OKIDATA®

OL600e/610e/610e-PS/OL610e-S
Service Manual

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1. CONFIGURATION

1.1 System Configuration

The printer consists of control and engine blocks in the standard configuration shown below.

In addition, the options marked with an asterisk (*) are available.
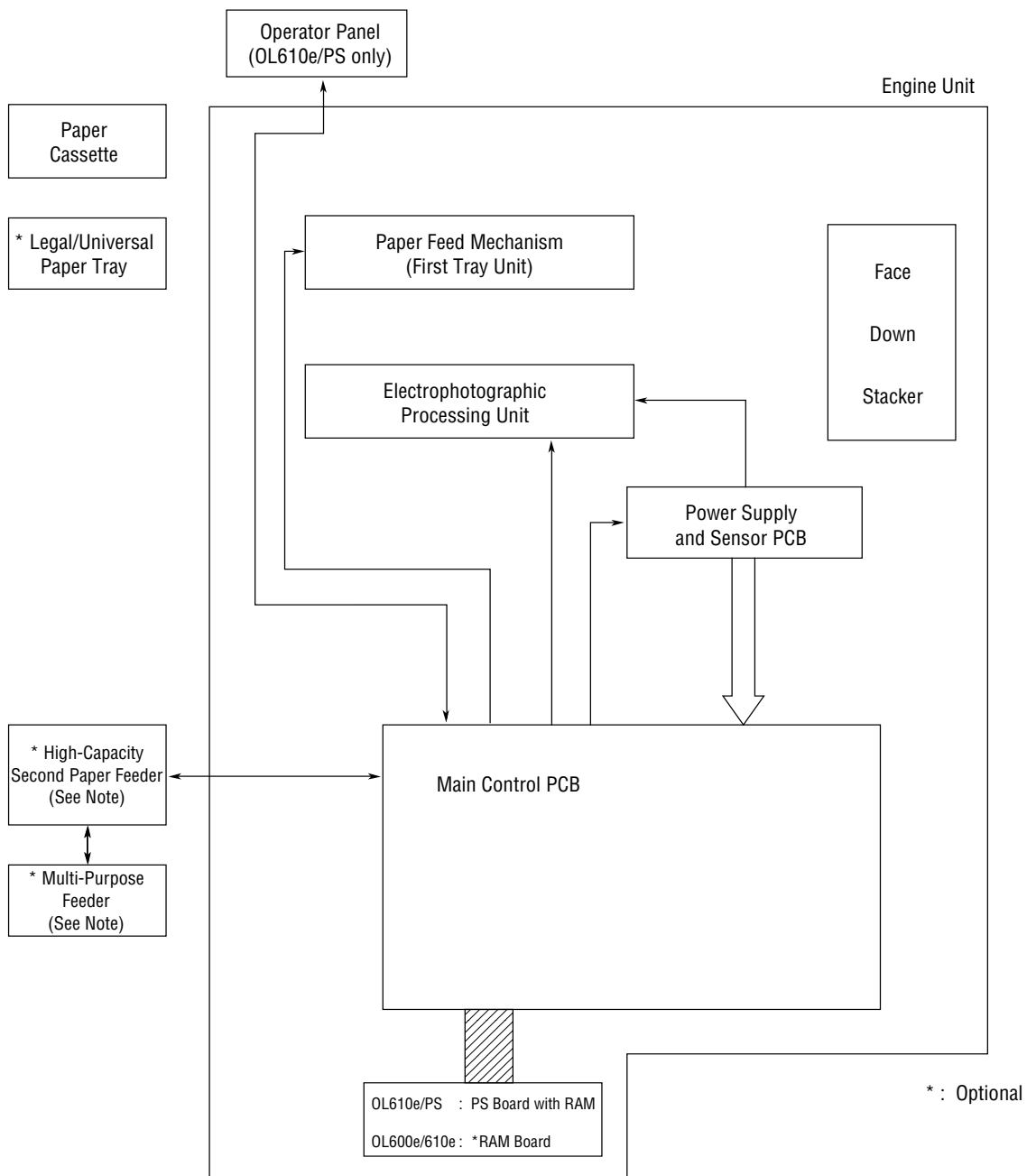
Figure 1-1

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1.2 Printer Configuration

The printer unit consists of the following hardware components:

- Electrophotographic Processor
- Paper Feeder
- Main Control PCB
- Operator Panel (OL610e/PS and OL610e/S)
- Power Supply Unit
- PS Board (OL610e/PS)

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

Operator panel assy (OL610e/PS)

Upper cover

Toner cartridge (consumables)

Stacker cover assy

Image drum unit (consumable)

Fusing unit

PS Board (OL610e/PS)

Main Control PCB
- LQ5C: OL600e
- LQ6C: OL610e and OL610e/PS

Power supply board
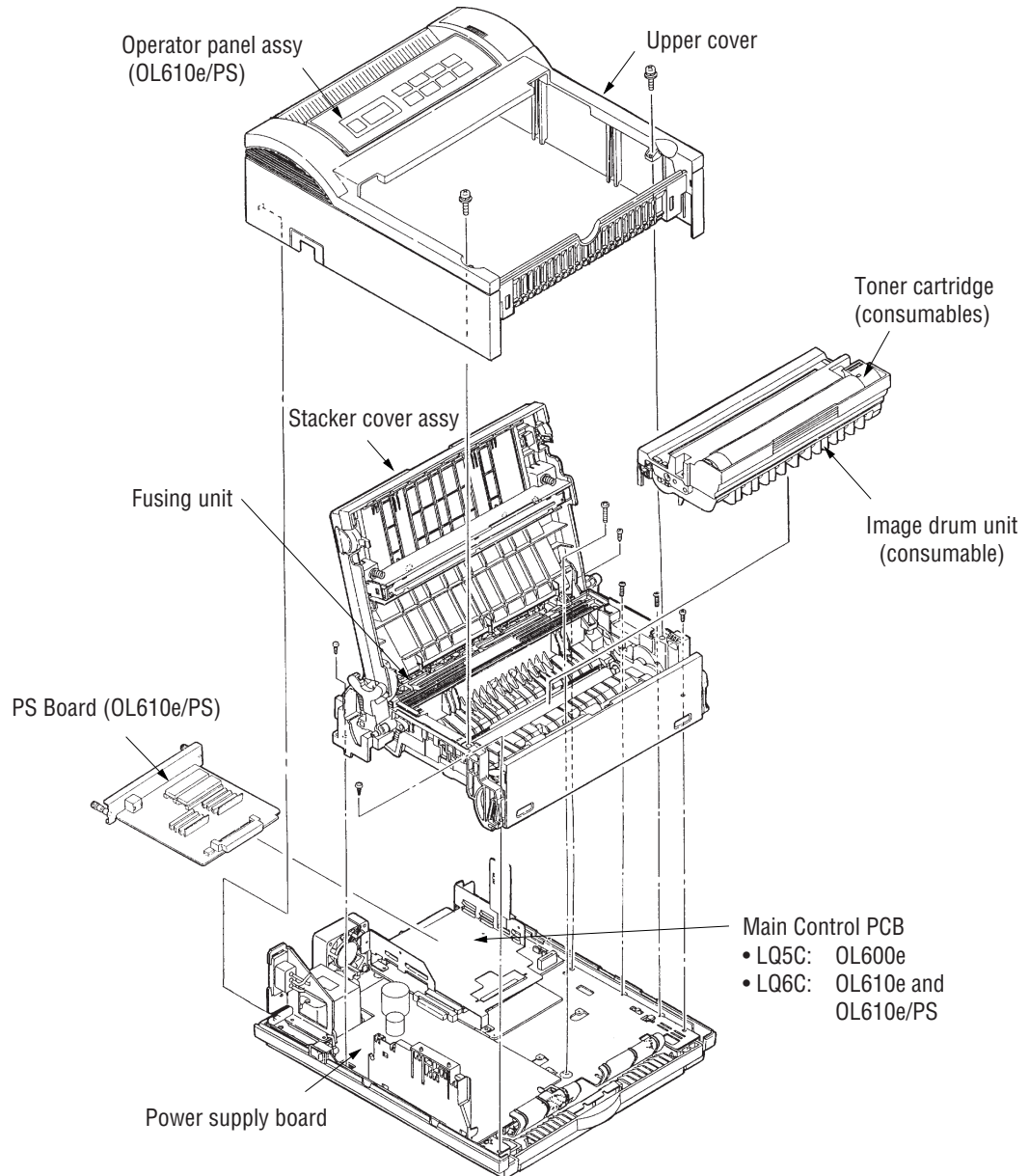
Figure 1-2

1.3 Optional Configuration

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

(1)   1MB Memory Expansion Board (OL600e/610e)
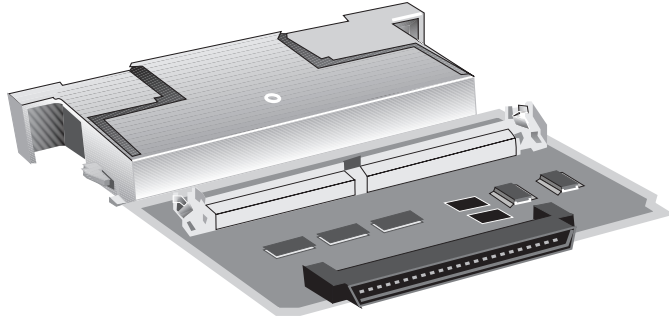
(2)   SIMM (Single In-line Memory Module)
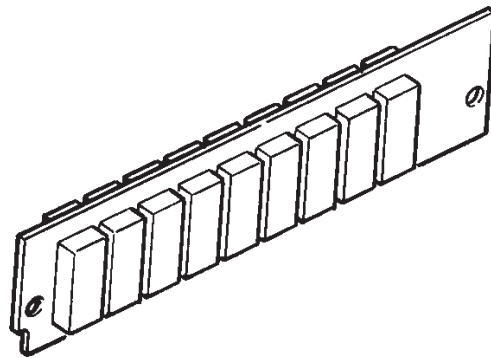
(3)   Legal/Universal Paper Cassette

Legal/Universal cassette

Cassette cover
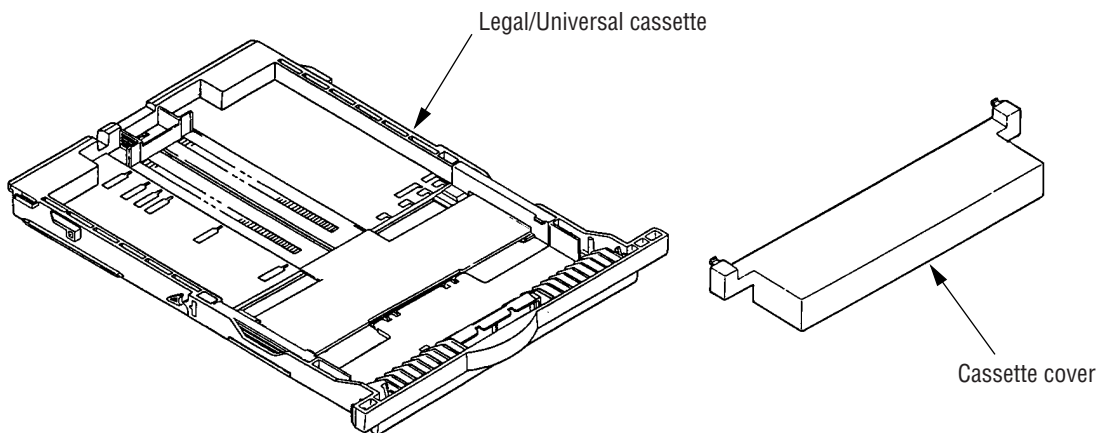
(4)   High Capacity Second Paper Feeder
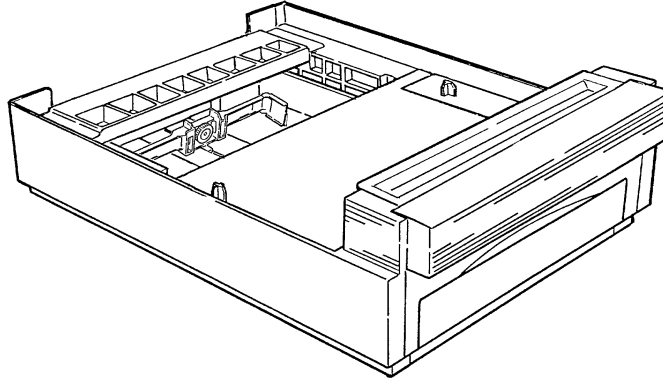
(5)   Multi-Purpose Feeder

1.4   Specifications

(1) Type   Desktop

(2) External Dimensions   Height 6.3 inches   (160 millimeters)
                                    Width 12.6 inches   (320 millimeters)
                                    Depth 14.17 inches   (360 millimeters)

(3) Weight   17 pounds (7.7 kilograms)

(4) Developing Method   Dry electrophotography
     Exposing Method   LED stationary head

(5) Paper Used   **Type**
                                    • Standard paper
                                       – e.g. Xerox 4200 (20 pound)
                                    • Application paper (manual face-up feed)
                                       – Label
                                       – Envelope
                                       – OHP paper (Transparency)

                                    Size
                                    • Standard sizes
                                       – Letter (ODA)
                                       – Legal (option)
                                       – Executive
                                       – Envelope
                                       – A4
                                       – A5
                                       – B5
                                       – A6
                                    • Applicable sizes
                                       – Width: 3.94 to 8.5 inches
                                                         (100 to 216 millimeters)
                                       – Length: 5.83 to 14 inches
                                                         (148 to 355.6 millimeters)

                                    Thickness
                                       – Automatic feed: 16 to 24 pound
                                                           (60 to 90 g/m^2)
                                       – Manual feed: Label, OHP paper (transparency)
                                                           Envelope

(6) Printing Speed   First print: 25 seconds
                                    Continuous print: 6 pages/minute for letter size paper
                                    Warm-up time: 60 seconds
                                                          [at room temperature
                                                          77 degrees Fahrenheit
                                                          (25 degrees Celsius)
                                                          and rated voltage (120 VAC)]

(7) Paper Feeding Method   Automatic feed or manual feed

(8) Paper Delivery Method   Face down/face up

(9) Resolution   OL600e: 300 x 300 dots/inch
                                 OL600e (Hiper-W driver), OL610e, OL610e/PS:
                                   600 x 600 dots/inch

(10) Power Input   120 VAC +5.5%, –15% (ODA)
                                 230 VAC +15%, –15% (ODA)

(11) Power Consumption   Peak: Approximately 420W
                                 Typical operation: Approximately 160W
                                 Idle: Approximately 55W
                                 Power save mode: Approximately 15W

(12) Temperature and Humidity   During operation: 50 to 90 degrees Fahrenheit
                                                       (10 to 32 degrees Celsius)
                                 In storage: 14 to 110 degrees Fahrenheit
                                                        (–10 to 43 degrees Celsius)

(13) Noise   During Operation: 48 dB (A) or less
                                 Standby: 38 dB (A) or less

(14) Consumables   Toner cartridge kit   2,000 pages (5% duty)
                                 Image drum cartridge 20,000 pages (at continuous printing)
                                                       15,000 pages (3 pages/job)
                                                       10,000 pages (1 page/job)

1.5   Safety Standards

1.5.1   Certification Label

The safety certification label is affixed to the printer at the location shown below.
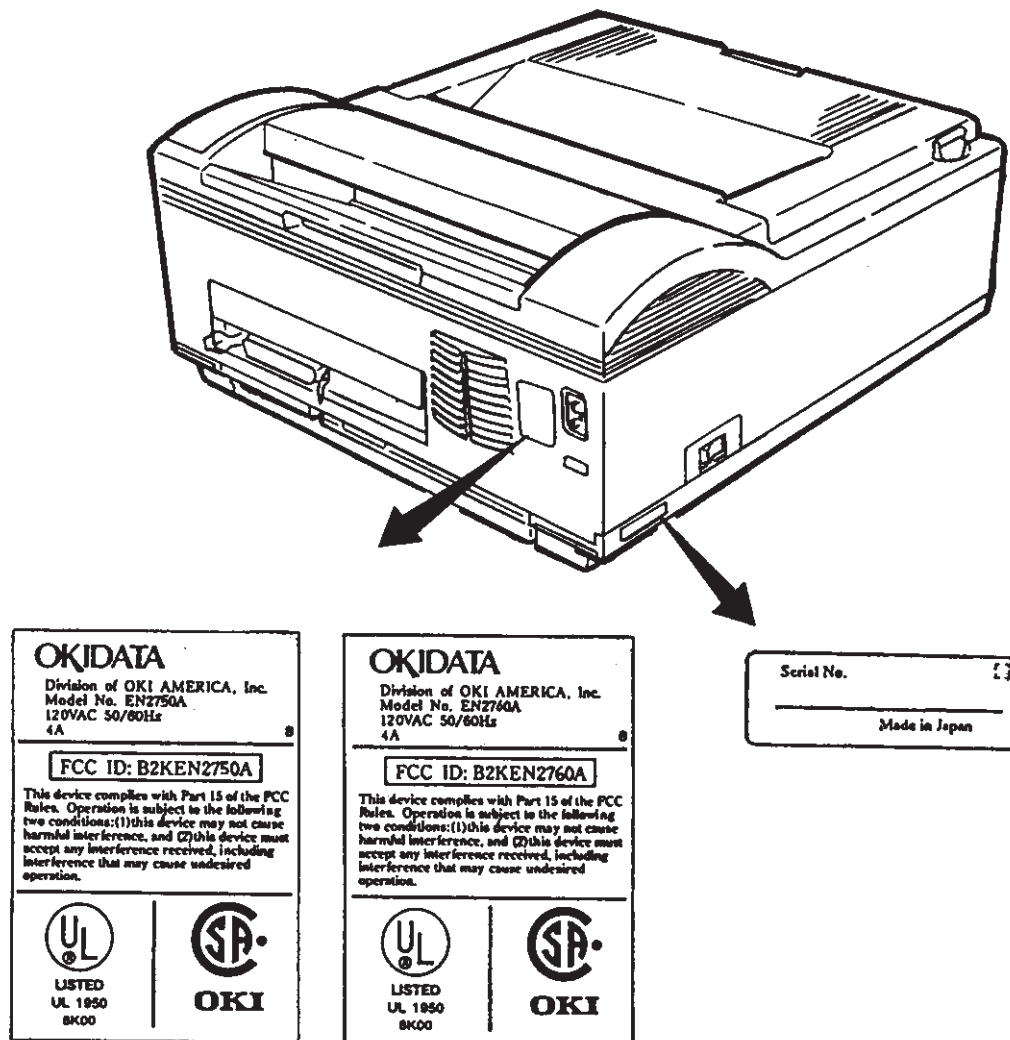
1.5.2 Warning Labels

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

Follow the instructions on warning labels during maintenance.

CAUTION-HOT
ATTENTION-CHAUDE
VORSICHT-HEIß
ATENCION-ALTA TEMPERATURA
ATENÇÃO-ALTA TEMPERATURA
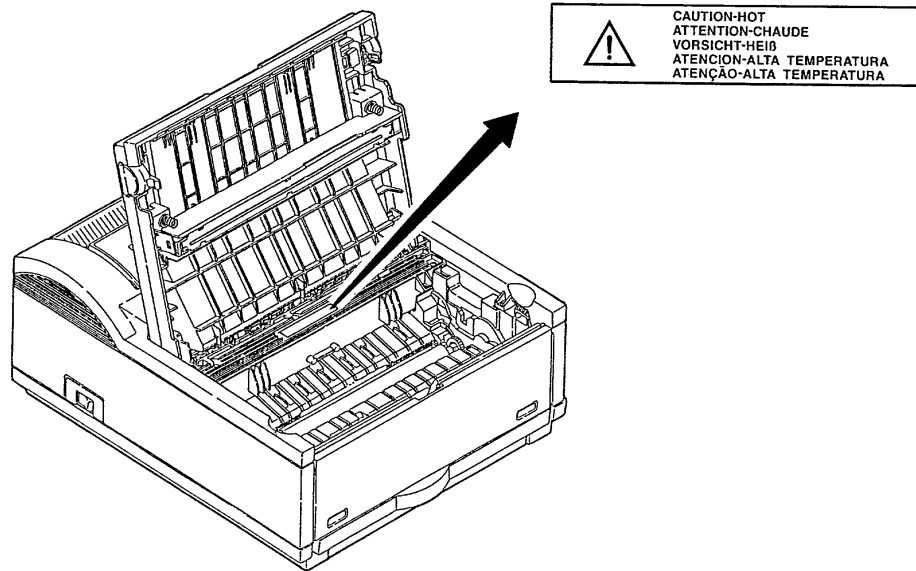
1.5.3   Warning/Caution Markings

The following warning and caution markings appear on the power supply board.
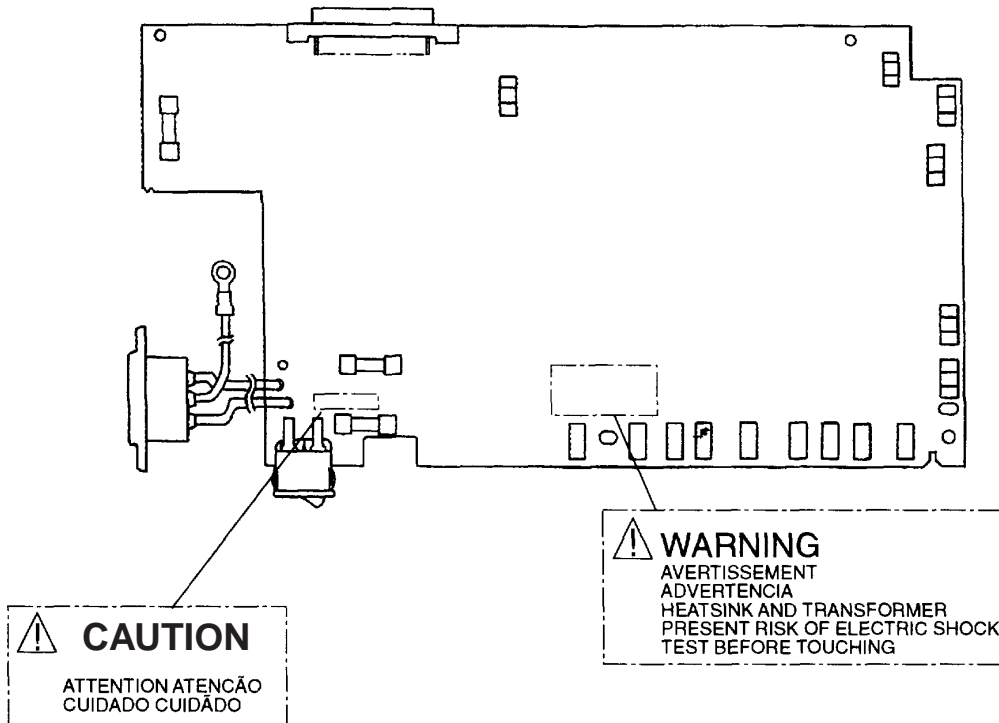
ENGLISH
Heatsink and transformer core present risk of electric shock. Test before touching.

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

SPANISH
Las disipadores de color el núcel del transformador pueden producir un choque eléctrico. Compruebe antes de tocar.

PORTUGUESE
O dissipador de calor e o núcleo do fransiormador apresentam risco de choque elétrico. Teste antes de focar.

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 rerirés.

SPANISH
Las circuitos pueden estar activos una vez que se hayan abierio los fusibles.

PORTUGUESE
Os circuitos podem estar energizados após os fusiveis se queimarem.

2. OPERATION DESCRIPTION

The printer consists of a main control board, a PostScript board (OL610e/PS), a power supply/ sensor board, an operator panel (OL610e/PS, OL610e/S), and an electrophotographic process mechanism.

The control board and the PostScript board receive data via the host interface; these then decode, edit and store the data in memory. After a single page of data is completely edited, they reference the font memory and generate bit image data, which is transferred to the LED head in one-dot line units.

The data is printed on the paper by means of the electrophotographic process mechanism.

The OL600e and OL610e use proprietary software to control printer operations and status monitoring. The OL610e/PS and the OL610e/S have an operator panel to perform these functions.

Block diagrams for each printer are on the following pages.

OL600e Block Diagram (Figure 2-1)

OL610e Block Diagram (Figure 2-2)

1MB Memory Board

or

2MB Memory Board
(Option)
Max. 4MB

For optional
RAM board

LQ6C-

16bit

Program & Font
ROM
4MB Mask ROM

DATA
BUS

16bit

Resident RAM
1M x 16 DRAM
(2MB)

High Capacity
Second Paper
Feeder (Option)

Multi-Purpose
Feeder (Option)

EEPROM

Centronics
parallel I/F

7407

1 Chip CPU

Drum motor &
Registration motor
drive circuit

M Drum Motor

M Registration Motor

Fusing temperature
control circuit

Thermistor

FAN Driver

FAN

FAN ALM

LED Head

CH TR DB
HEAT ON

+8V -8V 0V +5V +30V

Reset
circuit

Power Supply
Board

Inlet sensor 1

Inlet sensor 2

Low voltage
generation circuit

Cover
open
switch

High voltage
generation
circuit

Charge roller

Transfer roller

Paper sensor

Developping
roller

Outlet sensor

Toner supply
roller

Paper out sensor

Cleaning
roller

Toner low sensor

AC
transformer

Heater drive
circuit

Heater

Filter circuit

AC IN

OL610e/PS Block Diagram (Figure 2-3)
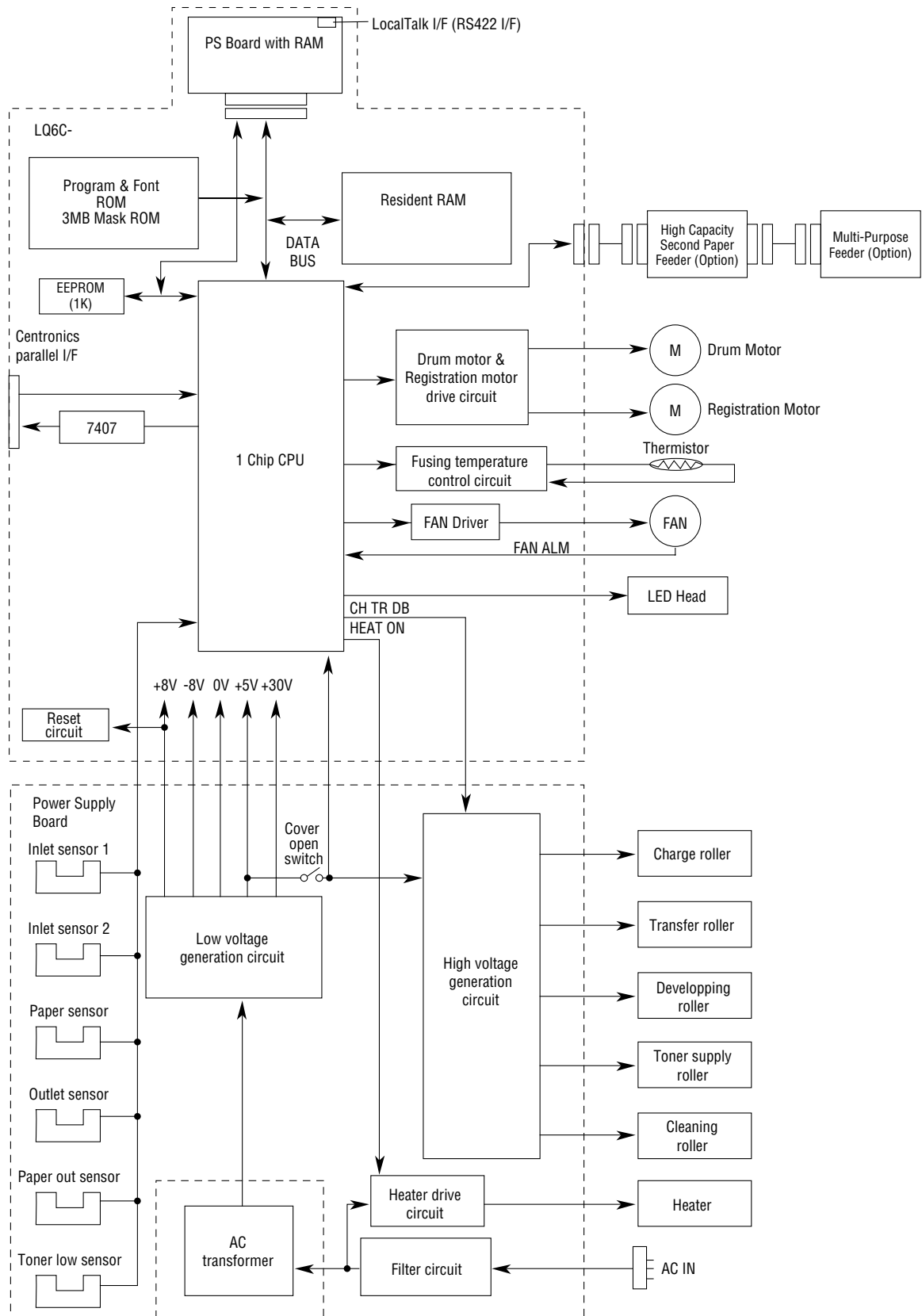
Picture Not Available at Press Time

2.1   Control Board

The control board consists of a single chip CPU, Program & Font ROMs—one DRAM for the OL600e, two DRAMs for the OL610e—an EEPROM, a host interface circuit, and a mechanism driving circuit.

Single Chip CPU

The single chip CPU is a custom CPU (32-bit internal bus, 16-bit external bus, 25.54 MHz clock with input frequency from a 12.27 MHz clock) which incorporates the MIPS 3000 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	Control of LED head
Timer	Generation of various control timing signals Monitoring of paper running and paper size
Serial I/O port	Control of operator panel, EEPROM, and options
I/O port	Input and output of sensor and motor signals

Program and Font ROM

OL600e/610e

The Program & Font ROM stores the equipment program and various types of fonts. EPROM or Mask ROM is used for a Program & Font ROM. The mounting location of this Program & Font ROM varies depending on the type of ROM (for the mounting location, refer to Section 7.2).

OL610e/PS

The Program ROM & Font ROM store the HP4 emulation program and various types of fonts. Mask ROM is used for a Program & Font ROM.

DRAM

OL600e/610e

The DRAM is a resident memory—1MB in the OL600e, 2MB in the OL610e—used as a buffer; it stores edited data, image data, DLL data, and macro data.

OL610e/PS

The DRAM is resident memory (2MB on the board plus 0.5MB on the PS board) used as a buffer; it stores edited data, image data, DLL data, and macro data.
In PostScript mode, it is used as VM and font cache also.

EEPROM

1,024-bit Electrically Erasable PROM (EEPROM), is loaded with the following data:

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

Parallel Interface

Parallel data is received from the host system via parallel interface which conforms to the Centronics specification. IEEE 1284 specification bidirectional parallel is supported.

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2.2   PS Board (OL610e/PS)

The PS Board consists of two Program & Font ROMs, DRAMs, an EEPROM, and a host interface circuit.

Program & Font ROMs

> The Program & Font ROMs store the PostScript Level II program and its fonts. Mask ROM is used for the Program & Font ROMs.

DRAM

> 0.5MB of DRAMs reside on the PS board.

EEPROM

> 4,096 bit-Electrically Erasable PROM (EEPROM) is mounted on the PS board for storing the PostScript menu settings.

LocalTalk Interface

> AppleTalk protocol data is received from the host system via LocalTalk interface. The block diagram is shown in Figure 2-4.
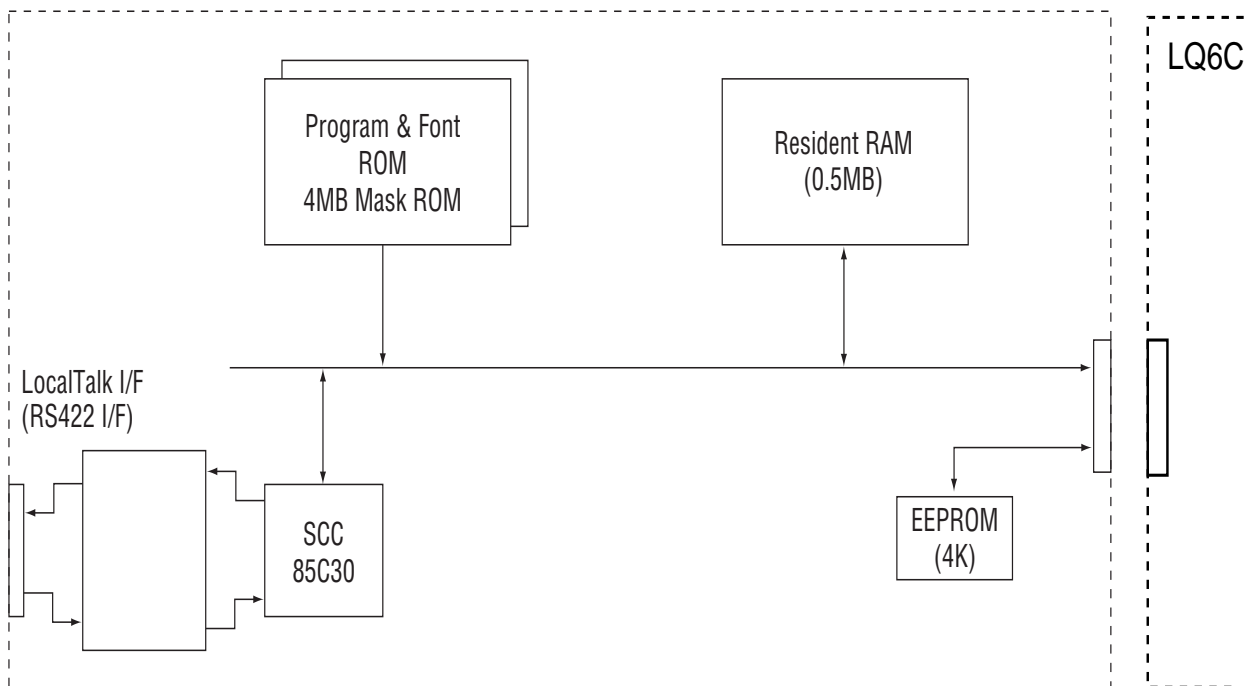
Figure 2-4 PS Board Block Diagram

2.3　Power Supply Board

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

Low Voltage Power Supply Circuit

This circuit generates the following voltages.

Output voltage	Use
+5 V	Logic circuit supply voltage
+30 V	Motor and fan drive voltage and source voltage for high-voltage supply
+8 V	Analog supply voltage
–8 V	PS board and analog circuit supply voltage

High Voltage Power Supply Circuit

This circuit generates following voltages required for electrophotographic process from +5 V, according to the control sequence from the 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	Applied To	Remarks
CH	-1.35 KV	Charging Roller	
DB	-300 V/+300 V	Developing Roller	
SB	-450 V/ 0 V	Toner Supply Roller	
TR	+500 V to +4 KV/-750 V	Transfer Roller	Variable
CB	+400 V	Cleaning Roller	

Photosensor

The photosensor mounted on this power supply board monitors the paper running state during printing.

Sensor Layout Diagram
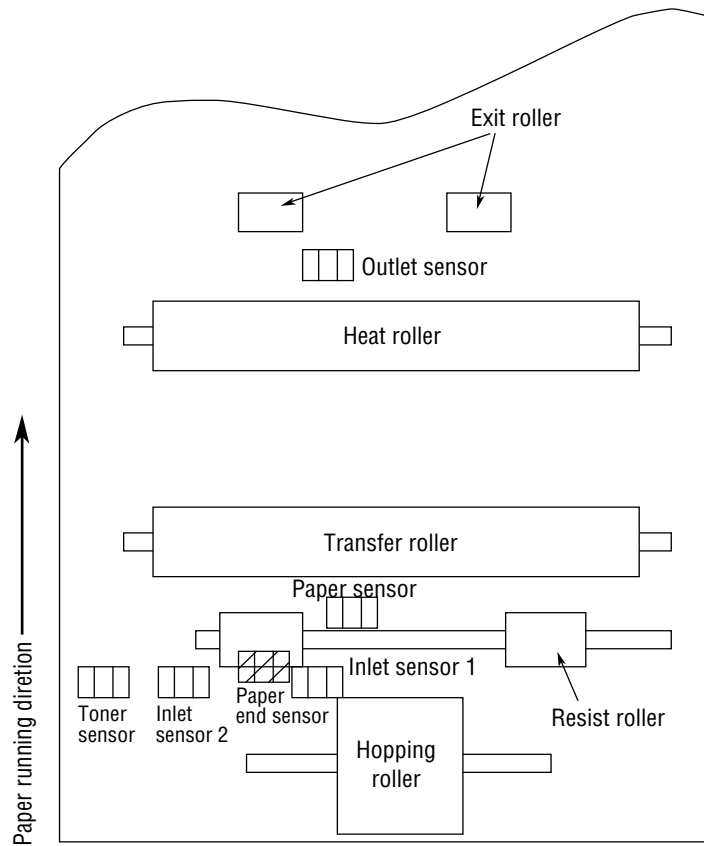
Sensor Functions and Sensing States

Sensor	Function	Sensing State
Inlet Sensor 1	Detects the leading edge of the paper and gives the supervision 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 form width.	ON: A4 or larger OFF: Smaller than A4
Paper Sensor	Detects the leading portion of the paper. Monitors the paper feeding situation.	ON: Paper Exists OFF: No Paper Exists
Outlet Sensor	Monitors the paper feeding and size according to the time of arrival to and leaving past the sensor.	ON: Paper Exists OFF: No Paper Exists
Paper End Sensor	Detects the end of the paper.	ON: Paper Exists OFF: No Paper Exists
Toner Low Sensor	Detects the lack of toner.	

2.4　Electrophotographic Process

2.4.1　Electrophotographic Process Mechanism

This mechanism uses the electrophotographic process to print image data supplied by the control board.

The layout of the electrophotographic process mechanism is shown in Figure 2-6.

(1)　Image Drum Unit

The image drum unit consists of a light-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, which is two-phase excited by the signal from the Main Control PCB. It drives the hopping and registration rollers via two one-way clutches according to the direction of rotation.

(3)　Drum Motor

The drum motor is a pulse motor of 48 steps/rotation, which is two-phase excited by the signal from the Main Control PCB and is the main motor of this mechanism.

(4)　LED Head

Image data for each dot line from the control board is received by the shift register and latch register. The 2560/2496 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 board is applied to the heater controlled by the HEATON signal from the control board. This AC voltage heats the heater. The Main Control PCB monitors the heat roller temperature via the thermistor, and regulates the heater roller to a predetermined temperature (165 degrees Celsius) by connecting or disconnecting the AC voltage supply to the heater.

When the temperature of the heater roller rises abnormally, the thermostat of the heater voltage supply circuit becomes active and cuts the AC voltage supply.

Electrophotographic Process Mechanism Layout (Figure 2-6)
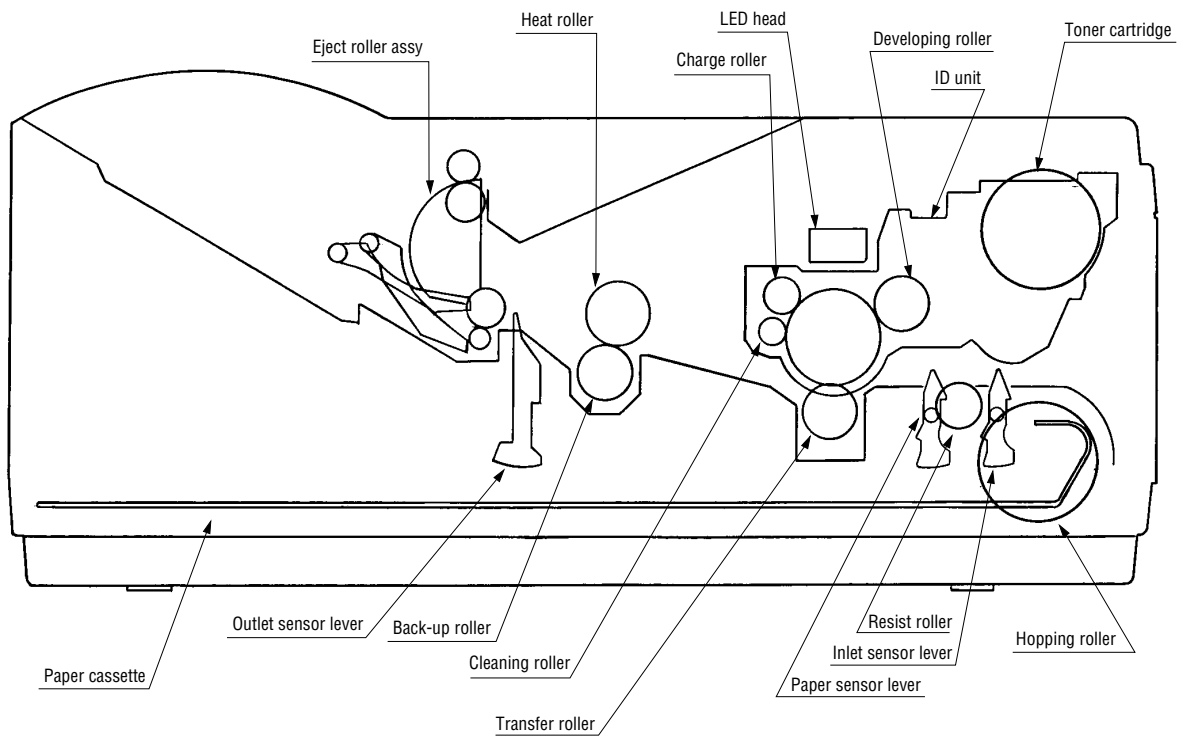
2.4.2 Electrophotographic Process

The electrophotographic processing is outlined below. Figure 2-7 shows the electrophotographic printing process.

1 Charging

The surface of the image drum is given a uniform 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 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 by the transfer roller. The toner is attracted by the positive charge and is transferred onto the paper. This transfers 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 attracted to the cleaning roller by static electricity.

6 Fusing

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

Electrophotographic Printing Process Timing Chart (Figure 2-8)
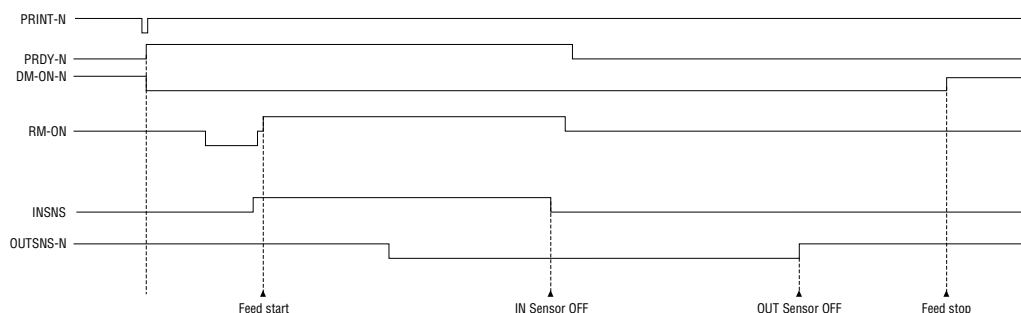
Electrophotographic Printing Process Diagram (Figure 2-7)

Paper
eject
roller

Paper
eject

(Face down)

Image data

LED head

Power
supply

Charger
roller

Exposure

Paper
eject
roller

Power
supply

Charging

Doctor
blade

Power
supply
(Bias voltage)

Toner
cartridge

Paper
eject

(Face up)

Paper
path
selector

Power
supply

Cleaning
roller

Cleaning

Developing

Developing
roller

Toner
supply
roller

Outlet sensor

Fusing

Transfer

Paper sensor

Paper
registration

Inlet sensor

Paper
supply

Paper
tray

Heater roller

Fusing pressure
roller

Power
supply

Transfer
roller

Resister roller

Hopping
roller

Paper eject | Fusing | Cleaning | Transfer | Image production developing | Paper feed | Paper hopping

Path of paper
feeding

Direction of
rotation of the
image drum

2.4.3 Process Operation Descriptions

Hopping and Feeding

Hopping and feeding motions are actuated by a single registration motor in the mechanism as shown below.
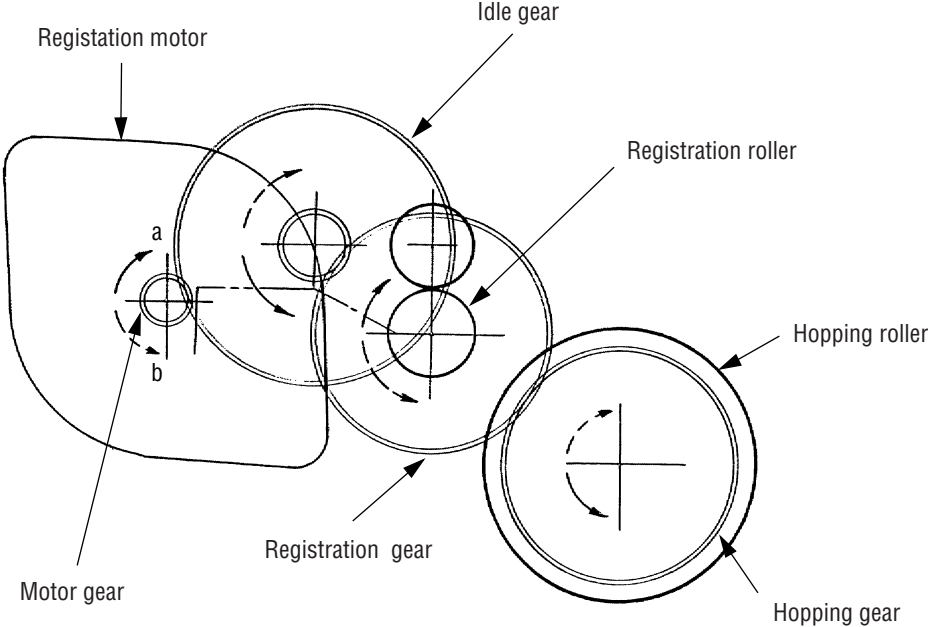
The registration motor turning in direction "a" drives the hopping roller. The registration motor turning in direction "b" drives the registration roller. The registration and hopping gears have one-way bearings, so turning any of these gears in the reverse direction will not transmit the motion to the corresponding roller.

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 bearings).

2 After the 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).

Paper

a

Registration roller
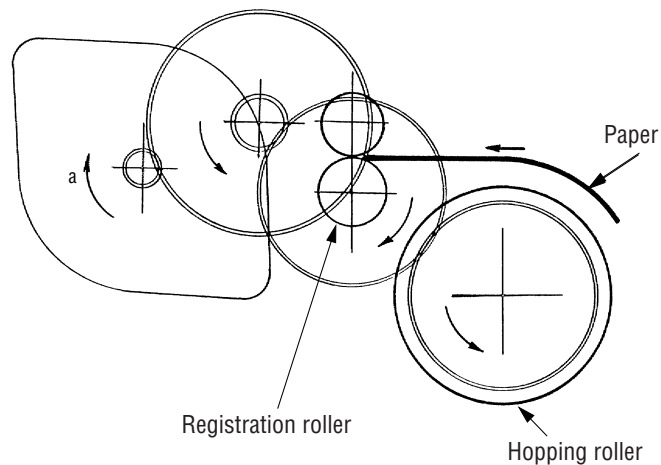
Hopping roller

Feeding

1 When hopping is completed, the registration motor turning in direction "b" (counterclockwise 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 bearings).

