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# OKI

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# OKIPAGE 14ex LED Page Printer

## Service Manual

Okidata

Based on Rev.1 2000-09-21

**Document Revision History**

Rev.No.	Date	Corrected items			Person in charge
		No.	Page	Description of change	
1	2000-09-21			ISSUE	EMP Ono
	02-27-2001			Translation	ODA Training

# PREFACE

This Maintenance Manual describes the field maintenance methods for LED Page Printers.

This manual is written for use by service technicians. Please note that you should refer to the Printer Handbook for the handling and operating methods of the equipment.

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# 1. CONFIGURATION

## 1.1 System Configuration

OKIPAGE 14ex consists of control and engine blocks in the standard configuration, as shown in Figure 1-1.

In addition, the options marked with asterisk(\*) are available.



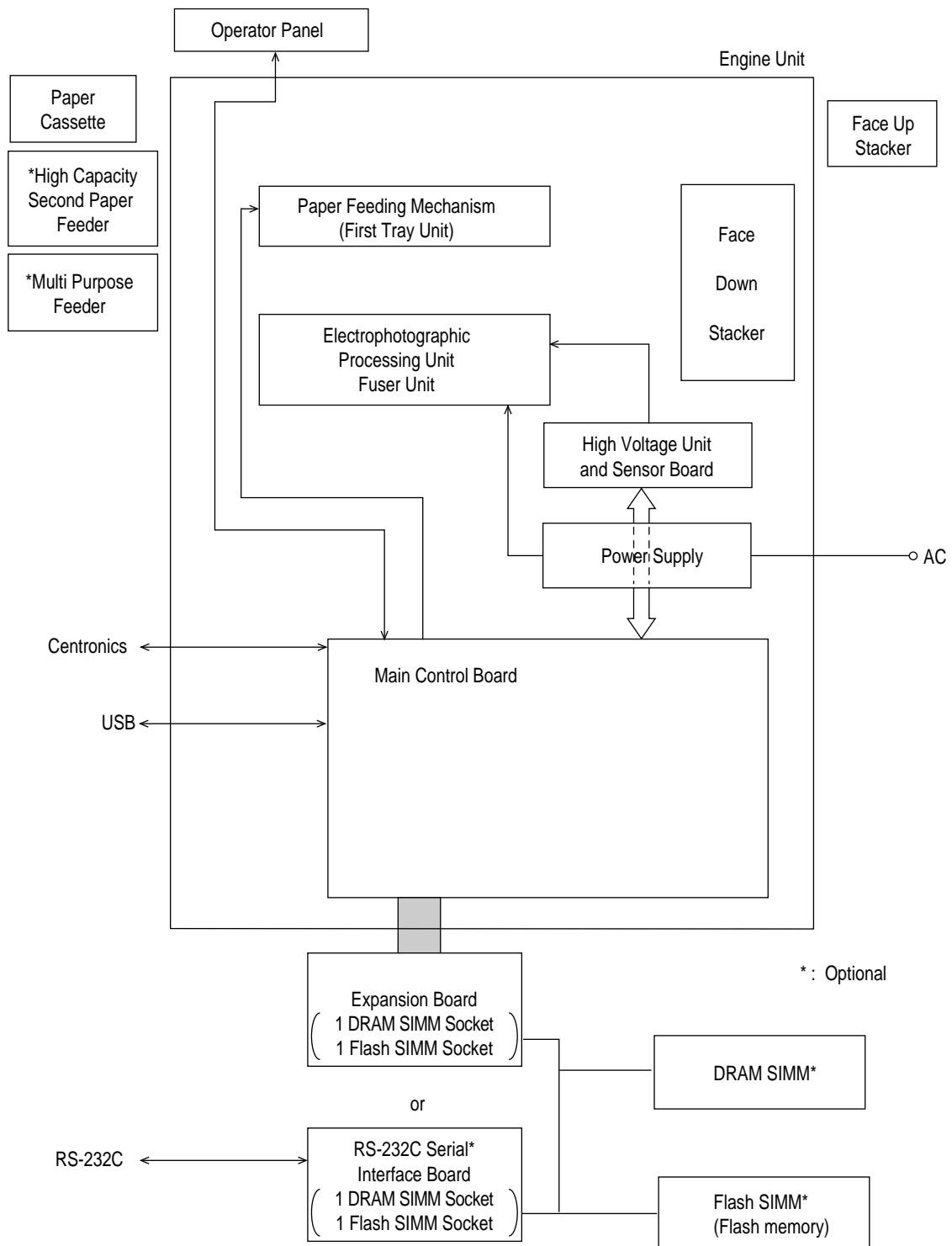


Figure 1-1

## 1.2 Printer Configuration

The printer unit consists of the following hardware components:

- Electrophotographic Processor
- Paper Feeder
- Controller
- Operator Panel
- Power Supply Unit

The printer unit configuration is shown in Figure 1-2.

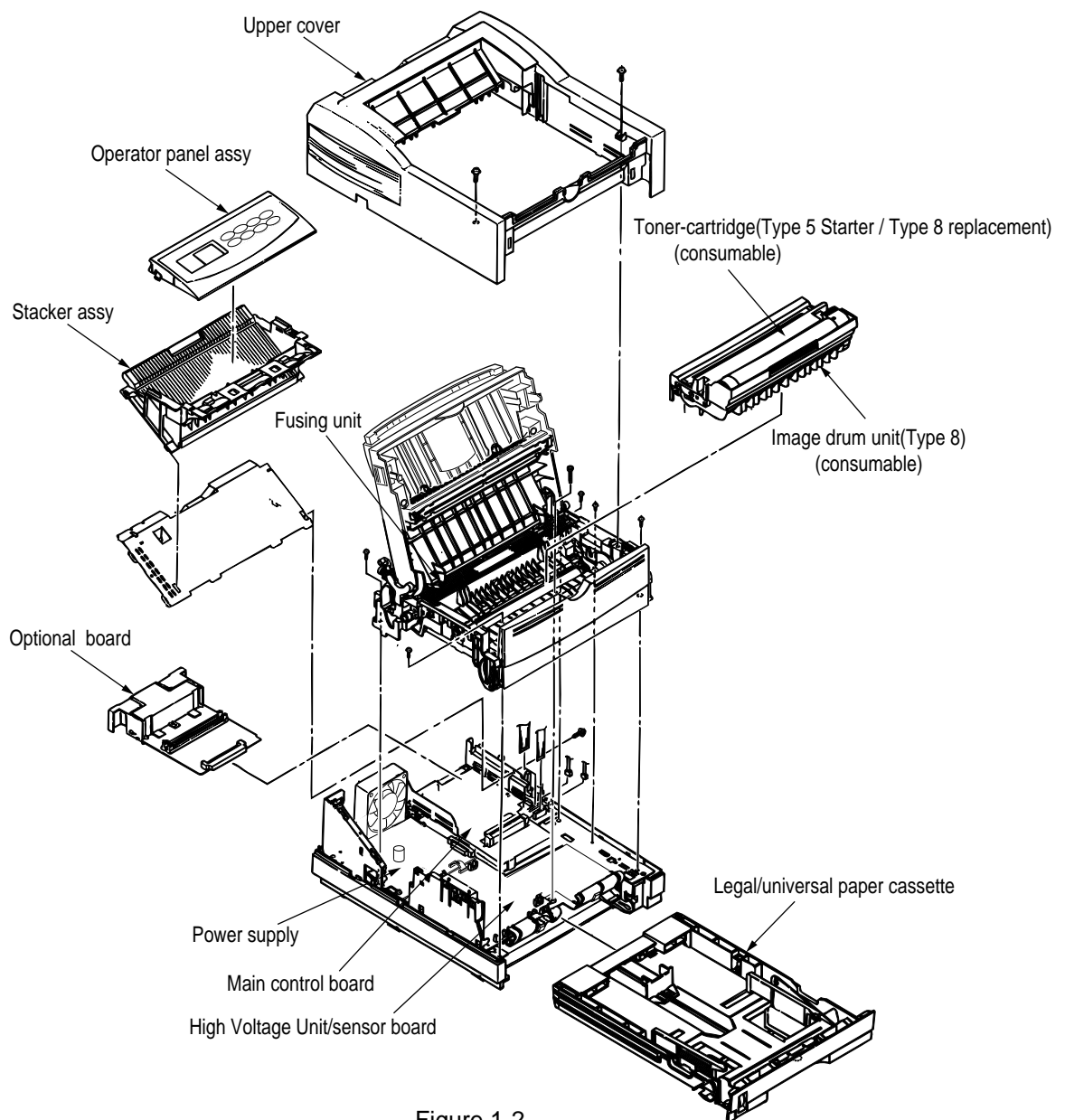
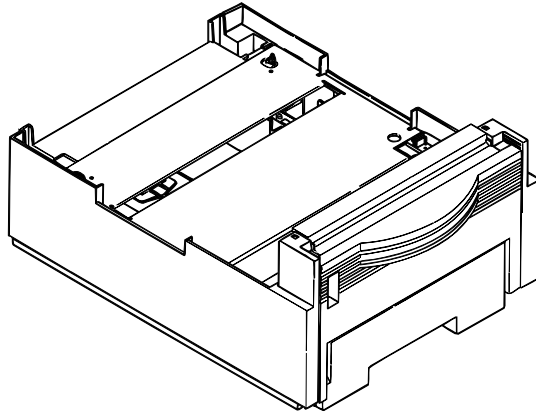


Figure 1-2

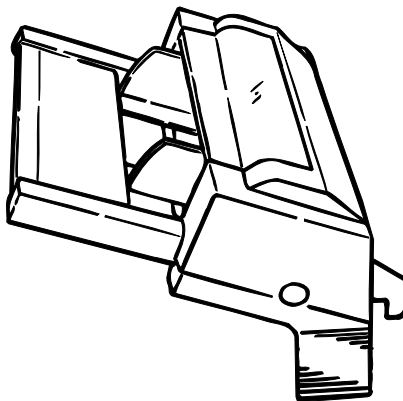
### 1.3 Optional Configuration

The options shown below are available for use with OKIPAGE 14ex. These are available separately from the printer unit.

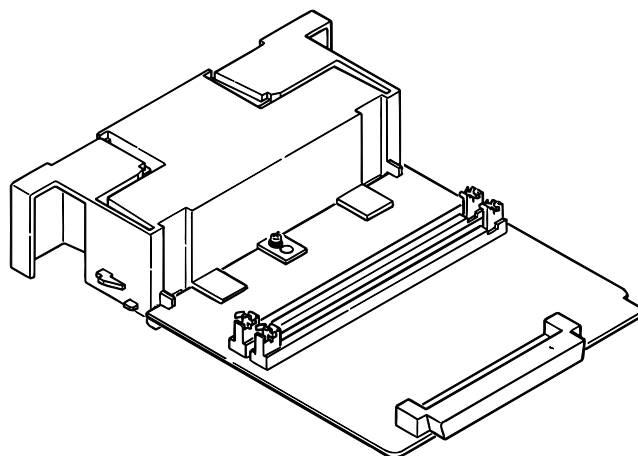
- (1) High Capacity Second Paper Feeder



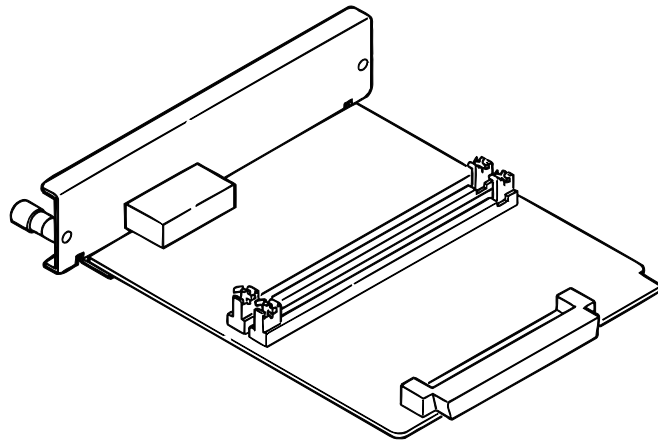
- (2) Multi Purpose Feeder



- (3) Expansion Board

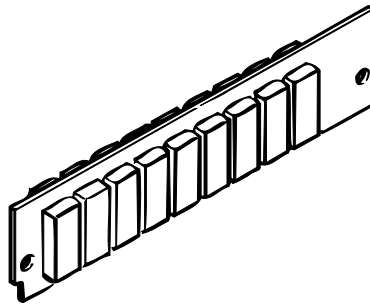


(4) RS-232C Serial Interface Board



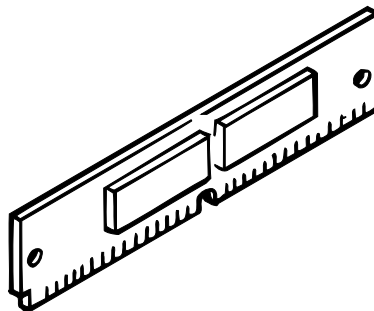
(5) DRAM SIMM Memory

DRAM SIMM memory is available with memory of 8MB,16MB,32MB [Oki Data genuine].  
The access time of SIMM memories are 60ns, 70ns, 80ns, and 100ns.



(6) Flash SIMM

Flash SIMM is available with memory of 4MB, 8MB and 16MB.



## 1.4 Specification

(1) Type	Desktop
(2) External dimensions	Height 8.5" (215 mm) Width 13.6" (345 mm) Depth 15.6" (395 mm)
(3) Weight	Approx. 19.8 lbs.
(4) Developing method Exposing method	Dry electrophotography LED stationary head
(5) Paper used	<p>&lt;Type&gt;</p> <ul style="list-style-type: none"> <li>• Standard paper <ul style="list-style-type: none"> <li>– Xerox 4200 (20 lbs)</li> </ul> </li> <li>• Application paper (manual face-up feed) <ul style="list-style-type: none"> <li>– Label</li> <li>– Envelope</li> <li>– OHP paper (transparency)</li> </ul> </li> </ul> <p>&lt;Size&gt;</p> <ul style="list-style-type: none"> <li>• Standard sizes <ul style="list-style-type: none"> <li>– Letter</li> <li>– Legal* [*Without Multi Purpose Feeder (Option)]</li> <li>– Legal-13*</li> <li>– Executive</li> <li>– COM-10** [**manual feed and Multi Purpose Feeder (Option) only]</li> <li>– Monarch**</li> <li>– DL**</li> <li>– C5**</li> <li>– A4</li> <li>– A5</li> <li>– B5 (JIS)</li> <li>– A6</li> </ul> </li> <li>• Applicable sizes <ul style="list-style-type: none"> <li>– Width: 3.4" to 8.5" (86 to 216 mm)</li> <li>– Length: 5.5" to 14" (140 to 355.6 mm)</li> </ul> </li> </ul> <p>&lt;Thickness&gt;</p> <ul style="list-style-type: none"> <li>– Automatic feed : 16 to 28 lbs (60 to 105 g/m<sup>2</sup>)</li> <li>– Manual feed : Label, OHP paper (transparency) Envelope (24 to 28lbs)</li> </ul>
(6) Printing speed	<p>Continuous printing : 14 pages per minute with Letter size paper. [Except, Multi purpose Feeder (11ppm)]</p> <p>Warm-up time : 45 seconds typical at room temperature [68°F (20°C), AC 120/230 V].</p> <p>First page print time : 7.5 seconds typical for the Letter size paper after warm-up.</p>
(7) Paper feeding method	Automatic feed or manual feed
(8) Paper delivery method	Face down/face up
(9) Resolution	600 × 600 dots/inch 600 × 1200 dots/inch
(10) Power input	120 VAC + 5.5%, -15% 230 VAC ± 10%

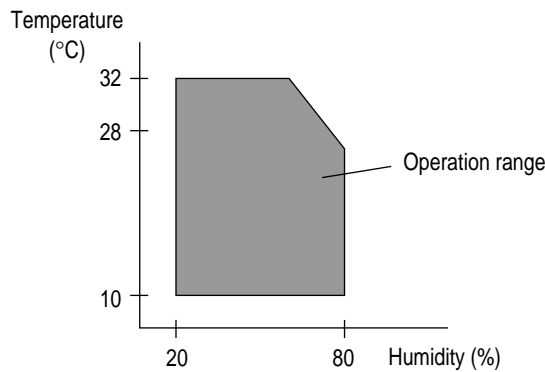
(11) Power consumption

	120VAC	230VAC
Peak	: Approx. 600W	Approx. 600W
Typical operation	: Approx. 340W	Approx. 340W
Idle	: Approx. 75W	Approx. 66W
Power save mode	: Approx. 10W	Approx. 11W

(12) Temperature and humidity

	In operation	Power off mode	During Storage	Unit
Temperature	50-90 (10-32)	32-110 (0-43)	14-110 (-10-43)	°F (°C)
Humidity	20%-80%	10%-90%	10%-90%	%RH
Maximum wet bulb temperature	77 (25)	80.4 (26.8)	————	°F (°C)
Minimum difference between wet and dry bulb temperatures	35.6 (2)	35.6 (2)	————	°F (°C)

1. Storage conditions specified above apply to printers in packed condition.
2. Temperature and humidity must be in the range where no condensation occurs.



(13) Noise

During operation:	53 dB (A) or less
Standby:	38 dB (A) or less
Quiet mode:	Back ground level

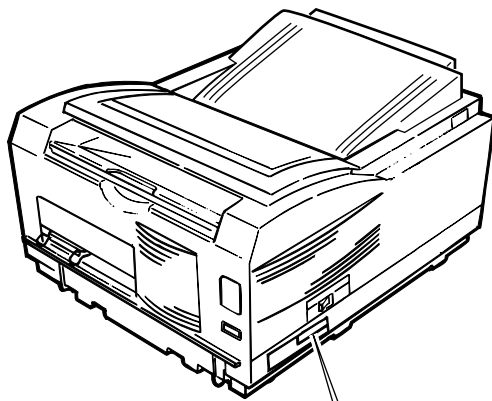
(14) Consumables

Toner cartridge kit	ODA : 2,000 (5% duty) 4,000(optional 4K Toner 5% duty)
	OEL/INT : 2,500 (5% duty) 4,000(optional 4K Toner 5% duty)
Image drum cartridge	20,000 (at continuous printing)
	14,000 (3 page/job) without Power Save

## 1.5 Safety Standards

### 1.5.1 Certification Label

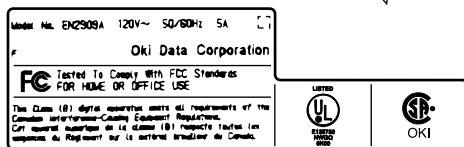
The safety certification label is affixed to the printer in the position described below.



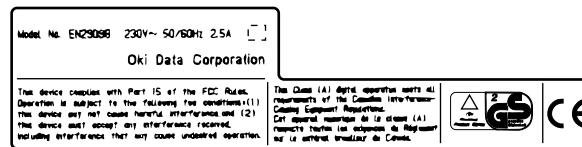
INT AC : 230V model



ODA AC : 120V model



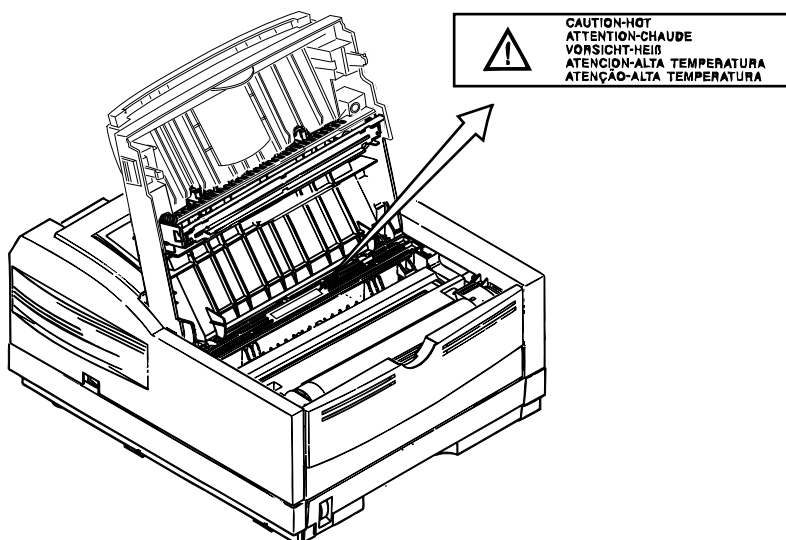
ODA AC : 230V model



### 1.5.2 Warning Label

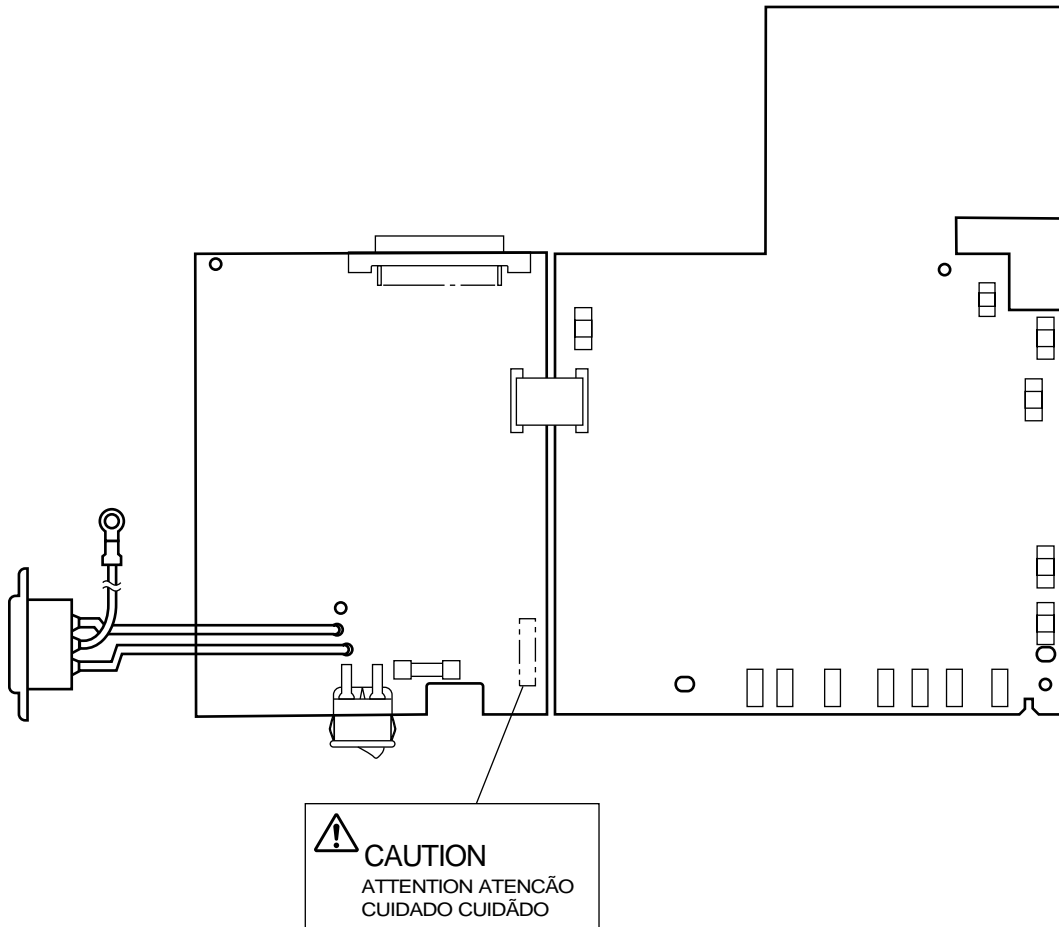
The warning labels are affixed to the sections which may cause bodily injury.

Follow the instructions on warning labels during maintenance.



### 1.5.3 Warning/Caution Marking

The following warning and caution markings are made on the power supply/sensor board.



#### ENGLISH

Heatsink and transformer core present risk of electric shock. Test before touching.

#### FRENCH

Le dissipateur thermique et le noyau du transformateur présentent des risques de choc électrique. Testez avant de manipuler.

#### SPANISH

Las disipadores de calor y el núcleo del transformador pueden producir un choque eléctrico. Compruebe antes de tocar.

#### PORTUGUESE

O dissipador de calor e o núcleo do transformador apresentam risco de choque elétrico. Teste antes de tocar.

#### ENGLISH

Circuits may be live after fuses open.

#### FRENCH

Il se peut que les circuits soient sous tension une fois que les fusibles ont été retirés.

#### SPANISH

Los circuitos pueden estar activos una vez que se hayan abierto los fusibles.

#### PORTUGUESE

Os circuitos podem estar energizados após os fusíveis se queimarem.



## **2. OPERATION DESCRIPTION**

OKIPAGE 14ex consists of a main control board, a power supply/sensor board, an operator panel, an electrophotographic process mechanism, and revision for illumination of LED head.

The main control board receives data via the host I/F, it then decodes, edits and stores the data in memory. After completing the editing of a single page of data, it references the font memory and generates bit image data, which is transferred to the LED head in one dot line units.

Through the electrophotographic process mechanism, the data is printed on the paper.

The operator panel is used for operations and status display.

OKIPAGE 14ex block diagram is shown in Figure 2-1.

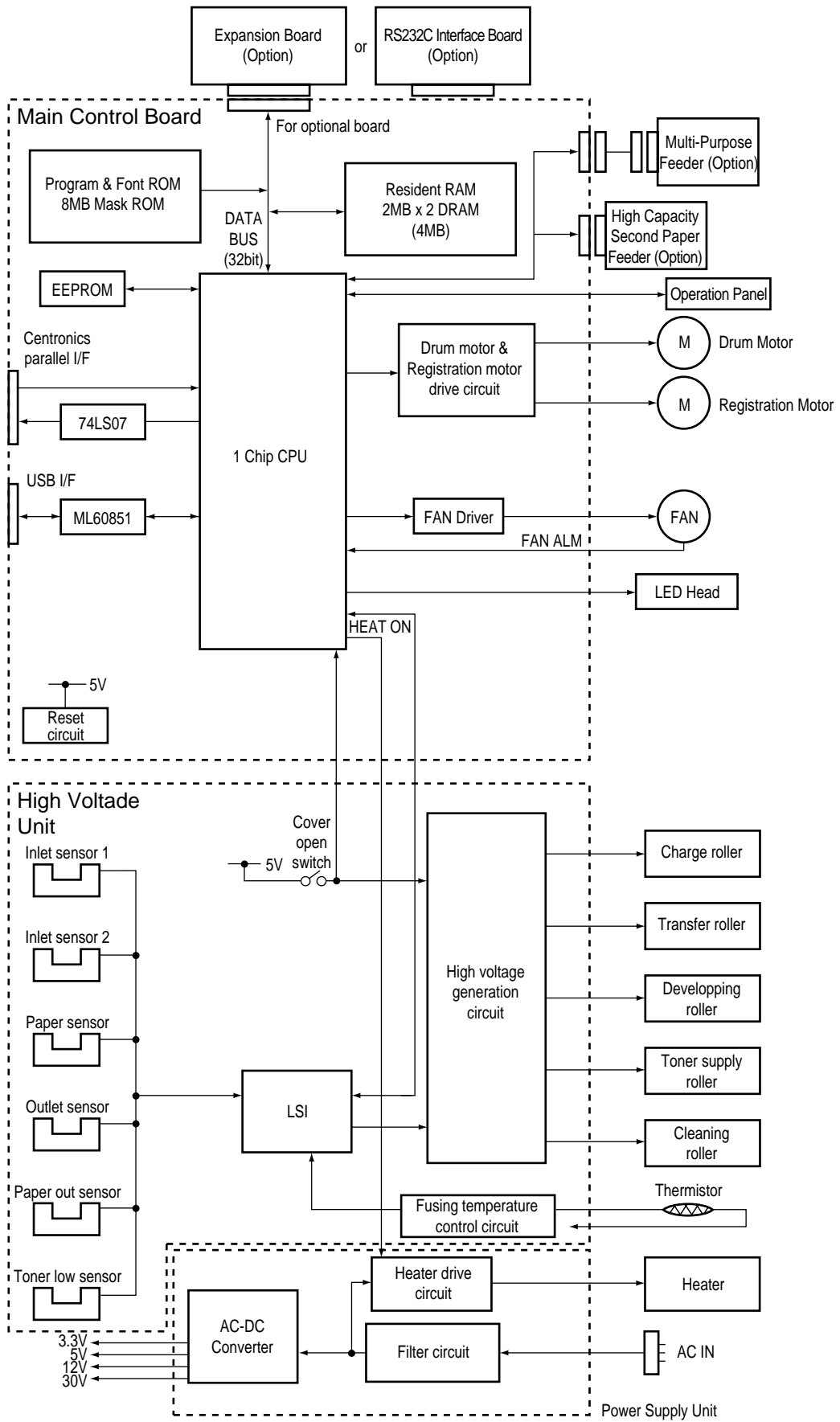


Figure 2-1 OKIPAGE 14ex Block Diagram

## 2.1 Main Control Board

The main control board consists of a single chip CPU, two program/font ROMs, four DRAMs, an EEPROM, a host interface circuit, and a mechanism driving circuit.

### (1) Single chip CPU

The single chip CPU is a custom CPU (32-bit internal bus, 32-bit external bus, 49.766-MHz clock) which incorporates the RISC CPU and its peripheral devices, and has the following functions:

### (2) Program and Font ROMs

Built-in device	Function
Chip select controller Bus controller DRAM controller	Control of ROM, DRAM and I/O device
DMA controller	Transfer of image data from DRAM to video output port
Parallel interface controller	Control of Centronics parallel interface
Serial interface controller	Control of RS-232C serial interface
Video output port LED STB output port	Control of LED head
Timer	Generation of various control timing Monitoring of paper running and paper size
Serial I/O port	Control of operator panel, EEPROM, and options
I/O port	Input and output of sensor and motor signals

The Program and Font ROMs store the equipment program and various types of fonts. Mask ROM is used as Program and Font ROMs. The mounting locations of these Program and Font ROMs vary depending on the type of the ROMs.

### (3) DRAM

The DRAM is a 4MB resident memory on the main control board that stores edited data, image data, DLL data and macro data.

### (4) EEPROM

4,096-bit Electrically Erasable PROM (EEPROM), is loaded with the following kinds of data:

- Menu data
- Various counter data (page counter, drum counter)
- Adjusting parameters (LED head drive time, print start position, paper feed length)

### (5) Parallel Interface

Parallel data is received from a host system via parallel interface which conforms to the IEEE1284 specification.

### (6) USB Interface

Serial data is received from a host system via USB which conforms to the USB 1.1 specification.

## 2.2 Power Supply/Sensor Board

The power supply/sensor board consists of an AC filter circuit, a low voltage power supply circuit, a high voltage power supply circuit, heater drive circuit, and photosensors.

### (1) Low Voltage Power Supply Circuit

This circuit generates the following voltages.

Output voltage	Use
+5 V	Logic circuit supply voltage
+30 V	Motor and fan drive voltage and source voltage for high-voltage supply
+12 V	Source voltage for high-voltage supply
+3.3V	LED head supply voltage

### (2) High Voltage Power Supply Circuit

This circuit generates the following voltages required for electrophotographic process from +5 V, according to the control sequence from the main control board. When cover open state is detected, +5 V supply is interrupted automatically to stop the supply of all high-voltage outputs.

Output	Voltage	Use	Remarks
CH	-1.3 KV	Voltage applied to charging roller	
DB	-265 V/+300 V	Voltage applied to developing roller	
SB	-500 V/ 0 V	Voltage applied to toner supply roller	
TR	+500 V to +4.5 KV/-1100 V	Voltage applied to transfer roller	Variable
CB	+400 V/-1350 V	Voltage applied to cleaning roller	

### (3) Photosensor

The photosensor mounted on this power supply/sensor board monitors the status of paper being fed through the printer during printing.

The sensor layout diagram is shown in Figure 2-2.

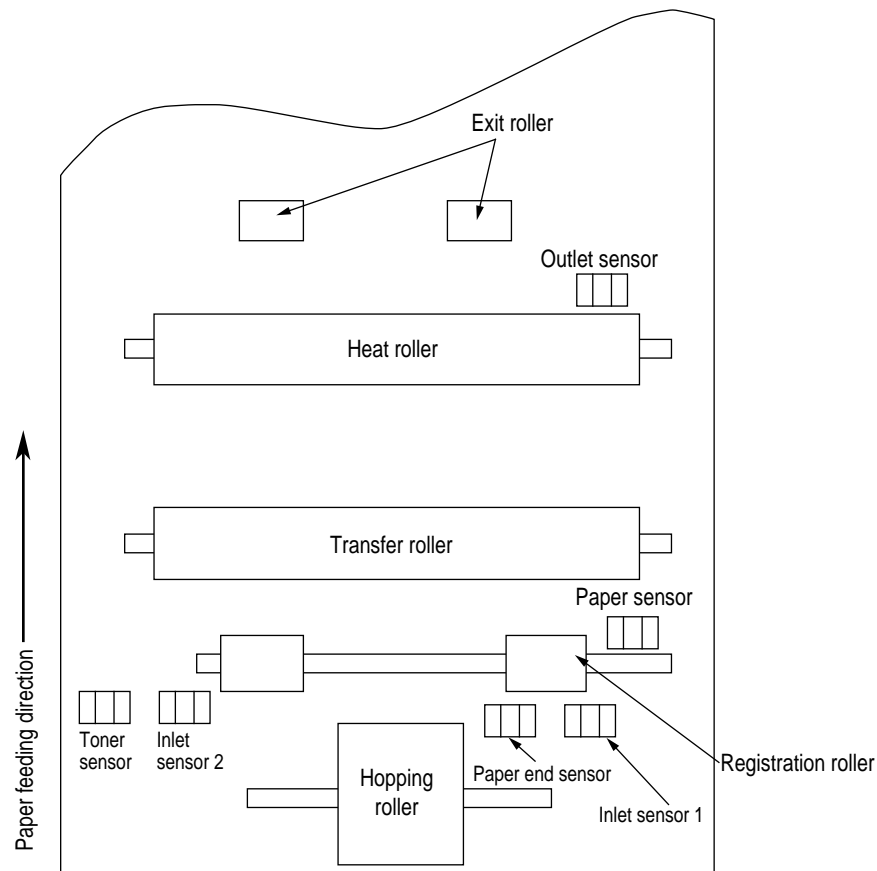


Figure 2-2

Sensor	Function	Sensing state
Inlet sensor 1	Detects the leading part of the paper and gives the monitor timing for switching from hopping operation to feeding operation. Monitors paper feeding situation and paper size based on the paper arrival time and running time.	ON : Paper exists. OFF : No paper exists.
Inlet sensor 2	Detects the paper width.	ON : A4 or larger OFF : Smaller than A4
Paper sensor	Detects the leading portion of the paper. Monitors the paper feeding situation.	ON : Paper exists. OFF : No paper exists.
Outlet sensor	Monitors the paper feeding and size according to the time of arrival to and leaving past the sensor.	ON : Paper exists. OFF : No paper exists.
Paper end sensor	Detects the end of the paper.	ON : Paper exists. OFF : No paper exists.
Toner low sensor	Detects the lack of toner.	- - - - -

## 2.3 Electrophotographic Process

### 2.3.1 Electrophotographic Process Mechanism

This mechanism actuates the printing of image data supplied by the main control board on the paper by electrophotographic process.

The layout of the electrophotographic process mechanism is shown in Figure 2-3.

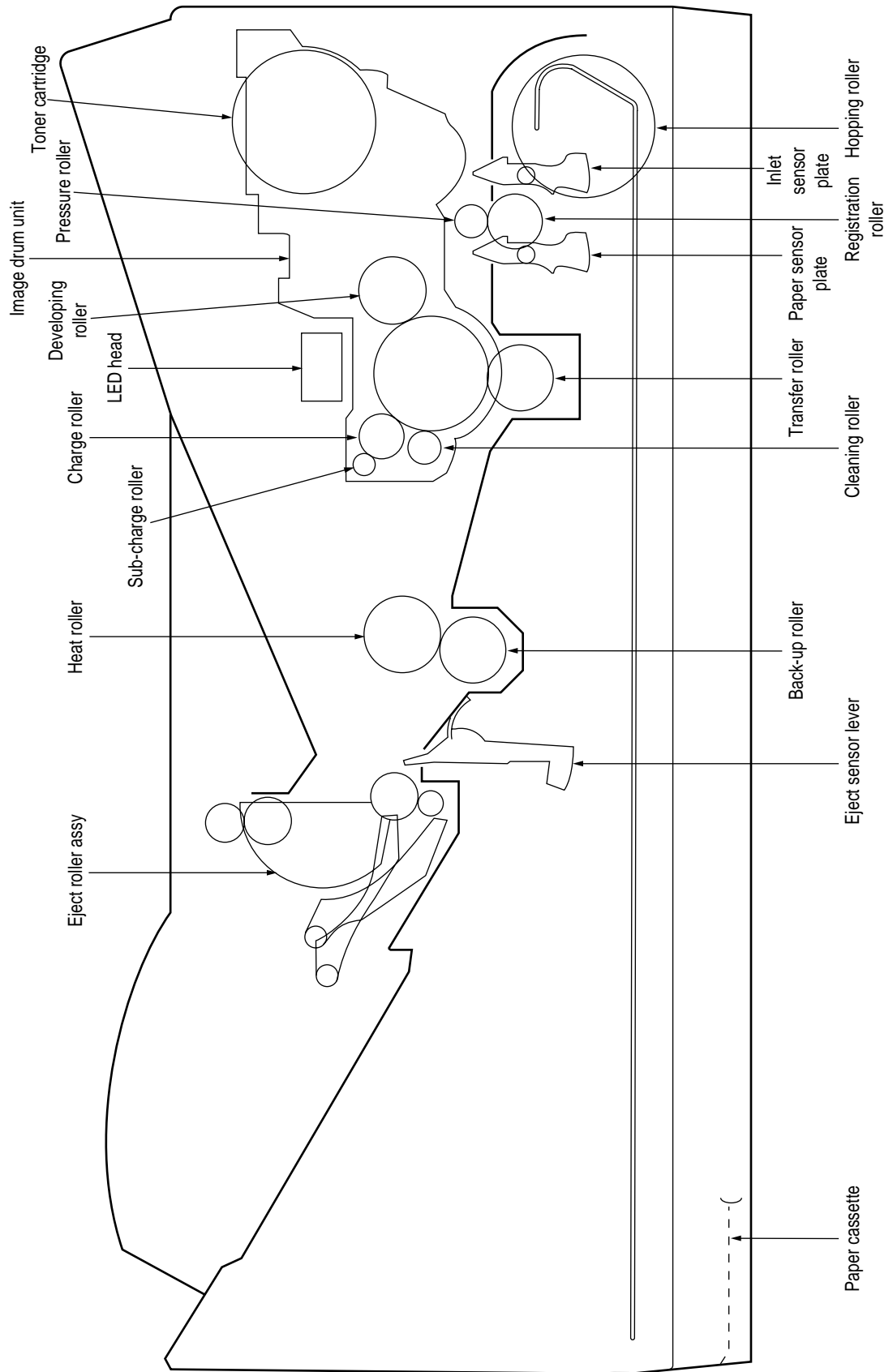


Figure 2-3

(1) Image Drum Unit

The image drum unit consists of a sensitive drum, a charger, and a developer. The unit forms a toner image on the sensitive drum, using an electrostatic latent image formed by the LED head.

(2) Registration Motor

The registration motor is a pulse motor of 48 steps/rotation with two-phase excitement by the signal from the main control board. It drives the hopping and registration rollers via two one-way clutches according to the direction of rotation.

(3) Main (Drum) Motor

The main or drum motor is a pulse motor of 48 steps/rotation with two-phase excitement by the signal from the main control board and is the main motor of this mechanism.

(4) LED Head

Image data for each dot line from the main control board is received by the shift register and latch register. The 4992 LED's are driven to radiate the image data on the image drum.

(5) Fuser

The fuser consists of a heater, a heat roller, a thermistor and a thermostat.

The AC voltage from the power supply/sensor board is applied to the heater controlled by the HEATON signal from the main control board. This AC voltage heats the heater. The main control board monitors the heat roller temperature via the thermistor, and regulates the heater roller to keep it at a designated temperature in the menu, depending on the thickness of the paper (tray 1&2: light=175~185°C, medium light=180~190°C, medium=185~195°C, medium heavy and heavy=195~205°C; manual feeding and power envelope feeder: light=165~180°C, medium light=170~185°C, medium=175~190°C, medium heavy=180~195°C, heavy=190~205°C, transparency = 170~185°C) by connecting or disconnecting the AC voltage supply to the heater.

When an abnormal rise of the heater roller temperature takes place, the thermostat of the heater voltage supply circuit becomes active and forcibly cuts the AC voltage supply.

The temperature setting of the fuser can be changed through operator panel setting.



### 2.3.2 Electrophotographic Process

The electrophotographic processing is outlined below. The electrophotographic printing process is shown in Figure 2-4.

① Charging

The surface of the image drum is charged uniformly with a negative charge by applying the negative voltage to the charge roller.

② Exposure

Light emitted from the LED head irradiates the negatively charged surface of the image drum. The surface potential of the irradiated portion of the image drum surface becomes lower, forming the electrostatic latent image associated with the print image.

③ Developing and toner recovery

When the negatively charged toner is brought into contact with the image drum, it is attracted to the electrostatic latent image by static electricity, making the image visible.

At the same time, the residual toner on the image drum is attracted to the developing roller by static electricity.

④ Transfer

When paper is placed over the image drum surface, the positive charge which is opposite in polarity to that of the toner, is applied to the reverse side of the paper by the transfer roller. The toner is attracted by the positive charge and is transferred onto the paper. This results in the transfer of the toner image formed on the image drum onto the paper.

⑤ Temporary cleaning

Residual toner which remains on the image drum without being transferred is evened out by the cleaning roller and is temporarily attracted to the cleaning roller by static electricity.

⑥ Fusing

The toner image transferred onto the paper is fused to the paper by heat and pressure.

An electrophotographic process timing chart is shown in Figure 2-5.

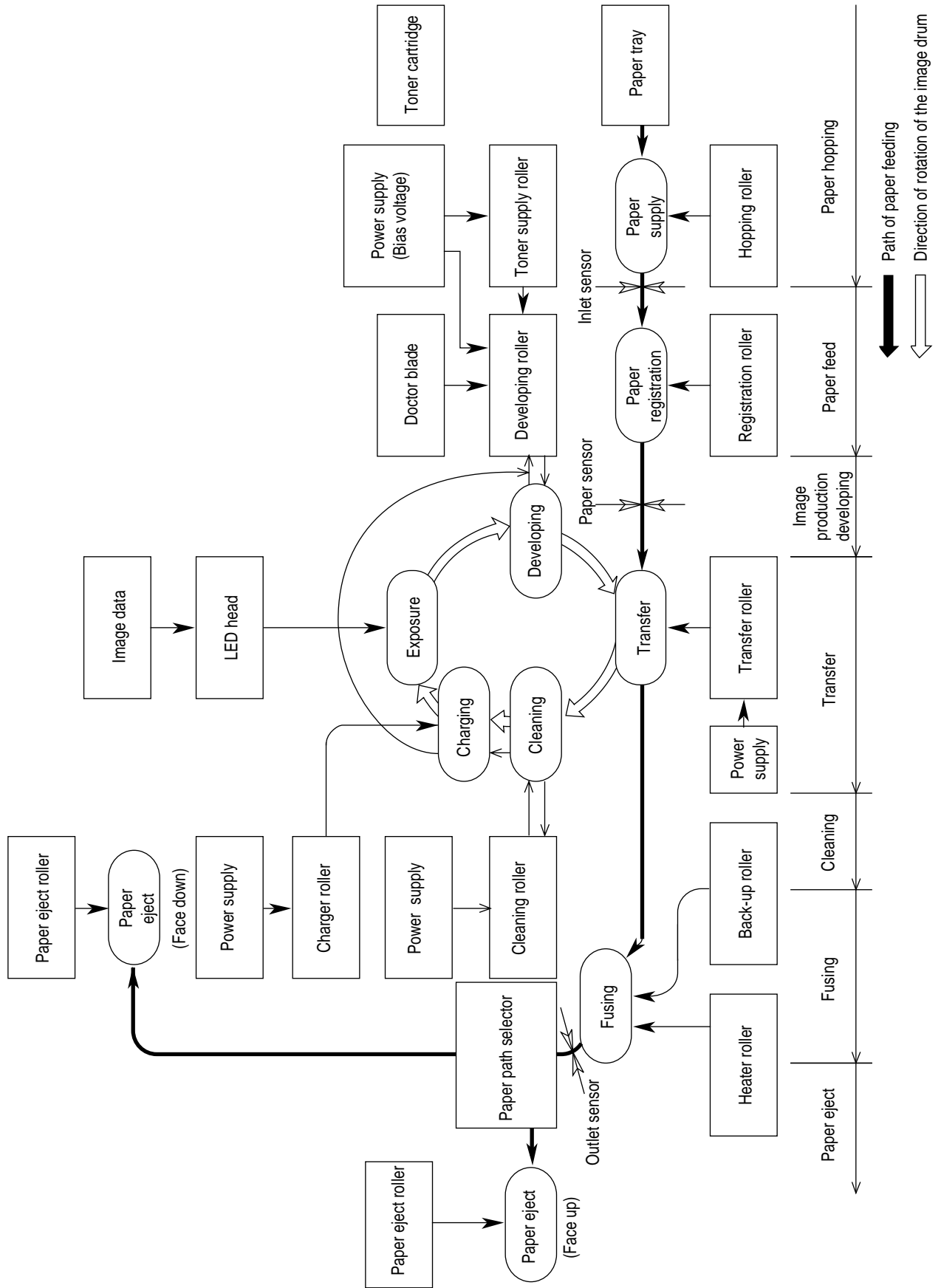


Figure 2-4

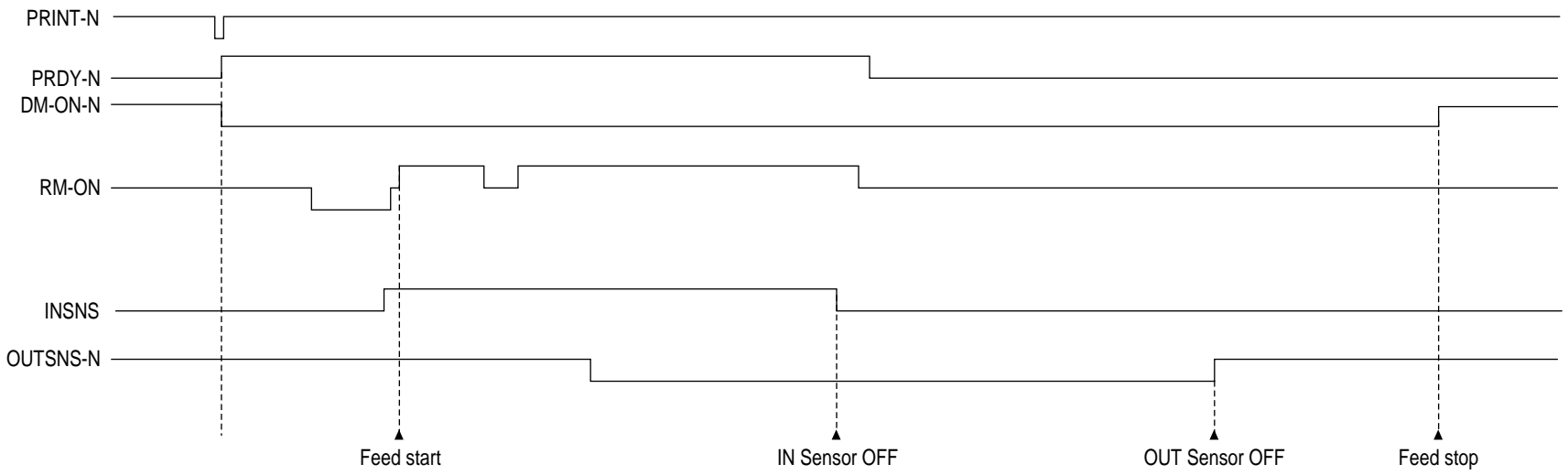
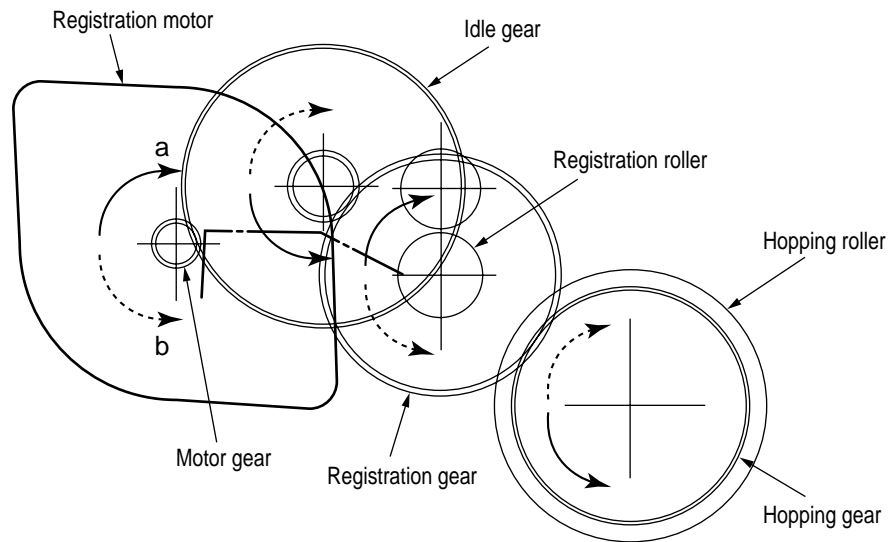


Figure 2-5

### 2.3.3 Process Operation Descriptions

#### (1) Hopping and Feeding

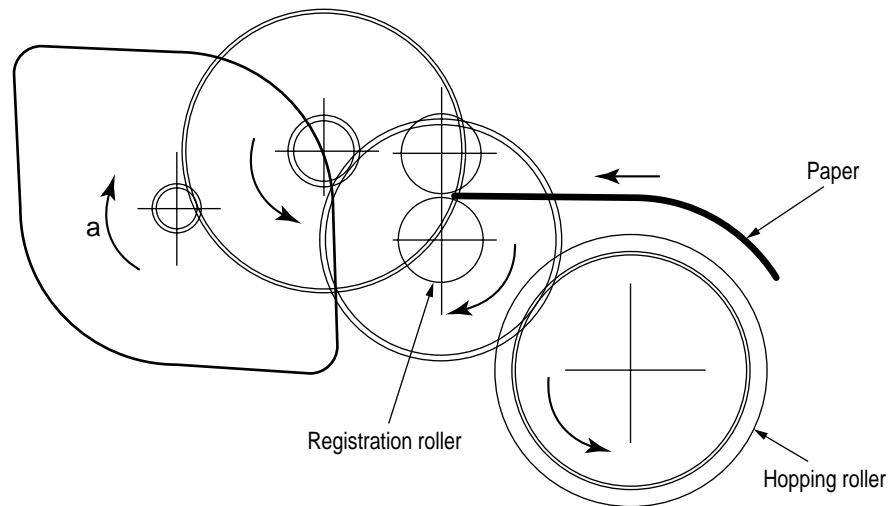
Hopping and feeding motions are actuated by a single registration motor in the mechanism as shown below:



The registration motor turning in direction "a" drives the hopping roller. The registration motor turning in direction "b" drives the registration roller. The registration and hopping gears have one-way bearing, so turning any of these gears in the reverse direction will not transmit the motion to the corresponding roller.

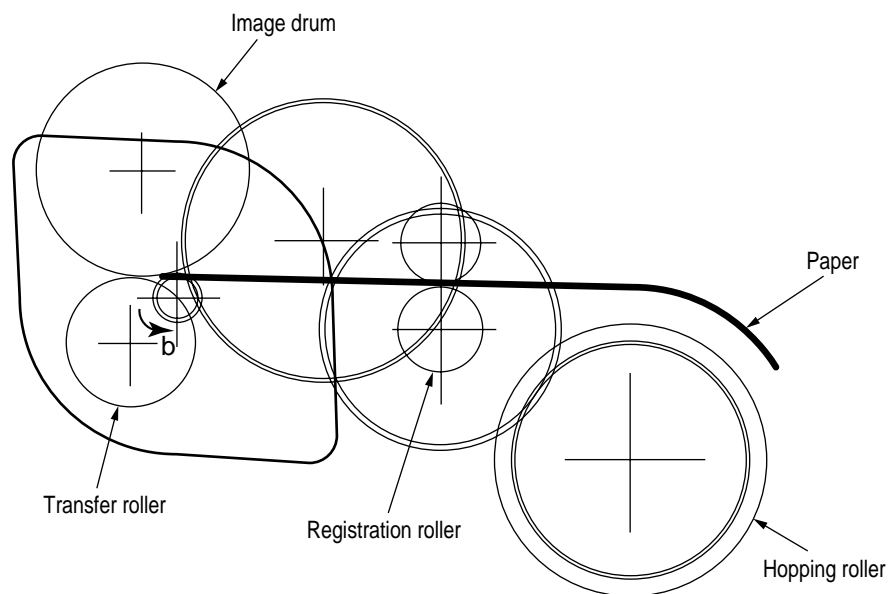
(a) Hopping

- ① For hopping, the registration motor turns in direction "a" (clockwise direction) and drives the hopping roller to advance the paper until the inlet sensor turns on (in this case, the registration gear also turns, but the registration roller is prevented from turning by the one-way bearing).
- ② After inlet sensor is turned on by the paper advance, the paper is further advanced to a predetermined distance until the paper hits the registration roller (the skew of the paper can thus be corrected).



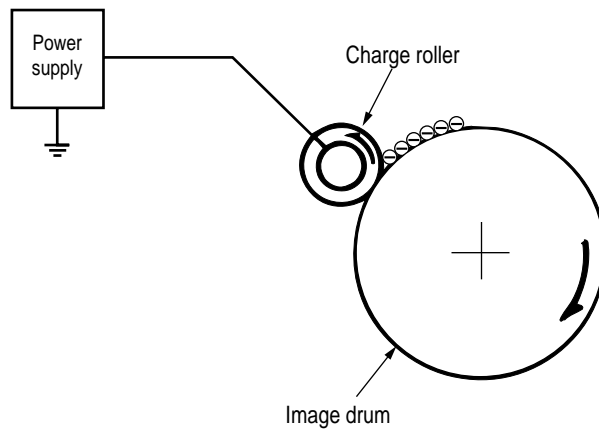
(b) Feeding

- ① When hopping is completed, the registration motor turning in direction "b" (counter-clockwise direction) drives the registration roller to advance the paper (in this case, the hopping gear also turns, but the hopping roller is prevented from turning by the one-way bearing).
- ② The paper is further advanced in synchronization with the print data.

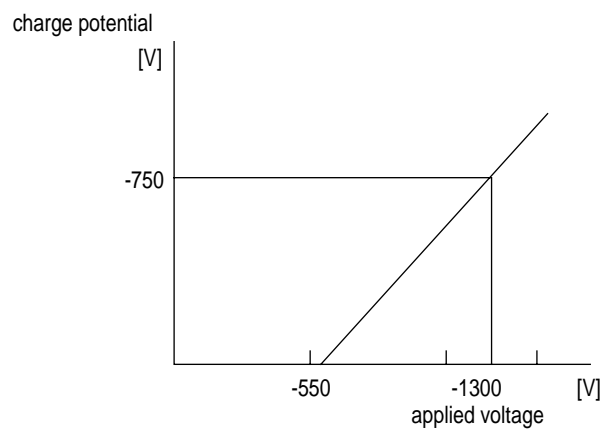


## (2) Charging

Charging is actuated by the application of the DC voltage to the charge roller that is in contact with the image drum surface.

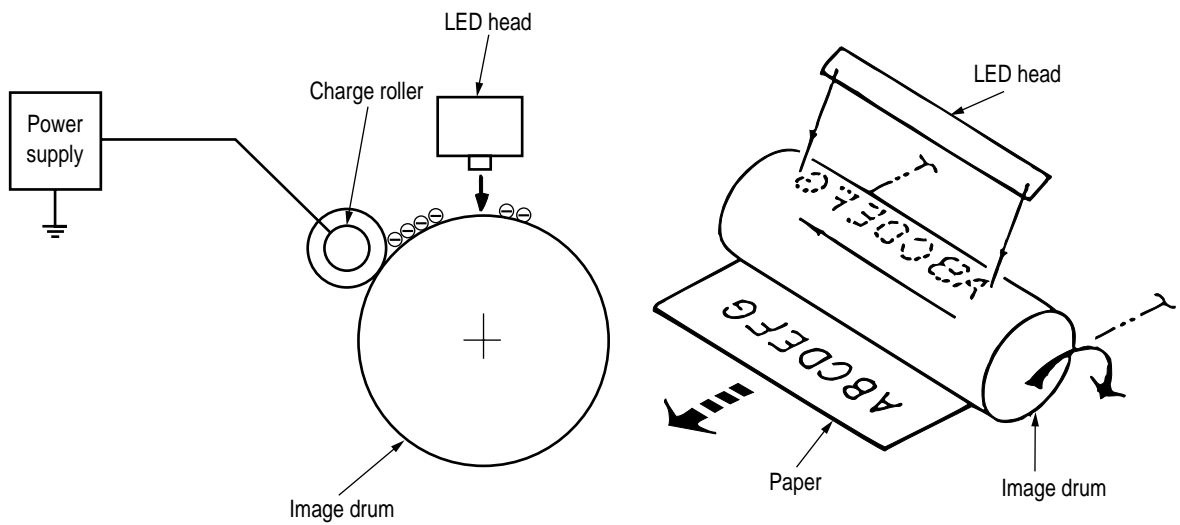


The charge roller is composed of two layers, a conductive layer and a surface protective layer, both having elasticity to secure good contact with the image drum. When the DC voltage applied by the power supply exceeds the threshold value, charging begins. The applied voltage is proportional to the charge potential, with offset of approximately  $-550\text{V}$ .

