HL-1050 only Change the following settings in the supplied Windows driver and try again. The best combination of the settings below will vary depending on your document. Graphics Mode TrueType™ mode Use Printer TrueType™ Fonts • If this does not clear the error, reduce the complexity of your document or reduce the print resolution.
MEMORY FULL (For HL-1040/1050 Only) This error can occur only when using DOS or Macintosh.	<ul style="list-style-type: none"> • Press the panel switch to print the data remaining in the printer. • Reduce the print resolution or reduce the complexity of your document. • For HL-1050 only Expand the printer memory by adding a commercially available SIMM.
Parallel Interface Line Error	<ul style="list-style-type: none"> • Press the panel switch to resume printing. • Check that the connection between your computer and printer is secure and correct, and check the interface cable.
Serial Interface Framing Error (For HL-1040/1050 Only)	<ul style="list-style-type: none"> • Press the panel switch to resume printing. • Check the communication parameters such as baud rate and stop bit settings on both your computer and printer.
Serial Interface Parity Error (For HL-1040/1050 Only)	<ul style="list-style-type: none"> • Press the panel switch to resume printing. • Check the communication parameters such as bit length and parity settings on both your computer and printer.

Error	Action
Serial Interface Overrun Error (For HL-1040/1050 Only)	<ul style="list-style-type: none"> • Press the panel switch to resume printing. • The interface hardware may be damaged. Consult your dealer.
Serial Interface Input Buffer Overflow (For HL-1040/1050 Only)	<ul style="list-style-type: none"> • Press the panel switch to resume printing. • Check the communication parameters such as the handshake protocols on both your computer and printer. • If the error occurs again, the interface hardware may be damaged. Consult your dealer.

 **Note**

If the printer 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.

Service Calls

If an unrecoverable error occurs, the printer 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 printer, 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.

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.

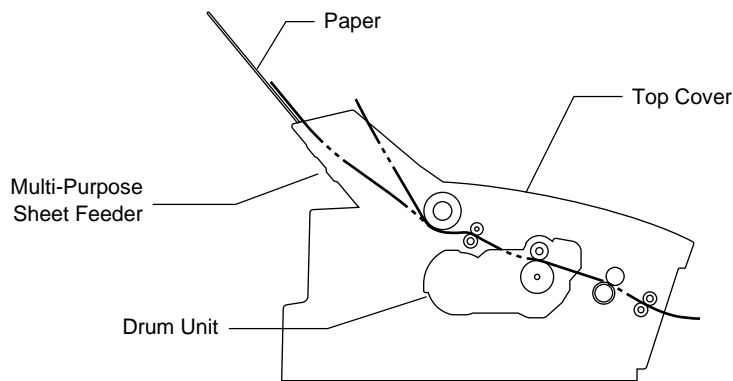
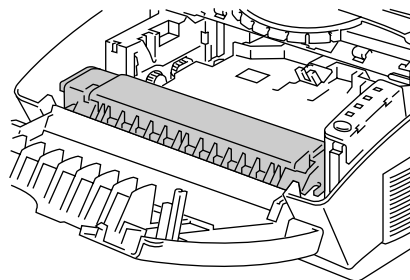


Fig. 6-1 Locating Paper Jam Position

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 printer may resume printing automatically. If the printer does not resume printing, press the control panel **switch**.

Warning

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



High Temperature

Fig. 6-2 Inside the Printer

⚠ 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.

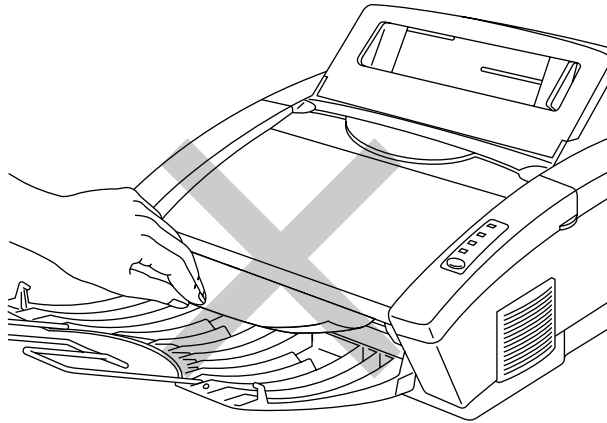


Fig. 6-3 Do Not Pull the Jammed Paper from the Output Tray

❑ 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 printer referring to the next section.