2 The paper advances in synchronization with the print data.

Image drum

Paper

b

Hopping roller

Transfer roller

Registration roller
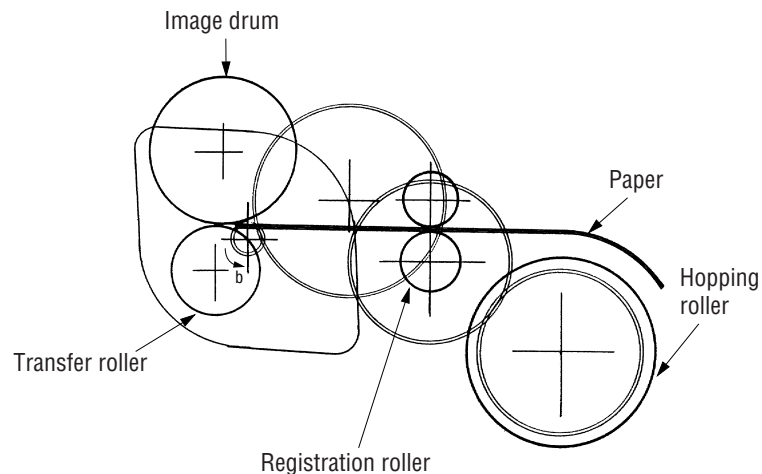
This page was intentionally left blank.

Charging

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

Power supply

Charge roller
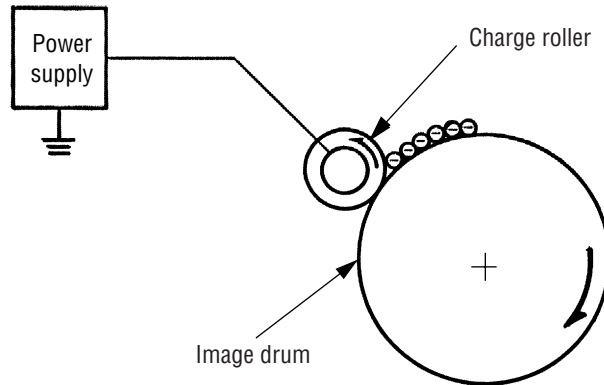
Image drum

The charge roller consists 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 an offset of approximately –550V.

charge potential [V]

-750

-550   -1300   [V]
                applied voltage
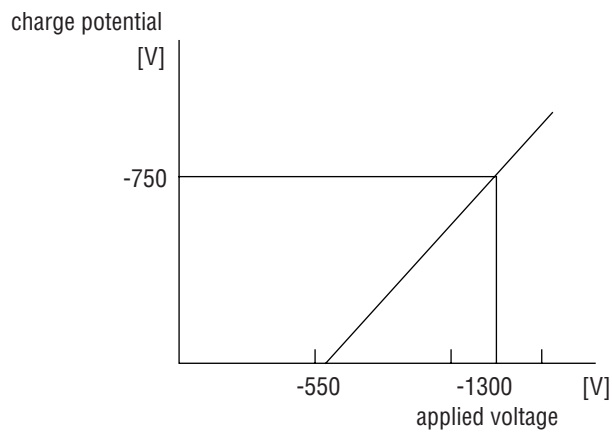
Exposure

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

Charge roller

LED head

LED head

Power supply

Image drum

Paper
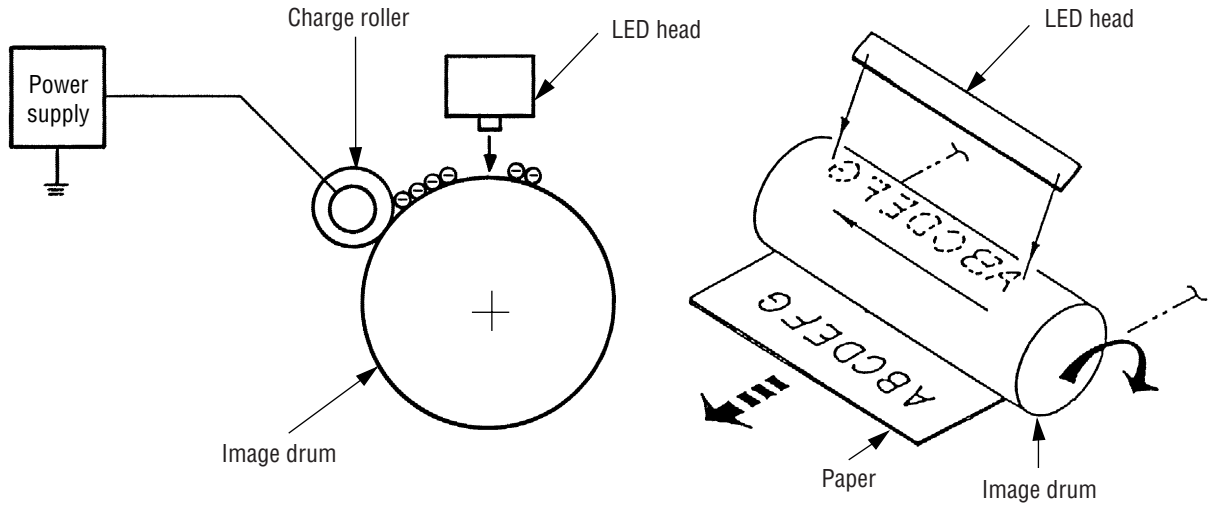
Image drum

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.

Image drum

CTL

CGL

UL

Base

20 μm

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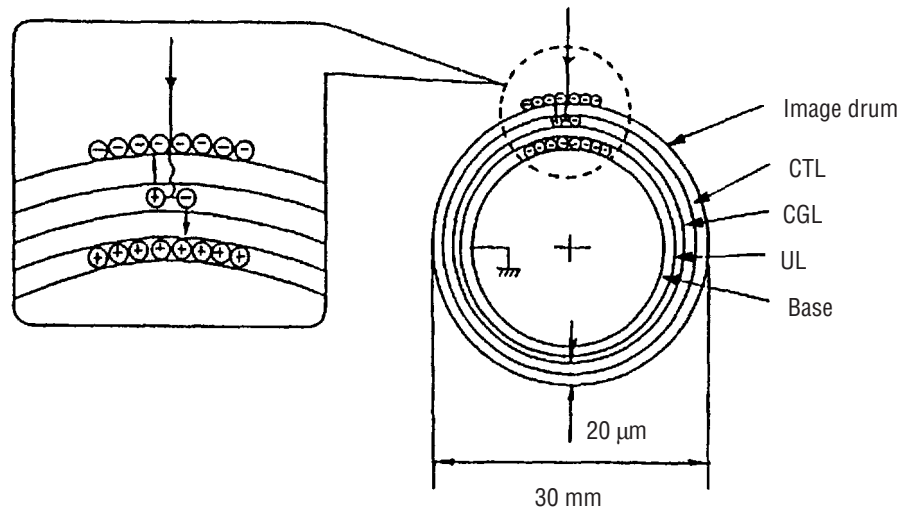
When the light from the LED head irradiates the image drum surface, the light energy generates positive and negative carriers in the carrier generation layer (CGL). The positive carriers are moved to the carrier transfer layer (CTL) by an electrical field acting on the image drum. Likewise, the negative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

The positive carriers moved to the carrier transfer layer (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.

(V)

Light
from
LED

−750

Image drum
surface potential

−100

0

Charged part

Part
irradiated
by
LED

Charged
part
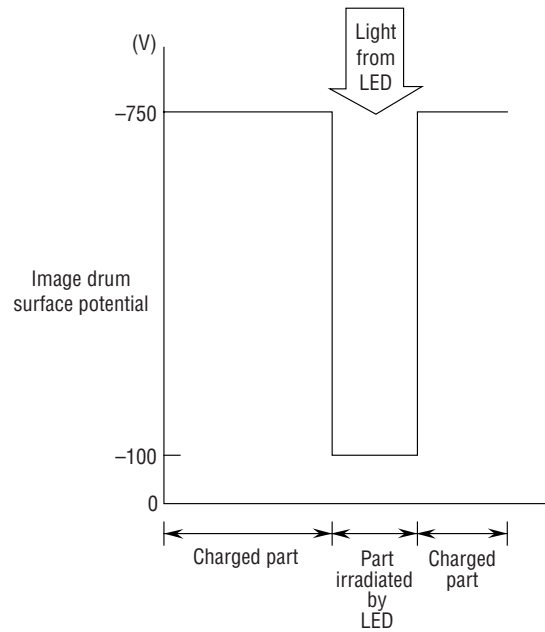
Developing

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   A.   As the toner supply roller rotates while rubbing on the developing roller, a friction charge is generated between the developing roller and the toner.

  B.   This allows the toner to be attracted to the developing roller.
The developing roller surface is charged positive.
The toner is charged negative.
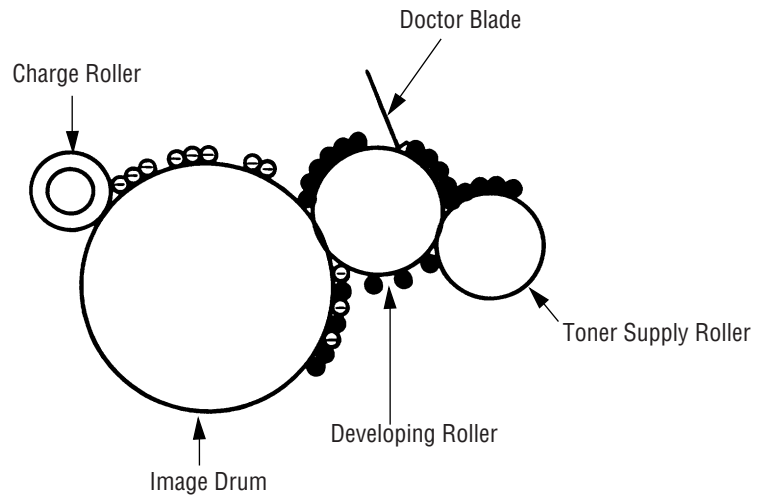
2   The toner attracted to the developing roller is scraped off by the doctor blade, forming a thin coat of toner on the developing roller surface.

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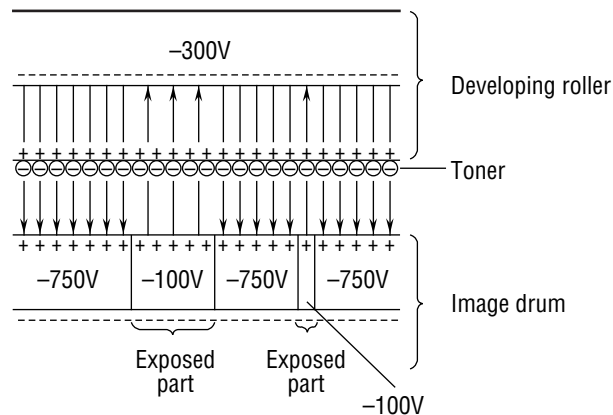
An illustration of activities at the contact point of the image drum surface and the developing roller (arrow marks denote the direction of the electric field).

Note: The bias voltage required during the developing process is supplied to the toner supply roller and the developing roller, as shown in the diagram below. –450 VDC is supplied to the toner supply roller. –300 VDC is supplied to the developing roller.

Connected and bias supplied when the cover is closed

Toner supply roller

Developing roller

Base
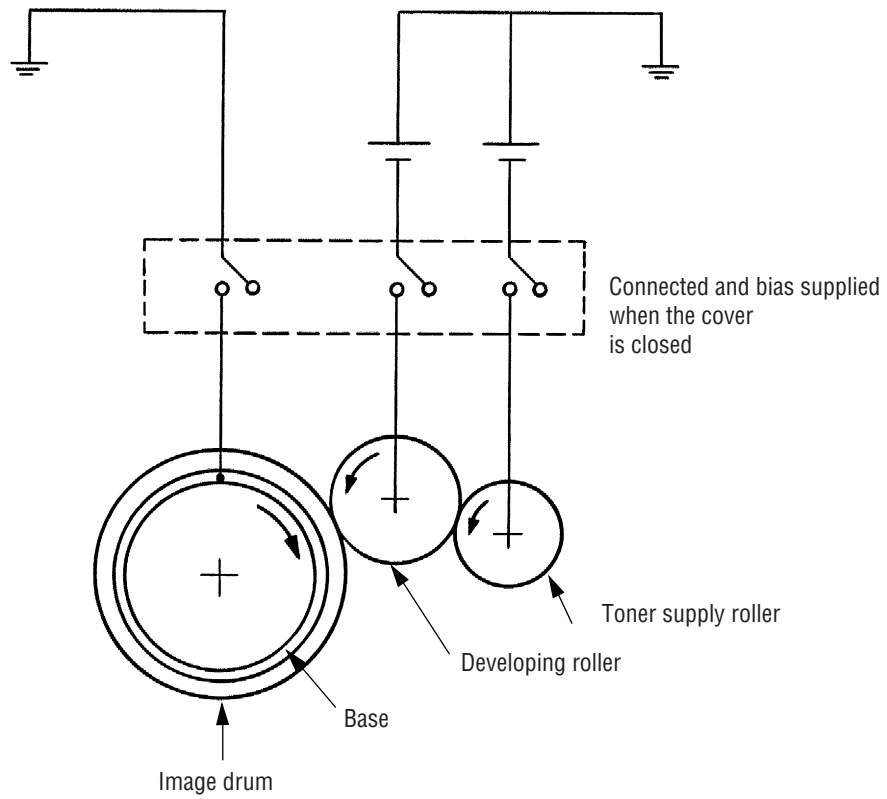
Image drum

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. A positive charge (opposite in polarity to that of the toner) is applied to the reverse side of the paper.

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.

Image drum

Paper

Transfer roller

Power supply
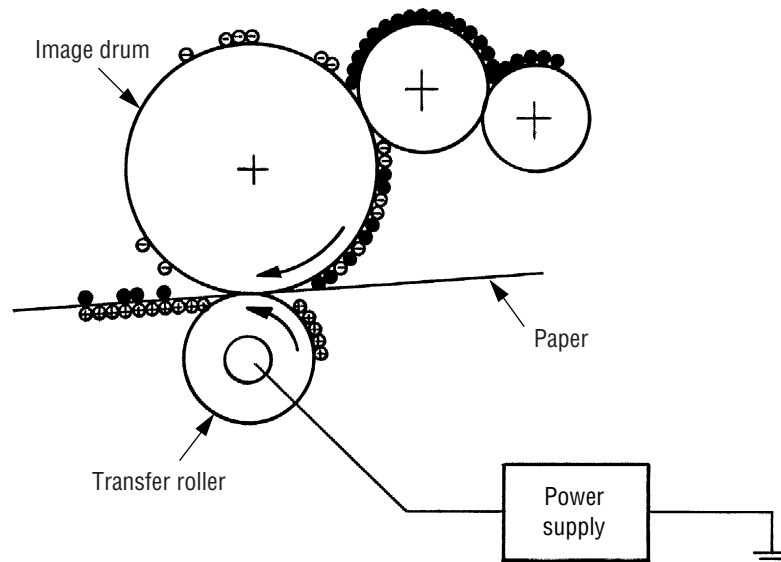
Fusing

When the image transfer is completed, the toner image is fused to the paper by heat and pressure as the paper with the toner image passes between the heater roller and the back-up roller. The heater roller has a Teflon coating. A 400W heater (Halogen lamp), inside the roller provides the heat needed for fusing.

A thermistor, which is in contact with the heater roller, regulates the temperature of the heater roller (about 165 degrees Celsius). 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 3.8 kilograms applied by the pressure spring on each side.
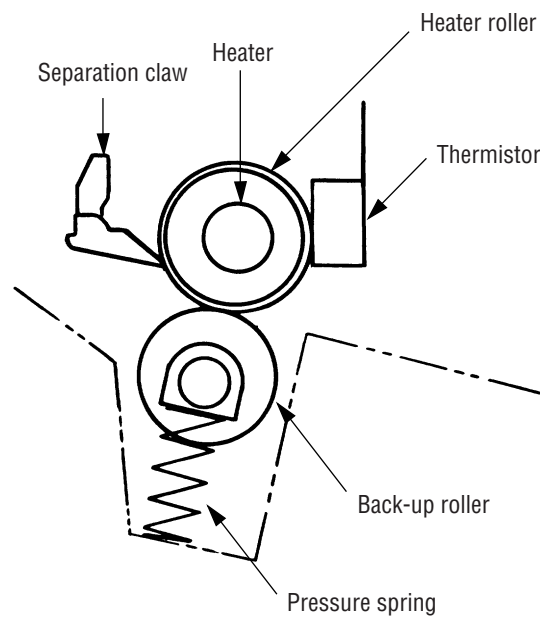
Cleaning

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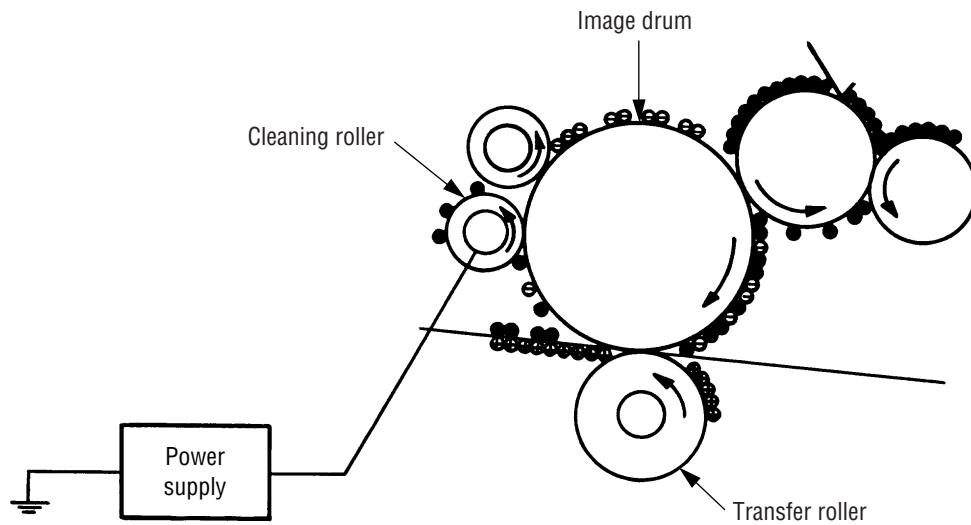
Cleaning of Rollers

The charge, transfer and cleaning rollers are cleaned in 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.
- Cleaning initiated by the user.

Changes in bias voltage applied to each roller moves the excess toner off the roller to the image drum and returns it to the developer.

2.5   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	• 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	• The paper is in contact with at the paper sensor when the power is turned on. • The leading edge of the paper does not reach the paper sensor within a predetermined distance since the paper has reached the inlet sensor. • The trailing edge of the paper does not pass over the paper sensor within a predetermined distance after the same has passed over the inlet sensor. • The leading edge of paper does not reach the outlet sensor within a predetermined distance after the paper has reached the paper sensor.
Paper exit jam	• 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 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	• The size of the paper is monitored by the inlet sensor 1. The paper is not detected by the inlet sensor 1 within predetermined 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

Drum motor

Resist motor

Paper feed

Hopping

Paper end sensor

Checking for paper form

Inlet sensor

Paper size check (paper width)

Paper sensor

Outlet sensor

Jam Monitor
Top to top

Monitoring paper input jam

Monitoring paper feed jam

Monitoring paper feed jam

Top to bottom

Paper size check (Paper length)

Top to bottom

Monitoring paper exit jam

Bottom to bottom

Monitoring paper feed jam

Paper feed

Paper Feed Check List

Type of Error	Monitor	Standard Value	Error	
			Plus	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	20.0	*
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	*

Unit: millimeters

Note: Asterisk (*) in the table indicates that no check is done.

Paper Length List

Type	Paper Length	Check Range Min.	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			
COM-10	241.3	196.3	286.3
DL	220.0	175.0	265.0
C5	229.0	184.0	274.0
Free	110.0 - 355.6	65.0	400.6

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2.6 Cover Open

When the stacker cover is opened, the cover open microswitch on the power/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 control board to notify that the microswitch is off, and the control board carries out the cover open process.

2.7 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.
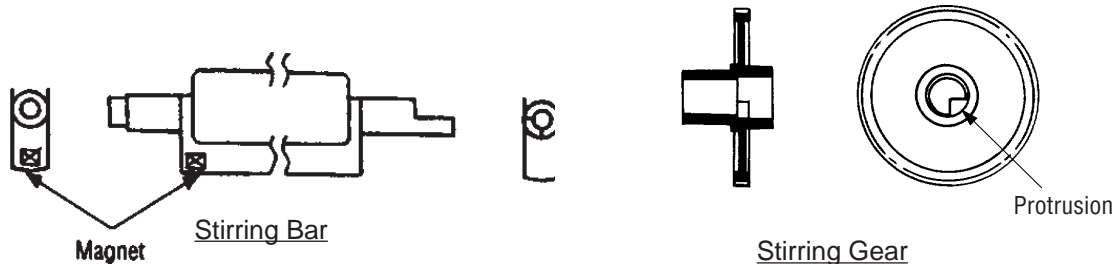
Operation

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.

Toner Full

• The stirring gear rotates the stirring bar.

• When toner is present, the stirring bar moves through the toner at a constant rate.
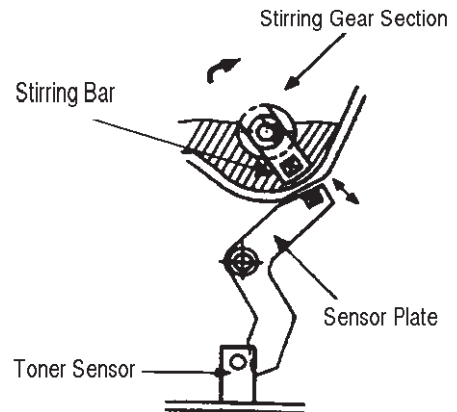
Toner Low

• When toner is low or empty, the stirring bar rises to the maximum height and then falls to the minimum height by its own weight. This increases the time of its encounter with the magnet on the sensor lever. By monitoring this time interval, Toner Low can be detected.

• When the Toner Low state is detected 2 times consecutively, Toner Low is established.

• When the Toner Full state is detected 2 times consecutively, Toner Low is cancelled.

TONER FULL State

TNRSNS-N ⎯⎯⎯⎯⎯|‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾|___|‾‾‾‾

240 ms < t1 < 1.5 sec

|← 4.875 sec. →| t1

TONER LOW State

TNRSNS-N ⎯⎯⎯⎯⎯|‾‾‾‾|_____|‾‾‾‾

t1 > 1.5 sec.
or
t1 < 240 ms

|← t1 →|
|← 4.875 sec. →|
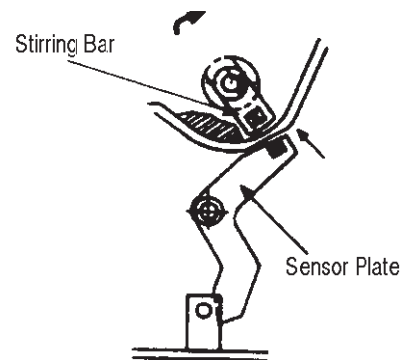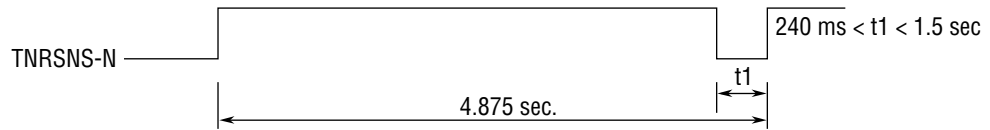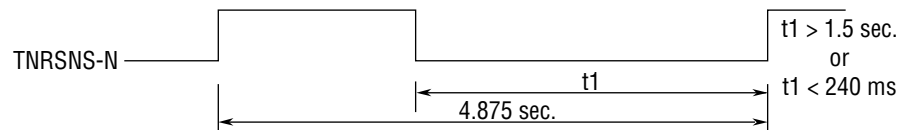
- When there is no change with the toner sensor for 2 cycles (4.875 sec. x 2) or more, the Toner Sensor Alarm is activated.

- The toner sensor is not monitored while the drum motor is in halt.

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3. PARTS REPLACEMENT

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

3.1 Precautions for Parts Replacement

Note: Always use proper anti-static precautions.
(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) Unplug the power cord from the AC outlet.
        iii) Disconnect the 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) Plug the power cord into the outlet.
        iii) Turn on ("I") the power switch.
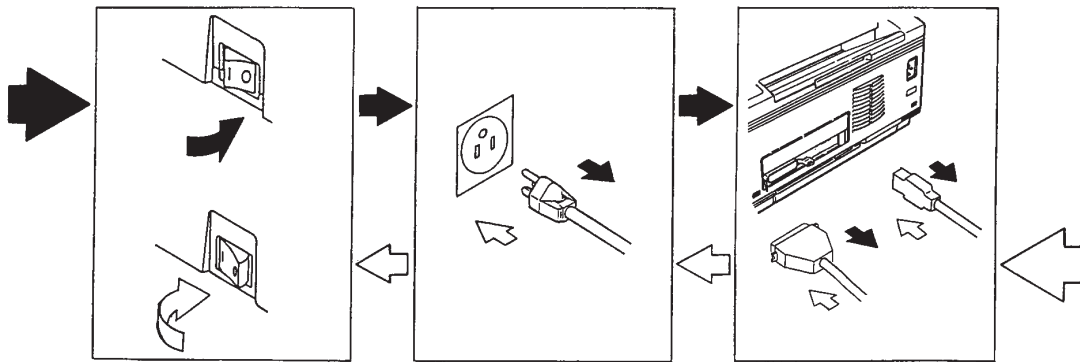
(2) Do not try to disassemble as long as the printer is operating normally.

(3) Do not remove parts which do not need to be touched; try to keep 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.
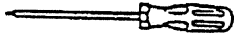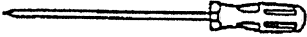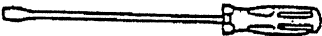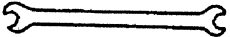
(7) When handling integrated circuits (microprocessors, ROMs, RAMs, or circuit boards), use proper anti-static precautions.

(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		Handy cleaner	1		
9		LED Head cleaner	1	Cleans LED head	

3.2 Parts Layout

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

Lower Base Unit

Figure 3-1

Operator Panel

Stacker

Stacker clamp

Upper cover

RAM board
• LQME-PCB (OL600e/610e)

PS board
• LQ8A-PCB (OL610e/PS)

AC power cord

Power supply

DC fan assy

Main Control PCB
• LQ5C: OL600e
• LQ6C: OL610e and
OL610e/PS

Transformer

Cassette guide (R)

Paper cassette

Contact assy

Cassette guide (L)
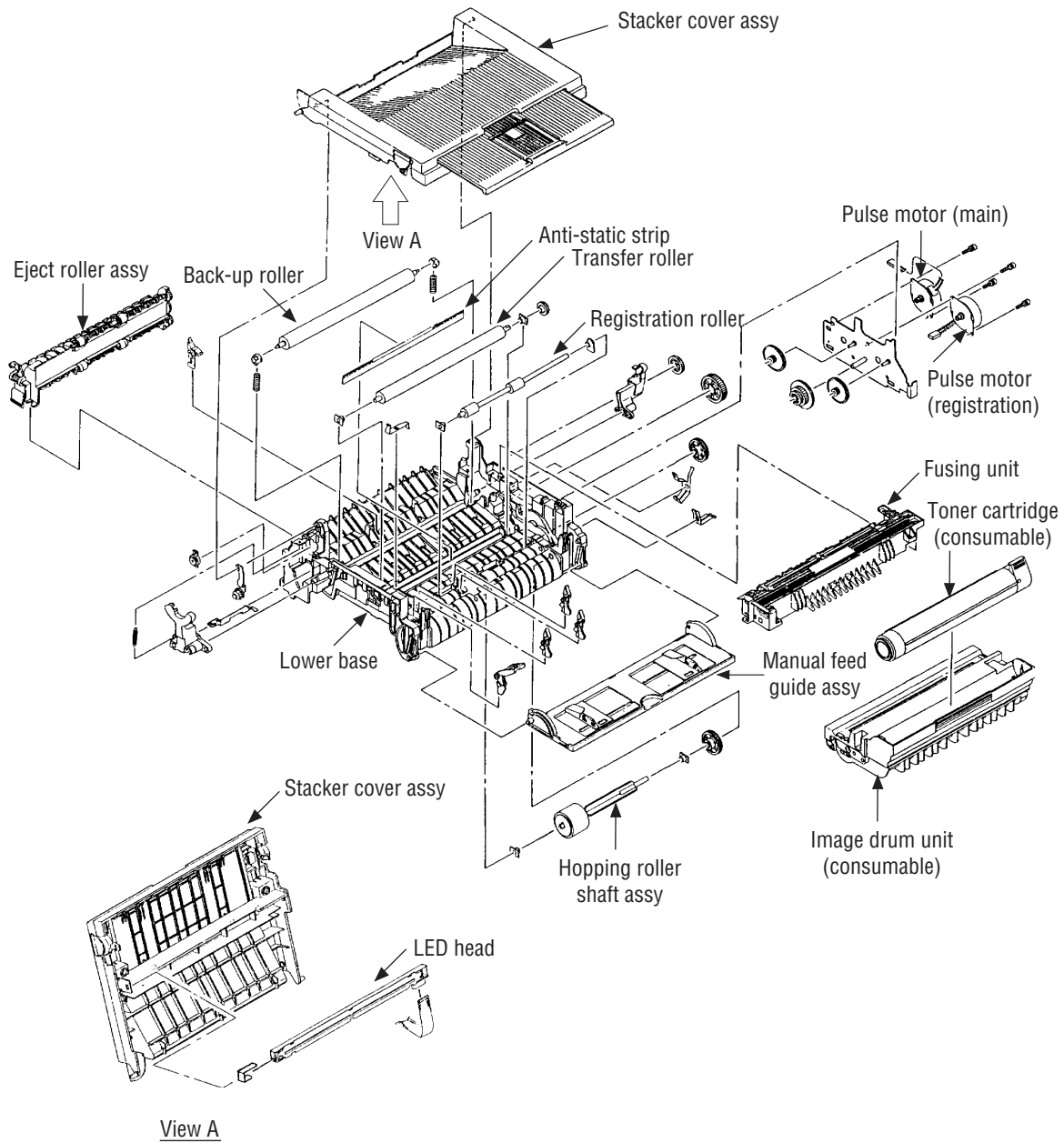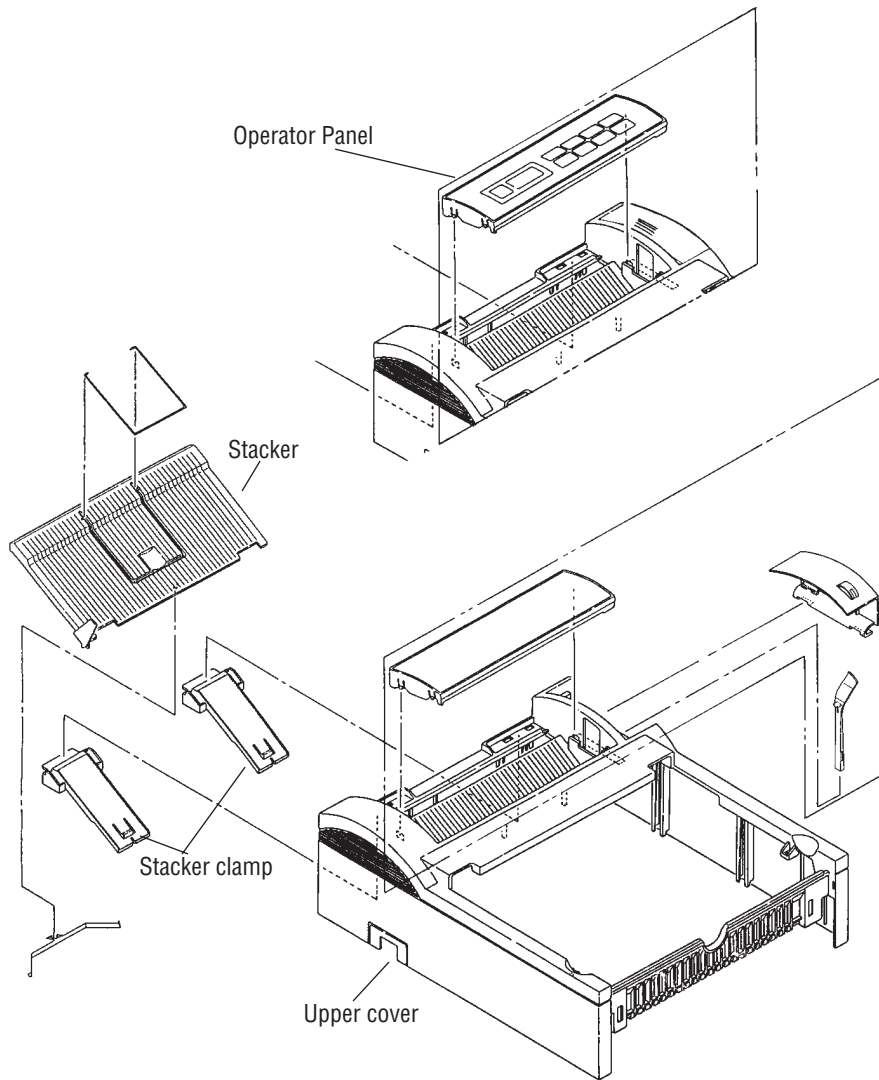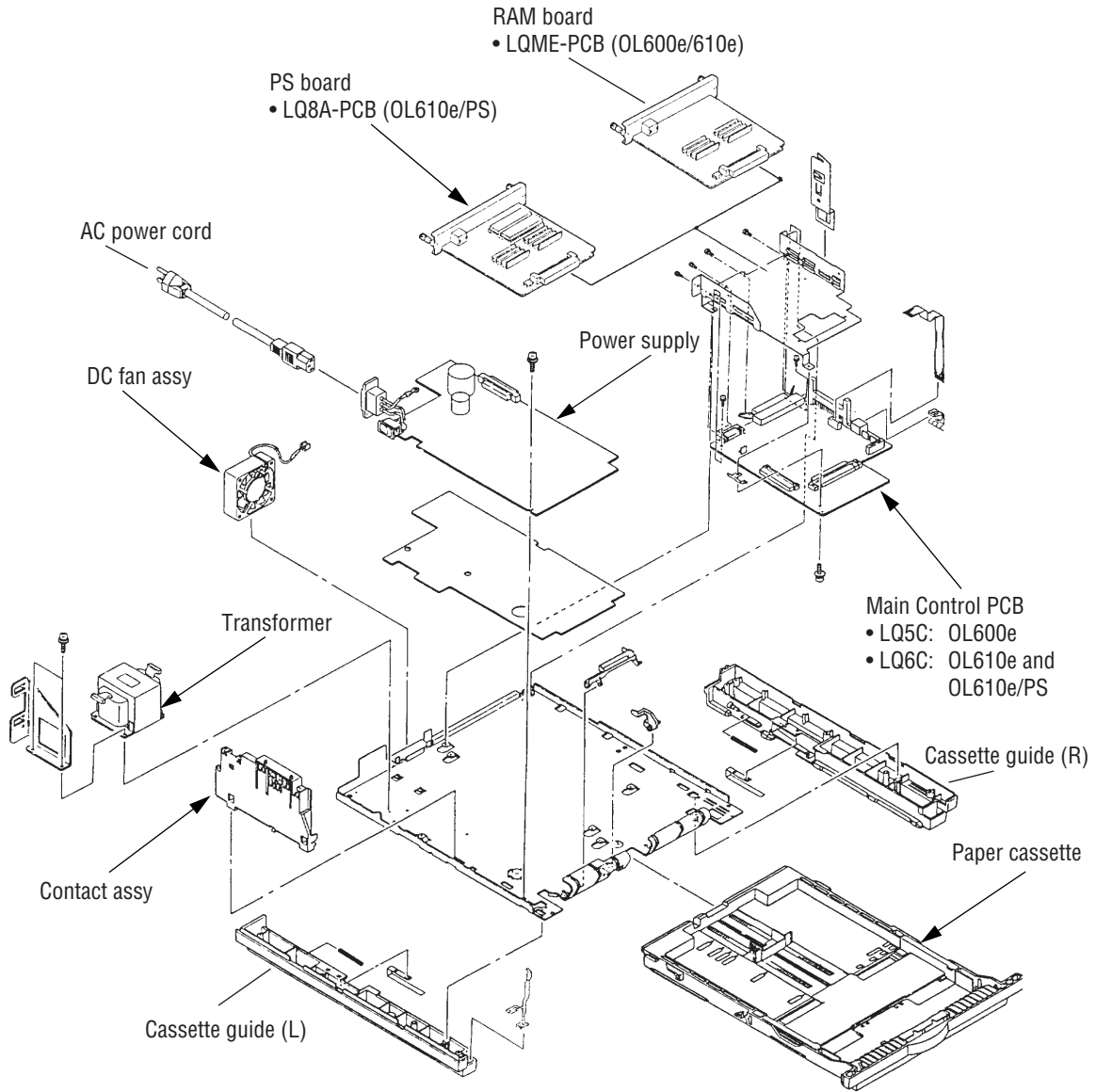
Figure 3-3

3.3 How to Change Parts

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

```
Printer unit ——— Upper cover ———— Stacker (3.3.2)
                  (3.3.1)
                            ——— LED head (3.3.3)

                            ——— Eject roller assy (3.3.4)

                            ——— Pulse motor (Hopping) (3.3.5)

                            ——— Pulse motor (Resist) (3.3.6)

                            ——— Lower base unit ———— Motor assy (3.3.8)
                                 (3.3.7)
                                            ——— Hopping roller assy (3.3.9)

                                            ——— Stacker cover assy (3.3.10)

                                            ——— Resist roller (3.3.11)

                                            ——— Transfer roller (3.3.12)

                                            ——— Fusing unit assy (3.3.13)

                                            ——— Back-up roller (3.3.14)

                                            ——— Sensor plate (inlet) (3.3.15)

                                            ——— Toner sensor (3.3.16)

                                            ——— Sensor plate (outlet) (3.3.17)

                                            ——— Manual feed guide assy (3.3.18)

                                            ——— Sensor plate (Paper supply) (3.3.19)

                                            ——— Main control PCB (3.3.20)

                                            ——— Power supply board and contact assy (3.3.21)

                                            ——— Transformer (3.3.22)

                                            ——— Cassette guide L (3.3.23)

                                            ——— Cassette guide R (3.3.24)
```

3.3.1   Upper Cover

(1) With the power switch turned off, unplug the AC power cord from the outlet.

(2) Disconnect the interface cable **1**.

(3) Remove two thumb screws **2** and remove the PS board (OL610e/PS) **3**.

(4) If a memory board is installed, remove it.

(5) On the OL610e/PS and OL610e/S, disconnect the flexible cable **4** from the connector (CN1) **5** of the operator panel board, and put the cable inside the cover.

(6) Open the stacker cover assembly **6** by pressing the knobs **7** on the left and right sides.

(7) Remove the image drum unit **8**.

(8) Remove two screws **9**, and open the manual feed guide assembly **10**. Lift up the front of the upper cover **11** and release the claws at two locations on the back side. Lift the cover straight up one or two inches, rotate the cover about 45 degrees to clear the face-up stacker, then lift the cover completely off of the printer (Detail **A**).

Note: When removing or installing the upper cover, be careful not to damage the cable **4**.

Stacker Cover
When removing the upper cover, align the stacker cover against the rectangular slot of the upper cover diagonally, and then lift it out.)

Upper cover

Rectangular slot
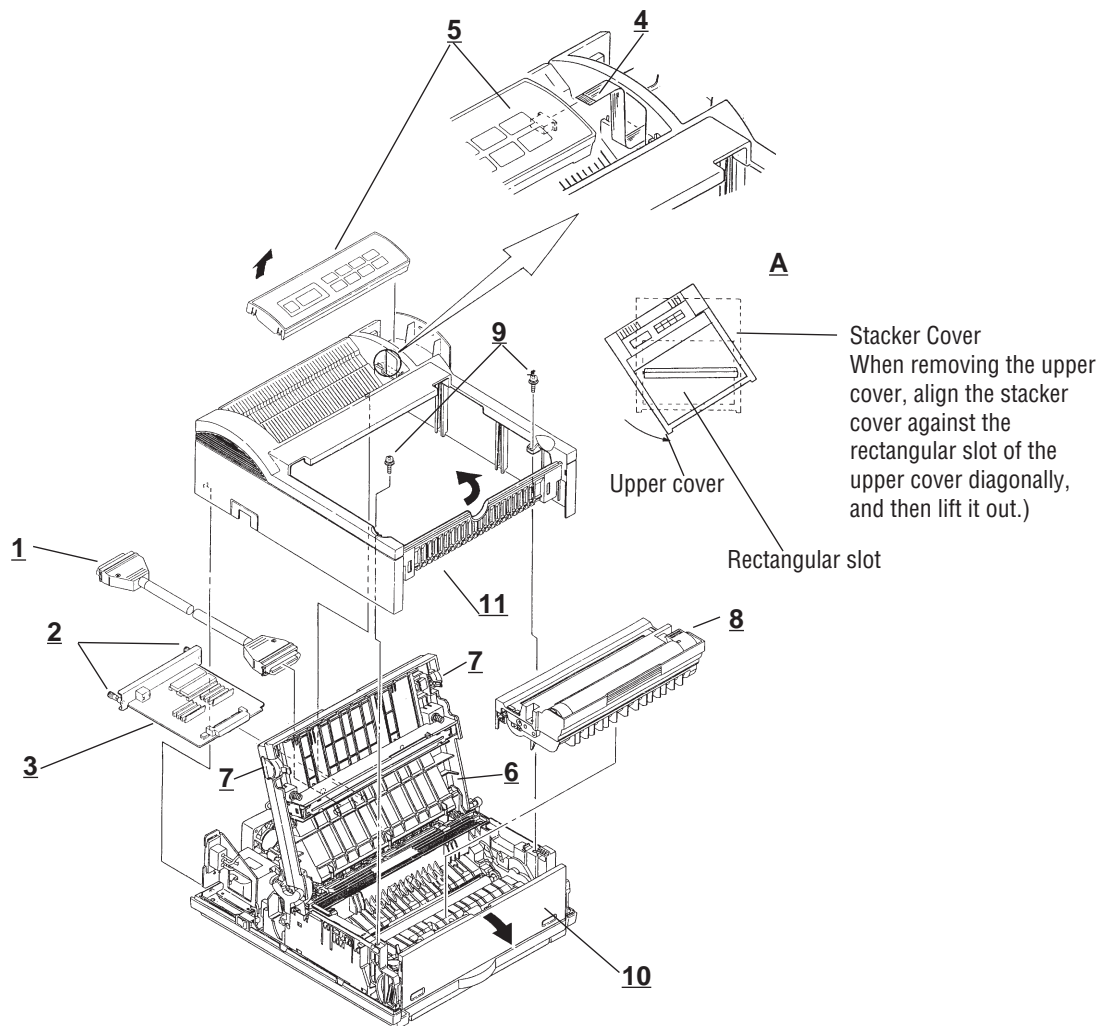
3.3.2   Stacker

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

(2)   Remove two stacker clamps **1** and the stacker **2** by flexing the upper cover.
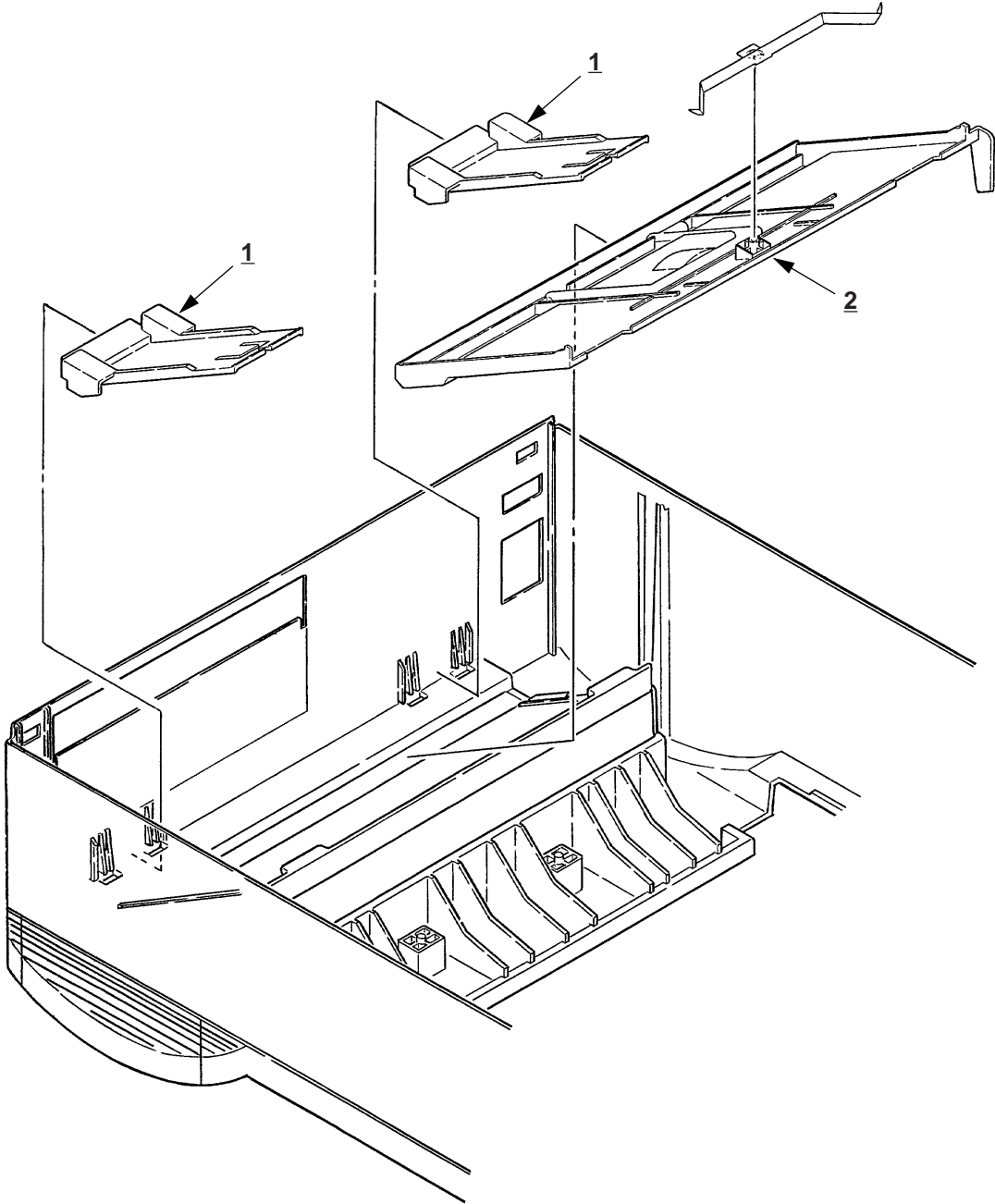
3.3.3   LED Head

    (1) Open the stacker cover.

    (2) Remove the flexible cable (LED) **1** from the PC connector **2** of the LED head **3**.

    (3) Remove the LED head by flexing the left side of the upper cover away from the retaining
        clip.
        Note: Be careful to not lose the frame ground clip **4**.

  Note: • Be sure not to directly touch or push the SLA (lens) part of the LED head.

              • After mounting the new LED head, set drive time of the LED head according to
                  the marking on the LED head (see 4.2.1).

              • For the installation of the flexible cable (LED) **1**, install the PC connector **2** to the
                  flexible cable (LED) **1** first, then connect the LED head **3** to the PC connector.