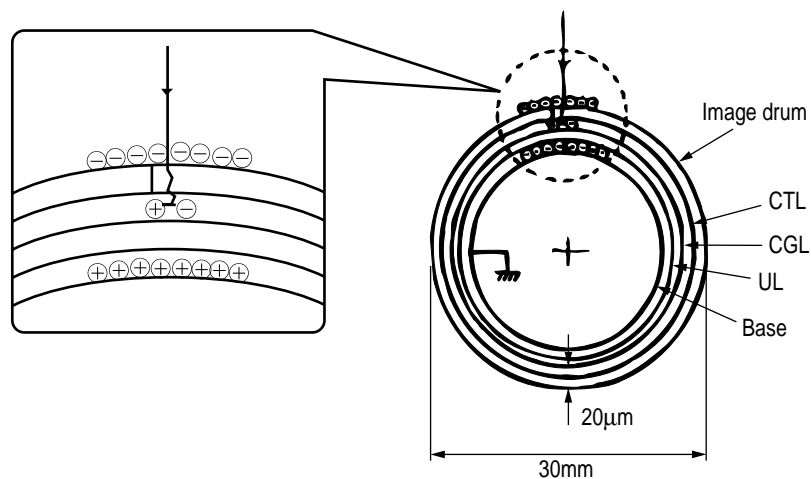


### (3) Exposure

Light emitted by the LED head irradiates the image drum surface with a negative charge. The surface potential of the irradiated portion of the image drum drops, forming an electrostatic latent image associated with the image signal.



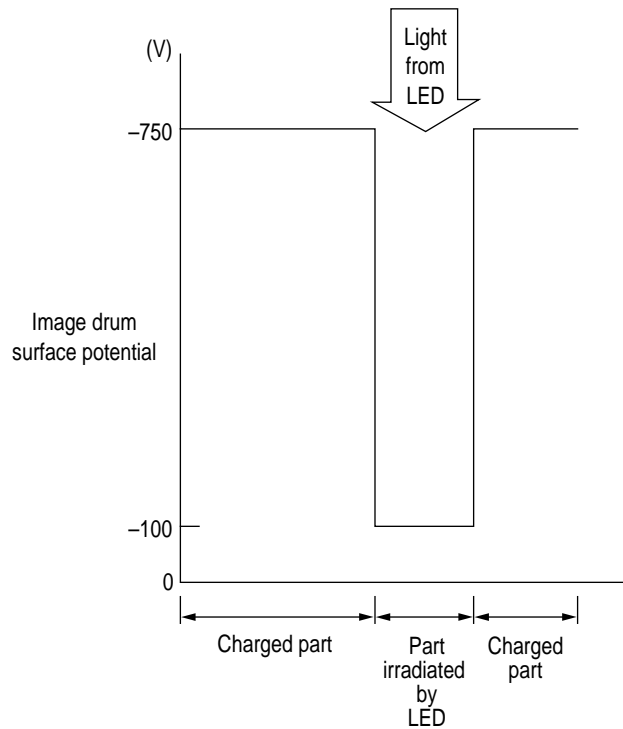
The image drum is coated with an underlayer (UL), a carrier generation layer (CGL), and carrier transfer layer (CTL) on aluminum base. The organic photo conductor layer (OPC), comprising CTL and CGL, is about 20  $\mu\text{m}$  thick.



The image roller surface is charged to about  $-750$  V by the contact charge of the charge roller.

When the light from the LED head irradiates the image drum surface, the light energy generates positive and negative carriers in the CGL. The positive carriers are moved to the CTL by an electrical field acting on the image drum. Likewise, the negative carriers flow into the aluminum layer (ground).

The positive carriers moved to the CTL combine with the negative charges on the image drum surface accumulated by the contact charge of the charge roller, lowering the potential on the image drum surface. The resultant drop in the potential of the irradiated portion of the image drum surface forms an electrostatic latent image on it. The irradiated portion of the image drum surface is kept to about  $-100$  V.

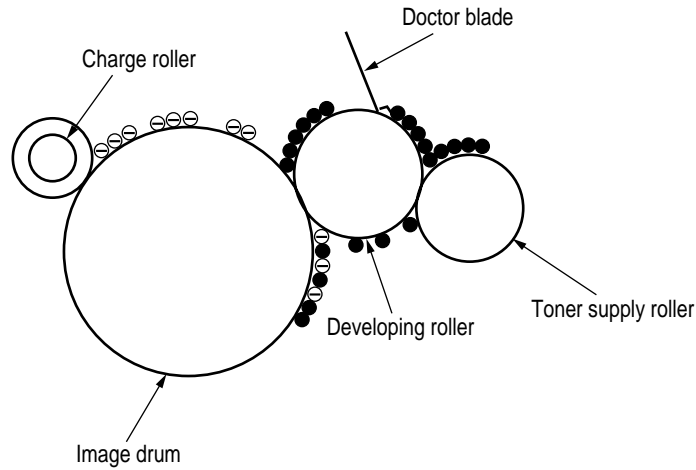




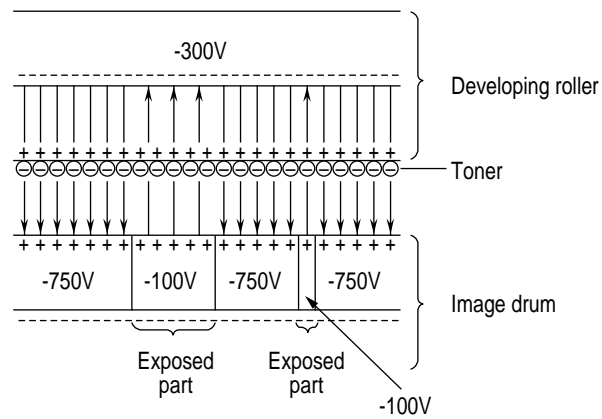
(4) Developing

Toner is attracted to the electrostatic latent image on the image drum surface, converting it into a visible toner image. Developing takes place through the contact between the image drum and the developing roller.

- ① As the toner supply roller rotates while rubbing on the developing roller, a friction charge is generated between the developing roller and the toner, allowing the toner to be attracted to the developing roller (the developing roller surface is charged positive and the toner, negative).

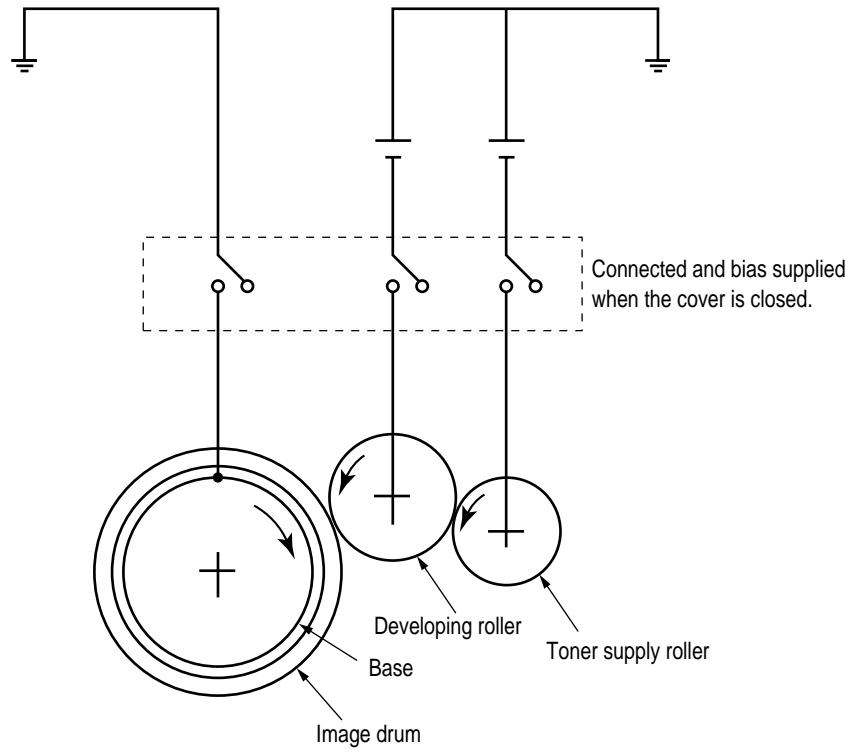


- ② The toner attracted to the developing roller is scraped off by the doctor blade, forming a thin coat of toner on the developing roller surface.
- ③ Toner is attracted to the exposed portion (low-potential part) of the image drum at the contact of the image drum and the developing roller, making the electrostatic latent image visible.



An illustration of activities at the contact point of the image drum surface and the developing roller (arrow marks denote the direction of the electrical field).

**Note:** The bias voltage required during the developing process is supplied to the toner supply roller and the developing roller, as shown below.  $-450\text{ VDC}$  is supplied to the toner supply roller,  $-255\text{ VDC}$  to the developing roller.

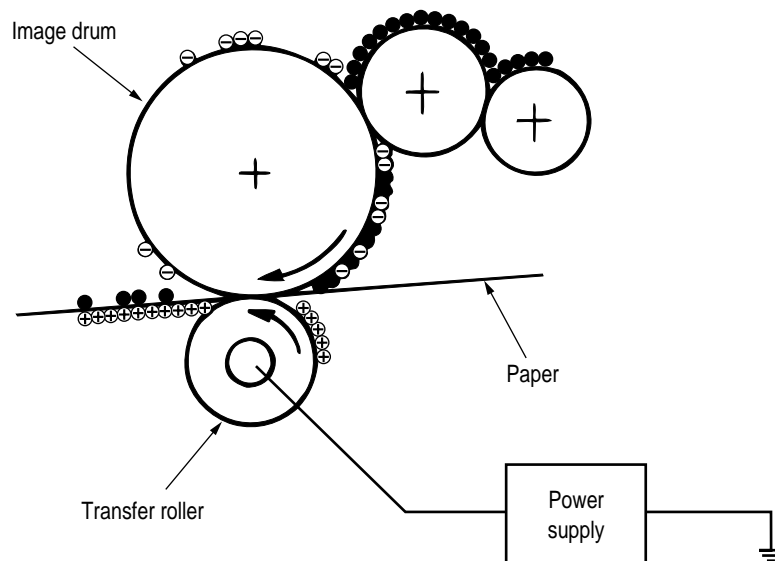


(5) Transfer

The transfer roller is composed of conductive sponge material, and is designed to get the image drum surface and the paper in a close contact.

Paper is placed over the image drum surface, and the positive charge, opposite in polarity to that of the toner, is applied to the paper from the reverse side.

The application of a high positive voltage from the power supply to the transfer roller causes the positive charge inducement on the transfer roller surface, transferring the charge to the paper as it contacts the transfer roller. The toner with negative charge is attracted to the image drum surface, and it is transferred to the upper side of the paper due to the positive charge on the reverse side of the paper.

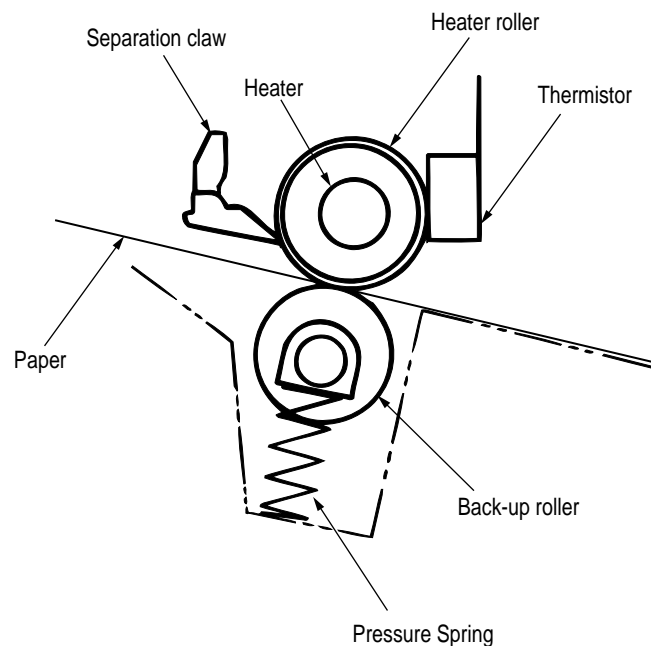


## (6) Fusing

When the transfer is completed, the toner image is fused to the paper by heat and pressure as the paper with unfused toner image passes between the heater roller and the back-up roller. The heater roller with Teflon coating incorporates a 550W heater (Halogen lamp), which generates heat.

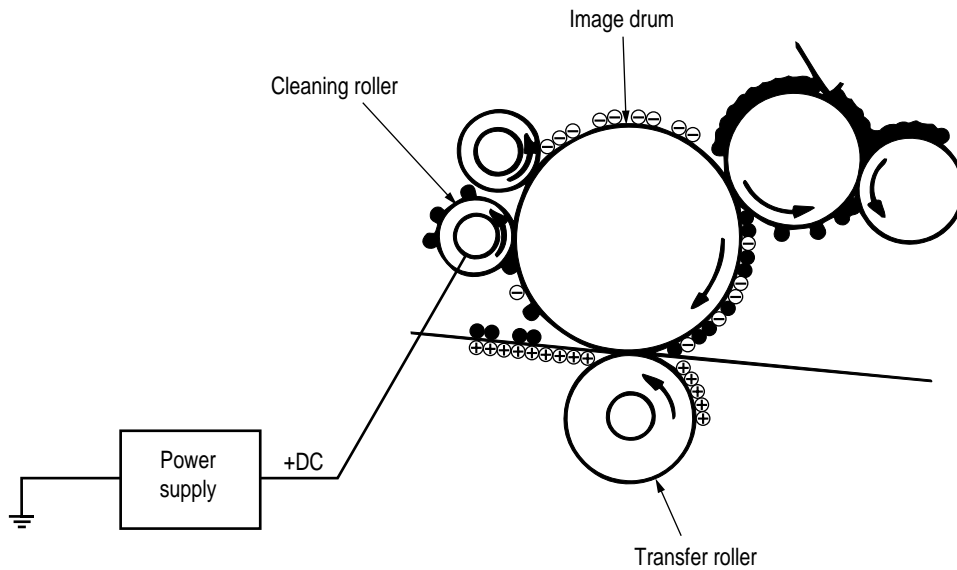
A thermistor which is in contact with the heater roller regulates the temperature of the heater roller to a designated temperature in the menu, depending on the thickness of the paper (tray 1&2: light=175~185°C, medium light=180~190°C, medium=185~195°C, medium heavy and heavy=195~205°C/manual feeding and power envelope feeder: light=165~180°C, medium light=170~185°C, medium=175~190°C, medium heavy=180~195°C, heavy=190~205°C, transparency = 170~185°C). A safety thermostat cuts voltage supply to the heater off by opening the thermostat in the event of abnormal temperature rises.

The back-up roller is held under a pressure of 3.76 kg applied by the pressure spring on each side.



### (7) Cleaning

When the transfer is completed, the residual toner left on the image drum is attracted to the cleaning roller temporarily by static electricity, and the image drum surface is cleaned.



### (8) Cleaning of rollers

The charge, transfer and cleaning rollers are cleaned for the following cases:

- Warming up when the power is turned on.
- Warming up after the opening and closing of the cover.
- When the number of sheets accumulated reaches 10 or more, and the printout operation ends.

Changes in bias voltage applied to each roller move the attaching toner off the roller to the image drum and return it to the developer.

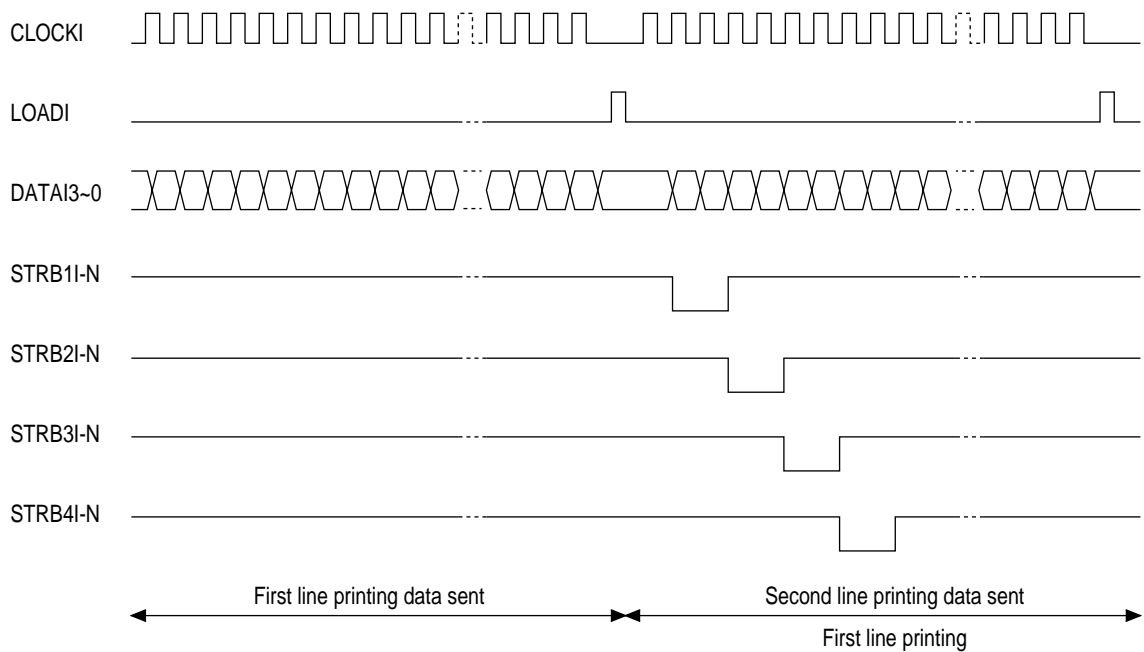
### 2.3.4 Revision of LED Head Illumination

An LED correcting head, which is capable of correcting the illumination of the LED for each dot, is being used in this printer. LED illumination correction function of 16 steps is carried out by using an EEPROM which is installed in the LSI that maintains the LED illumination correction values, and an LED correction drivers together as a pair.

The printing and correction data obtained from the CPU through four signal lines are sent to the LED array.

The printing operation timing chart is shown below.

Normal Mode Printing Timing Chart



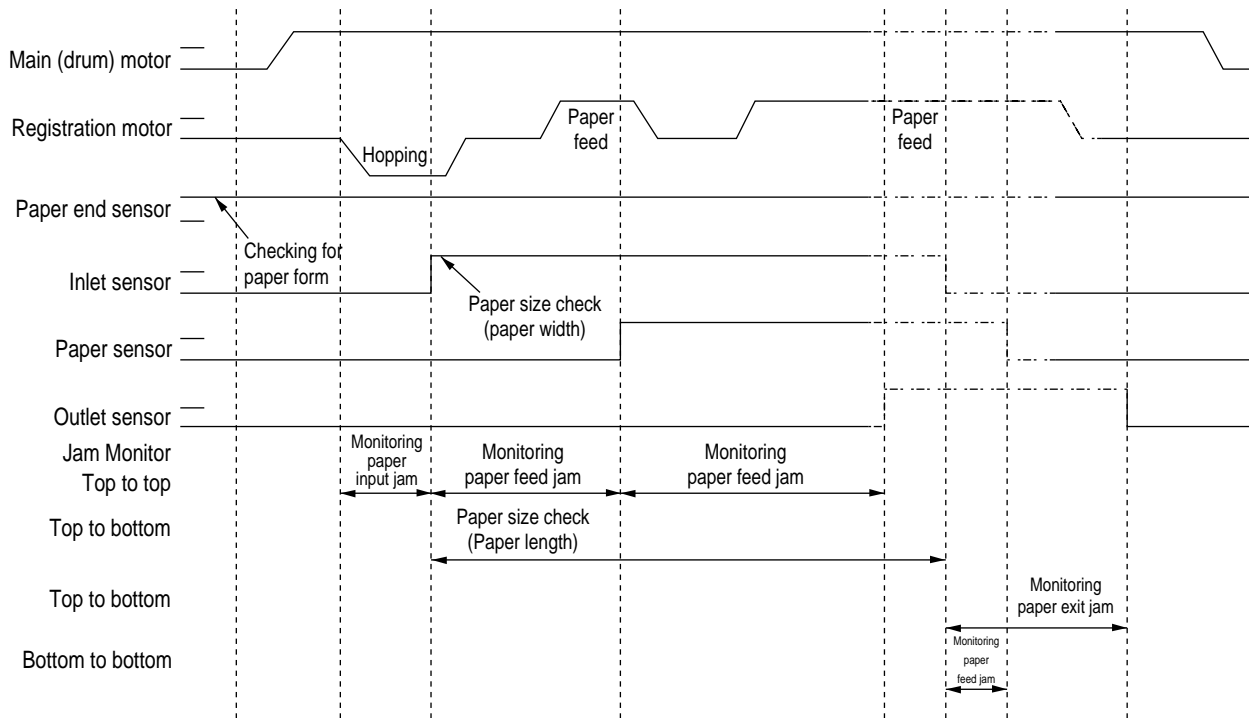
The printing operation is carried out in normal mode. Under ordinary circumstances such as when the power is turned on or when LOADI signal level is low, the normal mode is enabled.

The printing operation is carried out in the following sequence. First, the printing data DATAI3 through DATAI0 are stored, sequentially shifted, in the shift registers of the LED drivers, by the printing data synchronous clock, CLOCKI. Then the printing data stored in shift registers are latched by the high level pulse of LOADI. The latched printing data turns the LEDs on by STRB1I-N through STRB4I-N and actuates printing.

## 2.4 Paper Jam Detection

The paper jam detection function monitors the paper condition when the power is turned on and during printing. When any of the following conditions arises, this function interrupts the printing process. If any of the following errors is encountered, printing can be recovered by removing the jammed paper (by opening the upper cover, removing the jammed paper and closing the upper cover).

Error	Cause of error
Paper input jam	<ul style="list-style-type: none"> <li>The paper is in contact with the inlet sensor when the power is turned on.</li> <li>After hopping operation is attempted three times, the leading edge of the paper does not reach the inlet sensor.</li> </ul>
Paper feed jam	<ul style="list-style-type: none"> <li>The paper is in contact with the paper sensor when the power is turned on.</li> <li>The leading edge of the paper does not reach the paper sensor within a predetermined feeding distance since the paper has reached the inlet sensor.</li> <li>The trailing edge of the paper does not pass over the paper sensor within a predetermined feeding distance after the same has passed over the inlet sensor.</li> <li>The leading edge of paper does not reach the outlet sensor within a predetermined feeding distance after the paper has reached the paper sensor.</li> </ul>
Paper exit jam	<ul style="list-style-type: none"> <li>The paper is in contact with the outlet sensor when the power is turned on.</li> <li>The paper does not pass over the outlet sensor within a predetermined feeding distance after the leading edge of the paper has reached the outlet sensor.</li> <li>The paper size check for manual feeding finds that the paper size is free size.</li> </ul>
Paper size error	<ul style="list-style-type: none"> <li>The size of the paper is monitored by the inlet sensor 1. The paper is not detected by the inlet sensor 1 within predetermined feeding distance.</li> <li>The inlet sensor 2 detects that the size of the loaded paper is A4 or larger, or smaller than A4. The detected paper size differs from the paper size set by command or menu.</li> <li>The paper size check for manual feeding finds that the paper size is free size.</li> </ul>



Paper Feed Timing Chart

Paper Feed Check List

Type of error	Monitor		Standard value	Error	
				Plus	Minus
Paper feed error	Hopping start	to In sensor on	2.835	1.417	-
Paper feed jam	In sensor on	to Write sensor on	.7874	.8661	-
Paper feed jam	Write sensor on	to Out sensor on	5.531	.9843	-
Paper size error	In sensor on	to Out sensor on	Depends on the paper length	1.772	1.772
Paper exit jam	Out sensor on	to Out sensor off	Depends on the paper length	1.772	1.772
Paper feed jam	In sensor off	to Write sensor Off	.874	.8661	-

Unit : in

**Note:** Hyphen "-" in the table represents "not checked."

Paper Length List

Type	Paper length	Check range	
		Min	Max
A4	11.69	9.921	13.46
A5	8.268	6.496	10.04
B5	10.12	8.346	11.89
LETTER	11.0	9.228	12.77
LEGAL 13	13.0	11.23	14.77
LEGAL 14	14.0	12.23	15.77
EXEC	10.50	8.728	12.27
A6	5.827	4.055	7.598
Monarch	7.50	5.728	9.272
COM-9	8.874	7.102	10.65
COM-10	9.50	7.728	11.27
DL	8.661	6.89	10.43
C5	9.016	7.244	10.79
Free	4.335 ~ 14.0	2.559	15.77

Unit : in

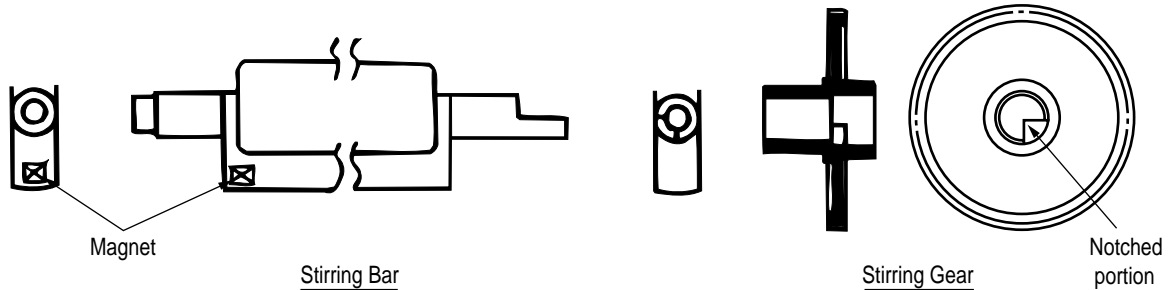


## 2.5 Cover Open

When the stacker cover is opened, the cover open microswitch on the power supply/sensor board is turned off to cut +5V supply to the high voltage power supply circuit. This results in the interruption of all high-voltage outputs. At the same time, the CVOPN signal is sent to the main control board to notify that the microswitch is off, and the main control board carries out the cover open process.

## 2.6 Toner Low Detection

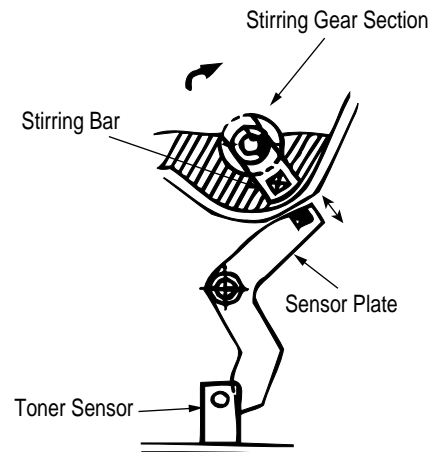
- **Device**  
The Toner Low Detection device consists of a stirring gear which rotates at a constant rate, a stirring bar and a magnet on the stirring bar. The stirring bar rotation is driven by the link to the notched portion in the stirring gear.



- **Operation**  
Toner Low is detected by monitoring the time interval of the encounter of the magnet set on the sensor plate and the magnet on the stirring bar.

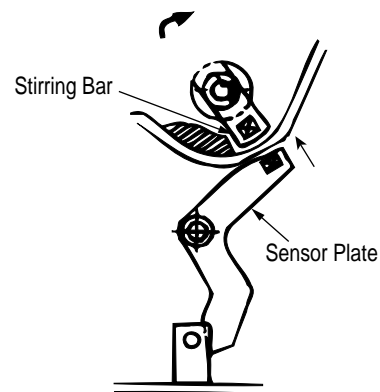
### Operation during Toner Full state

- The stirring bar rotates due to the mechanical transmission of energy originating from the interlocking with the stirring gear.
- Even when the magnet on the stirring bar reaches the maximum height, the stirring bar is pushed by the stirring gear, since the other side is being dipped in the toner.

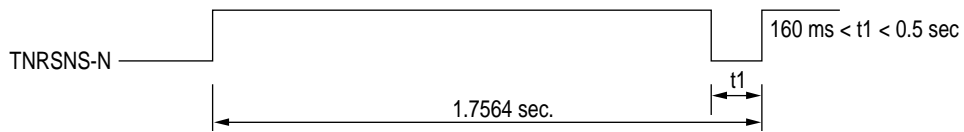


### Operation during Toner Low state

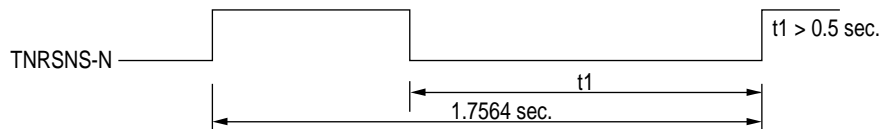
- When the stirring bar reaches the maximum height, it falls to the minimum height due to its own weight, since there is no resistance provided by the toner on the other side. Because of this, the time interval during which it is in encounter with the magnet of the sensor plate becomes longer. By monitoring this time interval, Toner Low state can be detected.



## TONER FULL state



## TONER LOW state



- When the Toner Low state is detected 2 times consecutively, Toner Low is established.
- When the Toner Full state is detected 2 times consecutively, Toner Low is cancelled.
- When there is no change with the toner sensor for 2 cycles (1.7564 sec. × 2) or more, then the Toner Sensor Alarm is activated.
- The toner sensor is not monitored while the main (drum) motor is not moving.

### 3. PARTS REPLACEMENT

The section explains the procedures for replacement of parts, assemblies, and units in the field. Only the disassembly procedures are explained here. For reassembly, reverse the disassembly procedure.

#### 3.1 Precautions for Parts Replacement

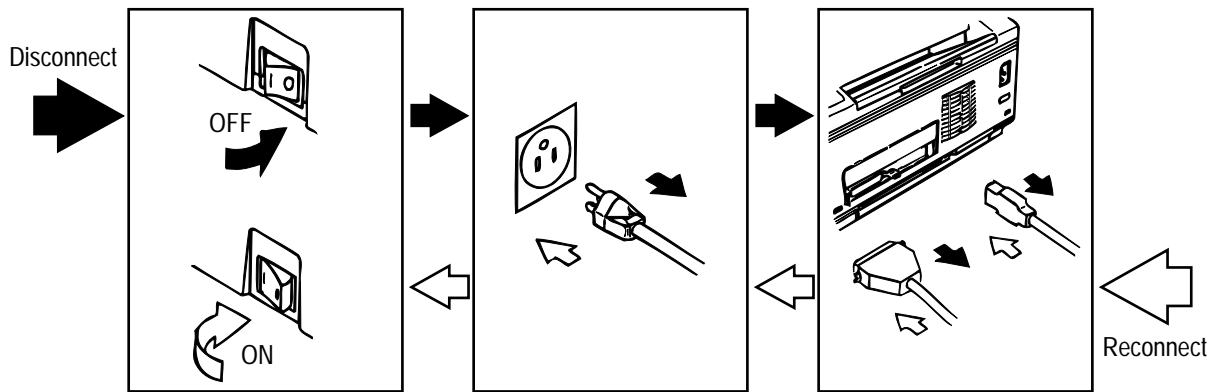
(1) Before starting to replace parts, remove the AC cord and interface cable.

(a) Remove the AC cord in the following sequence:

- i) Turn off ("o") the power switch of the printer
- ii) Disconnect the AC inlet plug of the AC cord from the AC receptacle.
- iii) Disconnect the AC cord and interface cable from the printer.

(b) Reconnect the printer in the following procedure.

- i) Connect the AC cord and interface cable to the printer.
- ii) Connect the AC inlet plug to the AC receptacle.
- iii) Turn on ("I") the power switch of the printer.



(2) Do not disassemble the printer as long as it is operating normally.

(3) Do not remove parts which do not have to be touched; try to keep the disassembly to a minimum.

(4) Use specified service tools.

(5) When disassembling, follow the laid out sequences. Parts may be damaged if these sequences are not followed.

(6) Since screws, collars and other small parts are likely to be lost, they should temporarily be attached in their original positions during disassembly.

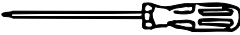
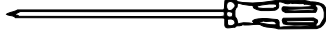






(7) When handling IC's such as microprocessors, ROMs and RAMs, or circuit boards, do not wear gloves that are likely to generate static electricity.

(8) Do not place printed circuit boards directly on the equipment or floor.

[Service Tools]

The tools required for field replacement of printed circuit boards, assemblies and units are listed in Table 3-1.

Table 3-1 Service Tools

No.	Service Tools	Q' ty	Application	Remarks
1	 No. 1-100 Philips screwdriver	1	2~2.5 mm screws	
2	 No. 2-100 Philips screwdriver	1	3~5 mm screws	
3	 No. 3-100 screwdriver	1		
4	 No. 5-200 screwdriver	1		
5	 Digital multimeter	1		
6	 Pliers	1		
7	 Toner vacuum cleaner	1		
8	 LED Head cleaner	1	Cleans LED head	

### 3.2 Parts Layout

This section explains the layout of main components of the equipment.

[Lower base unit]

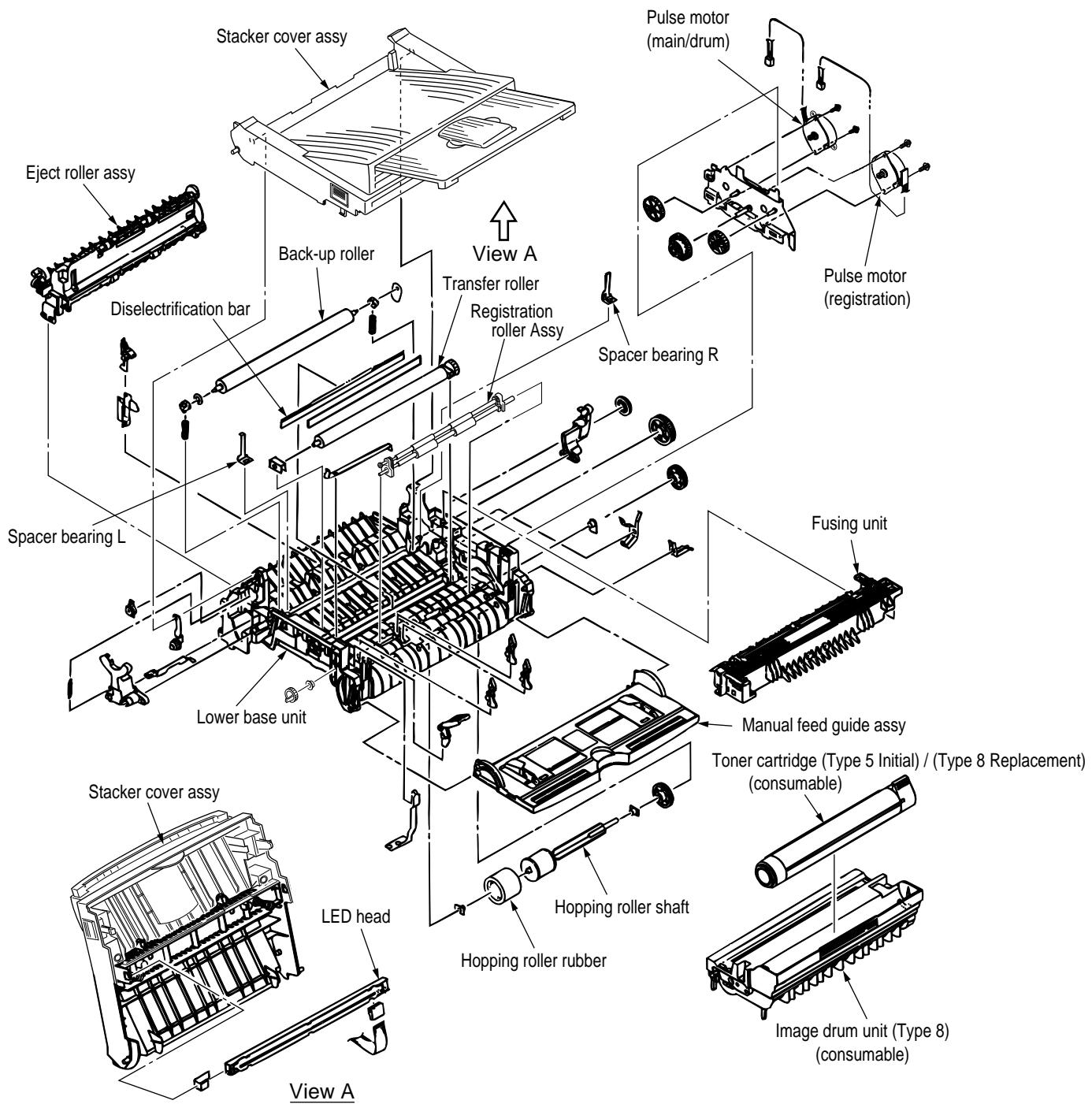


Figure 3-1

[Upper cover unit]

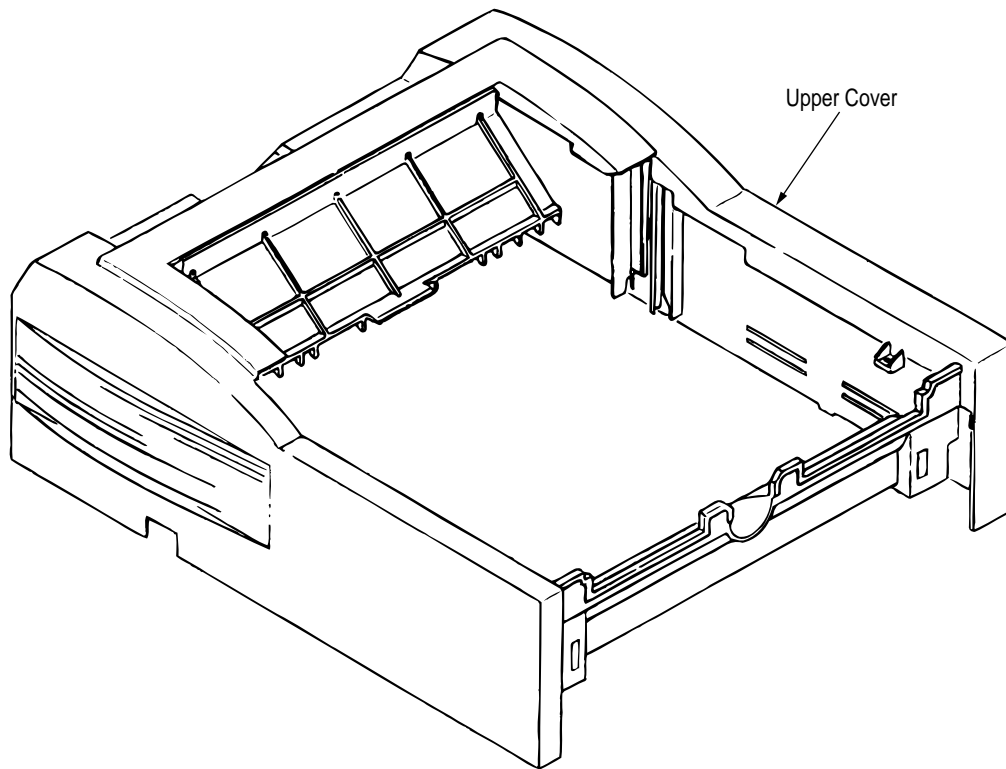


Figure 3-2

[Base unit]

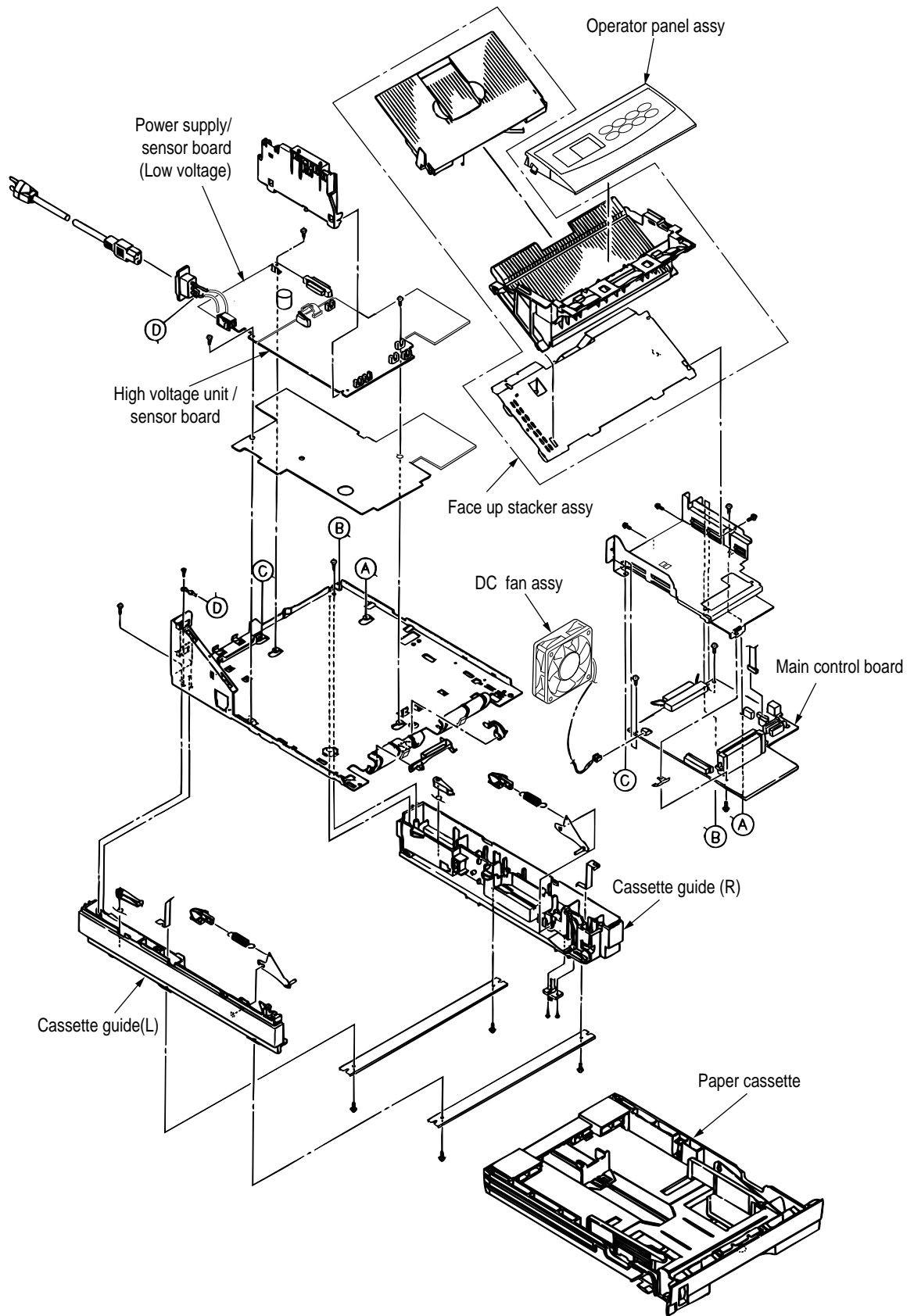


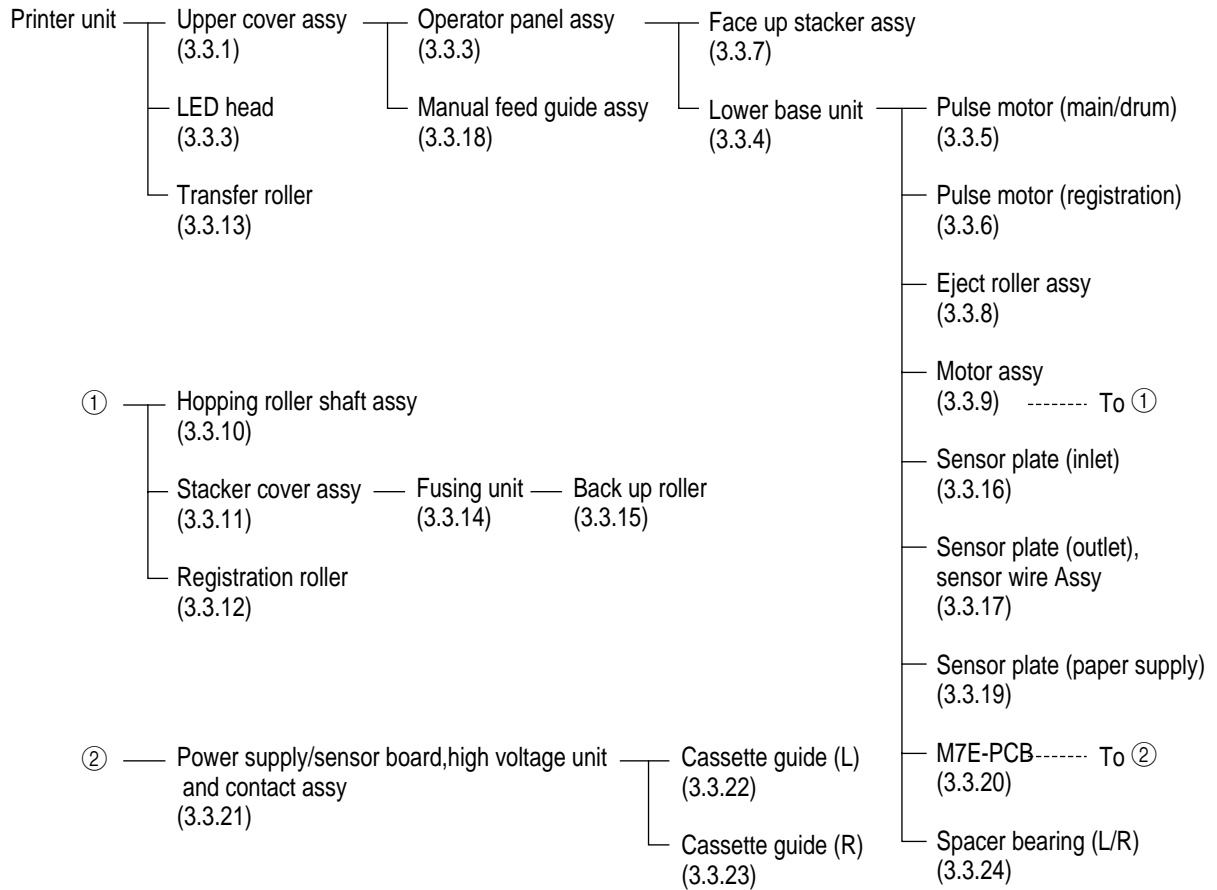
Figure 3-3



### 3.3 How to Change Parts

This section explains how to replace parts and assemblies listed in the disassembly diagram below.

In the parts replacement procedure, those parts marked with the part number inside ● with white letters are RSPL parts.

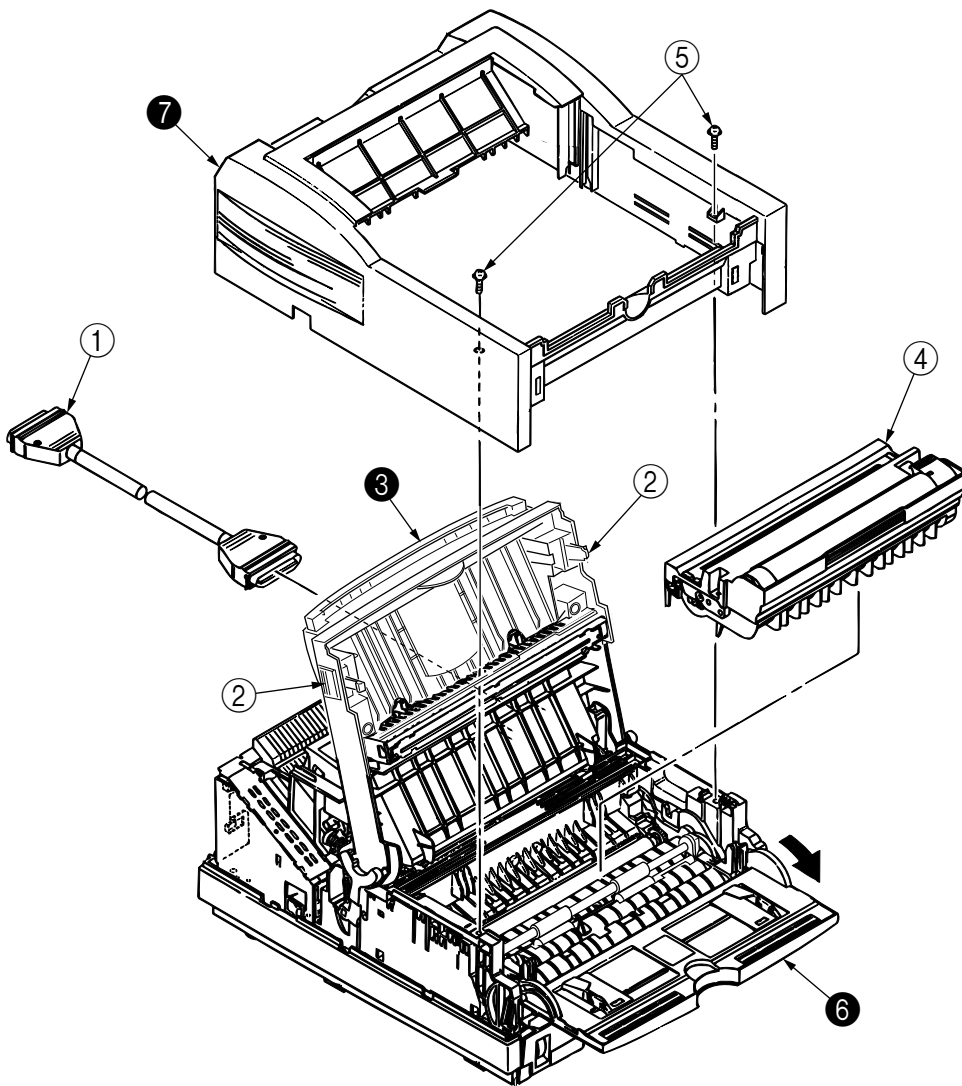


### 3.3.1 Upper Cover Assy

- (1) With the power switch turned off, unplug the AC power cord from the outlet.
- (2) Disconnect the interface cable ①.
- (3) Press the latches ② on left and right sides and open the stacker cover assy ③.
- (4) Take out the image drum unit ④.
- (5) Remove two screws ⑤, and open the manual feed guide assy ⑥. Lift the front side of the upper cover ⑦ up and unlock the tabs at two locations on the back side. Lift and remove the upper cover assy ⑦.

**Note :** 1. When removing or reinstalling the upper cover, be careful not to get the motor cables tangled or caught.

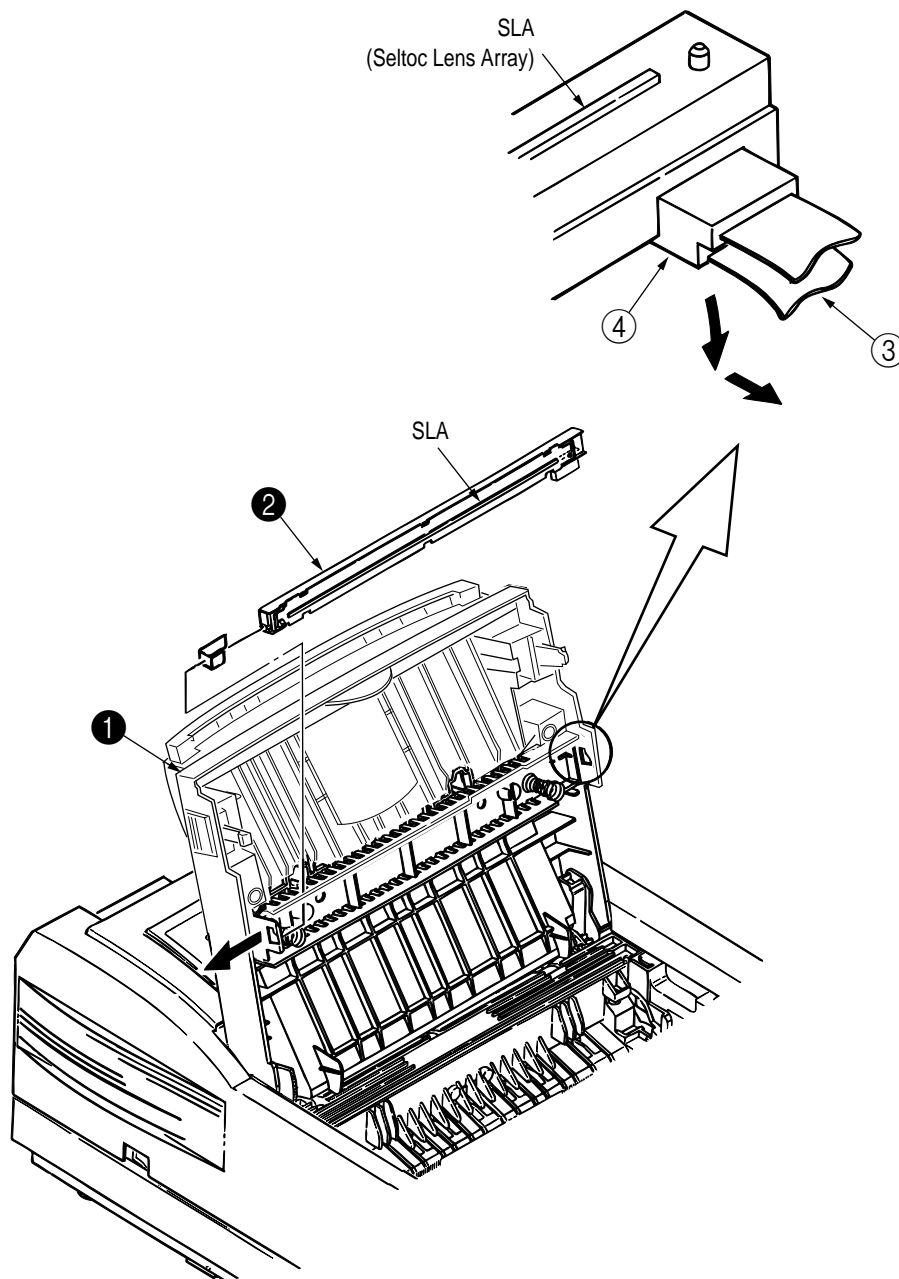
2. When reinstalling the screws ⑤, be sure to utilize the existing threads.



### 3.3.2 LED Head

- (1) Press the latches on left and right sides and open the stacker cover assy ①.
- (2) Open the hook section on the left side of the stacker cover and remove the LED head ②.

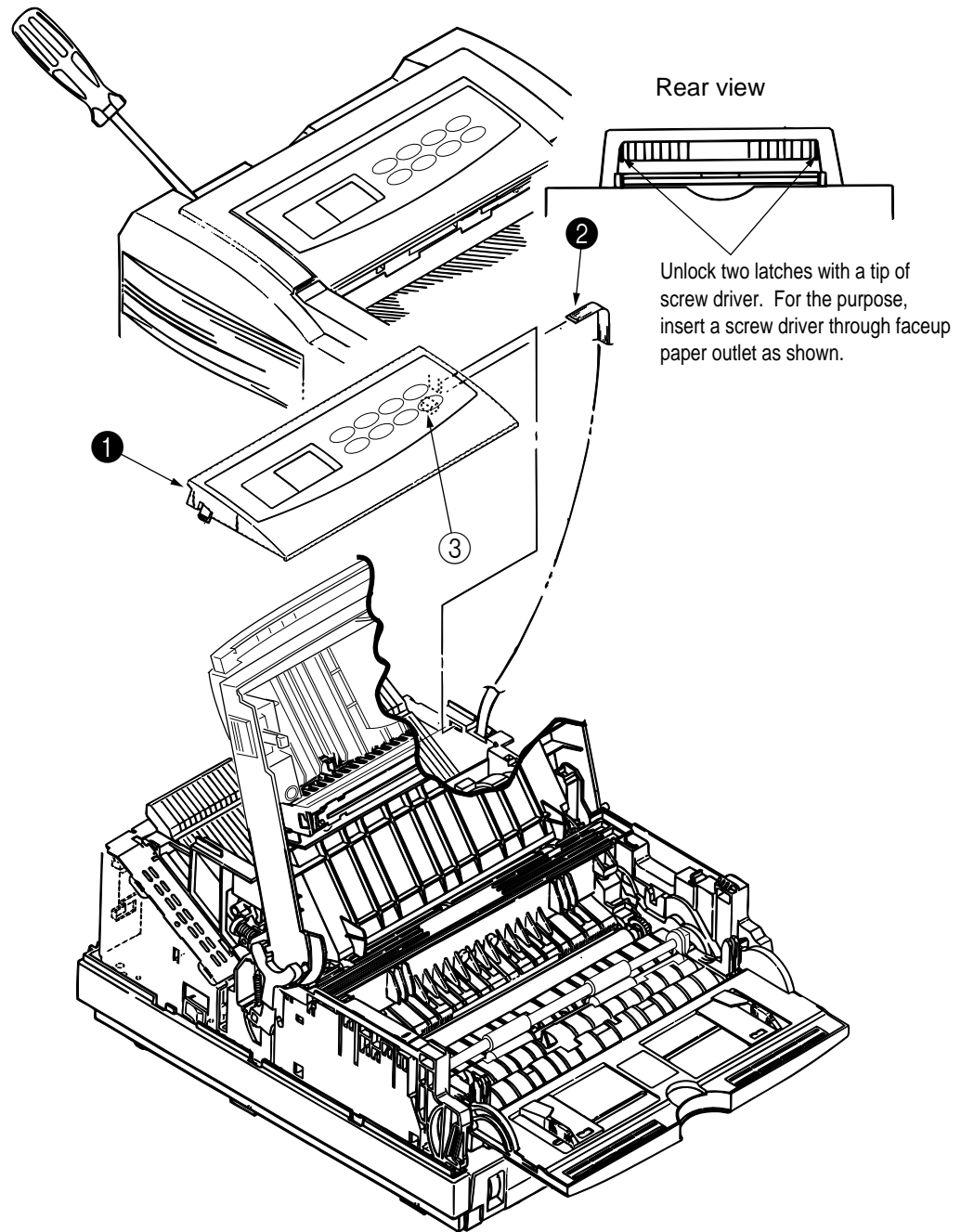
- Note:**
- Be sure not to touch directly or push on the SLA part of the LED head.
  - Do not remove the LED cable ③ from the connector.
  - Remove connector ④ and cable ③ together as an assembly from the LED head.



