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LBP-2460

SERVICE MANUAL

REVISION 1

Canon

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Use of this manual should be strictly supervised to avoid disclosure of confidential information.

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SERVICE INFORMATION

Issued by Peripheral Products Quality Assurance Center, Canon Inc.

MODEL :

LBP-2460

NO. : RAD-12E-0001

DATE : DEC. 12, 1997

Y. Kajihara

LOCATION

SUBJECT

Revision of Service Manual

Canon has published a revised version of LBP-2460 Service Manual (RY8-1383-000). Revision 1 (RY8-1383-010) includes supplementary materials as well as corrections, so please use it in place of the original.

RY8-1383-01Y

PREFACE

This Service Manual contains basic information required for after-sales service of the LBP-2460 laser beam printer (hereinafter referred to as the "printer"). This information is vital to the service technician in maintaining the high print quality and performance of the printer.

The 2,000-sheet paper deck, option controller, envelope feeder, and duplexing unit, which are prepared for the printer as options, are also described in this manual.

In this manual, the optional 2,000-sheet paper deck is simply called the paper deck.

This manual consists of the following chapters:

- Chapter 1: Product information
Features, specifications, operation, and installation
 - Chapter 2: Operation and Timing
A description of the operating principles and timing sequences of the electrical and mechanical systems.
 - Chapter 3: The Mechanical System
Explanation of mechanical operation, disassembly, reassembly, and adjustment procedures
 - Chapter 4: Troubleshooting
Maintenance and servicing, reference values and adjustments, troubleshooting procedures, lubricants, and solvents
- Appendix: General timing chart, general circuit diagram, etc.

Information in this manual is subject to change as the product is improved or redesigned.

All relevant information in such cases will be supplied in Service Information Bulletins.

A thorough understanding of this printer, based on information in this Manual and Service Information Bulletins, is required for maintaining its performance and for locating and repairing the causes of malfunctions.

DTP system

This manual was produced on an Apple PowerMacintosh 9500/132 personal computer and output by an Apple LaserWriter 16/600 PS laser beam printer.

All graphics were produced with Aldus FreeHand (J), and all documents and page layouts were created with QuarkXPress (J).

The video images were captured with Canon Hi-8 8mm video camcorder and MASS microsystems Quickimage 24 video capture board, and modified with Adobe Photoshop™ (J).

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CHAPTER 1

PRODUCT INFORMATION

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I. FEATURES

1. High-speed printing

The controller of this printer has equipped Intel i960HD processor that enables a print speed of up to 24 pages per minute. (A4-size paper, or letter size paper).

2. Superior image quality

High resolution printing at 600 x 600 dpi (dots per inch) is further enhanced with AIR(Automatic Imaging Refinement) technology to smooth jagged edges, and the use of super fine toner.

3. Auto-duplexing

The optional duplex unit enables the printer to conduct automatic duplexing.

4. Large-volume continuous printing

By mounting the optional paper deck, the paper handling capacity is raised by 2,000 sheets (75g/m²). As a result, the upper/lower cassettes, multi-purpose tray, and paper deck together can accommodate a total of 3,100 sheets (75g/m²) for large-volume continuous printing.

5. 5-way paper feeding (including options)

The addition of the optional paper deck and optional envelope feeder to the standard-equipped multi-purpose tray and upper/lower cassettes results in 5-way paper feeding capability.

6. Memory saving technology

Memory reduction technology accomplishes 600 x 600 dpi printing with only 4 MB of memory. Complex data is compressed.

7. Energy saving and ecology

The printer conserves electricity by automatically reducing power consumption when it remains idle for a specified length of time. The printer then returns to full power after a button of control pane is pressed or print job is started.

To save toner the economy mode can be selected to print rough drafts with less toner.

8. Automatic interface switching

In addition to the standard-equipped bi-directional parallel interface (Centronics specifications), the printer has been equipped with expansion port which enables network board to be installed. And, data sent from the host computer is automatically switched among both interfaces no matter which interface port it enters.

9. Automatic emulation switching

This printer supports Hewlett-Packard's enhanced PCL5 printer language. When the optional Canon Translator module A4(an add-in ROM) is installed, the printer also supports Adobe PostScript Level 2. The printer can sample the print data as it is received and then automatically switch between the PCL and PostScript personalities.