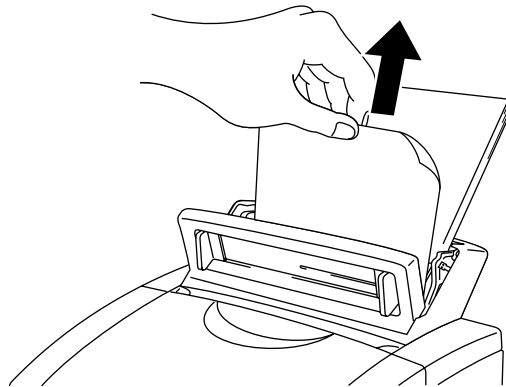


Fig. 6-4 Paper Jam in the Feeder

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 printer. Install the drum unit and close the top cover.

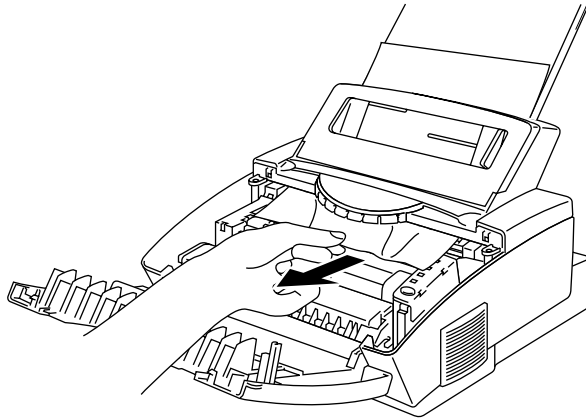


Fig. 6-5 Paper Jam near the Drum Unit

❑ **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.

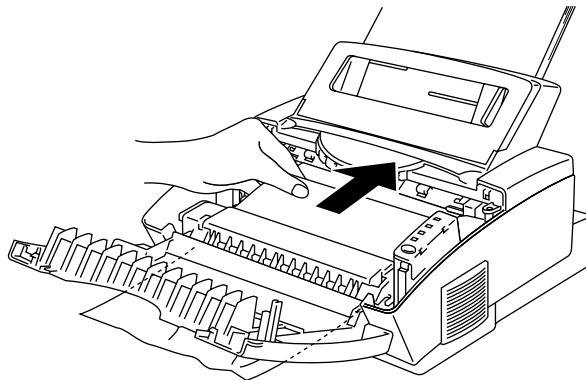


Fig. 6-6 Paper Jam Inside the Printer

Q & A

This section contains questions and answers for using your printer. 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 Printer Hardware

Question	Recommendation
The printer does not work. All lamps are off.	The printer may be in sleep mode. Press the panel switch to wake up the printer. Check to see if the printer is plugged into a live power source and the power switch is on.
The printer does not print.	Check the following: <ul style="list-style-type: none"> • The printer 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 printer 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 printer might be cooling down to lower the printers internal temperature. Open the top cover of the printer to lower the temperature.

Setting Up the Printer for Windows

Question	Recommendation
I cannot print from my application software.	<ul style="list-style-type: none"> • Make sure the supplied Windows printer driver is installed and selected with your application software. • (For HL-1040/1050) If you use the serial interface, make sure that the serial slide switch of the serial interface is in the correct position and the interface settings are correctly set up with the DIP switches.

Question	Recommendation
<p>Sometimes I get the memory Full message. How can I correct this?</p>	<ul style="list-style-type: none"> • Reduce the print resolution or reduce the complexity of your document and try again. • (For HL-1050) Expand the printer memory by adding a commercially available SIMM. • (For HL-1050) Change the following settings in the supplied Windows driver and try again. The best combination of the following settings may vary depending on your document. Graphics Mode TrueType Mode Use Printer TrueType Fonts
<p>Sometimes I get a Print Overrun error when printing certain documents from Windows.</p>	<ul style="list-style-type: none"> • 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. • (For HL-1050) Expand the printer memory by installing a commercially available SIMM and set the Page Protection ON in the supplied Windows driver. • (For HL-1050) Change the following settings in the supplied Windows driver and try again. The best combination of the following settings may vary depending on your document. Graphics Mode TrueType Mode Use Printer TrueType Fonts

Setting Up the Printer for DOS (For HL-1040/1050 Only)