### 3.3.3 Operator Panel Assy

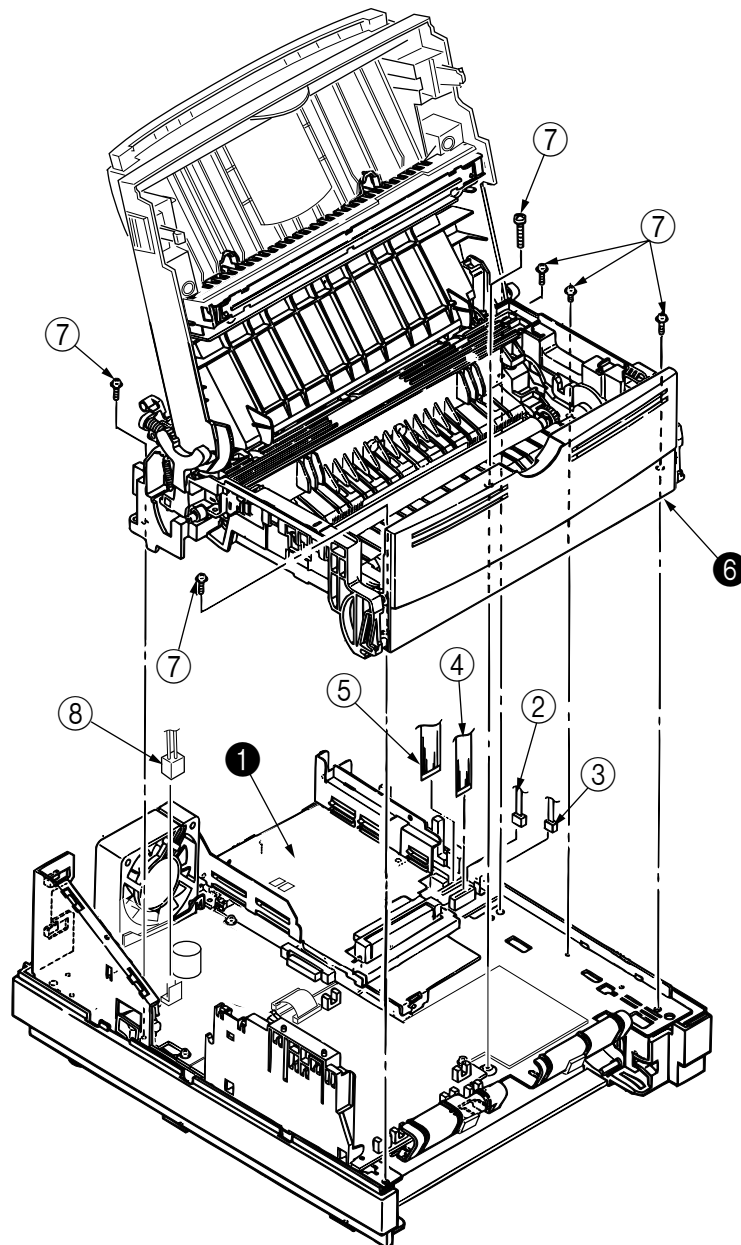
- (1) Unlock two latches on the upper cover from the rear side, lift the operator panel assy ❶ from the back and remove it.
- (2) Remove the Sumi card (operator panel) ❷ from the connector (CN1) ❸.

**Note :** You can remove the operator panel assy while the upper cover installed on the unit. However, it is much easier to remove the panel assy after removal of upper cover.



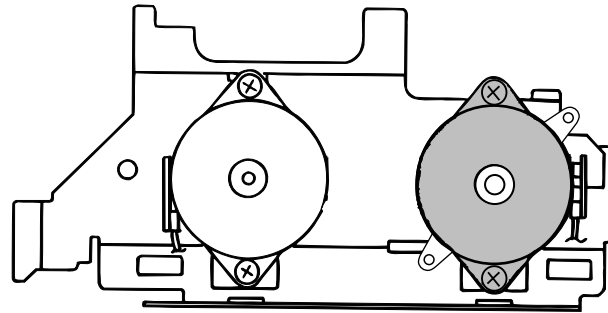
### 3.3.4 Lower Base Unit

- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the face up stacker assy (see 3.3.7).
- (4) Remove the connecting cables ② and ③ of the pulse motors from the connectors (DM, RM) of the M7E-PCB ❶.
- (5) Remove the LED head cables ④ and ⑤ from the connectors (HEAD1, HEAD2).
- (6) Remove the connecting cable ⑧ of the heater from the connector (CN2).
- (7) Open the manual feed guide assy, remove six screws ⑦, then remove the lower base unit ❷.

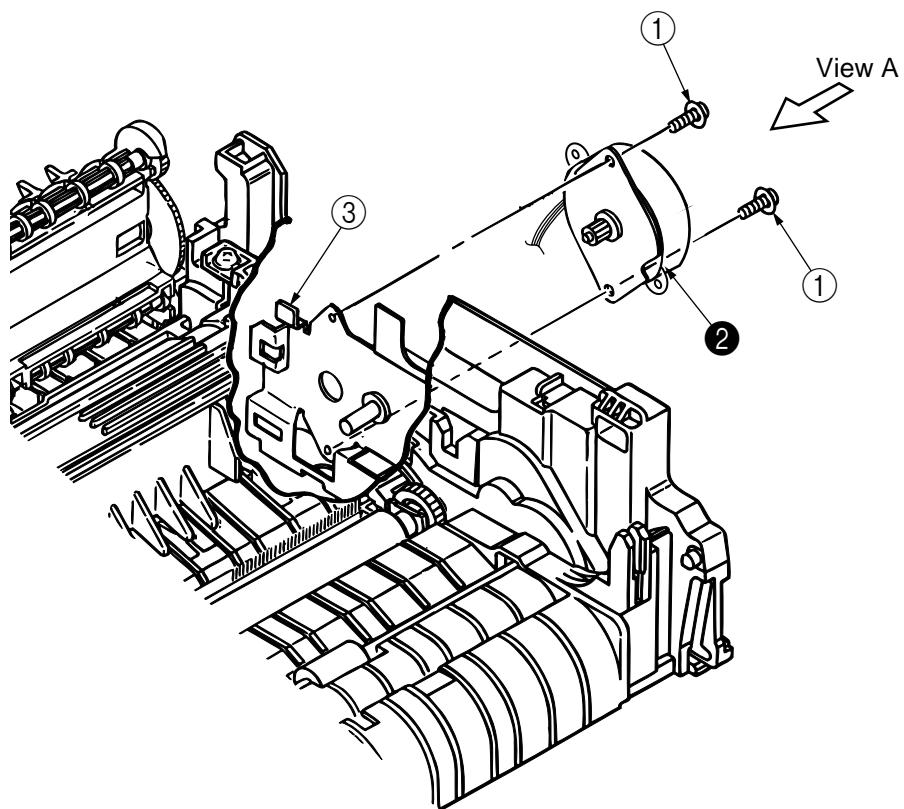


### 3.3.5 Pulse Motor (Main/Drum)

- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the lower base unit (see 3.3.4).
- (3) Remove two screws ① and remove the pulse motor (main/drum) ② from the motor bracket ③.

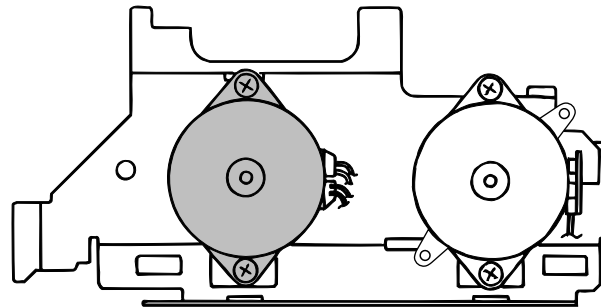


View A

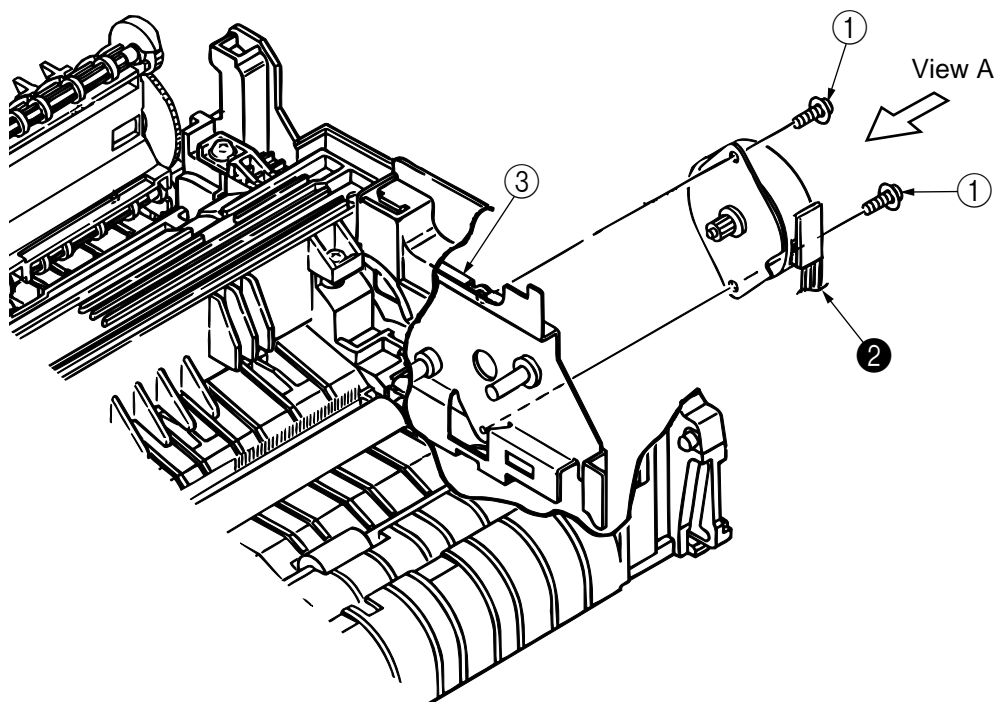


### 3.3.6 Pulse Motor (Registration)

- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the lower base unit (see 3.3.4).
- (3) Remove two screws ① and remove the pluse motor (registration) ② from the motor bracket ③.

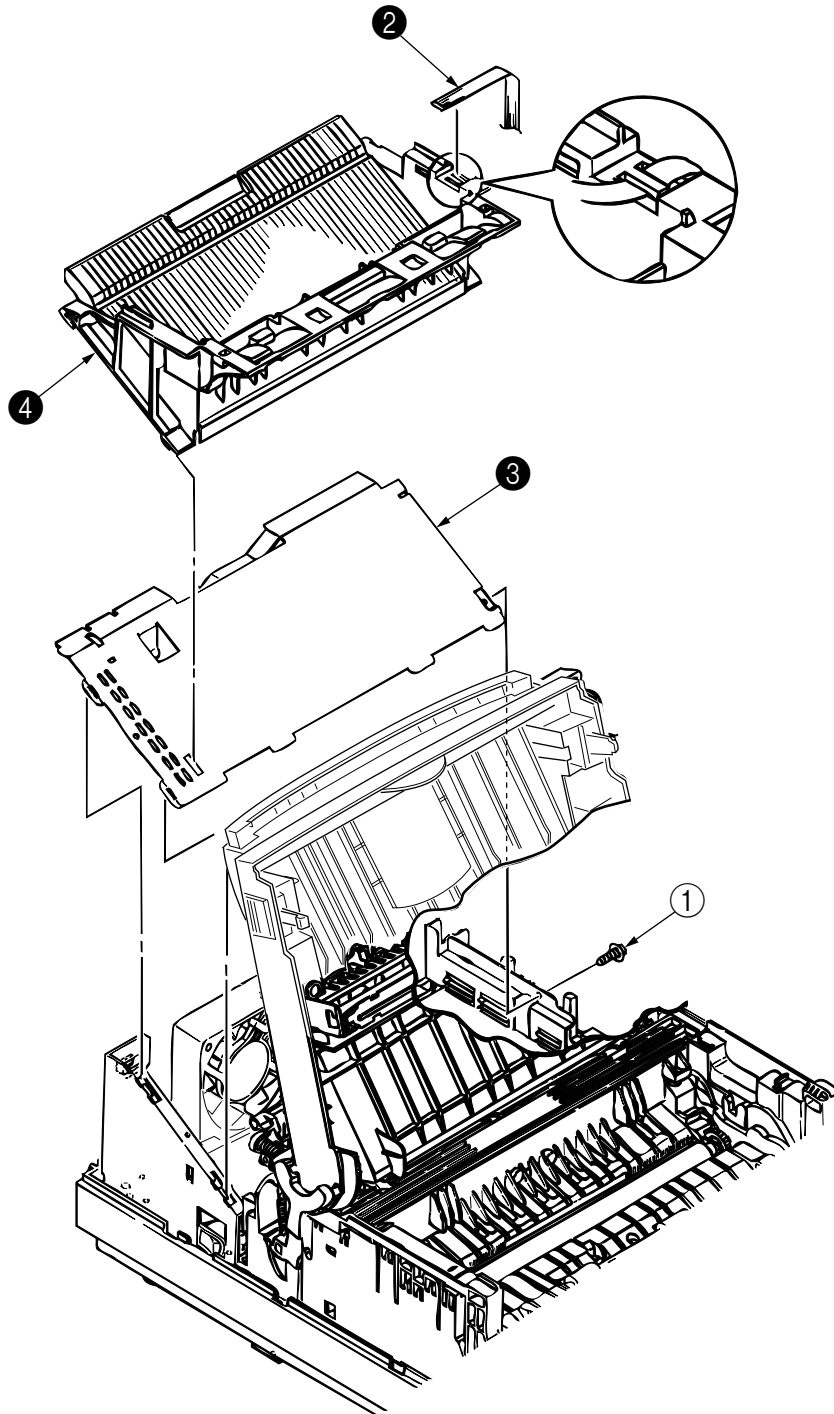


View A



### 3.3.7 Face Up Stacker Assy

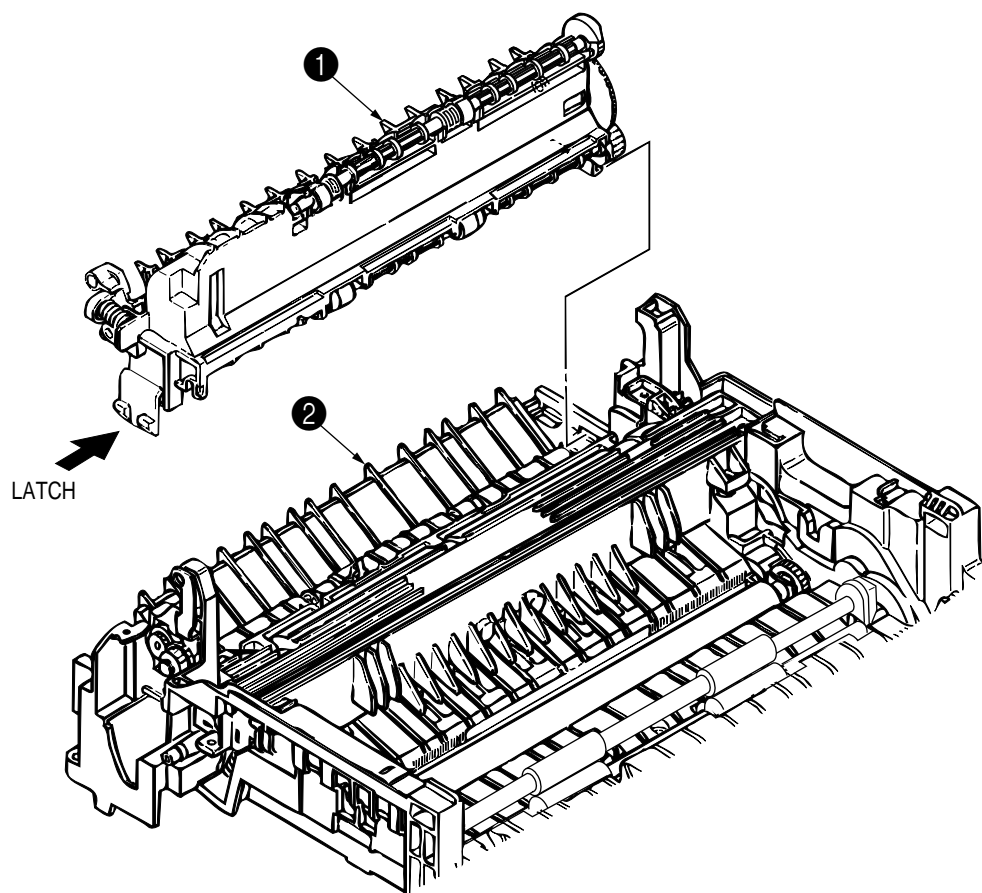
- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the screw ① and remove the Sumi card (operator panel cable) ② off the latch section of face up stacker ④. Remove both the shield plate ③ and face up stacker ④ together.
- (4) Unlock the latches at two locations, and remove the face up stacker ④.





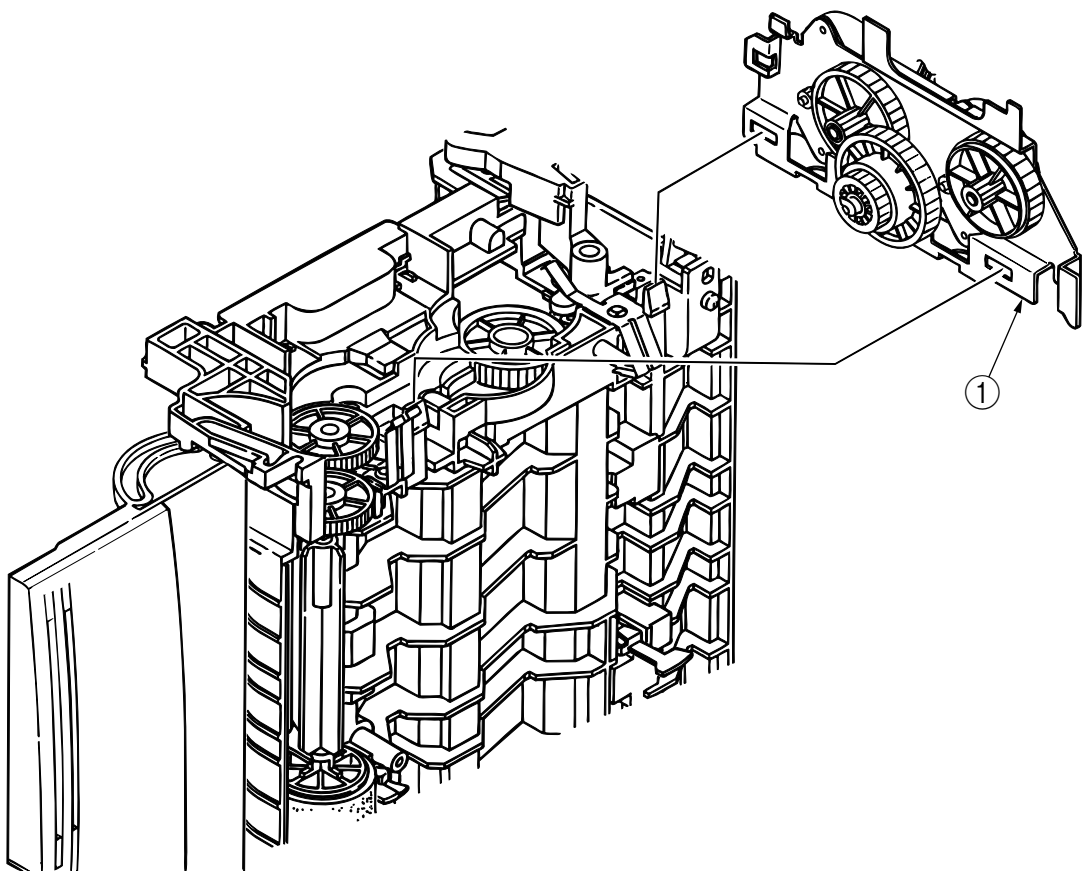
### 3.3.8 Eject Roller Assy

- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the face up stacker assy (see 3.3.7).
- (4) Remove the lower base unit (see 3.3.4).
- (5) Disengage the eject roller assy ❶ from the lower base ❷ by pressing the latch section of the eject roller assy ❶ in the direction of the arrow shown below, and remove the eject roller assy ❶.



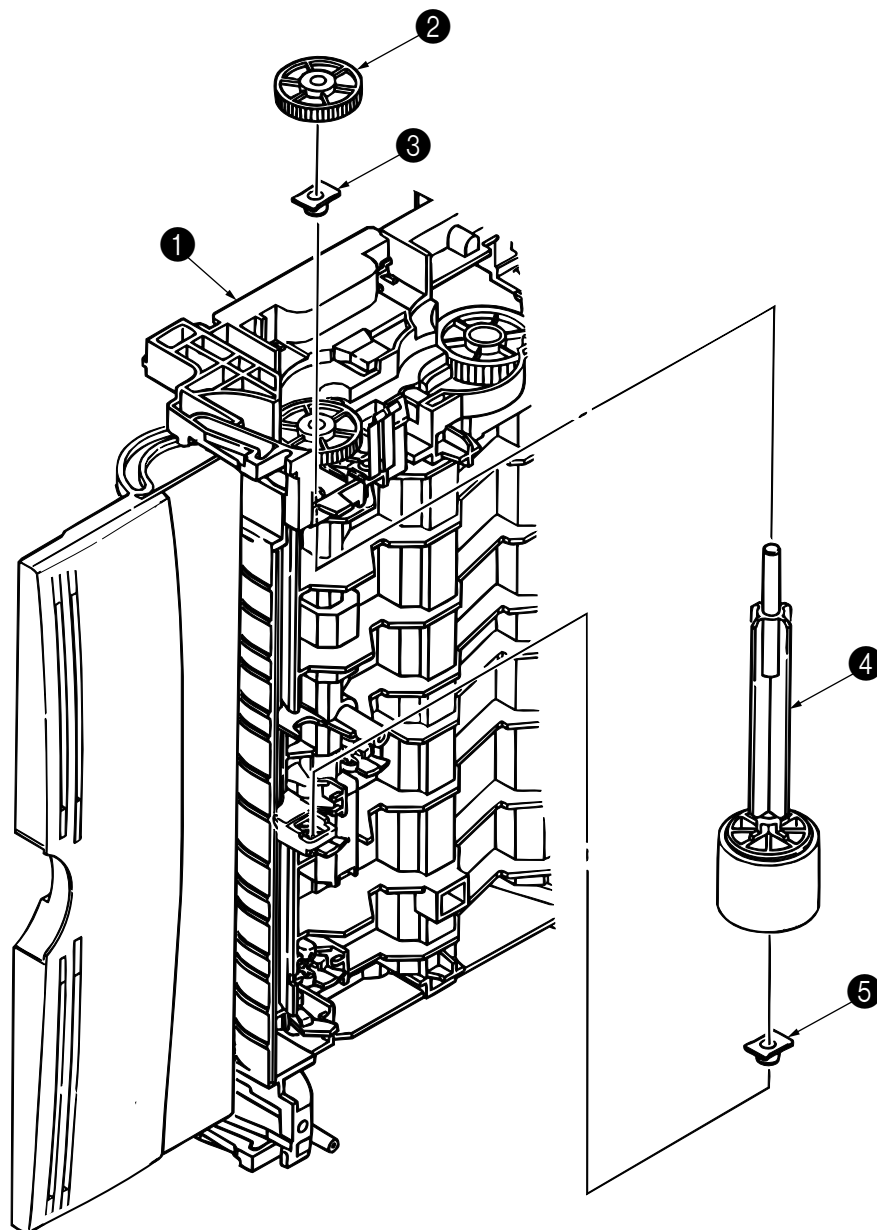
### 3.3.9 Motor Assy

- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the face up stacker assy (see 3.3.7).
- (4) Remove the lower base unit (see 3.3.4).
- (5) Remove the heat sink from the pulse motor (main/drum) (see 3.3.5).
- (6) Stand the lower base unit on its side as shown, and unlock two latches, then remove the motor assy ①.



### 3.3.10 Hopping Roller Shaft Assy

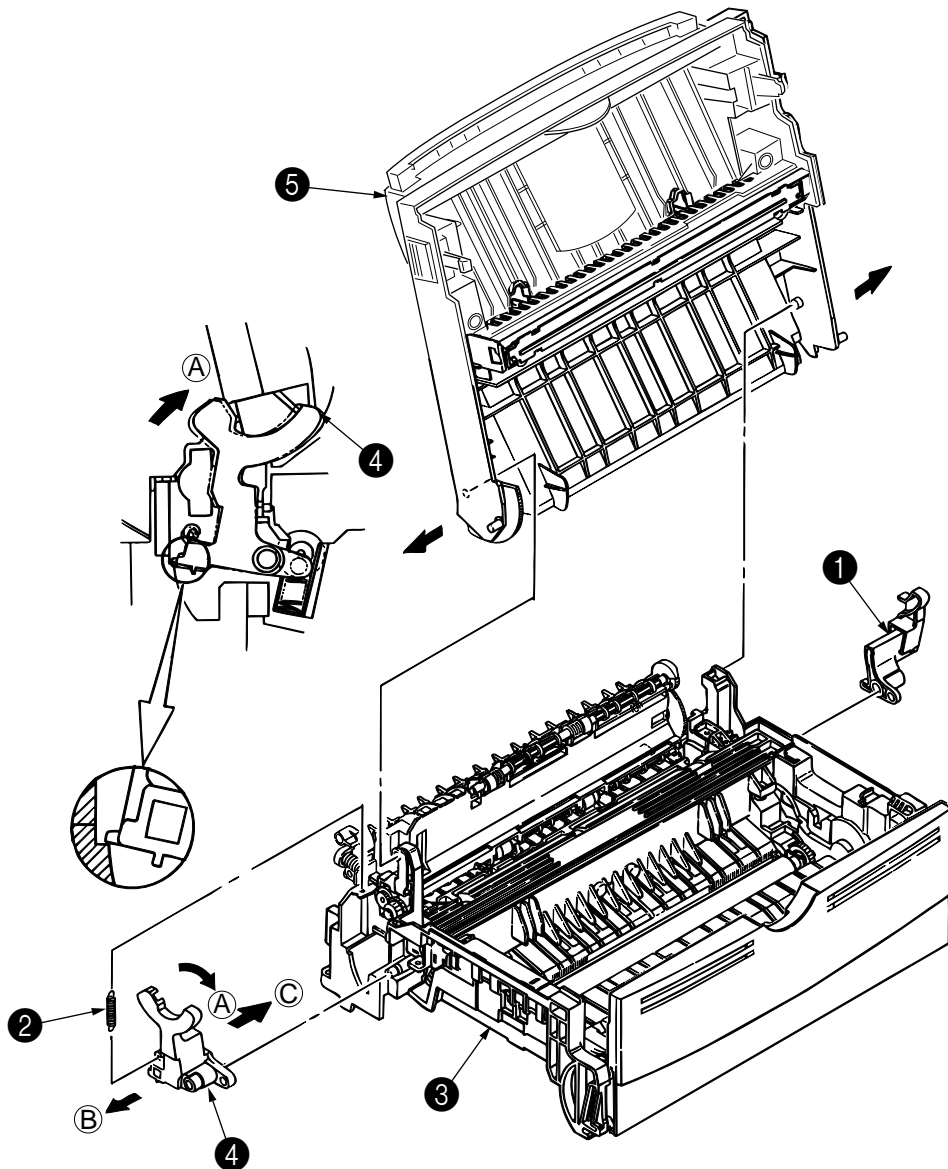
- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the face up stacker assy (see 3.3.7).
- (4) Remove the lower base unit (see 3.3.4).
- (5) Remove the motor assy (see 3.3.9).
- (6) With the lower base unit ① standing on its side, remove the one-way clutch gear ② and the bearing (A) ③.
- (7) Remove the hopping roller shaft assy ④ (the bearing (B) ⑤ comes off, so be careful not to lose it).



### 3.3.11 Stacker Cover Assy

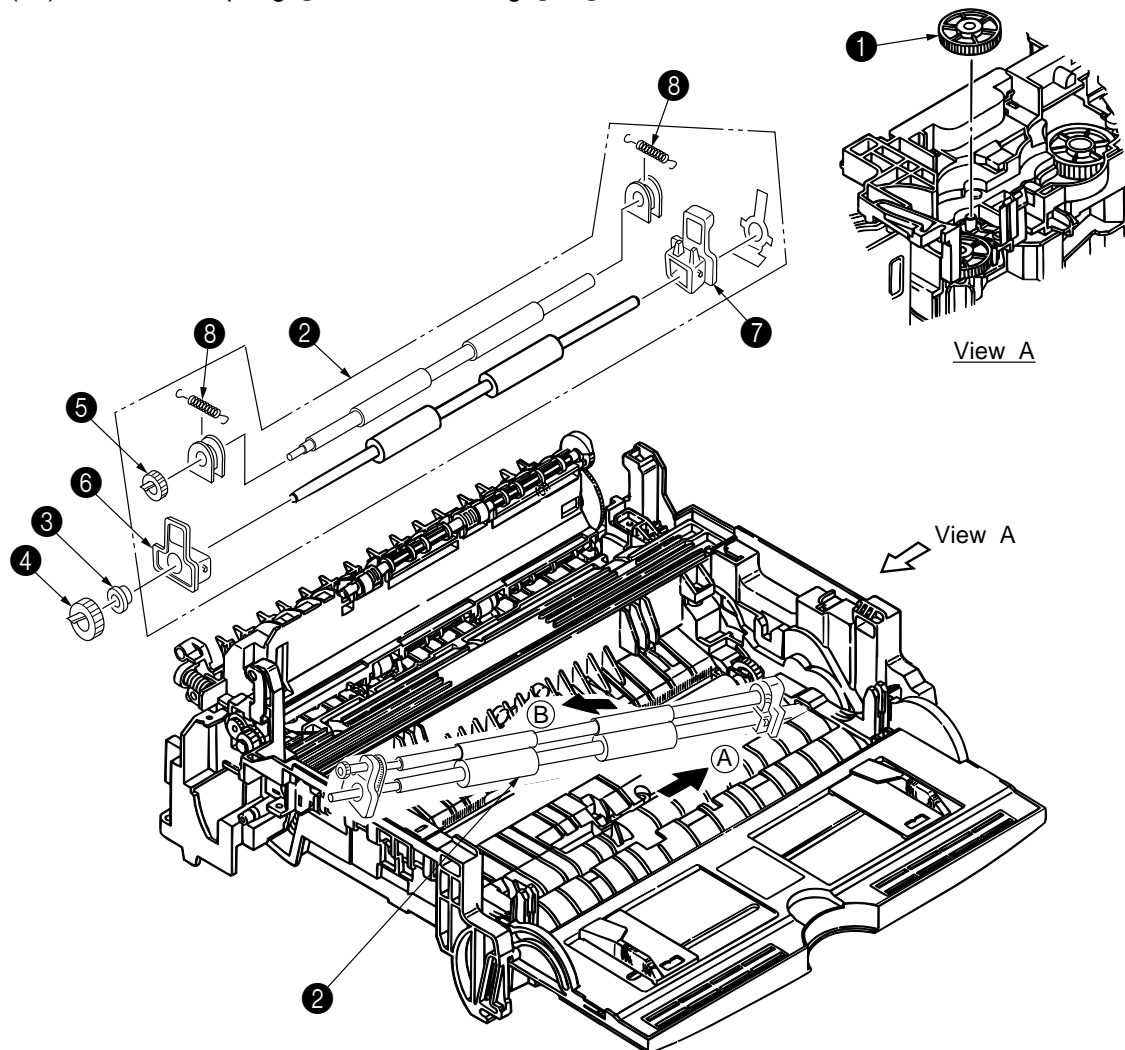
- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the face up stacker assy (see 3.3.7).
- (4) Remove the reset lever R ①.
- (5) Detach the reset spring ② from the lower base unit ③, turn the reset lever L ④ in the direction of arrow ⑤ until it stops, and remove it in the direction of arrow ⑥.
- (6) Unlock two latches of the lower base unit ③, then remove the stacker cover assy ⑤.

**Note :** When reinstalling the reset lever L ④, fit it onto the guide of the lower base unit ③, turn it in the direction of arrow ⑦ while pressing down the shaft of back up roller, and engage the reset lever L ④.



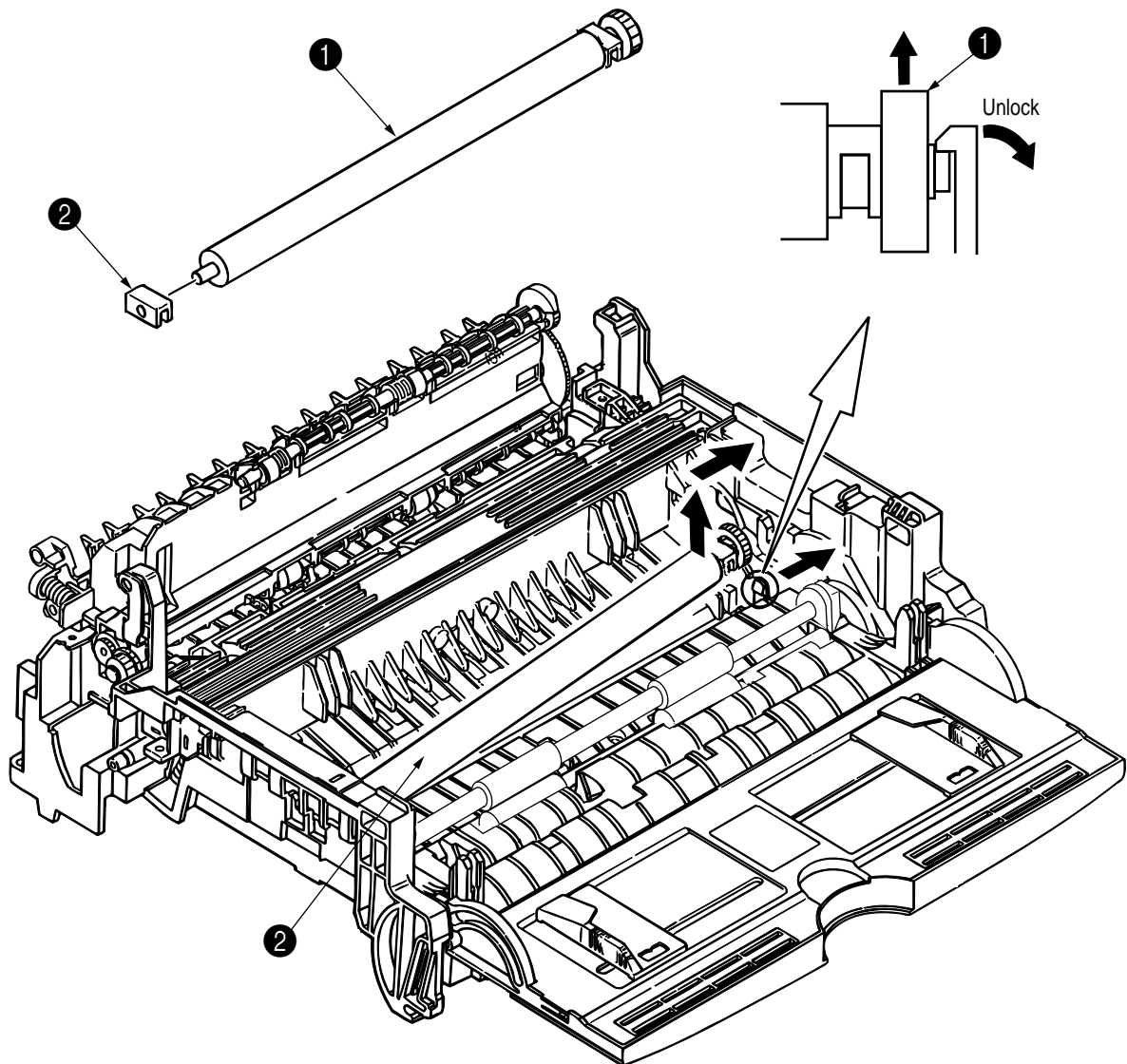
### 3.3.12 Registration Roller

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the face up stacker assy (see 3.3.7).
- (4) Remove the lower base unit (see 3.3.4).
- (5) Remove the motor assy (see 3.3.9).
- (6) With the lower base unit standing on its side, remove the one-way clutch gear ①.
- (7) Remove the Registration Gear by unlatching of the Gear ④.
- (8) Remove the Registration Bearing(L) ③.
- (9) Press the registration roller Assy ② in the direction of arrow (A) and lift up the left side of it, then remove the registration roller Assy ②.
- (10) Pull out the registration roller Assy ② in the direction of arrow (B).
- (11) Remove the pressure roller gear ⑤ by unlocking the latch of the gear ⑤.
- (12) Remove the bearing-Registration L 6 and bearing-Registration R 7.
- (13) Remove the spring ⑧ from the bearing ⑥, ⑦.



### 3.3.13 Roller Transfer Assy

- (1) With the power switch turned off, unplug the AC cord from the outlet.
- (2) Open the stacker cover.
- (3) Release the roller transfer assy ❶ by unlocking the latch of the main unit (never apply excessive force when unlocking the latch).
- (4) Lift the right side of the roller transfer assy ❶, and shift it to the right side, then pull it out from the main unit (at this time, the bearings ❷ of the left and right sides of the roller transfer assy ❶ will also come off).

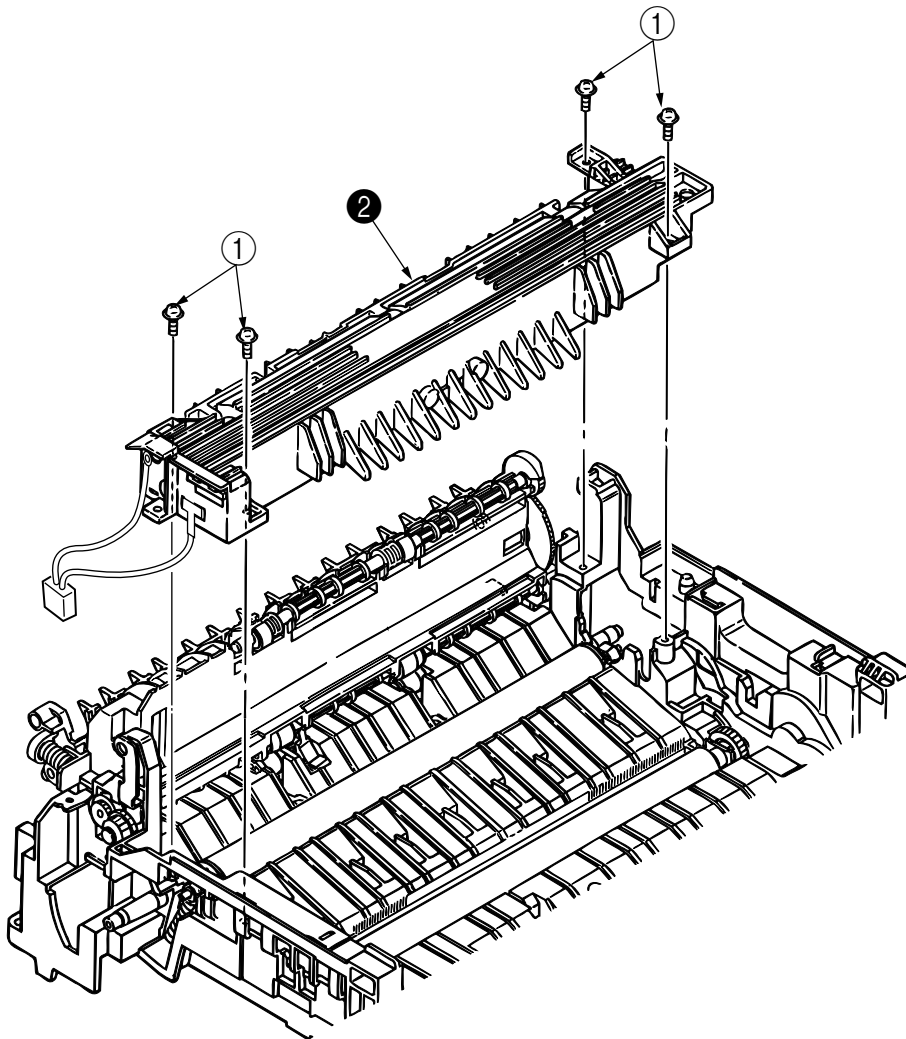


### 3.3.14 Fusing Unit

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the face up stacker assy (see 3.3.7).
- (4) Remove the lower base unit (see 3.3.4).
- (5) Remove the stacker cover assy (see 3.3.11).
- (6) Remove four screws ①, lift and remove the fusing unit ②.

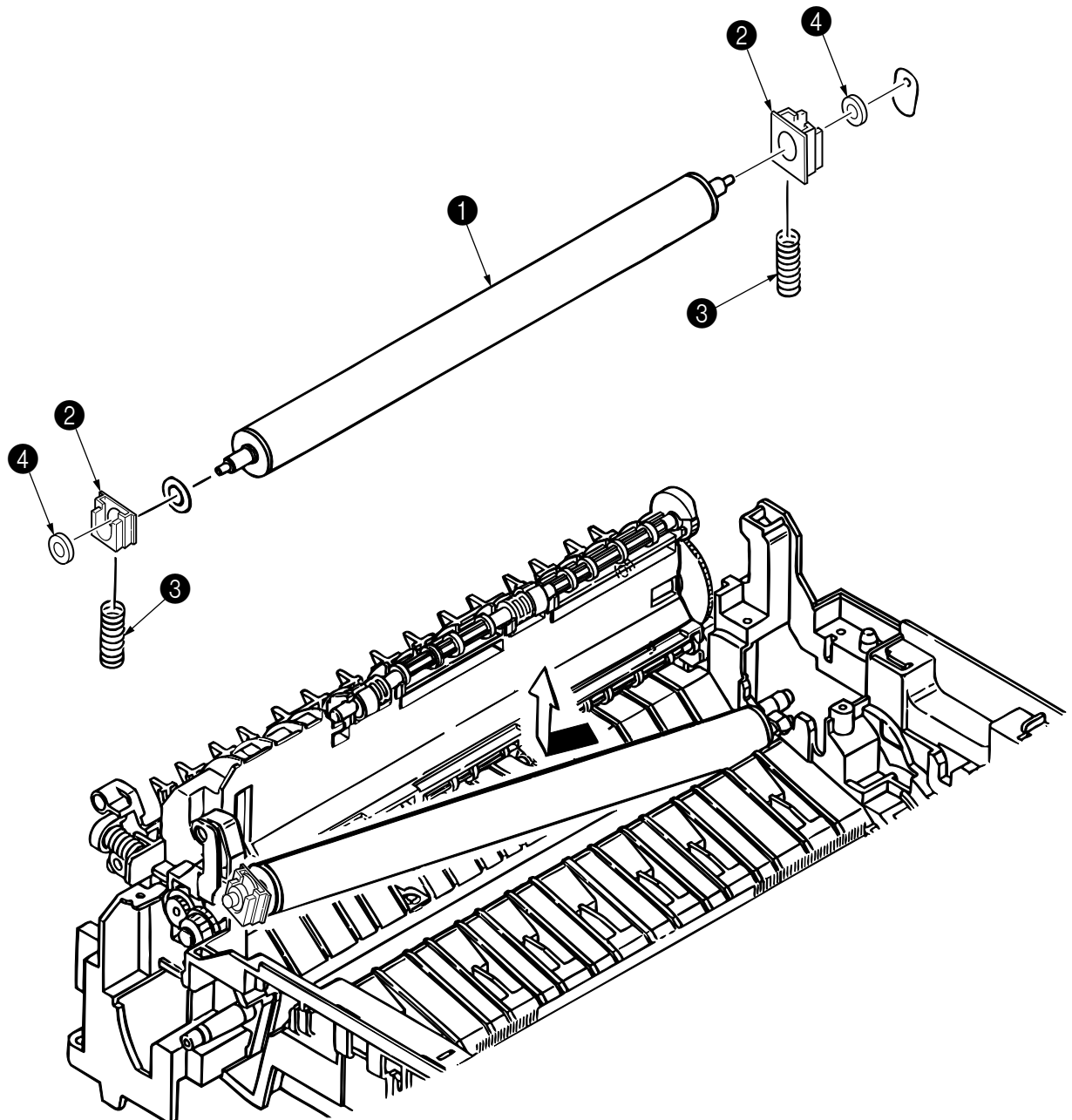
Caution: Fusing unit may be hot. Use care when handling.

- Note :**
1. When reinstalling or removing the fusing unit, tighten or loosen the screws while holding the fusing unit assy ② down with your hand (it is being pushed up by back up roller).
  2. When reinstalling the screws ①, be sure to direct the screws into pre-existing threads and avoid damaging the threads.
  3. Do not apply excessive torque when tightening the screws ①.



### 3.3.15 Back-up Roller

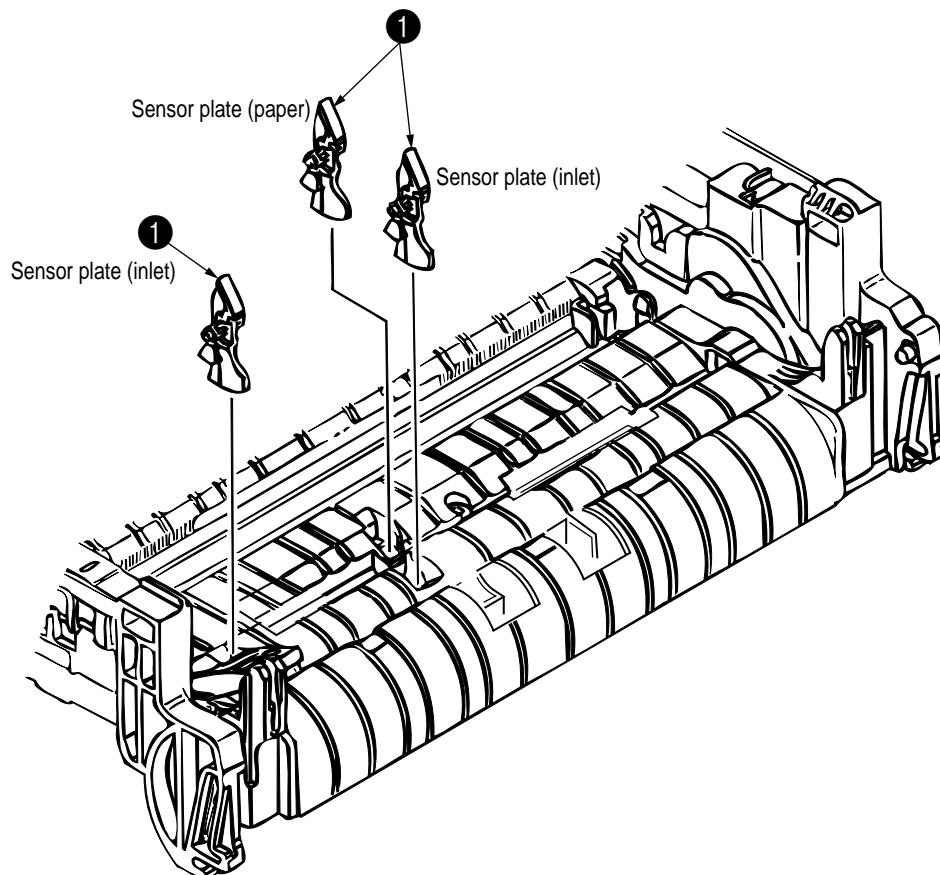
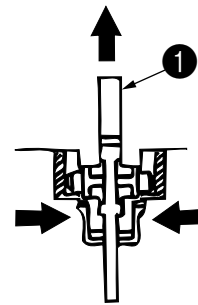
- (1) Remove the fusing unit assy (see 3.3.14).
- (2) Lift the left side of the back-up roller ①, and pull it out to the left side (at this time, two bearing holders (back-up) ② and the bias springs (back-up) ③ and the two ball-bearing ④ will also come off).





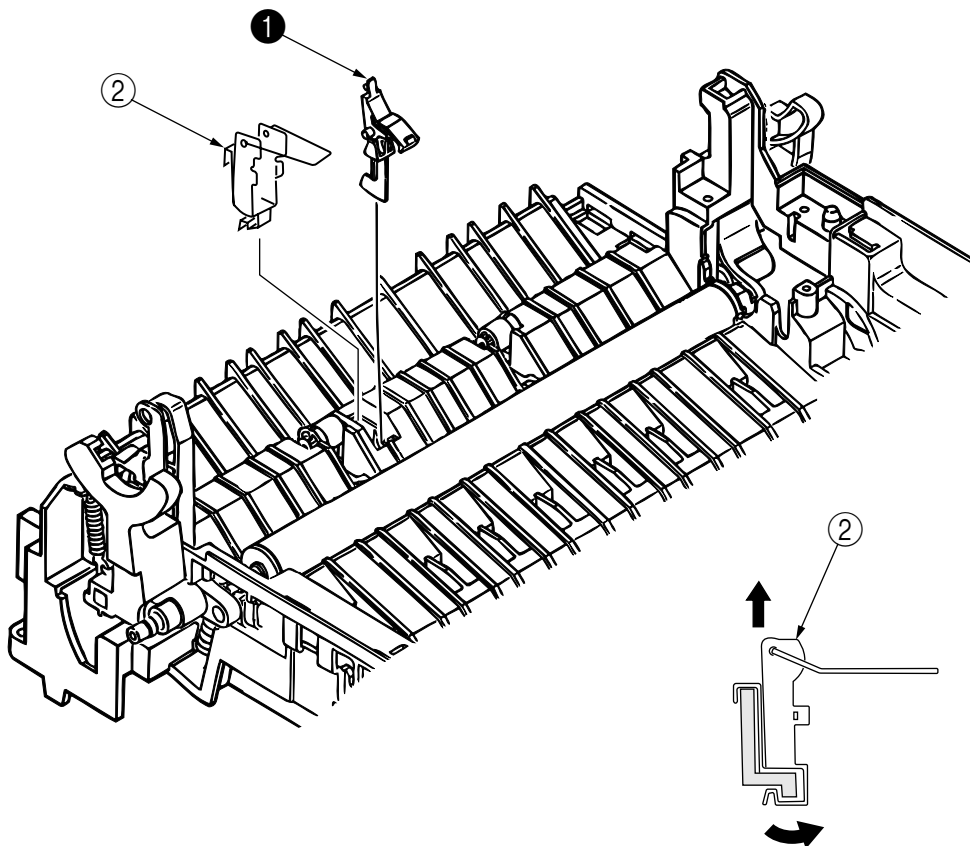
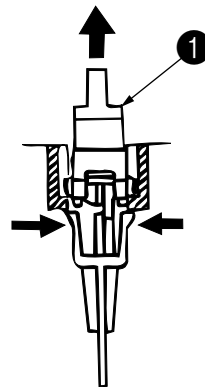
### 3.3.16 Sensor Plate (Inlet)

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the face up stacker assy (see 3.3.7).
- (4) Remove the lower base unit (see 3.3.4).
- (5) Press the clamps of three sensor plates (inlet and paper) ❶, and remove them by pressing them upward from the bottom.



### 3.3.17 Sensor Plate (Outlet), Sensor Wire Assy

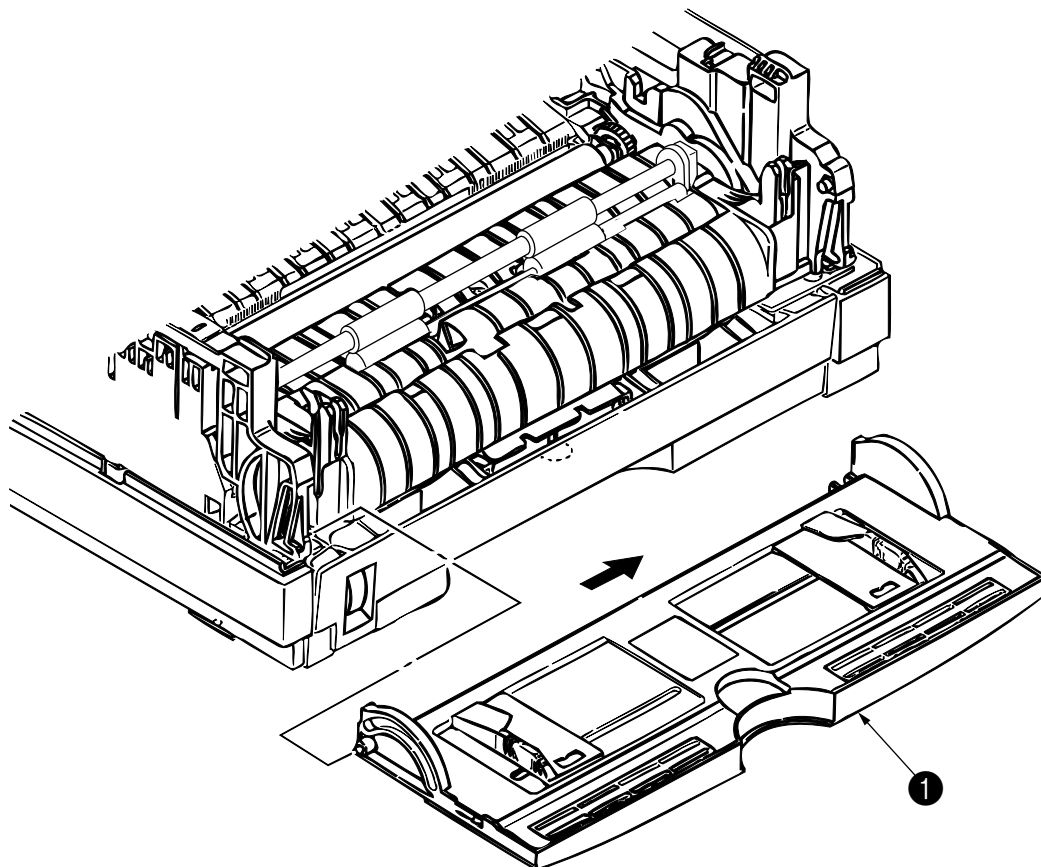
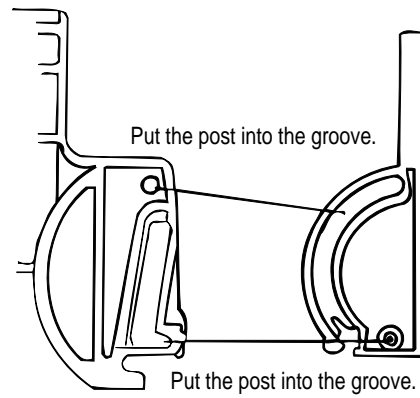
- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the eject roller assy (see 3.3.8).
- (4) Remove the face up stacker assy (see 3.3.7).
- (5) Remove the lower base unit (see 3.3.4).
- (6) Remove the fusing unit assy (see 3.3.14).
- (7) Press the clamps of the sensor plate (outlet) ①, and remove the sensor plate by pushing it up.
- (8) Turn the clamps of the sensor wire assy ② remove the sensor wire assy from the lower base unit.



### 3.3.18 Manual Feed Guide Assy

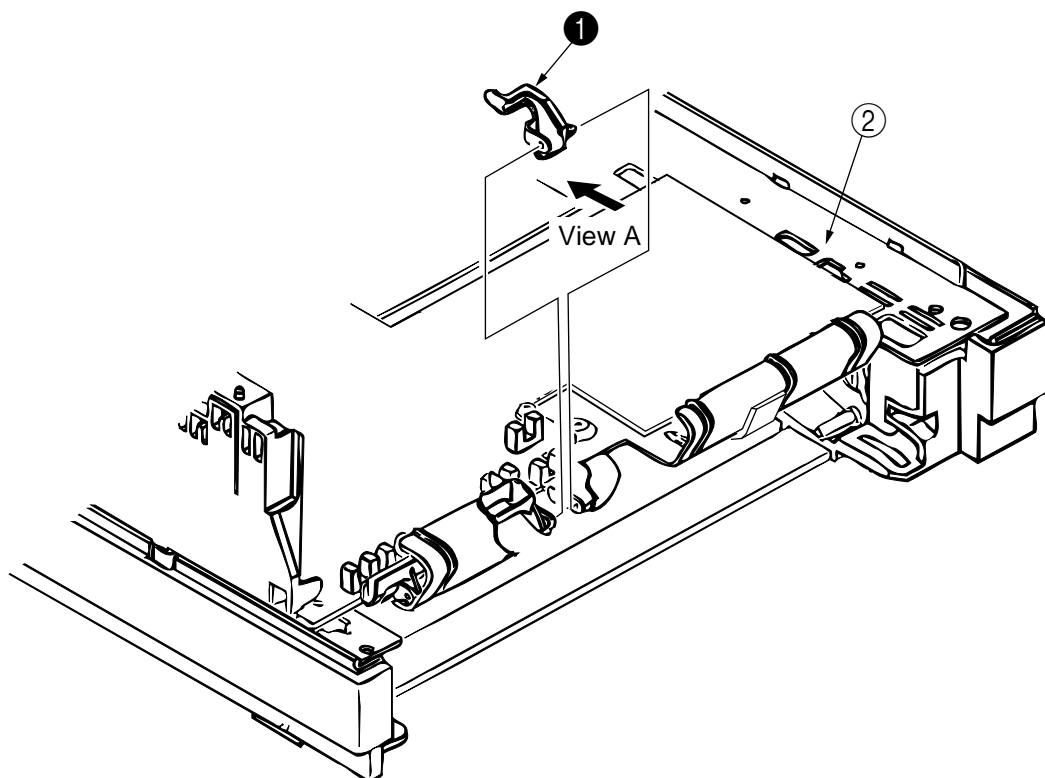
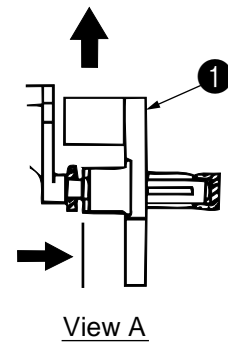
- (1) Remove the upper cover assy (see 3.3.1).
- (2) Open the manual feed guide assy ❶, and release the engagement on both sides with the main unit by carefully bending the manual feed guide assy ❶.