              • When installing a new LED head, be careful not to lose the frame ground clip **4**.
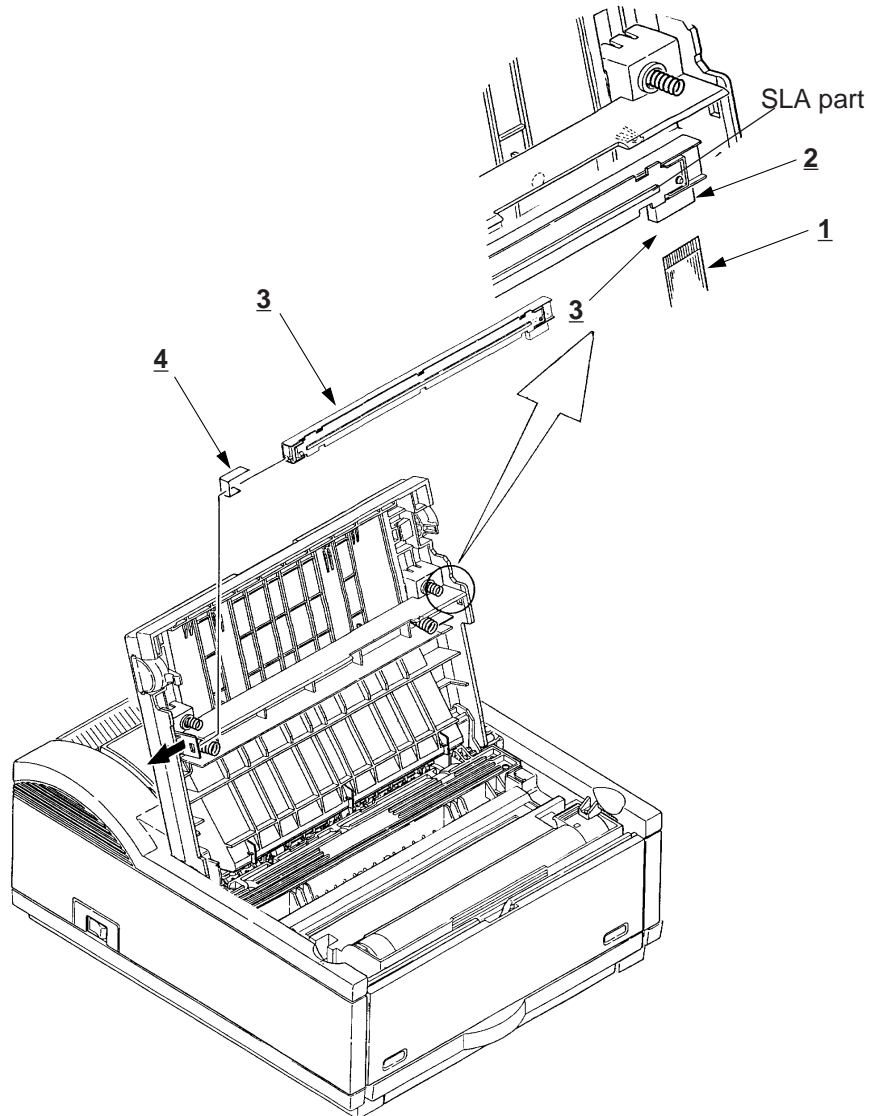
3.3.4   Eject Roller Assembly

(1) Remove the upper cover (see 3.3.1). Leave the face-down stacker open.

(2) Using a small flatblade screwdriver, press the clamp on the left side of the eject roller assembly **1** in the direction of the arrow. Detach the eject roller assembly from the lower base unit **2**, and remove it.

Note: When installing the eject roller, verify that the right side of the roller assembly is properly aligned with the main unit.

Front of printer
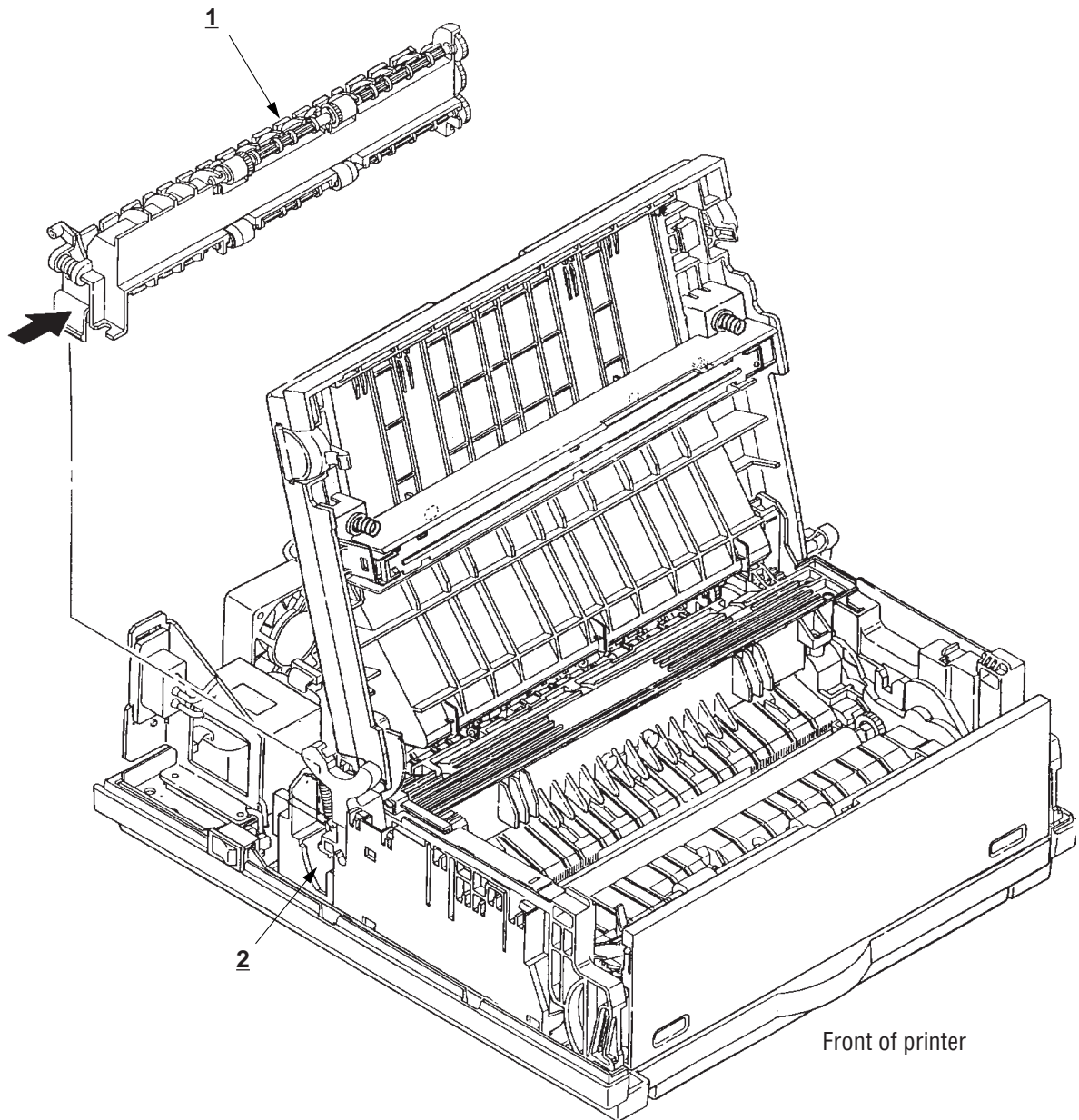
3.3.5 Pulse Motor (Main)

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

(2) Remove the connector **3** from (CN2) **2** of the Main Control board **1**.

(3) Remove two screws **4** and remove the pulse motor (main) **6** from the motor bracket **5**.
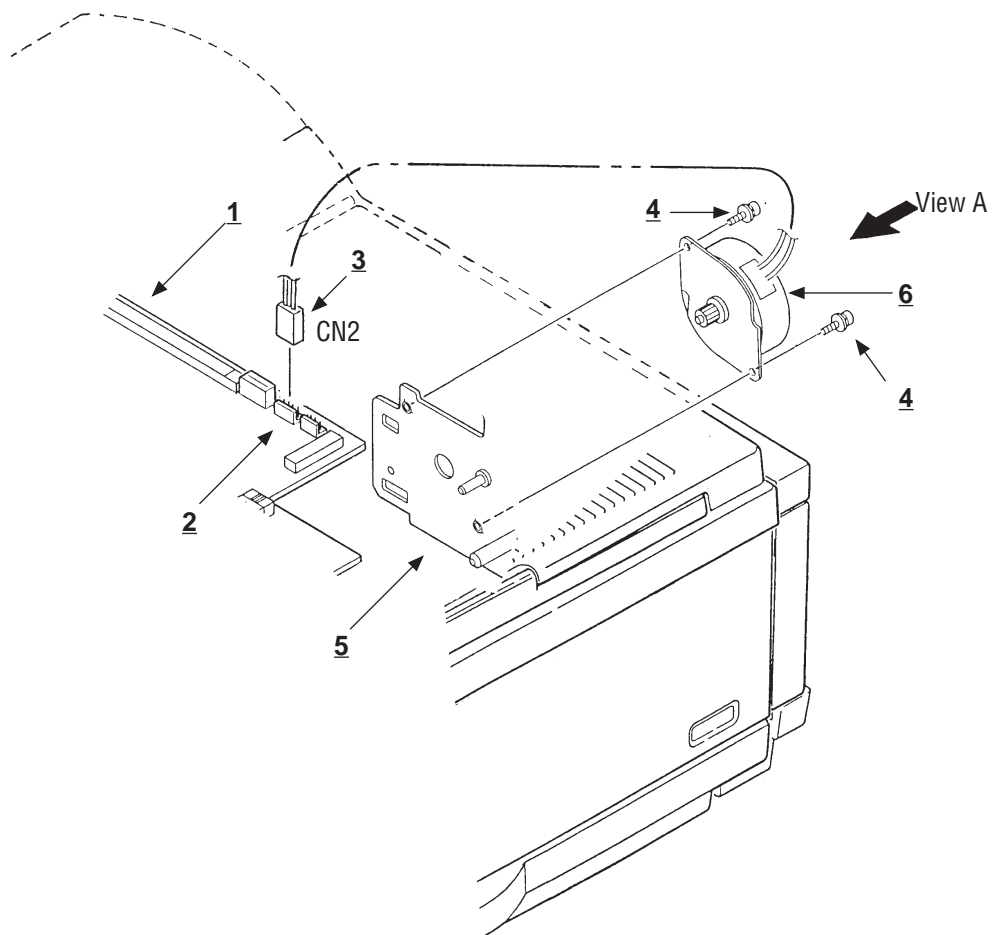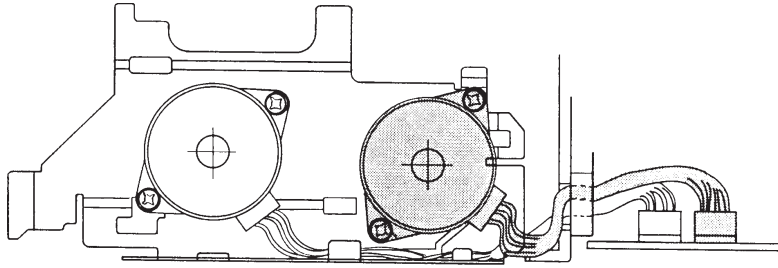
3.3.6   Pulse Motor (Registration)

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

    (2)   Remove the connector **3** from (CN3) **2** of the Main Control board **1**.

    (3)   Remove two screws **4** and remove the pluse motor (registration) **6** from the motor bracket **5**.
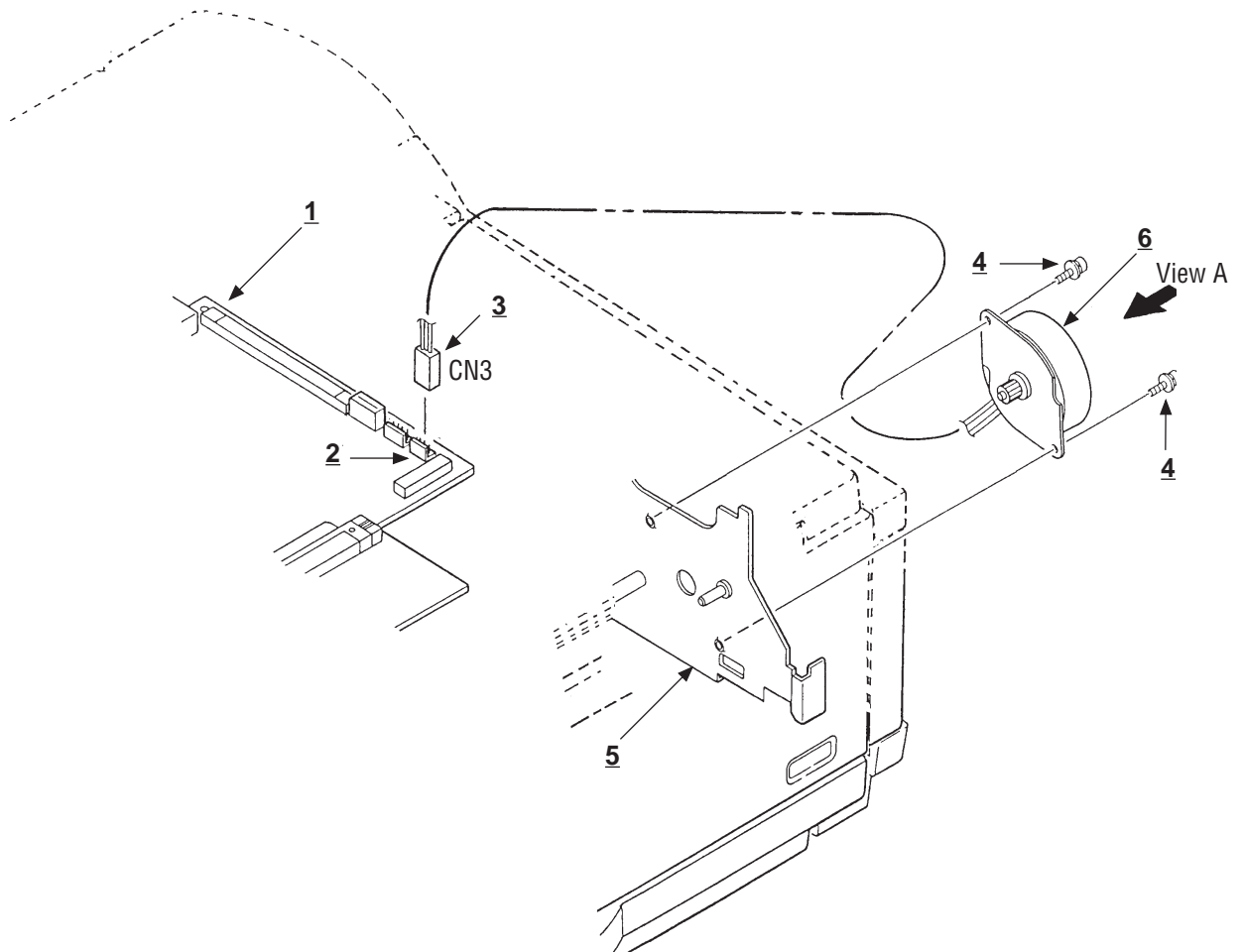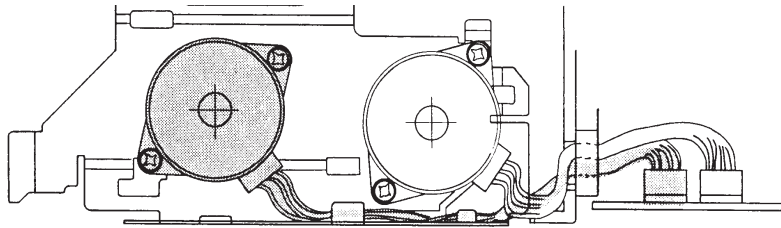
3.3.7   Lower Base Unit

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

(2) Remove the connecting cables **4** and **5** of the pulse and main motor from the connectors **2** and **3** of the Main Control board **1**.

(3) Remove the screw **9** from the grounding cable and the metal shield. The screw is located directly above CN1 and the 8-pin DIN connector for the second feeder/multi-purpose feeder.

(4) Remove the connector **6** of the LED head from the Main Control board **1**.

(5) Remove seven screws **7**, then remove the lower base unit **8**.

Note: Use care when lifting the lower base unit. Do not deform the ground clip **10** for the second sheet feeder.
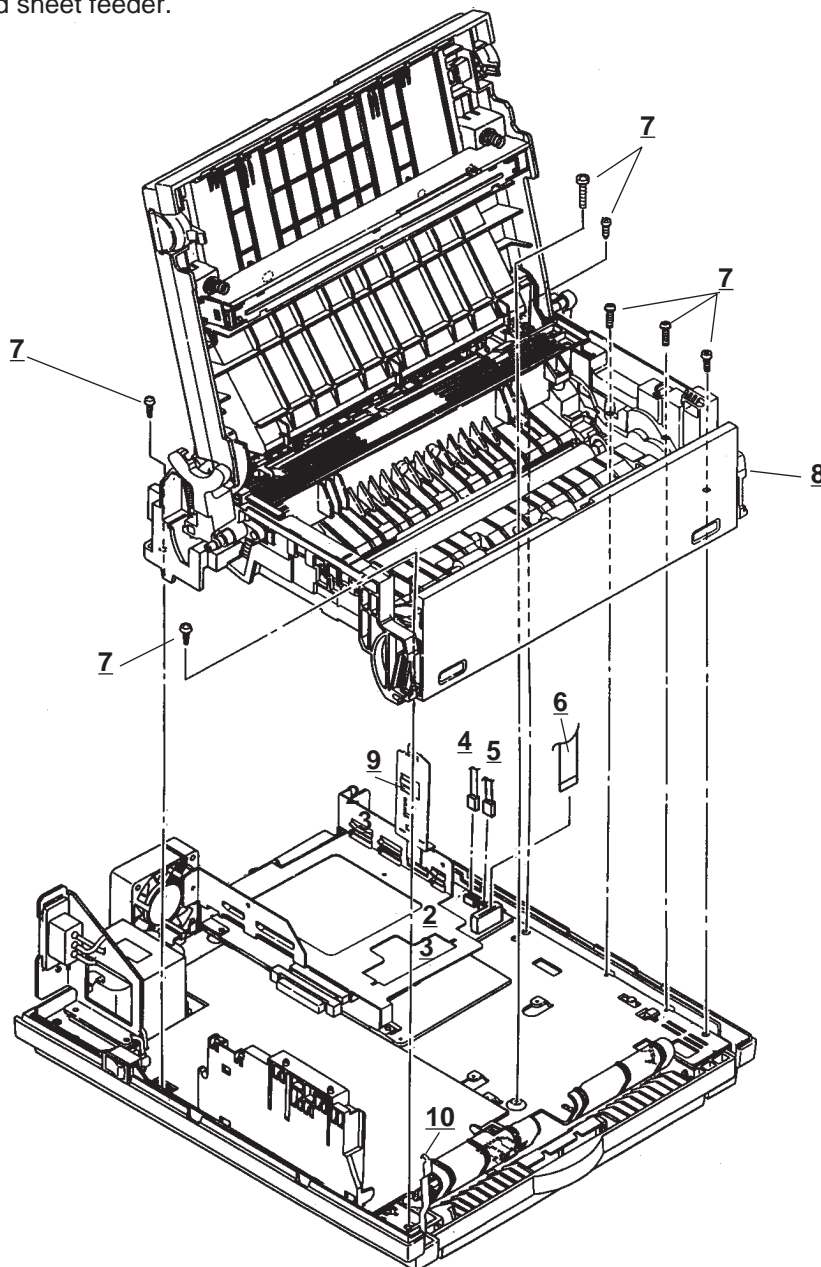
3.3.8   Motor Assembly

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

(2) Remove the lower base unit (see 3.3.7).

(3) Stand the lower base unit on its left side as shown. Free the pulse and main motor cables from the lower base unit at location **3**, , and unlock two clamp levers **2;** then remove the motor assembly **1**.

Note: Use special care, because the idle gears and the reduction gear are *not* permanently attached and will become loose.

Idle gear

1

2

Idle gear

3

Reduction gear

Clamp lever
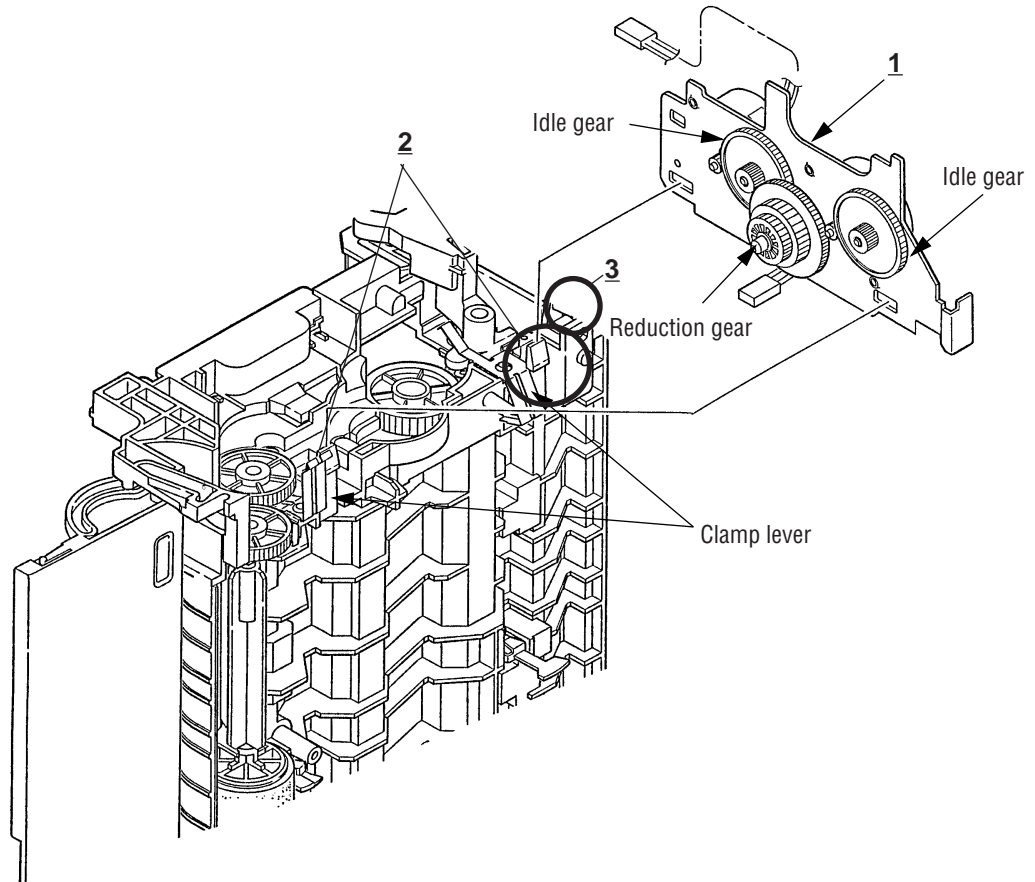
3.3.9   Hopping Roller Assembly

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

(2)   Remove the lower base unit (see 3.3.7).

(3)   Remove the motor assembly (see 3.3.8).

(4)   With the lower base unit **1** standing on its side, remove the one-way clutch gear **2** and
         the bearing (A) **3**, then remove the hopping roller assembly **4** and the bearing (B) **5**.

   Note: Take special note of the orientation and position of the bearings. Do not lose the
              bearings.
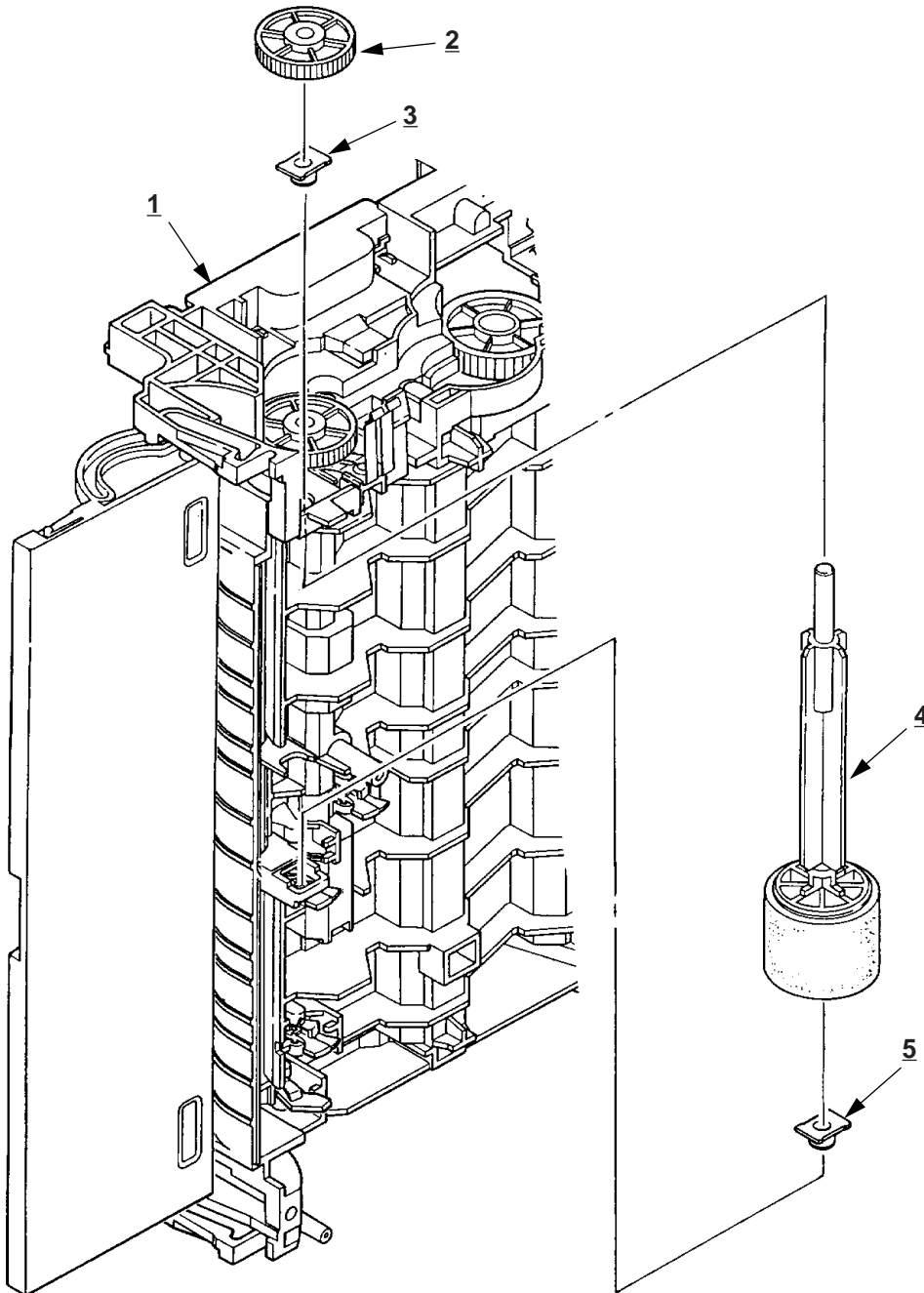
3.3.10 Stacker Cover Assembly

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

(2) Remove the LED head cable from the connector on the Main Control board and remove the LED head grounding screw (see 3.3.7, steps 3 & 4).

(3) Remove the reset lever R **1** . Remove the reset spring **2**, then turn L **4** in direction **A** to release the tabs on the face-down stacker cover assembly **5**.

(4) Release two pins of the lower base unit **3**, then remove the stacker cover assembly **5**.

Note: Use care when removing the stacker assembly, because the cover close damper **6** is not permanently attached.
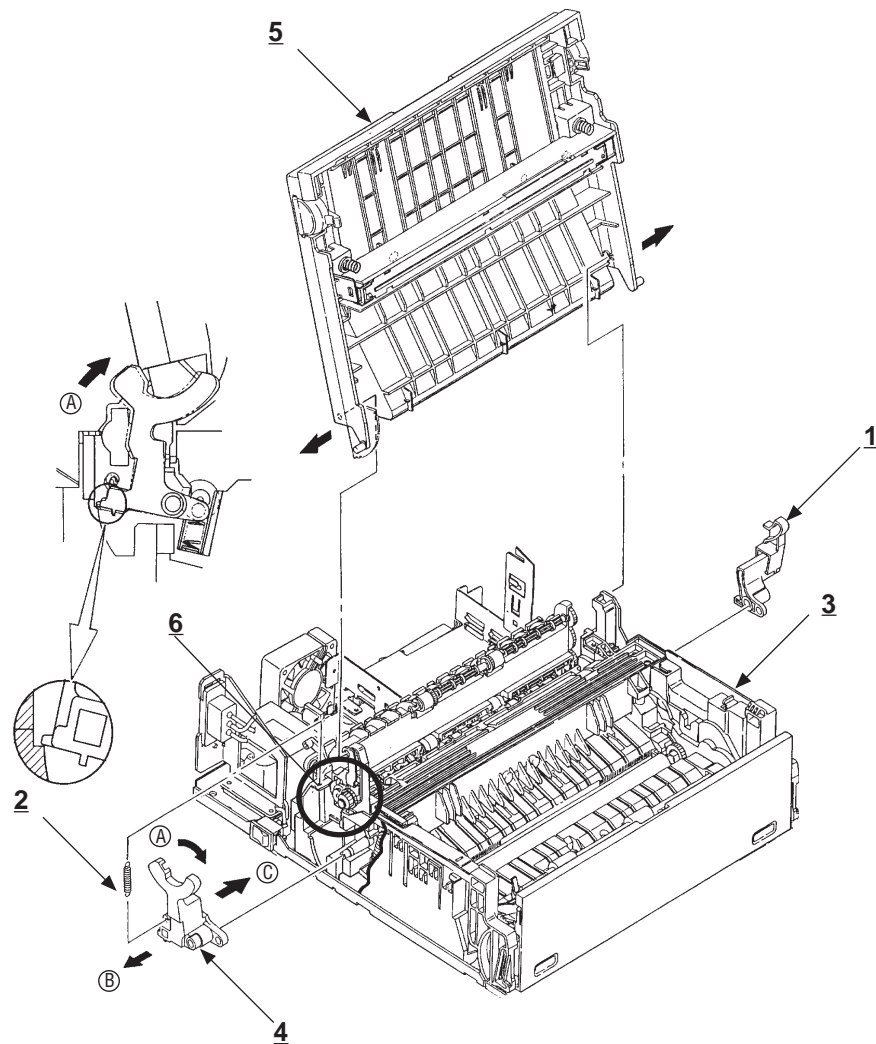
3.3.11 Registration Roller

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

(2) Remove the lower base unit (see 3.3.7).

(3) Remove the motor assembly (see 3.3.8).

(4) With the lower base unit standing on its side (view A), remove the one-way clutch gear **1**.

(5) Note the placement of the bearing on the left side of the registration roller. Press the registration roller **2** to the right side (in the direction of the arrow as shown) and lift up the left side. Remove the registration roller **2** and the bearing (registration) **3**.

View A

View A
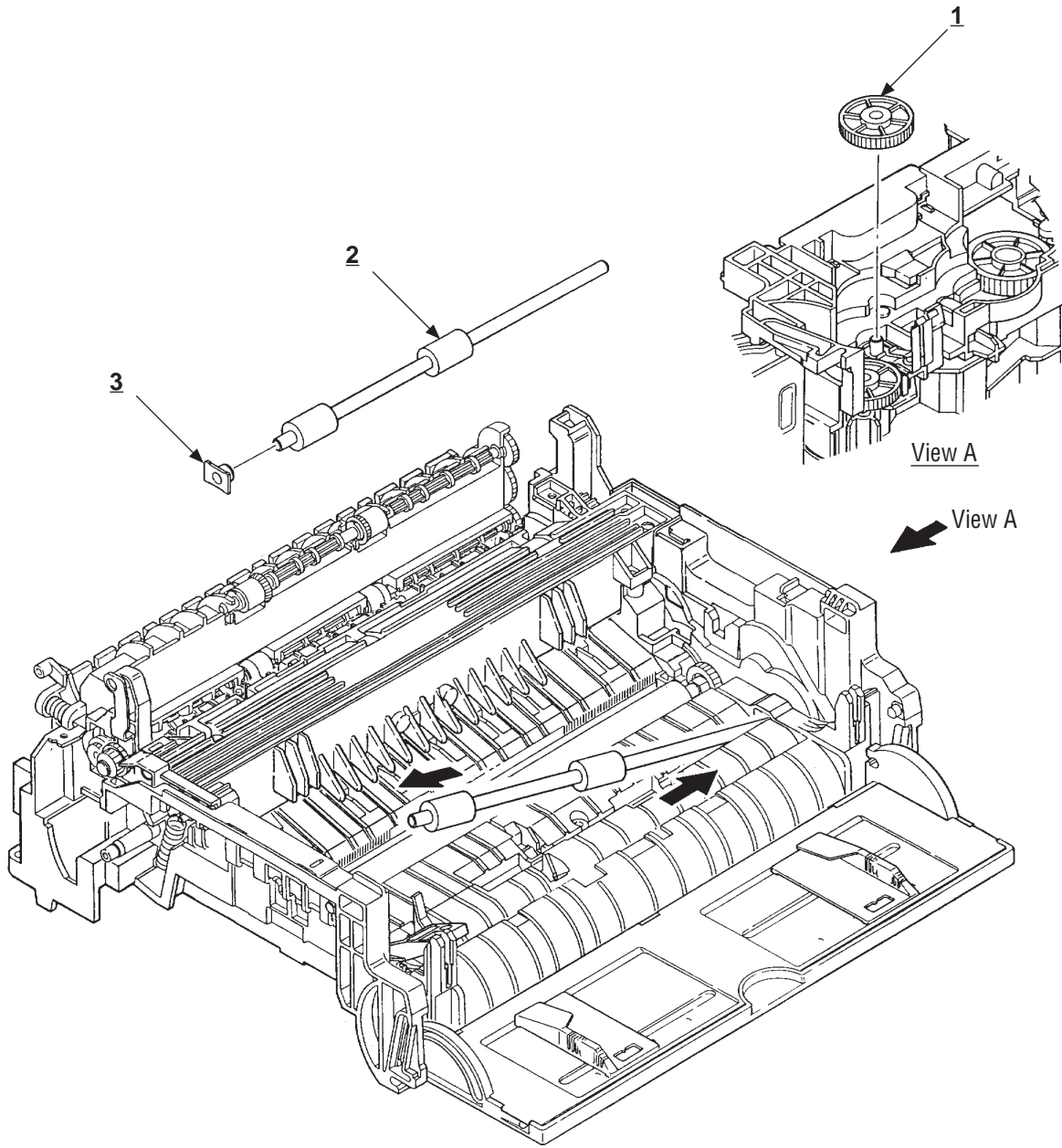
3.3.12 Transfer Roller

Special Note: Handling the transfer roller unnecessarily will cause poor print quality. *Do not* touch the surface of the roller.

Note: Use care when removing the roller: do not lose or damage the bearing.

(1) With the power switch turned off, unplug the AC power cord from the outlet.

(2) Open the stacker cover.

(3) From the top of the machine, release TR gear **1** by unlocking the latch **4** of the main unit with a small flathead screwdriver (never apply an excessive force when unlocking the latch).

(4) Lift the right side of the transfer roller **2**, and shift it to the right side, then pull it out from the main unit (at this time, the bearings **3** of the left and right sides of the transfer roller **2** will release themselves).

Note: Use great care: the bearings are not permanently attached.

Insert screwdriver and pry

latch
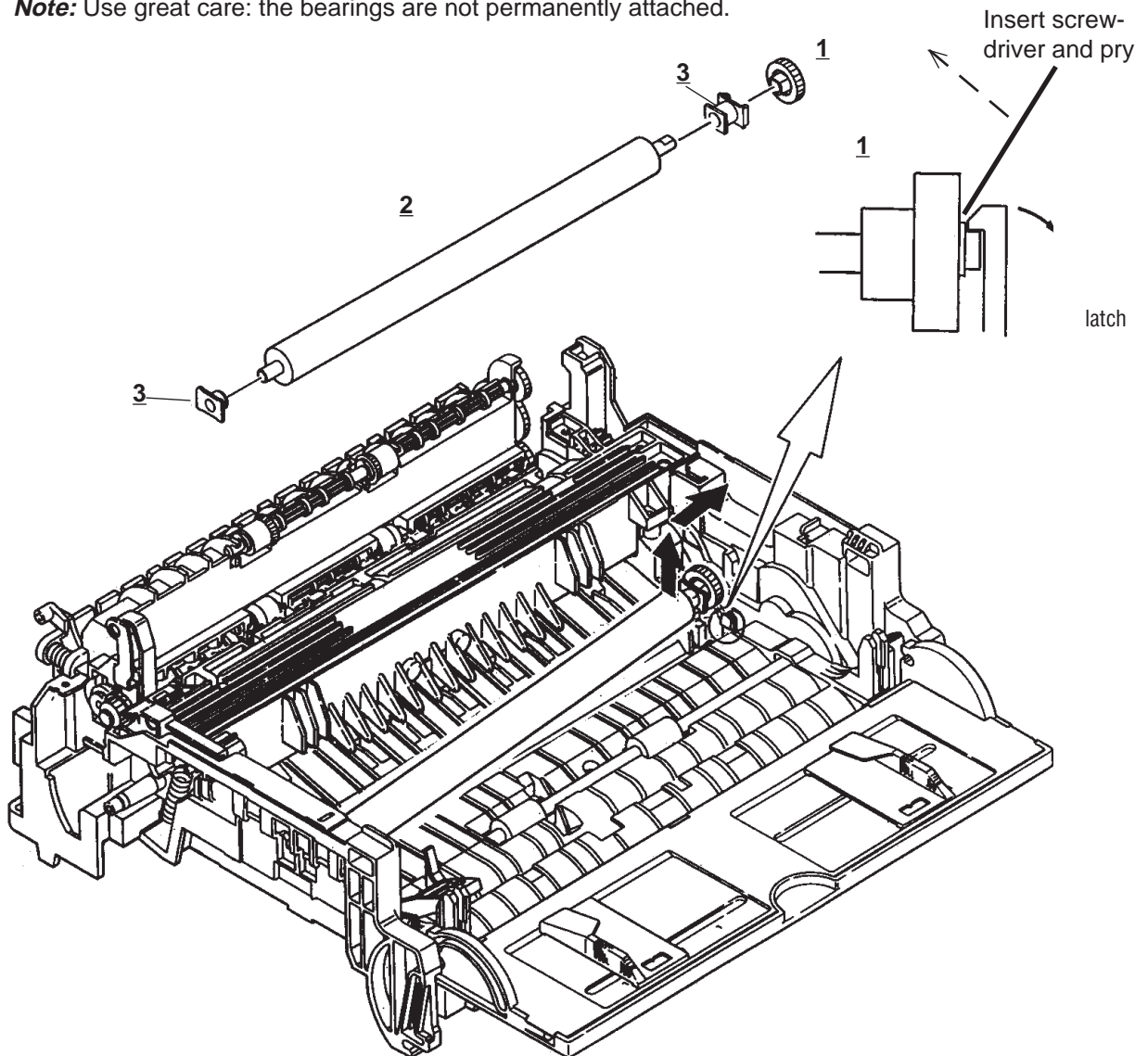
3.3.13 Fusing Unit Assembly

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

   (2) Remove the stacker cover assembly (see 3.3.10).

   (3) Remove four screws **1** and remove the fusing unit **2**.

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

   Notes:
   - When installing or removing the fusing unit assembly, tighten or loosen the screws while holding the fusing unit down with your hand.
   - When reinstalling screws **1** , be sure to direct the screws into the pre-existing hole to avoid damaging the threads.
   - Do not apply excessive torque when tightening the screws **1**; if these screws are stripped, the entire lower unit assembly must be replaced.
   - When reinstalling the fuser, insert the left side first, then lower the right side into place.
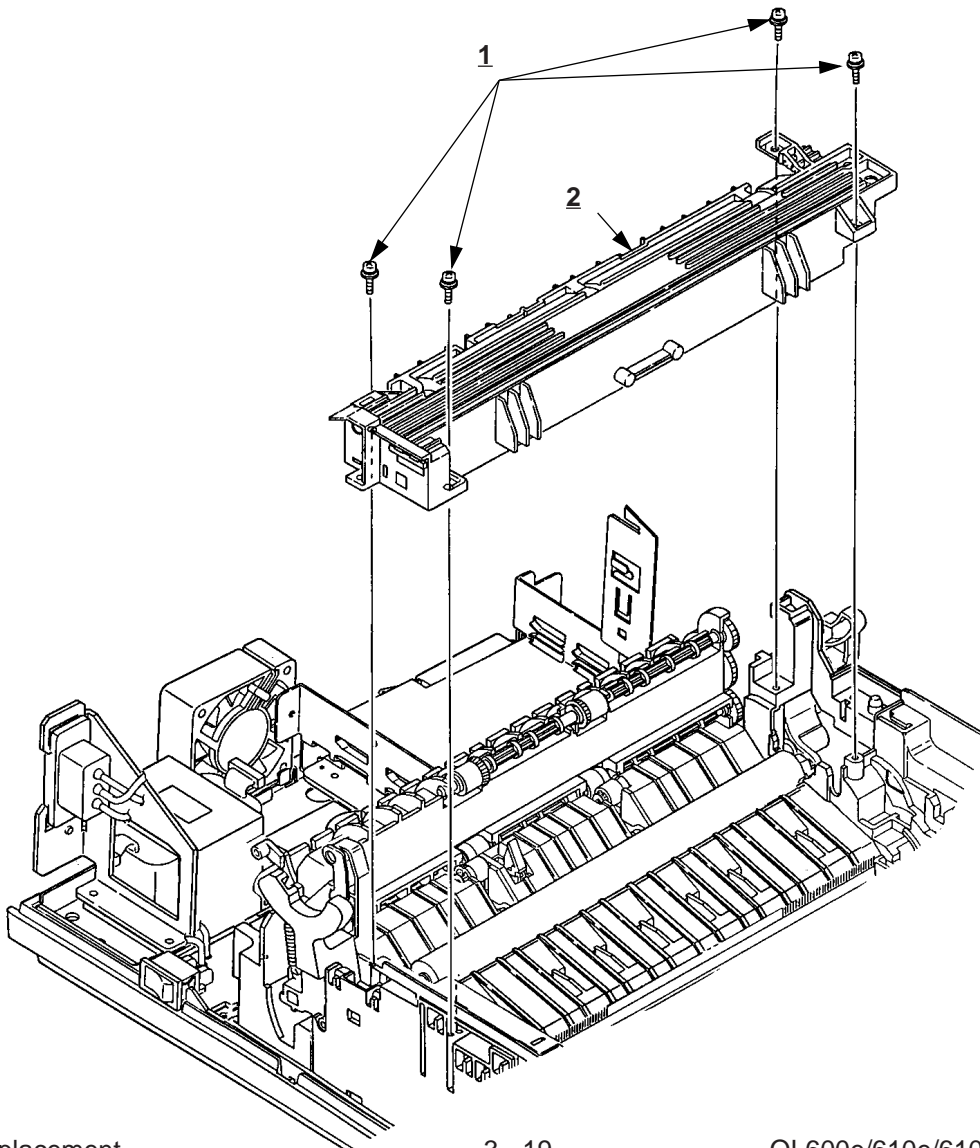
3.3.14   Fusing Pressure Roller

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

(2)   Remove the stacker cover assembly (see 3.3.10).

(3)   Remove the lower base unit (see 3.3.7).

(4)   Remove the fusing unit assembly (see 3.3.13).

(5)   Remove the motor assembly (see 3.3.8).

(6)   Remove the reset lever R (see 3.3.10 for location). Press down on the fusing pressure roller to take pressure off of the reset lever R.

(7)   Lift the right side of the fusing pressure roller **1**, and pull it out to the right side (at this time, two bushings **2** and the bias springs **3** will release themselves).

Note: • Do not bend or lose springs.
          • Note the orientation and position of the bearings, springs, and ground clips.
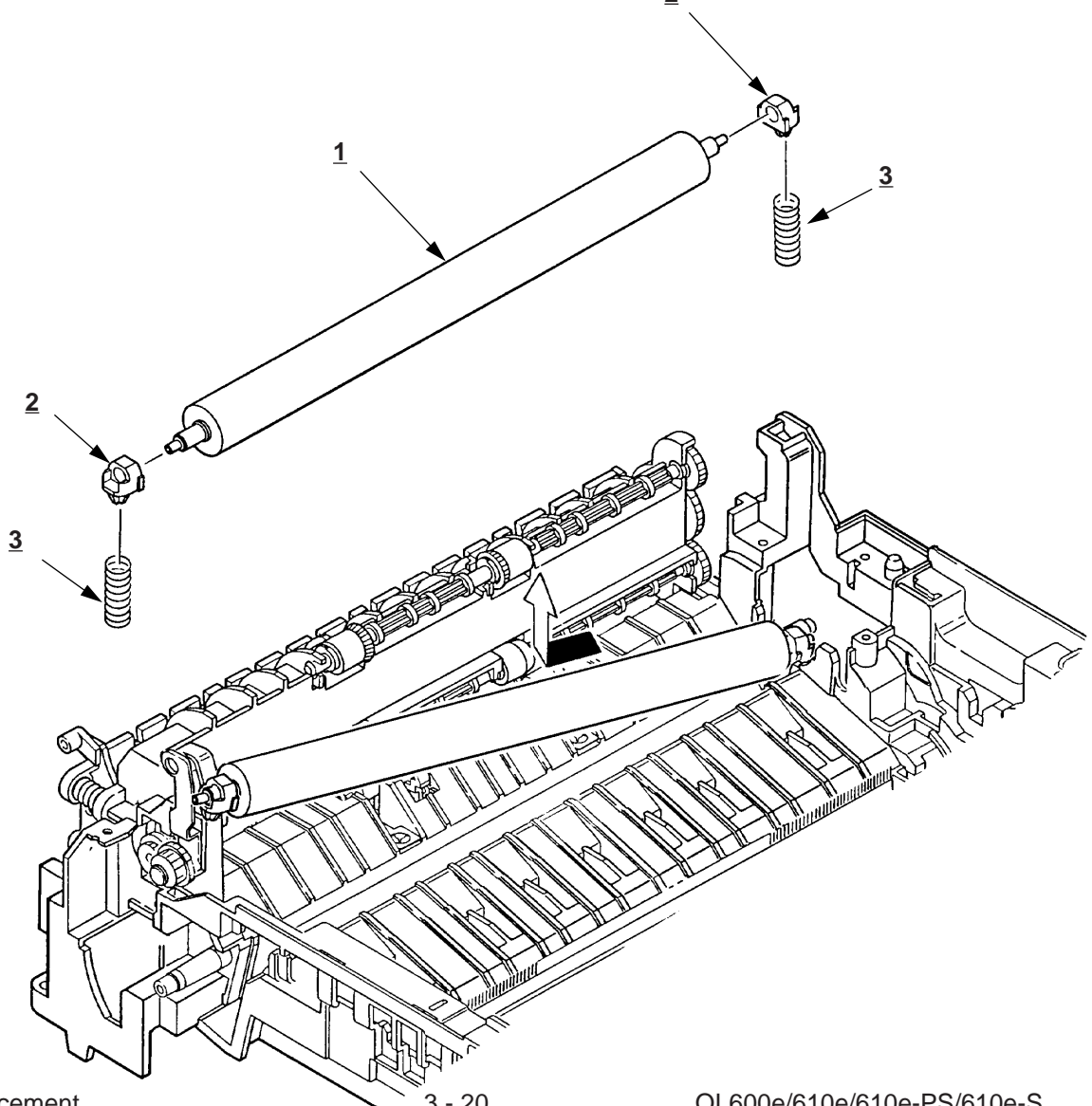
3.3.15   Sensor Plate (Inlet)

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

(2)   Remove the lower base unit (see 3.3.7).

