



**Lower Tray Unit for HL-2400C
Color Laser Printer
SERVICE MANUAL**

MODEL: LT-24CL

Feb., 1999
54S004BE0

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PREFACE

This service manual contains basic information required for after-sales service of the optional lower tray unit for color laser printer (here-in-after referred to as "the unit"). This information is vital to the service technician to maintain the high quality and performance of the printer and unit.

This service manual covers the LT-24CL lower tray unit.

Information in this manual is subject to change due to improvement or re-design of the product. All relevant information in such cases will be supplied in service information bulletins (Technical Information).

A thorough understanding of this unit, based on information in this service manual and service information bulletins, is required for maintaining its quality performance and for improving the practical ability to find the cause of problems.

CONTENTS

1. PRODUCT OUTLINE	1
1.1 PARTS NAMES & FUNCTIONS.....	1
2. SPECIFICATIONS	2
3. INSTALLATION	3
3.1 CONDITIONS REQUIRED FOR INSTALLATION.....	3
3.1.1 Environmental conditions.....	3
3.1.2 Basic layout of printer set-up location	3
3.2 UNPACKING.....	4
3.3 INSTALLATION PROCEDURES.....	5
3.3.1 Install the lower tray unit to the printer	5
3.3.2 Connect the LT signal connector into the printer	8
3.3.3 Install the covers	9
3.3.4 Relocate the printer / Test print.....	9
4. MAINTENANCE	10
4.1 DAILY MAINTENANCE	10
4.2 PERIODIC MAINTENANCE	10
5. DISASSEMBLY PROCEDURE.....	11
5.1 PAPER SENSOR / OHP SENSOR.....	12
5.2 PAPER SIZE SENSOR	12
5.3 PAPER FEEDING CLUTCH	12
5.4 PAPER FEEDING ROLLER / SEPARATION PAD	13
6. CLEARING PAPER JAMS	14
6.1 PAPER FEEDING JAM	14
6.2 INNER JAM / OUTER JAM	14

REGULATIONS

LASER SAFETY (FOR 110-120 V MODEL ONLY)

The printer, HL-2400C is certified as a Class I laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

FDA REGULATIONS (FOR 110-120 V MODEL ONLY)

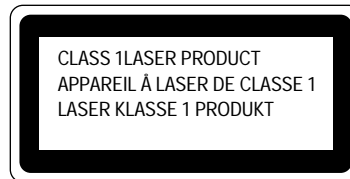
U.S. Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. One of the following labels on the back of the printer indicates compliance with the FDA regulations and must be attached to laser products marketed in the United States.

Caution

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

IEC 825 SPECIFICATION (FOR 220-240 V MODEL ONLY)

The printer, HL-2400C is a Class 1 laser product as defined in IEC 825 specifications. The label shown below is attached in countries where required.

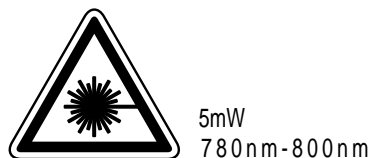


This printer has a Class 3B Laser Diode which emits invisible laser radiation in the Scanner Unit. The Scanner Unit should not be opened under any circumstances.

Caution

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

The following caution label is attached near the scanner unit.



For Finland and Sweden

LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

Varoitus! Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

Varning – Om apparaten används på annat sätt än i denna Bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

SAFETY INSTRUCTIONS

SAFETY PRINCIPLE

- 1) Before starting any operations, read this manual thoroughly. Especially read the safety instructions in this section carefully and ensure that you understand the contents.
- 2) Perform all the operations by following the procedures described in this manual. Follow all the cautions and warnings set out in the procedures and on safety labels affixed to the machine. Failure to do so may result in human injury or equipment damage.
- 3) Perform only the procedures explained in this manual. Refrain from opening or touching any portions that are not related to your required operation(s).
- 4) Repair and replacement of parts should be performed by trained and qualified persons only. Operators should not attempt to do such repair or replacement work.
- 5) It must be appreciated that the above-mentioned cautions and warnings do not cover everything because it is impossible to evaluate all the circumstances of repair situations.