Question	Recommendation
<p>I cannot print from my application software.</p>	<ul style="list-style-type: none"> • Check if the DOS application software interface settings match that of your printer: 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 printer has any printer alarms active. • Check if the appropriate printer is selected in your application software. • The HL-820/1020 cannot print from DOS applications. • If the serial interface is used, make sure that the RS-232C serial interface is selected with the slide switch. Make sure that the interface settings are correctly set up with the proper DIP switches. Make sure the serial parameters of baud rates, parity and stop bits match between your application software and the printer.
<p>The printer prints, but it prints incorrect information. Sometimes it prints a couple of characters and then ejects the page, etc.</p>	<p>This is an indication that your application printer emulation setting and the printer's emulation do not match. Check in your application software which printer you have selected to make sure the printer is set up correctly. Remember the printer emulates three widely used printer selections: HL-1040 (HP LaserJet IIP, Epson FX-850, and IBM Proprinter XL) / HL-1050 (HP LaserJet 6L/6P, Epson FX-850 and IBM Proprinter XL). Try setting the printer into HP emulation and then select the HP LaserJet IIP (for HL-1040) or HP LaserJet 6P/6L (for HL-1050) printer in your application software.</p>
<p>The printer does not print when I press the Print Screen Key. (Data lamp On)</p>	<p>Press the panel switch. The data has been sent to the printer but the printer did not receive the Page Eject command: print screens do not send this command.</p>
<p>The printer prints the first part of my document but does not print the last page. (Data lamp On)</p>	<p>This was a common problem with database software and spreadsheet software when not correctly set up. The data has been sent to the printer but the printer 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.</p>
<p>How can I change the User settings or default settings of the printer?</p>	<p>Use the remote printer console (RPC) program.</p>

Setting Up the Printer for Apple Macintosh Computers When the Optional RS-100M Serial Interface Is Installed into Your Printer (For HL-1040/1050 Only)

Question	Recommendation
I cannot print from my application software.	<ul style="list-style-type: none"> • Make sure that the supplied Macintosh printer driver is installed in the System Folder and it is selected with Chooser. • Check the PORT selection within the Chooser: it should match the port to which you physically attached the printer cable. • The serial slide switch of the optional interface board should be in the Apple (RS-422A) position. • Check the printer cable type: you cannot use a LocalTalk or straight-through cable. Refer to Chapter 4 for details on printer cable type.

Paper Handling

Question	Recommendation
The printer does not load paper.	<ul style="list-style-type: none"> • Check to see if the “PAPER EMPTY” message appears on your computer screen or the Alarm and Paper lamps are blinking on the printer 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.
The printer does not load paper from the manual feed slot.	Re-insert the paper firmly, one sheet at a time.
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


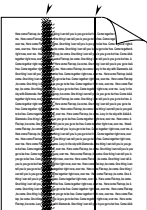

Question	Recommendation
<p>The printer prints unexpectedly or it prints garbage.</p>	<ul style="list-style-type: none"> • Turn the printer off and on again to reset the printer. • Make sure your application software is correctly set up to use this printer by checking the printer settings in your application software. • (For HL-1040/1050) Check the printer 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 Printer Control Panel. • (For HL-1040/1050) Make sure that the correct interface type and settings are made to match your computer. Be sure to use the RS-422A serial interface for Macintosh computers and the RS-232C serial interface for PCs. Refer to “SERIAL INTERFACE BOARD RS100M” in Chapter 4.
<p>The printer cannot print full pages of a document. An error message “PRINT OVERRUN” occurs.</p>	<p>The printer received a very complex print job and could not process part of the page. This may be solved by the following ways.</p> <ul style="list-style-type: none"> • If you are using Windows 95/98 or Windows 3.1 with the supplied printer driver, see the “Setting up the Printer for Windows” section. • Try to reduce the complexity of your document or reduce the print resolution.
<p>The printer prints the first couple of pages correctly, then some pages have text missing. (For HL-1040/1050 Only)</p>	<p>This is a problem usually relating to serial interface settings. Your computer is not recognizing the printer’s input buffer full signal. Causes could be incorrect serial cable (incorrectly wired or too long) or incorrect setting of your computer serial interface.</p>

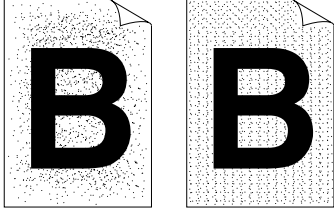

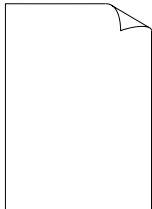
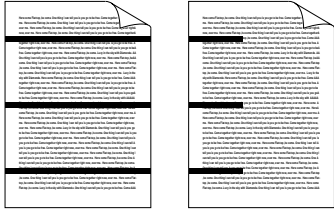
Question	Recommendation
<p>The printer cannot print full pages of a document. A "MEMORY FULL" error message occurs. (For HL-1040/1050 Only)</p>	<ul style="list-style-type: none"> • (For HL-1050) Change the following settings in the supplied Windows driver and try again. The best combination of the following settings may vary depending on your document. <ul style="list-style-type: none"> Graphics Mode TrueType Mode Use Printer TrueType Fonts • Reduce the graphic quality or the number of font sizes within your application software. • Reduce the printer resolution. • Reduce the complexity of your document and try again. • (For HL-1050) Expand the printer memory by adding a commercially available SIMM and set the Page Protection to ON by using the supplied Windows driver.
<p>The printer cannot print full pages of a document. A "MEMORY FULL" error message occurs. (For HL-10-40/1050 Only)</p>	<ul style="list-style-type: none"> • (For HL-1050) Expand the printer memory by installing a commercially available memorySIMM. • Reduce the printer resolution. • Reduce the complexity of your document and try again. • Reduce the graphic quality or the number of font sizes within your application software.
<p>My headers or footers appear when I view my document on screen but do not show up when I print them.</p>	<p>Most laser printers 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.</p>

