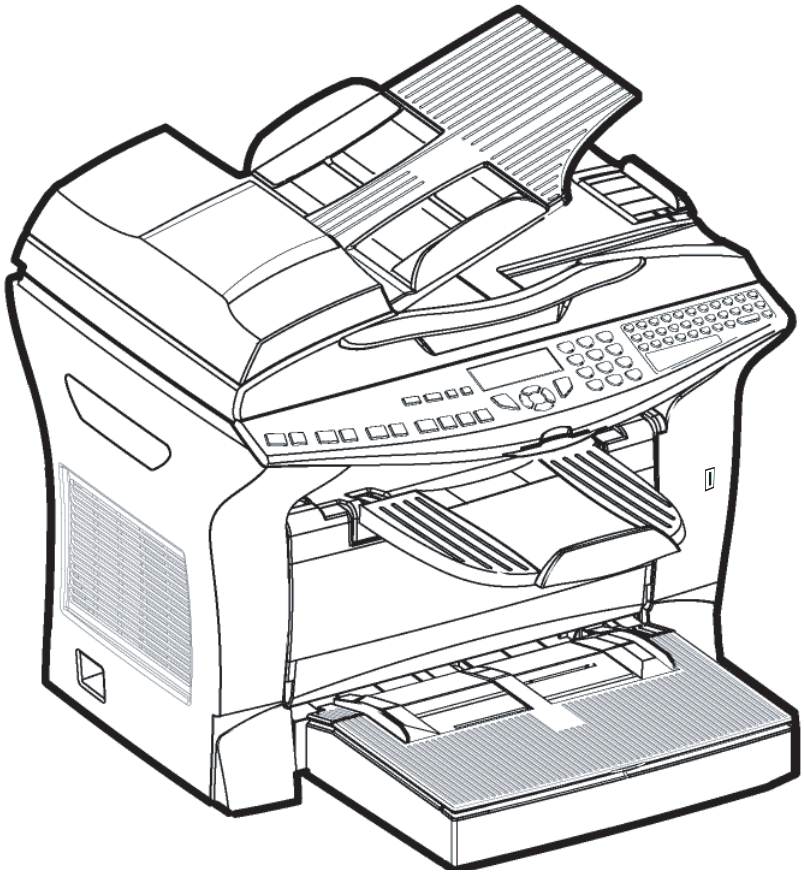
B 4545 MFP



TECHNICAL DOCUMENT
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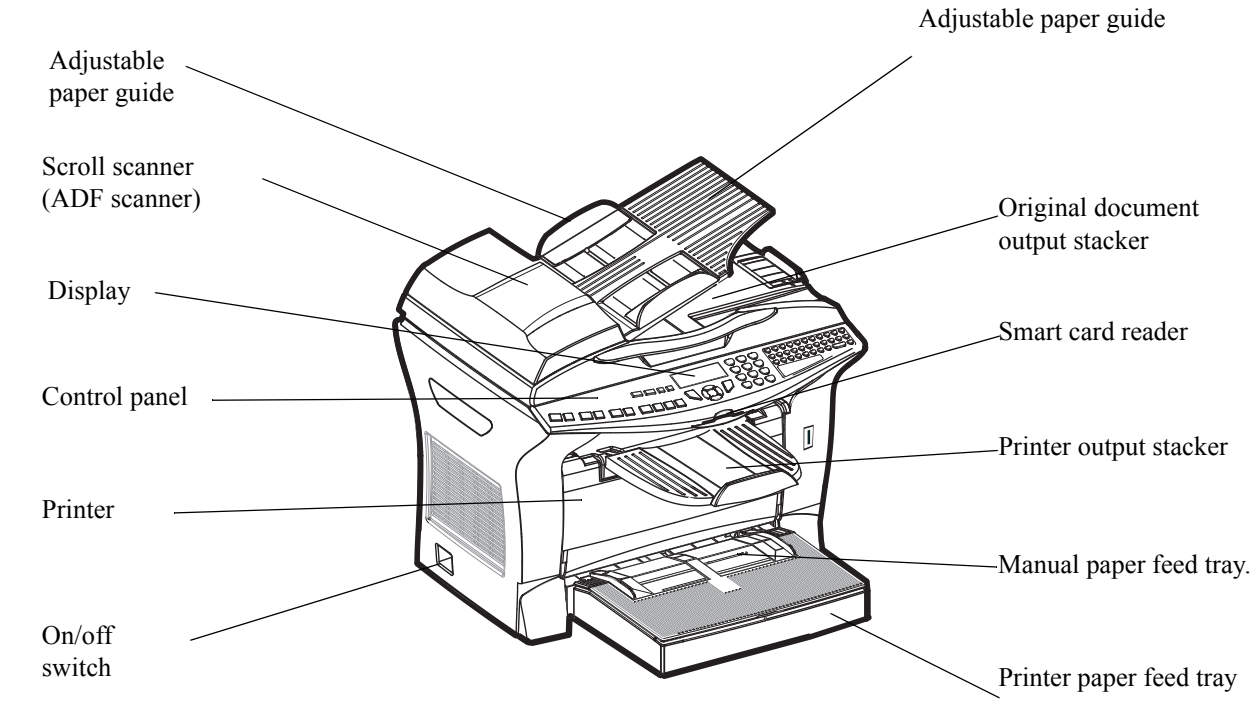
CONTENTS

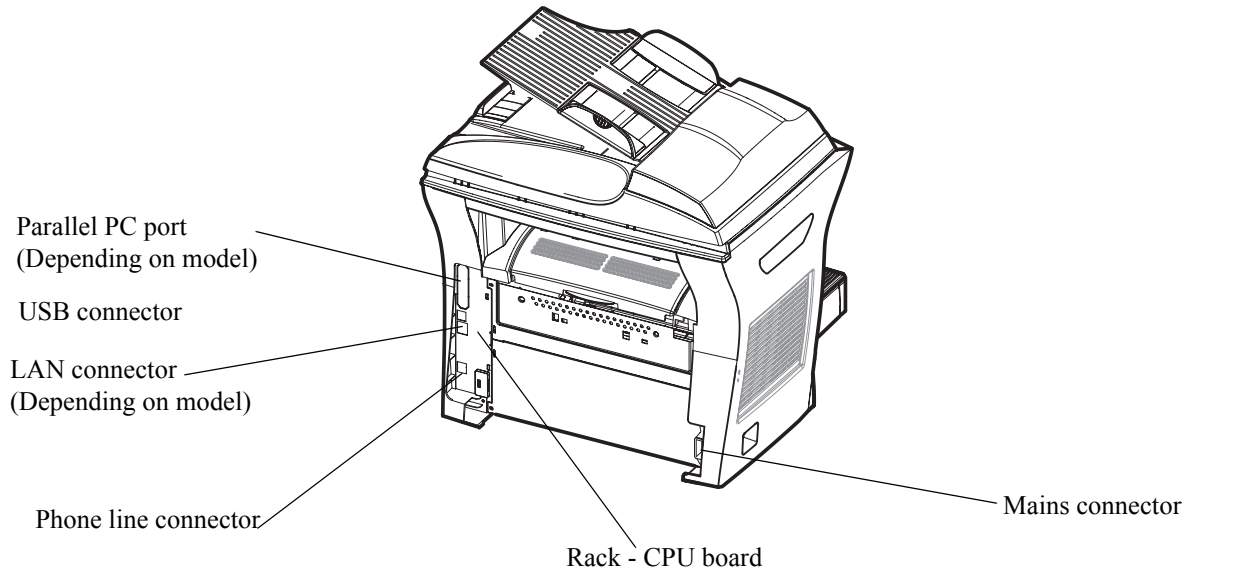
TECHNICAL DESCRIPTION

CONTENTS

1. GENERAL

1.1 PRESENTATION





1.2 GENERAL DESCRIPTION

MFF terminals are part of a range of multifunction office equipment.

The product consists of a duplex color scanner with a resolution of 600 dpi and a black-and-white laser printer with a resolution of 600 dpi. These two components are combined in a monobloc unit.

The documents to be processed are read by means of a sheet feeder scanner using CIS (Contact Image Sensor) technology via the ADF (Automatic Document Finder) or via la the exposition window for bulky documents.

The control panel comprises:

- An alphanumeric keyboard and function keys used to control the monobloc unit,
- A display with 2 lines and a line of icons, to display control messages and alerts to the user,
- A smart card reader used to initialize the consumables. It can also be used to store user functions (directory and user parameter).

When replacing the printer assembly, it is advised to transfer the consumables (toner cartridge and drum) to the new printer so as to keep their validity.

When replacing all or part of the consumables, perform the installation procedure for the new consumable item(s) (refer to the User Guide).

2. CHARACTERISTICS

2.1 PHYSICAL CHARACTERISTICS

Environment

- Operating:
  - The machine should not be exposed to direct sunlight.
  - Supply: 230 V/50 Hz.
  - Power consumption, standby: ≤ 15 W.
  - Power consumption, printing: 580 W.
  - Temperature: 10 °C à 35 °C.
  - Temperature changes: ≤ 10 °C/hour.
  - Humidity: 20 % to 80 % (RH non-condensing).
  - Humidity changes: ≤ 20 %/hour.
  - Altitude: 0 to 2 500 meters (above sea level).
  - Ambient light: ≤ 3000 lux.
- Storage :

Fax:

- Temperature: 0 °C to 40 °C.
- Temperature changes: ≤ 10 °C/hour.
- Humidity: 20 % to 80 % (RH non-condensing).
- Humidity changes: ≤ 20 %/hour.
- Altitude: from 0 to 2 500 meters (above sea level).

Consumables (drum and toner cartridge):

- Normal temperature: 0 to 35 °C.
- Extreme temperatures: - 10 to 0 °C and 35 to 40 °C (less than 10 % of the storage time).
- Humidity: 20 % to 90 % (RH non-condensing).

Maximum storage time: 18 months

2.2 GENERAL TECHNICAL CHARACTERISTICS

	MFF
Equipment	
Dimensions (width x depth x height in mm., without trays)	440 x 460 x 460
Weight (kg)	14
Consumables	
Reference Paper (RP)	
Type	Bellegarde Turbo A4 - 80 g/m^2
Reference Document (RD)	
Type	ITU #1 - A4
Black/white ratio	3 %
Resolution	Normal mode (200 x 100 DPI)
Scroll Scanner	
Type	CIS Colourr
Colour analysis	Yes
Resolution in dpi	600
Grey scale	256
Color scale	48 bits (3 x 16)/pixel
Paper size in mm.	A4 (210 x 297)
• Maximum width in mm	216
• Minimum width in mm	145
• Maximum length in mm	1 000
• Minimum length in mm	120
Paper weight	60 à 90 g/m^2
Capacity of document loading tray	30 pages
Acquisition time for black and white document:	
• 300 x 100 DPI	1,8 s
• 300 x 200 DPI	3,6 s
• 300 x 300 DPI	5,4 s
Acquisition time for color document:	
• 300 x 300 DPI	16 s
Effective scanner width in mm.	206
Zoom in steps of 1 %	25 % à 400 %
Contrast	7 levels
Brightness	7 levels
Margin adjustment (left/right)	Oui
Origin adjustment	Oui
Duplex scan	Oui
Flatbed Scanner	
Type	CIS Colour
Colour analysis	Yes
Resolution in dpi	600
Grey scale	256
Color scale	48 bits (3 x 16)/pixel

	MFF
Window size	220 mm x 304 mm
Acquisition time for black and white document:	
• 600 x 200 dpiI	5,9 s
• 600 x 300 dpi	8,8 s
• 600 x 600 dpi	10,6 s
• 600 x 1200 dpi	21,1 s
• 600 x 2400 dpi	42,2 s
Acquisition time for colour document:	
• 600 x 200 dpi	10,6 s
• 600 x 300 dpi	15,9 s
• 600 x 600 dpi	31,7 s
• 600 x 1200 dpi	63,3 s
• 600 x 2400 dpi	126,5 s
Zoom in steps of 1 %	25 % à 400 %
Contrast	7 levels
Brightness	7 levels
Printer	
Type	B/w laser
Resolution in dpi	600 x 600
Taille du papier en mm	A4 (210 x 297)
Capacity of the paper feed tray in pages	250
• Paper weight	60 à 90 g/m^2
Manual paper feed:	
• Paper (RP)	60 à 90 g/m^2
• Heavy paper	90 à 163 g/m^2
• Transparencies (laser printer compatible)	Yes
Capacity of the output tray in pages	100
Printing rate	20 ppm
First page printed after	≤ 15 s
Printing time at start-up	21 s
Printing area in mm.	206 x 292
Duplex unit	Depending on model or option
Number of jobs in the print queue	500
Consumables for RD document:	
• Maximum drum capacity (in A4 pages, ratio 5 %)	20 000
• Maximum toner cartridge capacity (in A4 pages, ratio 5 %)	6 000
Consumables management	By smart card
Weight of drum (g)	300
Weight of toner cartridge (g)	500

	MFF
Fax-Modem	
Type	PSTN-G3
Maximum speed in bps (V34Fax)	33 600
V34Fax capacity in bps	33 600 à 2 400
• Incrementation in bps	2 400
V17 capacity in bps	14 400, 12 000, 9 600, 7 200
V29 capacity in bps	9 600, 7 200
V27ter capacity in bps	4 800, 2 400
Data-Modem	
Type	PSTN-V90
Maximum speed in bps (V90)	56 000
V90 capacity in bps	56 000 à 28 000
• Incrementation in bps	1 333
V34plus capacity in bps	33 600 à 2 400
• Incrementation in bps	2 400
V32bis capacity in bps	14 400, 12 000, 9 600, 7 200
V32 capacity in bps	9 600, 4 800
V22bis capacity in bps	2 400
V22 capacity in bps	1 200, 600
Fax Communication	
Type	PSTN, ITU T30, G3
Maximum speed in bps (V34Fax)	33 600
Coding	MH, MR, MMR, JBIG
ECM	T30 ECM
Time to transmit RD	2,5 s
Type of transmission	Mémoire et direct
Max. send delay	24 heures
PSTN redial	10
Internet Access	
Type	PSTN-V90
Maximum speed in bps (V90)	56 000
Modem error correction mode	V42
Data compression	V42bis
Modem transmission rate adjustment	Oui
ISP subscriptions	1 à 6 (seulement 1 actif)
ISP access protocol	PPP
• ISP access security	PAP & CHAP-MD5C
Internet protocol	TCP/IP
LAN Access (depending on model	
Type	Ethernet 10/100 base T
Plug and Play configuration	DHCP & BOOTP
Internet protocol	TCP/IP
DNS	2 DNS servers access

	MFF
E-Mail and Fax Communication	
Compatibility	ITU T37
Mail protocol : sending	SMTP
Mail protocol : polling	POP3
Mail format	MIME
• Charset	US-ASCII
• Encoding	7 bits, base 64, quoted-printable
SMS Communication (depending on model)	
Transmission	V23
Reception	Yes
Mailing	10 directly 499 from address list
Keyboard and Screen	
Keyboard	QWERTY 25, 59 or 64 keys (depending on model)
Screen	2 lines of 16 characters + 6, 8 ou 9 icons (depending on model)
Address List	
Capacity	500
Type	Name/PSTN and SMS number-email
Transmission list	32
Transmission list capacity	499
Alphabetical typing	Yes
Associated key	No
Import/export directory	Email (CSV format)
Copier	
Type	Black-and-white
Input resolution (optical) in dpi	300 x 100 (fast) ou 300 x 300 (quality)
Output resolution in dpi	600 x 600
Paper size in mm.	A4 (210 x 297)
Maximum speed with resolution 300 x 200 (fast)	20 ppm
Time to print first page	15 s
Multicopy	1 à 99
Zoom	25 % à 400 %
Zoom steps	1 %
Associated copies	Yes
Duplex	Depending on model or option

2.3 GENERAL CHARACTERISTICS OF CONSUMABLES

For each consumable (toner cartridge and drum) a counter contains the current number of pages that can still be printed.

For a new consumable this counter is initialized to the capacity of the consumable, expressed in number of pages, as specified by the manufacturer. The counter is then decremented by 1 for each page printed.

The displayed percentage is calculated by means of this counter, relative to the initial capacity of the consumable (from 100 % to 1 %).

The values of the consumable counters are updated regularly in the EEPROM memory. At each start-up of the machine the counters are read from the EEPROM memory.

3. FONCTIONING

The equipment is a Group 3 multifunction fax functioning in accordance with the UIT-T T30 recommendation.

It consists of a laser printer, a CIS (Contact Image Sensor) color sheet scroll scanner, a flatbed scanner, a control panel with an alphanumerical keyboard and an LCD screen with 2 lines of 16 characters (refer to the User Guide to consult a more detailled presentation of control panels).

Its main functions are:

- Fax transmission and reception on the switched telephone network using the V34 protocol (max. 33.6 kbits/s) and the V17 protocol (max. 14.4 kbits/s),
- SMS (Short Message Service) transmission and reception,
- Internet e-mail transmission and reception on the switched telephone network using the V90 protocol,
- Photocopying (duplex option),
- Local printer and scanner, via a PC parallel or USB interface,
- Network printer and scanner, via a local area network (LAN),
- E-mail transmission and reception on the local area network.

Note(s) : The machine does not have any facilities for managing an external telephone answering machine connected on the same line (with a stackable plug). More generally, it is not designed to function with any telephone equipment connected in parallel on the same phone line. It is preferable to used a dedicated phone line for the fax: this allows to leave the fax permanently in service and to receive communications without user intervention. The fax is equipped with a standard telephone plug for connection to the switched telephone network.

The electronics of the machine consist of a control panel board and a CPU board. For the printer, refer to the printer section. Electrical power is supplied by the printer.

Note(s) : **(for the attention of technicians).** The ECP and LAN interfaces conform to the TBTS (Très Basse Tension de Sécurité, very low safety voltage) safety level.
The phone line input conforms to the TRT3 safety level.

Before performing any intervention on the CPU board, disconnect the phone lead.

Before performing any intervention on the CPU electronic circuit board, it is also preferable to:

- Set the mains switch to the OFF position,
- Disconnect all external interconnect leads (LAN, ECP),
- Disconnect the mains lead.

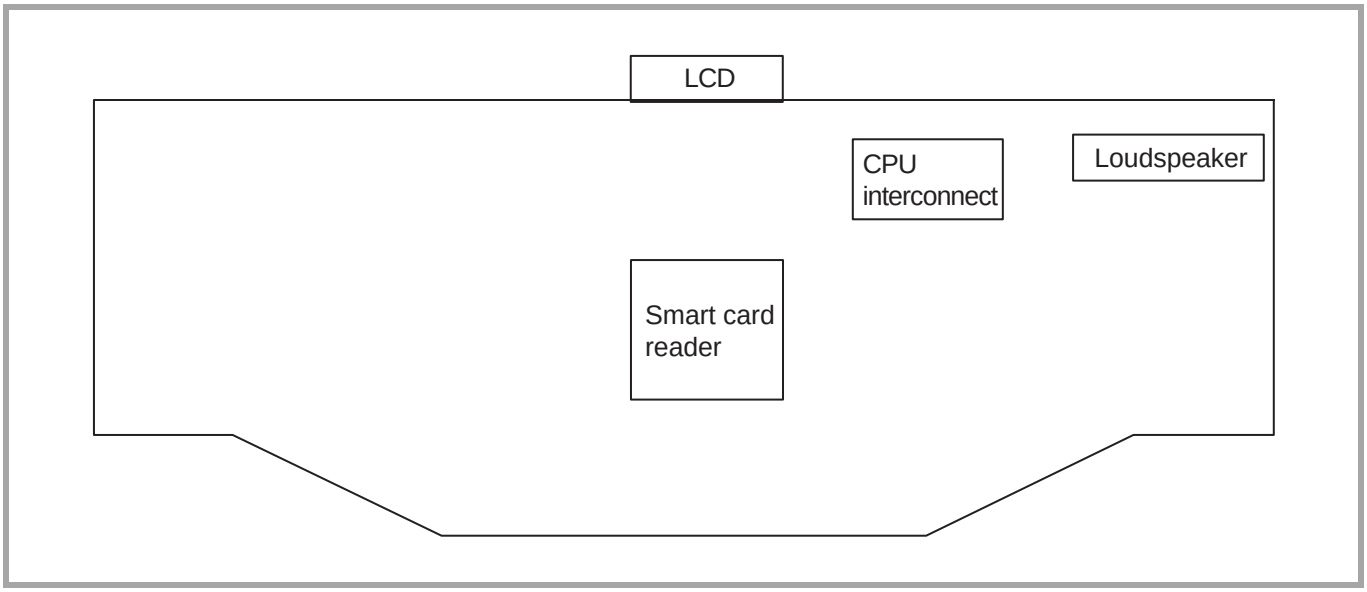
3.1 CONTROL PANEL BOARD

The control panel board manages the keyboard and the LCD screen by means of a microcontroller.

The LCD screen is equipped with its own driver using COG (Chip On Glass) technology.

On this board are also installed: the external connector for the smart card and the internal connector for the loudspeaker, these latter elements being managed by the CPU.

Diagram of the Connector and Sensor Locations:



List of Connectors:

Connector	Location ref.	Number of pins	Male/Female	Type
CPU interconnect	P4200	24	Female	Elbow, top contact
Loudspeaker	P4201	2	Female	Elbow
LCD	P5001	24	Female	Elbow, bottom contact
Smart card reader	P4002	10	Female	Elbow

3.2 CPU BOARD

The CPU board is based on the Digicolor2 circuit which performs in particular the function of microprocessor.

The executable code is stored in the flash memory Z460.

This flash memory is divided in two zones: a zone reserved for the storage of the code and a zone reserved for the storage of the documents.

The code is loaded from this flash memory into SDRAM, and the microprocessor executes its instructions from the SDRAM.

Before printing, the documents to be printed are stored as bitmaps in SDRAM.

The SDRAM is also used as the working memory for the Digicolor2.

Block Diagram of the Electronics Architecture :

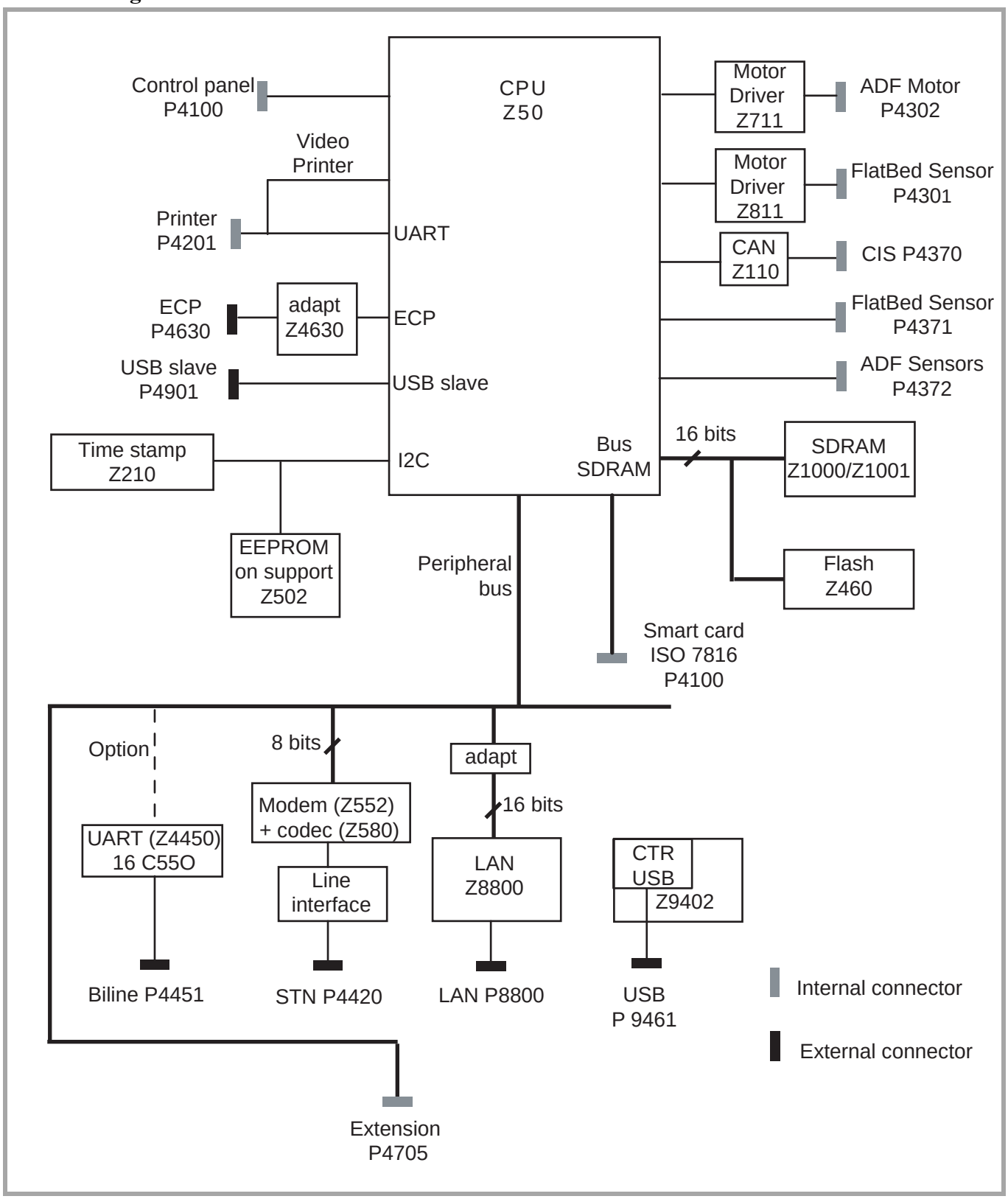
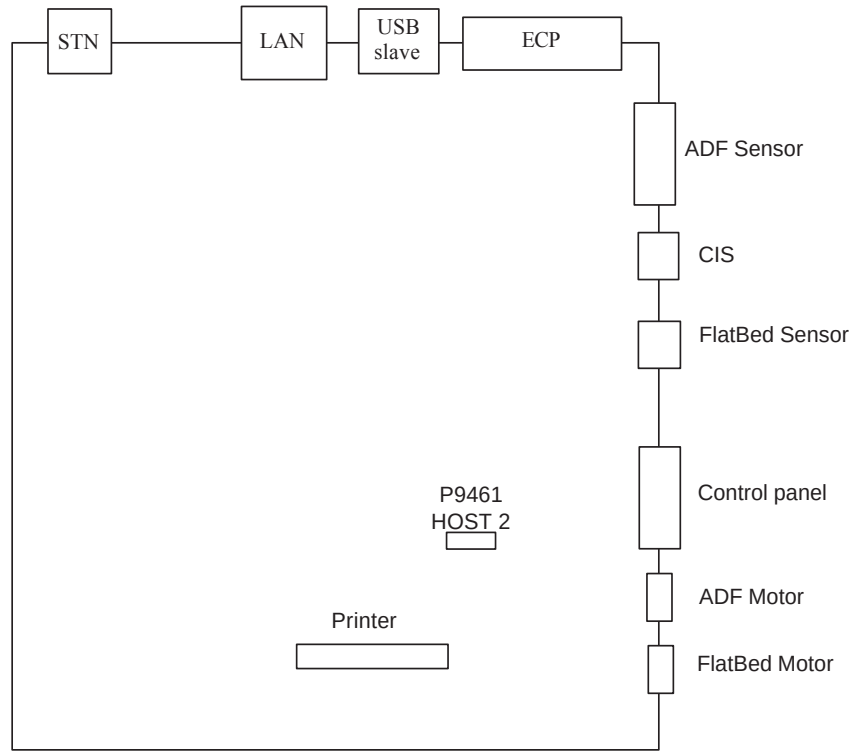


Diagram of the Connector Locations:



List of Connectors:

Connector	Location ref.	Number of pins	Male/female	Type
Printer	P4201	26	Male	straight
CIS	P4370	12	Female	Elbow, top contact
Control panel	P4100	24	Female	Elbow, top contact
ADF Motor	P4301	5	Female	Elbow
FlatBed Motor	P4302	4	Female	Elbow
ECP	P4630	36	External, Centronics type	
USB SLAVE	P4901	4	External, USB type B	
LAN	P8800	8	External, RJ45	
STN	P4420	6	External, RJ11	
ADF Sensor	P4372	9	-	Elbow
Flatbed Sensor	P4371	3	-	Elbow
USB HOST	P9461	6	Internal	Straight

- Printer: Connections to the Printer

Pin	Signal	Input/Output	Use
1-6-7-8	GND	-	Ground
2	P24V	-	24V Supply
3	GND	-	Ground
4	-	-	not connected
5	RESETIMP	O	Printer reset
9	HSYNC	I	Horizontale sync (line)
10	linked to 23	-	
11	READY	I	Printer ready (not used)
12	VSYNC	I	Verticale sync (page)
13	ETBSY	I	Engine status busy

Pin	Signal	Input/Output	Use
14	RXIMP	I	Printer status (serial data transmitted by printer)
15	TXIMP	O	CPU command (serial data transmitted to printer)
16	CBSY	-	Controller status busy
18	SCLKIMP	O	Serial link clock printer sync
19	VIDEO	O	Printer video
17-20-21	GND	O	Ground
22-25	-	-	not connected
23	linked to 10	-	
24	P5V	-	5 V supply
26	P5V	-	5 V supply

- Control panel: Connections to the Control Panel Board

Pin	Signal	Input/Output	Use
1-3	GND	-	Ground
2	CLKPUCE	O	Smart card clock
4	IOPUCE	I/O	Smart card serial data
5	RSTPUCE	O	Smart card reset
6	CVCC	O	Smart card supply control
7	FERCAP	I	Smart card present detection
8	SELALIM	O	Smart card supply select
9-10	P3V3	-	3,3 V Supply
11-12	VCC	-	5 V Supply
13	RESETLCD*	I	Reset
14	LCM2	O	Chip select 2
15-17	GND	-	Ground
16	SCLKPUP	O	Clock
18	TXPUP	O	Data transmitted from the CPU
19	RXPUP	I	Data received by the CPU
20	CSLCM	O	Chip select
21-24	HPP	-	Ground
22	HPP	O	Differential LF signal to loudspeaker
23	HPN	O	Differential LF signal to loudspeaker

- CIS: Connections to the CIS

Pin	Signal	Input/Output	Use
1	VIDCIS	I	CIS video
2	CMD RESOL	O	300/600dpi Resolution command
3	VIDEOGND	-	Ground
4	ALIMCIS	-	5 V Supply
5	VREFCIS	O	CIS reference voltage
6	SPCIS	O	CIS start pulse (line sync)
7	CLKCIS	O	CIS pixel clock (point sync)
8	ALIMLED	O	LED supply (current)
9	GNDLEDB	O	Blue LED cathode
10	GNDLEDV	O	Green LED cathode
11	GNDLEDR	O	Red LED cathode
12	GND	-	Ground

- ECP: Parallel Interface to PC

Pin	Signal	Input/Output	Use
1	HOSTCLK	I	Data clock (forward)
2	DATAECP0	I/O	Data bus LSB
3	DATAECP1	I/O	Data bus bit 1
4	DATAECP2	I/O	Data bus bit 2
5	DATAECP3	I/O	Data bus bit 2
6	DATAECP4	I/O	Data bus bit 4
7	DATAECP5	I/O	Data bus bit 5
8	DATAECP6	I/O	Data bus bit 6
9	DATAECP7	I/O	Data bus MSB
10	PRPHCLK	O	Data clock (reverse)
11	PRPHACK	O	Data acknowledgment (forward)
12	ACKRVRS	O	Acknowledgment of reverse request
13	XFLAG	O	Indicates that ECP mode is supported
14	HOSTACK	I	Data acknowledgment (reverse)
32	PRPHREQ	O	Data drive request
31	RVRSREQ	I	Data drive enable
36	ECPACTIVE	O	Mode select
18	ERREUR	-	Proprietary
16	GND	-	Ground
17-19	GND	-	Ground
20	GND	-	Ground
21	GND	-	Ground
22	GND	-	Ground
23	GND	-	Ground
24	GND	-	Ground
25	GND	-	Ground
26-27-28-29-30	GND	-	Ground
15-33-34-35	-	-	Not connected

- USB: slave USB Interface

Pin	Signal	Input/Output	Use
1	VBUS_USB	I	Supply from master
2	USBN	I/O	Differential pair
3	USBP	I/O	Differential pair
4	GND	I/O	Ground

- LAN: Local Area Network Interface

Pin	Signal	Input/Output	Use
1	TXP	O	Network transmission differential pair
2	TXN	O	Network transmission differential pair
3	RXP	I	Network reception differential pair
4	NC	-	Not connected
5	NC	-	Not connected
6	RXN	I	Network reception differential pair
7	NC	-	Not connected
8	NC	-	Not connected

- USB: HOST

Pin	Signal	Input/Output	Use
1	VBUS_USB	I	Supply from master
2	USBN	I/O	Differential pair
3	USBP	I/O	Differential pair
4-5	GND	I/O	Ground
6	NC	-	Not connected

- STN: Switched Telephone Network Interface

Pin	Signal	Input/Output	Use
1	NC	-	Not connected
2	R2	I/O	Loopback L1
3	L2	I/O	Telephone line pair
4	L1	I/O	Telephone line pair
5	R1	I/O	Loopback L2
6	NC	-	Not connected

- ADF Sensor

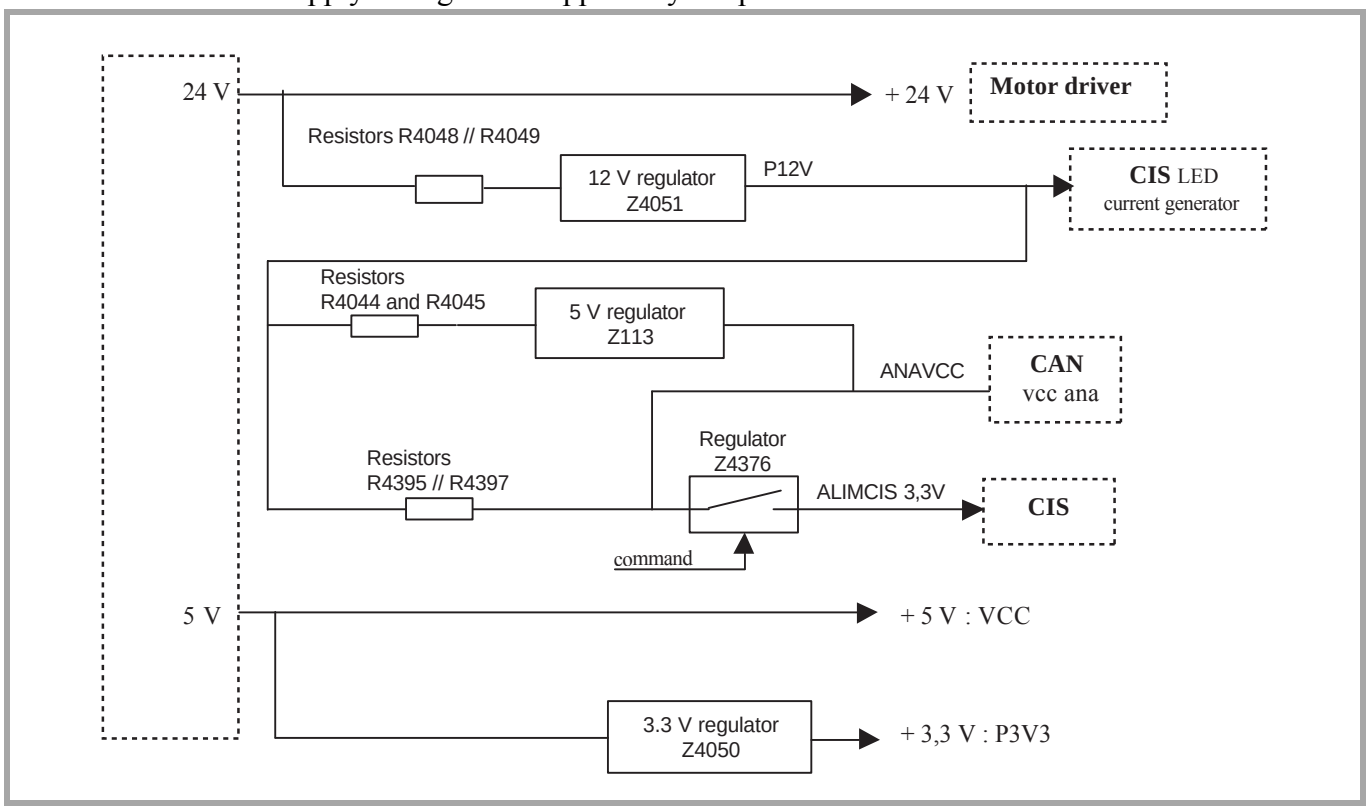
Pin	Signal	Input/Output	Use
1	VCC	-	Supply
2	STSC*	I	Start Scan
3	GND	-	Ground
4	VCC	-	Supply
5	OUVCAP	I	Cover opening
6	GND	-	Ground
7	VCC	-	Supply
8	PSF*	-	Sheet to scan
9	GND	-	Ground

- ADF Sensor

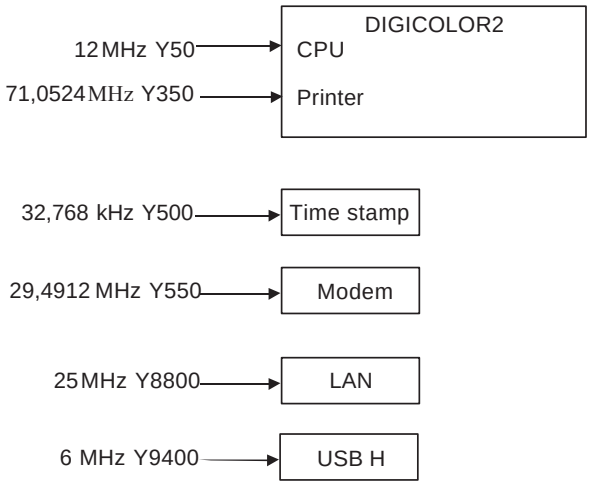
Pin	Signal	Input/Output	Use
1	VCC	-	Supply
2	HPOS	I	Home position CIS bar
3	GND	-	Ground

4. SUPPLY

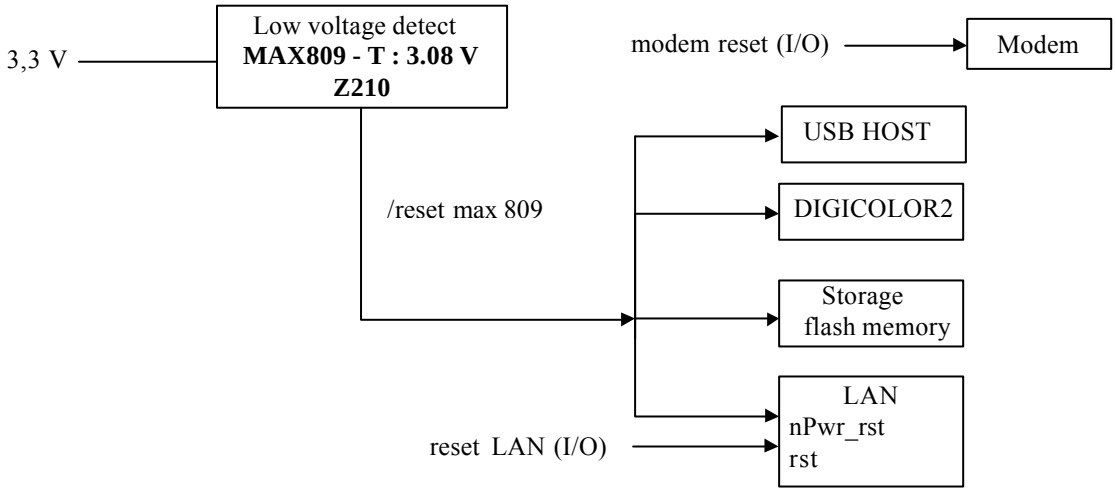
The 24 V and 5 V supply voltages are supplied by the printer.



5. CRYSTAL



6. RESET



7. PRINTING LANGUAGES (DEPENDING ON MODEL)

PCL5e emulation: advised driver HP LasetJet 5Si

PCL XL 2.1 (PCL6) emulation: advised driver: HP Laserjet 2200: Version 4.3.2.192 dated the 14/06/2002.

SG Script (Adobe PS Emulation): advised driver: Adobe PS Version 1.0.6 dated the 23/05/2002 for Windows and version 8.8 for Macintosh.

The PPD setting file required for the installation is on 1.3 installation CD Rom, DRIVER/PPD directory.

These drivers are displayed by Windows when adding a printer. If not, they can be downloaded from the following websites:

- For Hewlett Packard products:
  www.hp.com -> printing & multi-fonction -> support & driver
- For Adobe products:
  www.adobe.com -> support -> download -> Postscript driver

To install the drivers, refer to the PC KIT of the User Guide.

7.1 INTERFACES

Network:

RAW server on port 9100 (The port number can be configured by menu 2990)
LPD server sur port 515.

Centronics:

PNP detection.

7.2 INTERNAL FONTS LIST

The following list shows internal fonts as it is printed by MF products (depending on model):

PCL Emulation Fonts Page 1

Font ID	Font Name	Escape Sequence	Print Sample
I0	Internal 1000	<esc>(#<esc>(s0p*h0s0b4099T	ABCDEfghij#{}$£€@&0123%*+/ éèçùïô
I1	Internal 1001	<esc>(#<esc>(s1p*v0s0b4101T	ABCDEfghij#{}$£€@&0123%*+/ éèçùïô
I2	Internal 1002	<esc>(#<esc>(s1p*v0s3b4101T	**ABCDEfghij#{}$£€@&0123%*+/ éèçùïô**
I3	Internal 1003	<esc>(#<esc>(s1p*v1s0b4101T	*ABCDEfghij#{}$£€@&0123%*+/ éèçùïô*
I4	Internal 1004	<esc>(#<esc>(s1p*v1s3b4101T	***ABCDEfghij#{}$£€@&0123%*+/ éèçùïô***
I5	Internal 1005	<esc>(#<esc>(s1p*v0s0b4113T	ABCDEfghij#{}$£€@&0123%*+/é èçùïô
I6	Internal 1006	<esc>(#<esc>(s1p*v0s3b4113T	**ABCDEfghij#{}$£€@&0123%*+/é èçùïô**
I7	Internal 1007	<esc>(#<esc>(s1p*v1s0b4113T	*ABCDEfghij#{}$£€@&0123%*+/é èçùïô*
I8	Internal 1008	<esc>(#<esc>(s1p*v1s3b4113T	***ABCDEfghij#{}$£€@&0123%*+/é èçùïô***
I9	Internal 1009	<esc>(#<esc>(s1p*v1s0b4116T	*ABCDEfghij#{}$£€@&0123%*+/éèçùïô*
I10	Internal 1010	<esc>(#<esc>(s1p*v4s3b4140T	**ABCDEfghij#{}$£€@&0123%*+/éèçùïô**
I11	Internal 1011	<esc>(#<esc>(s1p*v0s0b4148T	ABCDEfghij#{}$£€@&0123%*+/ éèçùïô
I12	Internal 1012	<esc>(#<esc>(s1p*v0s3b4148T	**ABCDEfghij#{}$£€@&0123%*+/ éèçùïô**
I13	Internal 1013	<esc>(#<esc>(s1p*v1s0b4148T	*ABCDEfghij#{}$£€@&0123%*+/ éèçùïô*
I14	Internal 1014	<esc>(#<esc>(s1p*v1s3b4148T	***ABCDEfghij#{}$£€@&0123%*+/ éèçùïô***
I15	Internal 1015	<esc>(#<esc>(s1p*v4s0b4148T	ABCDEfghij#{}$£€@&0123%*+/éèçùïô
I16	Internal 1016	<esc>(#<esc>(s1p*v4s3b4148T	**ABCDEfghij#{}$£€@&0123%*+/éèçùïô**
I17	Internal 1017	<esc>(#<esc>(s1p*v5s0b4148T	*ABCDEfghij#{}$£€@&0123%*+/éèçùïô*
I18	Internal 1018	<esc>(#<esc>(s1p*v5s3b4148T	***ABCDEfghij#{}$£€@&0123%*+/éèçùïô***

: Symbol set * : Font height

PCL Emulation Fonts

I19	Internal 1019	<esc>(#<esc>(s1p*v0s0b4168T	ABCDEfghij#{}$£€@&0123%* +/éèçùïô
I20	Internal 1020	<esc>(#<esc>(s1p*v0s3b4168T	**ABCDEfghij#{}$£€@&0123 %* +/éèçùïô**
I21	Internal 1021	<esc>(#<esc>(s1p*v1s0b4168T	*ABCDEfghij#{}$£€@&0123%* + /éèçùïô*
I22	Internal 1022	<esc>(#<esc>(s1p*v0s0b4197T	ABCDEfghij# {}$£€@&0123%*+/ éèçùïô
I23	Internal 1023	<esc>(#<esc>(s1p*v0s3b4197T	**ABCDEfghij# {}$£€@&0123%*+/ éèçùïô**
I24	Internal 1024	<esc>(#<esc>(s1p*v1s0b4197T	*ABCDEfghij# {}$£€@& 0123%*+/ éèçùïô*
I25	Internal 1025	<esc>(#<esc>(s1p*v1s3b4197T	***ABCDEfghij# {}$£€@&0123%*+/ éèçùïô***
I26	Internal 1026	<esc>(#<esc>(s1p*v0s0b4297T	ABCDEfghij#{}$£€@&0123%*+/éèçùïô
I27	Internal 1027	<esc>(#<esc>(s1p*v0s1b4362T	ABCDEfghij#{}$£€@&0123%* + /éèçùïô
I28	Internal 1028	<esc>(#<esc>(s1p*v0s4b4362T	**ABCDEfghij#{}$£€@&0123% * +/éèçùïô**
I29	Internal 1029	<esc>(#<esc>(s1p*v0s0b16602T	ABCDEfghij#{}$£€@&0123%*+/ éèçùïô
I30	Internal 1030	<esc>(#<esc>(s1p*v0s3b16602T	**ABCDEfghij#{}$£€@&0123%*+/ éèçùïô**
I31	Internal 1031	<esc>(#<esc>(s1p*v1s0b16602T	*ABCDEfghij#{}$£€@&0123%*+/ éèçùïô*
I32	Internal 1032	<esc>(#<esc>(s1p*v1s3b16602T	***ABCDEfghij#{}$£€@&0123%*+/ éèçùïô***
I33	Internal 1033	<esc>(#<esc>(s1p*v0s0b16901T	ABCDEfghij#{}$£€@&0123%*+/ éèçùïô
I34	Internal 1034	<esc>(#<esc>(s1p*v0s3b16901T	**ABCDEfghij#{}$£€@&0123%*+/ éèçùïô**
I35	Internal 1035	<esc>(#<esc>(s1p*v1s0b16901T	*ABCDEfghij#{}$£€@&0123%*+/ éèçùïô*
I36	Internal 1036	<esc>(#<esc>(s1p*v1s3b16901T	***ABCDEfghij#{}$£€@&0123%*+/ éèçùïô***
I37	Internal 1037	<esc>(19M<esc>(s1p*v0s0b16686T	ABXΔEφγηιφ#{}∃≤∈≅&0123%*+/⟨ ®Γ|⌉| |
I38	Internal 1038	<esc>(#<esc>(s1p*v0s0b45101T	[illegible]

: Symbol set   * : Font height

PCL Emulation Fonts

I39	Internal 1039	<esc>(#<esc>(s0p*h0s3b4099T	**ABCDEfghij#{}$£€@&0123%*+/ éèçùïô**
I40	Internal 1040	<esc>(#<esc>(s0p*h1s0b4099T	*ABCDEfghij#{}$£€@&0123%*+/ éèçùïô*
I41	Internal 1041	<esc>(#<esc>(s0p*h1s3b4099T	***ABCDEfghij#{}$£€@&0123%*+/ éèçùïô***
I42	Internal 1042	<esc>(#<esc>(s0p*h0s0b4102T	ABCDEfghij#{}$£€@&0123%*+/ éèçùïô
I43	Internal 1043	<esc>(#<esc>(s0p*h0s3b4102T	ABCDEfghij#{}$£€@&0123%*+/ éèçùïô
I44	Internal 1044	<esc>(#<esc>(s0p*h1s0b4102T	*ABCDEfghij#{}$£€@&0123%*+/ éèçùïô*
I45	Internal 1045	<esc>(#<esc>(s1p*v0s0b24607T	ABCDEfghij#{}$£€@&0123%*+/éèçùïô
I46	Internal 1046	<esc>(#<esc>(s1p*v1s0b24607T	*ABCDEfghij#{}$£€@&0123%*+/éèçùïô*
I47	Internal 1047	<esc>(#<esc>(s1p*v0s2b24607T	**ABCDEfghij#{}$£€@&0123%*+/éèçùïô**
I48	Internal 1048	<esc>(#<esc>(s1p*v1s2b24607T	***ABCDEfghij#{}$£€@&0123%*+/éèçùïô***
I49	Internal 1049	<esc>(#<esc>(s1p*v0s-3b24623T	ABCDEfghij#{}$£€@&0123%*+/éèçùïô
I50	Internal 1050	<esc>(#<esc>(s1p*v1s-3b24623T	*ABCDEfghij#{}$£€@&0123%*+/éèçùïô*
I51	Internal 1051	<esc>(#<esc>(s1p*v0s2b24623T	**ABCDEfghij#{}$£€@&0123%*+/éèçùïô**
I52	Internal 1052	<esc>(#<esc>(s1p*v1s2b24623T	***ABCDEfghij#{}$£€@&0123%*+/éèçùïô***
I53	Internal 1053	<esc>(#<esc>(s1p*v0s0b24703T	ABCDEfghij#{}$£€@&0123%*+/éèçùïô
I54	Internal 1054	<esc>(#<esc>(s1p*v1s0b24703T	*ABCDEfghij#{}$£€@&0123%*+/éèçùïô*
I55	Internal 1055	<esc>(#<esc>(s1p*v0s3b24703T	**ABCDEfghij#{}$£€@&0123%*+/éèçùïô**
I56	Internal 1056	<esc>(#<esc>(s1p*v1s3b24703T	***ABCDEfghij#{}$£€@&0123%*+/éèçùïô***
I57	Internal 1057	<esc>(#<esc>(s0p*h0s0b24579T	ABCDEfghij#{}$£€@&0123%*+/éèçùïô
I58	Internal 1058	<esc>(#<esc>(s0p*h0s3b24579T	**ABCDEfghij#{}$£€@&0123%*+/éèçùïô**