SPECIAL SAFETY INFORMATION

Introductory Information

Cautions and warnings are made clear by following the 'Safety Alert Symbols' or 'Signal Words' such as DANGER, WARNING and CAUTION.

<SAFETY ALERT SYMBOL>

This is the safety alert. When you find this symbol placed on the equipment or marked in this manual, be aware of the potential of human injuries. Follow the recommended precautions and safety operation practices.

<Understanding Signal Words>

DANGER is used to indicate the presence of a hazard which will cause severe human injuries or a fatal accident if the warning is ignored.

WARNING is used to indicate the presence of a hazard or unsafe practices which may cause severe human injuries or a fatal accident if the warning is ignored.

CAUTION is used to indicate the presence of a hazard or unsafe practices which may cause minor human injuries if the warning is ignored. CAUTION also calls your attention to safety messages in this manual.

<Follow Safely Instructions>

Carefully read all the safety messages set out in this manual and also in the safety warning signs placed on the equipment. In this manual, the safety instructions (safety alert symbols and signal words) are enclosed in a rectangular enclosure to bring them to your attention. Keep the safety signs on the equipment in good condition and ensure none are missing or damaged.

Replace the safety signs if unreadable or damaged. Learn how to operate the equipment and how to use the controls properly. Do not let anyone operate this equipment without following the instructions. Keep the equipment in proper working condition. Unauthorized modification to the equipment may impair the function & safety and affect the life of the equipment.

Listed below are the various kinds of "WARNING" messages contained in this manual.



WARNING

HAZARDOUS VOLTAGE

May cause serious injuries or fatal accidents. Voltage is now being supplied from the power supply of printer. There is a danger of electrical shock if you touch the active area inside the printer.

Be sure to turn the power supply switch OFF and pull the plug out from the power outlet before starting maintenance work on the printer.



WARNING

HARMFUL OZONE GAS

Inhalation of an excessive amount of ozone gas may adversely affect the respiratory organs.

An Ozone Filter is fitted to this printer to reduce the exhausted ozone. This filter must be replaced with a new filter periodically in accordance with the manual supplied with the printer.



WARNING

HOT SURFACE

The Fusing Unit reaches a temperature of approx. 160°C and adjacent parts are also very hot.

When you need to change the cleaning pad or remove jammed paper, wait about 20 minutes after opening the paper exit unit to allow the unit to cool down.



CAUTION

ROTATING PARTS

Be aware of the potential danger of various rollers and take care not to get your fingers or hand caught into the machine, this can cause serious injuries. Note that the exit roller that ejects the printed paper is rotating while printing.

Be careful not to get your hair, fingers, hands, sleeve or necktie caught in the machine while operating the machine.

**HAZARDOUS POWDER**

Toner is a fine powder which can cause a powder explosion if disposed of into a fire. Under no circumstances dispose of toner into a fire.

**HAZARDOUS POWDER**

Toner is a fine powder which may cause irritation to the eyes and respiratory organs if inhaled.

Handle the toner cartridge, waste toner pack and developing unit carefully so as not to spill the toner.

**POWER CORDS & PLUGS**

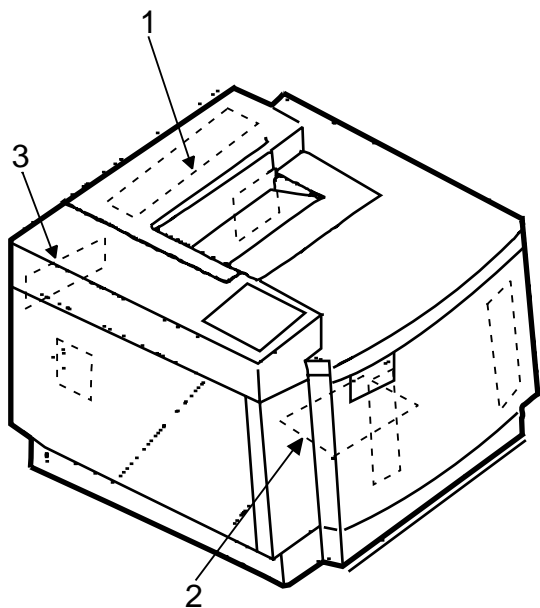
This printer is equipped with a 3-wire power cord fitted with a 3-pronged plug with an earth connection for the user's safety.