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II. SPECIFICATIONS

A. Printer

1. Printer engine

Type	Desktop page printer (console type when paper deck is installed)
Printing method	Electrophotography
Printing speed (Note 1)	About 24 pages/min. (A4) About 13 pages/min. (A3)
First print time (Note 2)	18.9 sec. or less (A4)
Wait time (Note 3)	80 sec. or less (100V, 220V) 60 sec. or less (120V, 240V)
Scanning pitch	
Horizontal	600 DPI
Vertical	600 DPI
Image formation system	
Laser	Semiconductor laser
Scanning system	Six-faced prism mirror scanning
Photosensitive Drum	OPC
Charging	Roller charging
Exposure	Laser scanning system
Toner	Magnetic single-component dry toner
Development	Toner projection development system
Toner supply	By EP-W cartridge replacement (about 15,000 A4-sized prints; with image density set in the middle and 4% dot density)
Transfer	Roller transfer
Separation	Curvature/discharge bias
Cleaning	Blade
Fixing	Heated rollers (500W x 2)
Paper pick-up	Multi-purpose tray, upper cassette, lower cassette, envelope feeder (option), paper deck (option)
Print paper	Plain paper, coloured paper, labels, OHT, envelopes
Paper sizes	
Multi-purpose tray	98.4mm (W) x 190.5mm (L) ~ 297mm (W) x 432mm (L) plain paper (64g/m ² ~128g/m ² recommended paper), above-mentioned paper
Upper cassette	B4, A4, Legal, Letter-sized plain paper (64g/m ² ~ 105g/m ² recommended paper), coloured paper
Lower cassette	A3, B4, A4, Ledger, Legal, Letter-sized plain paper (64g/m ² ~ 105g/m ² recommended paper), coloured paper
Multi-purpose tray capacity	10mm stack (about 100 sheets of 75g/m ² paper)
Cassette capacity	50mm stack (about 500 sheets of 75g/m ² paper)
Cassette types	
Upper cassette	Universal (accommodates B4, A4, Legal, Letter sizes)
Lower cassette	Universal (accommodates A3, B4, A4, Ledger, Legal, Letter sizes)
Print delivery	Face-down/face-up
Print tray capacity	
Face-down	About 500 sheets (75g/m ² paper)
Face-up	About 100 sheets (75g/m ² paper)
Duplexing	
Auto-duplexing	When duplex unit (option) is installed, and plain paper only (64g/m ² ~ 105g/m ² recommended paper)

2. Video Controller

CPU	RISC processor (Intel A80960HD-66 66MHz)
Memory (RAM)	4 MB (Expandable to 96 megabytes in total with optional RAM SIMM)
ROM DIMM Slots	2
RAM SIMM Slots	3
Host interface	Standard: IEEE1284 compliant parallel Option: Expansion interface (LocalTalk, Ethernet, Token Ring)
Translators	Standard: Enhanced PCL5 Option: Adobe PostScript Level 2
Internal fonts	45 Scalable fonts (35 Intellifont typefaces, 10 TrueType typefaces) 6 Bitmap fonts
Scaler	USFT (Universal Font Scaling Technology by Agfa, Miles Inc.)

- <Internal fonts>
 • Bit Map Fonts

Table 1-2-1

Type face	Pitch (CPI)	Size (Points)	Style	Stroke weight	Remarks
Lineprinter	16.66	8.5	Upright	Medium	Separate internal fonts are provided for portrait landscape orientations.

- Scalable Fonts

Table 1-2-2

Type face	Pitch (CPI)	Size (Points)	Type face
<ul style="list-style-type: none"> • Intellifont (35 type faces) Courier, Courier Bold, Courier Italic, Courier Bold Italic, CG Times, CG Times Bold, CG Times Italic, CG Times Bold Italic, CG Omega, CG Omega Bold, CG Omega Italic, CG Omega Bold Italic, Coronet, Clarendon Condensed, Univers Medium, Univers Bold, Univers Medium Italic, Univers Bold Italic, Univers Medium Condensed, Univers Bold Condensed, Univers Medium Condensed Italic, Univers Bold Condensed Italic, Antique Olive, Antique Olive Bold, Antique Olive Italic, Garamond Antiqua, Garamond Halbfett, Garamond Kursiv, Garamond Kursiv Halbfett, Marigold, Albertus Medium, Albertus Extra Bold, Letter Gothic, Letter Gothic Bold, Letter Gothic Italic • TrueType (10 type faces) Arial, Arial Bold, Arial Italic, Arial Bold Italic, Times New Roman, Times New Roman Bold, Times New Roman Italic, Times New Roman Bold Italic, Symbol, Wingdings 			Scalable It is possible to print both portrait and landscape orientations.

Specifications are subject to change with product modification.

B. Options

1. Envelope feeder (Envelope Feeder EF-9)

Feeding speed	About 16 envelopes/min.
Envelope types	COM-10, DL, Monarch, C5, B5 ISO-typed envelope (90g/m ² recommended paper)
Capacity	73mm stack or 100 envelopes
Dimensions	368 (W) x 320 (D) x 140 (H) mm
Weight	About 3kg
Power supply	DC24V (supplied from the printer)

2. Duplex unit (Duplex Unit TP-9)

Feeding speed	About 19 sheets/min. (A4)
Paper types	A3, A4, B4, B5 JIS, Ledger, Legal, Letter, Executive-sized plain paper (64g/m ² ~ 105g/m ² recommended paper)
Dimensions	379 (W) x 423 (D) x 82 (H) mm
Weight	About 3kg
Power supply	DC24V (supplied from the printer)

3. Paper deck (2,000 Sheet Paper Deck PD-9)

Feeding speed	About 24 sheets/min. (A4), about 13 sheets/min. (A3)
Paper types	A3, A4, B4, Ledger, Legal-sized plain paper (64g/m ² ~ 105g/m ² recommended paper)
Capacity	Stacking height of 200mm (accommodates about 2,000 sheets of 75g/m ² paper)
Power consumption	Max. about 75W or less (20°C room temperature, rated voltage)
Dimensions	629 (W) x 520 (D) x 651 (H) mm
Weight	About 30kg
Line voltage requirements	100 - 120V (±10%), 50 - 60Hz(±2Hz) 220 - 240V (-10% +6%), 50 - 60Hz(±2Hz)

4. Option controller

CPU	NEC UPD784020GC-3B9
Memory (RAM)	512 bytes
Frequency	25MHz
EPROM	TEXAS INSTRUMENTS TMS27C512-12JL
Memory (ROM)	64Kbytes
SRAM	SAMSUNG KM62256CLG-7L
Memory	32Kbytes

Specifications are subject to change with product modification.