: Symbol set * : Font height

PCL Emulation Fonts

159	Internal 1059	<esc>(#<esc>(s0p*h1s0b24579T	*ABCDEfghij#{}$£€@&0123%*+/éèçùïô*
160	Internal 1060	<esc>(#<esc>(s0p*h1s3b24579T	***ABCDEfghij#{}$£€@&0123%*+/éèçùïô***
161	Internal 1061	<esc>(#<esc>(s1p*v0s0b24580T	ABCDEfghij#{}$£€@&0123%*+/éè çùïô
162	Internal 1062	<esc>(#<esc>(s1p*v1s0b24580T	*ABCDEfghij#{}$£€@&0123%*+/éè çùïô*
163	Internal 1063	<esc>(#<esc>(s1p*v0s3b24580T	**ABCDEfghij#{}$£€@&0123%*+/é èçùïô**
164	Internal 1064	<esc>(#<esc>(s1p*v1s3b24580T	***ABCDEfghij#{}$£€@&0123%*+/é èçùïô***
165	Internal 1065	<esc>(#<esc>(s1p*v4s0b24580T	ABCDEfghij#{}$£€@&0123%*+/éèçùïô
166	Internal 1066	<esc>(#<esc>(s1p*v5s0b24580T	*ABCDEfghij#{}$£€@&0123%*+/éèçùïô*
167	Internal 1067	<esc>(#<esc>(s1p*v4s3b24580T	**ABCDEfghij#{}$£€@&0123%*+/éèçùïô**
168	Internal 1068	<esc>(#<esc>(s1p*v5s3b24580T	***ABCDEfghij#{}$£€@&0123%*+/éèçùïô***
169	Internal 1069	<esc>(#<esc>(s1p*v0s0b24591T	ABCDEfghij#{}$£€@ &0123%*+/éè çùïô
170	Internal 1070	<esc>(#<esc>(s1p*v1s0b24591T	*ABCDEfghij#{}$£€@&0123%*+/é èçù ïô*
171	Internal 1071	<esc>(#<esc>(s1p*v0s3b24591T	**ABCDEfghij#{}$£€@ &0123%*+/éè çùïô**
172	Internal 1072	<esc>(#<esc>(s1p*v1s3b24591T	***ABCDEfghij#{}$£€@ &0123%*+/éèç ùïô***
173	Internal 1073	<esc>(#<esc>(s1p*v0s0b25093T	ABCDEfghij#{}$£€@&0123%*+/éèç ùïô
174	Internal 1074	<esc>(#<esc>(s1p*v1s0b25093T	*ABCDEfghij#{}$£€@ &0123%*+/éèç ùïô*
175	Internal 1075	<esc>(#<esc>(s1p*v0s3b25093T	**ABCDEfghij#{}$£€@&0123%*+/éè çùïô**
176	Internal 1076	<esc>(#<esc>(s1p*v1s3b25093T	***ABCDEfghij#{}$£€@&0123%*+/éèç ùïô***
177	Internal 1077	<esc>(#<esc>(s1p*v1s0b45099T	*ABCDEfghij#{}$£€@&0123%*+/éèçùïô*
178	Line Printer	<esc>(0N<esc>(s0p16.67h8.5v0s0b0T	ABCDEfghij#{}$£@&0123%*+/ áâéèçùïô

: Symbol set * : Font height

PCL Emulation Fonts

Page 5

I79	Line Printer	<esc>(1U<esc>(s0p16.67h8.5v0s0b0T	ABCDEfghij#§•$ @&0123%*+/
I80	Line Printer	<esc>(2N<esc>(s0p16.67h8.5v0s0b0T	ABCDEfghij#{}$Ł@&0123%*+/ áâéčçůďô
I81	Line Printer	<esc>(5N<esc>(s0p16.67h8.5v0s0b0T	ABCDEfghij#{}$£@&0123%*+/ áâéèçùïô
I82	Line Printer	<esc>(8U<esc>(s0p16.67h8.5v0s0b0T	ABCDEfghij#{}$È@&0123%*+/ ÃãÕÒÓªÿ¶
I83	Line Printer	<esc>(10U<esc>(s0p16.67h8.5v0s0b0T	ABCDEfghij#{}$ú@&0123%*+/ ßΓΘΦτ·∩√
I84	Line Printer	<esc>(11U<esc>(s0p16.67h8.5v0s0b0T	ABCDEfghij#{}$ú@&0123%*┼/ ßΓΘΦτ·∩√
I85	Line Printer	<esc>(12U<esc>(s0p16.67h8.5v0s0b0T	ABCDEfghij#{}$ú@&0123%*+/ ßÔÚÞþ¨´¶

: Symbol set * : Font height

SG Script Fonts

Page 1

Font ID	Font Name	Print Sample
I0	Internal 0	ABCDEfghIj#{}$£€@&0123%*+/½©éèçùïô
I1	Internal 1	*ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô*
I2	Internal 2	**ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô**
I3	Internal 3	***ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô***
I4	Internal 4	**ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô**
I5	Internal 5	***ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô***
I6	Internal 6	ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô
I7	Internal 7	*ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô*
I8	Internal 8	ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô
I9	Internal 9	**ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô**
I10	Internal 10	***ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô***
I11	Internal 11	*ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô*
I12	Internal 12	ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô
I13	Internal 13	**ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô**
I14	Internal 14	***ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô***
I15	Internal 15	ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô
I16	Internal 16	**ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô**
I17	Internal 17	***ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô***
I18	Internal 18	*ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô*
I19	Internal 19	*ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô*
I20	Internal 20	**ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô**
I21	Internal 21	***ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô***
I22	Internal 22	*ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô*

SG Script Fonts		Page 2
I23	Internal 23	ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô
I24	Internal 24	**ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô**
I25	Internal 25	***ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô***
I26	Internal 26	*ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô*
I27	Internal 27	ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô
I28	Internal 28	ABXΔEϕγηιφ#{}∃≤ ≅&0123%*+/| ♥⌈⌊| ⌉| |
I29	Internal 29	**ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô**
I30	Internal 30	***ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô***
I31	Internal 31	*ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô*
I32	Internal 32	ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô
I33	Internal 33	*ABCDEfghij#{}$£€@&0123%*+/½©éèçùïô*
I34	Internal 34	✡✢✣✤✥❋✳✻✼✳✂❝❝✂❣ ✠✆✐✑✒✓☎☛☞✏✪✦ ➪➨➧➶➭➴

7.3 PAPER FORMAT

The following table lists the supported formats:

Media		Trays			
Media sizes	**Dimensions (mm)**	**Upper**	**Manual**	**Lower 1**	**Lower 2**
A4	210 x 297	yes	yes	yes	yes
Letter	215,9 x 279,4	yes	yes	no	no
Legal	215,9 x 355,6	yes	yes	no	no
Executive	184,2 x 266,7	yes	yes	no	no
A5	148 x 210	yes	yes	no	no
B5 (JIS)	182 x 257	yes	yes	no	no
Env B5 ISO	176 x 250	yes	yes	no	no
Env COM 10	104,8 x 241,3	yes	yes	no	no
Env Monarch	98,4 x 190,5	yes	yes	no	no
Env DL	110 x 220	yes	yes	no	no
Env C5	162 x 229	yes	yes	no	no
Env C6	114 x 162	yes	yes	no	no
Postcard	100 x 148	yes	yes	no	no
Capacities		**250**	**1**	**500**	**500**

7.4 COMPATIBILITY WITH RECOMMENDED DRIVERS

HP Laserjet 2200					
Media sizes		**Media Sources**		**Media types**	
driver parameter	**printer parameter**	**driver parameter**	**printer parameter**	**driver parameter (not PCL XL documented)**	**printer parameter**
A4	yes	Automatic selection	automatic tray *	ordinary paper	normal paper
Letter	yes	manual feed	upper tray	transparent	normal paper
Legal	yes	tray 1	upper tray	labels	normal paper
A5	yes	tray 2	lower tray *	document paper	normal paper
B5 ISO	yes			fine cardboard	normal paper
Env COM 10	yes			rough paper	normal paper
Env Monarch	yes			heavyweight paper	normal paper
Env DL	yes	*** If media Size is different from**		envelope	normal paper
B5 (JIS)	yes	**A4: forced in upper tray**		fine paper	normal paper
Postcard	yes				
C5	yes	automatic bac means: the last			
Executive	yes	selected tray.			
Jpnse Dble postcard	A4				
FanFold	A4				
A6	A4				
16 Ko	A4				
210 x 304.8	A4				
8.5 x 13 po.	A4				

Some of mediasize or mediasource values come from the PCL XL standard, some others are copyright.
To know them, see Appendix G - Attribute Value Enumerations Table of PCL XL standard Feature Reference.

default(unsupported forr	A4	default (not named cmd)	automatic tray *	default	normal

HP LaserJet 5Si					
Media sizes		**Media sources**		**Media types**	
driver parameter	**printer parameter**	**driver parameter**	**printer parameter**	**driver parameter (not PCL 5e documented)**	
A4	yes	auto selection	automatic tray *	No driver option	
Letter	yes	upper tray	upper tray		
Legal	yes	manual feed	upper tray		
Env COM 10	yes	env. manual feed	upper tray		
Env Monarch	yes	lower tray	lower tray *		
Env DL	yes	env. tray	upper tray		
B5 (JIS)	yes	MP tray	automatic tray *		
C5	yes	large capacity	lower tray *		
Executive	yes				
A3	A4	*** If media Size is different**			
Ledger	A4	**from A4: forced in upper tray**			
Tabloïd US	A4				
Dble jpnse postcard	A4	automatic bac means: the last			
B4 (JIS)	A4	selected tray.			

Some of mediasize or mediasource values come from the PCL XL standard, some others are copyright.
See Chapter 5-2 : Page Control Command (Page Size Command et Page source command) to know them.

default (unsupported fo	A4	default (non standard cmd)	automatic tray *	default	normal

ADOBE PS					
Media sizes		**Media sources**		**Media types**	
driver parameter (not PS documented)	**printer parameter**	**driver parameter (not PS documented)**	**printer parameter**	**driver parameter (not PS documented)**	**printer parameter**
A4	yes	auto selection	automatic tray *	Normal	normal paper
Letter	yes	upper tray	upper tray	Transparent	normal paper
Legal	yes	lower tray	lower tray *	Thick	normal paper
A5	yes	manual tray	upper tray		
B5 ISO	yes				
Env COM 10	yes	*** If media Size is different**			
Env Monarch	yes	**from A4: forced in upper tray**			
Env DL	yes				
B5 (JIS)	yes	automatic bac means: the last			
Postcard	yes	selected tray.			
C5	yes				
C6	yes				
Executive	yes				

default (unsupported fo	A4	default (non standard cmd)	automatic tray *	default	normal

7.5 FAQ

1 - The bidirectional PJL mode is not supported

2 - Wingdings Font:

The Wingdings font is not part of our internal fonts.
You can download the Windgings font. If not, the Dingbats font is displayed instead.

3 - The "MISSING FONT" message is displayed on LCD screens:

At boot start, fonts stored in the flash memory are not detected.
Reboot the machine: if the message is displayed again, download the font again.

4 - The web server is blocked on secured access and the client has forgotten his login and password:

See the SOS 22 soft-switch: SOS_WEB_ACCES

5 - The client has emailed his adress list to a MFF machine. The attached files format fields are restored in "IMAGE":

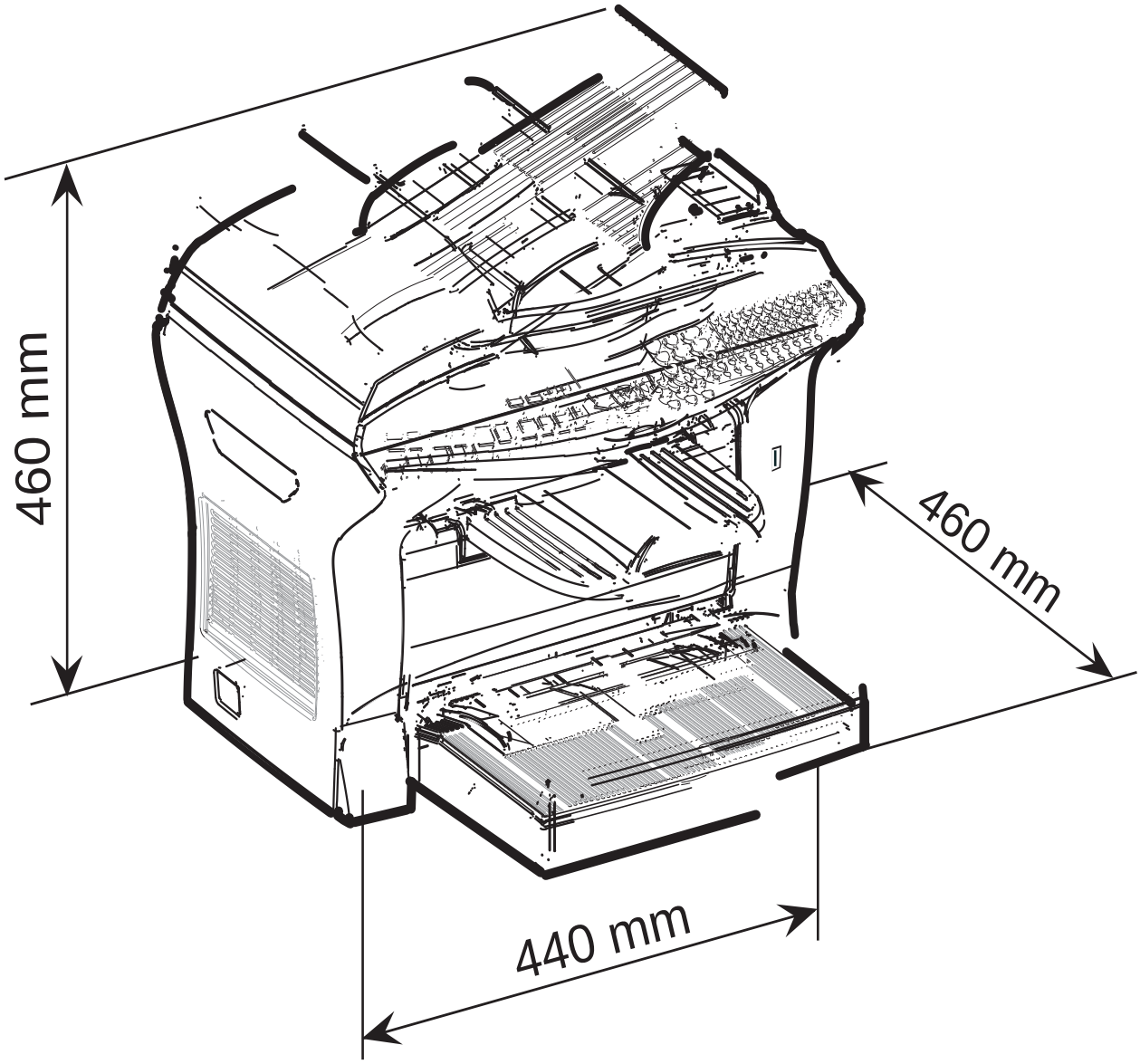
See the SOS 25 soft-switch: SOS_EXPBITPDF

INSTALLATION GUIDE

CONTENTS

1. INSTALLATION REQUIREMENTS

1.1 SPACE REQUIREMENTS



The figure above shows the overall dimensions of the machine, optional accessories not included.

1.2 ELECTRICAL REQUIREMENTS

1.2.1 MAINS

Single-phase AC supply with earth, in conformance with the information on the label on the back of your fax.

Note(s) :

- The machine cannot be connected to an **IT** type power supply.
- The mains input of the machine conforms to the overvoltage **safety level**.

1.2.2 TELEPHONE LINE

The telephone line is equipped with a standardized telephone connector and must be connected to the switched telephone network (private exchange (PABX) or public exchange).

Note(s) : The telephone line input conforms to the **TRT3** safety level.

1.3 ENVIRONNEMENTAL CONDITIONS

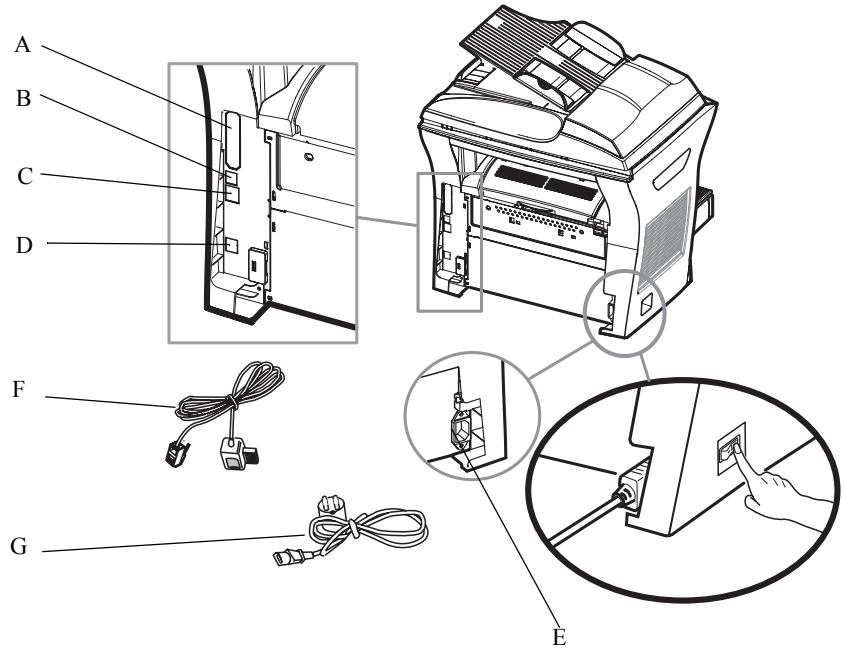
When selecting a location for the machine, the following points should be taken into account:

- The telephone socket should be located at no more than 2 meters.
- A standard single-phase mains socket with earth (rated in conformance with the information on the label on the back of the fax) should be located at no more than 2 meters.
- For easy access to the machine, leave a space of about 25 cm. at the sides and the back. Also leave sufficient space in front of the machine.
- Do not install the machine in direct sunlight, near heating radiators or near air conditioning outlets (see §2.1 of the Technical Description).
- The room should be adequately ventilated.
- Avoid locations where frequent vibrations occur.
- Avoid locations where water or other products might be splashed on the machine.
- The machine should not be installed directly on the floor.
- Place the machine on a flat horizontal support.

2. UNPACKING

- Terminal
- Scanner output tray
- Printer output tray
- Printer paper feed tray
- Mains lead
- Telephone lead
- Document loading tray
- Installation Guide
- CD ROM including the UG (User Guide)

3. CONNECTIONS



3.1 CONNECTING THE TELEPHONE LINE AND LAN

- Plug one end of the telephone lead (F) into socket (D) of the fax and the other end into the telephone wall socket.
- If the machine is equipped with a LAN connection (depending on the model), plug one end of the LAN cable (supplied by your network administrator) into socket (C) of the fax and the other end into the local area network socket allocated to your terminal.

3.2 CONNECTING THE MAINS SUPPLY AND SWITCHING ON

Attention - REFER TO THE SAFETY REGULATIONS IN THE SAFETY CHAPTER OF THE USER GUIDE.

- Plug one end of the mains lead (G) into the mains socket (E) of the fax and the other end into the mains supply wall socket.
- Set the on/off switch to the I position (On).

After a few seconds, as soon as the warm-up of the printer is finished, the date and the time are displayed.

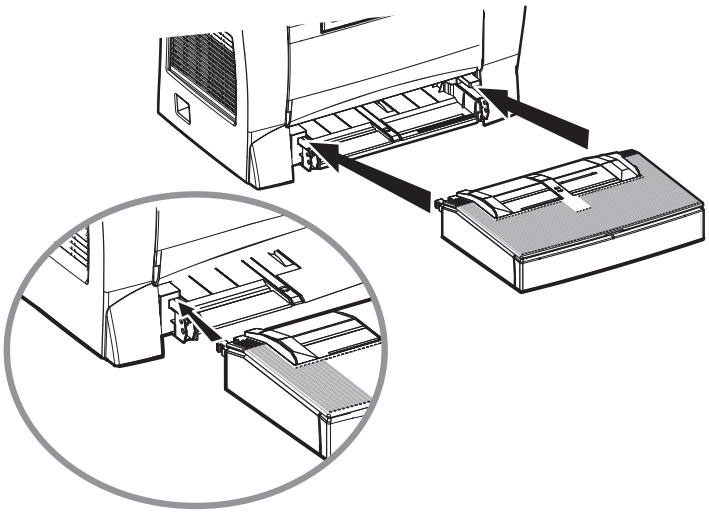
3.3 CONNECTING THE PC (OPTION)

- Connect one end of the PC cable to the PC connector (A) located at the back of your fax.
- Connect the other end of the PC cable to the printer port of your PC.

4. INSTALLING PAPER SUPPLY

4.1 INSTALLING THE PRINTER FEED TRAY

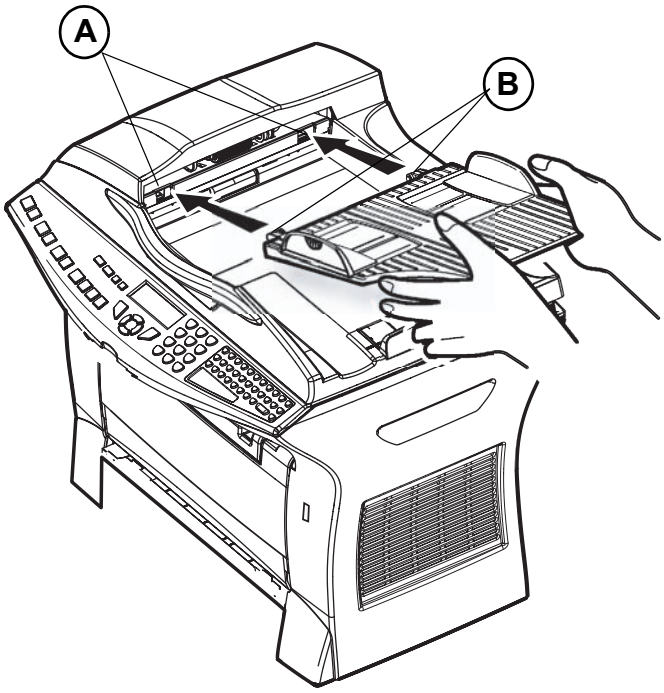
Using the left and right notches of the printer as a guide, carefully push in the tray until it stops (as shown in the illustration).



5. INSTALLING THE TRAYS

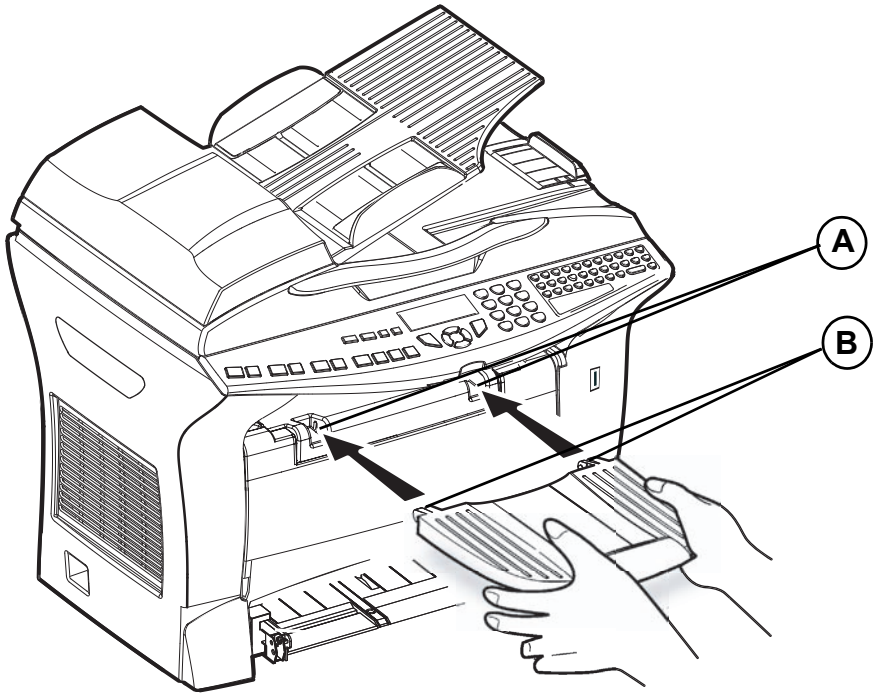
5.1 DOCUMENT LOADING TRAY

Install the tray by clipping the two lugs (B) in the corresponding openings (A).



5.2 DOCUMENT OUTPUT TRAY

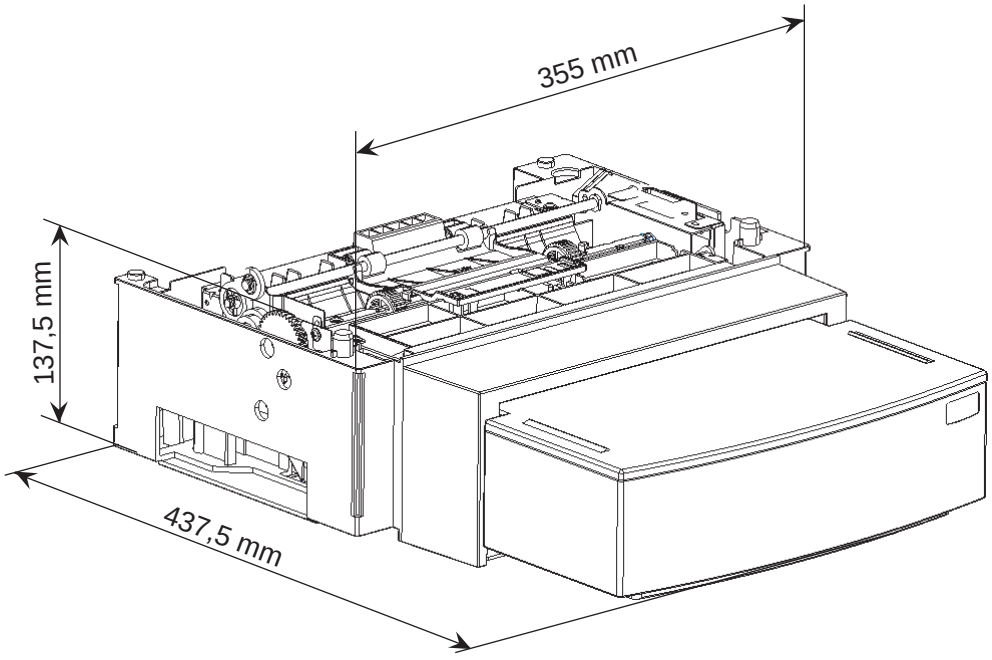
Install the tray by clipping the two lugs of the tray (B) in the corresponding openings (A).



6. INSTALLING ADDITIONAL PAPER TRAYS

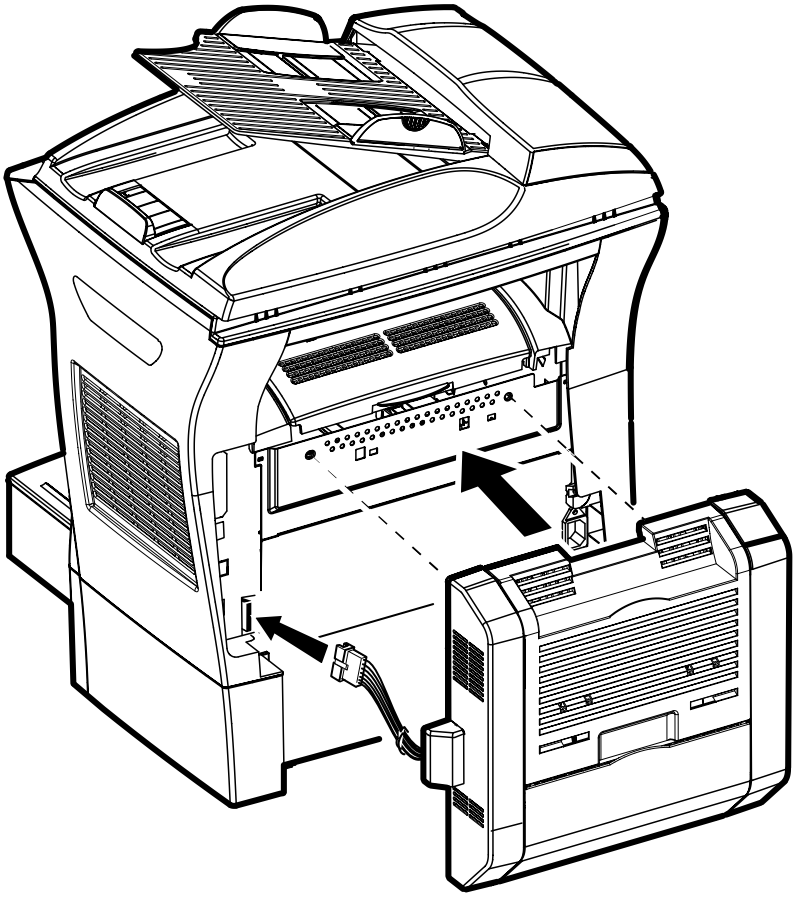
6.1 INSTALLING THE ADDITIONAL PAPER TRAY (DEPENDING ON MODEL OR OPTION)

Refer to the User Guide.



6.2 INSTALLING THE DUPLEX UNIT (DEPENDING ON MODEL OR OPTION)

Refer to the User Guide.



7. INSTALLING THE CONSUMABLES

Refer to the User Guide.

8. START-UP AND SOFTWARE CONFIGURATION

A few seconds after switching on, as soon as the warm-up of the printer is finished, the date and the time are displayed.

Note(s) : When the machine is switched on for the first time, bar codes are displayed then the date and the time are displayed in english.

8.1 USER PARAMETERS

Refer to the User Guide.

8.2 INSTALLATION PARAMETERS

The purpose of these parameters is to adapt the fax to specific user requirements and to the telecommunication standards of the country where the fax is to be installed.

At delivery, each fax is programmed with the factory test configurations. The installer can obtain a printed listing of these parameters (key sequence **MENU**, **5**, **4**, **OK**).

Note(s) : It is advised to keep a paper copy of the list of these parameters at delivery.

The access to these parameters is only authorized to maintenance and/or installation technicians.

The fax is equipped with a set of logic blocks referred to as SOS (SOft Switches) N°1 to 30. Each block consists of 8 bits called bit 1 to 8. Each bit can take a value of either 0 or 1. On the display, a block (from bit 1 to bit 8) is read from right to left. When a configuration is first selected, the blinking cursor is always placed on bit 8 (the bit at the left).

When the display shows the date and the time, you can access the configuration bytes by means of the key sequence:

MENU * #

The description of these parameters can be found below. They are modified in the same manner as all other parameters.

8.3 LIST OF CONFIGURATIONS (SW)

8.3.1 SOFT-SWITCH 1: RINGING AND AUTOMATIC PRINTING

Bit	Value	Naming
1	1	Reserved
2	0	Reserved
3	0	SOS-DURPAUSE: Long/short pause while dialing Values: # 0 (Short 2sec.) or 1 (Long 6sec.)
4	0	Reserved
5	0	Reserved
6	1	SOS-IMPAUTO: Automatic log print Values: 0 (No) or 1 (Yes)
7	0	SOS-IMPT30: Automatic printing of T30 trace after comm error. Values: # 0 (No)1 (Yes)
8	0	SOS-IMPTRA: Trace printing/PC download enable Values: # 0 (No)1 (Yes)

8.3.2 SOFT-SWITCH 2: SCANNER / PRINTER CONFIGURATION

Bit	Value	Naming
1	0	Reserved
2	0	Reserved
3	0	Keyboard beep on/off Values: # 0 (Beep on)1 (no beep)
4	1	Reserved
5	0	Reserved
6	0	Reserved
7	0	SOS-COPLOC: Restriction on local copies Values: # 0 (No)1 (Yes)
8	0	SOS-TIMKONIKA : Timed memorizing of photocopier resolution/contrast/settings Values: # 0 enabled1 disabled

8.3.3 SOFT-SWITCH 3: LINE CONFIGURATION

Bit	Value	Naming
1	1	SOS-NIVEMI: Transmission level Values: 00 = 0 dBm 01 = -1 dBm ... # 06 = -6 dBm ... 0F = -15 dBm
2	0	
3	0	
4	1	
5	0	Reserved
6	0	SOS-SEUILREC: Reception threshold 1 Values: # 0 (-43 dB)1 (-47 dB)
7	0	SOS - EPTV29: Use Echo Protect Tone with V29 Values: #0: (No) 1: (Yes)
8	0	SOS - ECHO: Echo cancelling Values: #0: (No) 1: (Yes)

8.3.4 SOFT-SWITCH 4: FAX PROTOCOL CONFIGURATION

Bit	Value	Naming
1	1	SOS-MODPRIV: Communication in private mode Values: 0 (No)# 1 (Yes)
2	0	SOS-DIS-COURT: Restricted DIS size Values: # 0 (long DIS (complete))1 (Short DIS)
3	0	SOS-TCF: TCF accept criterion Values: # 0 (Normal) refused if there has not been 1 continuous second. 1 (Special) 1 discontinuous second in the TCF, then accepted systematically at 2 400 b/s
4	0	SOS-RTN: Page accept criterion Values: # 0 (10 percent) 1 (15 percent) 2 (20 percent) 3 (no check)
5	0	

Bit	Value	Naming
6	1	SOS-DISINF: Unlimited DIS length Values: 0 (No)# 1 (Yes)
7	0	SOS-LGINF: Maximum length of scan, printing, communication Values: # 0 (1 meters)1 (3 meters)
8	1	SOS-ECM: Restricted ECM Values: 0 (No)# 1 (Yes)

8.3.5 SOFT-SWITCH 5: VOICE/LOUDSPEAKER CONFIGURATION

Bit	Value	Naming
1	1	Reserved
2	0	Reserved
3	0	Reserved
4	0	Reserved
5	0	SOS-HP: Line monitoring during fax comm. Values: # 0 (No)1 (Yes)
6	1	Reserved
7	1	Reserved
8	0	Reserved

8.3.6 SOFT-SWITCH 6: LINE ADJUSTMENT

Bit	Value	Naming
1	0	Reserved
2	0	Reserved
3	0	Reserved
4	0	Reserved
5	0	Reserved
6	0	Reserved
7	0	Reserved
8	0	SOS-TSTDCOM: Driver test functions Values: # 0 (No)1 (Yes)

8.3.7 SOFT-SWITCH 7: RESERVED

Bit	Value	Naming
1	1	Reserved
2	1	Reserved
3	1	Reserved
4	0	Reserved
5	0	Reserved
6	0	Reserved
7	0	Reserved
8	1	Reserved

8.3.8 SOFT-SWITCH 8: REMOTE READOUT/INTERNAL ANSWERING MACHINE / MODEM

Bit	Value	Naming
1	0	SOS-TLR: Remote readout enable (ATTENTION!!) Values: # 0 (No remote readout) 1 (Remote readout enabled)
2	1	Reserved
3	1	Reserved
4	0	Reserved
5	1	Reserved
6	1	Reserved
7	0	Reserved
8	1	Reserved

8.3.9 SOFT-SWITCH 9: APPROVAL + COMMUNICATION APPLICATIONS

Bit	Value	Naming
1	0	Reserved
2	1	Reserved
3	1	Reserved
4	0	SOS-REPERR: Redialing from page fault Values: 0 (No) # 1 (Yes)
5	1	SOS-NOTREMIS: Printing of first page on trasmission rapport Values: 0 (No) # 1 (Yes)
6	1	SOS-GRILLAGE: Burn phone numbers Values: # 0 (No) 1 (Yes)
7	0	SOS-LIGNE5S: Lines of 5 sec.during reception Values: # 0 (Length of lines not limited to 5 sec./line) 1 (Maximum length of a line: 5 seconds)
8	1	SOS-AGRE-FRA: Fench approval functions Values: # 0 (No)1 (Yes)

8.3.10 SOFT-SWITCH 10: COMMUNICATIONS: LOCKS/MISCELLANEOUS

Bit	Value	Naming
1	0	SOS-AFFVIT: Communication rate display Values: # 0 (No) the page number is displayed 1 (Yes) the comm. rate is displayed.
2	1	SOS-BTYPNUM: Access to impulse/DTMF parameter Values: 0 (Yes) Reserved # 1 (No)
3	0	Reserved
4	1	Reserved
5	1	SOS-TLRFAX: Remote readout by fax (ATTENTION!!!) Values: # 0 (Remote readout to Quadrige in transparent mode) 1 (Remote readout by fax)
6	0	Reserved
7	0	SOS-SONREA: Access to redialing parameters (screen /printer) Values: # 0 (No access)1 (With access)
8	0	Reserved

8.3.11 SOFT-SWITCH 11: RETRANSMISSIONS/LOGS

Bit	Value	Naming
1	0	Reserved
2	0	Reserved
3	0	Reserved
4	0	Reserved
5	1	Reserved
6	1	Reserved
7	0	Reserved
8	1	Reserved

8.3.12 SOFT-SWITCH 12: RESERVED

Bit	Value	Naming
1	1	Reserved
2	0	Reserved
3	0	Reserved
4	1	Reserved
5	1	Reserved
6	0	Reserved
7	0	Reserved
8	0	Reserved

8.3.13 SOFT-SWITCH 13: INTERNET

Bit	Value	Naming
1	0	SOS-BRIDEMAIL: Restricted text e-mail reception Values: # 0 (No)1 (Yes)
2	1	SOS-ACKNORECNET: Send "message not received" reply on reception of corrupted messages Values: 0 (No) # 1 (Yes)
3	1	SOS-EFFMSGNOK: Delete corrupted messages Values: 0 (No) # 1 (Yes)
4	1	SOS-PROMONET: Auto directory enrichment (Internet promotion) Values: 0 (No automatic enrichment of directory) #1 (automatic enrichment of directory enabled)
5	0	SOS-VIDEMBOX: Delete first message in the mailbox Values: # 0 (No) 1 (Systematically delete first document)
6	0	SOS-VIDEALLMBOX: Delete entire mailbox Values: # 0 (No) 1 (Systematically empty mailbox)
7	0	Réservé
8	1	SOS-PJTXT: Text attachment processing Values: 0 (No) #1 (Process text attachment)

8.3.14 SOFT-SWITCH 14: INTERNET

Bit	Value	Naming
1	0	SOS-CODNET: Document encoding type for Internet Comm.
2	0	Values: # 00 (MH encoding) 01 (MR encoding) 10 (MMR encoding)
3	0	SOS-BRIDINET: Interet functional restrictions Values: # 0 (No restriction) 1 (Internet functions restricted (no access to the menu))
4	1	SOS-CHAP: CHAP restrictions, password encoding Values: 0 (CHAP not used) # 1 (Use CHAP)
5	0	SOS-DNS: Restricted dynamic DNS, static DNS only Values: # 0 (No dynamic DNS server addresses) 1 (Fixed DNS server addresses)
6	0	SOS-REEMINFINI: Unlimited transmission/reception (Internet relay transmission) Values: # 0 (No)1 (Yes)
7	0	Reserved
8	0	SOS-T2CMPI: Save Internet passwords on i2c card Values: # 0 (No) 1 (Yes)

8.3.15 SOFT-SWITCH 15: INTERNET

Bit	Value	Naming
1	1	SOS-CMPHPPP: PPP header compression: adress/control field Values: 0 (No Compression) # 1 (Compression enabled)
2	1	SOS-AUTHENT: PPP authentification Values: 0 (No authentification) # 1 (With authentification)
3	1	SOS-CMPHPPP2: PPP header compression: protocol field Values: 0 (No compression) 1 (compression enabled)
4	1	SOS-REPSMTP: Wait for 2 packets after HELO command in SMTP Values: # 0 (Normal, wait for single rely packet) 1 (Wait for a second packet if the first one is empty)
5	0	Reserved
6	0	Reserved
7	0	Reserved
8	1	Reserved

8.3.16 SOFT-SWITCH 16: INTERNET

Bit	Value	Naming
1	0	SOS-ACKNORECNET2: Send a "message not understood" reply on reception of TIFF attchment Values: # 0 (Send message) 1 (Do not send message)
2	0	SOS-MAILSWIMP: Printout when rerouting mailswitch Values: # 0 (Printout) 1 (No printout)
3	0	Reserved
4	0	Reserved
5	0	SOS-ACTREEM: Enable/disable rerouting Values: # 0 (Rerouting disabled) 1 (Rerouting/transfer enabled)
6	0	SOS-IMP-MAILTXT: Double printout of mail text in translation Values: # 0 (Double impression) 1 (Single printout but unlimited reception impossible)
7	0	Reserved
8	0	Reserved

8.3.17 SOFT-SWITCH 17: INTERNET

Bit	Value	Naming
1	1	SOS-LAN-ACTIF: Detection of LAN chip (read-only) Valeurs:0 (No) - Default value for model without LAN fct # 1 (Yes) - Default value for model with LAN fct
2	0	SOS - REPERTOIRE-IMPORT: Enable directory import by e-mail Values: # 0 (Unauthorised) 1 (Authorised)
3	0	Reserved
4	0	Reserved
5	0	SOS-NO-TRT-FCERROR: Retry after modem high speed data detection problem Values:# 0 (Yes) 1 (No)
6	0	Reserved
7	0	SOS-IMP-AVISDEPOT: "Delivery notice" report printout Values: # 00 (no) 01 (yes) 10 (systematically) 11 (only in case of error)
8	0	

8.3.18 SOFT-SWITCH 18: CODING/UART RATE

Bit	Value	Naming
1	1	SOS-CODMEM: Stored document encoding type Values: 00 (RL encoding) 01 (MH encoding) 10 (MR encoding) #11 (MMR encoding)
2	1	
3	1	SOS-CODCOM: COM negociated encoding type Values: 01 (MH encoding) 10 (MR encoding) #11 (MMR encoding)
4	1	
5	0	SOS-VITUART: Baud rate of serial link to modem Values: # 00 (115 200 bauds) 01 (57 600 bauds) 10 (38 400 bauds)
6	0	
7	0	SOS-AFF_VIT_REELLE: Show/hide real communication rates Values: # 0 show reduced rates 1 show real rates
8	0	Reserved

8.3.19 SOFT-SWITCH 19: MISCELLANEOUS SOFTWARE FUNCTIONS

Bit	Value	Naming
1	0	Reserved
2	1	Reserved
3	0	SOS-GROUPE: Restriction on groups (or distribution list) Values: # 0 (No groups)1 (Groups accepted)
4	0	SOS-REGULREC: T30 reception control inhibited Values: # 0 (No) 1 (Yes)
5	0	Reserved
6	1	SOS-MENUCLAVIER: Hide keyboard menus and force QWERTY keyboard Values: 0 (Shows) # 1 (Hide)
7	0	SOS-ONETOUCH: Enable "One touche" functions Values: # 0 (No) 1 (Yes)
8	0	SOS-TLC: Accept software download via STN Values: # 0 (No) 1 (Yes)

8.3.20 SOFT-SWITCH 20: RESERVED

Bit	Value	Naming
1	0	Reserved
2	0	Reserved
3	0	Reserved
4	1	Reserved
5	1	Reserved
6	1	Reserved
7	1	Reserved
8	1	Reserved

8.3.21 SOFT-SWITCH 21: T4 DECODEUR/DEBUG

Bit	Value	Naming
1	1	SOS-TRAITLIGERR: T4 decoding line copying mode Values: 0 (For each line with an error) # 1 (Only once, then destroy)
2	0	Reserved
3	0	Reserved
4	0	Reserved
5	1	SOS-GARBAGE-FLASH: Flash memory garbage collection method Values: 0 (garbage collection when application terminates) # 1 (garbage collection as background task) ATTENTION : taken into account only after reboot of the CPU
6	0	Reserved
7	0	SOS-DETECT OCCUP: Inhibition of engaged tone detect Values: # 0 (No)1 (Yes)
8	0	Reserved

8.3.22 SOFT-SWITCH 22: MISCELLANEOUS

Bit	Value	Naming
1	0	SOS-DUREE-2100: Transmission time of the 2100 modified for V34 reception
2	0	Values: # 00 (5 seconds) 01 (4.5 seconds) 10 (4 seconds) 11 (3.5 seconds)
3	0	SOS-SORTIMP: Printing at the end of fax or Internet communications Values: # 0 (Printing during comm.)1 (Print after comm.)
4	0	SOS-MTU-TCP: MTU-TCP size restriction for compatibility with ADSL router Values: # 0 (MTU of 1514 octets)1 (MTU of 1466 octets)
5	0	SOS - WEB- ACCES: Access Mode to embedded Web server Values: # 0 (Unprotected access) 1 (Password protected access)
6	0	SOS-AUTO-GDFID: Enable periodic self-identification Values: # 0 (no)1 (Yes)
7	0	SOS-AUTO-GDFSTS: Enable status automatic transmission to the F@x manager Values: # 0 (No)1 (Yes)
8	0	SOS-AUTO-GDFTLR: Enable remote readout automatic transmission to the F@x manager

8.3.23 SOFT-SWITCH 23: MISCELLANEOUS

Bit	Value	Naming
1	1	SOS-JBIG: SUPER G3 capability to execute communication with JBIG encoding Values: 0 (No SUPER G3) 1 (negociated SUPER G3)
2	0	SOS-BRID-LAN: Restriction on LAN function Values: # 0 (No)1 (Yes)
3	0	SOS-FSI-NOCOVER: Inhibition of generation of cover pages Values: # 0 (FSI V6 cover page) 1 (FSI V7 cover page)
4	0	SOS-COMPACTE-RL: Compacting of run length (for fax server ELLIPSE) Values: # 0 (No compacting)1 (Compacting run length of no length)
5	0	SOS-DEBRIDAGE-JAUGE: Acceptation of EEPROM cards at any moment Values: # 0 (No) 1 (Yes) Returne to 0 after removing the card
6	0	SOS-TLCNET: Download software from Internet/intranet Values: # 0 (Download disabled) 1 (Download enabled)
7	0	SOS-POINT-FINAL-SEUL: Final DATA_SMTP point on its own in the TCP frame ("Pel-tex" problem) Values: # 0 (Disabled)1 (Enabled)
8	1	SOS-PDF: Transmission and reception of PDF document via e-mail. Values : 0 (Disabled) 1 (Enabled)

8.3.24 SOFT-SWITCH 24: IEEE ADRESS, SMS

Bit	Value	Naming
1	1	SOS-AOP-IEEE: Modification of the IEEE address by the AOP Values: # 0 (Modification impossible)1 (Modification possible)
2	0	SOS-FAXSWITCH: Activation of fax switch Values: # 0 (No)1 (Yes)
3	0	SOS-SMS PROTOCOLE: Type of protocol for SMS V23 Values: # 0 (protocol according to the country)1 (Protocole 1)
4	0	SOS-SMSSWITCH: Activation of the SMS SWITCH function Values: # 0 (Disabled)1 (Enabled)
5	0	SOS-SMSSWITCH2: Activation of SMS SWITCH2 the function Values: # 0 (Disabled)1 (Enabled)
6	0	Reserved
7	0	SOS-SMSRECV23: Activation of the SMS V23 reception function Values: # 0 (No SMS V23 reception) 1 (With SMS V23 reception)
8	1	SOS-SMSV23: Activation of the SMS V23 reception function Values: # 0 (SMS V23 enabled)1 (SMS Internet enabled)

8.3.25 SOFT-SWITCH 25: SMS

Bit	Value	Naming
1	1	SOS-TIMSMSSWITCH: Waiting time before transmitting a RING after the first buzzer preceding the CLIP # 00 = 2 seconds 01 = 1 x 200 ms 02 = 2 x 200 ms 03 = 3 x 200 ms 04 = 4 x 200 ms 05 = 5 x 200 ms 06 = 6 x 200 ms ..... 0F = 15 x 200 ms
2	0	
3	0	
4	0	
5	0	SOS-NORXSMSTORXFAX: Switch to FAX reception after faulty SMS reception. # 0: Switches to FAX reception 1: No FAX reception

Bit	Value	Naming
6	0	SOS-TXADTERMINAL: Transmit the terminal address in the server number # 0: No 1: Yes
7	0	SOS-RXADTERMINAL: Receive the terminal address in the server number # 0: No 1: Yes
8	1	SOS-EXPBITPDF: Export the attached file format field (Image/PDF) when exporting the directory via e-mail. # 0: No 1: Yes ATTENTION: If the directory is exported to a machine which does not support this format, the machine (receiver) will loose its current directory, and won't be able to restore the new one.

8.3.26 SOFT-SWITCH 26: MISCELLANEOUS

Bit	Value	Naming
1	0	Display the SMS type #0: No default SMS type menu 1: With SMS type menu
2	0	LOGIN authentification activation #0: LOGIN authentification enabled 1: LOGIN authentification disabled
3	0	With or without dual chip consumable card #0: With dual chip card->display PUT IN OTHER WAY sync chip detected 1: No dual chip card management-> display WRONG CARD if sync chip detected
4	0	Restriction on USB function #0: No 1: Yes
5	0	With or without duplication of on page passage threshold #0: No duplication: NBI_SUP_B (1cm) 1: Duplication: NBI_SUP_B * 2 (2 cm)
6	0	RR/RNR regulation limitation to 4 in T30 #0: No limitation 1: With limitation
7	0	Double alternation optocoupler use #0: Optocoupleur mono alternation 1: Optocoupleur double alternation
8	0	Restriction of CCD lamp extinction #0: With extinction 1: No extinction

8.3.27 SOFT-SWITCH 27: MISCELLANEOUS

Bit	Value	Naming
1	0	Size of remote readout serial number #1000: 8 digits remote readout serial number 1111: 15 digits remote readout serial number (only for EGT for now)
2	0	
3	0	
4	0	
5	0	Waiting time before validation of unexpected modulation in comparison with expected modulation. (~/driver/m_lucent/sms_m_dp2v/src/dpmain.c) # 00 = 60 + 0*30 ms= 60 ms 01 = 60 + 1*30 ms = 90 ms 02 = 60 + 2*30 ms = 120 ms 03 = 60 + 3*30 ms = 150 ms 04 = 60 + 4*30 ms = 180 ms 05 = 60 + 5*30 ms = 210 ms 06 = 60 + 6*30 ms = 240 ms ..... 0F = 60 + 15*30 ms = 510 ms
6	0	
7	0	
8	0	

8.3.28 SOFT-SWITCH 28: MISCELLANEOUS

Bit	Value	Naming
1	0	Activation of fax modification for DTS label #0: Missing 1: Present
2	0	Carrier drop in ECP mode for DTS label #0: Missing 1: Présent
3	0	Disable the 1 second timer before the hanging up #0: Enabled 1: Disabled
4	0	SMS reception error in manual mode in Austria #0: Modification disabled 1: Modification enabled
5	0	Number of bits at the end of frame #0: 18 mark bits (1-10) 1: 6 mark bits
6	0	Telecom Timers Italia #0: With 1: Without
7	0	Telecom settings Italia #0: With 1: Without
8	0	Recall protection #0: With 1: Without

8.3.29 SOFT-SWITCH 29: MISCELLANEOUS

Bit	Value	Naming
1	0	Numbers of SMS centres menus #0: Present 1: Missing
2	0	Activation of the Notification menu #0: Enabled 1: Disabled
3	0	Activation of the validated menu #0: Enabled 1: Disabled
4	0	Force the V29 modulation for 9600 and 7200 rates #0: Enabled 1: Disabled
5	0	Restriction on ECP driver for dumping without menu* D #0: ECP enabled 1: Disabled
6	0	Restriction on Modem presence #0: Modem present 1: Modem missing
7	0	Reserved
8	0	Reserved

8.3.30 SOFT-SWITCH 30: MISCELLANEOUS

Bit	Value	Naming
1	0	Reserved
2	0	Reserved
3	0	Reserved
4	1	Reserved
5	1	Reserved
6	1	Reserved
7	1	Reserved
8	1	Reserved

8.4 SOFTWARE DOWNLOAD

Three methods can be used to update the machine software:

- by means of a link to a PC,
- by means of an STN (switched telephone network) connection,
- by means of a local network.

The main software (that runs on the CPU board), the boot software, the line 2 modem software and the **PCL/SG Script** font files can be downloaded independently.

8.4.1 DOWNLOAD VIA PC LINK

This procedure requires a basic PC running under DOS or Windows and a parallel or USB cable.