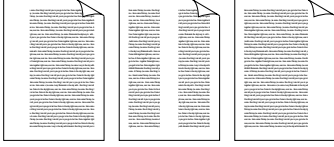
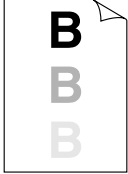
Print Quality

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
<p>Printed pages contain white stripes.</p>  <p>Fig. 6-7 White Stripes or Faint Images</p>	<p>You may clear the problem by wiping the scanner windows with a soft cloth. (See “Cleaning the printer interior and Drum unit.” in Chapter 5.)</p> <p>If the same problem occurs and the Drum lamp is still on after cleaning, replace the drum unit with a new one.</p>
<p>Printed pages are stained with toner or have vertical stripes.</p>  <p>Fig. 6-8 Dark Stripes or Toner Stains</p>	<ul style="list-style-type: none"> • Clean the printer interior and the primary corona wire of the toner cartridge. See “Cleaning the Printer Interior and Drum Unit” in Chapter 5. • Make sure that the tab of the corona wire is at the home position. <p>If the same print problem occurs and the Drum lamp is still on after cleaning, replace the drum unit with a new one.</p>
<p>Printed pages have white spots in black text and graphics area.</p>  <p>Fig. 6-9 White Spots</p>	<p>Make sure that you use paper that meets the specifications. Rough surface or thick media can cause the problem.</p> <p>If you still have the same problem and the Drum lamp is on, replace the drum unit with a new one.</p>

Question	Recommendation
<p>Toner scatters and stains the printed page.</p>  <p>Fig. 6-10 Scattering Toner</p>	<p>Clean the printer interior. See “Cleaning the Printer Interior and Drum Unit” in Chapter 5.</p> <p>Make sure that you use paper that meets specifications.</p> <p>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.</p> <p>If you still have the same problem and the Drum lamp is on, replace the drum unit with a new one.</p>
<p>The whole page is printed in black.</p>  <p>Fig. 6-11 Black Page</p>	<p>Wipe the electric terminals referring to “Cleaning the Printer Interior and Drum Unit” in Chapter 5. Never use heat-sensitive paper as it will cause this problem.</p> <p>If the same problem occurs and the Drum lamp is still on after cleaning, replace the drum unit with a new one.</p>
<p>Nothing is printed on the page.</p>  <p>Fig. 6-12 White Page</p>	<ul style="list-style-type: none"> • Make sure that the toner cartridge is not empty. • Wipe the electric terminals referring to “Cleaning the Printer Interior and Drum Unit” in Chapter 5. • Make sure that a torn piece of paper does not remain on the scanner window.
<p>Printed pages are marked at regular intervals.</p>  <p>Fig. 6-13 Example of Regular Marking</p>	<p>The problem may disappear by itself. Try printing multiple pages to clear this problem especially if the printer has not been used for a long time.</p> <p>If the surface of the drum has been scratched, replace the drum unit with a new one.</p> <p>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.</p>

Question	Recommendation
<p>Printed pages are blurred at the center or either edge.</p>  <p>Fig. 6-14 Blurred Page</p>	<p>Certain environmental conditions such as humidity, high temperatures, etc. may cause this situation to occur.</p> <ul style="list-style-type: none"> • Make sure that the printer 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 windows with a soft cloth. (See “Cleaning the Printer Interior and Drum Unit.”) <p>If the same problem occurs after cleaning and Drum lamp is still on, replace the drum unit with a new one.</p>
<p>Ghost images show up on printed pages.</p>  <p>Fig. 6-15 Ghost Images</p>	<ul style="list-style-type: none"> • 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.

Note

The drum unit is a consumable, and it is necessary to replace it periodically.