III. SAFETY INFORMATION

A. Laser Safety

An invisible laser beam is irradiated within the laser/scanner unit.

Since the laser beam can injure the eye if it strikes it, be sure not to disassemble the laser/scanner unit. It cannot be adjusted in the field, anyway.

The label shown below is attached to the laser/scanner unit cover.



Figure 1-3-1

B. Toner Safety

Composed of minute, plastic, colored components, toner is a non-poisonous substance.

If toner adheres to your skin or clothes, remove as much of it as possible with a dry tissue, then wash with cold water. If you use hot water, the toner will gel and become difficult to remove.

As toner easily breaks down vinyl materials, avoid letting toner come into contact with vinyl.

C. Ozone Safety

An infinitesimal amount of ozone gas (O₃) is generated during corona discharge from the charging roller used in this printer. The ozone gas is emitted only when the printer is operating.

This printer meets the ozone emission reference value set by Underwriters Laboratory (UL) at the time it is shipped from the factory.

D. Power Supply Unit Safety

Care is needed as even though the printer switch may be OFF, there is a possibility that a current may still flow on the primary side. Be sure to remove the power plug before disassembly and assembly of this printer.

IV. PARTS OF THE PRINTER

A. External Views

1. Printer

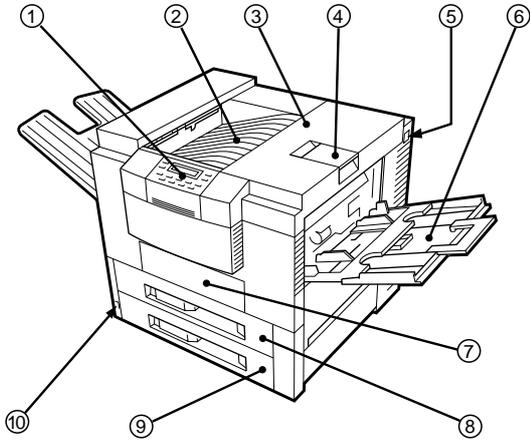


Figure 1-4-1

- 1: Operation panel unit
- 2: Face-down tray
- 3: Upper cover
- 4: Delivery stopper
- 5: Test print switch
- 6: Multi-purpose tray
- 7: Duplex unit door
- 8: Upper cassette
- 9: Lower cassette
- 10: Power switch
- 11: Delivery cover
- 12: Face-up tray
- 13: Parallel interface connector
- 14: Power receptacle
- 15: Connector for option interface (option)
- 16: Expansion board slots
- 17: Cleaning brush
- 18: EP-W cartridge
- 19: Pick-up unit door

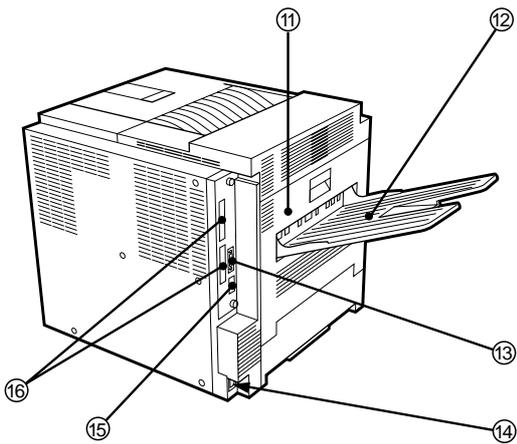


Figure 1-4-2

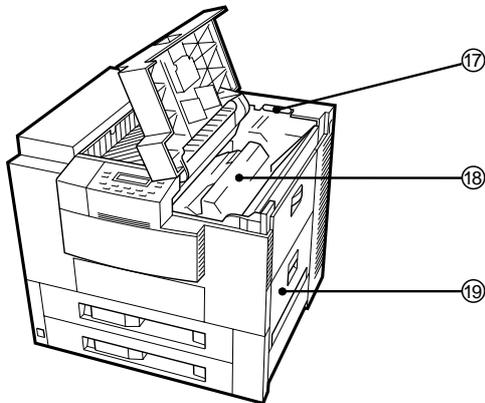
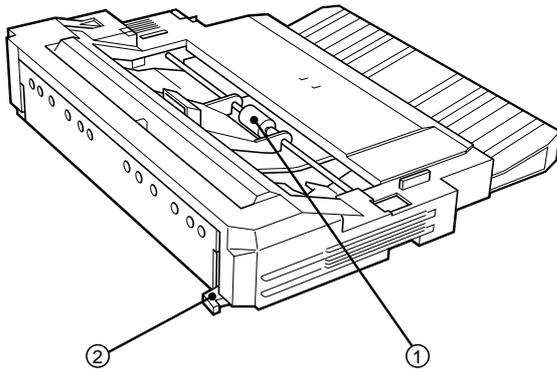