- With the machine in an inactive state, disconnect the phone plug so as not to receive any incoming calls. Make sure that all documents in the printer memory have been printed. It is preferable that there are no send commands queued and that the Internet provider selection has been set to **None** (key sequence **MENU 9, 1, 1**): this may affect the programming of the modem software, but should not result in a download failure.
- Connect the PC to the fax by means of the special download cable. Switch the machine to PC download mode (key sequence **MENU, *, 4**), after setting bit 1 of SOS 8 to 1 (1xxxxxxx).
  In a DOS window, type the command ***copy /b machine.bin lpt1*** in the directory where the software is located (assuming that the CPU software file is named machine.bin).
- After between 3 seconds and 2 minutes which can vary depending on the power of the PC, the PC displays ***1 file copied***. The machine should not reboot immediately. If this occurs, either the file is corrupted (wrong checksum) or the software is not compatible with the MFF machine, and the machine reboots with the software that was already installed. Check the file and restart from step 2.
- After approximatly 40 seconds, the machine switches itself off, then switches on again. The **PLEASE WAIT** message is displayed.
- Check the main software version by typing **MENU * V**, and check the software version and the checksum of the boot software by typing **MENU * B** or soft modem **MENU * M** and the fonts checksum **MENU * F.**
- Reconnect the phone plug.

8.4.2 DOWNLOAD VIA STN

This requires a Quadrige (any version), the only equipment that can transmit software to the fax in a special mode referred to as **transparent**. The MFF must be connected to a phone socket with a known phone number. The data rate is less than or equal to 14400 bauds.

- Make sure that all documents in the printer memory have been printed. It is preferable that there are no send commands queued and that the Internet provider selection has been set to **None** (key sequence **MENU 9, 1, 1**): this may affect the programming of the modem software, but should not result in a download failure.
  Set up the machine in STN download mode (key sequence **MENU, *, 3**). There is no confirmation and an alarm sounds (indicating that a special key sequence has been entered).
- On the Quadrige, set up a transmission in Express mode of the binary file that contains the software and start it. To do so:
  - Click on the <**Envelope**> icon: this opens the Express mode window;
  - Find the binary file in the appropriate directory and click on <**Valider**> (validate);

- Enter the phone number of the fax to be downloaded in the first ***destinataire*** (addressee) field;
- Click on <**Emettre**> (send): the transmission is effected when it reaches the top of the transmission queue.

- The Quadrige calls the fax. If the connection is made, the fax displays ***Téléchargement en cours*** (download in progress) and the comm. pictograph is displayed. The communication can take about 23 minutes for a software of about 2000 kbytes. At the normal end of the communication the machine should not reboot immediately. If this occurs, there are two possibilities:
  - The file is corrupted (wrong checksum) or the software is not compatible with the MFF machine, and the machine reboots with the software that was already installed. Check the file and restart the procedure.
  - The communication has been interrupted. Check the number of the fax, skip step 1 and directly restart the communication.
- After approximately 40 seconds, the machine switches itself off, then switches on again. The **PLEASE WAIT** message is displayed.
- Check the software version and the soft checksum by typing **MENU * V**. Or check the software version and the miniboot checksum by typing **MENU * B** or soft modem **MENU * M** and fonts checksum **MENU * F**.

8.4.3 Downloading with the Miniboot

- Position the SOS trace (1 bit 8 à 1)
- Press the 4, 6 and 0 keys simultaneously until the end of this procedure.
- Press stop and type the following sequence: down arrow, * and R (4, 6 and 0 keys pressed).
- The machine reboots, the miniboot detects that the 4, 6 and 0 keys are pressed and switches to download mode. The machine displays the **Waiting for ECP or USB link** message and beeps.
- Release the keys.
- Perform the downloading process following one of the procedures bellow.

8.4.4 Downloading via Local Network

This procedure requires an Ethernet cable and a PC equipped with a LAN card and the Outlook express software.

- Create an Outlook Express account:
  - Launch Outlook Express.
  - In the **Tools** menu, select **Accounts** . The window **Internet Accounts** appears.
  - Click on the **Add** button and select **Mail**.
  - Type "toto" in the **Display Name** field and click on **Next**.
  - Type "toto@toto" in the **Email Adress** field and click on **Next**.
  - Type the address "169.254.0.1" in the **Incoming Mail Server** field and **Outgoing Mail Server** field and click on **Next**.
  - Type "toto" in the **Account Name** field and click on **Next** and **Finish**.
- Check the account connection:
  - Select the newly create account in the Internet accounts list and click on the **Properties**.
  - In the **Connection** tab, tick the **Connect using my local area network (LAN)** "Local Network" checkbox and click on **OK**.
- Connect the PC and the terminal to the Ethernet cable.

- Perform the downloading process following the steps bellow:
  - Modify the terminal IP adress following the steps bellow:
    - Go to the menu: ▼, 2, 5, 3, 2 then OK.
    - Type 169 254 000 001 then OK and STOP.
  - Position the SOS Softswitch bit 8 at 1: ▼, *, #, OK, 1, OK, STOP.
  - Switch to the download mode: ▼, *, T. The machine displays the WAITING @ LOAD message.
  - Create a message (using Outlook Express) on the PC destinated to "toto@toto" and attach to it the file containing the software to download to the terminal . Send the message.
    The terminal LCD screen displays the TELELOADING message.
    At the end of download, the terminal reboots.
  - Check that the download was successfull by typing the following sequence on the terminal keyboard: ▼, *, V.
    The terminal display shows the software version and the checksum.

9. REMOTE READOUT

Attention - Before and after each intervention on a machine equipped with the Remote Readout option, perform a manual transmission of the Remote Readout parameters to the Server center, if the state of the machine allows it.

All faxes are equipped with the Remote Readout option (locked).

The option is unlocked by the installer or maintenance technician during the initial installation or during the intervention following the subscription of the contract (voir § **8.3.8** page **11**).

When intervening on these machines, it is **very important** to proceed with care, because the remote readout parameters are verified by the processing center in order to detect any anomalies, such as moving the machine, withdrawal, unintentional modification of the parameters, attempted fraud, etc.

At each automatic transmission, the Remote Readout parameters are transmitted in the night to the Server center. A report of the transmission of these parameters is printed.

9.1 ENABLING THE REMOTE READOUT

The remote readout is enabled by means of a softswitch: bit 1 of SOS 8. The parameters can then be set by means of the hidden menu (key sequence **MENU, *, 6**). The essential parameters that trigger a remote readout are the interval in days and the page thresholds. Once the parameters have been entered, they can be consulted by means of the key sequence **MENU, 8, 6, 1** and printed by means of the key sequence **MENU, 8, 6, 2**.

The transmission mode of the remote readout can be selected by means of another softswitch, bit 5 of SOS 10, which can be set to 1 for conventional fax transmission and 0 for transparent mode.

9.2 TRIGGER CRITERIA

The remote readout can be triggered by two types of criteria: “day” or “threshold”.

- The “day” criterion is based on the “interval in days” parameter entered in the remote readout menu accessed by means of the key sequence **MENU, *, 6**. This parameter represents the interval at the end of which a remote readout is transmitted. If the parameter has been set to 30, a remote readout will be transmitted every 30 days. This parameter cannot exceed 365 days. A transmission using the day criterion allows the server center to regularly monitor its installed base of machines and to detect any anomalies that may occur. The remote readout using the day criterion can be disabled by entering an interval of zero.

- The “threshold” criterion is based on the page thresholds entered in the remote readout menu accessed by means of the key sequence **MENU, *, 6**. When a consumables counter drops below the corresponding threshold, the remote readout is triggered. For instance, if the toner threshold is set to 1500 pages, a remote readout will be transmitted when the toner counter drops below 1500, or in other words, when the remaining toner allows no more than 1500 pages to be printed.

These counters cannot be read directly, however, they can be calculated easily by means of the percentages displayed in the advanced functions menu (key sequence **MENU, 8, 6**),
relative to the initial number of pages for the consumable (as shown in the remote readout report).
If, for instance, the initial number of pages for the consumable is **8000** and the threshold is set to **2000** pages, the remote readout will be triggered when the corresponding percentage drops below 25 %.

The remote readout using the threshold criterion can be triggered only once per consumable. Once the remote readout has been transmitted, the criterion will no longer be tested until the consumable has been replaced.

The transmissions triggered by the two criteria (thresholds and day) are independent of each other. I.e., as soon as one of the criteria is met, the transmission is triggered, irrespective of the state of the other parameters. The transmission is immediate.

It is also possible to force a transmission manually by means of the **FONCTIONS ÉVOLUÉES** (advanced functions) menu (key sequence **MENU, 8, 6, 3**).

9.3 INITAL CONSUMABLES

On a new machine, the consumables are activated by reading an initial EEPROM card. The consumables present in the machine at that time are referred to as the ***initial*** consumables. In this case, regardless of the thresholds entered in the **FONCTIONS ÉVOLUÉES** (advanced functions) menu (key sequence **MENU, *, 6**), for each consumable the first remote readout will be triggered on the base of a threshold criterion of 1000 pages. After this, when the consumable has been replaced and after reading the EEPROM card, the machine switches to the standard remote readout mode as described earlier.

9.4 DESCRIPTION OF THE TRANSMITTED DATA

9.4.1 FORMAT OF TRANSMITTED DATA IN TRANSPARENT MODE

When a criterion is met, a transmission in transparent mode is generated (the softswitch SOS 10 bit 5 must have been set to 0).
The structure of the transmitted file is of the type TLV (Type - Length - Value).

The transmitted data are defined below, with for each item: its identifier (TLV “type”), its format (numerical or character string) and its origin (entered by the operator or generated by the software).

These parameters, which are also present in the transmission report, will be described further on.

Field	Type	Char. / Num.	Manual entry
TVERS_TLR	0x00	char	No
TNO_23MIL	0x01	char*	Yes
TNO_SERIE	0x02	char*	Yes
TNO_CLIENT	0x03	char*	Yes
TNO_VERSION	0x04	char*	No
TINDICATIF	0x05	char*	Yes
TIDENTIFIANT	0x06	char*	Yes
TNO_SERVEUR	0x08	char*	Yes
TCAUSE_EMIS	0x09	uchar	No
TNOMRESP	0x10	char[15]	Yes

Field	Type	Char. / Num.	Manual entry
TSOCIETE	0x11	char[15]	Yes
TADRESSEL1	0x12	char[30]	Yes
TADRESSEL2	0x13	char[30]	Yes
TADRESSEL3	0x14	char[30]	Yes
TCODEPOSTAL	0x15	char[15]	Yes
TVILLE	0x16	char[30]	Yes
TPAYS	0x17	char[15]	Yes
TLANGUE	0x18	char[15]	Yes
TTELEPHONE	0x19	char[30]	Yes
TDATE_EMIS	0x21	char*	No
T_CPT_PAGES	0x40	long	No
T_CRIT_JOURS	0x42	long	Yes
T_CPT_PAGES_JOURS	0x43	long	No
T_DATE_SEUIL_JOURS	0x45	char*	No
T_INIT_NOIR	0x46	long	No
T_CPT_NOIR	0x47	long	No
T_SEUIL_NOIR	0x48	long	Yes
T_DATE_SEUIL_NOIR	0x49	char*	No
T_DATE_CHG_NOIR	0x4a	char*	No
T_INIT_OPC	0x5a	long	No
T_CPT_OPC	0x5b	long	No
T_SEUIL_OPC	0x5c	long	Yes
T_DATE_SEUIL_OPC	0x5d	char*	No
T_DATE_CHG_OPC	0x5e	char*	No
T_INIT_FOUR	0x64	long	No
T_CPT_FOUR	0x65	long	No
T_SEUIL_FOUR	0x66	long	Yes
T_DATE_SEUIL_FOUR	0x67	char	No
T_DATE_CHG_FOUR	0x68	char	No

The values of the field ***Cause d'émission*** (TCAUSE_EMIS, reason for transmission) are the following :

Interval (days)	2
Manual send	3
Toner	4
Drum	8
Revision	10

The initial values of the page counters for new consumables are:

- 2 000 pages for the toner (T_INIT_NOIR)
- 4 000 pages for the drum (T_INIT_OPC)

9.4.2 REMOTE READOUT REPORT

For each transmission a remote readout report is printed. It contains all the data that have been transmitted to the server in transparent mode. In the case of a transmission in fax mode, the fax that is received is identical to this report.

The report uses the presentation shown below :

**** PARAMETRES DE TELERELEVE ****

INFORMATIONS GENERALES

Numéro 23 millions	: XXXXXXXXXXX
Numéro de série	: XXXXXXXX
Numéro compte client	: XXXXXXXXXXX
Numéro de version	: XXXXXXXXX
Numéro	: XXXXXXXXXXXXXX
Nom	: XXXXXXXXXXX
Centre serveur	: XXXXXXXXXXXXXX
Nom de la personne responsable	: XXXXXXXXXXXXXX
Société	: XXXXXXXXXXXXXX
Adresse	: XXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Adresse	: XXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Adresse	: XXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Code postal	: XXXXXXXXXXXXXX
Ville	: XXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Pays	: XXXXXXXXXXXXXX
Langue	: XXXXXXXXXXXXXX
Téléphone	: XXXXXXXXXXXXXXXXXXXXXXXXXXXXX

INFORMATIONS DE GESTION

Statut de l'imprimante: Nombre de pages : XXXXX

Intervalle jours : Intervalle jours : XXXX
Précédente télérelève le JJ/MM/AA HH :MM
- Nombre de pages = XXXXX

Toner : Nombre estimé de pages : XXXXX Seuil pages : XXXXX
Précédente télérelève le JJ/MM/AA hh:mm (XXXX pages)
Dernier renouvellement le JJ/MM/AA hh:mm

Tambour : Nombre estimé de pages : XXXXX Seuil pages : XXXXX
Précédente télérelève le JJ/MM/AA hh:mm (XXXX pages)
Dernier renouvellement le JJ/MM/AA hh:mm

INFORMATIONS EMISSION

Cause émission : XXXXXXXXXXXXXX

Heure émission : JJ/MM/AA hh:mm

9.4.3 DESCRIPTION OF THE PARAMETERS

The different fields shown in the report are described below.

General Information

- No 23 millions (TNO_23MIL): the 23M of the module managed by the server, entered by the installer;
- No de série (TNO_SERIE): the identification of the terminal, entered by the installer;
- No compte client (TNO_CLIENT): the identification of the contract, entered by the installer;
- No de version (TNO_VERSION): generated automatically;
- Indicatif (TINDICATIF): the machine number, entered by the installer;
- Identifiant (TIDENTIFIANT): the machine name, entered by the installer;
- Centre Serveur (TNO_SERVEUR): the phone number of the server center or of the fax, entered by the installer.
- Nom du responsable (TNOMRESP): the name of the person responsible for the terminal, entered by the installer.
- Nom de la société (TSOCIETE): the name of the company who owns the terminal, entered by the installer.
- Adresse (TADRESSEL1, TADRESSEL2 et TADRESSEL3):postal adress of the terminal, entered by the installer.
- Code postal (TCODEPOSTAL): entered by the installer.
- Nom de la ville (TVILLE): entered by the installer.
- Nom du pays (TPAYS): entered by the installer.
- Langue (TLANGUE): entered by the installer.
- Téléphone (TTELEPHONE): entered by the installer.

Printer Status

- Nombre de pages (T_CPT_PAGES): the cumulative total number of pages printed since the installation of the machine.

Interval in Days

- Intervalle jours (T_CRIT_JOURS): the trigger interval using the day criterion (0 if the criterion is not active), entered by the installer;
- Précédente télérelève le… (T_DATE_SEUIL_JOURS): date of the last remote readout triggered by the day criterion, or installation date if there has not been any previous remote readout;
- Nombre de pages (T_CPT_PAGES_JOURS): value of the cumulative number of pages printed at the date of the previous remote readout triggered by the day criterion (or 0 if there has not been any previous remote readout).

Toner

- Nombre estimé de pages (T_INIT_NOIR): theoretical capacity of the cartridge estimated in average pages;
- Seuil pages (T_SEUIL_NOIR): trigger level (expressed as the number of pages remaining to be printed) for the transmission of a remote readout triggered by the toner threshold criterion, entered by the installer;

- Précédente télérelève le… (T_DATE_SEUIL_NOIR): date of the last remote readout triggered by the toner threshold criterion, or installation date if there has not been any previous remote readout;
- (XXXX pages) (T_CPT_NOIR): theoretical number of pages remaining to be printed at the instant of the triggering of the previous remote readout by the toner threshold criterion (or 0 if there has not been any previous remote readout);
- Dernier renouvellement le… (T_DATE_CHG_NOIR): date of the last replacement of the toner cartridge.

Drum

- Nombre estimé de pages (T_INIT_OPC): theoretical capacity of the drum estimated in average pages;
- Seuil pages (T_SEUIL_ OPC): trigger level (expressed as the number of pages remaining to be printed) for the transmission of a remote readout triggered by the drum threshold criterion, entered by the installer;
- Précédente télérelève le… (T_DATE_SEUIL_ OPC): date of the last remote readout triggered by the drum threshold criterion, or installation date if there has not been any previous remote readout;
- (XXXX pages) (T_CPT_OPC): number of pages remaining to be printed at the instant of the triggering of the previous remote readout by the drum threshold criterion (or 0 if there has not been any previous remote readout);
- Dernier renouvellement le… (T_DATE_CHG_ OPC): date of the last replacement of the drum.

Revision

- Nombre estimé de pages (T_INIT_FOUR): Number of pages estimated before the next revision;
- Seuil pages (T_SEUIL_ FOUR): entered by the installer, valeur de déclenchement (en nombre de pages restant à imprimer) pour l'émission d'une télérelève sur critère seuil révision ;
- Précédente télérelève le… (T_DATE_SEUIL_ FOUR): date of the last remote readout triggered by the drum threshold criterion, or installation date if there has not been any previous remote readout ;
- (XXXX pages) (T_CPT_FOUR): number of pages remaining to be printed at the instant of the triggering of the previous remote readout by the drum threshold criterion (or 0 if there has not been any previous remote readout);
- Dernier renouvellement le… (T_DATE_CHG_ FOUR): date of the last replacement of the drum.

Transmission Data

- Cause émission (TCAUSE_EMIS): reason for the remote readout transmission;
- Heure émission (TDATE_EMIS): date of the transmission of the remote readout.

9.5 REMINDERS

- Every fax is equipped with a copy counter, implemented in EEPROM memory on the CPU board. This counter is used in particular by the Remote Readout function. It can be consulted by the user (see § 5 of the Installation Guide). This counter cannot be modified. It is stored indefenitely.
- Before any corrective intervention on the machine that risks modifying the installation parameters or the value of the counter (replacement of the CPU board or installation of new software), a manual Remote Readout transmission should be performed, if the state of the machine allows it.

If this transmission is not possible for any reason, print out the Remote Readout parameters or display the copy counter and note these values on the intervention report.

10. SAVING DATA ON EEPROM CARD

The control panel is equipped with a reader that can read and write on EEPROM cards in I2C format ("directory card").

The printer consumables worn state is stored in EEPROM memory (on the CPU board) and can be seen by **MENU 8 6** (in percent) regarding the number of pages initial values.

The printer counters are saved in EEPROM memory too (on the CPU board). These absolute counters show the global use of the machine regardless of consumables: number of printed pages, number of scanned pages, number of transmitted/received pages.
They can be seen by **MENU 8 2** and printed with **MENU * 1** (parameters printout)

The directory cards can be used to save the entire directory (with the e-mail addresses) and optionally the technical parameters.

- Archiving/restoring of the directory only: **MENU 16**.
- Archiving of the directory and the parameters: **MENU * 5**.
- Restoring of the directory and the parameters: **MENU * 9**.

Simplified List of the Parameters Saved on a Directory Card

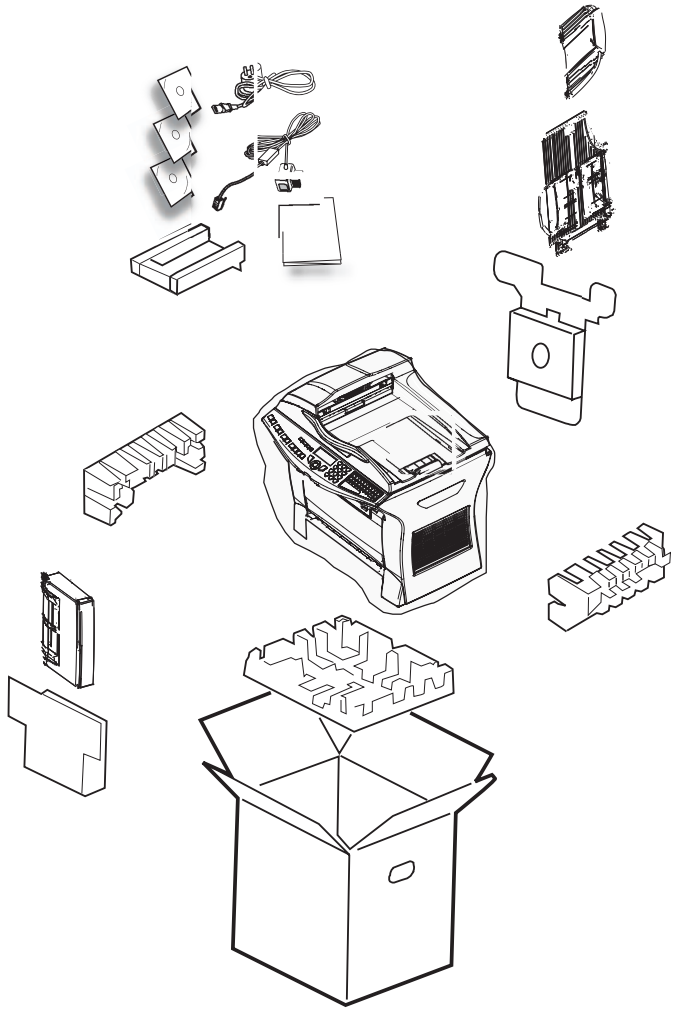
- General Parameters
  - Softswitches
  - Fax number of the machine
  - Mnemonic of the machine
  - Index number of the rerouting address list
  - Reduced-tariff hours for transmission
  - Dialing prefix
  - Passwords for keyboard and direct dialing locks
  - Stanby mode programming + **technical parameters 76 / 90 / 91 / 92 / 93 cf User Guide Chapter 3.**
- Scan/print Parameters
  - Default scan mode
  - Number of copies to print
  - CIS/CCD scanner/printer settings
  - Management modes of the paper trays
  - Enabling of fax answering machine mode
- Fax Communication Parameters
  - Type of STN network
  - Transmission mode
  - Transmission report printout mode
  - Fax transmission/reception rate
  - Number of rings
  - Header (LIC) transmission and printing
- Internet/LAN Communication Parameters
  - Data rate
  - Internet provider

- Time period of connection to the Internet
- Fixed times for Internet access
- Prohibited time period for periodic connection
- Internet connection/transmission modes
- Internet rerouting mode
- LAN configuration mode (manual/automatic)
- Internet provider connection/mail service/servers/**authentification** parameters des providers internet
- LAN mail service/server/**authentification** parameters.

11. PACKING AND TRANSPORT OF THE MACHINE

When you need to transport the machine, always the original packing material. If you do not pack the machine correctly, you risk invalidating the warranty.

1 - Set the mains switch of the machine to “O” (Off).
2 - Disconnect the mains lead from the wall socket, then disconnect all cable connected to the machine.
3 - Remove all the document and paper trays, including the paper feed tray. If your machine has the optional second paper feed tray installed, remove it and keep it.
4 - Pack the document and paper trays in their original plastic bags and packing boxes. Pack the machine in its original plastic cover and place it in the original packing box together with the accessories (trays, documentation, etc.).



5 - Pack the documentation (manuals and printed documents) in the packing box and seal the packing box with adhesive tape.

MAINTENANCE GUIDE

CONTENTS

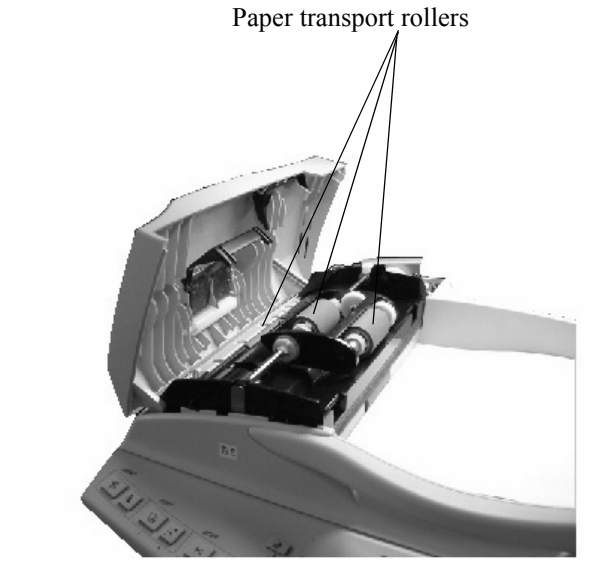
1. SCANNER AND COMMUNICATION

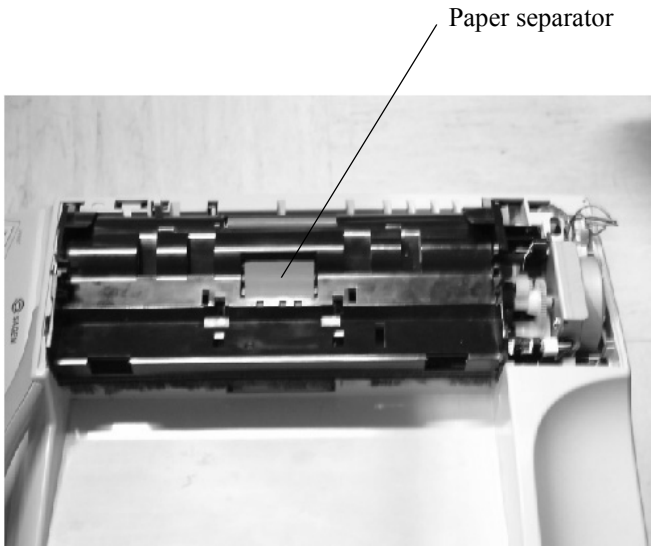
1.1 PREVENTIVE MAINTENANCE

To maintain the fax in good working order, it is recommended to periodically perform the following operations:

- Cleaning the paper transport rollers (document feeder, idler rollers).
- Cleaning the paper separator.
- Cleaning the CIS and flatbed windows.
- Cleaning the control panel keys and the machine covers.
- Printer maintenance (refer to chapter 2).
- To clean the printer, use a soft cloth. Never use abrasives or detergents.

1.1.1 PAPER TRANSPORT ROLLERS





- Set the on/off switch to “O” (off).
- Open the ADF cover.

Clean the rollers of the document feeder and feed shafts, and also the two idler rollers located on the mobile part of the scanner, with a lint-free cloth moistened in isopropyl alcohol.

To clean them, rotate them in the same direction as during paper transport.

Recommended interval: 2 to 6 months, depending on utilization.

1.1.2 PAPER SEPARATOR MODULE

See illustration in § 1.1.1

- Set the on/off switch to “O” (off).
- Open the ADF cover.
- Disassemble the ADF feeder (see worksheet D8).
- Wipe the elements of the paper separator module with a lint-free cloth soaked with isopropyl alcohol.

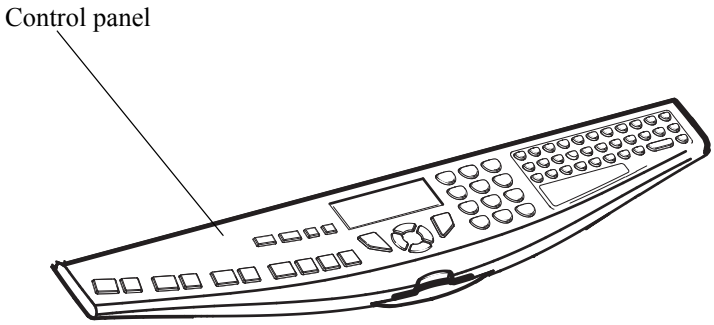
Recommended interval: 2 to 6 months, depending on utilization.

1.1.3 CIS AND FLATBED WINDOWS

- Set the on/off switch to “O” (off).
- Open the flatbed scanner cover.
- Wipe the scanner window with a lint-free cloth moistened with isopropyl alcohol, or with antistatic paper tissues as used for cleaning optical glass.

Recommended interval: to be defined depending on utilization. After cleaning, is advised to make a local copy to check the cleanliness of the window.

1.1.4 CONTROL PANEL KEYS AND COVERS



1.1.4.1 Cleanning the Control Panel Keys

- Set the on/off switch to “O” (off).
- Clean the top of the control panel and the keys with a lint-free cloth moistened with isopropyl alcohol or by means of a spray-on cleaning product. Let the product act for a few moments before wiping it off.

Recommended interval: to be defined depending on utilization**.**

1.1.4.2 Cleaning the Covers

It is advisable to clean all covers during a maintenance visit.

1.2 SCANNING AND COMMUNICATION ERROR CODES

Communication error codes

The communication error codes appear in the logs and in the transmission reports.

1.2.1 GENERAL CODES

Code 01 - Engaged or no fax tone

This code appears after 6 failed attempts. You will have to restart the transmission at a later time.

Code 03 - Stopped by operator

Communication stopped by the operator by pressing the ⊘ key.

Code 04 - Programmed number invalid

Invalid single-key or quick-dial number: check the number (for example, a delayed transmission has been programmed with a single key and the number corresponding to this key has been deleted).

Code 05 - Scanning fault

An incident has occurred at the location of the document to be transmitted. For example, the sheet is jammed.

Code 06 - Printer not available

An incident has occurred on the printer: out of paper, paper jam or cover open. In the case of a reception, this incident code only appears if the “reception without paper” parameter is set to **WITHOUT PAPER**.

Code 07 - Disconnect

The communication has been cut (bad connection).

Code 08 - Quality

This code generally indicates line quality problems. The document that you have transmitted has not been received correctly. Contact your correspondent to check whether it is necessary to retransmit the document: the interference may have occurred in an unimportant area of the document.

Code 0A - No document to recover

You have attempted to recover a document from a correspondent, but the latter has not prepared (stored) the document or the password that was entered is wrong.

Code 0B - Wrong number of pages

There is a difference between the number of pages indicated when the document was prepared for transmission and the number of pages actually transmitted: check the number of pages of the document.

Code 0C - Received document faulty

Ask the correspondent who calls you to check the length of his document (it is too long to be received in its entirety).

Code 0D - Document transmission fault

Ask the correspondent who calls you to retransmit his document.

Code 13 - Memory full

Your fax can no longer receive incoming documents because the memory is full: there are too many documents that have been received but not yet printed, or there are too many documents waiting to be transmitted.
Print the received documents, and delete or transmit in immediate mode the documents waiting to be transmitted.

Code 14 - Memory full

Received document memory saturated. Restore the printer to working order.

Code 15 - Mailbox number x unknown

You want to deposit a document in a mailbox of a correspondent, but the mailbox with this number does not exist with this correspondent.

Code 16 - List number x not retransmitted

You have requested the retransmission of a document by a remote fax, but the latter has not programmed the requested list of recipients.

Code 17 - Mailbox number x unknown

You want to recover a document from a mailbox of a correspondent but the mailbox with this number does not exist with this correspondent.

Code 18 - Retransmission impossible

You have requested the retransmission of a document by a fax that does not have a retransmit function.

Code 19 - Stopped by correspondent

Communication stopped by your correspondent (for example, a fax attempts to recover a document from your fax, while there is no document waiting for this correspondent).

Code 1A - Disconnect

Transmission has not started: the phone line is too noisy.

Code 1B - Document transmission fault

In the case of a transmission: restart the transmission.
In the case of a reception: ask your correspondent to retransmit his document.

1.2.2 INTERNET CODES

Codes 40 and 41 - No reply from provider

The modem cannot connect to the service provider. If this is a systematic error, verify the phone number of the service provider and (if applicable) the dialing prefix associated with the machine.

Code 42 - Connection to service provider impossible

The service provider refuses the connection: the service is momentarily not available. If this is a systematic error, verify the Internet connection parameters (connection identifier, connection password or subscription validity).

Code 43 - Connection to SMPT server impossible

Impossible to connect to the SMPT server to send mail: the service is momentarily not available. If this is a systematic error, verify the Internet e-mail and server settings.

Code 44 - Connection to POP3 server impossible

Impossible to connect to the POP3 server to receive mail: the service is momentarily not available. If this is a systematic error, verify the Internet e-mail and server settings.

Code 45 - Provider disconnect

The service has become momentarily unavailable: try to connect again later.

Code 46 - SMPT server disconnect

Disconnect of the SMPT server to send mail, or mailbox full. The service has become momentarily unavailable: try to connect again later.

Code 47 - POP3 server disconnect

Disconnect of the POP3 server to receive mail. The service has become momentarily unavailable: try to connect again later.

Code 48 - Internet disconnect

The service has become momentarily unavailable: try to connect again later.

Code 49 - Internet connection impossible

Verify the phone number and (if applicable) the dialing prefix associated with the machine.

To verify the Internet parameters, print them out by entering the key sequence **MENU, 9, 4, 5** followed by the **OK** key.

Code 50 - Server Error

Verify the parameterized SMS server number or a communication error occured during data transfer.

1.3 CHECKS - ADJUSTMENTS

1.3.1 SUPPLY VOLTAGES: CONNECTIONS BETWEEN POWER SUPPLY BOARD AND CPU BOARD

CPU board pin	Value	Function
12	+ 5 V	5 V supply
1-3-6-7-8	GND	Ground
2	+ 24 V	24 V supply

Note(s) :

- The mains input of the supply is protected by a fuse.

1.3.2 ADJUSTMENT OF SCANNER CHASSIS

No adjustment required.

1.3.3 VIDEO CHECK

First calibrate the machine. To do so, use the following procedure:

- Place a blank A4 sheet of paper in the loading tray of the sheet feeder scanner.
- Enter the key sequence **MENU**, *****, **a**, and validate by pressing **OK**.
- Wait until the machine restarts.

Make some copies with the CIS and check that the quality of the copies is satisfactory.

In the case of a scanner problem, repeat the calibration procedure above.

In the case of a printer problem (the result remains unsatisfactory after scanner calibration):

- Print the logs to check the printer component of the machine.
- Check the consumable.

1.4 DISASSEMBLY/ASSEMBLY WORKSHEETS

Note(s) : Before any disassembly or assembly operations, the machine must be switched off and all leads on the back of the fax must be disconnected (phone line, LAN, parallel port and mains leads).

Remove the document trays and the paper feed tray.

1.4.1 TOOLS

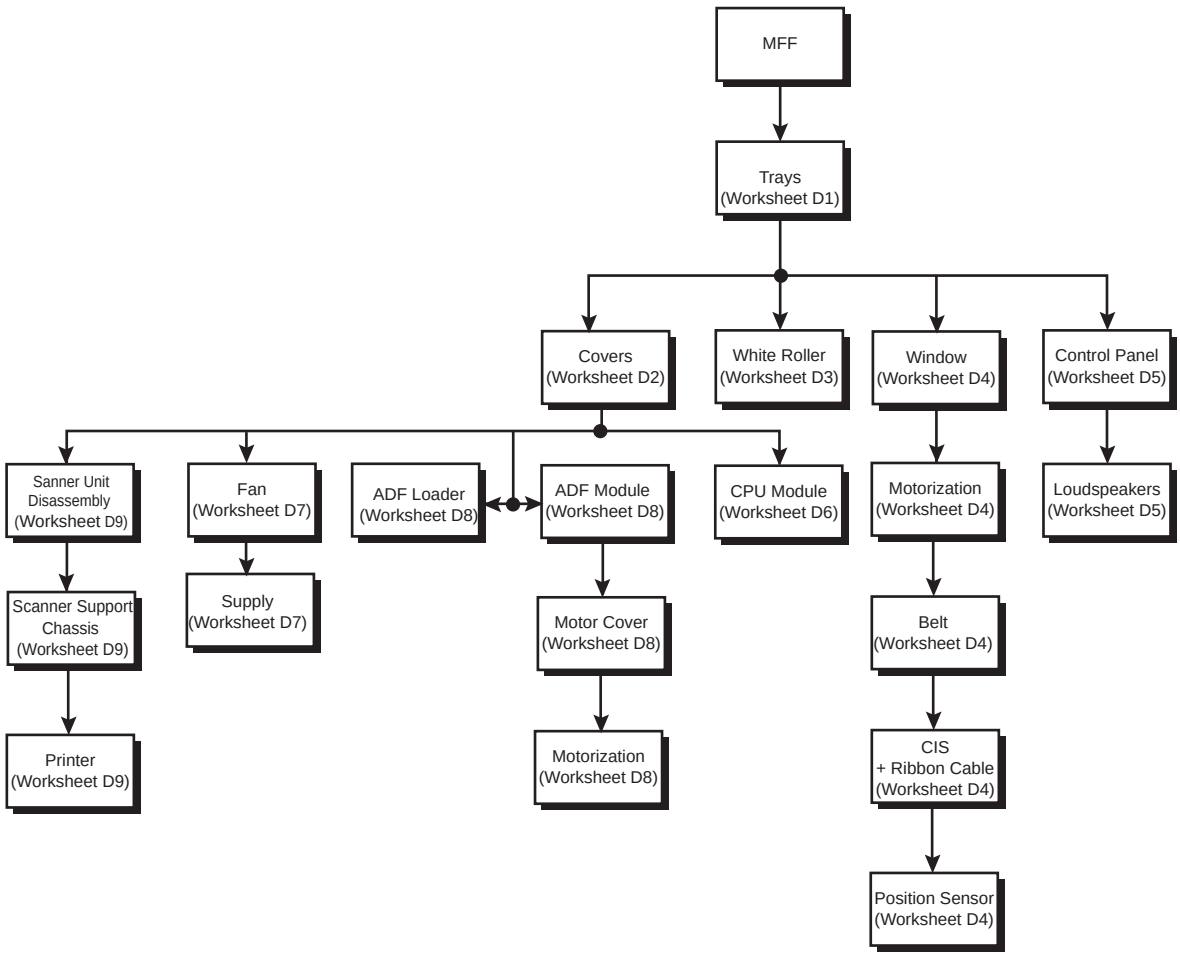
- Phillips screwdriver
- Torx hex screwdriver (Torx10)
- Flat screwdriver (medium size)

1.4.2 WORKSHEETS

- D1=Trays
- D2=ADF, side, printer and paper jam covers,
- D3=White roller
- D4=CIS window - CIS motor - Belt - CIS + CIS cord - Position sensor
- D5=Control panel - Loudspeakers
- D6=CPU module

- D7=Supply (Depending on model or option) - Fan
- D8=ADF module unit
- D9=Scanner-scanner support chassis-Printer unit disassembly

1.4.3 BLOCK DIAGRAM OF WORKSHHEETS



D1	**SUBJECT:** SCANNER OUTPUT TRAY

Tools

- None

Preliminary Steps

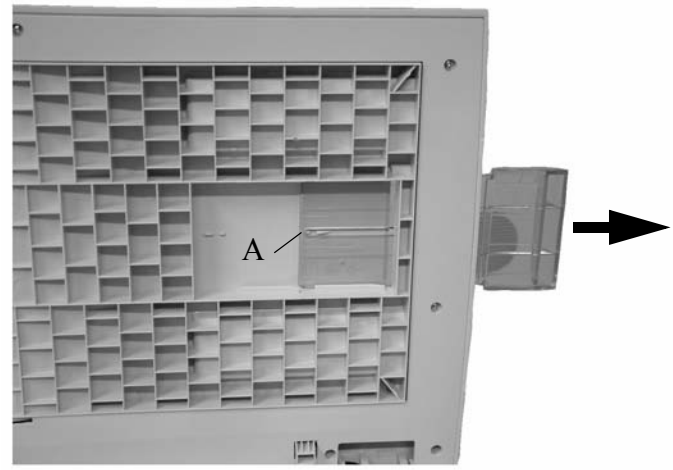
- None.

Disassembly

Note(s) : To install the other trays, refer to User Guide.

- Open the flatbed scanner cover.
- Unstick the white panel located inside the flatbed scanner cover.

- Pull the tray outward lifting the back of the tray (A) to pass the stop.



Assembly

- Insert the tray in its housing.
- Stick the white panel.

D2	**SUBJECT:**ADF, SIDE, PRINTER AND PAPER JAM COVERS,

Tools

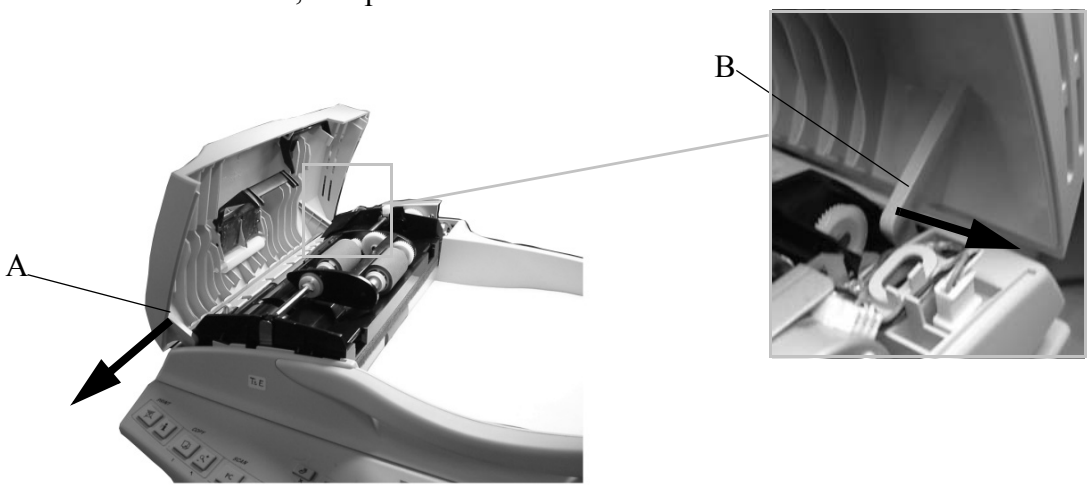
- Phillips screwdriver.
- Flat screwdriver.

Preliminary Steps

- None.

Disassembly

- ADF Cover
  - Stand at the left-hand side of the terminal.
  - Open the ADF cover.
  - Move the arms A and B away from each other in the direction of the arrows shown on the illustration bellow, and pull the cover backward at the same time.



- Side Covers
  - Remove the two mounting screws of side covers.

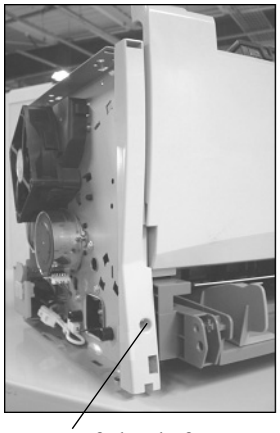
Mounting screw of right-hand side cover

Mounting screw of left-hand side cover

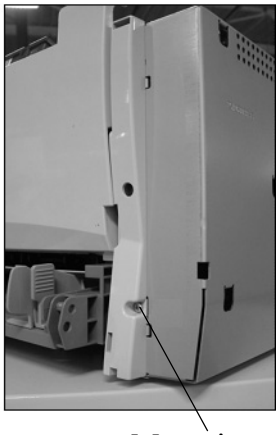
  - Pull out and disassemble the covers.

D2	**SUBJECT:**COVERS

- Printer Covers
  - Remove the printer covers mounting screws and pull out the covers.

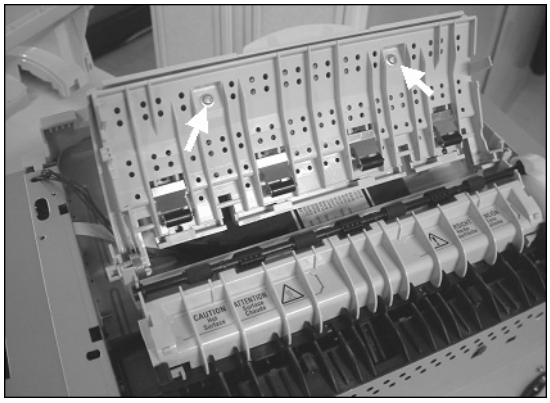


Mounting screw of the left-hand side printer cover



Mounting screw of the right-hand side printer cover

- Paper Jam
  - Remove the two mounting screws of the paper access cover.



  - Disassemble the paper access cover.

Assembly

- Assemble the covers performing the reverse disassemble operations.

D3	**SUBJECT:** WHITE ROLLER

Tools

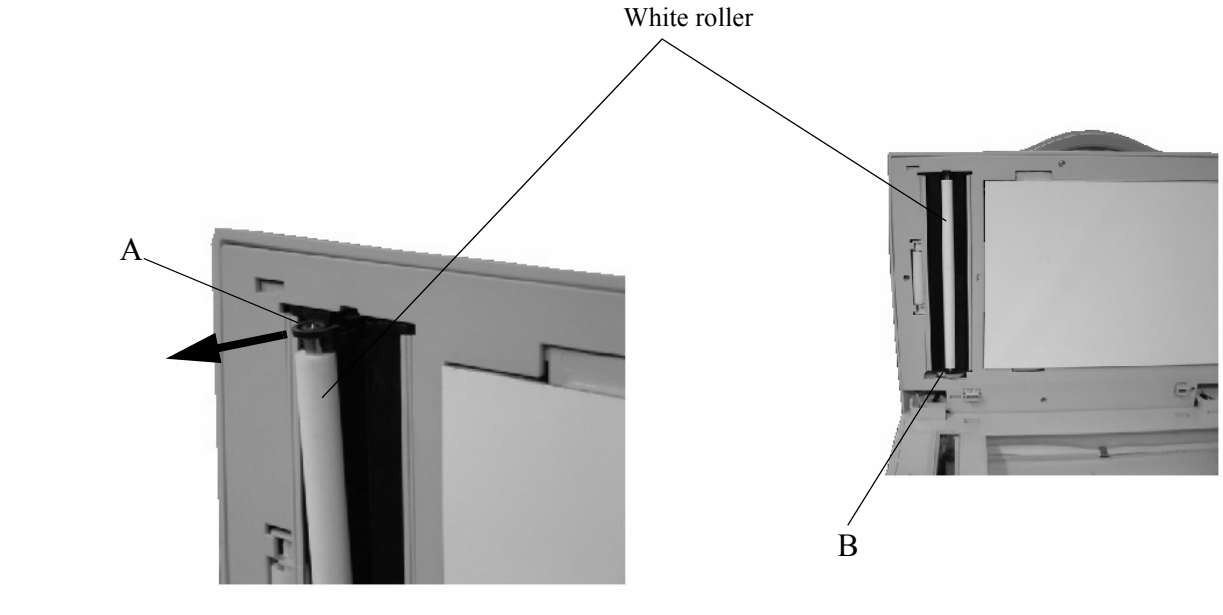
- Flat screwdriver.

Preliminary Steps

- None.

Disassembly

- Stand in front of the terminal.
- Open the flatbed scanner cover.



- Apply a simultaneously downward and outward pressure on the bearing (A), use a flat screwdriver if necessary.
- Press outward the other bearing (B), hold and extract the white roller.
- Remove and keep the pinion and the bearings.

Assembly

- Unpack the new white roller and inspect it visually. Fit the bearings and pinion on the new roller.
- Place the equipped white roller, inserting the two bearings in their housing (oriented the same way as during disassembly).
- Press on the two bearings until it clips.

D4	**SUBJECT:**CIS WINDOW- MOTOR - BELT - CIS + CIS CORD - FB SENSOR

Tools

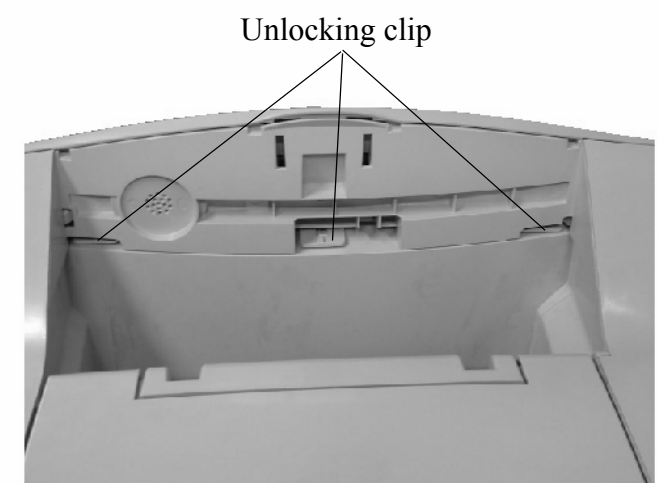
- Phillips screwdriver.

Preliminary Steps

- Disassembly the right-hand side cover (Worksheet D2).

Disassembly

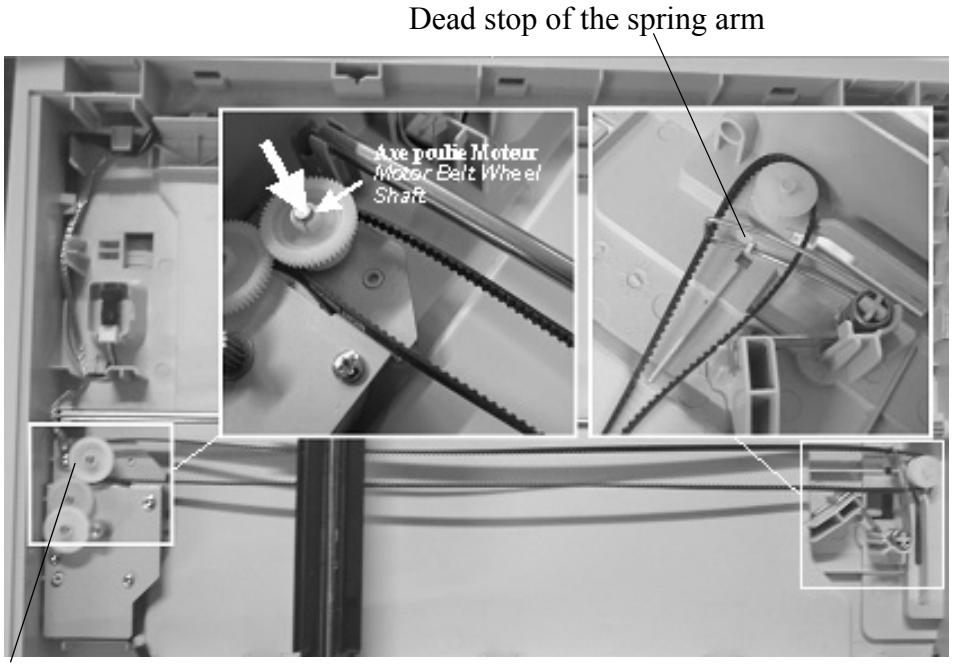
- Stand at the front of the terminal.
- Open the flatbed scanner cover.
- CIS Window
  - Unlock the three clips located under the scanner support chassis.



  - Lift the front of the window and remove the window.

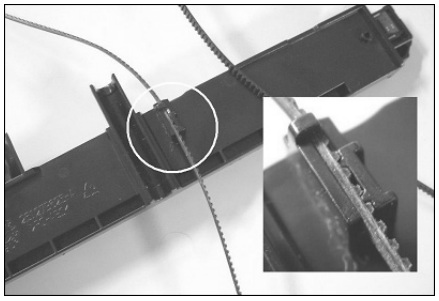
D4	**SUBJECT:**CIS WINDOW- MOTOR - BELT - CIS + CIS CORDCIS CORD - FB SENSOR

- Belt
  - Compress the belt spring and lock its arm as shown on the illustration bellow..