CHAPTER 7 APPENDIX

PRINTER SPECIFICATIONS

Printing

Print Method	Electrophotography by semiconductor laser beam scanning
Laser	Wavelength: 780 nm Output: 5 mW max
Resolution	HL-820/1020: 600 dots/inch (under Brother Printing Solution for Windows) HL-1040: 600 dots/inch (under Brother Printing Solution for Windows / under Brother Software PCL5e for DOS box in Windows) 300 dots/inch (under DOS, Apple Macintosh and other operating system) HL-1050: 1200 (H) x 600 (V) dots/inch (for Windows DIB graphics) 600 x 600 dots/inch (for Windows and DOS) 300 x 300 dots/inch (using Apple Macintosh with the optional RS-100M)
Print Quality	Normal printing mode Economy printing mode (up to 25% and 50% toner saving)
Print Speed	HL-820 : Up to 8 pages/minutes HL-1020/1040/1050: 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.)

USER'S GUIDE

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..

Functions

TrueType Fonts on disks	TrueType-compatible soft-fonts for Windows on the supplied disk
Emulation	HL-820/1020: Brother Printing Solution for Windows HL-1040: Brother Printing Solution for Windows Automatic emulation selection among HP LaserJet IIP (PCL level 4), EPSON FX-850, or IBM Proprinter XL HL-1050: Brother Printing Solution for Windows Automatic emulation selection among HP LaserJet 6P (PCL level 6), 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 Optional Macintosh driver available for System 6.0.7 or higher (For HL-1040/1050 Only)
Interface	Bi-directional parallel USB interface (HL-1050 only) RS-422A/RS-232C serial interface (RS-100M) is optionally available. (For HL-1040/1050 only)

Memory	HL-820/1020/1040 :	2 MB
	HL-1050:	4 MB Expandable up to 36 MB by installing an industry standard SIMM
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
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 245 x 365 mm (14.4 x 9.8 x 13.9 inches) (when the output tray is closed.)	
Weight	Approx. 7.2 kg (14.3 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	<u>DATA STROBE</u>	Input	19	0V (S.G.)	–
2	DATA 1	Input	20	0V (S.G.)	–
3	DATA 2	Input	21	0V (S.G.)	–
4	DATA 3	Input	22	0V (S.G.)	–
5	DATA 4	Input	23	0V (S.G.)	–
6	DATA 5	Input	24	0V (S.G.)	–
7	DATA 6	Input	25	0V (S.G.)	–
8	DATA 7	Input	26	0V (S.G.)	–
9	DATA 8	Input	27	0V (S.G.)	–
10	<u>ACKNLG</u>	Output	28	0V (S.G.)	–
11	BUSY	Output	29	0V (S.G.)	–
12	PE	Output	30	0V (S.G.)	–
13	SLCT	Output	31	<u>INPUT PRIME</u>	Input
14	<u>AUTO FEED</u>	Input	32	<u>FAULT</u>	Output
15	N.C.	–	33	N.C.	–
16	0V (S.G.)	–	34	N.C.	–
17	0V (S.G.)	–	35	N.C.	–
18	+5V	–	36	<u>SLCT IN</u>	Input

Note

To use bi-directional communication, an interface cable which has the pin connections above must be used.

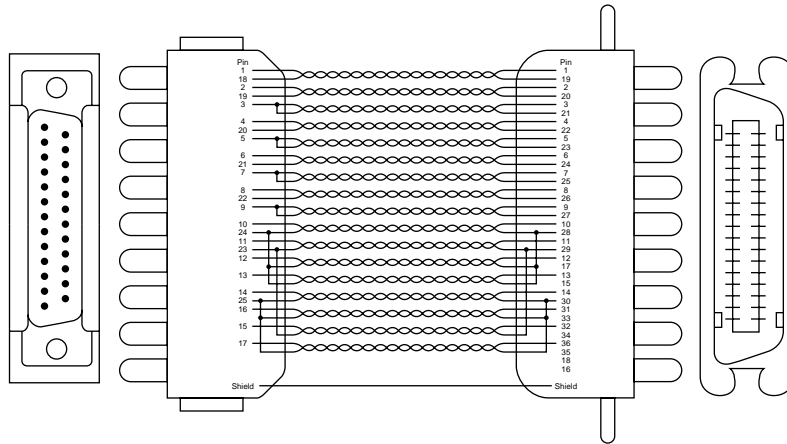
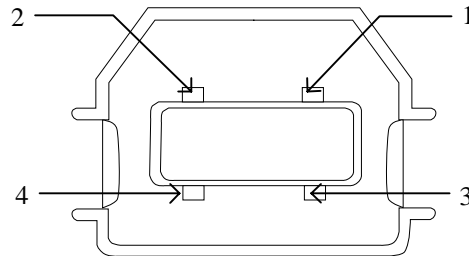


Fig. A-1 Parallel Interface Cable

UNIVERSAL SERIAL BUS (USB) INTERFACE (HL-1050 only)

Interface Connector



Pin Assignment

Pin No.	Signal	
1	Vcc (+5V)	
2	- Data	Serial Data -
3	+ Data	Serial Data +
4	Ground	

RESIDENT FONTS

The following bitmapped fonts are resident in this printer.