**Note :** When remounting, verify the proper the engagements as shown in the diagram.



### 3.3.19 Sensor Plate (Paper Supply)

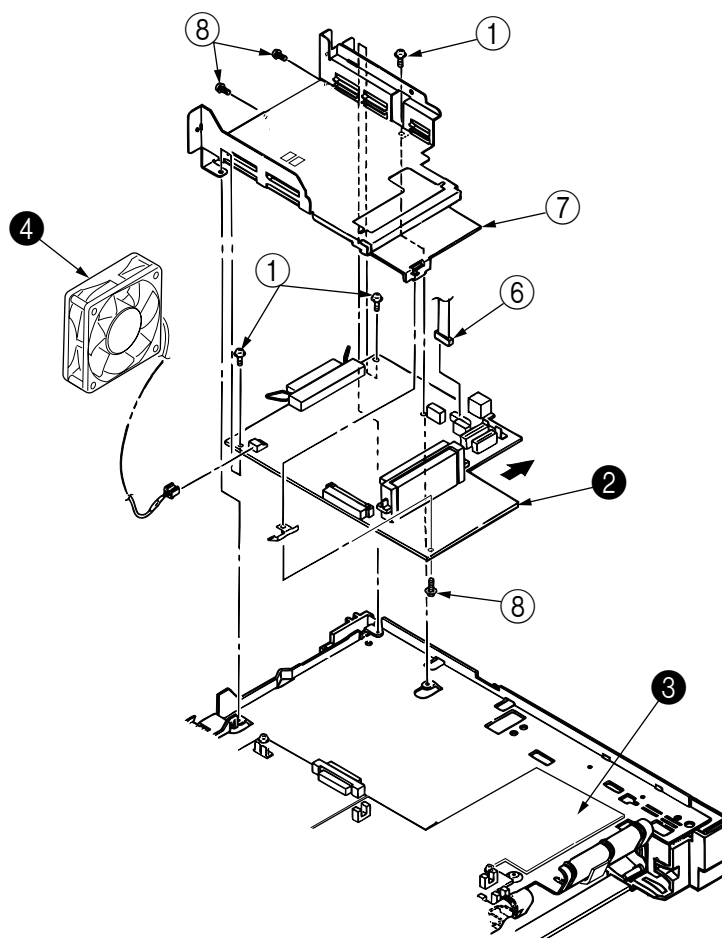
- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the face up stacker assy (see 3.3.7).
- (4) Remove the lower base unit (see 3.3.4).
- (5) Press the clamps of the sensor plate (paper supply) ① to unlock the latch, and remove it from the base plate ②.



### 3.3.20 M7E-PCB

- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.3).
- (3) Remove the face up stacker assy (see 3.3.7).
- (4) Remove the lower base unit (see 3.3.4).
- (5) Remove the connector (2NDTRAY) ⑥.
- (6) Remove three screws ①.
- (7) Move the M7E-PCB ② in the direction of arrow to disconnect it from the power supply/sensor board ③.
- (8) Remove the connector FAN, and disconnect the fan motor ④.
- (9) Remove the M7E-PCB ②, together with the PCB guide plate (remove the fan motor ④ at the same time).
- (10) Remove three screws ⑧ and remove the PCB guide plate ⑦ from the M7E-PCB ②.

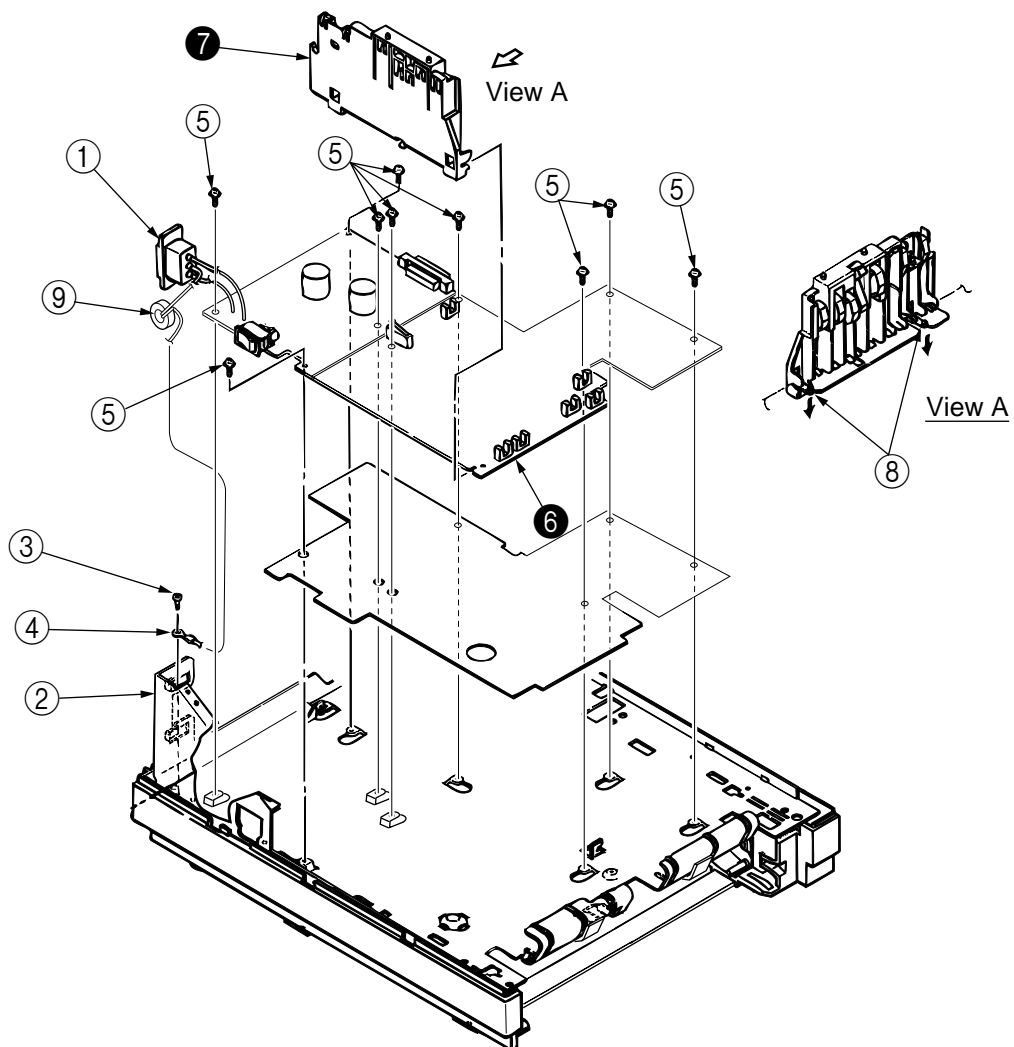
**Note :** When reinstalling the M7E-PCB ② onto the guide plate ⑦, be careful not to bend the base plate (it is desirable to place a block underneath it to prevent bending).



### 3.3.21 Power Supply/Sensor Board, High Voltage Unit and Contact Assy

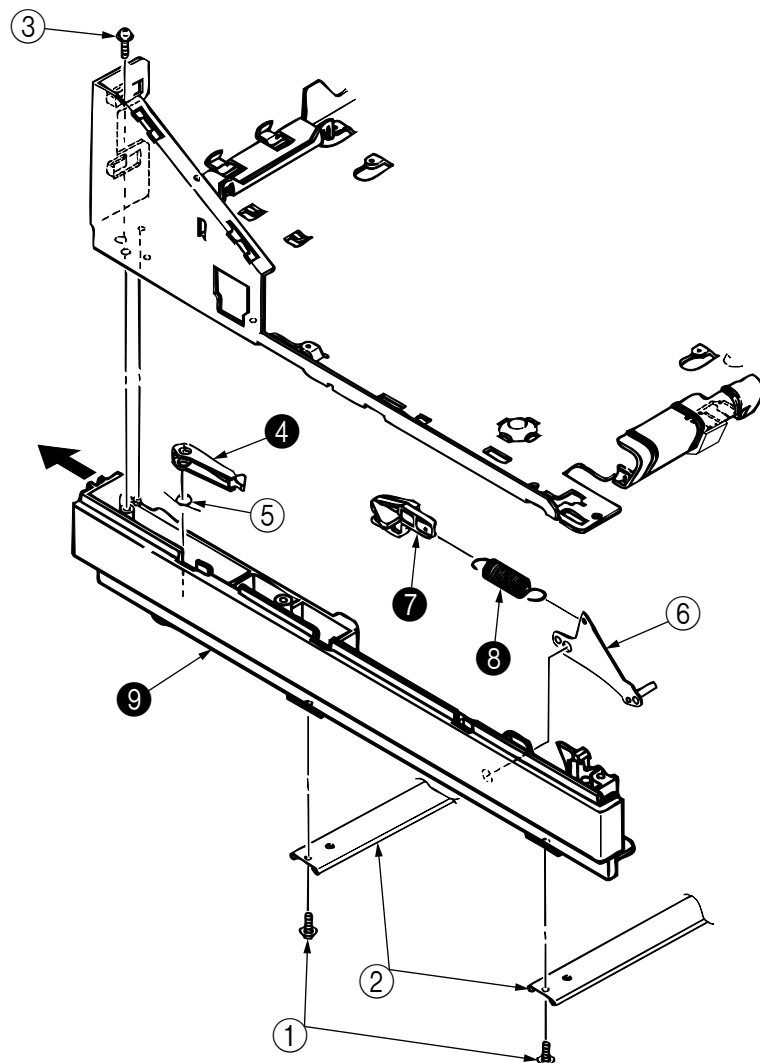
- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the lower base unit (see 3.3.4).
- (3) Remove the M7E-PCB (See 3.3.20).
- (4) Remove the AC inlet ① from the base plate ②.
- (5) Remove the screw ③ and remove the grounding (earth) wire ④.
- (6) Remove the Ferite core ⑨ from the grounding wire.
- (7) Remove nine screws ⑤, and remove the power supply/sensor board ⑥ and contact assy ⑦ together.
- (8) Unlock two latches ⑧, and remove contact assy ⑦ from the power supply/sensor board ⑥.

- Note :**
1. Be careful about the sensor (paper supply) when reinstalling the lower base.
  2. Make sure that no excessive force is applied to the power supply switch.
  3. When installing the power supply/sensor onto the base plate, be careful not to bend the base plate (it is desirable to place a block underneath it to prevent bending).



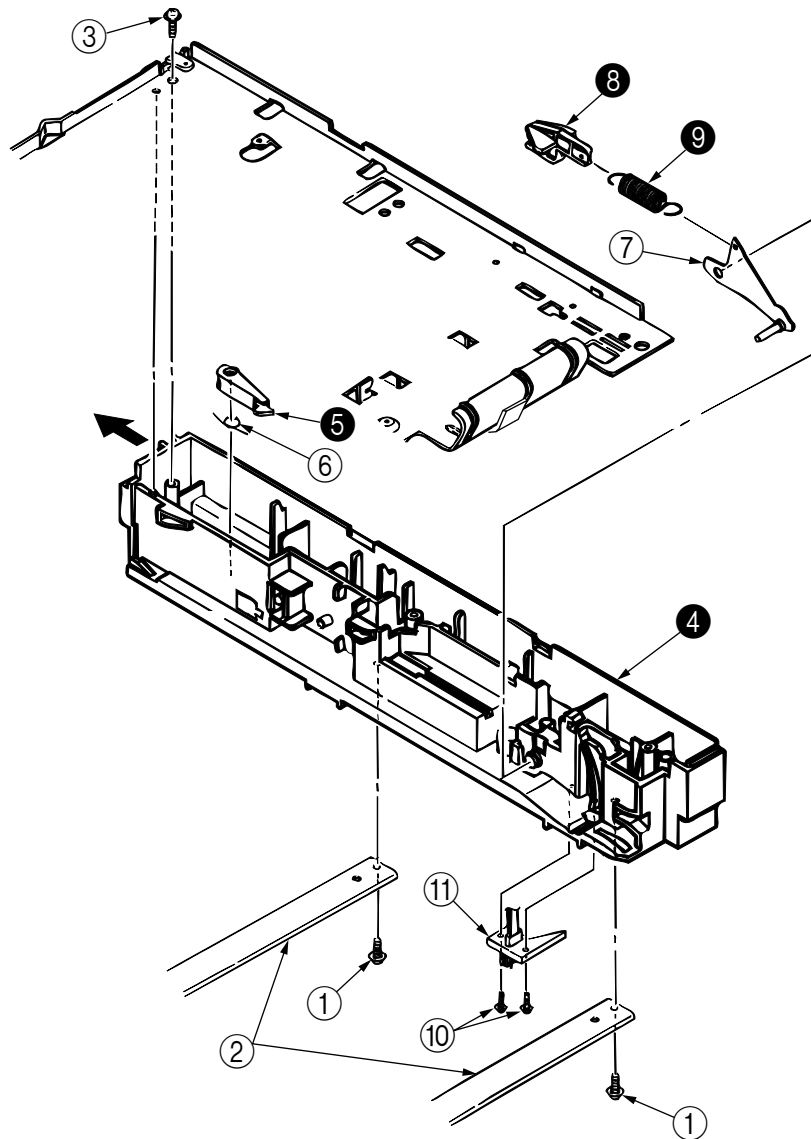
### 3.3.22 Cassette Guide L Assy

- (1) Remove the paper cassette.
- (2) Remove the upper cover assy (see 3.3.1).
- (3) Remove the lower base unit (see 3.3.4).
- (4) Remove the M7E-PCB (see 3.3.20).
- (5) Remove the power supply/sensor board (see 3.3.21).
- (6) Remove two screws ①, and remove the guide rails ②.
- (7) Remove the screw ③, and remove the cassette guide L ⑨ by shifting it in the direction of the arrow as shown below.
- (8) Remove cassette lock lever ④ and torsion spring ⑤.
- (9) Remove cassette lock lever spring ⑧ then remove the sheet link (L) ⑥ and Pull block ⑦.



### 3.3.23 Cassette Guide R Assy

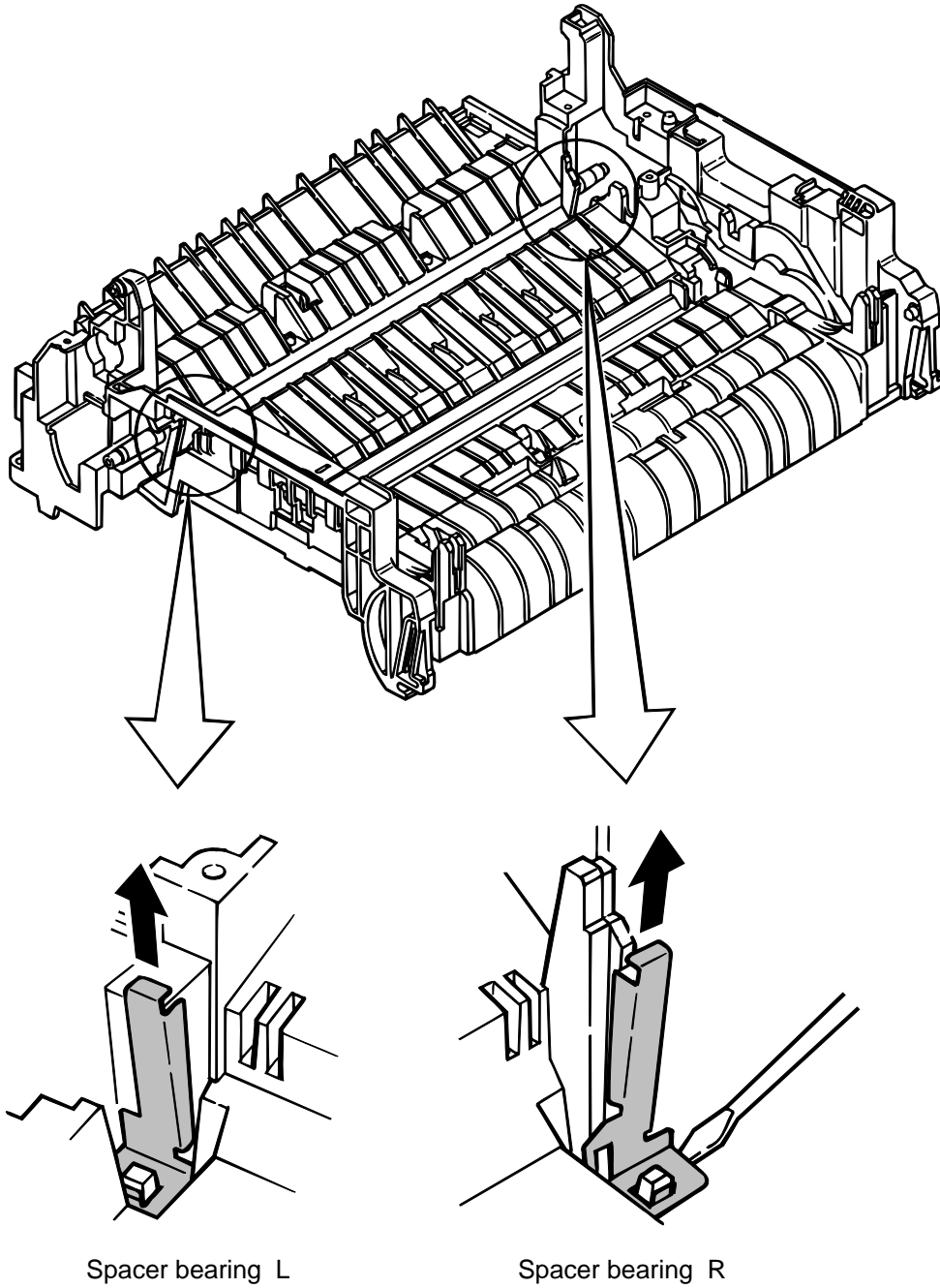
- (1) Remove the paper cassette.
- (2) Remove the upper cover assy (see 3.3.1).
- (3) Remove the lower base unit (see 3.3.4).
- (4) Remove the M7E-PCB (see 3.3.20).
- (5) Remove two screws ①, and remove the guide rails ②.
- (6) Remove the screw ③, and remove the cassette guide R ④ by shifting it in the direction of arrow.
- (7) Remove the cassette lock lever ⑤ and torsion spring ⑥.
- (8) Remove the cassette lock lever spring ⑨, then remove the sheet link (R) ⑦ and link pull block ⑧.
- (9) Remove two screws ⑩, and remove the square-shaped connector ⑪.





### 3.3.24 Spacer Bearing (L/R)

- (1) Remove the back-up roller (see 3.3.15).
- (2) Remove spacer bearing (L/R) with a tip of screw driver.



## 4. ADJUSTMENT

This chapter provides explanations concerning the adjustment necessary when replacing a part. The adjustment is made by changing the parameter value set in EEPROM on the main control board. The parameter can be set by the key operation from the operator panel. This printer has three kinds of maintenance modes, and it is necessary to select one of the modes when replacing any parts.

### 4.1 Maintenance Modes and Functions

#### 4.1.1 User Maintenance Mode

To enter into the user maintenance mode, turn the POWER switch on while holding the MENU key down.

Function

There are thirteen functions as follows:

- Menu reset (See Table 4-1)
- Hex dump
- Drum counter reset
- Recieve buffer
- ECP disable
- Op panel menu disable
- X-adjust
- Y-adjust
- 2nd Tray
- Place page command
- Setting
- Jam Recovery (Print Performance for continuous)
- Power Save disable

Detailed descriptions of these functions are provided in Appendix E, **DIAGNOSTICS TEST**.

#### 4.1.2 System Maintenance Mode

**Note:** This mode is used only by maintenance personnel and it should not be released to the end-users.

To enter into the system maintenance mode, turn the POWER switch on while holding the *Recover* key down.

Function

There are seven functions as follows:

- Page count display
- Page count printing enable/disable
- Rolling ASCII continues printing
- Loop test
- EEPROM reset (See Table 4-1)
- SIDM enable/ disable
- DRAM Memory Check mode

Detailed descriptions of these functions are provided in Appendix E, **DIAGNOSTICS TEST**.

### 4.1.3 Engine Maintenance Mode

**Note:** This mode is used only by maintenance personnel, and it should not be released to the end users.

- (1) To enter into the engine maintenance mode, turn the power on while holding ENTER and FORM FEED keys down.
- (2) Functions of this mode are selected by the menu.
- (3) The way to exit out of this mode varies depending on the settings.
- (4) There are following engine maintenance modes:
  - a) Head drive time setting  
Sets the drive time of the LED head.
  - b) 600 x 1200 DPI strobetime relative value.
  - c) Installed LED head identification.
  - d) Printing start position setting  
Sets the starting position of printing.
  - e) Drum count total display  
The total image drum rotation count of the printer, as counted by the engine section, is displayed on the LCD.
  - f) Drum count display  
The total image drum rotation count, as counted by the engine section, is displayed on the LCD.
  - g) Standard tray paper feeding quantity setting  
Sets the amount of paper to be fed from the standard tray.
  - h) High Capacity Second Paper Feeder paper feeding quantity setting  
Sets the amount of paper to be fed from High Capacity Second Paper Feeder.
  - i) High Capacity Second Paper Feeder downloading table selection  
Selects the downloading table of High Capacity Second Paper Feeder.
  - j) Power Envelope Feeder paper feeding quantity setting  
Sets the amount of paper to be fed from Power Envelope Feeder.
  - k) Power Envelope Feeder downloading table selection  
Selects the downloading table of Power Envelope Feeder.
  - l) Engine Test
  - m) Engine Reset  
All EEPROM areas used by the engine section are reset to factory default values.  
(See Table 4-1)  
After reset, the printer returns to normal operating mode.

**Note:** "Printing start position setting" is for shipping. Do not change its default value.

Detailed descriptions of these functions are provided in Appendix E, **DIAGNOSTICS TEST**.

#### 4.1.4 EEPROM initialization

The corresponding are of the EEPROM is initialized for each event as shown Table 4-1.

Talbe 4-1 EEPROM Initial Setting Range

No	Event	Menu level 1	Menu level 2	F/W revision area	Customer information	User maintenance area <i>Note1)</i>	System maintenance area <i>Note1)</i>	Engine maintenance area <i>Note1)</i>	Drum counter	Fuser counter	Page counter
1	User maintenance menu reset	○									
2	System maintenance EE-PROM reset	○	○			○	○				
3	Engine maintenance engine reset							○	○	<i>Note2)</i>	<i>Note2)</i>
4	Firm revision check error at power-on	○	○	○		○	○				
5	Customer setting	○	○		○	○	○				
6	User information error	○	○		○	○	○				

○: Represents initialization

*Note1)* Items of each maintenance menu which are subjects here are listed in the following table.

Engine ID check error at power on is set at default for all menu items, thus it will not be mentioned here.

*Note2)* Only when the page counter is 500 sheets or less, it is reset to 0.

Talbe 4-1 Items of Each Maintenance Menu Targeted for EEPROM Reset

User maintenance menu area	System maintenance menu area	Engine maintenance menu area
Resource save	Whether a page counter printing is added or not to a menu printing	No items subjected to. All except counters are subjected to reset.
Receiving buffer	SIDM emulation switch enable/disable	As a common spec.
Operator panel menu function enable/disable		
X/Y ADJUST		
2ND feed destination designating command		
Left alignment based printing shift		
Cleaning cycle		
Jam recovery Enable/Disable		

## 4.2 Adjustment When Replacing a Part

Adjustment is necessary when replacing any of the following parts.

Part Replaced	Adjustment
Image Drum Cartridge	Reset the image drum counter (refer to User's manual).
Main Control Board	EEPROM data Upload / Download

### 4.2.1 Uploading/Downloading EEPROM data

When the controller printed circuit board is replaced, the contents of the old EEPROM should be copied to the new EEPROM on the new board to preserve customer settings. For the purpose, use the EEPROM operation on the Option of the Maintenance Utility. To copy follow the steps below.

- (1) Be sure to confirm that the printer and the PC are connected with a centronics I/F cable. Then execute the Maintenance Utility. (Note: Printer driver should be un-installed.)
- (2) Select the Option on the Maintenance Utility.
- (3) Click the "UPLOAD EEPROM" button on the "EEPROM Operations".
- (4) The contents of the EEPROM data is displayed on the "DIALOG" of the Maintenance Utility. The contents of the old EEPROM is now copied into the memory of the PC.
- (5) Replace the controller P.C.B. with a new one while it displays the above "DIALOG".
- (6) After the replacement, click "Download EEPROM" on the "EEPROM Operations". EEPROM download has been completed.

In case of troubles such as centronics I/F failure, etc. EEPROM data may not be uploaded properly. In such case, it is necessary to adjust the following settings manually after the replacement using the Maintenance Utility.

- Factory setting (ODA/OEL/INT-A/INT-L)

The maintenance utility is designed to be used only by service technicians and it should not be released to end-users.

## 5. PERIODICAL MAINTENANCE

### 5.1 Periodical Replacement Parts

The parts are to be replaced periodically as specified below:

Part name	Condition for replacement	Cleaning	Remarks
• Toner cartridge (Type 5)	About 2000 sheets of paper have been printed (Type 5 toner cartridges are shipped with units)	• LED head	Consumables
• Toner cartridge (Type 8)	About 4,000 sheets of paper have been printed.	• LED head	Consumables
• Image drum cartridge (Type 8)	About 20,000 sheets of paper have been printed. See 1.4. (14)		Consumables

### 5.2 Cleaning

Remove any toner or dust accumulated inside the printer. Clean in and around the printer with a piece of cloth when necessary. Use the vacuum cleaner (service tool) to clean inside the printer.

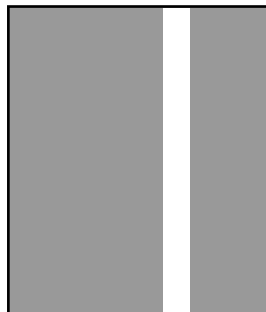
**Note:** Do not touch the image drum, LED lens array, or LED head connector block.

#### 5.2.1 Cleaning of LED Lens Array

Clean the LED lens array or replace the toner cartridge when white lines or stripes (void, light printing) are generated vertically down the page, as shown below.

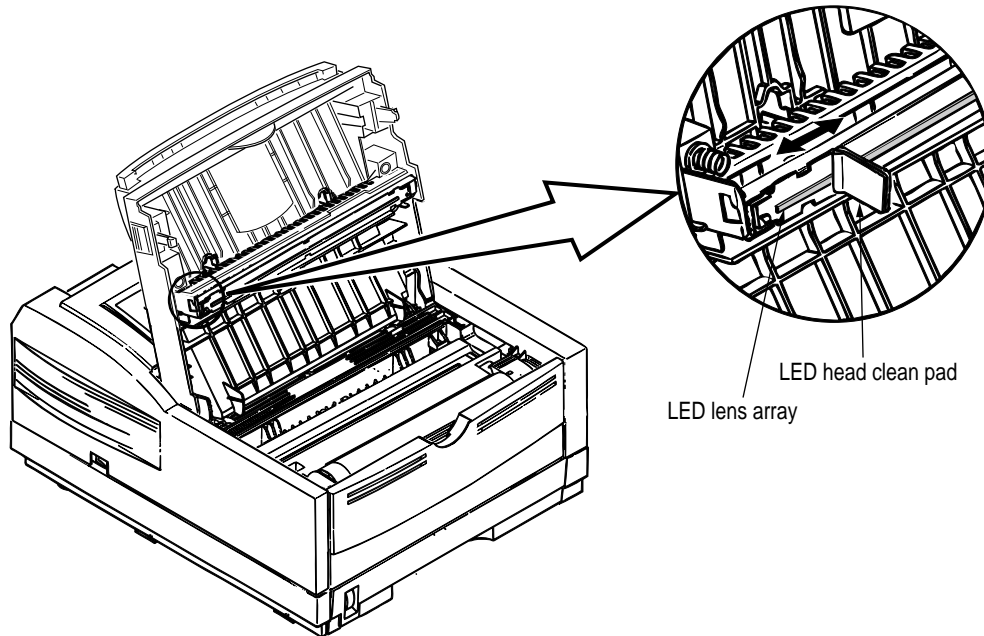
**Note:** The LED lens array must be cleaned with an LED head cleaner included in the replacement toner kit.

White lines or stripes  
(void, light printing)



- (1) Set the LED head cleaner to the LED lens array as shown in the figure, then slide the cleaner back and forth horizontally several times to clean the head.

**Note:** Gently press the LED head cleaner onto the LED lens array.



- (2) Throw the cleaner pad away.

### 5.2.2 Cleaning Page Function

There is a charge roller cleaning function with this printer, which can be executed by the user.

- (1) While the printer is in off-line mode, press both ◀ and ▶ keys simultaneously for at least 2 seconds. The printer enters the cleaning mode.
- (2) The LCD displays "CLEANING" on the upper line, and on the lower line, "MANUAL LETTER REQUEST" is displayed, scrolling one character width at a time from right to left "LETTER" on the lower line may instead be "A4" depending on the printer designation. While the lower line scrolls the message, the message on the upper line remains fixed in place.

When the above messages appear on the LCD, the user can verify that the printer has entered the cleaning mode and that it is requesting insertion of a letter (or A4) size paper into the manual feederslot.

- (3) Insert a sheet of paper into the manual feeder slot.
- (4) Toner attached to the image drum is transferred onto the inserted sheet, and the sheet is ejected with the toner residues printed. While this process is going on, the LCD displays "PRINT CLEANING" message.
- (5) The printer returns to the off-line mode.



## **6. TROUBLESHOOTING PROCEDURES**

### **6.1 Troubleshooting Tips**

- (1) Check the troubleshooting section in the Printer Handbook.
- (2) Gather as much information about the situation as possible.
- (3) Inspect the equipment under the conditions close to those in which the problem had occurred.

### **6.2 Points to Check before Correcting Image Problems**

- (1) Is the printer being run in proper ambient conditions?
- (2) Are supplies (toner) and routine replacement part (image drum cartridge) being replaced properly?
- (3) Is the printing paper normal (acceptable quality)?
- (4) Is the image drum cartridge being loaded properly?

### **6.3 Tips for Correcting Image Problems**

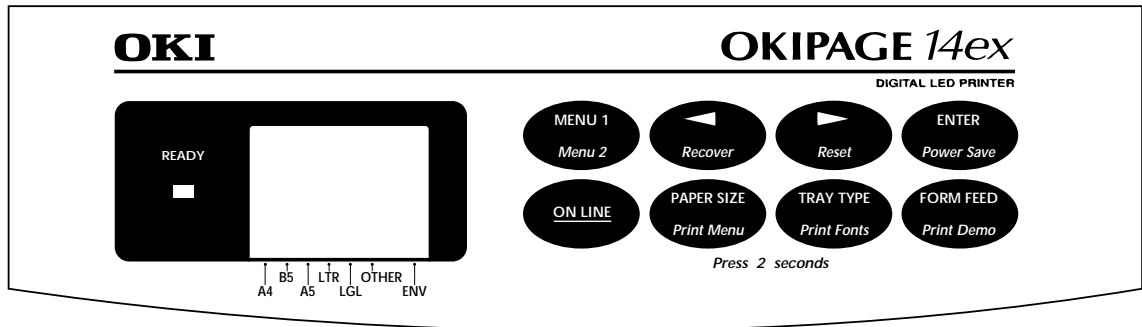
- (1) Do not touch, or bring foreign matter into contact with the surface of the image drum.
- (2) Do not expose the image drum to direct sunlight.
- (3) Keep hands off the fuser unit as it heats up during operation.
- (4) Do not expose the image drum to light for longer than 2 minutes at room temperature.

## 6.4 Preparation for Troubleshooting

### (1) Operator panel display





The failure status of the printer is displayed by the liquid crystal display (LCD) of the operator panel. Take proper corrective action as directed by messages which are being displayed on the LCD.

<ODA/OEL/INT>



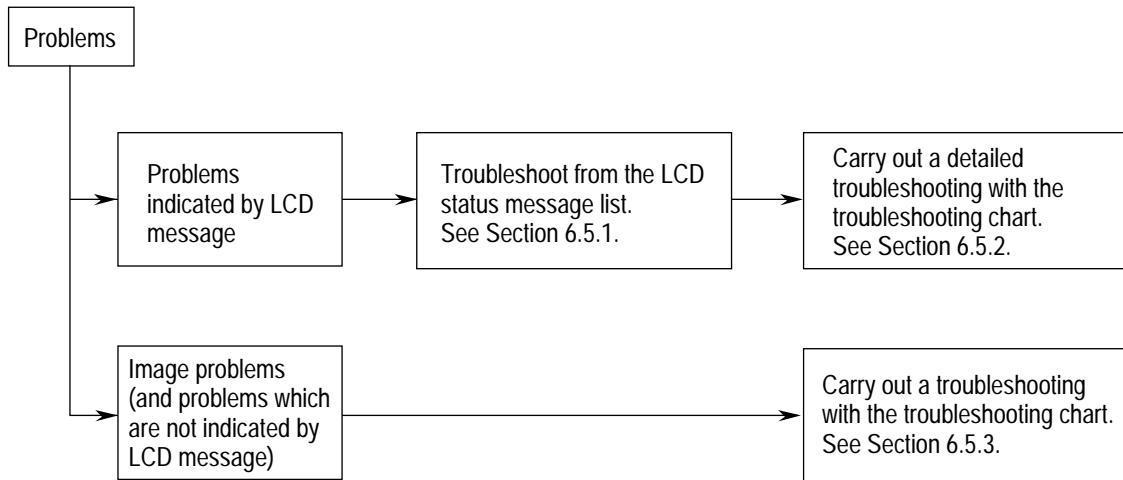
Status message display

Ready LED display

	: Off		: Blinking
	: On		: Undefined

## 6.5 Troubleshooting Flow

Should there be a problem with the printer, carry out troubleshooting according to the following procedure flow:



### 6.5.1 LCD Status Message/Problem List

The status and problems which may be displayed by messages on the LCD are listed in Table 6-1.

Table 6-1(1/9)

Category	LCD status message	Problem or status	Remedy	
Controller errors	<div style="border: 1px solid black; padding: 5px; width: fit-content;">                     ERROR On                      aaaaaaaa                 </div>	An error occurred in the controller. n = Exception Code aaaaaaaa = Error Address	- Normal operation cannot be ensured. Turn the power off, then back on to restart.  - If normal operation is not recovered by this restart procedure, replace the main control board.  Note 1) Since this printer uses NKK4, this error that will result in Coprocessor Instruction Exception Interrupt will not occur.	
		Code (nn)		Error
		1~3 D~F		Reserved
		4		Address Error Exception (Load command, command fetch)
		5		Address Error Exception (Store command)
		6		Bus Error Exception (Command fetch)
		7		Bus Error Exception (Load command, store command)
		8		System Call Extension
		9		Break Point Exception
		A		Reserved Instruction Exception
		B		Coprocessor Unusable Exception (Note 1)
		C		Arithmetic Overflow Exception

Table 6-1 (2/9)


Category	LCD status message	Problem or status	Remedy	
Controller errors (continued)	<div style="border: 1px solid black; padding: 5px; display: inline-block;">  ERROR nn                 </div>	An error occurred in the controller.	<ul style="list-style-type: none"> <li>- Turn the power off, then back on to recover from the error.</li> <li>- If normal operation is not recovered by this restart procedure, use the following remedial actions.</li> </ul>	
		Code (nn)	Remedy	
		10	An error was detected by program ROM check.	Replace the main control board.
		20	An error was detected by font ROM check.	(Can't Happen)
		30	An error was detected by resident RAM check.	Replace the main control board.
		40	An error was detected by EEPROM check.	Replace the EEPROM or main control board.
		41	EEPROM installation error. OP14i have 16Kbit EEPROM, and this error is indicated when 4Kbit EEPROM is installed. This error dose not occur in the OP14ex since they are designed to use both 4K/16Kbit.	Replace the EEPROM or main control board.
		50	An error was detected by optional software ROM check.	Check the optional software ROM board for proper connection or replace it.
		51	An error was detected by Flash SIMM.	Check the optional Flash SIMM for proper connection or replace it.
		60	An error was detected by optional RAM check.	<ul style="list-style-type: none"> <li>- Check the optional RAM board for proper connection.</li> <li>- Check the mounting position of short plugs and additional RAM chips (see Section 7.4).</li> <li>- Replace the optional RAM board.</li> </ul>
		61	Data bus Error between Cos and Databus for Option DRAMs.	Check the optional DRAM SIMM for proper connection or replace it.
		70	A failure occurred with the Fan motor.	<ul style="list-style-type: none"> <li>- Check the fan motor for proper connection and for any presence of foreign matter in the fan (see Section 6.5.2-⑥).</li> <li>- Replace the fan or the main control board.</li> </ul>
71	A failure occurred with the fuser (timeout error etc.).	See Section 6.5.2 - ④.		

Table 6-1 (3/9)


Category	LCD status message	Problem or status		Remedy	
		Code (nn)	Error		
Controller errors (continued)	<div style="border: 1px solid black; padding: 5px; display: inline-block;">  </div>	72	A failure occurred with the fuser (thermistor open error).	See Section 6.5.2 - ④.	
		73	A failure occurred with the fuser (thermistor short error).	See Section 6.5.2 - ④.	
		74	SSIO Error	<ul style="list-style-type: none"> <li>- Check the connection between the main control board and the power supply/sensor board.</li> <li>- Replace the main control board or power supply/sensor board.</li> </ul>	
		77	A toner sensor fault has occurred when the TOTAL DRAM COUNT is 30 or less.	<ul style="list-style-type: none"> <li>- Check the installing of Image drum unit.</li> <li>- Replace the power supply/sensor board.</li> </ul>	
		80	I/F timeout occurred between the main control board and the operator panel.	<ul style="list-style-type: none"> <li>- Check the operator panel for proper connection.</li> <li>- Replace the flexible cable, operator panel or main control board.</li> </ul>	
		90	A watchdog timer timeout occurred.	<ul style="list-style-type: none"> <li>- Turn the power off, then back on again.</li> <li>- Replace the main control board.</li> </ul>	
		91	CPU Error	<p><b>Note:</b> When replacing the main control board, be sure to install the EEPROM from the old board onto the new board.</p>	
		F0	Monitor error (double weight)		
		F1	Monitor error (argument error)		
		F2	Optional Timeout error	See Section 6.5.2 - ⑤.	
		F3	Optional status error		
		F4	BG program error	<ul style="list-style-type: none"> <li>- Turn the power off, then back on again.</li> <li>- Replace the main control board.</li> </ul> <p><b>Note:</b> When replacing the main control board, be sure to install the EEPROM from the old board onto the new board.</p>	

Table 6-1 (4/9)

Category	LCD status message	Problem or status		Remedy
		Code (nn)	Error	
Controller errors (continued)	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     ■ ERROR nn                 </div>	F5	System timer program error. Defect in the cable of the front feeder paper sensor and the 2-pin connector on the main control board. Poor connection of connectors.	- Turn the power off, then back on again. - Repair or replace the defective front feeder paper sensor cable and 2-pin connector on the main control board or reconnect the connectors. - Replace the main control board.
		F6	IPT2 program error	- Turn the power off, then back on again. - Replace the main control board.
		F7	IPT1 program error	- Turn the power off, then back on again. - Replace the main control board.
Interface errors	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     □ HOST I / F RS232C                 </div>	An error occurred in the serial I/F. This message is displayed when a parity error, a framing error or an overrun error is detected. (When an error occurred in serial I/F)		- Press the operator panel <i>RECOVER</i> key to release the error display. When serial I/F board has been installed, - Check the settings related serial I/F of the menu. - Replace the serial I/F cable or main control board.
Cover open	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     ■ COVER OPEN                 </div>	The upper cover was opened.		- Close the cover to release the error display. - If the display does not change after this procedure, replace the power supply/sensor board.
	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     ■ COVER T2 OPEN                 </div>	The High Capacity Second Paper Feeder option cover was opened.		- Close the cover to release the error display. - Check the connection between the main control board and TQSB-2-PCB. - Replace the main control board, TQSB-2-PCB or connector.
Jam errors	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     ■ tray INPUTJAM                 </div>	A jam occurred during paper hopping from the tray.  tray : TRAY1, TRAY2, FEEDER, MANUAL		- Check the paper in the cassette. Open and then close the cover. When the cover is closed, recovery printing is performed and the error display is released. - If this error occurs frequently, see Section 6.5.2.②-1.

Table 6-1 (5/9)

Category	LCD status message	Problem or status	Remedy
Jam errors (continued)	<div style="border: 1px solid black; padding: 2px; display: inline-block;">                     tray FEED JAM                 </div> <input checked="" type="checkbox"/>	A jam occurred during paper feeding after completion of paper hopping from the tray. tray : TRAY1, TRAY2, FEEDER	<ul style="list-style-type: none"> <li>- Open the cover, remove the paper, then close the cover. When the cover is closed, recovery printing is performed and the error display is released.</li> <li>- If this error occurs frequently, see Section 6.5.2.②-2.</li> </ul>
	<div style="border: 1px solid black; padding: 2px; display: inline-block;">                     tray EXIT JAM                 </div> <input checked="" type="checkbox"/>	A jam occurred during paper ejecting. tray : TRAY1, TRAY2, FEEDER, MANUAL	<ul style="list-style-type: none"> <li>- Open the cover, remove the paper, then close the cover. When the cover is closed, recovery printing is performed and the error display is released.</li> <li>- If this error occurs frequently, see Section 6.5.2.②-3.</li> </ul>
Paper size error	<div style="border: 1px solid black; padding: 2px; display: inline-block;">                     tray SIZE ERR                 </div> <input checked="" type="checkbox"/>	Paper of improper size is being fed from the tray. tray : TRAY1, TRAY2, FEEDER, MANUAL	<ul style="list-style-type: none"> <li>- Check the paper in the tray or check to see if more than one sheet of paper were being fed simultaneously.</li> <li>- Set the designated paper in the tray.</li> <li>- Open the cover, then close it to perform recovery printing and release the error display.</li> <li>- If this error occurs frequently, see Section 6.5.2.③.</li> </ul>
Tray paper out	<div style="border: 1px solid black; padding: 2px; display: inline-block;">                     tray PAPEROUT                 </div> <input checked="" type="checkbox"/>	The tray has run out of paper. tray : TRAY1, TRAY2, FEEDER	Load paper in the tray.
Size error	<div style="border: 1px solid black; padding: 2px; display: inline-block;">                     tray #PAPER REQUEST                 </div> <input checked="" type="checkbox"/> (The indicate rotate)	Loading of paper indicated by the first line message is requested. The paper size may be one of the followings: tray : TRAY1, TRAY2, FEEDER Paper : LETTER, EXECUTIV, LEGAL 14, LEGAL 13, A4 SIZE, A5 SIZE, A6 SIZE, B5 SIZE, COM-9, COM-10, MONARCH, DL ENV, C5 ENV	Load the requested paper in the tray.
	<div style="border: 1px solid black; padding: 2px; display: inline-block;">                     MANUAL #REQUEST                 </div> <input type="checkbox"/> (The indicate rotate)	Manual loading of paper indicated by the first line message is requested. The paper size one of the followings: LETTER, EXECUTIV, LEGAL 14, LEGAL 13, A4 SIZE, A5 SIZE, A6 SIZE, B5 SIZE, FREE SIZE, COM-10, MONARCH, DL ENV, C5 ENV	



Table 6-1 (6/9)








Category	LCD status message	Problem or status	Remedy
Buffer overflow	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">REC BUFF OVERFLOW</div>	The receive buffer is overflowing.	<ul style="list-style-type: none"> <li>- Press the operator panel RECOVER key on the operator panel to release the error display.</li> <li>- Change the setting of the host or printer so that the host can detect the busy status of the printer. Resend the data from the host to the printer.</li> <li>- Replace the interface cable or main control board.</li> </ul>
	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">MEMORY OVERFLOW</div>	The page buffer is overflowing because it received too much data for printing on the page. Macro buffer is overflowing. The DLL buffer is overflowing.	<ul style="list-style-type: none"> <li>- Press the RECOVER key to release the error display.</li> <li>- Install additional optional RAM board or reduce the print data.</li> </ul>
	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">PRINT OVERRUN</div>	The printer overrun because the print data is too complicated to be printed.	<ul style="list-style-type: none"> <li>- Press the RECOVER key on the operator panel to release the error display.</li> <li>- Simplify page data formatting.</li> </ul>
Daily status	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">OFF-LINE emulate</div>	The printer is in the off-line mode. The second line indicates the emulation. emulate : AUTO, PCL, PPR, FX, HEX	Normal operation.
	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">ACTIVE</div>	The printer is processing data.	
	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">PRINTING</div>	The printer is printing a page.	
	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">DATA emulate</div>	The printer is processing data in the on-line mode. Ready ON : The data that is not printed remains in the buffer. Ready flashing : The printer is receiving data or in printing process. emulate : AUTO, PCL, PPR, FX, HEX	

Table 6-1 (7/9)



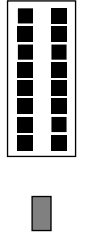


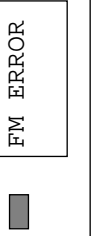

Category	LCD status message	Problem or status	Remedy
Daily status (continued)		All fonts of the printer are being printed during self-test. Ready ON : Executed by command entry. Ready flashing : Executed by key operation.	Normal operation.
		The current menu setting is being printed. Ready ON : Executed by command entry. Ready flashing : Executed by key operation.	
		Message displayed when the power is turned on. When the power is turned on, the LEDs are turned on for approximately 1 second, conducting a test to verify the conditions of the LEDs and LCD.	
		Message displayed to indicate that the controller is undergoing an initialization when the power is turned on. This message is displayed after the turning on of the LEDs as described above.	
		Indicates in Cold mode due to downloading to flash memory.	
		Indicates that an error occurs during downloading to flash memory or deleting.	
		The demo page is being printed. Ready LED on : Executed by command entry. Ready LED blinking : Executed by key operation.	

Table 6-1 (8/9)















Category	LCD status message	Problem or status	Remedy
Daily status (continued)	<input type="checkbox"/> 	<p>When the number of copies being printed is two or more, the number of copies being printed is displayed. This message is displayed together with another message on the first line.</p> <p>nnn : Current page tmmmm : Total page</p>	Normal operation.
	<input type="checkbox"/> 	<p>This message is displayed when the printer is performing the cleaning print.</p>	
	<input checked="" type="checkbox"/> 	<p>Manual loading of paper indicated by the second line message is being requested for cleaning. The paper size (#) may be one of the following: # : LETTER REQUEST, A4 SIZE REQUEST</p>	
	<input checked="" type="checkbox"/> 	<p>The data which remained unprinted in the buffer is deleted and the printer is initialized to user default settings. The temporary DLLs, macros and user pattern are deleted.</p>	
	<input checked="" type="checkbox"/> 	<p>This message is displayed when the printer cannot reset automatically to exit from the menu because there are date and DLL's and macros having temporary attributes when the printer is changed from set mode to another mode.</p>	
	<input type="checkbox"/> 	<p>Toner is running out. This message is displayed together with another message on the first line. Normal operation can be continued.</p>	Replace the toner cartridge.
	<input type="checkbox"/> 	<p>A fault occurred with the toner sensor. This message is displayed together with another message on the first line. Normal operation can be continued.</p>	Replace the power supply/sensor board.

Table 6-1 (9/9)

Category	LCD status message	Problem or status	Remedy
Daily status (continued)		<p>Displays that the amount of toner is near empty (this status will appear after 100 sheets from a TONER LOW indication). It is indicated by being combined with other messages in the first line. Normal operation can be continued.</p>	
		<p>Displays that the amount of toner is near empty. After 100 sheets from a TONER LOW indication, this status will appear and the printing be stopped. If pressing ON-LINE SW, other 31 sheets can be printed and stopped. And from the next time on, the printing is stopped each sheet.</p>	
		<p>This message is displayed together with another message on the first line. Normal operation can be continued.</p>	<ul style="list-style-type: none"> <li>- Replace the image drum cartridge.</li> <li>- After replacing the drum cartridge, reset the drum counter. (refer to the Printer Handbook)</li> </ul>
		<p>The printer is in the power -saving mode. This message is displayed together with another message on the first line.</p>	<p>Normal operation.</p>
		<p>Informs drum life end. It can be temporarily released by opening and closing the cover or pressing the "ON LINE" switch, but basically, the drum must be replaced.</p>	
		<p>Indicates an error from the result of checking EEPROM ID No. The printer will display this for a few seconds and reset the EEPROM to the factory default for a continuous operation. It will occur with a new EEPROM.</p>	
		<p>Reformat error including CPCMCIA header of ROM-SIMM and byte sum. It will be displayed for 2 seconds at power-on or just before a shift to ON LINE.</p>	

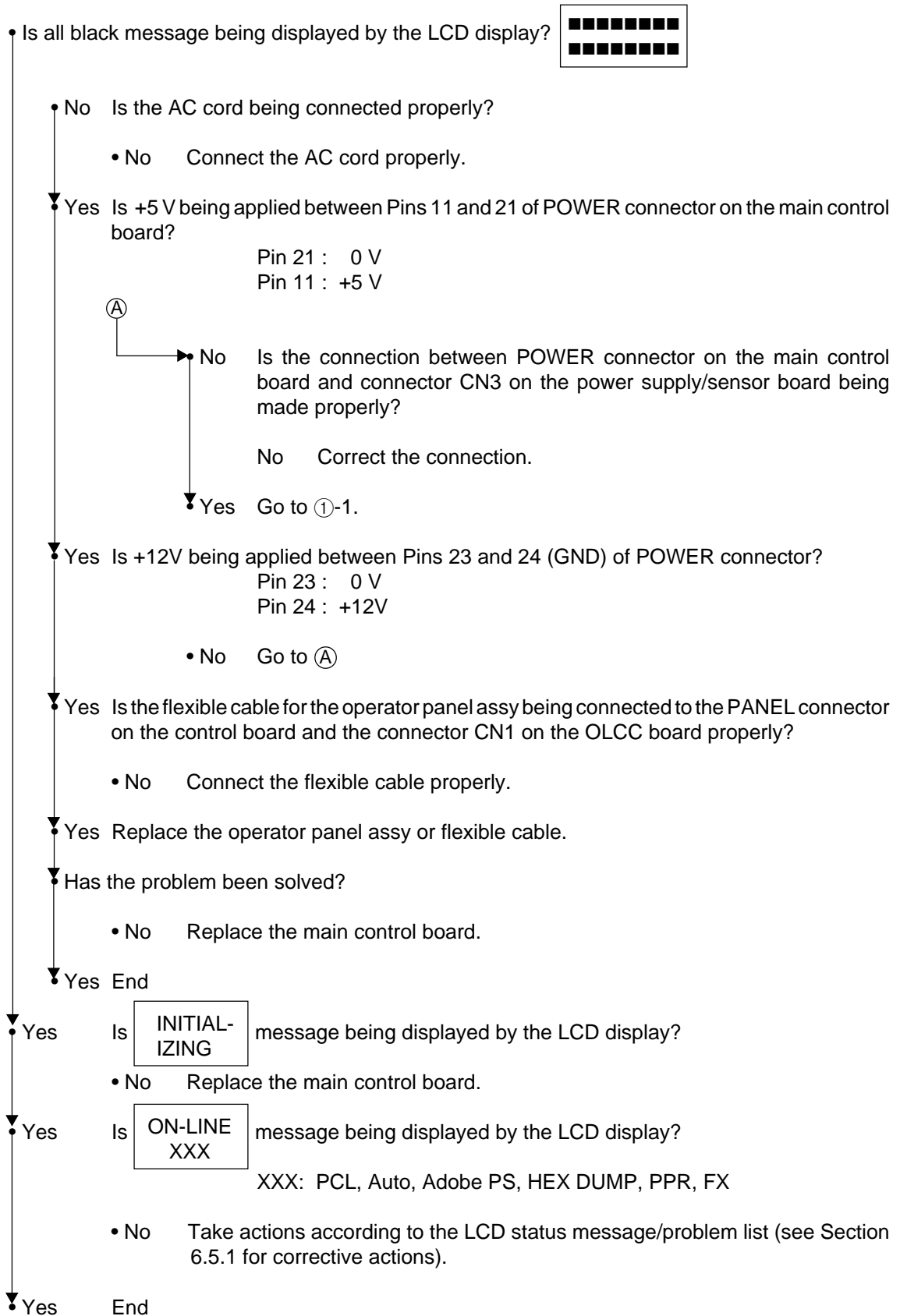
## 6.5.2 LCD Message Troubleshooting

If the problems cannot be corrected by using the LCD status message/problem list, follow the troubleshooting flowcharts given here to deal with them.

No.	Trouble	Flowchart number
1.	The printer does not work normally after the power is turned on.	①
2.	Jam alarm <ul style="list-style-type: none"><li>— Paper input jam</li><li>— Paper feed jam</li><li>— Paper exit jam</li></ul>	②-1 ②-2 ②-3
3.	Paper size error	③
4.	Fusing unit error	④
5.	SSIO (Synchronous Serial Input/Output) error I/F timeout (no response) between the printer and an optional tray (High Capacity Second Paper Feeder, Power Envelope Feeder).	⑤
6.	Fan error	⑥

① The printer does not work normally after the power is turned on.

- Turn the power off, then back on.



①-1

▼ Take the measurement of the following voltage readings at connector CN3 on the power supply board without main control board:

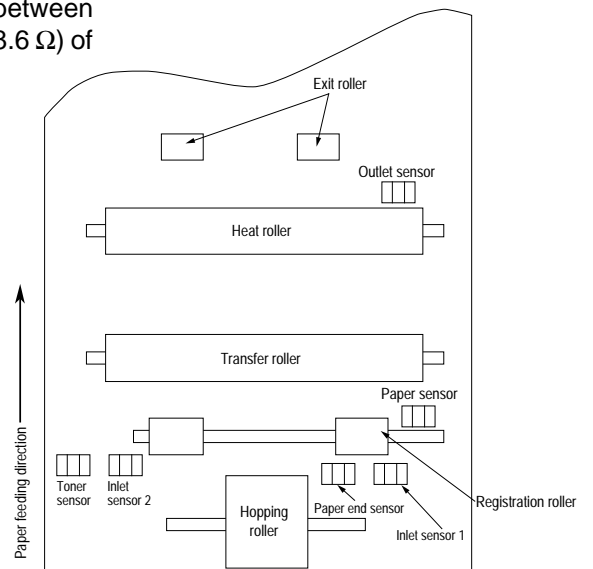
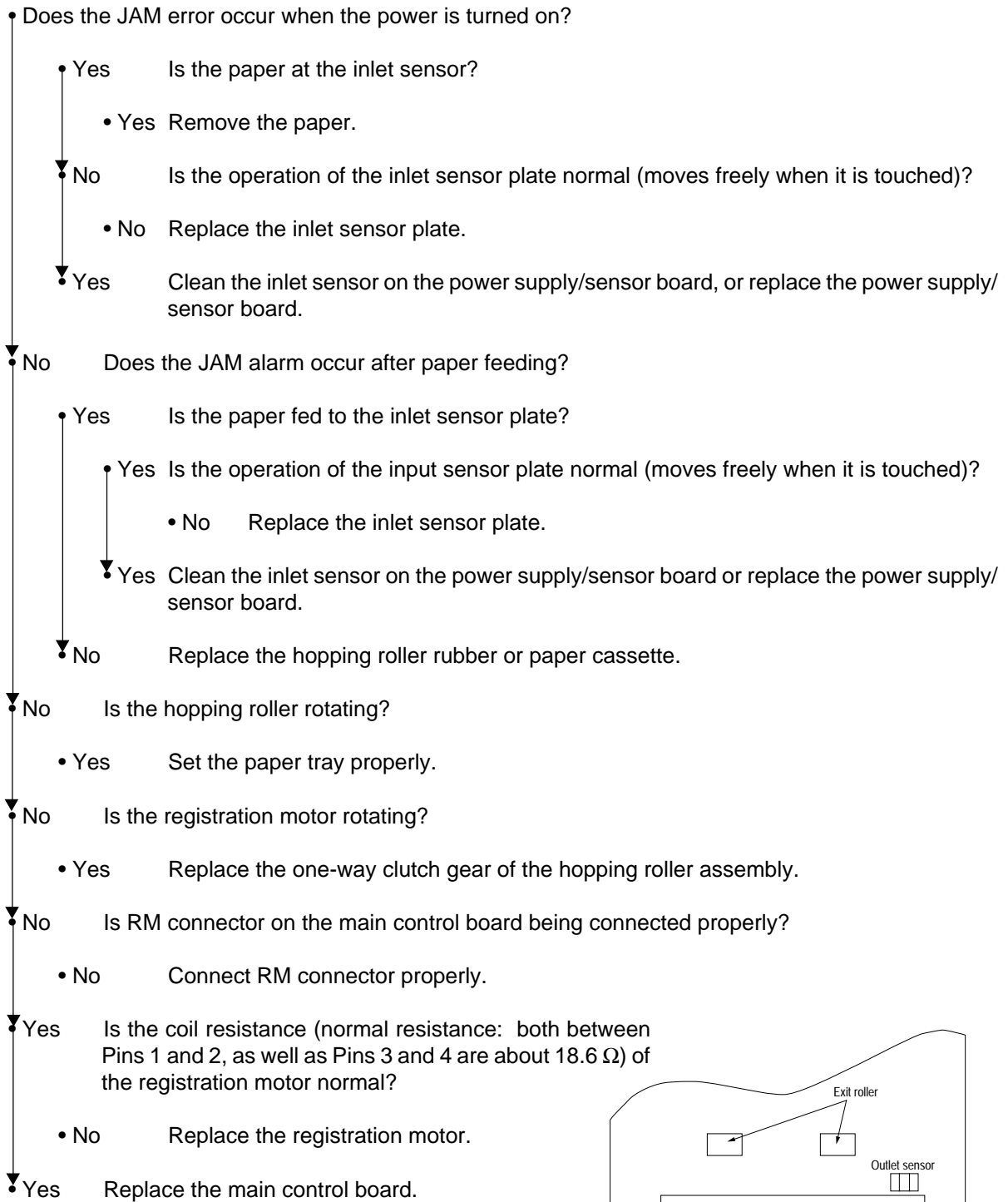
Voltage between Pins 11 and 16: ... about 5VDC

Voltage between Pins 17 and 16: ... about 30VDC

Voltage between Pins 24 and 16: ... about 12VDC

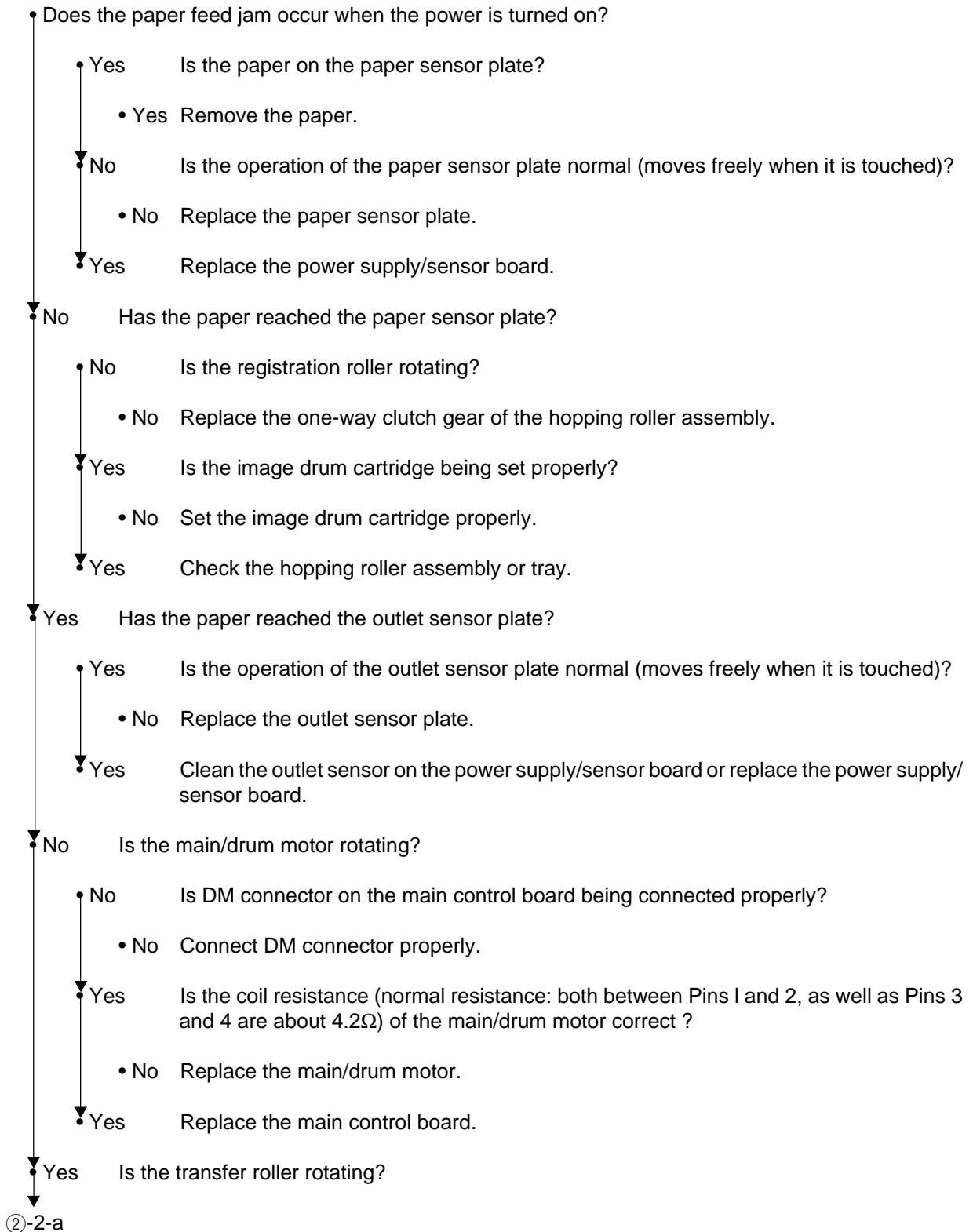
▼ Yes      Replace the AC transformer.