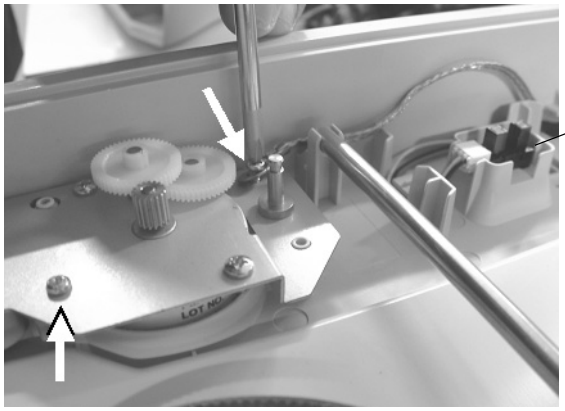


  - Remove the motor wheel using a screwdriver and free the belt.
  - Hold the COS + support unit, turn it over and separate the belt from the CIS support.

Attention - Do not loose the two stoppers at the end of the CIS while turning it over.



- CIS Motor
  - Remove the two mounting screws of the motor.



  - Free the motor wire from its cable guide and disassemble the motor + cable unit.

D4	**SUBJECT:**CIS WINDOW- MOTOR - BELT - CIS + CIS CORD - FB SENSOR

Attention - Memorize the cable path for re-assembly.

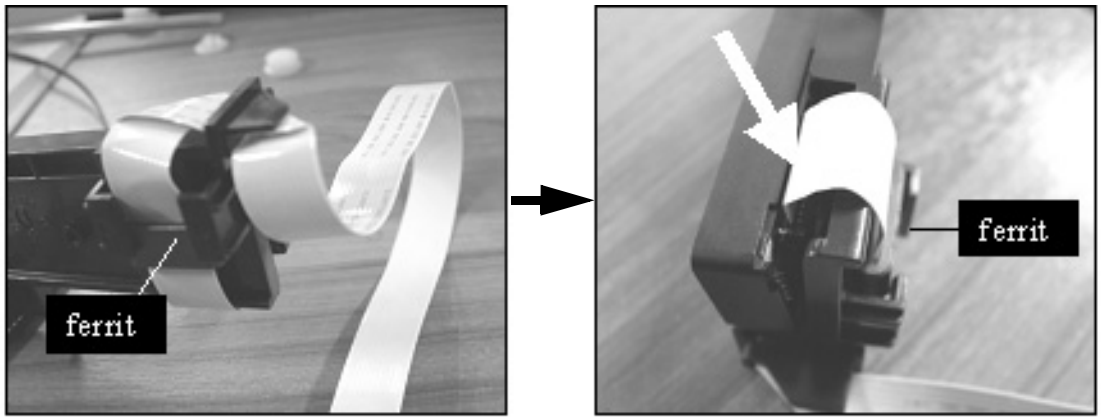
- Remove the FB sensor from its housing and disconnect the lead.

- CIS
  - Disconnect the CIS cord and disassemble the CIS + support unit.
  - Separate the CIS from its support.

Attention - Do not loose the CIS support springs.

Reassembly

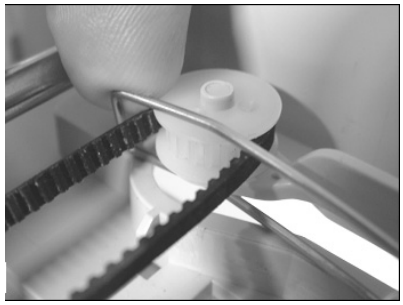
- Unpack and visually inspect the new parts.
- Assemble the CIS with its support and the two springs.
- Fit the CIS cord and the CIS ferrite core, and connect it to the CIS.



- Connect the cable to the FB sensor and clip the FB sensor in its housing.
- Guide the motor lead in its cable guide, and position the motor and fix it with its two mounting screws.
- Mount the belt on the CIS support.
- Put the belt into the belt spring, and around the belt wheel.
- Put the belt around the motor wheel. Assemble and lock it onto its axis.

Attention - Verify that there is enough grease on the motor wheel axis.

- Release the belt spring, check its right position.



- Position the CIS window inserting the back of the window first (slightly lift vertically the scanner cover), and clip the front.
- Assemble the right-hand side cover (woksheet D2).

D5	**SUBJECT:** EQUIPPED CONTROL PANEL - LOUDSPEAKERS

Tools

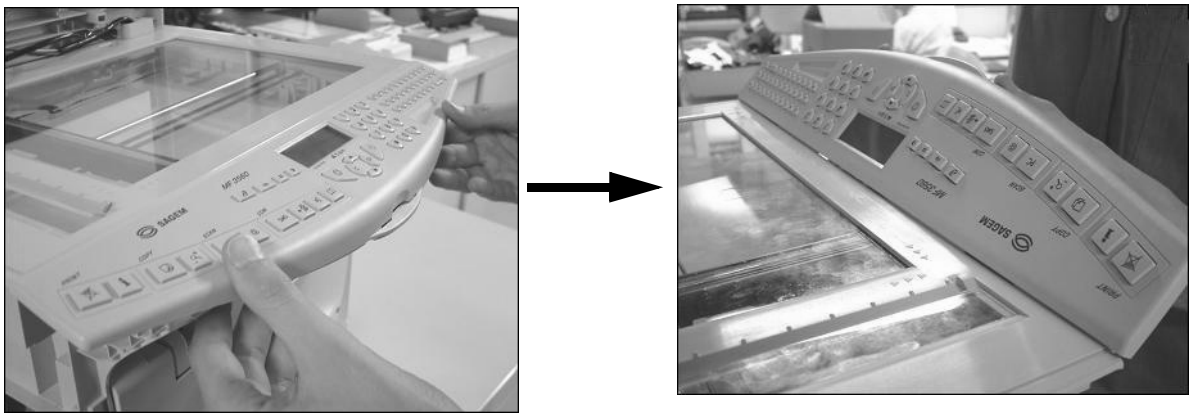
- None.

Preliminary Steps

- None.

Disassembly

- Stand at the front of the terminal.
- Gently lift the front part of the control panel until it comes out.



- Disconnect the PCU card CIS cord and the loudspeaker connector.

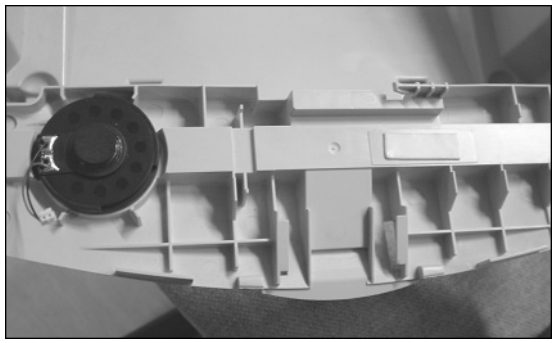
- Lift and pull out the control panel.
- Unstick the loudspeaker from the scanner support chassis.
- Clean the possible residues with a lint-free cloth moistened with isopropyl alcohol .

Assembly

- Unpack and visually inspect the news parts.

D5	**SUBJECT:** EQUIPPED CONTROL PANEL - LOUDSPEAKERS

- Position the loudspeaker in its housing as shown on the illustration bellow



- Position the upper part of the control panel on the chassis.
- Connect the loudspeaker and control panel connectors.
- Apply a pressure on the front of the control panel to put it into place.

D6	**SUBJECT:**CPU MODULE

Tools

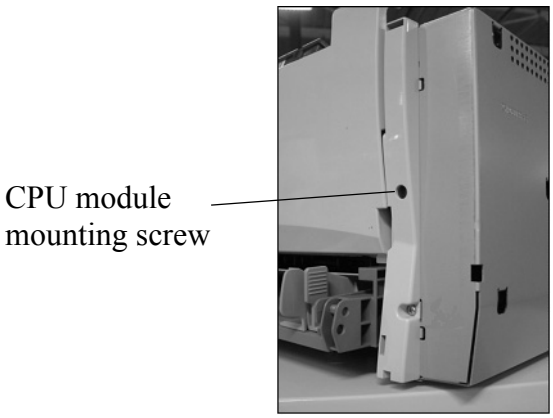
- Phillips screwdriver.

Preliminary Steps

- Disassemble the right-hand side cover. (worksheet D2).

Disassembly

- Disconnect the leads and the CIS cords coming on the CPU module connectors.
- Remove the CPU module mounting screw located at the front of the terminal.



- Rotate the CPU module cover and take it down.

- Remove the five mounting screws of the board on the chassis and disassemble the board.

Assembly

- Unpack and visually inspect the new parts.
- Position the CPU board in the rack, screw in and tighten the five mounting screws.
- Put the chassis hook in its housing and rotate the front part into place.
- Screw and tighten the mounting screw.
- Connect leads and CIS cords.
- Assemble the right-hand side cover (Worksheet D2).

D7	**SUBJECT:** SUPPLY (DEPENDING ON MODEL OR OPTION) - FAN

Tools

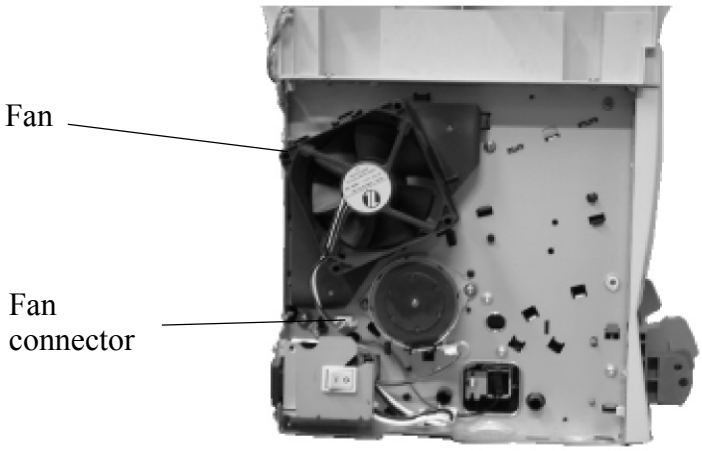
- Phillips screwdriver.

Preliminary Steps

- Disassemble the left cover (Worksheet D2).

Disassembly

- Disconnect the supply and fan leads



- Remove the fan from its housing.
- Disassemble the fan.
- Remove the supply mounting screw.
- Disassemble the power supply.

Assembly

- Unpack and visually inspect the new parts.
- Position the fan in its housing.
- Position the supply in its housing and attach the mounting screws.
- Connect the connectors.
- Assemble the left cover (worksheet D2).

D8	**SUBJECT:** ADF MODULE

Tools

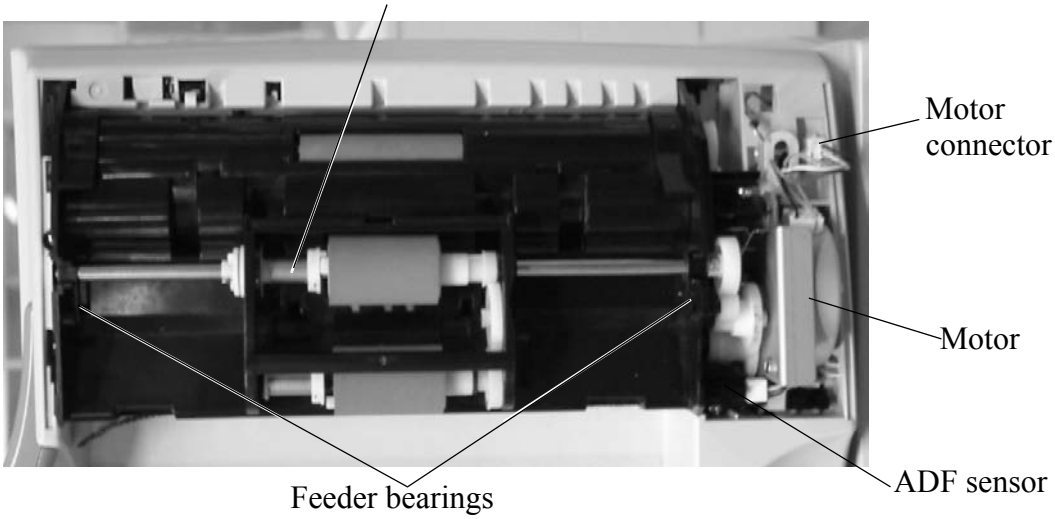
- Phillips screwdriver.

Preliminary steps

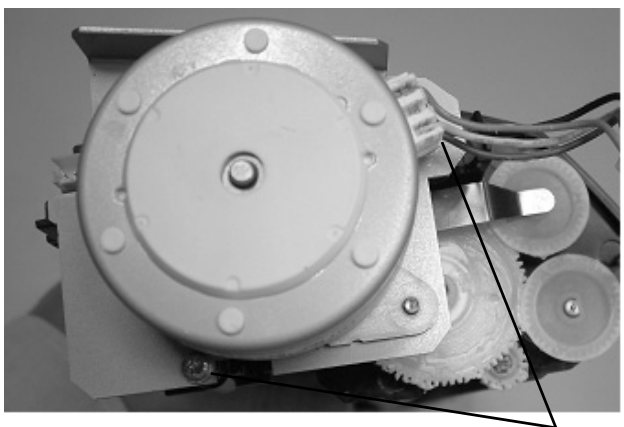
- Disassemble the ADF cover (worksheet D2).

Disassembly

- Disassemble the motor cover
- ADF Feeder
  - Unlock the two feeder bearings (1) and remove the feeder.



- ADF Module
  - Disconnect the motor lead and remove the sensor located on the module.
  - Remove the three mounting screws of the ADF module.
  - Disassemble the ADF module.
- ADF Motor
  - Remove the two mounting screws of the ADF motor



  - Disassemble the motor.

D8	**SUBJECT:**ADF UNIT

Assembly

- Unpack and visually inspect the new parts.
- Position the motor using the guides.
- Attach the motor with the two screws, do not forget to put the ground braid between the screw and the motor support.
- Install the ADF module in its housing.
- Position the sensor in its housing and connect the motor wire.
- Put the ADF feeder and attach the three mounting screws of the ADF module.
- Put the motor cover.
- Assemble the ADF feeder (worksheet D2).

D9	**SUBJECT:** SCANNER-PRINTER INTERFACE-PRINTER UNIT DISASSEMBLY

Tools

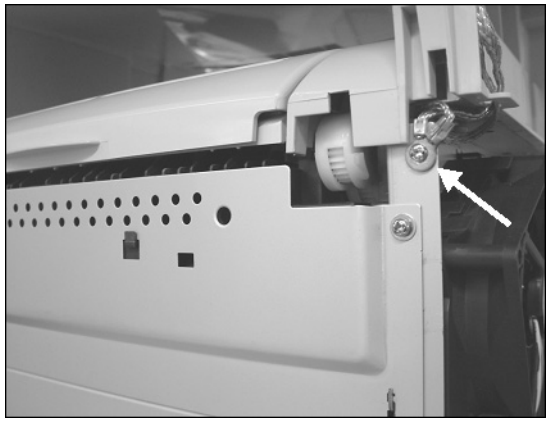
- Phillips screwdriver.

Preliminary Steps

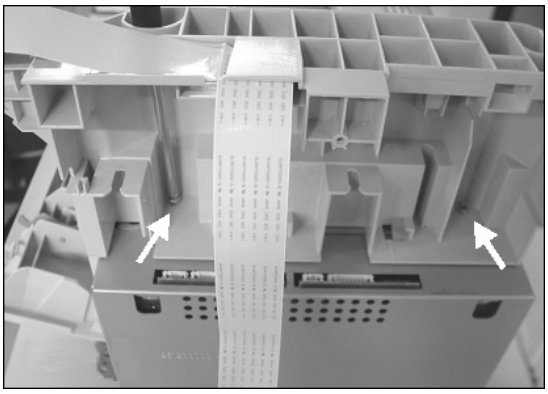
- Disassemble side covers, printer covers and paper access cover (worksheet D2).

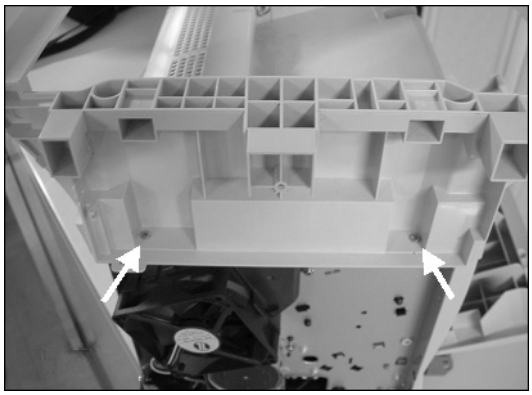
Disassembly

- Disconnect all wires coming from the scanner unit, and free them from their cable guide.
- Remove the mounting screw of the ground braid located at the back of the terminal, on the printer chassis



- Stand at the front of the terminal, disassemble the control panel (see worksheet D5).
- Hold the scanner module, slide it to the left-hand side until it unlocks.
- Disassemble the scanner module.
- Remove the four mounting screws of the printer interface





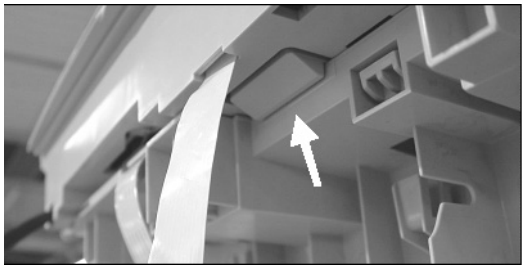
- Open the toner-cartridge access cover and disassemble the printer interface.
- Disassemble the CPU module (see worksheet D6) and the fan (see worksheet D7).

Assembly

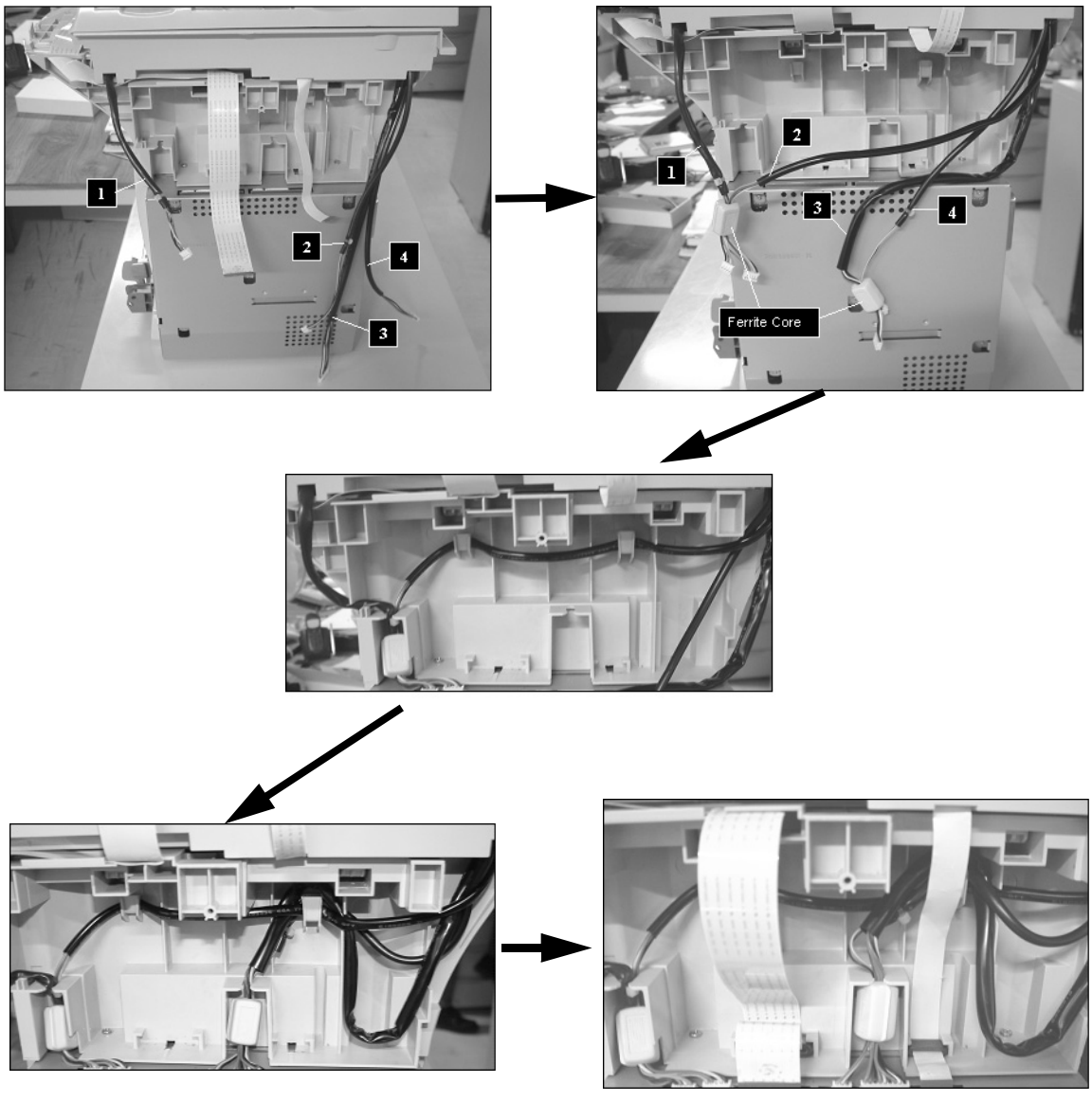
- Assemble the CPU module (see worksheet D6) and the fan (see worksheet D7).
- Open the toner-cartridge access cover and put it the printer interface.
- Attach the four mounting screws of the interface to the printer.

D9	**SUBJECT:** SCANNER-PRINTER INTERFACE-PRINTER UNIT DISASSEMBLY

- Put the scanner module on the interface, push it to the right-hand side until the clip locks (see illustration bellow).



- Insert the control panel (see worksheet D5).
- Arrange the cables as shown on the illustrations bellow.



- Attach the ground braid to the printer chassis.
- Assemble all the covers (worksheet D2).

1.5 FUNCTIONS OF THE ADMINISTRATOR

1.5.1 INITIALIZING AND ERASING THE MEMORIES

First set the installation parameter **CONFIGURATION** bit 8 to 1.

- Reset to default configuration (factory configuration) of all parameters (user and installer (or technical)):

MENU # 0

- Erase directory:

MENU # 1

- Erase logs:

MENU # 2

- Erase printer counters:

MENU # 3

- Erase consumables counters (menu 85)

Attention - This procedure erases options GDF, FSI and kit LAN too.

MENU # 4

To see the initialization message, switch the machine off, then on.

- Re-initialize the flash memory data (complete erase): open the scanner cover, then:

MENU # 5

- Erase mailboxes (internal) only:

MENU # 6

- Erase all, including the e-mail addresses stored in the directory, except for the other data in the directory.
  Reset to default configuration (combination of functions 0, 2, 6, 8):

MENU # 7

- Erase all documents in memory (documents to be transmitted, received documents and deposited documents):

MENU # 8

- Erase first element of printing queue:

MENU # I

- Re-initialize the remote readout counter:

MENU # K

1.5.2 OTHER FUNCTIONS

For these functions, bit 8 of configuration 1 of the installation parameters must first have been set to 1.

- Printout of all parameters (including installation and technical parameters):

MENU * 1

- Switch to forced standby mode, independently of the clock:

MENU * 2

- Switch to “software download by phone” mode:

MENU * 3

- Switch to “software download by PC link” mode:

MENU * 4

- Save the directory and the parameters on an EEPROM card via the smart card reader:

MENU * 5

- Save the directory and parameters via STN:

MENU * 7

- Accept directory and parameters download via STN:

MENU * 8

- Restore directory and parameters from an EEPROM card via the smart card reader:

MENU * 9

- Start feeder scanner calibration:

MENU * A

- Display miniboot version:

MENU * %

- Display PCL/SG Script fonts checksum:

MENU *)

- Retransmission of faxes to print to rerouting mail:

MENU * G

- Activation of dump RAM server:

MENU * K

- Display modem software version:

MENU * M

- Enter serial number (with SOS 1 bit 8, similar to **MENU * R**) :

MENU * 1

- Display LAN rate :

MENU * 3

- Manually reboot the machine (with SOS 1 bit 8 set to 1):

MENU * R

- Accept soft download via Internet or Intranet (with SOS 1 bit 8 set to 1):

MENU * T

- Display main software version, checksum and device serial number:

MENU * V

1.6 REPLACING THE CPU BOARD

Perform the following procedure:

- Perform a remote readout (if the function has been enabled). See chapter 8 of the Installation Guide.
- Save the directory and the parameters on an EEPROM card (**MENU * 5**). See chapter 9 of the Installation Guide
- Replace the CPU board and reinstall the PLCC32 flash memory from the old CPU board on the new board (location ref. Z460 or Z465 or Z 466).
- Restore directory and parameters from the smart card (**MENU * 9**).
- Perform a remote readout (if the function has been enabled).
- Perform a scanner calibration (**MENU 8 0**).

Attention - It is essential that the EEPROM memory "stays" with the printer, because this memory contains, in addition to the boot software:
- the consumables counters,
- the counters of the number of printed pages,
- the remote readout counters,
- the network options (FSI, GDF, kit LAN).

1.7 REPLACING THE SCANNER

Perform the following procedure:

- Perform a remote readout (if the function has been enabled). See chapter **8** of the Installation Guide.
- Save the directory and the parameters on a smart card (**MENU * 5**). See chapter **9** of the Installation Guide.
- Replace the scanner.
- Restore directory and parameters from the EEPROM card (**MENU * 9**).
- Perform a remote readout (if the function has been enabled).
- Perform a scanner calibration (**MENU 8 0)** only if the image quality is low.

2. LASER PRINTER

2.1 PERIODIC MAINTENANCE

Refer to the laser printer Technical Description ref. 251 593 296

2.2 ERROR MESSAGES AND CORRECTIVE MEASURES

Refer to the laser printer Technical Description ref. 251 593 296

2.3 REPAIR

Refer to the laser printer Technical Description ref. 251 593 296

2.4 DISASSEMBLY/ASSEMBLY WORKSHEETS

Refer to the laser printer Technical Description ref. 251 593 296

2.5 REPLACING THE PRINTER

Perform the following procedure:

- Set the on/off switch to the O position (Off).
- Disconnect the phone line, LAN (depending on the model) and mains leads, located at the back of the printer.
- Remove the consumables (these are the property of the client).
- Disassemble the printer (see worksheet D9 of GM 251 593 358).
- Reinstall all elements on the new printer (see worksheet D9 of GM 251 593 358).
- Put the customer’s consumables back in place.
- Reconnect the phone line, LAN (depending on the model) and mains leads.
- Set the on/off switch to the I position (On).

ILLUSTRATED PART LIST

2. USING THE PART LIST TABLES

2.1 TABLE COLUMNS

- ITEM NUMBER column: number of the item illustrated on the corresponding figure.
  Note 1: An item number preceded by a hyphen "-" is a non-illustrated item.
  Note 2: An item may be illustrated in a figure without being listed in the corresponding part list: such an article cannot be replaced other than by replacing the subassembly of which it is part.
- REFERENCE column : part number.
- DESIGNATION column : description of the item.
- QTY column : quantity.
- R column :
  The letter R indicates that an item is repairable in the workshop.

2.2 SPARE PARTS ORDERING

When ordering spares parts, please state:

- the name of the equipment, its part number and its serial number (on manufacturer's nameplate).
- the designation of the part as given in the parts list.
  Example: Right cover,
- the part number, followed by its key.

It is also recommended to state the reference of the document in which the part number has been found.

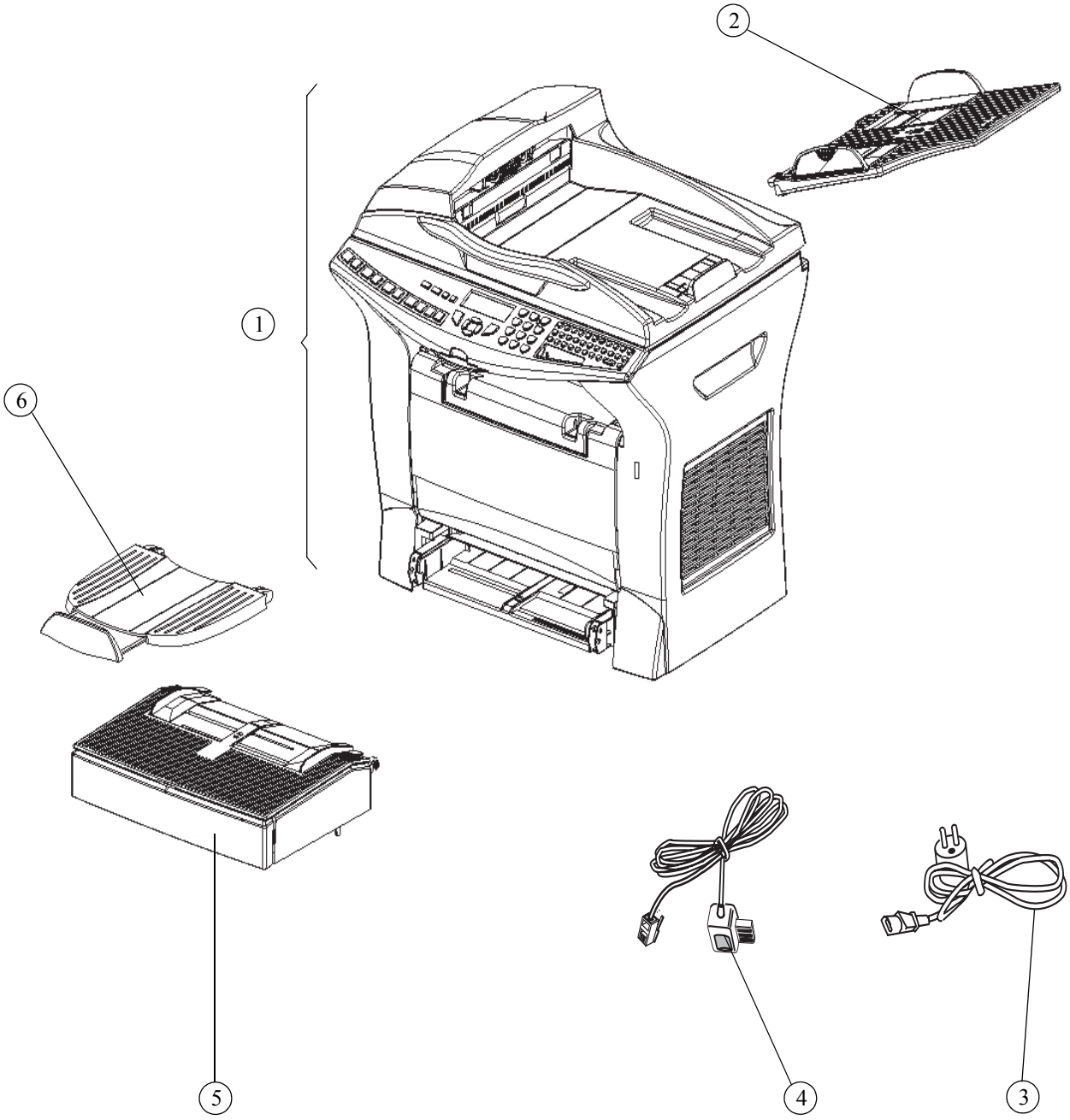
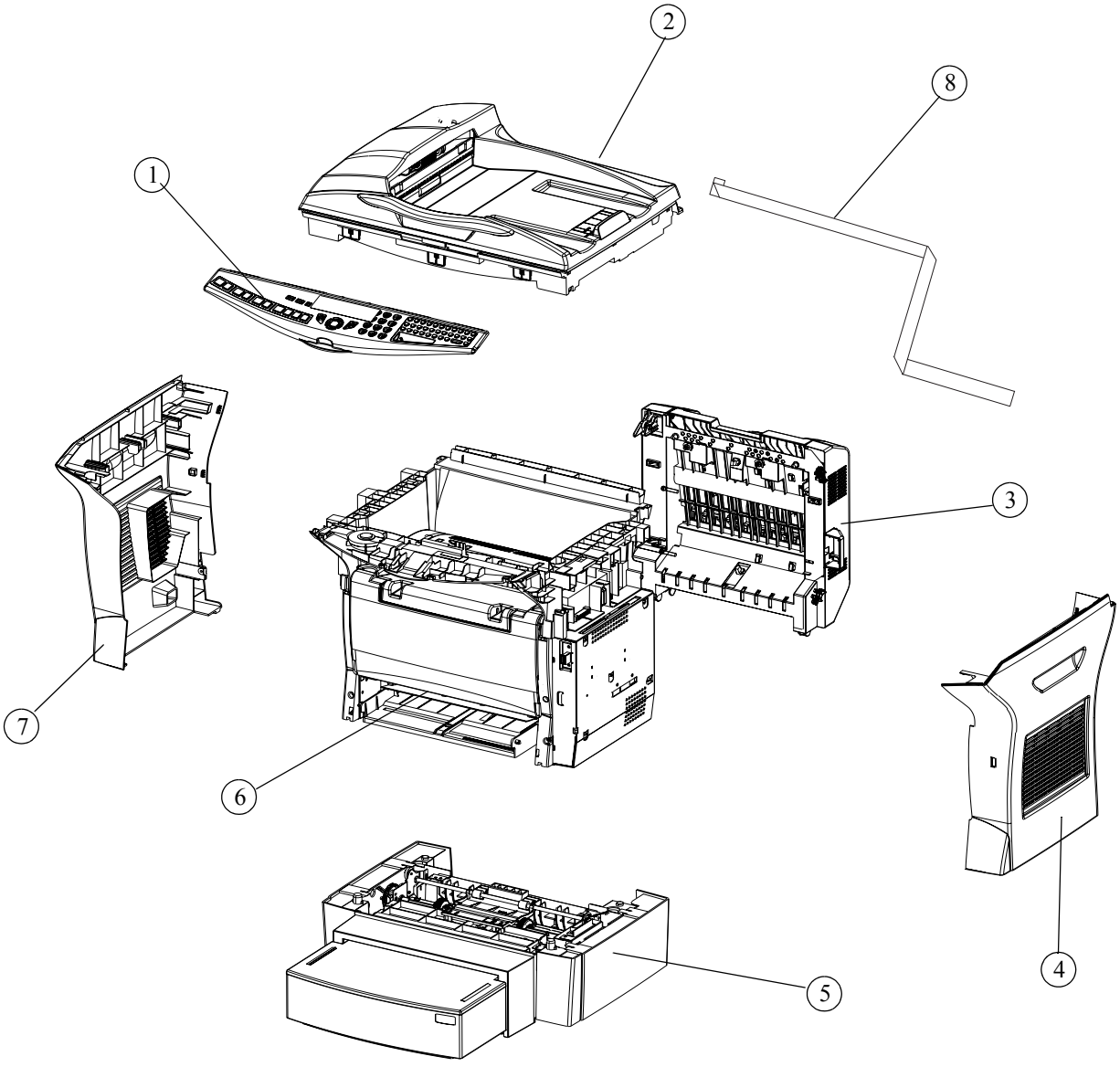


PLANCHE 1 / FIGURE 1

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	252440808	Basic MFFV2 unit	1	
2	50233001	Document loading tray	1	
5	50233501	Print paper feed tray	1	
6	50233101	Printer output tray assembly	1	

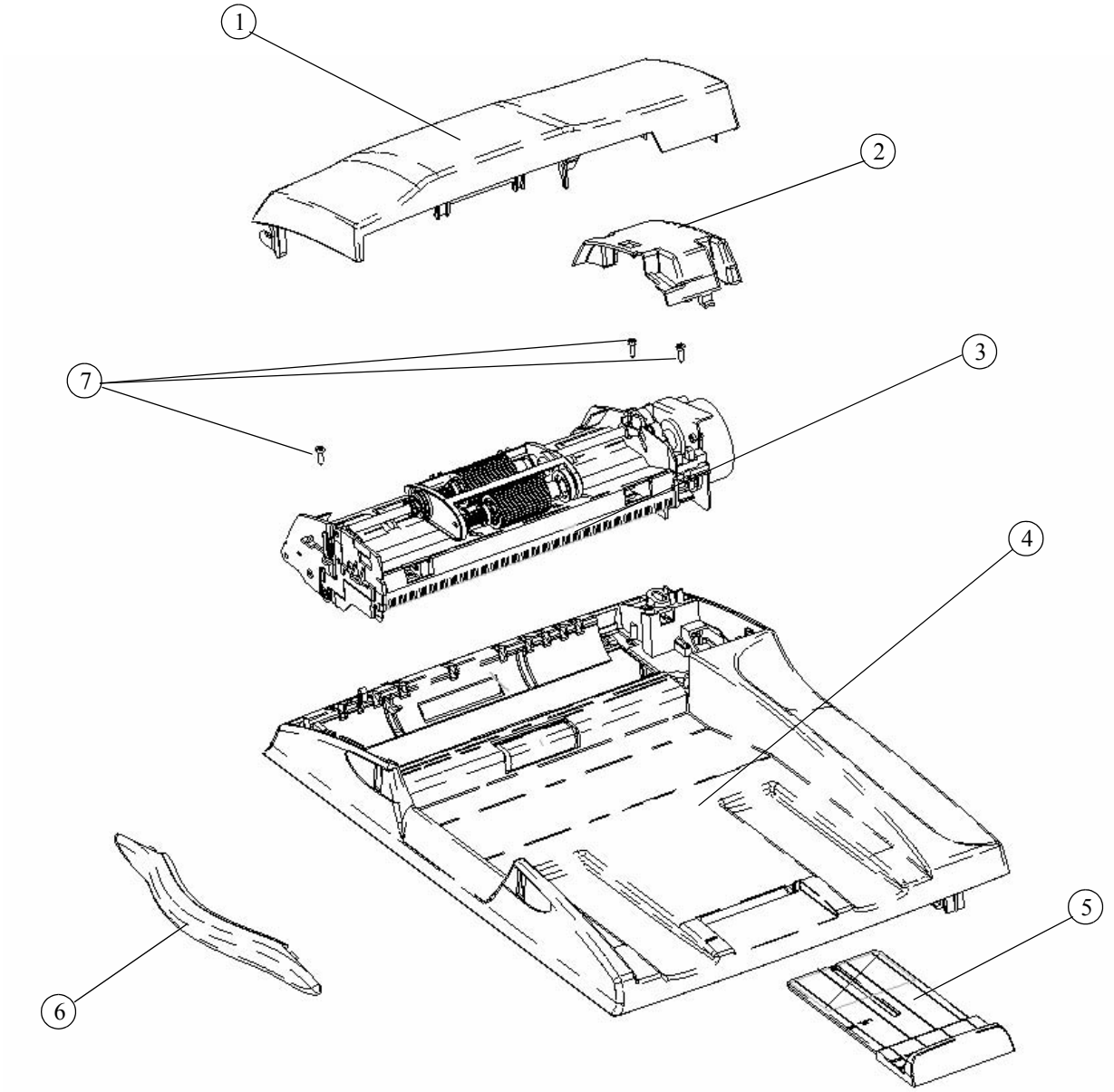


Page 2 / FIGURE 2

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	50138801	Panel equiped B4545 MFP	1	
8	56641401	Keyboard flat cable	1	

Control panel - scanner chassis assembly and printer

FIGURE 2

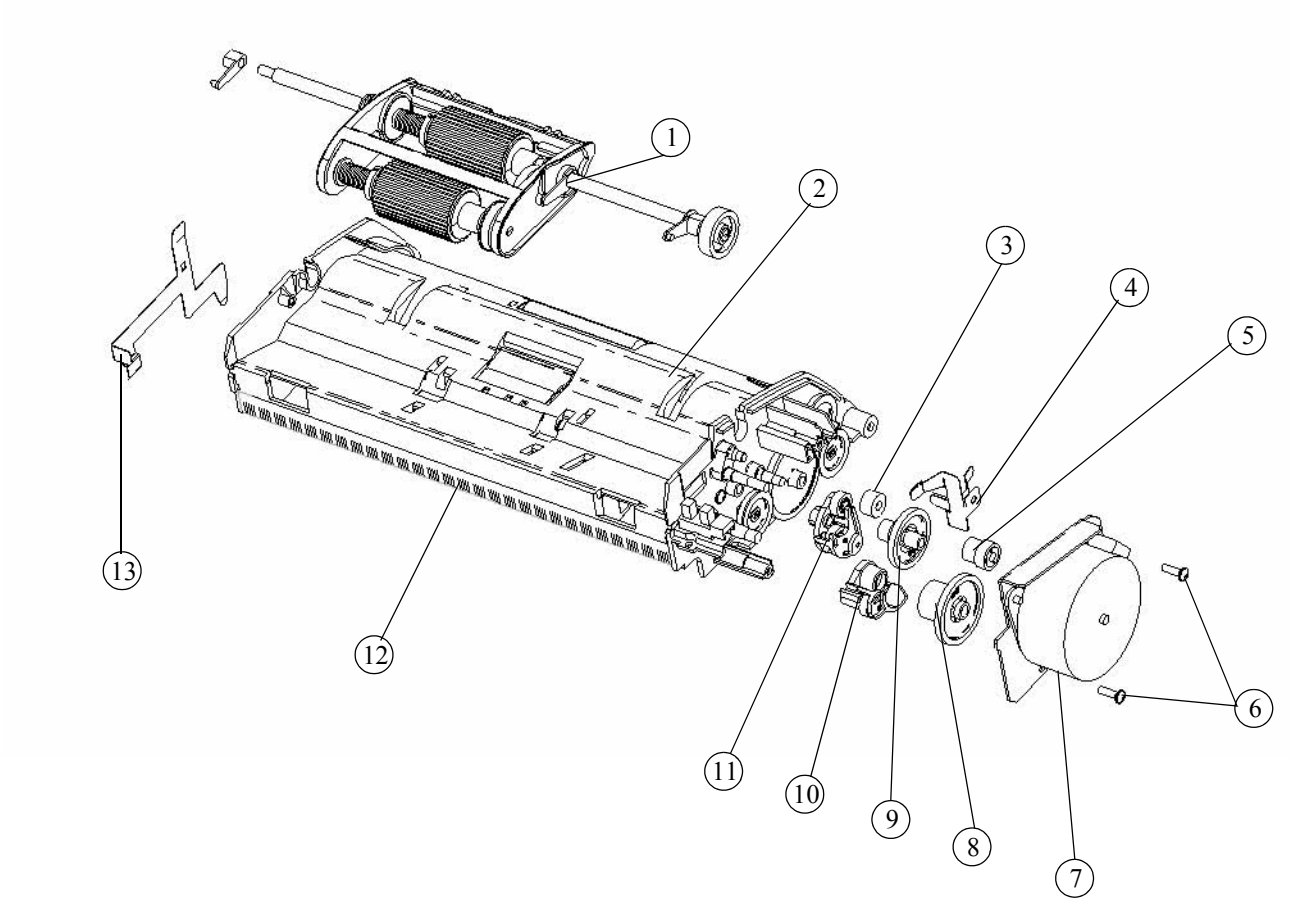


Page 3 / FIGURE 3

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	53088601	ADF Cover assembly	1	
2	53088701	Motor cover	1	
3	50233201	ADF assembly	1	
4	53088501	Flap assembly	1	
5	50937201	Scanner output tray adjuster	1	
6	51902901	Handle assembly	1	

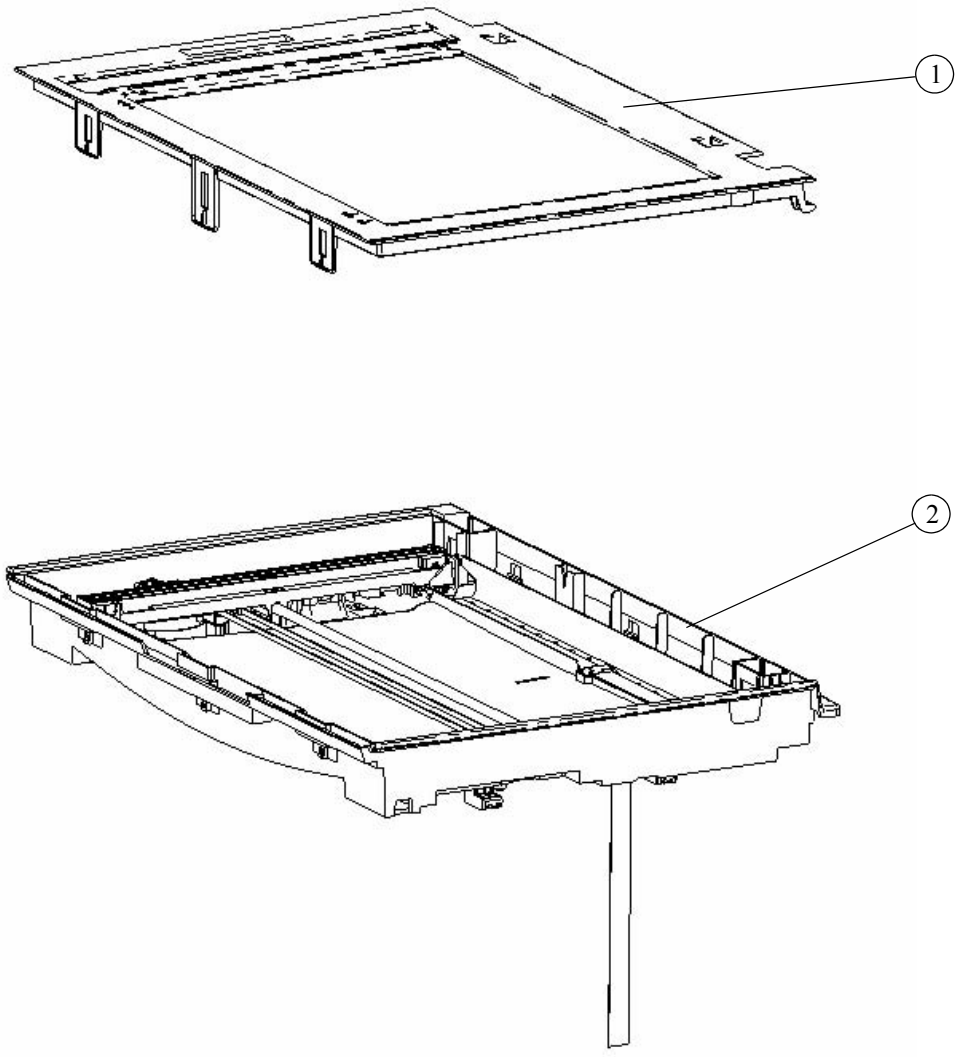
Upper cover

Page 3 / FIGURE 3



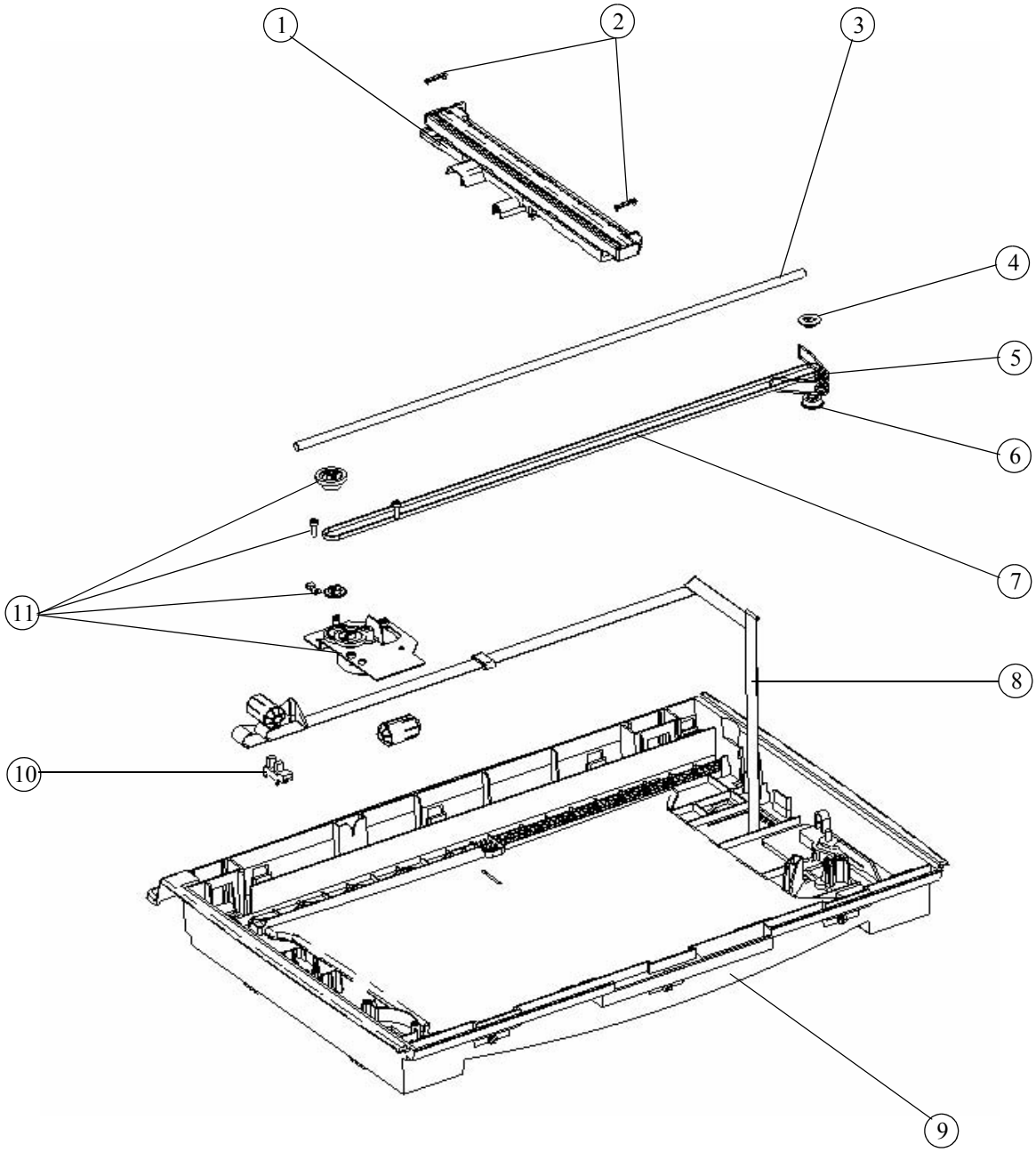
Page 4 / FIGURE 4

ITEM No.	REFERENCE	DESIGNATION	QTY	R
			1	
2	50233301	ADF paper way assembly	1	



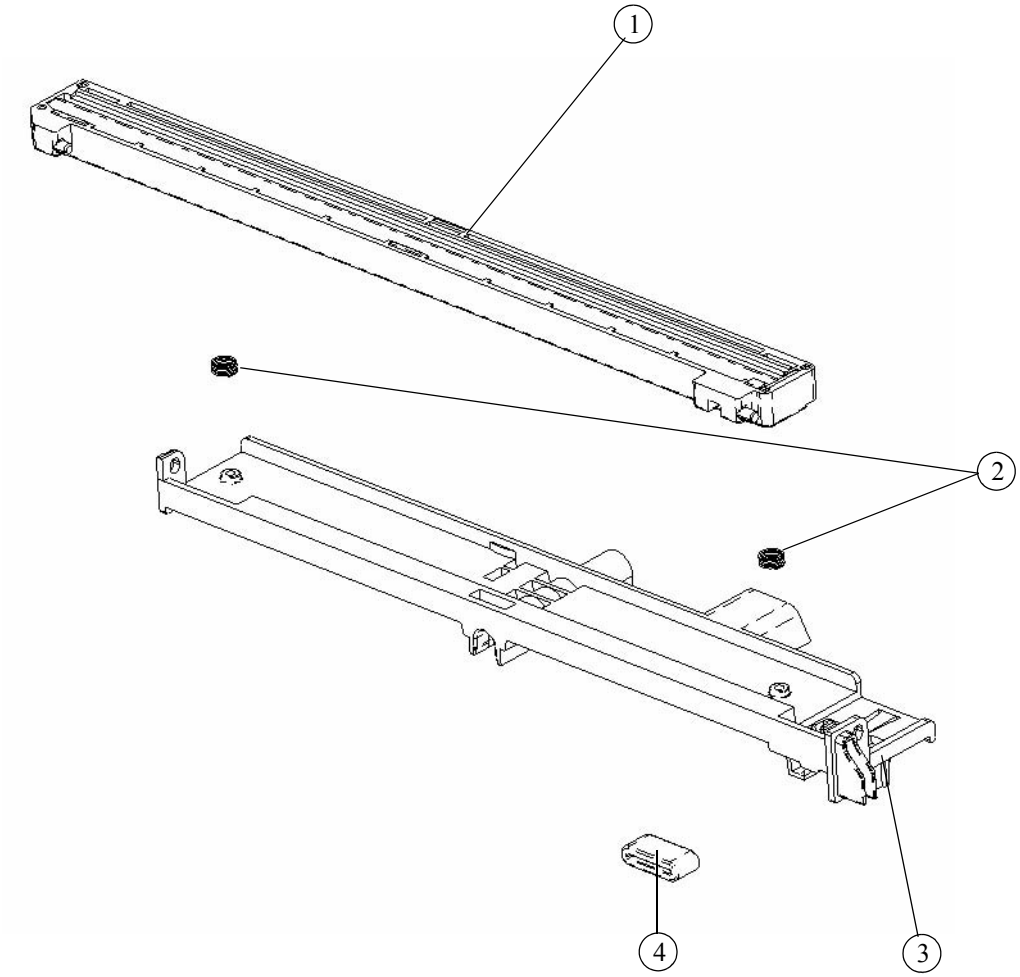
Page 5 / FIGURE 5

ITEM No.	REFERENCE	DESIGNATION	QTY	R
CIS support and motor drive assemblies			Page 5 / FIGURE 5	