(3)   Press the clamps of three sensor plates (inlet) **1**, and remove the sensor plates by
pressing them upward from the bottom side.
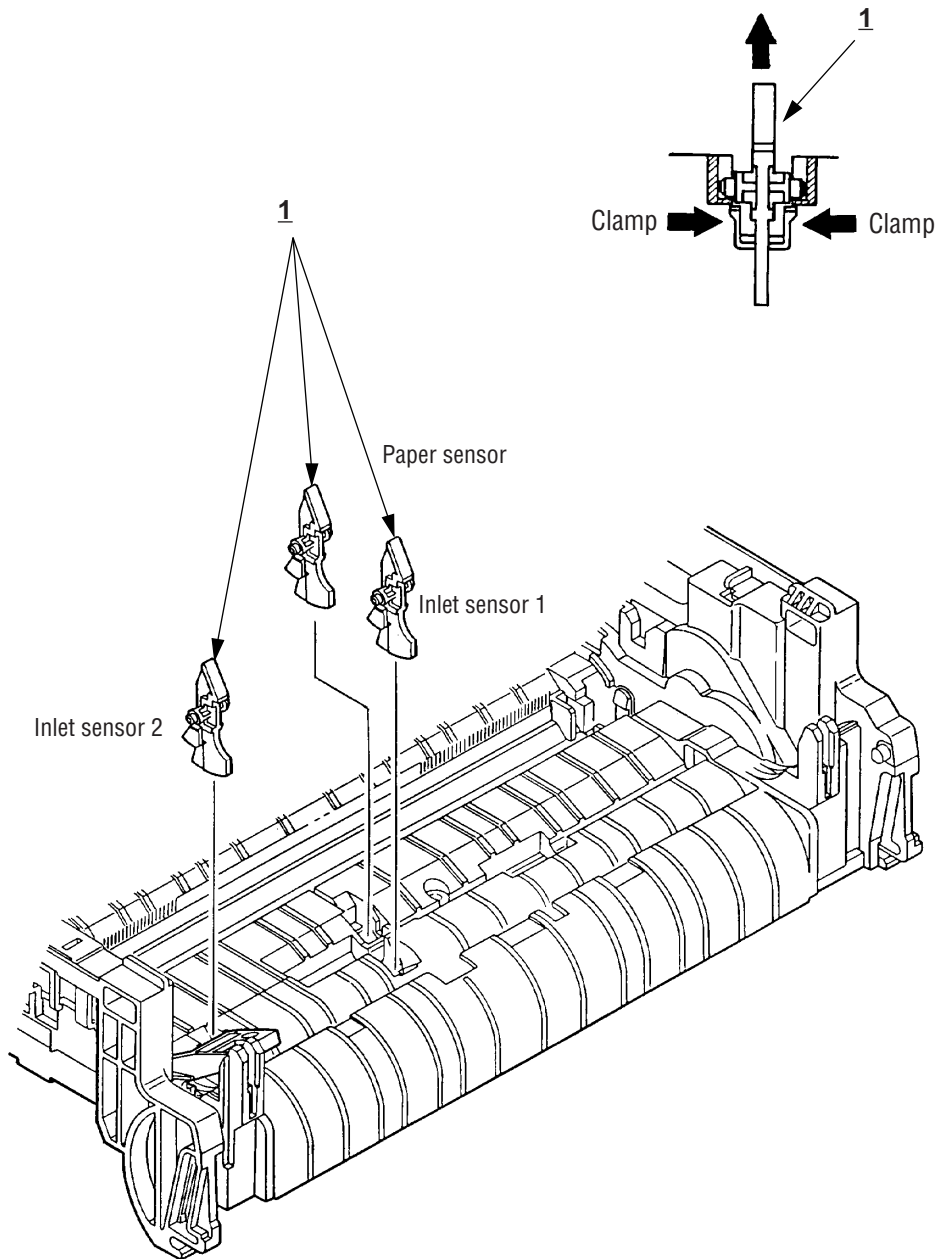
3.3.16   Toner Sensor (Adhesion)

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

(2)   Remove the lower base unit (see 3.3.7).

(3)   Press the clamp of the toner sensor **1**, and remove the sensor by pushing it up from the bottom.

Clamp ➡   ⬅ Clamp

1

1
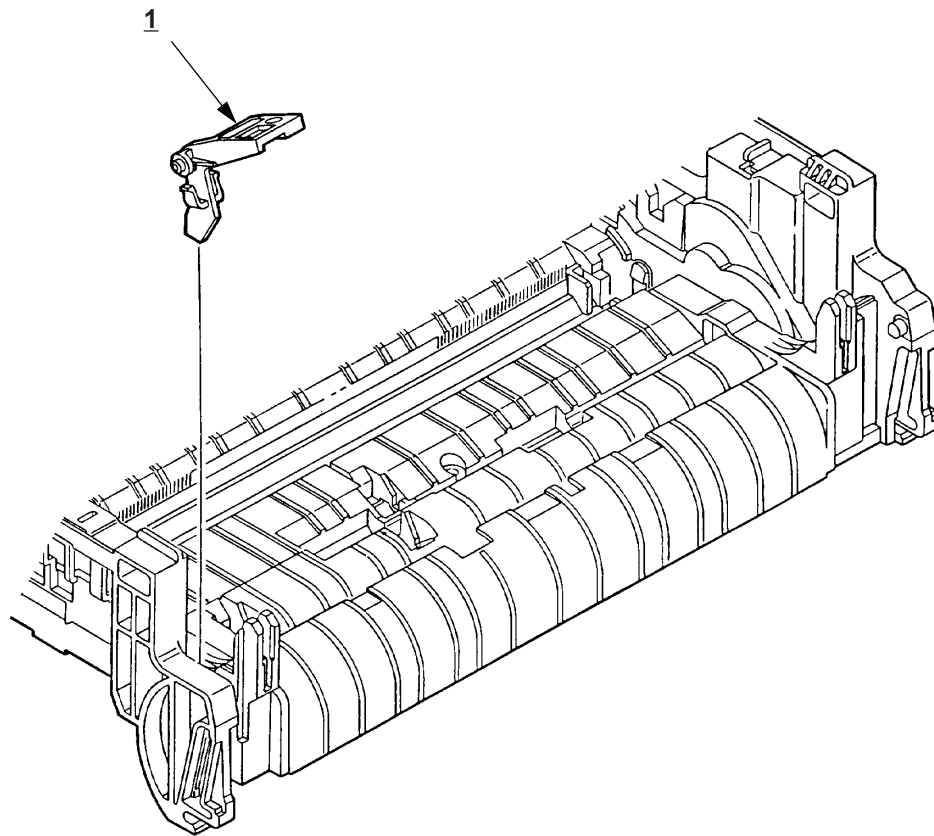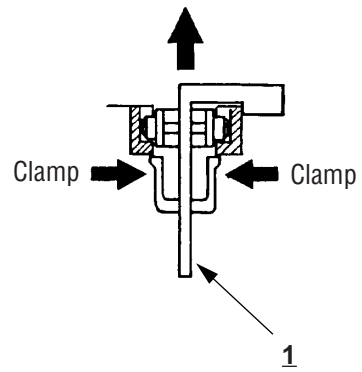
3.3.17 Sensor Plate (Outlet)

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

(2) Remove the eject roller assembly (see 3.3.4).

(3) Remove the lower base unit (see 3.3.7).

(4) Remove the fusing unit assembly (see 3.3.13).

(5) Press the clamp of the sensor plates (outlet) **1**, and remove the sensor plate by pushing it up from the bottom.

Note: This is a two-part sensor. Use great care when handling/replacing.
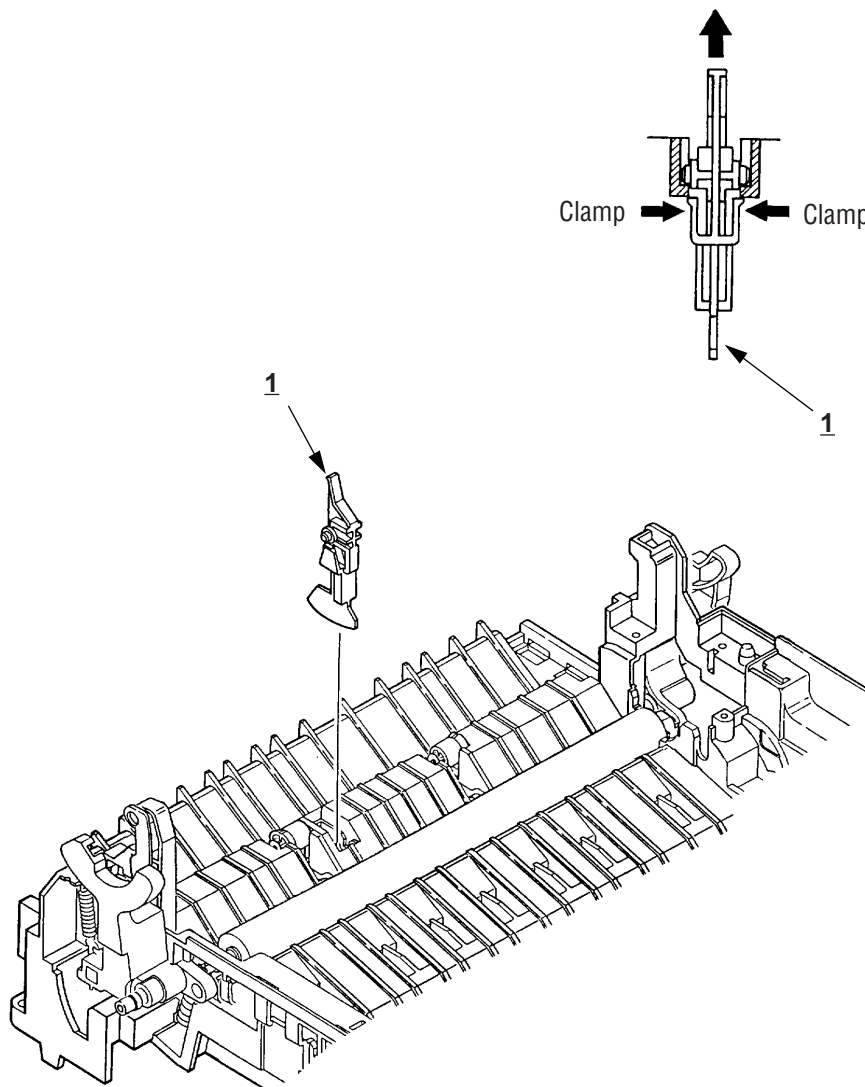
3.3.18 Manual Feed Guide Assembly

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

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

Note: When re-mounting, verify the proper the engagements as shown in the diagram.

Put into the post.

Put into the groove.

1
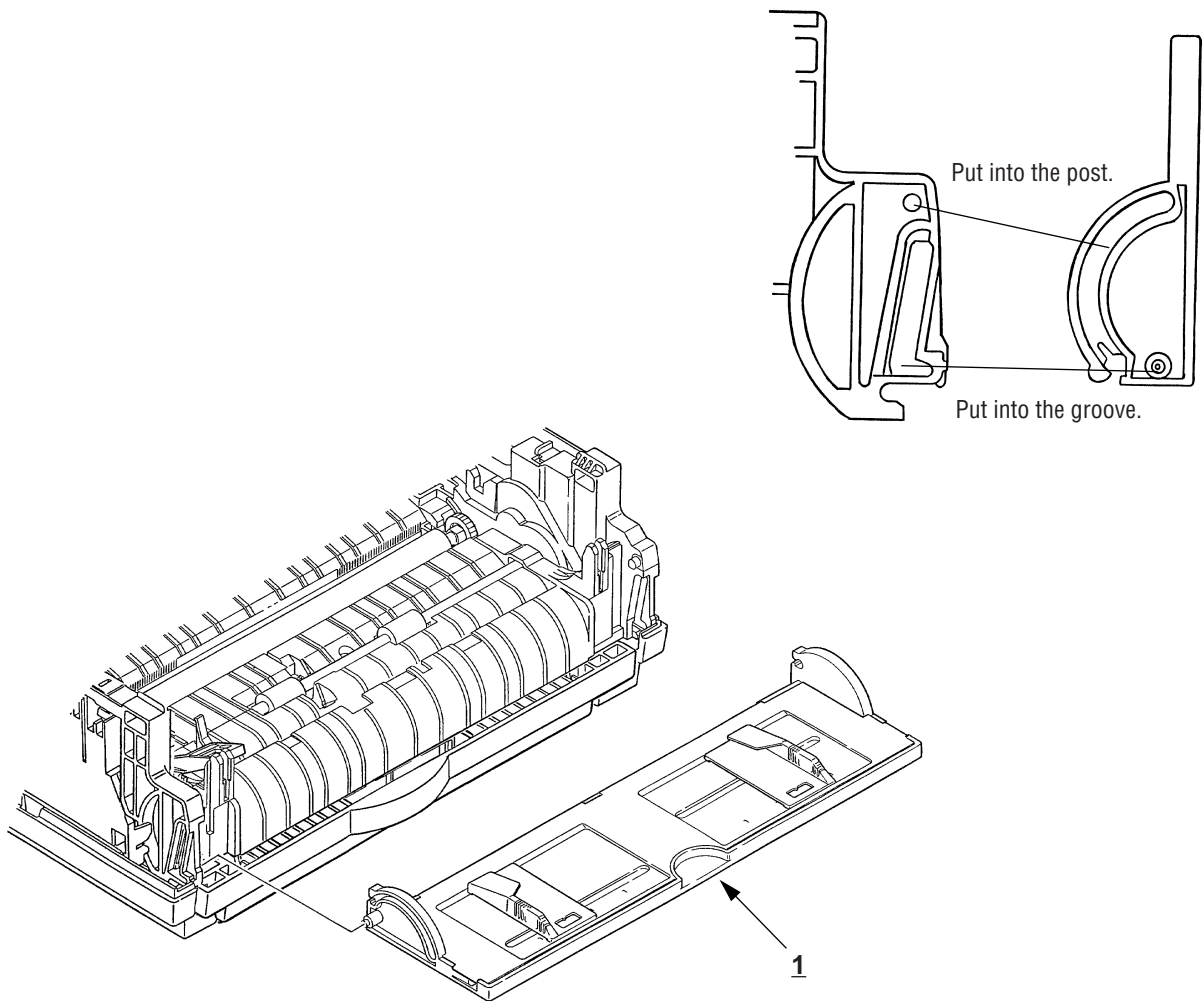
3.3.19 Sensor Plate (Paper Supply)

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

(2) Remove the lower base unit (see 3.3.7).

(3) Press the clamp of the sensor plate (paper supply) **1**, and remove it from the base plate **2**.

View A

View A
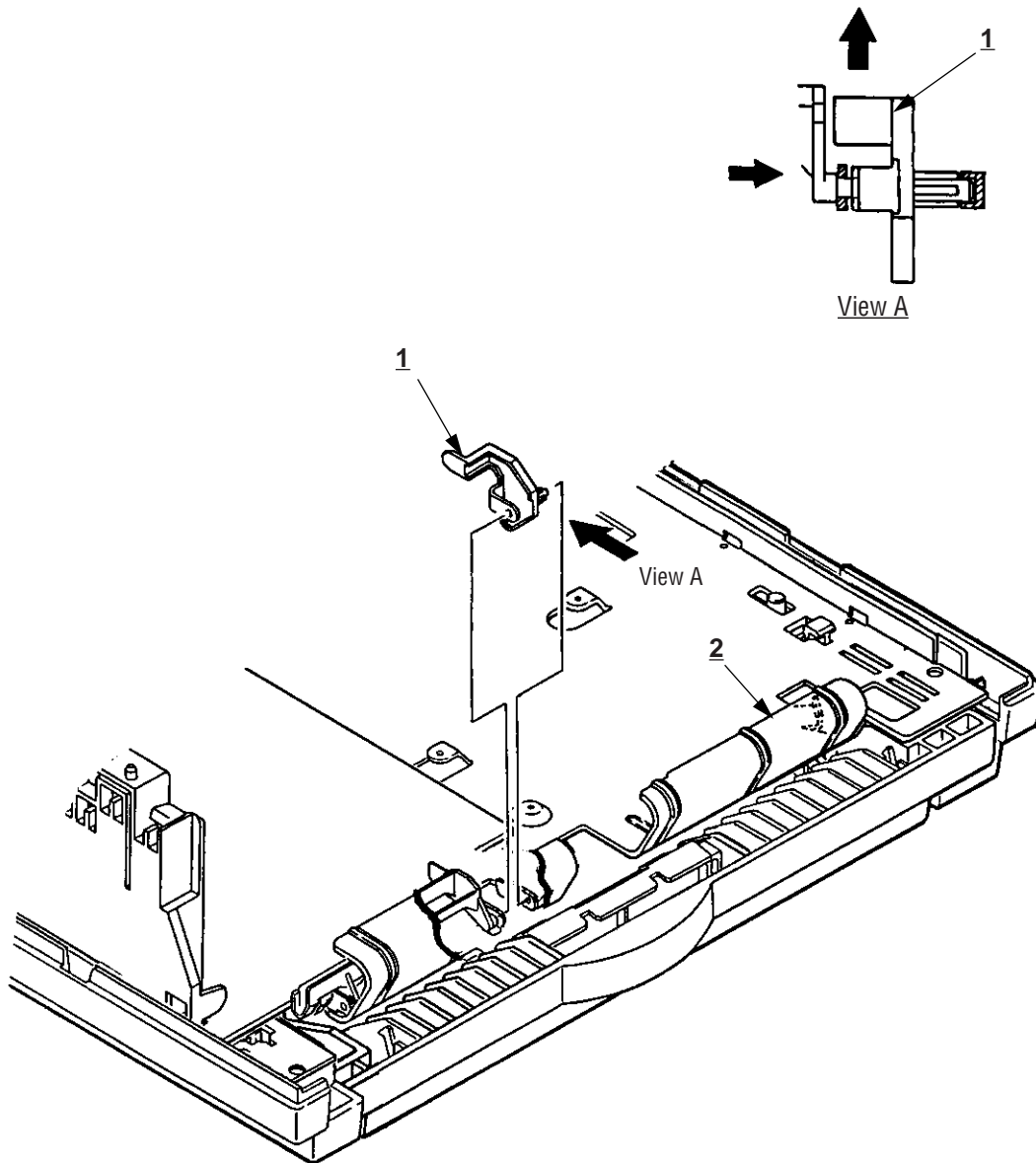
3.3.20 Main Control Board

Note: All user settings are lost when the main logic board is changed.

The Main Control board is different for each model.
    OL600e :   LQ5C-PCB
    OL610e and OL610e/PS :   LQ6C-PCB

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

(2) Remove the lower base unit (see 3.3.7).

(3) Remove two screws **1**.

(4) Move the Main Control board **2** in the direction of arrow A to disconnect it from the power supply board **3**.

(5) Disconnect the LED head cable, the fan motor connector **5**, the main motor connector CN2, and the registration motor connector CN3 from the Main Control board CN1. On the OL610e/PS, disconnect the operator panel cable. Then remove the Main Control board **2** together with the board guide plate **4**

(6) Remove three screws **6** and two posts **7**, and remove the board guide plate **4** from the Main Control board **2**. Do not bend or lose ground plate **9**.
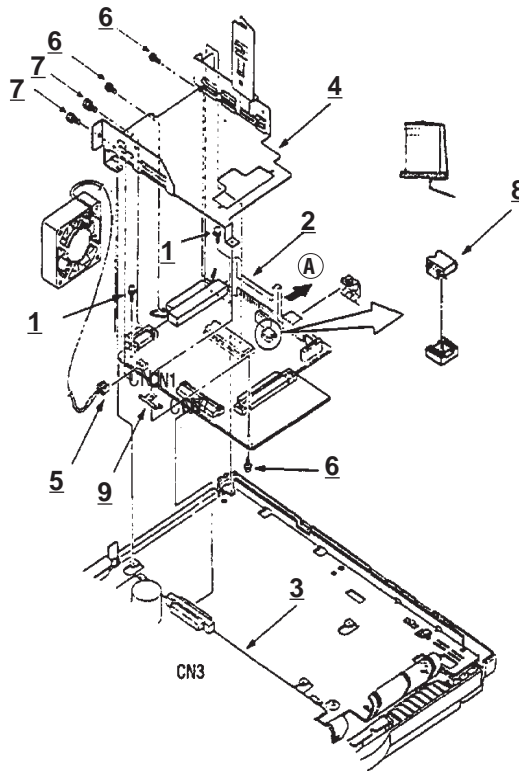
3.3.21 Power Supply Board and Contact Assembly

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

(2) Remove the lower base unit (see 3.3.7).

(3) Remove the Main Control board (see 3.3.20).

(4) Remove the AC inlet **1** from the inlet holder **2**, and remove the connector **3** of the transformer from CN1.

(5) Remove the screw **4**, and remove the ground cable **5**.

(6) Remove three screws **6**, and remove the power supply board **7** and contact assembly **8** at the same time.

(7) Unlock two claws **9**, and remove the contact assembly **8** from the power supply board **7**.

Notes: • When mounting the lower base unit, be careful around the paper end sensor.
• Do not apply excessive force to the power switch during reassembly.
• When reinstalling the power supply/sensor board onto the base plate, be careful not to bend the mounting tabs **10** on the base plate.
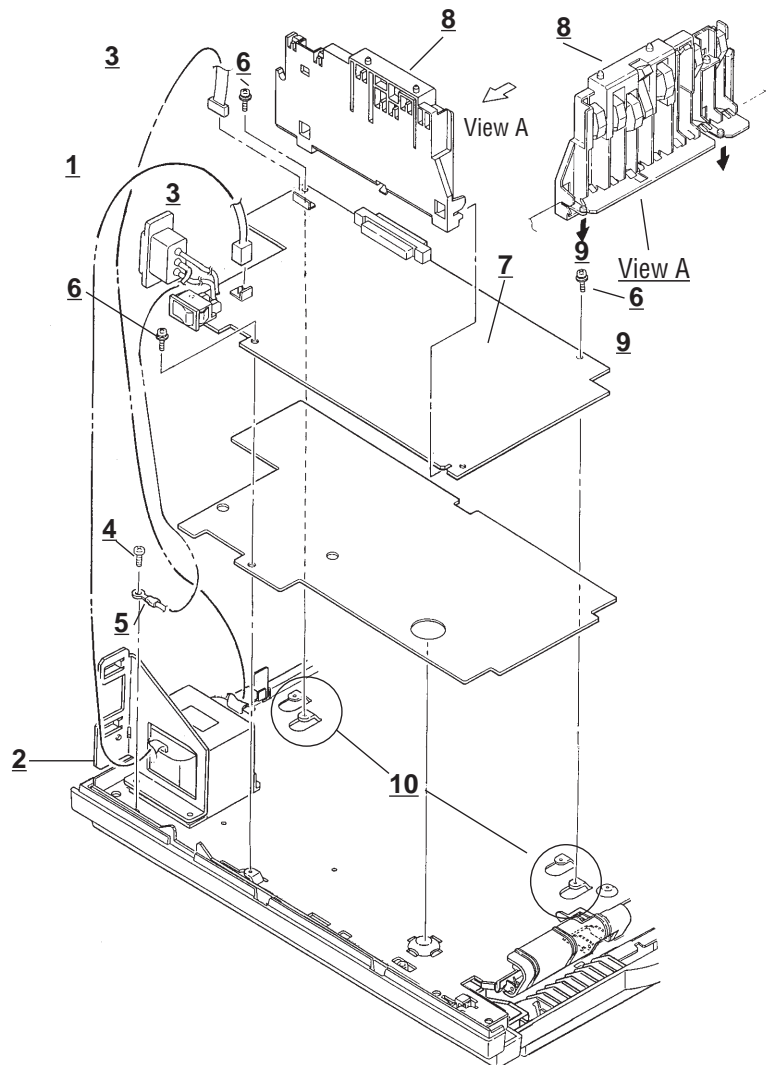
3.3.22 Transformer

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

    (2)   Remove the lower base unit (see 3.3.8).

    (3)   Remove the connectors (CN1 and CN2).

    (4)   Remove the inlet **3** from the inlet holder **2**.

    (5)   Remove two screws **1**, and remove the inlet holder **2** and the transformer **4**.
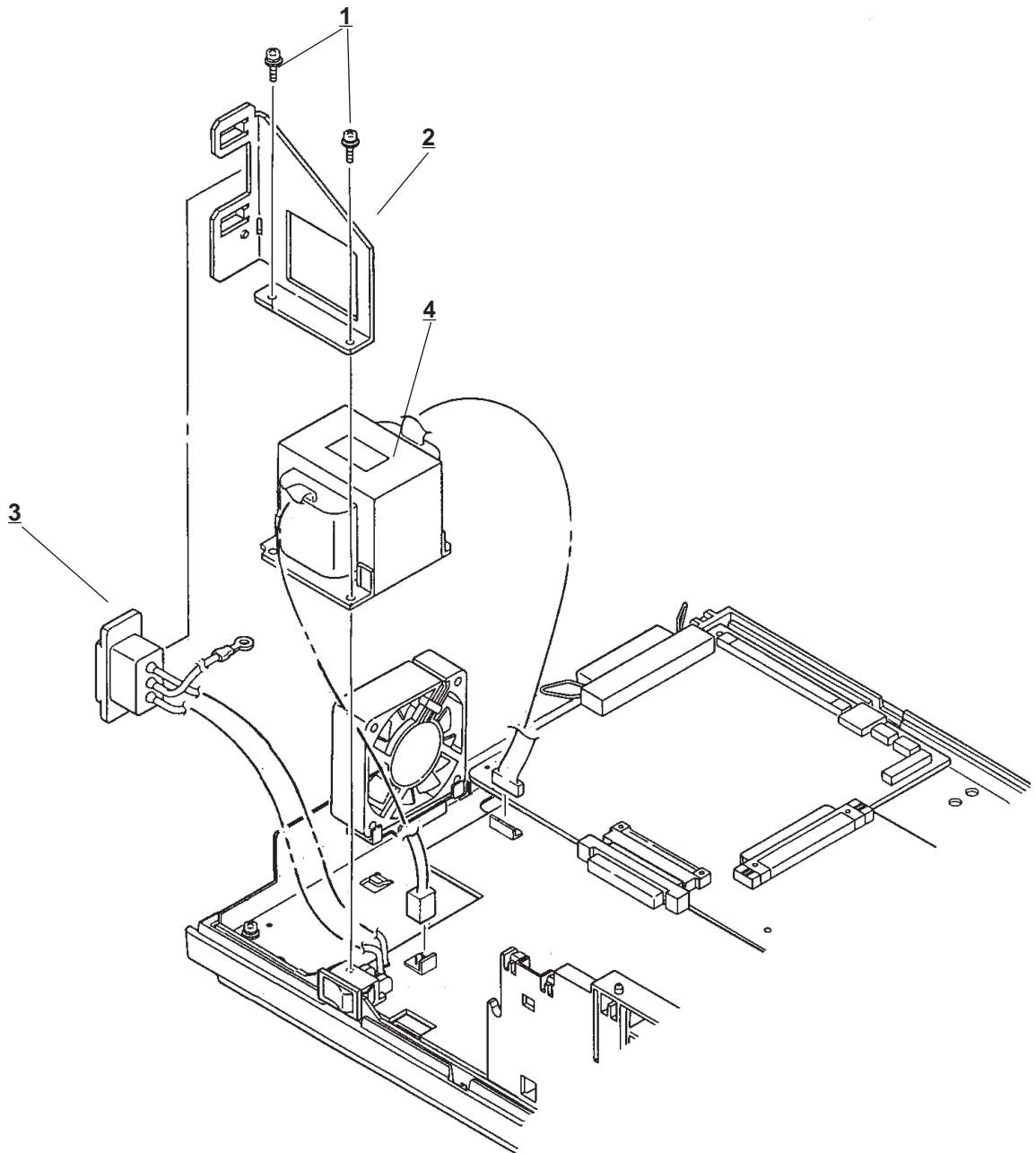
3.3.23   Cassette Guide L

    (1)   Remove the paper cassette.

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

    (3)   Remove the lower base unit (see 3.3.8).

    (4)   Remove the Main Control board (see 3.3.21).

    (5)   Remove the power supply board (see 3.3.22).

    (6)   Remove the screw **1**, and remove the cassette guide L **2** by shifting it in the direction of the arrow.

    (7)   Detach the eject spring **3**, and remove the support spring **4** from the cassette guide L **2**.
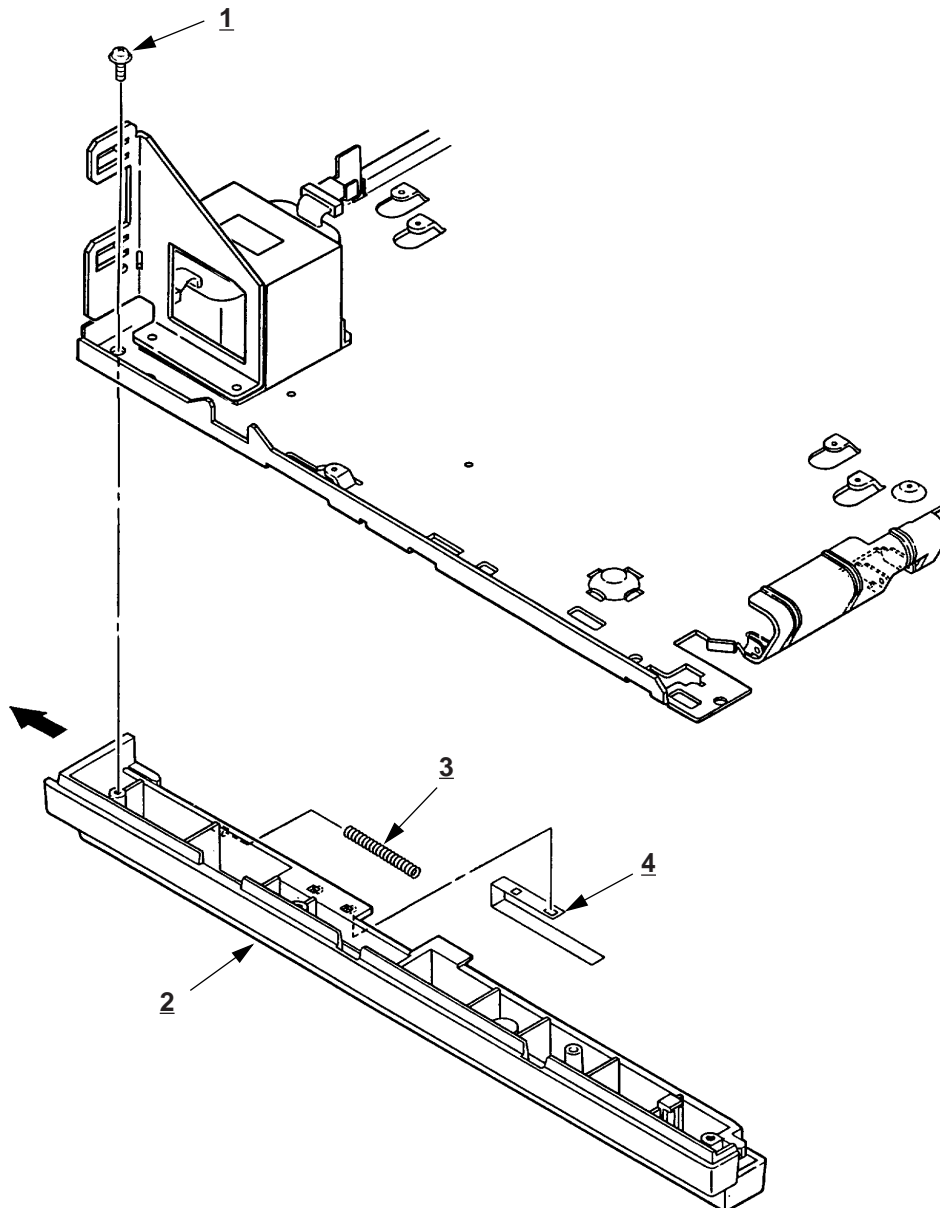
3.3.24 Cassette Guide R

(1) Remove the paper cassette.

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

(3) Remove the lower base unit (see 3.3.8).

(4) Remove the Main Control board (see 3.3.21).

(5) Remove the screw **1**, and remove the cassette guide R **2** by shifting it in the direction of the arrow.

(6) Pull the eject spring **3** out of the cassette guide R **2**, then remove the support spring **4**.
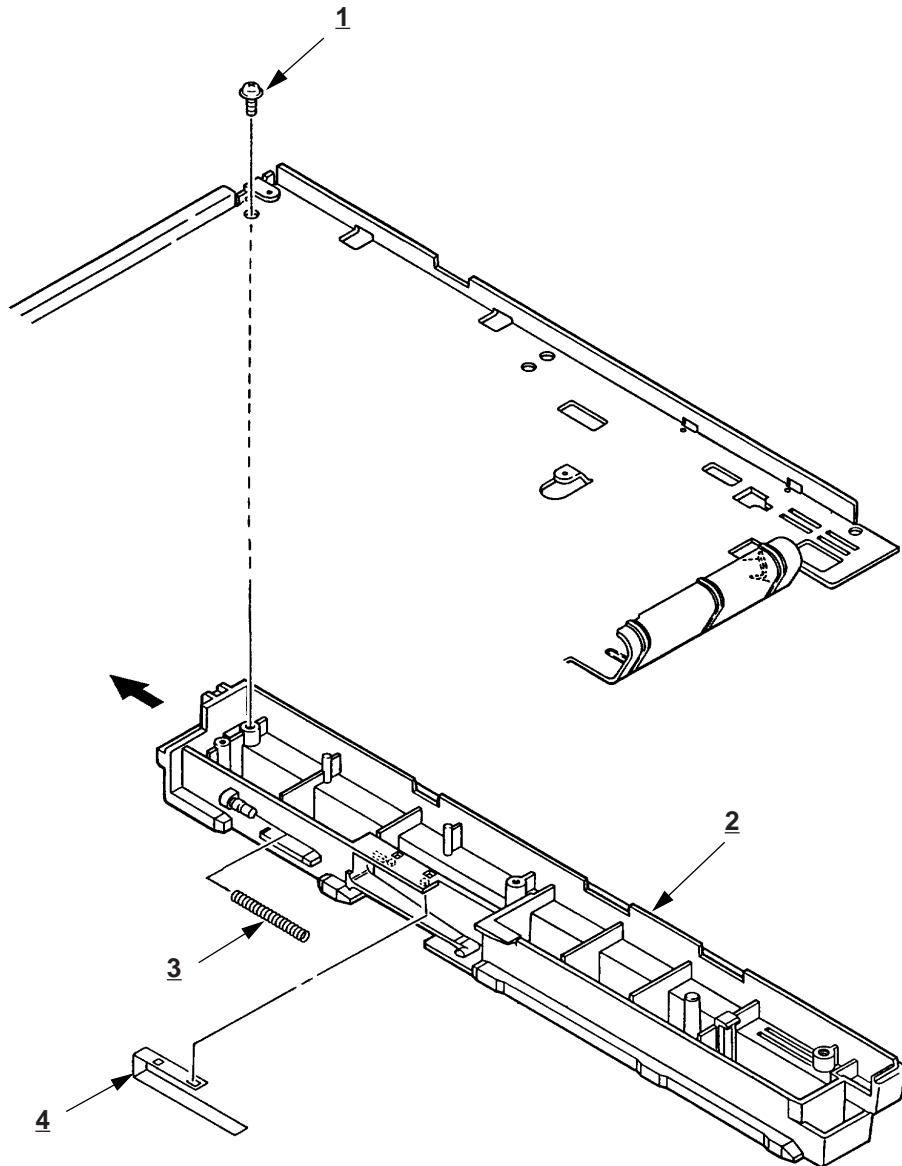
4.   ADJUSTMENT

This chapter describes the adjustments necessary when replacing a part. The adjustments are made by changing the parameter value set in EEPROM on the Main Control PCB. The parameter can be set from the operator panel (OL610e/PS only) or from the DOS Operator Panel software (OL600e, OL610e only) .

4.1   Maintenance Menus and Functions

4.1.1   User Maintenance Menu—OL610e/PS

End-users can use this mode.
To enter the user maintenance menu, turn the printer on while holding down the MENU button.

Functions:

- Hex dump
- Menu reset
- X-adjust / Y-adjust

- Drum counter reset
- Operator panel menu disable

Detailed descriptions of these functions are provided in Appendix C, **Software Diagnostics & Adjustments**.

4.1.2   System Maintenance Menu—OL610e/PS

Note: Only service personnel should use this mode; it should not be released to end-users.

To enter the system maintenance menu, turn the printer on while holding down the RE-COVER key.

Functions:

- Page count display
- Page count printing enable/disable
- Rolling ASCII continues printing

- Loop test
- EEPROM reset

Detailed descriptions of these functions are provided in Appendix C, **Software Diagnostics & Adjustments**.

4.1.3   Engine Maintenance Menu—OL610e/PS

>   ***Note:***   Only service personnel should use this mode; it should not be released to end-users.

>   To enter the engine maintenance menu, turn the printer on while holding down the FORM FEED and ENTER buttons.

>   Functions:

>   - Head drive time setting
>   - Printing start position setting
>   - Drum count display

>   - Drum count total display
>   - Engine reset
>   - Factory adjustment

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

>   Detailed descriptions of these functions are provided in Appendix C, **Software Diagnostics & Adjustments**.

4.1.4.   DOS Operator Panel—OL600e, OL610e

>   Settings Tab

>   At the DOS Prompt, enter <u>OL600</u>, then click on Settings.

>   Functions:

>   - Reset EEPROM, Menu, Drum count

>   - Print position adjust

>   Detailed descriptions of these functions are provided in Appendix C.

>   Service Tab

>   ***Note:***   Only service personnel should use this mode; it should not be released to end-users.

>   At the DOS Prompt, enter <u>OL600 \S</u> , then click on Service.

>   Functions:

>   - Head Drive Time
>   - Climate
>   - Market Place

>   - Revision information
>   - Count information

>   Detailed descriptions of these functions are provided in Appendix C**.**

4.2   Adjustment When Replacing a Part

Adjustment is necessary when replacing any one 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).

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 set the LED head drive time.

Luminous Intensity Marking Label

10000100221127107
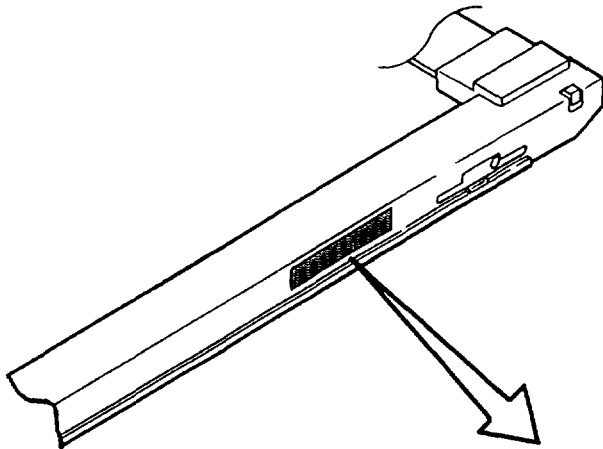
Last 3 digits represent the
LED head marking number.

Luminous intensity marking
100
I
313

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 lumious intensity marking on the LED head.

Table of Lumious Intensity Marking and Drive Time Parameter

Luminous intensity marking on LED head	Drive time parameter	Luminous intensity marking on LED head	Drive time parameter
056 ~ 062	34	132 ~ 142	23
063 ~ 065	33	143 ~ 154	22
066 ~ 069	32	155 ~ 167	21
070 ~ 076	31	168 ~ 180	20
077 ~ 082	30	181 ~ 195	19
083 ~ 088	29	196 ~ 211	18
089 ~ 096	28	212 ~ 228	17
097 ~ 104	27	229 ~ 247	16
105 ~ 112	26	248 ~ 268	15
113 ~ 121	25	169 ~ 290	14
122 ~ 131	24	291 ~ 313	13

Setting

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

OL610e/PS

Operation   LCD display after operation

Turn the POWER switch
on while holding the   ┌─────────────┐
FORM FEED and ENTER   │ ENG MNT   │
keys down.   └─────────────┘

                                        ⬇

                                  ┌─────────────┐
                                  │ LED HEAD   │   Displays previous
                                  │ No. 21 * │   parameter No.
                                  └─────────────┘

                                        ⬇

Press + or - key, until "19"   ┌─────────────┐
is displayed.   │ LED HEAD   │
                                  │ No. 19   │
                                  └─────────────┘

                                        ⬇

Press the ENTER key.   ┌─────────────┐   Parameter 19 is
                                  │ LED HEAD   │   set to EEPROM
                                  │ No. 19 * │   (* is displayed on
                                  └─────────────┘   LCD).

Turn the POWER switch on
while pressing the FORM
FEED and ENTER keys.
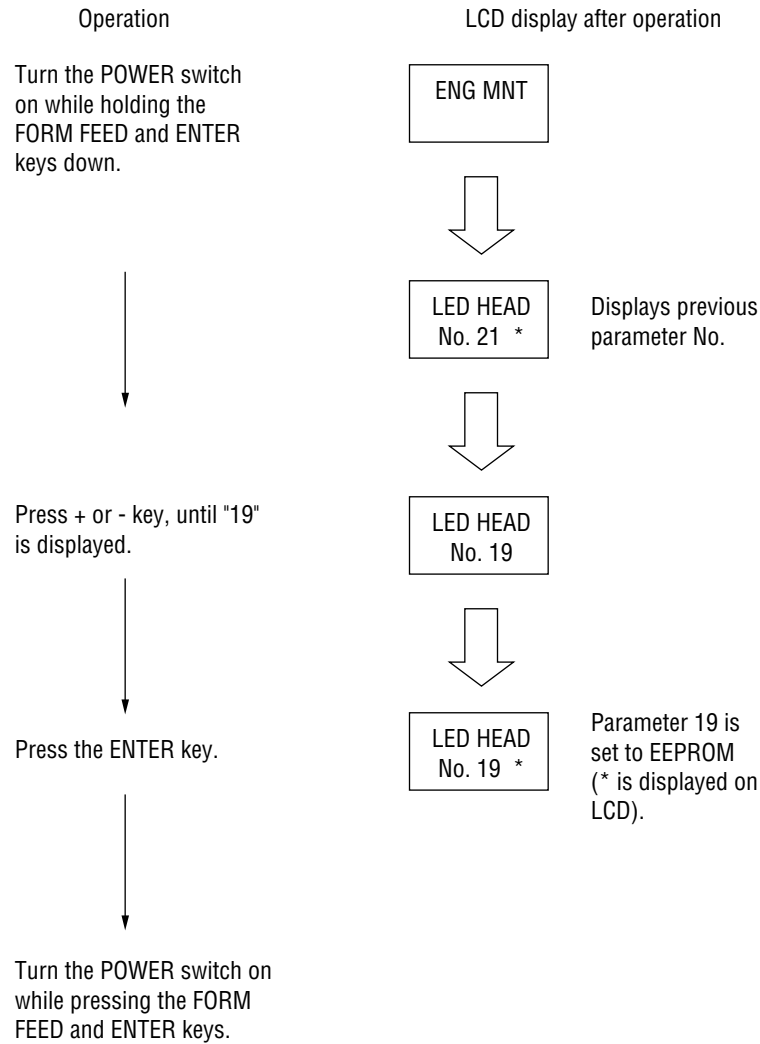
OL600e, OL610e

1.   At the DOS prompt, enter OL600 /S, then click on Service tab.
2.   On the Head Drive Time listbox, click the up arrow until 19 shows in the box.
3.   Click OK.

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5. PERIODICAL MAINTENANCE

5.1 Periodical Replacement Parts

The parts are to be replaced periodically as specified below:

Part Name	Condition for Replacement	Cleaning	Remarks
• Toner cartridge	About 2,000 sheets of paper have been printed.	• LED head	Consumables
• Image drum cartridge	About 20,000 sheets of paper have been printed.	• LED head	Consumables

5.2 Cleaning

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

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

5.2.1 Cleaning the LED Lens Array

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

Note: The LED lens array must be cleaned with an LED head cleaner, provided with each toner replacement kit.

White lines or stripes
(void, light printing)
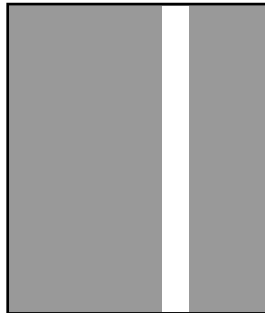
(1) Set the LED head cleaner to the LED lens array as shown in the figure, then slide the cleaner back and forth horizontally several times to clean the head.

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

(2) Throw the cleaner pad away.

LED head cleaner pad

LED lens array
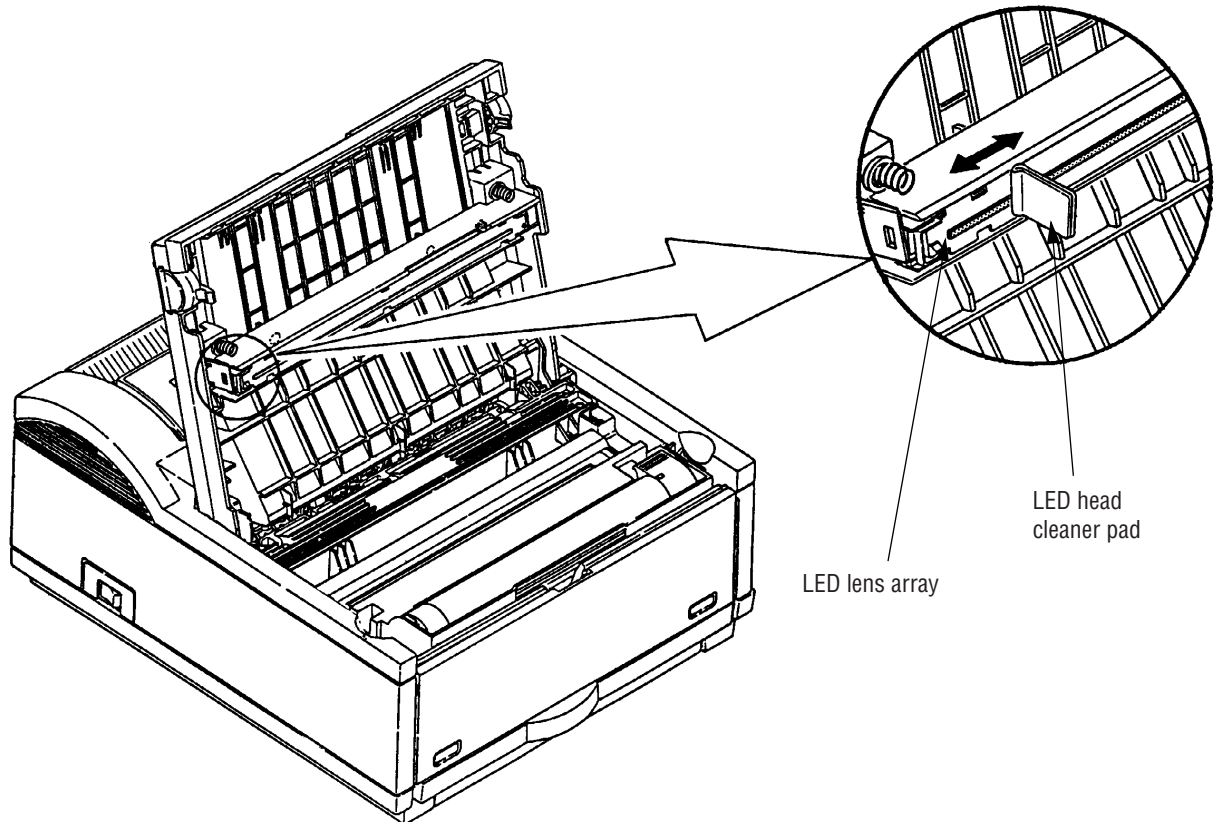
5.3 Lubrication

5.3.1 General Information

Lubricate once a year or as needed.
Use Lithium Grease.
Do not over-lubricate.
Do *not* allow lubricant to contact the surface of any rollers or paper guides.
Lubricate the items listed in the table below.

