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Service Guide OKIPAGE 10ex
Chapter 0 Introduction

Front Cover

OKIDATA
Service Guide



OKIPAGE 10ex

To propel your company into the future, you need technology that fits the way you work. You need the OKIPAGE® 10ex, the best-featured desktop printer in its class. This digital LED printer combines professional performance with exceptional value, for years of high-quality documents and low ongoing operating costs.

Adobe Acrobat printable reference copy
of the OKIDATA Service Training Manual.
05/13/98

Note: This Adobe Acrobat version of the Okidata Service Training Manual was built with the pictures rendered at 300 dpi, which is ideal for printing, but does not display well on most displays.

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Introduction

This Service Handbook describes the field maintenance methods for OKIPAGE 10ex Digital LED Printer. This manual is written for use by the maintenance personnel. Please note that you should refer to the Printer Handbook and Printer Setup for the handling and operating methods of the equipment.

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1.1 System Configuration

OKIPAGE 10ex 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.

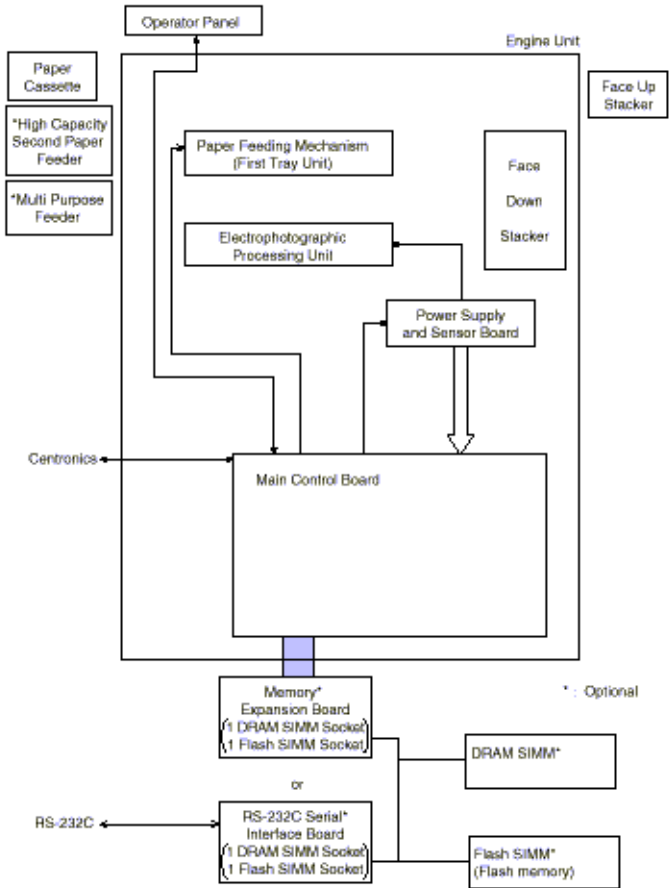


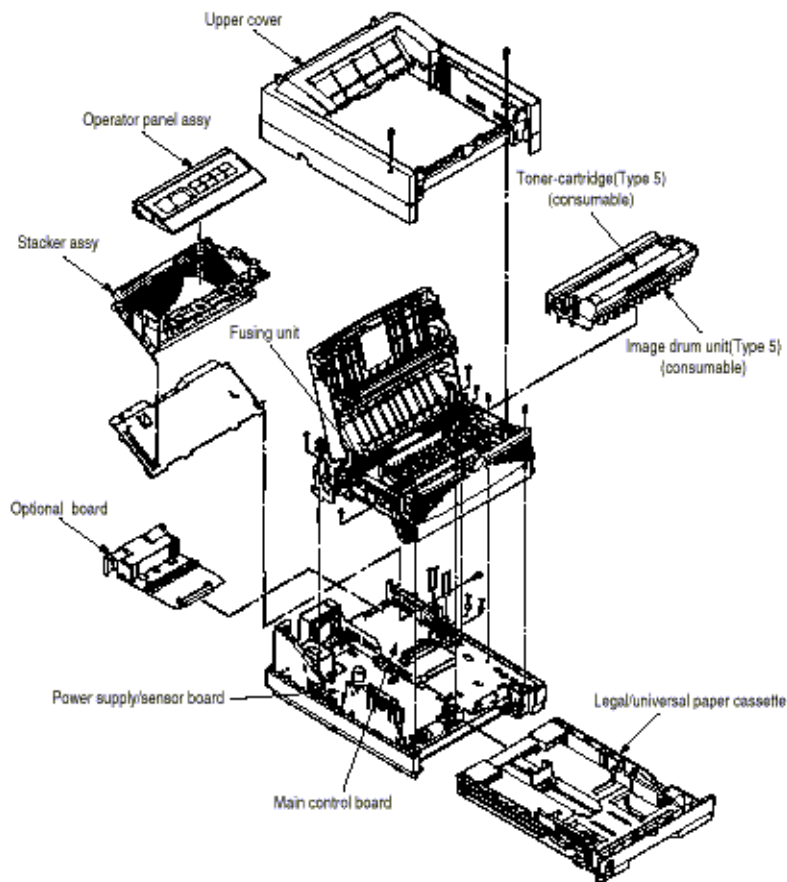
Figure 1-1

1.2 Printer Configuration

The printer unit consists of the following hardware components:

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

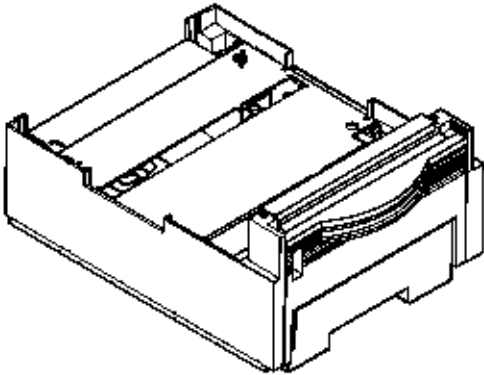
The printer unit configuration is shown in Figure 1-2.



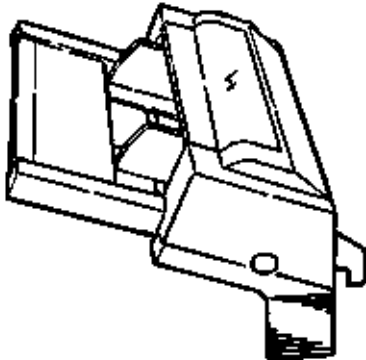
1.3 Optional Configuration

The options shown below are available for use with OKIPAGE 10ex. These are available separately from the printer unit.

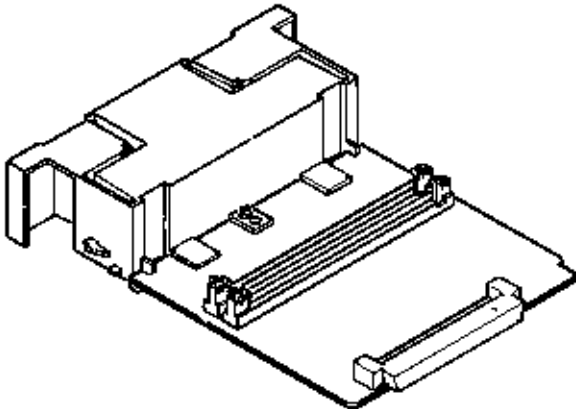
(1) High Capacity Second Paper Feeder



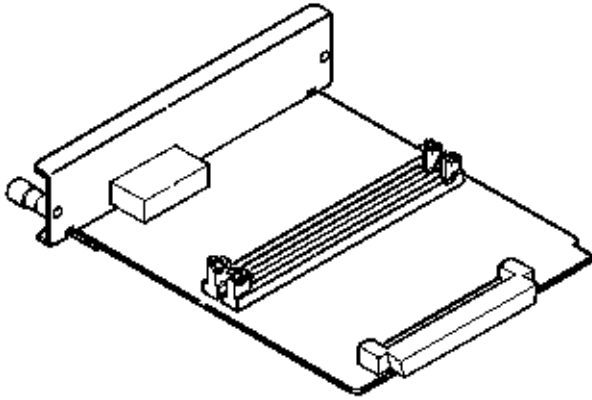
(2) Multi-Purpose Feeder



(3) 1 MB Memory Expansion Board

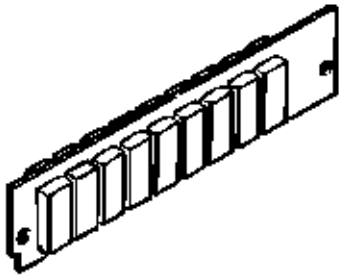


(4) RS-232C Serial Interface Board



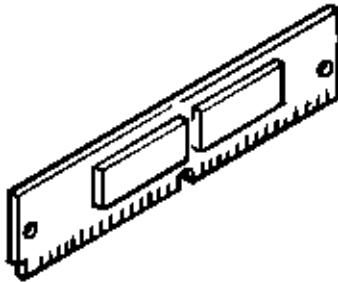
(5) DRAM SIMM Memory

DRAM SIMM memory is available with memory of 1 MB (min.) to 32 MB (max.). The access time of SIMM memories are 60ns, 70ns, 80ns, and 100ns.



(6) Flash SIMM

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





1.4 Specification

- | | |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) Type: | Desktop |
| (2) Outside dimensions | Height: 7.9" (200 mm)
Width 13.0" (330 mm)
Depth 15.6" (395mm) |
| (3) Weight | 22 lbs. (10 kg) |
| (4) Development method
Exposure method | Dry electrophotography LED stationary head |
| (5) Paper used | <Type> <ul style="list-style-type: none">● Standard paper- Xerox 4200 (20 lbs)● Application paper (manual face-up feed)- Label- Envelope- OHP paper (Transparency) <Size> <ul style="list-style-type: none">● Standard Letter
Legal * [*Without Mutli-Purpose Feeder (Option)]
Legal-13*
Executive
-COM-10** [**manual feed and Multi-Purpose Feeder (Option) only]
Monarch**
DL**
C5**
B5 (JIS)
A6 <ul style="list-style-type: none">● Applicable sizes- Width: 3.87" x 8.5" (116 to 216 mm)- Length: 5.83" to 14" (148 to 355.6 mm) <Thickness> <ul style="list-style-type: none">- Automatic feed: 16 to 28 lbs (60 to 135 g/m²)- Manual feed: Label, OHP paper (transparency), Envelope (24 to 28 lbs.) |

- (6) Printing speed: First print: 12 seconds typical for the Letter size paper after warm-up
 Continuous print: 10 pages per minute with Letter size paper.
 [Except Second Paper Feeder (8.8 PPM), Multi-Purpose Feeder (8.3 PPM)]
 Warm-up time: 60 seconds typical at room temperature [68° F (20° C), AC 120/230 V].(120 VAC for ODA, 230 VAC for OEL/INT)
- (7) Paper feeding method Automatic paper feed or manual paper feed
- (8) Paper delivery method Face down/face up
- (9) Resolution 600 dpi x 600 dpi (true)
 600 x 1200 dots/inch graphics
- (10) Power input 230 VAC +/-10%
 120 VAC +/-15% for
- (11) Power consumption Peak: Approx. 460W
 Typical operation: Approx. 215W
 Idle: Approx. 61W
 Power save mode: Approx. 18W
- (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

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

- (13) Noise During operation: 50 dB (A) or less
 Standby: 38 dB (A) or less
 Quite mode: Back ground level
- (14) Consumables Toner cartridge kit - 2,000 (5% duty) ---- 45g cartridge kit
 Image drum cartridge - 20,000 (at continuous printing); 14,000 (3 page/job) without Power Save



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1.5 Safety Standards

1.5.1 Certification Label

1.5.2 Warning Label

1.5.3 Warning/Caution Marking

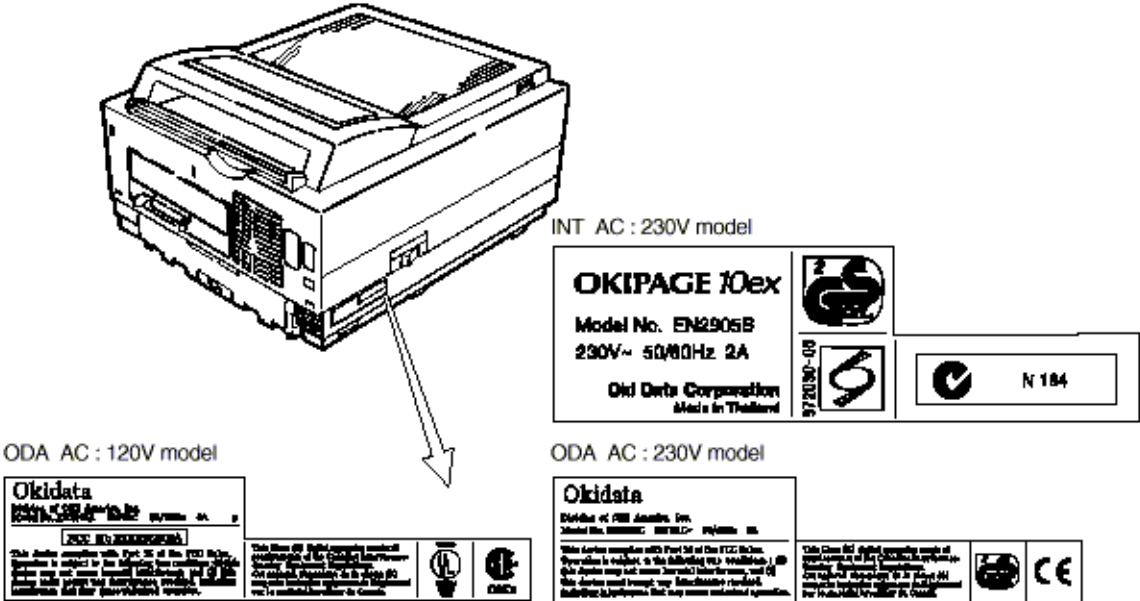
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Service Guide OKIPAGE 10ex Chapter 1 Specifications

1.5.1 Certification Label

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



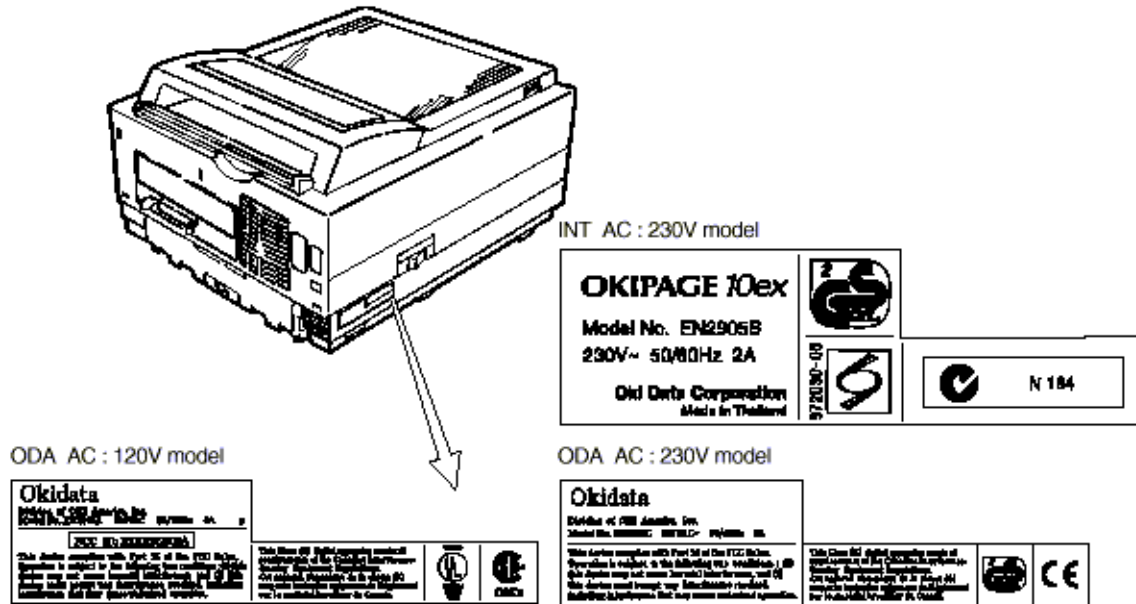


Service Guide OKIPAGE 10ex Chapter 1 Specifications

1.5.2 Warning Label

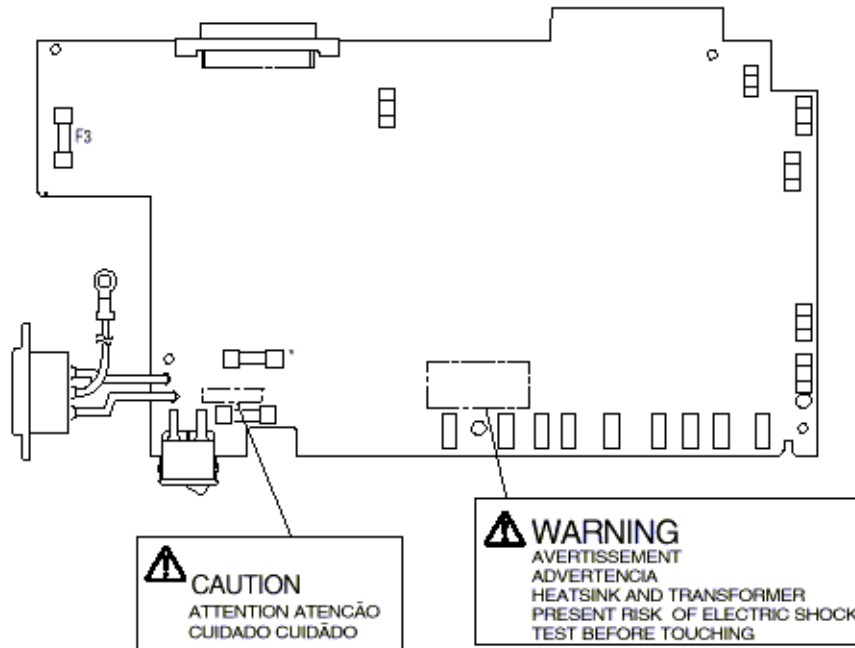
The warning labels are affixed to the sections which may cause bodily injury.

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.



* No fuse is mounted here for 200V series.

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.



Service Guide OKIPAGE 10ex Chapter 2 Operation

Operation Description

OKIPAGE 10ex 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 10ex block diagram is shown in Figure 2-1.

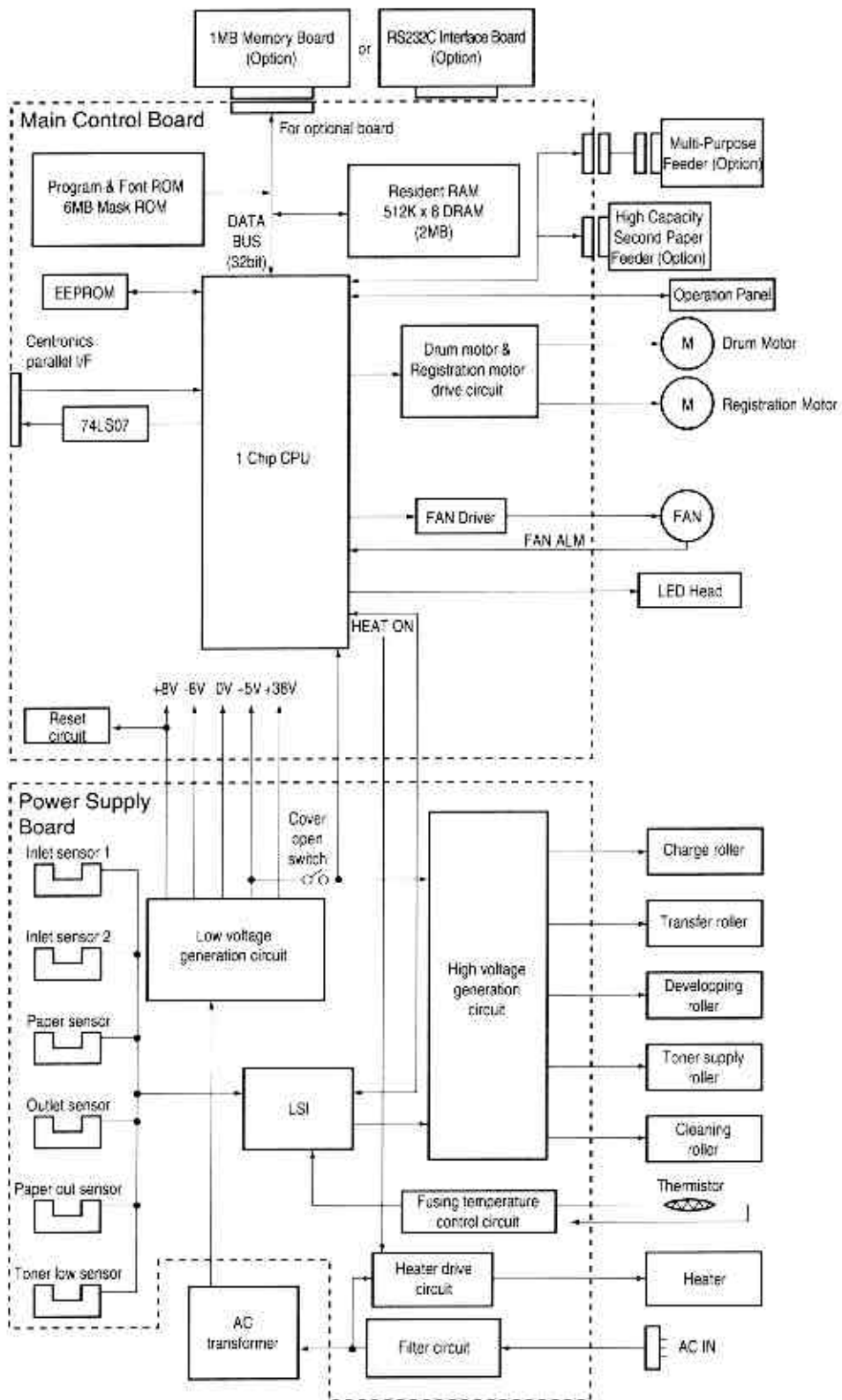


Figure 2-1 OKIPAGE 10ex Block Diagram

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Service Guide OKIPAGE 10ex

Chapter 2 Operation

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, 28.24-MHz clock, with input frequency from a 7.06-MHz clock) which incorporates the RISC CPU and its peripheral devices, and has the following functions:

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	Controls LED head.
Timer	Generation of various control timing Monitoring of paper running and paper size.
I/O Port	Input and output of sensor and motor signals.

(2) Program and Font ROMs

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 2MB resident memory on the main control board that stores edited data, image data, DLL data and macro data.

(4) EEPROM

1,024-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 IEEE 1284 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	Application
+5 V	Logic circuit supply voltage.
+38 V	Motor and fan drive voltage and source voltage for high-voltage supply.
+ 8 V	RS-232C line voltage.
- 8 V	RS-232C line voltage and PS board supply voltage.
+ 3.3 V	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	Application
CH	-1.3 KV	Voltage to be applied to charge roller.
DB	-265 V/+300 V	Voltage to be applied to a developing roller.
SB	-500 V/ 0 V	Voltage to be applied to a sponge roller.
CB	+400 V/+3.5 KV	Voltage to be applied to a cleaning roller.
TR	+500 V to +3.5 KV/-1100 V	Voltage to be applied to a transfer roller. (Variable)

(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 below.

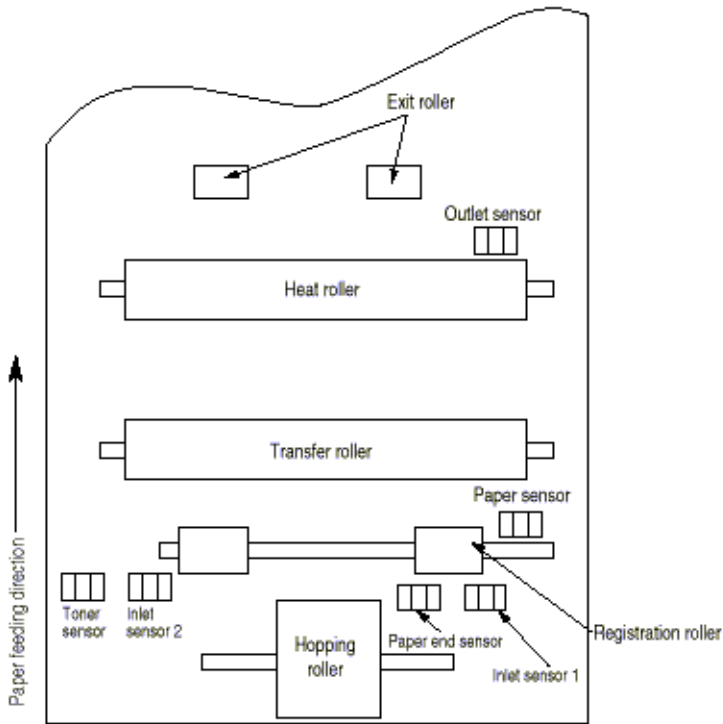


Figure 2-2

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 paper feeding situation.	ON: Paper exists. OFF: No paper exists.
Output sensor	Monitors paper feeding and size according to the time of arrival to and leaving past the sensor.	ON: Paper exists. OFF: No paper exists.
Toner sensor	Detects the lack of toner.	-----



2.3 Electrophotographic Process

2.3.1 Electrophotographic Process Mechanism

2.3.2 Electrophotographic Process

2.3.3 Process Operation Descriptions

2.3.4 Revision of LED Head Illumination

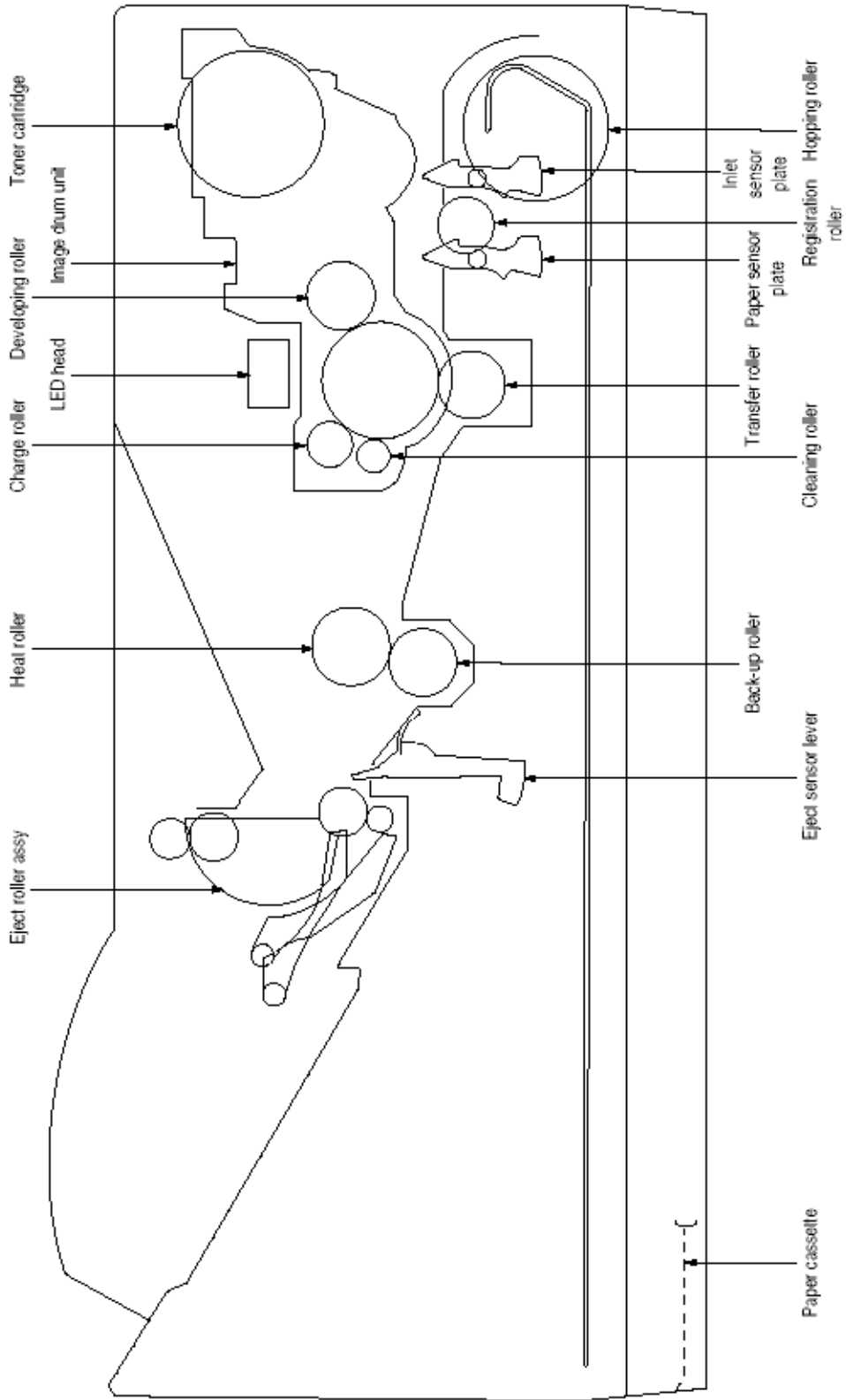
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2.3.1 Electrophotographic Process Mechanism

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.



(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 excitation 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 excitation 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 LEDs 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=165°C, medium light=170°C, medium=175°C, medium heavy and heavy=195°C; manual feeding and power envelope feeder: light=175°C, medium light=180°C, medium=185°C, medium heavy=190°C, heavy=195°C, transparency = 160°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 (see below).

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 (see last chart below).

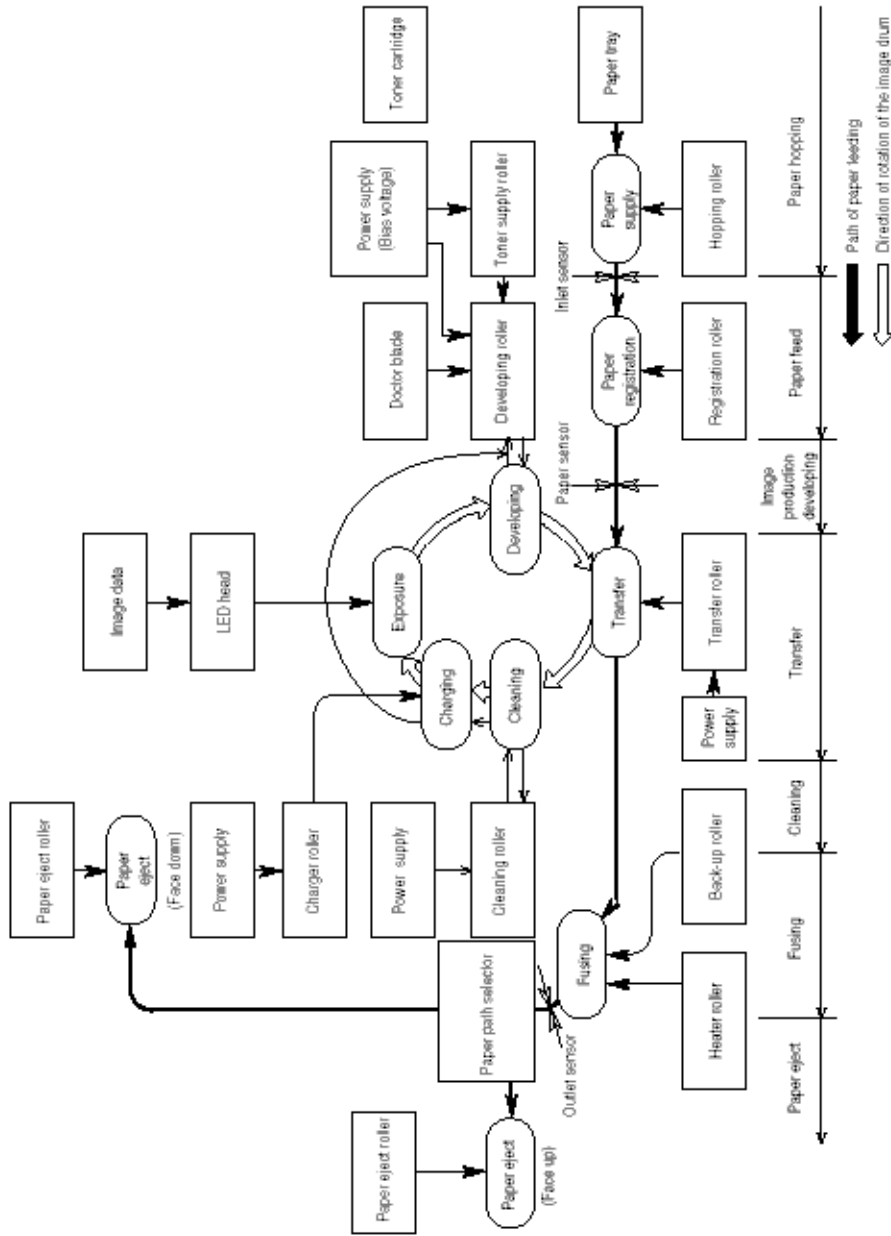


Figure 2-4

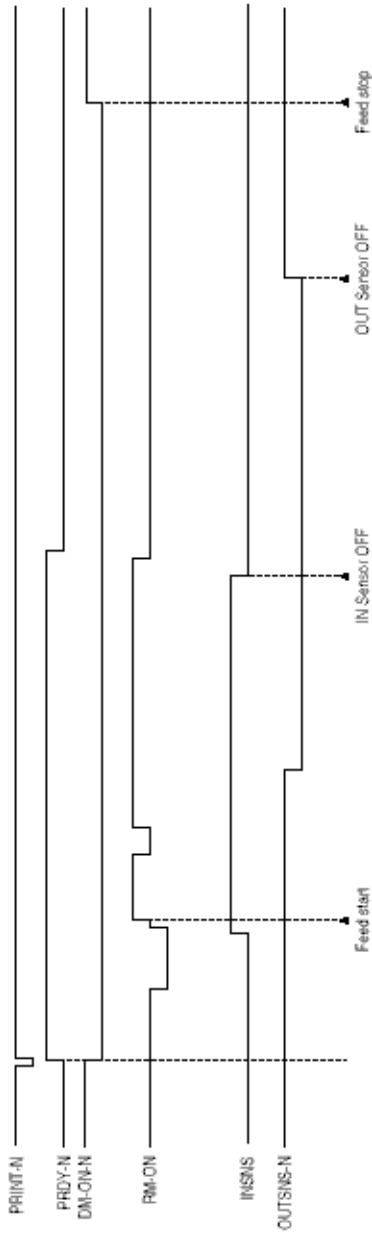
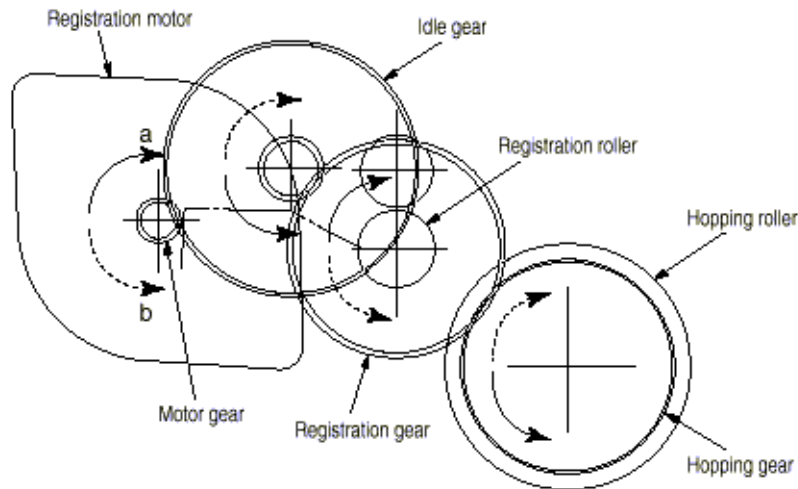


Figure 2-5

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:

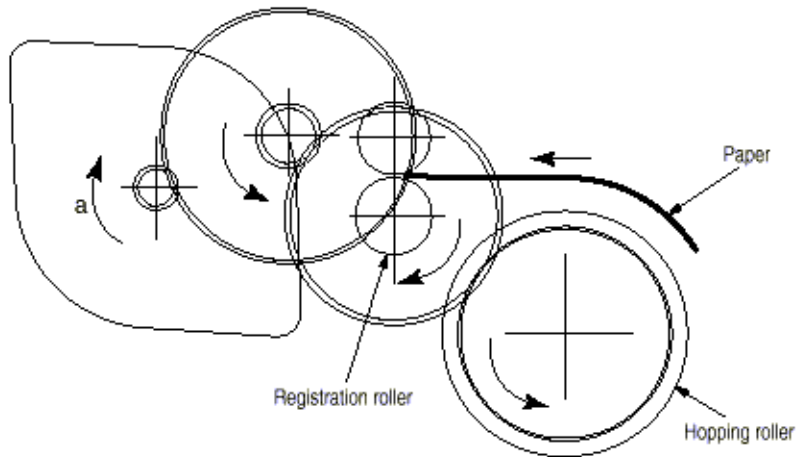


The registration motor turning in direction "a" drives the hopping roller. The registration motor turning in direction "b" drives the registration roller. The registration and hopping gears have one-way bearing, so turning any of these gears in the reverse direction will not transmit the motion to the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

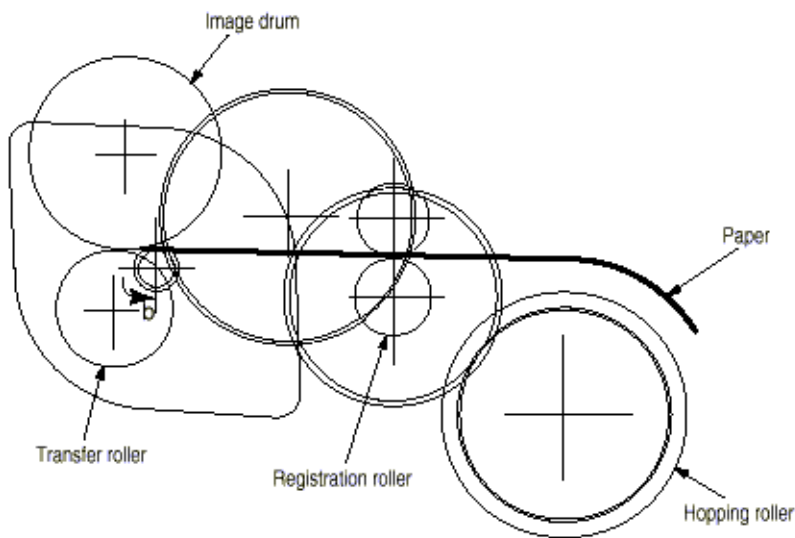
2 After inlet sensor is turned on by the paper advance, the paper is further advanced to a predetermined distance until the paper hits the registration roller (the skew of the paper can thus be corrected).