Figure 1-4-3

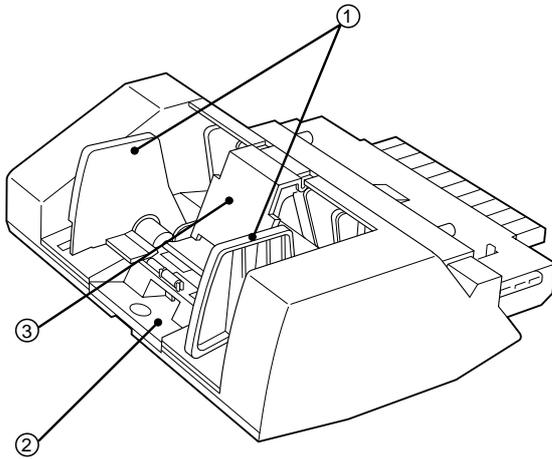
2. Duplex unit



- 1: Duplexing feed roller
- 2: Duplex unit removal lever

Figure 1-4-4

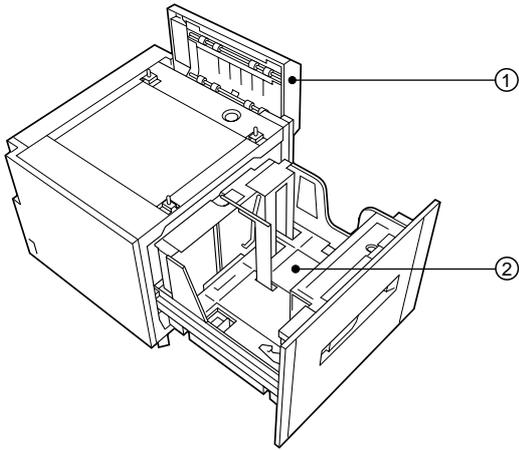
3. Envelope feeder



- 1: Envelope guide
- 2: Extension tray
- 3: Weight

Figure 1-4-5

4. Paper deck



- 1: Feed cover
- 2: Tray
- 3: Interface connectors
- 4: Power receptacle

Figure 1-4-6

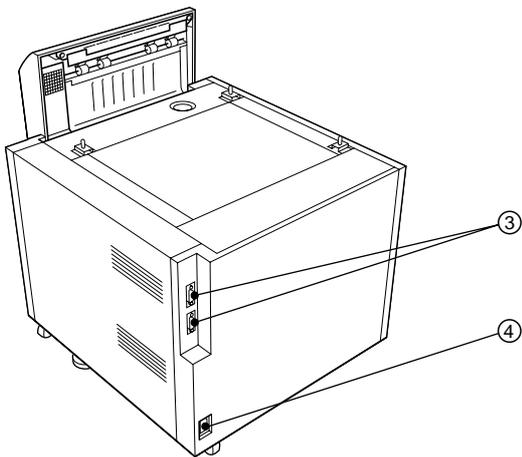


Figure 1-4-7

B. Cross Sectional Views

1. Printer, Duplex unit

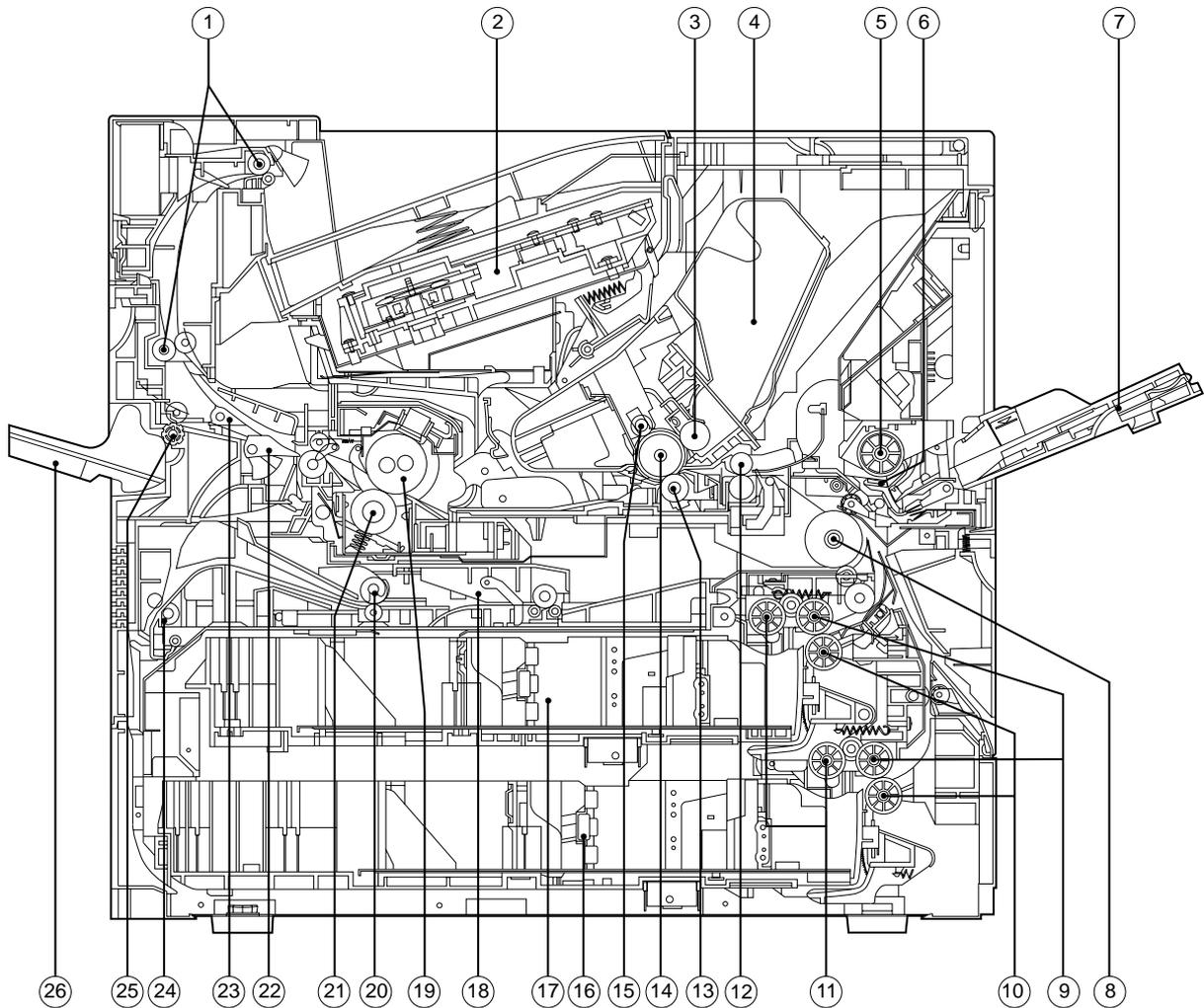


Figure 1-4-8

- | | |
|----------------------------------|---|
| 1: Delivery roller | 14: Photosensitive drum |
| 2: Laser/scanner unit | 15: Primary charging roller |
| 3: Developing cylinder | 16: Lower cassette |