Note

HL-820/1020 printer does not have resident fonts inside the printer.

HL-1040 : 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.)

HL-1050 : Bitmapped Fonts

This printer has the following bitmapped fonts. They can be used in the HP LaserJet 6P, EPSON FX-850, and IBM Proprinter XL modes. They have the following characteristics.

- Letter Gothic 16.66 Normal, Italic, Bold, BoldItalic (Portrait & Landscape)
- OCR-A (Portrait & Landscape)
- OCR-B (Portrait & Landscape)

Scalable Fonts

The following scalable fonts can be used in the HP LaserJet 6P, EPSON FX-850, and IBM Proprinter XL modes.

Intellifont Compatible Fonts

- Alaska (Extrabold)
- Antique Oakland (Oblique, Bold)
- Brougham (Oblique, Bold, BoldOblique)
- Cleveland Condensed
- Connecticut
- Guatemala Antique (Italic, Bold, BoldItalic)
- Letter Gothic (Oblique, Bold)
- Maryland
- Oklahoma (Oblique, Bold, BoldOblique)
- PC Tennessee Roman (Italic, Bold, BoldItalic)
- PC Brussels Light (Italic, Demi, DemiItalic)
- Utah (Oblique, Bold, BoldOblique)
- Utah Condensed (Oblique, Bold, BoldOblique)

Microsoft Windows 3.1 TrueType Compatible Fonts

- BR Symbol
- Helsinki (Oblique, Bold, BoldOblique)
- Tennessee Roman (Italic, Bold, BoldItalic)
- W Dingbats

SYMBOL SETS/CHARACTER SETS

OCR Symbol Sets (HL-1050 Only)

When the OCR-A or OCR-B font is selected, the corresponding symbol set is always used.

- OCR-A
- OCR-B

HP LaserJet IIP Mode (HL-1040)

- | | | |
|--------------------|-------------------------|---------------------|
| • ISO14 JIS ASCII | • PC-8 D/N | • ISO61 Norwegian 2 |
| • ISO57 Chinese | • PC-8 Turkish | • ISO4 UK |
| • ISO11 Swedish | • PC-850 | • ISO25 French |
| • HP Spanish | • PC-852 | • ISO69 French |
| • ISO17 Spanish | • PC-860 | • HP German |
| • ISO10 Swedish | • PC-863 | • ISO21 German |
| • ISO16 Portuguese | • PC-865 | • ISO15 Italian |
| • ISO84 Portuguese | • Roman 8 | • ISO6 ASCII |
| • ISO85 Spanish | • ISO Latin 1 (ECMA-94) | • Legal |
| • PC-8 | • ISO60 Norwegian 1 | • ISO2 IRV |

HP LaserJet 6P Mode (HL-1050)

- | | | |
|------------------------|----------------------|--------------------|
| • Roman 8 (8U) | • Legal (1U) | • ISO6 ASCII |
| • ISO Latin1 (0N) | • Ventura Math (6M) | • ISO10 Swedish |
| • ISO Latin2 (2N) | • Ventura Intl (13J) | • ISO11 Swedish |
| • ISO Latin5 (5N) | • Ventura US (14J) | • ISO14 JIS ASCII |
| • ISO Latin6 (6N) | • PS Math (5M) | • ISO15 Italian |
| • PC-8 (10U) | • PS Text (10J) | • ISO16 Portuguese |
| • PC-8 D/N (11U) | • Math-8 (8M) | • ISO17 Spanish |
| • PC-850 (12U) | • Pi Font (15U) | • ISO21 German |
| • PC-852 (17U) | • MS Publishing (6J) | • ISO25 French |
| • PC-775 (26U) | • Windows 3.0 (9U) | • ISO57 Chinese |
| • PC-1004 (9J) | • Desktop (7J) | • ISO60 Norwegian1 |
| • PC-8 Turkish (9T) | • MC Text (12J) | • ISO61 Norwegian2 |
| • Windows Latin1 (19U) | • Symbol (19M) | • ISO69 French |
| • Windows Latin2 (9E) | • Windings (579L) | • ISO84 Portuguese |
| • Windows Latin5 (5T) | • ISO2 IRV | • ISO85 Spanish |
| • Windows Baltic (19L) | • ISO4 UK | • HP German |
| | | • HP Spanish |