(b) Feeding

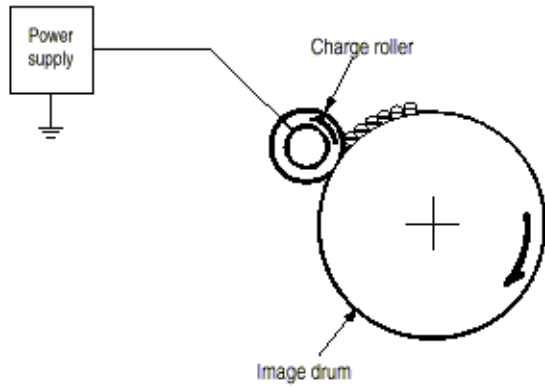
1 When hopping is completed, the registration motor turning in direction "b" (counter-clockwise direction) drives the registration roller to advance the paper (in this case, the hopping gear also turns, but the hopping roller is prevented from turning by the one-way bearing).

2 The paper is further advanced in synchronization with the print data.

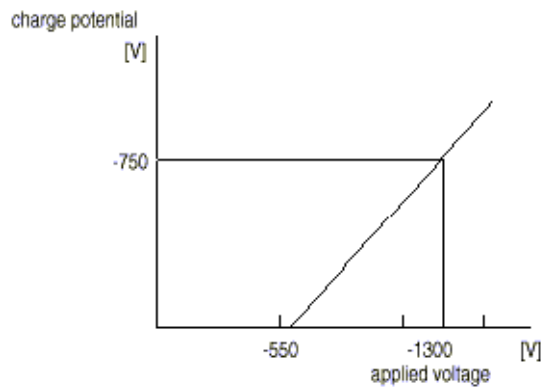


(2) Charging

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

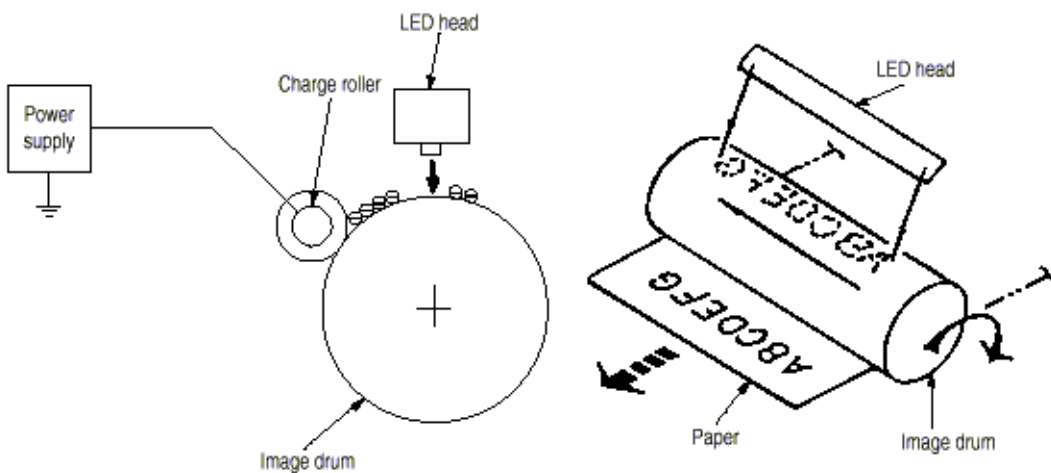


The charge roller is composed of two layers, a conductive layer and a surface protective layer, both having elasticity to secure good contact with the image drum. When the DC voltage applied by the power supply exceeds the threshold value, charging begins. The applied voltage is proportional to the charge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



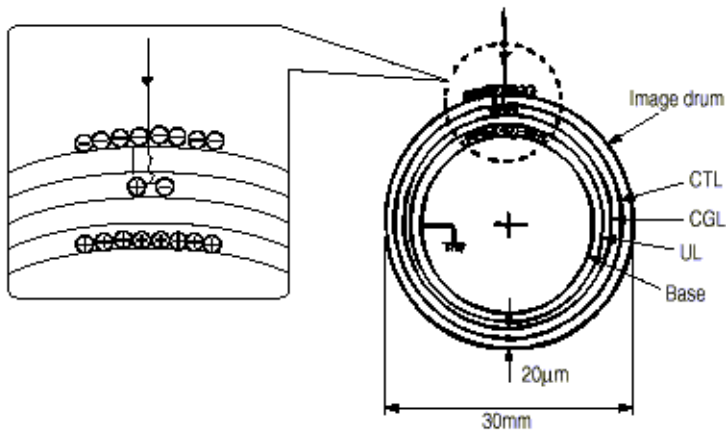
(3) Exposure

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

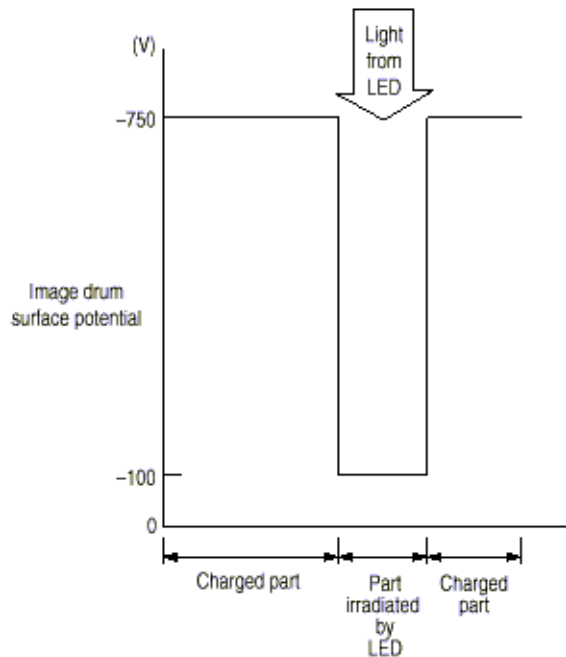
aluminum base. The organic photo conductor layer (OPC), comprising CTL and CGL, is about 20 μm thick.



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).

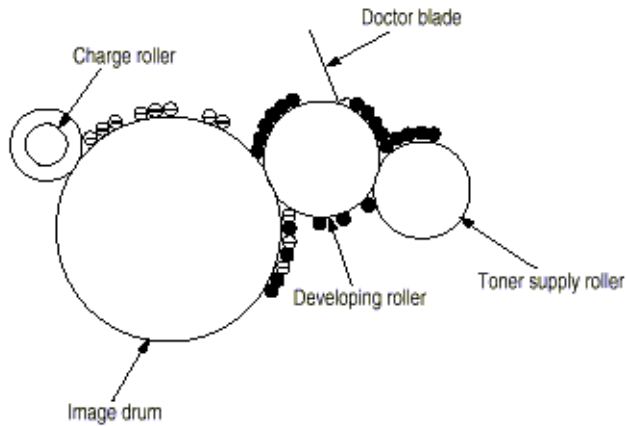
The positive carriers moved to the CTL combine with the negative charges on the image drum surface accumulated by the contact charge of the charge roller, lowering the potential on the image drum surface. The resultant drop in the potential of the irradiated portion of the image drum surface forms an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



(4) Developing

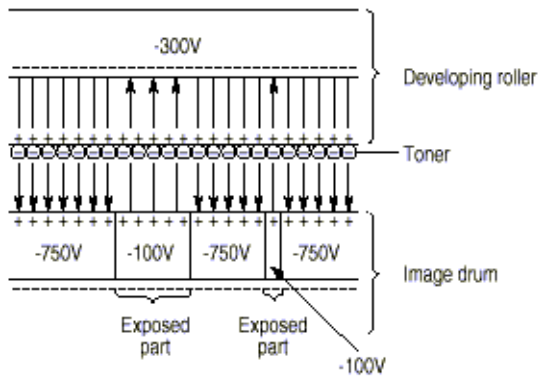
Toner is attracted to the electrostatic latent image on the image drum surface, converting it into a visible toner image. Developing takes place through the contact between the image drum and the developing roller.

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).



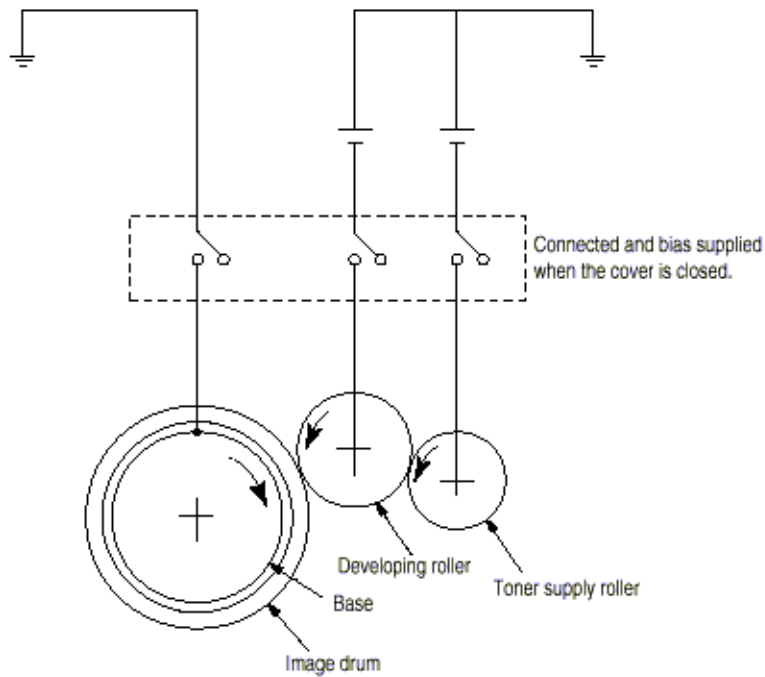
2 The toner attracted to the developing roller is scraped off by the doctor blade, forming a thin coat of toner on the developing roller surface.

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. -500 VDC is supplied to the toner supply roller, -265 VDC to the developing roller.

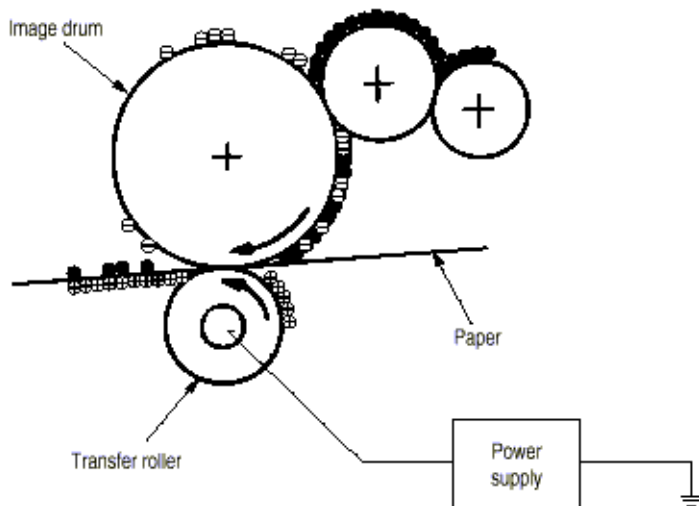


(5) Transfer

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.

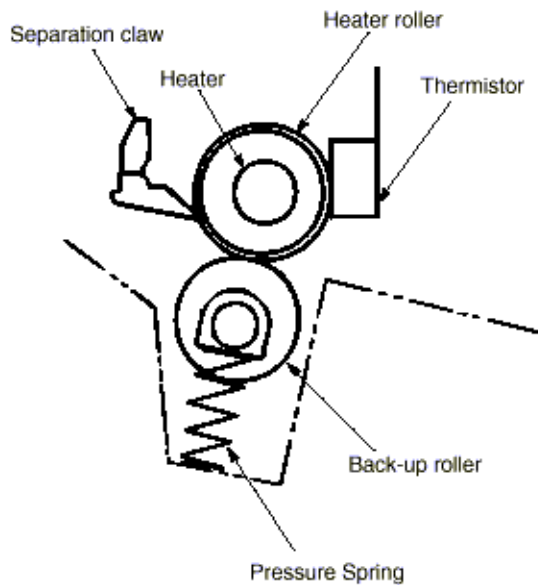


(6) Fusing

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 400W heater (Halogen lamp), which generates heat.

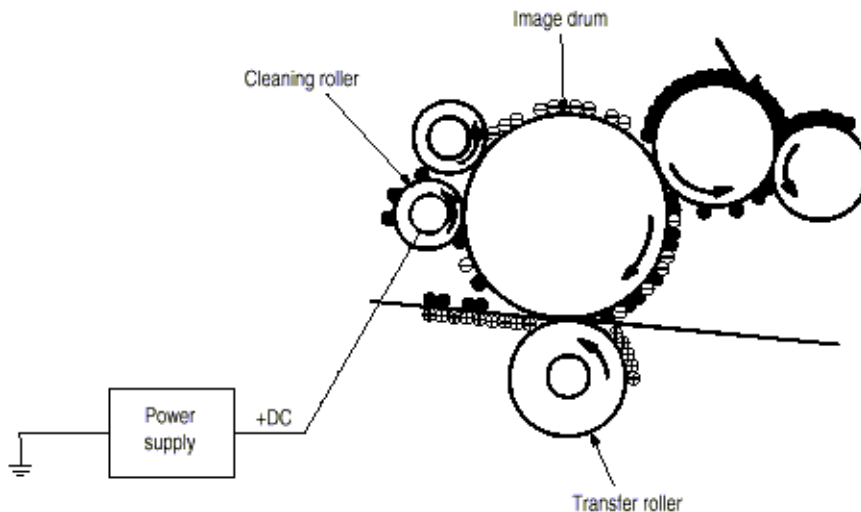
A thermistor which is in contact with the heater roller regulates the temperature of the heater roller to a designated temperature in the menu, depending on the thickness of the paper (tray 1&2: light=165°C, medium light=170°C, medium=175°C, medium heavy and heavy=195°C/manual feeding and power envelope feeder: light=175°C, medium light=180°C, medium=185°C, medium heavy=190°C, heavy=195°C, transparency = 160°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:

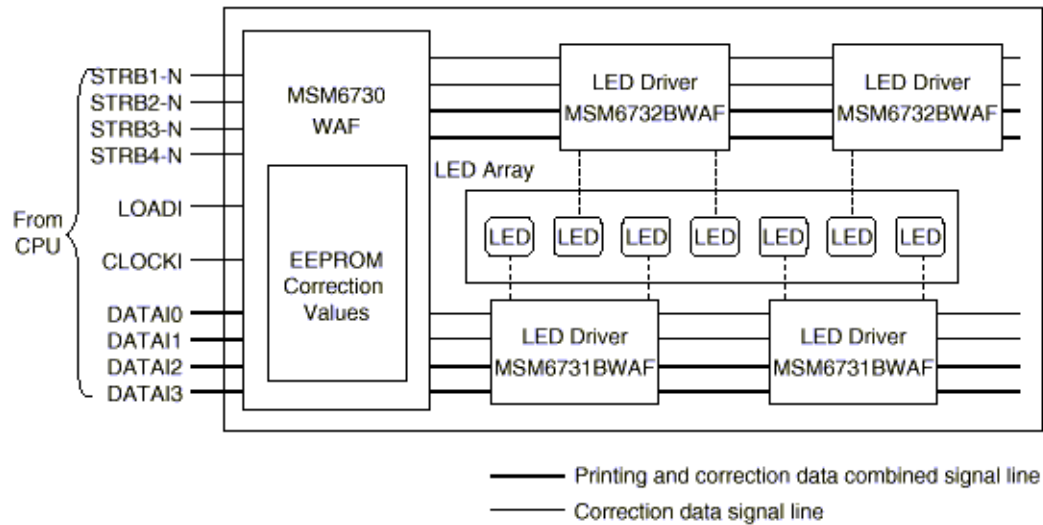
- Warming up when the power is turned on.
- Warming up after the opening and closing of the cover.
- When the number of sheets accumulated reaches 10 or more, and the printout operation ends.

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.

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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 (MSM6731BWAF or MSM6732BWAF) together as a pair. The LED correcting head consists of the correction control LSI (MSM6730WAF), LED drivers (MSM6731BWAF or MSM6732BWAF), and an LED array. The block diagram of the LED correcting head is shown below.

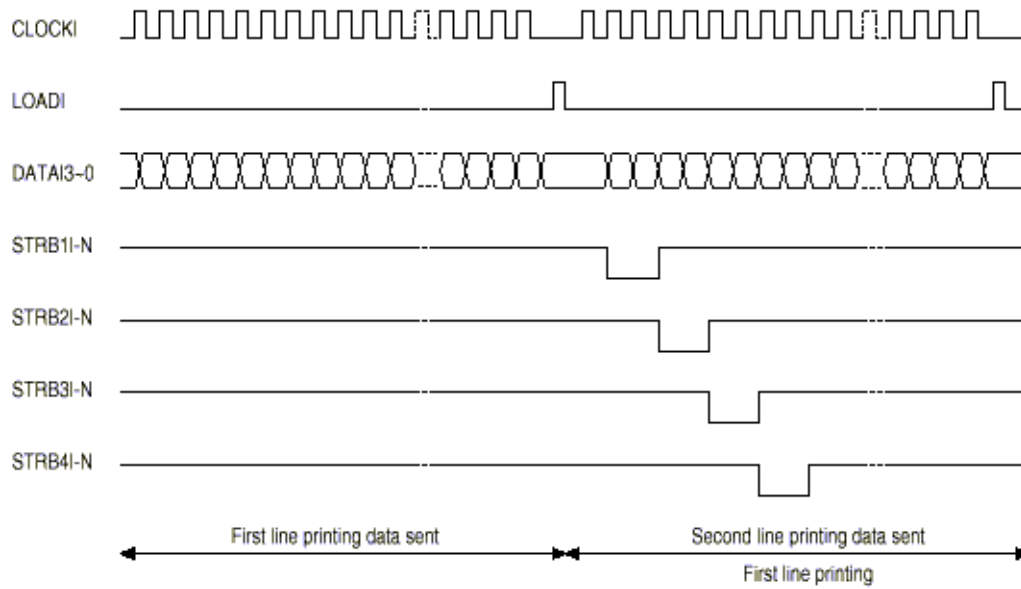


The existing LED head receives the printing data from the CPU directly at its LED drivers. With the LED correcting head, a correction control LSI (MSM6730WAF) is connected between the CPU and LED drivers, so the printing data is input to the LED drivers through the correction control LSI. In order to maintain compatibility with the existing LED head, the printing operation of the LED correcting head is carried out through identical sequence.

The LED correcting head is a 600 dpi head, with the LED drivers located on both sides of the LED array with a 300 dpi pitch spacing. 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

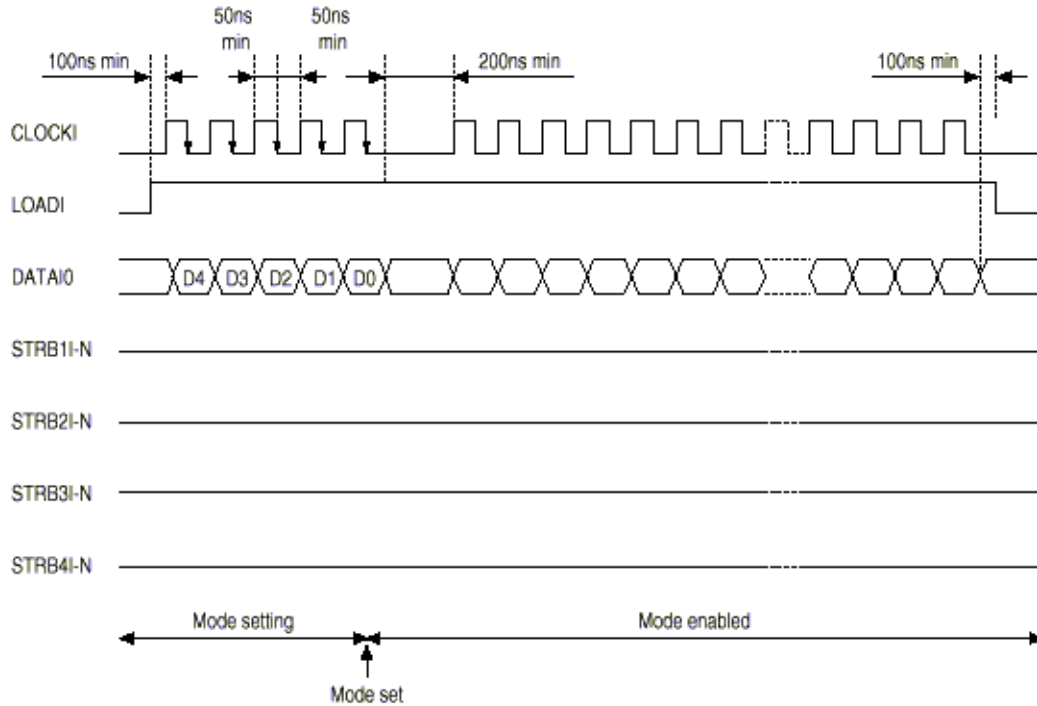


The printing operation is carried out in normal mode. Under ordinary circumstances such as when the power is turned on or when LOADI signal level is low, the normal mode is enabled.

The printing operation is carried out in the following sequence. First, the printing data DATA13 through DATA10 are stored, sequentially shifted, in the shift registers of the LED drivers, by the printing data synchronous clock, CLOCK. Then the printing data stored in shift registers are latched by the high level pulse of LOAD. The latched printing data turns the LEDs on by STRB11-N through STRB41-N and actuates printing.

The mode setting timing chart during illumination correction is shown below.

Illumination Correction Mode Setting Timing Chart



The mode setting is carried out in the following manner. LOAD is fixed at high level, and DATA10 which comes up following this is 4-data latched with the timing of the fall of CLOCK. The illumination correction mode is selected based on the latched 4-data combination. Then the mode becomes valid at the fifth fall of CLOCKI.

The period during which the illumination correction mode is valid is from the fall of the fifth CLOCK and while the level of LOAD is high. When the level of LOAD becomes low, the illumination correction mode is terminated, and the head returns to the normal mode, which is mode with which the printing is normally carried out.

The LED driver (MSM6731BAAF) corrects the LED illumination by controlling the LED current. The LED illumination can be set in 16 steps, with 7 steps in the direction of illumination increase in relation to the standard value, and 8 steps in the direction of decrease. For this reason, the LED correction data is a 4-bit data for each dot.

The relationship between the LED correction data and LED current correction steps with the LED driver (MSM6731BAAF) used in an LED head is shown below.

LED Correction Data

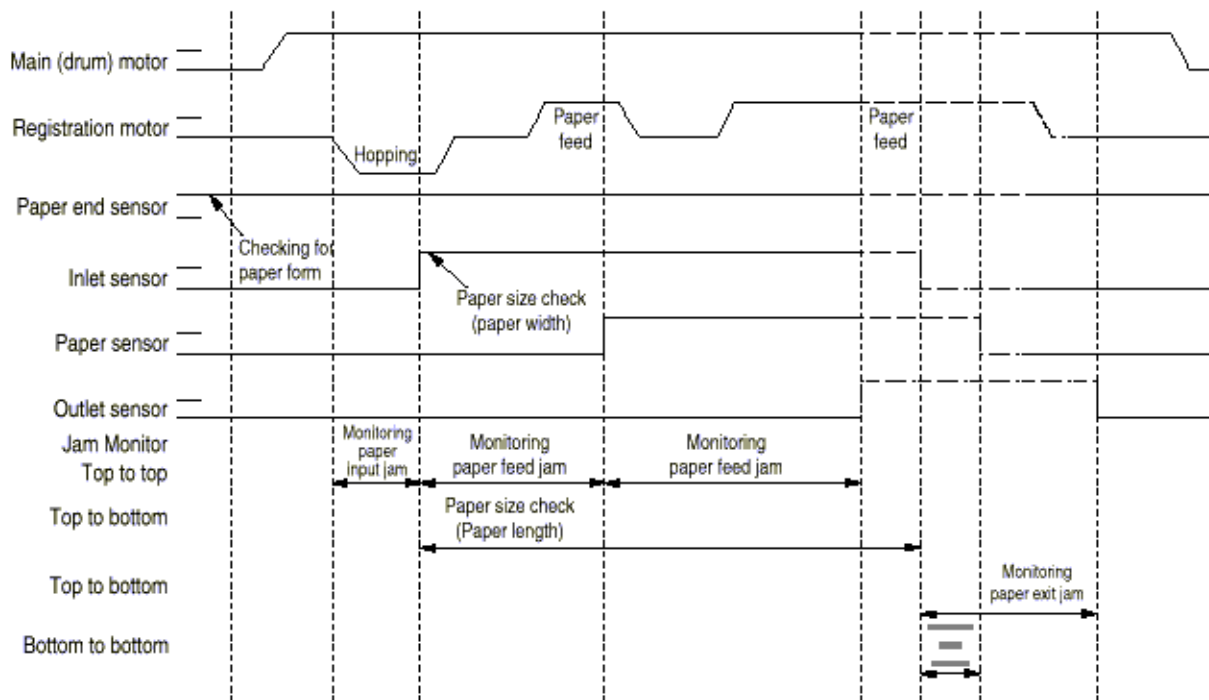
Correction Data				Correction Step	Correction Mode
msb b3	b2	b1	lsb b0		
1	0	0	0	+16%	↑
0	1	1	1	+14%	↑
0	1	1	0	+12%	Correction by increasing illumination
0	1	0	1	+10%	
0	1	0	0	+8%	
0	0	1	1	+6%	
0	0	1	0	+4%	↑
0	0	0	1	+2%	↑
0	0	0	0	0%	No correction
1	1	1	1	-2%	↓
1	1	1	0	-4%	↓
1	1	0	1	-6%	Correction by decreasing illumination
1	1	0	0	-8%	
1	0	1	1	-10%	
1	0	1	0	-12%	
1	0	0	1	-14%	↓

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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"> The paper is in contact with the inlet sensor when the power is turned on. After hopping operation is attempted three times, the leading edge of the paper does not reach the inlet sensor.
Paper feed jam	<ul style="list-style-type: none"> The paper is in contact with the paper sensor when the power is on. 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. The leading edge of paper does not reach the outlet sensor within a predetermined feeding distance after the paper has reached the paper sensor.
Paper exit jam	<ul style="list-style-type: none"> The paper is in contact with the outlet sensor when the power is turned on. 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. The paper size check for manual feeding finds that the paper size is free size.
Paper size error	<ul style="list-style-type: none"> 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. 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. The paper size check for manual feeding finds that the paper size is free size.



Paper Feed Timing Chart

Paper Feed Check List

Type of error	Monitor	Standard Value	Error Plus	Error Minus
Paper feed error	Hopping start to In Sensor on	72.0	36.0	-
Paper feed jam	In sensor on to Write sensor on	20.0	22.0	-
Paper feed jam	Write sensor on to Out sensor on	140.5	25.0	-
Paper size error	In sensor on to Out sensor on	Depends on the paper length	45.0	45.0
Paper exit jam	Out sensor on to Out sensor off	Depends on the paper length	45.0	45.0
Paper feed jam	In sensor off to Write sensor off	22.2	22.0	-

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

Paper Length List

Type	Paper length	Check range Min.	Check range Max.
A4	297.0	252.0	342.0
A5	210.0	165.0	255.0
B5	257.0	212.0	302.0
LETTER	279.4	234.4	324.4
LEGAL 13	330.2	285.2	375.2
LEGAL 14	355.6	310.6	400.6
EXEC	266.7	221.7	311.7
A6	148.0	103.0	193.0
Monarch	190.5	145.5	235.5
COM-9	225.4	180.4	270.4
COM-10	241.3	196.3	286.3
DL	220.0	175.0	265.0
C5	229.0	184.0	274.0
Free	110.1-355.6	65.0	400.6

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2.5 Cover Open

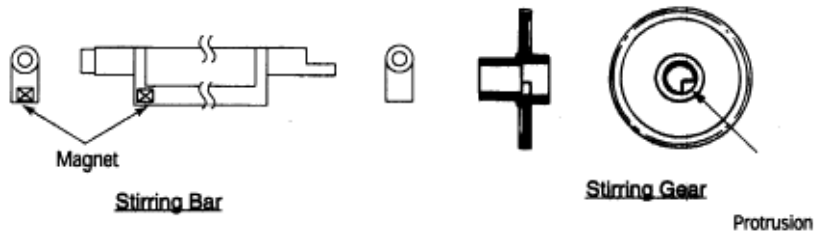
When the stacker cover is opened, the cover open microswitch on the power supply/sensor board is turned off to cut +5V supply to the high voltage power supply circuit. This results in the interruption of all high-voltage outputs. At the same time, the CVOPN signal is sent to the main control board to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

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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 protrusion in the stirring gear.

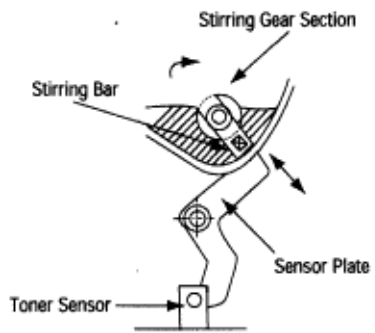


- **Operation**

Toner Low is detected by monitoring the time interval of the encounter of the magnet set on the sensor lever and the magnet on the stirring bar.

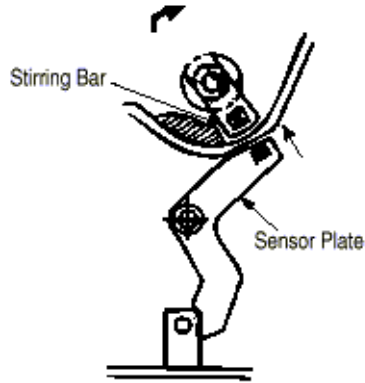
Operation during Toner Full state

- The stirring bar is rotated 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 end is being dipped in the toner.

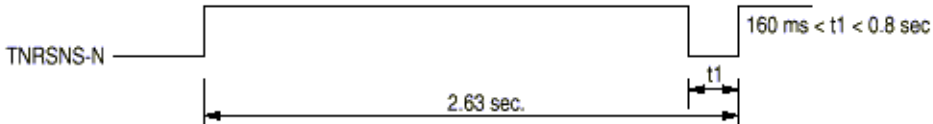


Operation during Toner Low state

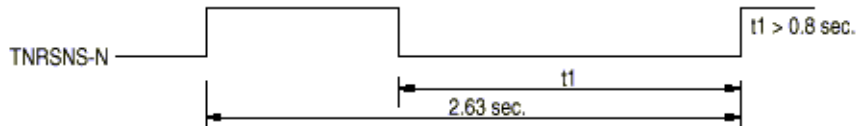
- When the stirring bar reaches the maximum height, it falls to the minimum height due to its own weight, since there is no resistance provided by the toner on the other side. Because of this, the time interval during which it is in encounter with the magnet of the sensor lever becomes longer. By monitoring this time interval, Toner Low 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 canceled.
- When there is no change with the toner sensor for 2 cycles (4.875 sec. x 2) or more, then the Toner Sensor Alarm is activated.
- The toner sensor is not monitored while the drum motor is in halt.

3.1 Precautions for 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 steps of disassembly procedure.

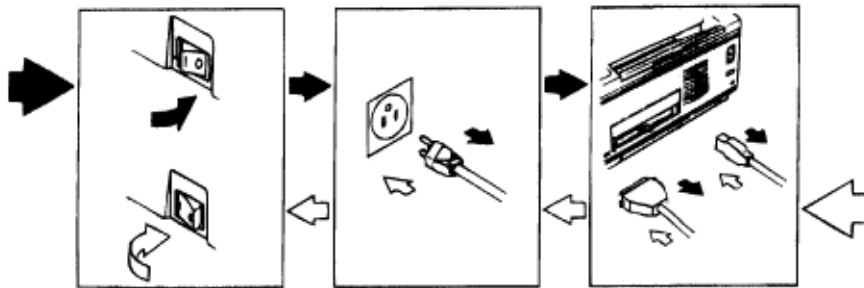
(1) Before starting the parts replacement, remove the AC power cord and interface cable.

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

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

(b) Reconnect the printer in the following sequence.

- i) Connect the AC power 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 try to disassemble as long as the printer is operating normally.

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

(4) Use specified service tools.

(5) When disassembling, follow the procedure in sequence laid out in this manual. 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 to the original positions during disassembly.











(7) When handling IC's such as microprocessors, ROM's and RAM's, 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 and units are listed in Table 3-1.

Table 3-1 Service Tools

No.	Service Tools	Q'ty	Place of use	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	 5.0 mm wrench	1		
8	 Vacuum (with toner filter)	1		
9	 LED Head cleaner	1	Cleans LED head	
10	 Maintenance Utility	1	Adjustment of printer, etc.	OKIPAGE 6e OKIPAGE 6ex

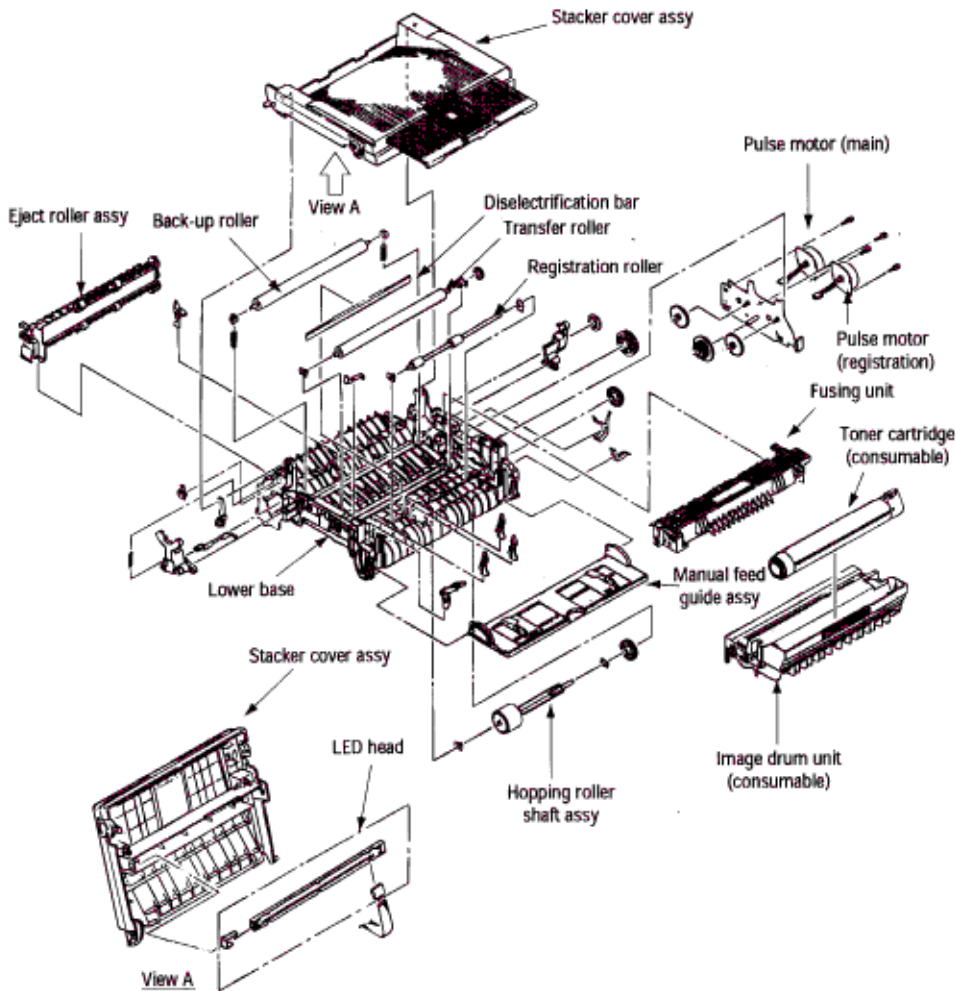
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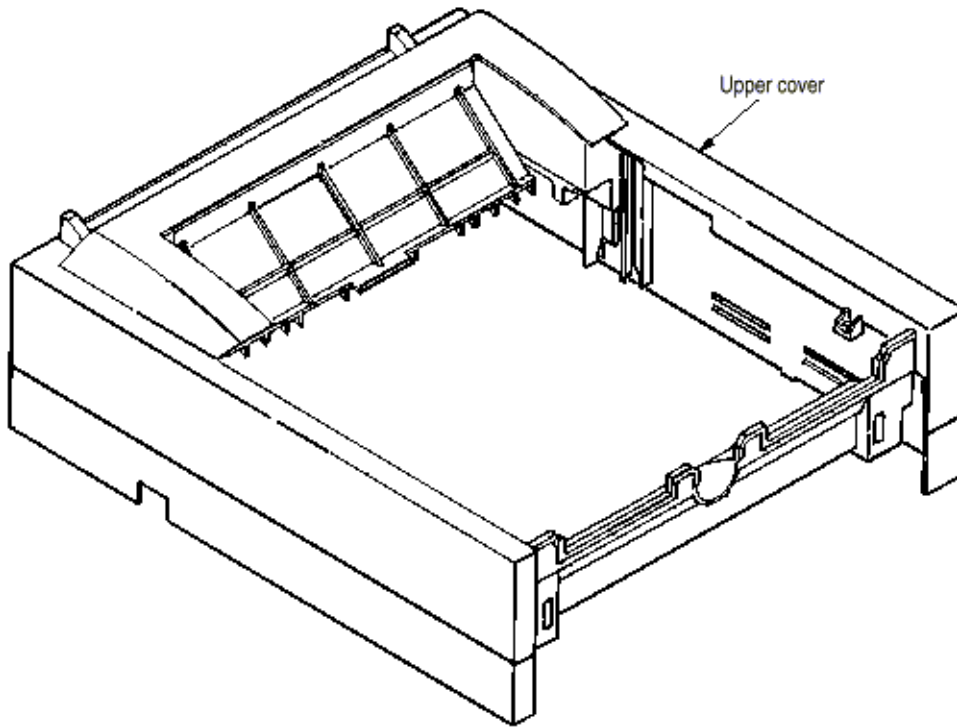
3.2 Parts Layout - [Lower base unit]

This section describes the layout of main parts of the equipment.