Use these power cords in conjunction with a properly grounded electrical outlet to avoid the possibility of an electrical shock.






**SAFETY INTERLOCK**

The front cover, paper exit unit and transfer unit of this printer have electrical safety interlocks to turn the power off whenever they are opened. Do not attempt to circumvent these safety interlocks.

<Label Location>



1. Hot Caution Label

	 WARNING	 WARNUNG	 AVERTISSEMENT	 高圧注意
	Hot surface. Avoid contact.	Heiße oberfläche. Bei beseitigung.	Surface chaude. Eviter tout contact.	火傷の恐れがあります。 触れないでください。

2. Laser Caution Label



5mW
780nm-800nm

DANGER- INVISIBLE LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM.

VORSICHT- UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG
GEÖFFNET UND SICHERHEITSVERRIEGELUNG
ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN.


DANGER- RAYON LASER INVISIBLE LORS DE L'OUVERTURE.
EVITER L'EXPOSITION DIRECTE.

PELIGRO- RADIACION LASER INVISIBLE AL ABRIR. EVITAR
LA EXPOSICION DIRECTA AL HAZ.

危険 開けたときレーザ放射の危険有り。
ビームに直接当たらないように注意して下さい。 **MAS**


3. Rating Label

(For US)




MODEL HL-C1

SER. NO.



U 5 2 4 9 2 L 7 H 1 1 1 1 0 1



120V ~ 50/60Hz 8.0A

BROTHER INDUSTRIES, LTD.

MADE IN JAPAN

**BROTHER PRINTER HL SERIES COVERED
BY ONE OR MORE FOLLOWING PATENTS:**
USP4, 968, 159 USPS, 050, 228 USPS, 068, 805
USPS, 086, 481 USPS, 093, 904 USPS, 126, 788

CLASS 1 LASER PRODUCT
APPAREIL À LASER DE CLASSE 1
LASER KLASSE 1 PRODUKT


MANUFACTURED: **NOVEMBER 1997** HTJ

BROTHER INDUSTRIES, LTD.
15-1, Naoshino-cho, Mizuho-ku, Nagoya 467, Japan.
This product complies with FCC radiation
performance standards, 21 CFR Subchapter J.

FCC ID: B3QHLC1


This device complies with Part 15 of the FCC Rules. Operation is
subject to the following two conditions: (1) This device may
not cause harmful interference, and (2) this device must
accept any interference received, including interference that
may cause undesired operation.

(For Europe)







MODEL HL-C1

SER. NO.



E 5 2 6 1 9 L 7 H 1 1 1 1 0 1



220V-240V ~ 50/60Hz 4.0A

BROTHER INDUSTRIES, LTD.