Item	Disassembly Procedure
Gear on the shaft of the main pulse motor	Section 3.3.5
Gear on the shaft of the registration motor	Section 3.3.6
Teeth of the reduction gear	Section 3.3.8
Inside of bearings, hopping roller assy.	Section 3.3.9
Hopping roller shaft	Section 3.3.9
Inside of the pivot points of the reset levers	Section 3.3.10
Gear on the damper stacker arm	Section 3.3.10
Stacker cover damper gear	Section 3.3.10
Transfer roller gear	Section 3.3.12
Inside of bearings of the transfer roller	Section 3.3.12
Ends of the back-up roller shaft	Section 3.3.14

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6. TROUBLESHOOTING PROCEDURES

Note: Be sure to use proper anti-static practices when handling electrostatically sensitive components.

6.1   Troubleshooting Tips

(1) Check the toubleshooting section in the user's manual and soft manual.

(2) Gather as much information about the situation as possible.

(3) Inspect the equipment under the conditions close to those in which the problem had occurred.

6.2   Points to Check before Correcting Image Problems

(1) Is the printer being used in proper ambient conditions?

(2) Are supplies (toner) and routine replacement parts (image drum cartridge) being replaced properly?

(3) Does the paper being used meet specifications?

(4) Is the image drum cartridge installed properly?

6.3   Tips for Correcting Image Problems

(1) Do not touch, or bring foreign matter into contact with the surface of the image drum.

(2) Do not expose the image drum to direct sunlight.

(3) Keep hands away from the fuser unit as it heats up during operation.

(4) Do not expose the image drum to light for longer than five (5) minutes at room temperature.

6.4   Preparation for Troubleshooting

(1) Operator panel display

The failure status of the printer is displayed on the software-based Status Monitor (OL600e/610e) or on the liquid crystal display (LCD) of the operator panel (OL610e/PS). Take proper corrective action as directed by messages.
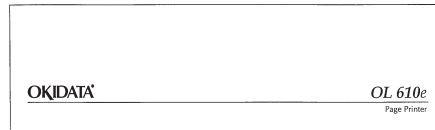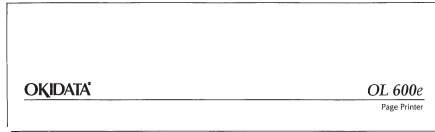
Status message display

Ready LED display

: OFF   : BLINKING

: ON   : Undefined

6.5   Troubleshooting Flow

Should there be a problem with the printer, troubleshoot according to the following procedure flow:


```
Problems
  ├── Problems indicated by message  →  Troubleshoot from the LCD status message list. See 6.5.1.  →  Carry out a detailed troubleshooting with the troubleshooting chart.  See 6.5.2.
  └── Image troubles (and troubles which are not indicated by message)  →  Carry out a troubleshooting with the troubleshooting chart.  See 6.5.3.
```
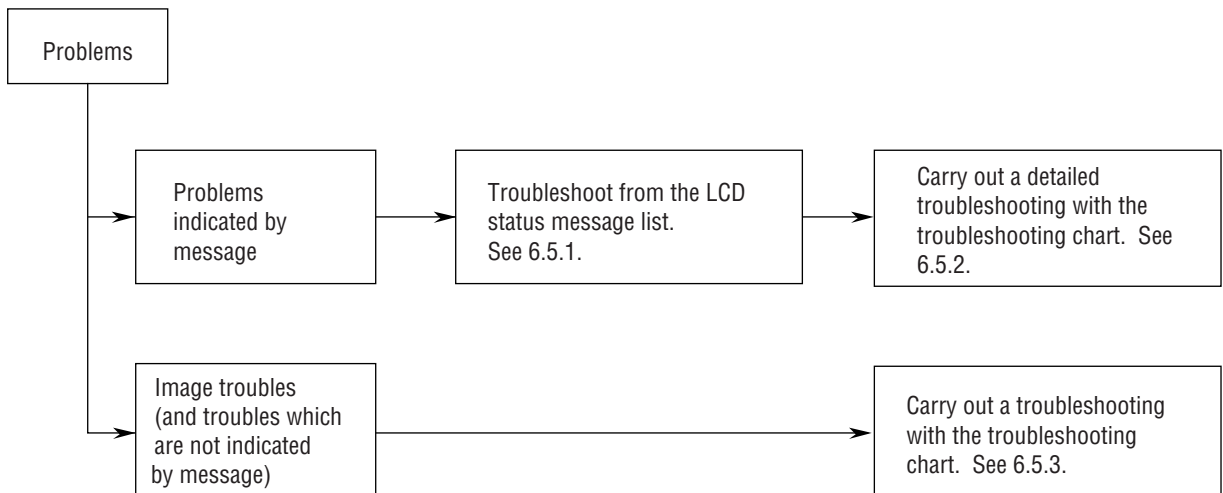
6.5.1   Status Message/Trouble List

Table 6-1 lists status messages and remedies. The messages are listed as they appear on the LCD display of the OL610e/PS and the OL610e/S. For the OL600e and OL610e, similar messages appear in the Status Monitor window.

Table 6-1

Category	Status message	Trouble or status	Remedy
Controller errors **Note:** *On the OL600e and OL610e, controller errors are described, not listed by Exception code.*	▬ `ERROR 0n` `aaaaaaaa`	An error occurred in the controller. n = Exception Code aaaaaaa = Error Address	– Normal operation cannot be ensured. Turn the power off, then back on to restart. – If normal operation is not recovered by this restart procedure, replace the Main Control PCB.
	▬ `ERROR nn`	An error occurred in the controller.	– Turn the power off, then back on to recover from the error. – If the normal operation is not recovered by this restart procedure, use the following remedial actions.

Table 6-1 (Cont'd)

Category	Status message	Trouble or status		Remedy
Controller errors **Note:** *On the OL600e and OL610e, controller errors are described, not listed by Exception code.*	■ `ERROR nn`	**Code (nn)**	**Error**	**Remedy**
		0n	A fault occurred in the controller. n = Exception Code	Replace the Main Control PCB.
		10	An error was detected by program ROM check.	Replace the Main Control PCB.
		20	An error was detected by font ROM check.	Replace the Main Control PCB.
		30	An error was detected by resident RAM check.	Replace the Main Control PCB.
		40	An error was detected by EEPROM check.	– Replace the EEPROM or Main Control PCB. – EEPROM
		50	An error was detected by optional software ROM check.	Check the optional ROM board for proper connection or replace it.

Table 6-1 (Cont'd)
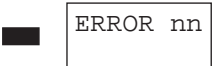
Category	Status message	Trouble or status		Remedy
Controller errors **Note:** *On the OL600e and OL610e, controller errors are described, not listed by Exception code.*	▬ `ERROR nn`	Code (nn)	Error	Remedy
		60	An error was detected by optional RAM check.	– Check the optional RAM board for proper connection. – Check the mounting position of short plugs and additional RAM chips (see 7.4). – Replace the option RAM board.
		70	A fault occurred in the Fan motor.	– Check the fan motor for proper connection and for any presence of foreign matter in the fan (see 6.5.2-**5**). – Replace the fan or the Main Control PCB.
		71	A fault occurred in the fuser (timeout error etc.).	See 6.5.2 - **4** .
		72	A fault occurred in the fuser (thermistor open error).	See 6.5.2 - **4** .
		73	A fault occurred in the fuser (thermistor short error).	See 6.5.2 - **4**.
		74	Power supply board SSIO I/F error	
		80	I/F timeout occurred between the Main Control PCB and the operator panel.	– Check the operator panel for proper connection. – Replace the flexible cable, operator panel or Main Control PCB.

Table 6-1 (Cont'd)
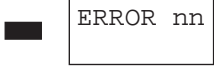
Category	Status message	Trouble or status		Remedy
Controller errors	■ `ERROR nn`	Code (nn)	Error	Remedy
		81	I/F timeout occurred between the Main Control PCB and the optional tray (2nd tray, envelope feeder, etc.).	Check the optional tray for proper connection.
		90	A watchdog timer timeout occurred.	– Turn the power off, then back on to recover from the error. – Replace the Main Control PCB.
Cover open	■ `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 board.
Jam errors	■ `tray INPUTJAM`	A jam occurred during paper hopping from the tray being displayed . tray: TRAY 1, TRAY 2, FEEDER		– Check the paper in the cassette. Open and then close the cover. When the cover is closed, recovery printing is carried out and the error display is released. – If this error occurs frequently, see 6.5.2., **2**-1.

Table 6-1 (Cont'd)
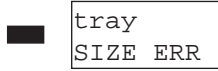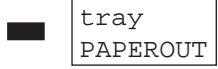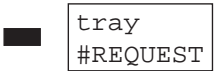
Category	Status message	Trouble or status	Remedy
Jam errors	▬ `tray` `FEED JAM`	A jam occurred during paper feeding after completion of paper hopping from the tray being displayed. tray: TRAY 1, TRAY 2, FEEDER	– Open the cover, remove the paper, then close the cover. When the cover is closed, recovery printing is carried out and the error display is released. – If this error occurs frequently, see 6.5.2, **2**-2.
	▬ `PAPER` `EXIT JAM`	Jam occurred during paper ejecting.	– Open the cover, remove the paper, then close the cover. When the cover is closed, recovery printing is carried out and the error display is released. – If this error occurs frequently, see 6.5.2, **2**-3.
Paper size error	▬ `tray` `SIZE ERR`	Paper of improper size is being fed from the tray being displayed. tray: TRAY 1, TRAY 2, 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 carry out recovery printing and release the error display. – If this error occurs frequently, see 6.5.2, **3**.
Tray paper out	▬ `tray` `PAPEROUT`	The tray being displayed has run out of paper. tray: TRAY 1, TRAY 2, FEEDER	Load paper in the tray.

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Service Manual, P/N 59271602   OL600e/610e/610e-PS/610e-S

Table 6-1 (Cont'd)

Category	Status message	Trouble or status	Remedy
Size error	▬ `tray` `#REQUEST`	Loading of paper indicated by the second line message to the first line's tray is requested. tray: TRAY 1, TRAY 2, FEEDER #: LETTER, EXECUTIV, LEGAL 14, LEGAL 13, A4 SIZE, A5 SIZE, A6 SIZE, B5 SIZE, FREE SIZE	Load the requested paper in the tray.
	▬ `MANUAL` `#REQUEST`	Manual loading of paper indicated by the second line message is requested. The paper size one of the followings: #: LETTER, EXECUTIV, LEGAL 14, LEGAL 13, A4 SIZE, A5 SIZE, A6 SIZE, B5 SIZE, FREE SIZE, COM-10, MONARCH, DL ENV, C5 ENV	Load the requested paper in the manual tray.

Table 6-1 (Cont'd)

Category	Status message	Trouble or status	Remedy
Buffer overflow	▬ `REC BUFF OVERFLOW` (HP 4 mode)	The receive buffer is overflowing.	− OL610e/PS: Press RECOVER key to release the error display. Other models: reinitialize the printer through the Status Monitor. − Change the setting of the host or printer so the host can detect the busy status of the printer. Resend the data from the host to the printer. − Replace the interface cable or control board.
	▬ `PAGE BUF OVERFLOW` (HP 4 mode)	The page buffer is overflowing because it received too much data for printing on the page.	− Press the operator panel RECOVER key to release the error display. − Install additional optional RAM board or reduce the print data.
	▬ `DLL BUFF OVERFLOW` (HP 4 mode)	The DLL buffer is overflowing.	− Press the operator panel RECOVER key to release the error display. − Install additional optional RAM board or reduce the DLL data.
	▬ `MACRO OVERFLOW` (HP 4 mode)	Macro buffer is overflowing.	− Press the operator panel RECOVER key to release the error display. − Install additional optional RAM board or reduce the macros.
	▬ `PRINT OVERRUN`		− Press the operator panel RECOVER key to release the error display. − Simplify page data formatting.

Table 6-1 (Cont'd)

Category	Status message	Trouble or status	Remedy
Daily status	▬ `OFF-LINE` `emulate`	The printer is in the off-line mode. The second line indicates the emulation. emulate: HP4, AdobePS	Normal operation.
	▭ `PROCS'NG`	Post Script mode only. The printer is processing data	
	▭ `WAITING`	Post Script mode only. The printer is in the middle of a job and waiting for data to be processed.	
	▭ `PRINTING`	The printer is printing a page.	

Table 6-1 (Cont'd)

Category	Status message	Trouble or status	Remedy
Daily status	▭ `DATA` `HP4` (HP 4 mode)	The printer is processing data in on-line mode. Ready ON: The data that is not printed remains in the buffer. Ready flashing: The printer is receiving data.	Normal operation.
	▭ `PRINT` `FONTS`	All fonts of the printer are being printed during self-test.	
	▭ `PRINT` `MENU`	The current menu setting is being printed. Ready ON: Executed by command entry. Ready flashing: Executed by key operation.	

Table 6-1 (Cont'd)

Category	Status message	Trouble or status	Remedy
Daily status	PRINT DEMO	The demo page is being printed.	Normal operation.
	CPYnn/mm (HP 4 mode)	When the number of copies being printed is two or more, the number of copies being printed is displayed. This message is displayed together with another message on the first line.	
	PR BUSY	Post Script mode only This message is displayed when ON-LINE key is pressed when the printer is processing the job, if the JOB RESET menu is OFF. The printer will go off-line after completing the job.	

Table 6-1 (Cont'd)

Category	Status message	Trouble or status	Remedy
Daily status	▬ RESET TO FLUSH	Post Script mode only This message is displayed when ON-LINE key is pressed while the printer is processing the job, if the JOB RESET menu is ON. Even while this message is being displayed, the printer continues to process processing the job normally.	- Press ON-LINE key again The printer goes back to on-line mode and continues processing the job. - Press RESET key. The job is cancelled.
	▭ FLUSHING	Post Script mode only This message is displayed during cancelling of a job. The message goes off when the job cancellation is completed.	Normal operation.
	▬ RESET (HP 4 mode)	The data which remained unprinted in the buffer is deleted and the printer is initialized to user default settings. Temporary DLLs and macros are deleted.	

Table 6-1 (Cont'd)

Category	Status message	Trouble or status	Remedy
Daily status	RESET TO SAVE (HP 4 mode)	This message is displayed when the printer cannot reset automatically to exit from the menu because there are data, DLLs, and macros having temporary attributes when the printer is changed from set mode to other mode.	Normal operation.
	TONERLOW	Toner is running out. This message is displayed together with other message on the first line. Normal operation can continue.	− Replace the toner cartridge.
	TONERSNS	A fault occurred in the toner sensor. This message is displayed together with other message on the first line. Normal operation can continue.	− Replace the power supply board.
	CHG DRUM	This message is displayed together with other message on the first line. Normal operation can be continued.	− Replace the image drum cartridge. − After replacing the drum cartridge, reset the drum counter (refer to the User's Manual).

Table 6-1 (Cont'd)

Category	Status message	Trouble or status	Remedy
Daily status	☐ `PWR SAVE`	The printer is in the power-saving mode. This message is displayed together with other message on the first line.	Normal operation.
	▬ `ERROR PS` `AdobePS`	PostScript mode only This message will appear when the interpreter detects an error during a job processing. The remainder of the job will be ignored.	- Check the printer setting of the host. - Check the printer job data to see if there is any un-supported or illegal operation in the data.

6.5.2   Message Troubleshooting

If the problems are not correctable by using the message trouble 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
	    — 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.	Fan error	**5**

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

• Turn the power off, then back on.

• Does the all 8's message display (OL610e/PS) or the power light go on? | 88888888 |
                                                                             | 88888888 |

No   Is the AC cable properly connected?

• No   Connect the cable properly.

Yes Is +5 V being applied between pins 2 and 5 of CN5 on the Main Control
        PCB?

Pin 2 :   0 V
Pin 5 : +5 V

Ⓐ

No   Is the connection between connector CN7 on the control
          board and connector CN3 on the power supply board made
          properly?

No   Correct the connection.

Yes   Go to **1**-1.

Yes Is +8 V being applied between pins 30 and 31 (GND) of connector CN7?

• No   Go to Ⓐ .

Yes *OL610e/PS only:* Is the flexible cable for the operator panel assy properly
        connected to the connector CN5 on the Main Control PCB and the connector
        CN1 on the OLLD board?

• No   Connect the flexible cable properly.

Yes Replace the operator panel assy or flexible cable.

Remedy?

• No   Replace the control board.

Yes End

Yes   Does INITIALIZING message display?

• No   Replace the control board.

Yes   Does the ON-LINE message display?

• No   Take actions following the message list (see 6.5.1).
Yes   End

1-1

Take the measurement of the following voltages at connector CN2 on the power supply board:

    Voltage between pins 1 and 3: ... about 28 V AC
    Voltage between pins 5 and 6: ... about 10 V AC Are the voltages normal?

    • Yes Is fuse F3 on the power supply board blown?

        • No   Replace the power supply board.

    • Yes Replace fuse F3 (if it blows again, check the resistance of the registration and drum motors. If the resistance is wrong, replace motors or replace the power supply board or Main Control PCB).

• No   Is the AC input voltage output between pins 1 and 2 of connector CN1 on the power supply board normal?

    • Yes Replace the AC transformer.

• No   Is fuse F1 or F2 on the power supply board blown?

    • No Replace the power supply board.

• Yes   Replace open fuse F1 or F2 (if it blows again, replace the power supply board).

AC Input / Fuse	120 V	230 V
F1	125 V 6.3 A	250 V 5 A
F2	125 V 1.6 A	250 V 1 A
F3	125 V 2.5A	250 V 2.5A

Figure 6-1 Low-voltage Power Supply Block Diagram

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Jam Error

2-1   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 lever normal (moves freely when touched)?

       • No   Replace the inlet sensor lever.

    • Yes   Clean the inlet sensor on the power supply board, or replace the power supply board.

• No   Does the JAM alarm occur after paper feeding?

    • Yes   Is the paper fed to the inlet sensor lever?

       • Yes Is the operation of the input sensor lever normal (moves freely when touched)?

          • No   Replace the inlet sensor lever.

      • Yes Clean the inlet sensor on the power supply board or replace the power supply board.

    • No   Replace the hopping roller rubber or tray.

• 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 connector CN3 on the control board being connected properly?

    • No   Connect connector CN3 properly.

• Yes   Is the coil resistance (normal resistance: about 32 Ω) of the registration motor normal (see 7.3)?

    • No   Replace the registration motor.

• Yes   Replace the Main Control PCB.

2-2   Paper Feed Jam

• Does the paper feed jam occur when the power is turned on?

     • Yes   Is the paper on the paper sensor lever?

       • Yes   Remove the paper.

     • No   Is the operation of the paper sensor lever normal (moves freely when touched)?

       • No   Replace the paper sensor lever.

     ▼ Yes   Replace the power supply board.

• No   Has the paper reached the paper sensor lever?

     • No   Is the registration roller rotating?

       • No   Replace the one-way clutch gear.

     ▼ Yes   Is the image drum cartridge 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 lever?

     • Yes   Is the operation of the outlet sensor lever normal (moves freely when touched)?

       • No   Replace the outlet sensor lever.

       • Yes   Clean the outlet sensor on the power supply board or replace the power supply board.

• No   Is the drum motor rotating?

     • No   Is connector CN2 on the Main Control PCB connected?

       • No   Connect connector CN2 properly.

     ▼ Yes   Is the coil resistance (normal resistance: about 32Ω) of the drum motor correct (refer to 7.3)?

       • No   Replace the drum motor.

    2-2-a   **2**-2-b

2-2-a   **2**-2-b

• Yes   Replace the control board.

• Yes   Is the transfer roller rotating?

   • No   Check the gears (TR gear, idle gear and reduction gear).

• Yes   Is the fuser unit installed properly?

   • No   Install the fuser unit properly.

• Yes   Is the image drum cartridge 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.

2-3   Paper Exit Jam

• Does the paper exit jam error occur when the power is turned on?

    • Yes   Is the paper on the outlet sensor lever?

        • Yes Remove the paper.

    • No   In the operation of the outlet sensor lever normal (moves freely when touched)?

        • No   Replace the outlet sensor lever.

    • Yes   Clean the outlet sensor on the power supply board or replace the power supply 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 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.

<u>3</u>   Paper Size Error

• Is paper of the specified size being used?

   • No   Use paper of the specified size.

• Yes   Are inlet sensor levers 1 and 2 operating properly (moves freely when touched)?

   • No   Replace the inlet sensor lever or clean the inlet sensor on the power supply
               board.

• Yes   Does the outlet sensor lever operate properly (moves freely when touched)?

   • No   Replace the outlet sensor lever or clean the outlet sensor on the power
               supply board.

• Yes   Replace the power supply board.
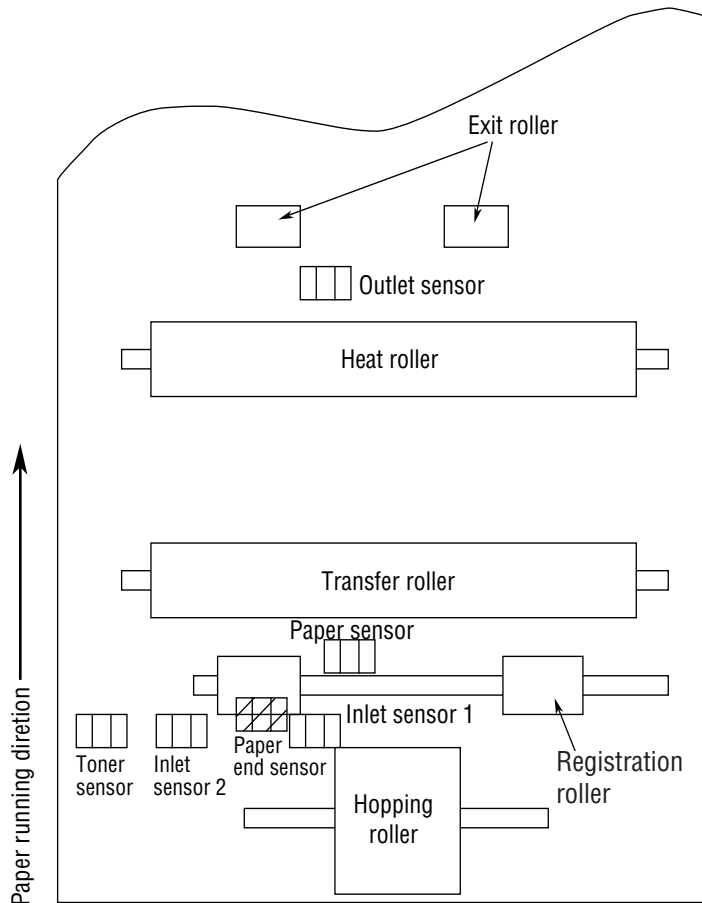
4   Fusing Unit Error (ERROR 71, 72 and /or 73)

• Turn the power off, then back on.

• Does the fusing unit error occur immediately?

     • Yes   Is the thermistor open or shorted?
                      Measure the resistance between
                      thermistor contacts (about 220kΩ at
                      room temperature) (see Fig. 6-2 or
                      see 7.3).

        • Yes Replace the fusing unit.

Heater
contacts

Themistor contacts

Figure 6-2

     • No   Do the thermistor contacts touch the contact assembly properly when the
                    fusing unit is mounted in the printer (see Fig. 6-4 contact Ⓕ)?

        • No   Adjust the contact.

     Yes   Replace the Main Control PCB or power supply board.

• No   Does the fusing unit error occur about 60 seconds after the power is turned on?

     • No   Check the thermistor for poor contact or replace the Main Control PCB.

• Yes   Turn the power off, then back on.

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

     • Yes   Check thermistor contacts or replace the Main Control PCB or the fuser unit.

• No   Is the heater or the thermostat open?
             Measure the resistance between the heater contacts (normal resistance: about 0Ω)
             (see Fig. 6-2 or see 7.3).

     • Yes   Replace the fusing unit.

• No   Is the AC voltage being supplied to the contacts for the heater of the contact assembly?
             (Refer Fig. 6-2)

     • No   Replace the Main Control PCB or the power supply board.

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

<u>5</u>   Fan Error (ERROR 70)

• Is the fan rotating?

    • Yes   Replace the Main Control PCB.

• No   Is connector CN1 on the Main Control PCB being connected?

    • No   Connect connector CN1.

• Yes   Replace the fan or Main Control PCB (check coil resistance of the fan, See 7.3).
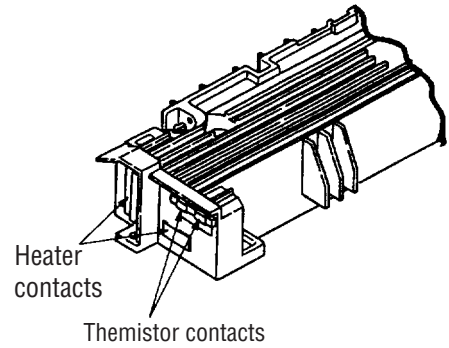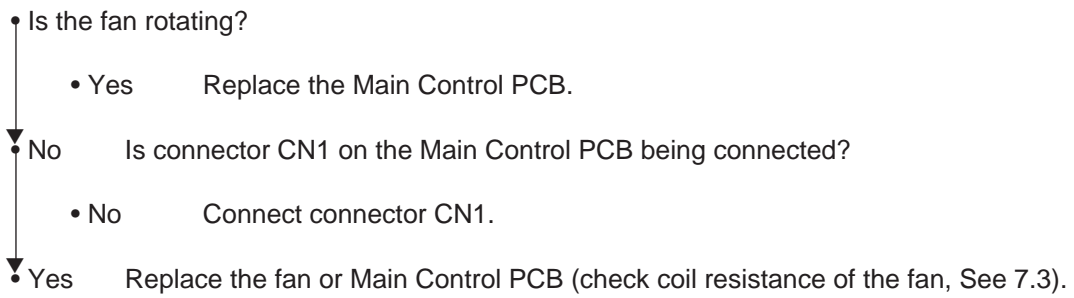
6.5.3 Image Troubleshooting

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, Ⓐ)	**1**
Dark background density (Figure 6-3, Ⓑ)	**2**
Blank paper is output (Figure 6-3, Ⓒ)	**3**
Black vertical stripes (Figure 6-3, Ⓓ)	**4**
Cyclical defect (Figure 6-3, Ⓔ)	**5**
Print voids	**6**
Poor fusing (images are blurred or peeled off when touched by hands)	**7**
White vertical streaks (Figure 6-3, Ⓕ)	**8**
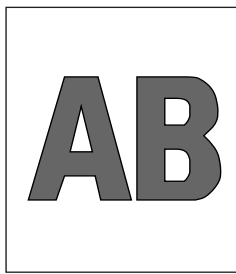
Ⓐ Light or blurred images entirely
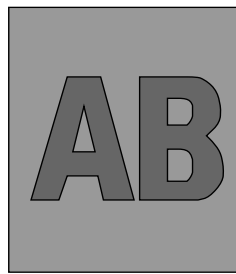
Ⓑ Dark background density
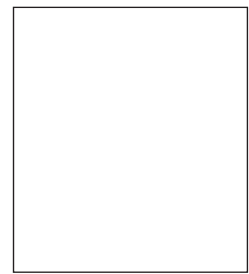
Ⓒ Blank paper
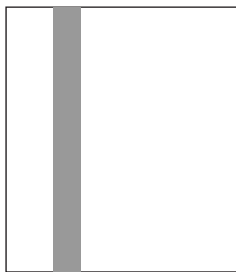
Ⓓ Black vertical stripes
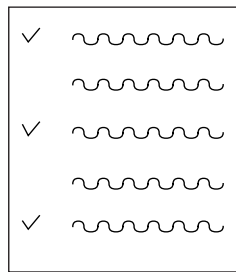
Ⓔ Cyclical defect
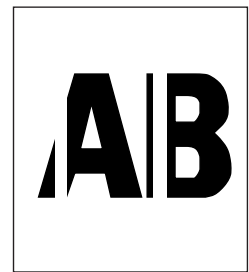
Ⓕ White vertical belts or streaks

Figure 6-3

1   Images are Light or Blurred Entirely.

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

    • Yes   Supply toner.

• No   Is paper of the specified grade being used?

    • No   Use paper of the specified grade.

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

    • Yes   Clean the lens.

• No   Is the LED head installed properly (check connector CN4 of the 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 board properly (see Fig. 6-5)?

    • Adjust the contact plate of the transfer roller to make a proper contact with the power
      supply 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 cartrige in proper contact with the contact assembly (see Fig. 6-4
                  Ⓐ and Ⓑ)?

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

• Yes   Replace the transfer roller.

• Has the problem been elimninated?

    • Yes   End

• No   Replace the image drum cartridge. Reset the drum counter from the User
                 Maintenance menu (OL610e/PS), or from the Settings tab of the DOS Operator
                 Panel (OL600e/610e).

• Has the problem been eliminated?

    • Yes   End

• No   Replace the control board or power supply board.

2   Dark Background Density

• Has the image drum been exposed to external light?

    • Yes   Mount the image drum in the printer and wait about 30 minutes.

• 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 properly in contact with the contact assembly (see Fig. 6-4 Ⓒ)?

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

• Yes   Replace the image drum cartridge. Reset the drum counter from the User Maintenance menu (OL610e/PS), or from the Settings tab of the DOS Operator Panel (OL600e/610e).

• Has the problem been eliminated?

    • Yes   End

• No   Replace the Main Control PCB or power supply board.

3   Blank paper is output.

- Is the LED head being connected properly (check connector CN4 on the Main Control PCB and PC connector on the LED head)?

     • No   Connect the LED head properly or replace the head cable.

• Yes   Is the contact of the image drum cartrige in proper contact with the ground contact (see Fig. 6-4)?

     • No   Check the ground contact of the image drum cartridge.

• Yes   Replace the LED head.

- Has the problem been eliminated?

     • Yes   End

         Note: Set the LED head drive time if the luminous rating of the old head and the new head are different. See page 4.2..

• No   Replace the Main Control PCB or power supply board.

4   Black Vertical Belts or Stripes

•   Replace the image drum cartridge. Reset the drum counter from the User
Maintenance menu (OL610e/PS), or from the Settings tab of the DOS Operator Panel
(OL600e,/OL610e).

• Has the problem been eliminated?

    • Yes   End

• No   Replace the LED head.

• Has the problem been eliminated?

    • Yes   End

            Note: Set the LED head drive time if the luminous rating of the old head
                   and the new head are different. See 4.2.

• No   Replace the Main Control PCB or power supply board.

5   Cyclic Error

	Frequency	Remedy
Image drum	3.71" (94.2 mm)	Replace or clean the image drum cartridge.
Developing roller	1.66" (44.4 mm)	Replace the image drum cartridge.
Toner supply roller	2.27" (57.8 mm)	Replace the image drum cartridge.
Charging roller	1.56" (39.6 mm)	Replace the image drum cartridge.
Cleaning roller	1.24" (31.4 mm)	Replace the image drum cartridge.
Transfer roller	2.01" (51.0 mm)	Replace the transfer roller.
Heat roller	2.47" (62.8 mm)	Replace the fusing unit assy.
Back-up roller	2.72" (69.08 mm)	Replace the back-up roller.

Notes:

1.   After replacing the image drum cartridge, reset the drum counter.

2   After replacing the fusing unit assy, reset the fuser counter. *OL610e/PS:* See 4.1.

6   Print Voids

• Is the contact plate of the transfer roller in proper contact with the power supply/sensor board (see Fig. 6-5)?

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

• Yes   Replace the transfer roller.

• Has the problem been eliminated?

    • Yes   End

• No   Are the contacts of the toner supply roller, developing roller, image drum and charging roller in proper contact with the contact assy (see Fig. 6-4 Ⓐ, Ⓑ, Ⓒ, Ⓓ, Ⓔ)?

    • No   Adjust the contacts so that they touch the contact assy properly.

• Yes   Replace the image drum cartridge. Reset the drum counter from the User Maintenance menu (OL610e/PS), or from the Settings tab of the DOS Operator Panel (OL600e/OL610e).

• Has the problem been eliminated?

    • Yes   End

• No   Is the LED head installed properly (check connector CN4 on the Main Control PCB and PC Connector on the LED head)?

    • No   Install the LED head properly.

• Yes   Replace the LED head or the head cable.

• Has the problem been eliminated?

• Yes   End

      Note: Set the LED head drive time if the luminous rating of the old head and the new head are different.

• No   Replace the Main Control PCB or power supply board.

7 Poor Fusing

• Is paper of the specified grade being used?

    • No   Use paper of the specified grade.

• Yes   Is the spring of the back-up roller normal?

    • No   Replace the spring.

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

    • 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 the problem been eliminated?

    • Yes   End

• No   Replace the Main Control PCB or power supply board.

8   White Vertical Belts or Streaks

• Is 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
board (see Fig. 6-5)?

    • No   Adjust the contact plate to make a proper contact with the power supply
board.

Yes   Replace the transfer roller.

• Has the problem been eliminated?

    • Yes   End

No   Is the LED head installed properly (check CN4 connector on the Main Control PCB
and PC connector on the LED head)?

    • No   Install the LED head properly.

Yes   Replace the LED head.

• Has the problem been eliminated?

    • Yes   End

            Note: Set the LED head drive time if the luminous rating of the old head and
the new head are different. *OL610e/PS:* See 4.2. *OL600e/610e:* See
Software Supplement.

No   Replace the image drum cartridge. Reset the drum counter from the User
Maintenance mode (OL610e/PS), or from the Service menu of the Status Monitor
(OL600e/610e).

• Has the problem been eliminated?

    • 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. Reset the drum counter (see User's Manual).

No   Replace the Main Control PCB or power supply board.

Diagram: Contact Points of Contact Assembly

Contacts
- Heater AC
- G Thermistor
- F Thermistor
- F Heater AC
- G Charge Roller
- E Ground (Drum)
- D Cleaning Roller
- C Developing Roller
- B Toner Supply Roller
- A

Figure 6-4

Diagram: Contact Plate for Transfer Roller to Power Supply

Contact plate
for transfer roller

Contact

Power supply/sensor board

Figure 6-5

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7. WIRING DIAGRAM

7.1 Interconnect Signal Diagram

7.2   PCB Layout and Connector Signal List

(1) Control Board
 • OL600e   : LQ5C-PCB
 • OL610e and OL610e/PS :   LQ6C-PCB

LQ5C-PCB

LQ6C-PCB

LED head

OL610e/PS only

Operator panel

Printer front side

Contact face

Printer front side

6 — 1

6 — 1

Contact face

14 — 1

14 — 1

(2) Power Supply Board

(3) PS Board (LQ8A-) (OL610e/PS)

- CN1 Pin Assignment
  To Fan motor

		PIN NO.	I/O	Signal	Description
	1	1	O	FANPOW	Power supply for fan driving
Opening	2	2	C	0V	Ground
	3	3	I	FANALM-N	Fan alarm

- CN2 Pin Assignment
  To Drum motor

		PIN NO.	I/O	Signal	Description
	1	1	O	DMPH1-N	Coin 1-N
	2	2	O	DMPH1-P	Coin 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	2	3	4
2	Yellow	+	-	-	+
4	Black	+	+	-	-
1	Orange	-	+	+	-
3	Brown	-	-	+	+

Turning direction   Clockwise when viewed from the output axis.

I/O Legend
I = In
O = out
C = Common

- CN3 Pin Assignment
   To Registration motor

	PIN NO.	I/O	Signal	Description
1	1	0	RMPH1-N	Coin 1-N
2	2	0	RMPH1-P	Coin 1-P
3	3	0	RMPH2-N	Coil 2-N
4	4	0	RMPH2-P	Coil 2-P

Excitation sequence

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

Turning direction   Clockwise as viewed from the output axis.

I/O Legend
I = In
O = out
C = Common

- CN4 Pin Assignment
  To LED head

		PIN NO.	I/O	Signal	Description
1		1	C	0V	Grount for LED
	2	2	C	0V	Ground for LED
3		3	O	5V	+5V power supply for LED diriving
	4	4	O	5V	+5V power supply for LED driving
5		5	C	0V	Logic ground
	6	6	O	HDDT0-P	Data
7		7	O	HDDT1-P	Data
	8	8	O	HDCLK-P	Clock
9		9	C	HDLD-P	Load
	10	10	O	STB1-N	Strobe1
11		11	O	STB2-N	Strobe 2
	12	12	O	STB3-N	Strobe 3
13		13	O	STB-4	Strobe 4
	14	14	C	FG	FG

I/O Legend
I = In
O = out
C = Common

• CN6 Pin Assignment
    To Option feeder

5	8
2	7
1	4
3	6

PIN NO.	I/O	Signal	Description
1	O	OPTPSIN-N	Paper sense 1
2	O	SPTSCLK-N	Clock
3	C	OPTSDR-N	Data
4	I	OPRSDR-N	OPT send data ready
5	C	OVP	Analog groud
6	O	30V	+30V power supply
7	C	0V	Logic gound
8	O	5V	+5V power supply

I/O Legend
I = In
O = out
C = Common

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

Pin No.	Signal	I/O	Description	Pin No.	Signal	I/O*	Description
2	TRSEL1	O	TR control switch	1	SQCR-N	I	Sequence clear signal of serial I/F
4	THERM-CMP	I	Heater temperature	3	SCLK-N	I	Clock signal of serial I/F
6	CVOPN-N	I	Cover open (+30V)	5	PSIN1	I	Paper sense
8	DOUT-P	O	Serial data output	7	WRSNS	I	Reading of paper edge
10	DIN	I	Serial data input	9	OVL	C	Ground for logic
12	+5V	I	Logic circuit supply voltage	11	+5V	I	Logic circuit supplysoltage
14	+5V	I	Logic circuit supply voltage	13	+5V	I	Logic circuit supply soltage
16	OVL	C	Logic ground	15	OVL	C	Logic ground
18	+30V	I	Motor and fan drive voltage and source voltage for high voltage supply	17	+30V	I	Motor and fan drive voltage and source voltage for high voltage supply
20	HEATON-N	O	Heater on	19	TRSEL2	O	TR control switch
22	-8V	I	RS232C line voltage and PS board supply voltage	21	OVP	C	Power ground
24	+8V	I	RS232C line voltage	23	OVP	C	Power ground
26	TRSEL3	O	TR control switch	25	OVP	C	Power ground

I/O Legend
I = In
O = out
C = Common

- CN8 Pin Assignment
  Centro Parallel

Pin No.	I/O*	Signal	Description	Pin No.	I/O	Signal	Description
1	I	STROBE-N	Strobe	19	C	SG	Ground
2	C	DATA1-P	Data bit 0	20	C	SG	Ground
3	C	DATA2-P	Data bit 1	21	C	SG	Ground
4	C	DATA3-P	Data bit 2	22	C	SG	Ground
5	C	DATA4-P	Data bit 3	23	C	SG	Ground
6	C	DATA5-P	Data bit 4	24	C	SG	Ground
7	C	DATA6-P	Data bit 5	25	C	SG	Ground
8	C	DATA7-P	Data bit 6	26	C	SG	Ground
9	C	DATA8-P	Data bit 7	27	C	SG	Ground
10	O	ACK-N	Acknowledge	28	C	SG	Ground
11	O	BUSY-P	Busy	29	C	SG	Ground
12	O	PE-P	paper end	30	C	SG	Ground
13	O	SEL-P	Select	31	I	IPRIME-N	Input prime
14	I	AUTOFEED-N	Auto feed	32	O	FAULT-N	Fault
15		NC		33	C	SG	Ground
16	C	SG	Ground	34		NC	
17	C	FG		35	O	HILEVEL	Always kept high
18	O	P-LOGIC-H	+5V power supply	36	I	SELIN-N	Select in

I/O Legend
I = In
O = out
C = Common

• CN11 Pin Assignment
  To Option board

Pin No.	I/O	Signal	Description	Pin No.	I/O	Signal	Description
01	O	-8V	-8V power supply	41	C	0V	Logic ground
02	C	0V	Logic ground	42	C	0V	Logic ground
03	C	0V	Logic ground	43	C	SSTXD-P	EEPROM data
04		NC		44	O	EEPRMCLK-P	EEPROM clock
05		NC		45	O	EEPRMCS1-P	EEPROM select
06	C	0V	Logic ground	46	O	+5V	+5V power supply
07	C	0V	Logic ground	47	I	INT2-N	Interrupt request 2
08	I	INT1-N	Interrupt request 1	48	O	IOS1-N	I/O select 1
09	O	IOS0-N	I/O select 0	49	O	CS3-N	ROM select 3
10	O	CS2-N	ROM select 2	50		NC	OL610ex only, OL600ex: NC
11	O	CS4-N	ROM select 4	51	O	DDRAS1-N	
12		NC		52	O	RESET-N	Reset signal
13	I	SCSRE0-P	SCC receive request	53		NC	
14	I	SCRRE0-P	SCC send request	54	O	A22-P	Address bit 22
15	O	A08-P	Address bit 8	55	O	A07-P	Address bit 7
16	O	A06-P	Address bit 6	56	O	A05-P	Address bit 5
17	O	A04-P	Address bit 4	57	O	A03-P	Address bit 3
18	O	A02-P	Address bit 2	58	O	A01-P	Address bit 1
19	O	A00-P/ORE-N	OR write enable	59	O	A21-P	Address bit 21
20	O	A20-P	Address bit 20	60	O	A19-P	Address bit 19
21	O	A17-P	Address bit 17	61	O	DCAS0-N	DCAS0
22	O	DCAS1-N	DCAS1	62	O	RD-N	RD-N
23	O	A18-P	Address bit 18	63	O	A16-P	Address bit 16
24	O	A15-P	Address bit 15	64	O	A14-P	Address bit 14
25	O	A13-P	Address bit 13	65	C	0V	Logic ground
26	O	+5V	+5V power supply	66	O	A12-P	Address bit 12
27	O	A11-P	Address bit 11	67	O	A10-P	Address bit 10
28	O	A09-P	Address bit 9	68	O	WR-N	WR-N
29	O	DRAS2-N	DRAM select 2	69	O	DRAS3-N	DRAM select 3
30	C	DRAN4-N	DRAM select 4	70	O	DRAS5-N	DRAM select 5
31	C	D07-P	Data bit 7	71	C	D06-P	Data bit 6
32	C	D05-P	D05-P Data bit 5	72	C	D04-P	Data bit 4
33	C	D02-P	D02-P Data bit 2	73	C	D03-P	Data bit 3
34	C	D00-P	D00-P Data bit 0	74	C	D01-P	Data bit 1
35	C	0V	Logic ground	75	O	+5V	+5V power supply
36	C	D14-P	Data bit 14	76	C	D15-P	Data bit 15
37	C	D12-P	Data bit 12	77	C	D13-P	Data bit 13
38	C	D11-P	Data bit 11	78	C	D10-P	Data bit 10
39	C	D09-P	Data bit 9	79	C	D08-P	Data bit 8
40		NC		80	C	0V	Logic ground

PS Board (OL610e/PS)
• CN1 Pin Assignment
    To LocalTalk (RS422)

5	8
2	7
1	4
3	6

PIN NO.	I/O	Signal	Description
1	NC	NC	
2	I	SYNC	Not used
3	O	TXD-	Transmit data -
4	C	SG	Signal ground
5	I	RXD-	Receive data -
6	O	TXD+	Transmit data +
7	NC	NC	
8	I	RXD+	Receive data +

I/O Legend
I = In
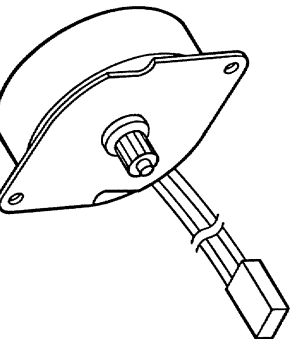O = out
C = Common
NC = Not Connected
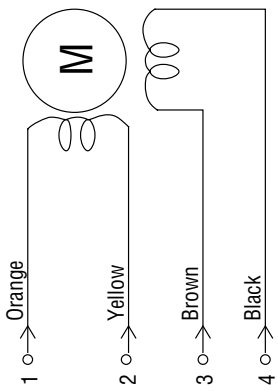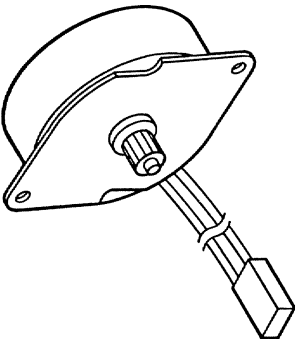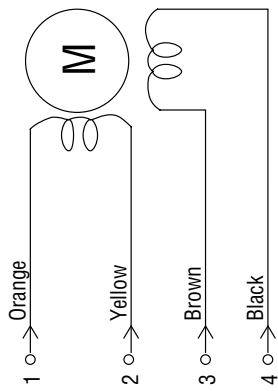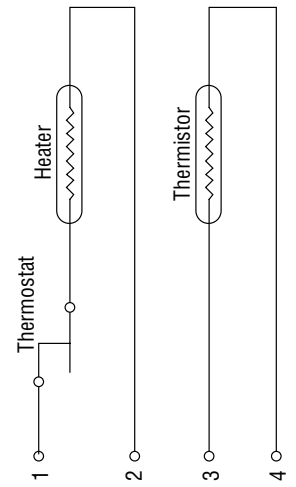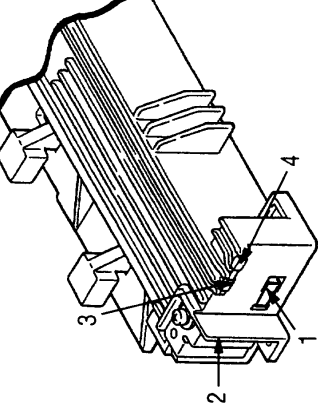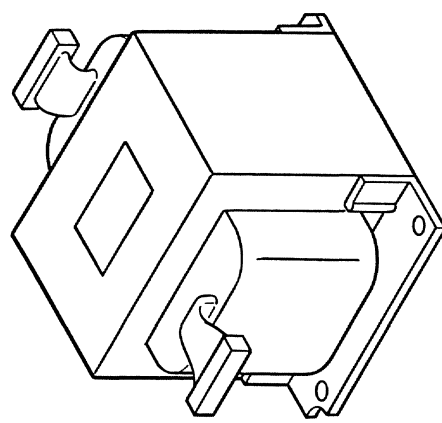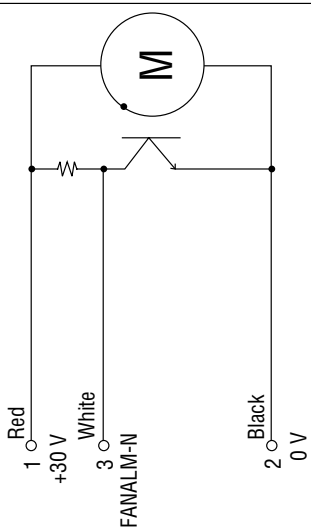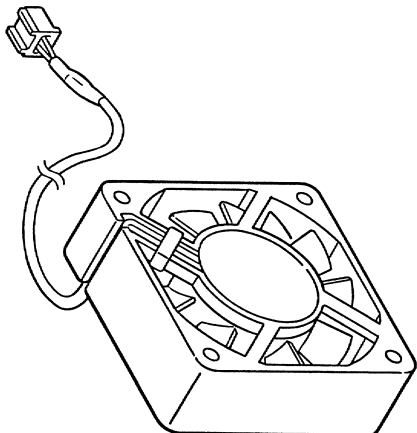
PS Board (OL610e/PS)
- CN2 Pin Assignment
  To Main Control PCB