[Lower base unit]

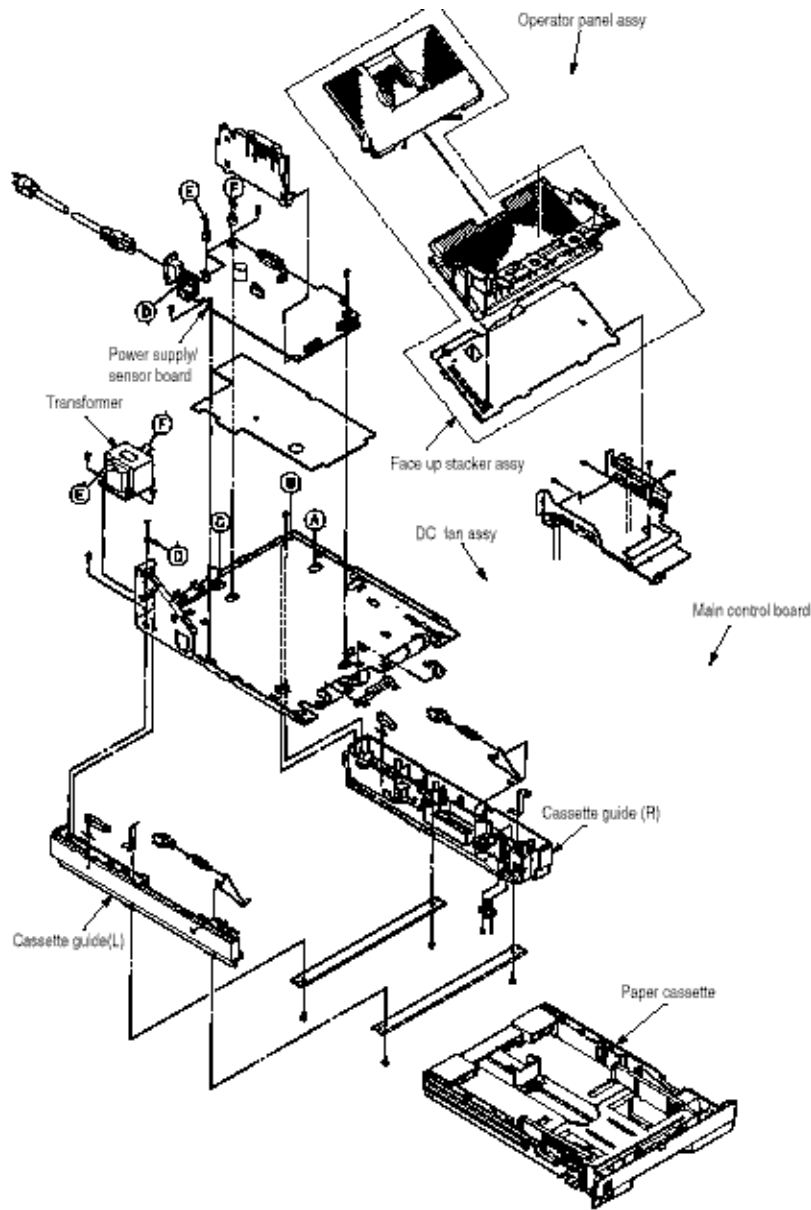


[Upper cover unit]



Service Guide OKIPAGE 10ex Chapter 3 Disassembly

[Base unit]





3.3 How to Change Parts

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

3.3.1 Upper cover

3.3.2 IC Card Cover

3.3.3 LED head

3.3.4 Operator Panel Assy

3.3.5 Lower Base Unit

3.3.6 Pulse Motor (Main/Drum)

3.3.7 Pulse Motor (Registration)

3.3.8 Face Up Stacker Assy

3.3.9 Eject Roller Assy

3.3.10 Motor Assy

3.3.11 Hopping Roller Shaft Assy

3.3.12 Stacker Cover Assy

3.3.13 Registration Roller

3.3.14 Back-up roller

3.3.15 Sensor plate (inlet)

3.3.16 Toner sensor

3.3.17 Sensor plate (outlet)

3.3.18 Manual feed guide assy

3.3.19 Sensor plate (Paper supply)

3.3.20 Main control PCB

3.3.21 Power supply board and contact assy

3.3.22 Transformer

3.3.23 Power supply/sensor board and contact assy

3.3.24 Cassette guide (L)

3.3.25 Cassette guide (R)

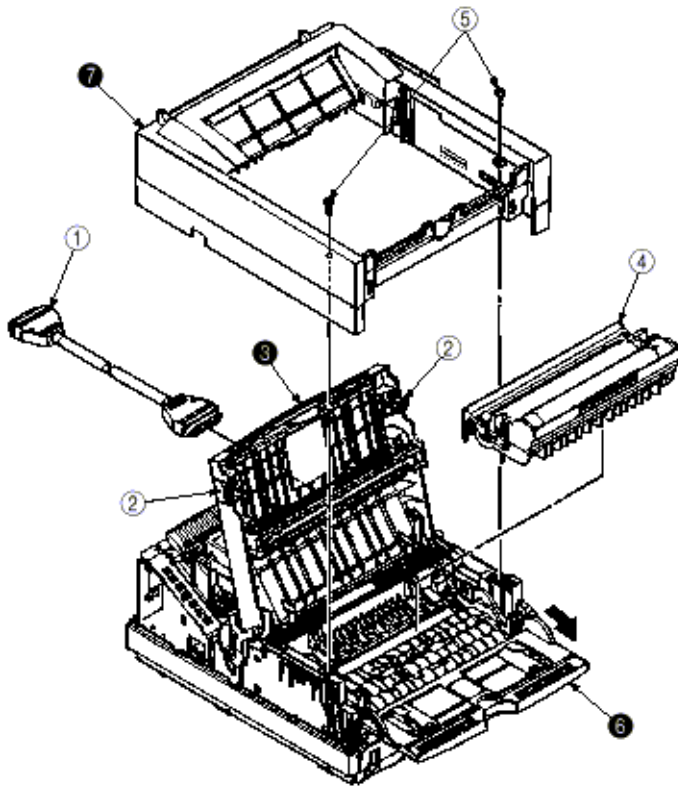
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3.3.1 Upper Cover Assy

- (1) With the power switch turned off, unplug the AC power cord from the outlet.
- (2) Disconnect the interface cable (1).
- (3) Press the knobs (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 latches at two locations on the back side. Lift and remove the upper cover assy (7).

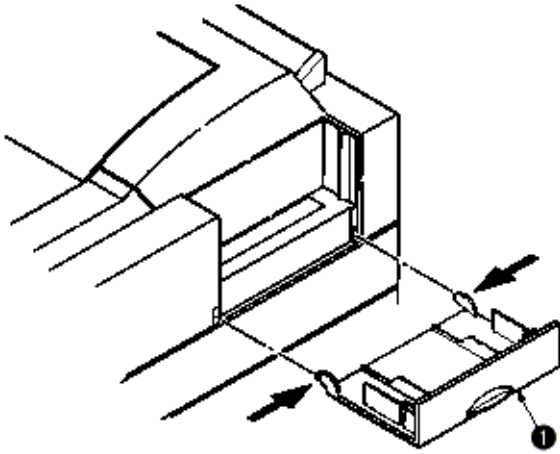
Notes:

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 direct the screws into preexisting threads.



3.3.2 IC Card Cover

(1) Open the IC card cover (1), press it from both sides at the hinges in the directions of arrows shown below and remove it.



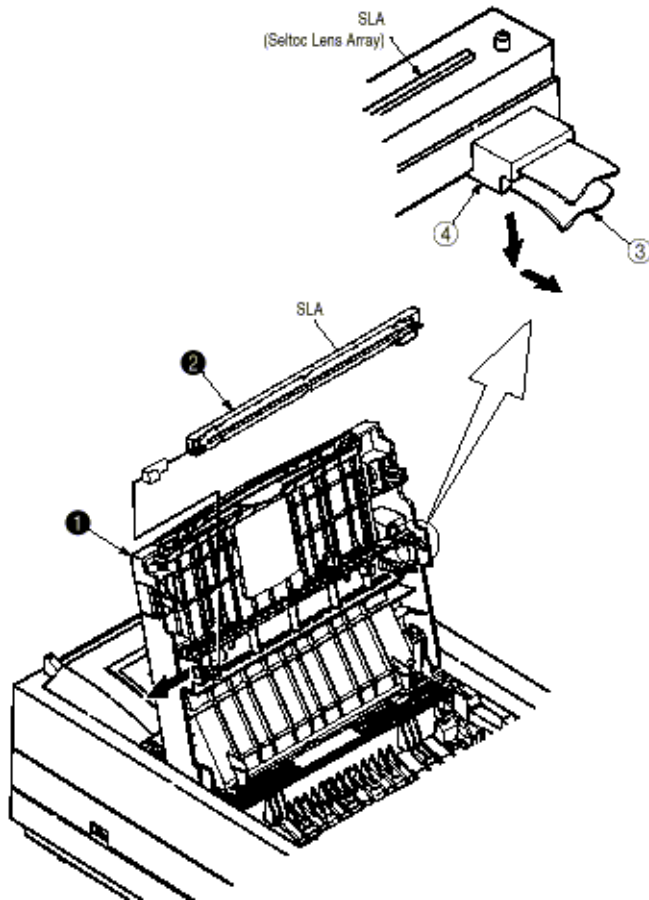
3.3.3 LED Head

(1) Press the knobs 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.
- After mounting the new LED head and reinstalling the cable, set drive time of the LED head according to the marking on the LED head (see 4.2.1).



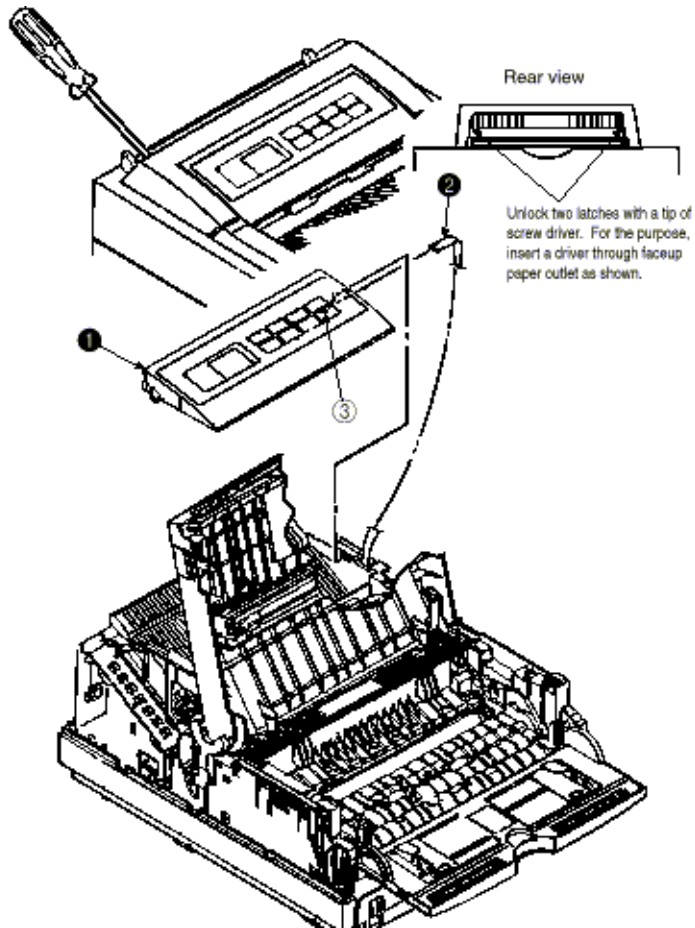
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Chapter 3 Disassembly

3.3.4 Operator Panel Assy

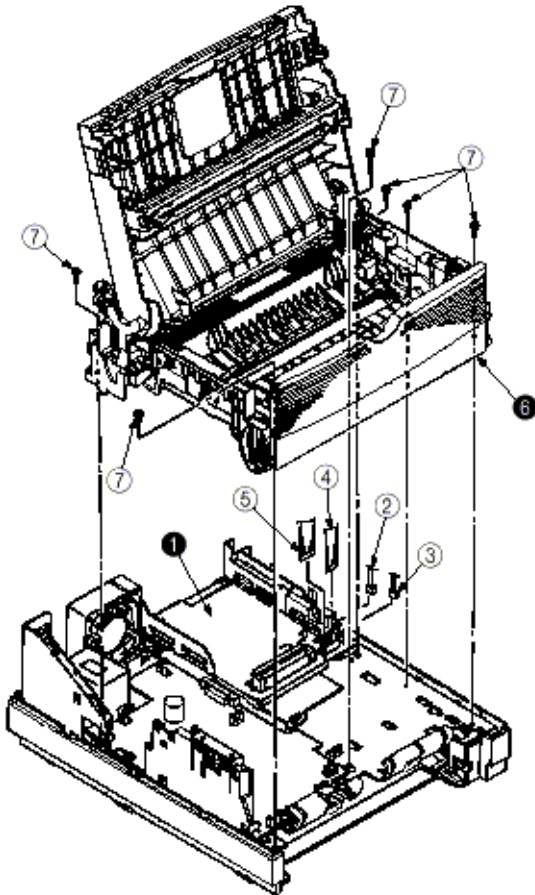
- (1) Unlock two latches on the upper cover from the rear side, lift the operator panel assy (1) from the back and remove it.
- (2) Remove the Sumi card (operator panel) (2) from the connector (CN1) (3).

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.



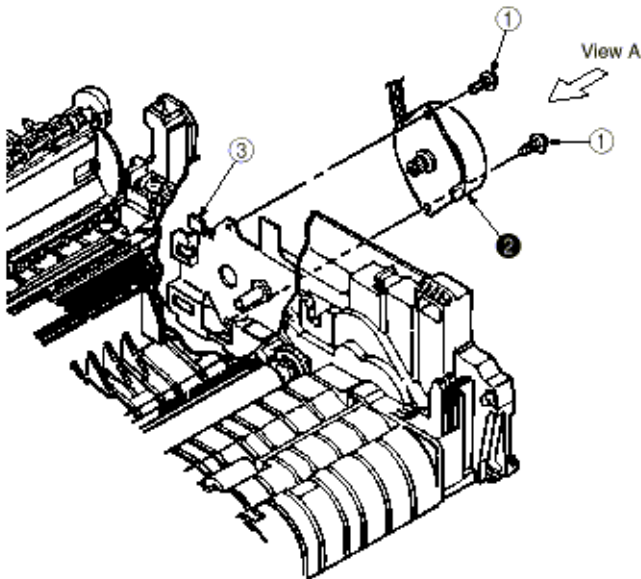
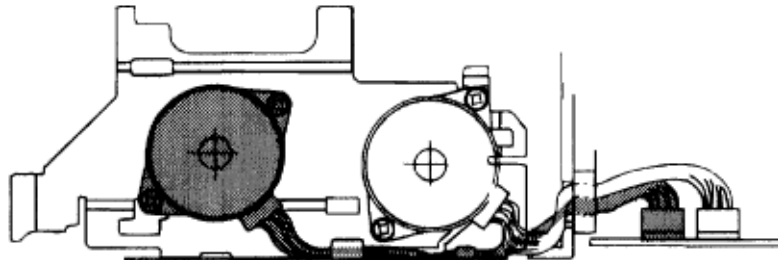
3.3.5 Lower Base Unit

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8)
- (4) Remove the connecting cables (2) and (3) of the pulse motors from the connectors (DM, RM) of the M5B-PCB (1).
- (5) Remove the LED head cables (4) and (5) from the connectors (HEAD1, HEAD2).
- (6) Open the manual feed guide assy, remove six screws (7), then remove the lower base unit (6).



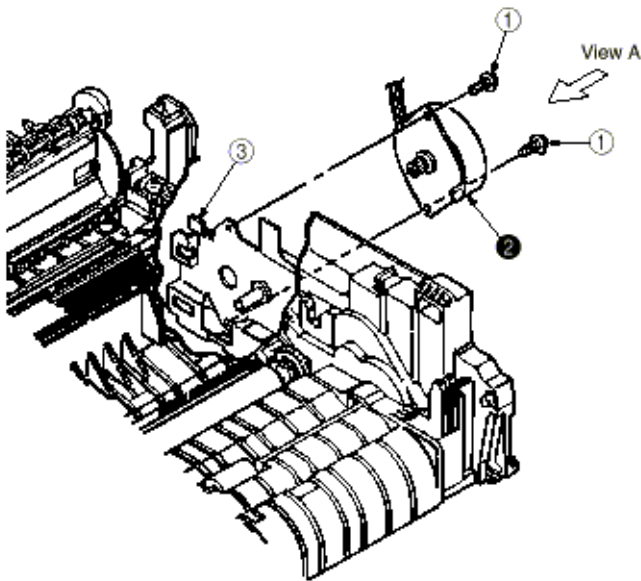
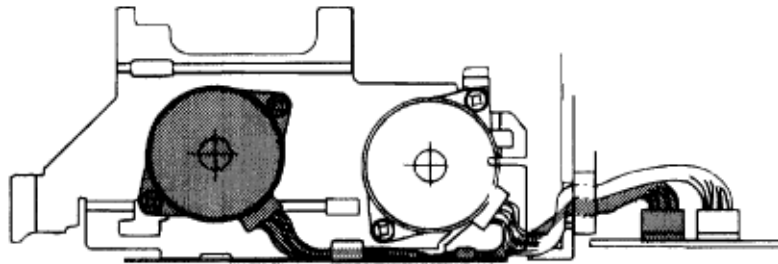
3.3.6 Pulse Motor Main/Drum

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the lower base unit (see 3.3.5).
- (3) Remove two screws (1) and remove the pulse motor (main drum) (2) from the motor bracket (3).



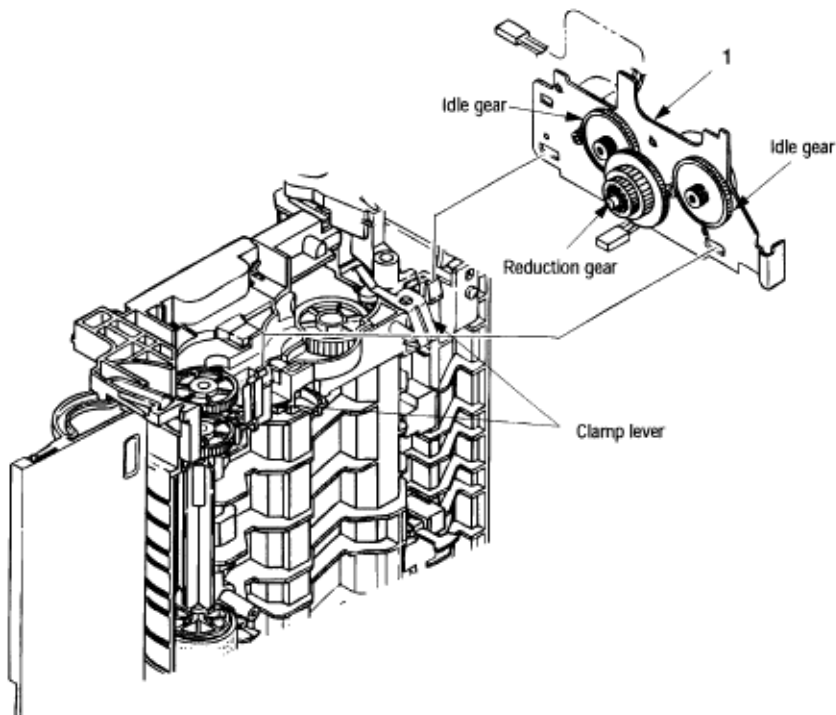
3.3.7 Pulse Motor (Registration)

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the lower base unit (see 3.3.5).
- (3) Remove two screws (1) and remove the pulse motor (registration) (2) from the motor bracket (3).



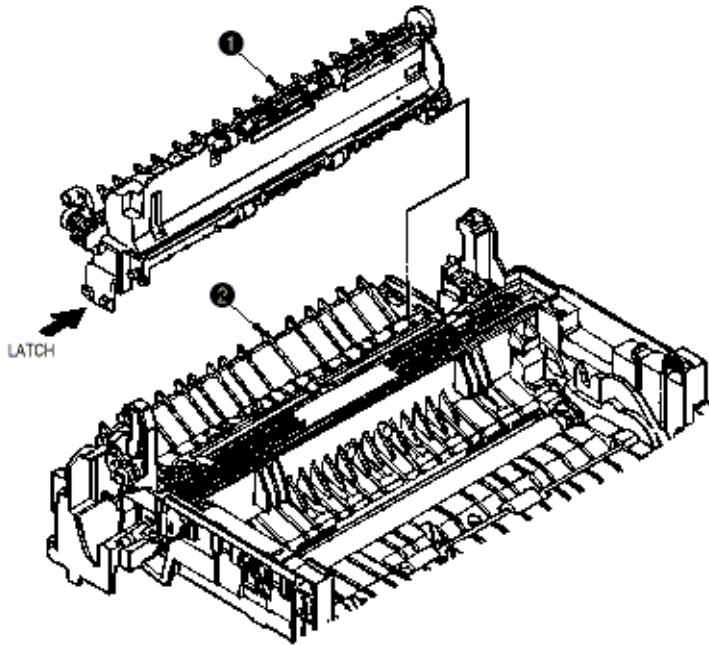
3.3.8 Face Up Stacker Assy

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (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).



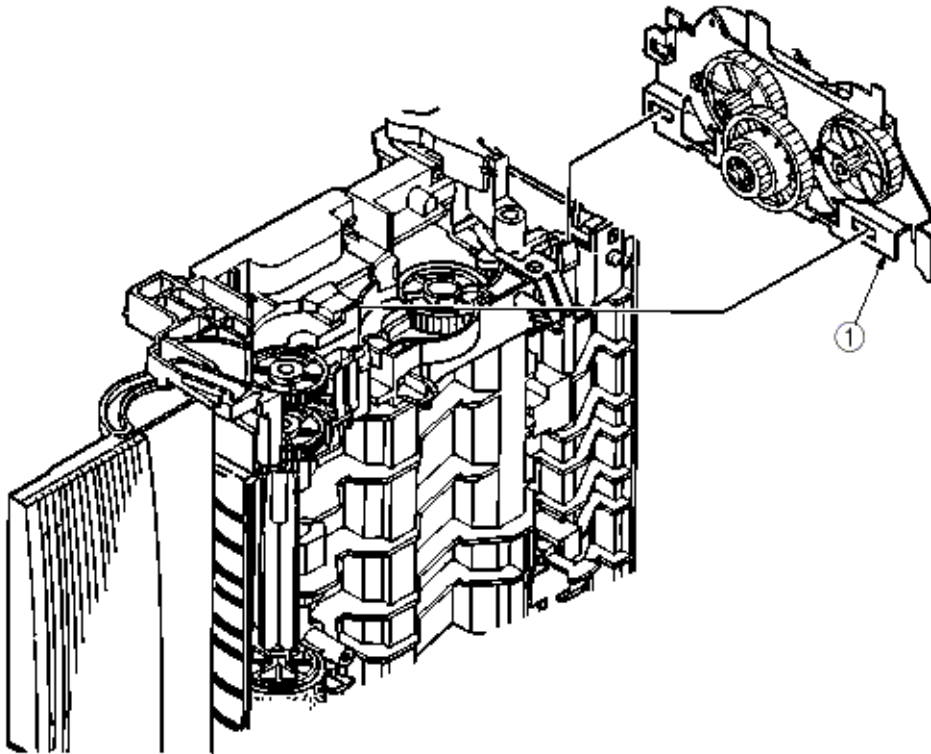
3.3.9 Hopping Roller Assy

- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8).
- (4) Remove the lower base unit (see 3.3.5).
- (5) Disengage the eject roller assy (1) from the lower base (2) by pressing the latch section of the eject roller assy (1) in the direction of the arrow shown below, and remove the eject roller assy (1).



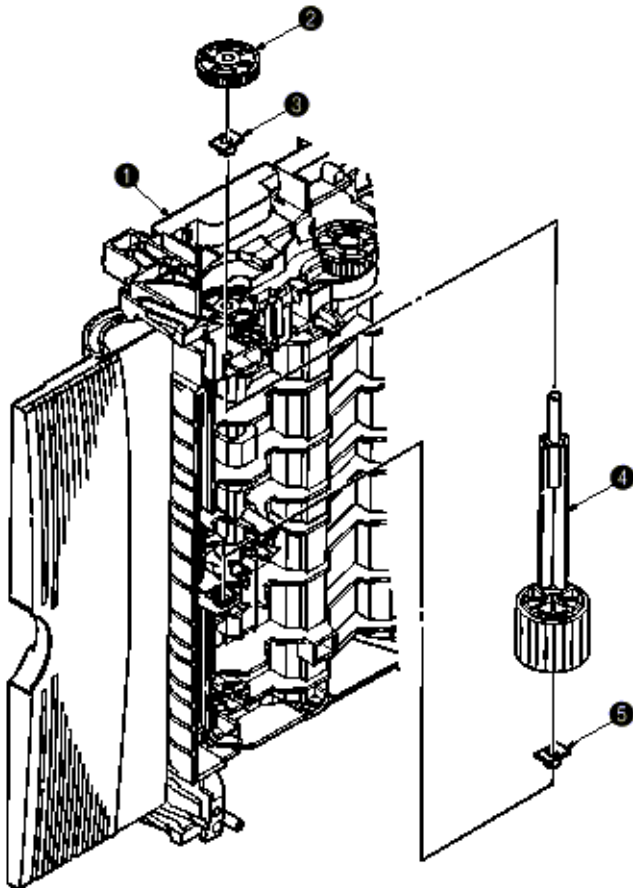
3.3.10 Motor Assy

- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8).
- (4) Remove the lower base unit (see 3.3.5).
- (5) Stand the lower base unit on its side as shown, and unlock two latches, then remove the motor assy (1).



3.3.11 Hopping Roller Shaft Assy

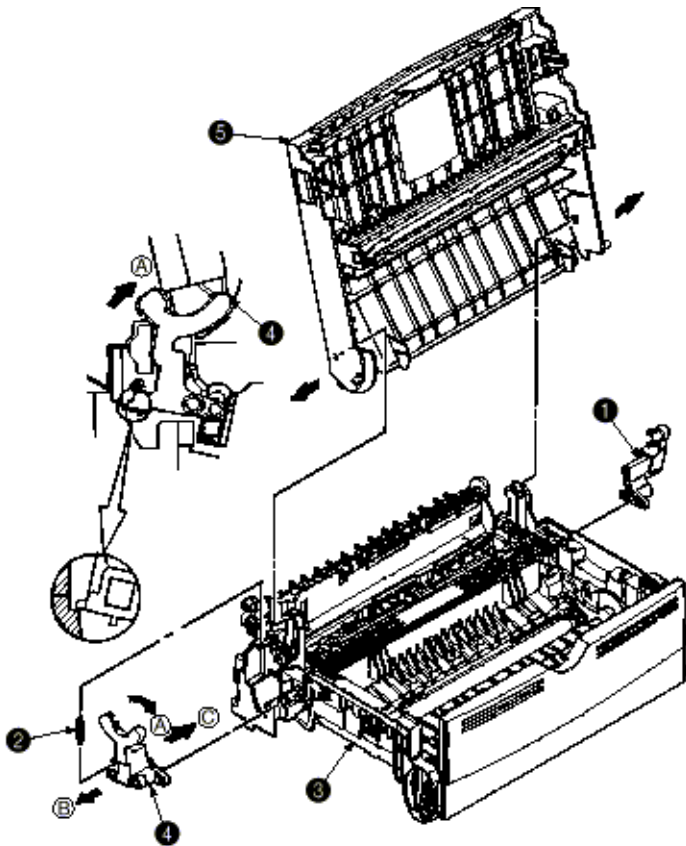
- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8).
- (4) Remove the lower base unit (see 3.3.5).
- (5) Remove the motor assy (see 3.3.10).
- (6) With the lower base unit (1) standing on its side, remove the 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).



3.3.12 Stacker Cover Assy

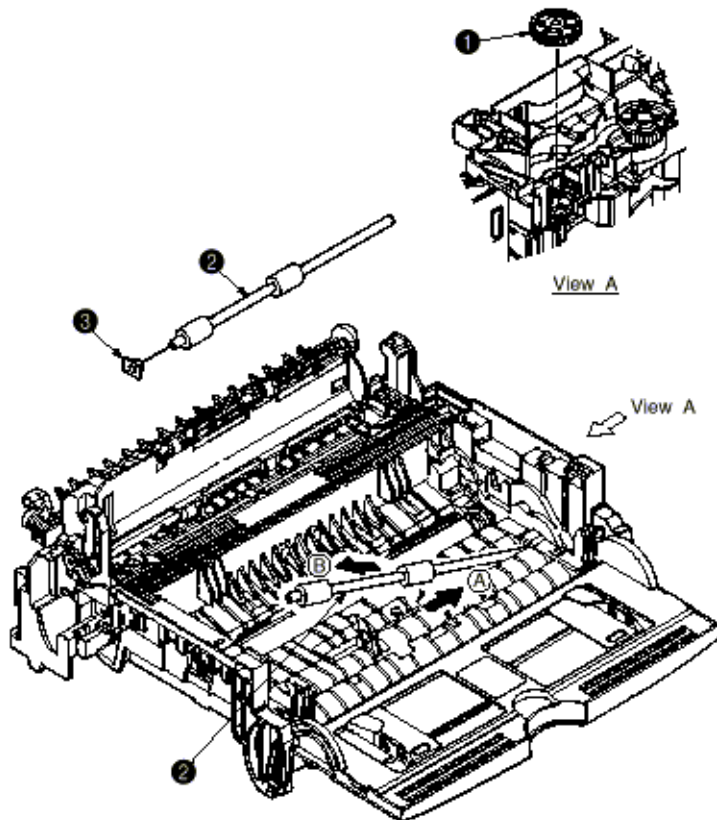
- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8).
- (4) Remove the reset lever R (1).
- (5) Detach the reset spring (2) from the lower base unit (3), turn the reset lever L (4) in the direction of arrow (A) until it stops, and remove it in the direction of arrow (B).
- (6) Unlock two latches of the lower base unit (3), then remove the stacker cover assy (5).

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



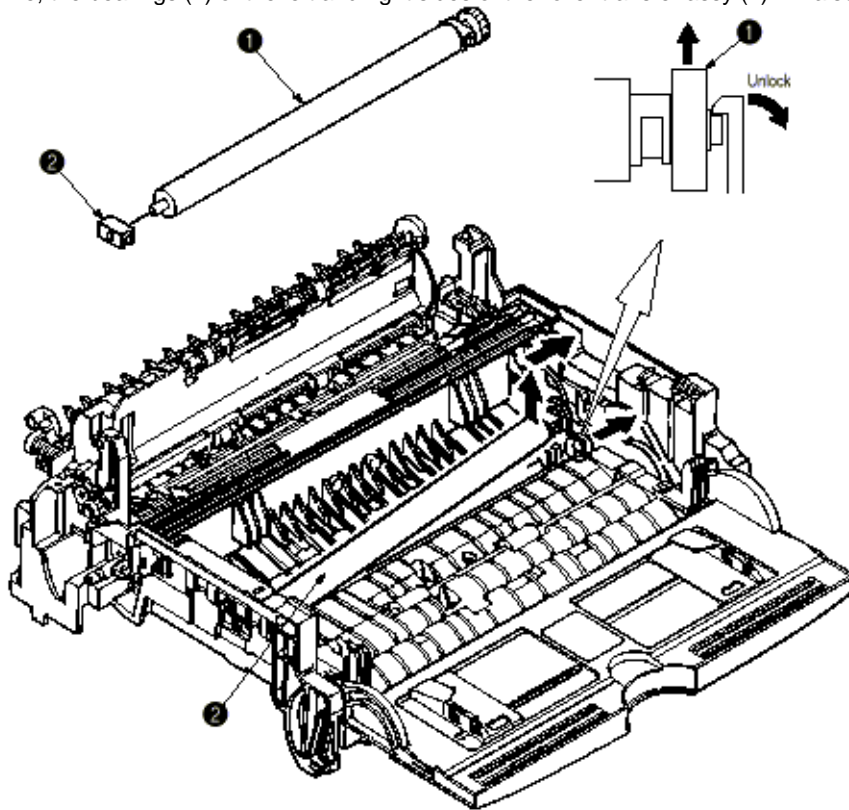
3.3.13 Registration Roller

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8).
- (4) Remove the lower base unit (see 3.3.5).
- (5) Remove the motor assy (see 3.3.10).
- (6) With the lower base unit standing on its side, remove the one-way clutch gear (1).
- (7) Press the registration roller (2) in the direction of arrow (A) and lift up the left side of it, then remove the registration roller (2) and the bearing (registration) (3).
- (8) Pull out the registration roller (2) in the direction of arrow (B).



3.3.14 Transfer Roller 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 (1) 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 (1), and shift it to the right side, then pull it out from the main unit (at this time, the bearings (2) of the left and right sides of the roller transfer assy (1) will also come off).



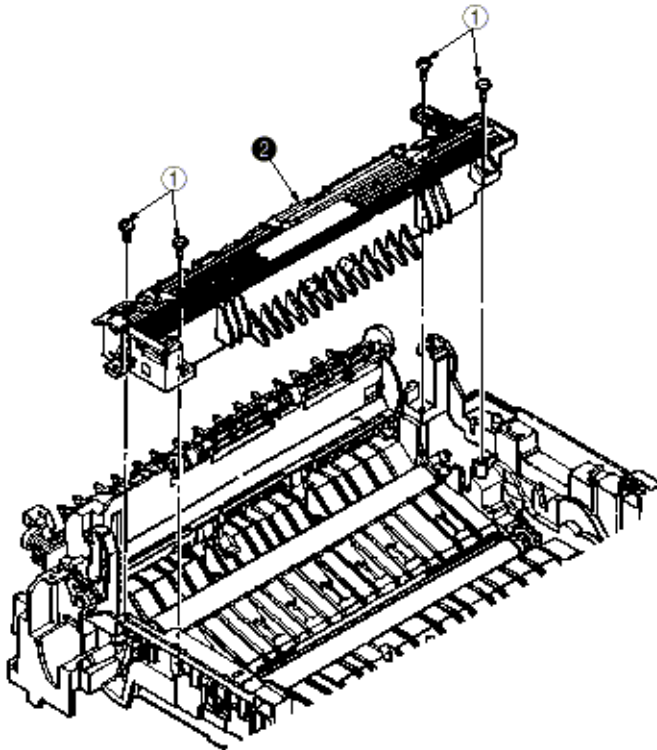
3.3.15 Fusing Unit

- (1) Remove the upper cover assy (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8).
- (4) Remove the lower base unit (see 3.3.12).
- (5) Remove the four screws (1), lift and remove the fusing unit (2).

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

Notes:

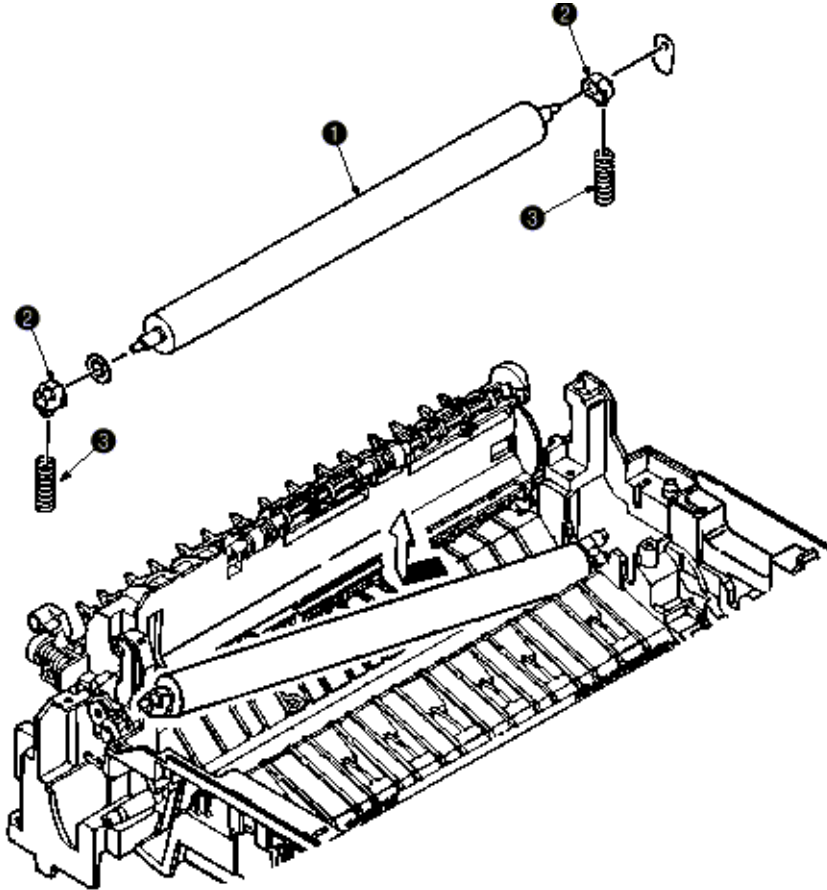
1. When reinstalling or removing the fusing unit, tighten or loosen the screws while holding the fusing unit assy (2) down with your hand (it is being pushed up by back up roller).
2. When reinstalling the screws (1), be sure to direct the screws into preexisting thread and avoid damaging the threads.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



3.3.16 Back-up Roller

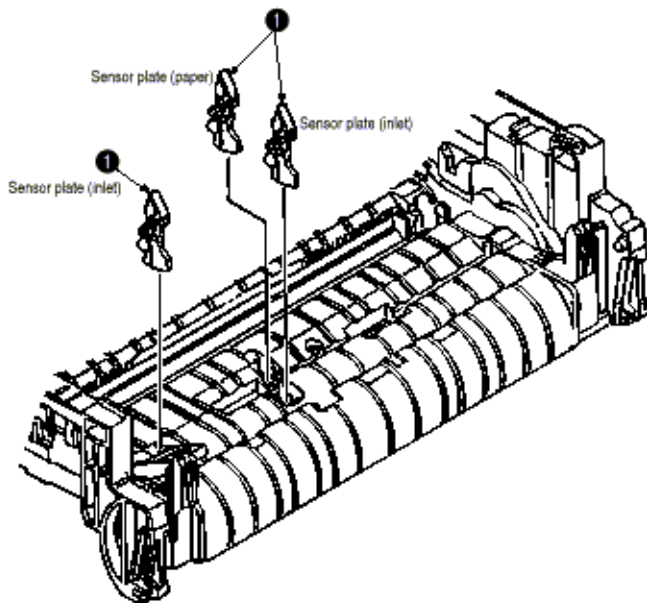
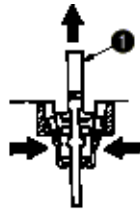
(1) Remove the fusing unit assy (see 3.3.15).

(2) Lift the left side of the back-up roller (1), and pull it out to the left side (at this time, two bushings (back-up) (2) and the bias springs (back-up) (3) will also come off).



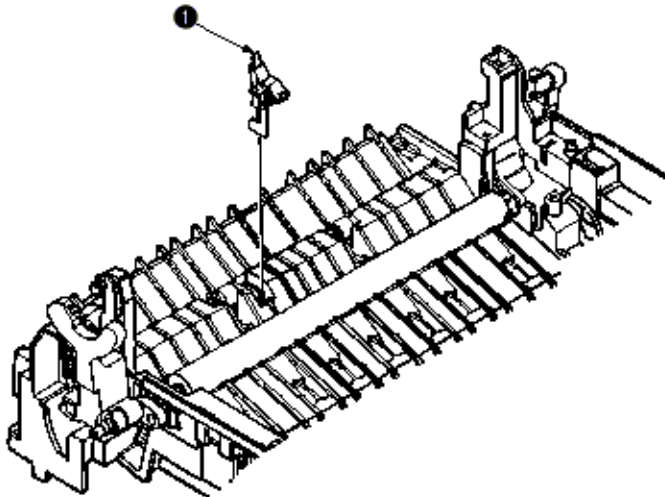
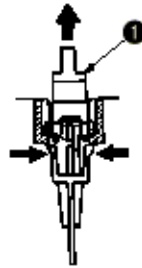
3.3.17 Sensor Plate (Inlet)

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the eject roller assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8).
- (4) Remove the lower base unit (see 3.3.5).
- (5) Press the clamps of three sensor plates (inlet and paper) (1), and remove them by pressing them upward from the bottom.