②-1 Paper input jam





②-2 Paper feed jam



②-2-a

- No Check the gears (transfer roller gear, idle gear and reduction gear).
- ▼ Yes Is the fusing unit being installed properly?
  - No Install the fusing unit properly.
- ▼ Yes Is the image drum cartridge being set properly?
  - No Set the image drum cartridge properly.
- ▼ Yes Clean the paper sensor on the power supply/sensor board or replace the power supply/sensor board.

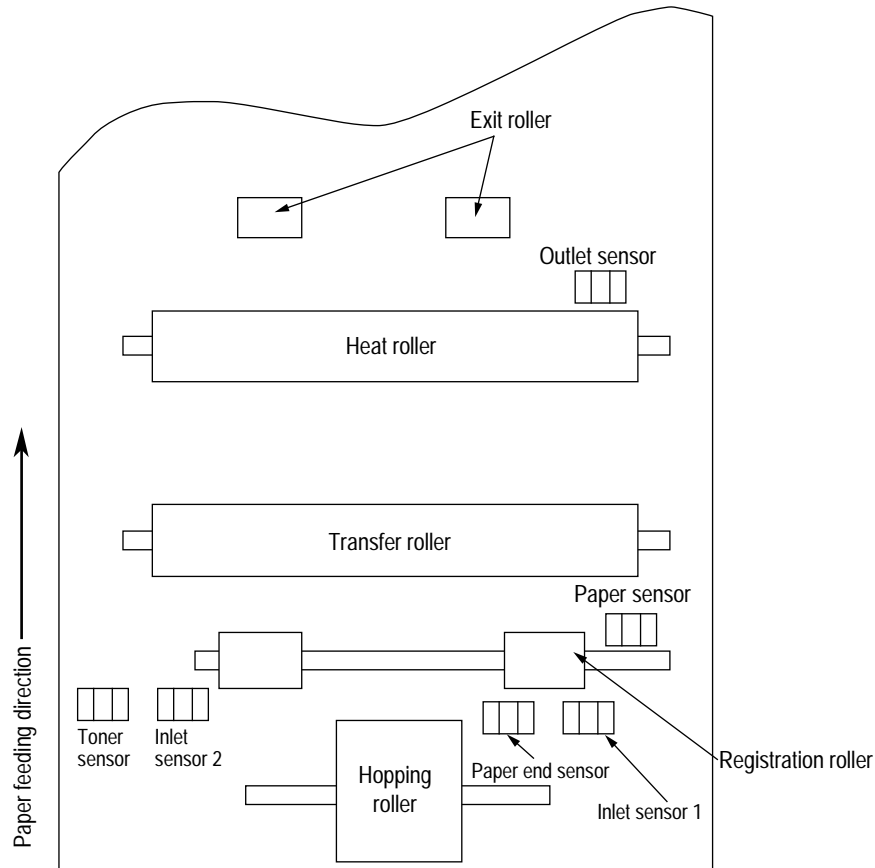
[JAM error]

②-3 Paper exit jam

- Does the paper exit jam error occur when the power is turned on?
  - Yes Is the paper on the outlet sensor plate?
    - Yes Remove the paper.
  - ▼ No In the operation of the outlet sensor plate normal (moves freely when it is touched)?
    - No Replace the outlet sensor plate.
  - ▼ Yes Clean the outlet sensor on the power supply/sensor board or replace the power supply/sensor board.
- ▼ No Is the face-up stacker pulled out completely from the printer or, pushed into the printer completely?
  - No Pull the face-up stacker out of the printer completely or push it into the printer completely.
- ▼ Yes Is the eject roller assembly being installed properly?
  - No Install the eject roller assembly properly.
- ▼ Yes Has the coil spring come off the eject roller assembly?
  - Yes Install the coil spring to the eject roller assembly.
- ▼ No Replace the eject roller assembly.

③ Paper size error

- Is paper of the specified size being used?
  - No Use paper of the specified size.
- Yes Are inlet sensor plates 1 and 2 operating properly (moves freely when they are touched)?
  - No Replace the inlet sensor plate or clean the inlet sensor on the power supply/sensor board.
- Yes Does the outlet sensor plate operate properly (moves freely when it is touched)?
  - No Replace the outlet sensor plate or clean the outlet sensor on the power supply/sensor board.
- Yes Replace the power supply/sensor board.



④ Fusing unit error (ERROR 71) (ERROR 72) (ERROR 73)

• Turn the power off, then back on again.

• Yes Is the thermistor open or shorted? Measure the resistance between thermistor contacts (heater contacts 120V/3Ω or 240V/10Ω, and thermistor contacts 220KΩ at room temperature) (see Figure 6-2 or Section 7.3).

• Yes Replace the fusing unit.

• No Do the thermistor contacts touch the contact assembly properly when the fusing unit is mounted in the printer?

• No Adjust the contacts of the contact assembly.

• Yes Is the heater of the fusing unit turned on (when the heater is turned on, light is emitted)?

• Yes Check the thermistor contacts or replace the main control board or the fusing unit.

• No Is the AC voltage being supplied to the connector for the heater of the power supply board? (see Figure 6-2)

• No Replace the main control board or the power supply/sensor board.

• Yes Check the heat contacts of the fusing unit and the contact assembly for poor contact (see Figure 6-4 contact ③).

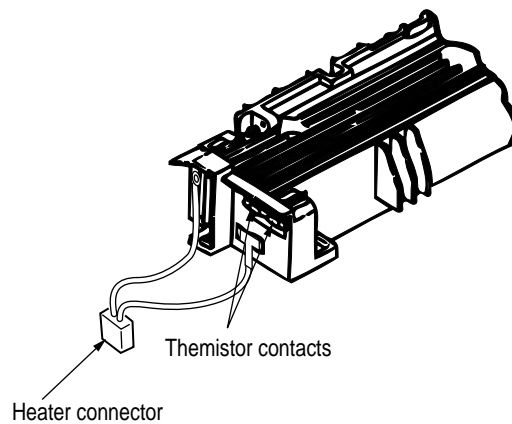
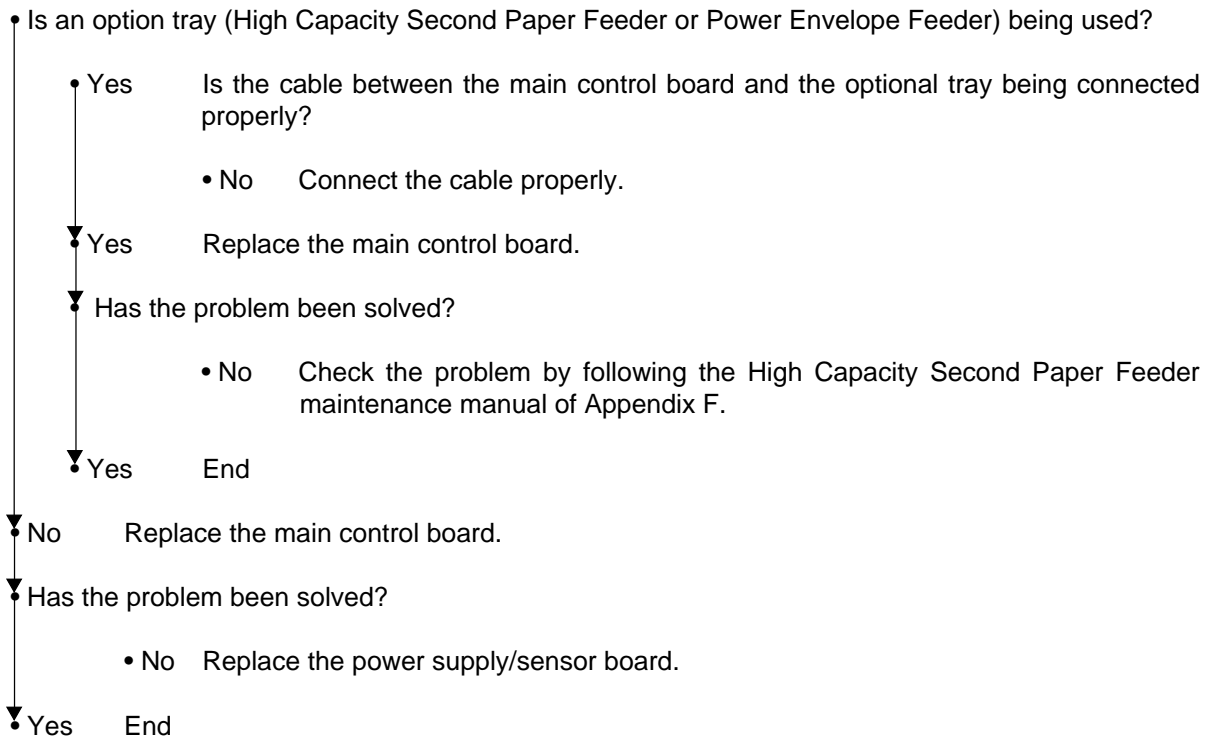
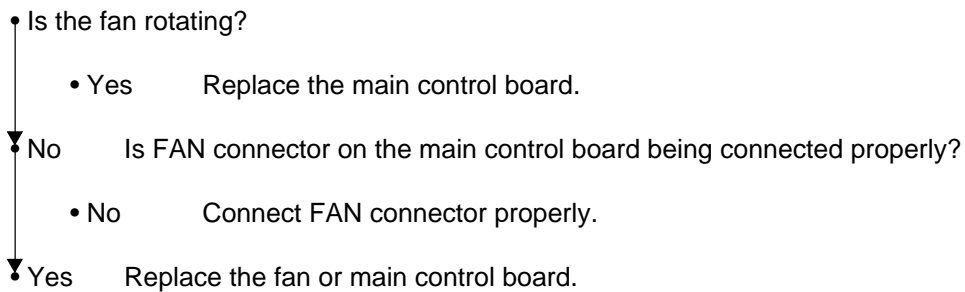


Figure 6-2

⑤ Synchronous serial I/O error (ERROR 74) or I/F timeout between printer and optional tray (ERROR F2, F3)



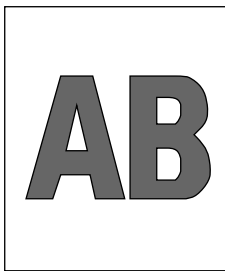
⑥ Fan error (ERROR 70)



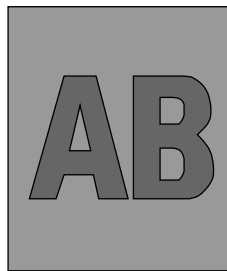
### 6.5.3 Image Troubleshooting

Procedures for troubleshooting for abnormal image printouts are explained below. Figure 6-3 below shows typical abnormal images.

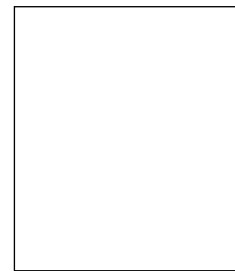
Problem	Flowchart number
Images are light or blurred entirely (Figure 6-3 (A))	①
Dark background density (Figure 6-3 (B))	②
Blank paper is output (Figure 6-3 (C))	③
Black vertical belts or stripes (Figure 6-3 (D))	④
Cyclical defect (Figure 6-3 (E))	⑤
Prints voids	⑥
Poor fusing (images are blurred or peels off when the printed characters and images on the paper are touched by hand)	⑦
White vertical belts or streaks (Figure 6-3 (F))	⑧



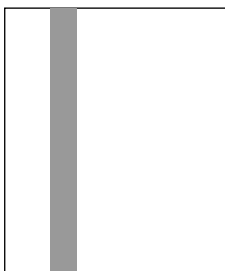
(A) Light or blurred images entirely



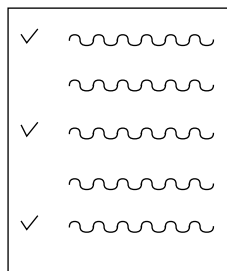
(B) Dark background density



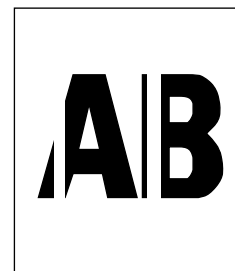
(C) Blank paper



(D) Black vertical belts or stripes



(E) Cyclical defect



(F) White vertical belts or streaks

Figure 6-3

① Images are light or blurred entirely.

• Is toner low (is the TONER LOW message displayed)?

- Yes Supply toner.

▼ No Is paper of the specified grade being used?

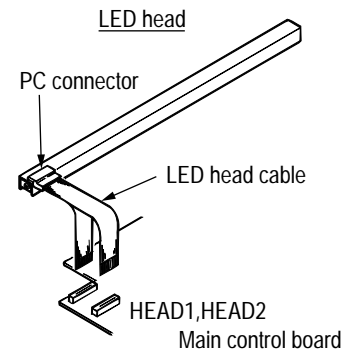
- No Use paper of the specified grade.

▼ Yes Is the lens surface of the LED head dirty?

- Yes Clean the lens.

▼ No Is the LED head being installed properly (check the HEAD1 and HEAD2 connectors of the main control board and PC connector on the LED head for proper connection)?

- No Install the LED head properly.



▼ Yes Is the contact plate of the transfer roller in contact with the contact assembly of the power supply/sensor board properly (see Figure 6-5)?

- No Adjust the contact plate of the transfer roller to make a proper contact with the power supply/sensor board and shaft of the transfer roller.

▼ Yes Are the contact of the developing roller and the contact of the toner supply roller of the image drum cartridge in contact with the contact assembly properly (see Figure 6-4 (A) and (B))?

- No Adjust the contacts of the developing and toner supply roller to make a proper contact with the contact assembly.

▼ Yes Replace the transfer roller.

▼ Has the problem been solved?

- Yes End

▼ No Replace the image drum cartridge.

▼ Has the problem been solved?

- Yes End

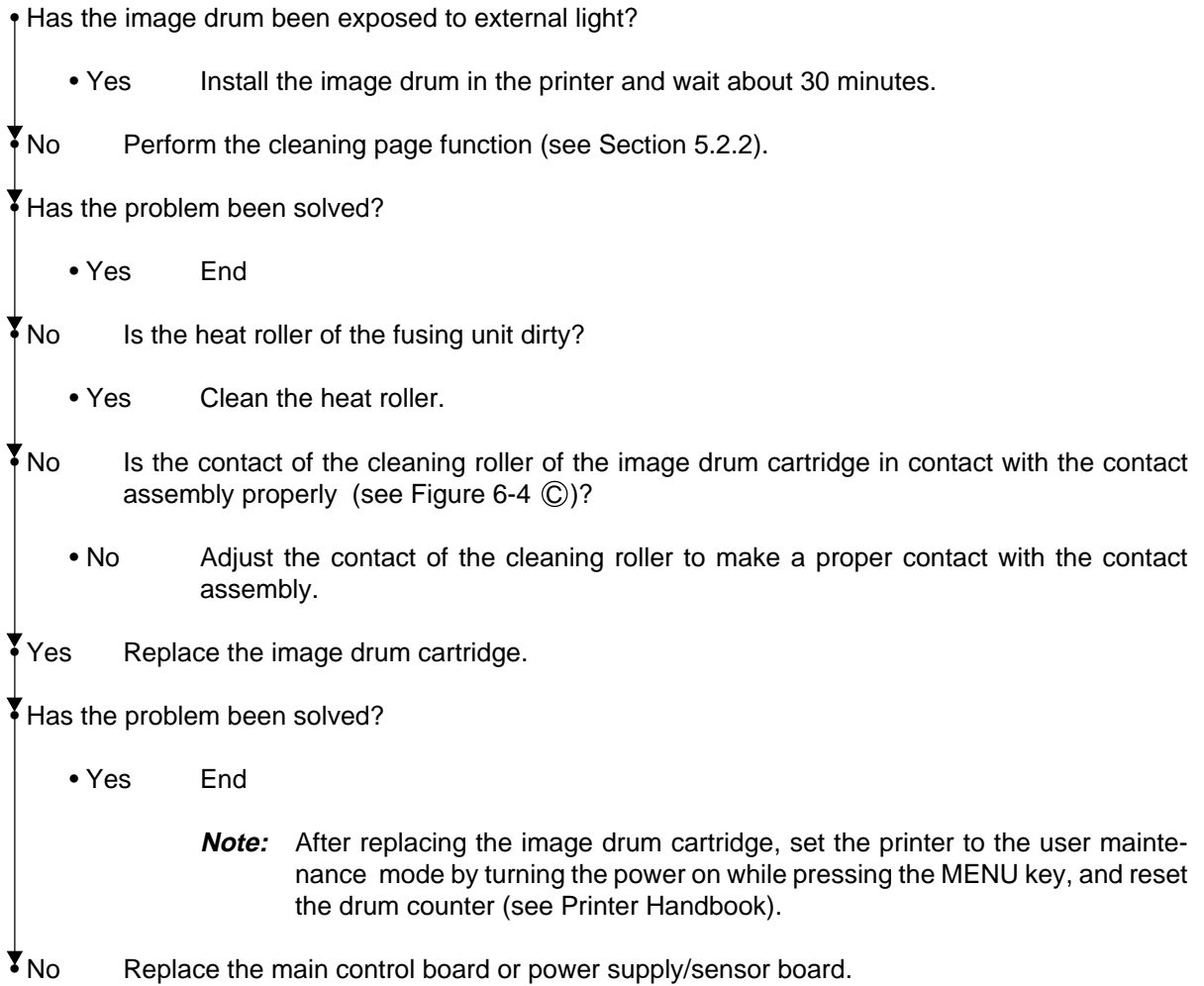
**Note:** After replacing the image drum cartridge, set the printer in the user maintenance mode by turning the power on while pressing the MENU key and reset the drum counter (see Printer Handbook).

▼ No Is the tension between the back-up roller (7.52kg) and the surface of back-up roller normal?

- No Replace the back-up roller or bias spring.

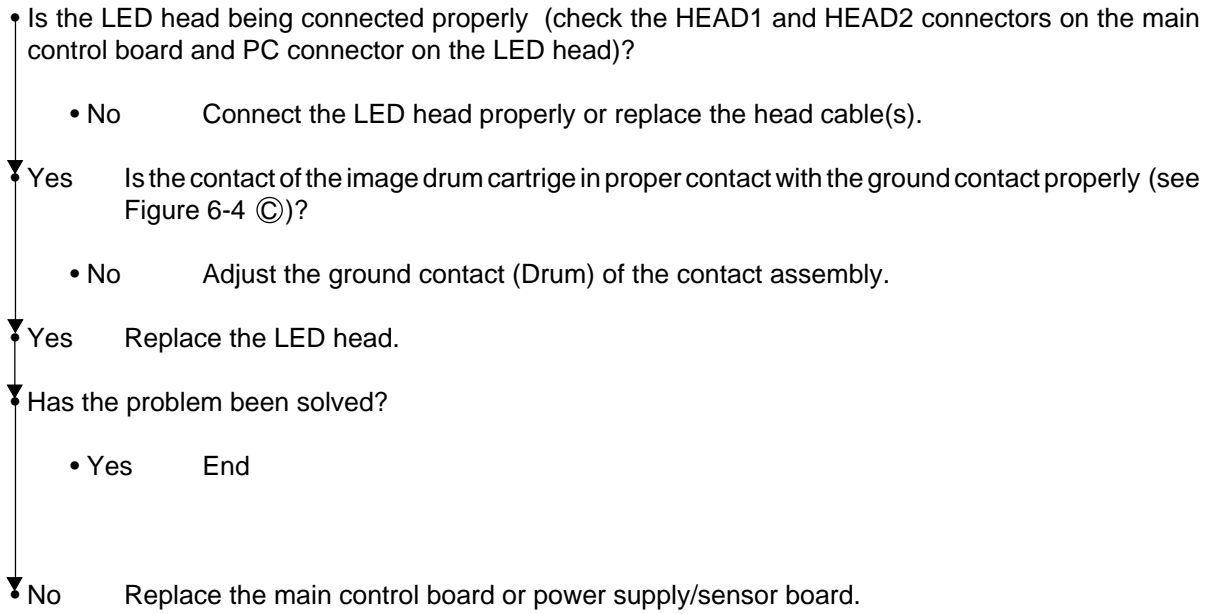
▼ Yes Replace the main control board or power supply/sensor board.

② Dark background density





③ Blank paper is output.



④ Black vertical belts or stripes

• Perform the cleaning page function (see Section 5.2.2).

▼ Has the problem been solved?

• Yes      End.

▼ No      Replace the image drum cartridge.

▼ Has the problem been solved?

• Yes      End

**Note:** After replacing the image drum cartridge, set the printer to the user maintenance mode by turning the power on while pressing the MENU key, and reset the drum counter (see Printer Handbook).

▼ Clean the LED lens array of the LED head.

▼ Has the problem been solved?

• Yes      End.

▼ No      Replace the LED head.

▼ Has the problem been solved?

• Yes      End

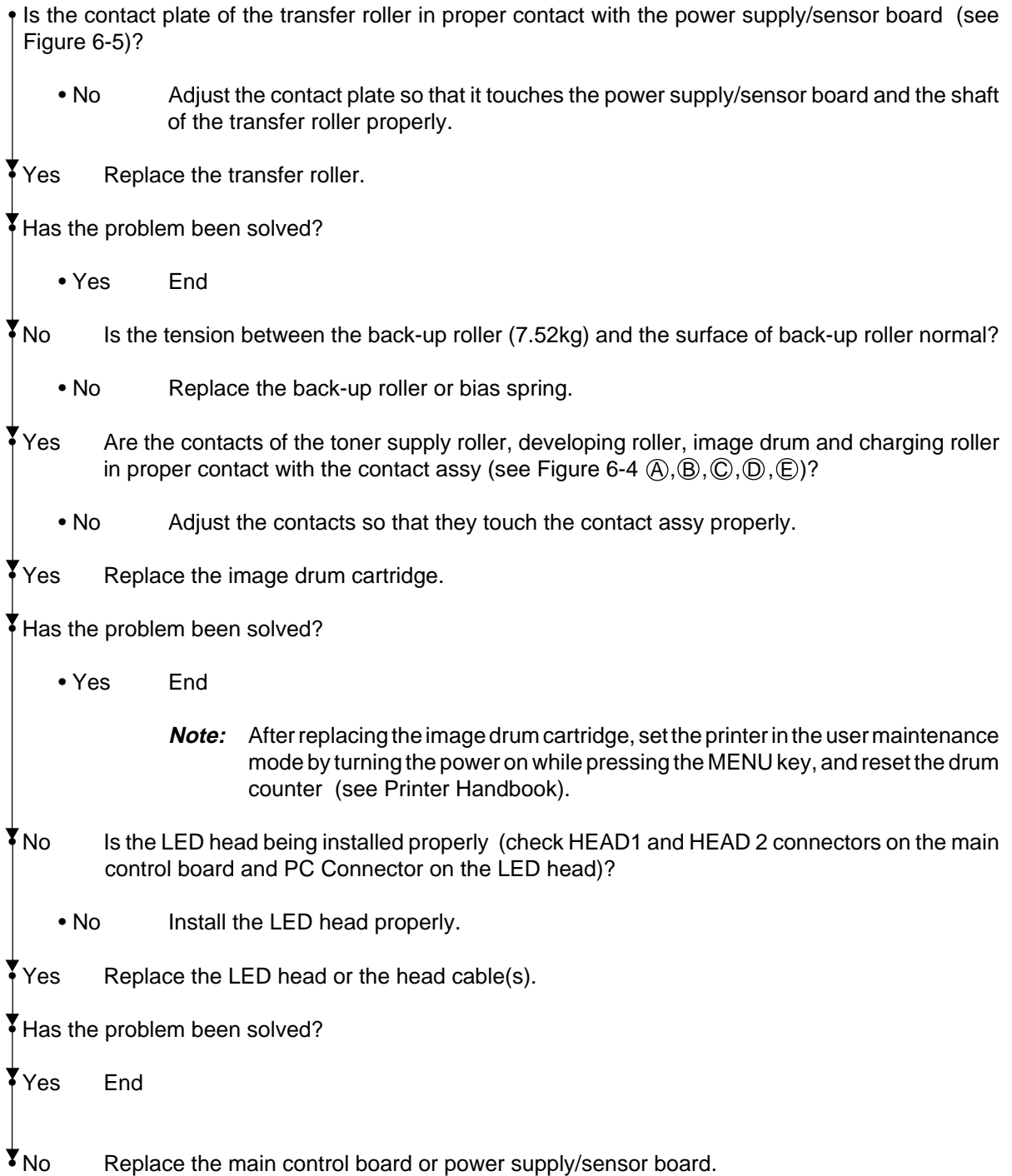
▼ No      Replace the main control board or power supply/sensor board.

⑤ Cyclical defect

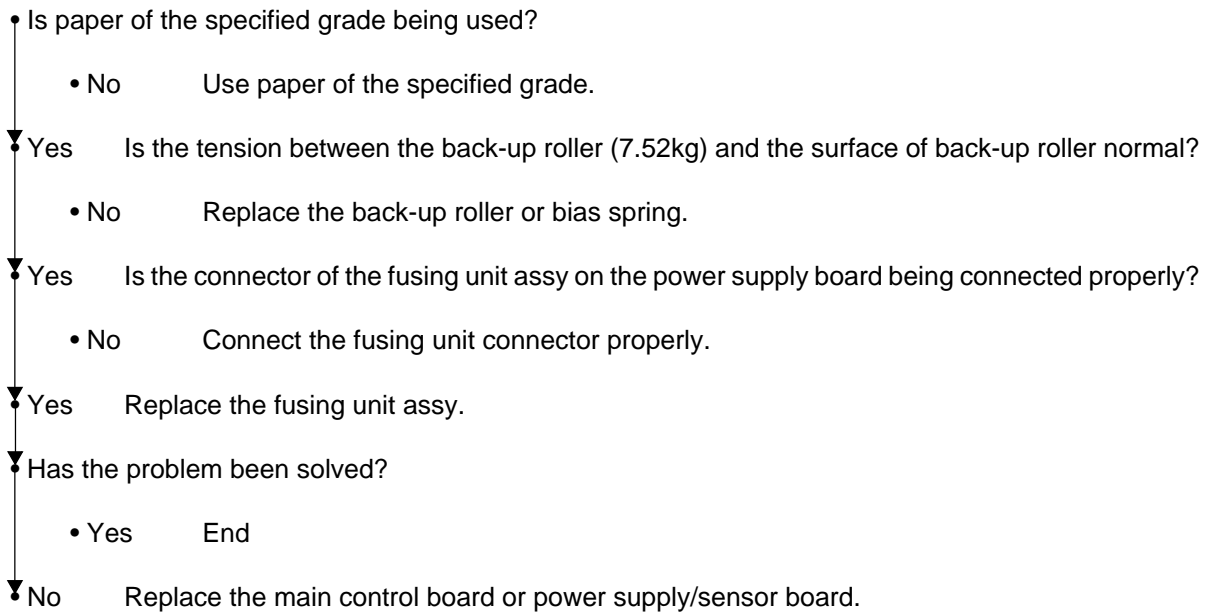
	Frequency	Remedy
Image drum	3.71" (94.2mm)	Replace or clean the image drum cartridge.
Developing roller	1.86" (47.12mm)	Replace the image drum cartridge.
Toner supply roller	2.96" (75.27mm)	Replace the image drum cartridge.
Charging roller	1.21" (30.63mm)	Replace the image drum cartridge.
Cleaning roller	0.93" (23.56mm)	Replace the image drum cartridge.
Transfer roller	1.95" (49.6mm)	Replace the transfer roller.
Heat roller	2.44" (62.0mm)	Replace the fusing unit assy.
Back-up roller	2.73" (69.4mm)	Replace the back-up roller.

**Note:** After replacing the image drum cartridge, set the printer to the user maintenance mode by turning the power on while pressing the MENU key, and reset the drum counter (see Printer Handbook).

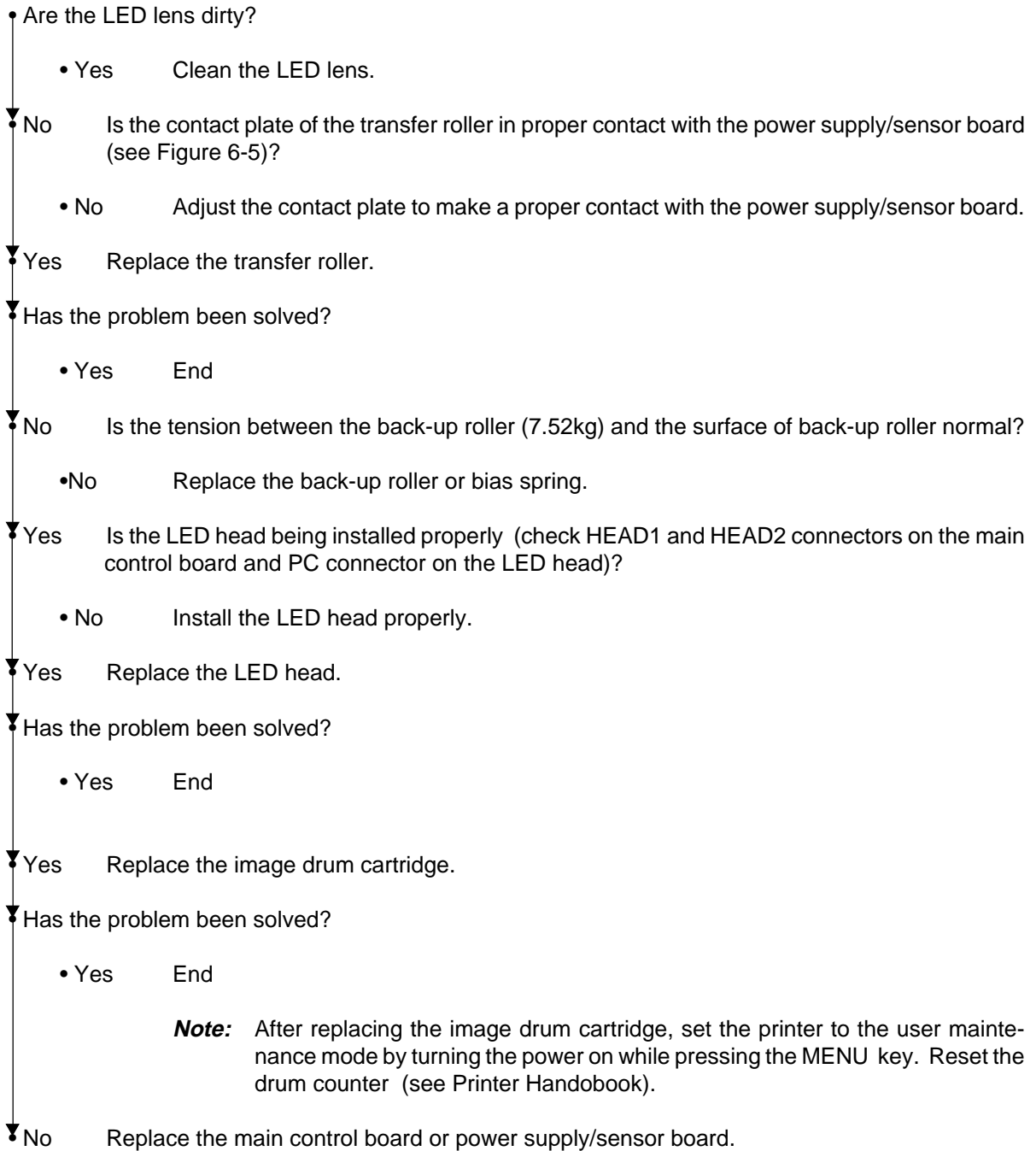
⑥ Prints voids



⑦ Poor fusing (images are blurred or peels off when the printed characters and images on the paper are touched by hand)



⑧ White vertical belts or streaks



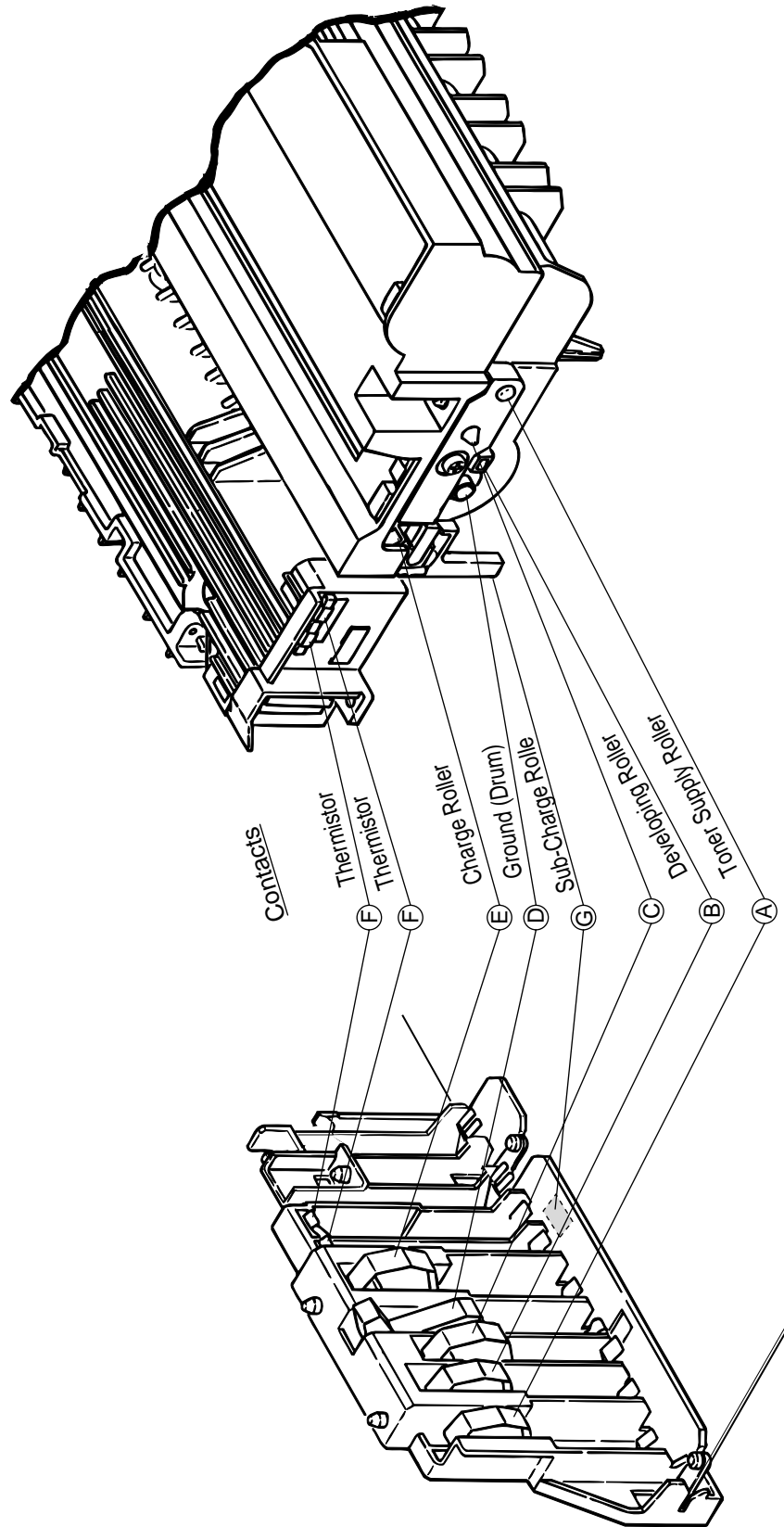


Figure 6-4

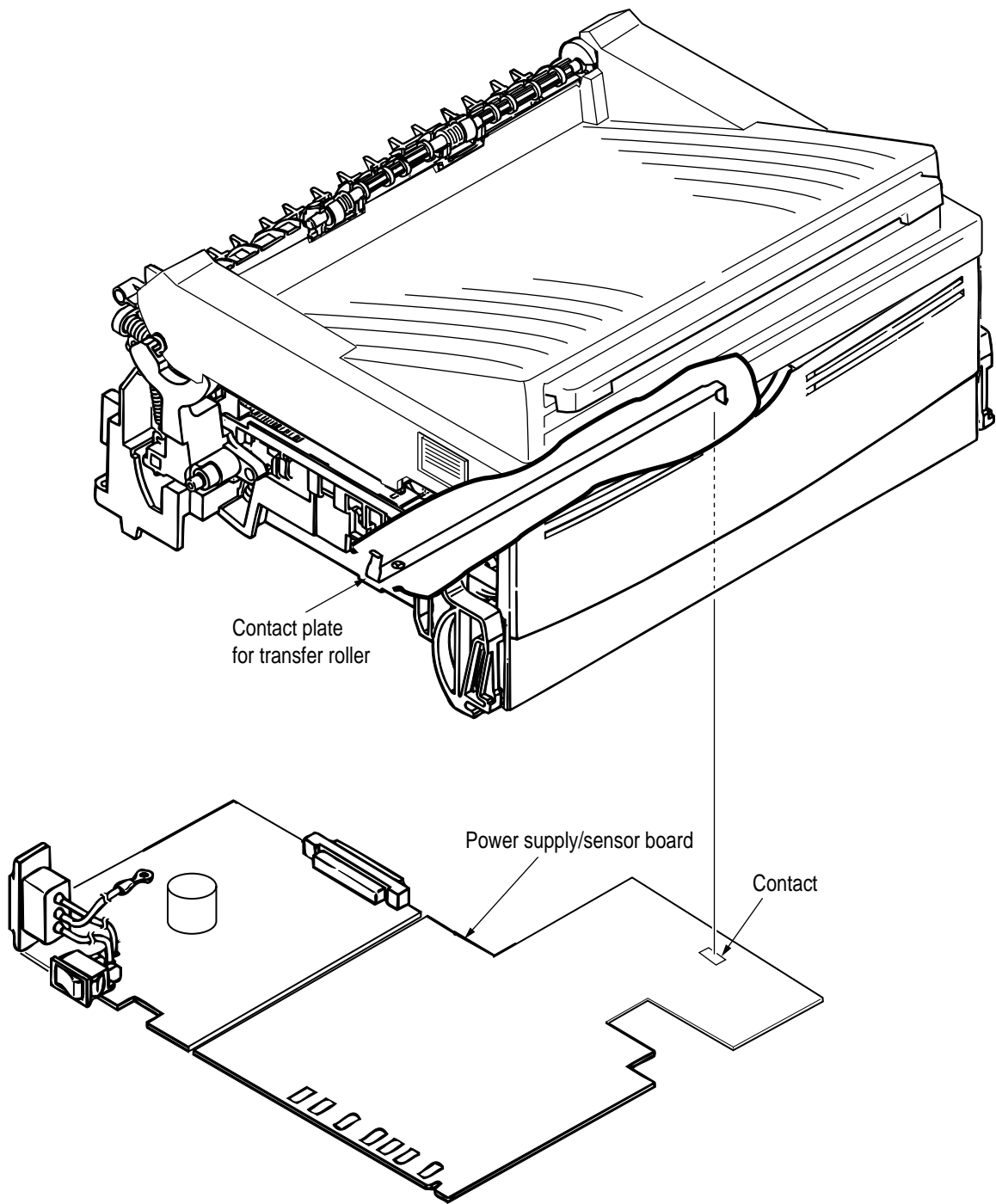
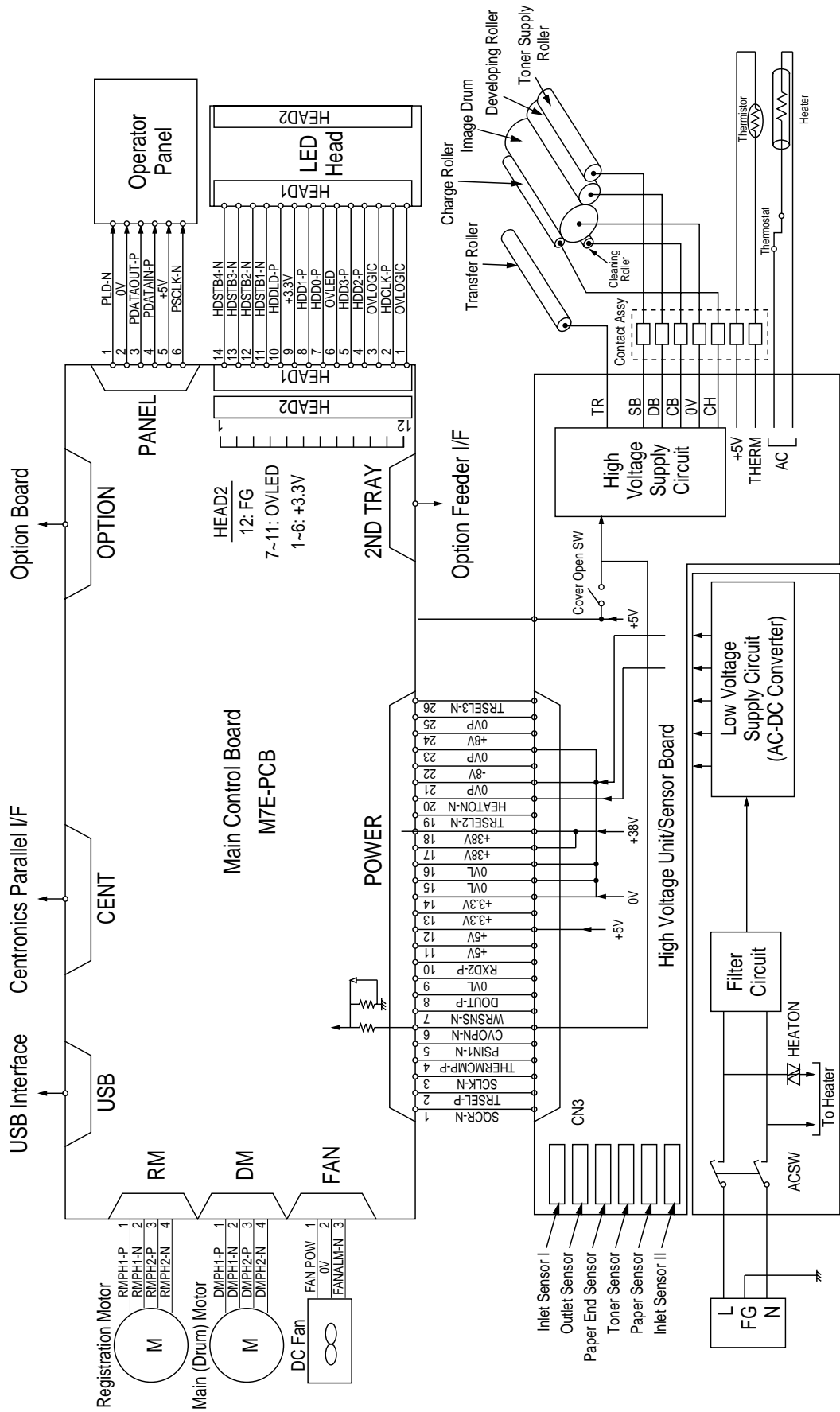


Figure 6-5



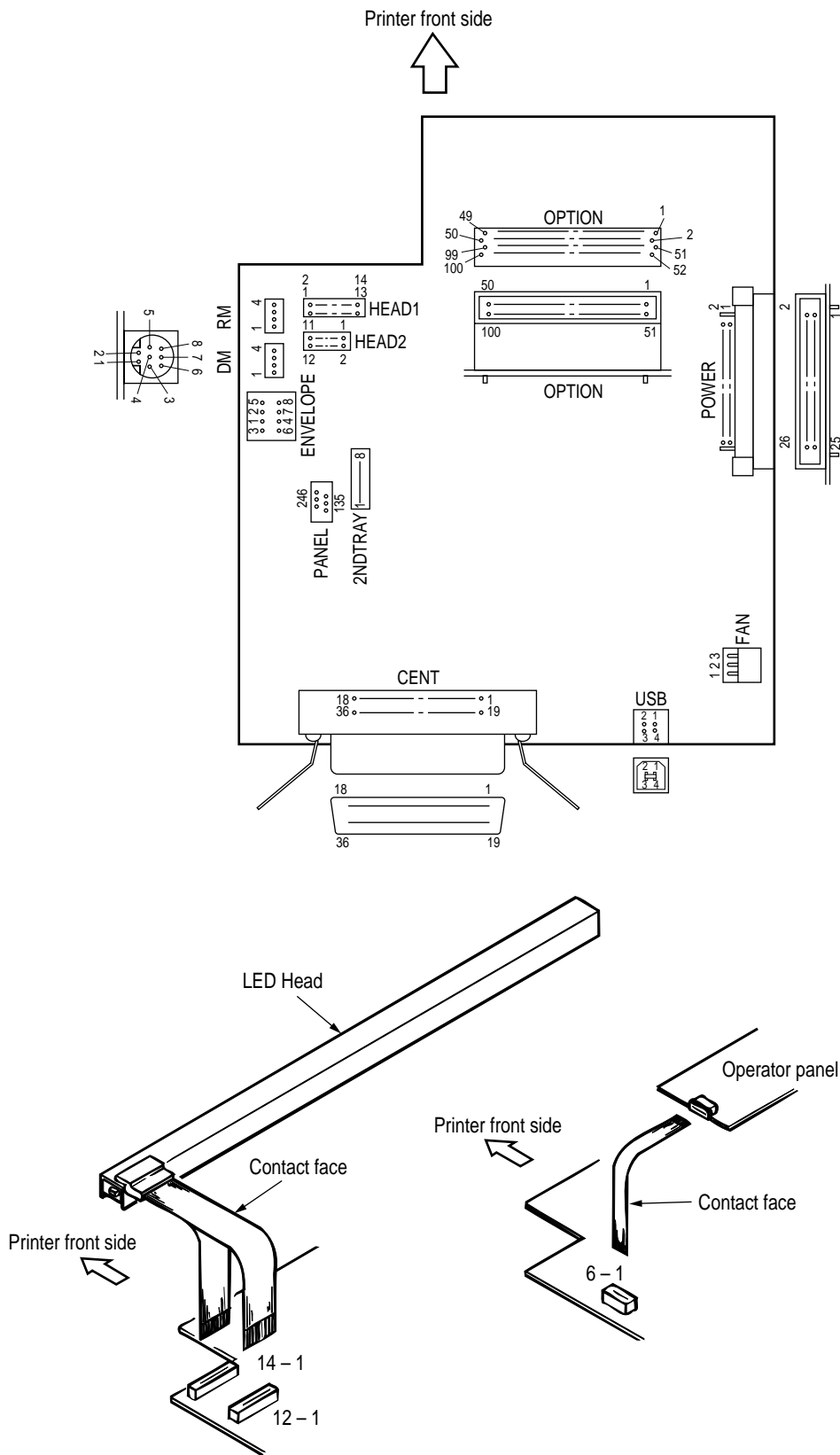
## 7. WIRING DIAGRAM

### 7.1 Interconnect Signal Diagram

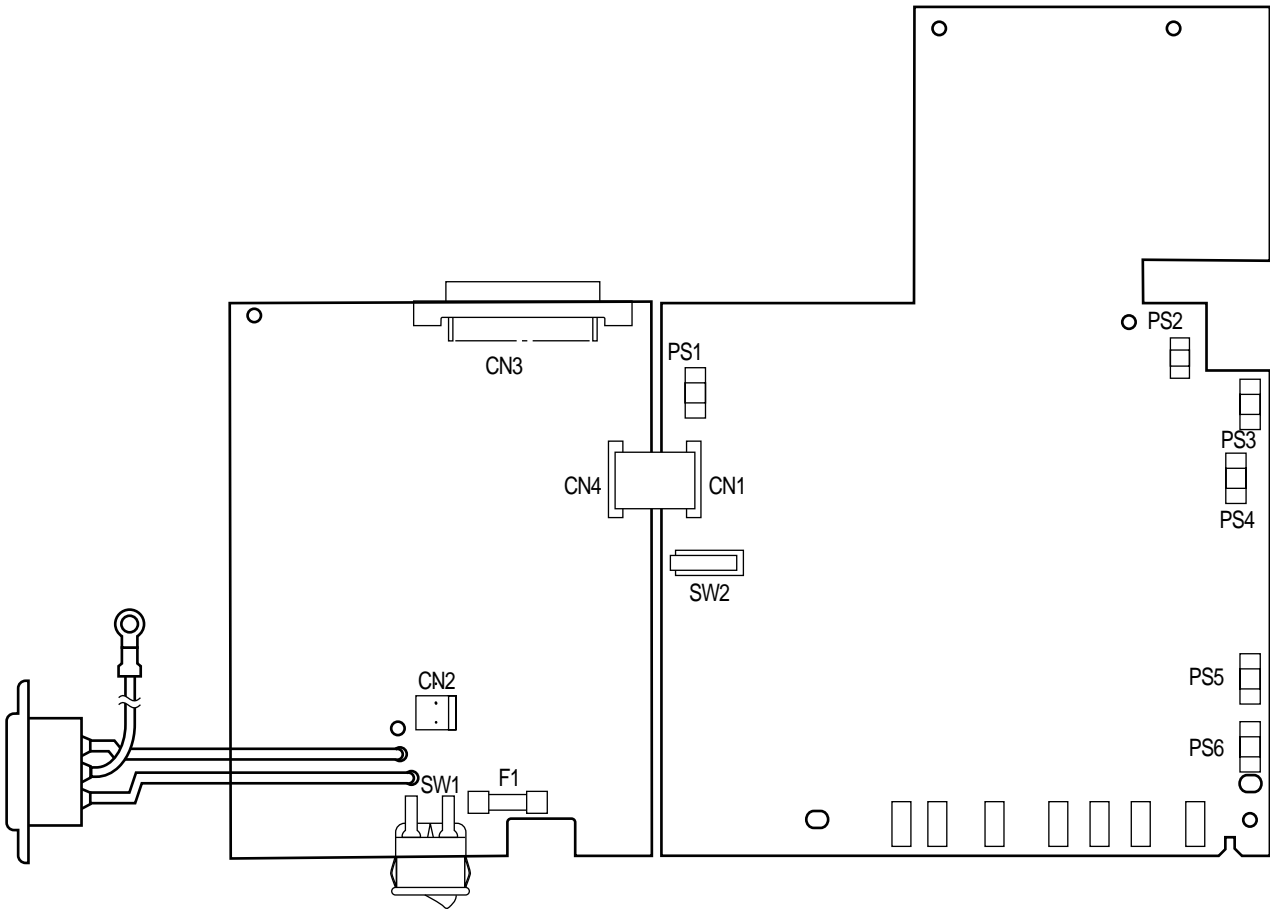


## 7.2 PCB Layout and Connector Signal List

### (1) Main Control Board (M7E-PCB)



(2) Power Supply/Sensor Board



- FAN Connector Pin Assignment  
(To fan motor)

		PIN NO.	I/O*	Signal	Description
Opening	1	1	O	FANPOW	Power supply for fan driving
	2	2	C	OV	Ground
	3	3	I	FANALM-N	Fan alarm

- DM Connector Pin Assignment  
(To main/drum motor)

		PIN NO.	I/O*	Signal	Description
1	1	1	O	DMPH1-P	Coil 1-N
2	2	2	O	DMPH1-N	Coil 1-P
3	3	3	O	DMPH2-P	Coil 2-N
4	4	4	O	DMPH2-N	Coil 2-P

#### Excitation sequence

PIN NO.	Line Color	Step No.			
		1	2	3	4
2	Yellow	+	-	-	+
4	Black	+	+	-	-
1	Orange	-	+	+	-
3	Brown	-	-	+	+

Rotary direction                      Clockwise viewed from the output axis.

- \* I: In
- O: Out
- C: Common

- RM Connector Pin Assignment  
(To registration motor)

	PIN NO.	I/O*	Signal	Description
1	1	O	RMPH1-P	Coil 1-N
2	2	O	RMPH1-N	Coil 1-P
3	3	O	RMPH2-P	Coil 2-P
4	4	O	RMPH2-N	Coil 2-N

\* I: In  
O: Out

Excitation sequence

PIN NO.	Line Color	Step No.			
		1	2	3	4
2	Yellow	+	-	-	+
4	Black	+	+	-	-
1	Orange	-	+	+	-
3	Brown	-	-	+	+

Rotary direction

Clockwise viewed from the output axis.