| 4: EP-W cartridge | 17: Upper cassette |
| 5: Manual feeding pick-up roller | 18: Duplexing unit (option) |
| 6: Separation pad | 19: Fixing upper roller |
| 7: Multi-purpose tray | 20: Duplex feed roller (Duplexing unit) |
| 8: Feed roller 1 | 21: Fixing lower roller |
| 9: Feed roller 2 | 22: Duplex deflector |
| 10: Separation roller | 23: Face-up deflector |
| 11: Pick-up roller | 24: Switchback roller (Duplexing unit) |
| 12: Registration roller | 25: Face-up delivery roller |
| 13: Transfer charging roller | 26: Face-up tray |

2. Envelope feeder

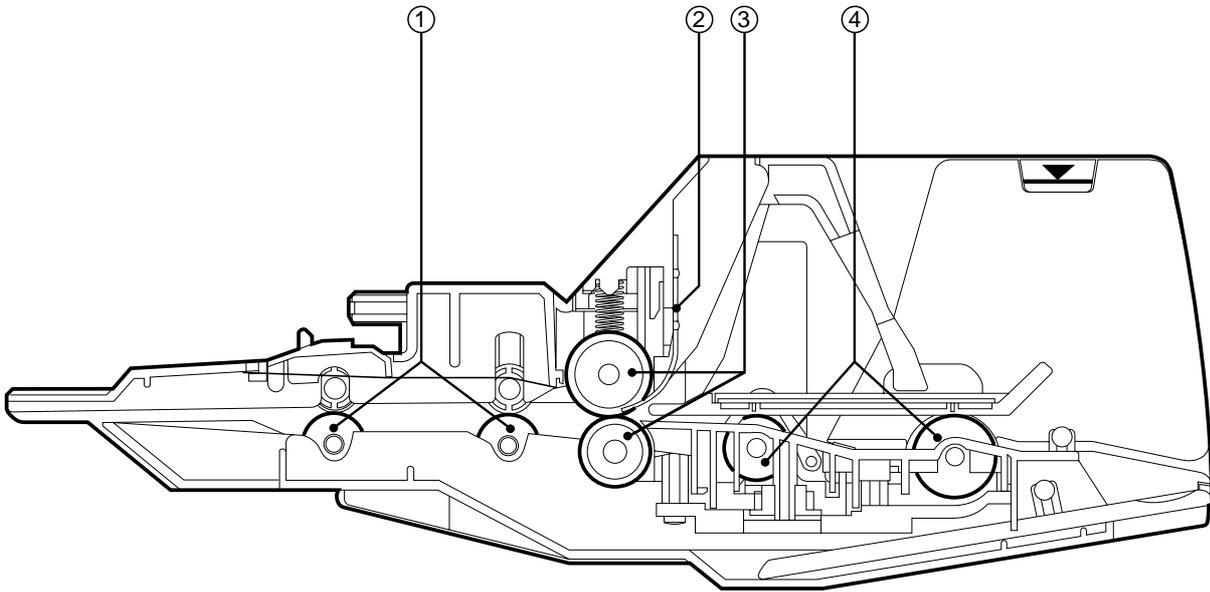


Figure 1-4-9

- 1: Feed rollers
- 2: Separation guide
- 3: Separation rollers
- 4: Pick-up rollers