3.3.18 Sensor Plate (Outlet)

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the eject roller assy (see 3.3.9).
- (4) Remove the face up stacker assy (see 3.3.8).
- (5) Remove the lower base unit (see 3.3.5).
- (6) Remove the fusing unit assy (see 3.3.15).
- (7) Press the clamps of the sensor plate (outlet) (1), and remove the sensor plate by pushing it up.

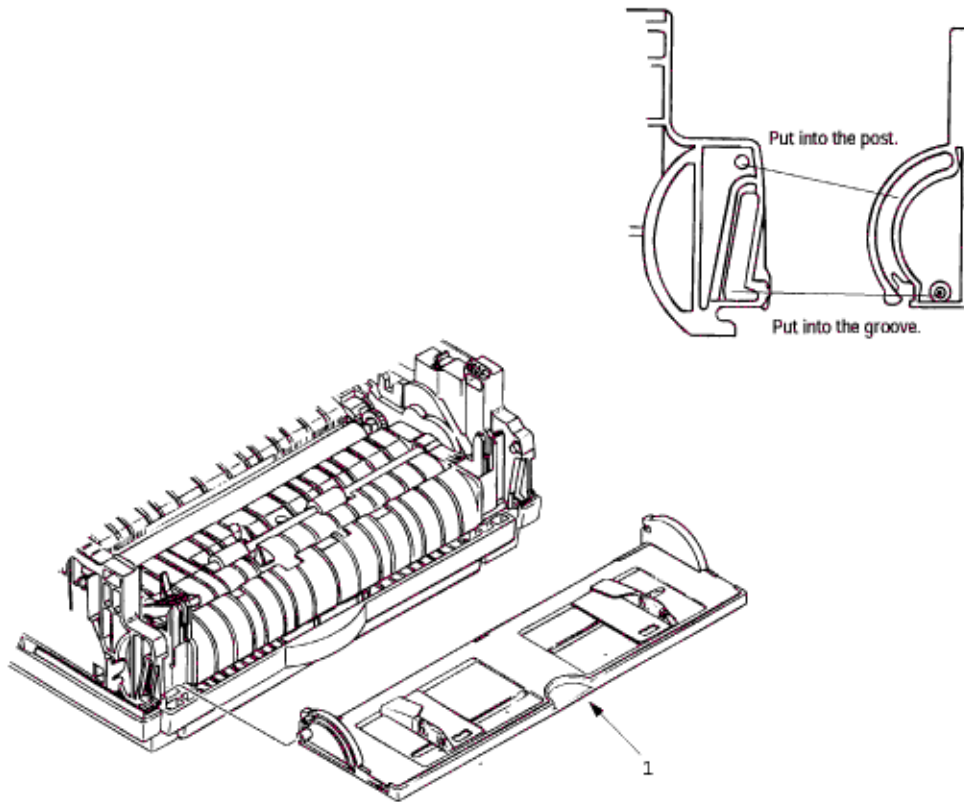


3.3.19 Manual Feed Guide Assy

(1) Remove the upper cover (see 3.3.1).

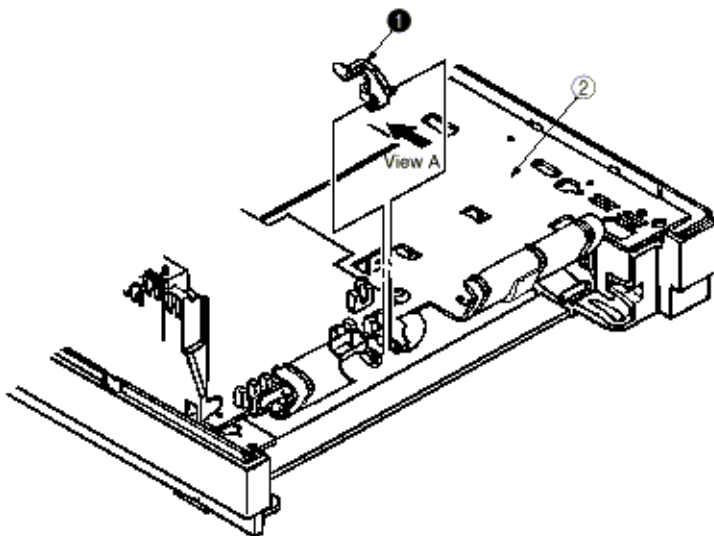
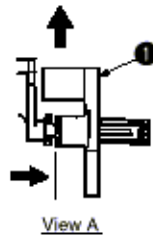
(2) Open the manual feed guide assy (1), and release the engagement on both sides with the main unit by carefully bending the manual feed guide assy (1).

Note: At the time of mounting, verify the proper the engagements as shown in the diagram.



3.3.20 Sensor Plate (Paper Supply)

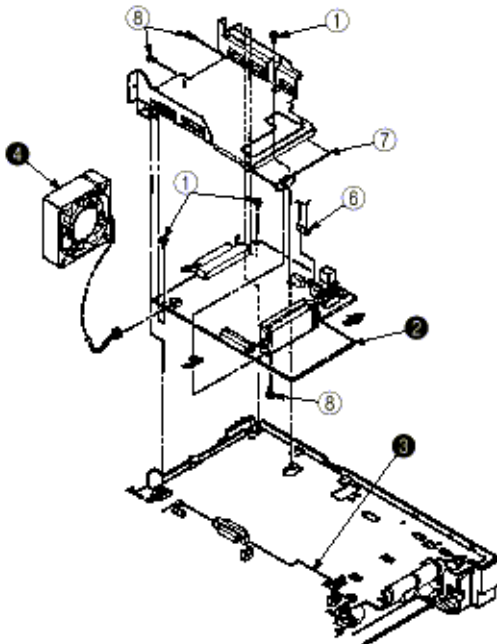
- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8).
- (4) Remove the lower base unit (see 3.3.5).
- (5) Press the clamps of the sensor plate (paper supply) (1) to unlock the latch, and remove it from the base plate (2).



3.3.21 Main Control M5B-PCB

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8).
- (4) Remove the lower base unit (see 3.3.5).
- (5) Remove the connector (2NDTRAY) (6).
- (6) Remove the screws (1).
- (7) Move the M5B-PCB Main Control Board (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 M5B-PCB Main Control Board (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 M5B-PCB Main Control Board (2).

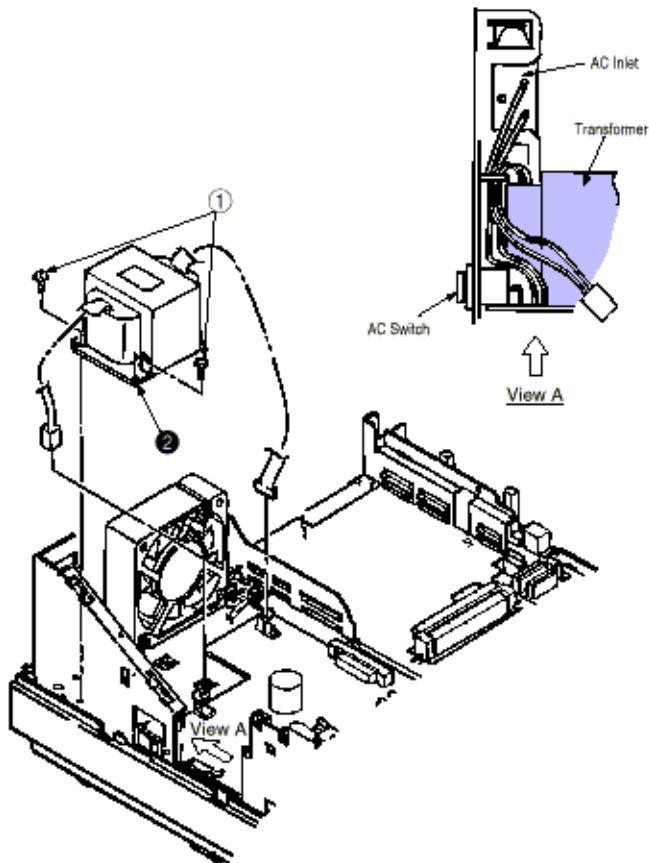
Note: When reinstalling the M5B-PCB (2) onto the guide plate (7), be careful not to bend the base plate (it is desirable to place a block underneath it to prevent bending).



3.3.22 Transformer

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the operator panel assy (see 3.3.4).
- (3) Remove the face up stacker assy (see 3.3.8).
- (4) Remove the connectors (CN1 and CN2).
- (5) Remove two screws (1), and remove the transformer.

Note: When reinstalling the transformer, be sure to lay the AC and transformer's primary side cables under the divider (see view A diagram below).

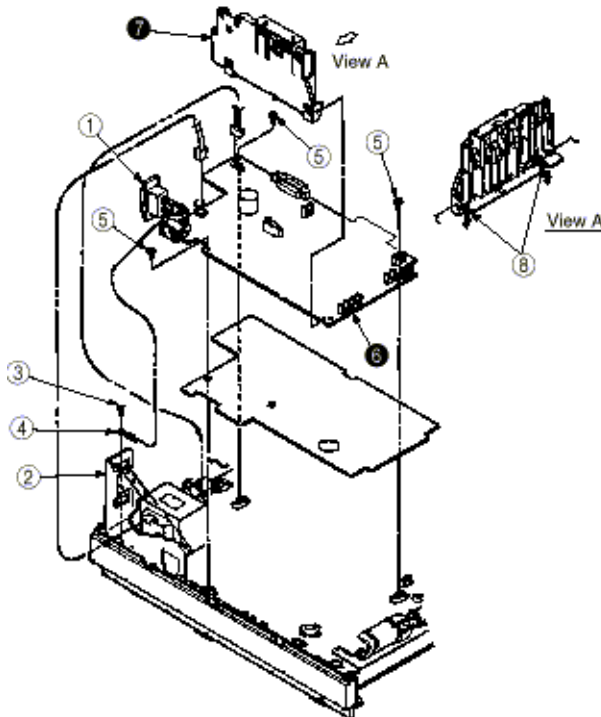


3.3.23 Power Supply/Sensor Board and Contact Assy

- (1) Remove the upper cover (see 3.3.1).
- (2) Remove the lower base unit (see 3.3.5).
- (3) Remove the M5B-PCB Main Control Board (see 3.3.21).
- (4) Remove the transformer (see 3.3.22).
- (5) Remove the AC inlet (1) from the base plate (2).
- (6) Remove the screw (3) and remove the grounding (earth) wire (4).
- (7) Remove three 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.

Notes:

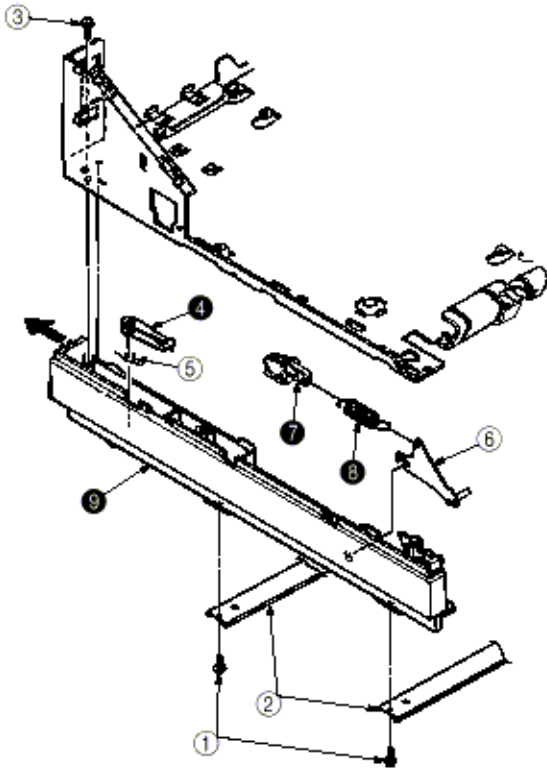
1. Be careful about the sensor (paper supply) when reinstalling the lower base.
2. Make sure that no excessive force is applied to the power supply switch.
3. When installing the power supply/sensor onto the base plate, be careful not to bend the base plate (it is desirable to place a block underneath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



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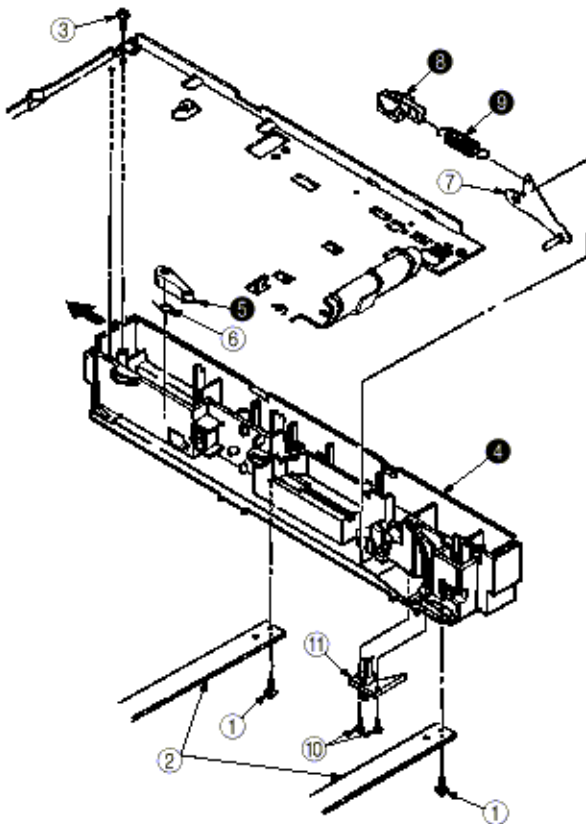
3.3.24 Cassette Guide L Assy

- (1) Remove the paper cassette.
- (2) Remove the upper cover (see 3.3.1).
- (3) Remove the lower base unit (see 3.3.5).
- (4) Remove the Main Control M5B-PCB (see 3.3.21).
- (5) Remove the transformer (see 3.33.22).
- (6) Remove the power supply/sensor board (see 3.3.23).
- (7) Remove two screws (1), and remove the guide rails (2).
- (8) Remove the screw (3), and remove the cassette guide L (9) by shifting it in the direction of the arrow as shown below.
- (9) Remove cassette lock lever (4) and torsion spring (5).
- (10) Remove cassette lock lever spring (8) then remove the sheet link (L) (6) and Pull block (7).



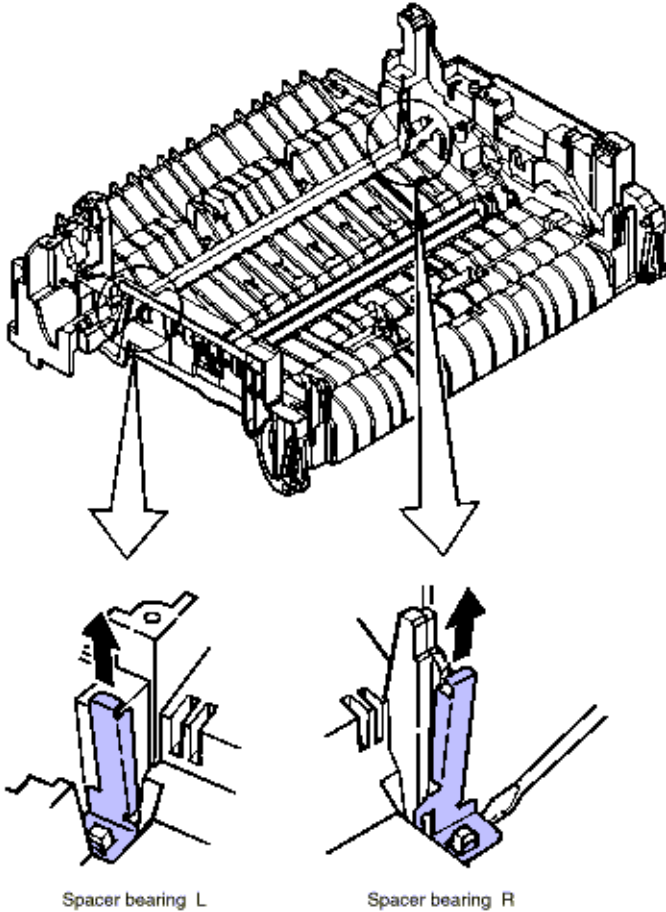
3.3.25 Cassette Guide R

- (1) Remove the paper cassette.
- (2) Remove the upper cover (see 3.3.1).
- (3) Remove the lower base unit (see 3.3.5).
- (4) Remove the Main Control M5B-PCB (see 3.3.21).
- (5) Remove the 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 ink (R) (7) and link pull block (8).
- (9) Remove two screws (10), and remove the square-shaped connector (11).



3.3.26 Spacer Bearing (L/R)

- (1) Remove the back-up roller (see 3.3.16).
- (2) Remove spacer bearing (L/R) with a tip of screw driver.





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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.

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4.1 Maintenance Modes and Functions

4.1.1 User Maintenance Mode

4.1.2 System Maintenance Mode

4.1.3 Engine Maintenance Mode

4.1.4 EEPROM Initialization

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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 five functions as follows:

- Menu reset
- Opepane menu disable
- Hex dump
- X-adjust
- Drum counter reset
- Y-adjust
- Receiove buffer
- 2nd Tray
- Setting
- Place page

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

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4.1.2 System Maintenance Mode

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 six functions as follows:

- Page count display
- Loop test
- Page count printing enable/disable
- EEPROM reset
- Rolling ASCII continues printing
- SIDM enable/ disable

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



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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) Head width setting - Sets the width of the LED head (39 or 40 chips).
 - c) Printing start position setting - Sets the starting position of printing.
 - d) Drum count total display - The total image drum rotation count of the printer, as counted by the engine section, is displayed on the LCD.
 - e) Drum count display - The total image drum rotation count, as counted by the engine section, is displayed on the LCD.
 - f) Standard tray paper feeding quantity setting - Sets the amount of paper to be fed from the standard tray.
 - g) High Capacity Second Paper Feeder paper feeding quantity setting - Sets the amount of paper to be fed from High Capacity Second Paper Feeder.
 - h) High Capacity Second Paper Feeder downloading table selection - Selects the downloading table of High Capacity Second Paper Feeder.
 - i) Power Envelope Feeder paper feeding quantity setting - Sets the amount of paper to be fed from Power Envelope Feeder.
 - j) Power Envelope Feeder downloading table selection - Selects the downloading table of Power Envelope Feeder.
 - k) Engine Reset - All EEPROM areas used by the engine section are reset to factory default values. The followings, however, are not reset:

After reset, the printer returns to normal operating mode.

- Menu Level-1
- Menu Level-2
- Operator Panel Menu Disable/Enable
- LED HEAD No.
- LED HEAD WID
- Page Print Disable/Enable

Note: Please do re-set up LED Head type to "Type2D4" when the printer was done the engine reset operation by manual or auto setting.

Because when it is done, the LED Head type is returned to the initial setting, which is "Type 1".

Application ROM (F/W Ver.1.01).

8174627N0011(MX23C2410MC-10-100 : IC3)
8174627N0012(MX23C2410MC-10-101 : IC2)

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

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

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4.1.4 EEPROM Initialization

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

No.	EEPROM Area	Menu Level 1	Menu Level 2	F/W revision area	Customer Information	User maintenance area Note1)	System maintenance area Note1)	Engine maintenance area Note1)	Drum counter	Fuser counter	Page counter
1	User maintenance menu reset	○									
2	System maintenance EEPROM reset	○	○			○	○				
3	Engine maintenance engine reset							○	○	Note2)	Note2)
4	Firm revision check error at power-on	○	○	○		○	○				
5	Engine ID check error at power-on							○	○	○	○
6	Customer setting	○	○		○	○	○				
7	User information error	○	○		○	○	○				

○ = Represents initialization

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

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

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

User maintenance menu area	System maintenance menu area	Engine maintenance menu area
Receiving buffer	SIDM emulation switch enable/disable	Adjusting head type (excluding during engine reset in engine maintenance)
Operator panel menu function enable/disable		600 x 1200 DPI strobe time relative value (excluding during engine reset in engine maintenance)
X / Y Adjust		Installed LED head identification (excluding during engine reset in engine maintenance)
2ND feed destination		
Designated command Left alignment based printing shift		Print start position ----- Paper feed amount from each paper feed tray

Cleaning cycle		Each optional tray motor controlling parameter ----- Engine test
Transfer current (Only Engine ID check error at power on Event)		

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4.2 Adjustment When Replacing a Part

Adjustment is necessary when replacing any of the following parts.

Part Replaced	Adjustment
LED Head	Set the LED head drive time.
Image Drum Cartridge	Reset the image drum counter (refer to User's Manual)
Main Control Board	EEPROM data Upload / Download

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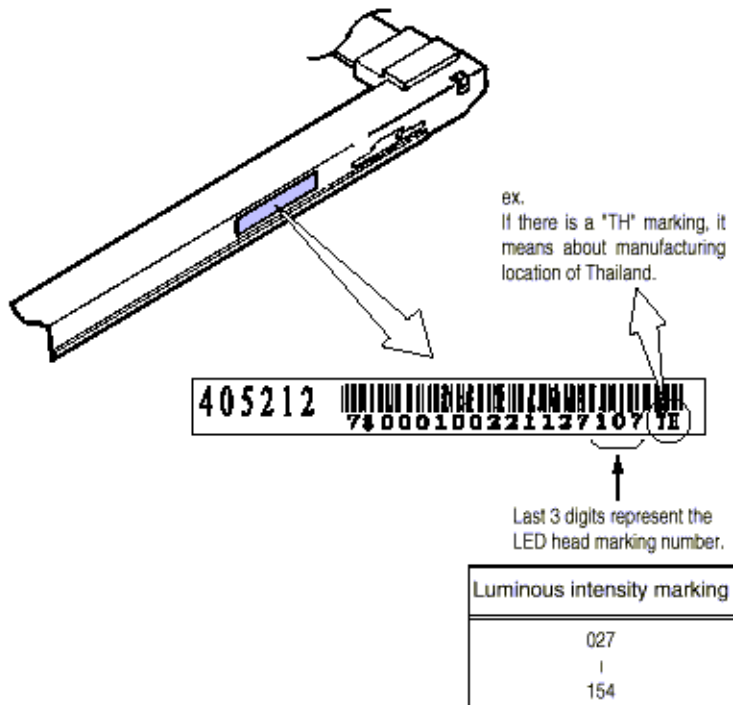


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4.2.1 Setting of LED Head Drive Time

Note: When the luminous intensity marking of the replacement LED head (new part) is same as that of the removed LED head (old part), do not reset the LED head drive time.

- Luminous Intensity Marking Label



- Setting of LED Head Drive Time

Drive time of the LED head is set by setting the parameter of drive time of EEPROM according to the luminous intensity marking on the LED head.

a. Corresponding table of luminous intensity marking and drive time parameter

Luminous intensity marking on LED head	Drive time parameter	Luminous intensity marking on LED head	Drive time parameter
(~ 020)	32	058 ~ 060	16
(021)	31	061 ~ 064	15
(022~ 024)	30	065 ~ 069	14
(025)	29	070 ~ 073	13
(026)	28	074 ~ 079	12
027 ~ 028	27	080 ~ 084	11
029 ~ 030	26	085 ~ 090	10
031 ~ 035	25	091 ~ 096	9
033 ~ 037	24	097 ~ 103	8
036 ~ 040	23	104 ~ 110	7
038 ~ 043	22	(111 ~ 118)	6
041 ~ 028	21	(119 ~ 126)	5

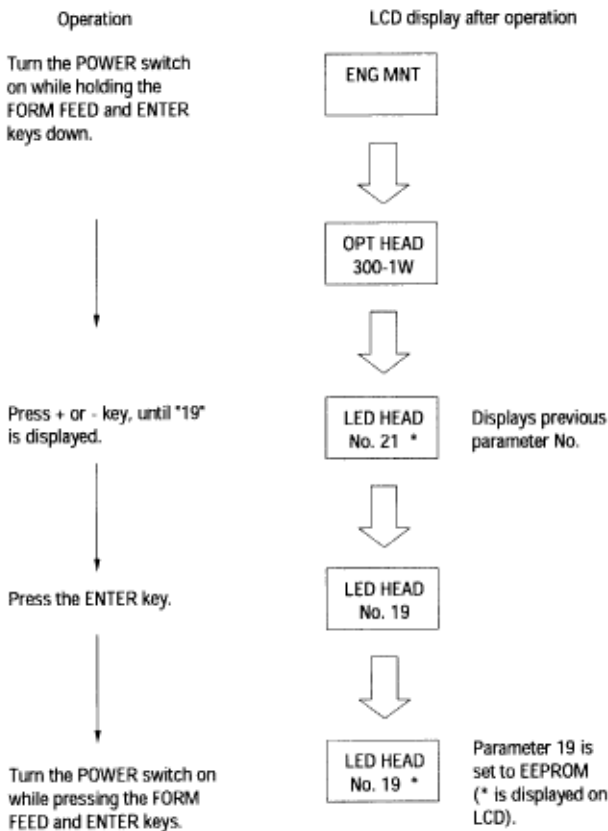
044 ~ 028	20	(127 ~ 135)	4
047 ~ 028	19	(136 ~ 144)	3
050 ~ 028	18	(145 ~ 154)	2
053 ~ 028	17	(155 ~)	1

* () marking of the luminous intensity marking on LED head depend on the darkness control parameter.

b. Corresponding table of darkness setting and drive time parameter.

Procedure

Example: Method for setting the parameter to 19 (for case where the previous parameter setting was 21).



Setting of LED Head Drive Time (OKIPAGE 6ex)

Drive time of the LED head is set by setting the parameter of drive time of EEPROM according to the luminous intensity marking on the LED head.

Luminous Intensity Marking and Drive Time Parameter Table

Luminous intensity marking on LED head	Drive time parameter	Luminous intensity marking on LED head	Drive time parameter
027 ~ 028	27	065 ~ 069	14
029 ~ 030	26	070 ~ 073	13
031 ~ 032	25	074 ~ 079	12
033 ~ 035	24	080 ~ 084	11
036 ~ 037	23	085 ~ 090	10

038 ~ 040	22	091 ~ 096	9
041 ~ 043	21	097 ~ 103	8
044 ~ 046	20	104 ~ 110	7
047 ~ 049	19	111 ~ 118	6
050 ~ 052	18	119 ~ 126	5
053 ~ 057	17	127 ~ 135	4
058 ~ 060	16	136 ~ 144	3
061 ~ 064	15	145 ~ 154	2

* () marking of the luminous intensity marking on LED head depend on the darkness control parameter.

b. Corresponding table of darkness setting and drive time parameter

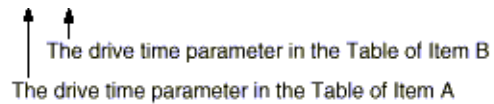
Darkness setting	Drive time parameter
-2	-4
-1	-2
0	0
+1	+3
+2	+6

* The drive time parameter of the LED head depend on the setting of the darkness control.

ex.: Luminous intensity marking on LED head : 027 ~ 028

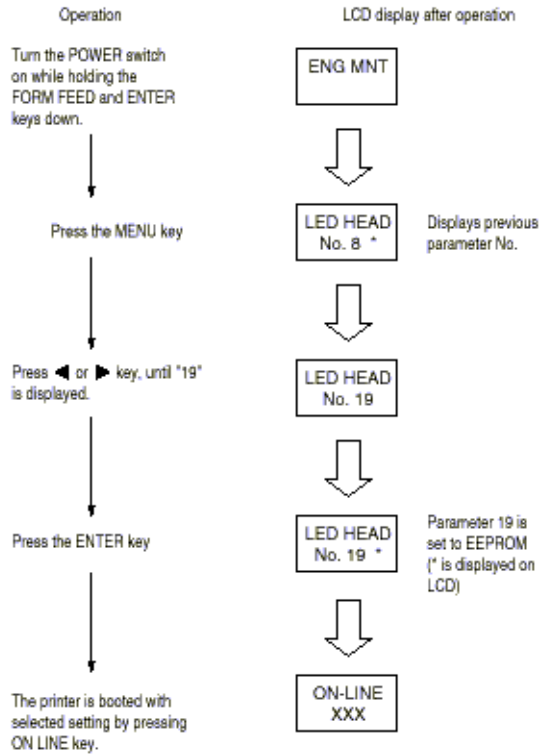
Darkness setting : -2

Drive time parameter : 31 [27-(-41)]



c. Setting

Example: Method for setting the parameter to 19 (for a case where the previous parameter setting was 8).



XXX: HP4, Auto, Adobe PS or HEX
HEX DUMP



Service Guide OKIPAGE 10ex

Chapter 4 Adjustments

4.2.2 Uploading/Downloading EEPROM data

When the controller printed circuit board is replaced, the contents of the old EEPROM shall 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 shall be deinstalled.)
- (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 upload 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.

- LED driver time (See 4.2.1)
- Factory setting (ODA/OEL/INT-A/INT-L)

The maintenance utility is designed to be used only by field engineer and it should not be released to the end-users.



Service Guide OKIPAGE 10ex Chapter 5 Maintenance

5.1 Periodical Replacement Parts

Part name	Condition for replacement	Cleaning	Remarks
Toner cartridge (Type 5)	About 2,000 sheets of paper have been printed	LED head	Consumables
Image drum cartridge (Type 5)	About 20,000 sheets of paper have been printed. See 1.4 (14)		Consumables

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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 handy 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

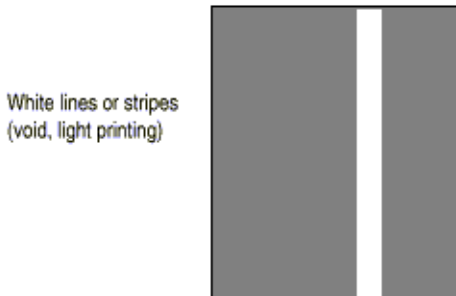
5.2.2 Cleaning Page Function

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5.2.1 Cleaning of LED Lens Array

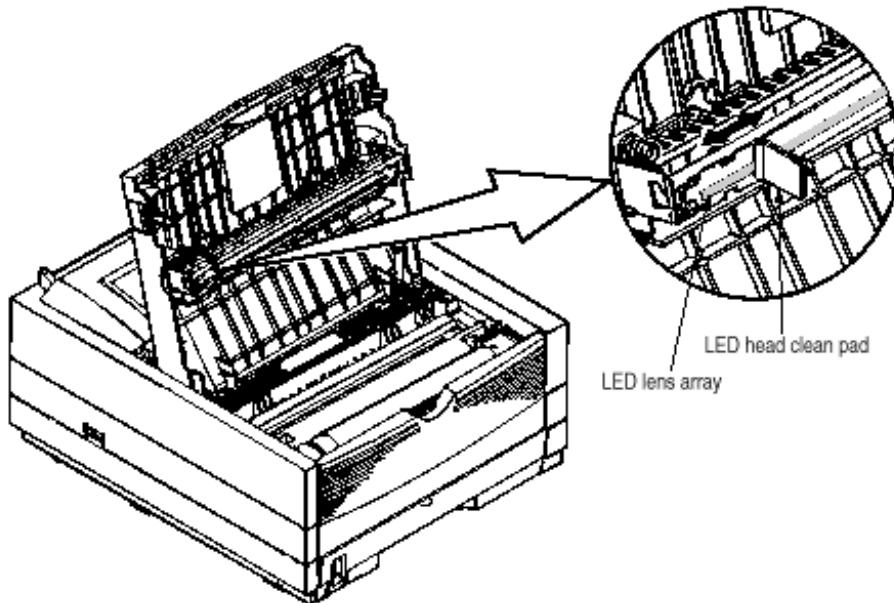
Clean the LED lens array or replace the toner cartridge when white lines or stripes (void, light printing) are generated vertically down the page, as shown below.

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



(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.



Service Guide OKIPAGE 10ex Chapter 5 Maintenance

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 off-line mode.



Service Guide OKIPAGE 10ex Chapter 6 Troubleshooting

6.1 Troubleshooting Tips

- (1) Check the problem solving 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.

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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?

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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 5 minutes at room temperature.

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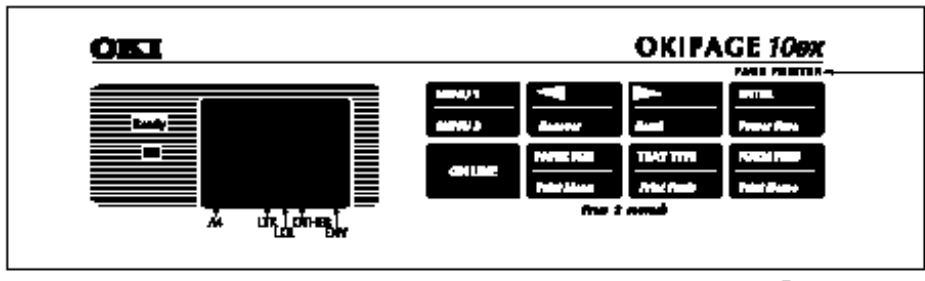
Service Guide OKIPAGE 10ex Chapter 6 Troubleshooting

6.4 Preparation for Troubleshooting

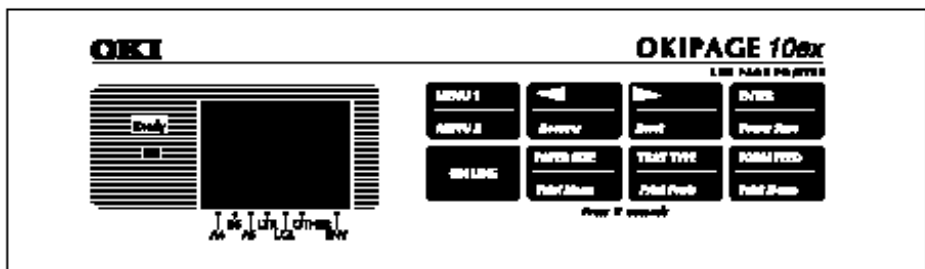
(1) Operator panel display

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.

<For ODA>



<For 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.

6.5.2 LCD Message Troubleshooting



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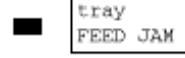
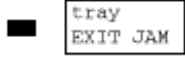


6.5.1 LCD Status Message/Problem List



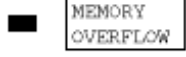
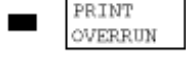
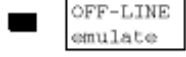


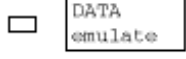

The status and problems which may be displayed by messages on the LCD are listed in Table 6-1.














Category	LCD status message	Code (nn)	Problem or Status Error	Remedy
Control errors			An error occurred in the controller	- 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.
		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	
		C	Arithmetic Overflow Exception	
			An error occurred in the controller.	- Turn the power off, then back on to recover from the error. - If normal operation is not recovered by this restart procedure, use the following remedial actions.
		10	An error was detected by program ROM check.	Replace the main control board.
		20	An error was detected by font ROM check.	Replace the main control board.
		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.
		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.	- Check the optional RAM board for proper connection. - Check the mounting position of short plugs and additional RAM chips (see Section 7.4). - Replace the optional RAM board.
		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.	- Check the fan motor for proper connection and for any presence of foreign matter in the fan (see Section 6.5-2(6)). - Replace the fan or the main control board.
		71	A failure occurred with the fuser (timeout error etc).	See Section 6.5.2-(4).
		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	- Check the connection between the main control board and the power supply/sensor board. - Replace the main control board or power supply/sensor board.
		77	A toner sensor fault has occurred when the TOTAL DRUM COUNT is 30 or less.	- Check the installation of image drum unit. - Replace the power supply/sensor board.
		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				

Category	LCD status message	Problem or status	Remedy
----------	--------------------	-------------------	--------

Interface errors		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/F0.	- 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		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.
Cover open		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		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.
Jam errors		A jam occurred during paper feeding after completion of paper hopping from the tray. tray: TRAY1, TRAY2, FEEDER	- Open the cover, remove the paper, then close the cover. When the cover is closed, recovery printing is performed and the error displayed is released. - If this error occurs frequently, see Section 6.5.2 (2)-2.
Paper size error		Paper of improper size is being fed from the tray. tray: TRAY1, TRAY2, FEEDER	- Check the paper in the tray or check to see if more than one sheet of paper were being fed simultaneously. - Set the designated paper in the tray. - Open the cover, then close it to perform recovery printing and release the error display. - If this error occurs frequently, see Section 6.5.2.(3).
Tray paper out		The tray has run out of paper. tray: TRAY1, TRAY2, FEEDER	Load paper in the tray.
Size error	 (The indicate rotate)	Loading of paper indicated by the first line message is requested. The paper size may be one of the followings: 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.

Size error	 (The indicate rotate)	Manual loading of paper indicated by the first line message is requested. The paper size may be 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	Load the requested paper in the tray.
Buffer overflow		The receive buffer is overflowing.	<ul style="list-style-type: none"> - Press the operator panel <i>RECOVER</i> key on the operator panel to release the error display. - 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. - Replace the interface cable or main control board.
Buffer overflow		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"> - Press the <i>RECOVER</i> key to release the error display. - Install additional optional RAM board or reduce the print data.
Buffer overflow		The printer overrun because the print data is too complicated to be printed.	<ul style="list-style-type: none"> - Press the <i>RECOVER</i> key on the operator panel to release the error display. - Simplify page data formatting.
Daily status		The printer is in the off-line mode. The second line indicates the emulation. emulate: AUTO, PCL, PPR, FX, HEX	Normal operation.
Daily status		The printer is processing data.	Normal operation.
Daily status		The printer is printing a page.	Normal operation.
Daily status		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	Normal operation.
Buffer overflow		The receive buffer is overflowing.	<ul style="list-style-type: none"> - Press the operator panel <i>RECOVER</i> key on the operator panel to release the error display. - 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. - Replace the interface cable or main control board.

Buffer overflow	 MEMORY OVERFLOW	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.	- Press the <i>RECOVER</i> key to release the error display. - Install additional optional RAM board or reduce the print data.
Buffer overflow	 PRINT OVERRUN	The printer overrun because the print data is too complicated to be printed.	- Press the <i>RECOVER</i> key on the operator panel to release the error display. - Simplify page data formatting.
Daily status	 OFF-LINE emulate	The printer is in the off-line mode. The second line indicates the emulation. emulate: AUTO, PCL, PPR, FX, HEX	Normal operation.
Daily status	 ACTIVE	The printer is processing data.	Normal operation.
Daily status	 PRINTING	The printer is printing a page.	Normal operation.
Daily status	 DATA emulate	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	Normal operation.
Daily status	 PRINT FONTS	All fonts of the printer are being printed during self-test.	Normal operation.
Daily status	 PRINT MENU	The current menu setting is being printed. Ready ON: Executed by command entry. Ready flashing: Executed by key operation.	Normal operation.
Daily status	 	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.	Normal operation
Daily status	 INITIAL-IZING	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.	Normal operation.
Daily status	 FMLOADING	Indicates in Cold mode due to downloading to flash memory.	Normal operation.
Daily status	 FM ERROR	Indicates that an error occurs during downloading to flash memory or deleting.	Normal operation.