MADE IN JAPAN

CLASS 1 LASER PRODUCT
APPAREIL À LASER DE CLASSE 1
LASER KLASSE 1 PRODUKT

ACN 001 393 835

MADE IN JAPAN

1. PRODUCT OUTLINE

1.1 Parts Names & Functions

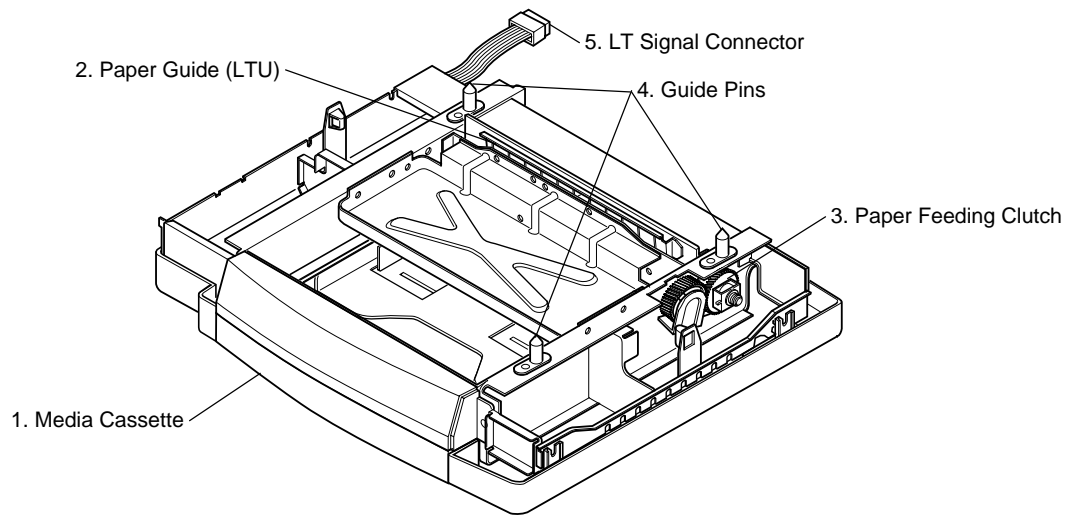


Fig. 1

No.	Parts Name	Outline of Function
1	Media Cassette	To feed paper automatically
2	Paper Guide (LTU)	To guide paper from the media cassette to the printer.
3	Paper Feeding Clutch	To transport paper from the media cassette.
4	Guide Pins	Guide pin to correctly locate the printer onto the lower tray unit.
5	LT Signal Connector	Connection to the printer to control the lower tray unit.

2. SPECIFICATIONS

No.	Item	Specification
1	Applicable Printer	Brother Color Laser Printer HL-2400C
2	Cassette Capacity	Normal paper: 250 sheets Transparency: 50 sheets
3	Feedable Paper Sizes	Letter, Legal, A4, Executive, B5, Transparency, Label
4	Dimensions (W x D x H)	500 x 484 x 116 mm (139 x 134.5 x 32.2 inch)
5	Weight	Approximately 8.0 kg (17.6 lb.)

3. INSTALLATION

3.1 Conditions Required for Installation

Installation conditions for the lower tray unit are the same as for the printer. Any laser beam printer is likely to be influenced by the environment of the set-up location. If the printer is set-up in an inappropriate location, the printer may not perform as expected. Therefore, the following factors should be taken into consideration before deciding where to set-up the printer.

3.1.1 Environmental conditions

The printer should not be set up in the locations referred to in the following items 1) through 4) which specify inappropriate locations for set-up.

- 1) Where it is likely to receive direct sunlight or similar light. (For example, next to a window)
- 2) Where it is likely to suffer a big difference in temperature and humidity between the maximum and minimum levels. (Normal operation environment is within 10°C ~ 32.5°C, 20 ~ 80%RH and without any condensation.)
- 3) Where it is likely to be in a draft of cold air from an air-conditioner or warm air from a heater, or to receive direct radiant heat.
- 4) Where it is likely to be excessively dusty or be subject to corrosive gases such as ammonia.
- 5) Users should select a location with good ventilation and set the printer on a flat surface.
- 6) Users should check that the maximum angle of the set-up location is horizontal to within $\pm 1^\circ$.

3.1.2 Basic layout of printer set-up location

Fig.2 shows the basic layout of the printer set-up location that is suitable for smooth operation and maintenance of the printer.