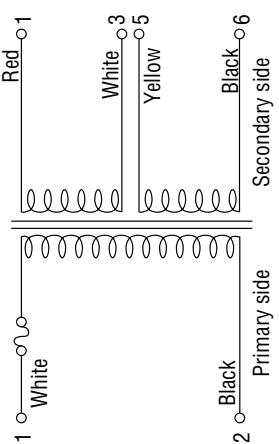| Pin No.	I/O	Signal	Description	Pin No.	I/O	Signal	Description
01	I	-8V	-8V power input	41	C	0V	Logic ground
02	C	0VP	Analog ground	42	C	0V	Logic Ground
03	C	0V	Logic ground	43	I	SSTXD-P	EEPROM data
04		NC		44	I	EEPRMCLK-P	EEPROM clock
05		NC		45	I	EEPRMCS1-P	EEPROM 1 select
06	C	0V	Logic ground	46		+5V	+5V power input
07	C	0V	Logic Ground	47	O	INT2-N	Interrupt request 2
08	O	INT1-N	Interrupt request 1	48	I	IOS1-N	I/O select 1
09	I	IOS0-N	I/O select 0	49	I	CS3-N	ROM/SRAM select 3
10	I	CS2-N	ROM/SRAM select 2	50		NC	
11		NC		51		NC	
12	O	DRDY-N	Data read	52	I	CLRST-N	Cold reset
13	O	SCSREQ-P	SCC receive request	53		NC	
14	O	SCRREQ-P	SCC send request	54		NC	
15	I	A08-P	Address bit 8	55	I	A07-P	Address bit 7
16	I	A06-P	Address bit 6	56	I	A05-P	Address bit 5
17	I	A04-P	Address bit 4	57	I	A03-P	Address bit 3
18	I	A02-P	Address bit 2	58	I	A01-P	Address bit 1
19	I	A00-P/ORE-N	Address bit 0	59	I	A21-P	Address bit 21
20	I	A20-P	Address bit 20	60	I	A19-P	Address bit 19
21	I	A17-P	Address bit 17	61	I	DCAS0-N	DCAS0
22	I	DCAS1-N	DCAS1	62	I	RD-N	RD-N
23	I	A18-P	Address bit 18	63	I	A16-P	Address bit 16
24	I	A15-P	Address bit 15	64	I	A14-P	Address bit 14
25	I	A13-P	Address bit 13	65	C	0V	
26	I	+5V	+5V power input	66	I	A12-P	Address bit 12
27	I	A11-P	Address bit 11	67	I	A10-P	Address bit 10
28	I	A09-P	Address bit 9	68	I	WR-N	WR-N
29	I	DRAS2-N	DRAM select 2	69	I	DRAS3-N	DRAM select 3
30	I	DRAN4-N	DRAM select 4	70	I	DRAS5-N	DRAM select 5
31	C	D07-P	Data bit 7	71	C	D06-P	Data bit 6
32	C	D05-P	Data bit 5	72	C	D04-P	Data bit 4
33	C	D02-P	Data bit 2	73	C	D03-P	Data bit 3
34	C	D00-P	Data bit 0	74	C	D01-P	Data bit 1
35	C	0V	Logic ground	75	I	+5V	+5V power input
36	C	D14-P	Data bit 14	76	C	D15-P	Data bit 15
37	C	D12-P	Data bit 12	77	C	D13-P	Data bit 13
38	C	D11-P	Data bit 11	78	C	D10-P	Data bit 10
39	C	D09-P	Data bit 9	79	C	D08-P	Data bit 8
40		NC		80		NC	

7.3 Resistance Check

Unit	Circuit Diagram	Illustration	Resistance
Registration motor	M — 1 Orange, 2 Yellow, 3 Brown, 4 Black		Between pins 1 and 2: 18.6Ω Between pins 3 and 4: 18.6Ω
Main (drum) motor	M — 1 Orange, 2 Yellow, 3 Brown, 4 Black		Between pins 1 and 2: 12.6Ω Between pins 3 and 4: 12.6Ω
Fusing Unit	Thermostat, Heater, Thermistor — 1, 2, 3, 4		Between pins 1 and 2: 120V 3Ω 240V 10Ω Between pins 3 and 4: 220KΩ (at room temperature)

Unit	Circuit Diagram	Illustration	Resistance
Transformer	Primary side: 1 White, 2 Black. Secondary side: Red 1, White 3, Yellow 5, Black 6		Primary side Between pins 1 and 2: 56.8Ω (OEL) 14.8Ω (ODA) Secondary side Between pins 1 and 3: 1.3Ω Between pins 5 and 6: 1.2Ω
Fan	1 Red +30 V, 3 White FANALM-N, 2 Black 0 V, M		

7.4   Short Plug Setting

(1) Control Board
   • OL600e   : LQ5C-PCB
   • OL610e and OL610e/PS : LQ6C-PCB
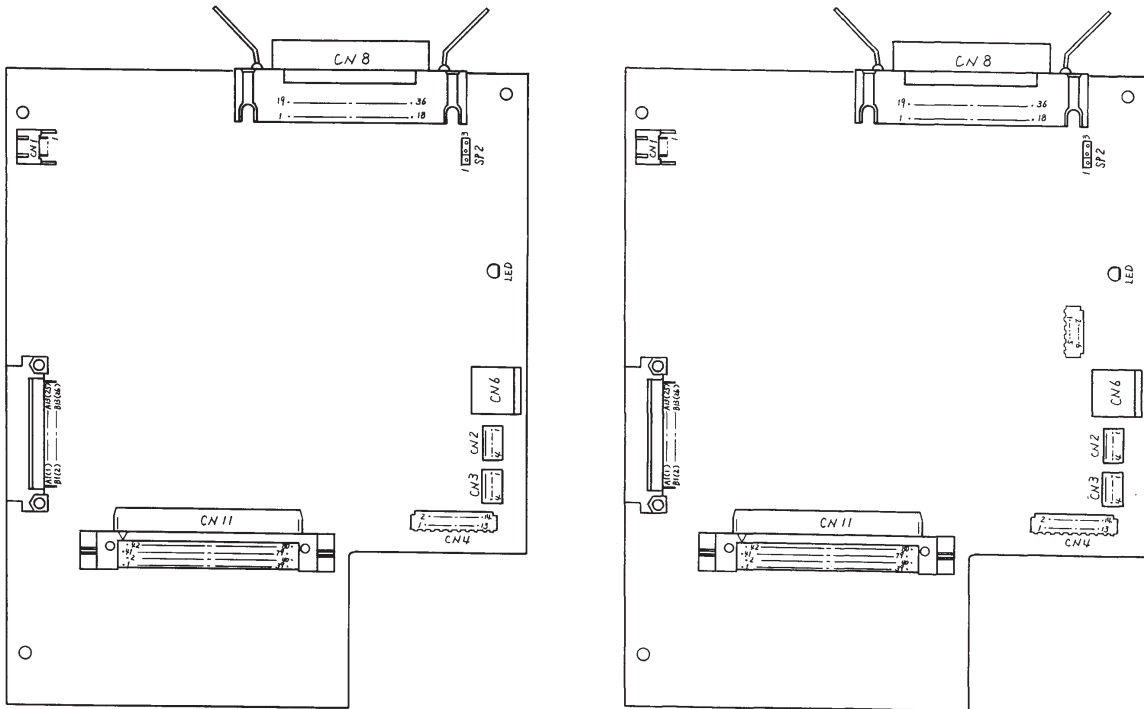
• Short plug settings

Short plug	Plug setting	Description	Factory setting
SP2	A	+5 V is supplied to pin 18 of Centronics parallel I/F connector.	A-side
	B	High level is supplied to pin 18 of Centronics parallel I/F connector.	

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8.   PARTS LIST

8.1   General Information

This section will assist you in identifying the assemblies and parts of the product.

Use Section 6 (Troubleshooting) to determine the defective part(s).

Locate the part and its part number in this section.

Table 8-1 Lower Base Unit

No.	Name	Part No.	USE OL600e	USE OL610e	Remarks
1	Hopping roller shaft assy	3PP4083-6020P1	1	1	50219601
1	Hopping roller rubber F	4PB4122-1280P1	1	1	51711401
2	Bearing	4PP4083-6022P2	4	4	51607402
3	Gear, one-way clutch	4PB4083-6024P1	2	2	51228901
4	Registration roller	3PB4083-6030P1	1	1	53342501
5	Bearing (Registration)	4PP4083-6031P1	1	1	51607501
6	Transfer roller	3YB4083-7640P4	1	1	50409304
6-2	Bearing TR	3PP4083-6289P1	1	1	51609001
6-3	TR Gear	3PP4083-6290P1	1	1	51236601
8	Back-up roller	3PB4083-6064P2	1	1	53343702
9	Bias spring	4PP4083-7620P1	2	2	50929301
10	Bush, pressure roller	4PP4083-6052P1	2	2	51607601
11	Reset lever L	3PP4083-6053P1	1	1	50805801
12	Reset lever R	3PP4083-6054P1	1	1	50805901
13	Cover open arm	3PP4083-6058P1	1	1	53068901
14	Stacker cover reset spring	4PP4083-6057P1	1	1	50924201
15	Fuser roller idle gear	4PP4083-6080P1	1	1	51229101
16	Eject roller idle gear	4PP4083-6081P1	1	1	51229201
17	Sensor plate (Inlet, paper)	4PP4083-6083P1	3	3	51010701
18	Sensor plate (Outlet)	4PA4083-6025G1	1	1	51010802
19	Toner sensor (Adhesion)	4PP4083-6086G1	1	1	50405501
20	Anti-static strip	4PB4083-3182P3	1	1	51010903
21	Pulse motor, main/drum	4PB4076-6150P1	1	1	56513201
22	Pulse motor, registration	4PB4076-6151P1	1	1	56513301
22-1	Pulse motor main idle gear	3PP4076-6145P1	1	1	51236701
22-2	Pulse motor registration gear	3PP4076-6146P1	1	1	51236801
23	Reduction gear	3PP4076-6147P1	1	1	51236901
24	Fusing unit, 120V	2YX4083-6100G5	1	1	50217505
	Fusing unit, 230V	2YX4083-6100G6	1	1	50217506
25	Eject roller assy	2PA4083-6120G2	1	1	53342802
26	Manual feed guide assy	2PA4083-6130G1	1	1	51011001
27	Face down stacker cover assy	2PA4083-6160	1	1	53069001
28	Image drum kit	4YA4083-7300G2	1	1	Consumable
29	Toner cartridge kit	4YA4083-6400G2	1	1	Consumable
30	LED head	3YX4083-6245G3	1		56111203
31	Lower base	2PP4083-6801G2	1	1	50217602
32	Stacker cover damper arm	4PP4083-6191G1	1	1	53069101
33	Stacker cover damper gear	4PB4083-6197P1	1	1	51229401
34	PC connector	224A1286P0140	1	1	56730001
35	Flexible cable (LED head)	4YX4121-1025G2	1	1	56629001
36	Connector, PC	4PP4083-6173P1	1	1	56730201
37	Plate, Ground (BU)	4PP4083-6056P1	1	1	53344401
38	Plate, Ground (RE)	4PP4083-6033P1	1	1	53344301
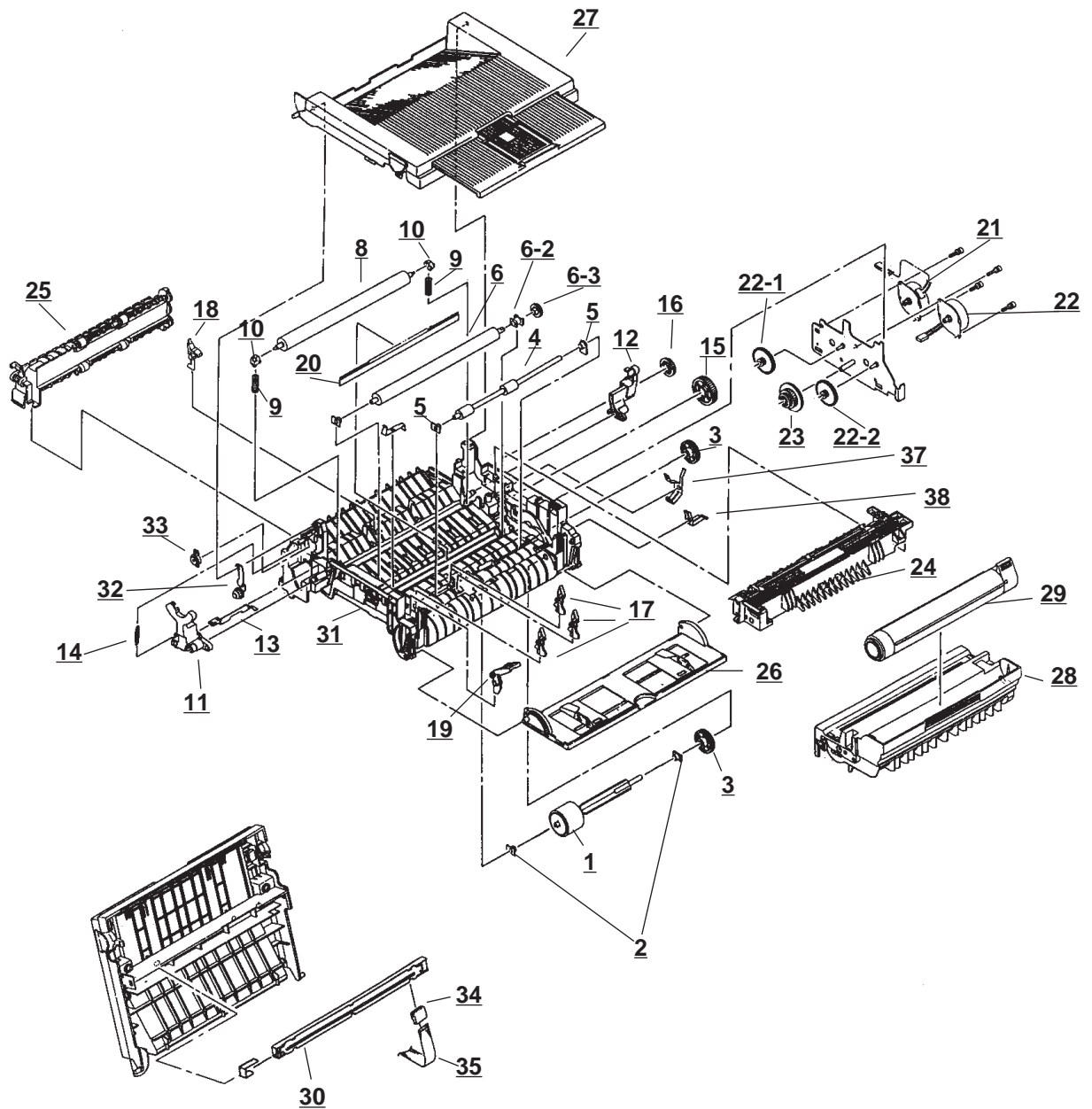
Figure 8-1 Lower Base Unit

Table 8-2 Upper Cover Unit

No.	Name	Part No.	USE	Remarks
1	Upper cover	2PP4083-6808G1	1	53070301
	Upper cover 610e/PS	2PP4083-6808G002	1	53070302
	Upper Cover 610e/S	2PA4094-7812G4	1	53070304
2	Stacker	1PP4094-7814P1	1	50101301
3	Stacker clamp	3PP4094-7816P1	2	50708001
4	Guide wire	4PB3517-1567P1	1	51013801
5	Leaf spring	3PP3517-1601P1	1	50931901
6	Panel: Operator 610e/PS	1PP4094-7814P1	1	50101301
	Panel: Operator 610e/S		1	40086901
7	Cord: Flexible (Op Panel)	238A107100003	1	56627901

OL610ePS

6

4

2

3

3

5

1

7
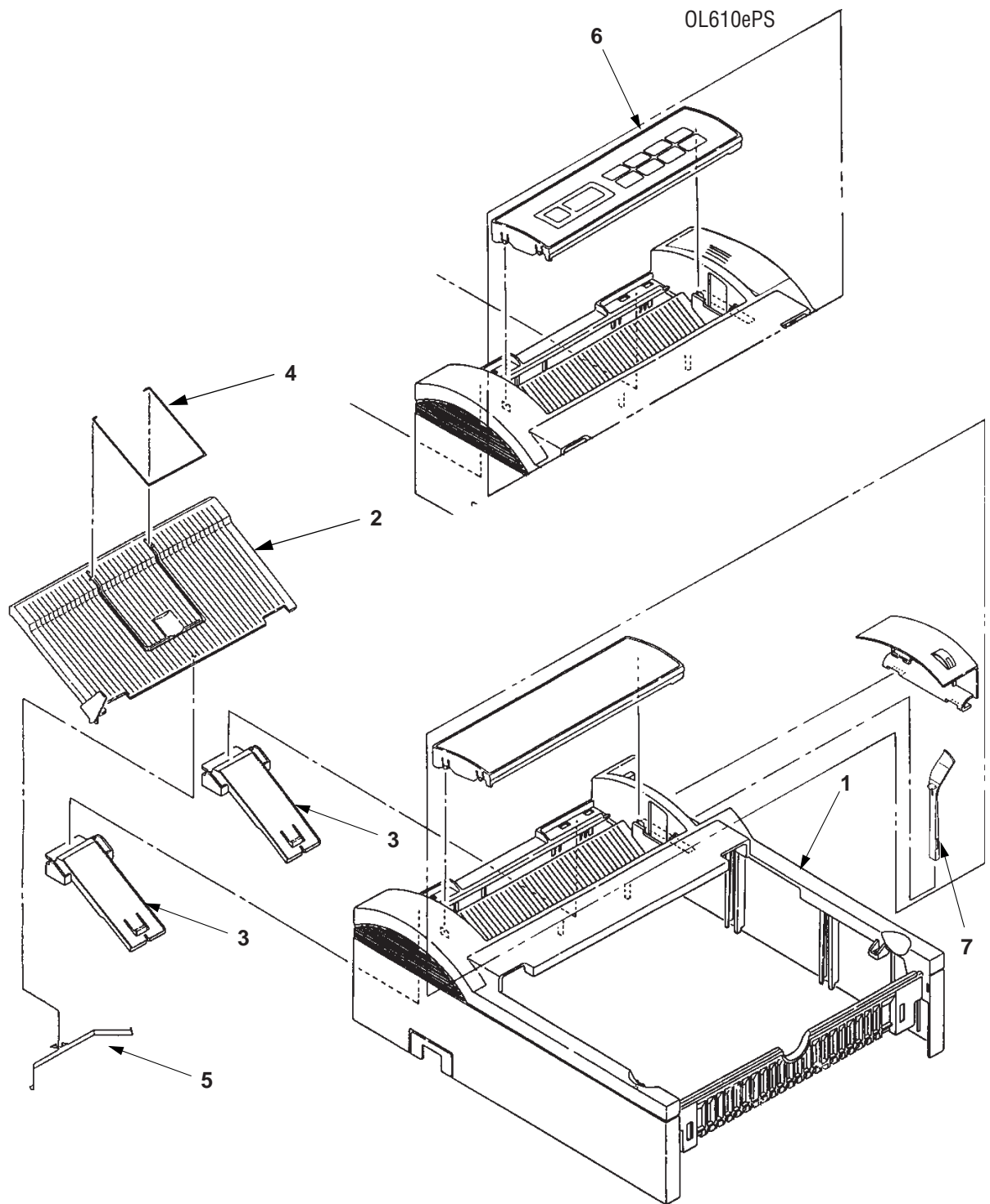
Figure 8-2 Upper cover unit

Table 8-3 Base Unit

No.	Name/Rating	Part No.	USE OL600e	USE OL610e	Remarks
1	Base plate	2PP4083-6809G1	1	1	50217602
2	Cassette guide L	3PP4083-6802G1	1	1	51011201
3	Cassette guide R	3PP4083-6803G1	1	1	51011301
4	Cassette eject spring	4PP4083-6152P1	2	2	50924401
5	Sensor plate (paper end)	4PP4083-6082P1	1	1	51011401
6	Insulator	3PB4083-6144P1	1	1	51709401
7	Control board (LQ5C) OL600e Rev 2.15	4YA4046-1670G11	1		55079808
*	Control board LQ6C OL610e/610e/S Rev 1.16	4YA4046-1671G11		1	55079911
	Control board PS (LQ8A) OL610e/PS	4YA4046-1672G011			55080011
8	Power supply board, 120V	4YA4049-7101G01	1	1	56414901
	Power supply board, 230V	4YA4049-7101G02	1	1	56414902
9	Transformer, 120V	4YB4049-7032P3	1	1	56414703
	Transformer, 230V	4YB4049-7033P3	1	1	56415003
10	Fan motor	4PB4076-6152P1	1	1	56513401
11	Contact assy	3PA4083-6090G1	1	1	56730001
12	AC cord, 120V		1	1	56609701
	AC cord, 220–240V		1	1	56624301
	AC cord, U.K.		1	1	56624501
13	Cassette sensor plate	3PP4083-6154P1	1	1	51011501
14	Paper cassette	1PA4083-6200G1	1	1	50217701
15	Support spring	4PP4083-6153P1	2	2	50924501
16	Inlet holder	4PP4083-6145P1	1	1	50516301
17	Ground plate	4PP4083-6137P1	1	1	51011601
18	I/F Converter Kit (Serial to Parallel)				50115001

* NOTE:

All of the control boards for the OL6xxe Series Printers contain soldered firmware.
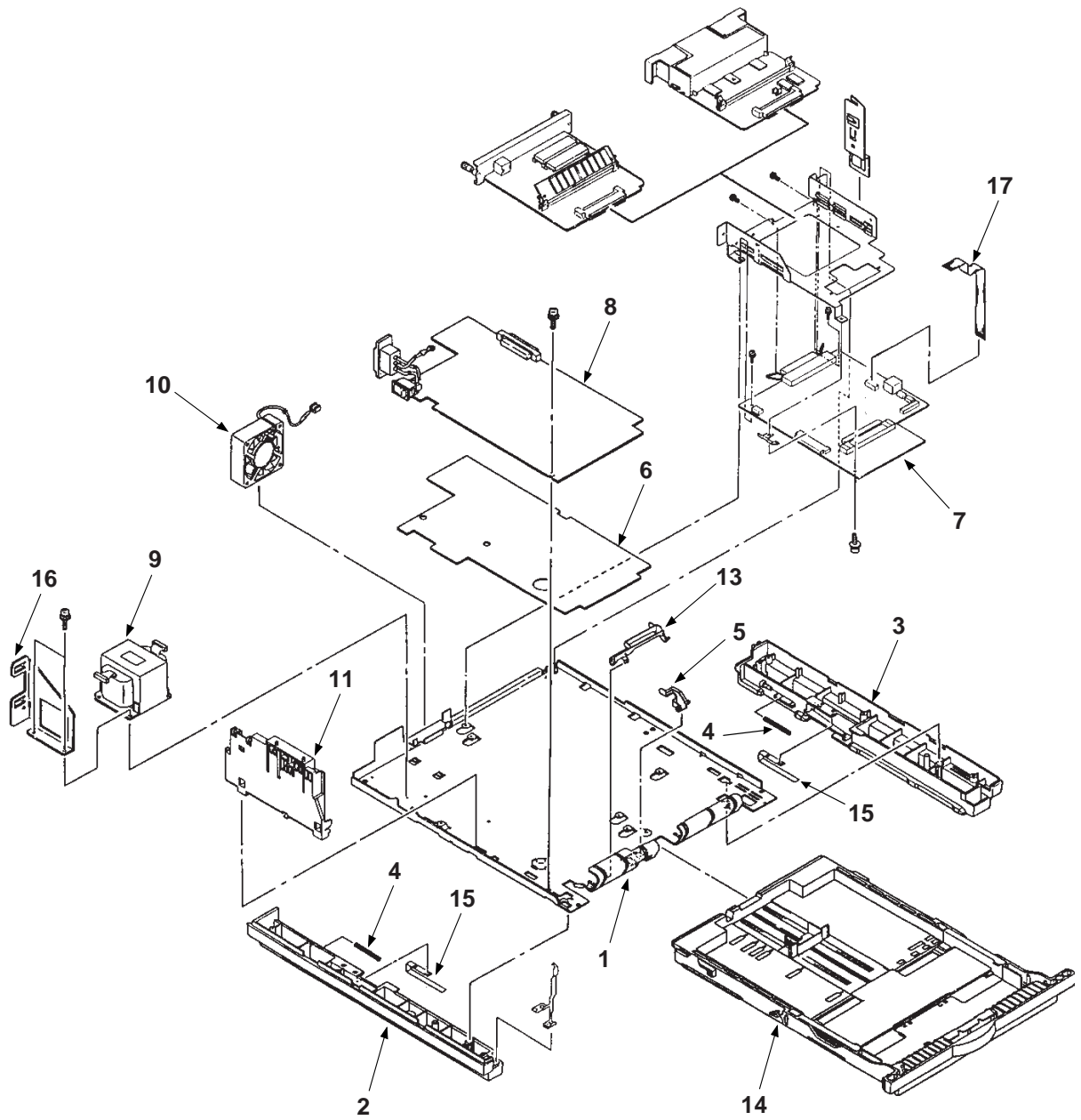
Firmware IS NOT available separately.

Figure 8-3 Base unit

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APPENDIX A: CENTRONICS PARALLEL INTERFACE

1)   Connector

- • Printer side   :   36-pin receptacle
(single port) Type 57-40360-12-D56 (made by Daiichi Denshi) 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 required for FCC compliance.
  - •   IEEE-1284-compatible cable is required for use with DOS and Windows printer conrtrol software.

Note: Cable is not supplied.

3)   Table of Parallel I/F Signals

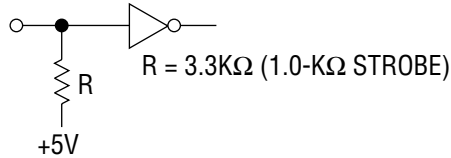| Pin No.	Signal name	Signal direction	Functions
1	$\overline{\text{DATA STROBE}}$	$\rightarrow$ PR	Parallel data sampling strobe
2	DATA BIT - 1		
3	DATA BIT - 2		
4	DATA BIT - 3		
5	DATA BIT - 4	$\rightarrow$ PR	PR Parallel input data
6	DATA BIT - 5		
7	DATA BIT - 6		
8	DATA BIT - 7		
9	DATA BIT - 8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

• Connector pin arrangement
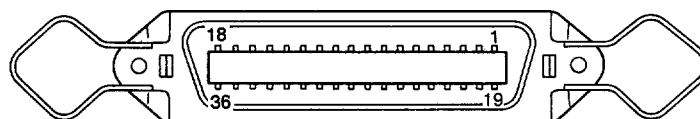
4)   Signal Level

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

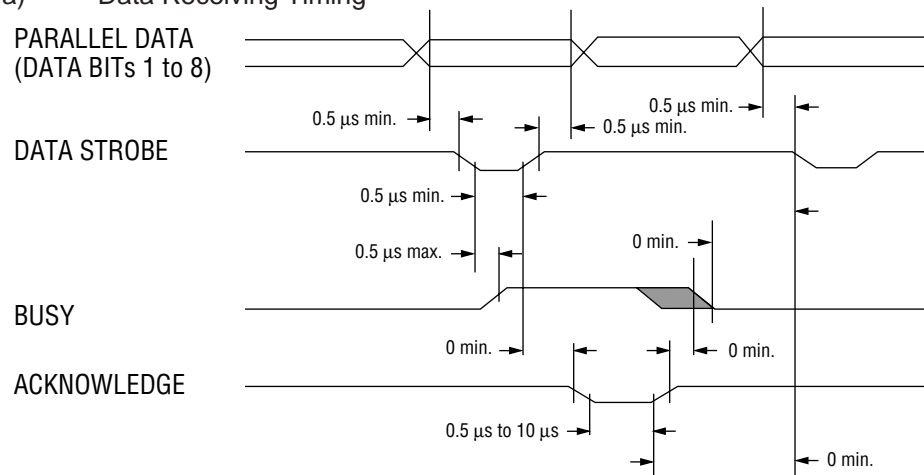5)   Interface Circuit

   a)   Receiving Circuit

R = 3.3KΩ (1.0-KΩ STROBE)

R

+5V

   b)   Sending Circuit

(Open Collector)

3.3KΩ

+5V
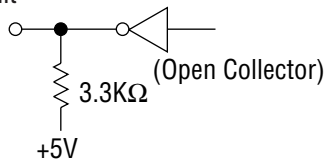
6)   Timing Charts

   a)   Data Receiving Timing

PARALLEL DATA
(DATA BITs 1 to 8)

0.5 μs min.

0.5 μs min.
0.5 μs min.

DATA STROBE

0.5 μs min.

0.5 μs max.

0 min.

BUSY

0 min.

0 min.

ACKNOWLEDGE

0.5 μs to 10 μs

0 min.

   b)   On-line → off-line switching timing by ON-LINE SW (HP4 emulation)

ON-LINE SW

BUSY

SELECT

50 ms max.
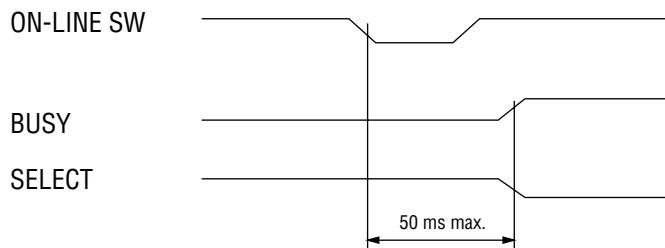
c)   Off-line → on-line switching timing by ON-LINE SW (HP4 emulation)

ON-LINE SW

BUSY

SELECT
ACKNOWLEDGE

0 min.

100 ms max.

0.5 μs to 10 μs
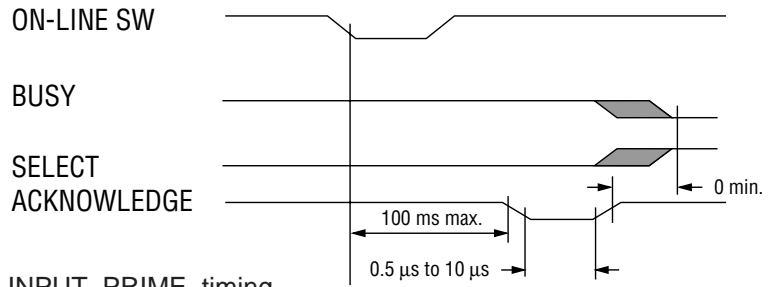
d)   INPUT PRIME timing
     (when set to the effective INPUT PRIME signal on HP4 emulation)

50 μs min.

INPUT PRIME

BUSY

SELECT

5 μs max.

0 min.

ACKNOWLEDGE

5 μs max.

0.5 μs to 10 ms
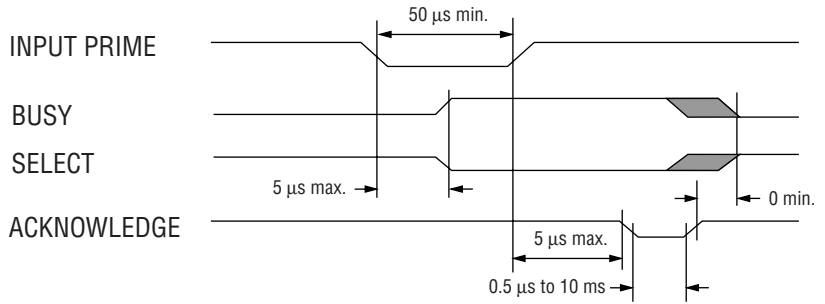
APPENDIX B: LOCALTALK (RS422) SERIAL INTERFACE (OL610E/PS ONLY)

1) Connector

- Printer side   : 8-pin mini DIN receptacle
  Type TCS7187-01-201 (made by HOSHIDEN) or equivalent
- Cable side   : 8-pin mini DIN plug
 Type TCP7180-01-110 (made by HOSHIDEN) or equivalent

2) Cable

- To be shielded cable
- Cable length
  LocalTalk
  Defined max. length   : 1,000 ft. (305 m)--maximum length for a LocalTalk
  network.
  Recommended max. length : 10 ft. (3 m) (For noise prevention)
  RS422 : 6 ft. (1.8 m) max.

3) Interface signal

Pin No.	Signal Name	Abbreviation	Signal Direction	Description
1	–			(Not used)
2	Sync. signal	SYNC	← PR	(Not used)
3	Transmit data minus	TxD-	← PR	Transmit data minus polarity
4	Signal ground	SG		Signal ground
5	Receive data minus	RxD-	→ PR	Receive data minus polarity
6	Transmit data plus	TxD+	← PR	Transmit data plus polarity
7	–			(Not used)
8	Receive data plus	RxD+	→ PR	Receive data plus polarity

• Connector Pin Arrangement
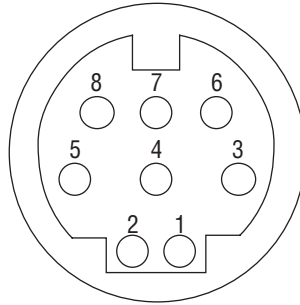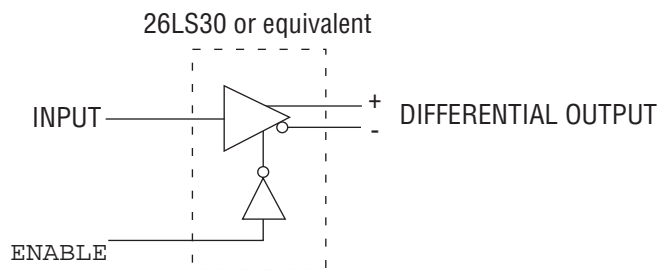
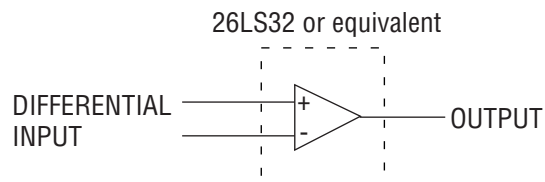

(As viewed from the cable side)

4) Signal level

Differential output : ±5V
Differential input   : ±7V

5) Interface circuit

a) Receiving circuit

b) Transmitting circuit

6) Receive margin

7) Communication protocol
   • LocalTalk I/F
   LocalTalk protocol
   • RS422 I/F
       X-ON/X-OFF protocol

8) Interfacing parameter setting–OL610e/PS

The following settings are possible by pressing 【ENTER / PowerSave】 key after selecting the display

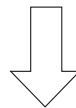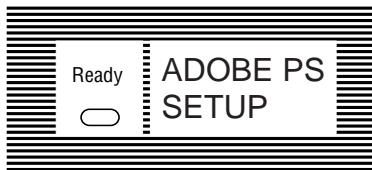contents of the LCD of the operator panel by using 【▶ / Reset】 and 【◀ / Recover】 keys.

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

By pressing 【ON-LINE】 key, menu setting mode is completed and the printer returns to

ON-LINE state.

a) LocalTalk ↔ RS422 switching

```
┌─────────────────────────┐
│  Ready  │  OFF-LINE      │
│   ⬭     │  Adobe PS      │
└─────────────────────────┘
```

⬇
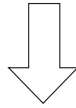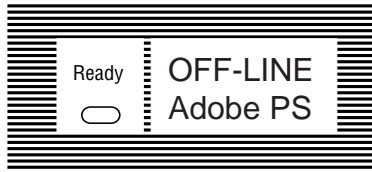
Press [MENU 1 / *Menu 2*] key for 2 seconds to enter the menu mode (level 2), then press [MENU 1 / *Menu 2*]

key, 7 times.

⬇

```
┌─────────────────────────┐
│  Ready  │  ADOBE PS      │
│   ⬭     │  SETUP         │
└─────────────────────────┘
```

⬇

Press [ENTER / *PowerSave*] key.

⬇

```
┌─────────────────────────┐
│  Ready  │  JAM RECV      │
│   ⬭     │                │
└─────────────────────────┘
```

⬇
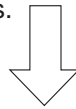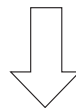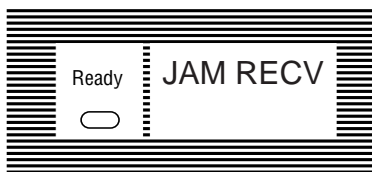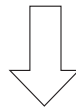
Press [MENU 1 / *Menu 2*] key, 6 times.
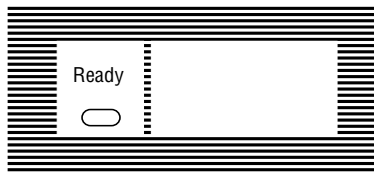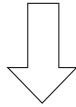
Item	ACTIV 422
Selection	Function
LOCALTK	LocalTalk I/F
RS422	RS422 I/F

Factory Setting: LOCALTK

Press ON-LINE key.

Ready ON-LINE Adobe PS
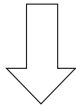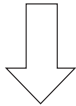
Setting completed.

b) RS422 I/F parameter setting

```
╔══════════════════╗
║ Ready │ OFF-LINE  ║
║ ⊂⊃   │ Adobe PS  ║
╚══════════════════╝
```

⬇
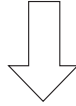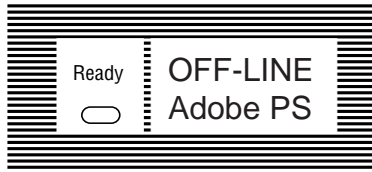
Keep ┌─────────┐ key down for more than 2 seconds and bring the printer into menu
     │ MENU 1 │
     │ Menu 2 │
     └─────────┘

setting mode (level 2).

Next, press ┌─────────┐ key, 8 times.
            │ MENU 1 │
            │ Menu 2 │
            └─────────┘

⬇

```
╔══════════════════╗
║ Ready │ RS422     ║
║ ⊂⊃   │ SERIAL    ║
╚══════════════════╝
```

⬇

Press ┌───────────┐ key.
      │ ENTER   │
      │ PowerSave │
      └───────────┘

⬇
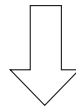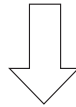
```
╔═══════════╗
║ Ready │   ║
║ ⊂⊃   │   ║
╚═══════════╝
```
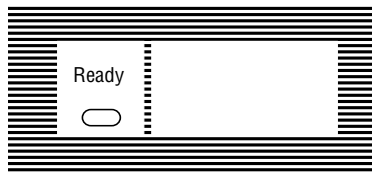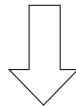
Item	BAUDRATE
Selection	Function
300	300 baud
600	600 baud
1200	1200 baud
2400	2400 baud
4800	4800 baud
9600	9600 baud
19200	19200 baud
38400	38400 baud

Factory Setting: 9600 baud
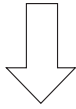
Press ⬇

Press MENU 1 / Menu 2 key.

⬇
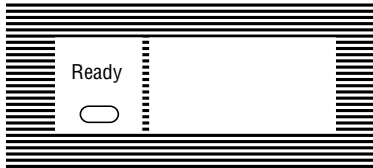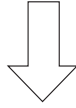
Item	DATABITS
Selection	Function
8 BITS	8 bit length
7 BITS	7 bit length

Factory Setting: 8 bit

⬇
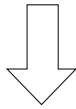
Press MENU 1 / Menu 2 key.

⬇
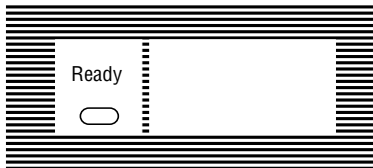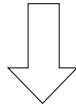
Item	PARITY
Selection	Function
NONE	No parity
EVEN	Even parity
ODD	Odd parity

Factory Setting: No parity

⬇

Press ON-LINE key.

⬇

Ready ON-LINE
       Adobe PS
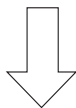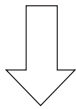
Setting completed.

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APPENDIX C: SOFTWARE DIAGNOSTICS AND ADJUSTMENTS

C.1.   Maintenance Menus—OL610e/PS

- These menus are available on the *OL610e/PS only*–see Section 2 for the equivalents for other models.

- The maintenance menus consist of the user maintenance menu available to the user, and the system and engine maintenance menus, for service personnel only.

- Press the Menu key to update each category. The operation returns to the first category after updating the last category.

- Press the Enter key to select or execute the function being displayed.

- To exit from any of these menus during category display, press the RECOVER or ON-LINE key and the operation mode will start.

C.1.1   User Maintenance Menu

- To enter the user maintenance menu, turn the power on while holding down the Menu key.

- The user maintenance menu provides the following functions:

(1) Hex Dump

- The data received from the host is sent to the printer in hexadecimal notation.

- Printing starts automatically when the received data exceeds one page. If the received data is less than one page, printing can be activated manually be pressing the Form Feed key after changing to the OFF LINE mode. To print automatically even when the received data is less than one page, select the Auto Eject function on the menu.

- To exit from this menu, turn the power off.

(2) Menu Reset

- All settings for Menu level-1 are reset to the factory default values.

- The menus for all available emulations, including options, are reset to the factory default values.

- The operation mode starts automatically when the menu reset is complete.

(3) Drum Counter Reset

- This function resets the drum life data when the user replaces the image drum unit.

- The operation mode starts automatically when the reset is complete.

(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 of the operation panel menu functions (Menu 1, Menu 2, Tray Select, Copies and Paper Size).

Diagram of User Maintenance Mode

LCD display

┌─────────────┐
│ USER MNT   │
└─────────────┘

Press the Menu key.

Press the Enter key.

After the end of processing.

┌─────────────┐   ┌─────────────┐   ┌─────────────┐
│ MENU   │ ─────▶ │ MENU   │ ─────▶ │ ON-LINE   │
│ RESET   │   │ RESET'NG   │   │ Adobe PS   │
└─────────────┘   └─────────────┘   └─────────────┘

Press the Menu key.

Press the Enter key.

┌─────────────┐   ┌─────────────┐
│ HEX DUMP   │ ─────▶ │ ON-LINE   │
│   │   │ HEX DUMP   │
└─────────────┘   └─────────────┘

Press the Menu key.

Press the Enter key.

After the end of processing

┌─────────────┐   ┌─────────────┐   ┌─────────────┐
│ DRUM CNT   │ ─────▶ │ DRUM CNT   │ ─────▶ │ ON-LINE   │
│ RESET   │   │ RESET'NG   │   │ Adobe PS   │
└─────────────┘   └─────────────┘   └─────────────┘

Press the Menu key

Press the + or - key.

┌─────────────┐   ┌─────────────┐
│ OP MENU   │ ◀────▶ │ OP MENU   │   Writing into the EEPROM is carried out
│ ENABLE *   │   │ DISABLE   │   after pressing the Enter key, then
└─────────────┘   └─────────────┘   On-line or Recover key.

OL 600e   Press the Menu key.

OL 610e

Press the + or - key.

┌─────────────┐   ┌─────────────┐
│ X ADJUST   │ ◀────▶ │ X ADJUST   │   Writing into the EEPROM is carried out
│ 0mm*   │   │ +0.25mm   │   after pressing the Enter key, then
└─────────────┘   └─────────────┘   On-line or Recover key.
                                         (Range of Adjustment: +2.00mm to
Press the Menu key.   -2.00mm; 0.25mm steps)

Press the + or - key.

┌─────────────┐   ┌─────────────┐
│ Y ADJUST   │ ◀────▶ │ Y ADJUST   │   Writing into the EEPROM is carried out
│ 0mm*   │   │ +0.25mm   │   after pressing the Enter key, then
└─────────────┘   └─────────────┘   On-line or Recover key.
                                         (Range of Adjustment: +2.00mm to
Press the Menu key.   -2.00mm; 0.25mm steps)

C.1.2   System Maintenance Menu

- The system maintenance menu is activated when the power is turned on while holding down the Recover key.

- The system maintenance menu 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

- This tests 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 carried out even when another interface is selected in Menu level-2.

- Installation of the loop connector is necessary for the loop test.

- The realtime loop count is displayed on the LCD.

- When an error occurs in the course of the test, the corresponding error message is displayed.

- Press the ON-LINE key to cancel this mode.