Daily status	<input checked="" type="checkbox"/> PRINT DEMO	The demo page is being printed: Ready LED on: Executed by command entry. Ready LED blinking: Executed by key operation.	Normal operation.
Daily status	<input type="checkbox"/> nnn/mmm	When the number of copies being printed is two or more, the number of copies being printed is displayed. The message is displayed together with another message on the first line. nnn : Current page mmm : Total page	Normal operation.
Daily status	<input type="checkbox"/> PRINT CLEANING	This message is displayed when the printer is performing the cleaning print.	Normal operation.
Daily status	<input checked="" type="checkbox"/> CLEANING MANUAL# (The indicate rotate)	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	Normal operation.
Daily status	<input checked="" type="checkbox"/> RESET	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.	Normal operation.
Daily status	<input checked="" type="checkbox"/> RESET TO SAVE	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.	Normal operation.
Daily status	<input type="checkbox"/> TONERLOW	Toner is running out. This message is displayed together with another message on the first line. Normal operation can be continued.	Replace the toner cartridge.
Daily status	<input type="checkbox"/> TONERENS	A fault occurred with the toner sensor. This message is displayed together with another message on the first line. Normal operation can be continued.	Replace the power supply/sensor board.

Daily status	<input type="checkbox"/> TONEREMP	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.	
Daily status	<input type="checkbox"/> TONEREMP CHG CART	Displays that the amount of toner is near empty. After 100 sheets from a TONER LOW indication, this status will appear and the printing will stop. If pressing ON-LINE SW, another 31 sheets can be printed and stopped. And from the next time on, the printing is stopped after each sheet.	
Daily status	<input type="checkbox"/> PWR SAVE	The printer is in the power-saving mode. This message is displayed together with another message on the first line.	Normal operation.
Daily status	<input type="checkbox"/> CHG DRUM	Inform 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.	
Daily status	<input type="checkbox"/> EEPROM RESET'NG	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.	
Daily status	<input type="checkbox"/> ROM-SIMM ERROR	Reformat error including CPCMCIA HEADER or ROM-SIMM and byte sum. It will be displayed for 2 seconds at power-on or just before a shift to ON LINE.	



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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">● Paper input jam● Paper feed jam● Paper exit jam	(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)



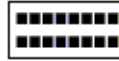
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(1) The printer does not work normally after the power is turned on.

- Turn the power off, then back on.

- Is all black message being displayed by the LCD display?



- No - Is the AC cord being connected properly?
 - No - Connect the AC cord properly.
- Yes - Is +5 V being applied between Pins 11 and 21 of POWER connector on the main control board?

Pin 21 : 0 V
Pin 11 : +5 V

(A)

- No - Is the connection between POWER connector on the main control board and connector CN3 on the power supply/sensor board being made properly?

No - Correct the connection.

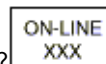
- Yes - Go to 1-1.
- Yes - Is +8 V being applied between Pins 23 and 24 (GND) of POWER connector?

Pin 23 : 0 V
Pin 24 : +8 V

- No - Go to A
- Yes - Is the flexible cable for the operator panel assy being connected to the PANEL connector on the control board and the connector CN1 on the OLCC board properly?
 - No - Connect the flexible cable properly.
 - Yes - Replace the operator panel assy or flexible cable.
 - Has the problem been solved?
 - No - Replace the main control board.
 - Yes - End
- Yes - Is INITIALIZING message being displayed by the LCD display?
- No - Replace the main control board.



- Yes - Is ON-LINE XXX message being displayed by the LCD display?



XXX: PCL, Auto, Adobe PS, HEX DUMP, PPR, FX

- No - Take actions according to the LCD status message/problem list (see Section 6.5.1 for corrective actions).

- Yes - End

(1)-1

- Take the measurement of the following voltage readings at connector CN2 on the power supply/sensor board:
 - Voltage between Pins 1 and 3: ... about 40 V AC
 - Voltage between Pins 5 and 6: ... about 9.2 V AC
 - Are the voltages within the normal range?
- Yes - Is fuse F3 on the power supply/sensor board blown?
 - No - Replace the power supply/sensor board.
- Yes - Replace fuse F3 (if it blows again, check the resistance of the registration and main/drum motors. If it is faulty, replace motors or replace the power supply/sensor board or main control board).
- No - Is the AC input voltage output between Pins 1 and 2 of connector CN1 on the power supply/sensor board normal?
 - Yes - Replace the AC transformer.
- No - Is fuse F1 or F2 on the power supply/sensor board blown?
 - No - Replace the power supply/sensor board.
- Yes - Replace blown fuse F1 or F2 (if it blows again, replace the power supply/sensor board).

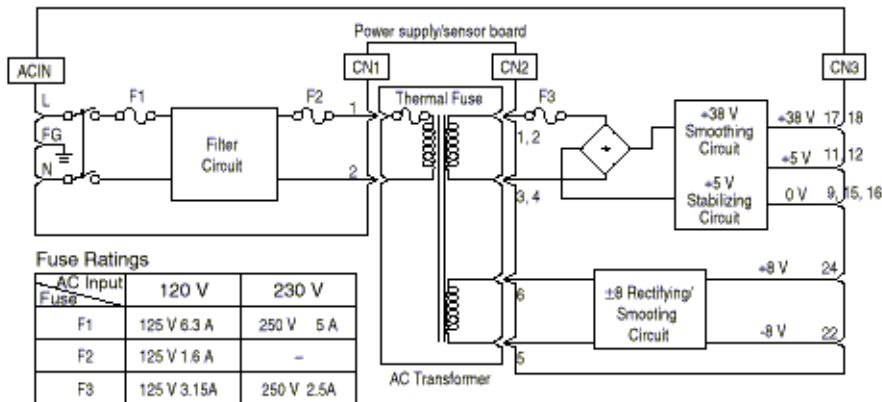


Figure 6-1 Low-voltage Power Supply Block Diagram



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(2) [JAM error]

Paper input jam

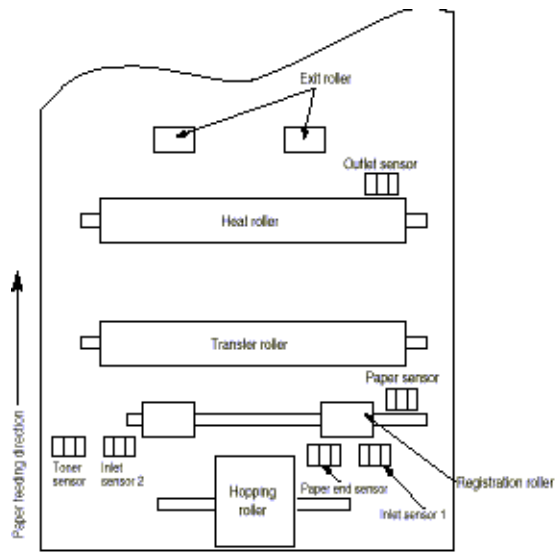
Paper feed jam

Paper exit jam

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Paper input jam

- Does the JAM error occur when the power is turned on?
 - Yes - Is the paper at the inlet sensor?
 - Yes - Remove the paper.
 - No - Is the operation of the inlet sensor plate normal (moves freely when it is touched)?
 - No - Replace the inlet sensor plate.
 - Yes - Clean the inlet sensor on the power supply/sensor board, or replace the power supply/sensor board.
- No - Does the JAM alarm occur after paper feeding?
 - Yes - Is the paper fed to the inlet sensor plate?
 - Yes - Is the operation of the input sensor plate normal (moves freely when it is touched)?
 - No - Replace the inlet sensor plate.
 - Yes - Clean the inlet sensor on the power supply/sensor board or replace the power supply/sensor board.
 - No - Replace the hopping roller rubber or paper cassette.
- No - Is the hopping roller rotating?
 - Yes - Set the paper tray properly.
- No - Is the registration motor rotating?
 - Yes - Replace the one-way clutch gear of the hopping roller assembly.
- No - Is RM connector on the main control board being connected properly?
 - No - Connect RM connector properly.
- Yes - Is the coil resistance (normal resistance: both between Pins 1 and 2, as well as Pins 3 and 4 are about 18.6 W) of the registration motor normal?
 - No - Replace the registration motor.
- Yes - Replace the main control board.



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Paper feed jam

- Does the paper feed jam occur when the power is turned on?
 - Yes - Is the paper on the paper sensor plate?
 - Yes - Remove the paper.
 - No - Is the operation of the paper sensor plate normal (moves freely when it is touched)?
 - No - Replace the paper sensor plate.
 - Yes - Replace the power supply/sensor board.
- No - Has the paper reached the paper sensor plate?
 - No - Is the registration roller rotating?
 - No - Replace the one-way clutch gear of the hopping roller assembly.
 - Yes - Is the image drum cartridge being set properly?
 - No - Set the image drum cartridge properly.
 - Yes - Check the hopping roller assembly or tray.
- Yes - Has the paper reached the outlet sensor plate?
 - Yes - Is 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 main/drum motor rotating?
 - No - Is DM connector on the main control board being connected properly?
 - No - Connect DM connector properly.
 - Yes - Is the coil resistance (normal resistance: both between Pins 1 and 2, as well as Pins 3 and 4 are about 2.9W) of the main/drum motor correct ?
 - No - Replace the main/drum motor.
 - Yes - Replace the main control board.
- Yes - Is the transfer roller rotating?

(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.

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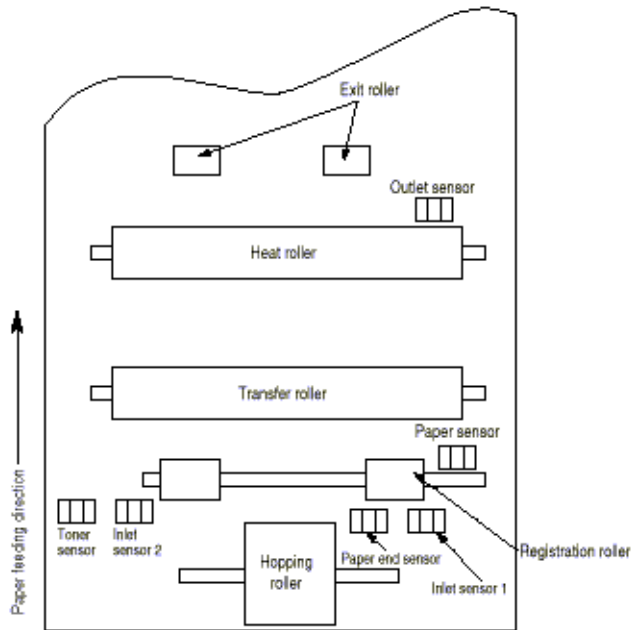


Paper exit jam

- 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.

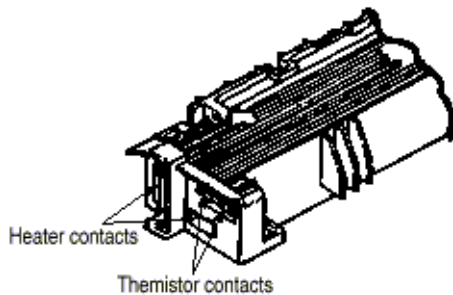
(3) Paper size error

- 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/3W or 240V/10W, and thermistor contacts 220K Ohms at room temperature) (see Figure 6-2 below 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 contacts for the heater of the contact assembly? (see Figure 6-2 below)
 - 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 (G)).

**Figure 6-2**



(5) SSIO error (ERROR 74)

Synchronous Serial I/O (ERROR 74) or I/F timeout between printer and optional tray (ERROR 81)

- Is an option tray (High Capacity Second Paper Feeder or Power Envelope Feeder) being used?
 - Yes - Is the cable between the main control board and the optional tray being connected properly?
 - No - Connect the cable properly.
 - Yes - Replace the main control board.
 - Has the problem been solved?
 - No - Check the problem by following the High Capacity Second Paper Feeder maintenance manual of Appendix F.
 - Yes - End
- No - Replace the main control board.
- Has the problem been solved?
 - No - Replace the power supply/sensor board.
- Yes - End



(6) Fan error (ERROR 70)

- Is the fan rotating?
 - Yes - Replace the main control board.
- No - Is FAN connector on the main control board being connected properly?
 - No - Connect FAN connector properly.
- Yes - Replace the fan or main control board.

6.5.3 Image Troubleshooting

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

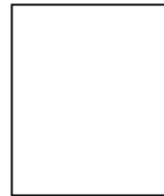
Problem	Flowchart number
Images are light or blurred entirely (Figure 6-3, A)	(1)
Dark background density (Figure 6-3, B)	(2)
Blank paper is output (Figure 6-3, C)	(3)
Vertical block belt/black stripe (Figure 6-3, D)	(4)
Cyclical defect (Figure 6-3, E)	(5)
Print void	(6)
Poor fusing (images are blurred or peeled off when touched by hands)	(7)
Vertical white belt/white stripe (Figure 6-3, F)	(8)



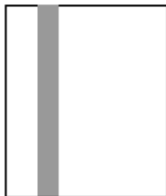
A Light or blurred images entirely



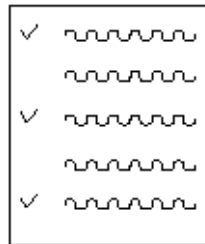
B Dark background density



C Blank paper



D Black vertical stripes



E Cyclical defect



F White vertical belts or streaks

Figure 6-3 Image Problems



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(1) Images are light or blurred entirely

Is the toner low? (Is the "Toner Low" being displayed?)

Yes - Supply toner.

No - Is paper of the specified grade being used?

No - Use paper of the specified grade.

Yes - Is the lens of the LED head dirty?

Yes - Clean the lens.

No - Is the LED head 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 to make a proper contact with the contact assembly.

Yes - Replace the transfer roller.

No - Has the problem been solved?

Yes - End

No - Replace the image drum cartridge.

Has this problem been resolved?

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 the back-up roller normal?

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

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

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(2) Dark background density

Has the image drum been exposed to external light?

Yes - Install the image drum in the printer and wait about 30 minutes.

No - Perform the cleaning page function (see Section 5.2.2).

Has the problem been solved?

Yes - End

No - Is the heat roller of the fusing unit dirty?

Yes - Clean the heat roller.

No - Is the contact of the cleaning roller of the image drum cartridge in contact with the contact assembly properly (see Figure 6-4 (C))?

No - Adjust the contact of the cleaning roller to make a proper contact with the contact assembly.

Yes - 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).

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



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(3) Blank paper is output

Is the LED head being connected properly (check the HEAD1 and HEAD2 connectors on the main control board and PC connector on the LED head)?

No - Connect the LED head properly or replace the head cable(s).

Yes - Is the contact of the image drum cartridge in the proper contact with the ground contact properly (see Figure 6-4 (c))?

No - Adjust the ground contact (Drum) of the contact assembly.

Yes - Replace the LED head.

Has this problem been solved?

Yes - End

Note: After replacing the LED head, set the printer to the engine maintenance mode by turning the power on while pressing the FORM FEED and ENTER keys. Set the LED head drive time (see 4.2.1).

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



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(4) Black vertical belts or stripes

Performing the cleaning page function (see Section 5.2.2).

Has this problem been solved?

Yes - End

No - Replace the image drum cartridge.

Has this 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

Note: After replacing the LED head, set the printer to the engine maintenance mode by turning the power on while pressing the FORM FEED and ENTER keys. Set the LED head drive time (see 4.2.1).

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



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(5) Cyclical defect

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

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(6) Prints voids

Is the contact plate of the transfer roller in proper contact with the power supply/sensor board. (See Figure 6-5.

No - Adjust the contact plate so that it touches the power supply/sensor board and the shaft of the transfer roller properly.

Yes - Replace the transfer roller.

Has this problem been solved?

Yes - End

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 - Are the contacts of the toner supply roller, developing roller, image drum and charging roller in proper contact with the contact assy (see Figure 6-4 (A), (B), (C), (D), (E)?

No - Adjust the contact so that they touch the contact assy properly.

Yes - Replace the image drum cartridge.

Has this 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).

No - Is the LED head installed properly (check the HEAD1 and HEAD2 connectors the main control board and PC Connector on the LED head)?

No - Install the LED head properly.

Yes - Replace the LED head or the head cable(s).

Has this problem been solved?

Yes - End

Note: After replacing the LED head, set the printer to the engine maintenance mode by turning the power on while pressing the FORM FEED and ENTER keys. Set the LED head drive time (see 4.2.1).

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



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(7) Poor fusing

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

Is paper of the specified grade being used?

No - Use paper of the specified grade.

Yes - Is the tension between the back-up roller (7.52kg) and the surface of the back-up roller normal?

No - Replace the back-up roller bias spring.

Yes - Is the contact of the fusing unit assy in proper contact with the contact assy (see Figure 6-4 (G))?

No - Adjust the contact of the fusing unit assy to make a proper contact with the contact assembly.

Yes - Replace the fusing unit assy.

Has this problem been solved?

Yes - End

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



(8) Vertical belts or streaks

Are the LED lens dirty?

Yes - Clean the LED lens.

No - Is the contact plate of the transfer roller in proper contact with the power supply/sensor board? (See Figure 6-5 (E).

No - Adjust the contact plate to make a proper contact with the power supply/sensor board.

Yes - Replace the transfer roller.

Has this problem been solved?

Yes - End

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

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

Yes - Is the LED head being installed properly (check HEAD1 and HEAD2 connectors on the main control board and PC connector on the LED head)?

No - Install the LED head.

Yes - Replace the LED head.

Has the problem been solved?

Yes - End

Note: After replacing the LED head, set the printer to the engine maintenance mode by turning the power on while pressing the FORM FEED and ENTER keys. Set the LED head drive time (see 4.2.1).

Yes - Replace the image drum cartridge.

Has this 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. Reset the drum counter (see Printer Handbook).

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

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Figure 6-4

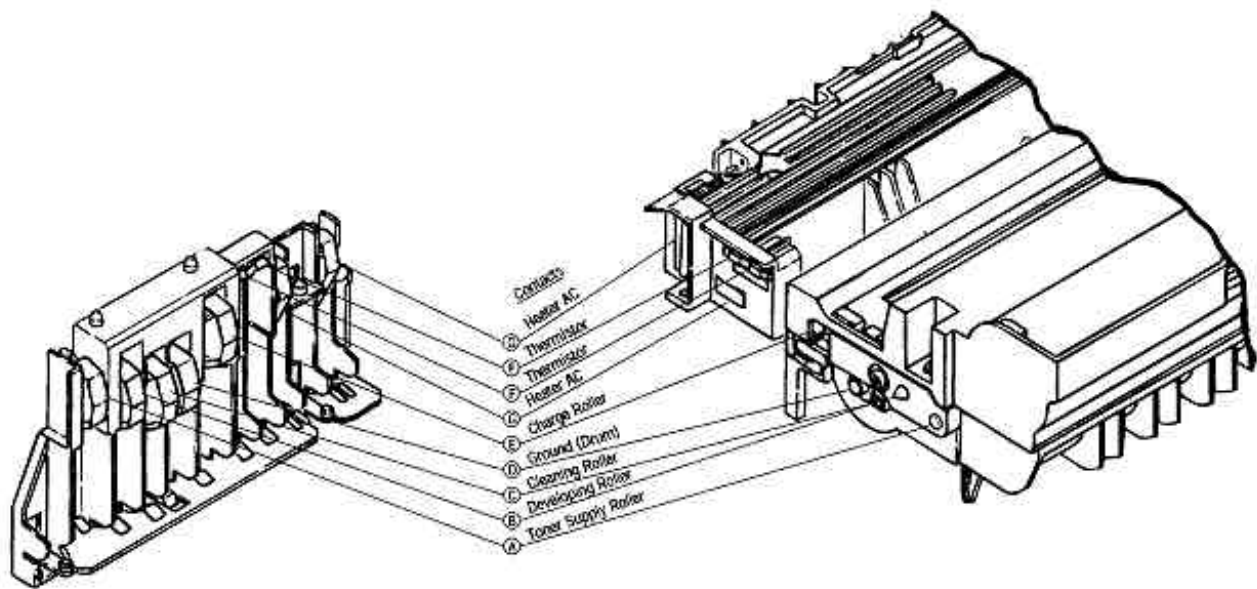
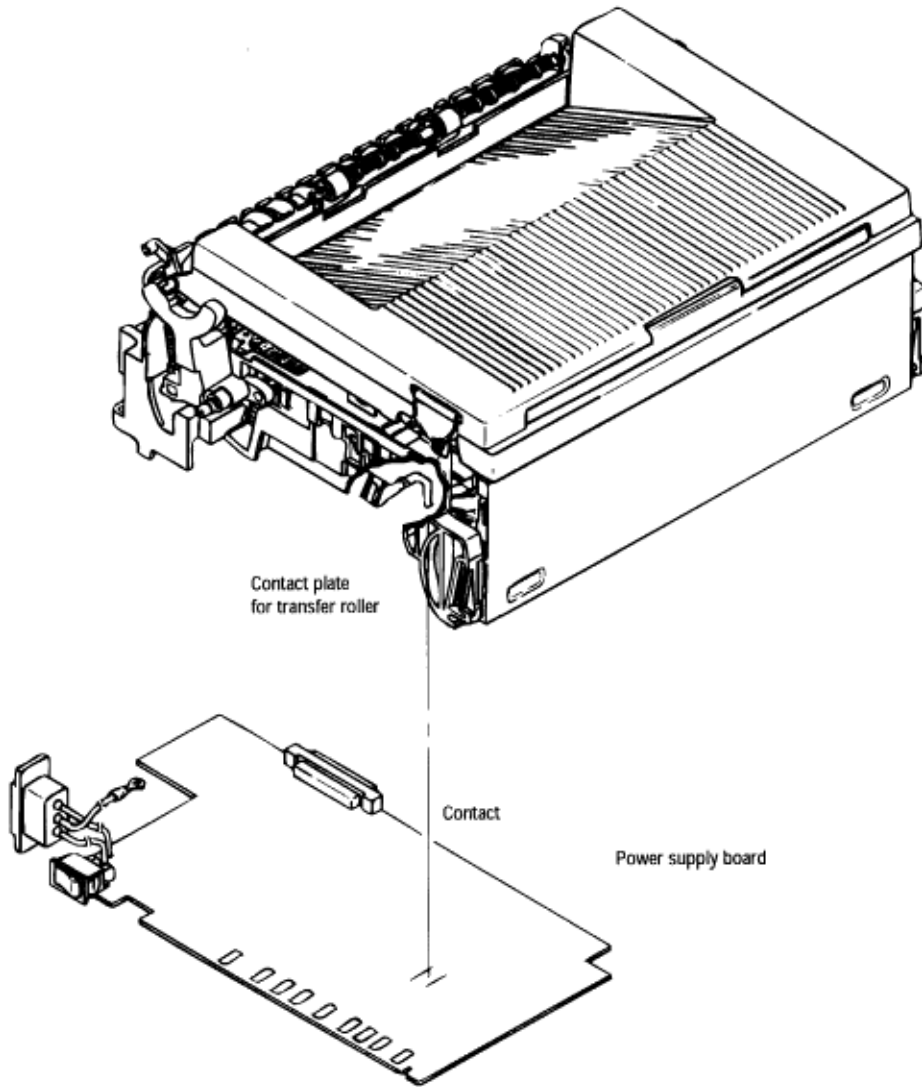
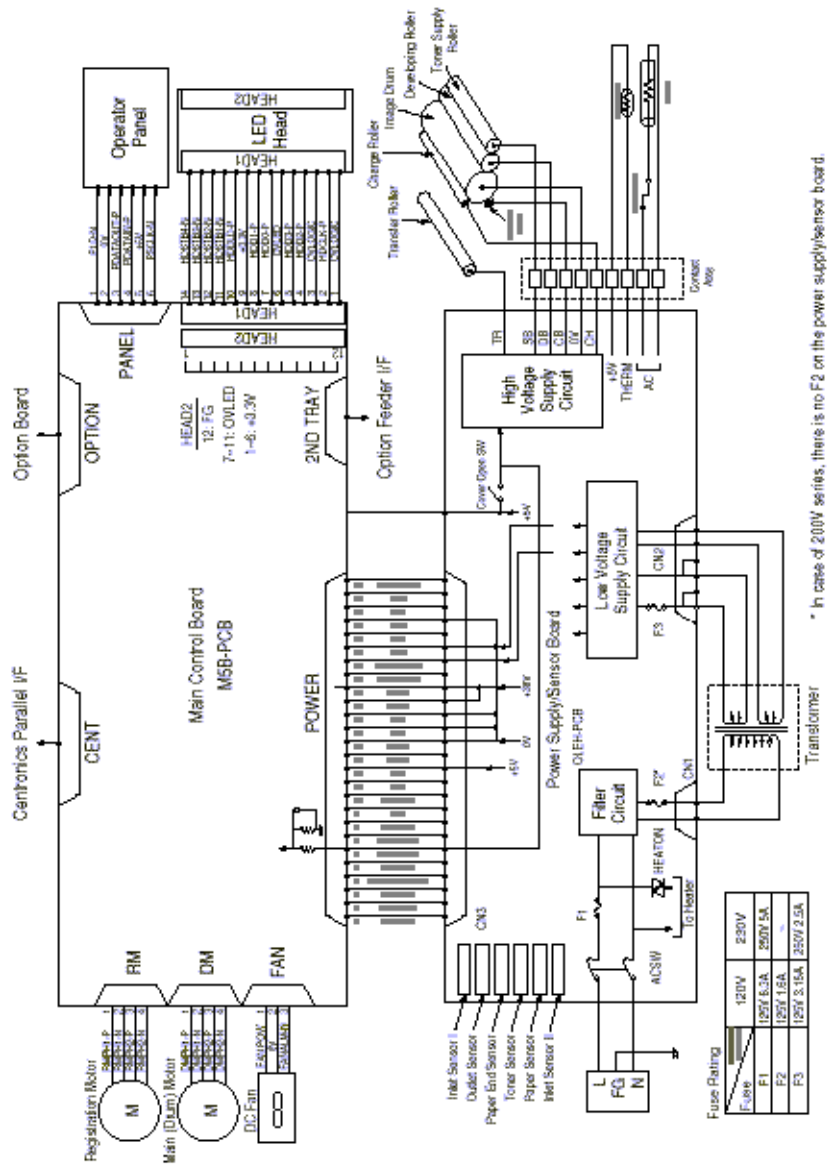


Figure 6-5

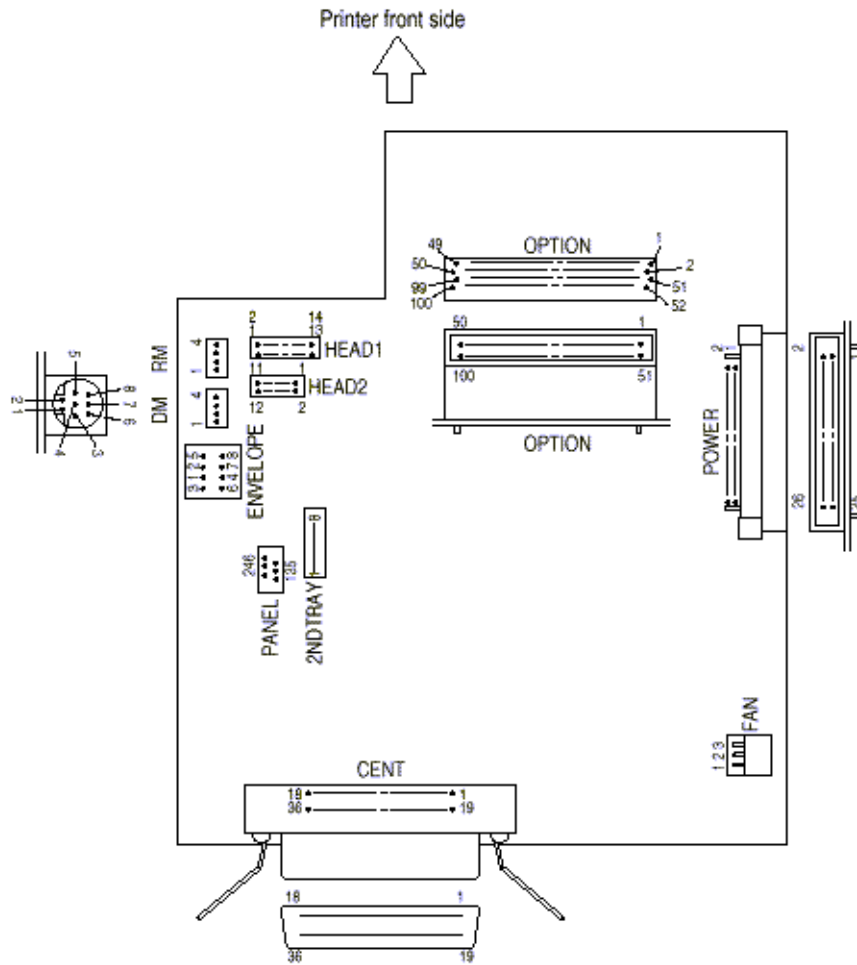


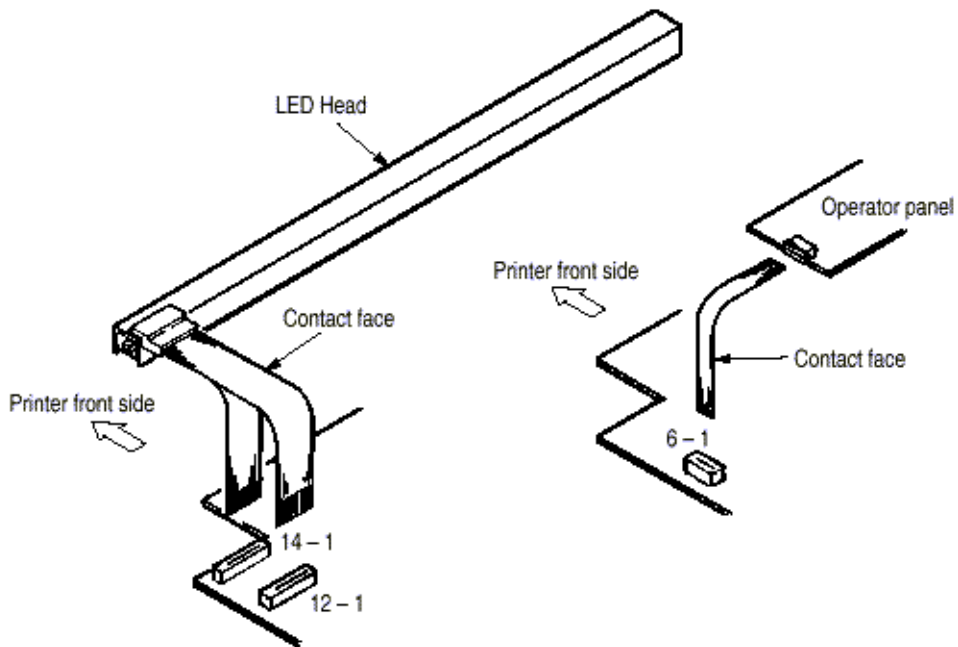
7.1 Interconnect Signal Diagram



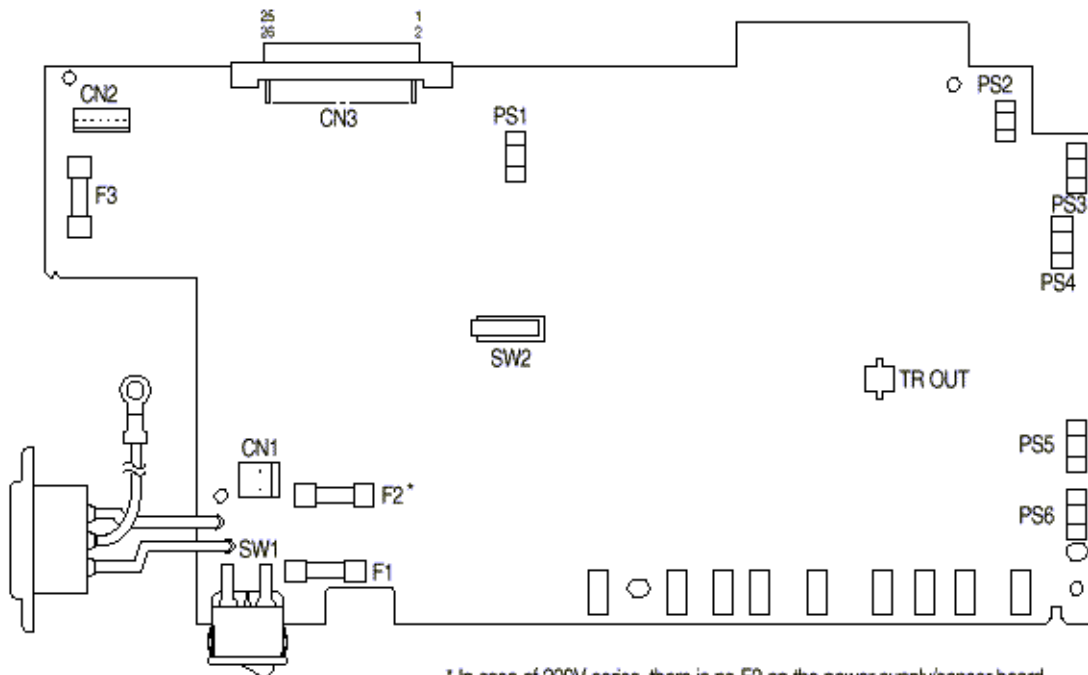
7.2 PCB Layout and Connector Signal List

(1) Main Control Board (M5B-PCB)





(2) Power Supply Board



FAN Connector Pin Assignment (To fan motor)

Opening	PIN NO.	I/O	Signal	Description
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)

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

Excitation sequence

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

Turning direction Clockwise when viewed from the output axis.