- HEAD1 Connector Pin Assignment  
(To LED head)

		PIN NO.	I/O*	Signal	Description
14		14	O	HDSTB4-N	Strobe 4
	13	13	O	HDSTB3-N	Strobe3
12		12	O	HDSTB2-N	Strobe 2
	11	11	O	HDSTB1-N	Strobe 1
10		10	O	HDDL-D-P	Load
	9	9	O	+3.3V	+3.3V power supply for LED driving
8		8	O	HDD1-P	Data 1
	7	7	O	HDD0-P	Data 0
6		6	C	OVLED	Ground for LED
	5	5	O	HDD3-P	Data 3
4		4	O	HDD2-P	Data 4
	3	3	C	OVLOGIC	Ground for logic
2		2	O	HDCLK-P	Clock
	1	1	C	OVLOGIC	Ground for logic

\* O: Out  
C: Common

- HEAD2 Connector Pin Assignment  
(To LED head)

		PIN NO.	I/O*	Signal	Description
1		1	O	+3.3V	+3.3V power supply for LED driving
	2	2	O		
3		3	O		
	4	4	O		
5		5	O		
	6	6	O		
7		7	C	OVLED	Ground for LED
	8	8	C		
9		9	C		
	10	10	C		
11		11	C		
	12	12	C	FG	FG

\* O: Out  
C: Common

- PANEL Connector Pin Assignment  
(To operator panel)

		PIN NO.	I/O*	Signal	Description
1		1	O	PLD-N	Load
	2	2	C	0V	Logic ground
3		3	O	PDATAOUT-P	Data output
	4	4	I	PDATAIN-P	Data input
5		5	C	5V	+5V power supply
	6	6	O	PSCLK-N	Clock

\* I: In  
O: Out  
C: Common

- ENVELOPE Connector Pin Assignment  
(To option feeder I/F)

		PIN NO.	I/O*	Signal	Description
5	8	1	O	PAPERIN-N	Paper sense 1
2	7	2	O	OPTSCLK-N	Clock
1	4	3	O	DATA-N	Data
3	6	4	I	PAPERIN-N	OPT send data ready
		5	C	OVP	Analog ground
		6	O	38V	+30V power supply
		7	C	0V	Logic ground
		8	O	5V	+5V power supply

\* I: In  
O: Out  
C: Common

- 2ND TRAY Connector Pin Assignment  
(To option tray I/F)

		PIN NO.	I/O*	Signal	Description
1		1	O	PAPERIN-N	Paper sense 1
2		2	O	OPTSCLK-N	Clock
3		3	O	DATA-N	Data
4		4	I	PAPERIN-N	OPT send data ready
5		5	C	OVP	Analog ground
6		6	O	38V	+30V power supply
7		7	C	0V	Logic ground
8		8	O	5V	+5V power supply

\* I: In  
O: Out  
C: Common

- POWER Connector Pin Assignment  
(To power supply/sensor board)

Pin No.	I/O*	Signal	Description	Pin No.	I/O*	Signal	Description
2	O	TRSEL-P	TR control switch	1	I	SQCR-N	Sequence clear signal of serial I/F
4	I	THERMCOMP-P	Heater temperature	3	I	SCLK-N	Clock signal of serial I/F
6	I	CVOPN-N	Cover open (+5V)	5	I	PSIN1-N	Paper sense
8	O	DOUT-P	Serial data output	7	I	WRSNS-N	Reading of paper edge
10	I	RXD2-P	Serial data input	9	C	OVL	Ground for logic
12	I	+5V	Logic circuit supply voltage	11	I	+5V	Logic circuit supply voltage
14	I	+3.3V	LED head supply voltage	13	I	+3.3V	LED head supply voltage
16	C	OVL	Logic ground	15	C	OVL	Logic ground
18	I	+38V	Motor and fan drive voltage and source voltage for high voltage supply	17	I	+38V	Motor and fan drive voltage and source voltage for high voltage supply
20	O	HEATON-N	Heater on	19	O	TRSEL2-N	TR control switch
22	I		NC	21	C	0VP	Analog
24	I	+12V	High voltage Supply	23	C	0VP	Analog
26	O	TRSEL3-N	TR control switch	25	C	0VP	Analog

\* O : Out

I : In

C : Common



• CENT Connector Pin Assignment  
(To Centro parallel I/F)

Pin No.	I/O*	Signal	Description	Pin No.	I/O*	Signal	Description
1	I	STROBE-N	Strobe	19	C	SG	Ground
2	C	DATA1-P	Data bit 0	20	C	SG	Ground
3	C	DATA2-P	Data bit 1	21	C	SG	Ground
4	C	DATA3-P	Data bit 2	22	C	SG	Ground
5	C	DATA4-P	Data bit 3	23	C	SG	Ground
6	C	DATA5-P	Data bit 4	24	C	SG	Ground
7	C	DATA6-P	Data bit 5	25	C	SG	Ground
8	C	DATA7-P	Data bit 6	26	C	SG	Ground
9	C	DATA8-P	Data bit 7	27	C	SG	Ground
10	O	ACK-N	Acknowledge	28	C	SG	Ground
11	O	BUSY-P	Busy	29	C	SG	Ground
12	O	PE-P	paper end	30	C	SG	Ground
13	O	SEL-P	Select	31	I	IPRIME-N	Input prime
14	I	AUTOFEED-N	Auto feed	32	O	FAULT-N	Fault
15		NC	Not connected	33	C	SG	Ground
16	C	SG	Ground	34		NC	Not connected
17	C	FG		35	O	HILEVEL	Always kept high
18	O	P-LOGIC-H	+5V power supply	36	I	SELIN-N	Select in

\* O : Out

I : In

C : Common

- USB Connector Pin Assignment  
(To USB I/F)

2	1
3	4

PIN NO.	I/O*	Signal	Description
1	I	Vcc	+5V Power
2	I/O	D-	USB Data
3	I/O	D+	USB Data
4	C	0V	Ground

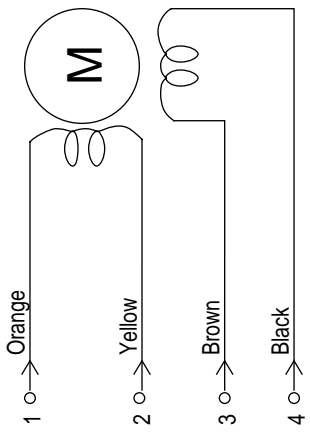
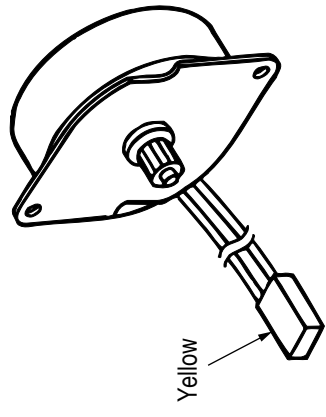
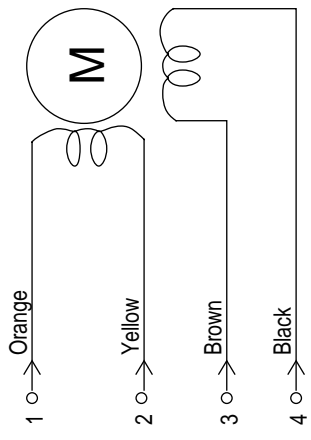
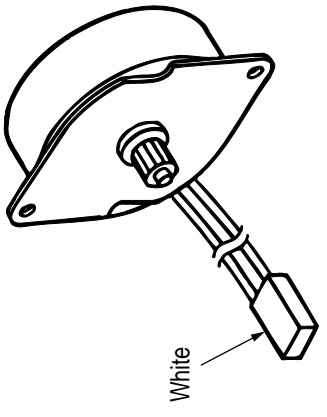
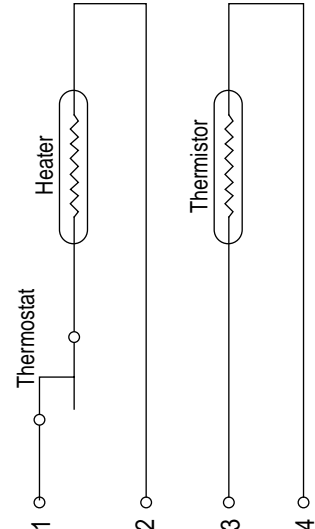
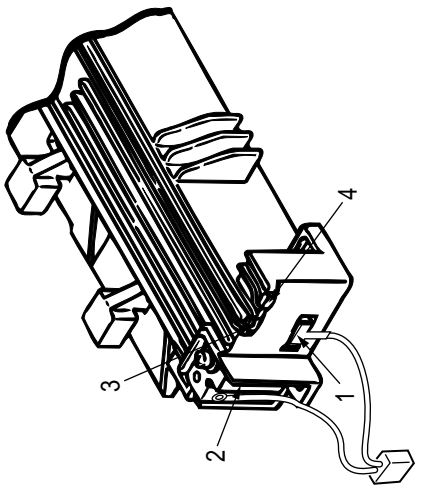
\* I: In  
 O: Out  
 C: Common

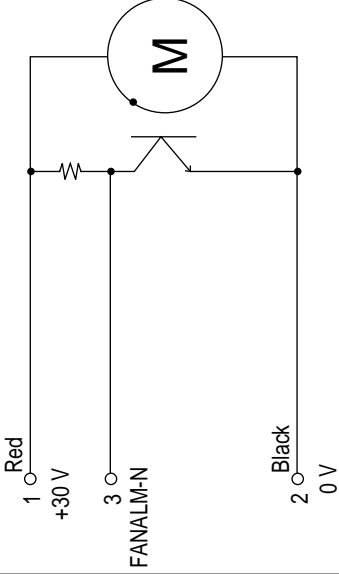
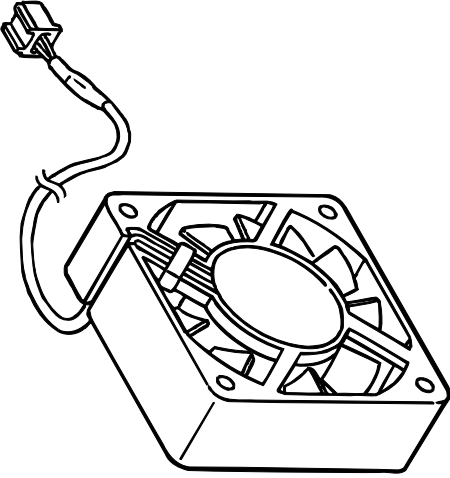
- OPTION Connector Pin Assignment  
(To option RAM or RS232C board)

Pin No.	I/O*	Signal	Description	Pin No.	I/O*	Signal	Description			
01		51	01	O	A0	OR write enable	51	I/O	D16	Data bit 16
	02		02	C	0V	Logic ground	52	I/O	D0	Data bit 0
03		53	03	O	A1	Address bit 1	53	I/O	D17	Data bit 17
	04		04	O	A2	Address bit 2	54	I/O	D1	Data bit 1
05		55	05	O	RS232C Data terminal ready	58	I/O	D18	Data bit 18	
	06		06	O	A3	Address bit 3	56	I/O	D2	Data bit 2
07		57	07	O	A4	Address bit 4	57	I/O	D19	Data bit 19
	08		08	C	0V	Logic ground	58	I/O	D3	Data bit 3
09		59	09	O	A5	Address bit 5	59	I/O	D20	Data bit 20
	10		10	O	A6	Address bit 6	60	I/O	D4	Data bit 4
11		61	11	O	+5V	Logic power supply	61	I/O	D21	Data bit 21
	12		12	O	A7	Address bit 7	62	I/O	D5	Data bit 5
13		63	13	O	A8	Address bit 8	63	I/O	D22	Data bit 22
	14		14	C	0V	Logic ground	64	I/O	D6	Data bit 6
15		65	15	O	A9	Address bit 9	65	I/O	D23	Data bit 23
	16		16	O	A10	Address bit 10	66	I/O	D7	Data bit 7
17		67	17	O	+5V	Logic power supply	67	I/O	D24	Data bit 24
	18		18	O	A11	Address bit 11	68	I/O	D8	Data bit 8
19		69	19	O	A12	Address bit 12	69	I/O	D25	Data bit 25
	20		20	C	0V	logic ground	70	I/O	D9	Data bit 9
21		71	21	O	A13	Address bit 13	71	I/O	D26	Data bit 26
	22		22	O	A14	Address bit 14	72	I/O	D10	Data bit 10
23		73	23	O	+5V	Logic power supply	73	I/O	D27	Data bit 27
	24		24	O	A15	Address bit 15	74	I/O	D11	Data bit 11
25		75	25	O	A16	address bit 16	75	I/O	D28	Data bit 28
	26		26	C	0V	Logic ground	76	I/O	D12	Data bit 12
27		77	27	O	A17	Address bit 17	77	I/O	D29	Data bit 29
	28		28	O	A18	Address bit 18	78	I/O	D13	Data bit 13
29		79	29	O	+5V	Logic power supply	79	I/O	D30	Data bit 30
	30		30	O	A19	Address bit 19	80	I/O	D14	Data bit 14
31		81	31	O	A20	Address bit 20	81	I/O	D31	Data bit 31
	32		32	C	0V	Logic ground	82	I/O	D15	Data bit 15
33		83	33	O	A21	Address bit 21	83	O	DRAS2-N	DRAM select 2
	34		34	O	A22	Address bit 22	84	O	DRAS3-N	DRAM select 3
35		85	35	O	A23	Address bit 23	85	O	DRAS4-N	DRAM select 2
	36		36	O	0V	Logic ground	86	O	DRAS5-N	DRAM select 5
37		87	37	O	0V	Logic ground	87	O	DCAS3-N	DCAS3
	38		38	C	0V	Logic ground	88	O	DCAS2-N	DCAS2
39		89	39	O	RS232C request to send	89	O	DCAS1-N	DCAS1	
	40		40	O	CS1-N	ROM/SRAM select 1	90	O	DCAS0-N	DCAS0
41		91	41	O	CS2-N	ROM/SRAM select 2	91	O	RD-N	RD-N
	42		42	O	CS3-N	ROM/SRAM select 3	92	O	WR-N	WR-N
43		93	43	I	SCRREQ-P	SCC send request	93	I	INT1-N	Interrupt request 1
	44		44	C	0V	Logic ground	94	I	INT2-N	Interrupt request 2
45		95	45	I	SCSREQ-P	SCC receive request	95	O	EEPRMCS1-P	EEPROM select
	46		46	O	IOS0-N	I/O select 0	96	O	EEPRMCLK-P	EEPROM clock
47		97	47	O	IOS1-N	I/O select 1	97	C	SSTXD-P	EEPROM data
	48		48	O	RSTXD0-N	RS232C send data	98	I	DRDY-N	Data read
49		99	49	O	-8V	RS232C line voltage	99	C	+8V	RS232C line voltage
	50		50	I	RSRXD0-P	RS232C receive data	100	O	RESET-N	Reset signal

\* O : Out  
I : In  
C : Common

### 7.3 Resistance Check

Unit	Circuit Diagram	Illustration	Resistance
Registration motor			<p>Between Pins 1 and 2: 18.6Ω                      Between Pins 3 and 4: 18.6Ω</p>
Main/drum motor			<p>Between Pins 1 and 2: 4.2Ω                      Between Pins 3 and 4: 4.2Ω</p>
Fusing unit			<p>Between Pins 1 and 2: 120V 3Ω                      240V 10Ω                      Between Pins 3 and 4: 220KΩ                      (at room temperature)</p>

Unit	Circuit Diagram	Illustration	Resistance
Fan	 <p>1 Red +30 V</p> <p>3 FANALM-N</p> <p>2 Black 0 V</p> <p>M</p>		

# 8. PARTS LIST

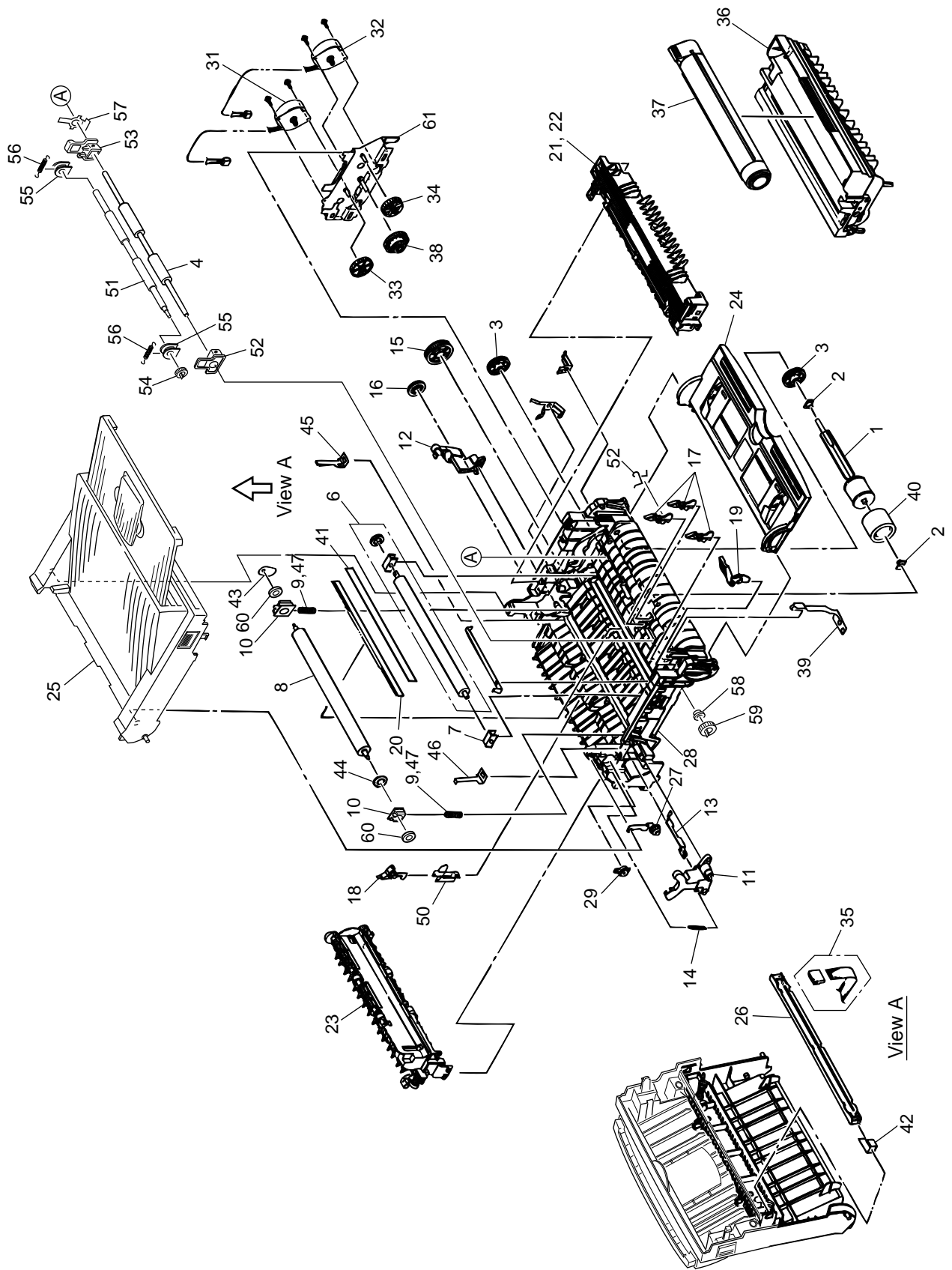


Figure 8-1 Lower Base Unit

Table 8-1 Lower Base Unit (1/2)

No.	Name/Rating	Part No.	Use	Remarks
1	Hopping roller shaft	51112601	1	
2	Bearing	51607402	2	
3	Hopping roller one-way clutch gear	51228901	2	
4	Roller registration	41281101	1	
5	Bearing (registration)	51607501	1	
6	Roller-Transfer Assy	40437802	1	
7	Bearing TR	40438001	1	
8	Roller Back-up	41301801	1	
9	Spring Bias	41584101	2	
10	Holder BU	41536201	2	
11	Reset lever L	50805801	1	
12	Reset lever R	50805901	1	
13	Cover open switch arm	53068901	1	
14	Stacker cover reset spring	50924201	1	
15	Fuser roller idle gear	51229101	1	
16	Eject roller idle gear	51229201	1	
17	Sensor plate (inlet)	51010701	3	
18	Lever eject sensor Assembly	40771401	1	
19	Toner sensor (adhesion)	50405501	1	
20	Diselectrification bar	51010903	1	
21	Heat Assy - OP14 ex / i	40470107	1	120V
22	Heat Assy - OP14 ex / i	40470108	1	230V
23	Roller assy - Eject	40772501	1	
24	Manual feed guide assy	40715501	1	
25	Stacker-Assy	41423101	1	
26	LED head unit - 51LS	41366001	1	
27	Stacker cover damper arm	53069101	1	
28	Frame subassy	41453901	1	
29	Stacker cover damper	51229401	1	
30				
31	Motor-Pulse (main)	41301901	1	
32	Motor-Pulse (regist)	40722301	1	
33	Gear-Idle A (Z60/20)	41279001	1	
34	Gear-Idle B (Z45/16)	41279101	1	
35	Cord-LED Assembly	40241702	1	
36	Image drum unit	41331601	1	ODA
	Image drum unit	41331602	1	OEL
	Image drum unit	41331603	1	APS
37	Toner Cartridge	40433203	1	Starter (2.5k)
	Toner Cartridge (Type 8)	41331701	1	Replacement (4k)

Table 8-1 Lower Base Unit (2/2)

No.	Name/Rating	Part No.	Use	Remarks
38	Gear-Reduction	41279201	1	
39	FG plate (O.P.)	53347201	1	
40	Hopping roller rubber	53342401	1	
41	Diselectrification Film	52203802	1	
42	LED Contact	51014601	1	
43	Washer C	50517201	1	
44	Washer B	50517201	1	
45	Spacer-Bearing R	41583901	1	
46	Spacer-Bearing L	41584001	1	
47	Bias spring A	41599601	2	Special parts for envelope *
48				
49				
50	Sensor wire Assembly	41027701	1	
51	Roller-Pressure	41281001	1	
52	Holder-Regist L	41279501	1	
53	Holder-Regist R	41279601	1	
54	Gear-Pressure	41279801	1	
55	Bearing-Pressure	41279401	2	
56	Spring-Tension	41281201	2	
57	Plate-Contact PA	41280401	1	
58	Bearing-Regist L	41279301	1	
59	Gear-Regist	41279701	1	
60	Bearing-Ball	41584201	2	
61	Bracket-Motor	41280001	1	

\* This part is counter-measure for envelope wrinkle.  
Both side springs must be exchanged at the same time.



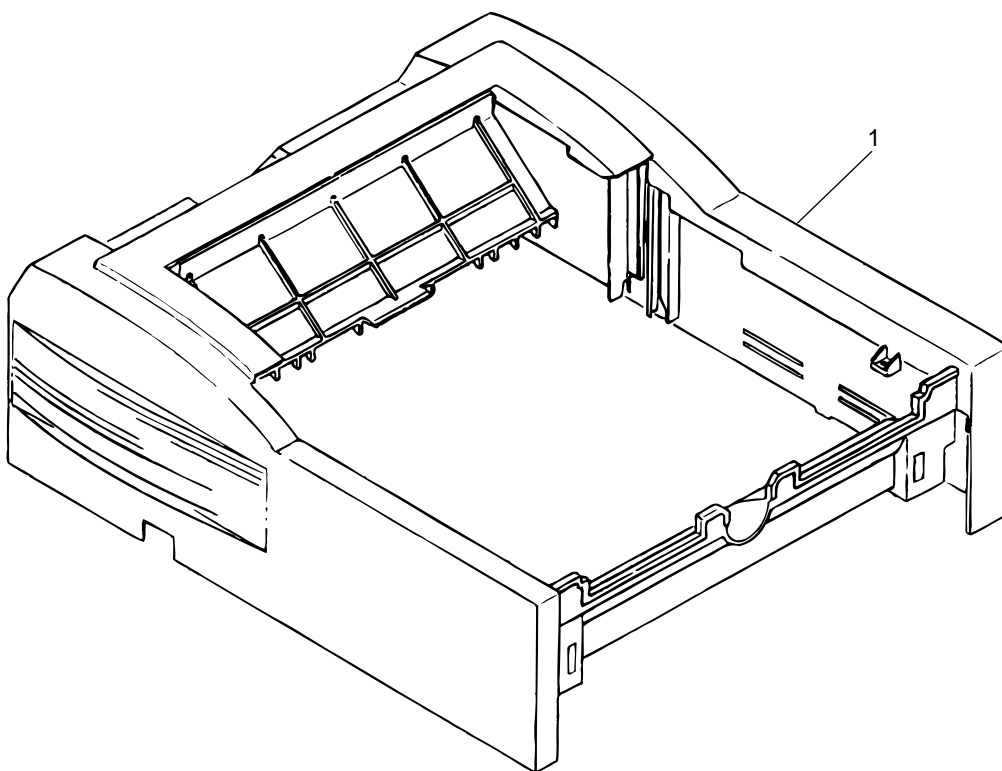


Figure 8-2 Upper cover unit

Table 8-2 Upper cover unit

No.	Name/Rating	Part No.	Use	Remarks	
1	Cover-Upper	40715101	1		

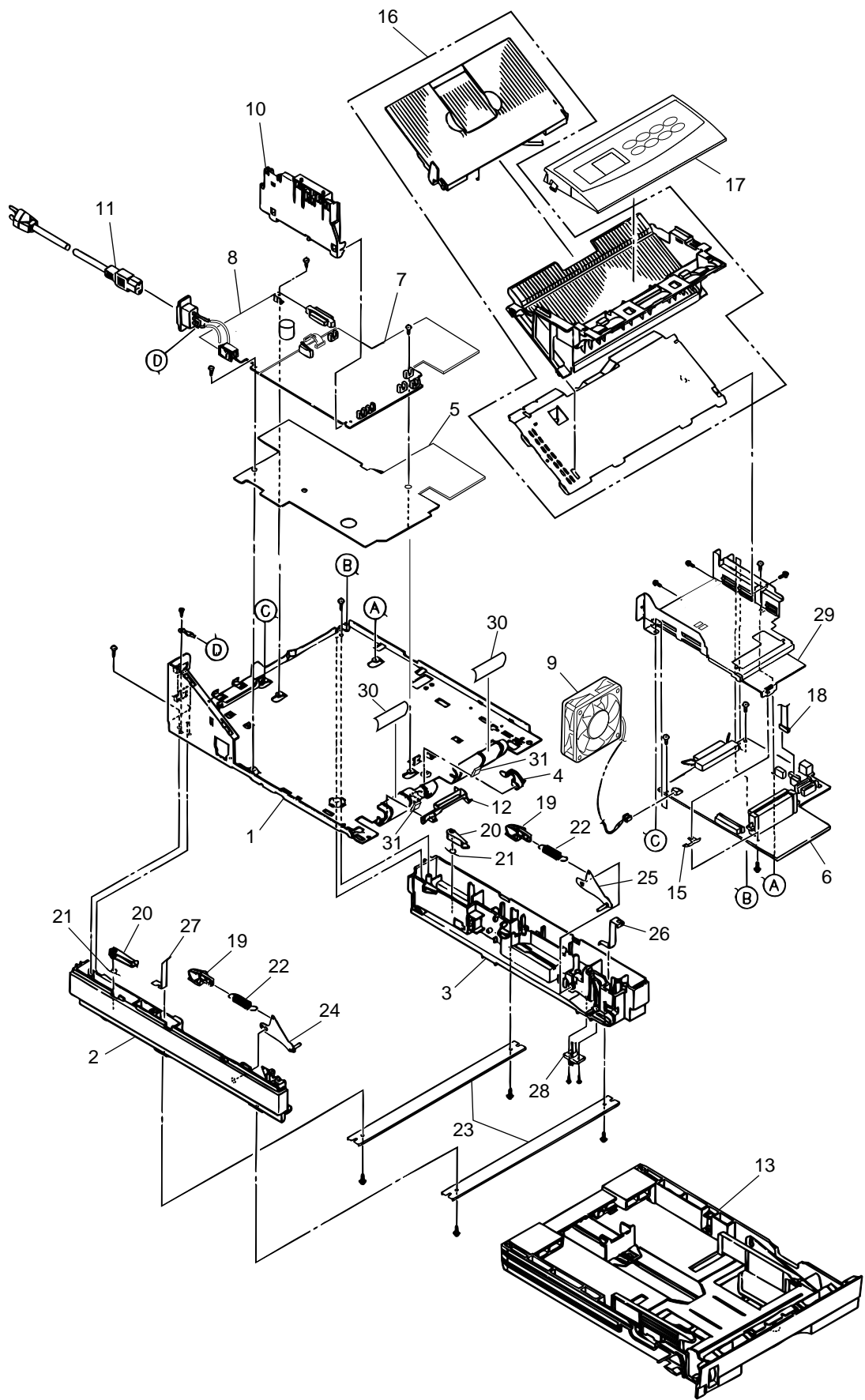


Figure 8-3 Base unit

Table 8-3 Base unit

No.	Name/Rating	Part No.	Use	Remarks	
1	Plate base	41279901	1		
2	Cassette guide (L) assy	51011201	1		
3	Cassette guide (R) assy	51011301	1		
4	Sensor plate (paper supply)	51011401	1		
5	Plate-Insulator	41301601	1		
6	Board-M7E	41249206	1		
7	PCB Assy-HV1	41228501	1		
8	Power supply Unit	41087901	1	120V	
	Power supply Unit	41088001	1	230V	
9	Fan motor	41454401	1		
10	Contact assy	41445801	1		
11	AC cord	56609701	1	120V	
	AC cord	56624301	1	220~240V	
12	Cassette sensor plate	51011501	1		
13	Cassette Assy-Paper	40473001	1		
14					
15	Earth plate	51011601	1		
16	Face up stacker cover assy	51011301	1		
17	Frame Assy-OP Panel	40715207	1	ODA/OEL/INT	
18	Card assy /OP	41445901	1	120V	
19	Link pull block	53345201	2		
20	Cassette lock lever	50808401	2		
21	Cassette lock lever spring	50929501	2		
22	Sheet spring	50919901	2		
23	Beam	51608801	2		
24	Sheet link L assy	50808501	1		
25	Sheet link R assy	50808601	1		
26	FG plate (2nd)	51023701	1		
27	FG plate (bm)	51023601	1		
28	Connector cord		1		
29	Plate Guide-PCB	41301701	1		
30	Polyethylene Tape		2	L=91.5mm	
31	Guide-Paper H	40828301	2		
32	CS-RING(CS3-SUS)	50709102	2		
33	Board-MN6	40755408	1	APS	
	Board-MN8	41047304	1	APS	

## Appendix A RS-232C SERIAL INTERFACE (option)

### 1) Connector

- Printer side : 25-pin receptacle  
Type DB-25S (made by Canon) or equivalent
- Cable side : 25-pin plug  
Type DB-25S (made by Canon)  
Shell  
Type DB-C8-J10-F2-1 (made by Nihon Kouku Denshi) or equivalent

**Note:** Plug shall be fixable with a lock screw.

### 2) Cable

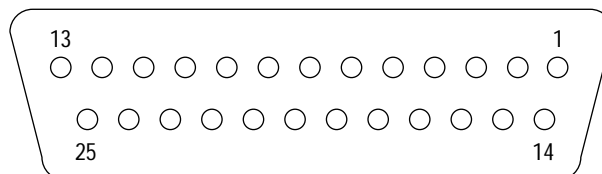
- Cable length : 6 ft (1.8 m) max. (cable shall be shielded)

**Note:** Cable is not provided.

### 3) Interface signal

Pin No.	Signal name	Abbreviation	Signal direction	Functions
1	Frame Ground	FG		Frame Ground
2	Transmitted Data	TD	← PR	Transmitted Data
3	Received Data	RD	→ PR	Received Data
4	Request to Send	RTS	← PR	Stay space level
5	-			(Not connected)
6	-			(Not connected)
7	Signal Ground	SG		Signal Ground
9	-			(Not connected)
17	-			(Not connected)
18	-			(Not connected)
19	-			(Not connected)
20	Data Terminal Ready	DTR	← PR	Data terminal ready
21	-			(Not connected)
25	-			(Not connected)

- Connector pin arrangement



(View from the cable side)

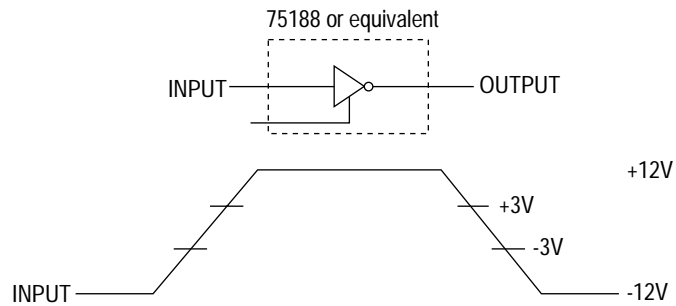
When the Ready/Busy protocol is used for the buffer busy control method, the busy signal can be set to Pin-20 (DTR) in the menu.

4) Signal Level

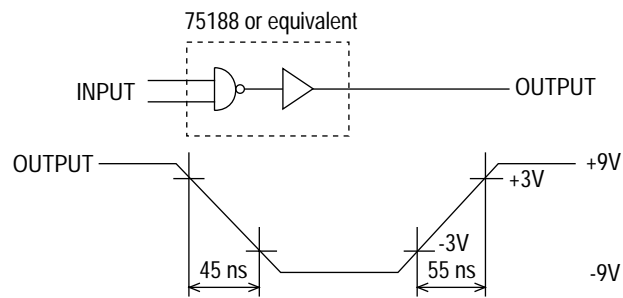
- MARK polarity : -3V to -15V (LOGIC = 1)
- SPACE polarity : +3V to +15V (LOGIC = 0)

5) Interface Circuit

a) Receiving Circuit



b) Sending Circuit



**Note:** The signal levels described above is for the case where  $3K \Omega \times 15pF$  is connected to the terminal.

6) Receive Margin

37% min. at all reception rates.

7) Communications Protocol

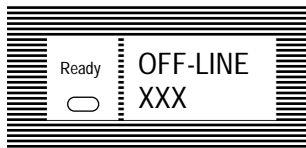
- READY/BUSY protocol
- X-ON/X-OFF protocol

## 8) Interface Parameter Setting

The following settings are possible by pressing the ENTER key, after selecting the display contents of the LCD of the operator panel by using the ◀ and ▶ keys.

Settings are retained even when the printer power is turned off.

By pressing the ON LINE key, menu setting mode is completed and the printer returns to on-line state.



XXX : PCL, AUTO, HEX DUMP, PRR or FX

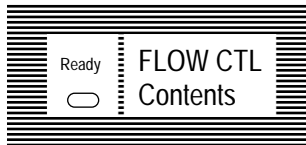


Keep the MENU key down for more than 2 seconds and bring the printer into menu setting mode (level 2). Next, press the MENU key 10 times.



"RS232C SERIAL" is displayed on the LCD.

Press the ENTER key.



Item	Flow CTL
Contents of Display	Function
DTR HI	SPACE-READY
DTR LO	MARK-READY
XONXOFF	
RBSTXON	Sending at intervals of 1 sec.

Factory Setting: DTR HI



Press the MENU key.

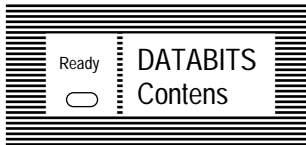


Item	Baud Rate
Contents of Display	Function
300	300 baud
600	600 baud
1200	1200 baud
2400	2400 baud
4800	4800 baud
9600	9600 baud
19200	19200 baud

Factory Setting: 9600 baud



Press the MENU key.



Item	Bit Length
Contents of Display	Function
8 BITS	8 bits
7 BITS	7 bits

Factory Setting: 8 bit



Press the MENU key.



Item	Parity
Contents of Display	Function
NONE	No parity
EVEN	Even parity
ODD	Odd parity

Factory Setting: NONE





Press the MENU key.



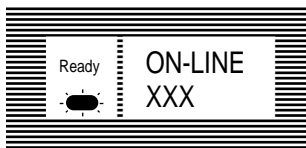
Item	Minimum BUSY Time
Contents of Display	Function
200 m SEC	200 ms
1 SEC	1 sec (1000 ms)

Factory Setting: 200 m SEC

(PCL only)



Press the ON LINE key.



Setting completed.

XXX : PCL, AUTO, HEX DUMP, PRR or FX

## Appendix B CENTRONICS PARALLEL INTERFACE

### 1) Connector

- Printer side : 36-pin receptacle  
(single port) Type 57RE-40360-730B-D29A (made by Daiichi Denshi), CN-AX05841A36AT (made by Ougat) or equivalent
- Cable side : 36-pin plug  
Type 57-30360 (made by Daiichi Denshi) or equivalent  
Plug-552274-1 (AMP), 552073-1 (AMP) or equivalent

### 2) Cable

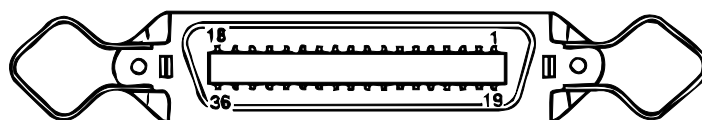
- Cable length : 6 ft (1.8 m) max.  
(A Shielded cable composed of twisted pair wires is recommended for noise prevention.)

**Note:** Cable is not supplied with the printer, and is not available from Oki.

### 3) Table of Parallel I/F Signals

Pin No.	Signal name	Signal direction	Functions
1	$\overline{\text{DATA STROBE}}$	→ PR	Parallel data sampling strobe
2	DATA BIT - 1		
3	DATA BIT - 2		
4	DATA BIT - 3		
5	DATA BIT - 4	→ PR	PR Parallel input and output data
6	DATA BIT - 5		
7	DATA BIT - 6		
8	DATA BIT - 7		
9	DATA BIT - 8		
10	$\overline{\text{ACKNOWLEDGE}}$	← PR	Completion of data input or end of a function
11	BUSY	← PR	During print processing or alarm
12	PAPER END	← PR	End of paper
13	SELECT	← PR	Select state (ON-LINE)
14	$\overline{\text{AUTOFEED}}$	→ PR	Request to change mode
15	-		(Not used)
16	0V		Signal ground
17	CHASSIS GROUND		Chassis ground
18	+5V	← PR	50 mA max.
19 ⋮ 30	0V		Signal ground
31	$\overline{\text{INPUT PRIME}}$	→ PR	Initializing signal
32	$\overline{\text{FAULT}}$	← PR	End of paper or during alarm
33	-		Signal ground
34	-		(Not used)
35	-		High level (3.3 kΩ)
36	$\overline{\text{SELECT IN}}$	→ PR	Request to change mode

- Connector pin arrangement



#### 4) Signal Level

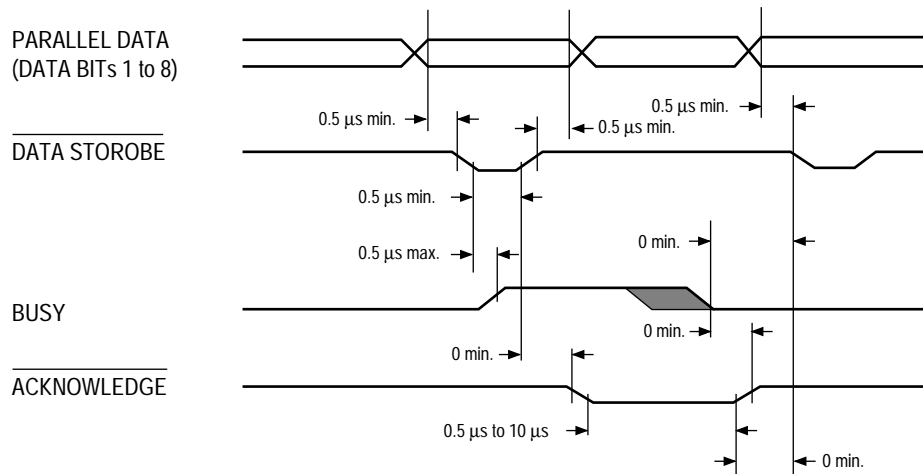
- LOW : 0 V to +0.8 V
- HIGH : +2.4 V to 5.0 V

#### 5) Specifications

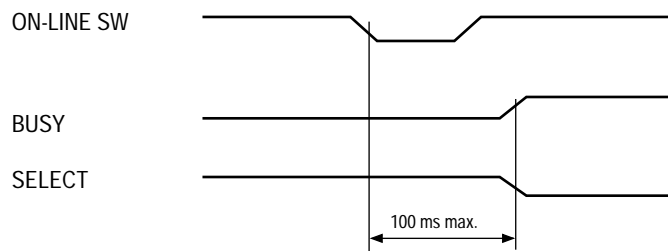
Item	Description
Mode	Compatibility mode, Nibble mode, ECP mode
Data bit length	8 bits (in the compatibility mode)
Input prime	Valid/Invalid
Receive buffer	8K, 20K, 50K, 100K, 1M Bytes
Control	Handshaking control is performed in each mode. Data received from the host is stored in the receive buffer. Busy control is performed. Signal lead control is performed.

## 6) Timing Charts

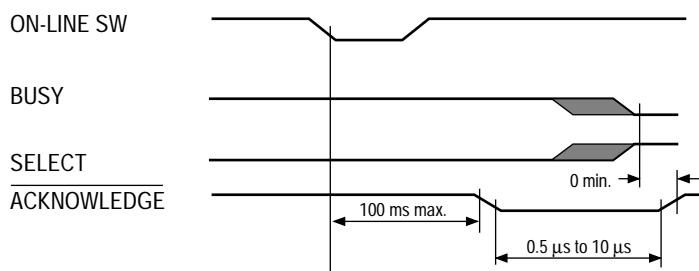
### a) Data receiving timing



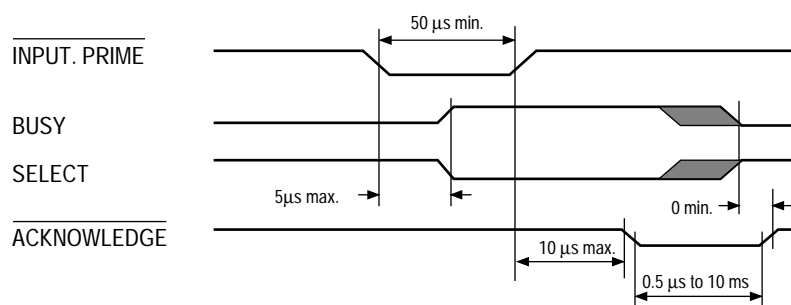
### b) On-line → off-line switching timing by ON-LINE SW



### c) Off-line → on-line switching timing by ON-LINE SW



### d) INPUT PRIME timing (when set to the effective INPUT PRIME signal)

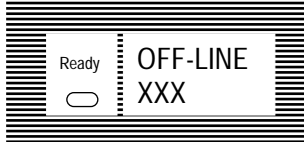


## 7) Interface Parameter Setting

The following settings are possible by pressing the ENTER key, after selecting the display contents of the LCD of the operator panel by using the ◀ and ▶ keys.

Settings are retained even when the printer power is turned off.

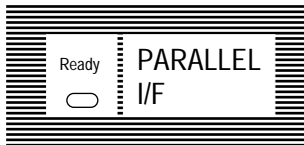
By pressing the ON LINE key, menu setting mode is completed and the printer returns to on-line state.



XXX : PCL, AUTO, HEX DUMP, PRR or FX



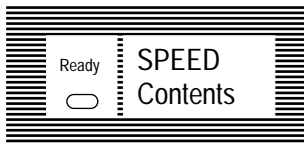
Keep the MENU key down for more than 2 seconds and bring the printer into menu setting mode (level 2). Next, press the MENU key 9 times.



"PARALLEL I/F" is displayed on the LCD.



Press the ENTER key.



Item	Data Transfer Speed
Contents of Display	Function
HIGH	High speed
MEDIUM	Normal speed

Factory Setting: HIGH



Press the MENU key.



Item	Direction of Data Transfer
Contents of Display	Function
ENABLE	Bi-directional data transmission
DISABLE	Uni-directional data transmission

Factory Setting: ENABLE



Press the MENU key.

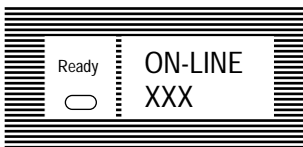


Item	I-PRIME
Contents of Display	Function
OFF	I-PRIME signal ignored
ON	I-PRIME signal effective

Factory Setting: OFF



Press the ON LINE key.



Setting completed.

XXX : PCL, AUTO, HEX DUMP, PRR or FX

## Appendix C Universal Serial Bus (USB)

Universal Serial Bus Specification Revision 1.1 compliance.

1) Connector

- Printer Side : "B" Receptacle (Upstream Input to the USB Device)
- Cable Side : Series "B" Plug

2) Cable

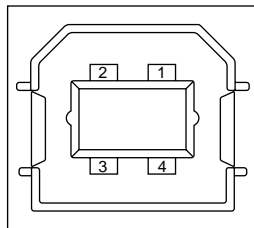
- Cable Length : Max 5m (A cable must be met USB Spec Rev 1.1 for normal operation)

**Note:** Cable is not provided.

3) Table of USB I / F signals

Contact Number	Signal Name
1	Vbus
2	D -
3	D +
4	GND
Shell	Shield

4) Connector pin arrangement



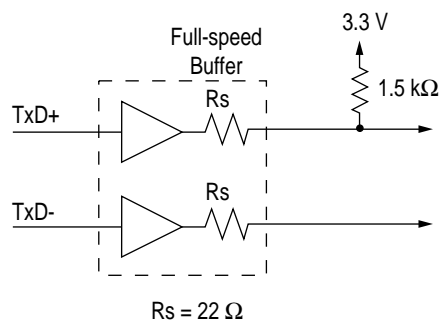
5) Mode & Class of Device

- Full - speed Driver
- Self - powered Device

6) Data Signaling Rate

- Full - speed function - 12Mb/s

7) Interface circuit





8) Signal Level

• Input / Output Level

Parameter	Symbol	Min.	Max.	Units
Input Levels :				
High (driven)	V <sub>IH</sub>	2.0		V
High (floating)	V <sub>IHZ</sub>	2.7	3.6	V
Low	V <sub>IL</sub>		0.8	V
Output Levels :				
Low	OL	0.0	0.3	V
High (driven)	OH	2.8	3.6	V
Output Signal Crossover Voltage	V <sub>CRS</sub>	1.3	2.0	V

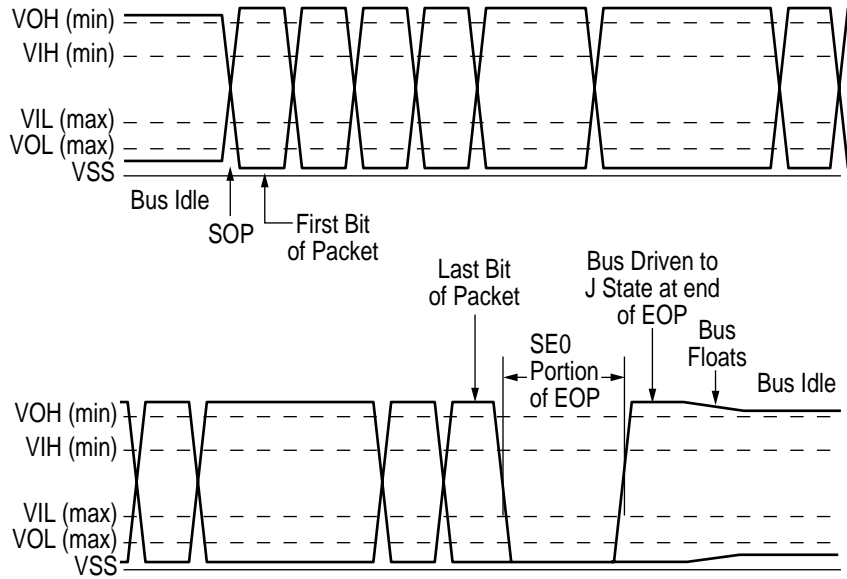
• Signaling Levels

Bus State	Signaling Levels	
	Required	Acceptable
Differential "1"	(D+) - (D-) > 200mV and D+ > V <sub>IH</sub> (min)	(D+) - (D-) > 200mV
Differential "0"	(D-) - (D+) > 200mV and D- > V <sub>IH</sub> (min)	(D-) - (D+) > 200mV
Single-ended 0 (SE0)	D+ and D- < V <sub>IL</sub> (max)	D+ and D- < V <sub>IH</sub> (min)
Data J state:		
Low-speed	Differential "0"	
Full-speed	Differential "1"	
Data K state:		
Low-speed	Differential "1"	
Full-speed	Differential "0"	
Idle state:		
Low-speed	D- > V <sub>IHZ</sub> (min) and D+ < V <sub>IL</sub> (max)	D- > V <sub>IHZ</sub> (min) and D+ < V <sub>IH</sub> (min)
Full-speed	D+ > V <sub>IHZ</sub> (min) and D- < V <sub>IL</sub> (max)	D+ > V <sub>IHZ</sub> (min) and D- < V <sub>IH</sub> (min)
Resume state	Data K state	
Start-of-Packet (SOP)	Data lines switch from Idle to K state	
End-of-Packet (EOP)	SE0 for ≥ 1 bit time <sup>1</sup> followed by a J state for 1 bit time	SE0 for ≥ 1 bit time <sup>1</sup> followed by a J state
Disconnect (at downstream port)	SE0 for ≥ 2.5μs	
Connect (at downstream port)	Idle for ≥ 2ms	Idle for ≥ 2.5μs
Reset	D+ and D- < V <sub>IL</sub> (max) for ≥ 10ms	D+ and D- < V <sub>IL</sub> (max) for ≥ 2.5μs

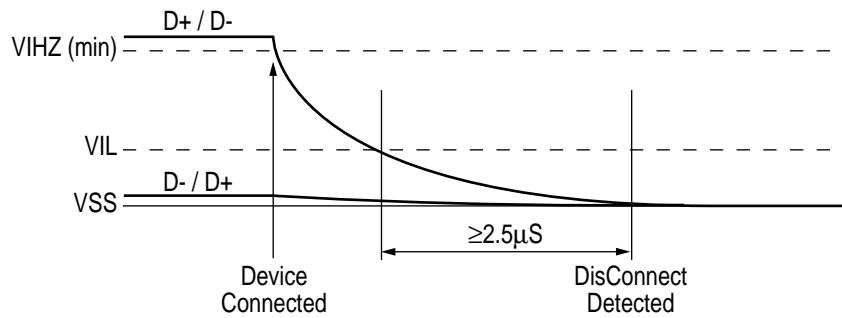
**Note:** The width of EOP is defined in bit times relative to the device type receiving the EOP. The bit time is approximate.

9) Timing Chart

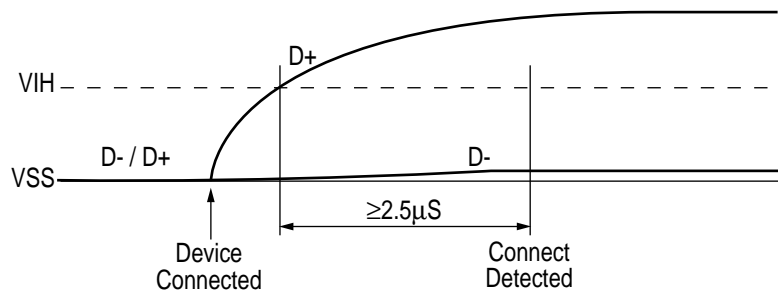
a) Packet Voltage Levels



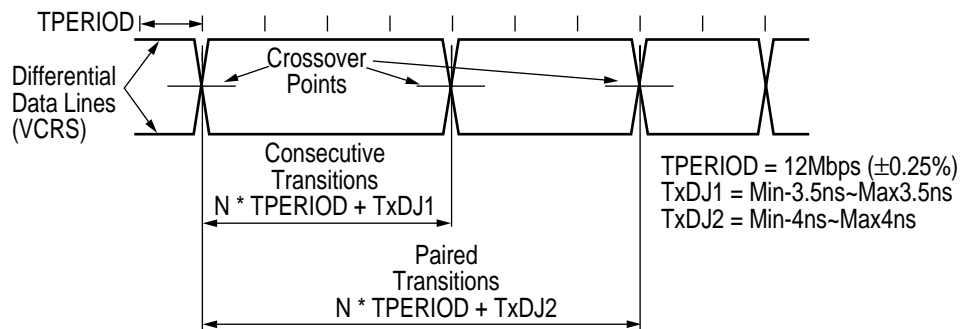
b) Disconnect Detection



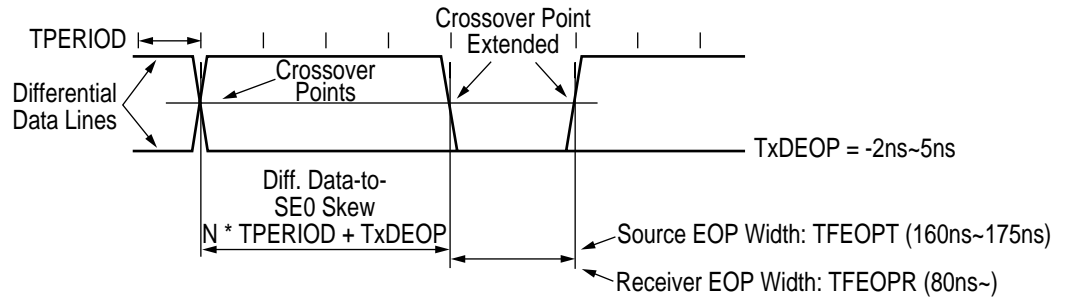
c) Full-speed Device Connect Detection



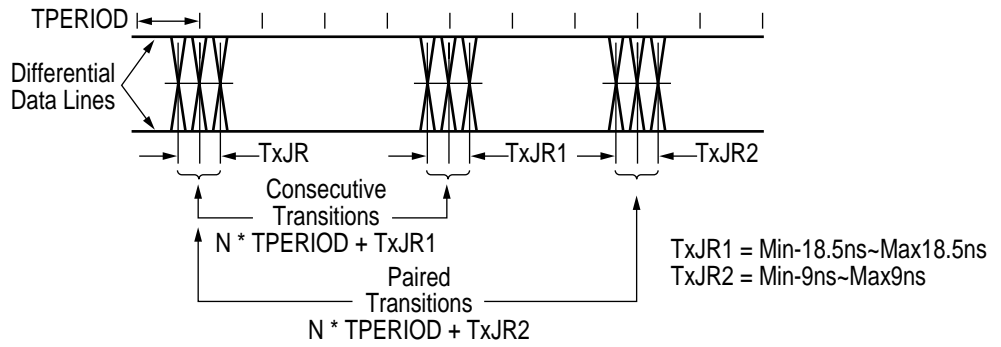
d) Differential Data Jitter



e) Differential-to-EOP Transition Skew and EOP Width

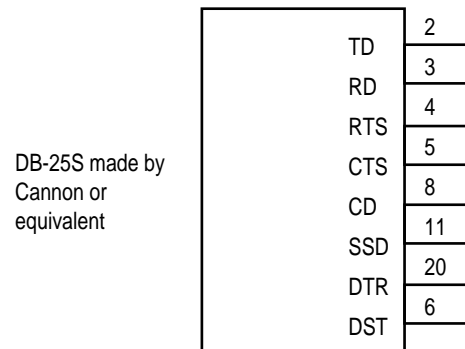


f) Receiver Jitter Tolerance



## Appendix D LOOP TEST (RS-232C INTERFACE)

- 1) Connect the test connector



Test Connector Connection Diagram

- 2) Select "LOOP Test" in the system maintenance mode.  
The codes transmitted from the TD signals are comparatively checked with the data received from the RD signals. If any error occurs, the error message is displayed on the LCD.

## Appendix E    **DIAGNOSTICS TEST**

### **1.    Maintenance Modes**

- The maintenance modes consist of the user maintenance mode which is released to the user, and the system and engine maintenance modes in the maintenance personnel level are not released to the user.
- Press the MENU key to update each category. The operation returns to the first category after updating the last category, in a loop.
- Press the Enter key to execute the function being displayed.
- To exit from any of these modes during a category display, press the *Recover* or ON LINE key and the operation mode will start.

#### **1.1    User Maintenance Mode**

- To enter the user maintenance mode, turn the power on while keeping the MENU key pressed down.
- This mode uses the menu for function selection.
- The user maintenance mode provides the following functions:
  - (1) Hex Dump
    - The data received from the host is printed in hexadecimal notation to the printer.
    - Printing is activated automatically when the received data exceeds one page. If the received data is less than one page, printing can be activated manually by pressing the FORM FEED key after deselecting the on-line mode by pressing the ON LINE key (automatic activation of printing even when the received data is less than one page is possible by selecting the Auto Eject function on the menu).
    - The only way to exit from this mode is by turning the power off.
  - (2) Menu Reset
    - All settings for Menu level-1 are reset to factory default values. The menus for all executable emulations, including options, are reset to factory default values.(See Table 4-1)
    - The operation mode starts automatically upon completion of resetting.
  - (3) Drum Counter Reset
    - This function resets the drum life data when the user replaces the image drum unit.
    - The operation mode starts automatically upon completion of resetting.
  - (4) X-Adjust / Y-Adjust
    - This function sets the first character printing position on the first line.
    - The operation mode starts automatically upon completion of resetting.

(5) Operator Panel Menu Disable

- This function is for enabling and disabling the operation panel menu functions (Menu 1, Menu 2, Tray Select, Copies and Paper Size).

(6) Receive Buffer Area size

(7) ECP Receive Disable

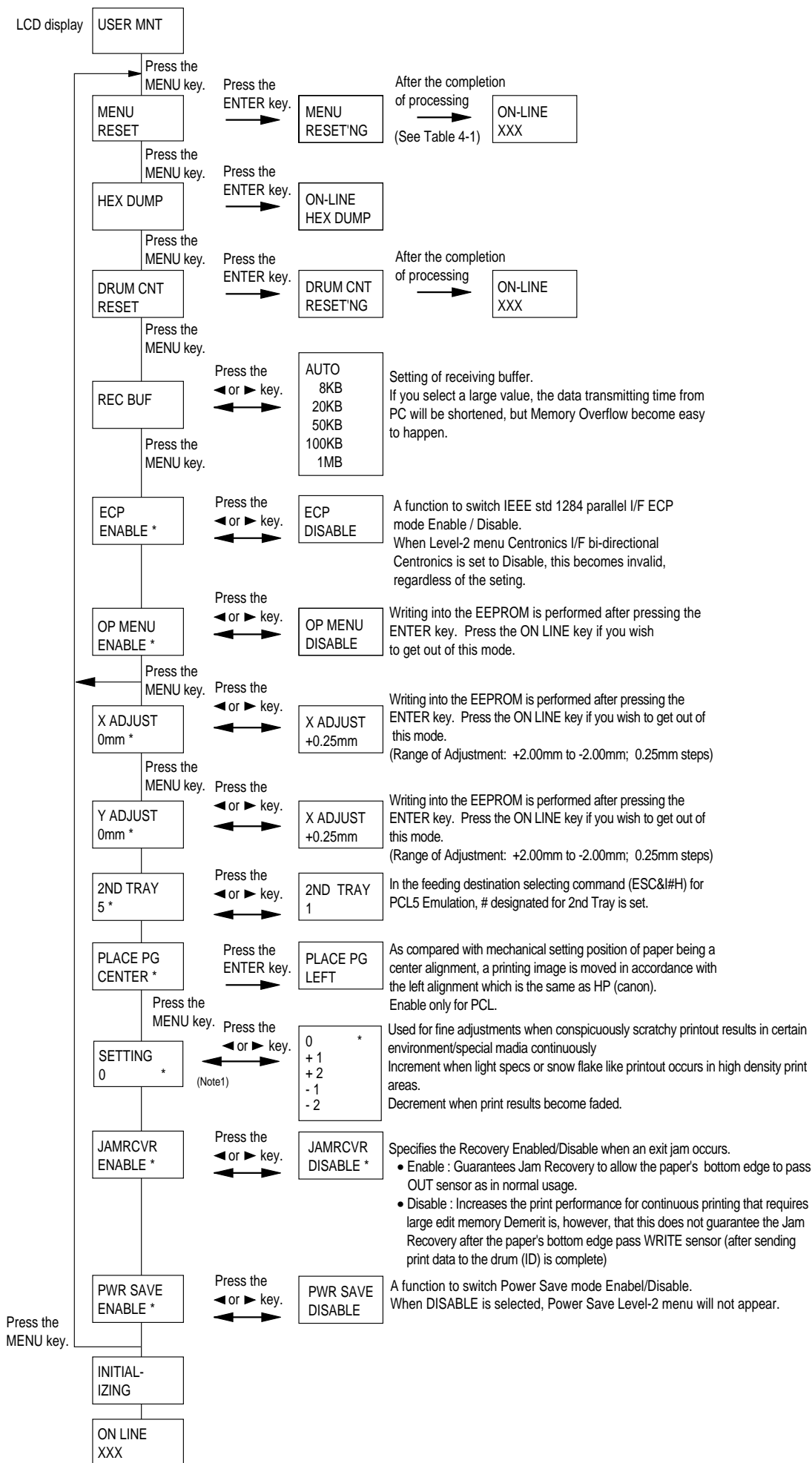
(8) Designated for 2nd Tray command for PCL5 Emulation is set.