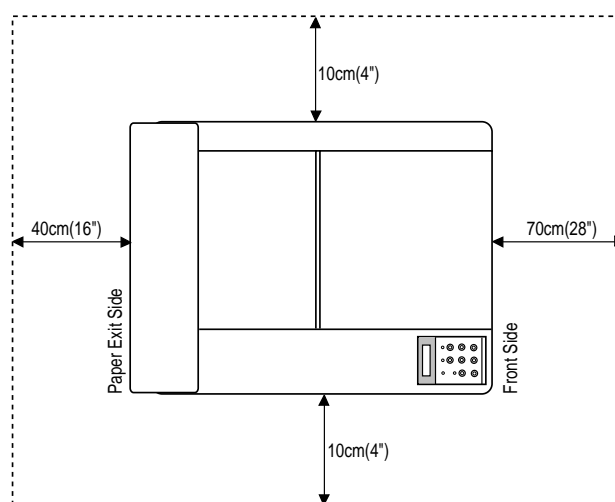


Fig. 2

- The space in front of the printer (70cm) is necessary to open the front cover.
- The space at back of the printer (40cm) is necessary to open / close the rear access cover.
- The space on both sides of the printer (10cm) is necessary for general access.

3.2 Unpacking

Follow the unpacking steps below referring to Fig.3.

- 1) Remove the binding tape from the top of the package.
- 2) Take the side covers R/L out of the box.
- 3) Remove the upper packing carton.
- 4) Take the lower tray unit (with media cassette and set-up guides R/L already installed) out of the box.