RM Connector Pin Assignment (To registration motor)

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

Excitation sequence

PIN NO.	Line Color	Step No. 1	Step No. 2	Step No. 3	Step No. 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
1	C	0VLOGIC	Ground for logic
2	O	HDCLK-P	Clock
3	C	0VLOGIC	Ground for logic
4	O	HDD2-P	Data 4
5	O	HDD3-P	Data 3
6	C	0VLED	Ground for LED
7	O	HDD0-P	Data 0
8	O	HDD1-P	Data 1
9	O	+3.3V	+3.3V power supply for LED driving
10	O	HDDL-D-P	Load
11	O	HDSTB1-N	Strobe 1
12	O	HDSTB2-N	Strobe 2
13	O	HDSTB3-N	Strobe 3
14	O	HDSTB4-N	Strobe 4

O: Out

C: Common

HEAD2 Connector Pin Assignment (To LED head)

HEAD1	HEAD1	PIN NO.	I/O	SIGNAL	DESCRIPTION
1		1	O	+3.3V	+3.3V power supply for LED driving
	2	2	O	+3.3V	+3.3V power supply for LED driving
3		3	O	+3.3V	+3.3V power supply for LED driving
	4	4	O	+3.3V	+3.3V power supply for LED driving
5		5	C	+3.3V	+3.3V power supply for LED driving
	6	6	O	+3.3V	+3.3V power supply for LED driving
7		7	C	0VLED	Ground for LED
	8	8	C	0VLED	Ground for LED
9		9	C	0VLED	Ground for LED
	10	10	C	0VLED	Ground for LED
11		11	C	0VLED	Ground for LED
	12	12	C	0VLED	Ground for LED

O: Out

C: Common

PANEL Connector Pin Assignment (To operator panel)

HEAD2	HEAD2	PIN NO.	I/O	SIGNAL	DESCRIPTION
1		1	O	PLD-N	Load
	2	2	C	OV	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

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

		Pin No.	Signal	I/O	Description	Pin No.	Signal	I/O*	Description
2	1	2	TRSEL1	O	TR control switch	1	SQCR-N	I	Sequence clear signal of serial I/F
4	3	4	THERM-CMP	I	Heater temperature	3	SCLK-N	I	Clock signal of serial I/F
6	5	6	CVOPN-N	I	Cover open (+35V)	5	PSIN1-N	I	Paper sense
8	7	8	DOUT-P	O	Serial data output	7	WRSNS	I	Reading of paper edge
10	9	10	RXD2-P	I	Serial data input	9	OVL	C	Ground for logic
12	11	12	+5V	I	Logic circuit supply voltage	11	+5V	I	Logic circuit supply voltage
14	13	14	+3.3V	I	LED head supply voltage	13	+3.3V	I	LED head supply voltage
16	15	16	OVL	C	Logic ground	15	OVL	C	Logic ground
18	17	18	+38V	I	Motor and fan drive voltage and source voltage for high voltage supply	17	+38V	I	Motor and fan drive voltage and source voltage for high voltage supply
20	19	20	HEATON-N	O	Heater on	19	TRSEL2	O	TR control switch
22	21	22	-8V	I	RS232C line voltage	21	OVP	C	Analog
24	23	24	+8V	I	RS232C line voltage	23	OVP	C	Analog
26	25	26	TRSEL3-N	O	TR control switch	25	OVP	C	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	19	1	I	Strobe	Strobe	19	C	SG	Ground
2	20	2	C	DATA1-P	Data bit 0	20	C	SG	Ground
3	21	3	C	DATA2-P	Data bit 1	21	C	SG	Ground
4	22	4	C	DATA3-P	Data bit 2	22	C	SG	Ground
5	23	5	C	DATA4-P	Data bit 3	23	C	SG	Ground
6	24	6	C	DATA5-P	Data bit 4	24	C	SG	Ground
7	25	7	C	DATA6-P	Data bit 5	25	C	SG	Ground
8	26	8	C	DATA7-P	Data bit 6	26	C	SG	Ground
9	27	9	C	DATA8-P	Data bit 7	27	C	SG	Ground
10	28	10	O	ACK-N	Acknowledge	28	C	SG	Ground
11	29	11	O	BUSY-P	Busy	29	C	SG	Ground
12	30	12	O	PE-P	paper end	30	C	SG	Ground
13	31	13	O	SEL-P	Select	31	I	Iprime-N	Input prime
14	32	14	I	AUTOFEED-N	Auto feed	32	O	FAULT-N	Fault
15	33	15		NC	Not connected	33	C	SG	Ground
16	34	16	C	SG	Ground	34		NC	Not connected
17	35	17	C	FG		35	O	HILEVEL	Always kept high
18	36	18	O	P-LOGIC-H	+5V power supply	36	I	SELIN-N	Select in

O: Out

I: In

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	O	A0	OR write enable	51	I/O	D16	Data bit 16

	02		52	02	C	0V	Logic ground	52	I/O	D10	Data bit 0
03		53		03	O	A1	Address bit 1	53	I/O	D17	Data bit 17
	04		54	04	O	A2	Address bit 2	54	I/O	D1	Data bit 1
05		55		05	O	RSDTR0-N	RS232C Data terminal ready	55	I/O	D18	Data bit 18
	06		56	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		58	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		60	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		62	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		64	14	C	0V	Address bit 9	64	I/O	D6	Data bit 6
15		65		15	O	A9	Address bit 10	65	I/O	D23	Data bit 23
	16		66	16	O	A10	Logic power supply	66	I/O	D7	Data bit 7
17		67		17	O	+5V	Address bit 11	67	I/O	D24	Data bit 24
	18		68	18	O	A11	Address bit 12	68	I/O	D8	Data bit 8
19		69		19	O	A12	Logic ground	69	I/O	D25	Data bit 25
	20		70	20	C	0V	Address bit 13	70	I/O	D9	Data bit 9
21		71		21	O	A13	Address bit 14	71	I/O	D26	Data bit 26
	22		72	22	O	A14	Logic power supply	72	I/O	D10	Data bit 10
23		73		23	O	+5V	Address bit 15	73	I/O	D27	Data bit 27
	24		74	24	O	A15	Address bit 16	74	I/O	D11	Data bit 11
25		75		25	O	A16	Logic ground	75	I/O	D28	Data bit 28
	26		76	26	C	0V	Address bit 17	76	I/O	D12	Data bit 12
27		77		27	O	A17	Address bit 18	77	I/O	D29	Data bit 29
	28		78	28	O	A18	Logic power supply	78	I/O	D13	Data bit 13
29		79		29	O	+5V	Address bit 19	79	I/O	D30	Data bit 30
	30		80	30	O	A19	Address bit 20	80	I/O	D14	Data bit 14
31		81		31	O	A20	Logic ground	81	I/O	D31	Data bit 31
	32		82	32	C	0V	Address bit 21	82	I/O	D15	Data bit 15
33		83		33	O	A21	Address bit 22	83	O	DRAS2-N	DRAM select 2
	34		84	34	O	A22	Address bit 23	84	O	DRAS3-N	DRAM select 3
35		85		35	O	A23	Logic ground	85	O	DRAS4-N	DRAM select 4
	36		86	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		88	38	C	0V	RS232C request to send	88	O	DCAS2-N	DCAS2
39		89		39	O	RSRTS0-N	ROM/SRAM select 1	89	O	DCAS1-N	DCAS1
	40		90	40	O	CS1-N	ROM/SRAM select 2	90	O	DCAS0-N	DCAS0
41		91		41	O	CS2-N	ROM/SRAM select 3	91	O	RD-N	RD-N
	42		92	42	O	CS3-N	SCC send request	92	O	WR-N	WR-N
43		93		43	I	CSRREQ-P	Logic ground	93	I	INT1-N	Interrupt request 1
	44		94	44	C	0V	SCC receive request	94	I	INT2-N	Interrupt request 2
45		95		45	I	SCSREQ-P	I/O select 0	95	O	EEPRMCS 1-P	EEPROM select
	46		96	46	O	IOS0-N	I/O select 1	96	O	EEPRMCLK-P	EEPROM clock

47		97		47	O	IOS1-N	RS232C send data	97	C	SSTXD-P	EEPROM data
	48		98	48	O	RSTXD0-N	RS232C line voltage	98	I	DRDY-N	Data read
49		99		49	O	-8V	RS232C receive data	99	C	+8V	RS232C line voltage
	50		100	50	I	RSRXD0-P		100	O	RESET-N	Reset signal

O: Out

I: In

C: Common

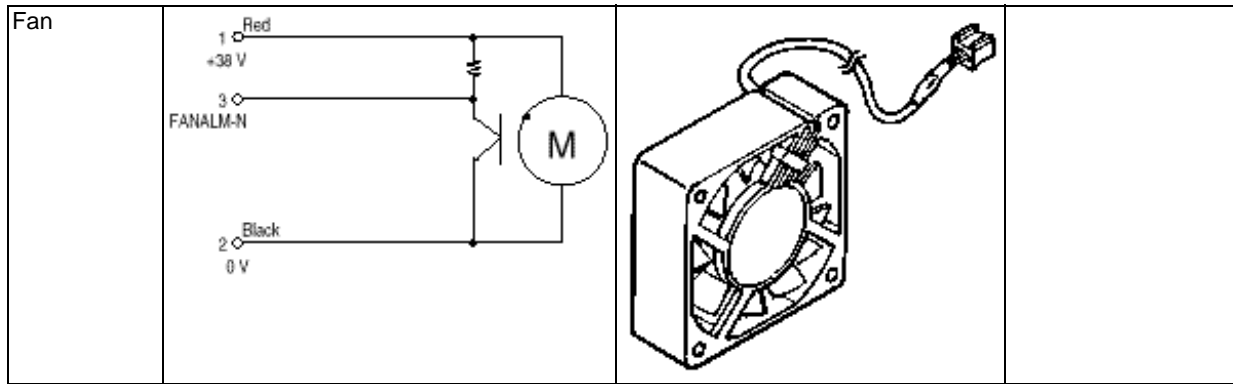
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Service Guide OKIPAGE 10ex
Chapter 7 Wiring Diagram

7.3 Resistance Check

Unit	Circuit Diagram	Illustration	Resistance
Registration Motor			Between Pins 1 and 2: 18.6 Ohms Between Pins 3 and 4: 18.6 Ohms
Main/drum motor			Between Pins 1 and 2: 2.9 Ohms Between Pins 3 and 4: 2.9 Ohms
Fusing unit			Between Pins 1 and 2: 120V 3 Ohms 240V 10 Ohms Between Pins 3 and 4: 220K Ohms (at room temperature)
Transformer			Primary side Between Pins 1 and 2: 8.4 Ohms (120V); 28.8 Ohms (230V) Secondary side Between Pins 1 and 3: 1.2 Ohms Between Pins 5 and 6: 1.5 Ohms



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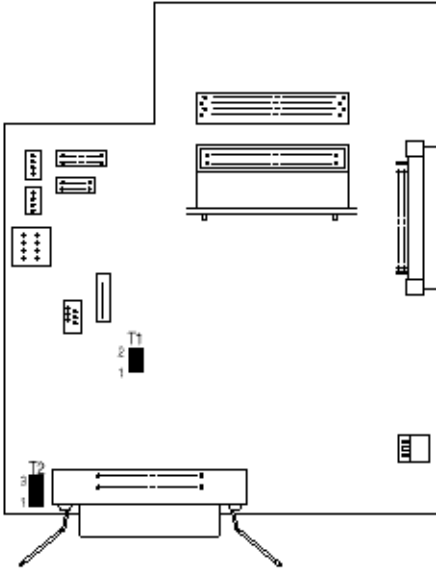


Service Guide OKIPAGE 10ex

Chapter 7 Wiring Diagram

7.4 Short Plug Setting

Main Control Board (M5B-PCB)



Short Plug Settings

Short plug	Plug setting	Description	Factory setting
T1	Provided	Debug mode	Not provided
T1	Not provided	Normal	Not provided
T2	2-3 Short	+5 V is supplied to Pin 18 of Centronics parallel I/F connector.	2-3 Short
T2	1-2 Short	+5 V is not supplied to Pin 18 Centronics parallel I/F connector. Pin 18 if High Level output.	2-3 Short

Service Guide OKIPAGE 10ex Chapter 8 Parts List

Lower Base Unit

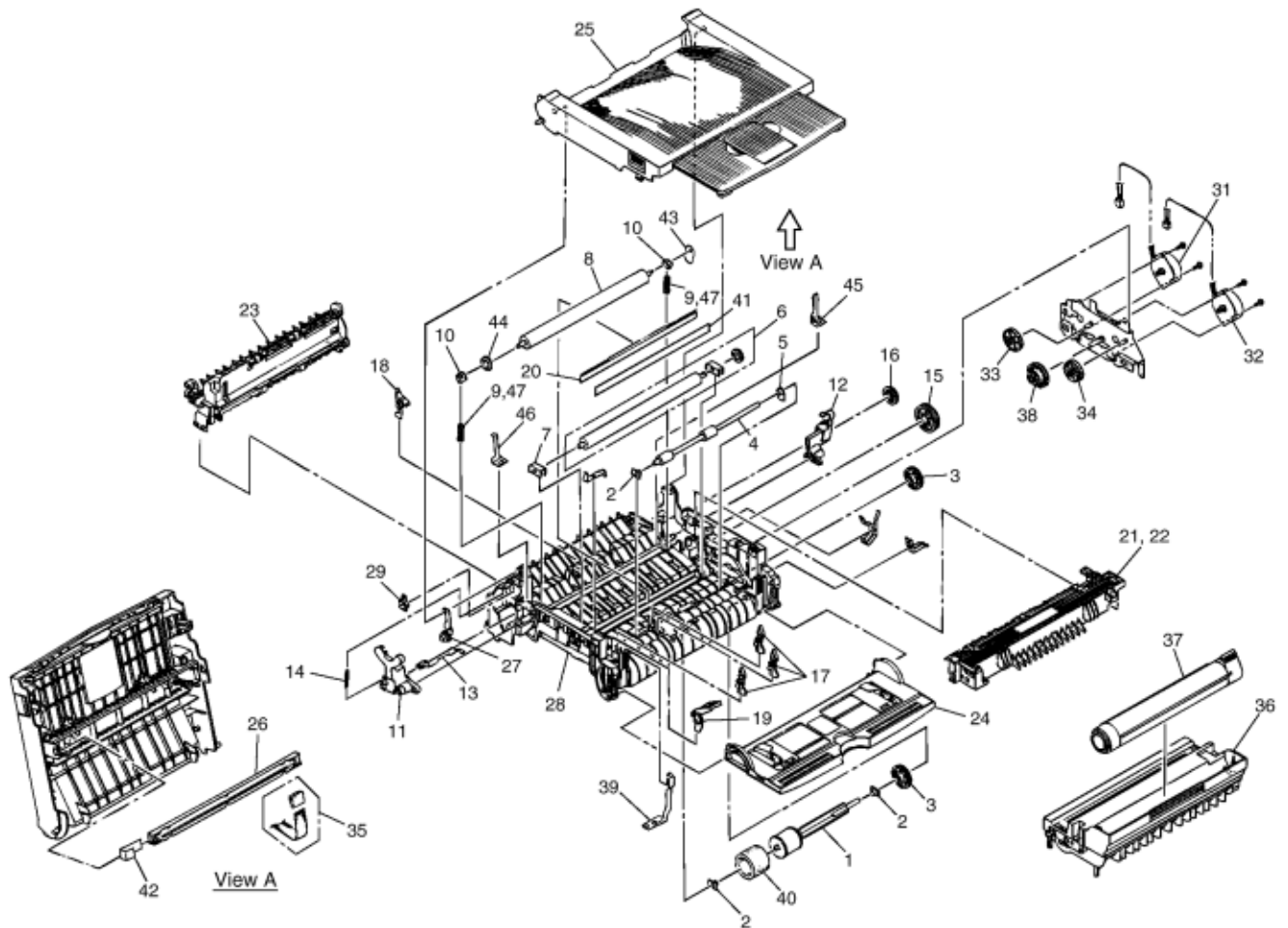


Figure 8-1 Lower Base Unit

No.	Name/Rating	Part No.	Use	Remarks	ODA Part No.
1	Hopping roller shaft	3PP4083-6020P001	1		50219601
2	Bearing	4PP4083-6022P002	4		51607402
3	Hopping roller one-way clutch gear	4PB4083-6024P01	2		51228901
4	Registration roller	3PB4083-6030P001	1		53342501
5	Bearing (registration)	4PP4083-6031P001	1		51607501
6	Roller-Transfer B Assy	40437801	1		40437801
7	Bearing TR	40438001	1		40438001
8	Back-up roller	3PB4083-6064P002	1		53343701
9	Bias spring	4PP4083-7620P001	2		50929301
10	Back-up roller bushing	4PP4083-6052P001	2		51607601
11	Reset lever L	3PP4083-6053P001	1		50805801
12	Reset lever R	3PP4083-6054P001	1		50805901
13	Cover open switch arm	3PP4083-6058P001	1		53068901

14	Stacker cover reset spring	4PP4083-6057P001	1		50924201
15	Fuser roller idle gear	4PP4083-6080P001	1		51229101
16	Eject roller idle gear	4PP4083-6081P001	1		51229201
17	Sensor plate (inlet)	4PP4083-6083P001	3		51010701
18	Eject sensor lever Assembly	4PA4083-6025G001	1		40771401
19	Toner sensor	4PP4083-6086G001	1		50405501
20	Strip: Anti-Static	4PB4083-6979P001	1		51010903
21	Heat Assy - OP10ex		1	120V	40470101
22	Heat Assy - OP10ex		1	230V	40470102
23	Roller assy - eject		1		40772501
24	Manual feed guide assy	2PA4128-1149G001	1		51017201
25	Stacker-Assy		1		40103803
26	LED head unit - 512K		1		40521201
27	Stacker cover damper arm	4PP4083-6191G001	1		53069101
28	Frame-Base lower		1		40771301
29	Stacker cover damper	4PB4083-6197P001	1		51229401
30					
31	Motor-Pulse (main)		1		40229001
32	Motor-Pulse (regist)		1		40396201
33	Gear-Idle A (Z60/16)		1		40778101
34	Gear-Idle B (Z60/16)		1		40295101
35	Cord-LED Assembly		1		40241702
36	Image drum unit (Type 5)		1	ODA	40433305
37	Toner Cartridge (Type 5)		1	Consumable	52109001
38	Reduction Gear	3PP4083-7617P001	1		51239501
39	FG plate (O.P.)	4PP4083-7663P001	1		53347201
40	Hopping roller rubber	4PB4122-1280P001	1		51711401
41					
42	LED Contact	4PP4083-6173P001	1		51014601
43	Washer C	4PP4120-1210P001	1		50517201
44	Washer B	4PP4120-1209P001	1		50517001
45	Spacer-Bearing R		1		40392801
46	Spacer-Bearing L		1		40392901
47	Bias spring A	4PP4083-6065P001	2	Special parts for envelope*	50925301

* This part is countermeasure for envelope wrinkle and common part to bias spring A. Both side springs must be exchanged at the same time.

Upper Cover Unit

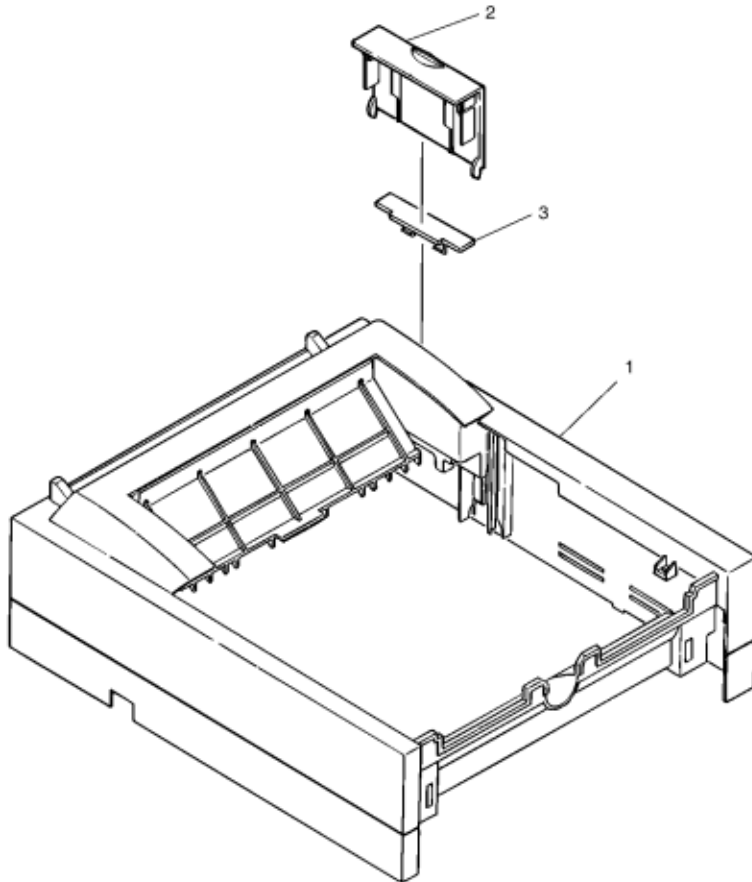


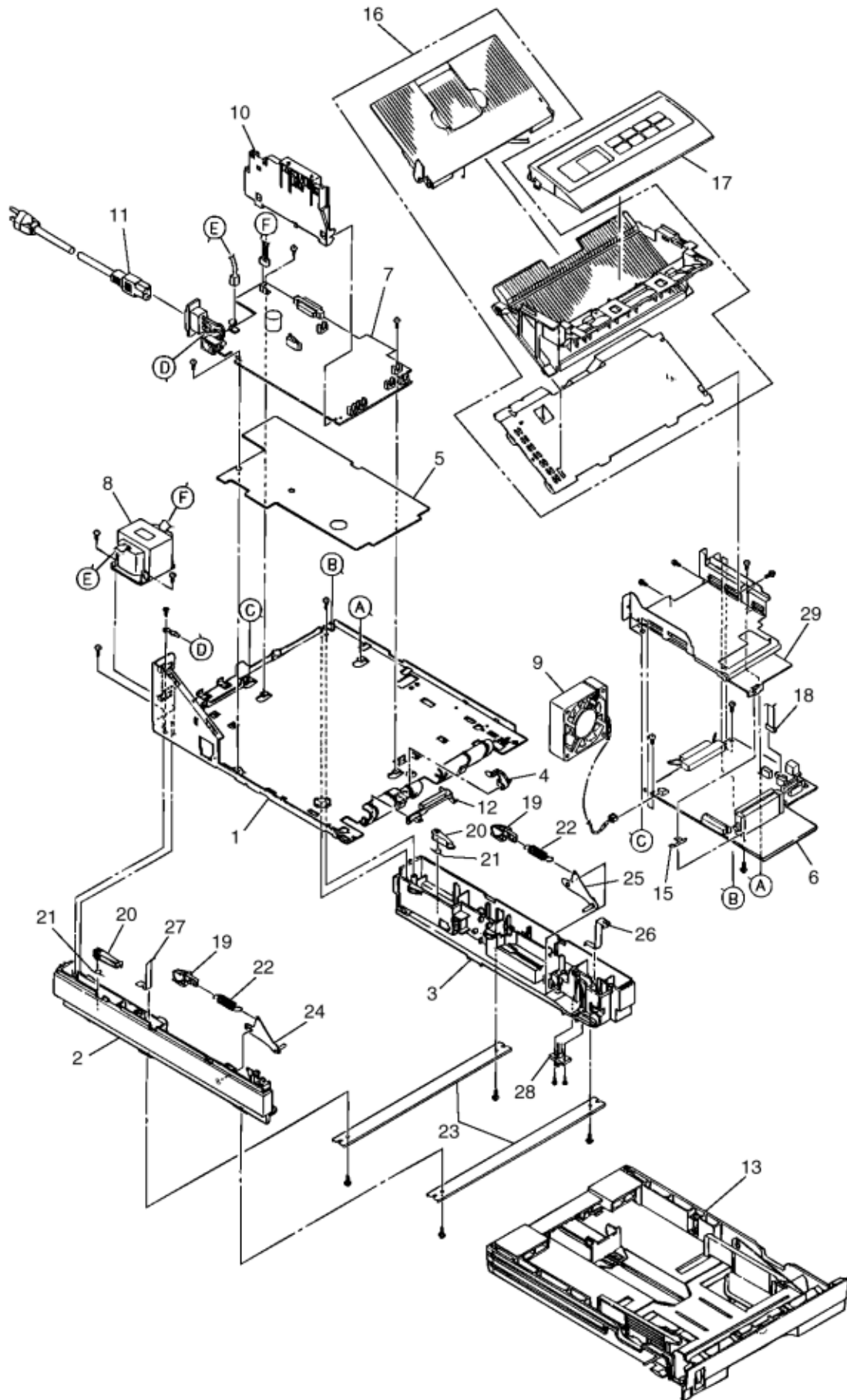
Figure 8-2 Upper cover unit

No.	Name/Rating	Part No.	Use	Remarks	ODA Part No.
1	Upper cover	1PP4128-1133P001	1		53074501
2	IC card cover	2PP4128-1155P001	1		53069301
3	Cover-Lid	40104801	1		40104801



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Chapter 8 Parts List

Base Unit



No.	Name/Rating	Part No.	Use	Remarks	ODA Part No.
1	Base plate (adhesion)	2PP4083-7672G001	1	809A3000001 810AXXXXXXX	51011101
1	Plate Assy-Base	40919401	1	811AXXXXXXX-	40919401
2	Cassette guide (L) assy	3PP4083-7670G001	1		51017301
3	Cassette guide (R) assy	3PP4083-7671G001	1		51017401
4	Sensor plate (paper supply)	4PP4083-7667P001	1		51011401
5	Insulator	3PB4083-6144P001	1		51709401
6	Main control board (Board-M5B)	40217008	1		40217008
7	Power Supply Unit	40217701	1	120V	40217701
	Power Supply Unit	40217702	1	230V	40217702
8	PWR Transformer	40138801	1	120V	40138801
	PWR Transformer	40139001	1	230V	40139001
9	Fan motor	270A2167P0001	1		56512301
10	Contact assy	3PA4083-6090G001	1		56730001
11	AC cord	3YS4011-1315P001	1	120V	56631801
	AC cord	3YS4011-1266P001	1	220-240V	56624301
12	Cassette sensor plate	3PP4083-6154P001	1		51011501
13	Cassette Assy-Paper	40473001	1		40473001
14	Stacker: Face-up	see # 16	1		50101301
15	Earth plate	4PP4083-6137P01	1		51011601
16	Face up stacker cover assy	2PA4128-1143G001	1		50110301
17	OP Panel assy	40104403	1	ODA	40104403
18	SUMI card assy (op panel)	4YX4046-1656G001	1	120V	56636001
19	Link pull block	4PP4122-1170P001	2		53345201
20	Cassette lock lever	3PP4083-7653P001	2		50808401
21	Cassette lock lever spring	4PP4083-7655P001	2		50929501
22	Sheet spring	4PP4083-7666P001	2		50929901
23	Beam	3PP4083-7660P001	1		51608801
24	Sheet Link L assy	4PP4083-7662P001	1		50808501
25	Sheet Link R assy	4Pp4083-7658G001	1		50808601
26	FG plate (2nd)	4Pp4083-7662P001	1		51023701
27	FG plate (bm)	4PP4083-7665P001	1		51023601
28	Connector cord	3YS4111-3527P001	1		56632801
29	Plate guide -PCB	40396101	1		40396101

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Service Guide OKIPAGE 10ex

Chapter A Centronics Parallel

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

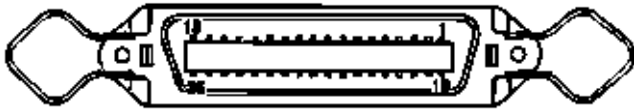
- Cable length : 6 ft (1.8 m) max.

(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.

Pin No.	Signal Name	Signal direction	Functions
1	----- DATA STROBE	--> PR	Parallel data sampling strobe
2	DATA BIT -1	--> PR	PR Parallel input and output data
3	DATA BIT -2	--> PR	PR Parallel input and output data
4	DATA BIT -3	--> PR	PR Parallel input and output data
5	DATA BIT -4	--> PR	PR Parallel input and output data
6	DATA BIT -5	--> PR	PR Parallel input and output data
7	DATA BIT -6	--> PR	PR Parallel input and output data
8	DATA BIT -7	--> PR	PR Parallel input and output data
9	DATA BIT -8	--> PR	PR Parallel input and output data
10	----- 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	----- AUTO FEED	--> PR	Request to change mode
15	--		(Not used)
16	0V		Signal ground
17	CHASSIS GROUND		Chassis ground
18	+5V	<-- PR	50 mA max.
19 through 30	0V		Signal ground
31	----- INPUT PRIME	--> PR	Initializing signal
32	----- FAULT	<-- PR	End of paper or during alarm
33	-		Signal ground
34	-		(Not used)
35	-		High level (3.3 k Ohms)
36	----- select in	--> PR	Request to change mode

- Connector pin arrangement



4) Signal Level

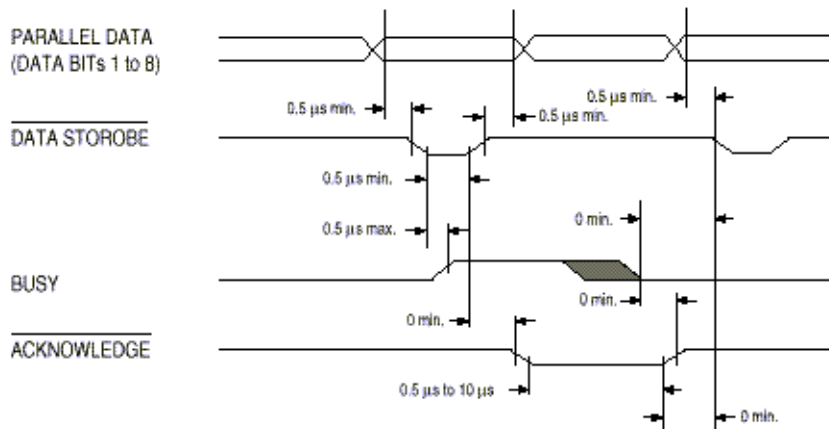
LOW : 0 V to +0.8V
 HIGH : +2.4 V to 5.0 V

5) Specifications

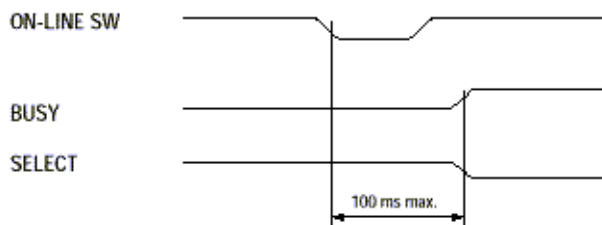
Item	Description
Mode	Compatibility mode, Nibble mode, ECP mode
Data bit length	8 bits (in the compatibility mode)
Input prime	Valid/Invalid
Receive buffer	8K, 20K, 50K, 100K, 1M Bytes
Control	Handshaking control is performed in each mode. Data received from the host is stored in the receive buffer.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

6) Timing Charts

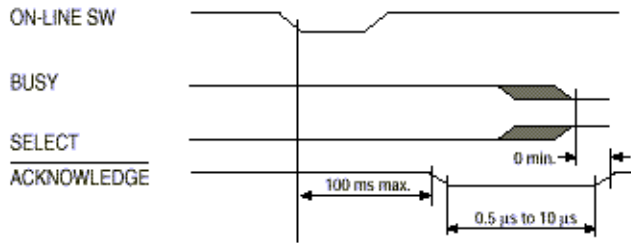
a) Data receiving timing



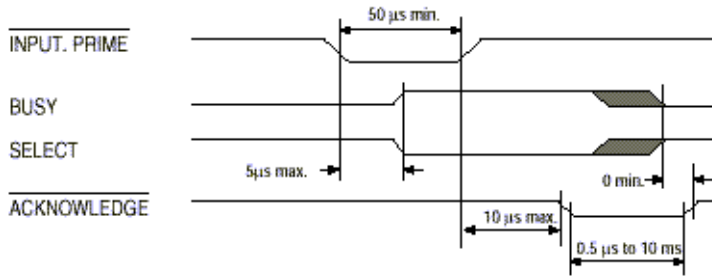
b) On-line --> off-line switching timing by ON-LINE SW



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



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

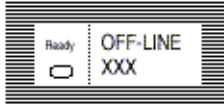


7) Interface Parameter Setting

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.

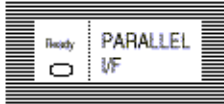
By pressing the ON LINE key, menu setting mode is completed and the printer returns to on-line state.



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

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.

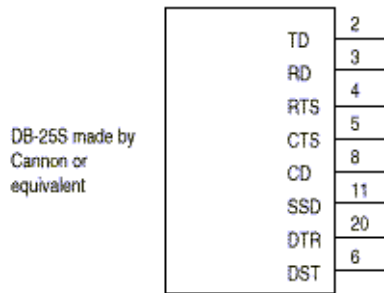
XXX : PCL, AUTO, HEX DUMP, PRR or FX



Service Guide OKIPAGE 10ex Chapter B Loop Test (RS-232C Interface)

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.



Service Guide OKIPAGE 10ex

Chapter C Diagnostics Test

1. Maintenance Modes

- The maintenance modes consist of the user maintenance mode which are released to the user, and the system and engine maintenance modes in the maintenance personnel level 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

1.2 System Maintenance Mode

1.3 Engine Maintenance Mode

1.4 User Factory Set Operation

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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 (higher position) is dumped 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 desetting the off-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.
- The operation mode starts automatically upon completion of resetting.

(3) Drum Counter Reset

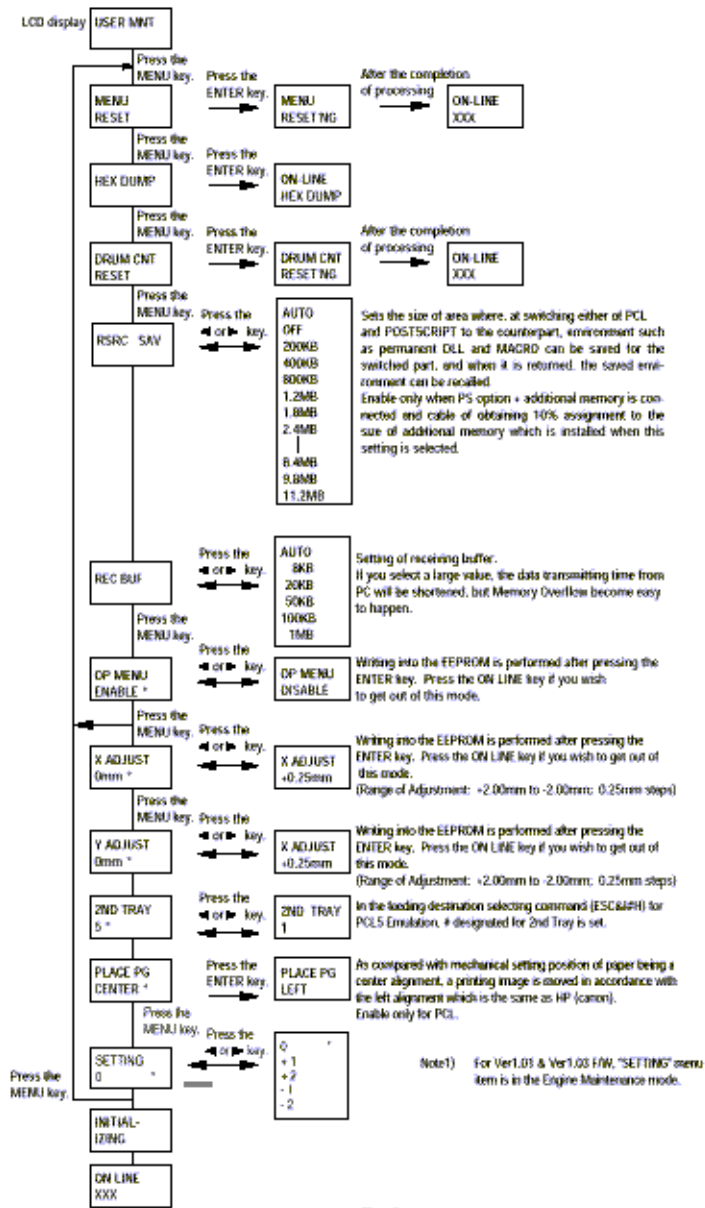
- This function resets the drum life data when the user replaces the image drum unit.
- The operation mode starts automatically upon completion of resetting.

(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).



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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 real-time 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

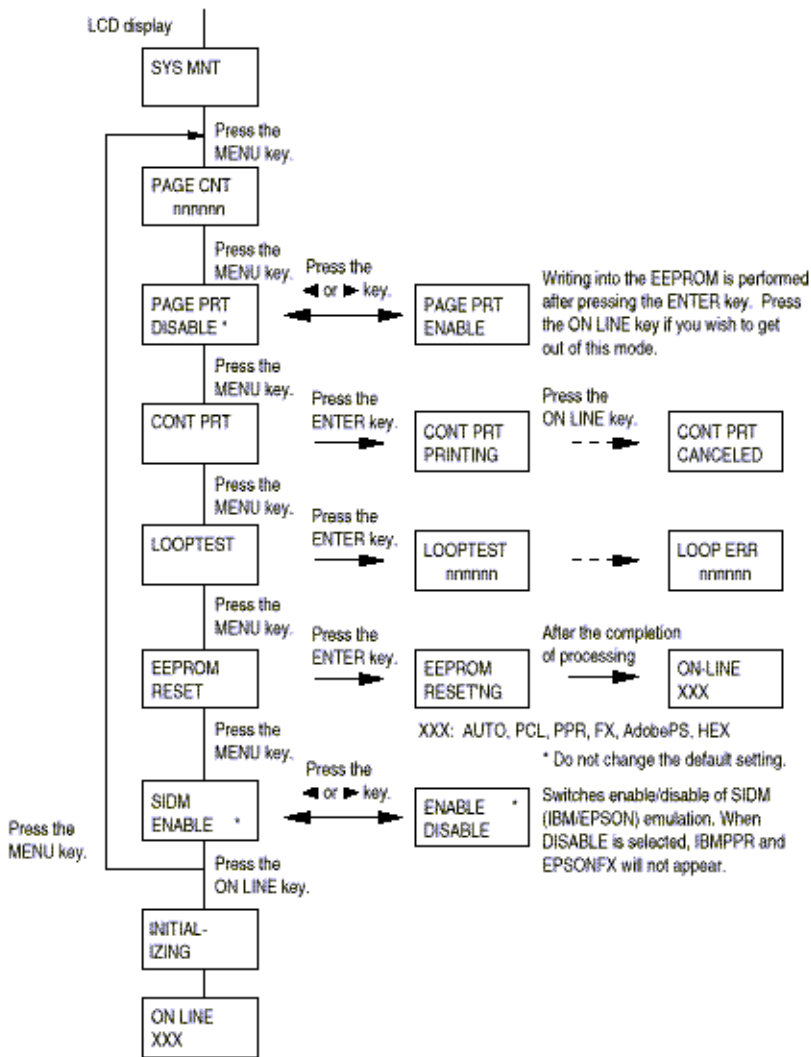
- All EEPROM areas, including Menu level-2 are set to the factory default values.
- The following items are excluded:

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) 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) Type

- 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)

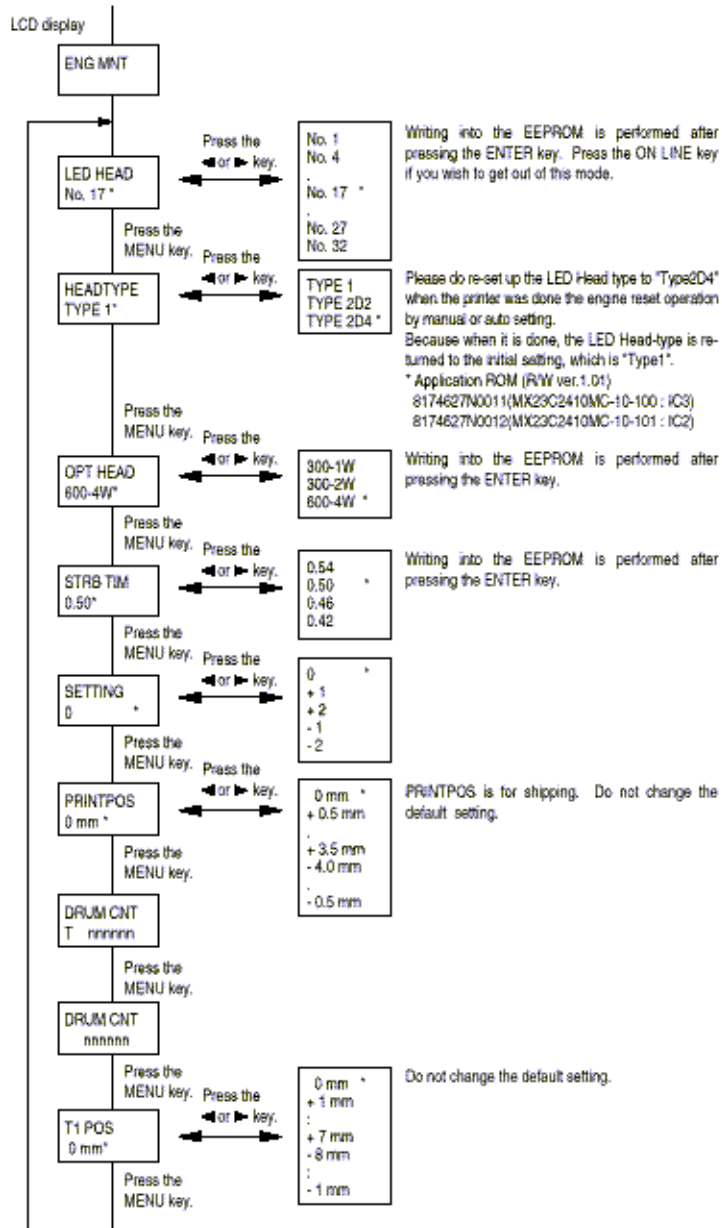
- Do not change the default settings since these are factory settings and were set at the factory.

(7) Engine Reset

- All EEPROM areas used by the engine block are reset to factory default values.
- The following items are excluded:

- Menu level-1
- Menu level-2
- Operator panel menu disable/enable
- Page print disable/enable

- Transition to the operation mode occurs upon completion of resetting.
- Engine maintenance mode menu system





Service Guide OKIPAGE 10ex Chapter C Diagnostics Test

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.

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

This function shall not be open for users.



Service Guide OKIPAGE 10ex

Chapter Product Accessory 1: RS-232C Serial Interface (Option)

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

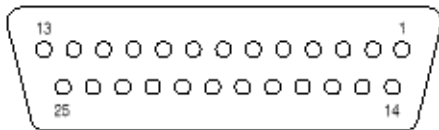
- Cable length : 6 ft (1.8 m) max. (cable shall be shielded)

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	Receive Data
4	Request to Send	RTS	<-- PR	Stay space level
5	---			(Not connected)
6	---			(Not connected)
7	Signal Ground	SG		Signal Ground
9 to 17	---			(Not connected)
18	---			(Not connected)
19	---			(Not connected)
20	Data Terminal Ready	DTR	<-- PR	Data terminal ready
21 to 25	---			(Not connected)

- Connector pin arrangement



(View from cable side)

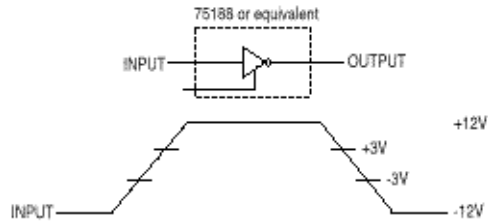
When the Ready/Busy protocol is used for the buffer busy control method, the busy signal can be set to Pin-20 (DTR) in the menu.