3. Paper deck

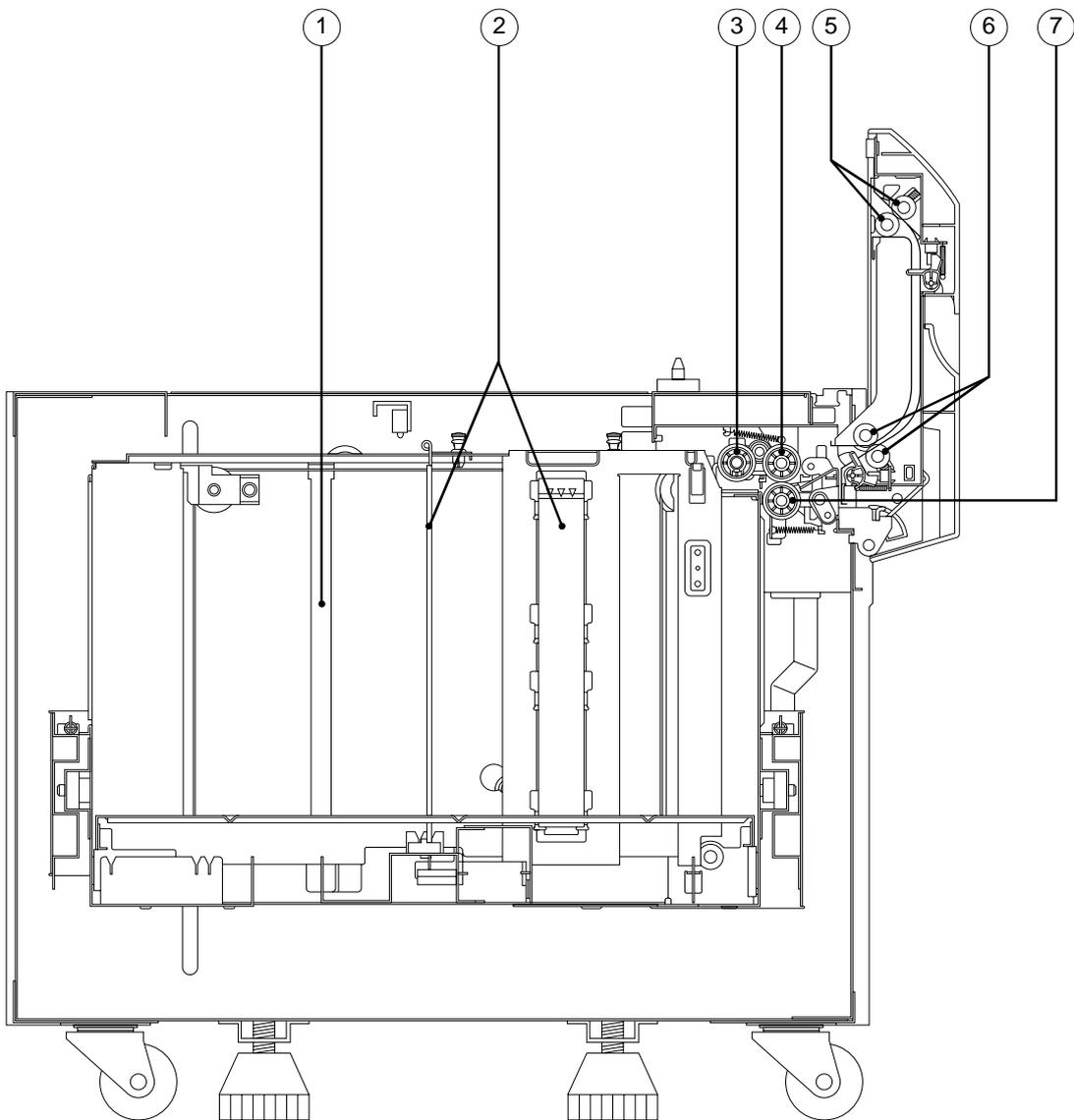


Figure 1-4-10

- 1: Deck
- 2: Paper guides
- 3: Pick-up roller
- 4: Feed roller 1
- 5: Feed roller 2
- 6: Registration rollers
- 7: Separation roller

V. INSTALLATION

A. Notes

This printer is packaged and shipped from the factory after careful adjustments and rigorous inspections.

When installing the printer, it is important to demonstrate its performance in the same way as when it passes the factory inspection.

The service engineer must sufficiently understand the performance of the printer, install it correctly in a location with an appropriate environment, and conduct sufficient checks of the unit.

B. Location Selection

Before taking the printer to the customer's premises, you should confirm the following conditions at the installation location.

1. Power supply

Use the following power supplies:

- Line voltage (AC): 100 - 120V $\pm 10\%$
220 - 240V -10% +6%
- Power frequency: $\pm 2\text{Hz}$ rated frequency

2. Operating environment

Install in a location that meets the following conditions:

- Level, flat surface
- Temperature, humidity within the following ranges:
Surrounding temperature: 10 to 32.5°C
Surrounding humidity: 20 to 80%RH (relative humidity), without condensation
- Cool, well-ventilated space

Do not install in the following locations:

- Exposed to direct sunlight
- If you cannot avoid such a location, hang heavy curtains, etc., to shut out the direct sunlight.
- Near magnets and devices that emit a magnetic field
- Areas with vibration
- Dusty places
- Near fire or water

3. Installation space

Install the printer a suitable distance from the wall, leaving enough room to operate it (see Figure 1-5-1).

When installing the printer on a desk, etc., be sure that it is large enough to accommodate the printer's feet (rubber pads) and sturdy enough to hold its weight.