(9) Place Page

(10) Setting

(11) Jam Recovery & Print Performance for continuous mode

(12) Power Save Mode Disable



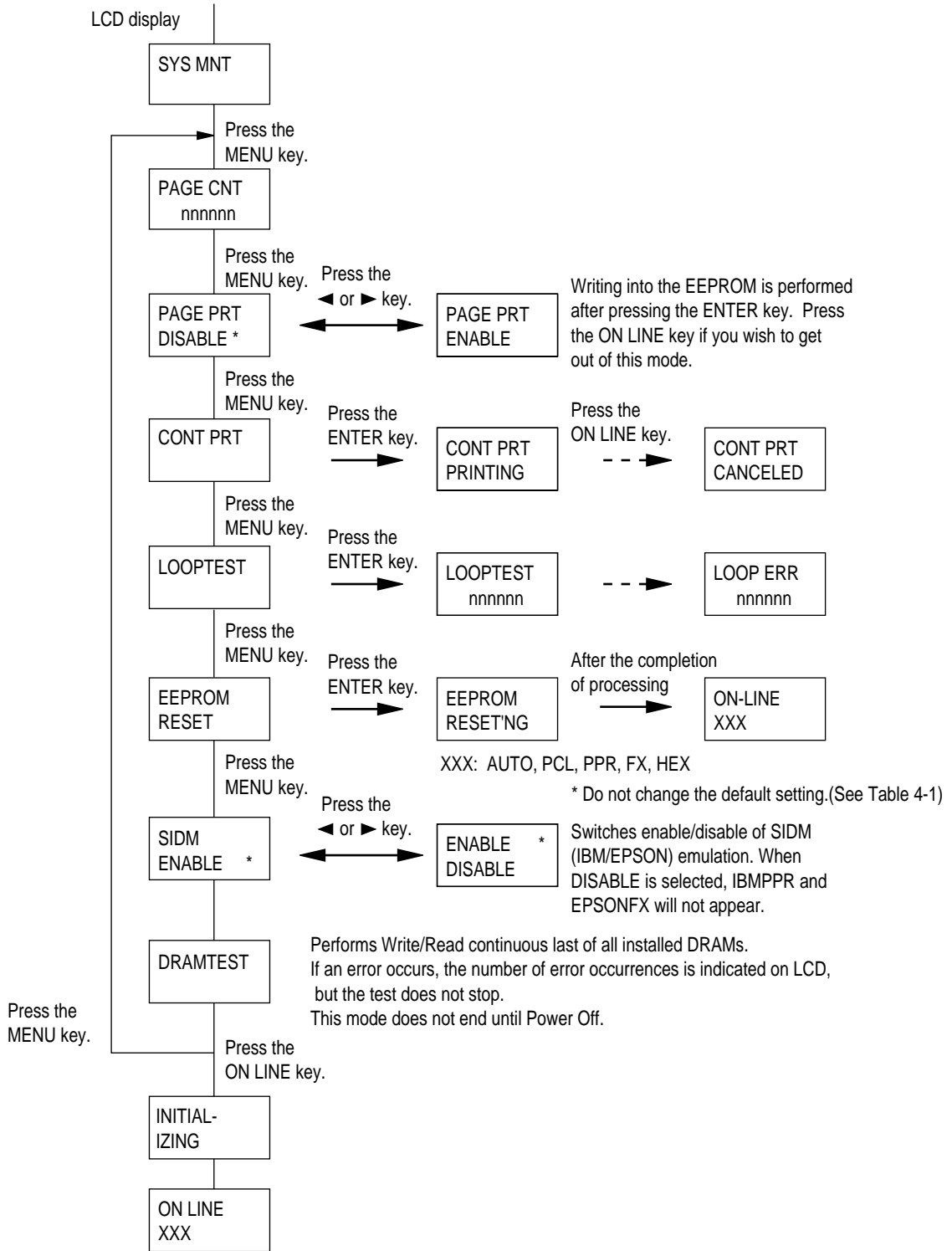
## 1.2 System Maintenance Mode

- To enter the system maintenance mode, turn the power on while keeping the *Recover* key pressed down.
- This mode adopts the menu for function selection.
- The system maintenance mode provides the following functions:
  - (1) Page Count Display
    - The total number of pages counted at the engine block is displayed on the LCD.
  - (2) Page Count Printing Enable/Disable
    - This function allows the selection to include (enable) or exclude (disable) the total number of printed pages counted at the engine block at the time of menu printing.
  - (3) Rolling ASCII Continuous Printing
    - The rolling ASCII pattern is printed continuously for various engine tests.
    - Press the ON LINE key to cancel this mode.
  - (4) Loop Test
    - The loop test is for testing the serial I/F functions without connecting the printer to the host.
    - The data is sent and received by loop back in the loop test.
    - The loop test is performed even when another interface is being selected in Menu level-2.
    - Installation of the loop connector is necessary for the loop test (refer to Appendix C, LOOP TEST (RS-232C INTERFACE)).
    - The realtime loop count is displayed on the LCD.
    - When an error occurs in the course of the test, the corresponding error message is displayed on the LCD.
    - Press the ON LINE key to cancel this mode.
  - (5) EEPROM Reset
    - All EEPROM areas, including Menu level-2 are set to the factory default values. (See Table 4-1)
    - The following items are excluded:
      - LED head drive time setting
      - Fine adjustment of printing start position
      - Standard tray paper feed amount setting
    - Transition to the operation mode occurs upon completion of resetting.
    - Press the MENU key to update each category. The operation returns to the first category after updating the last category, in a loop.



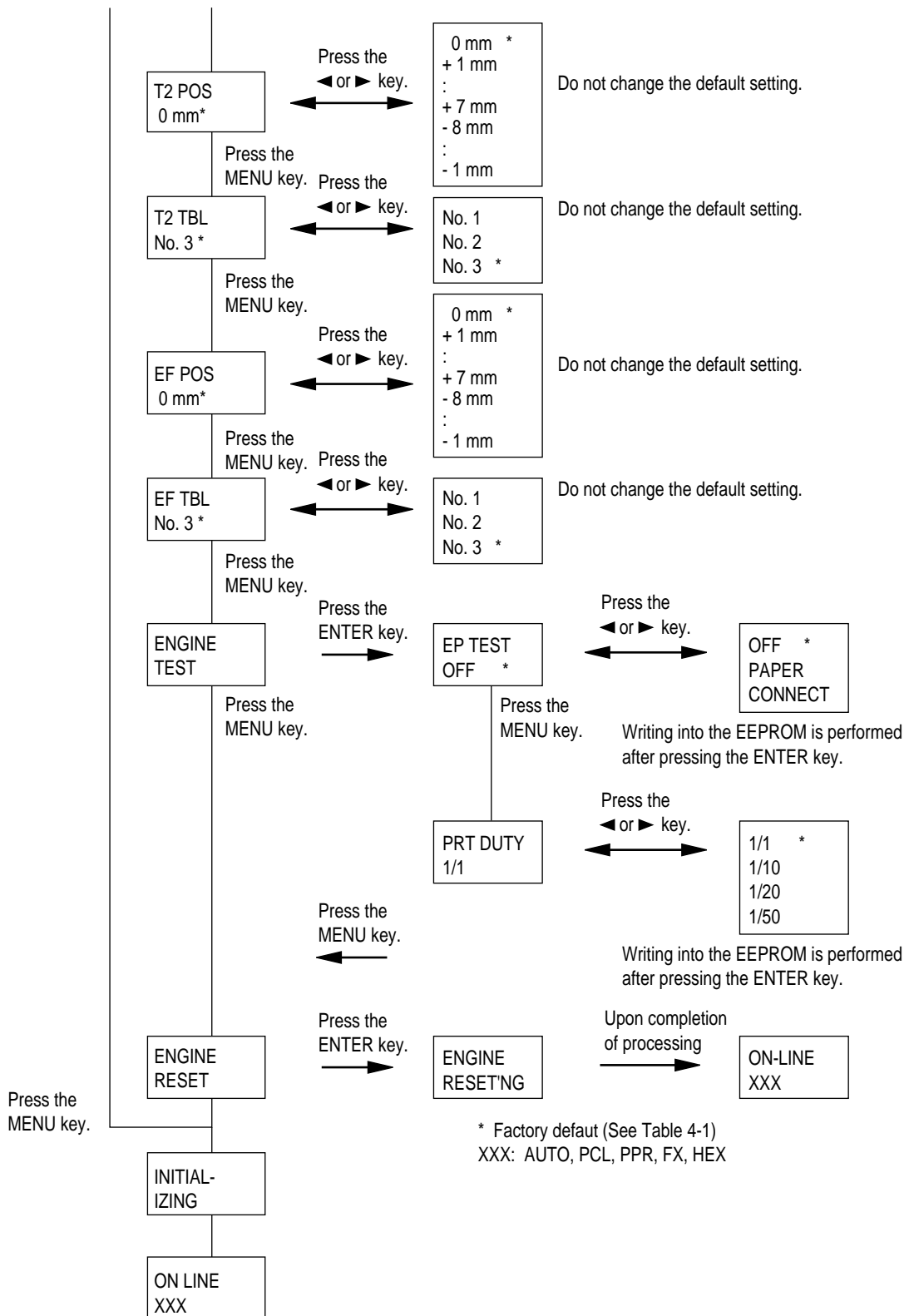
- (6) SIDM Emulation Disable
- (7) DRAM Memory Test
- (8) System Maintenance Mode Menu System

### 1.3 Engine Maintenance Mode



- The engine maintenance mode is activated when the power is turned ON while keeping the FORM FEED key and ENTER key pressed down.
- This mode adopts the menu for function selection.
- The method for exit from this mode depends on the setting.
- The engine maintenance mode provides the following functions:
  - (1) Head Drive Time Setting
    - Sets the drive time of the LED head.
  - (2) 600 x 1200 DPI strobe time
    - Do not change the default setting.
  - (3) Printing Start Position Setting
    - Sets the printing start position.
  - (4) Drum Count Total Display
    - Displays on the LCD the total number of drum revolutions of the unit, counted at the engine block.
  - (5) Drum Count Display
    - Displays on the LCD the total number of EP drum revolutions counted at the engine block.
  - (6) Factory Adjustment (for High Capacity Second Paper Feeder/Power Envelope Feeder)
    - Do not change the default settings since these are factory settings and were set at the factory.
  - (7) Engine Reset
    - No items subjected to, All except counters are subjected to reset, As a common spec. (See Table 4-1)





## 1.4 User Factory Set Operation

The desired destination can be set by turning the power on while depressing two keys corresponding to the destination according to the following table.

This function shall not be open for users.

Destination	Keys to be Depressed
ODA	MENU    ▷
OEL	MENU    ◁
INT A (A4) (Australia, etc.)	MENU, PAPER SIZE
INT L (Letter) (Singapore, etc.)	MENU, TRAY TYPE

## APPENDIX F MULTI PURPOSE FEEDER MAINTENANCE

### 1. OUTLINE

#### 1.1 Functions

This Multi-Purpose Feeder is installed on the front section of the printer, and it supplies paper automatically through the operation of pulse motor, which is driven by signals sent from the printer. The main functions are the followings:

- Paper that can be used:

[Paper Types]

- Standard paper: Xerox 4200 (20-lb)
- Special paper: OHP sheets (for PPC), label sheets (PPC sheets)  
\* Not guaranteed for OHP sheets with attachments on the edge or reverse side.
- Cut sheet size: Letter, Executive, A4, A5, B5, A6
- Special size:  
Width: 3.425 to 8.504 in.  
Length: 5.827 to 11.69 in.

[Weight and Thickness]

- 16-lb to 32-lb (60~128 g/m<sup>2</sup>)
- For labels and OHP Sheets: Label sheets: 0.003937 to 0.005906 in.  
OHP sheets: 0.00315 to 0.004331 in.

\* When using sheets which exceed 24-lb, make sure that the paper exits through the face-up route.

#### 1.2 External View and Component Names

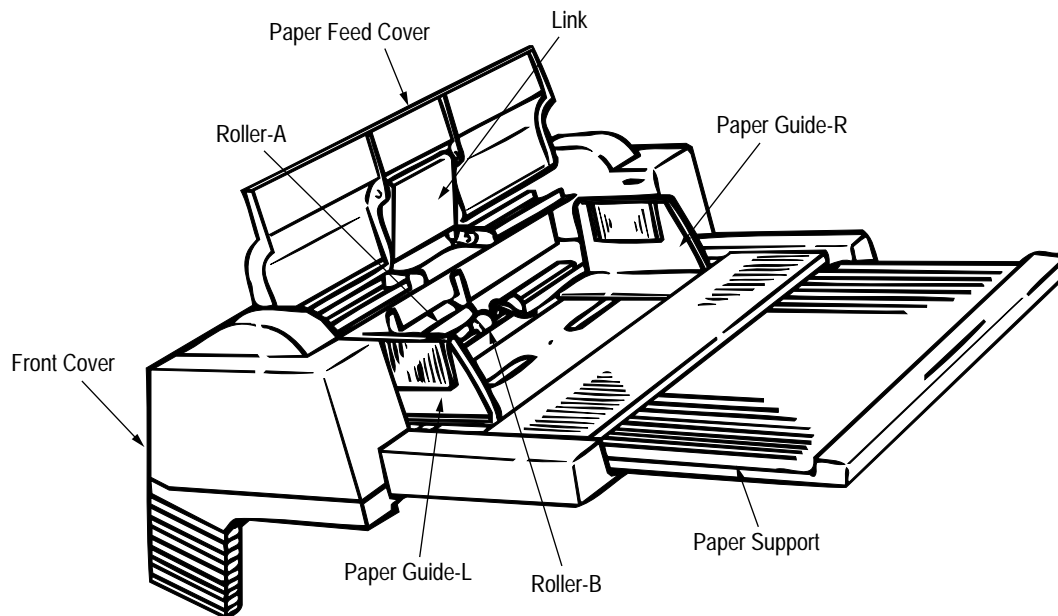


Figure 1-1

## 2. MECHANISM DESCRIPTION

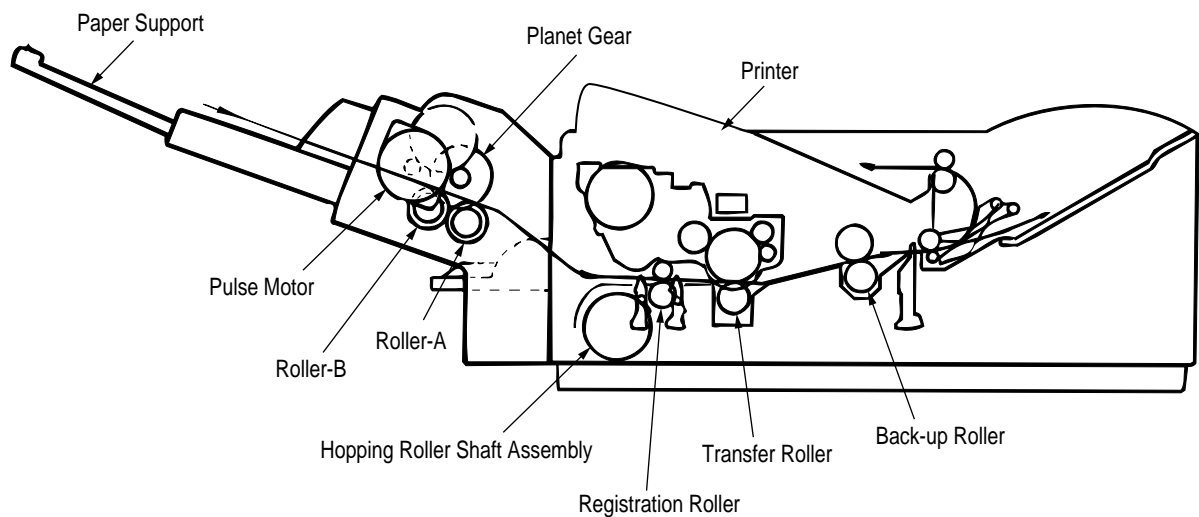
### 2.1 General Mechanism

The Multi-Purpose Feeder feeds the envelopes and paper into the printer by receiving the signal from the printer, which drives the pulse motor inside the Multi-Purpose Feeder, and this motion is transmitted to rotate roller-A and B. The envelope or paper is delivered from the separator into the printer.

Once delivered into the printer, the envelope or paper is then controlled and fed through by pulse motor (registration) of the printer.

### 2.2 Hopper Mechanism

The hopper automatically feeds the printer with the envelope or paper being set, one sheet at a time. After the envelope or paper is set in the Multi-Purpose Feeder, the pulse motor moves the envelope or paper and a single envelope or paper is fed into the printer.



### **3. PARTS REPLACEMENT**

This section covers the procedures for the disassembly, reassembly and installation in the field. This section describes the disassembly procedures, and for reassembly procedures, basically proceed with the disassembly procedures in the reverse order.

#### **3.1 Precautions Concerning Parts Replacement**


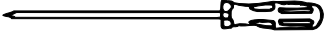

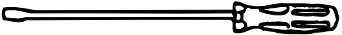



- (1) Parts replacements must be carried out, by first turning the printer power switch off "O" and removing the Multi-Purpose Feeder from the printer.
- (2) Do not disassemble the Multi-Purpose Feeder if it is operating normally.
- (3) Establish the extent of disassembly suitable for the purpose of the procedure, and do not disassemble any more than necessary.
- (4) Only specified service tools should be used.
- (5) Disassembly must be carried out according to the prescribed procedures. Parts may be damaged if such procedures are not followed.
- (6) Small parts such as screws and collars can easily be lost, therefore these parts should be temporarily replaced in their original location.
- (7) When handling printed circuit boards, do not use any glove which may generate static electricity.
- (8) Do not place the printed circuit boards directly on the equipment or floor.



[Service Tools]

Table 3-1 shows the tools required for the replacement of printed circuit boards, assemblies and units in the field.

Table 3-1 Service Tools

No.	Service Tools	Q'ty	Application	Remarks
1	 No. 1-100 Philips screwdriver	1	2 ~ 2.5 mm screws	
2	 No. 2-100 Philips screwdriver	1	3 ~ 5 mm screws	
3	 No. 3-100 screwdriver	1		
4	 No. 5-200 screwdriver	1		
5	 Digital multimeter	1		
6	 Pliers	1		
7	 Vacuum cleaner	1		

## 3.2 Parts Layout

This section describes the layout of the main components.

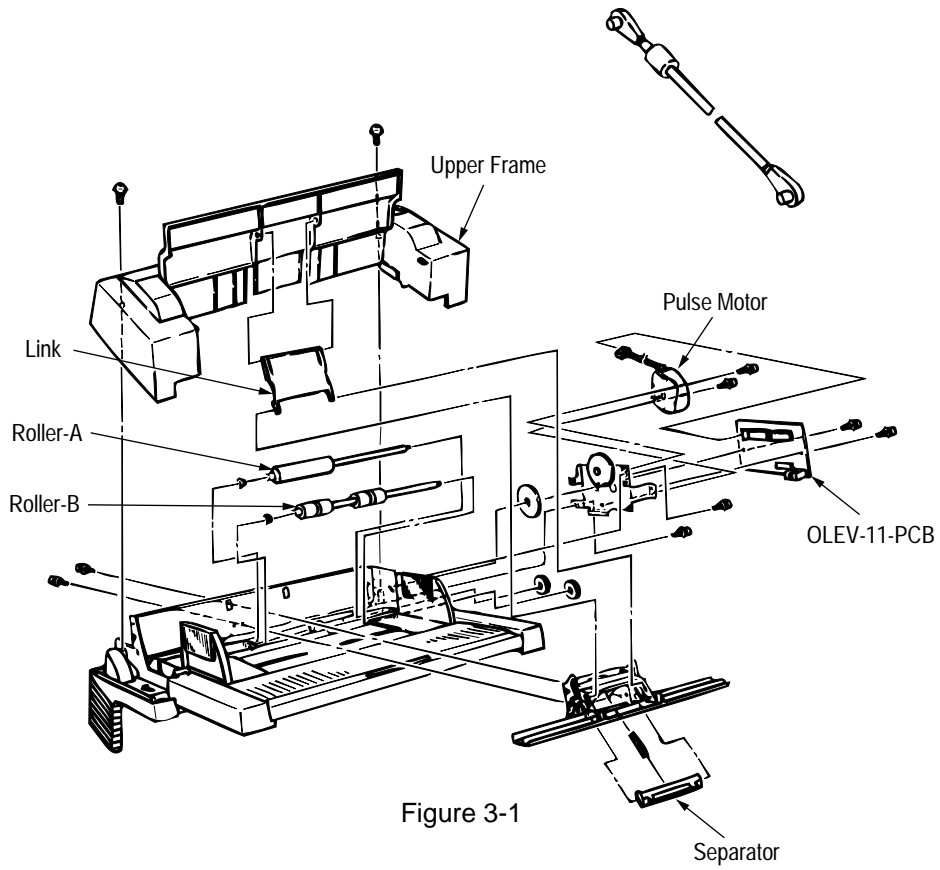
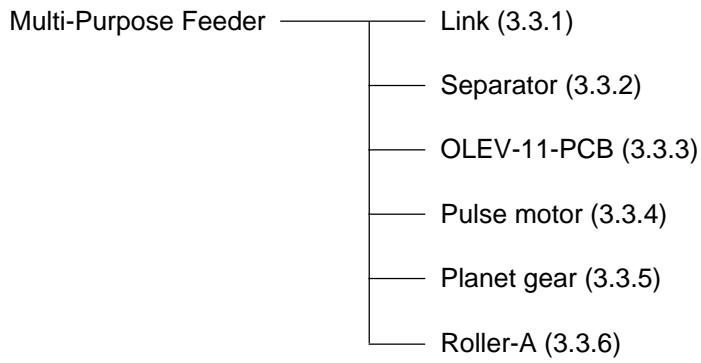


Figure 3-1

### 3.3 Parts Replacement Methods

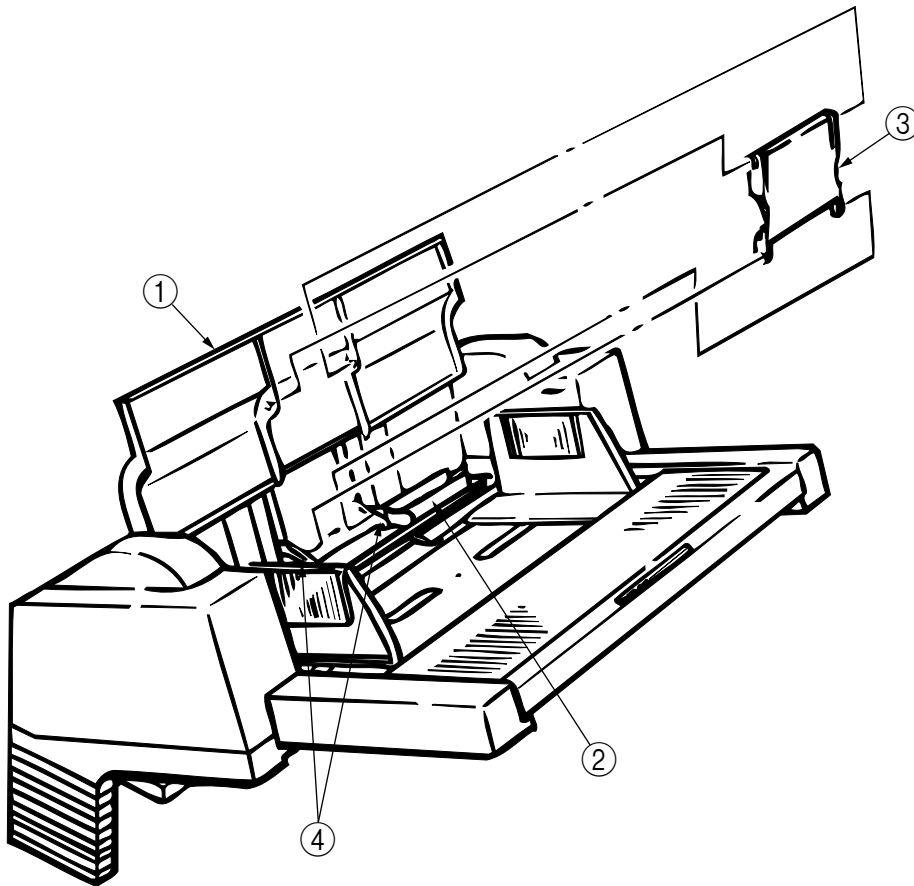
This section describes the parts replacement methods for the components listed in the disassembly order diagram below.



### 3.3.1 Link

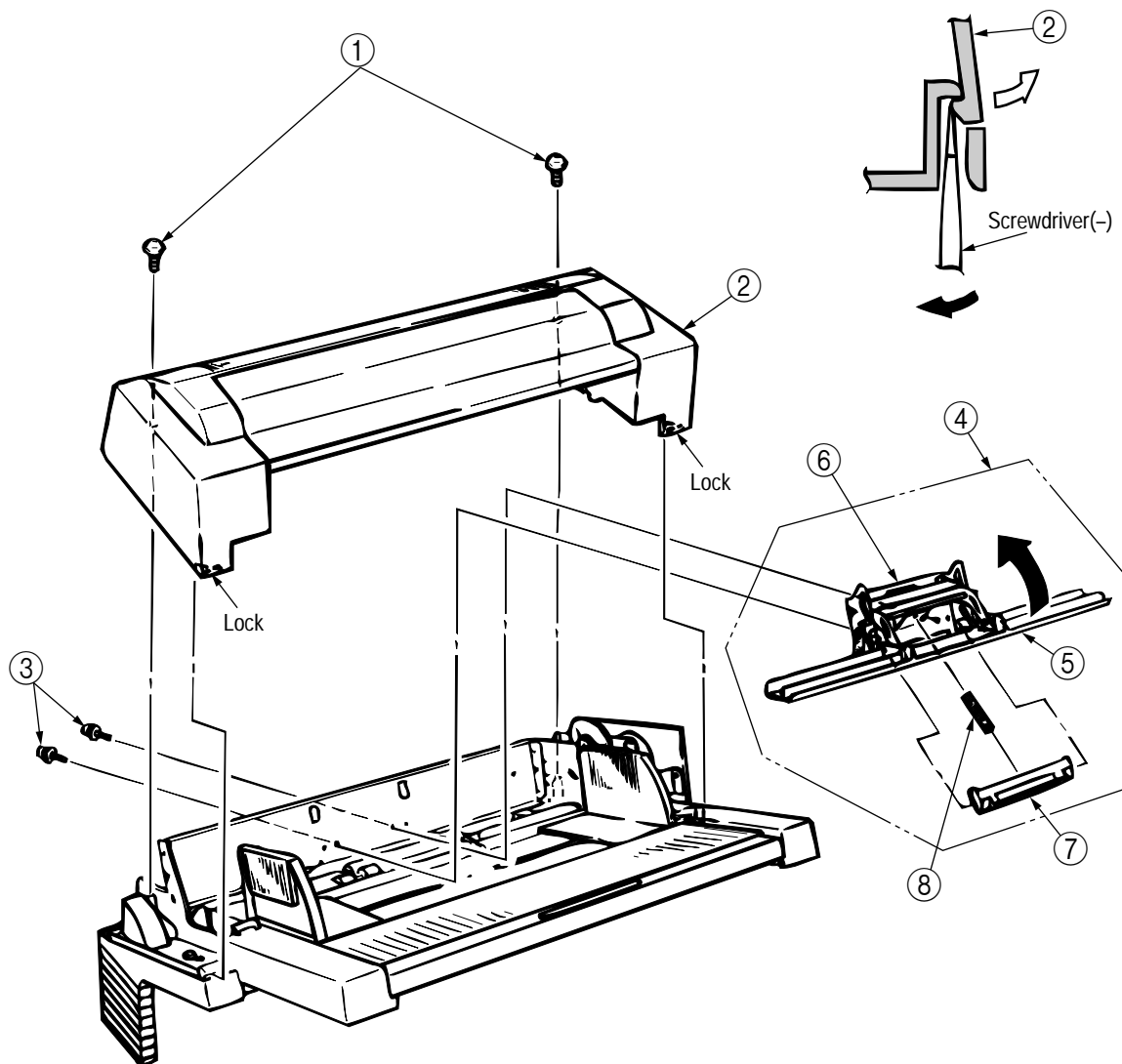
- (1) Open paper feed cover ①, and disengage the paper feed cover ① and link ③, while lifting the paper hold ②.
- (2) Remove the paper hold ② off the arm ④.
- (3) Disengage the link ③ from the arm ④, and remove it.

\* Be careful not to deform the link and arm.



### 3.3.2 Separator

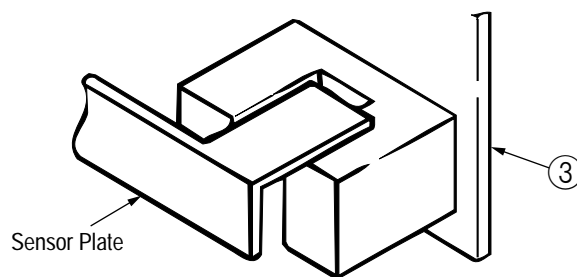
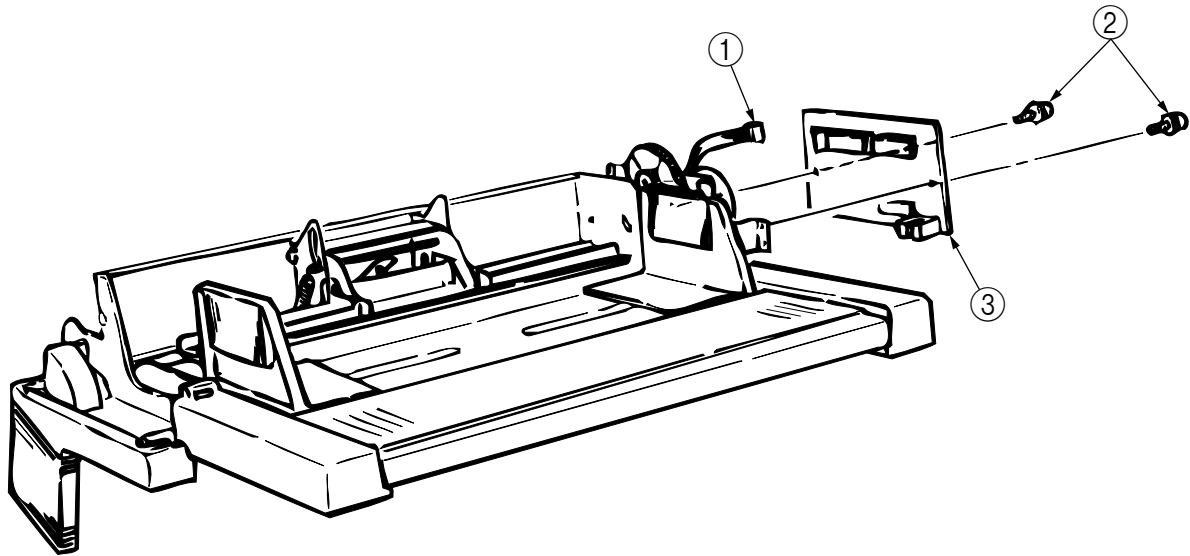
- (1) Turn the power switch off "O" and remove the connector cable.
- (2) Disengage the link and paper feeder cover (see 3.3.1).
- (3) Remove 2 screws ①, disengage the locks at 2 locations on the upper frame ② with a screwdriver, and remove the upper frame ②.
- (4) Remove 2 screws ③, and take out the separator assembly ④.
- (5) Disengage the separator ⑦ from the separator bracket ⑥ while lifting the paper hold ⑤, and take out the separator (be careful not to lose the spring ⑧ when you are doing this).



### 3.3.3 OLEV-11-PCB

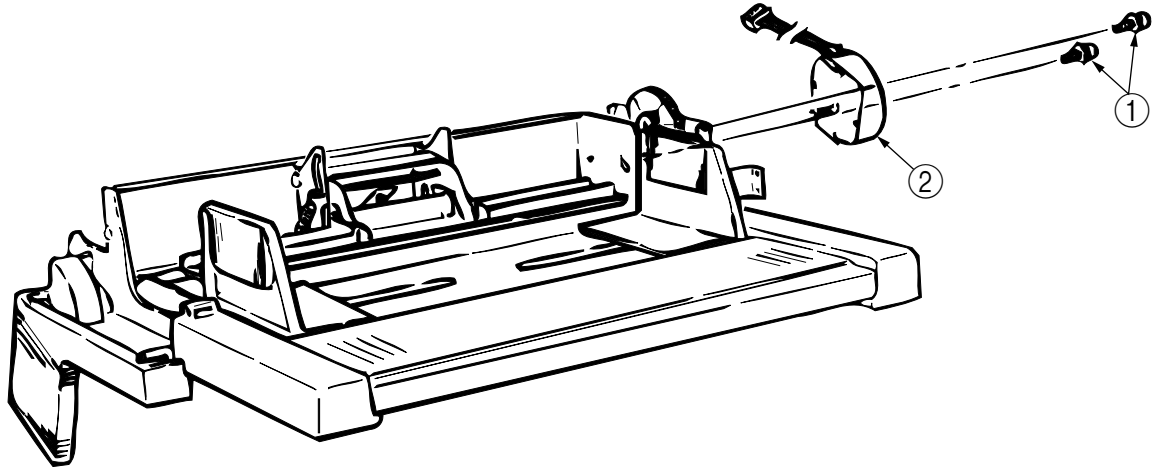
- (1) Remove the upper frame [ see 3.3.2 steps (1) through (3) ].
- (2) Remove the connector ①.
- (3) Remove 2 screws ②, and remove the OLEV-11 PCB ③.

When reinstalling the printed circuit board, be careful to make sure that the sensor plate is being set correctly.



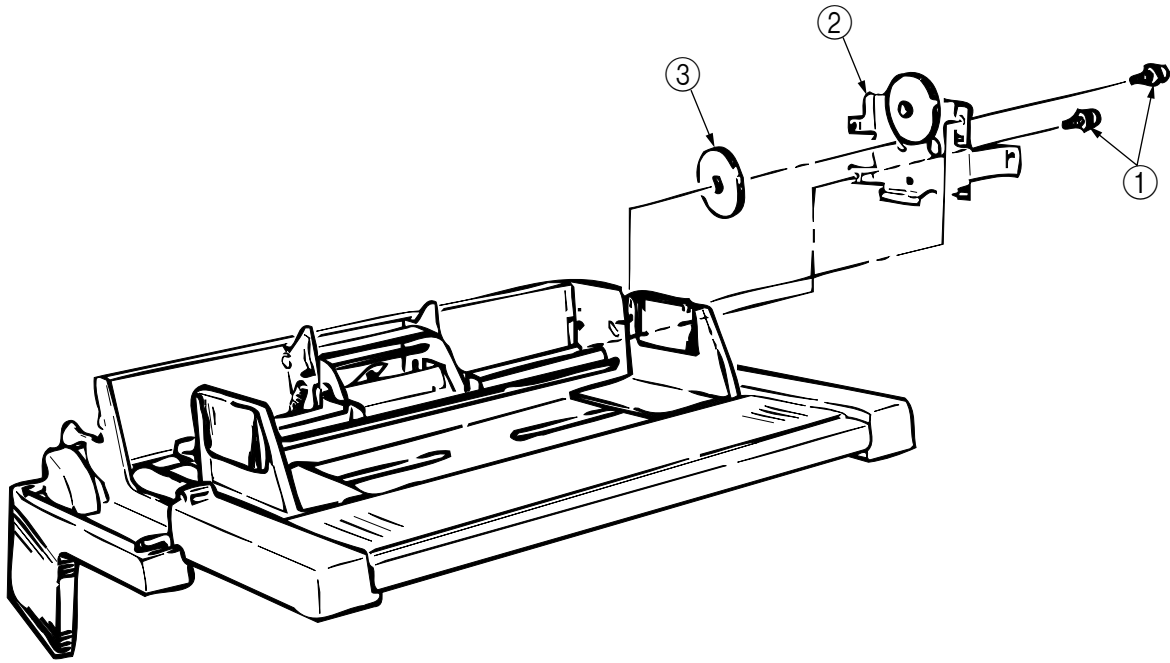
### 3.3.4 Pulse Motor

- (1) Remove the upper frame [ see 3.3.2 steps (1) through (3) ].
- (2) Remove the OLEV-11-PCB (see 3.3.3).
- (3) Remove 2 screws ①, and remove the pulse motor ②.



### 3.3.5 Planet Gear

- (1) Remove the upper frame [ see 3.3.2 steps (1) through (3) ].
- (2) Remove the OLEV-11-PCB (see 3.3.3).
- (3) Remove 2 screws ①, and remove the motor bracket assembly ② and planet gear ③.

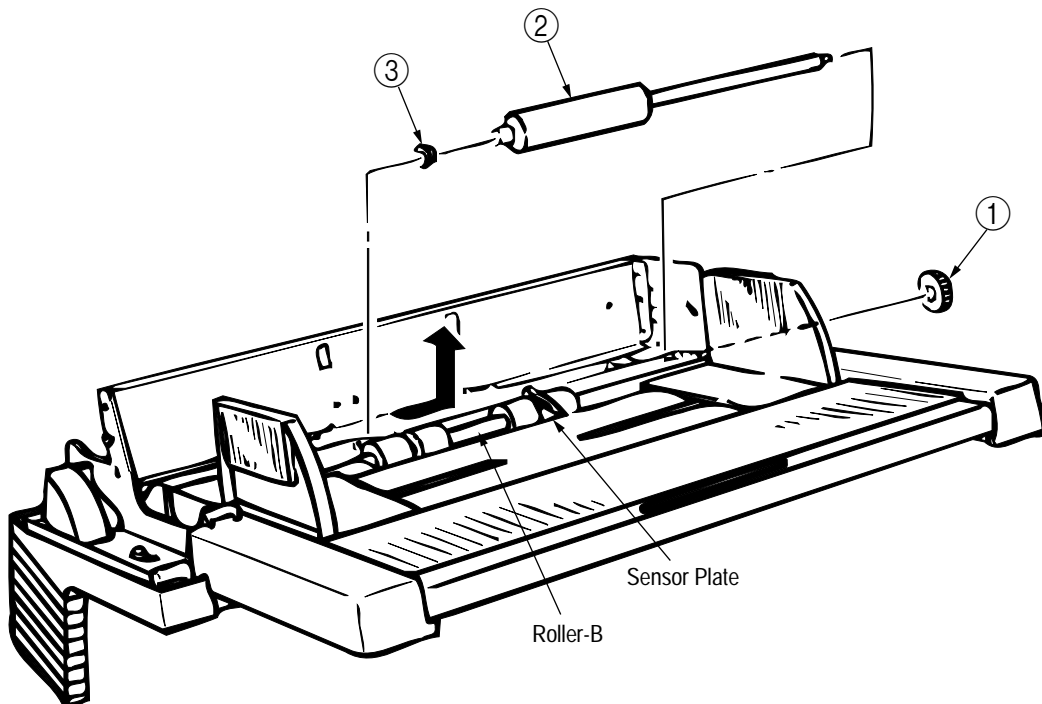




### 3.3.6 Roller-A and B

While only the removal procedure for roller-A is described here, the removal procedure for roller-B is basically same. When removing roller-B, however, be careful not to deform the sensor plate.

- (1) Remove the upper frame [ see 3.3.2 steps (1) through (3) ].
- (2) Remove the separator assembly (see 3.3.2).
- (3) Remove the OLEV-11-PCB (see 3.3.3).
- (4) Remove the motor bracket (see 3.3.5).
- (5) Remove the gear ①.
- (6) Shift the roller-A ② to the right, lift it on its left side and slide it out (the bearing ③ also comes off while you are doing this, so be careful not to lose it).



## 4. TROUBLESHOOTING

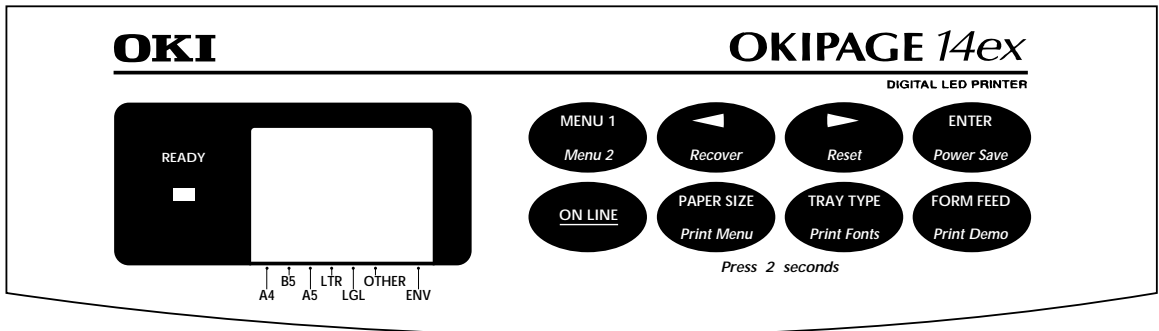
### 4.1 Precautions Prior to the Troubleshooting

- (1) Go through the basic checking items provided in the Printer Handbook.
- (2) Obtain detailed information concerning the problem from the user.
- (3) Go through checking in the conditions similar to that in which the problem occurred.

### 4.2 Preparations for the Troubleshooting

- (1) Display on the operator panel  
The status of the problem is displayed on the LCD (Liquid Crystal Display) on the operator panel. Go through the appropriate troubleshooting procedures according to the messages displayed on the LCD.

[ ODA/OEL/INT ]



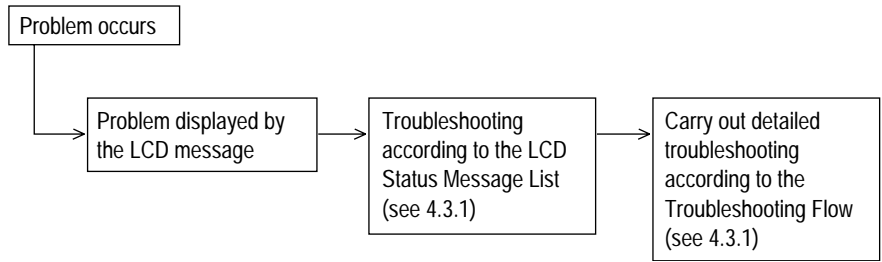
Status message display

Ready LED display

■	: OFF	⊠	: BLINKING
■	: ON	□	: Undefined

### 4.3 Troubleshooting Method

When a problem occurs, go through the troubleshooting according to the following procedure.



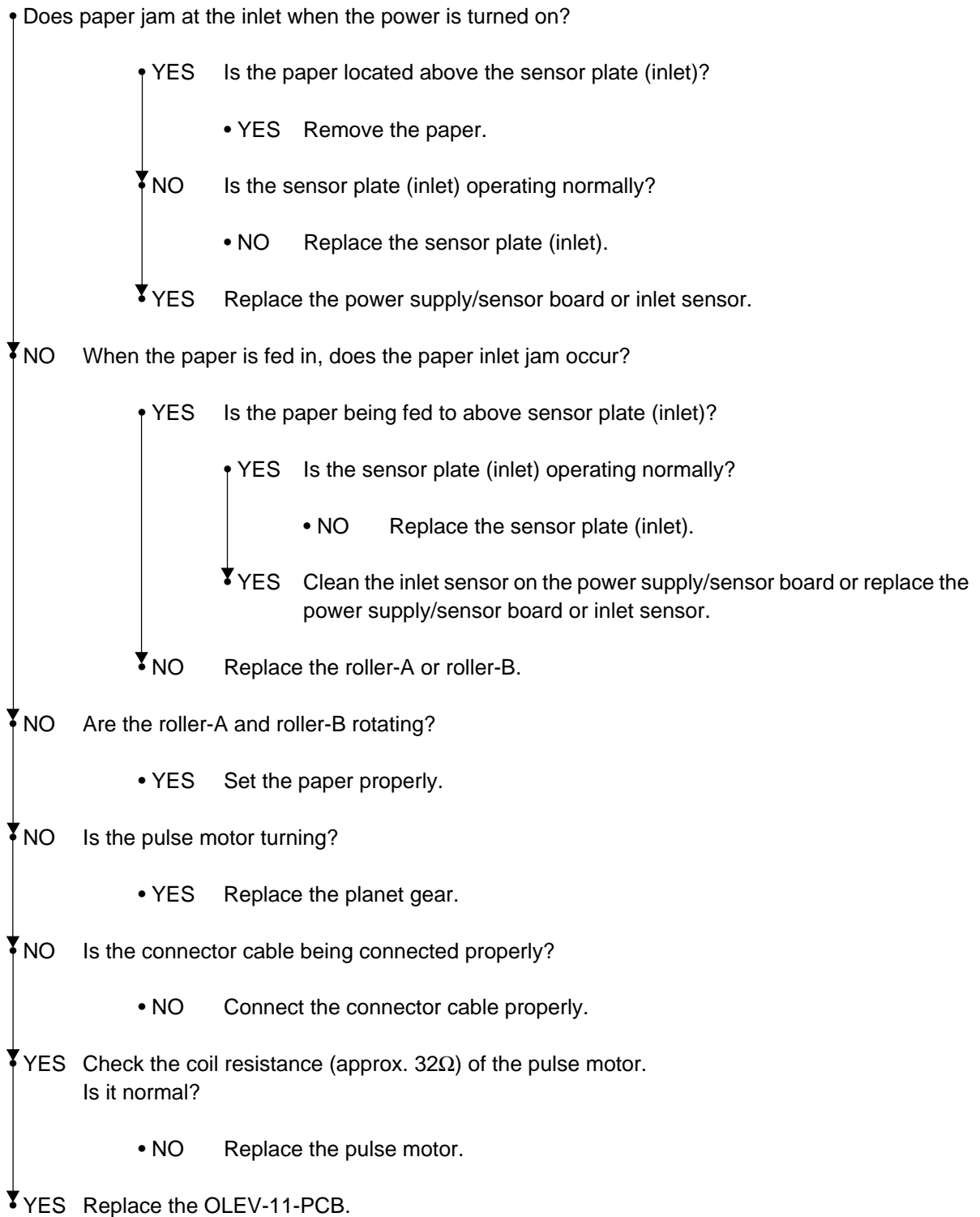
#### 4.3.1 LCD Status Message List

The listing of the statuses and problems displayed in the form of messages on the LCD is provided in Table 4-1.

Classification	LCD Status Message	Description	Recovery method
Jam error	<div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: black; margin-right: 5px;"></div> <div style="border: 1px solid black; padding: 2px;">FEEDER INPUT JAM</div> </div> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: black; margin-right: 5px;"></div> <div style="border: 1px solid black; padding: 2px;">FEEDER FEED JAM</div> </div> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: black; margin-right: 5px;"></div> <div style="border: 1px solid black; padding: 2px;">FEEDER EXIT JAM</div> </div> </div>	Notifies of occurrence of jam while the paper is being fed from Multi-Purpose Feeder.	<ul style="list-style-type: none"> <li>• Check the paper in the Multi-Purpose Feeder.</li> <li>• Carry out the recovery printing by opening and closing the cover, and turn the error display off.</li> <li>• When the problem occurs frequently, go through the Troubleshooting.</li> </ul>
Paper size error	<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: black; margin-right: 5px;"></div> <div style="border: 1px solid black; padding: 2px;">FEEDER SIZE ERR</div> </div>	Notifies of incorrect size paper feeding from Multi-Purpose Feeder.	<ul style="list-style-type: none"> <li>• Check the paper in the Multi-Purpose Feeder.</li> <li>• Also check to see if there was a feeding of multiple sheets.</li> <li>• Carry out the recovery printing by opening and closing the cover, and turn the error display off.</li> </ul>
Tray paper out	<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: black; margin-right: 5px;"></div> <div style="border: 1px solid black; padding: 2px;">FEEDER PAPEROUT</div> </div>	Notifies of no paper state of the Multi-Purpose Feeder.	<ul style="list-style-type: none"> <li>• Load the paper in Multi-Purpose Feeder.</li> </ul>

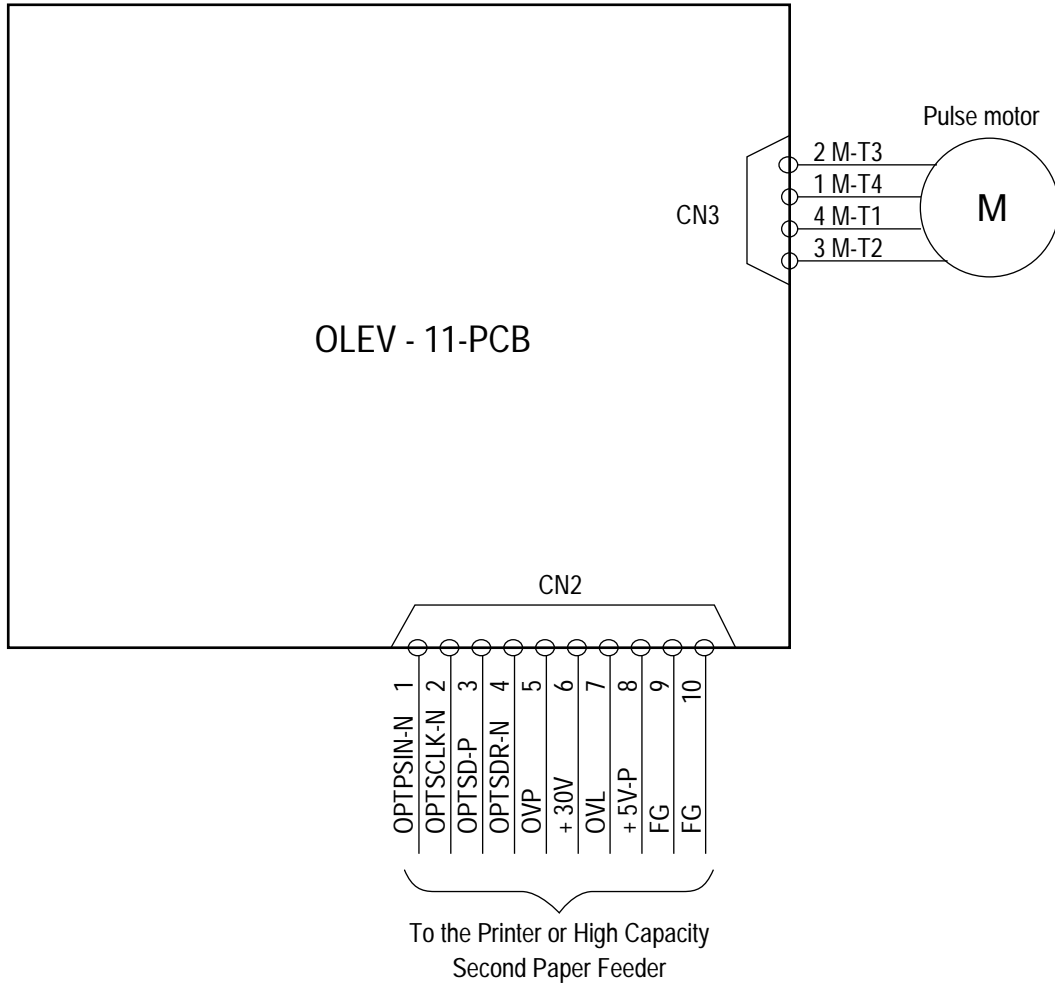
- ( JAM error )

Paper Inlet Jam



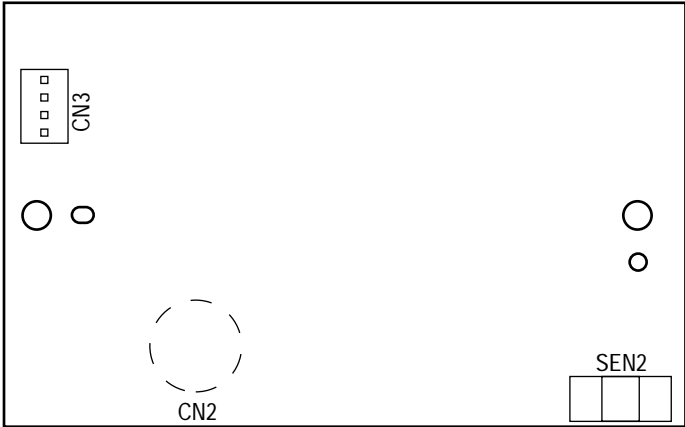
## 5. CONNECTION DIAGRAM

### 5.1 Interconnection Diagram



5.2 PCB Layout

OLEV-11-PCB



## 6. PARTS LIST

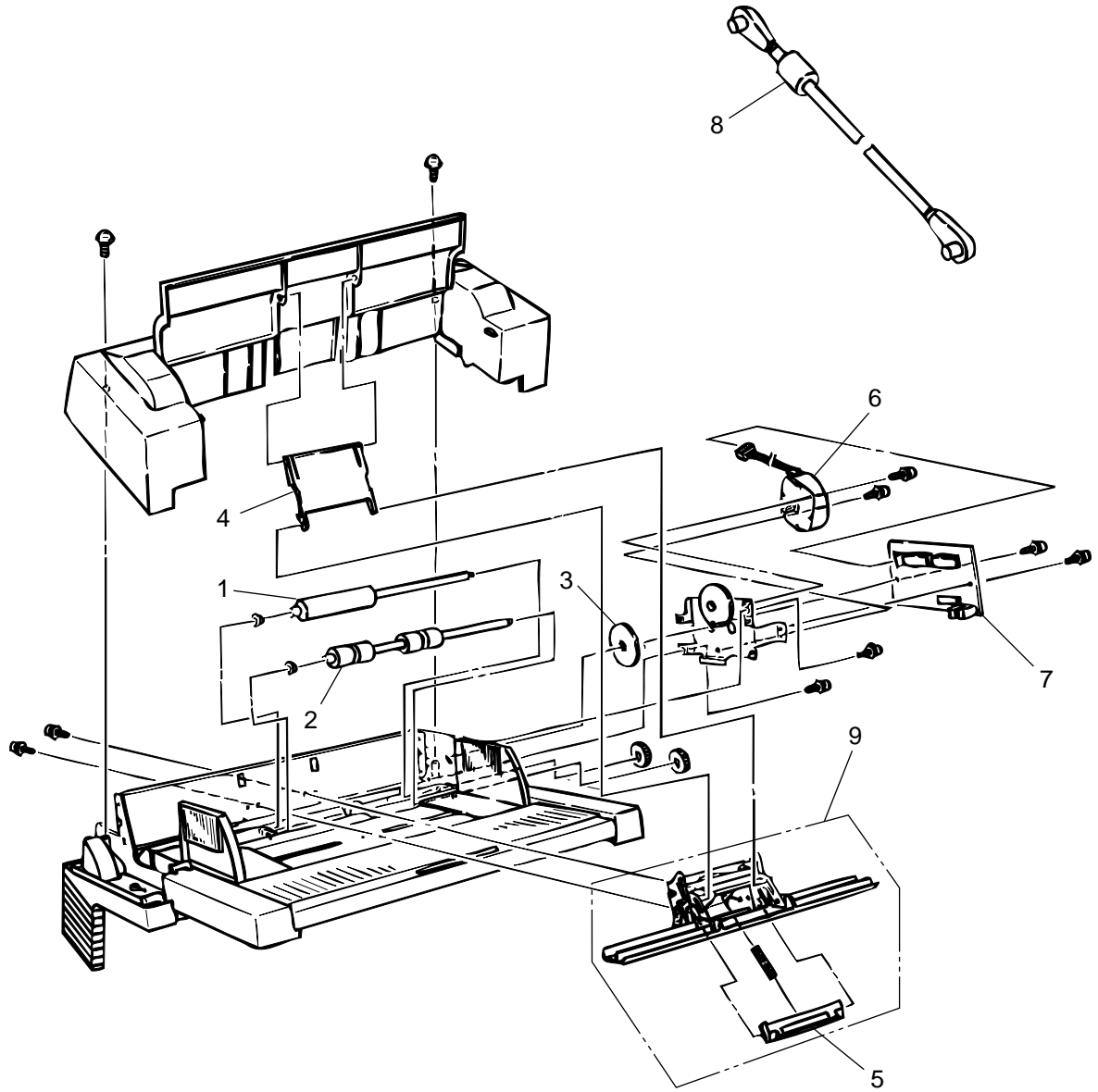


Figure 6-1 Multi-Purpose Feeder

**Table 6-1 Multi-Purpose Feeder**

No.	Description	ODA Part No.	ODA Part No.	Q'ty	Remark
1	Roller-A	53343801		1	
2	Roller-B	53343901		1	
3	Planet gear	51229601		1	
4	Link	53344101		1	
5	Separator	53344201		1	
6	Pulse motor	56510701		1	Same as printer unit.
7	OLEV-11-PCB	55074811		1	
8	Connector cable	56631203		1	For ODA
9	Separator assy	53347101		1	



# APPENDIX G HIGH CAPACITY SECOND PAPER FEEDER

## 1. OUTLINE

### 1.1 Functions

The printer is mounted on top of this High Capacity Second Paper Feeder. The High Capacity Second Paper Feeder supplies paper automatically through the operation of pulse motor (hopping), which is driven by signals sent from the printer.