4) Signal Level

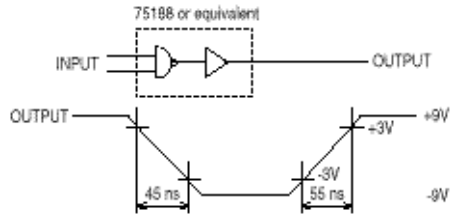
- MARK polarity: -3V to -15V (LOGIC =1)
- SPACE polarity: +3V to +15V (LOGIC = 0)

5) Interface Circuit

a) Receiving Circuit



b) Sending Circuit



Note: The signal levels described above is for the case where 3K Ohms x 15pF is connected to the terminal.

6) Receive Margin

37% min. at all reception rates.

7) Communications Protocol

- a) READY/BUSY protocol
- b) 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.

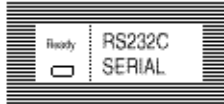
By press the ON LINE key, menu setting mode is completed an the printer returns to on-line state.



XXX : PCL, AUTO, Adobe PS, 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.

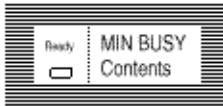


Item	Parity
Contents of Display	Function
NONE	No parity
EVEN	Even parity
ODD	Odd parity

Factory Setting: NONE



Press the MENU key.



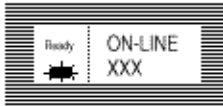
Item	Minimum BUSY Time
Contents of Display	Function
200 m SEC	200 ms
1 SEC	1 sec (1000 ms)

Factory Setting: 200 m SEC

(PCL only)



Press the ON LINE key.



Setting completed.

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



Service Guide OKIPAGE 10ex
Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

1. PREFACE

This Maintenance Manual is intended for the service person and describes the field maintenance methods for Multi-Purpose Feeder option of OKIPAGE 10ex Series LED Page Printer. Refer to the Printer Handbook for equipment handling and operation methods.

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Service Guide OKIPAGE 10ex

Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

1.1 Functions

This optional 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:

- 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 87 to 216mm

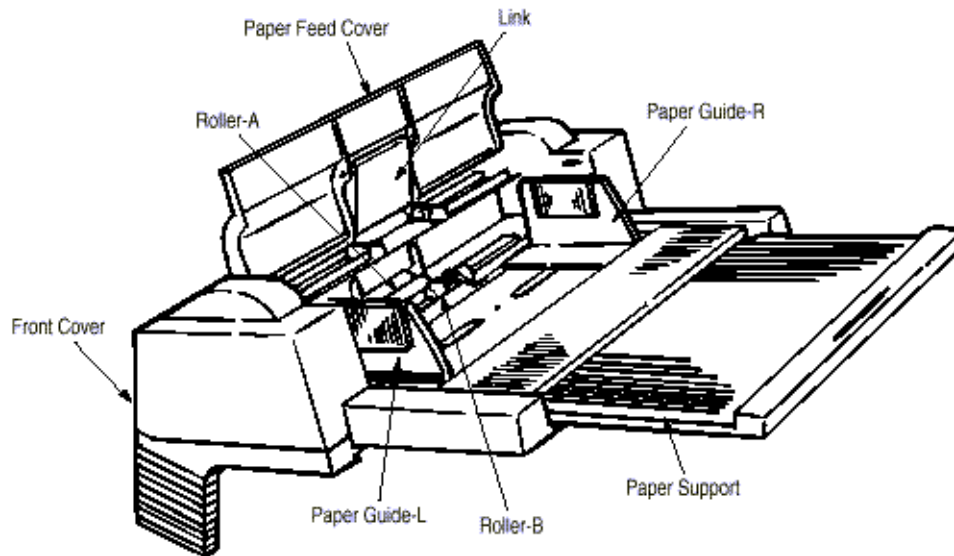
Length 148 to 297mm

[Weight and Thickness]

- 16-lb to 32-lb (60~128 g/m²)
- For Label and OHP Sheets: Label sheets: 0.1 to 0.15mm

OHP sheets: 0.08 to 0.11mm

* 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**

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Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

2. MECHANISM DESCRIPTION - General Mechanism

The Multi-Purpose Feeder feeds the 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 conveyed to rotate roller-A and B. The paper is delivered from the separator into the printer.

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

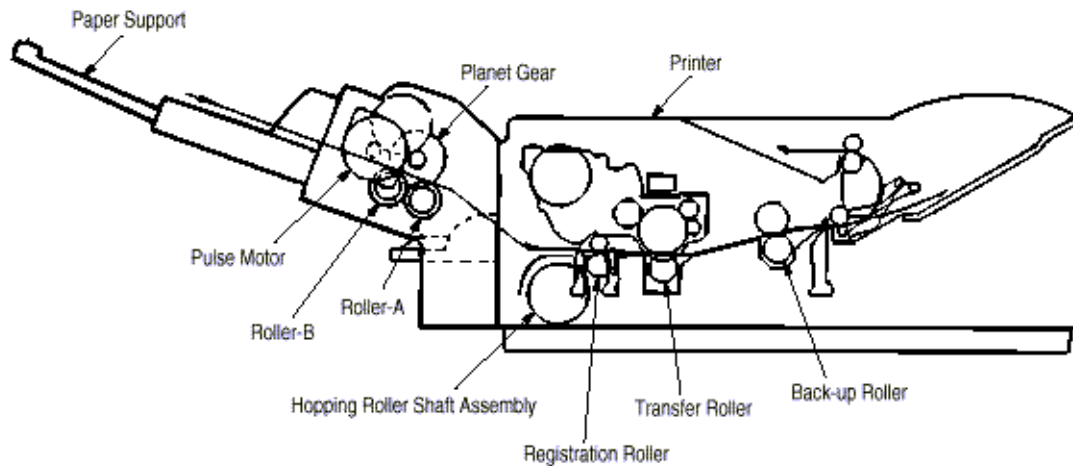
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Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

2.2 Hopper Mechanism

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





Service Guide OKIPAGE 10ex
Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

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.

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Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

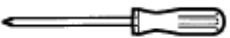






3.1 Precautions Concerning Parts Replacement

- (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 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 fixed in the 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 and units in the field.

Table 3-1 Service Tools

No.	Service tools	Q'ty	Place of use	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	 Handy cleaner	1		

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Service Guide OKIPAGE 10ex Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

3.2 Parts Layout

This section describes the layout of the main components.

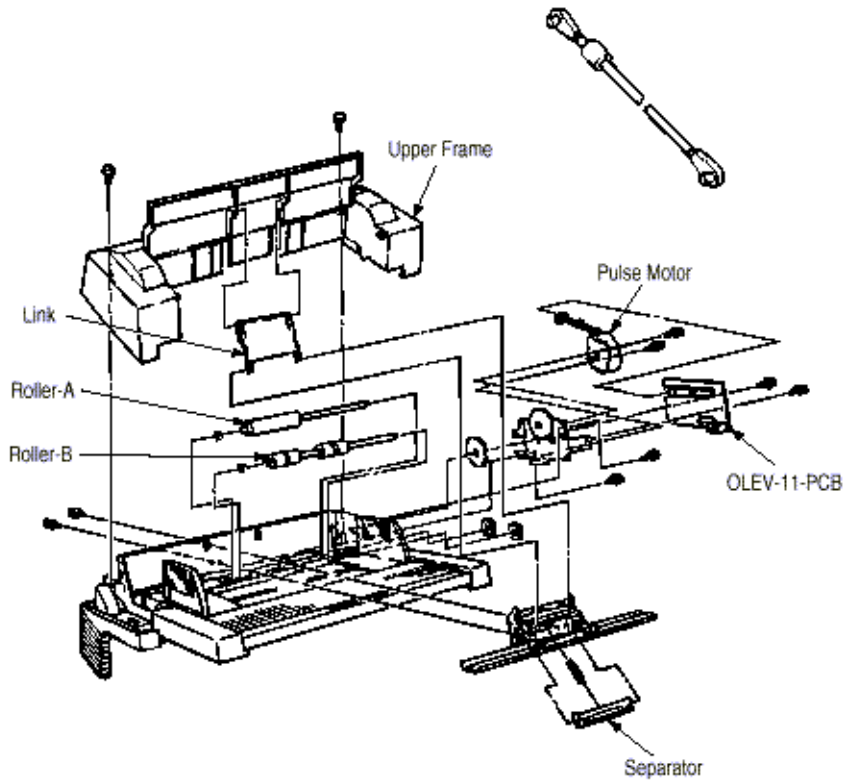


Figure 3-1



Service Guide OKIPAGE 10ex

Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

3.3 Parts Replacement Methods

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

Multi-Purpose Feeder

Link - (see 3.3.1)

Separator - (see 3.3.2)

OLEV-11-PCB (see 3.3.3)

Pulse motor (see 3.3.4)

Planet gear (see 3.3.5)

Roller-A (see 3.3.6)

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Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

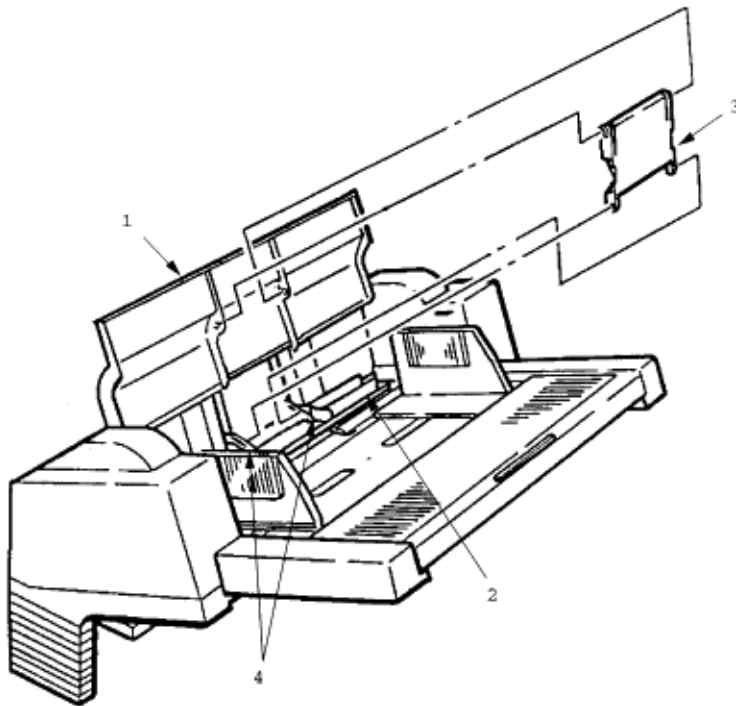
3.3.1 Link

(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.**



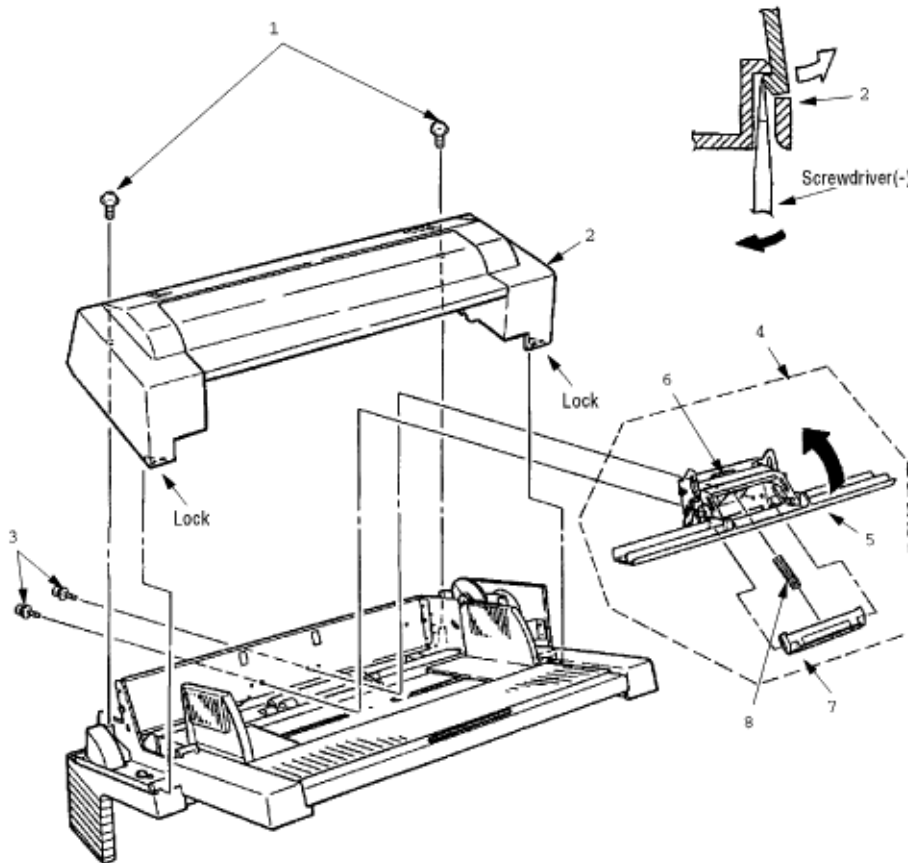


Service Guide OKIPAGE 10ex

Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

3.3.2 Separator

- (1) Turn the power switch off "O" and remove the connector cord.
- (2) Disengage the link and paper feeder cover (see 3.3.1).
- (3) Remove the 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 the 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).





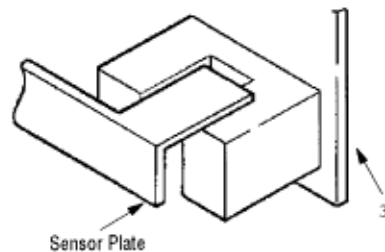
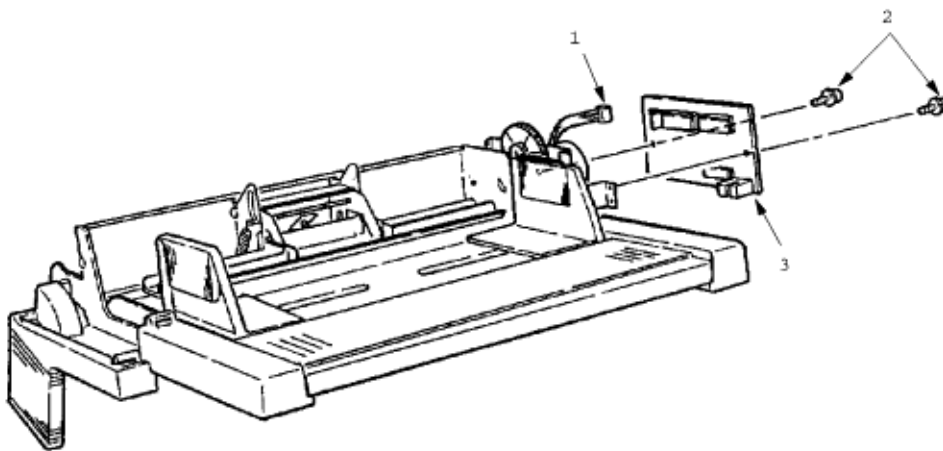
Service Guide OKIPAGE 10ex

Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

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 the 2 screws (2), and remove the OLEV-11 PCB (3).

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



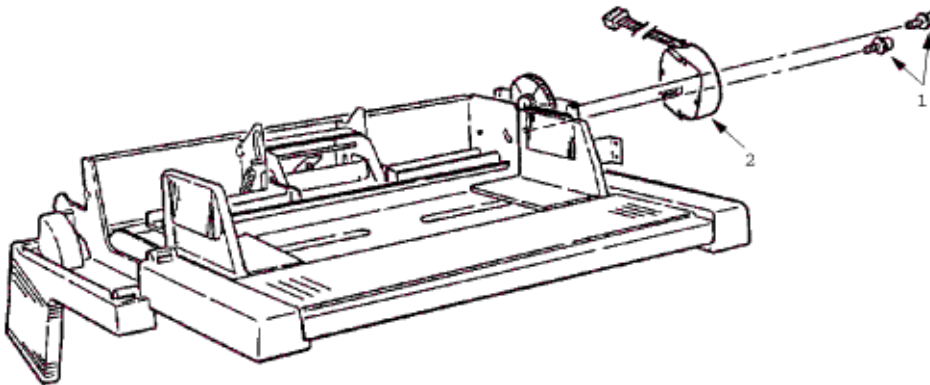


Service Guide OKIPAGE 10ex

Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

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 the 2 screws (1), and remove the stepping motor (2).



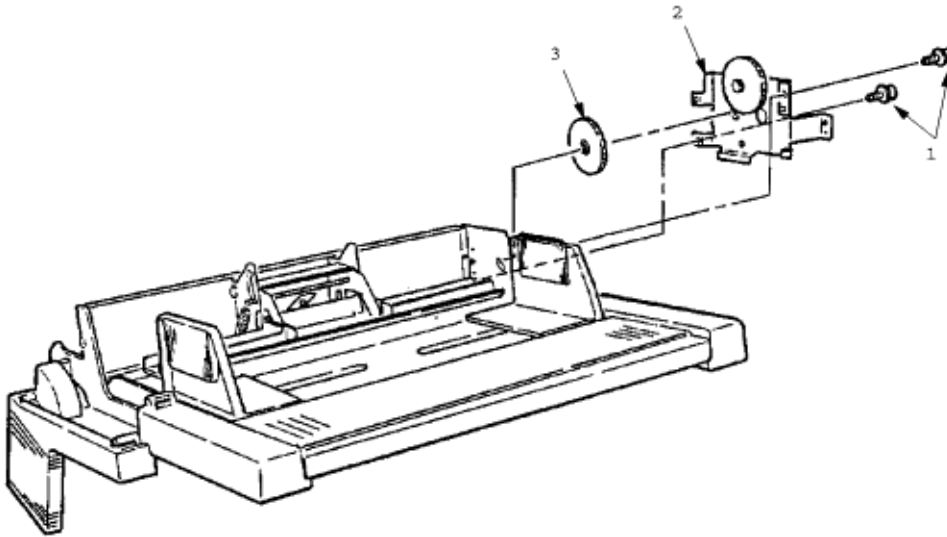


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Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

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 the 2 screws (1), and remove the motor bracket assembly (2) and planet gear (3).





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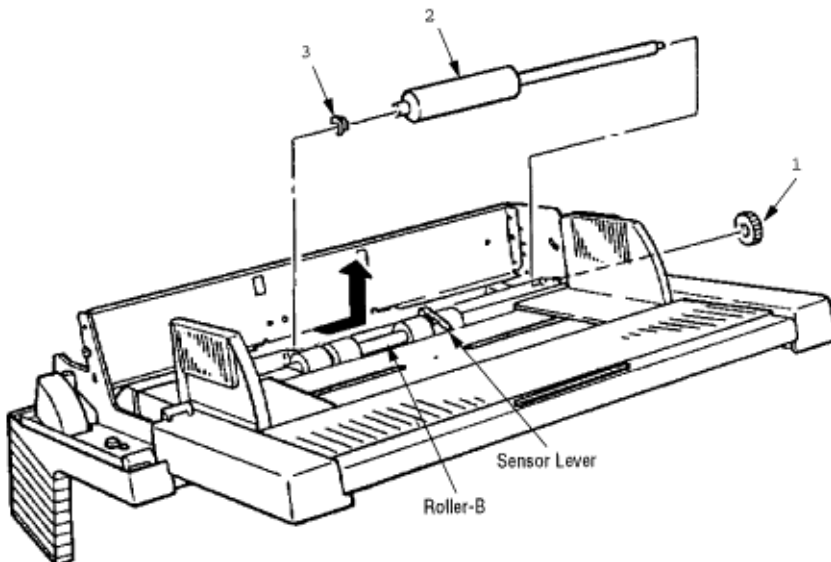
Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

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 lever.

- (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).





Service Guide OKIPAGE 10ex
Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

4. TROUBLESHOOTING - 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 the checking in the conditions similar to that in which the problem occurred.
-

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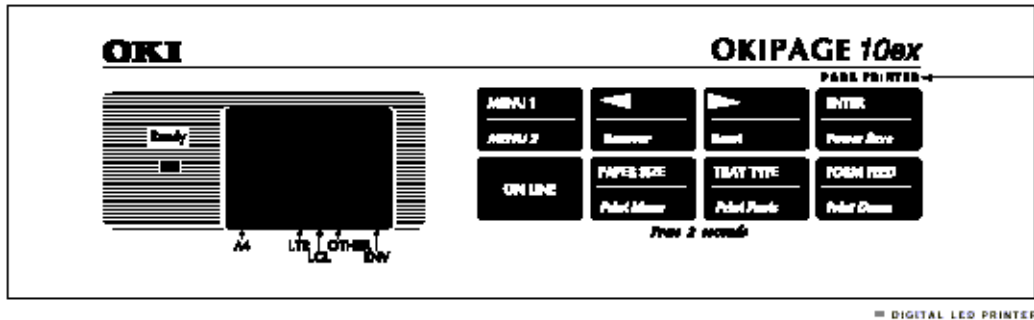
Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

4.2 Preparations for the Troubleshooting

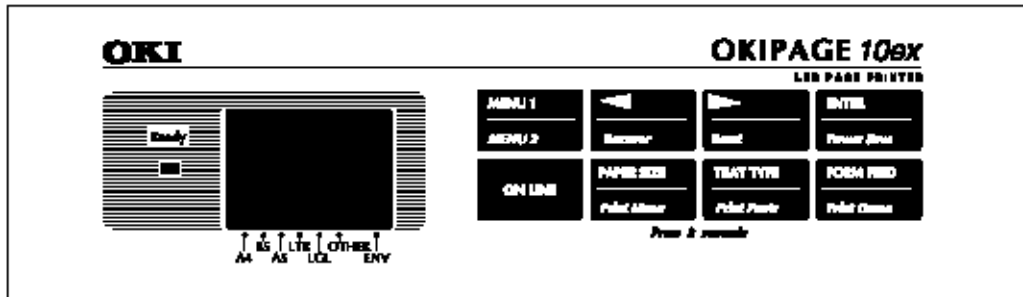
(1) Display on the operator panel

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 |



Service Guide OKIPAGE 10ex
Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

4.3 Troubleshooting Method

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

4.3.1 LCD Status Message List

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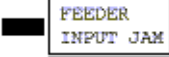
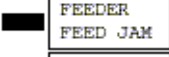
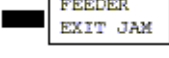
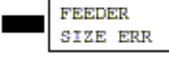
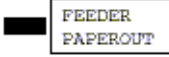


Service Guide OKIPAGE 10ex

Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

4.3.1 LCD Status Message List

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

Classification	LCD Status Message	Description	Recovery method
Jam error	  	Notifies of occurrence of jam while the paper is being fed from Multi-Purpose Feeder.	Check the paper in the Multi-Purpose Feeder. Carry out the recover printing by opening and closing the cover, and turn the error display off. When the problem occurs frequently, go through the Troubleshooting.
Paper size error		Notifies of incorrect size paper feeding from Multi-Purpose Feeder.	Check the paper in the Multi-Purpose Feeder. Also check to see if there was a feeding of multiple sheets. Carry out the recovery printing by opening and closing the cover, and turn the error display off.
Tray paper out		Notifies of no paper state of the Multi-Purpose Feeder.	Load the paper in Multi-Purpose Feeder.

JAM Error

Paper Inlet Jam

- Does paper jam at the inlet when the power is turned on?
 - YES - Is the paper located above the sensor plate (inlet)?
 - YES - Remove the paper.
 - NO - Is the sensor plate (inlet) operating normally?
 - NO - Replace the sensor plate (inlet).
 - YES - Replace the power supply/sensor board or inlet sensor.
 - NO - When the paper is fed in, does the paper inlet jam occur?
 - YES - Is the paper being fed to above sensor plate (inlet)?
 - YES - Is the sensor plate (inlet) operating normally?
 - NO - Replace the sensor plate (inlet).
 - YES - Clean the inlet sensor on the power supply/sensor board or replace the power supply/sensor board or inlet sensor.
 - NO - Replace the roller-A or roller-B.
- NO - Are the roller-A and roller-B rotating?
 - YES Set the paper properly.
- NO - Is the pulse motor turning?
 - YES - Replace the planet gear.

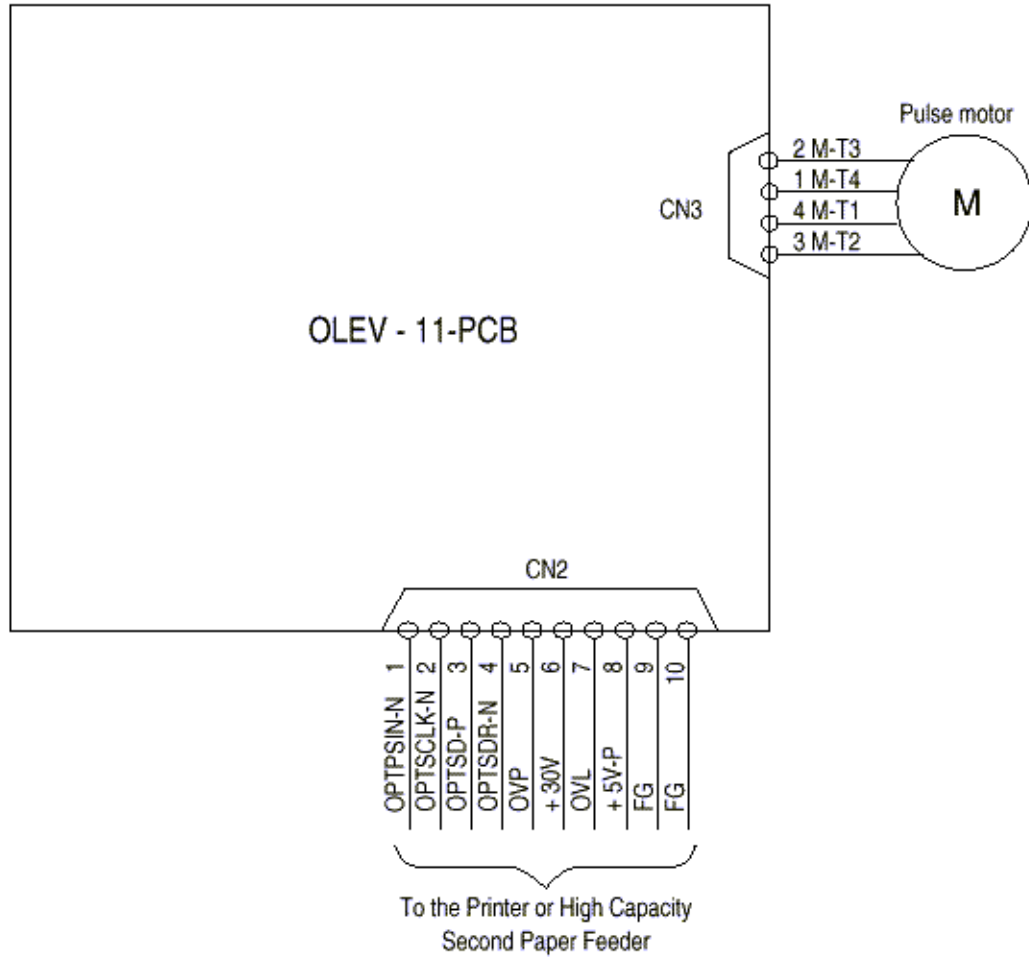
- NO - Is the connector cable being connected properly?
 - NO - Connect the connector cable properly.
 - YES - Check the coil resistance (approx. 32W) of the pulse motor. Is it normal?
 - NO - Replace the pulse motor.
 - YES - Replace the OLEV-11-PCB.
-

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Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

5. CONNECTION DIAGRAM - Interconnection Diagram



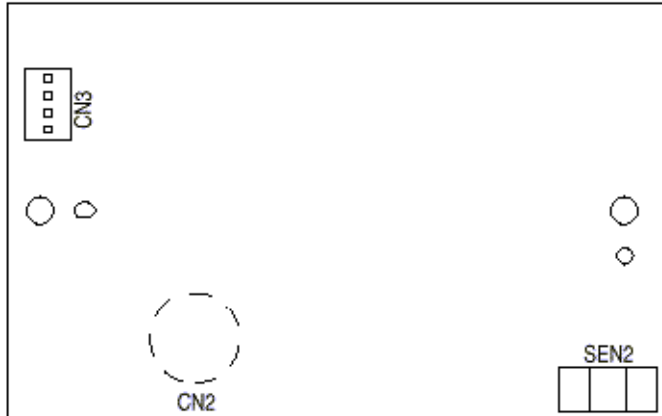


Service Guide OKIPAGE 10ex

Chapter Product Accessory 2: Multi-Purpose Feeder Maintenance

5.2 PCB Layout

OLEV-11 PCB



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6. PARTS LIST

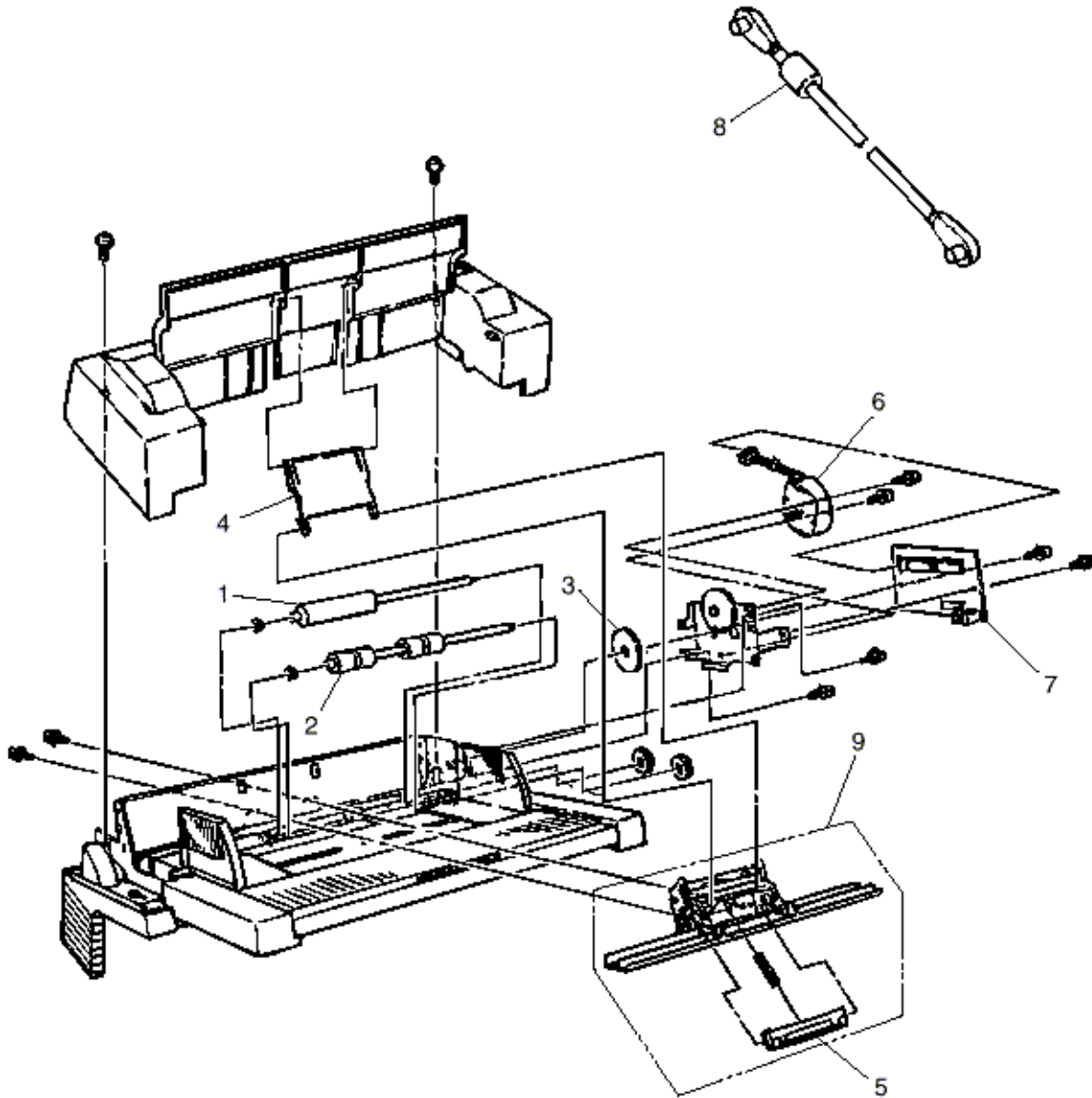


Figure 6-1 Multi-Purpose Feeder

Table 6-1 Multi-Purpose Feeder

No.	Description	Oki-J Part No.	ODA Part No.	Q'ty	Remark
1	Roller-A	3PB4083-5514P001	50409201	1	
2	Roller-B	3PB4083-5524P001	53343901	1	
3	Planet gear	4PP4083-5520P001	51229601	1	
4	Link	3PP4083-5540P001	53344101	1	
5	Separator	3PP4083-5544P001	53344201	1	
6	Pulse motor	4PB4083-6075P001	56510701	1	

7	OLEV-11-PCB	4YA4121-1014G011	55074811	1	
8	Connector cable	3YS4011-3141P003	56631203	1	For ODA
9	Separator assy	3PA4083-5549G001	53347101	1	

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Service Guide OKIPAGE 10ex
Chapter Product Accessory 3: High Capacity 2nd Paper Feeder

High Capacity Second Paper Feeder Maintenance

PREFACE

This Maintenance Manual is intended for the service person and describes the field maintenance methods for High Capacity Second Paper Feeder option of OKIPAGE 10ex Series LED Page Printer.

Refer to the Printer Handbook for the equipment handling and operation methods.

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Service Guide OKIPAGE 10ex

Chapter Product Accessory 3: High Capacity 2nd Paper Feeder

1. OUTLINE - 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:

- Paper that can be used:

[Paper Type]

- Standard Paper: Xerox 4200 (20-lb)
- Special Paper: OHP Sheets (for PPC), Labels 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: 148 to 216mm; Paper Length: 210 to 355.6mm

[Weight]

- 16-lb to 24-lb (60 to 90 g/m²)
 - Paper setting quantity: 500 sheets of paper weighing 64 g/m²
-

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1.2 External View and Component Names

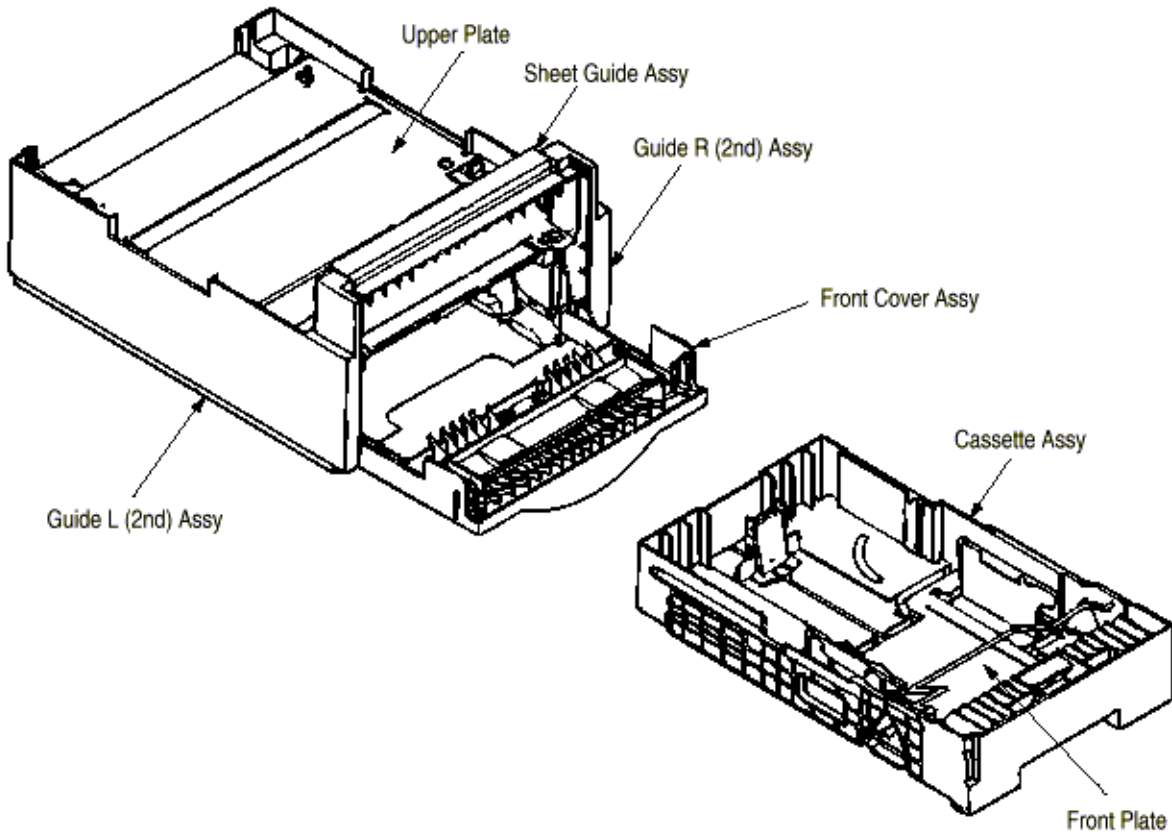


Figure 1-1 External View and Component Names



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2. MECHANISM DESCRIPTION - 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. This motion is conveyed to rotate the One-way clutch of the hopping shaft assembly. The paper is delivered from the hopper into the printer through the turning of the hopping shaft assembly.