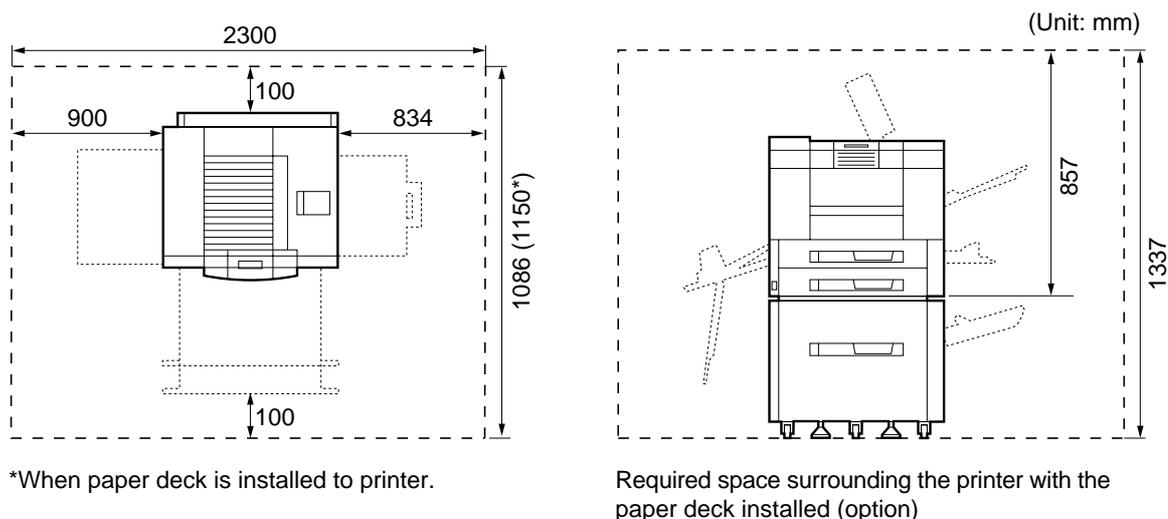


Figure 1-5-1

C. Unpacking and Installation

Condensation will form on metal surfaces when brought into a warm room from the cold. Therefore, when moving the printer to a warm environment, leave it packed in its box for at least an hour to acclimatize to room temperature.

1. Printer

- 1) Open the printer packaging.
- 2) Take out the accessories. Confirm that the power cord, cartridge, and face-up tray are included.
- 3) The printer weighs approx. 48kg, therefore 4 people may be needed to lift the printer and to move to the installation area.
- 4) Take the plastic bag off the printer and peel the tape off each part. Check that none of the covers were scratched or deformed during shipment.
- 5) Open the delivery cover, and remove the pressure release spacer from the fixing unit.
- 6) Open the upper cover, and remove the tape and the packing materials from inside the printer.
- 7) Pull the two cassettes out of the printer and remove the packaging from the cassette.

2. Cartridge

- 1) Open the bag holding the cartridge and take out the cartridge.
- 2) Remove the tape and the black sheet from the printer.
- 3) Hold the cartridge on each side as shown in figure 1-5-7 and slowly rock it 5 to 6 times to evenly distribute the toner.
- 4) Place the cartridge on a flat surface. While holding down on the top of the cartridge with one hand, grasp the tab with the other and gently pull out the cylinder tape.
- 5) Open the upper cover of the printer, and load the cartridge with both hands. Slowly insert it until it firmly contacts with the back of the slot.

3. Envelope feeder

- 1) Open the envelope feeder packaging.
- 2) Take off the plastic bag and peel the tape off.
Check that none of the covers have been scratched or deformed during shipment.
- 3) Remove the packing from the envelope feeder.
- 4) Open the multi-purpose tray and remove the envelope feeder slot cover.
- 5) Holding the envelope feeder in both hands, install it into the printer.

4. Duplex unit

- 1) Open the duplex unit packaging.
- 2) Take off the plastic bag and peel the tape off.
- 3) Remove the packing from the duplex unit.
- 4) Open the delivery cover on the printer.
- 5) Holding the duplex unit in both hands, install it into the printer.

5. Option controller

Note: Discharge electrical static from your body by touching the metal frame of the printer prior to installing the PCB in order to avoid causing damage by the difference in static charge at that time.

- 1) Open the option controller packaging.
- 2) Remove the plastic bag from the optional controller.
- 3) Loosen the 2 screws on the back of the printer and pull out the PCB.
- 4) Remove the screw holding the option interface cover of the PCB.

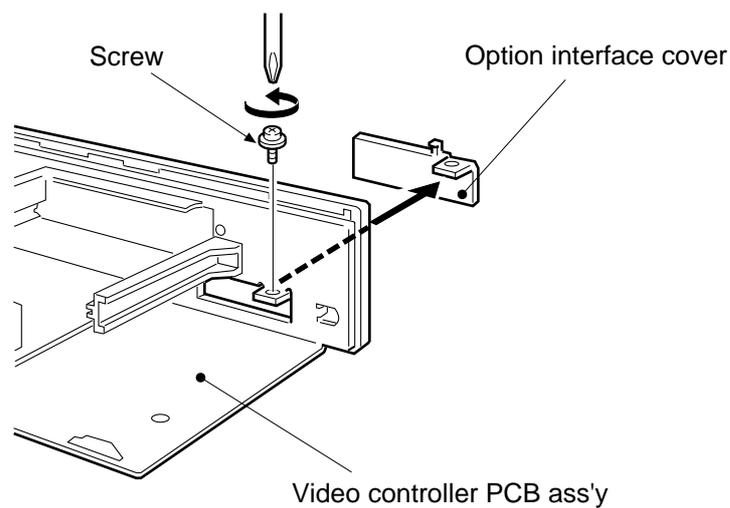


Figure 1-5-2

- 5) Insert the option controller as shown below.
- 6) Set the option controller with the 3 supplied screws.