(5) EEPROM Reset

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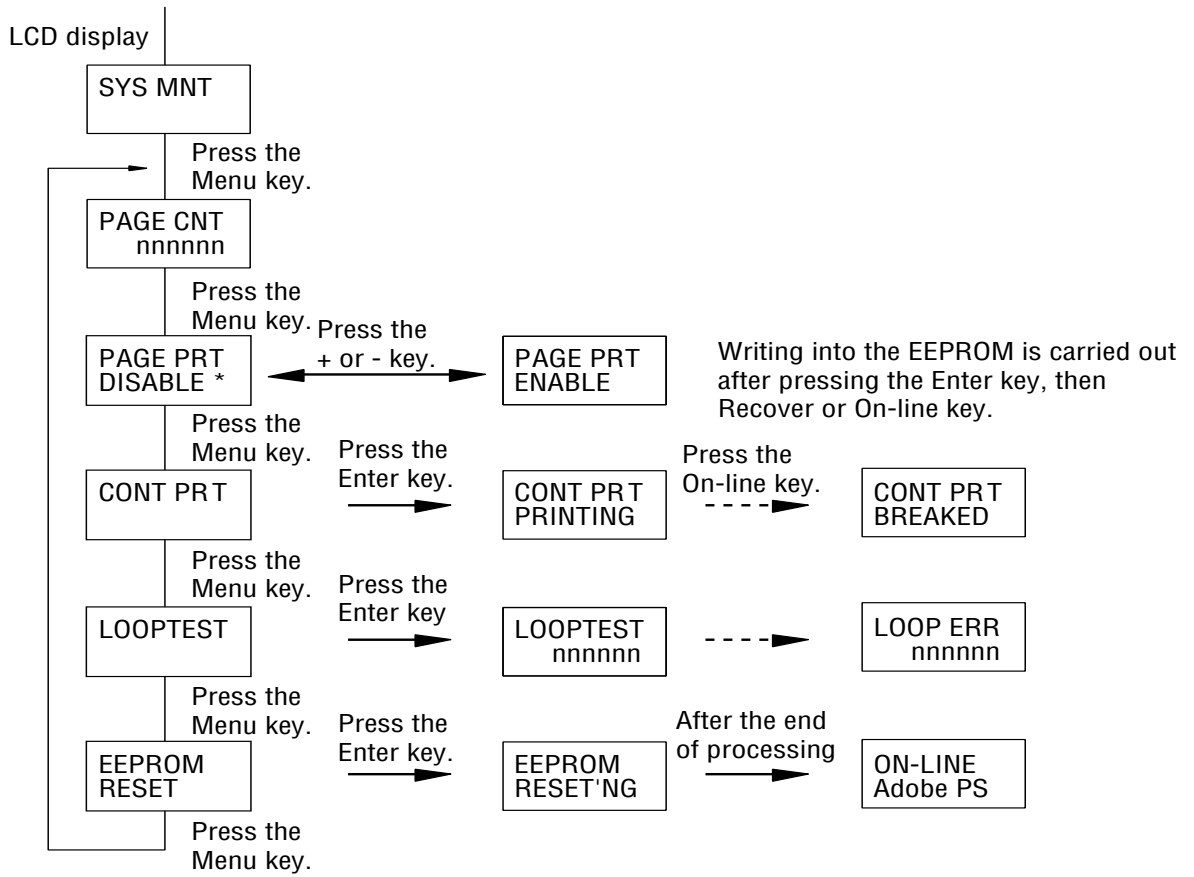
  The following items are excluded:

    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.
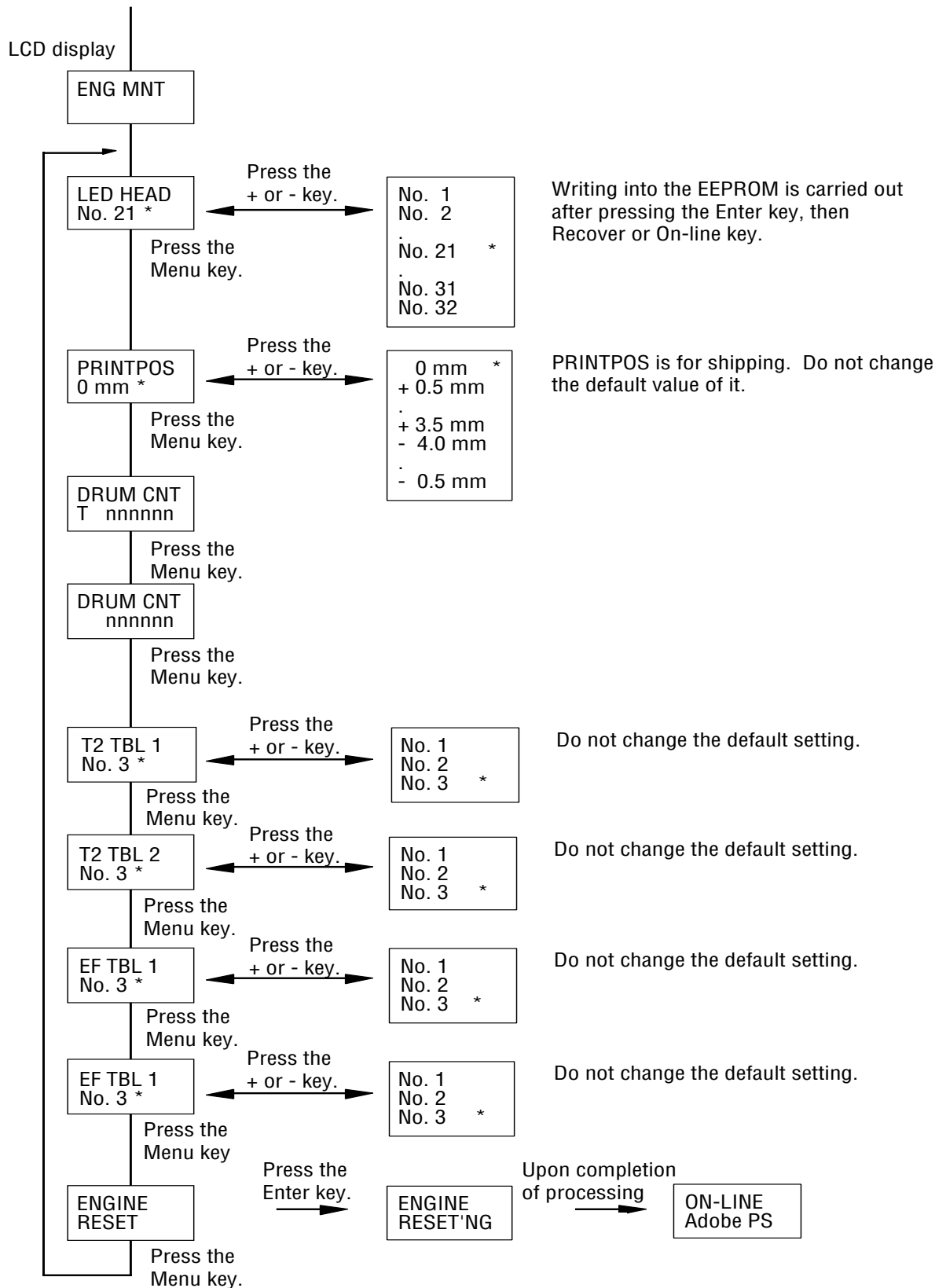
Diagram of System Maintenance Menu (Figure. C-1)

LCD display

```
┌──────────┐
│ SYS MNT  │
└──────────┘
        Press the
        Menu key.
┌──────────┐
│ PAGE CNT │
│  nnnnnn  │
└──────────┘
        Press the
        Menu key.   Press the
┌──────────┐        + or - key.          ┌──────────┐    Writing into the EEPROM is carried out
│ PAGE PRT │    ◄──────────────────►     │ PAGE PRT │    after pressing the Enter key, then
│ DISABLE *│                             │ ENABLE   │    Recover or On-line key.
└──────────┘                             └──────────┘
        Press the
        Menu key.   Press the                      Press the
┌──────────┐        Enter key.           ┌──────────┐   On-line key.   ┌──────────┐
│ CONT PRT │    ──────────────►          │ CONT PRT │  ─ ─ ─ ─►         │ CONT PRT │
└──────────┘                             │ PRINTING │                  │ BREAKED  │
                                         └──────────┘                  └──────────┘
        Press the
        Menu key.   Press the
┌──────────┐        Enter key            ┌──────────┐                  ┌──────────┐
│ LOOPTEST │    ──────────────►          │ LOOPTEST │  ─ ─ ─ ─►         │ LOOP ERR │
└──────────┘                             │  nnnnnn  │                  │  nnnnnn  │
                                         └──────────┘                  └──────────┘
        Press the                                     After the end
        Menu key.   Press the                         of processing
┌──────────┐        Enter key.           ┌──────────┐              ┌──────────┐
│ EEPROM   │    ──────────────►          │ EEPROM   │  ──────────► │ ON-LINE  │
│ RESET    │                             │ RESET'NG │              │ Adobe PS │
└──────────┘                             └──────────┘              └──────────┘
        Press the
        Menu key.
```

C.1.3   Engine Maintenance Menu

- The engine maintenance menu is activated when the power is turned on while holding down the Form Feed key and the Enter key.

- The method for exit from this menu depends on the setting.

- The engine maintenance menu provides the following functions:

(1) Head Drive Time Setting

- Sets the drive time of the LED head.

- For setting instructions, see page 4-3.

(2) Printing Start Position Setting

- Sets the printing start position.

(3) Drum Count Total Display

- Displays on the LCD the total number of drum revolutions of the unit, counted at the engine block.

(4) Drum Count Display

- Displays on the LCD the total number of EP drum revolutions counted at the engine block.

(5) Factory Adjustment (for High Capacity Second Paper Feeder/Multi-Purpose Feeder)

- Do not change the default settings.

(6) Engine Reset

- All EEPROM areas used by the engine block are reset to the 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.

Diagram of Engine Maintenance Menu (Figure C-2)

LCD display

ENG MNT

LED HEAD
No. 21 *

Press the
+ or - key.

No. 1
No. 2
.
No. 21   *
.
No. 31
No. 32

Writing into the EEPROM is carried out
after pressing the Enter key, then
Recover or On-line key.

Press the
Menu key.

PRINTPOS
0 mm *

Press the
+ or - key.

0 mm   *
+ 0.5 mm
.
+ 3.5 mm
- 4.0 mm
.
- 0.5 mm

PRINTPOS is for shipping. Do not change
the default value of it.

Press the
Menu key.

DRUM CNT
T   nnnnnn

Press the
Menu key.

DRUM CNT
nnnnnn

Press the
Menu key.

T2 TBL 1
No. 3 *

Press the
+ or - key.

No. 1
No. 2
No. 3   *

Do not change the default setting.

Press the
Menu key.

T2 TBL 2
No. 3 *

Press the
+ or - key.

No. 1
No. 2
No. 3   *

Do not change the default setting.

Press the
Menu key.

EF TBL 1
No. 3 *

Press the
+ or - key.

No. 1
No. 2
No. 3   *

Do not change the default setting.

Press the
Menu key.

EF TBL 1
No. 3 *

Press the
+ or - key.

No. 1
No. 2
No. 3   *

Do not change the default setting.

Press the
Menu key

ENGINE
RESET

Press the
Enter key.

ENGINE
RESET'NG

Upon completion
of processing

ON-LINE
Adobe PS

Press the
Menu key.

C.1.4   Factory User Setting Operation

- These procedures allow switching to ODA, OEL, and Non-Europe user settings .

- After executing a factory user setting operation, set the EEPROM areas which are for other than the engine block, to the factory default values.

Note 1: units are set for the intended destination at the time of shipment from the factory.

(1) Factory ODA Setting:

Turn the power on while holding down the Menu key and the NEXT+ key.

(2) Factory OEL Setting:

Turn the power on while holding down the Menu key and the LAST- key.

(3) Factory Non-Europe Setting:

Turn the power on while holding down the Menu key and the FORM FEED key.

C.2.   DOS Software Operating Panel—OL600e & OL610e

- The diagnostic and adjustment controls on the DOS Operating Panel are on the **Settings** tab, available to the end user, and the **Service** tab, available to service personnel only.

- The Operating Panel uses Windows-type controls and displays.

C.2.1   Settings Tab

- Selected controls on the **Settings** tab perform adjustment and resetting functions. This tab is avialble to the end user.

- At the DOS prompt, enter <u>OL600</u>. When the Operator Panel appears, click on Settings or press the ALT and S keys.

Reset Item

- Click on the item to be reset, then click on Reset.

(1) EEPROM
- Resets all EEPROM areas, including Menu level-2, to the factory default values.
- The following items are *not* reset:

  Head drive time setting

  Fine adjustment of printing start position

  Standard tray paper feed amount setting

(2) Menu
- Resets all level-1 menu settings to factory fefault values, including all available emulations and options.

(3) Drum Count
- Resets the drum life data. Perform this function whenever the image drum is replaced.

Print Position Adjust

- Adjusts the horizontal and vertical printing position of the first character of the first line on the page.

- Range of settings: -2.00mm to +2.00mm, in 0.25mm increments.

- Selected desired setting from list boxes.

C.2.2   Service Tab

- This portion of the DOS Operator Panel is available to service personnel only.

- At the DOS prompt, enter: <u>OL600 \S</u>. When the Operator Panel appears, click on Service or press the ALT and e keys.

(1) Head Drive Time

- Sets the drive time of the LED head using a scroll bar.

- For setting instructions, see page 4-3.

(2) LED Array

- Leave at default setting–2560 Dots.

- Alternate setting is for future development.

(3) LED Wires

- Leave at default setting–1 Wire.

- 2 Wire settting is for future development.

- Incorrect setting (2 Wire) causes two copies of the page image to be printed side by side.

(4) Climate

- Adjusts fuser for environmental conditions.

- Settings: +1 (default), 0, –1.

(5) Print Start Position

- This setting is for shipping–do not change it.

(6) Market Place

- Set at the factory for the region the unit will be shipped to:
    ODA (US default): North & South America
    OEL: Europe
    Non-Europe 1: Australia
    Non-Europe 2: Singapore, Far East

- Must be set to ODA for proper default settings for language, symbol set, page size, etc.

- If incorrectly set, menu page will read "OL600ex" or "OL610ex."

(7) Revision Information

- Displays revision/code numbers for the firmware, the engine, and the CPU.

- This information may be needed to determine the applicability of product updates and procedures outlined in Product Bulletins.

(8)   Count Information

- Displays usage information as follows:

    Drum: Number of revolutions of the image drum currently installed in the unit.

    Drum Total: Total number of revolutions of the unit.

    Page: Total number of pages printed by the unit.

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APPENDIX D: MULTI-PURPOSE FEEDER

D.1.   PREFACE

This Appendix is intended for service personnel. It describes the field maintenance procedures for the Multi-Purpose Feeder option for OL600e Series LED Page Printers.

Refer to the Multi-Purpose Feeder Instruction Sheet and Printer Handbook for equipment handling and operation.

D.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/m^2)
- 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.

D.1.2 External View and Component Names
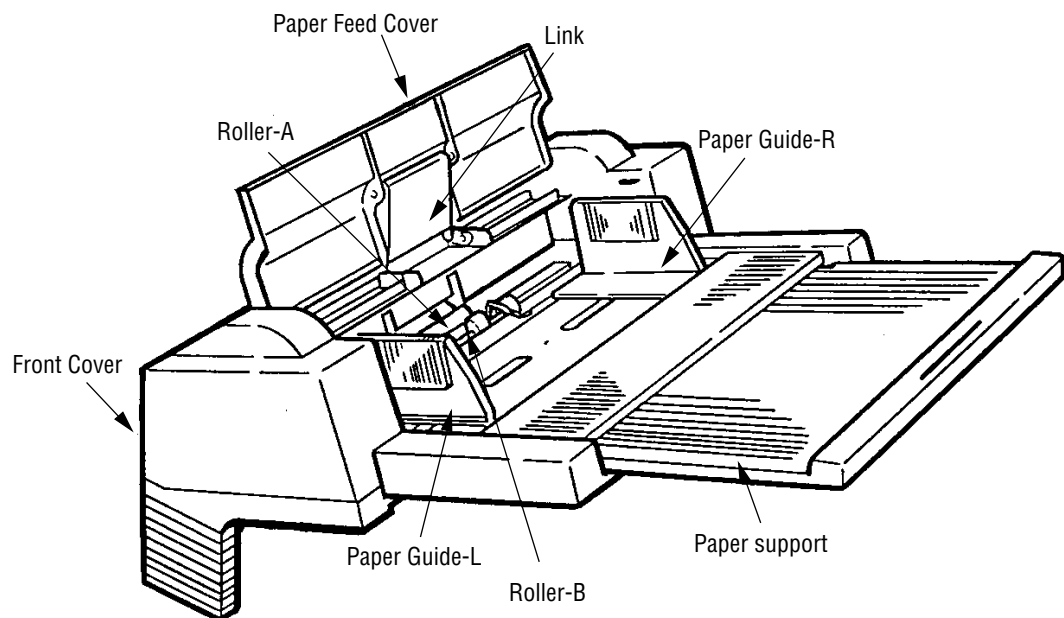
Figure 1-1

D.2.   MECHANISM DESCRIPTION

D.2.1   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.

D.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.
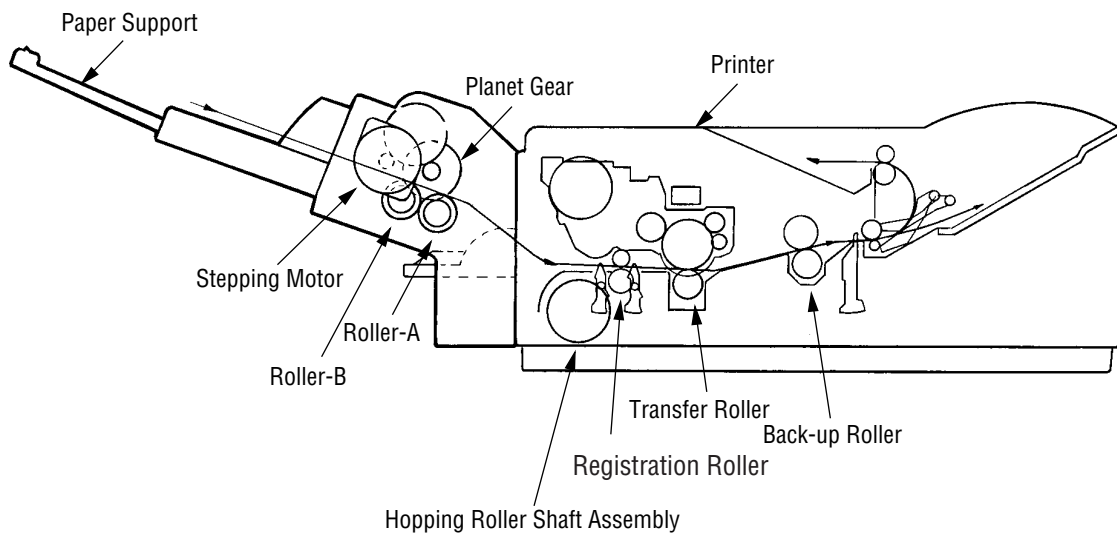
D.3. PARTS REPLACEMENT

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.
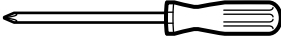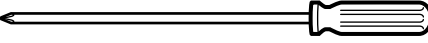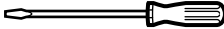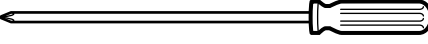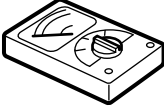
D.3.1   Precautions Concerning Parts Replacement
   Note: Always use good anti-static methods.
(1) Parts replacements must be carried out, by first turning the printer power switch off ["O"] and removing the Multi-Purpose Feeder from the printer.
(2) Do not disassemble the Multi-Purpose Feeder if it 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) Use only specified service tools.
(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 gloves, 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		N0. 3-100 screwdriver	1		
4		N0. 5-200 screwdriver	1		
5		Digital multimeter	1		
6		Pliers	1		
7		Handy cleaner	1		

D.3.2   Parts Layout

This section describes the layout of the main components.
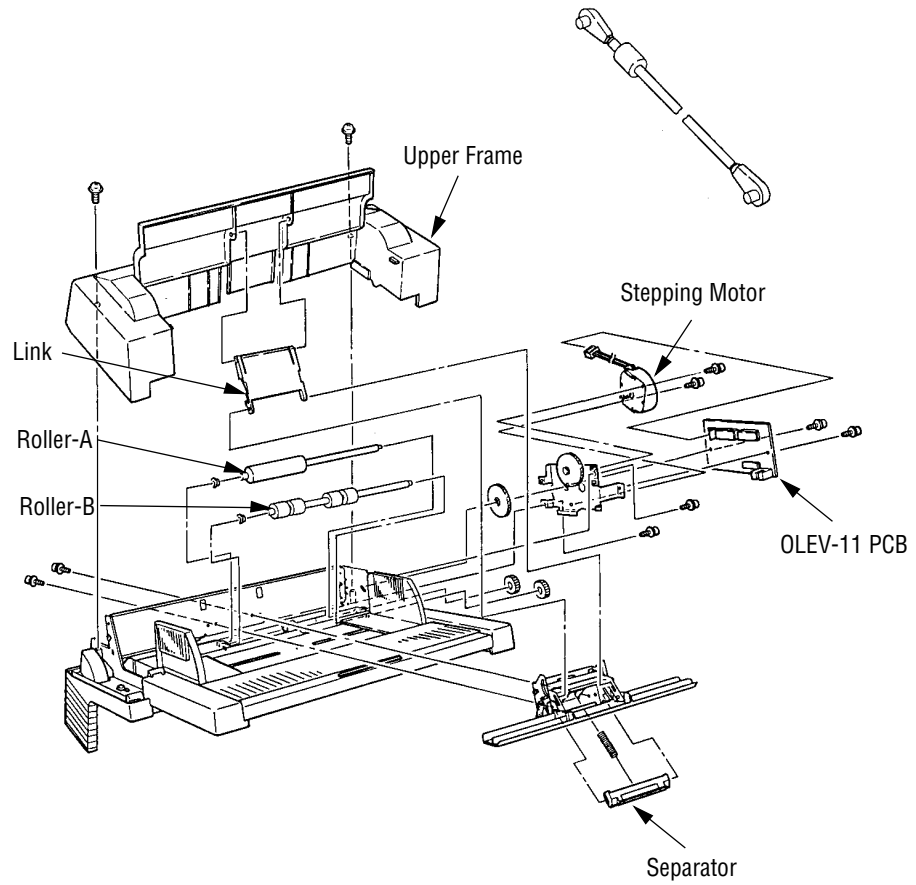
Figure 3-1

D.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 (3.3.1)

————— Separator (3.3.2)

————— OLEV-11 PCB (3.3.3)

————— Stepping motor (3.3.4)

————— Planet gear (3.3.5)

————— Roller-A (3.3.6)
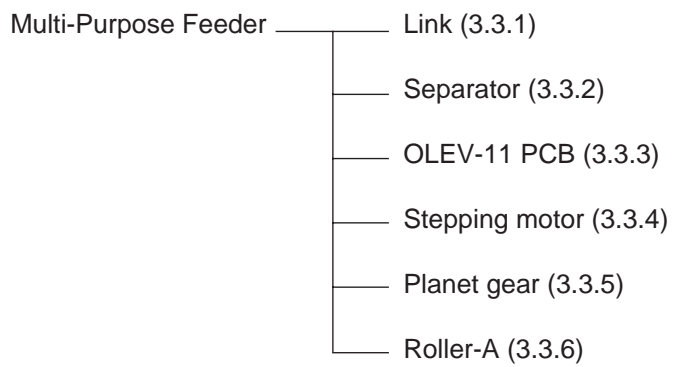
Link

(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 damage the link and arm.
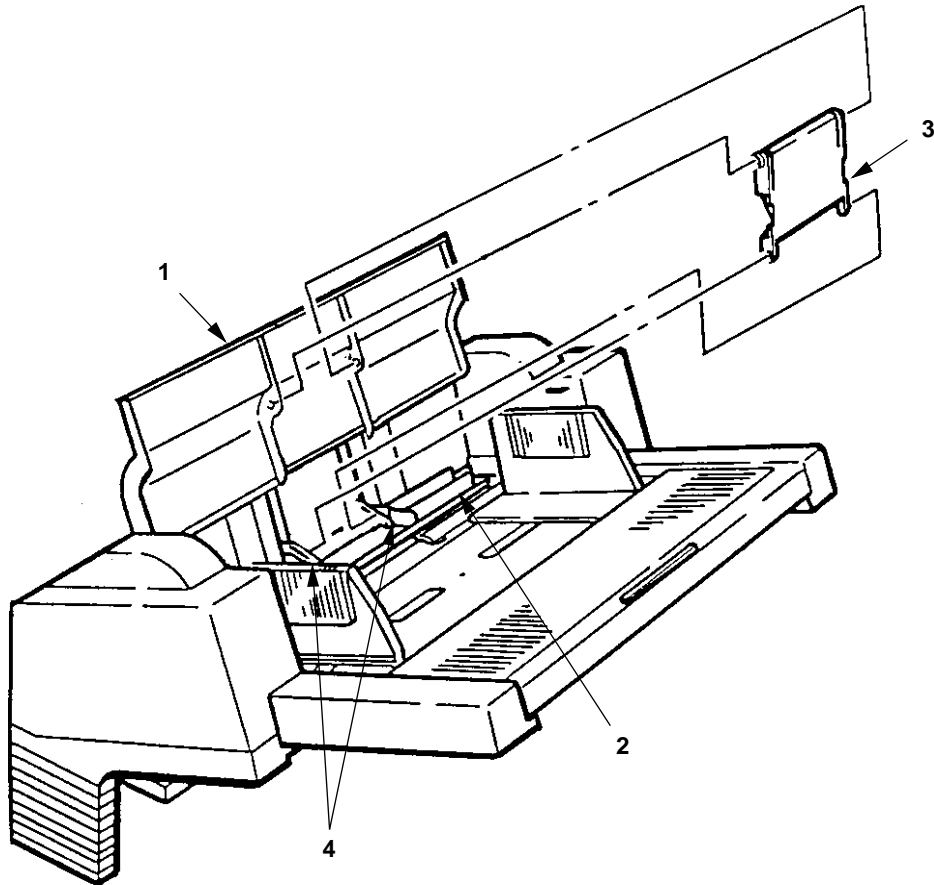
Separator

(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).

Screwdriver(-)

Lock

Lock

Lock
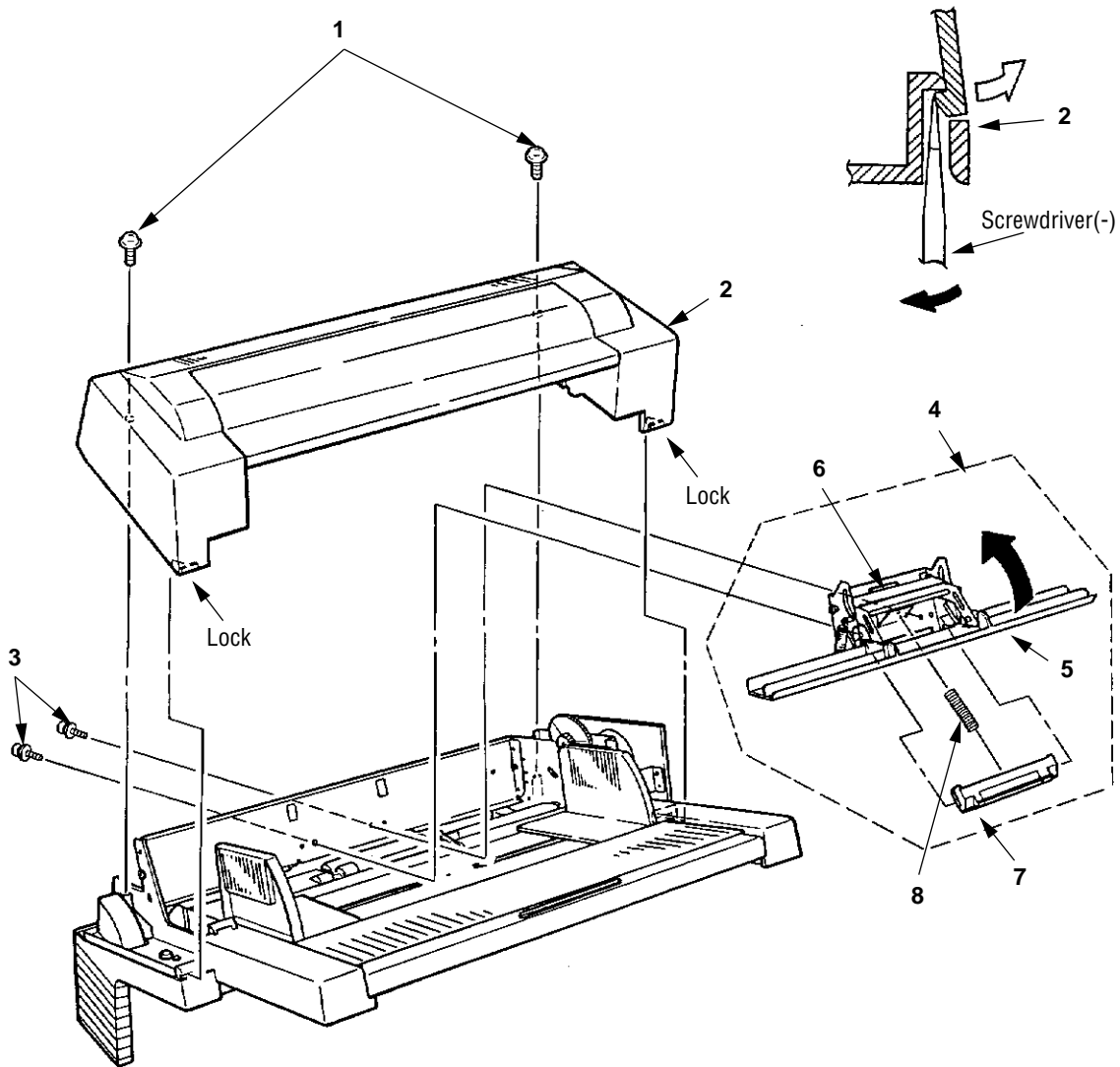
OLEV-11 PCB

(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 set correctly.
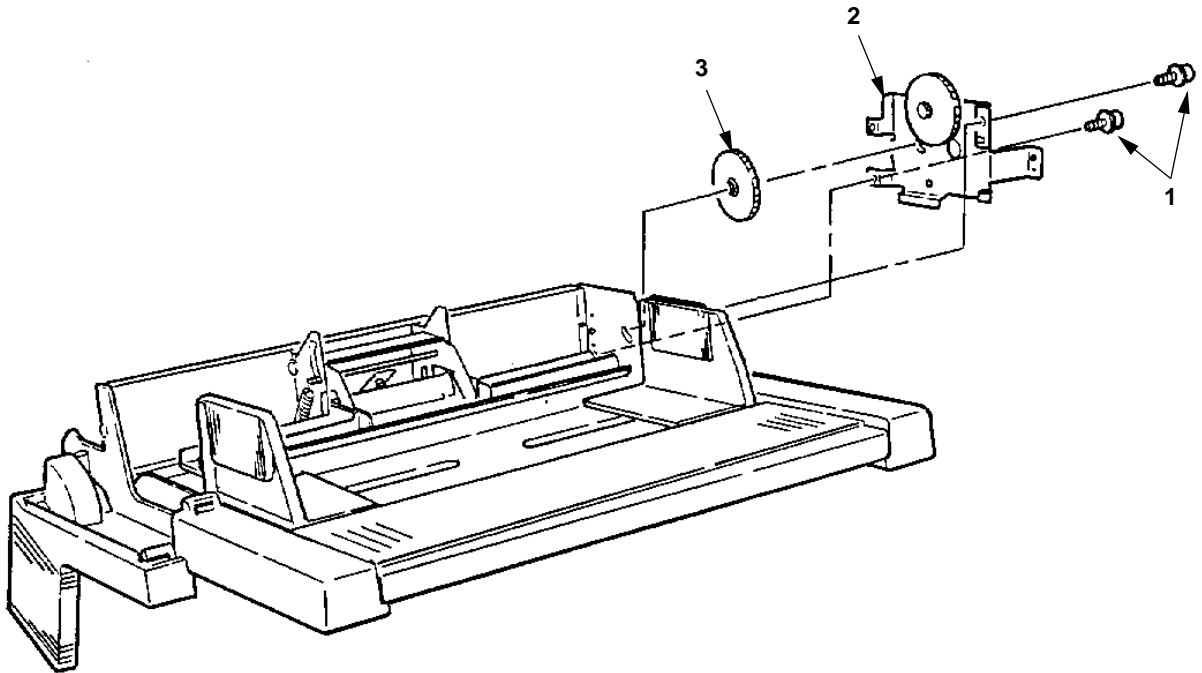
Sensor Plate
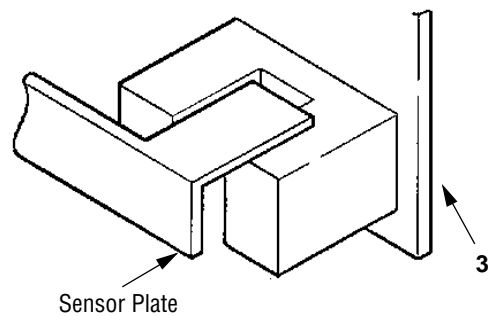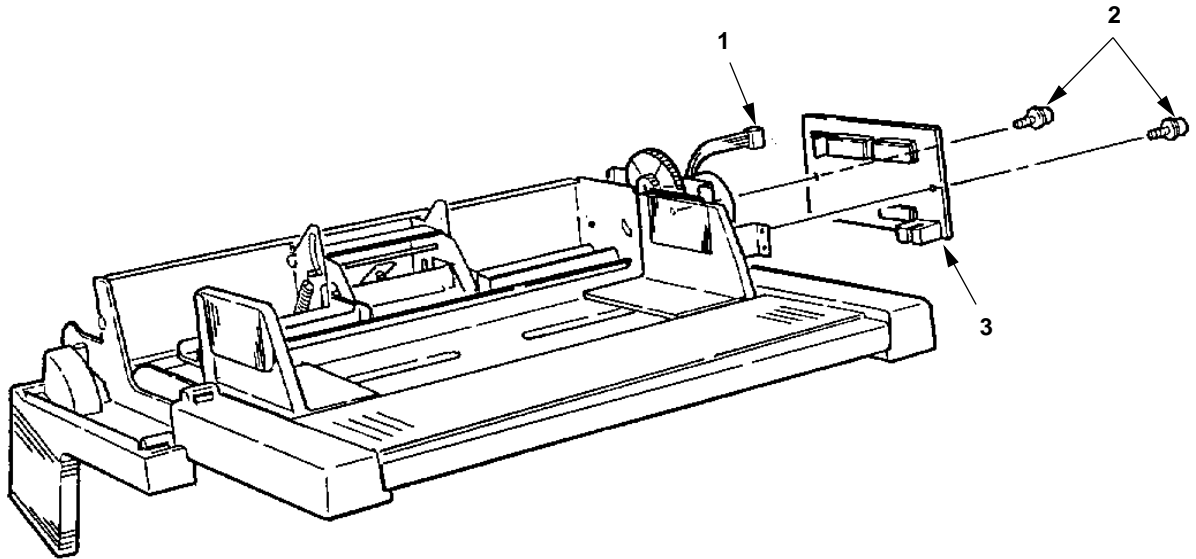
Pulse Motor

(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**.
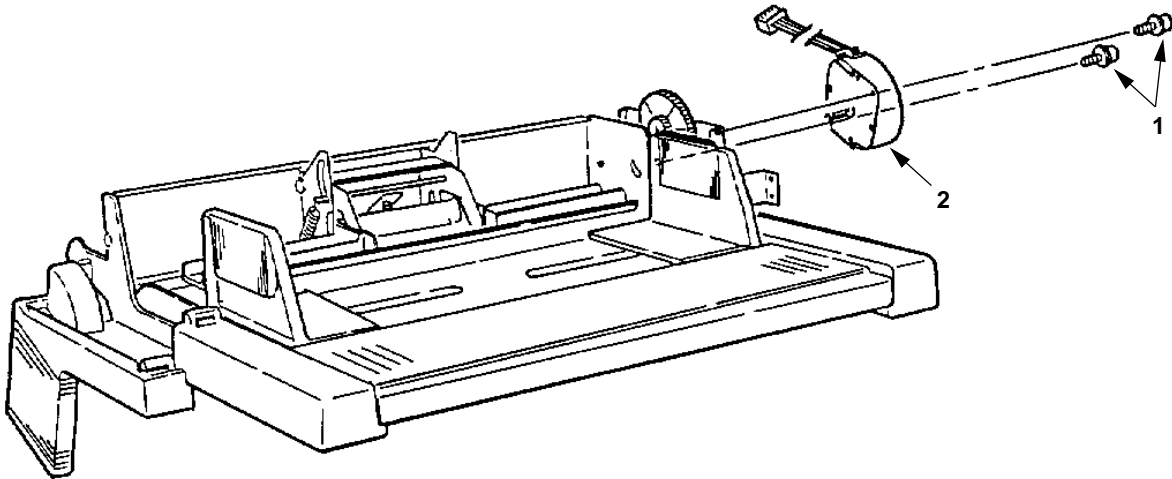
Planet Gear

(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**.

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 (bearing **3** also comes off while you are doing this, so be careful not to lose it).
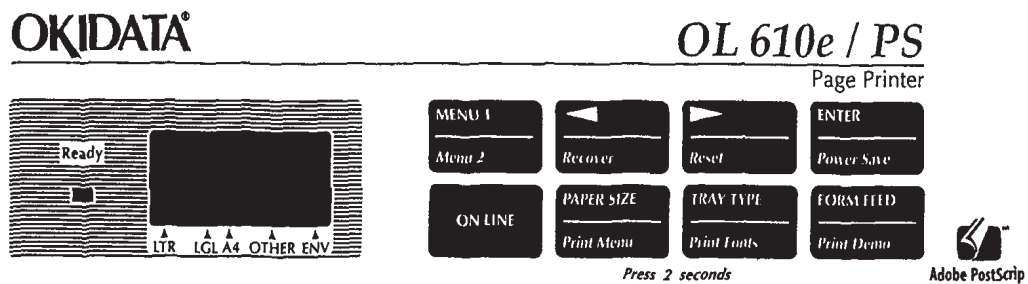
Sensor Lever

Roller-B
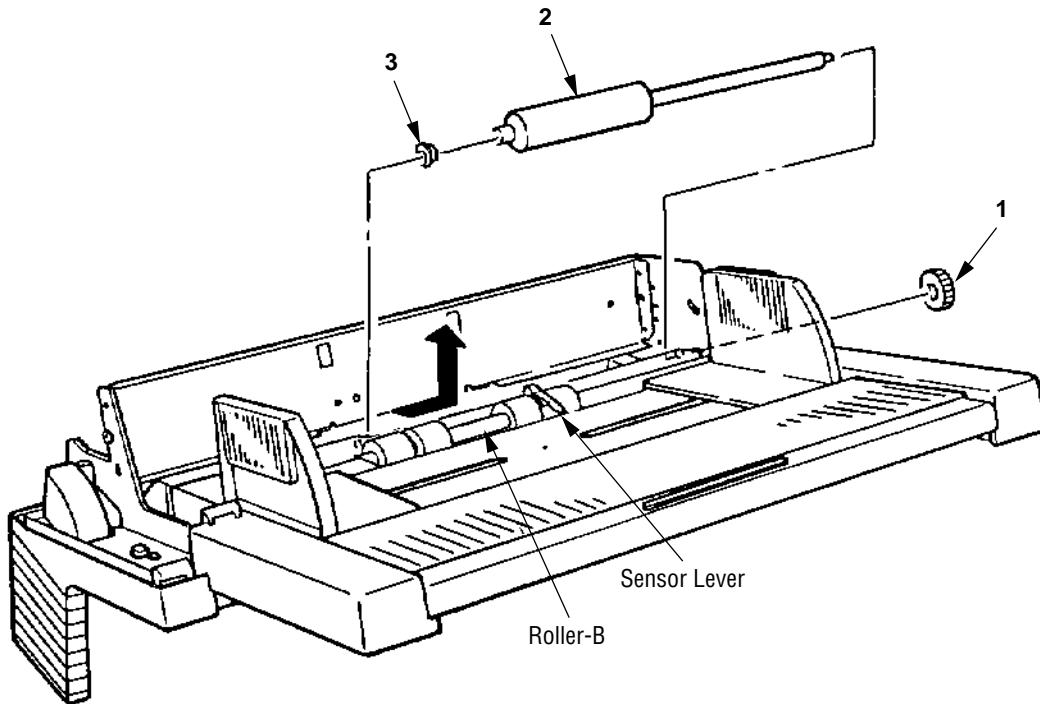
D.4. TROUBLESHOOTING

D.4.1 Precautions Prior to Troubleshooting

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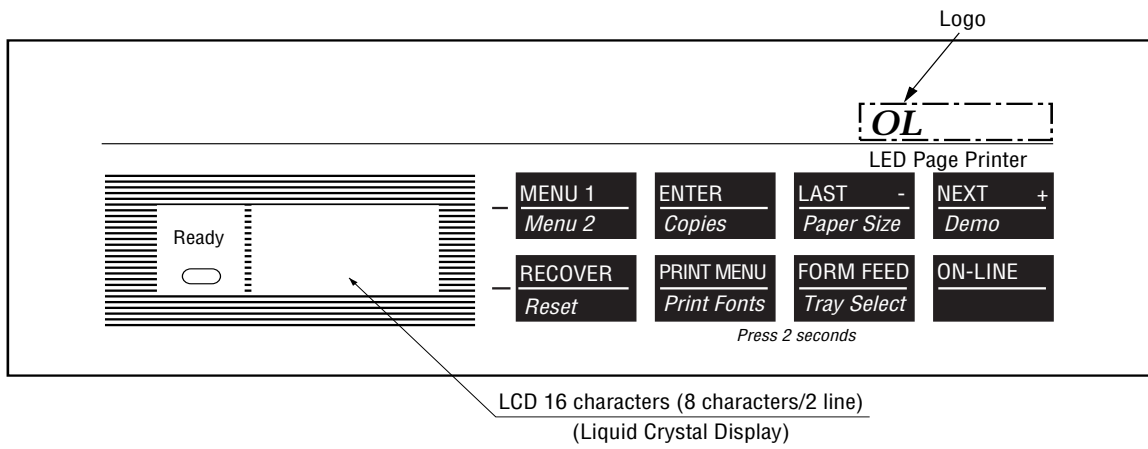(3) Go through the checking in the conditions similar to that in which the problem occurred.

D.4.2 Preparations for Troubleshooting

(1) Display on the operator panel
The status of the problem is displayed on the operator panel (OL610e/PS) or in the printer control software (other models). Go through the appropriate troubleshooting procedures according to the messages displayed.
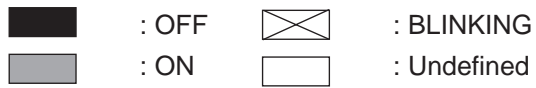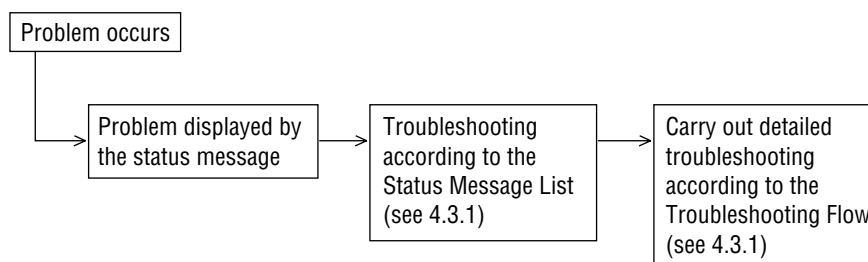
[ODA]

[OEL]

Logo

OL

LED Page Printer

Ready

| MENU 1 | ENTER | LAST - | NEXT + |
| *Menu 2* | *Copies* | *Paper Size* | *Demo* |

| RECOVER | PRINT MENU | FORM FEED | ON-LINE |
| *Reset* | *Print Fonts* | *Tray Select* | |

Press 2 seconds

LCD 16 characters (8 characters/2 line)
(Liquid Crystal Display)

Ready LED display

: OFF   : BLINKING

: ON   : Undefined

D.4.3   Troubleshooting Method

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

```
┌──────────────┐
│Problem occurs│
└──────┬───────┘
       │
       ▼
┌──────────────────┐   ┌──────────────────┐   ┌──────────────────────┐
│Problem displayed │   │Troubleshooting   │   │Carry out detailed    │
│by the status     │──▶│according to the  │──▶│troubleshooting       │
│message           │   │Status Message    │   │according to the      │
│                  │   │List              │   │Troubleshooting Flow  │
│                  │   │(see 4.3.1)       │   │(see 4.3.1)           │
└──────────────────┘   └──────────────────┘   └──────────────────────┘
```
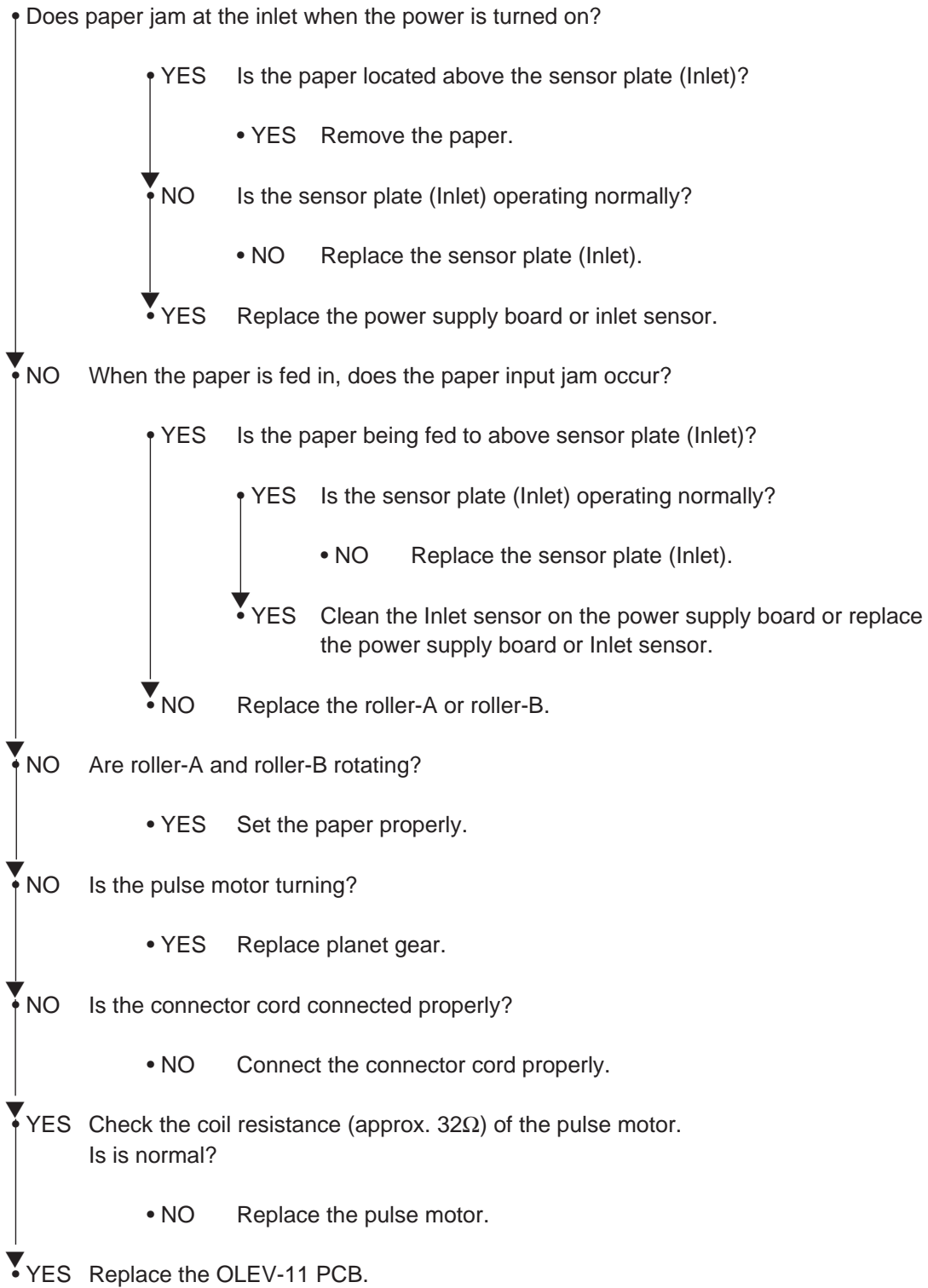
Status Message List

Table 6-1 lists status messages and error recovery procedures. Messages are listed as they appear on the LCD display of the OL610e/PS. For the OL600e and OL610e, similar messages appear in the Status Monitor window.

Classification	Status Message	Description	Recovery Method

Jam error	`FEED PAPER INPUT JAM`
	
	or
	
	`FEEDER FEED JAM`
		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 recovery printing by opening and closing the cover, and turn the error display off.
			• When the problem occurs frequently, to through the Troubleshooting.

Paper size error	`FEEDER SIZE ERR`	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	`FEEDER PAPEROUT`	Notifies that there is no paper in the Multi-Purpose Feeder.	• Load paper in Multi-Purpose Feeder.