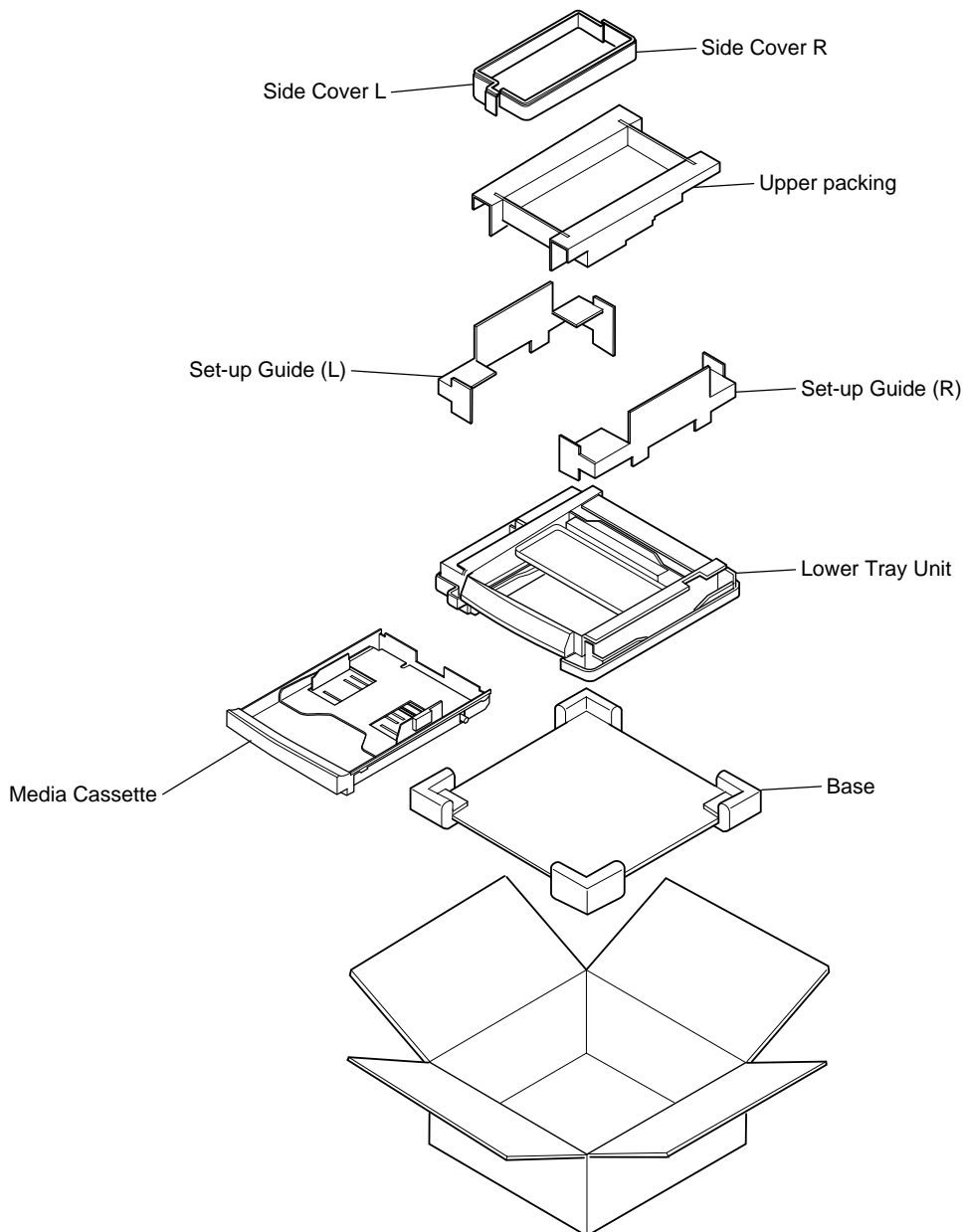


Fig. 3

3.3 Installation Procedures

3.3.1 Install the printer onto the lower tray unit

- 1) Place the lower tray unit on a solid, flat surface where the printer is to be installed ensuring that the conditions in [sections 3.1.1](#) and [3.1.2](#) are complied with.
- 2) Check that the set-up guides R/L are fixed onto the lower tray unit.

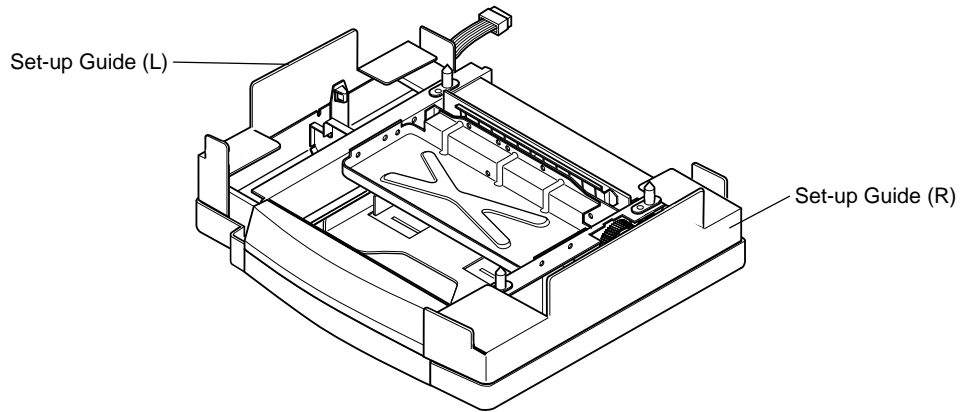


Fig. 4

- 3) Pull out the LT signal connector which is located at the rear left side of the unit, and remove the LT connector cover from the lower tray unit.

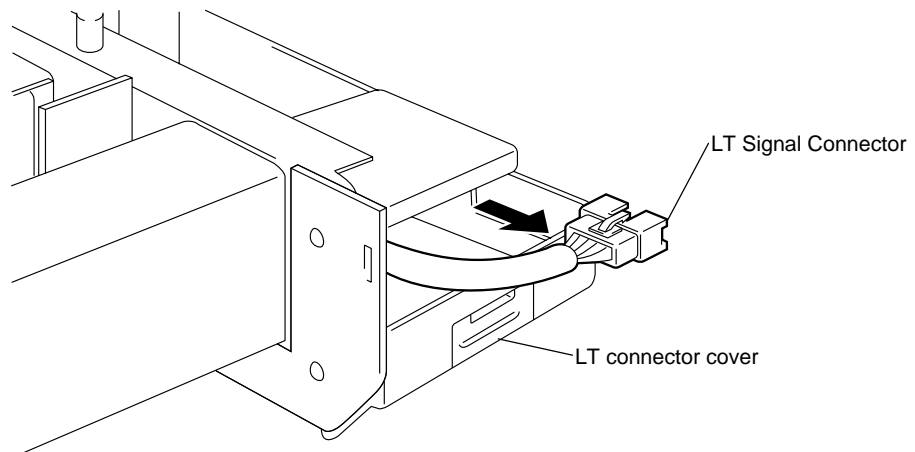


Fig. 5

- 4) Check the three alignment guide pins on the lower tray unit.