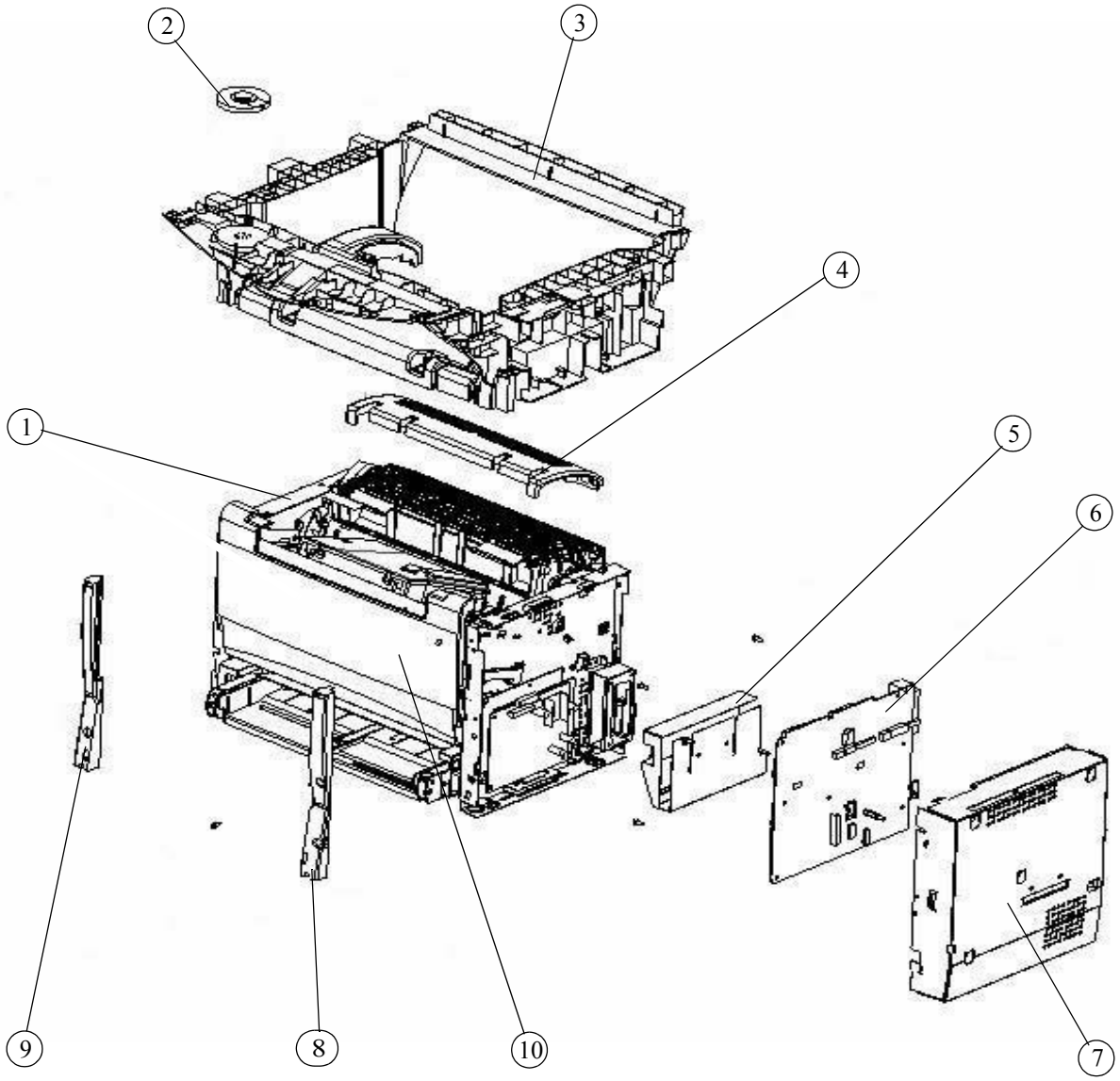
Page 6 / FIGURE 6

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	50518701	CIS support assembly	1	
2	50610101	CIS stopper	2	
10	50421901	FB Optical sensor	1	
11	53358801	FB motor frame assembly		



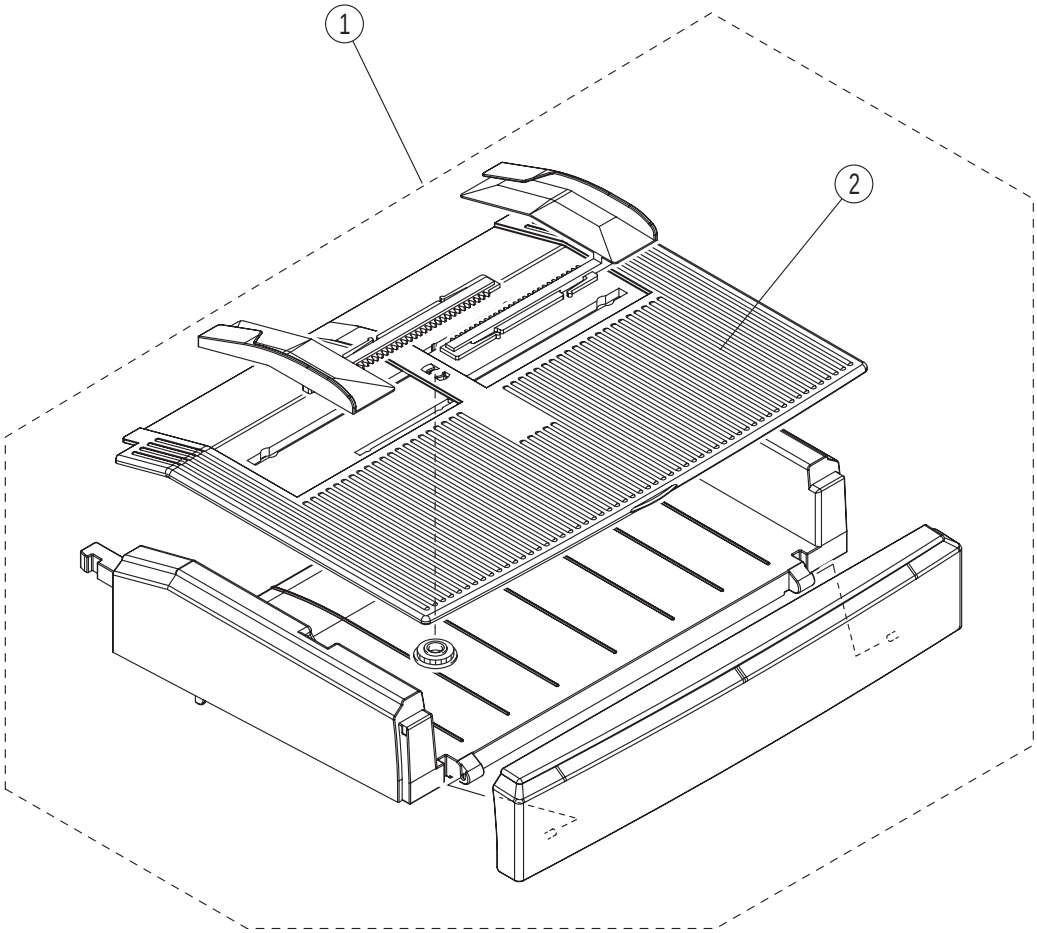
Page 7 / FIGURE 7

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	50138701	CIS	1	



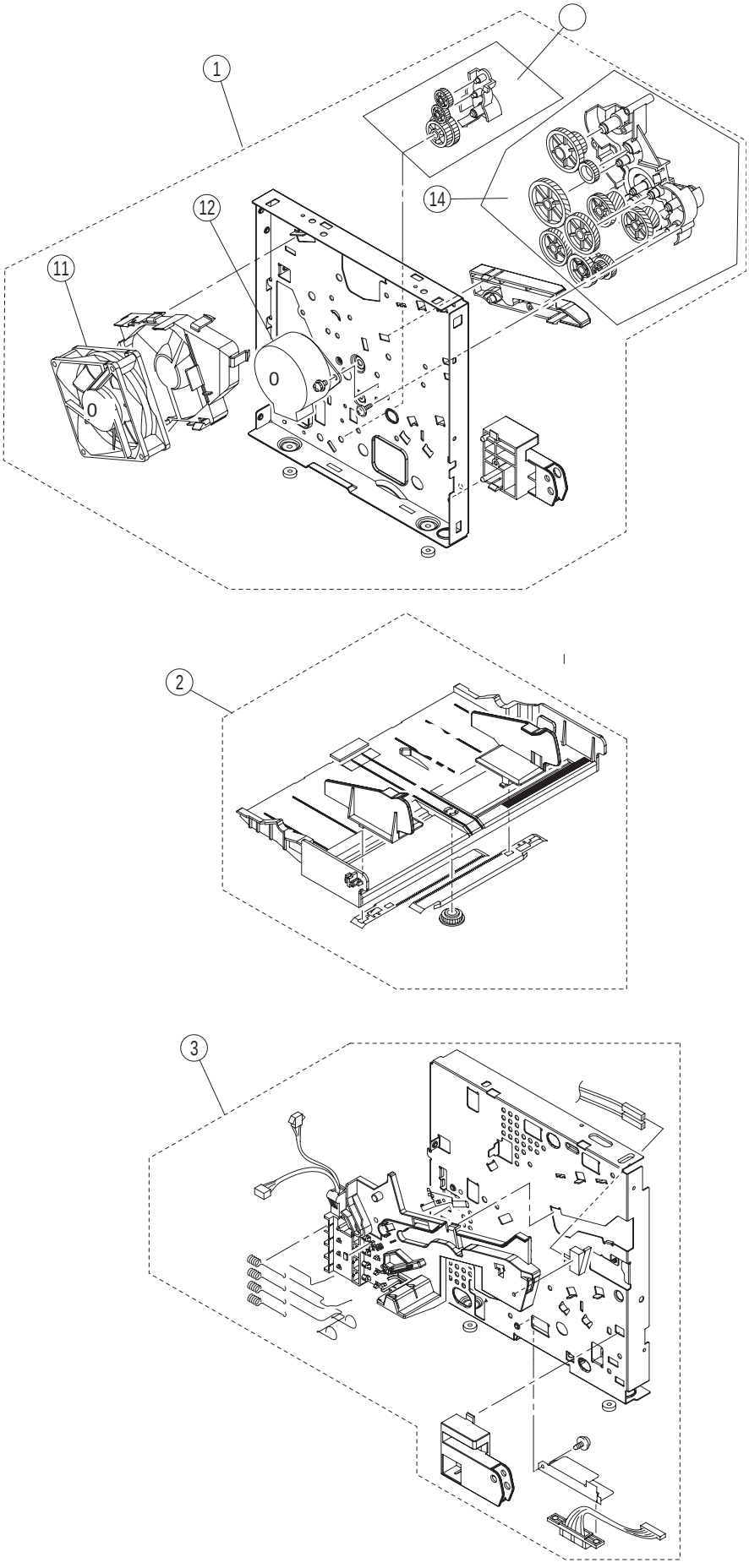
Page 8 / FIGURE 8

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1			1	
2	57001801	Speaker assembly	1	
			1	
4	53088801	Paper access cover	1	
5	50813501	Mylar UC board	1	
6	55093701	UC board	1	
Printer assembly			Page 8 / FIGURE 8	



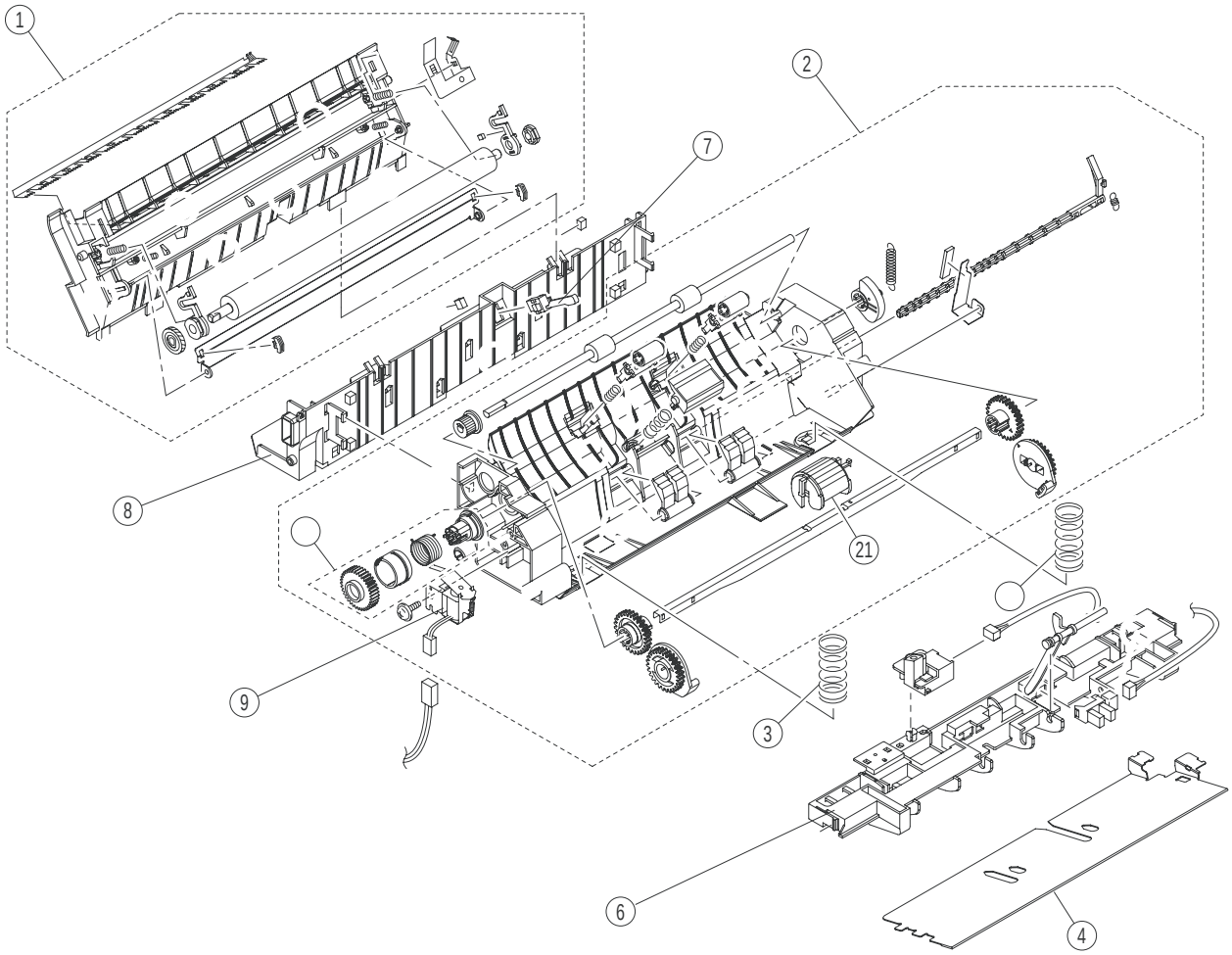
Page 9 / FIGURE 9

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	50233501	Tray assembly	1	



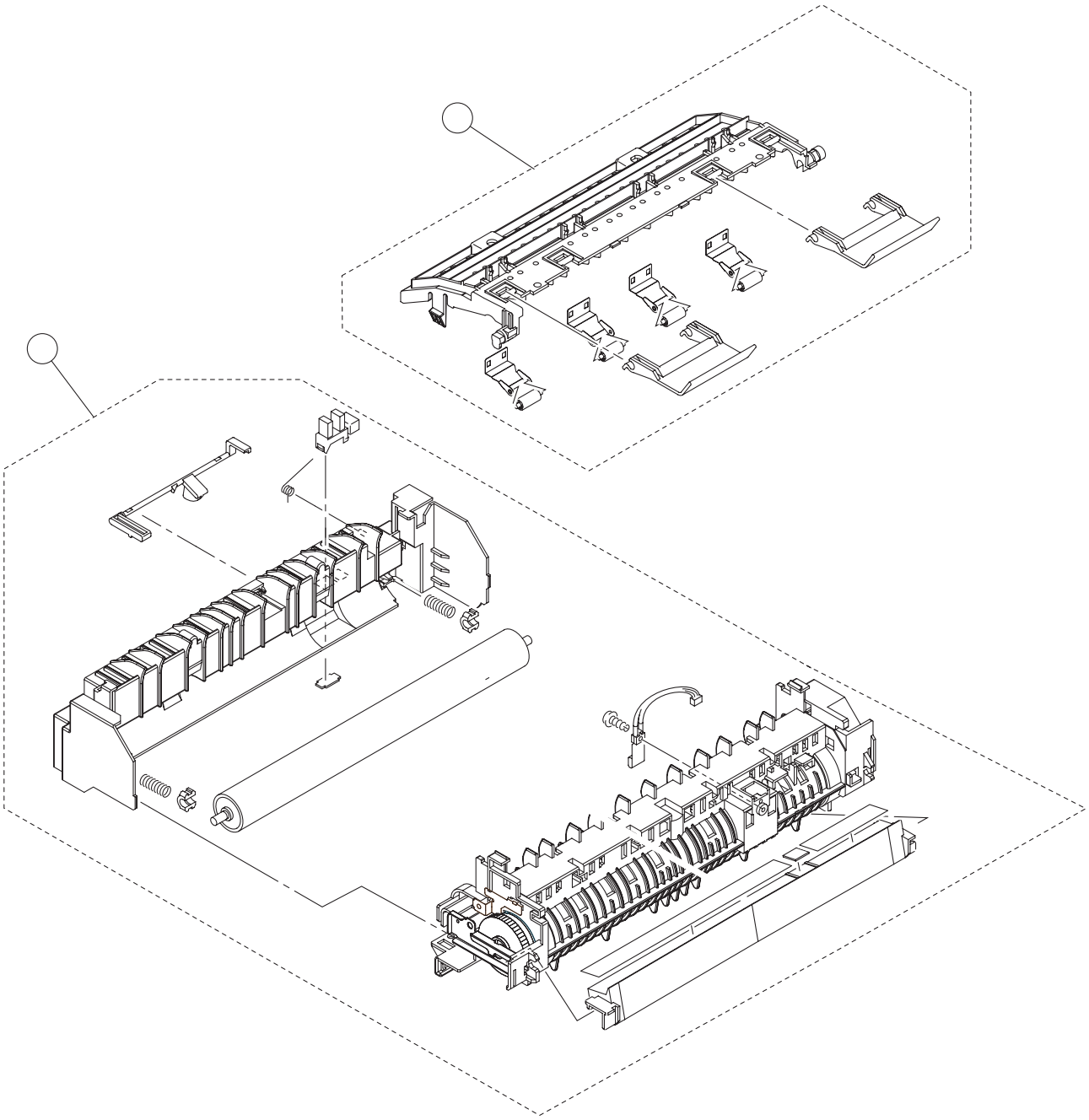
Page 10 / FIGURE 10

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	53359601	Left frame assy	1	
11	565522401	Fan unit	1	
			1	
			1	
2	51031701	Regulation plate assembly	1	
3	53358501	Right frame assembly	1	



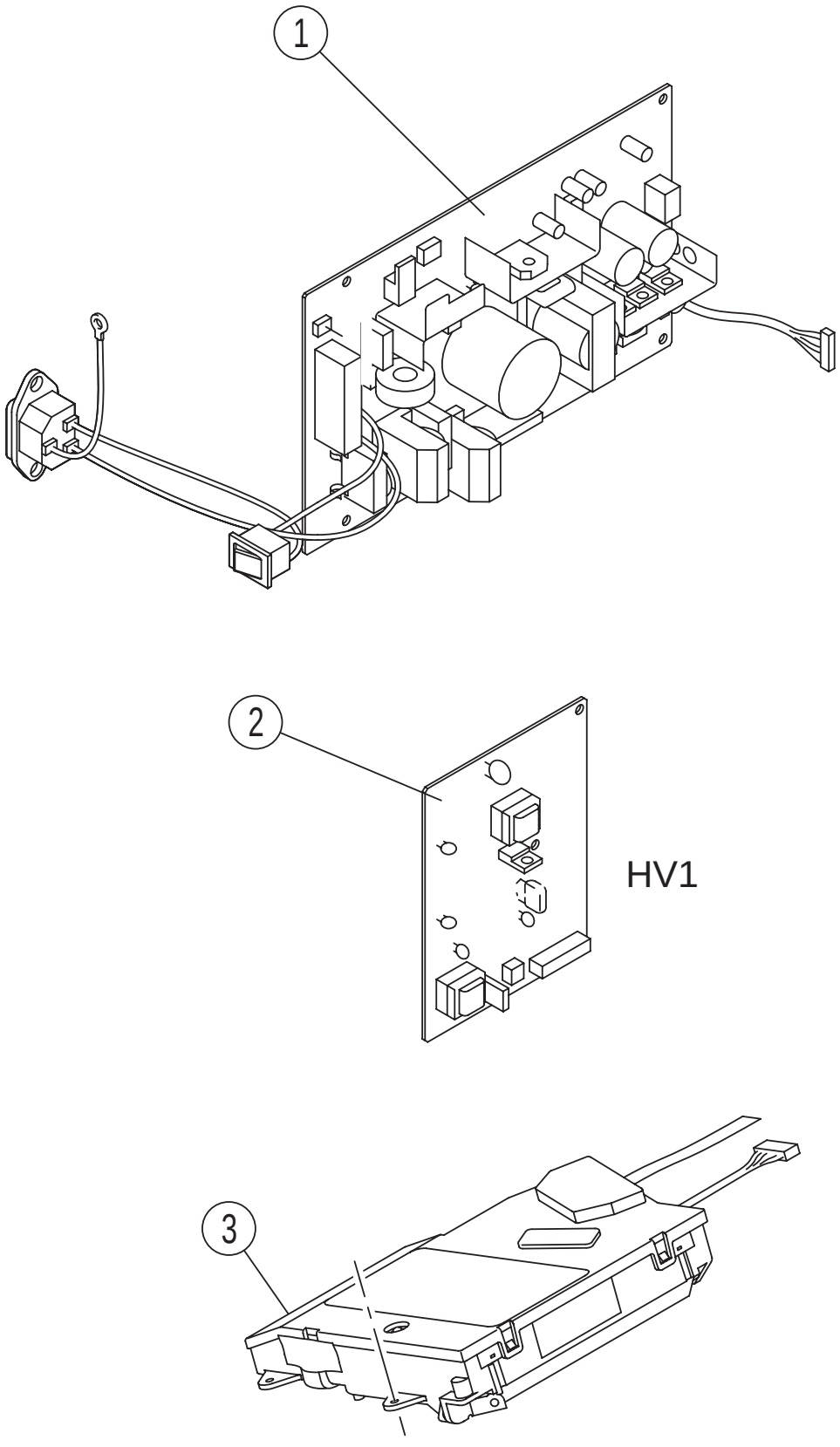
Page 11 / FIGURE 11

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	50233601	Transfert unit	1	
2	50233701	Paper take-up assembly	1	
21	53358601	Roller	1	
22	551402301	Clutch	1	
3	50936801	Pressure spring	1	
4	50235901	Tray	1	
5	56215601	Switch	1	
6	50710801	Holder	1	
7	56215501	Microswitch	1	
8	50236001	Guide	1	
			1	



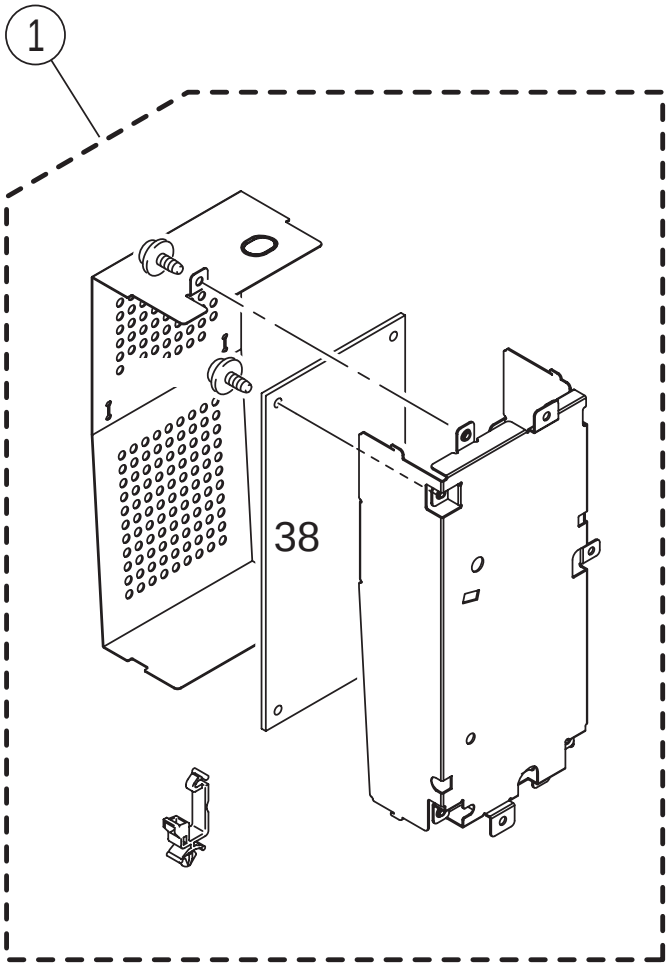
Page 12 / FIGURE 12

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	51031601	Guide assembly	1	
2	50233401	Fuser unit	1	



Page 13 / FIGURE 13

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	56420001	Power supply	1	
2	55093801	HT Card	1	
3	50138601	Print head assembly	1	
Boards and print head			Page 13 / FIGURE 13	



Page 14 / FIGURE 14

ITEM No.	REFERENCE	DESIGNATION	QTY	R
1	56419901	Power supply of duplex	1	

PRINTER

SERVICE MANUAL

TECHNICAL DOCUMENT

1. SAFETY PRECAUTIONS FOR INSPECTION AND SERVICE

- When performing inspection and service procedures, observe the following precautions to prevent accidents and ensure utmost safety.

✻ Depending on the model, some of the precautions given in the following do not apply.

- Different markings are used to denote specific meanings as detailed below.

⚠ WARNING

- Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

- Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

- The following graphic symbols are used to give instructions that need to be observed.

Used to call the service technician attention to what is graphically represented inside the marking (including a warning).

Used to prohibit the service technician from doing what is graphically represented inside the marking.

Used to instruct the service technician to do what is graphically represented inside the marking.

1-1. Warning

⚠ WARNING

1. Always observe precautions.

- Parts requiring special attention in this product will include a label containing the mark shown on the left plus precautionary notes. Be sure to observe the precautions.
- Be sure to observe the “Safety Information” given in the Operator’s Manual.

⚠ WARNING

2. Before starting the procedures, be sure to unplug the power cord.

- This product contains a high-voltage unit and a circuit with a large current capacity that may cause an electric shock or burn.
- The product also contains parts that can jerk suddenly and cause injury.
- If this product uses a laser, laser beam leakage may cause eye damage or blindness.

3. Do not throw toner or the toner bottle into a fire.

- Do not throw toner or the Toner Bottle (Imaging Cartridge, Toner Cartridge) into a fire. Toner expelled from the fire may cause burns.

4. Use the specified parts.

- For replacement parts, always use the genuine parts specified in the manufacturer's parts manual. Installing a wrong or unauthorized part could cause dielectric breakdown, overload, or undermine safety devices resulting in possible electric shock or fire.
- Replace a blown electrical fuse or thermal fuse with its corresponding genuine part specified in the manufacturer's parts manual. Installing a fuse of a different make or rating could lead to a possible fire. If a thermal fuse blows frequently, the temperature control system may have a problem and action must be taken to eliminate the cause of the problem.

5. Handle the power cord with care and never use a multiple outlet.

- Do not break, crush or otherwise damage the power cord. Placing a heavy object on the power cord, or pulling or bending it may damage it, resulting in a possible fire or electric shock.
- Do not use a multiple outlet to which any other appliance or machine is connected.
- Be sure the power outlet meets or exceeds the specified capacity.
- Use only the power cord supplied in the package. If a power cord is not supplied, only use the power cord and plug that is specified in POWER CORD INSTRUCTION. Failure to use this cord could result in a fire or electrical shock.
- Use the power cord supplied in the package only for this machine and NEVER use it for any other product. Failure to observe this precaution could result in a fire or electrical shock.

6. Be careful with the high-voltage parts.

- A part marked with the symbol shown on the left carries a high voltage. Touching it could result in an electric shock or burn. Be sure to unplug the power cord before servicing this part or the parts near it.

7. Do not work with wet hands.

- Do not unplug or plug in the power cord, or perform any kind of service or inspection with wet hands. Doing so could result in an electric shock.

⚠ WARNING

8. Do not touch a high-temperature part.

- A part marked with the symbol shown on the left and other parts such as the exposure lamp and fusing roller can be very hot while the machine is energized. Touching them may result in a burn.
- Wait until these parts have cooled down before replacing them or any surrounding parts.

9. Maintain a grounded connection at all times.

- Connect the power cord to an electrical outlet that is equipped with a grounding terminal.

10. Do not remodel the product.

- Modifying this product in a manner not authorized by the manufacturer may result in a fire or electric shock. If this product uses a laser, laser beam leakage may cause eye damage or blindness.

11. Restore all parts and harnesses to their original positions.

- To promote safety and prevent product damage, make sure the harnesses are returned to their original positions and properly secured in their clamps and saddles in order to avoid hot parts, high-voltage parts, sharp edges, or being crushed.
- To promote safety, make sure that all tubing and other insulating materials are returned to their original positions. Make sure that floating components mounted on the circuit boards are at their correct distance and position off the boards.

1-2. Caution

⚠ CAUTION

1. Precautions for Service Jobs.

- A star washer and spring washer, if used originally, must be reinstalled. Omitting them may result in contact failure which could cause an electric shock or fire.
- When reassembling parts, make sure that the correct screws (size, type) are used in the correct places. Using the wrong screw could lead to stripped threads, poorly secured parts, poor insulating or grounding, and result in a malfunction, electric shock or injury.
- Take great care to avoid personal injury from possible burrs and sharp edges on the parts, frames and chassis of the product.
- When moving the product or removing an option, use care not to injure your back or allow your hands to be caught in mechanisms.

⚠ CAUTION

2. Precautions for Servicing with Covers and Parts Removed.

- Wherever feasible, keep all parts and covers mounted when energizing the product.
- If energizing the product with a cover removed is absolutely unavoidable, do not touch any exposed live parts and use care not to allow your clothing to be caught in the moving parts. Never leave a product in this condition unattended.
- Never place disassembled parts or a container of liquid on the product. Parts falling into, or the liquid spilling inside, the mechanism could result in an electric shock or fire.

- Never use a flammable spray near the product. This could result in a fire.
- Make sure the power cord is unplugged before removing or installing circuit boards or plugging in or unplugging connectors.
- Always use the interlock switch actuating jig to actuate an interlock switch when a cover is opened or removed. The use of folded paper or some other object may damage the interlock switch mechanism, possibly resulting in an electric shock, injury or blindness.

3. Precautions for the Working Environment.

- The product must be placed on a flat, level surface that is stable and secure.
- Never place this product or its parts on an unsteady or tilting workbench when servicing.
- Provide good ventilation at regular intervals if a service job must be done in a confined space for a long period of time.
- Avoid dusty locations and places exposed to oil or steam.
- Avoid working positions that may block the ventilation ports of the product.

4. Precautions for Handling Batteries. (Lithium, Nickel-Cadmium, etc.)

- Replace a rundown battery with the same type as specified in the manufacturer's parts manual.
- Before installing a new battery, make sure of the correct polarity of the installation or the battery could burst.
- Dispose of used batteries according to the local regulations. Never dispose of them at the user's premises or attempt to try to discharge one.

5. Precautions for the Laser Beam. (Only for Products Employing a Laser)

- Removing the cover marked with the caution label could lead to possible exposure to the laser beam, resulting in eye damage or blindness. Be sure to unplug the power cord before removing this cover.
- If removing this cover while the power is ON is unavoidable, be sure to wear protective laser goggles that meet specifications.
- Make sure that no one enters the room when the machine is in this condition.
- When handling the laser unit, observe the "Precautions for Handling Laser Equipment."

6. Precautions for storing the toner or imaging cartridge.

- Be sure to keep the toner or imaging cartridge out of the reach of children. Licking the imaging cartridge or ingesting its contents is harmful to your health.

1-3. Used Batteries Precautions

ALL Areas

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Germany

VORSICHT!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.
Ersatz nur durch denselben oder einen vom Hersteller empfohlenen gleichwertigen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

France

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.
Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Denmark

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

Finland, Sweden

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

Norway

ADVARSEL

Eksplosjonsfare ved feilaktig skifte av batteri.
Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten.
Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

1-4. Other Precautions

- When handling circuit boards, observe the “HANDLING of PWBs”.
- The PC Drum is a very delicate component. Observe the precautions given in “HANDLING OF THE PC DRUM” because mishandling may result in serious image problems.
- Note that replacement of a circuit board may call for readjustments or resetting of particular items, or software installation.

1-5. Precautions for Service

- When performing inspection and service procedures, observe the following precautions to prevent mishandling of the machine and its parts.

✻ Depending on the model, some of the precautions given in the following do not apply.

1. Precautions Before Service

- When the user is using a word processor or personal computer from a wall outlet of the same line, take necessary steps to prevent the circuit breaker from opening due to overloads.
- Never disturb the LAN by breaking or making a network connection, altering termination, installing or removing networking hardware or software, or shutting down networked devices without the knowledge and express permission of the network administrator or the shop supervisor.

2. How to Use this Book

DIS/REASSEMBLY, ADJUSTMENT

- To reassemble the product, reverse the order of disassembly unless otherwise specified.

TROUBLESHOOTING

- If a component on a PWB or any other functional unit including a motor is defective, the text only instructs you to replace the whole PWB or functional unit and does not give troubleshooting procedures applicable within the defective unit.
- All troubleshooting procedures contained herein assume that there are no breaks in the harnesses and cords and all connectors are plugged into the right positions.
- The procedures preclude possible malfunctions due to noise and other external causes.

3. Precautions for Service

- Keep all disassembled parts in good order and keep tools under control so that none will be lost or damaged.
- After completing a service job, perform a safety check. Make sure that all parts, wiring and screws are returned to their original positions.
- Do not pull out the toner hopper while the toner bottle is turning. This could result in a damaged motor or locking mechanism.
- If the product is to be run with the front door open, make sure that the toner hopper is in the locked position.
- Do not use an air gun or vacuum cleaner for cleaning the ATDC Sensor and other sensors, as they can cause electrostatic destruction. Use a blower brush and cloth. If a unit containing these sensors is to be cleaned, first remove the sensors from the unit.

4. Precautions for Dis/Reassembly

- Be sure to unplug the copier from the outlet before attempting to service the copier.
- The basic rule is not to operate the copier anytime during disassembly. If it is absolutely necessary to run the copier with its covers removed, use care not to allow your clothing to be caught in revolving parts such as the timing belt and gears.
- Before attempting to replace parts and unplug connectors, make sure that the power cord of the copier has been unplugged from the wall outlet.
- Be sure to use the Interlock Switch Actuating Jig whenever it is necessary to actuate the Interlock Switch with the covers left open or removed.
- While the product is energized, do not unplug or plug connectors into the circuit boards or harnesses.
- Never use flammable sprays near the copier.
- A used battery should be disposed of according to the local regulations and never be discarded casually or left unattended at the user's premises.
- When reassembling parts, make sure that the correct screws (size, type) and toothed washer are used in the correct places.

5. Precautions for Circuit Inspection

- Never create a closed circuit across connector pins except those specified in the text and on the printed circuit.
- When creating a closed circuit and measuring a voltage across connector pins specified in the text, be sure to use the GND wire.

6. Handling of PWBs

During Transportation/Storage

- During transportation or when in storage, new P.W. Boards must not be indiscriminately removed from their protective conductive bags.
- Do not store or place P.W. Boards in a location exposed to direct sunlight and high temperature.
- When it becomes absolutely necessary to remove a Board from its conductive bag or case, always place it on its conductive mat in an area as free as possible from static electricity.
- Do not touch the pins of the ICs with your bare hands.
- Protect the PWBs from any external force so that they are not bent or damaged.

During Inspection/Replacement

- Avoid checking the IC directly with a multimeter; use connectors on the Board.
- Never create a closed circuit across IC pins with a metal tool.
- Before unplugging connectors from the P.W. Boards, make sure that the power cord has been unplugged from the outlet.
- When removing a Board from its conductive bag or conductive case, do not touch the pins of the ICs or the printed pattern. Place it in position by holding only the edges of the Board.
- When touching the PWB, wear a wrist strap and connect its cord to a securely grounded place whenever possible. If you cannot wear a wrist strap, touch a metal part to discharge static electricity before touching the PWB.
- Note that replacement of a PWB may call for readjustments or resetting of particular items.

7. Handling of Other Parts

- The magnet roller generates a strong magnetic field. Do not bring it near a watch, floppy disk, magnetic card, or CRT tube.

8. Handling of the PC Drum

✻ Only for Products Not Employing an Imaging Cartridge.

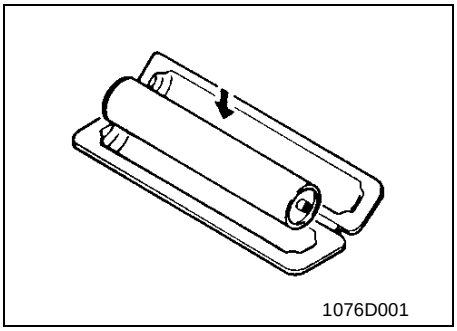
During Transportation/Storage

- Use the specified carton whenever moving or storing the PC Drum.
- The storage temperature is in the range between –20°C and +40°C.
- In summer, avoid leaving the PC Drum in a car for a long time.

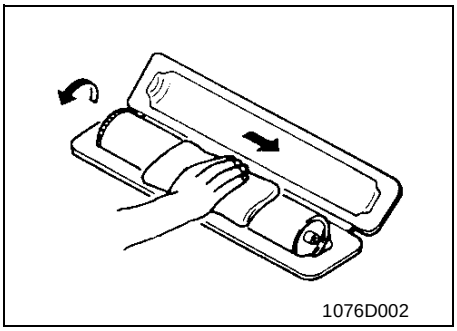
Handling

- Ensure that the correct PC Drum is used.
- Whenever the PC Drum has been removed from the copier, store it in its carton or protect it with a Drum Cloth.
- The PC Drum exhibits greatest light fatigue after being exposed to strong light over an extended period of time. Never, therefore, expose it to direct sunlight.
- Use care not to contaminate the surface of the PC Drum with oil-base solvent, fingerprints, and other foreign matter.
- Do not scratch the surface of the PC Drum.
- Do not apply chemicals to the surface of the PC Drum.
- Do not attempt to wipe clean the surface of the PC Drum.

If, however, the surface is contaminated with fingerprints, clean it using the following procedure.



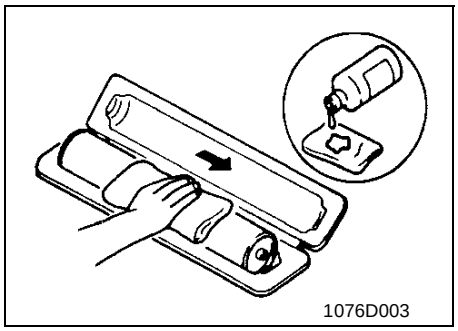
A. Place the PC Drum into one half of its carton.



B. Gently wipe the residual toner off the surface of the PC Drum with a dry, Dust-Free Cotton Pad.

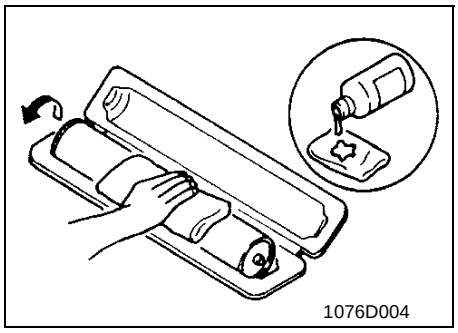
- Turn the PC Drum so that the area of its surface on which the line of toner left by the Cleaning Blade is present is facing straight up. Wipe the surface in one continuous movement from the rear edge of the PC Drum to the front edge and off the surface of the PC Drum.
- Turn the PC Drum slightly and wipe the newly exposed surface area with a CLEAN face of the Dust-Free Cotton Pad. Repeat this procedure until the entire surface of the PC Drum has been thoroughly cleaned.

✻ At this time, always use a CLEAN face of the dry Dust-Free Cotton Pad until no toner is evident on the face of the Pad after wiping.



C. Soak a small amount of either ethyl alcohol or isopropyl alcohol into a clean, unused Dust-Free Cotton Pad which has been folded over into quarters. Now, wipe the surface of the PC Drum in one continuous movement from its rear edge to its front edge and off its surface one to two times.

✻ Never move the Pad back and forth.



D. Using the SAME face of the Pad, repeat the procedure explained in the latter half of step 3 until the entire surface of the PC Drum has been wiped. Always OVERLAP the areas when wiping. Two complete turns of the PC Drum would be appropriate for cleaning.

NOTES

- *Even when the PC Drum is only locally dirtied, wipe the entire surface.*
- *Do not expose the PC Drum to direct sunlight. Clean it as quickly as possible even under interior illumination.*
- *If dirt remains after cleaning, repeat the entire procedure from the beginning one more time.*

9. Handling of the Imaging Cartridge and Print Unit

✻ Only for Products Employing an Imaging Cartridge and Print Unit.

During Transportation/Storage

- The storage temperature is in the range between –20 °C and +40 °C.
- In summer, avoid leaving the Imaging Cartridge and Print Unit in a car for a long time.

Handling

- Store the Imaging Cartridge and Print Unit in a place that is not exposed to direct sunlight.

Precautionary Information on the PC Drum Inside the Imaging Cartridge and Print Unit.

- Use care not to contaminate the surface of the PC Drum with oil-base solvent, fingerprints, and other foreign matter.
- Do not scratch the surface of the PC Drum.
- Do not attempt to wipe clean the surface of the PC Drum.

1-6. Safety information

(1) Laser Safety

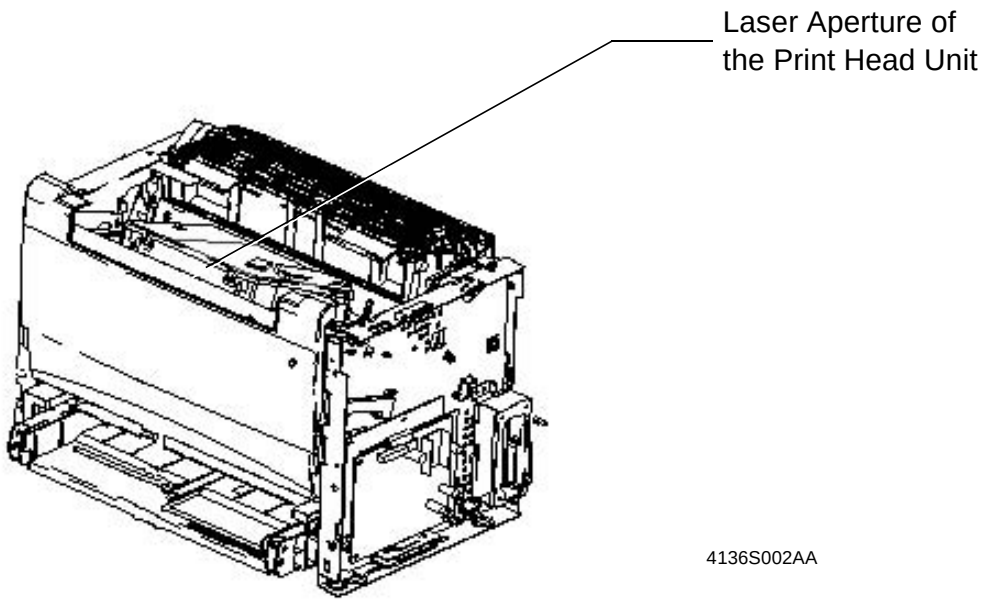
- This is a digital machine certified as a class 1 laser product. There is no possibility of danger from a laser, provided the machine is serviced according to the instruction in this manual.

(2) Internal Laser Radiation

semiconductor laser	
Maximum power of the laser diode	15 mW
Maximum average radiation power(*)	36.903 µW
Wavelength	770-800 nm

*:at laser aperture of the Print Head Unit

- This product employs a Class 3b laser diode that emits an invisible laser beam. The laser diode and the scanning polygon mirror are incorporated in the print head unit.
- The print head unit is NOT A FIELD SERVICE ITEM. Therefore, the print head unit should not be opened under any circumstances.



This figure shows the view inside the Front Cover with the Toner Cartridge and the Drum Cartridge removed.

the U.S.A., Canada
(CDRH Regulation)

- This machine is certified as a Class I Laser product under Radiation Performance Standard according to the Food, Drug and Cosmetic Act of 1990. Compliance is mandatory for Laser products marketed in the United States and is reported to the Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration of the U.S. Department of Health and Human Services (DHHS). This means that the device does not produce hazardous laser radiation.

- The label shown to page 13 indicates compliance with the CDRH 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.

semiconductor laser	
Maximum power of the laser diode	15 mW
Wavelength	770-800 nm

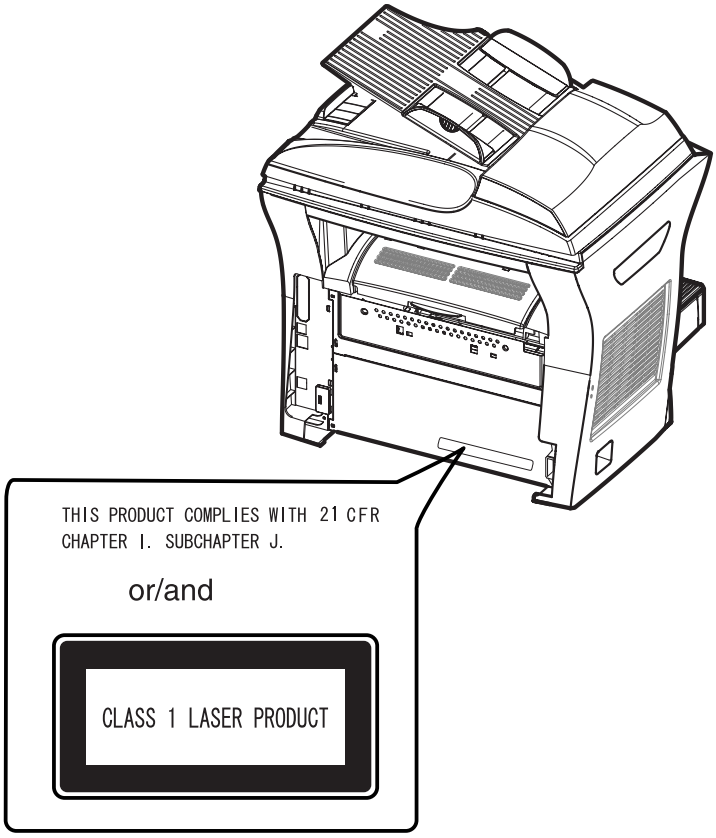
All Areas

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

semiconductor laser	
Maximum power of the laser diode	15 mW
Wavelength	770-800 nm

1-7. Laser Safety Label

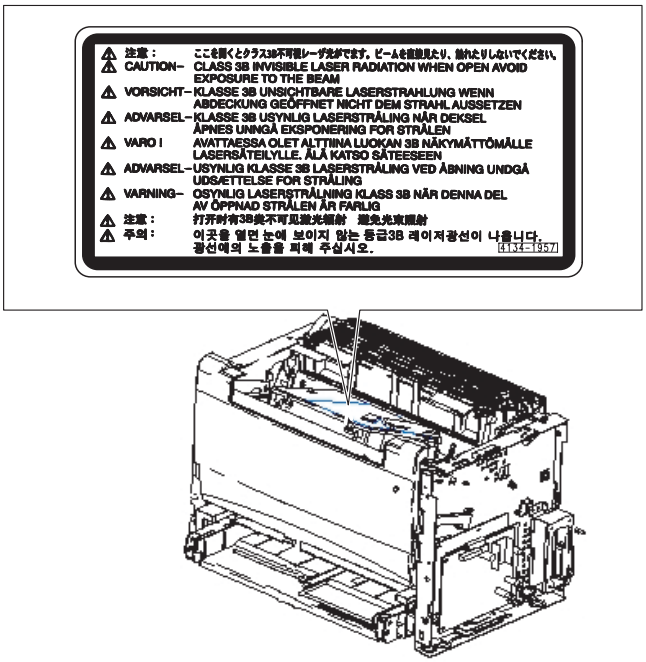
- A laser safety label is attached to the machine as shown below.



4136S505AB

1-8. Laser Caution Label

- A laser caution label is attached to the inside of the machine as shown below.



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1-9. PRECAUTIONS FOR HANDLING THE LASER EQUIPMENT

- When laser protective goggles are to be used, select ones with a lens conforming to the above specifications.
- When a disassembly job needs to be performed in the laser beam path, such as when working around the printerhead and PC Drum, be sure first to turn the printer OFF.
- If the job requires that the printer be left ON, take off your watch and ring and wear laser protective goggles.
- A highly reflective tool can be dangerous if it is brought into the laser beam path. Use utmost care when handling tools on the user's premises.
- The Print Head are not to be disassembled or adjusted in the field. Replace the Unit or Assembly including the Control Board. Therefore, remove the Laser Diode, and do not perform Control Board trimmer adjustment.