The main functions are the followings:

- Paper that can be used:

[Paper Type]

- Standard paper: Xerox 4200 (20-lb)
- Special paper: OHP sheets (for PPC), Label sheets (PPC sheets); use of envelopes or thick paper is not possible.
- Cut sheet size: A4, A5, B5, Letter, Executive, Legal13, Legal14
- Special size: Paper width: 5.827 to 8.504 in.  
Paper length: 8.268 to 14 in.

[Weight]

- 16-lb to 24-lb (60 to 90 g/m<sup>2</sup>)
- Paper setting quantity: 500 sheets of paper weighing 64 g/m<sup>2</sup>

### 1.2 External View and Component Names

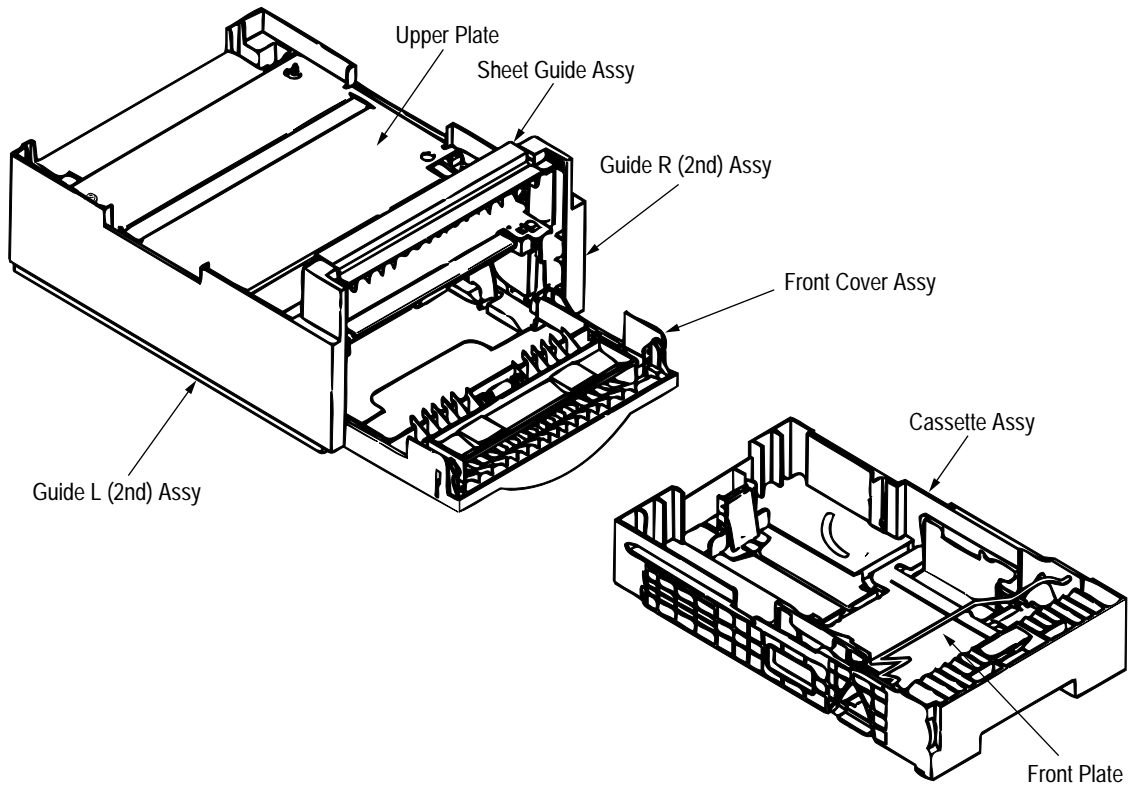


Figure 1-1 External View and Component Names

## 2. MECHANISM DESCRIPTION

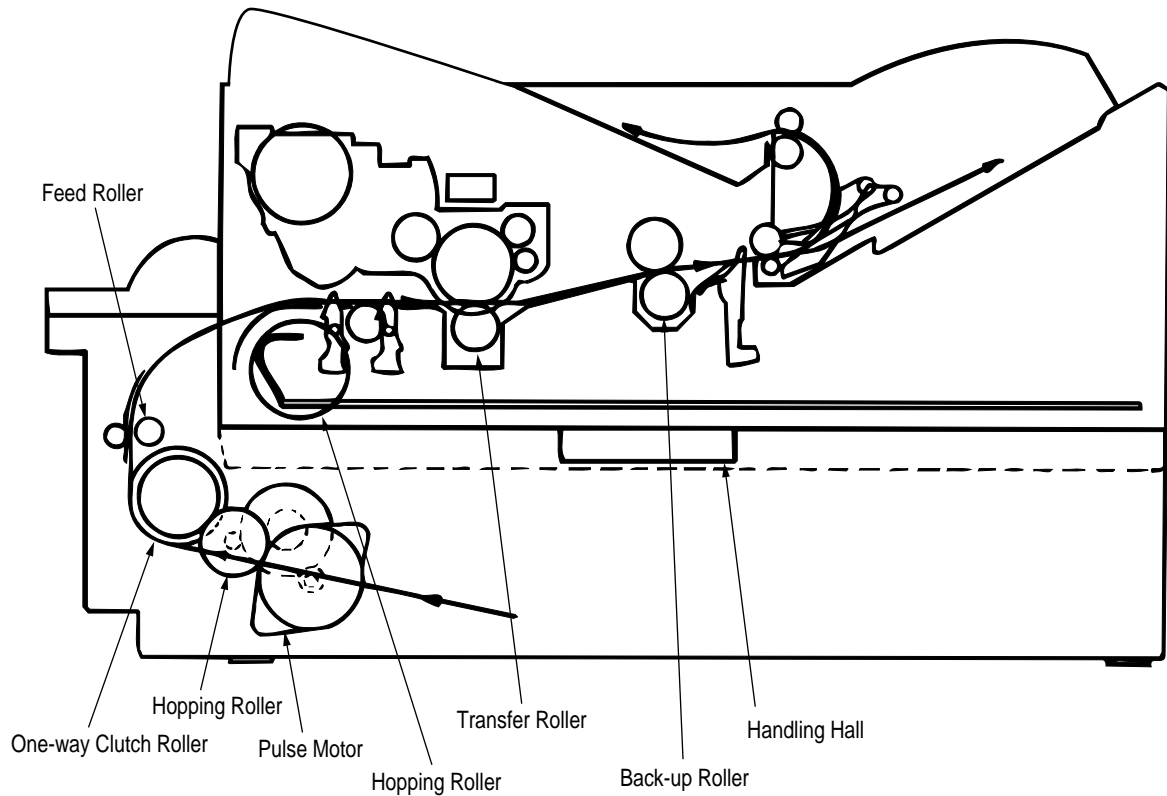
### 2.1 General Mechanism

The High Capacity Second Paper Feeder feeds the paper into the printer by receiving the signal from the printer, which drives the pulse motor inside the High Capacity Second Paper Feeder, and this motion is transmitted to rotate the one-way clutch of the hopping frame assembly. The paper is delivered from the hopper into the printer through the turning of the hopping roller and feed roller.

Once delivered into the printer, the paper is then controlled and fed through by pulse motor (registration) of the printer.

### 2.2 Hopper Mechanism

The hopper automatically feeds the printer with the paper being set, single sheet at a time. When the paper is loaded in the paper cassette, it is then transported by the pulse motor, carrying forward only a single sheet caught by the brake shoe at a time.



### **3. PARTS REPLACEMENT**

This section covers the procedures for the disassembly, reassembly and installations in the field. This section describes the disassembly procedures, and for reassembly procedures, basically proceed with the disassembly procedures in the reverse order.

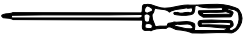
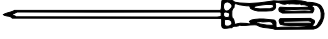



#### **3.1 Precautions Concerning Parts Replacement**

- (1) Parts replacements must be carried out, by first turning the printer power switch off "O" and removing the printer from the High Capacity Second Paper Feeder.
- (2) Do not disassemble the High Capacity Paper Feeder if it is operating normally.
- (3) Establish the extent of disassembly suitable for the purpose of the procedure, and do not disassemble any more than necessary.
- (4) Only specified service tools may be used.
- (5) Disassembly must be carried out according to the prescribed procedures. Parts may be damaged if such procedures are not followed.
- (6) Small parts such as screws and collars can easily be lost, therefore these parts should be temporarily replaced in their original location.
- (7) When handling printed circuit boards, do not use any glove which may generate static electricity.
- (8) Do not place the printed circuit boards directly on the equipment or floor.

[Service Tools]

Table 3-1 shows the tools required for the replacement of printed circuit boards, assemblies and units in the field.

Table 3-1 Service Tools

No.	Service Tools	Q'ty	Application	Remarks
1	 No. 1-100 Philips screwdriver	1	2 ~ 2.5 mm screws	
2	 No. 2-100 Philips screwdriver	1	3 ~ 5 mm screws	
3	 No. 3-100 screwdriver	1		
4	 Digital multimeter	1		
5	 Pliers	1		

### 3.2 Parts Layout

This section describes the layout of the main components.

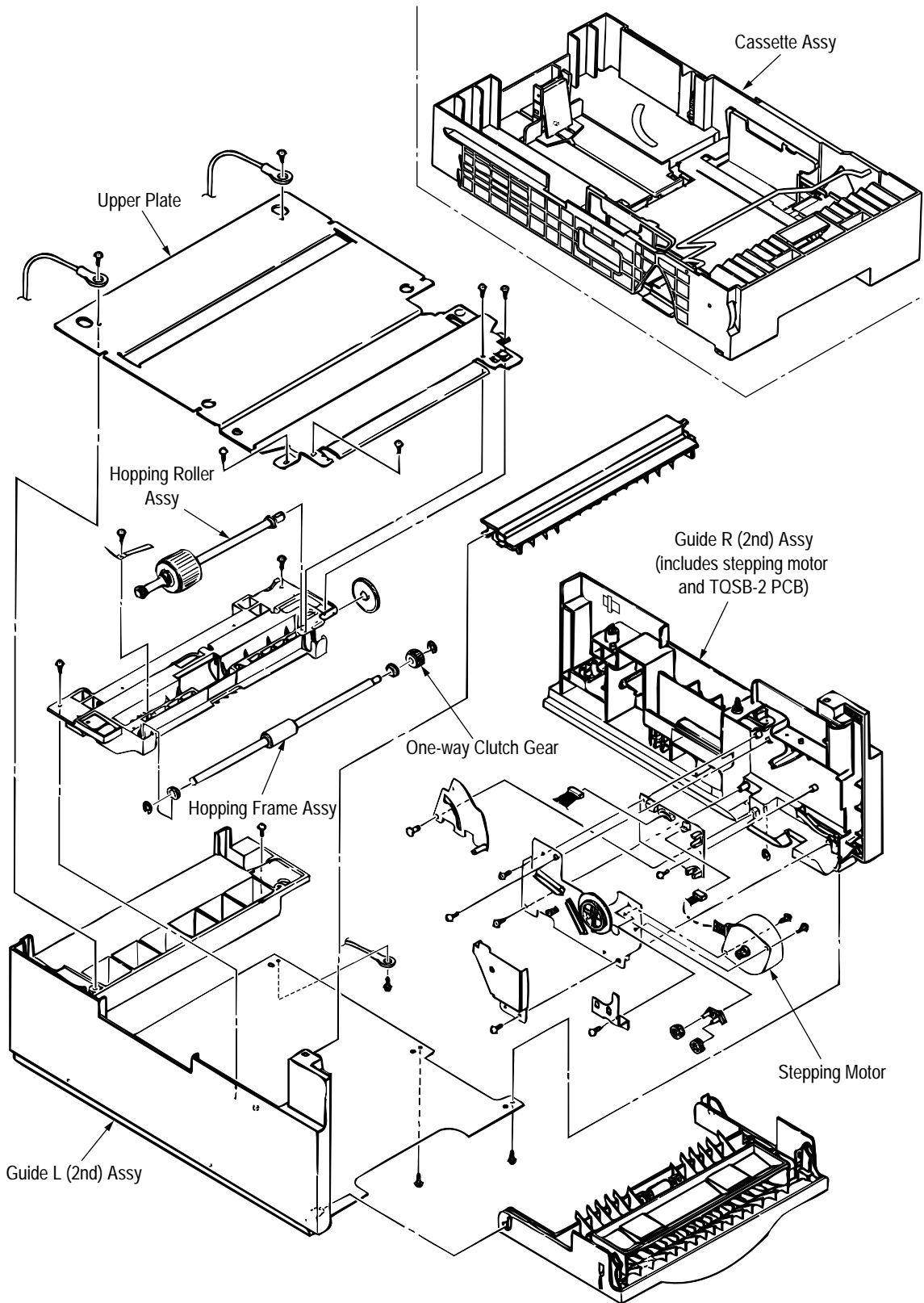
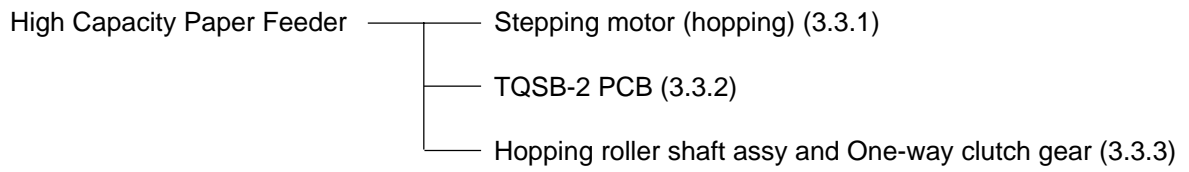


Figure 3-1

### 3.3 Parts Replacement Methods

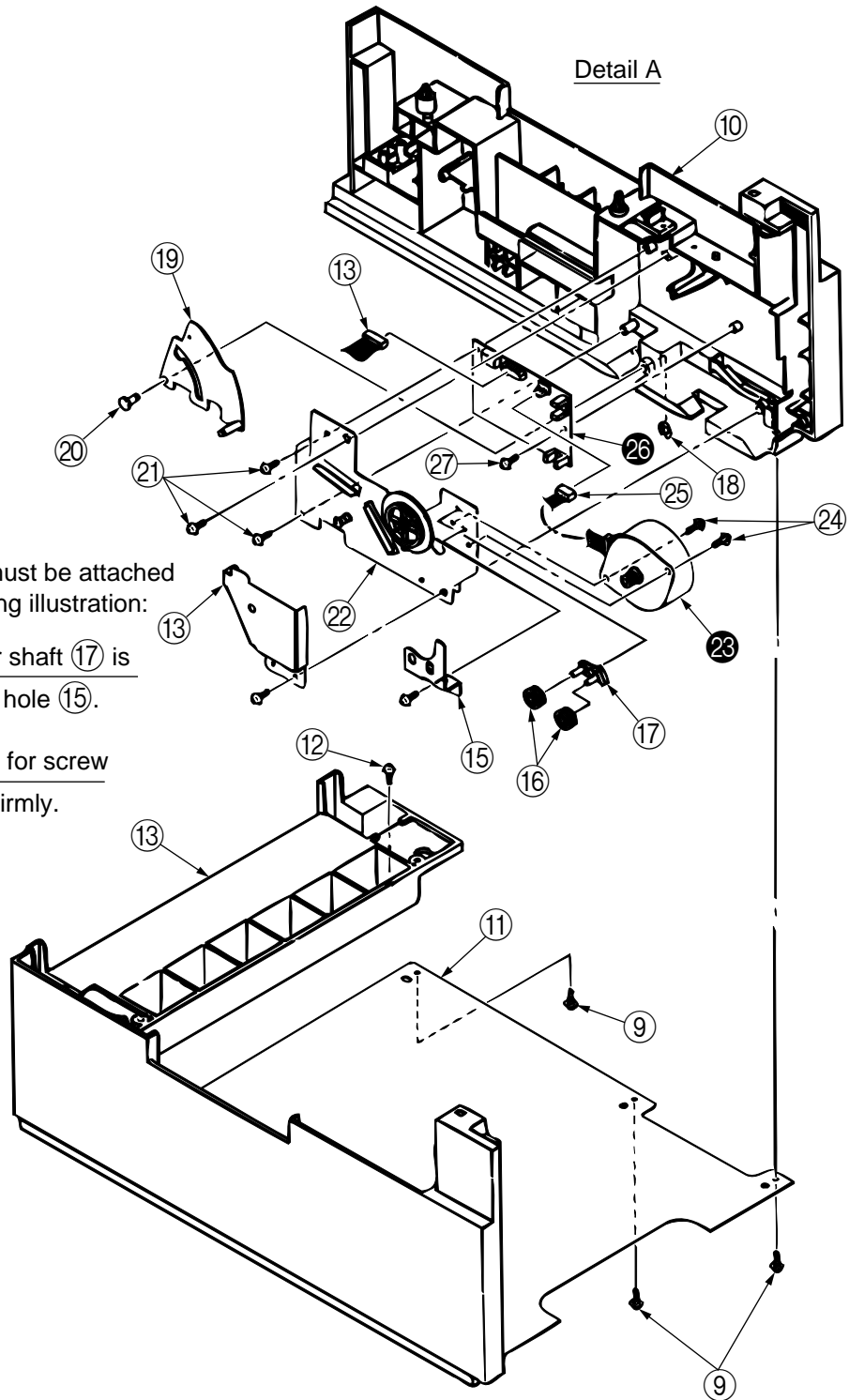
This section describes the parts replacement methods for the components listed in the disassembly order diagram below.





- (6) Remove three screws ⑨ which are holding the guide R (2nd) assy ⑩ to the bottom plate ⑪. Remove the screw ⑫ which is keeping the rear cover ⑬ and guide R (2nd) assy ⑩. Remove the guide R (2nd) assy ⑩.
- (7) Remove the protect (M) ⑭, guide bracket ⑮, planet gears ⑯ and planet gear bracket ⑰.
- (8) Remove the E-ring ⑱ which is keeping the sheet link ⑲ on the guide R (2nd) assy ⑩, and pull out the hinge stand ⑳.
- (9) Remove three remaining screws ㉑ which are keeping the motor on the motor bracket ㉒, and remove the connector off the Stepping Motor ㉓.
- (10) Remove two screws ㉔ on the Stepping Motor ㉓.

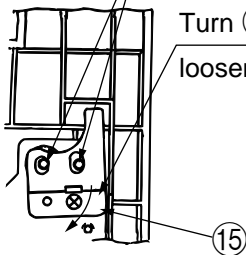
Detail A



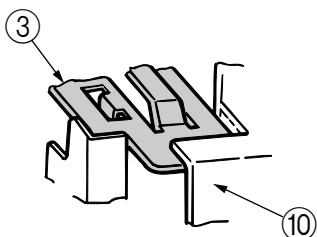
**Note :** The guide bracket ⑮ must be attached as shown in the following illustration:

No jutting of the gear shaft ⑰ is allowed into the oval hole ⑮.

Turn ⑮ clockwise for screw looseness to affix firmly.



The upper plate ③ must be attached as shown in the following illustration.





### 3.3.2 TQSB-2 PCB

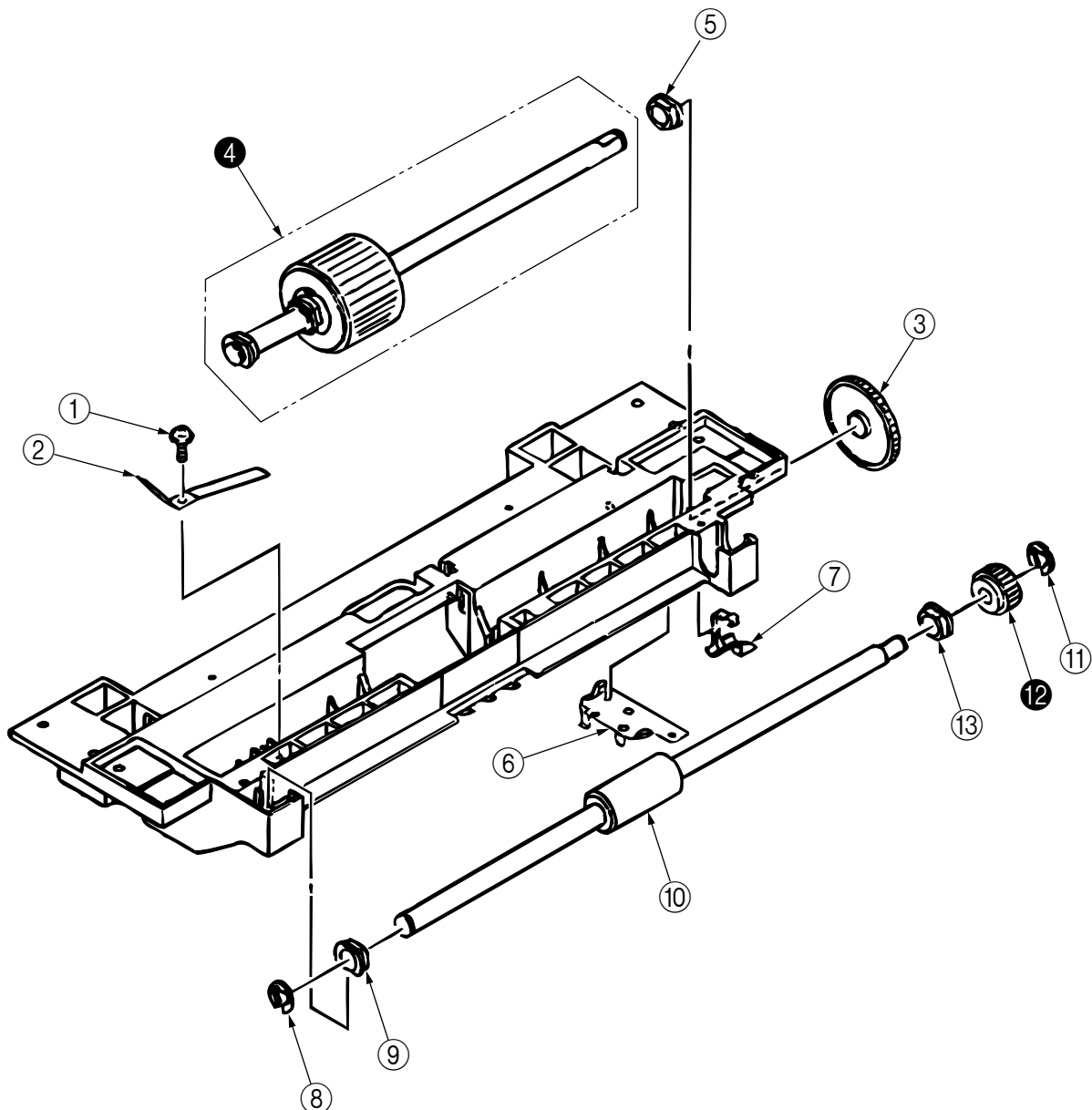
- (1) Remove the pulse motor (see 3.3.1).
- (2) Remove the connector ⑫ from the TQSB-2 PCB ⑫.
- (3) Remove the screw ⑮ and remove the TQSB-2 PCB ⑫.

**Note :** Refer to Detail A in the previous page.

### 3.3.3 Hopping Roller Shaft Assy and One-way Clutch Gear

- (1) Follow up to step (3) of 3.3.1 and remove the hopping frame assy.
- (2) Remove the screw ① and remove the earth plate ②. Remove the sensor lever ⑦ and remove the ground plate ⑥. Remove the gear ③ and remove the metal bush ⑤ and hopping roller shaft assy ④.
- (3) Remove the E-ring ⑪ and remove the one-way clutch gear ⑫ on the right side of the feed roller ⑩.

**Note :** The metal bush ⑬ also comes off. Be careful not to lose it.



## 4. TROUBLESHOOTING

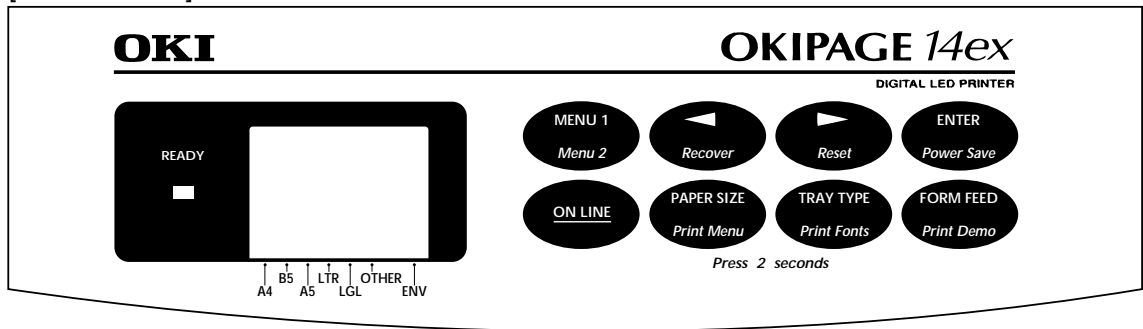
### 4.1 Precautions Prior to the Troubleshooting

- (1) Go through the basic checking items provided in the Printer Handbook.
- (2) Obtain detailed information concerning the problem from the user.
- (3) Go through checking in the conditions similar to that in which the problem occurred.

### 4.2 Preparations for the Troubleshooting





- (1) Display on the Operator panel  
The status of the problem is displayed on the LCD (Liquid Crystal Display) on the Operator panel. Go through the appropriate troubleshooting procedures according to the messages displayed on the LCD.

[ODA/OEL/INT]



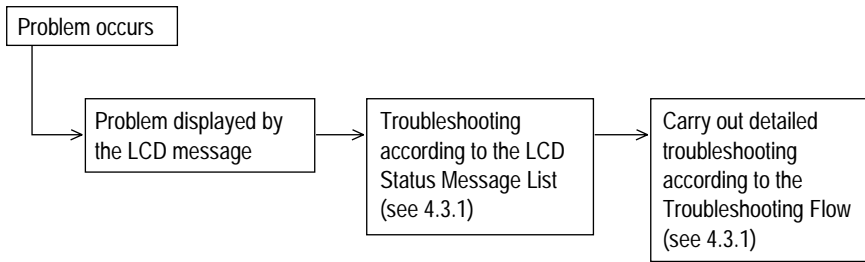
Status message display

Ready LED display

 : OFF	 : BLINKING
 : ON	 : UNDEFINED

### 4.3 Troubleshooting Method






When a problem occurs, go through the troubleshooting according to the following procedure.



#### 4.3.1 LCD Status Message List

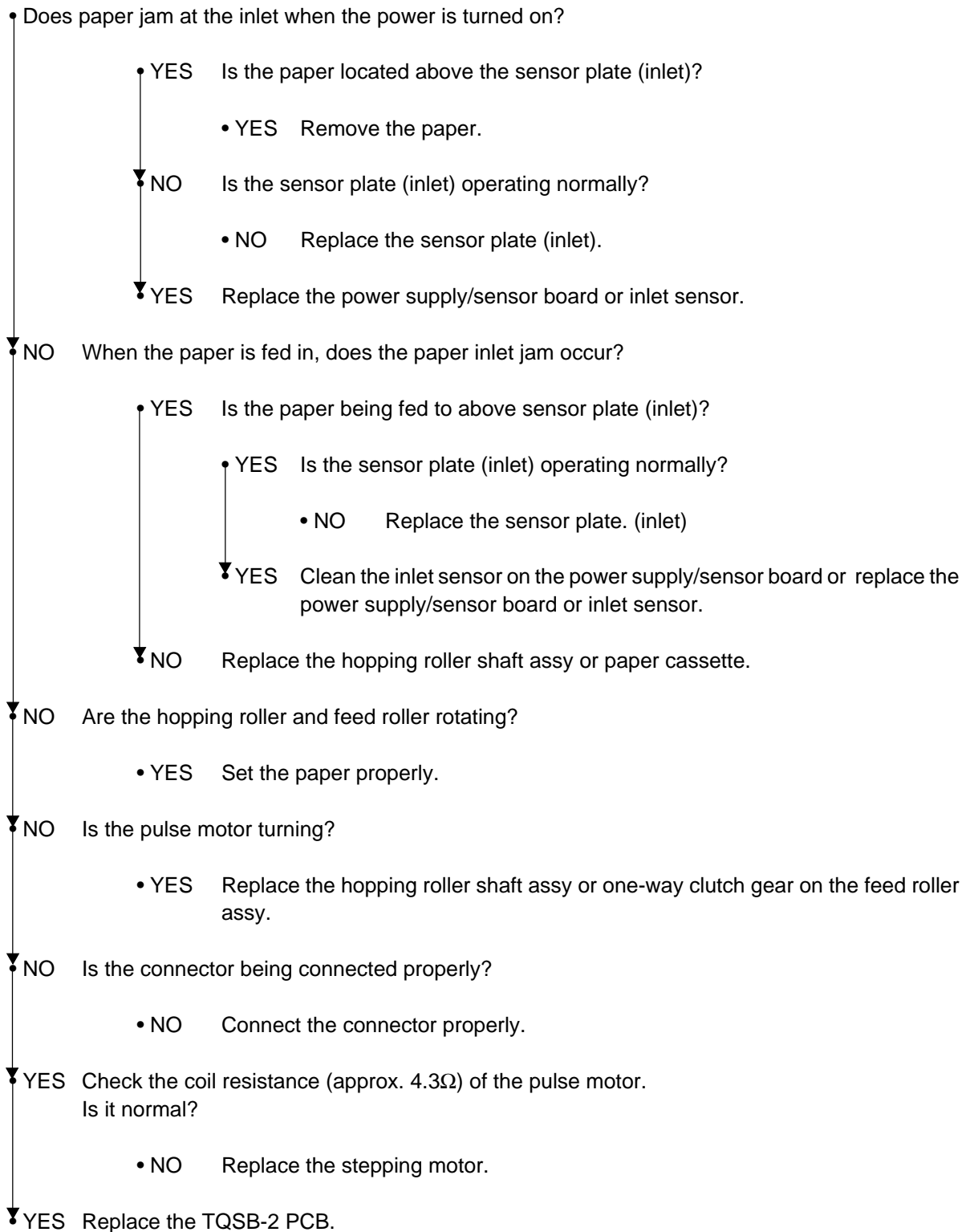
The listing of the status and problems displayed in the form of messages on the LCD is provided in Table 4-1.

Table 4-1

Classification	LCD Status Message	Description	Recovery method
Jam error (feeding)	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">           TRAY2 FEED JAM         </div>	Notifies of occurrence of jam while the paper is being fed from High Capacity Second Paper Feeder.	<ul style="list-style-type: none"> <li>• Check the paper in the High Capacity Second Paper Feeder.</li> <li>• Carry out the recovery printing by opening and closing the cover, and turn the error display off.</li> <li>• When the problem occurs frequently, go through the Troubleshooting.</li> </ul>
Jam error (ejection)	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">           TRAY2 EXIT JAM         </div>	Notifies of occurrence of jam while the paper is being ejected from the printer.	<ul style="list-style-type: none"> <li>• Check the paper in the printer. Carry out the recovery printing by opening and closing the cover, and turn the error display off.</li> </ul>
Paper size error	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">           TRAY2 SIZE ERR         </div>	Notifies of incorrect size paper feeding from High Capacity Second Paper Feeder.	<ul style="list-style-type: none"> <li>• Check the paper in the High Capacity Second Paper Feeder.</li> <li>• Also check to see if there was a feeding of multiple sheets.</li> <li>• Carry out the recovery printing by opening and closing the cover, and turn the error display off.</li> </ul>
Tray paper out	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">           TRAY2 PAPEROUT         </div>	Notifies of no paper state of the High Capacity Second Paper feeder.	<ul style="list-style-type: none"> <li>• Load the paper in High Capacity Second Paper Feeder.</li> </ul>
Paper size request	 <div style="border: 1px solid black; padding: 2px; display: inline-block;">           TRAY2 OOO PAPER → REQUEST         </div> <p>OOO : Paper size (A4, Letter, Legal, etc.) The 2nd line is shift-indicated.</p>	Notifies of correct paper size for the High capacity Second Paper Feeder.	<ul style="list-style-type: none"> <li>• Load the requested size paper in the High Capacity Second Paper Feeder.</li> </ul>

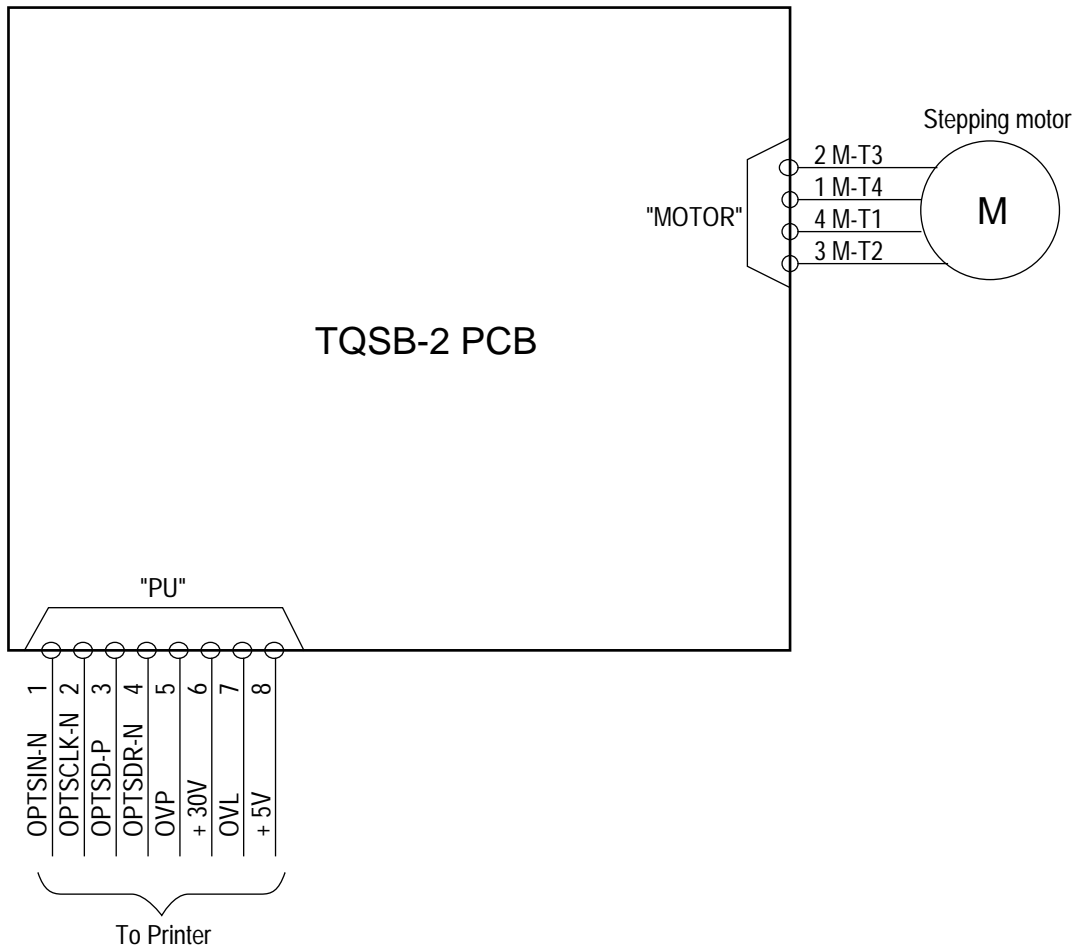
- ( JAM error )

Paper Inlet Jam



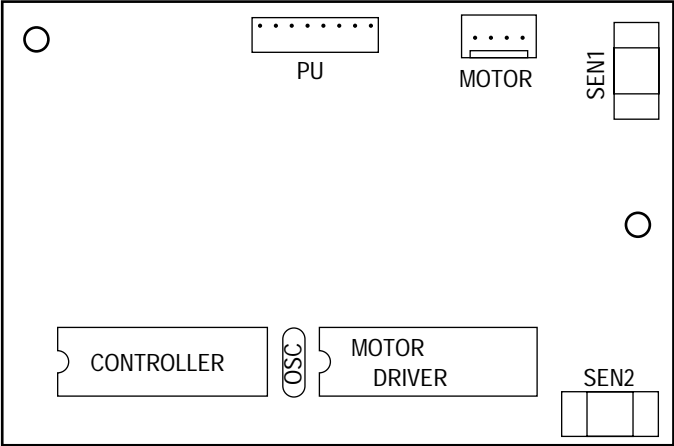
## 5. CONNECTION DIAGRAM

### 5.1 Interconnection Diagram



5.2 PCB Layout

TQSB-2 PCB



## 6. PARTS LIST

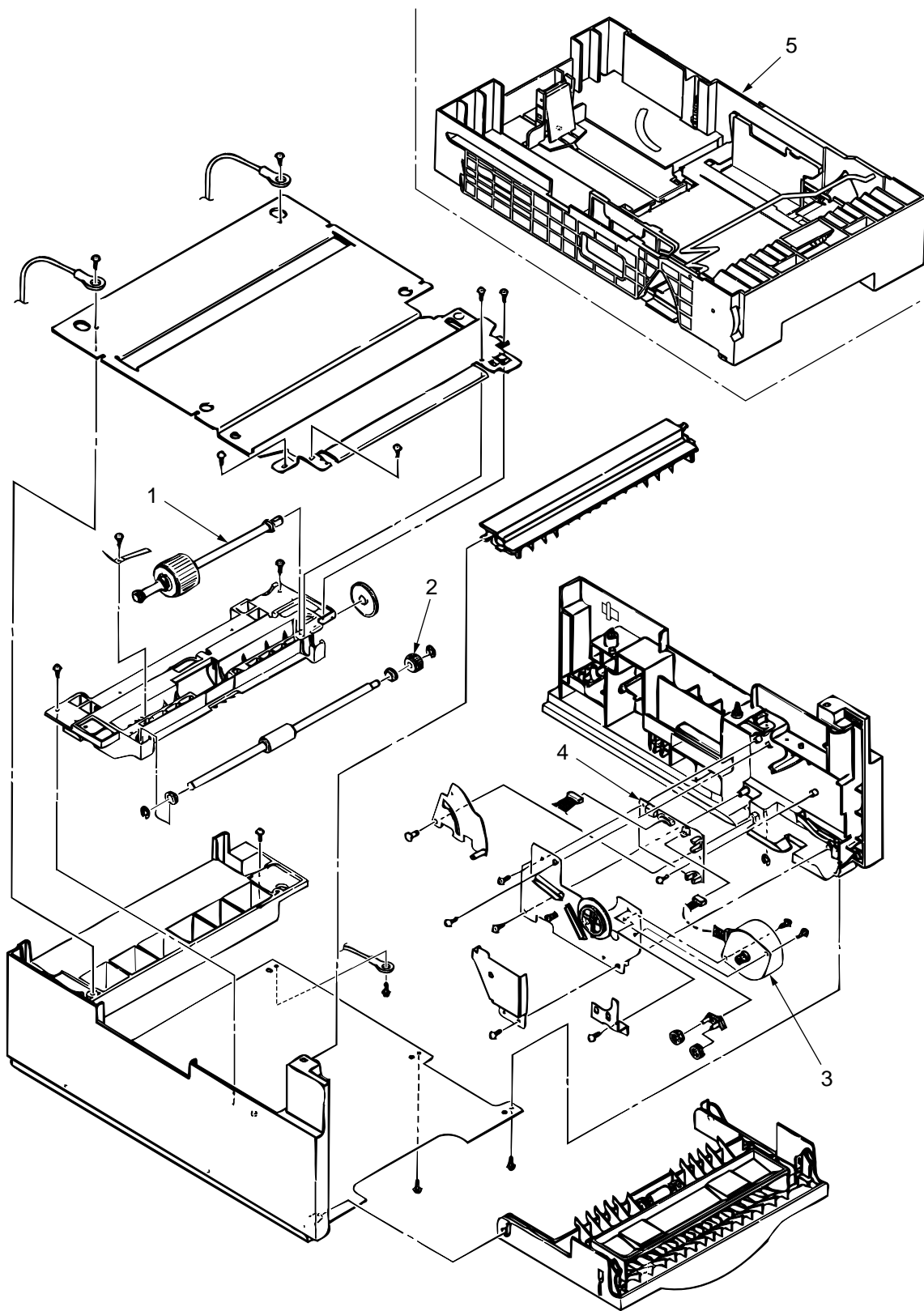


Figure 6-1 High Capacity Second Paper Feeder

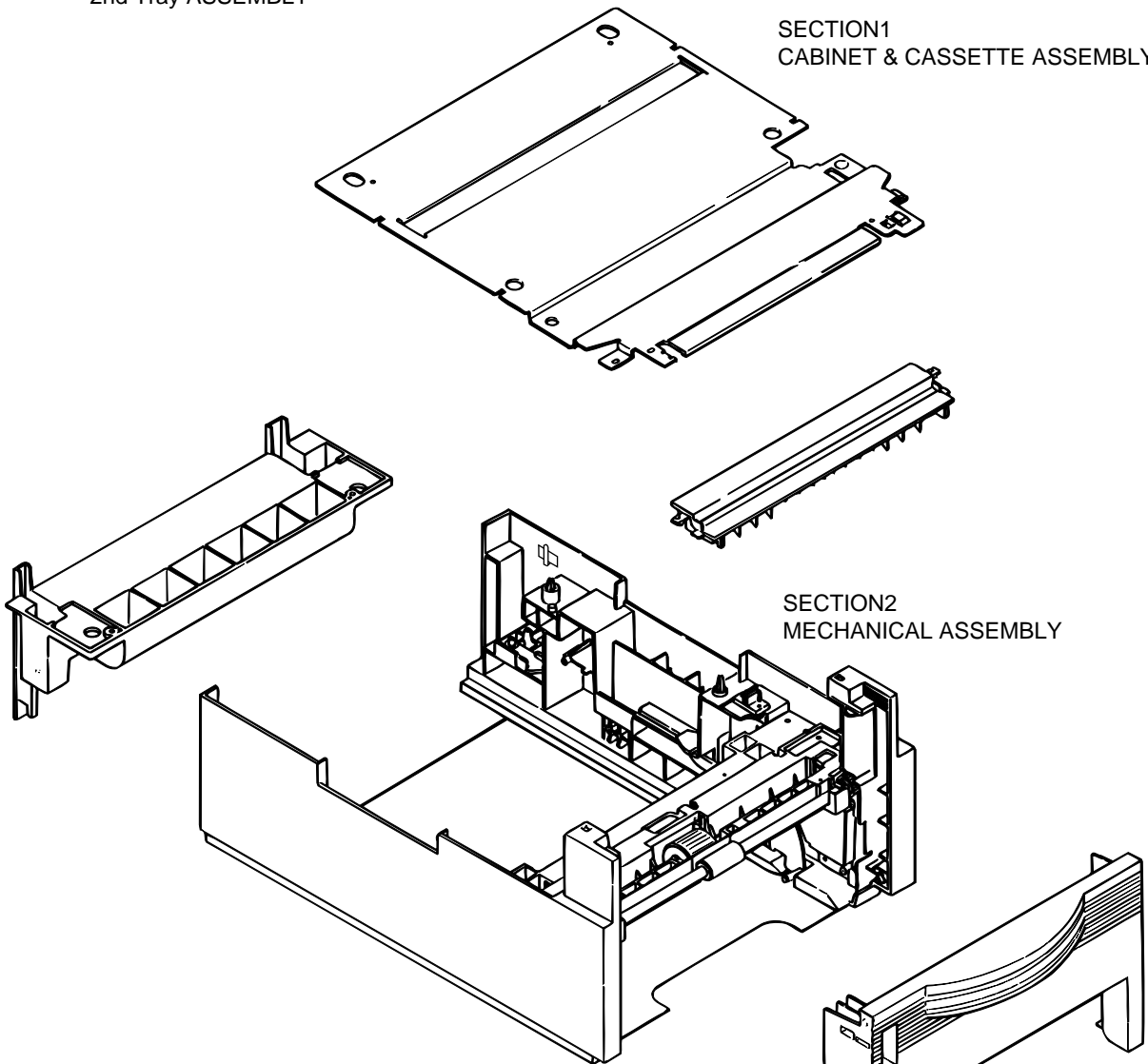
Table 6-1 High Capacity Paper Feeder

No.	Description	Part No.	Q'ty	Remark
1	Hopping roller shaft assy	50409501	1	
2	One-way clutch gear	51401101	1	
3	Stepping motor	56512201	1	
4	TQSB-2 PCB	55078102	1	
5	Cassette assy (2nd tray)	50107304	1	



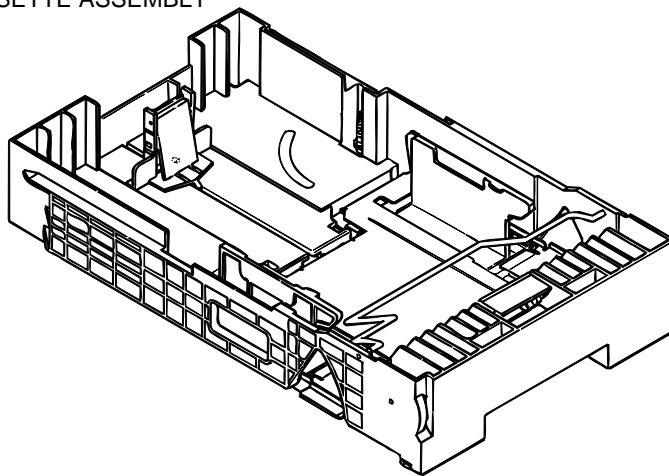
2nd Tray ASSEMBLY

SECTION1  
CABINET & CASSETTE ASSEMBLY

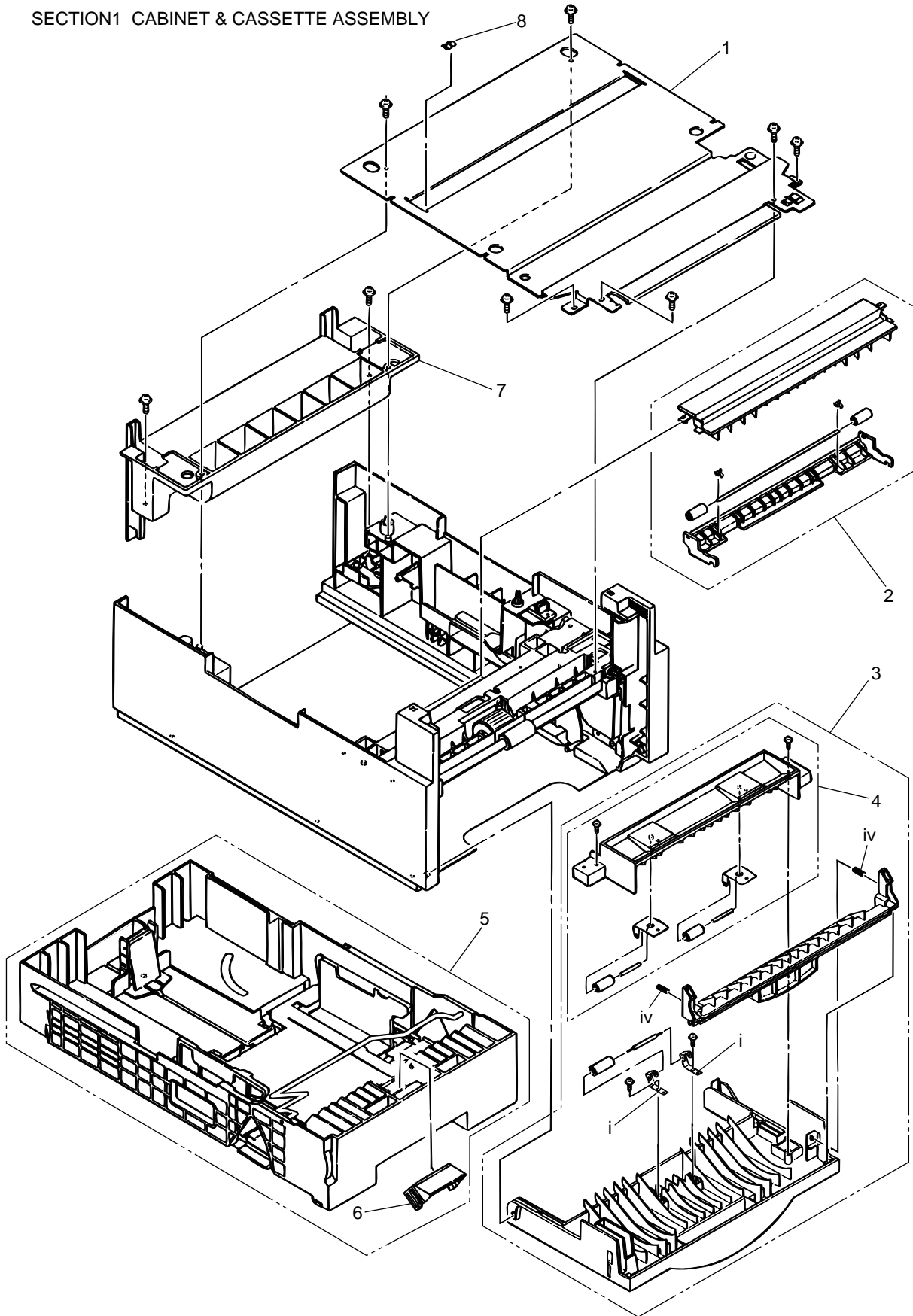


SECTION2  
MECHANICAL ASSEMBLY

SECTION1  
CABINET & CASSETTE ASSEMBLY



SECTION1 CABINET & CASSETTE ASSEMBLY



SECTION2 MECHANICAL ASSEMBLY

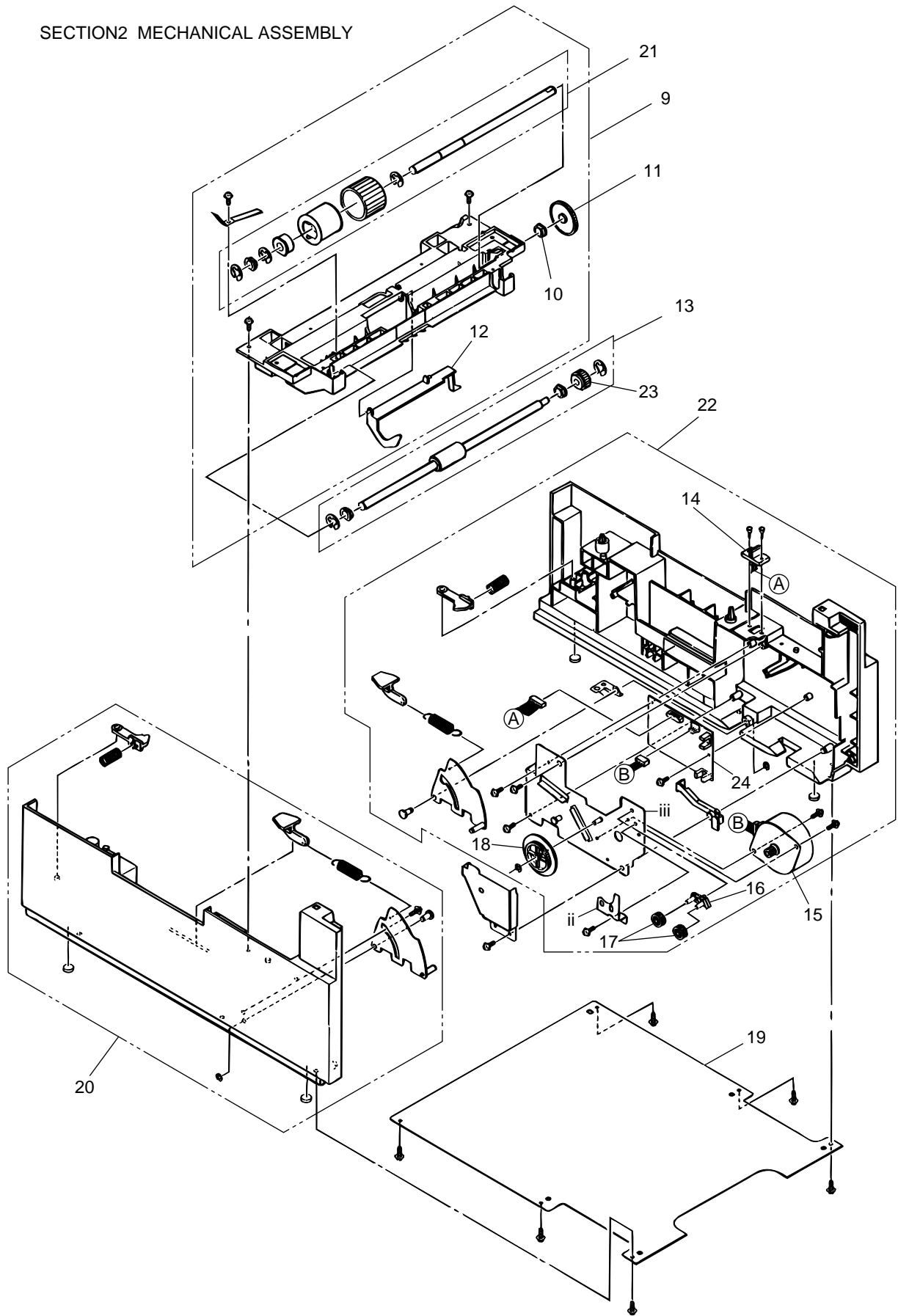


Table 6-2 2nd Tray Parts List

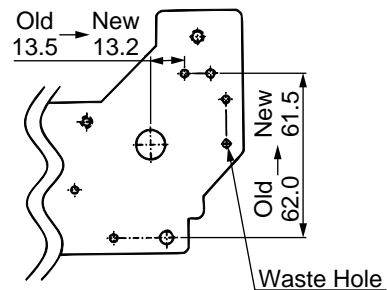
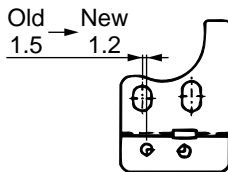
No.	Description	ODA Parts No.	Q'ty/U	500	1000
1	Plate, upper	51023301	1	3	5
2	Sheet guide assembly	50222001	1	3	5
3	Front cover assembly	53075301 *	1	3	5
4	Inner guide assembly	50221501	1	3	5
5	Cassette assembly (2nd tray)	50107304 ***	1	3	6
6	Separation frame assembly	50222101	1	6	12
7	Cover, rear	53075201	1	3	5
8	Stick finger	51023401	1	3	5
9	Hopping flame assembly	50222401	1	3	6
10	Bush, metal (ADF)	51608901	1	3	5
11	Gear (z70)	51239001	1	3	5
12	Lever, sensor (p)	50411201	1	3	5
13	Feed roller assembly	50222501	1	3	5
14	Cable & connector	56633901	1	3	5
15	Stepping motor	56512201	1	3	6
16	Bracket	51712001	1	3	5
17	Gear (z24)	51238901	2	3	5
18	Gear (z87/z60)	51239101	1	3	5
19	Plate, bottom	51023201	1	3	5
20	2nd cassette guide (L) assy	50222301	1	3	6
21	Hopping roller assembly	50409501	1	3	6
22	2nd cassette guide (R) assy	50222201 **	1	3	6
23	One-way clutch gear	51401101	1	6	12
24	TQSB-2 PCB	55078102	1	3	6

\* For the rev. no. of the Parts List for the Front cover assembly should be applied No.6.  
The No.6 includes a change of Release spring [P194, iv]

\*\* For the rev. no. of the Parts List for the 2nd cassette guide (R) assy should be applied No.5.  
In the No.5, the oval hole in the Guide Bracket [P195, ii] and the hole in the Motor Bracket [P195, iii] are relocated as shown in the following illustrations, respectively:

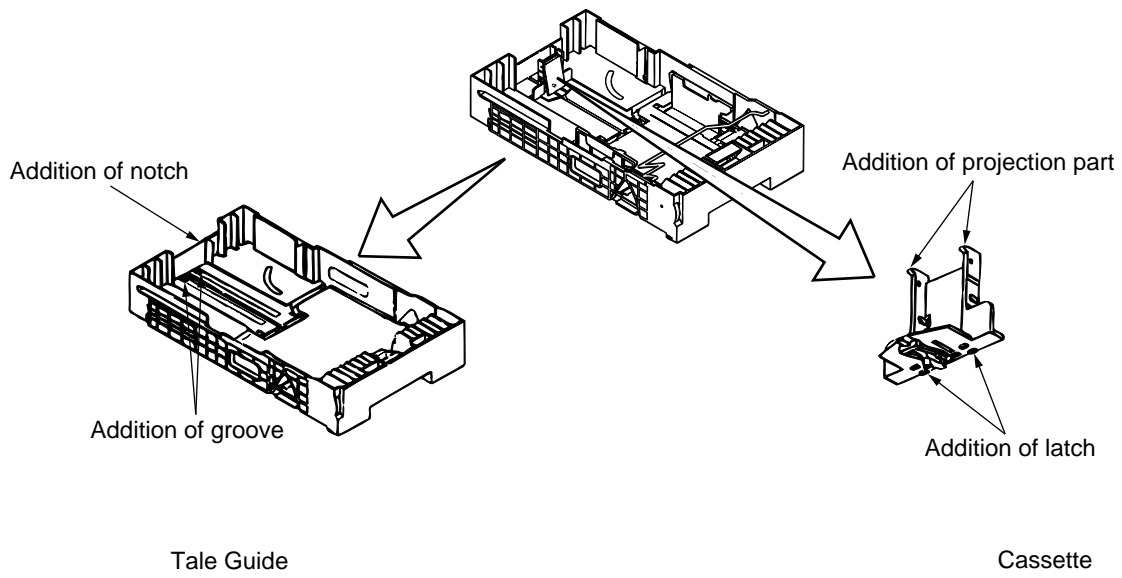
Guide Bracket Part No.:4PP4122-1392P001

Motor Bracket Part No.:3PP4122-1345P001



**Note :** Parts Nos. 3 and 22 need concurrent replacing.

\*\*\* For the rev. no. of the Parts List for the Cassette assembly (2nd tray) should be applied No.10.  
The No.10 includes a change of cassette and Tail Guide.



**Note :** Cassette and Tail Guide need concurrent replacing.