EPSON Mode (HL-1040/1050)

- 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 (HL-1040/1050)

- 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 / HP LaserJet 6P

Roman 8										ISO Latin1																					
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	'	p				À	Á	Â	Ã	Ä	Å	0		0	@	P	'	p				À	Á	Â	Ã	Ä	Å
1	!	1	A	Q	a	q				Â	Ë	Ê	Ë	Ì	Í	1	!	1	A	Q	a	q				Ë	Ê	Ë	Ì	Í	Î
2	"	2	B	R	b	r				Ë	°	Ë	°	Ë	°	2	"	2	B	R	b	r				Ë	°	Ë	°	Ë	°
3	#	3	C	S	c	s				Ë	°	Ë	°	Ë	°	3	#	3	C	S	c	s				Ë	°	Ë	°	Ë	°
4	\$	4	D	T	d	t				Ë	°	Ë	°	Ë	°	4	\$	4	D	T	d	t				Ë	°	Ë	°	Ë	°
5	%	5	E	U	e	u				Ë	°	Ë	°	Ë	°	5	%	5	E	U	e	u				Ë	°	Ë	°	Ë	°
6	&	6	F	V	f	v				Ë	°	Ë	°	Ë	°	6	&	6	F	V	f	v				Ë	°	Ë	°	Ë	°
7	'	7	G	W	g	w				Ë	°	Ë	°	Ë	°	7	'	7	G	W	g	w				Ë	°	Ë	°	Ë	°
8	(	8	H	X	h	x				Ë	°	Ë	°	Ë	°	8	(	8	H	X	h	x				Ë	°	Ë	°	Ë	°
9	)	9	I	Y	i	y				Ë	°	Ë	°	Ë	°	9	)	9	I	Y	i	y				Ë	°	Ë	°	Ë	°
A	*	:	J	Z	j	z				Ë	°	Ë	°	Ë	°	A	*	:	J	Z	j	z				Ë	°	Ë	°	Ë	°
B	+	;	K	[	k	{				Ë	°	Ë	°	Ë	°	B	+	;	K	[	k	{				Ë	°	Ë	°	Ë	°
C	,	<	L	\	l	|				Ë	°	Ë	°	Ë	°	C	,	<	L	\	l	|				Ë	°	Ë	°	Ë	°
D	-	=	M	]	m	}				Ë	°	Ë	°	Ë	°	D	-	=	M	]	m	}				Ë	°	Ë	°	Ë	°
E	.	>	N	^	n	~				Ë	°	Ë	°	Ë	°	E	.	>	N	^	n	~				Ë	°	Ë	°	Ë	°
F	/	?	O	_	o	¸				Ë	°	Ë	°	Ë	°	F	/	?	O	_	o	¸				Ë	°	Ë	°	Ë	°

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	£	\$	Š	°	ç	é	^	ù	à	ò	è	ì
ISO16 Portuguese	#	\$	Š	À	Ç	Ö	^	~	ã	ç	õ	°
ISO17 Spanish	£	\$	Š	ı	Ñ	ç	^	~	°	ñ	ç	—
ISO21 German	#	\$	Š	Ä	Ö	Ü	^	~	ä	ö	ü	ß
ISO25 French	£	\$	à	°	ç	Š	^	~	ä	ù	è	—
ISO57 Chinese	#	¥	@	[	\	\]	^	~	{	|	}	—
ISO60 Norwegian1	#	\$	@	Æ	Ø	Å	^	~	æ	ø	å	—
ISO61 Norwegian2	Š	\$	@	Æ	Ø	Å	^	~	æ	ø	å	|
ISO69 French	£	\$	à	°	ç	Š	^	~	μ	é	ù	è
ISO84 Portuguese	#	\$	·	À	Ç	Ö	^	~	ã	ç	õ	°
ISO85 Spanish	#	\$	·	ı	Ñ	Ç	ç	^	~	ñ	ç	—
HP German	£	\$	Š	Ä	Ö	Ü	°	~	ä	ö	ü	ß
HP Spanish	#	\$	@	ı	Ñ	ç	°	~	{	ñ	}	—