JAM Error

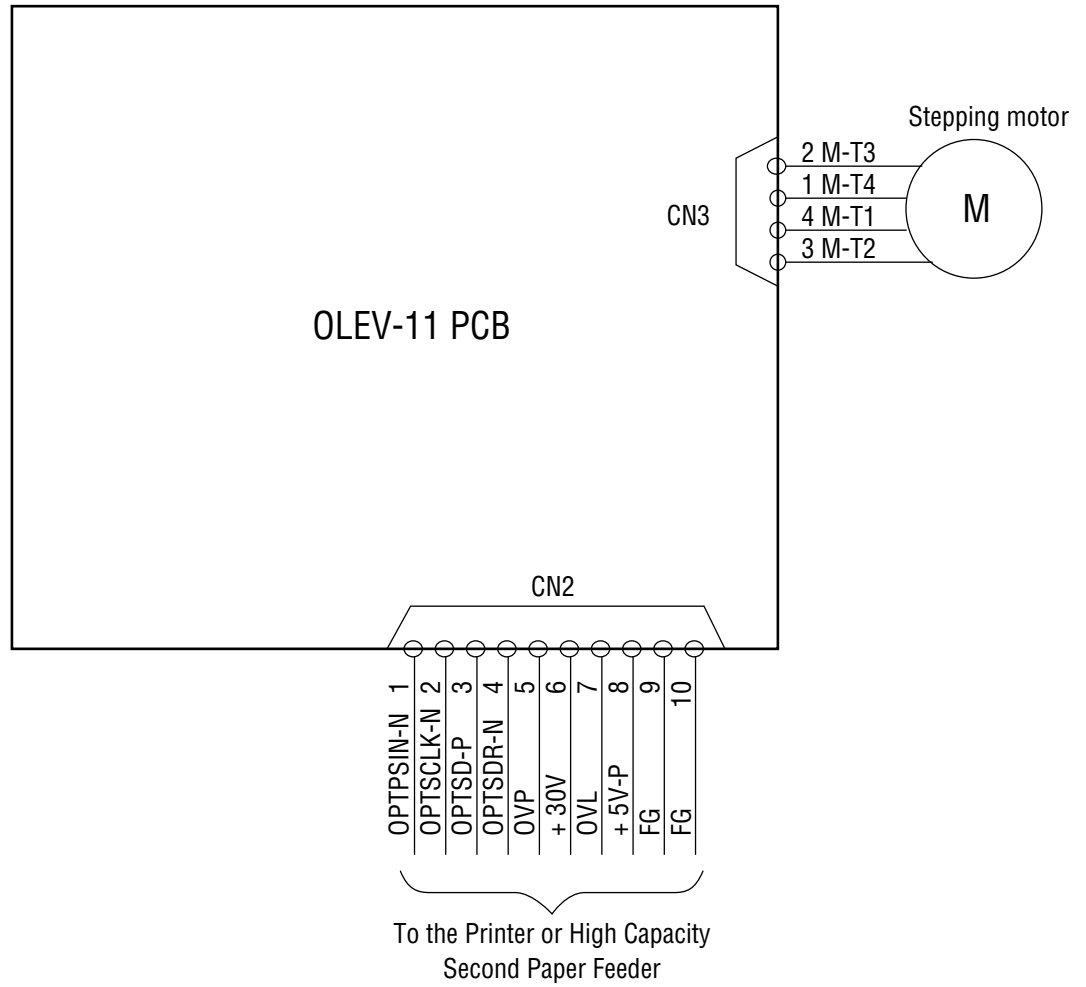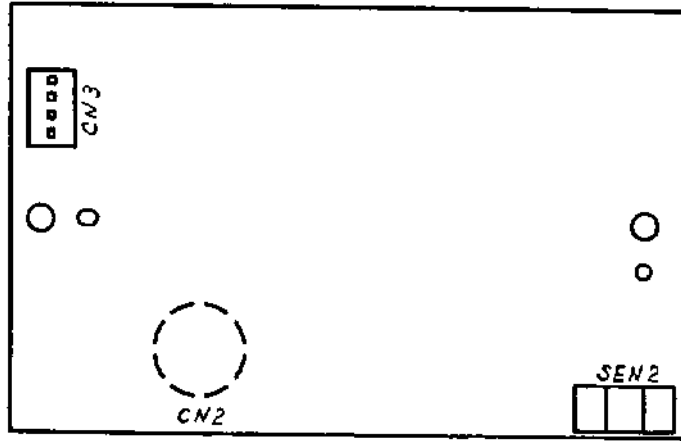Paper Input Jam

• 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 board or inlet sensor.

• NO   When the paper is fed in, does the paper input 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 board or replace the power supply board or Inlet sensor.

           • NO   Replace the roller-A or roller-B.

• NO   Are roller-A and roller-B rotating?

           • YES   Set the paper properly.

• NO   Is the pulse motor turning?

           • YES   Replace planet gear.

• NO   Is the connector cord connected properly?

           • NO   Connect the connector cord properly.

• YES   Check the coil resistance (approx. 32Ω) of the pulse motor. Is is normal?

           • NO   Replace the pulse motor.

• YES   Replace the OLEV-11 PCB.

D.5. CONNECTION DIAGRAM

D.5.1 Interconnection Diagram

To the Printer or High Capacity
Second Paper Feeder

D.5.2   PCB Layout

OLEV-11 PCB

D.6.   PARTS LIST
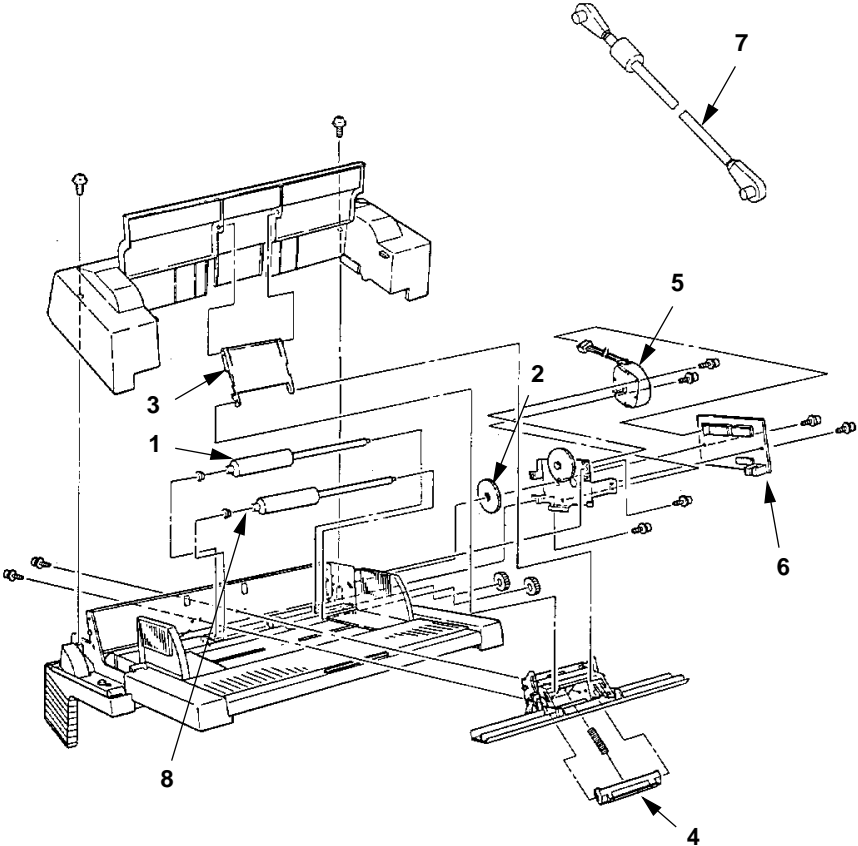
Figure 6-1 Multi-Purpose Feeder

Table 6-1 Multi-Purpose Feeder

No.	Description	Oki-J Part No.	ODA Part No.	Q'ty	Remark
1	Roller-A	3PB4083-5514P1	50409201	1	
2	Planet gear	4PP4083-5520P1	51229601	1	
3	Link	3PP4083-5540P1	53344101	1	
4	Separator	4PP4083-5544G1	5334201	1	
5	Pulse motor	4PB4083-6075P1	56510701	1	Same as printer unit.
6	OLEV-PCB	4YA4121-1014G11	55074811	1	
7	Connection cord	3YS4011-3141P1	56631201	1	
8	Roller-B	3PB4083-5523P1	53343901	1	
9	Separator assy	3PA4083-5549	53347101	1	Includes 3 and 4 above.

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APPENDIX E: SECOND PAPER FEEDER

E.1.   PREFACE

This Appendix is intended for service personnel. It describes the field maintenance procedures for the High Capacity Second Paper Feeder option for OL600e Series LED Page Printers.

Refer to the Second Paper Feeder Instruction Sheet and the Printer Handbook for equipment handling and operation.

E.1.1   Functions

The printer is mounted on top of this High Capacity Second Paper Feeder, and it 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), Label sheets
                          (PPC sheets);   use of envelopes or thick paper is not possible.
  • Cut Sheet Size: A4, A5, B5, Letter, Executive, Legal13, Legal14
  • Special Size: Paper Width: 87 to 216mm
                          Paper length: 190 to 355.6mm

Weight
  • 16-lb to 24-lb (60 to 90 g/m^2)

• Paper setting quantity: 250 sheets of paper weighing 64 g/m^2

Front Support Plate

Sheet Guide

Right Side Cover

Hopping Roller Shaft Assembly

Left Side Cover

Paper Cassette

Paper Hold

Font Cover
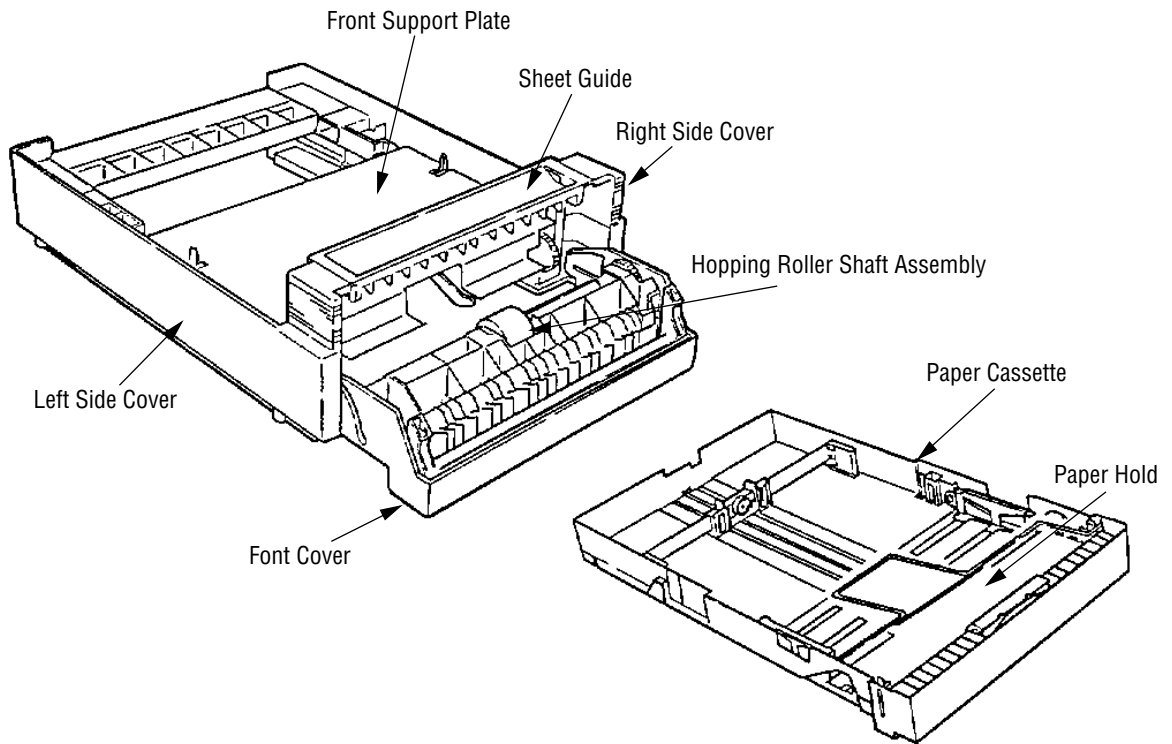
Figure 1-1 External View and Component Names
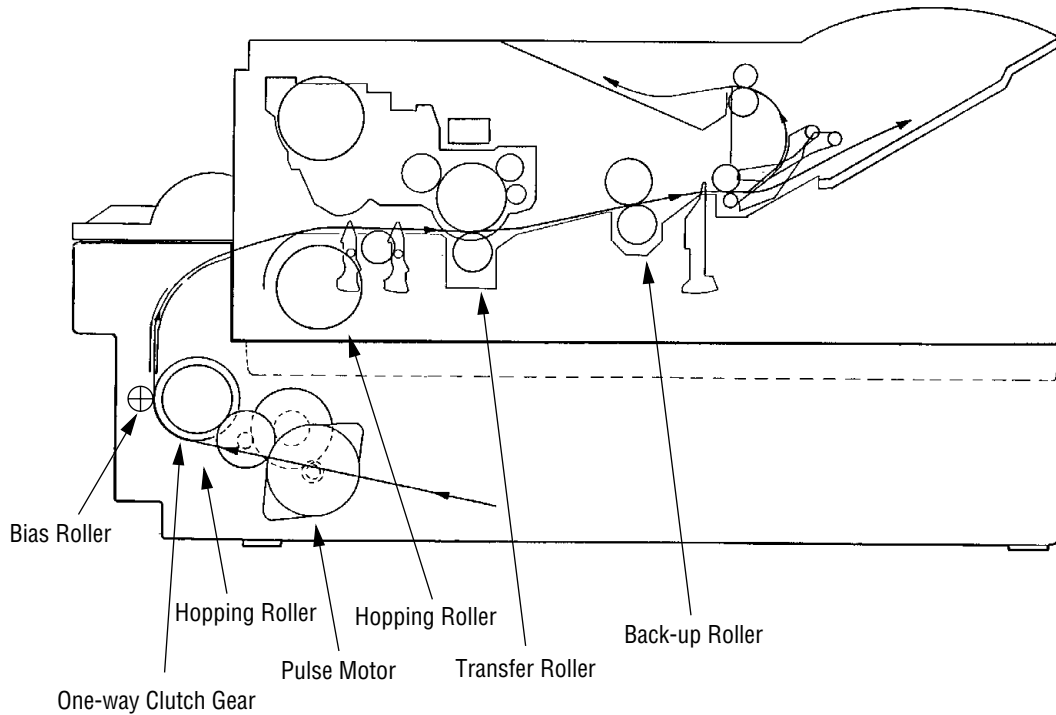
E.2. MECHANISM DESCRIPTION

E.2.1 General Mechanism

The High Capacity Second Paper Feeder feeds the paper into the printer by receiving the signal from the printer, which drives the pulse motor inside the High Capacity Second Paper Feeder. This motion is converyed 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.

E.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.

Bias Roller

Hopping Roller   Hopping Roller

Pulse Motor   Transfer Roller   Back-up Roller

One-way Clutch Gear

E.3. PARTS REPLACEMENT

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

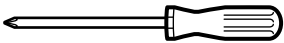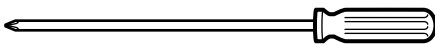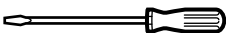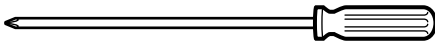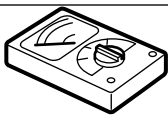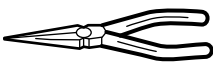E.3.1   Precautions Concerning Parts Replacement

Always use good anti-static procedures.

(1) Parts replacements must be carried out, by first turning the printer power switch off ["O"] and then 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 gloves, 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		

E.3.2   Parts Layout

This section describes the layout of the main components.
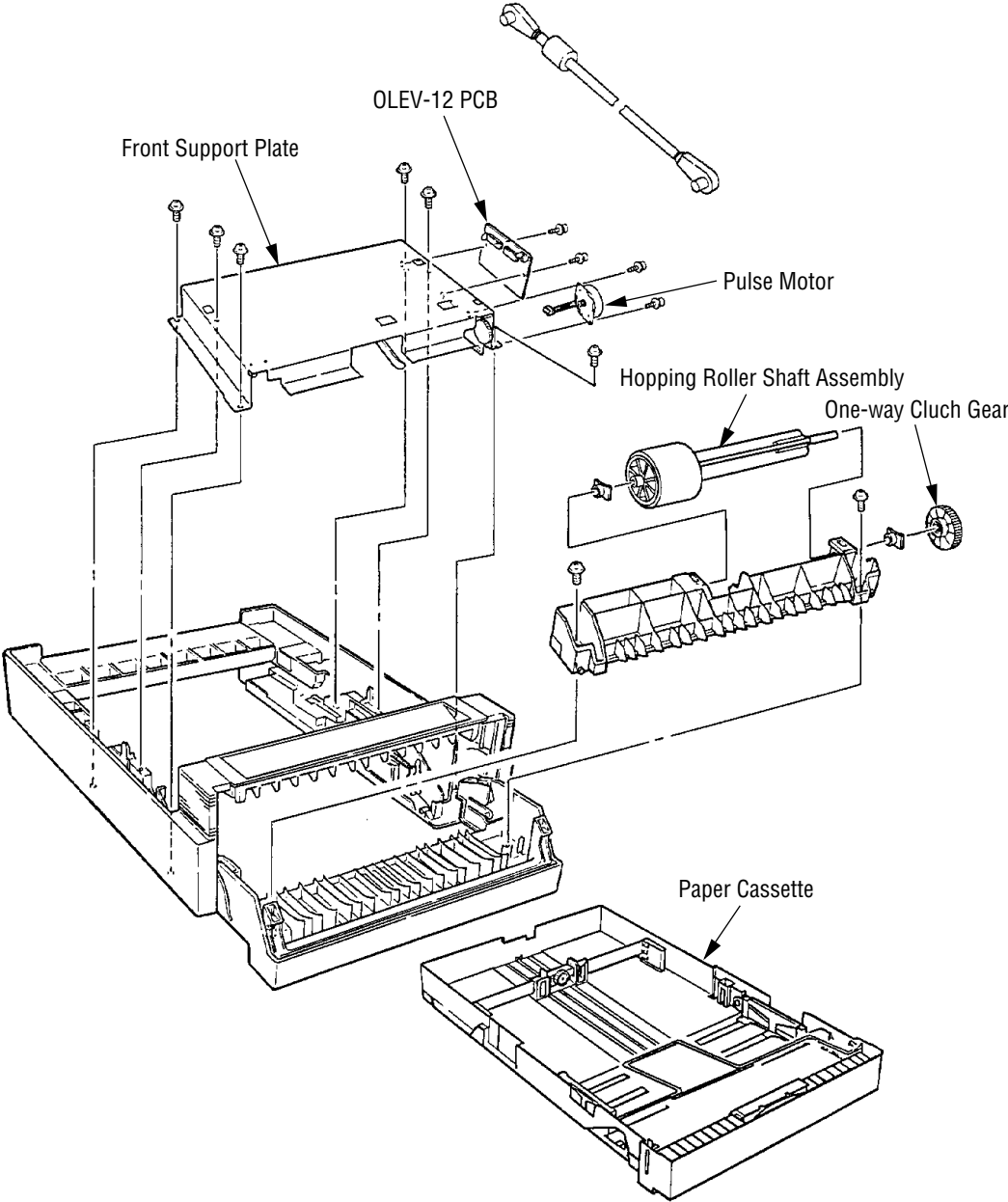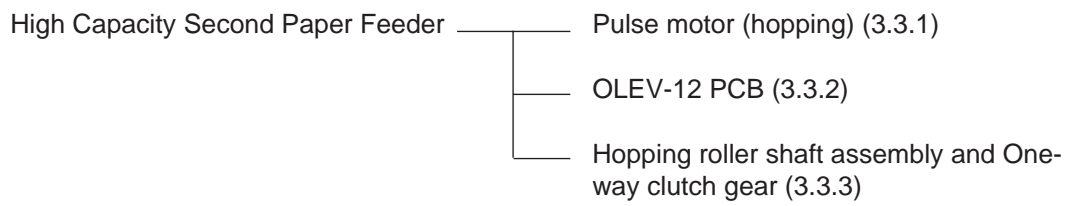

Figure 3-1

E.3.3   Parts Replacement Methods

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

High Capacity Second Paper Feeder ——————— Pulse motor (hopping) (3.3.1)

————— OLEV-12 PCB (3.3.2)

————— Hopping roller shaft assembly and One-way clutch gear (3.3.3)

Pulse Motor (Hopping)

(1) Turn the printer power switch off ["O"] and remove the interface cable.
(2) Remove the paper casette **1**.
(3) Open the Front cover **2**, stand the High Capacity Second Paper Feeder vertically and remove the 2 E-clamps **3**.
(4) Remove the 2 levers **4**, and remove the tension springs **5**.
(5) Pull out the sheet guide **6** to the front.
(6) Remove the 6 screws **7**, and remove the front support plate **8**.
(7) Remove the connector **9** and the 2 screws **10**, and remove the pulse motor **11**.
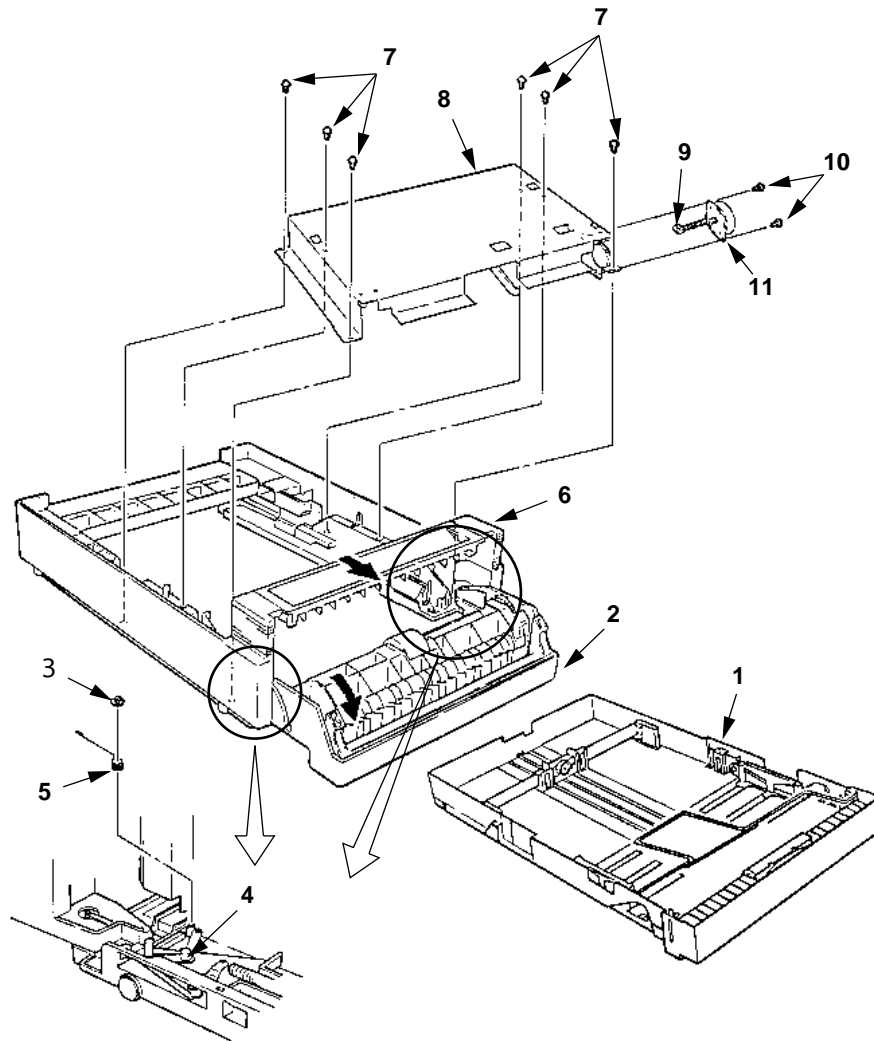
OLEV-12 PCB

(1) Remove the front support plate (see 3.3.1 steps (1) through (6)).
(2) Remove the connector **1**, and the 2 screws **2**, then remove the OLEV-12 PCB **3**.
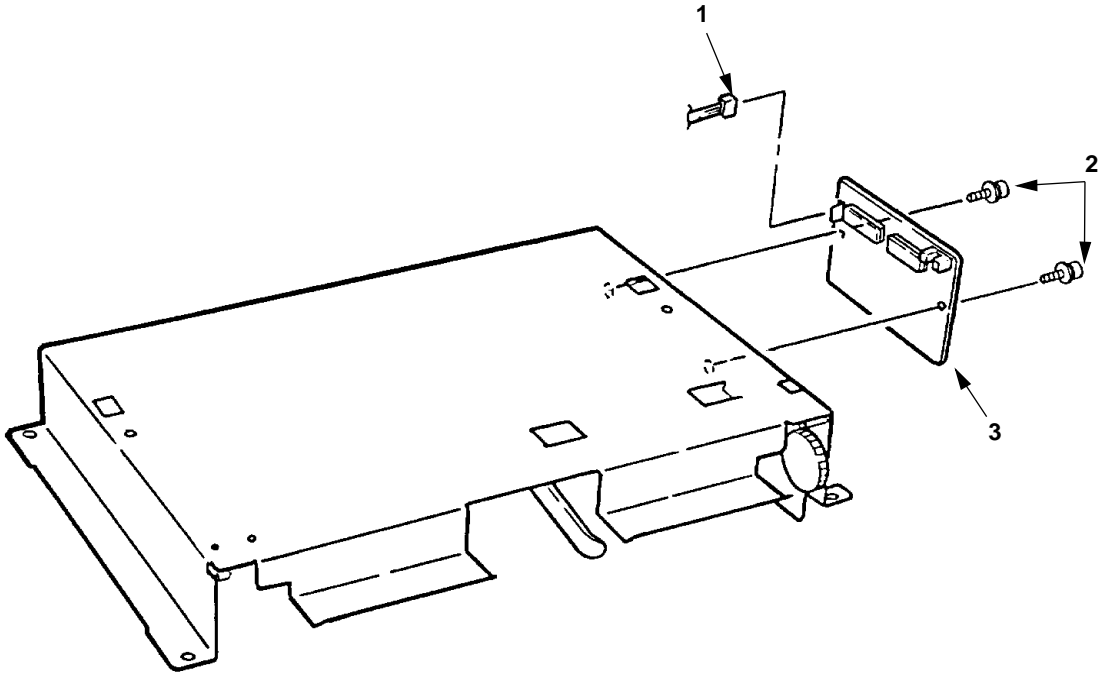
Hopping Roller Shaft Assembly and One-way Clutch Gear

(1) Open the front cover **1**.
(2) Remove the 2 screws **2**, and remove the hopping roller frame **3** (be careful not to lose the Springs **4** when you do this, since it comes off).
(3) Remove the One-way clutch gear **5**.
(4) Remove the bush-A **6**, and remove the hopping roller shaft assembly **7** (be careful not to lose the bush-B **8** when you do this, since it comes off).
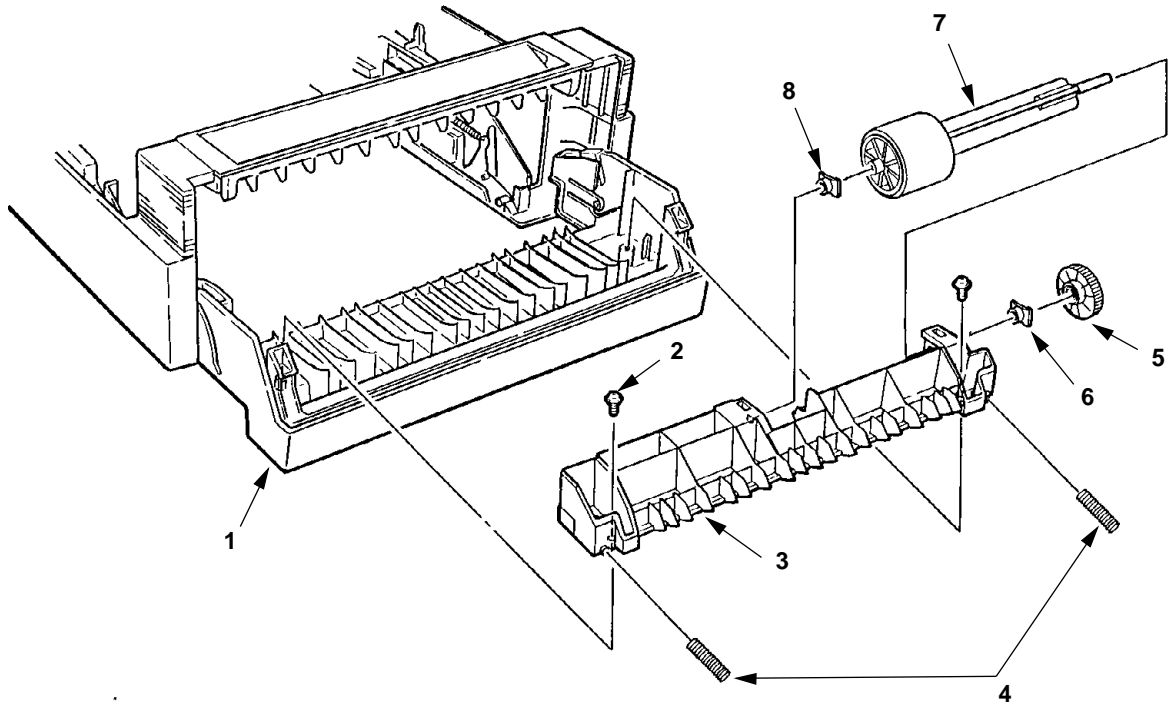
E.4. TROUBLESHOOTING

E.4.1   Precautions Prior to Troubleshooting

    (1) Go through the basic checking items provided in the Operator Guide.
    (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.

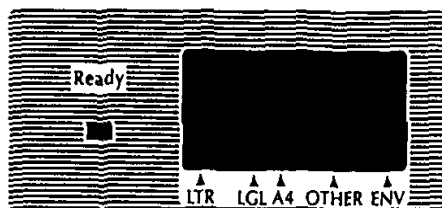E.4.2   Preparations for Troubleshooting

    (1) Display on the Operator panel
        The status of the problem is displayed on the LCD (Liquid Crystal Display) on the
        Operator panel of the OL610e/PS , and in the Status Monitor software display on other
        models. Go through the appropriate troubleshooting procedures according to the
        messages displayed on the LCD.

    [ODA]

[OEL]

Logo

OL

LED Page Printer

| MENU 1 | ENTER | LAST   - | NEXT   + |
| *Menu 2* | *Copies* | *Paper Size* | *Demo* |

| RECOVER | PRINT MENU | FORM FEED | ON-LINE |
| *Reset* | *Print Fonts* | *Tray Select* | |

Press 2 seconds
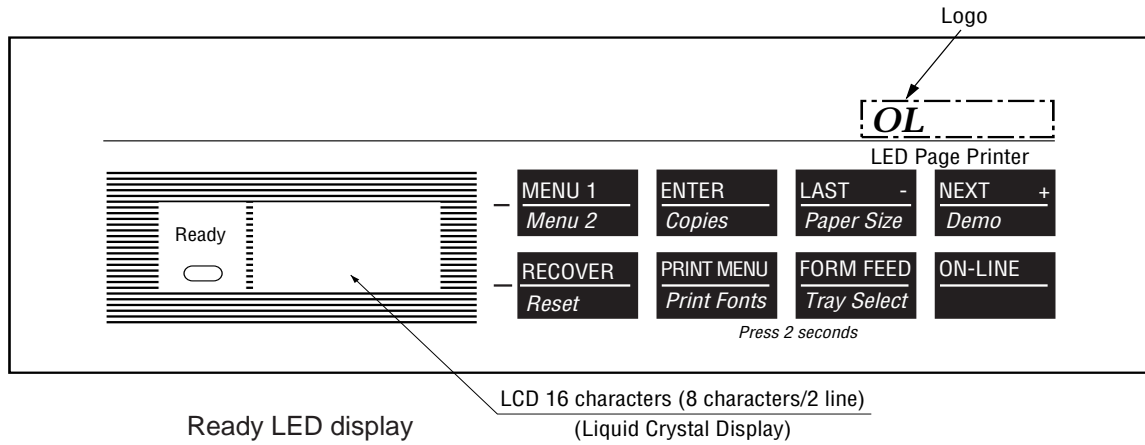
Ready

LCD 16 characters (8 characters/2 line)
(Liquid Crystal Display)

Ready LED display

███ : OFF   ⊠ : BLINKING
▒▒▒ : ON   ☐ : Undefined

E.4.3   Troubleshooting Method

When a problem occurs, go through the troubleshooting according to the following proce-
dure.

```
┌─────────────────┐
│ Problem occurs  │
└─────────────────┘
        │
        │    ┌──────────────────┐    ┌──────────────────┐    ┌──────────────────┐
        │    │ Problem displayed│    │ Troubleshooting  │    │ Carry out detailed│
        └──→ │ by the status    │─→  │ according to the │─→  │ troubleshooting   │
             │ message          │    │ Status Message   │    │ according to the  │
             └──────────────────┘    │ List             │    │ Troubleshooting   │
                                      │ (see 4.3.1)      │    │ Flow              │
                                      └──────────────────┘    │ (see 4.3.1)       │
                                                               └──────────────────┘
```
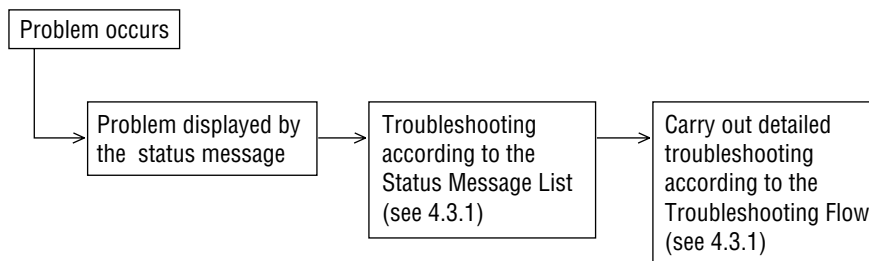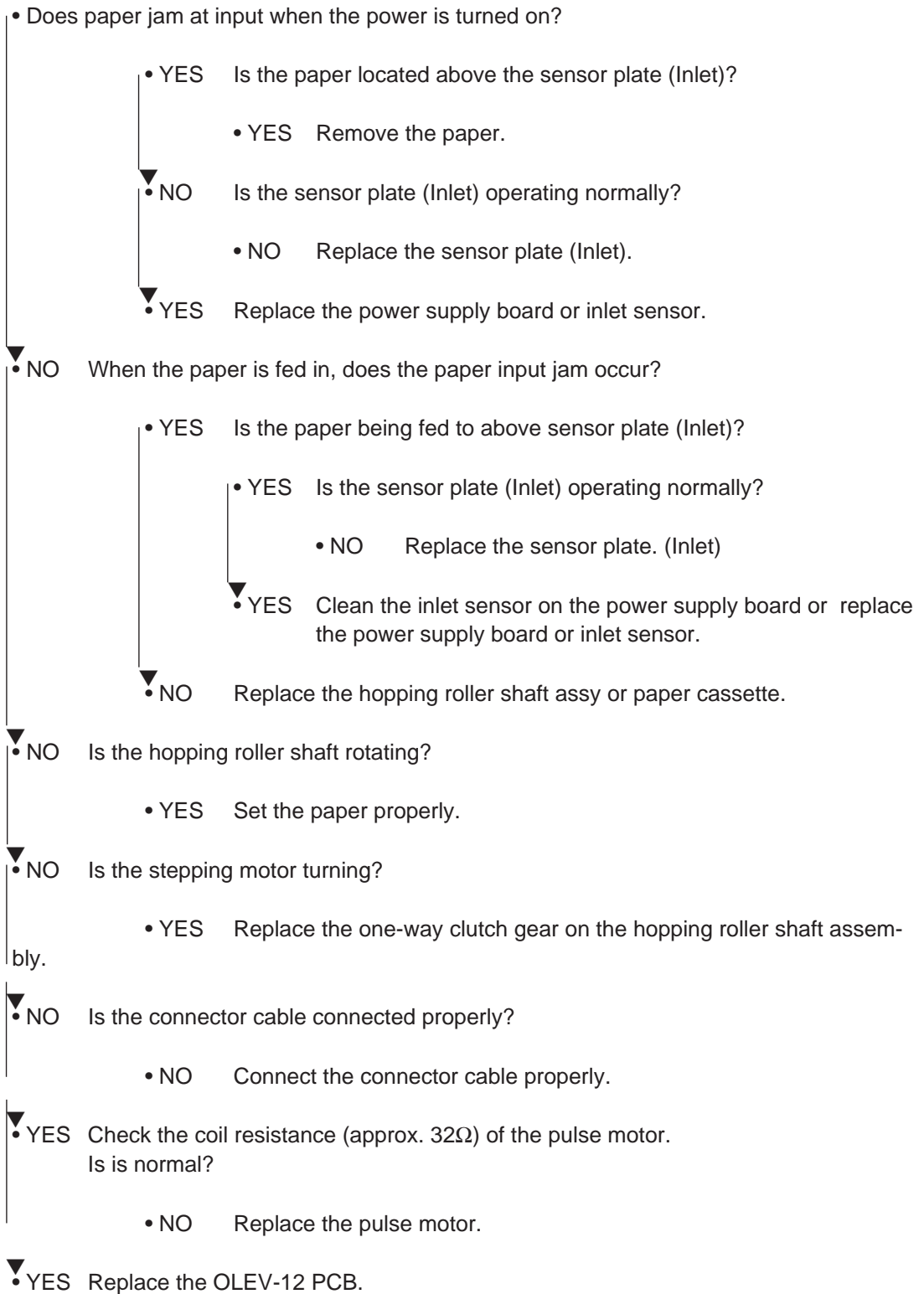
LCD Status Message List

Table 4-1 lists status messages and recovery procedures. Messages are listed as they
appear on the LCD display of the OL610e/PS. For the OL600e and OL610e, similar mes-
sages appear in the Status Monitor window.

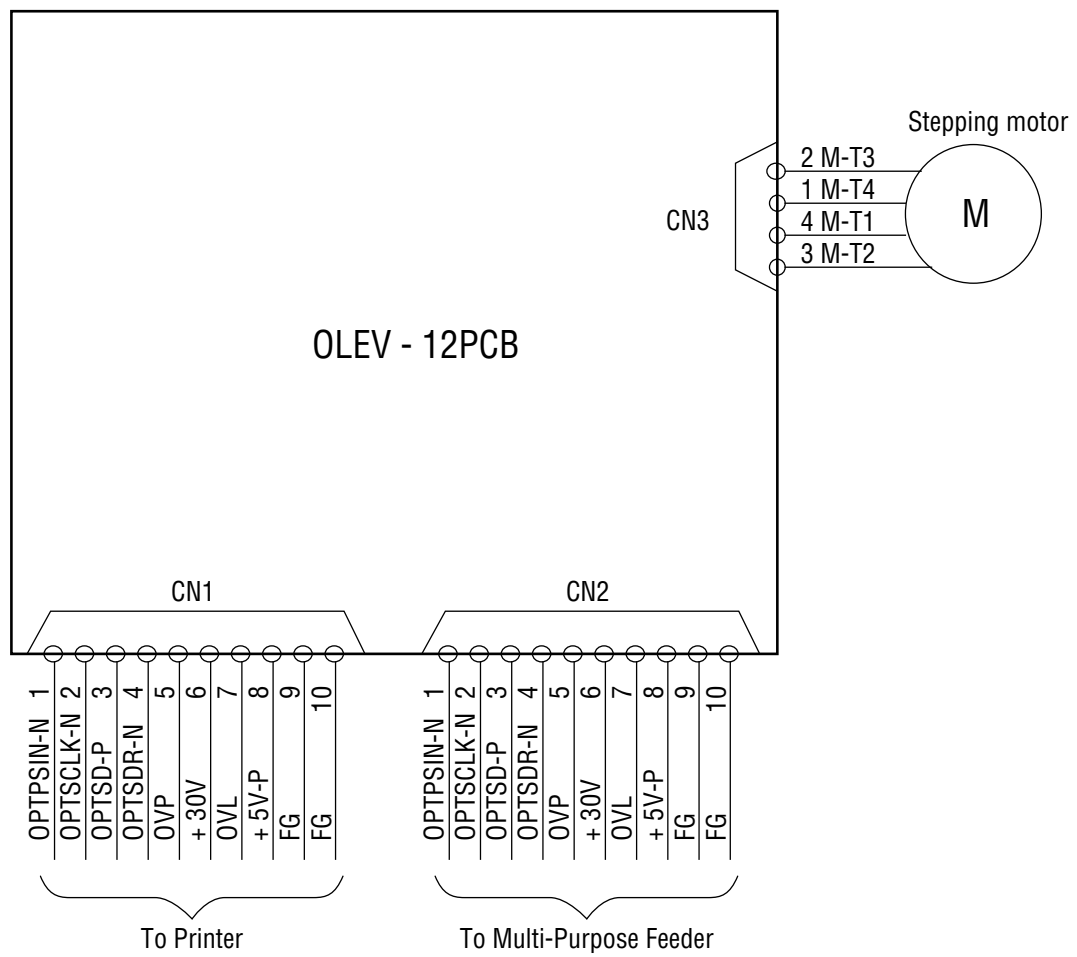| Classification	Status Message	Description	Recovery method

Jam error	` FEED PAPER `
	` INPUT JAM `
	
	or
	
	` FEEDER `
	` FEED JAM `
		Indicates occur-rence 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, to through the Troubleshooting.

Paper size error	` FEEDER ` ` SIZE ERR `	Indicates 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	` FEEDER ` ` PAPEROUT `	Indicates no paper or paper cassette state of the High Capacity Second Paper Feeder.	• Load the paper or paper cassette in High Capacity Second Paper Feeder.

• (JAM error)

Paper Input Jam

• Does paper jam at input 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 board or inlet sensor.

• NO   When the paper is fed in, does the paper input 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 board or replace the power supply board or inlet sensor.

     • NO   Replace the hopping roller shaft assy or paper cassette.

• NO   Is the hopping roller shaft rotating?

     • YES   Set the paper properly.

• NO   Is the stepping motor turning?

     • YES   Replace the one-way clutch gear on the hopping roller shaft assem-
bly.

• NO   Is the connector cable connected properly?

     • NO   Connect the connector cable properly.

• YES Check the coil resistance (approx. 32Ω) of the pulse motor.
       Is is normal?

     • NO   Replace the pulse motor.
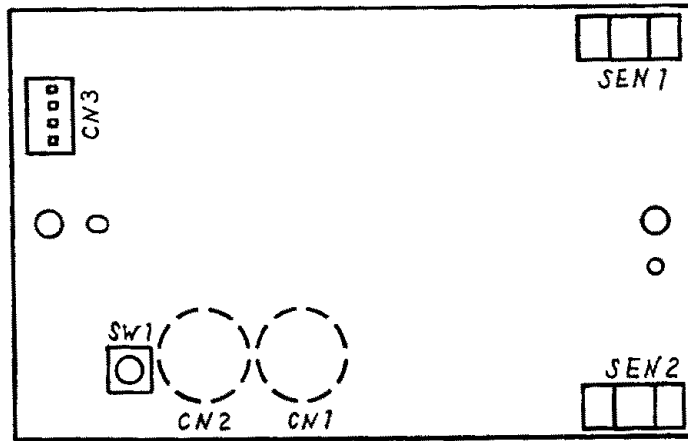
• YES Replace the OLEV-12 PCB.

E.5. CONNECTION DIAGRAM

E.5.1 Interconnection Diagram

E.5.2   PCB Layout

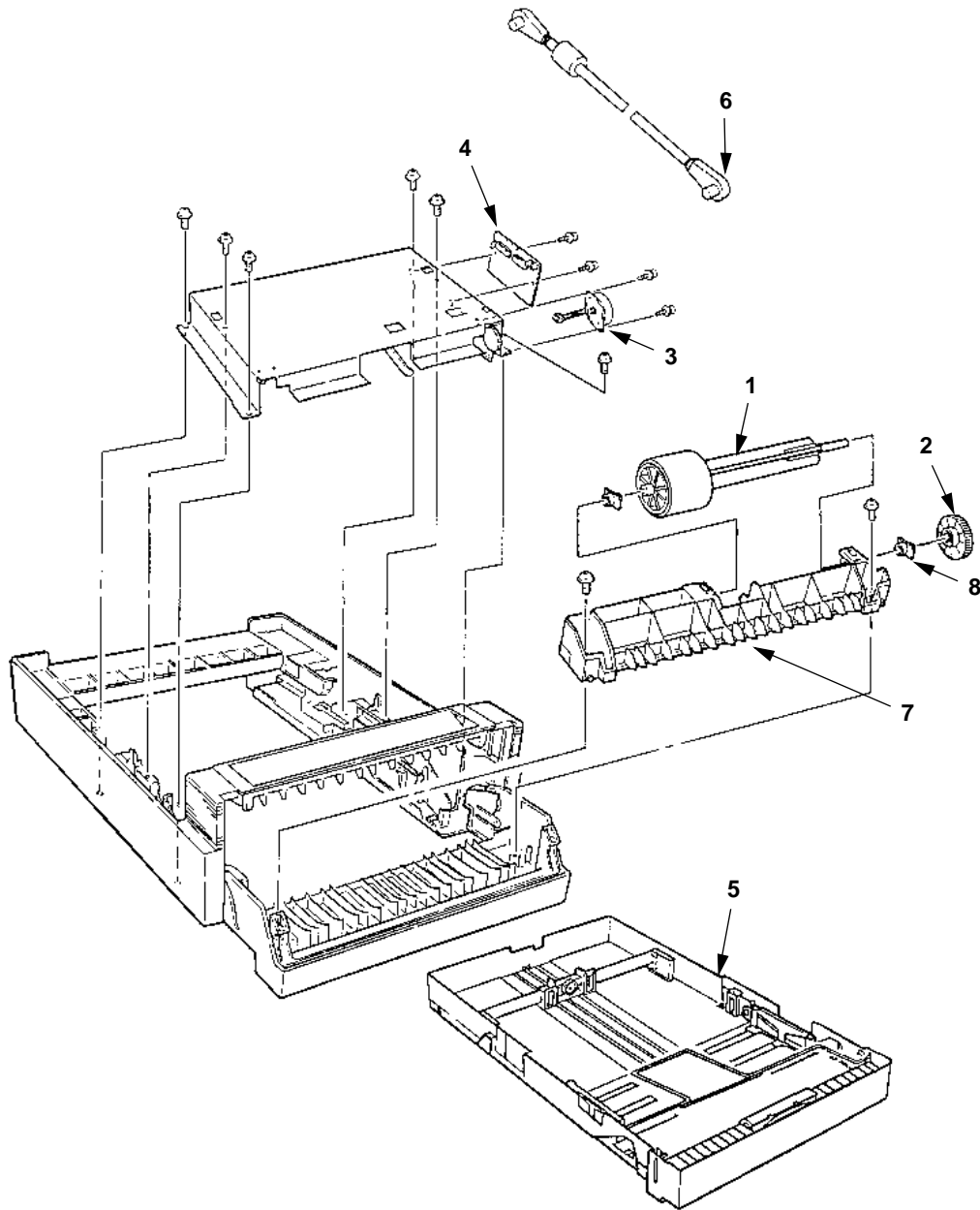OLEV-12 PCB

E.6.   PARTS LIST

Figure 6-1 High Capacity Second Paper Feeder

Table 6-1 High Capacity Paper Feeder

No.	Description	Oki-J Part No.	ODA Part No.	Q'ty	Remark
1	Hopping roller shaft assembly	3PA4083-6019G1	51112601	1	Same as the printer unit.
2	One-way clutch gear	4PB4083-6024P1	51228901	1	Same as the printer unit.
3	Pulse motor	4PB4083-6075P1	56510701	1	Same as the printer unit.
4	OLEV-12 PCB	4YA4121-1014G12	55074812	1	
5	Paper cassette	4YA4083-6270G2	50109910	1	
6	Connection cord	3YS4011-3140P3	56631101	1	
7	Hopping roller frame	1PP4083-5605P1	53345901	1	
8	Bearing	4PP4083-6022P2	51607402	2	Same as the printer unit.

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Service Manual