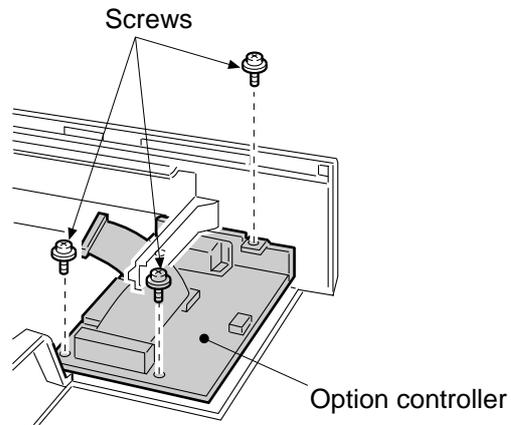


Figure 1-5-3

- 7) Insert a connector.

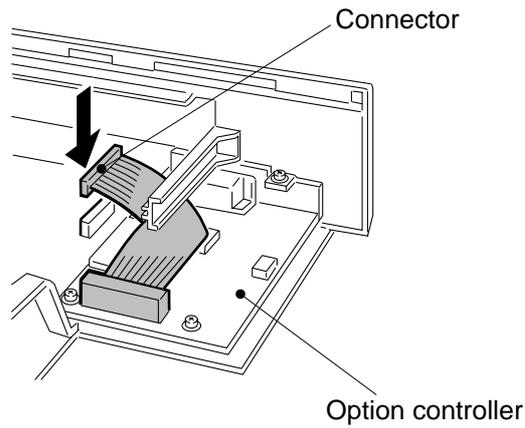


Figure 1-5-4

- 8) Insert the PCB to the printer and tighten the 2 screws.

6. Paper deck

a. Opening the packaging

- 1) Open the paper deck packaging and remove the box.
- 2) Take out the accessories. Confirm that the power cord, manuals and interface cable are included.
- 3) Remove the top pads (left/right) and remove the paper deck from the box.
- 4) Take off the plastic bag surrounding the paper deck and peel off the tape holding the various parts. Confirm that none of the covers were scratched or deformed during shipment.
- 5) Open the feed cover and remove the 2 spacers.
- 6) Open the deck and peel the tape off.
- 7) Peel off the tape holding the latch of the paper guide.

b. Installation

- 1) Carry the paper deck to the installation location and lock the casters.
- 2) Rotate the 4 adjusters to install it on the floor.
- 3) Open the feed cover.
- 4) Align the paper deck and the printer in the same direction, and have 4 people lift the printer. Lower the printer onto the paper deck while aligning the 3 locating pins on the paper deck.
- 5) Close the feed cover.
- 6) Connect the paper deck and the printer with an interface cable.

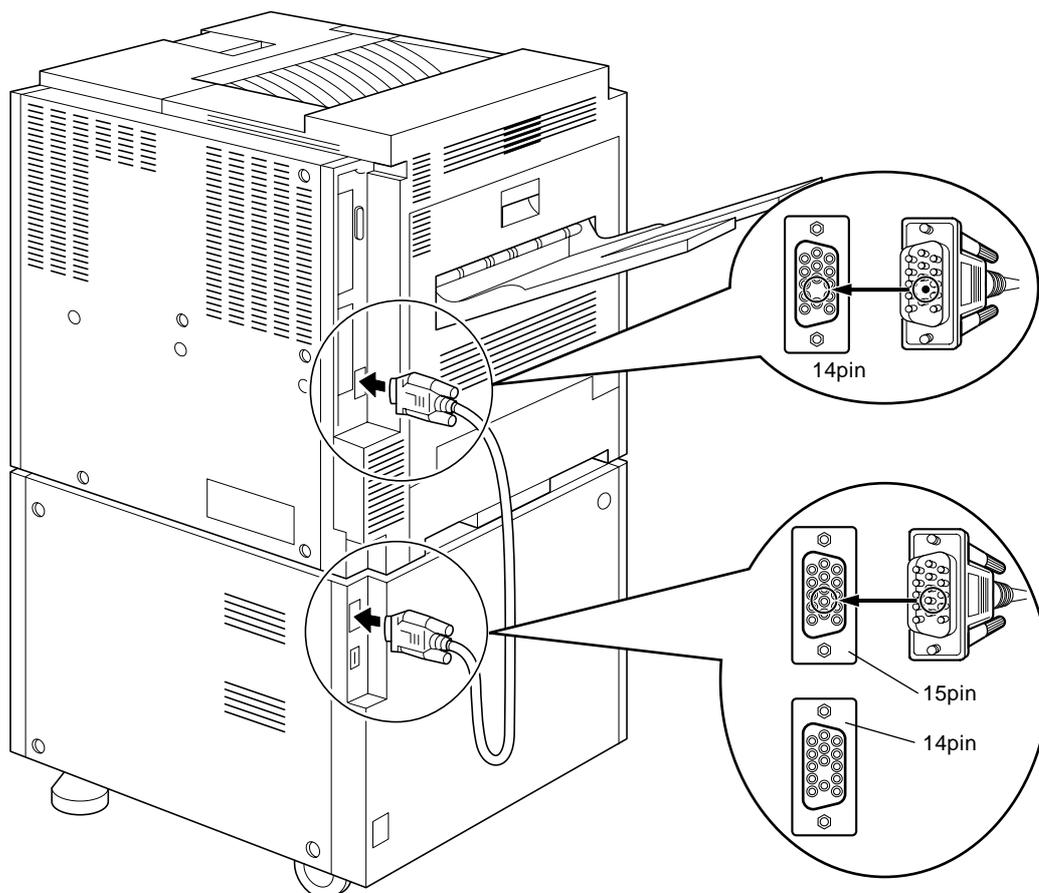


Figure 1-5-5