□ HP LaserJet IIP/6P, EPSON FX-850, IBM Propritner XL

PC-8													PC-850																		
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	▶	0	@	P	`	p	Ç	É	á	á	á	á	á	á	á	0	▶	0	@	P	`	p	Ç	É	á	á	á	á	á	á	á
1	⊙	◀	!	1	A	Q	a	q	ü	æ	í	í	í	í	í	1	⊙	◀	!	1	A	Q	a	q	ü	æ	í	í	í	í	í
2	⊙	‡	"	2	B	R	b	r	é	Æ	ó	ó	ó	ó	ó	2	⊙	‡	"	2	B	R	b	r	é	Æ	ó	ó	ó	ó	ó
3	♥	‡	#	3	C	S	c	s	â	ô	ú	ú	ú	ú	ú	3	♥	‡	#	3	C	S	c	s	â	ô	ú	ú	ú	ú	ú
4	♦	‡	\$	4	D	T	d	t	ä	ö	ñ	ñ	ñ	ñ	ñ	4	♦	‡	\$	4	D	T	d	t	ä	ö	ñ	ñ	ñ	ñ	ñ
5	‡	‡	%	5	E	U	e	u	à	ò	ñ	ñ	ñ	ñ	ñ	5	‡	‡	%	5	E	U	e	u	à	ò	ñ	ñ	ñ	ñ	ñ
6	♣	-	&	6	F	V	f	v	â	û	ä	ä	ä	ä	ä	6	♣	-	&	6	F	V	f	v	â	û	ä	ä	ä	ä	ä
7	•	‡	'	7	G	W	g	w	ç	ù	ë	ë	ë	ë	ë	7	•	‡	'	7	G	W	g	w	ç	ù	ë	ë	ë	ë	ë
8	▣	↑	(	8	H	X	h	x	è	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	8	▣	↑	(	8	H	X	h	x	è	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ
9	○	↓	)	9	I	Y	i	y	è	Ö	Ö	Ö	Ö	Ö	Ö	9	○	↓	)	9	I	Y	i	y	è	Ö	Ö	Ö	Ö	Ö	Ö
A	▣	→	*	:	J	Z	j	z	è	Ü	Ü	Ü	Ü	Ü	Ü	A	▣	→	*	:	J	Z	j	z	è	Ü	Ü	Ü	Ü	Ü	Ü
B	♂	←	+	;	K	[	k	{	è	½	½	½	½	½	½	B	♂	←	+	;	K	[	k	{	è	½	½	½	½	½	½
C	♀	↳	,	<	L	\	l	|	è	¼	¼	¼	¼	¼	¼	C	♀	↳	,	<	L	\	l	|	è	¼	¼	¼	¼	¼	¼
D	♂	↔	-	=	M	]	m	}	è	¼	¼	¼	¼	¼	¼	D	♂	↔	-	=	M	]	m	}	è	¼	¼	¼	¼	¼	¼
E	♂	▲	.	>	N	^	n	~	è	¼	¼	¼	¼	¼	¼	E	♂	▲	.	>	N	^	n	~	è	¼	¼	¼	¼	¼	¼
F	*	▼	/	? O	_	o	Δ	Å	è	¼	¼	¼	¼	¼	¼	F	*	▼	/	? O	_	o	Δ	Å	è	¼	¼	¼	¼	¼	¼

□ 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
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	#	\$	@	[]	f	^	`	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(FCC) Declaration of Conformity (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 HL-820, HL-1020, HL-1040, HL-1040DX,
HL-1050, HL-1050DX

Model Numbers : HL-8L, HL-8h

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)

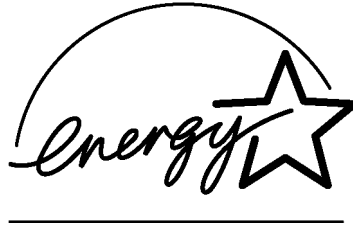
This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur la matériel brouilleur 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.

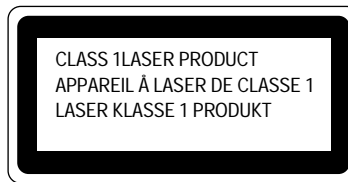
Safety: EN 60950, EN 60825
 EMC: EN 55022 Class B, EN 50082-1

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.

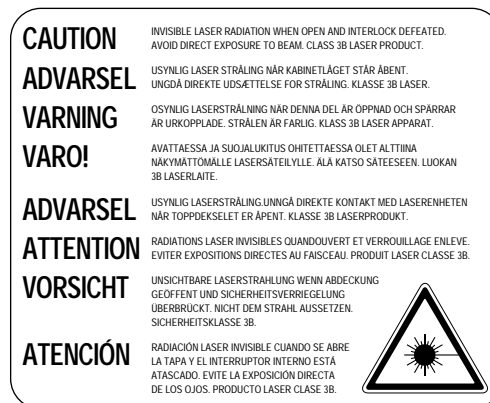


This printer has a Class 3B Laser Diode which emits invisible laser radiation in the Scanner Unit. The Scanner Unit should not be opened under any circumstances.

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)

$L_{pa} < 70 \text{ dB (A) DIN 45635-19-01-KL2}$

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.

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