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

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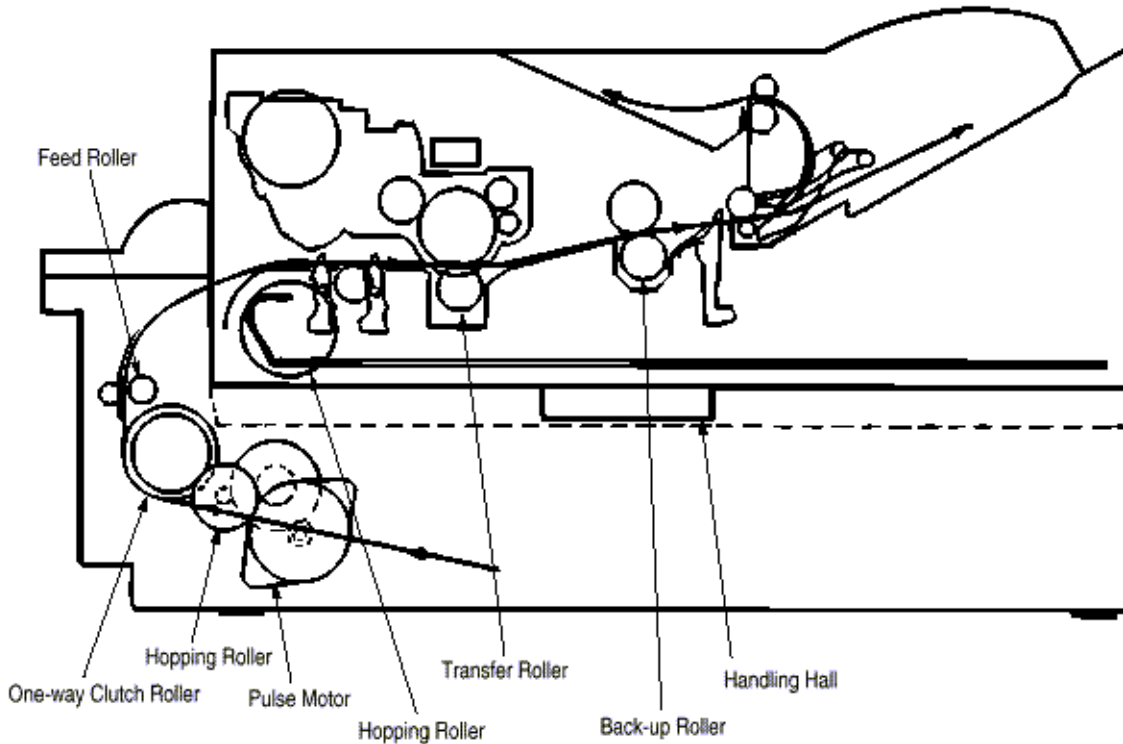


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2.2 Hopper Mechanism

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.



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3. PARTS REPLACEMENT

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

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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 High Capacity Second Paper Feeder from the printer.
- (2) Do not disassemble the High Capacity Second 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 fixed in the 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 and units in the field.

Table 3-1 Service Tools

No.	Service tools	Q'ty	Place of use	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	 Handy cleaner	1		

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3.2 Parts Layout

This section describes the layout of the main components.

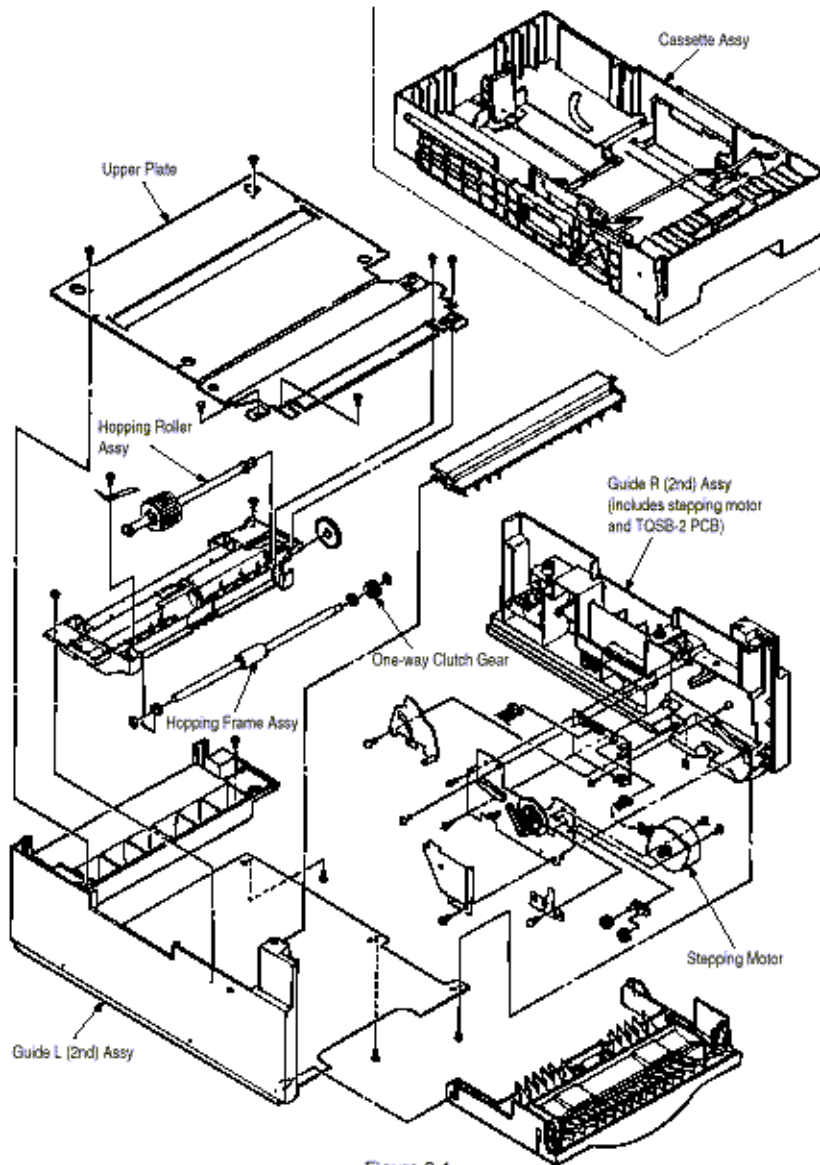


Figure 3-1

Figure 3-1



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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 Stepping Motor (Hopping)

3.3.2 TQSB-2 PCB

3.3.3 Hopping roller shaft assy and One-way clutch gear

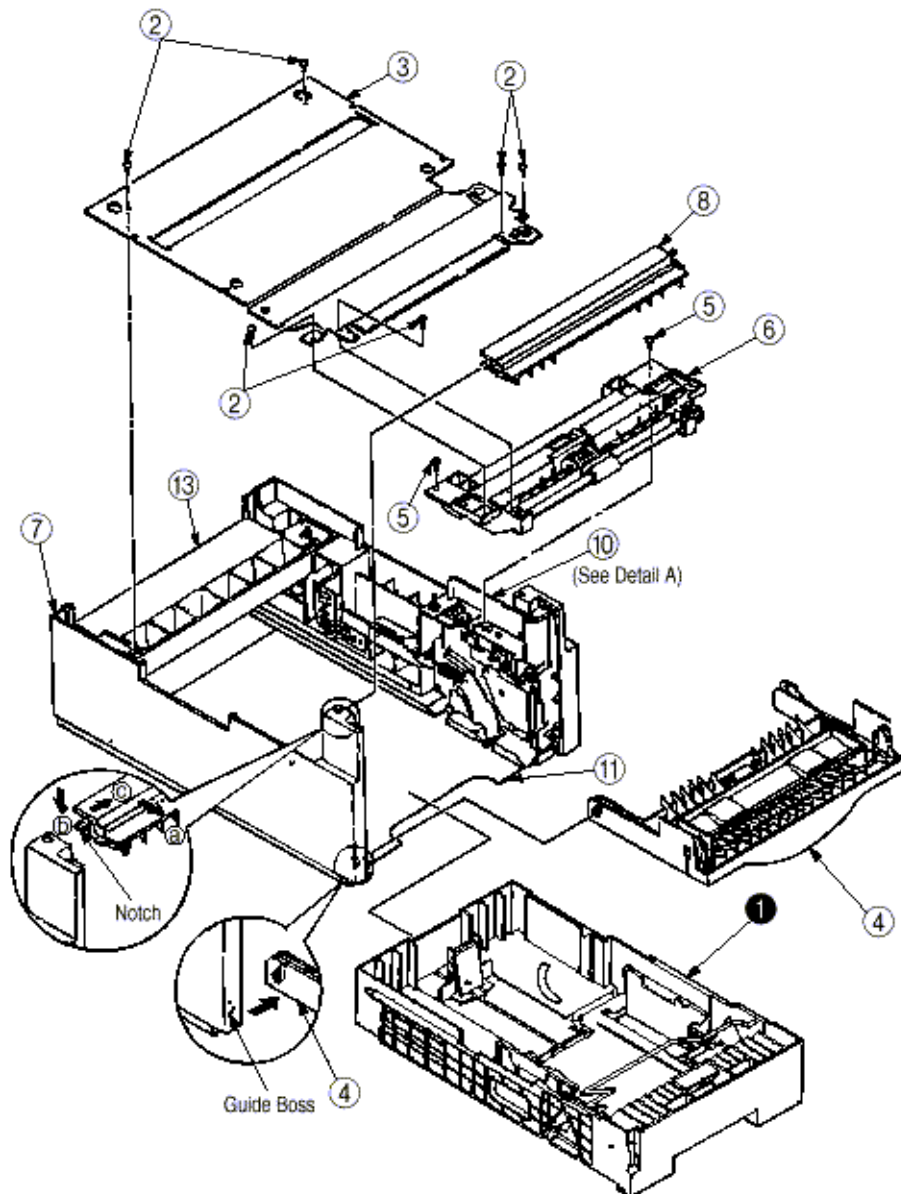
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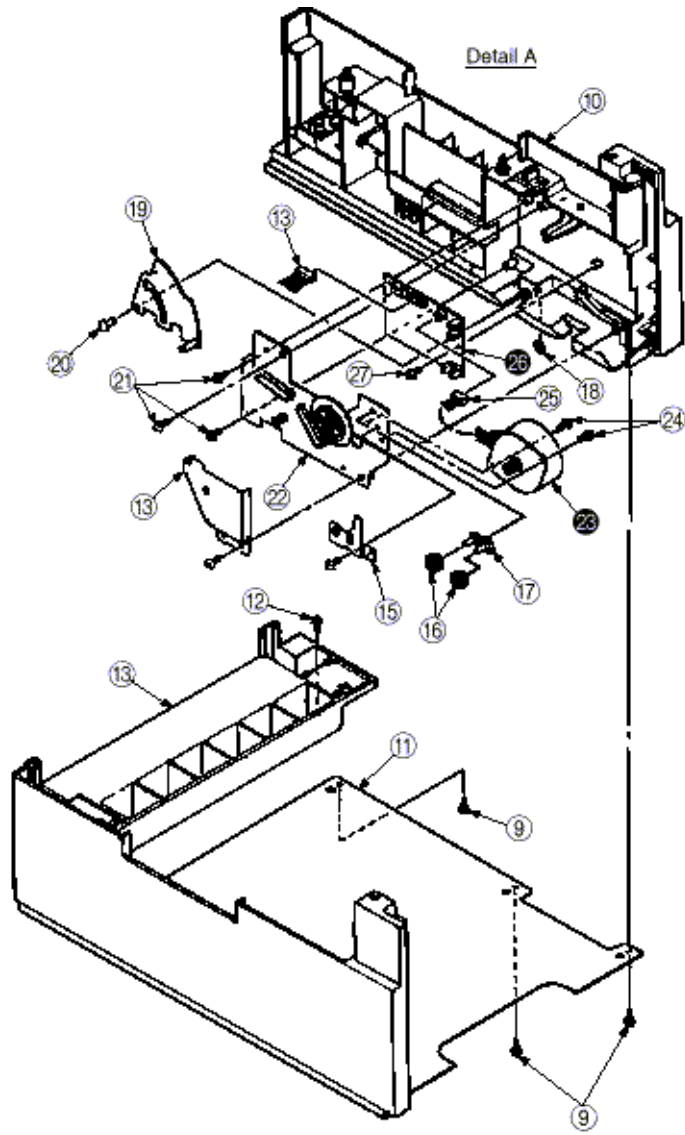
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3.3.1 Stepping Motor (Hopping)

- (1) Turn the printer power switch off, pull out the AC cord from the outlet. Remove the printer off High Capacity Second Paper Feeder.
- (2) Take the paper cassette assy (1) out of High Capacity Second Paper Feeder.
- (3) Remove six screws (2) and remove the upper plate (3). Remove two screws (5) and remove the hopping frame assy (6).
- (4) Remove the front cover assy (4) off the guide boss on the guide L (2nd) assy (7) by bending the guide L (2nd) assy (7) in the direction of arrow shown in the magnified view below.
- (5) Pull the sheet guide assy (8) in the direction of arrow a and also push in the direction of arrow (b) to unlock the notch, and bring the sheet guide assy (8) in the direction of arrow (c) to remove the sheet guide assy (8).



- (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 I 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).



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3.3.2 TQSB-2 PCB

- (1) Remove the pulse motor (see 3.3.1).
- (2) Remove the connector (25) from the TQSB-2 PCB (26).
- (3) Remove the screw (27) and remove the TQSB-2 PCB (26).

Note : Refer to Detail A in the previous section (see 3.3.1).

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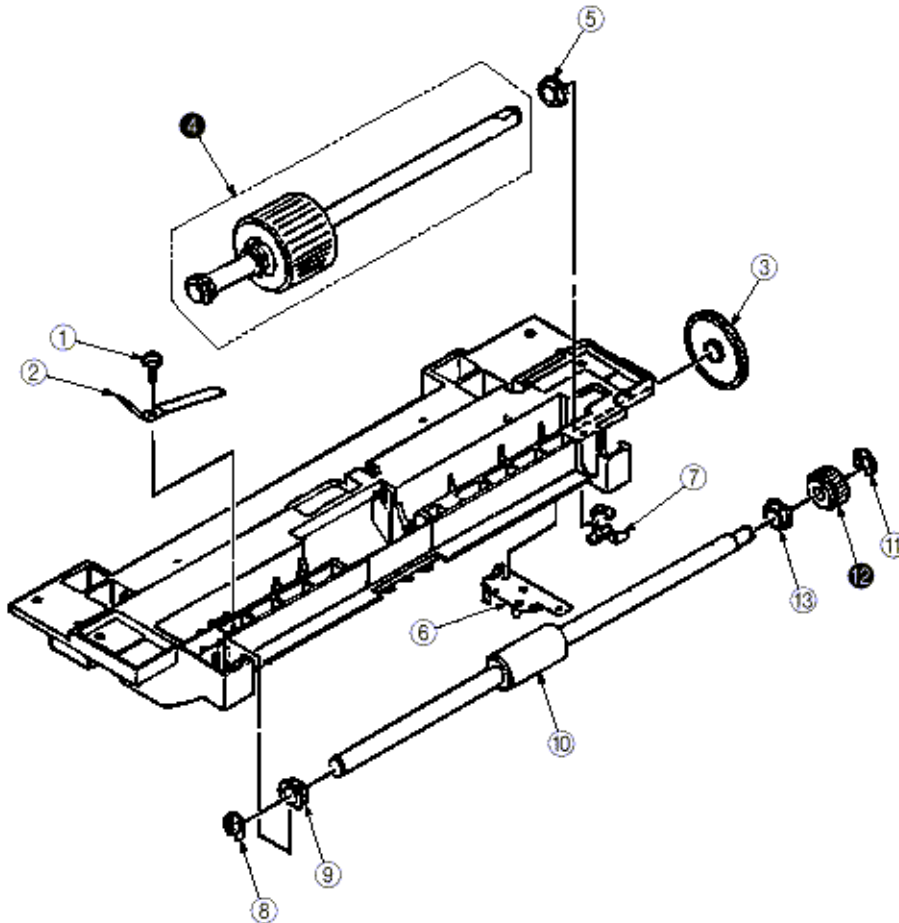
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3.3.3 Hopping Roller Shaft Assembly and One-way Clutch Gear

- (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.





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4. TROUBLESHOOTING - 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 the checking in the conditions similar to that in which the problem occurred.
-

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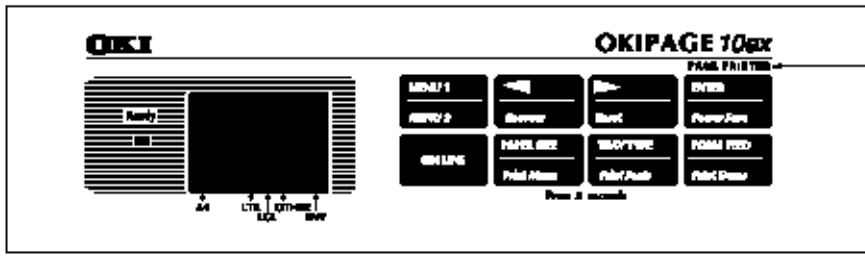
Chapter Product Accessory 3: High Capacity 2nd Paper Feeder

4.2 Preparations for the Troubleshooting

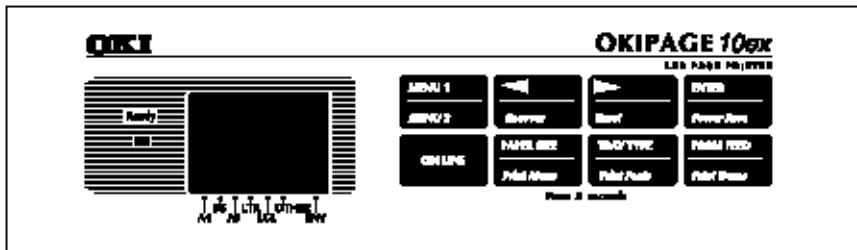
(1) Display on the Operator panel

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]



Logo print Status message display

Ready LED display

 : OFF	 : BLINKING
 : ON	 : Undefined



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4.3 Troubleshooting Method

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

4.3.1 LCD Status Message List

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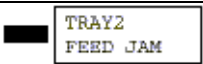
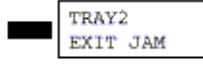
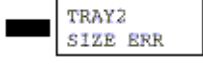
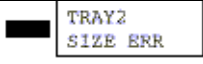
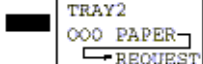
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4.3.1 LCD Status Message List

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

Table 4-1

Classification	LCD Status Message	Description	Recovery method
Jam error (feeding)		Notifies of occurrence of jam while the paper is being fed from High Capacity Second Paper Feeder.	Check the paper in the High Capacity Second Paper Feeder. Carry out the recovery printing by opening and closing the cover, and turn the error display off. When the problem occurs frequently, go through the Troubleshooting.
Jam error (ejection)		Notifies of occurrence of jam while the paper is being ejected from the printer.	Check the paper in the printer. Carry out the recovery printing by opening and closing the cover, and turn the error display off.
Paper size error		Notifies of incorrect size paper feeding from High Capacity Second Paper Feeder.	Check the paper in the High Capacity Second Paper Feeder. Also check to see if there was a feeding of multiple sheets. Carry out the recovery printing by opening and closing the cover, and turn the error display off.
Tray paper out		Notifies of no paper state of the High Capacity Second Paper Feeder.	Load the paper in High Capacity Second Paper Feeder.
Paper size request	 OOO: Paper size (A4, Letter, Legal, etc. The 2nd line is shift-indicated.	Notifies of correct paper size for the High Capacity Second Paper Feeder.	Load the requested size paper in the High Capacity Second Paper Feeder.

(JAM error)

Paper Inlet Jam

- Does paper jam at the inlet when the power is turned on?
 - YES - Is the paper located above the sensor plate (inlet)?
 - YES - Remove the paper.
 - NO - Is the sensor plate (inlet) operating normally?
 - NO - Replace the sensor plate (inlet).
- YES - Replace the power supply/sensor board or inlet sensor.

- NO - When the paper is fed in, does the paper inlet jam occur?
 - YES - Is the paper being fed to above sensor plate (inlet)?
 - YES - Is the sensor plate (inlet) operating normally?
 - NO - Replace the sensor plate. (inlet)
 - YES - Clean the inlet sensor on the power supply/sensor board or replace the power supply/sensor board or inlet sensor.
 - NO - Replace the hopping roller shaft assy or paper cassette.
- NO - Are the hopping roller and feed roller rotating?
 - YES - Set the paper properly.
- NO - Is the pulse motor turning?
 - YES - Replace the hopping roller shaft assy or one-way clutch gear on the feed roller assy.
- NO - Is the connector being connected properly?
 - NO - Connect the connector properly.
- YES - Check the coil resistance (approx. 4.3W) of the pulse motor. Is it normal?
 - NO - Replace the stepping motor.
- YES - Replace the TQSB-2 PCB.



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5. CONNECTION DIAGRAM

5.1 Interconnection Diagram

5.2 PCB Layout

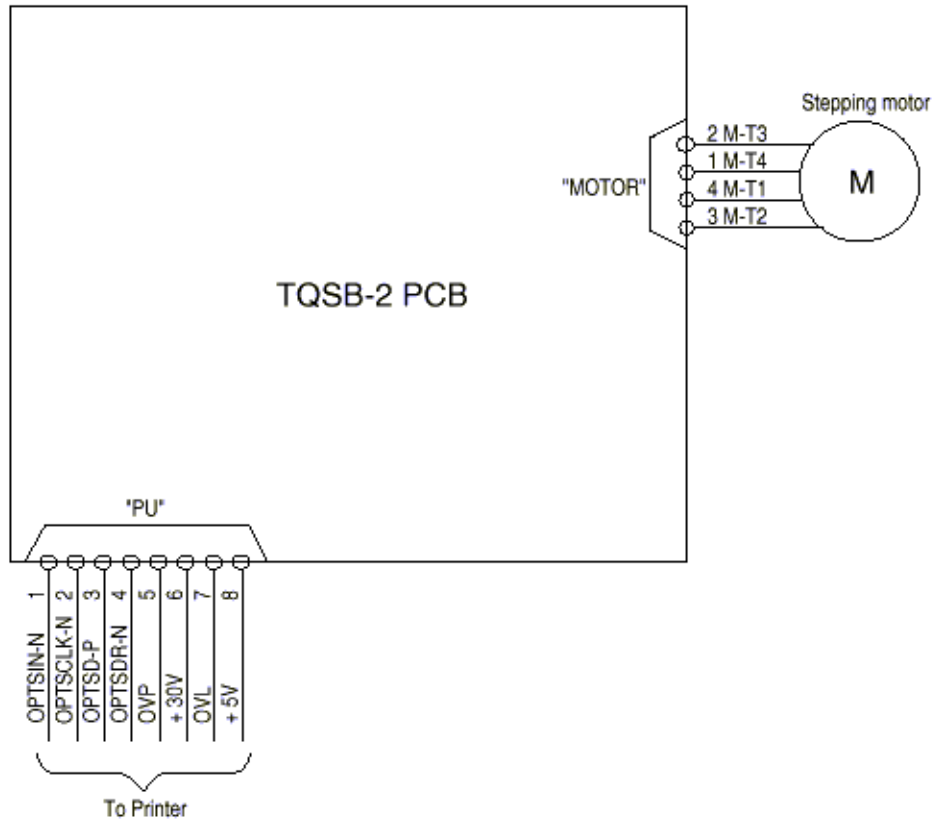
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5.1 Interconnection Diagram



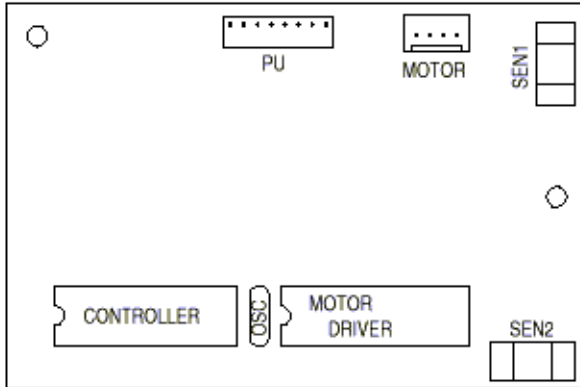


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5.2 PCB Layout

TQSB-2 PCB



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6. PARTS LIST

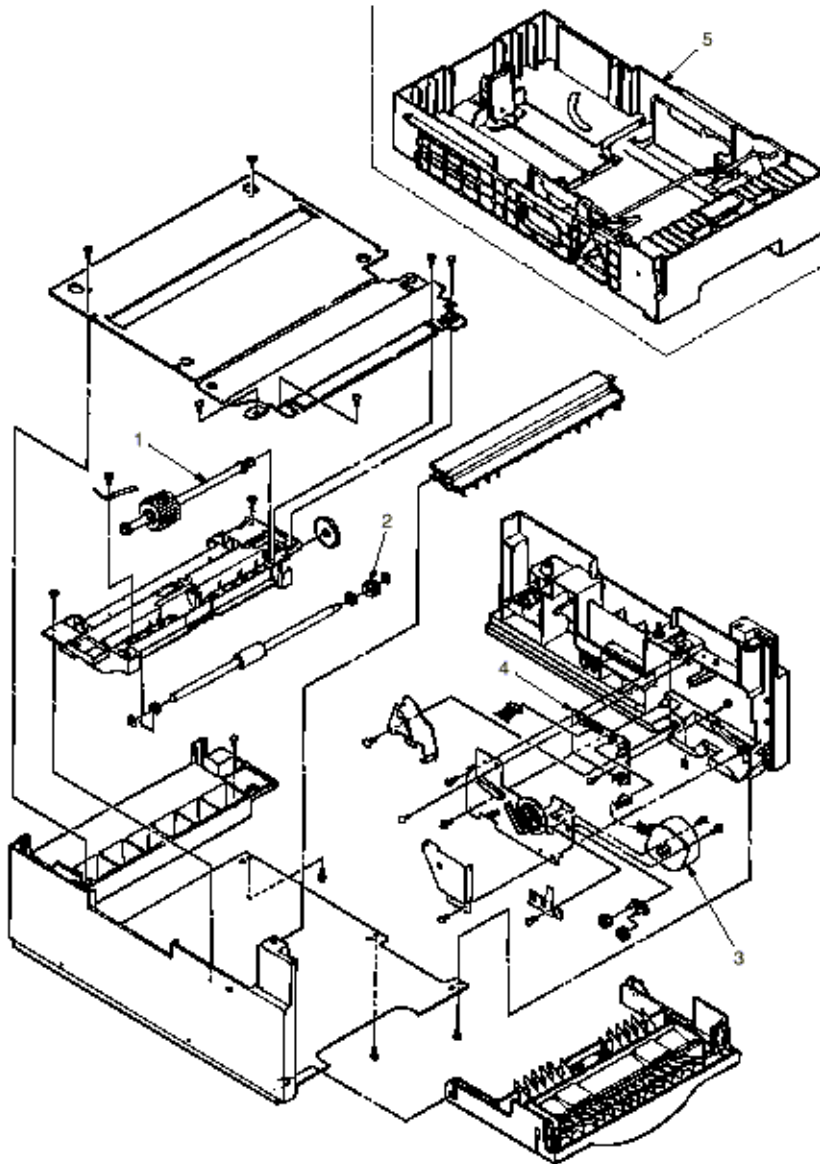


Figure 6-1 High Capacity Second Paper Feeder

Table 6-1 High Capacity Second Paper Feeder

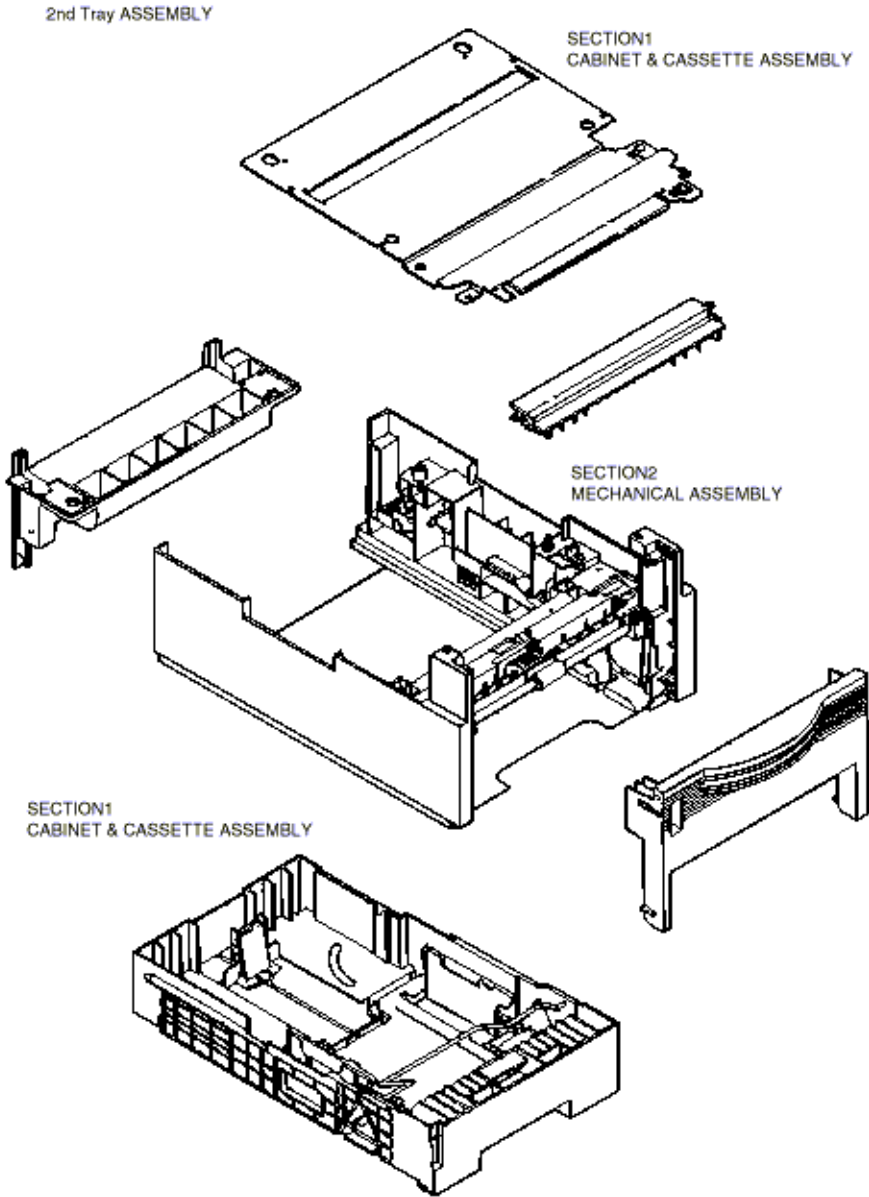
No.	Description	Oki-J Part No.	ODA Part No.	Q'ty	Remarks
1	Hopping roller shaft	3PA4122-1367G001	50409501	1	
2	One-way clutch gear	4PB4122-1382P001	51401101	1	
3	Pulse motor	3PB4122-1399P001	56512201	1	
4	TQSB-2 PCB	4YA4046-1651G002	55078102	1	
5	Cassette assy (2nd tray)	1PA4122-1362G004	50107304	1	

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2nd Tray ASSEMBLY

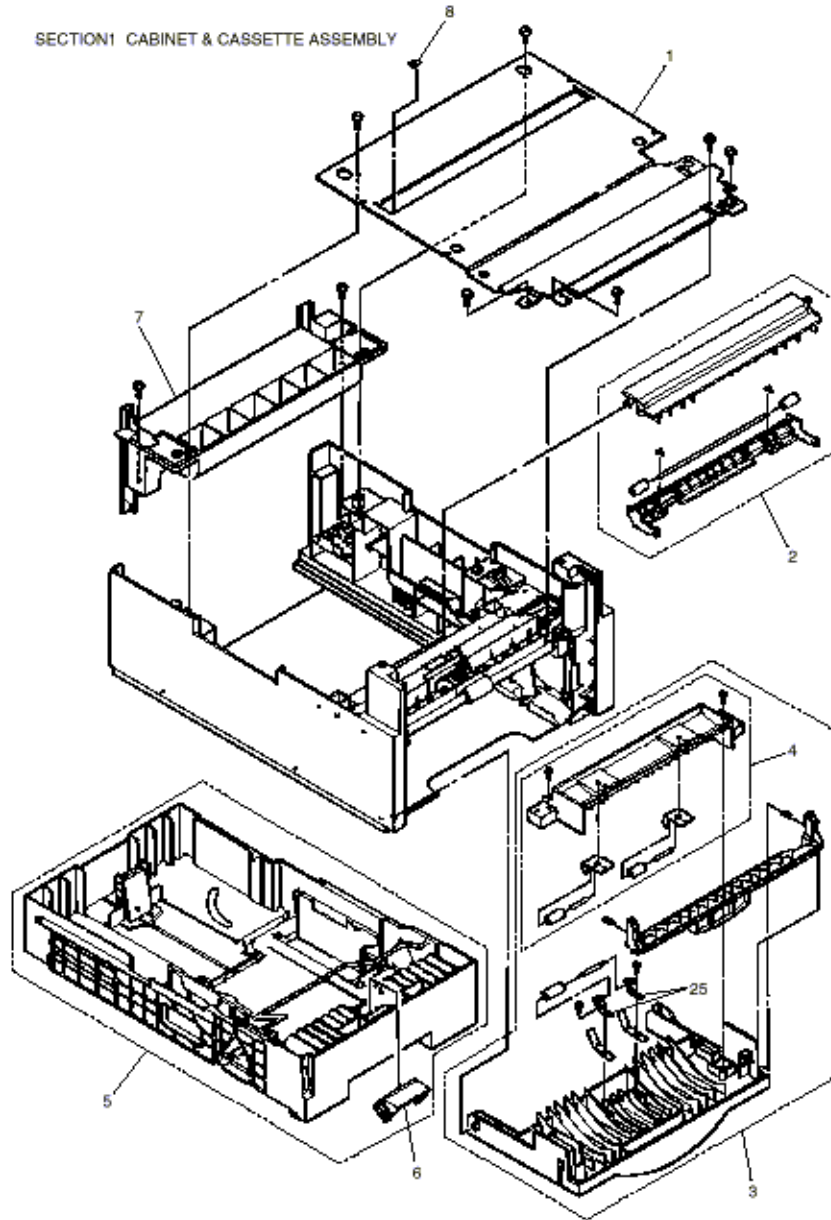




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SECTION 1 CABINET & CASSETTE ASSEMBLY

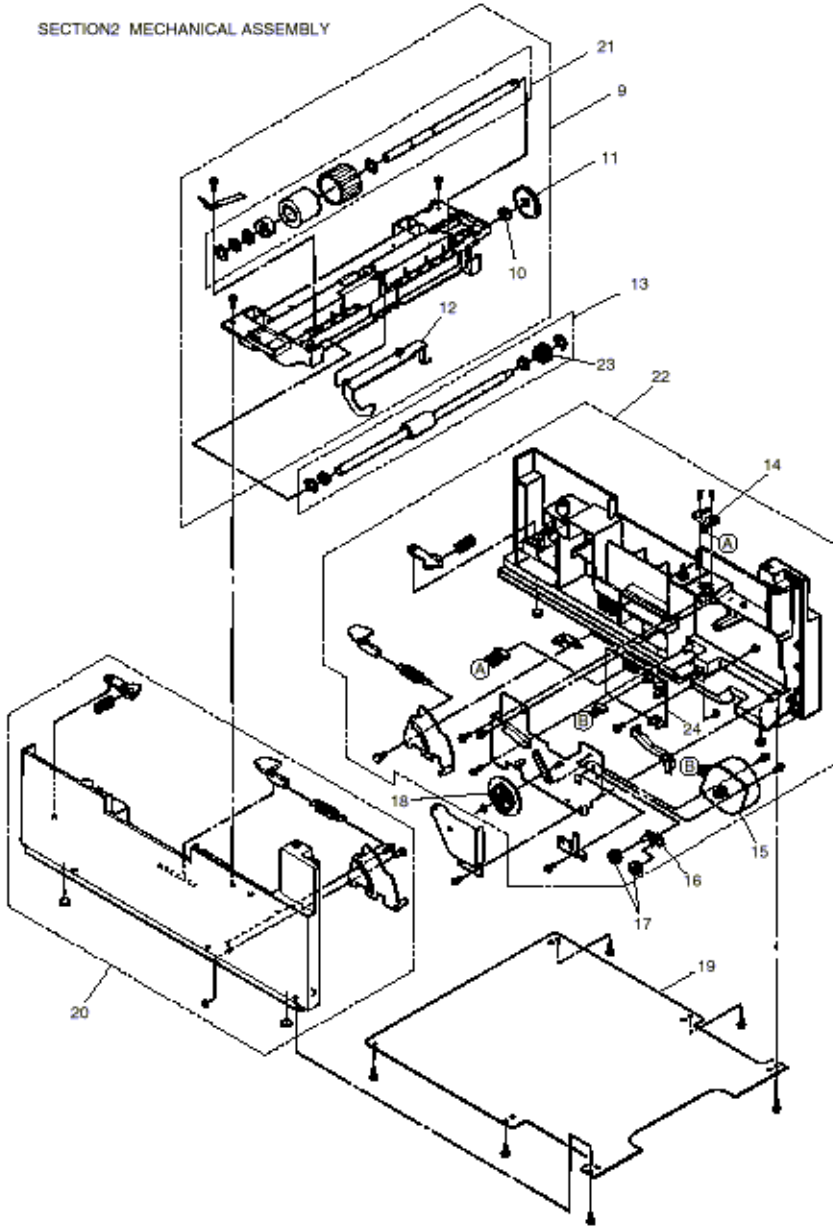




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SECTION 2 MECHANICAL ASSEMBLY





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2nd Tray Parts List
Table 6-2

No.	Description	OKI-J Part #	OKIDATA Part #	Qty/U	500	100
1	Plate, upper	1PP4122-1401P001	51023301	1	3	5
2	Sheet guide assembly	3PA4122-1370G001	50222001	1	3	5
3	Front cover assembly	1PA4122-1369G001*	53075301	1	3	5
4	Inner guide assembly	3PA4122-1371G001	50221501	1	3	5
5	Cassette assembly (2nd tray)	1PA4122-1362G004	50107304	1	3	6
6	Separation frame assembly	4PP4120-1009G001	53345801	1	6	12
7	Cover, rear	1PA4122-1323P001	n/a	1	3	5
8	Stick finger	4PB4122-1441P001	51023401	1	3	5
9	Hopping frame assembly	1PA4122-1366G001	50222401	1	3	6
10	Bush, metal (ADF)	4PP3522-3568P001	51608901	1	3	5
11	Gear (z70)	4PP4122-1207P001	51239001	1	3	5
12	Lever, sensor (p)	3PP4122-1331P001	50411201	1	3	5
13	Feed roller assembly	3PA4122-1393G001	50222501	1	3	5
14	Cable & connector	3YS4111-3528P001	56633901	1	3	5
15	Stepping motor	3PB4122-1399P001	56512201	1	3	6
16	Bracket	4PP4122-1384G001	51712001	1	3	5
17	Gear (z24)	4PP4122-1383P001	51238901	2	3	5
18	Gear (z87/z60)	4PP4122-1226P001	51239101	1	3	5
19	Plate, bottom	2PP4122-1389P001	51023201	1	3	5
20	2nd cassette guide (L) assy	1PA4122-1365G001	50222301	1	3	6
21	Hopping roller assembly	3PA4122-1367G001	50409501	1	3	6
22	2nd cassette guide (R) assy	1YX4122-1364G002	50222201	1	3	6
23	One-way clutch gear	4PB4122-1382P001	51401101	1	6	12
24	TQSB-2 PCB	4YA4046-1651G002	55078102	1	3	6

* For the rev. no. of the Parts List for the Front cover assembly should be applied No. 5. The No. 5 includes a change from 0.2 to 0.3 for the plate thickness of the roller Holder (F). [F - 21, 25]. Roller Holder (F) Part No.: 4PP4122-1379P003.