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MAINTENANCE

DIS/REASSEMBLY, ADJUSTMENT

TROUBLESHOOTING

GENERAL

1. SPECIFICATIONS

Printer

Type	:	Desktop Laser Beam Printer
Exposure System	:	Laser diode + Polygon Mirror
Resolution	:	600 dpi (1200 dpi in half-speed mode)
Copy Paper Size	:	A4, A5, B5 8.5 × 14, 8.5 × 11, 3 × 5, 5.5 × 8.5, 7 1/4 × 10 1/2
Media Type	:	Plain paper (60 to 90 g/m^2) Recycled paper (60 to 90 g/m^2) OHP transparencies, letterhead, envelopes, labels Thick paper (91 to 163 g/m^2) Postcard, prepaid postcard (with no crease)
First Printing Time	:	At 600 × 600 dpi: 13 sec. (A4L/Letter L) At 1200 × 600, 1200 × 1200 dpi: 21 sec. or less (A4L/Letter L)
Multi Print Speed	:	PP1350W At 600 dpi: 20 prints/min. or more (A4L/Letter L) At 1200 dpi: 10 prints/min. or more (A4L/Letter L) PP1300W At 600 dpi: 16 prints/min. or more (A4L/Letter L) At 1200 dpi: 10 prints/min. or more (A4L/Letter L)
Warm-up Time	:	10 sec. or less (with the rated voltage supplied at 23 °C, from Pause to be ready for first print; 21 sec. or less for a condition immediately after power has been turned ON)
System Speed	:	115.098 mm/sec. (57.505 mm/sec. during half-speed control)
Paper Feeding System	:	1-way system (Multipurpose Tray)
Capacity (recommended paper)	:	MP Tray = 150 sheets
Paper Exit System	:	Face down (tray capacity: 100 sheets) (recommended paper)
Drum Charging System	:	Rotating brush + pre-charge film
Developing System	:	FMT single-component developing system
Image Transfer System	:	Transfer Roller system
PC Drum	:	OPC (organic photoconductor)
Drum Cleaning System	:	Non-cleaner system
Paper Separating System	:	Curvature separating system + Charge Neutralizing Needle
Fusing System	:	Heated roller system
Dimensions	:	150-sheet-capacity printer Width: 386.8 mm Depth: 404.5 mm Height: 348 mm
Mass	:	7.8 kg (including DC/TC)
Power Requirements	:	100 V, 50/60 Hz ± 3 Hz, 9.2 A or less
Max. Power Consumption	:	900 W
Acoustic Noise	:	Standby: 30 dB(A) or less Printing: 54 dB(A) or less
Operating Environment	:	10 to 35 °C, 15 to 85 %

Controller (GDI)

Control Panel	:	LED × 1, SW × 1
ASIC	:	N1-Chips (Naltec Original ASIC)
Memory Configuration	:	Standard ROM: 64 KB (in ASIC) EEPROM: 1 Kilobit Flash ROM: 2 Megabits (250 KB) RAM: 8 MB (64-Megabit SDRAM: 64 Megabits × 1)
Interface	:	IEEE1284 Parallel (Compatible/Nibble/ECP) USB 1.1
Resolution	:	600 × 600 dpi, 1200 × 600 dpi, 1200 × 1200 dpi (1200 × 600 dpi and 1200 × 1200 dpi are half speed)
Emulation	:	None
Printer Driver	:	Windows 98SE/2000/Me/XP
Test Print	:	Configuration page

2. PRECAUTIONS FOR INSTALLATION

2-1. Installation Site

To ensure utmost safety and avoid breakdown, the printer should NOT be used in a place:

- Where it will be subjected to extremely high or low temperature or humidity.
- Where it will be subjected to sudden fluctuations in either temperature or humidity.
- Which is exposed to direct sunlight.
- Which is in the direct air stream of an air conditioner, heater, or ventilator.
- Which has poor ventilation or is dusty.
- Which does not have a stable, level floor or where it will receive undue vibration.
- Which is near any kind of heating device.
- Which is near volatile flammables (thinner, gasoline, etc.).
- Where it may be splashed with water and electric leakage is likely to occur.
- Which puts the operator in the direct stream of exhaust from the printer.
- Where ammonia gas might be generated.

2-2. Power Source

- If any other electrical equipment is sourced from the same power outlet, make sure that the capacity of the outlet is not exceeded.
- Use a power source with little voltage fluctuation.
- Never connect by means of a multiple socket any other appliances or machines to the outlet being used for the printer.
- Ensure that the printer does not ride on the power cord or communications cable of other electric equipment, and that it does not become wedged into or underneath the mechanism.
- Make the following checks at frequent intervals:

✻ Is the power plug abnormally hot?
✻ Are there any cracks or scrapes in the cord?
✻ Has the power plug been inserted fully into the outlet?
✻ Does something, including the printer itself, ride on the power cord?

Use an outlet with a capacity of 100 V, 15 A or more.

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3. PRECAUTIONS FOR USE

3-1. To Ensure the Printer is Used in an Optimum Condition

- Never place a heavy object on the printer or subject the printer to shocks.
- Insert the power plug all the way into the outlet.
- Do not attempt to remove any panel or cover that is secured while the printer is in a print cycle.
- Do not turn OFF the printer while it is in a print cycle.
- Provide good ventilation if the printer is to be used for a long time in a narrow room.
- Never use flammable sprays near the printer.
- If the printer becomes inordinately hot or produces abnormal noise, immediately turn it OFF and unplug it.
- Do not turn ON the power switch at the same time that you plug the power cord into the outlet.
- When unplugging the power cord, do not pull on the cord; hold the plug and pull it out.
- Do not bring any magnetized object near the printer.
- Do not place a vase or vessel containing water on the printer.
- Be sure to turn OFF the power switch at the end of the workday or upon power failure.
- Use care not to drop paper clips, staples, or other small pieces of metal into the printer.

3-2. Operating Environment

The operating environmental requirements of the printer are as follows.

- Temperature: 10 to 30 °C
- Humidity: 15 to 85 %
- Rate of temperature change: 10 °C/h
- Rate of humidity change: 10 %/h

3-3. Power Requirements

The power source voltage requirements are as follows.

- Voltage fluctuation: AC100 V ± 10 %
- Frequency fluctuation: 50/60 Hz ± 3 Hz

3-4. Miscellaneous Precautions

Use the following precautions when performing service jobs for a printer that uses a laser.

- When a service job needs to be performed in the laser beam path, such as when working around the Print Head Unit or PC Drum, be sure first to unplug the power cord of the printer from the outlet.
- If the service job requires that the power cord be left plugged in, observe the following precautions:
- Take off your watch, ring, and any other reflective object and wear laser protective goggles.
- Keep users away from the job site.
- Do not bring a highly reflective tool into the laser beam path during the service job.

4. HANDLING OF THE CONSUMABLES

Before using any consumables, always read the label on its container carefully.

- Paper can easily damp. To prevent absorption of moisture, store paper in a place with little moisture.
- Keep consumables out of the reach of children.
- Do not touch the PC Drum with bare hands.
- The same sized paper is of two kinds, short grain and long grain. Short grain paper should only be fed through the printer crosswise, while long grain paper should only be fed lengthwise. The wrapper of the paper is properly marked.
- If your hands become soiled with toner, wash them with soap and water.
- Do not throw away any used consumables. They are to be collected.
- Do not burn, bury in the ground, or throw into the water any consumables.
- Do not store consumables in a place which:

✻ Is hot and humid.

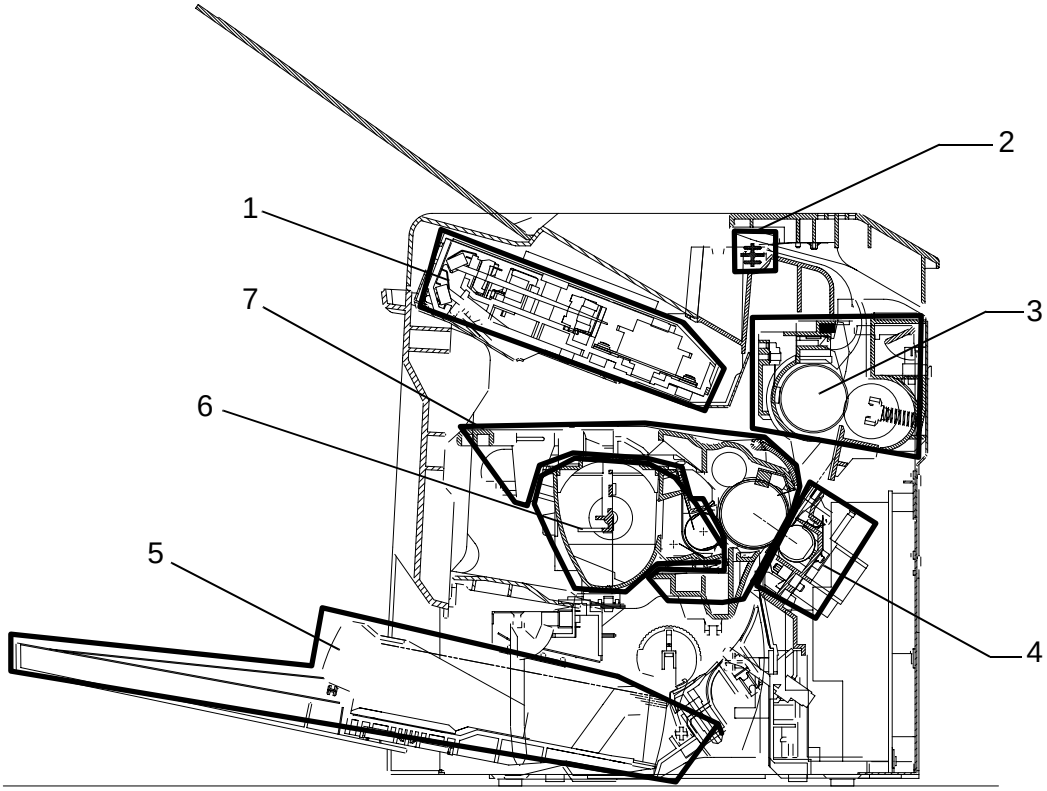
✻ Is subject to direct sunlight.

✻ Has an open flame nearby.

1. Upper Cover
2. Face-down Tray
3. Control Panel
4. Front Door
5. Multipurpose Tray
6. Edge Guides
7. Power Switch
8. Power Cord Socket
9. Parallel Interface Connector
10. USB Interface Connector
11. Toner Cartridge
12. Drum Cartridge

MECHANICAL/ ELECTRICAL

1. COMPONENTS LAYOUT



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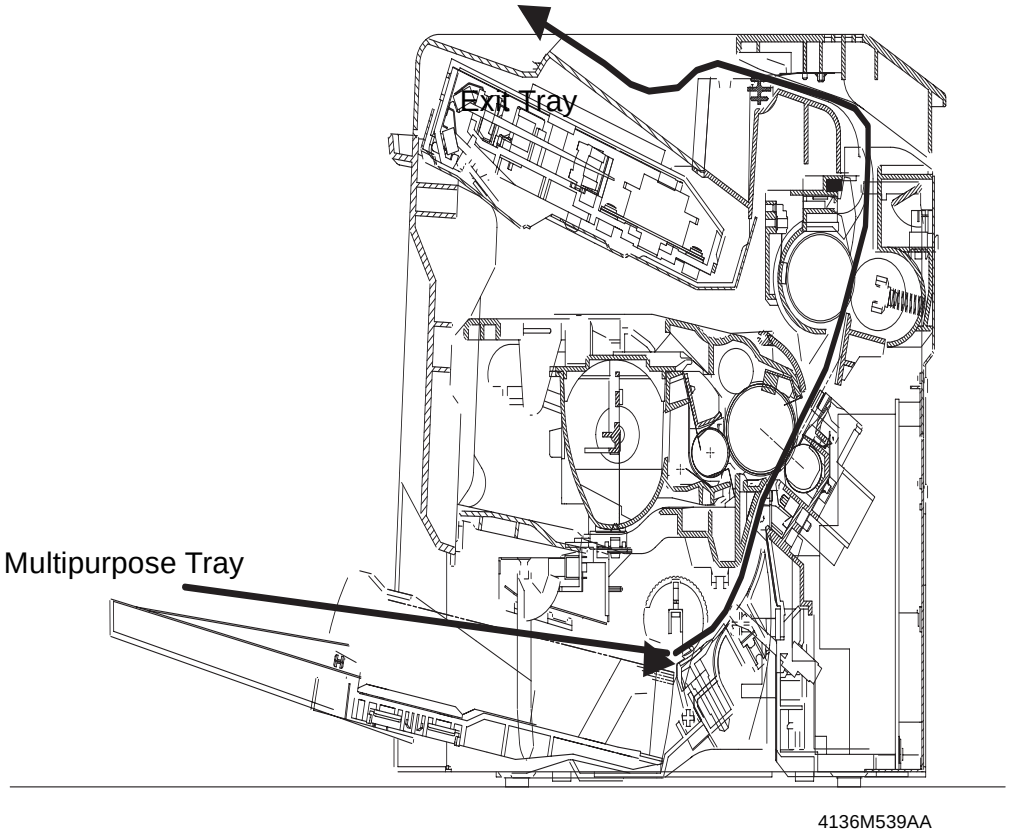
1. Print Head (PH) Unit
2. Exit Roller
3. Fusing Unit
4. Image Transfer Section
5. Multipurpose (MP) Tray
6. Toner Cartridge
7. Drum Cartridge

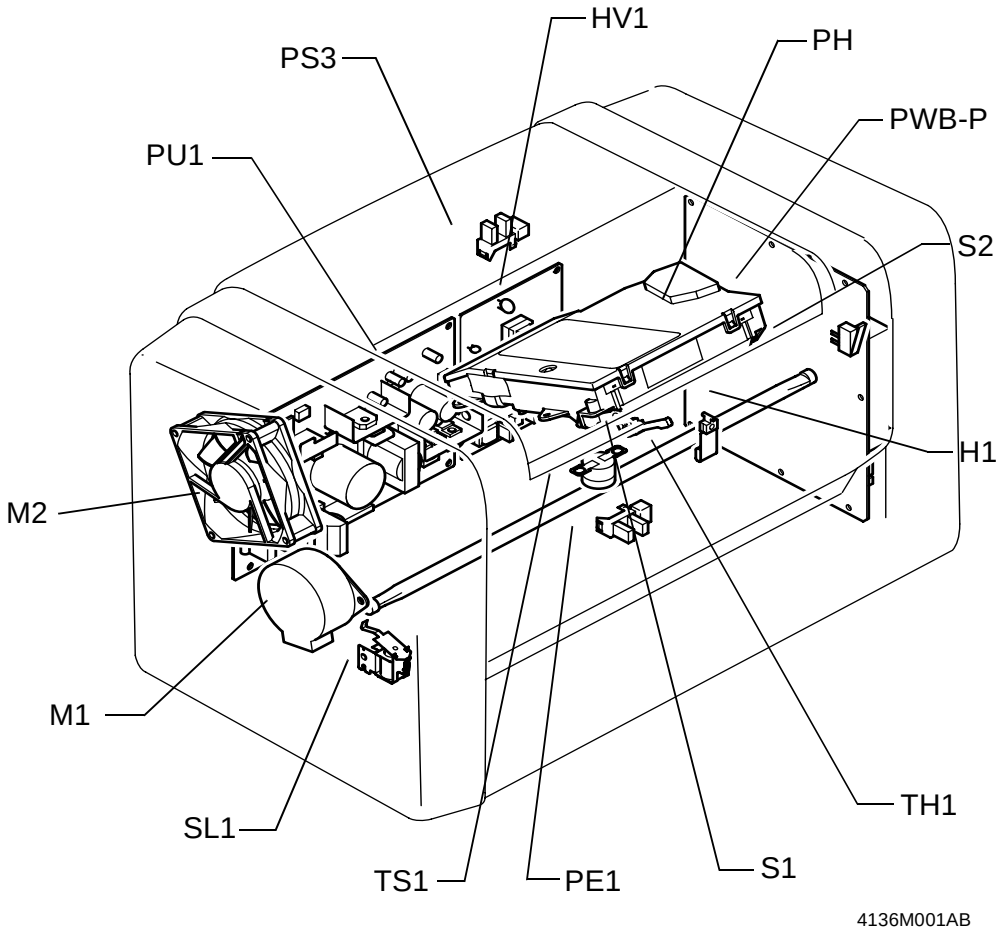
2. PAPER PATH



- The printer adopts the 1-way paper feeding system by means of the Multipurpose Tray (capable of holding up to 150 sheets of paper).
- The paper taken up and fed in by the Paper Take-Up Roll is transported through the printer by the Image Transfer Roller, Fusing Roller, and Exit Roller and fed out of the printer face down onto the Exit Tray.

3. ELECTRICAL COMPONENTS LAYOUT

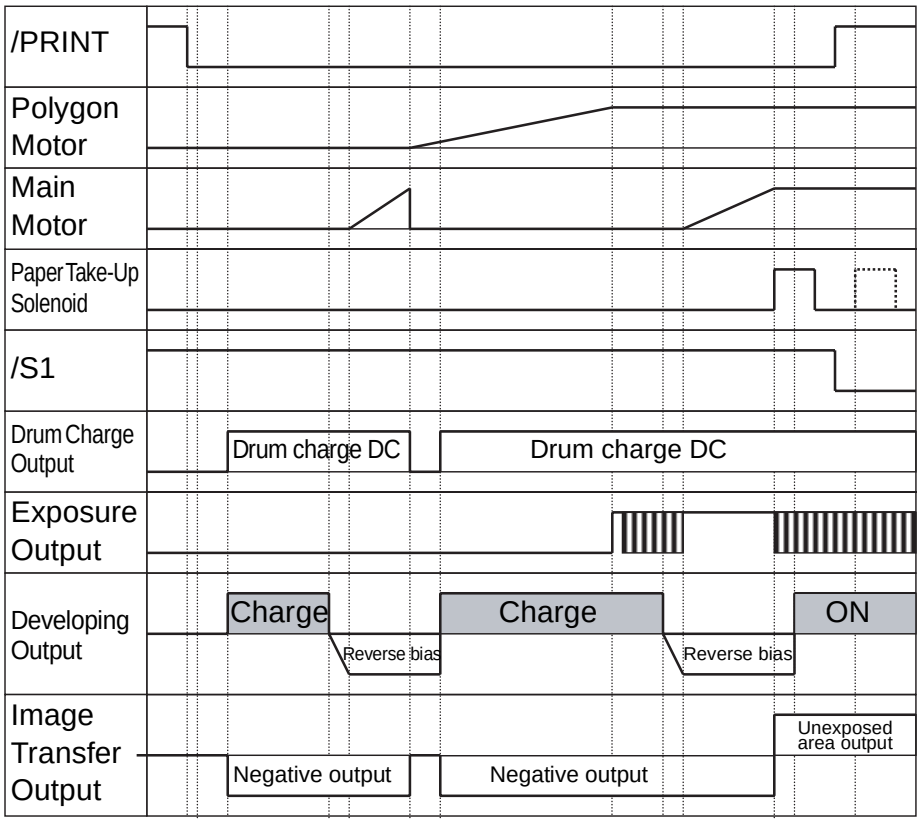
3-1. Printer



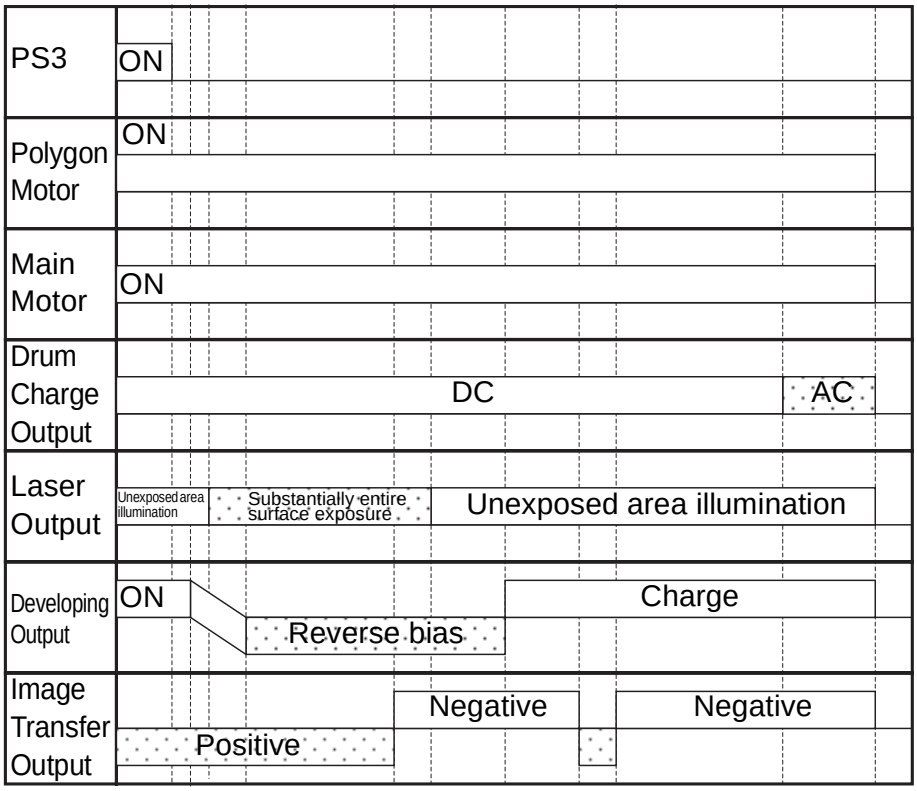
M1	Main Motor	S2	Front Door Switch
M2	Cooling Fan Motor	PE1	Multipurpose Tray Paper Empty Sensor
H1	Fusing Roller Heater Lamp	PS3	Exit Sensor
TH1	Thermistor	SL-1	Paper Take-Up Solenoid
TS1	Thermostat	PU-1	Power Unit
PH	Print Head Unit	HV-1	High Voltage Unit
S1	Paper Take-Up Switch	PWB-P	Controller/Mechanical Control Board

4. OPERATING SEQUENCE

4-1. Print Start Sequence



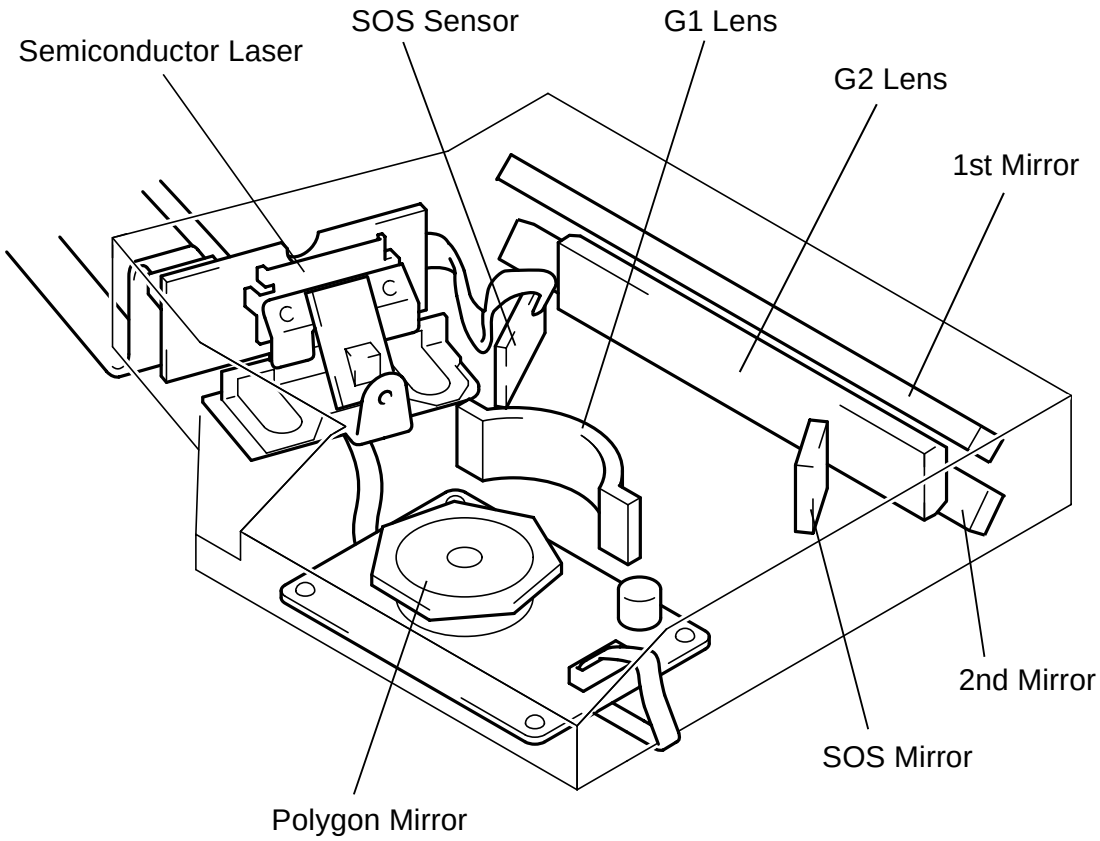
4-2. Print End Sequence



5. PRINT HEAD (PH)

5-1. Construction

- The laser beam light emitted from the Print Head is used to scan the image as driven by the Polygon Motor.



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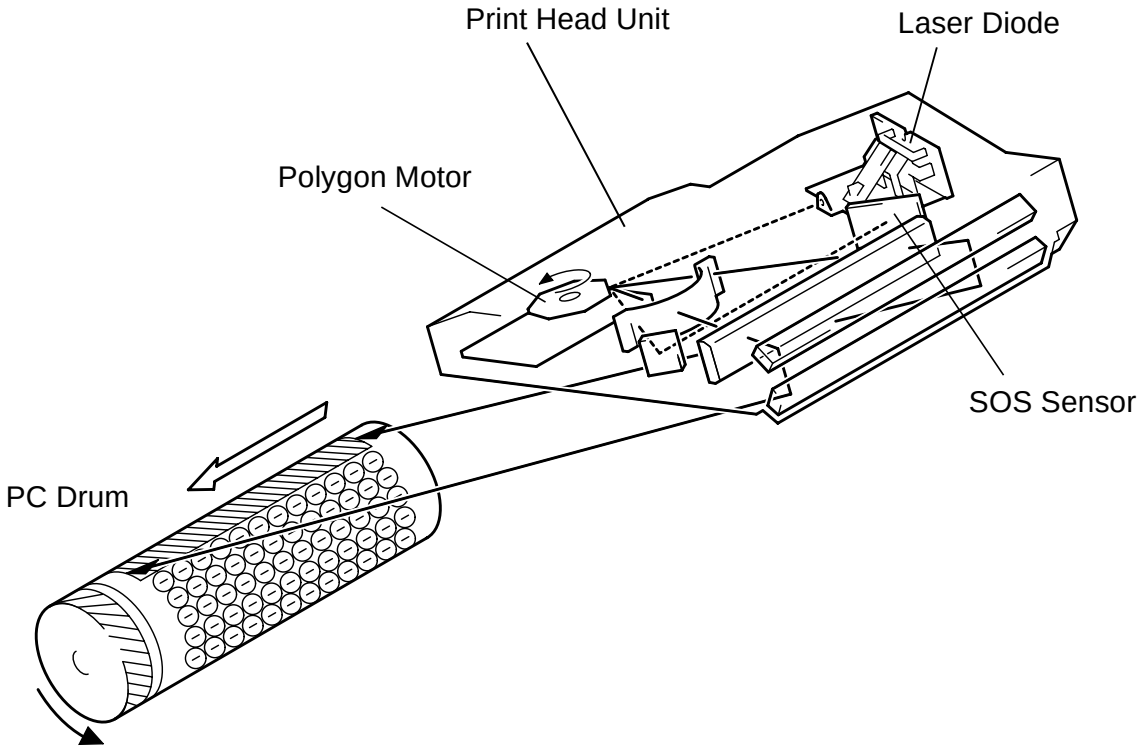
5-2. Laser Exposure Process

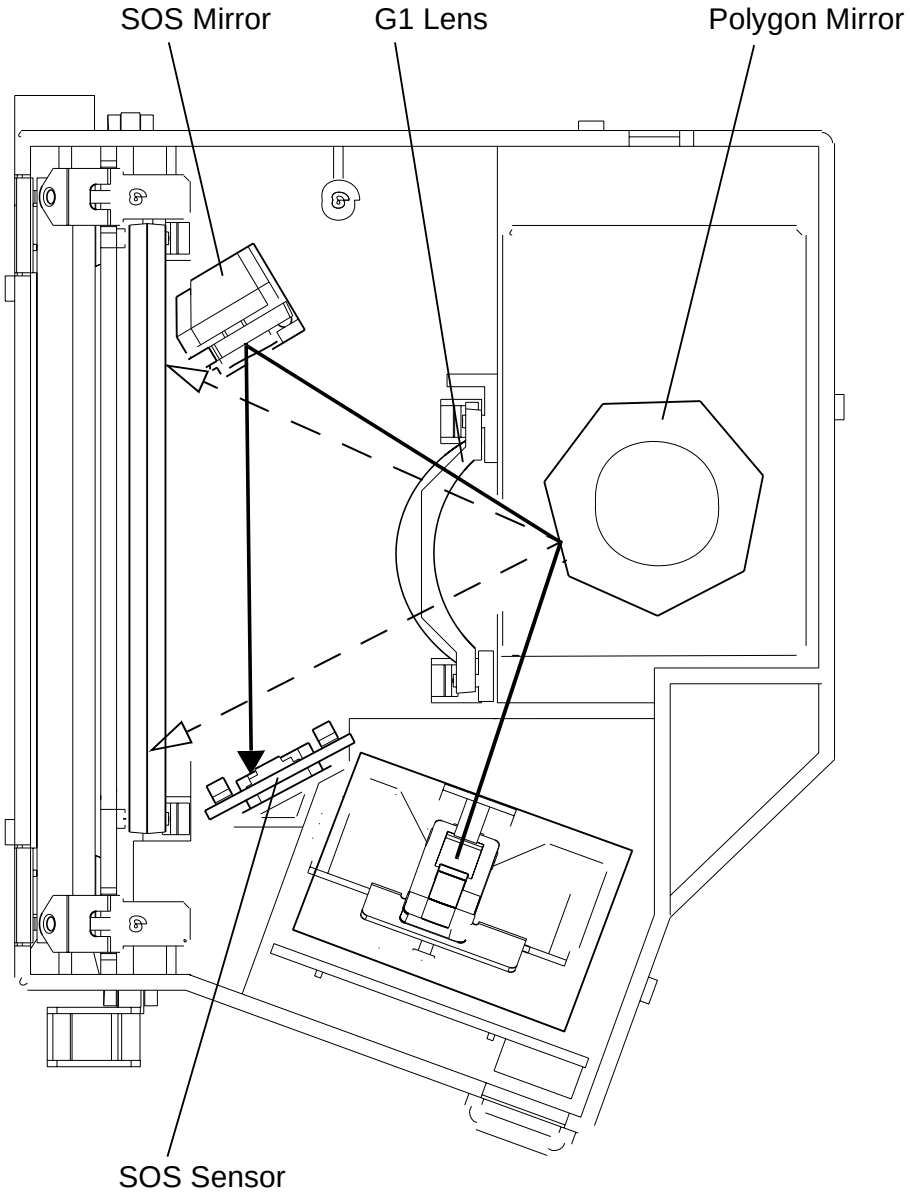
- The laser beam light emitted from the Print Head is used to create an electrostatic latent image on the surface of the PC Drum.
- The following control is provided to correctly time image printing.



- When the printer receives a PRINT signal, the Polygon Motor and the Main Motor start rotating and the paper is taken up and fed into the printer.
- The printing is started when the Controller/Mechanical Control Board sends a VIDEO signal to the Print Head a given period of time after the leading edge of the paper actuates the Paper Take-Up Switch (TOD signal).
- The print start position for the 2nd line is defined by delaying the time, at which the VIDEO signal is to be transmitted.
- The SOS Sensor provided in the PH ensures that the laser beam is emitted at the same timing for all lines in the main scanning direction.

5-3. Laser Emission Timing

- When a READY signal is detected a given period of time after the print command has been issued, the Controller/Mechanical Control Board outputs a laser ON signal.
- The laser ON signal makes a laser beam to be emitted and the laser beam travels to the Polygon Mirror, G1 Lens, and the SOS Mirror to eventually hit the SOS Sensor, which generates an SOS signal.
- The SOS signal determines the laser emission timing for each line in the main scanning direction.



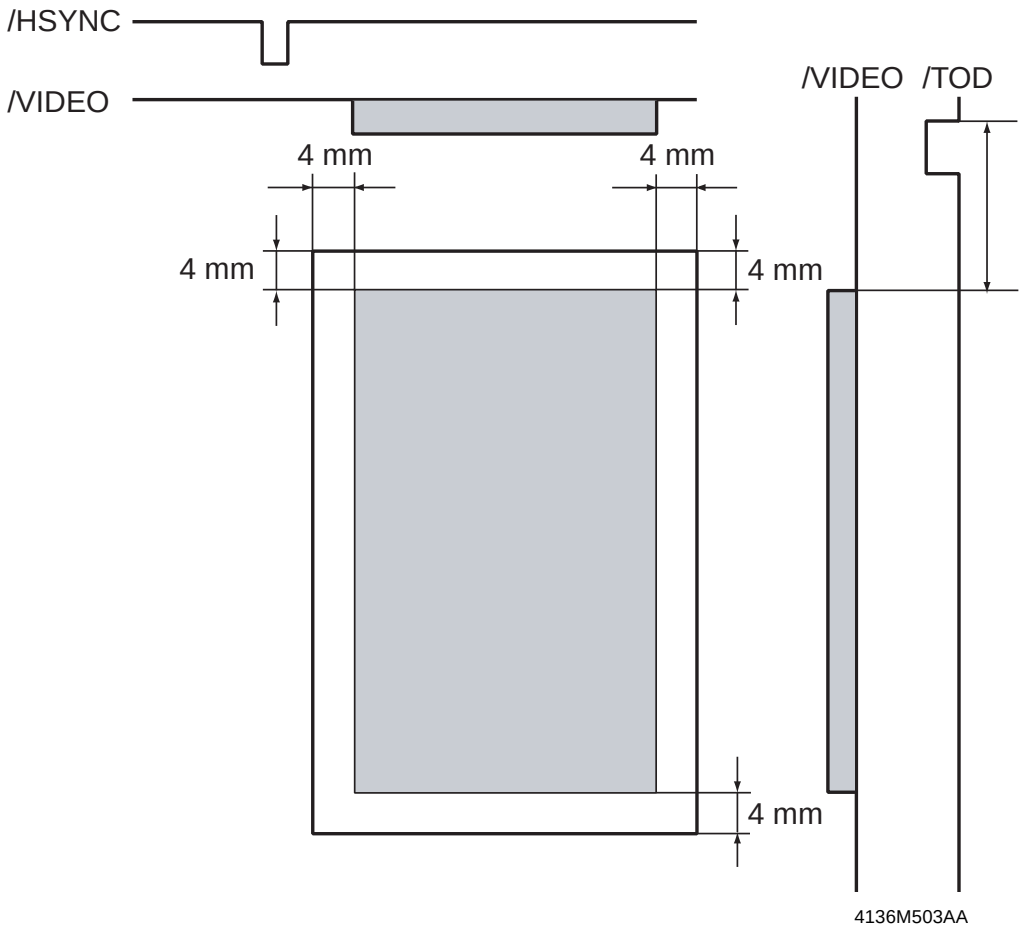
5-4. Laser Emission Area

(1) Main scanning direction

- The print start position is determined by the main scanning print start signal (/HSYNC) output from the Controller/Mechanical Control Board and the width of the paper.
- The laser emission area is determined by the paper size. Areas with a width of 4 mm on both edges are not, however, printed.

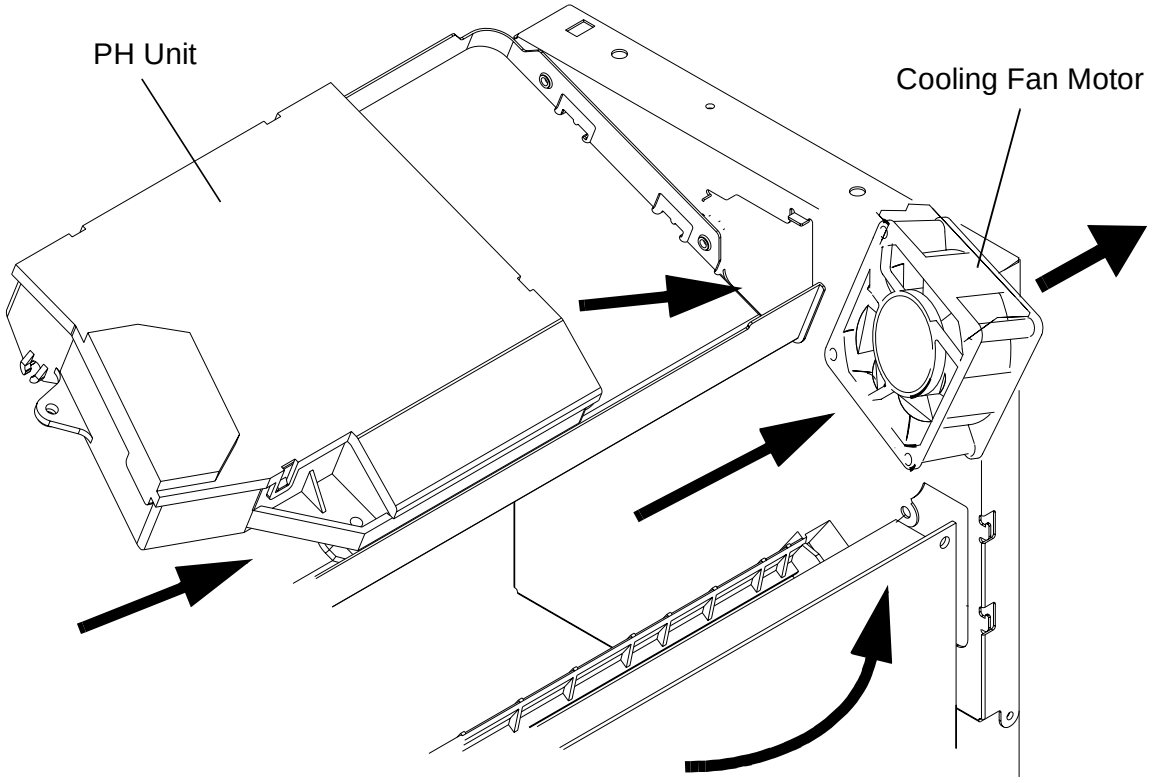
(2) Sub-scanning direction

- The print start position is determined by the sub-scanning print start signal (/TOD) output from the Controller/Mechanical Control Board and the length of the paper.
- The laser emission area is determined by the paper size. Areas with a width of 4 mm on both the leading and trailing edges are not, however, printed.



5-5. Cooling of the Printer Interior

- The Cooling Fan Motor is used to discharge heat generated from the PH Unit out of the printer, thereby preventing the PH Unit from getting hot.

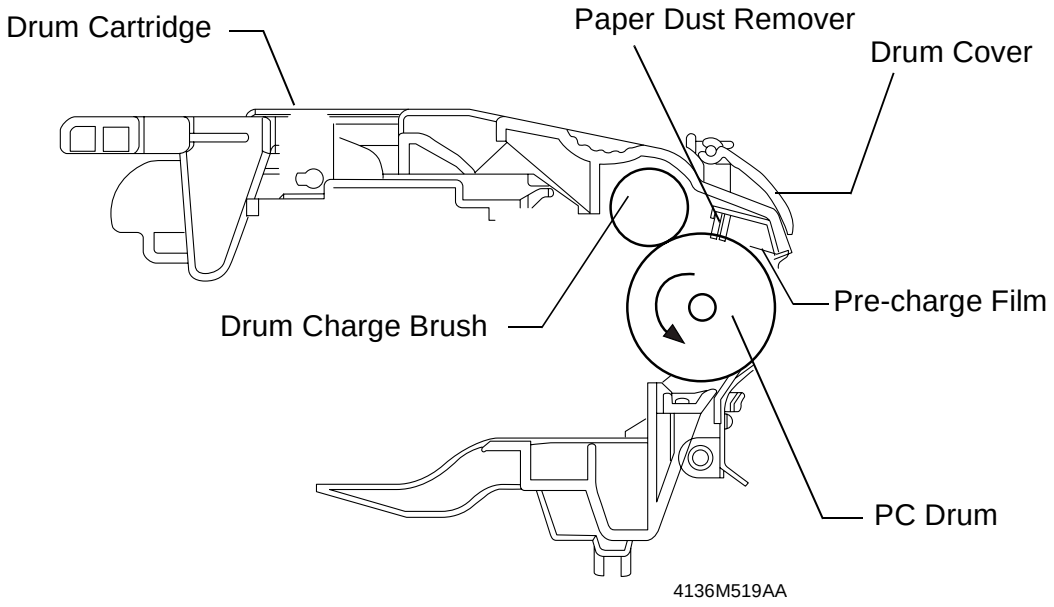


6. DRUM CHARGE

(1) Overview

- The PC Drum is charged with static electricity before laser exposure.
- The Drum Charge Brush and the Pre-charge Film are used for charging.
- Since the Drum Charge Brush and the Pre-charge Film directly deposit charge on the PC Drum, they produce little ozone. Further the charging voltage is low and the deposited charge is even and stable across the surface of the PC Drum.
- The Pre-charge Film supplies a preliminary charge to the PC Drum prior to charging by the Drum Charge Brush, thereby increasing charging efficiency.

(2) Construction



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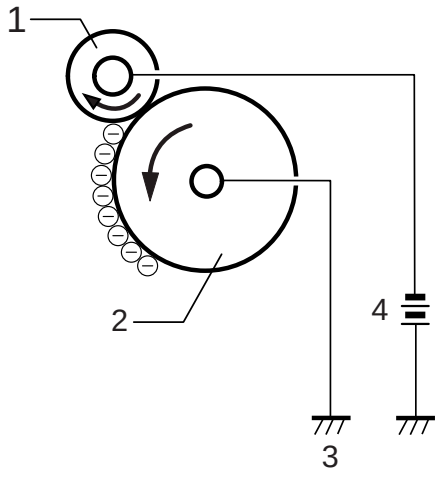

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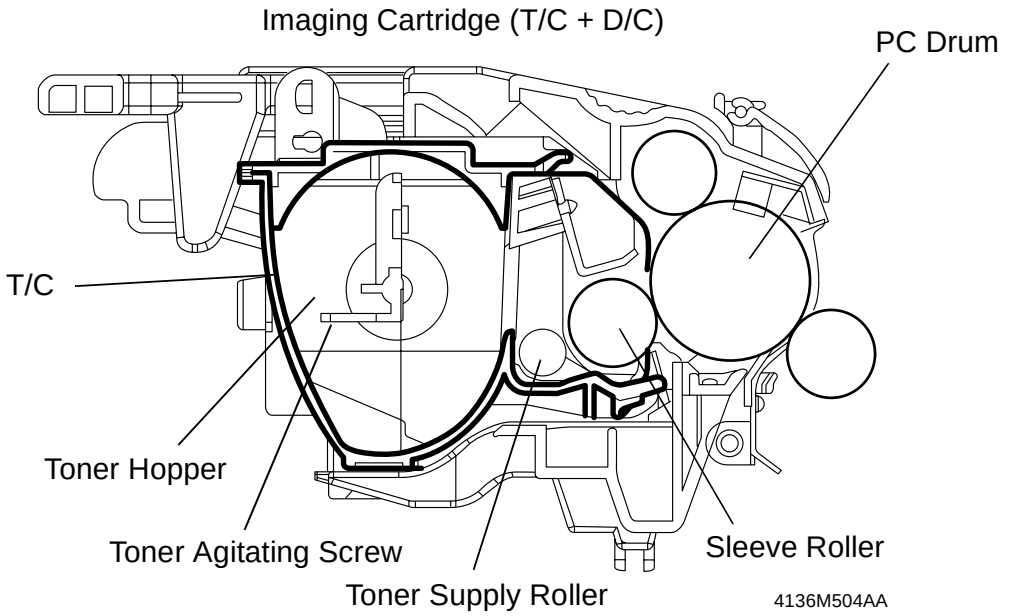
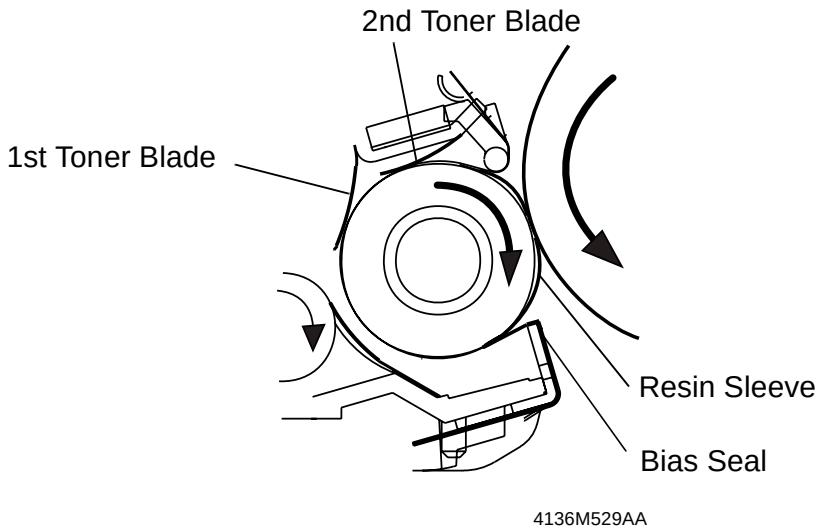
1. Drum Charge Brush
2. PC Drum
3. Ground
4. Drum Charge Brush voltage

7. IC (IMAGING CARTRIDGE) SECTION

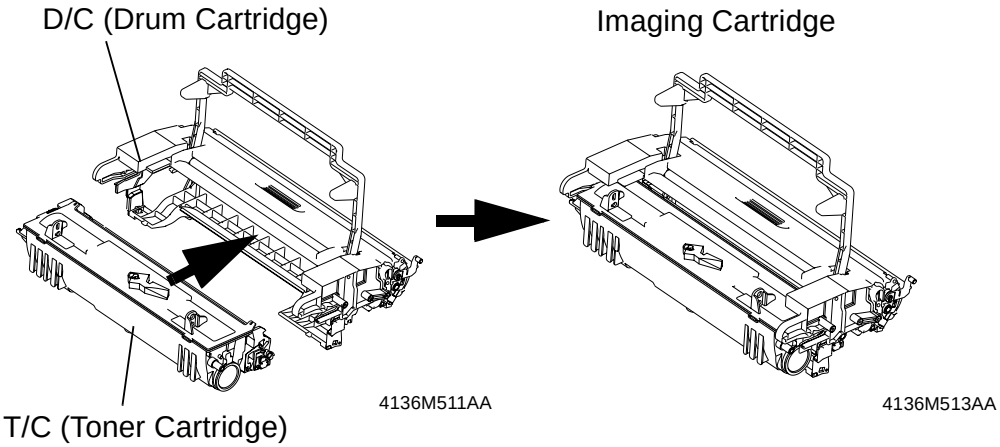
7-1. Overview

- The illustration below shows the construction of the Toner Cartridge and the Developing Unit.
- This printer adopts the single-component FMT, or Fine Micro Toning, developing system.
- The Toner Agitating Screw conveys toner in the Toner Cartridge onto the Toner Supply Roller.
- The Toner Supply Roller transports the toner to the Sleeve Roller. The Resin Sleeve of the Sleeve Roller carries the toner onto the PC Drum to form a toner image on the latent image formed on the surface of the PC Drum.





- The Imaging Cartridge consists of a T/C (Toner Cartridge) and a D/C (Drum Cartridge) (see the illustration below).

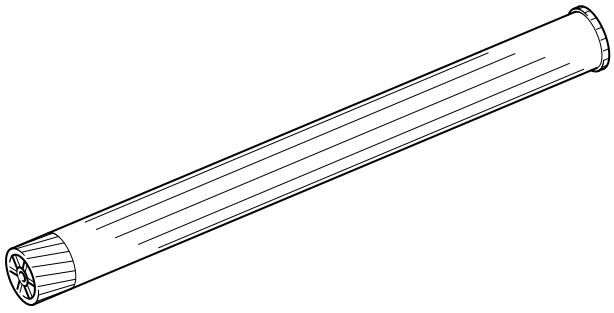


7-2. PC Drum

- The PC Drum used in this printer is the organic photoconductor (OPC) type.
- The drum consists of two layers - Charge Transport Layer (CTL) and the Charge Generating Layer (CGL) - applied to an aluminum alloy base (cylinder).

Handling Precautions:

The PC Drum of this type exhibits light fatigue after being exposed to light for a long time, which results in its sensitivity being changed. Therefore, always wrap the drum in the PC Drum Cloth or a soft cloth immediately after it has been removed from the printer. Use utmost care to prevent the surface of the PC Drum from being dirtied.



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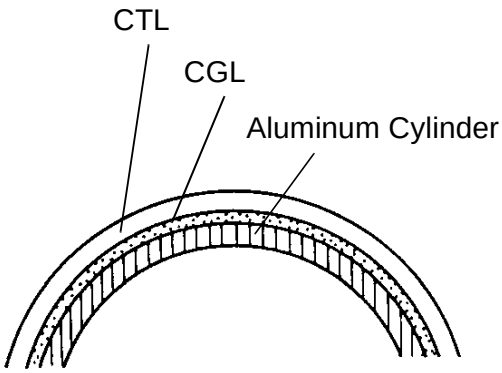

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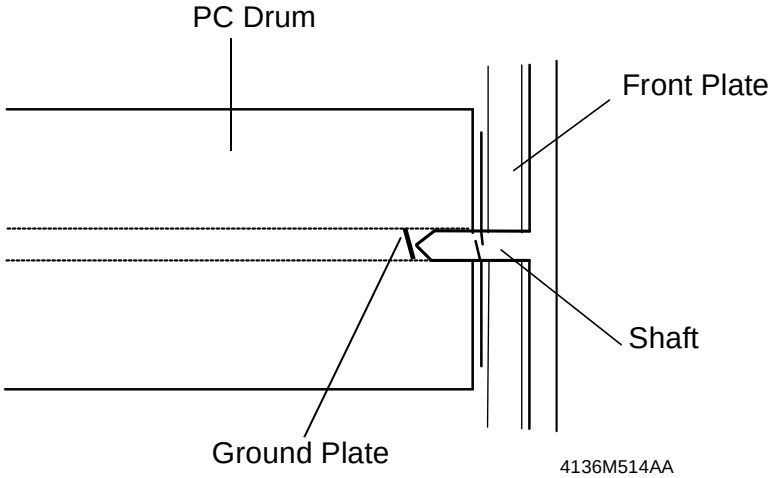
- Grounding of the PC Drum

  The ground contact point (Ground Plate) for the PC Drum is located inside the PC Drum at its front side. It is, at all times, in contact with the shaft of the front plate of the Imaging Cartridge. When the Imaging Cartridge is loaded in the printer, the set pin of the front plate of the Imaging Cartridge contacts a side plate on the printer side, thereby providing grounding. The potential on the surface of the PC Drum exposed to the laser beam is then grounded through the Ground Plate, shaft, and set pin to the frame of the printer.



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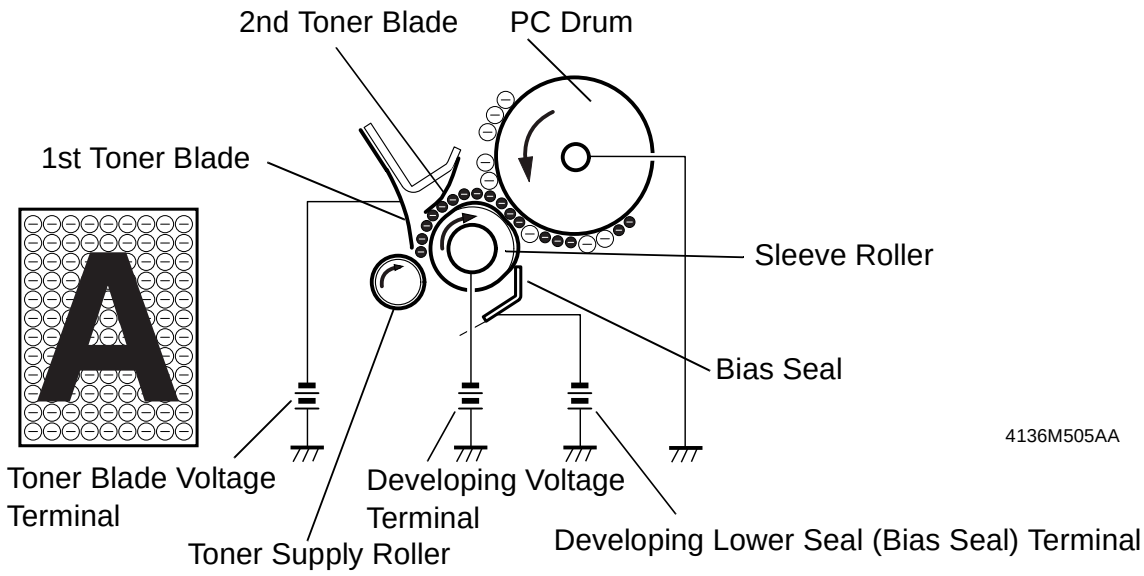
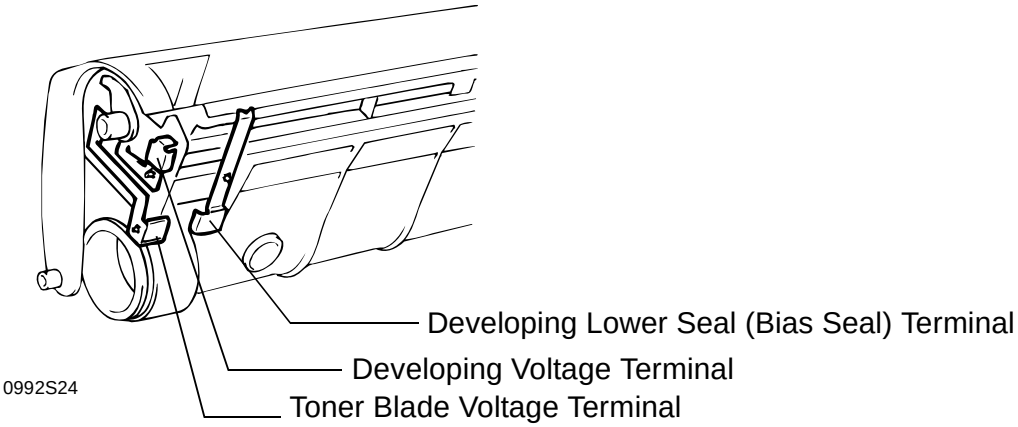
7-3. Developing System

- The Toner Agitating Screw conveys toner in the Toner Cartridge onto the Toner Supply Roller.
- The Toner Supply Roller transports the toner to the Sleeve Roller.
- The 1st Toner Blade located above the Sleeve Roller spreads a thin, even coat of toner over the Sleeve Roller.
- A negative charge is applied to the 2nd Toner Blade, which negatively charges the toner.
- The Sleeve Roller is negatively charged, which retains the toner thereon.
- The toner sticks to the area on the surface of the PC Drum that has been exposed to the laser beam.
- The Bias Seal on the underside of the Sleeve Roller separates toner, which has not been attracted onto the surface of the PC Drum, from the Sleeve Roller and returns it back to the Toner Hopper. The same bias as that applied to the Sleeve Roller is applied to this Bias Seal, thereby preventing toner from falling.
- The developing bias automatically adjusts the print image density over a range of seven steps through feedback control. A bias voltage, reversed from the developing bias, is applied before a print command is issued, before predrive, and during predrive, to prevent toner from sticking to the surface of the PC Drum.





7-4. Detection of Toner Cartridge

(1) Installation detection

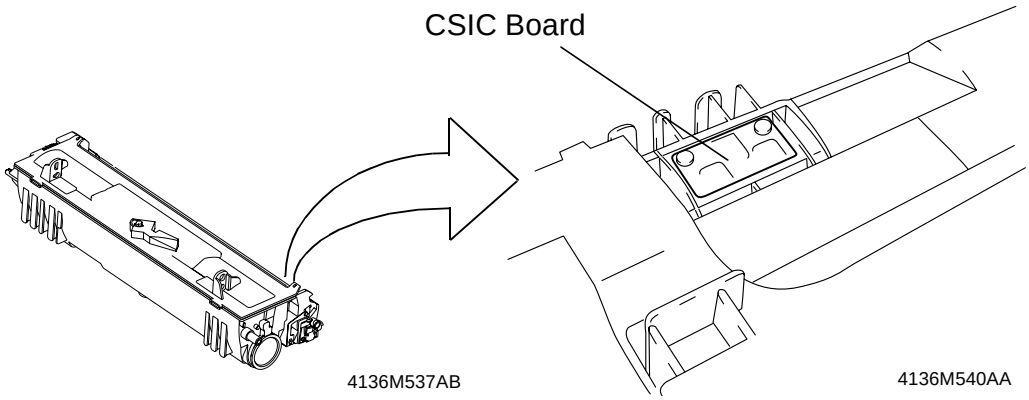
- The IC chip (CSIC) built into the Toner Cartridge detects that the Imaging Cartridge is installed in position when the power switch is turned OFF and ON, and the Front Door is opened and closed. The detection is made electrically.

(2) Detection of a new Toner Cartridge

- The IC chip (CSIC) built into the Toner Cartridge detects a new Toner Cartridge only when it is first installed.

(3) Toner near empty and empty detection

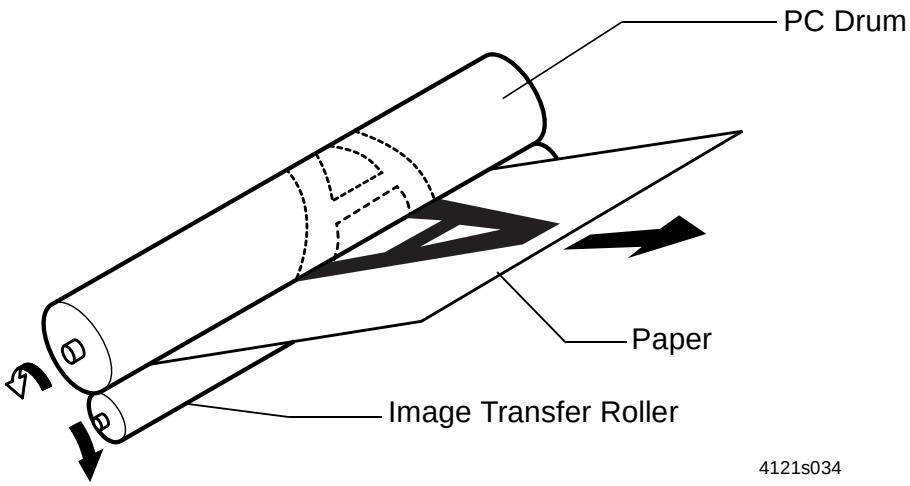
- The built-in CSIC Board counts the amount of toner still available for use in the Toner Cartridge.
- The counter counts one when the amount of toner equivalent to A4, B/W 5 % is consumed and the corresponding data is stored in the CSIC Board.
- A toner near empty condition and a toner empty condition are detected when the counter reads the corresponding predetermined count.



8. IMAGE TRANSFER

8-1. Overview

- The toner image formed on the surface of the PC Drum during the developing process is transferred onto the paper.
- This printer adopts the roller image transfer system, in which the Image Transfer Roller is used to transfer the image onto the paper.
- In the roller image transfer system, the paper is pinched between the PC Drum and the Image Transfer Roller at all times during the print cycle. This results in a very little amount of ozone being produced and there is a little chance of a double transferred image occurring.
- To clean the Image Transfer Roller, reverse bias is applied to the Image Transfer Roller.
- The cleaning sequence is carried out when the printer is started, a print command is issued, a print cycle is completed, and when the printer is started after a misfeed has been cleared.
- There is the Charge Neutralizing Needle installed for neutralizing the paper after image transfer.



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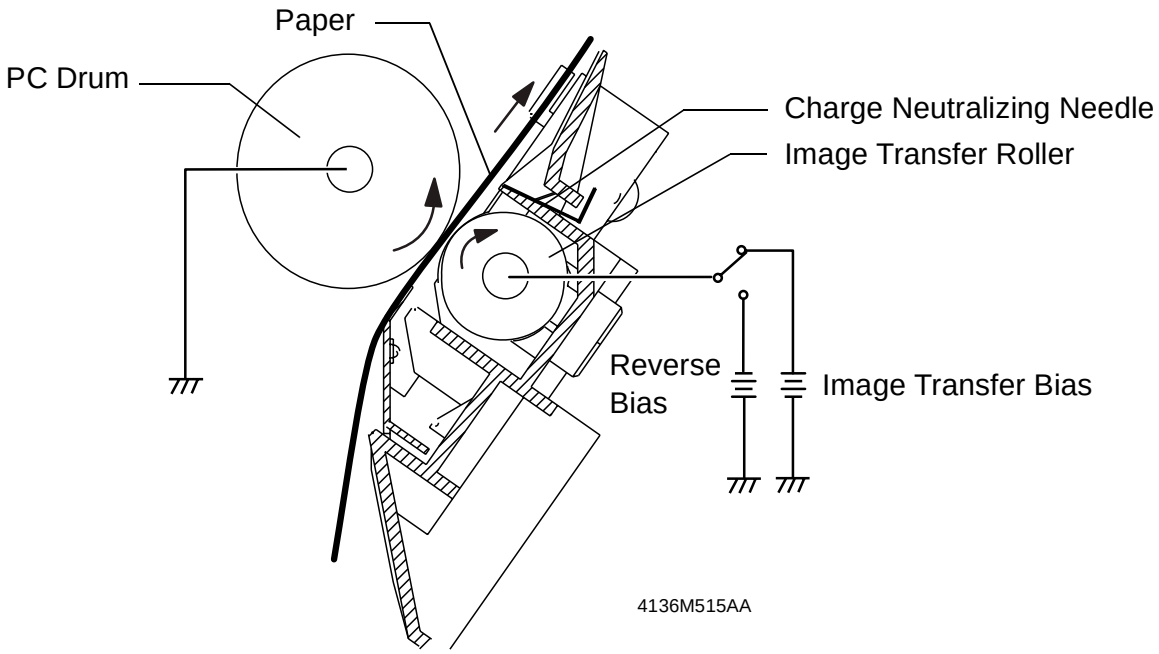

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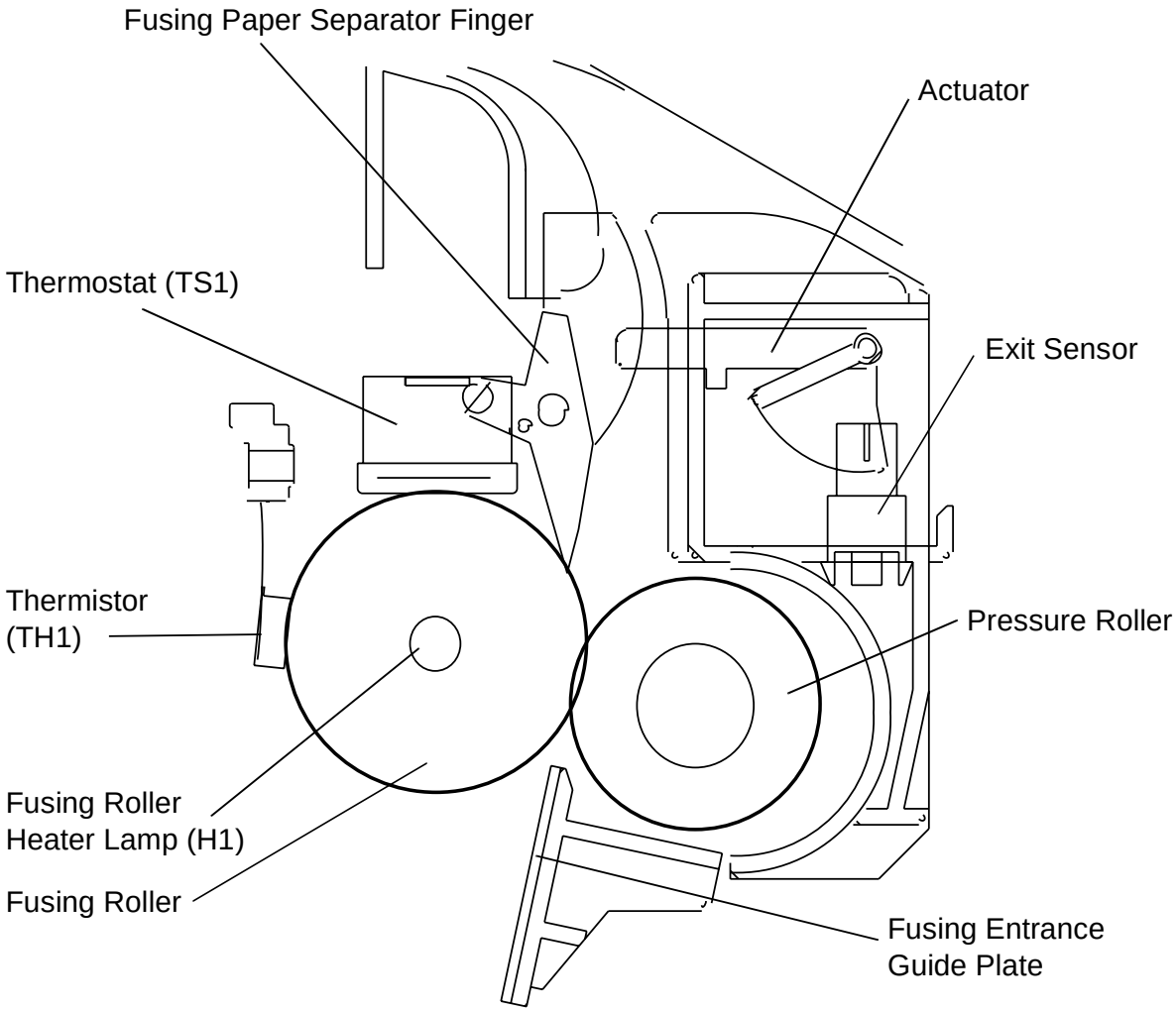
9. FUSING UNIT

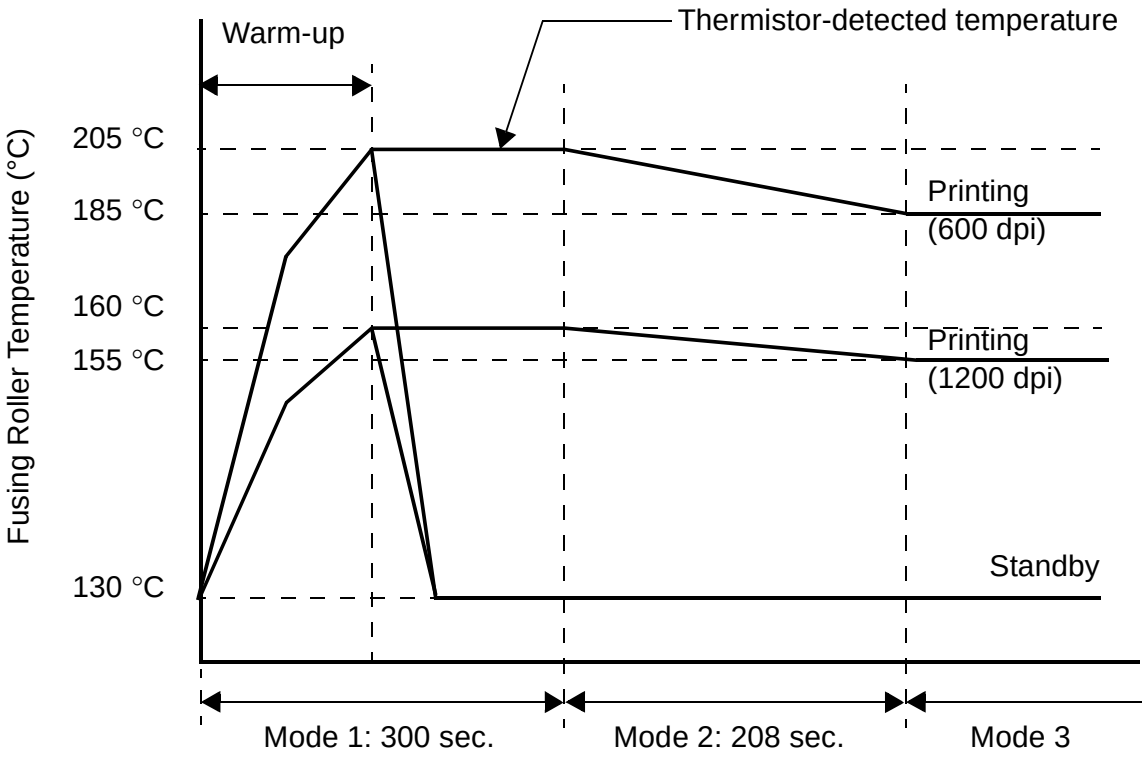
9-1. Overview

- The toner image transferred onto the paper is securely fixed to the paper.
- A heated roller system is used as the fusing system. The paper, to which the toner image has been transferred, is fed between the Fusing Roller heated by the Fusing Roller Heater Lamp and the Pressure Roller. This permanently fixes the toner image in the paper.



9-2. Fusing Unit Temperature Control

(1) Temperature change



		Thermistor-Detected Temperature at Start of Temperature Control		
		Less than 50 °C	50 °C to 130 °C	More than 130 °C
Mode before Temperature Control	Power OFF	Mode 1	Mode 2	Mode 3
	Mode 1		Mode 1	
	Mode 2		Mode 2	Mode 3
	Mode 3			

(2) Temperature control

- During a warm-up cycle, the fusing temperature is increased to a predetermined level.
- The warm-up control is performed when the power is turned ON, the Front Door is opened and closed, and the Pause mode is canceled.
- During the standby state, the fusing temperature is kept lower (130 °C) than during printing so as to economize on power consumption.
- The temperature control mode selected when temperature control is resumed (when the power is turned ON, the Front Door is opened and closed, or the Pause mode is canceled) is determined by the mode set before the interruption and the fusing temperature.
- In the Pause (low power consumption) mode, the Fusing Roller Heater Lamp is turned OFF to reduce power consumption.

(3) Temperature control mode

During a print cycle, the fusing temperature is regulated in accordance with the elapsed time since the completion of the warm-up cycle.

- Mode 1

  Mode 1 lasts for 5 min. If, however, mode 1 is interrupted in mid-operation and the thermistor temperature is 50 °C or more, the timer count before the interruption continues. When mode 1 is completed, mode 2 starts.

- Mode 2

  Mode 2 lasts for 208 sec. During this period, the fusing temperature is gradually decreased and, when it is decreased to the fusing temperature of mode 3, mode 2 is terminated and mode 3 is started.

- Mode 3

  Mode 3 continues until the temperature control is interrupted (as by opening and closing the Front Door, etc.).

(4) Fusing temperature in each mode

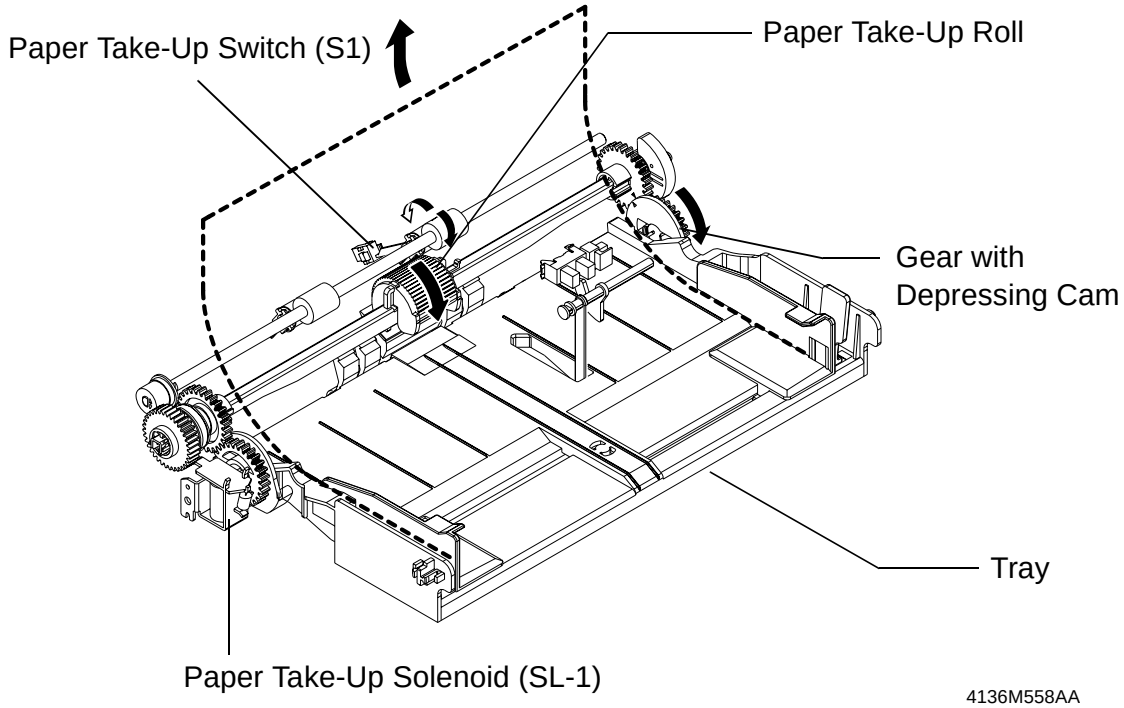
		Mode 1	Mode 2	Mode 3
600 dpi	Plain paper	205 °C	205 °C → 185 °C	185 °C
	Thick paper, envelope, postcard	205 °C → 215 °C		
	OHP transparencies	195 °C	195 °C → 185 °C	185 °C
1200 dpi	Plain paper	160 °C	160 °C → 155 °C	155 °C
	Thick paper, envelope, postcard	165 °C → 170 °C		
	OHP transparencies	155 °C	155 °C → 150 °C	150 °C

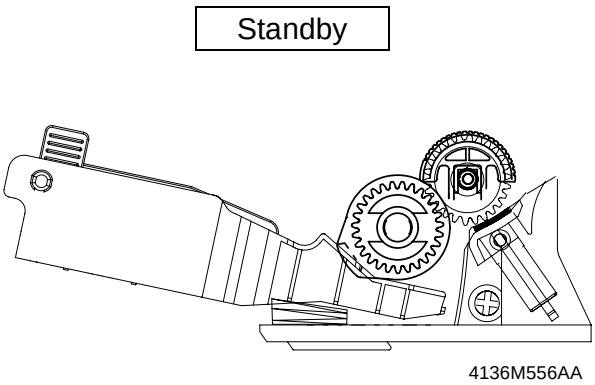
10. PAPER TAKE-UP SECTION

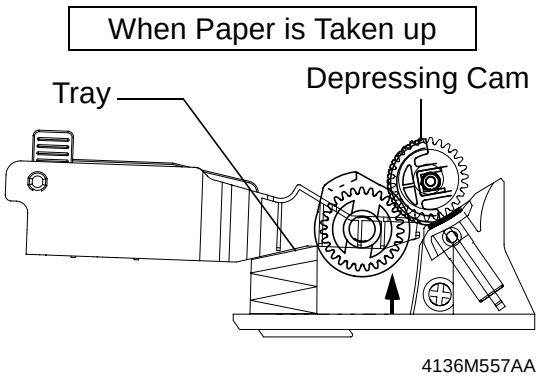
10-1. Multipurpose Tray

(1) Paper take-up mechanism

- When the Paper Take-Up Solenoid is energized, drive from the Main Motor is transmitted to the Paper Take-Up Roll through the Paper Take-Up Clutch, turning the Paper Take-Up Roll.
- At the same time, the Depressing Cam turns so as to raise the Paper Lifting Plate. Then, the top sheet of paper loaded in the tray is taken up and fed into the printer.
- The actual length of paper is detected based on the period of time through which the Paper Take-Up Switch remains actuated (or through which the paper moves past the switch) and the system speed. It is then determined whether or not the actual length matches the paper length specified on the controller.





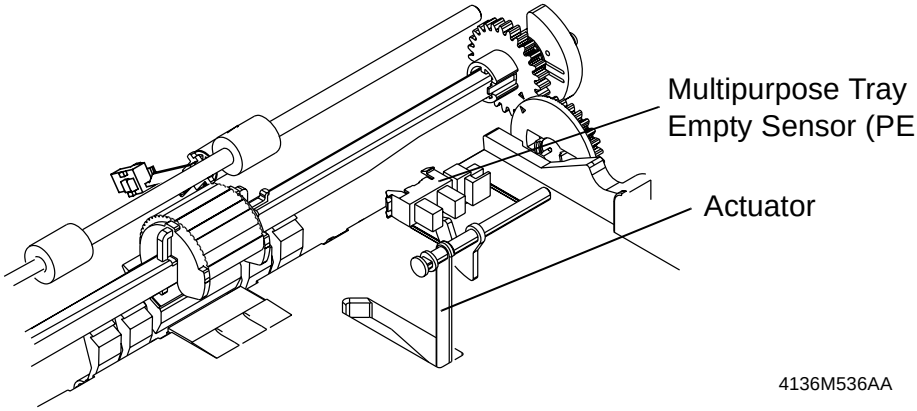


(2) Double feed preventive mechanism

A fixed paper separator pad is used to prevent the second and subsequent sheets of paper from being taken up and fed in with the first one.

(3) Paper empty detection

- There is a Multipurpose Tray Paper Empty Sensor provided on the upper portion of the Multipurpose Tray. It detects paper loaded in the tray.
- When there is a paper stack loaded in the tray, the actuator is raised to block the Paper Empty Sensor.
- When paper runs out, the actuator drops into the hole in the tray, unblocking the Paper Empty Sensor.



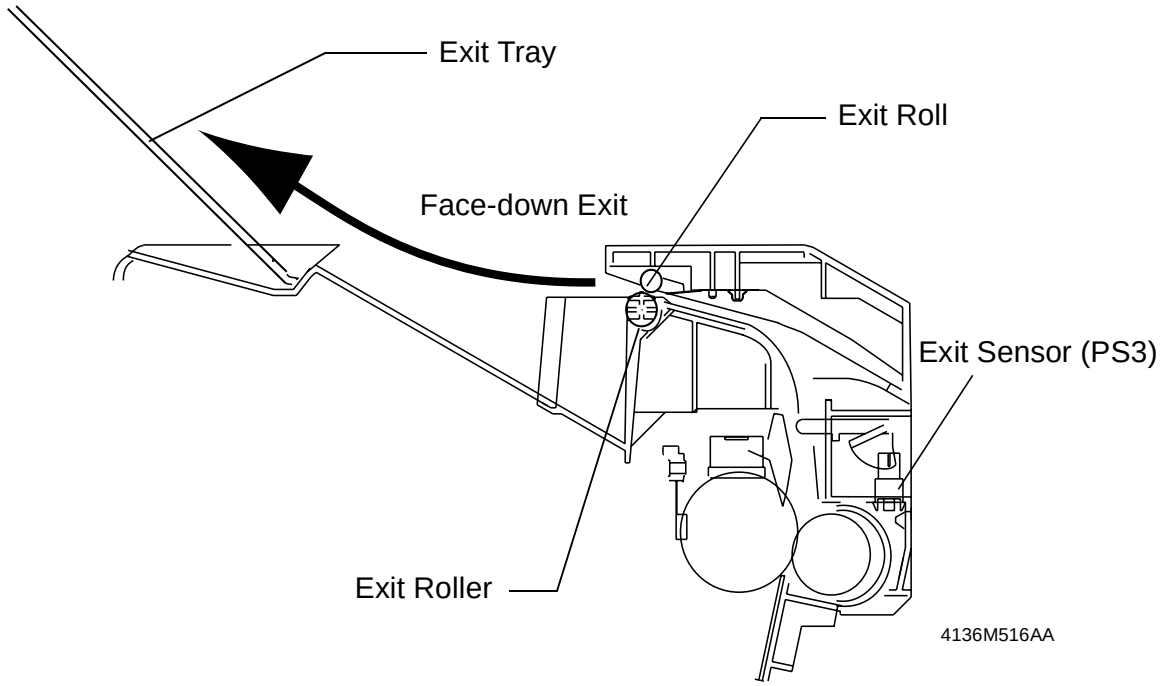
(4) Paper take-up retry function

- To reduce the number of paper misfeeds as a result of a paper take-up failure, a paper take-up retry sequence is carried if the Paper Take-Up Switch is not actuated and deactuated within a predetermined period of time.
- This function is provided for paper take-up from any printer paper tray.

11. PAPER EXIT

11-1. Paper Exit Mechanism

- The paper exit mechanism transports the paper that has been subjected to the fusing process onto the Exit Roller.
- The Exit Sensor detects not only a paper misfeed but also an open Upper Cover.



MAINTENANCE

1. MAINTENANCE SCHEDULE

- To ensure that the printer produces good printed pages and to extend its service life, it is recommended that the maintenance jobs described in this schedule be carried out as instructed.

PM Parts	Clean	Replace		Ref. Page in This Manual
		Continuous	Making one printed page per job	
Paper Take-Up Roll	When a paper take-up failure occurs	Replace when a paper take-up failure occurs		☞ E-3
Image Transfer Roller	–	50K		☞ E-4
Drum Cartridge	–	20K	16K	☞ E-7
Toner Cartridge (for replacement)	–	3K/6K	2.4K/4.8K	☞ E-5
Toner Cartridge (shipped with printer)	–	1.5K	1.2K	☞ E-5
Fusing Unit	–	50K		☞ E-8

NOTES

- *K = 1,000 printed pages*
- *As a rule, the Drum Cartridge and Toner Cartridge are to be replaced by the user.*
- *The contents of the Maintenance List are subject to change without notice.*
- *For the part numbers, see Parts Manual and Parts Modification Notice.*

1-1. Guidelines for Life Specifications Values by Unit

- The life specifications value represents the number of printed pages produced or figures equivalent to it when given conditions (see the Table given below) are met. It can be more or less depending on how each individual printer is used.

Print Conditions		
Job type	Making one printed page per job	Continuous
Paper size	A4L/Letter L	
B/W ratio	5 %	

(1) Near life values

Unit name		Near life value	Detection
Toner Cartridge	1.5K	1.3K	The value used for detection of the amount of toner still available for use is provided as feedback information for calculating toner consumption, thereby detecting a toner near empty condition.
	3.0K	2.9K	
	6.0K	5.8K	

(2) Life values

Unit name		Life value	Detection	Life reset
Toner Cartridge	1.5K	1.5K	The value used for detection of the amount of toner still available for use is provided as feedback information for calculating toner consumption, thereby detecting a toner empty condition.	Reset when the Toner Cartridge is replaced with a new one.
	3.0K	3.0K		
	6.0K	6.0K		

2. REPLACEMENT/CLEANING OF PARTS

(1) Cleaning of the Paper Take-Up Roll

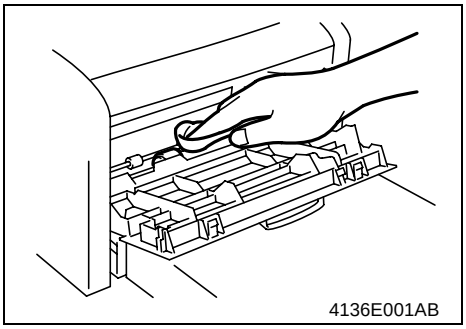
<Printer>

1. Remove the Imaging Cartridge.

☞ E-5

NOTE

- *The Imaging Cartridge is the Drum Cartridge, to which the Toner Cartridge is mounted.*



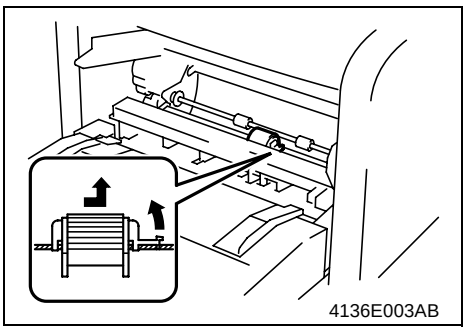
2. Using a soft cloth, wipe the surface of the Paper Take-Up Roll clean of dirt.

(2) Replacement of the Paper Take-Up Roll

<Printer>

1. Remove the Imaging Cartridge.

☞ E-5



2. Remove the Paper Take-Up Roll.

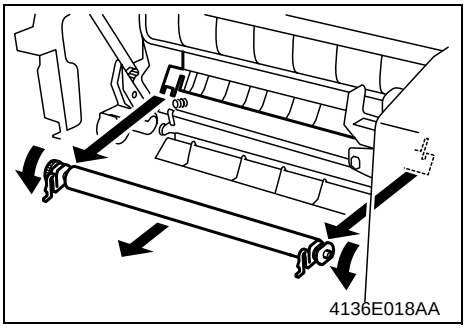
(3) Replacement of the Image Transfer Roller

1. Remove the Imaging Cartridge.

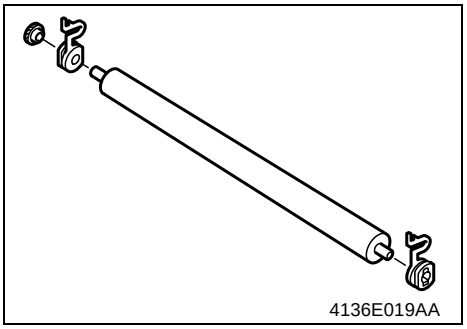
☞ E-5

2. Remove the Fusing Unit.

☞ E-8



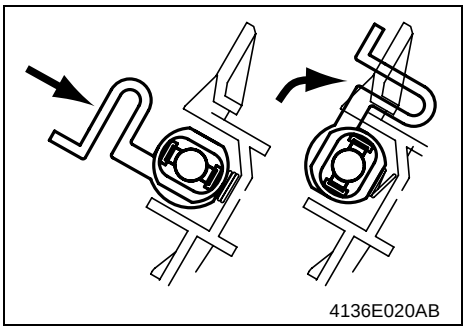
3. Place the levers of the bushings (white) on the right and left ends of the Image Transfer Roller toward this side and remove the Image Transfer Roller from the Image Transfer Roller holder.



4. Pull out the bushings on the right and left ends, and the gear, from the Image Transfer Roller removed from its holder. Install the bushings and the gear to the new Image Transfer Roller.

NOTES

- *Do not touch, or dirty with chemicals or toner, the surface of the Image Transfer Roller, as indentations in and dirt on the surface of the Image Transfer Roller adversely affect the quality of the printed image.*
- *When handling the Image Transfer Roller, hold onto the shaft and bushings of the roller.*
- *Do not place a new Image Transfer Roller directly on the floor or other surface.*

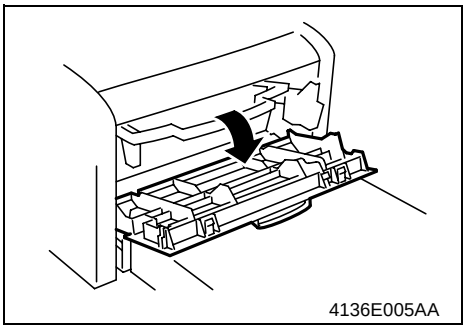


5. Insert the new Image Transfer Roller into the Image Transfer Roller holder and place the levers of the bushings into the original upward positions.

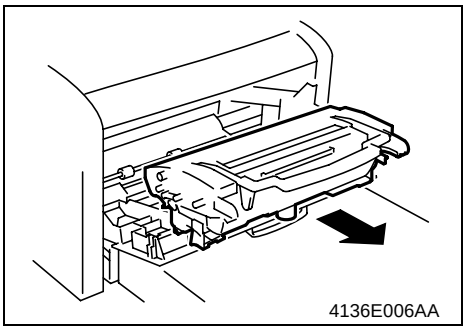
3. REPLACEMENT OF UNITS

(1) Replacement of the Toner Cartridge

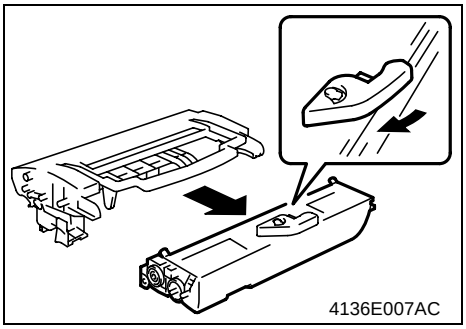
<Removal Procedures>



1. Open the Front Door.



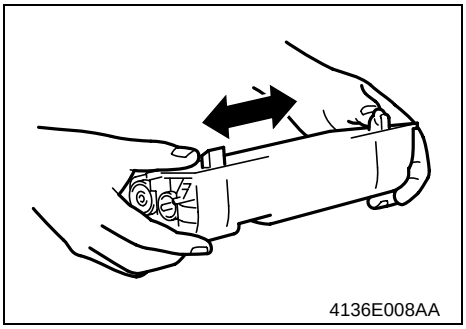
2. Remove the Imaging Cartridge.



3. Pull the lever of the Toner Cartridge in the direction shown in the illustration and disconnect the Toner Cartridge from the Drum Cartridge.

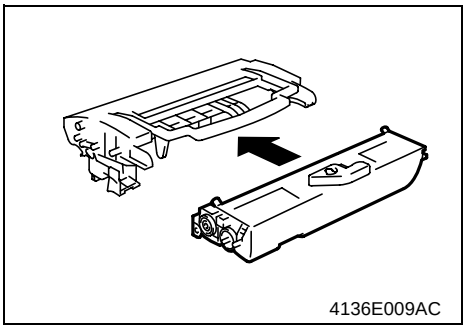
NOTE

- *If the Drum Cartridge is to be placed on a floor or similar place, use care to prevent toner from scattering around.*


4136E008AA

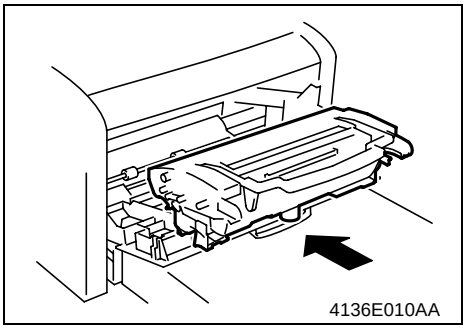
1. Take out a new Toner Cartridge and shake it in the horizontal direction sufficiently so that toner is agitated.

NOTE
- *Placing the Toner Cartridge in an upright position or shaking it vigorously will spill toner.*


4136E009AC

2. Install the new Toner Cartridge to the Drum Cartridge.

NOTE
- *Insert the Toner Cartridge along the guide provided on the Drum Cartridge side and make sure that the Toner Cartridge is not tilted when inserted.*


4136E010AA

3. Install the Imaging Cartridge in the printer.

NOTE
- *Insert the Imaging Cartridge along the guide provided on the printer side. Ensure that the Imaging Cartridge is not slid obliquely.*

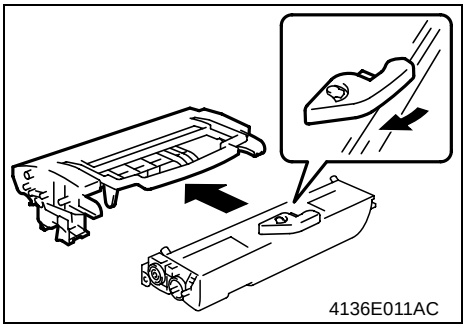
4. Close the Front Door.

(2) Replacement of the Drum Cartridge

<Removal Procedures>

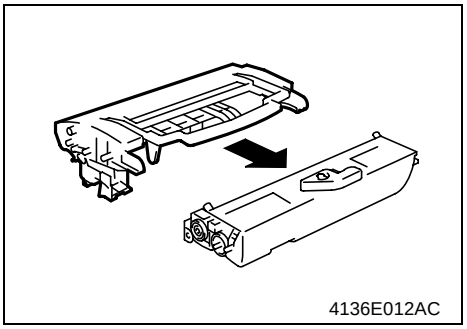
1. Remove the Imaging Cartridge.

☞ E-5



2. Pull the lever of the Toner Cartridge in the direction shown in the illustration and disconnect the Drum Cartridge.

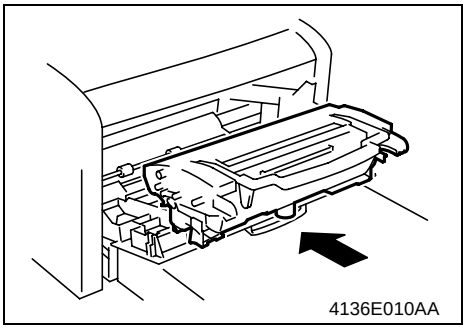
<Installation Procedures>



1. Mount the Toner Cartridge to a new Drum Cartridge.

NOTE

- Insert the Toner Cartridge along the guide provided on the new Drum Cartridge side and make sure that the Toner Cartridge is not tilted when inserted.



2. Install the Imaging Cartridge in the printer.

NOTE

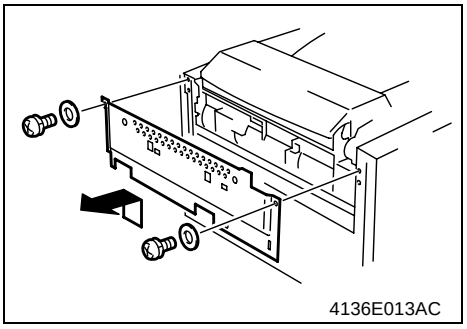
- Insert the Imaging Cartridge along the guide provided on the printer side. Ensure that the Imaging Cartridge is not slid obliquely.

3. Close the Front Door.

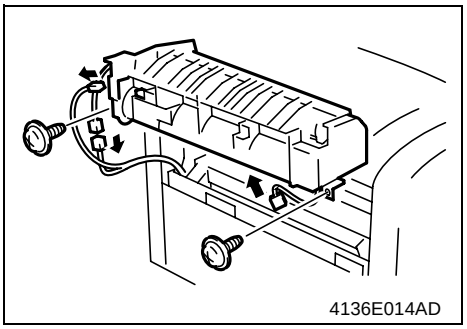
(3) Replacement of the Fusing Unit

<Removal Procedures>

1. Turn OFF the power switch and leave the printer to stand idle for about 20 min.
2. Remove the Left and Right Covers.



3. Remove two screws and two washers. Then, remove the Fusing Unit protective metal bracket.



4. Remove the Upper Cover.
5. Remove the Exit Cover.
6. Remove two screws, unplug three connectors, and remove the Fusing Unit.

NOTE

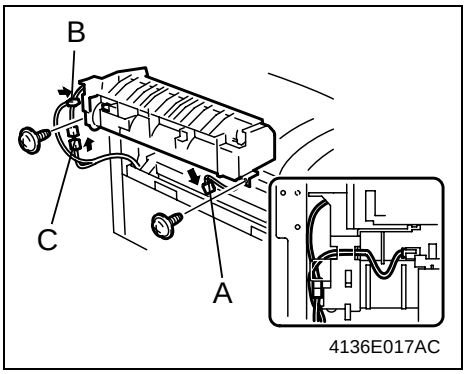
- The surfaces around the Fusing Unit are very hot. Use utmost care not to touch any surfaces other than the Fusing Unit.

NOTE

- *When replacing a part comprising the Fusing Unit individually to correct an image problem or a defective part, see D-9 ("Disassembly of the Fusing Unit" of DIS/REASSEMBLY, ADJUSTMENT).*

<Installation Procedures>

1. Take out the Fusing Unit and cushioning materials.



2. Connect connector A.
3. Mount the Fusing Unit in the printer and secure it in position by tightening the two screws.
4. Connect connectors B and C.

NOTE

- *When installing the Fusing Unit, route the harness as shown in the illustration and make sure that no part of the harness is wedged between the Fusing Unit and printer.*

5. Reinstall the Exit Cover.

6. Reinstall the Fusing Unit protective metal bracket.

DIS/REASSEMBLY, ADJUSTMENT

1. PRECAUTIONS FOR DISASSEMBLY/ADJUSTMENTS

1-1. Parts That Must Not be Touched

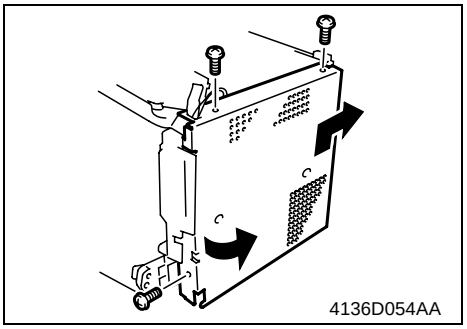
(1) Variable resistors on board

Do not turn the variable resistors on boards for which no adjusting instructions are given in ADJUSTMENT.

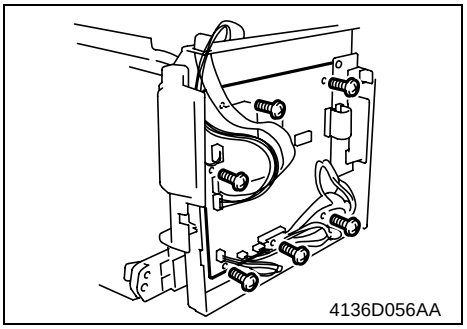
(2) Removal of the Controller/Mechanical Control Board

<Removal Procedures>

1. Remove the Right Cover.



2. Remove three screws and the protective metal bracket.



3. Disconnect all connectors and flat cables from the Controller/Mechanical Control Board.

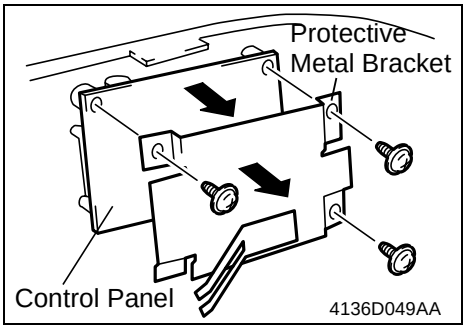
NOTE

- Use utmost care not to snap off the flat cable.

4. Remove six screws and the Controller/Mechanical Control Board.

(3) Removal of the Control Panel

1. Remove the Right Cover.

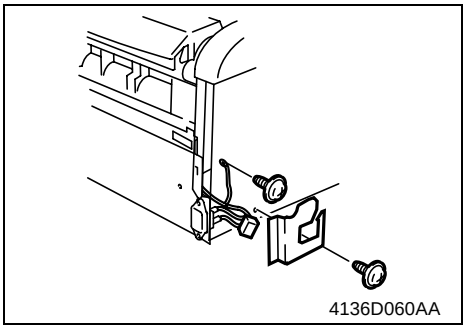


2. Remove three screws, protective metal bracket, and the Control Panel.

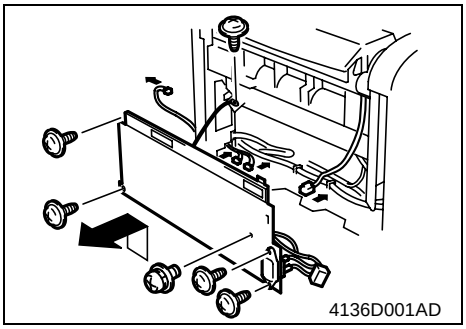
(4) Removal of the Power Unit

1. Remove the Fusing Unit.

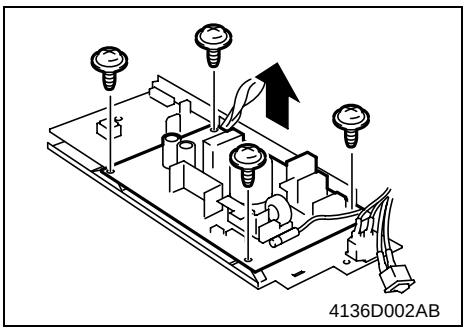
☞ E-8



2. Remove two screws and the Power Switch stay.
3. Remove the Power Switch.



4. Disconnect one connector from the Controller/ Mechanical Control Board.
5. Remove six screws, disconnect three connectors, and remove the Power Unit Assy.

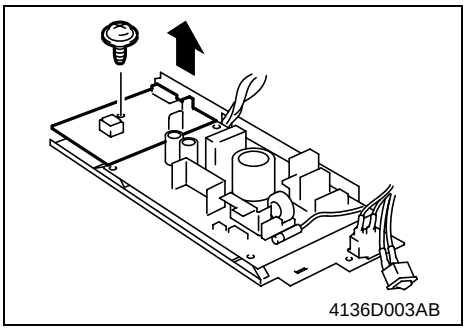


6. Remove four screws and the Power Unit.

(5) Removal of the High Voltage Unit

1. Remove the Power Unit Assy.

☞ D-3



2. Remove one screw and the High Voltage Unit.

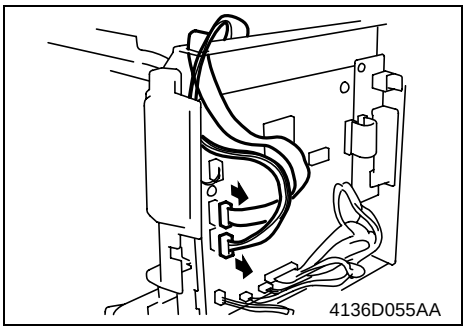
1-2. Removal of Units

(1) Removal of the PH Unit

⚠ CAUTION

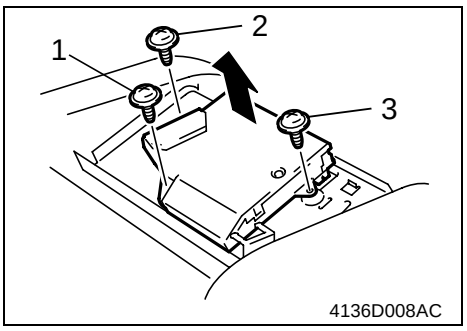
- NEVER attempt to replace the PH Unit with power being supplied to the printer. Doing that could lead to exposure to the laser beam, resulting in blindness.
- NEVER attempt to disassemble or adjust the PH Unit. Doing that could lead to exposure to the laser beam, resulting in blindness.

1. Remove the Exit Cover.



2. Disconnect one connector and one flat cable from the Controller/Mechanical Control Board.

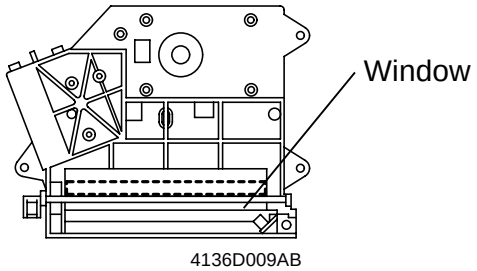
NOTE
- *Use utmost care not to snap off the flat cable.*



3. Remove three screws and the PH Unit.

NOTE
- *When reinstalling the PH Unit, tighten the screws in the numerical order shown in the illustration.*

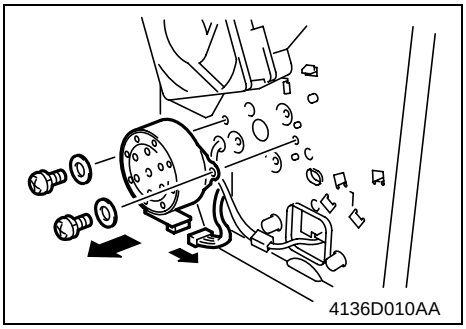
Precautions for Removal/Reinstallation of the PH Unit
- *NEVER touch the window on the backside of the PH Unit. A dirty window can cause an image problem.*



1-3. Disassembly of the Engine

(1) Removal of the Main Motor

1. Remove the Left Cover.



2. Disconnect one connector.
3. Remove two screws, two washers, and the Main Motor.

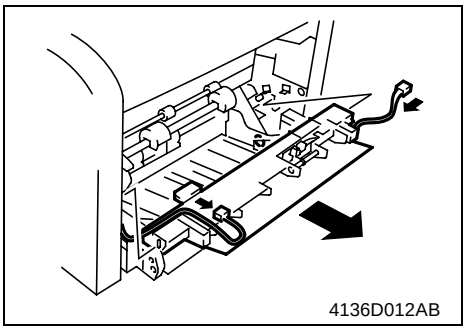
(2) Removal of the Paper Empty Sensor

1. Remove the Front Door.
2. Remove the Imaging Cartridge.

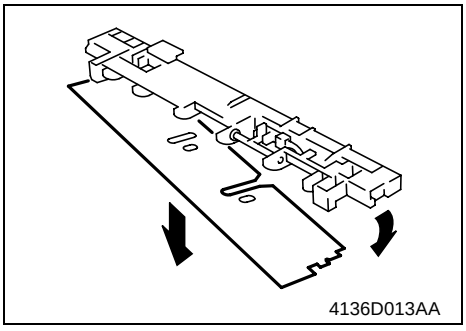
NOTE

- *The Imaging Cartridge is the Drum Cartridge, to which the Toner Cartridge is mounted.*

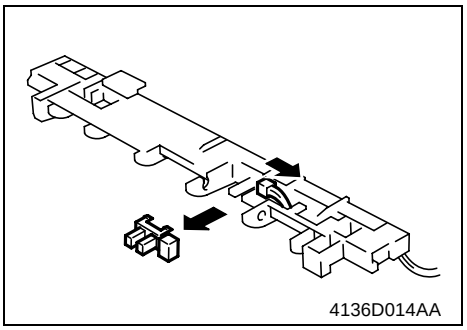
3. Remove the Left and Right Covers.



4. Disconnect one connector from the Controller/ Mechanical Control Board.
5. Unhook two tabs, disconnect one connector, and remove the Paper Take-Up Upper Guide Assy.



6. Unhook two tabs and remove the tray.

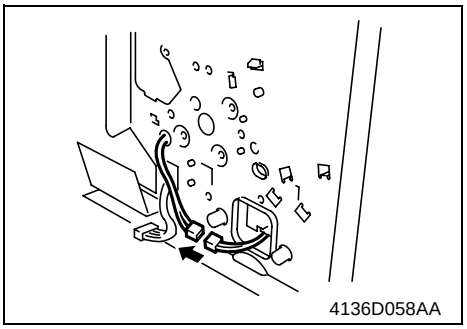


7. Disconnect one connector and remove the Paper Empty Sensor.

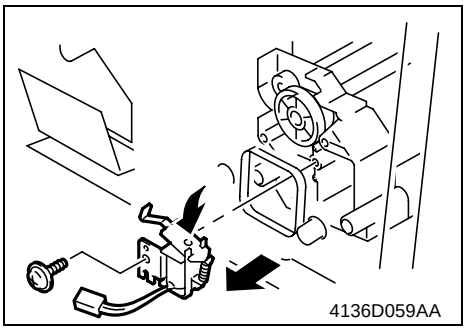
(3) Removal of the Paper Take-Up Solenoid

1. Remove the Left Cover.

☞ E-8



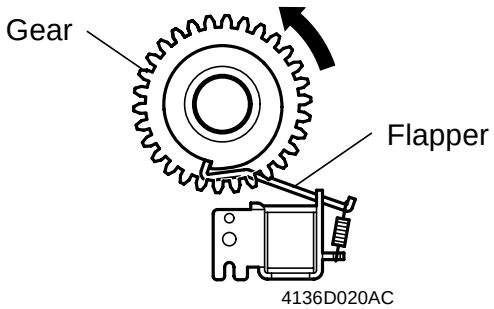
2. Disconnect one connector of the Paper Take-Up Solenoid.



3. Remove one screw and the Paper Take-Up Solenoid.

Precautions for Installation of the Paper Take-Up Solenoid

1. Mount the Paper Take-Up Solenoid and tighten one screw.
2. Turn the gear in the direction of the arrow shown below so that the flapper of the Paper Take-Up Solenoid catches the stopper of the gear.



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(4) Removal of the Paper Take-Up Clutch Gear

1. Remove the Fusing Unit.

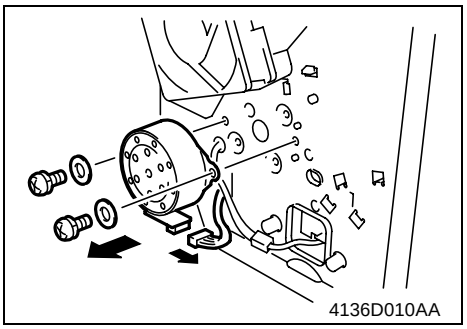
☞ E-8

2. Remove the Power Unit.

☞ D-3

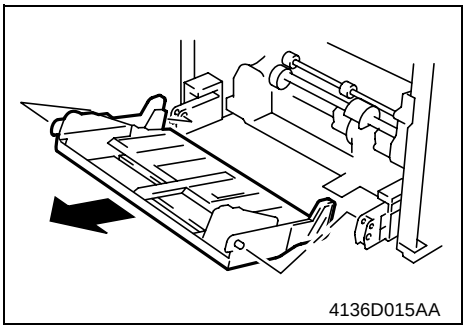
3. Remove the Paper Take-Up Upper Guide Assy.

☞ D-5

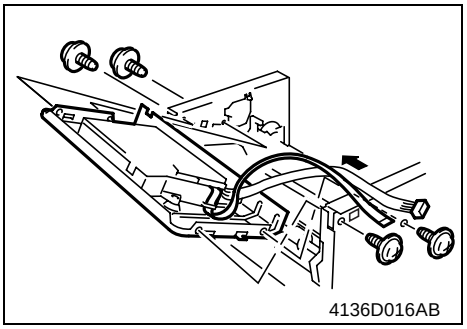


4. Disconnect one connector and remove the Cooling Fan Motor.
5. Remove the Main Motor.

☞ D-5



6. Remove the Paper Lifting Plate Assy.
7. Remove two springs.

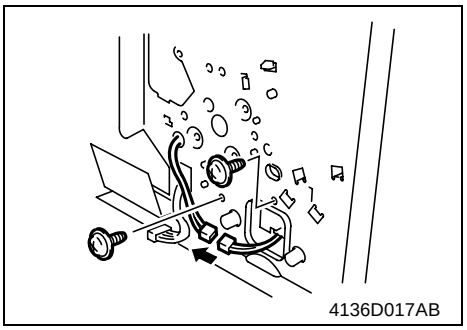


8. Disconnect one connector and one flat cable from the Controller/Mechanical Control Board.

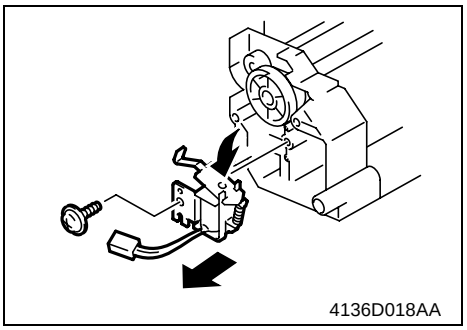
NOTE

- Use utmost care not to snap off the flat cable.

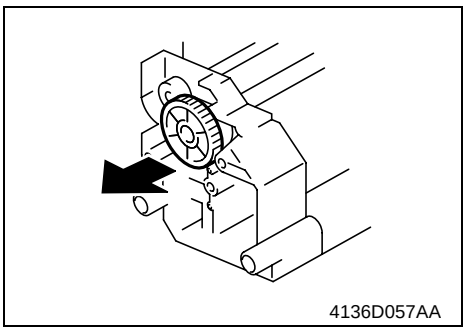
9. Remove four screws and the PH Base Plate Assy.



10. Disconnect one connector of the Paper Take-Up Solenoid.
11. Remove two screws and the Left Frame.



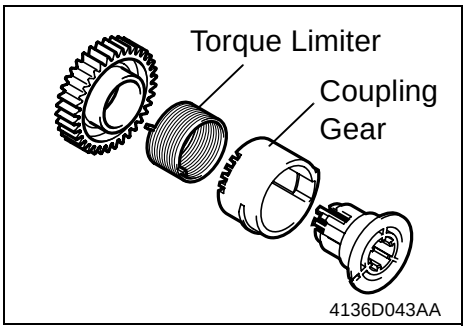
12. Remove one screw and the Paper Take-Up Solenoid.



13. Unhook two tabs and remove the Paper Take-Up Clutch Gear.

(5) Removal of the Torque Limiter

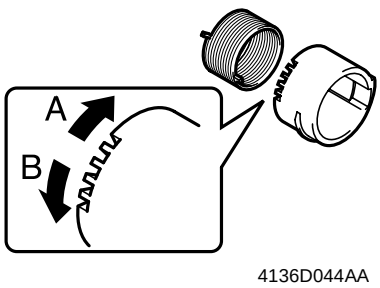
1. Remove the Paper take up Clutch Gear.

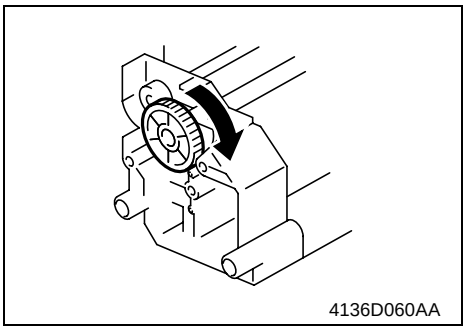


2. Unhook three tabs and take apart the Paper Take-Up Clutch Gear then, remove the Torque Limiter.

Precautions for Installation of the Torque Limiter

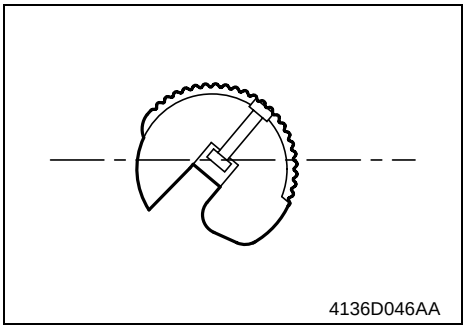
Coupling Gear has five dent for adjustment the Take-up Roller position. When Torque Limiter is replaced, adjust the set position of the Coupling Gear so that the Take-up Roller becomes level. The procedure is as follow.



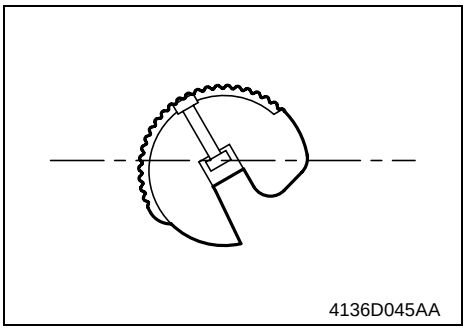


After setting replaced Paper Take-Up Clutch Gear (Torque Limiter) to the shaft, Rotate the Paper Take-Up Clutch Gear by hand (Need to be released Solenoid Flapper).

Look at the stop position of the Take-Up Roller from Clutch Gear side.



1. When the Roller is leant to clockwise, move the coupling Gear to A direction.



2. When the Roller is leant to counter clockwise, move the coupling Gear to B direction.

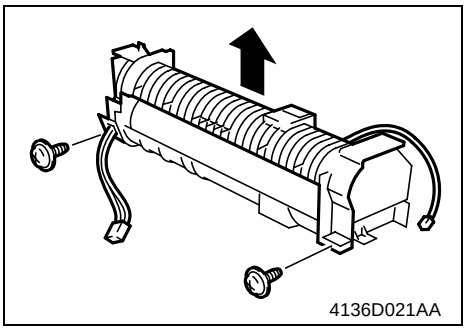
(6) Disassembly of the Fusing Unit

NOTE

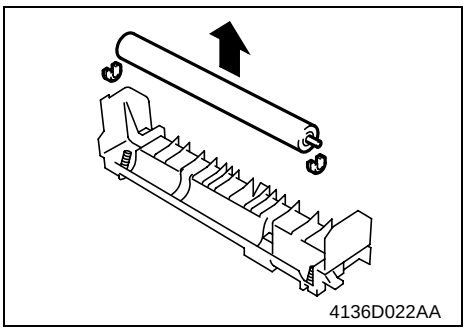
- *The Fusing Unit is extremely hot immediately after the Power Switch has been turned OFF. Allow a sufficient time to let it cool down before starting the procedure to prevent burn.*

1. Remove the Fusing Unit.

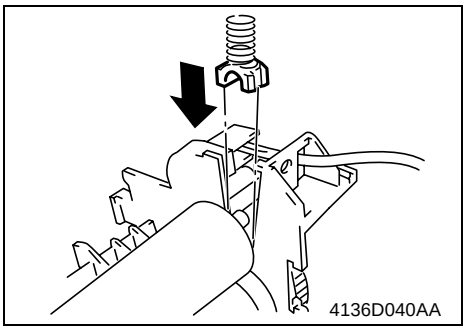
☞ E-8



2. Remove two screws and disconnect the Fusing Unit.

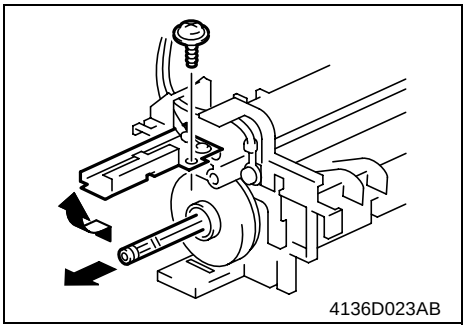


3. Remove two bushings and the Pressure Roller.



Precautions for Installation of Bushings

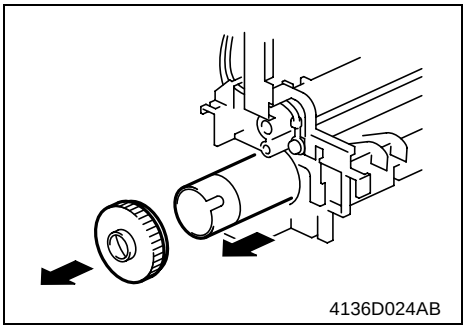
- *Make sure that the slits in the bushing are properly aligned with the rib of the Fusing Unit.*



4. Remove one screw and the terminal block.
5. Pull out the Fusing Roller Heater Lamp.

NOTES

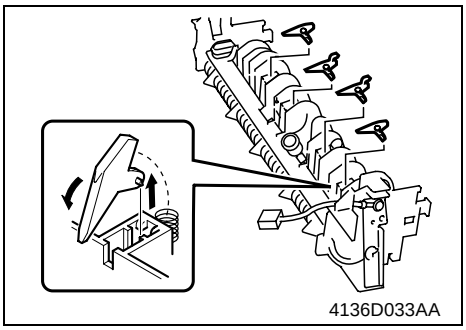
- *Do not touch the surface of the glass of the Fusing Roller Heater Lamp with bare hands.*
- *When reinstalling the Fusing Roller Heater Lamp, make sure that the side of the lamp having a voltage marking faces the gear side.*



6. Pull out the drive gear from the Fusing Roller.
7. Pull out the Fusing Roller.

NOTE

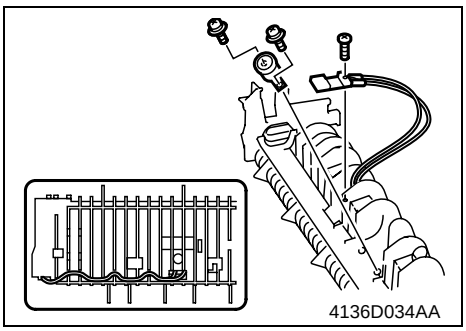
- *When removing and reinstalling the Fusing Roller, keep the Fusing Roller Paper Separator Fingers in their raised position. Use care not to damage the surface of the Fusing Roller.*



8. Remove the four Fusing Roller Paper Separator Fingers.

NOTE

- *Use care not to lose the springs.*



9. Remove one screw and the Thermistor.

NOTE

- *When reinstalling the Thermistor, route the harness as shown in the illustration.*

10. Remove two screws and the Thermostat.

TROUBLESHOOTING

1. INTRODUCTION

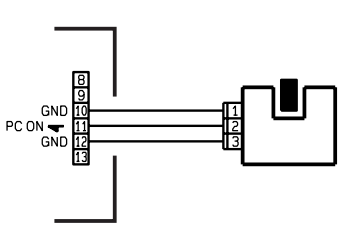
- This chapter contains the items required or used when troubleshooting various printer problems.

1-1. Electric Components Check Procedures

- The following procedures can be used to check to see if an electric component is fully operational when a paper misfeed or a malfunction occurs in the printer.

(1) Sensors

Step	Check	Result	Action
1	Does the input signal to the Controller/Mechanical Control Board go from HIGH to LOW, or vice versa, when the sensor is blocked?	NO	Replace the sensor.
		YES	Replace the Controller/Mechanical Control Board.



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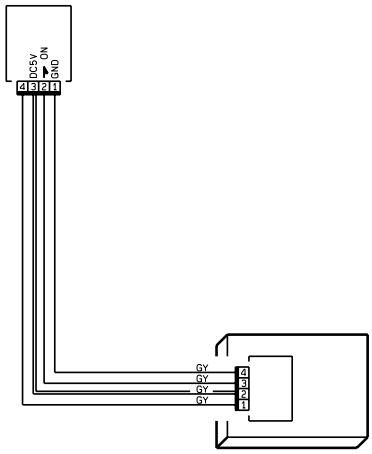

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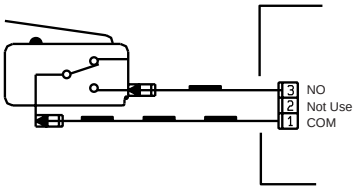
(2) Switches

Step	Check	Result	Action
1	Does the input signal (NO) to the Controller/Mechanical Control Board go from LOW to HIGH when the switch is actuated?	NO	Replace the switch.
		YES	Replace the Controller/Mechanical Control Board.



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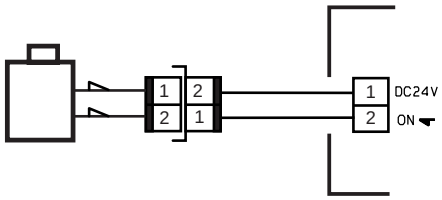
(3) Solenoids

Step	Check	Result	Action
1	Does the output signal from the Controller/Mechanical Control Board go from HIGH to LOW when the solenoid is energized?	NO	Replace the Controller/Mechanical Control Board.
		YES	Replace the solenoid.



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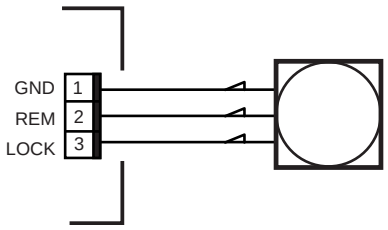
(4) Motors

Step	Check	Result	Action
1	Is the LOCK signal of the Controller/Mechanical Control Board HIGH when the printer is in the standby state?	NO	Replace the Controller/ Mechanical Control Board. Replace the motor.
2	Does the REM signal of the Controller/ Mechanical Control Board go from HIGH to LOW when the motor is energized?	YES	Replace the motor.
		NO	Replace the Controller/ Mechanical Control Board.



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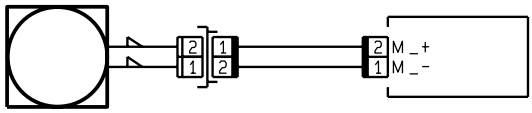
Step	Check	Result	Action
1	Does the input signal to the Controller/Mechanical Control Board go from HIGH to LOW when the motor is energized? (The input signal varies depending on the direction of rotation.)	YES	Replace the motor.
		NO	Replace the Controller/ Mechanical Control Board.



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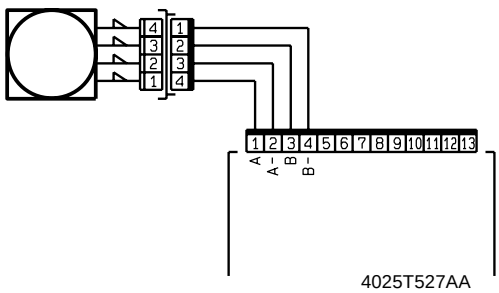
Step	Check	Result	Action
1	Are the hookup connector of the motor and print jack on the Controller/Mechanical Control Board connected properly?	YES	Replace the motor or the Controller/Mechanical Control Board.
		NO	Connect the connector or the print jack properly.



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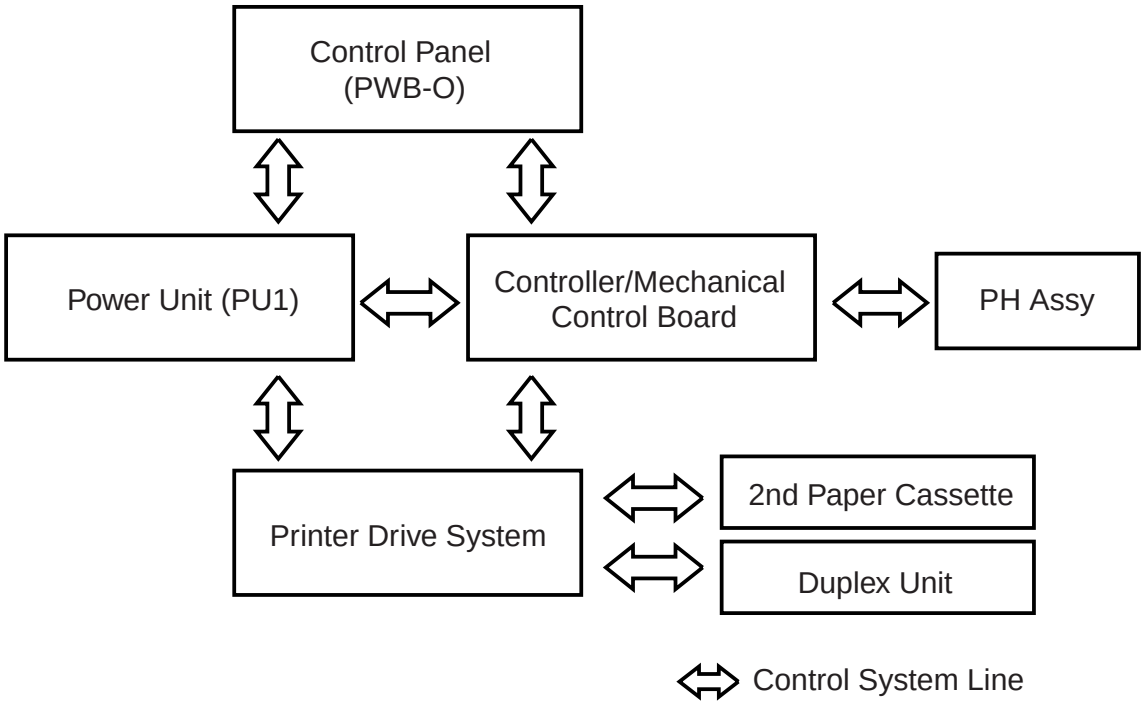
1-2. Overall Control Configuration

- Understanding the overall control configuration will help perform the troubleshooting procedures for paper misfeeds, malfunctions, and image problems.



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2. PAPER MISFEED

2-1. Initial Check Items

- When a paper misfeed occurs in the printer, first make the following initial checks.

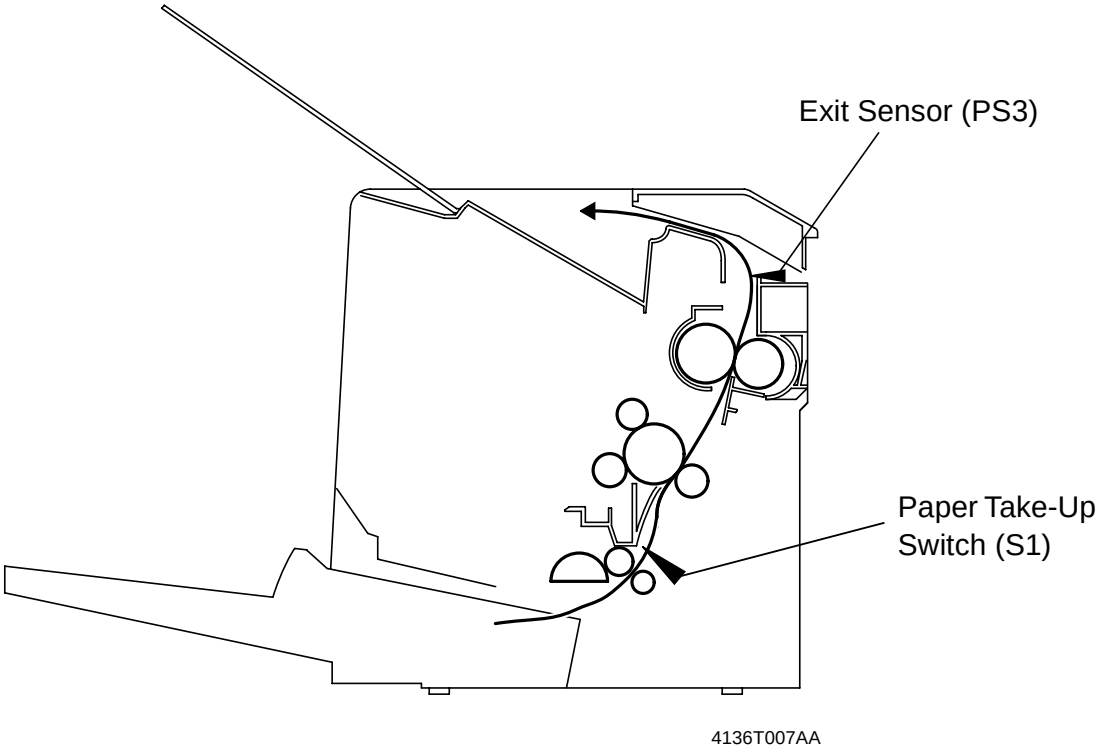
Check	Action
Does the paper meet product specifications?	Replace paper.
Is the paper curled, wavy, or damp?	Replace paper. Instruct user in correct paper storage.
Is the paper transport path deformed, dirty, or obstructed with foreign matter?	Clean the paper path and replace if necessary.
Are the Paper Separator Fingers dirty, deformed, or worn?	Replace Fusing Unit.
Is the roller dirty, deformed, or worn?	Clean the roller and replace if necessary.
Are Edge Guides at correct position to accommodate paper?	Slide the Edge Guides up against the edges of the paper stack.
Does the actuator operate correctly when checked?	Correct or replace the actuator.

Precautions for Clearing Misfeed

- *Reset the misfeed condition by opening and closing the Front Door after the misfeed has been cleared.*

2-2. Locations of Misfeed Detection Sensors

- 150-sheet-capacity Printer (printer only)



2-3. Misfeed Detection Timing and Troubleshooting Procedures

(1) Paper Take-Up/Transport Misfeed

<Detection Timing>

Type	Description
Misfeed detected at the paper take-up section	The Paper Take-Up Switch is actuated earlier than a predetermined period of time after the paper take-up sequence has been started.
	The Paper Take-Up Switch is not actuated even after the lapse of a predetermined period of time after the paper take-up sequence has been started.
Transport section	The Paper Take-Up Switch is deactuated earlier than a predetermined period of time after it has been actuated.
	The Paper Take-Up Switch is not deactuated even after the lapse of a predetermined period of time after it has been actuated.
Detection of paper left at the paper take-up section	Transport of paper is stopped before the Paper Take-Up Switch is actuated after the paper take-up sequence has been started.
Detection of paper left at the transport section	The Paper Take-Up Switch is actuated when the Power Switch is turned ON, the Front Door is opened and closed, or when a misfeed occurs or transport of paper is stopped.
	Paper is present between the Paper Take-Up Switch and Exit Sensor when transport of paper is stopped.

<Troubleshooting Procedures>

Relevant Electrical Parts	
Paper Take-Up Switch (S1) Exit Sensor (PS3) Paper Take-Up Solenoid (SL1)	Controller/Mechanical Control Board (PWB-P)

Step	Action	Ref. Page	WIRING DIAGRAM	
			Control Signal	Location (Electric Parts)
1	Initial check items	☞ T-5	–	–
2	SL1 operation check	☞ T-2	PWB-P PJ3A-2	4-F
3	S1 switch check	☞ T-2	PWB-P PJ10A-2	7-F
4	PS3 sensor check	☞ T-1	PWB-P PJ8A-3	6-F
5	Replace PWB-P.	–	–	–

(2) Fusing/Exit Misfeed

<Detection Timing>

Type	Description
Detection of paper left in Fusing Unit	The paper unblocks the Exit Sensor when the Power Switch is turned ON, the Front Door is opened and closed, or when a misfeed occurs or transport of paper is stopped.
Transport section	The paper unblocks the Exit Sensor earlier than a predetermined period of time after the Paper Take-Up Switch has been actuated.
	The paper does not unblock the Exit Sensor even after the lapse of a predetermined period of time after the Paper Take-Up Switch has been actuated.
Misfeed detected at the exit section	The Exit Sensor is blocked earlier than a predetermined period of time after the Paper Take-Up Switch has been actuated.

<Troubleshooting Procedures>

Relevant Electric Parts	
Paper Take-Up Switch (S1) Exit Sensor (PS3)	Controller/Mechanical Control Board (PWB-P)

Step	Action	Ref. Page	WIRING DIAGRAM	
			Control Signal	Location (Electric Parts)
1	Initial check items	☞ T-5	–	–
2	S1 switch check	☞ T-2	PWB-P PJ10A-2	7-F
3	PS3 sensor check	☞ T-1	PWB-P PJ8A-3	6-F
4	Replace PWB-P.	–	–	–

3. MALFUNCTIONS/WARNING

3-1. List of Malfunctions

Malfunction Name	Description
Polygon Motor malfunction	• The LOCK signal is not detected within a predetermined period of time that begins 1 sec. after the Polygon Motor has been energized. • No new LOCK signal is detected for a 1-sec. period that begins 1.5 sec. after the first LOCK signal was detected. • The LOCK signal is not detected for a continuous 0.5-sec. period in a state in which the Polygon Motor runs stably. • The LOCK signal remains ON for a continuous 5-sec. period or more when the Polygon Motor remains deenergized.
Laser malfunction	• The laser output exceeds the upper limit value. • The laser output remains lower than the lower limit value. • The Start Scan signal (-S_SCAN) is not detected at all within a predetermined period of time after the laser has been turned ON. • The Start Scan signal (-S_SCAN) is turned OFF.
Cooling Fan Motor malfunction	• The LOCK signal remains HIGH or LOW continuously for a predetermined period of time while the Cooling Fan Motor remains energized.
Warm-up failure	• The voltage of the Thermistor remains low for a predetermined period of time when a warm-up cycle is started. • The temperature detected by the Thermistor remains lower than a reference value for a predetermined period of time for the period of time that begins 5 sec. after, and ends 9 sec. after, the start of the warm-up cycle (where the temperature detected by the Thermistor is 80 °C or less). • The temperature detected by the Thermistor does not increase for a 3-sec. period or more for the period of time that begins after the lapse of a predetermined period of time after the Fusing Roller Heater Lamp has been turned ON and ends when the lamp is turned OFF. • The Fusing Roller Heater Lamp remains ON for a 30-sec. period or more (except during the period through which the Main Motor remains energized).
Abnormally low fusing temperature	• The temperature detected by the Thermistor remains lower than the set temperature continuously for a predetermined period of time while the fusing temperature control is being provided. (The set temperatures are as follows: 140 °C during a print mode at 600 dpi; 110 °C during a print mode at 1200 dpi; 70 °C during the standby mode.)
Abnormally high fusing temperature	• The temperature detected by the Thermistor remains higher than 235 °C for a predetermined period of time while the fusing temperature control is being provided.
High voltage failure	• The Drum Charge Monitor Voltage (HVC_MON) signal falls outside a predetermined range at any time after the lapse of a predetermined period of time after the Power Switch has been turned ON. • The Image Transfer Voltage Monitor signal (T_MON_V) and Image Transfer Current Monitor signal (T_MON_I) fall outside a corresponding predetermined range.

Controller-related malfunctions

Engine initialization failure	Engine I/F failure
ROM malfunction	DRAM malfunction
EEPROM malfunction	Video transfer malfunction
Data decompression failure	Vide output failure
Unsupported engine failure	

3-2. Malfunction Detection Timing and Troubleshooting Procedures

When any of the following malfunctions is detected, all drives are shut down and a hardware error message is displayed on the control panel.

(1) Polygon Motor malfunction

<Detection Timing>

Description
• The LOCK signal is not detected within a predetermined period of time that begins 1 sec. after the Polygon Motor has been energized. • No new LOCK signal is detected for a 1-sec. period that begins 1.5 sec. after the first LOCK signal was detected. • The LOCK signal is not detected for a continuous 0.5-sec. period in a state in which the Polygon Motor runs stably. • The LOCK signal remains ON for a continuous 5-sec. period or more when the Polygon Motor remains deenergized.

<Troubleshooting Procedures>

Relevant Electric Parts	
PH Unit Flat cable	Controller/Mechanical Control Board (PWB-P)

Step	Action	Ref. Page	WIRING DIAGRAM	
			Control Signal	Location (Electric Parts)
1	Check cables for connection and correct as necessary.	–	–	–
2	Replace PH Unit.	–	–	–
3	Replace PWB-P.	–	–	–

(2) Laser malfunction

<Detection Timing>

Description
• The laser output exceeds the upper limit value. • The laser output remains lower than the lower limit value. • The Start Scan signal (-S_SCAN) is not detected at all within a predetermined period of time after the laser has been turned ON. • The Start Scan signal (-S_SCAN) is turned OFF.

<Troubleshooting Procedures>

Relevant Electric Parts	
PH Unit Flat cable	Controller/Mechanical Control Board (PWB-P)

Step	Action	Ref. Page	WIRING DIAGRAM	
			Control Signal	Location (Electric Parts)
1	Check cables for connection and correct as necessary.	–	–	–
2	Replace PH Unit.	–	–	–
3	Replace PWB-P.	–	–	–

(3) Cooling Fan Motor malfunction

<Detection Timing>

Description
• The LOCK signal remains HIGH or LOW continuously for a predetermined period of time while the Cooling Fan Motor remains energized.

<Troubleshooting Procedures>

Relevant Electric Parts	
Cooling Fan Motor (M2)	Controller/Mechanical Control Board (PWB-P) Power Unit (PU1)

Step	Action	Ref. Page	WIRING DIAGRAM	
			Control Signal	Location (Electric Parts)
1	Check the Motor connectors for connection and correct as necessary.	–	–	–
2	Check the fan for possible overload and correct as necessary.	–	–	–
3	M2 operation check	☞ T-3	PWB-P PJ13A-1 to 3 (pulse)	5-F
4	Replace PWB-P.	–	–	–

(4) Warm-up failure

<Detection Timing>

Description
• The voltage of the Thermistor remains low for a predetermined period of time when a warm-up cycle is started. • The temperature detected by the Thermistor remains lower than a reference value for a predetermined period of time for the period of time that begins 5 sec. after, and ends 9 sec. after, the start of the warm-up cycle (where the temperature detected by the Thermistor is 80 °C or less). • The temperature detected by the Thermistor does not increase for a 3-sec. period or more for the period of time that begins after the lapse of a predetermined period of time after the Fusing Roller Heater Lamp has been turned ON and ends when the lamp is turned OFF. • The Fusing Roller Heater Lamp remains ON for a 30-sec. period or more (except during the period through which the Main Motor remains energized).

<Troubleshooting Procedures>

Relevant Electric Parts	
Fusing Unit Thermistor (TH1) Fusing Roller Heater Lamp (H1)	Controller/Mechanical Control Board (PWB-P) Thermostat (TS1) Power Unit (PU1)

Step	Action	Ref. Page	WIRING DIAGRAM	
			Control Signal	Location (Electric Parts)
1	Replace Thermistor (TH1).	–	–	–
2	Replace Fusing Roller Heater Lamp (H1).	–	–	–
3	Replace Thermostat (TS1).	–	–	–
4	Replace Fusing Unit.	–	–	–
5	Replace Controller/Mechanical Control Board (PWB-P).	–	–	–
6	Replace Power Unit (PU1).	–	–	–

(5) Abnormally low fusing temperature

<Detection Timing>

Description
• The temperature detected by the Thermistor remains lower than the set temperature continuously for a predetermined period of time while the fusing temperature control is being provided. (The set temperatures are as follows: 140 °C during a print mode at 600 dpi; 110 °C during a print mode at 1200 dpi; 70 °C during the standby mode.)

<Troubleshooting Procedures>

Relevant Electric Parts	
Fusing Unit Thermistor (TH1) Fusing Roller Heater Lamp (H1)	Controller/Mechanical Control Board (PWB-P) Thermostat (TS1) Power Unit (PU1)

Step	Action	Ref. Page	WIRING DIAGRAM	
			Control Signal	Location (Electric Parts)
1	Replace Thermistor (TH1).	–	–	–
2	Replace Fusing Roller Heater Lamp (H1).	–	–	–
3	Replace Thermostat (TS1).	–	–	–
4	Replace Fusing Unit.	–	–	–
5	Replace Controller/Mechanical Control Board (PWB-P).	–	–	–
6	Replace Power Unit (PU1).	–	–	–

(6) Abnormally high fusing temperature

<Detection Timing>

Description
• The temperature detected by the Thermistor remains higher than 235 °C for a predetermined period of time while the fusing temperature control is being provided.

<Troubleshooting Procedures>

Relevant Electric Parts	
Fusing Unit Thermistor (TH1) Fusing Roller Heater Lamp (H1)	Controller/Mechanical Control Board (PWB-P) Thermostat (TS1) Power Unit (PU1)

Step	Action	Ref. Page	WIRING DIAGRAM	
			Control Signal	Location (Electric Parts)
1	Replace Thermistor (TH1).	–	–	–
2	Replace Fusing Roller Heater Lamp (H1).	–	–	–
3	Replace Thermostat (TS1).	–	–	–
4	Replace Fusing Unit.	–	–	–
5	Replace Controller/Mechanical Control Board (PWB-P).	–	–	–
6	Replace Power Unit (PU1).	–	–	–

(7) High voltage failure

<Detection Timing>

Description
• The Drum Charge Monitor Voltage (HVC_MON) signal falls outside a predetermined range at any time after the lapse of a predetermined period of time after the Power Switch has been turned ON. • The Image Transfer Voltage Monitor signal (T_MON_V) and Image Transfer Current Monitor signal (T_MON_I) fall outside a corresponding predetermined range.

<Troubleshooting Procedures>

Relevant Electric Parts	
Fusing Unit	Controller/Mechanical Control Board (PWB-P)

Step	Action	Ref. Page	WIRING DIAGRAM	
			Control Signal	Location (Electric Parts)
1	Replace Fusing Unit.	–	–	–
2	Replace PWB-P.	–	–	–

(8) Controller-related malfunctions

- The following are malfunctions and failures as they relate to the controller.

Controller-related malfunctions	
Engine initialization failure	Engine I/F failure
ROM malfunction	DRAM malfunction
EEPROM malfunction	Video transfer malfunction
Data decompression failure	Video output failure
Unsupported engine failure	

<Troubleshooting Procedures>

Relevant Electric Parts	
Controller/Mechanical Control Board (PWB-P)	

Step	Action	Ref. Page	WIRING DIAGRAM	
			Control Signal	Location (Electric Parts)
1	Turn Power Switch OFF and ON.	–	–	–
2	Check flat cables for connection and correct or replace as necessary.	–	–	–
3	Check PJ101 connector for connection and correct as necessary.	–	–	7-C
4	Replace PWB-P.	–	–	–

4. MALFUNCTIONS RELATED TO POWER SUPPLY

4-1. Power is not Turned ON.

Relevant Electric Parts	
Controller/Mechanical Control Board (PWB-P)	Power Unit (PU1)

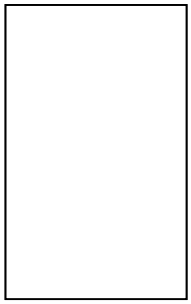
Step	Check	Wiring Diagram (Location)	Result	Action
1	Is the power cord plugged into the power outlet?	–	NO	Plug the power cord into the power outlet.
2	Is the power cord connected properly to the printer?	–	NO	Plug the power cord into the printer.
3	Is the Power Switch turned ON?	–	NO	Turn ON the Power Switch.
4	Are the fuses (F101 and F102) on the Power Unit conducting?	–	NO	Replace Power Unit (PU1).
		–	YES	Replace Controller/Mechanical Control Board (PWB-P).

5. IMAGE QUALITY PROBLEMS

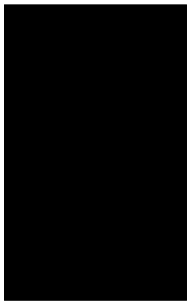
5-1. Troubleshooting Procedure by Image Quality Problem

(1) Blank print and black print

<Typical Faulty Images>



4011T035AA



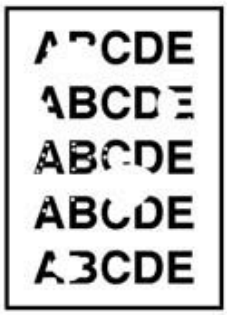
4011T036AA

<Troubleshooting Procedures>

Step	Check	Result	Action
1	Is a printed page blank?	YES	Check PH Unit connectors for proper connection.
2	Is the coupling of the drive mechanism of the Imaging Cartridge properly connected?	NO	Check coupling of drive mechanism for connection and correct as necessary, or replace Imaging Cartridge (Drum Cartridge, Toner Cartridge).
3	Is the drum charge voltage contact point or PC Drum ground contact point of the Imaging Cartridge properly connected?	NO	Check, clean, or correct contact point.
4	Is the High Voltage Unit (HV1) connector connected properly?	NO	Connect it properly.
5	Is the problem eliminated when step 4 was checked?	NO	Replace High Voltage Unit (HV1).
			Replace Controller/Mechanical Control Board (PWB-P).
			Replace PH Unit.

(2) Void areas

<Typical Faulty Image>



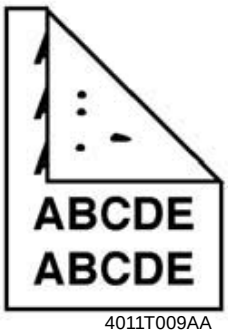
4011T008AA

<Troubleshooting Procedures>

Step	Check	Result	Action
1	Is paper damp?	YES	Replace paper for one just unwrapped.
2	Is the PC Drum scratchy?	YES	Replace Drum Cartridge.
3	Is there foreign matter on paper path?	YES	Remove foreign matter.
4	Is Image Transfer Roller dirty or scratchy? (3)	YES	Replace Image Transfer Roller.
			Replace High Voltage Unit (HV1).
			Replace Controller/Mechanical Control Board (PWB-P).

(3) Back marking

<Typical Faulty Image>



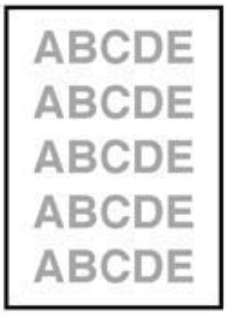
4011T009AA

<Troubleshooting Procedures>

Step	Check	Result	Action
1	Is there foreign matter on paper path?	YES	Remove foreign matter.
2	Is Fusing Roller dirty or scratchy?	YES	Replace Fusing Unit (Fusing Roller).
3	Is Image Transfer Roller dirty or scratchy?	YES	Replace Image Transfer Roller.

(4) Low image density

<Typical Faulty Image>



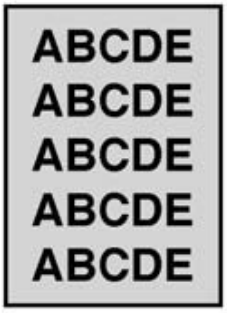
4011T003AA

<Troubleshooting Procedures>

Step	Check	Result	Action
1	Is paper damp?	YES	Replace paper for one just unwrapped.
2	Is there toner left in Toner Cartridge?	NO	Replace Toner Cartridge.
3	Is PC Drum faulty (life)?	YES	Replace Drum Cartridge.
4	Is developing bias faulty?	YES	Replace High Voltage Unit (HV1). Replace Controller/Mechanical Control Board (PWB-P).
5	Is image transfer faulty?	YES	Replace Image Transfer Roller.
			Replace High Voltage Unit (HV1).
			Replace Controller/Mechanical Control Board (PWB-P).

(5) Foggy background

<Typical Faulty Image>



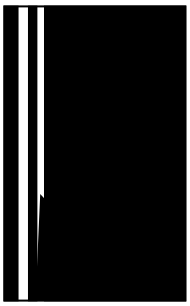
4011T004AA

<Troubleshooting Procedures>

Step	Check	Result	Action
1	Is PC Drum scratchy?	YES	Replace Drum Cartridge.
2	Is developing bias contact terminal in good contact with the mating part?	NO	Clean contact terminal or check terminal position.
3	Is PH window dirty?	YES	Clean.
4	Is the problem eliminated after checks have been made up to step 3?	NO	Replace High Voltage Unit (HV1).
			Replace Controller/Mechanical Control Board (PWB-P).

(6) White lines, white bands

<Typical Faulty Images>



4011T015AA

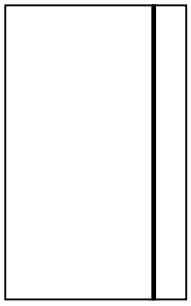
4011T020AA

<Troubleshooting Procedures>

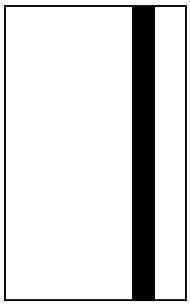
Step	Check	Result	Action
1	Is Image Transfer Roller dented, scratchy, or dirty?	YES	Replace Image Transfer Roller.
2	Is PC Drum scratchy or dirty?	YES	Replace Drum Cartridge.
3	Is Fusing Roller scratchy or dirty?	YES	Replace Fusing Unit (Fusing Roller).
4	Is PH window dirty?	YES	Clean.
5	Is the problem eliminated after checks have been made up to step 4?	NO	Replace Controller/Mechanical Control Board (PWB-P).

(7) Black lines, black bands

<Typical Faulty Images>



4011T017AA



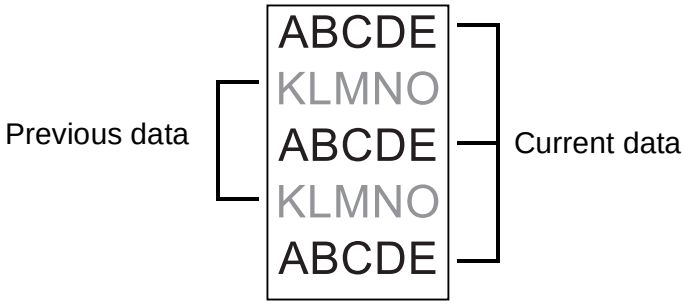
4011T023AA

<Troubleshooting Procedures>

Step	Check	Result	Action
1	Is paper path dirty with toner?	YES	Clean.
2	Is PC Drum scratchy or dirty?	YES	Replace Drum Cartridge.
3	Is Fusing Roller scratchy or dirty?	YES	Replace Fusing Unit (Fusing Roller).
4	Is the problem eliminated after checks have been made up to step 3?	NO	Replace Controller/Mechanical Control Board (PWB-P).

(8) Offset

<Typical Faulty Image>



4136T003AA

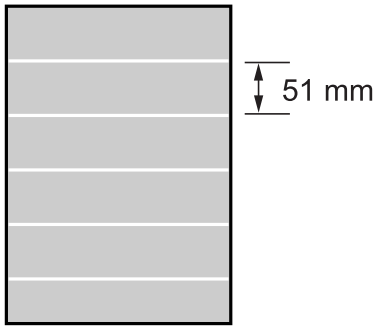
<Troubleshooting Procedures>

Step	Check	Result	Action
1	Is Fusing Roller faulty?	YES	Replace Fusing Unit (Fusing Roller).
2	Is Image Transfer Roller faulty?	YES	Replace Image Transfer Roller.

(9) Uneven image

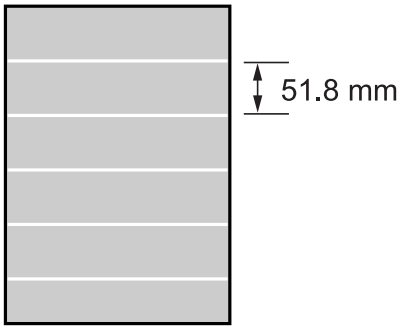
<Typical Faulty Images>

51-mm-pitch uneven image



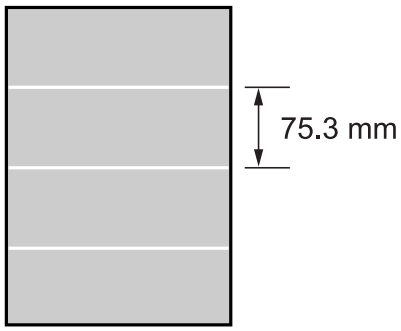
4136T004AA

51.8-mm-pitch uneven image



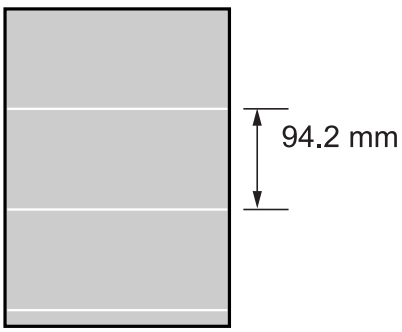
4136T008AA

75.3-mm-pitch uneven image



4136T005AA

94.2-mm-pitch uneven image



4136T006AA

<Troubleshooting Procedures>

Step	Check	Cause	Result	Action
1	Is uneven image at a pitch of 50.6 mm?	Image Transfer Roller is scratchy or dirty.	YES	Replace Image Transfer Roller.
2	Is uneven image at a pitch of 51.8 mm?	Flexible Sleeve is scratchy or dirty.	YES	Replace Toner Cartridge.
3	Is uneven image at a pitch of 75.3 mm?	Pressure Roller is scratchy or dirty.	YES	Replace Fusing Unit.
4	Is uneven image at a pitch of 94.2 mm?	PC Drum is scratchy or dirty.	YES	Replace Drum Cartridge.
		Fusing Roller is scratchy or dirty.	YES	Replace Fusing Unit.