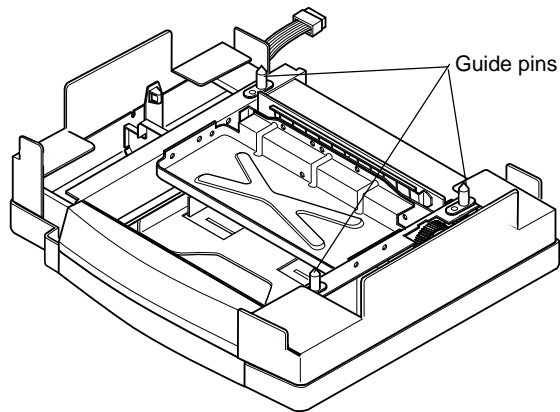


Fig. 6

- 5) Two people should be used to lift up the printer and place it onto the lower tray unit as shown in Figure 7.



WARNING

The printer weighs approximately 32kg, so it is too heavy for one person to carry. It needs two adults to move the printer. Since the printer is a precision machine, make sure that it is carried slowly with care so that no impact occurs to the printer while moving it.

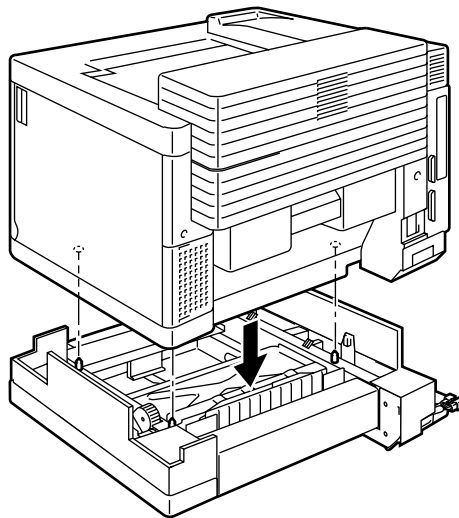


Fig. 7

NOTE:

- *Slowly lower the printer along the set-up guides provided at both sides of the unit so that the locating holes in the printer align correctly with the guide pins.*
- *After putting the printer onto the lower tray unit, ensure that the alignment pins are located correctly into the printer.*

- 6) Remove the set-up guides R/L from the unit.

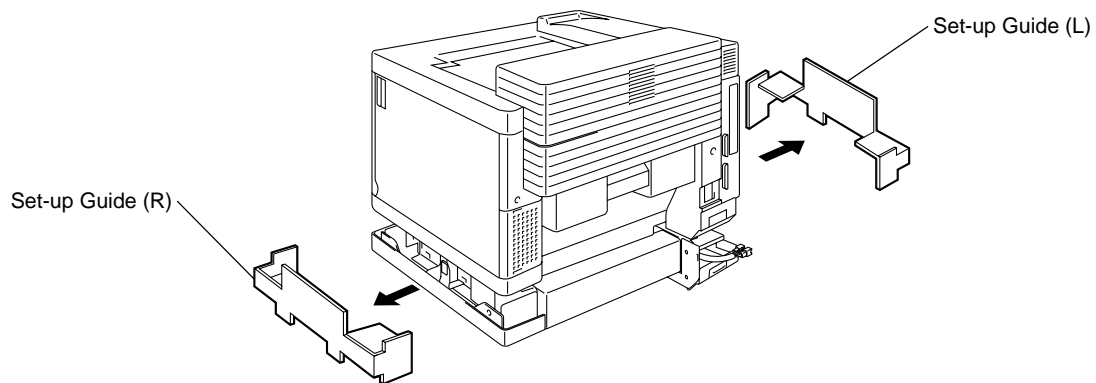


Fig. 8

- 7) Insert the metal fixtures into both sides of the lower tray unit from above.
8) Tighten the screws to secure the fixtures.

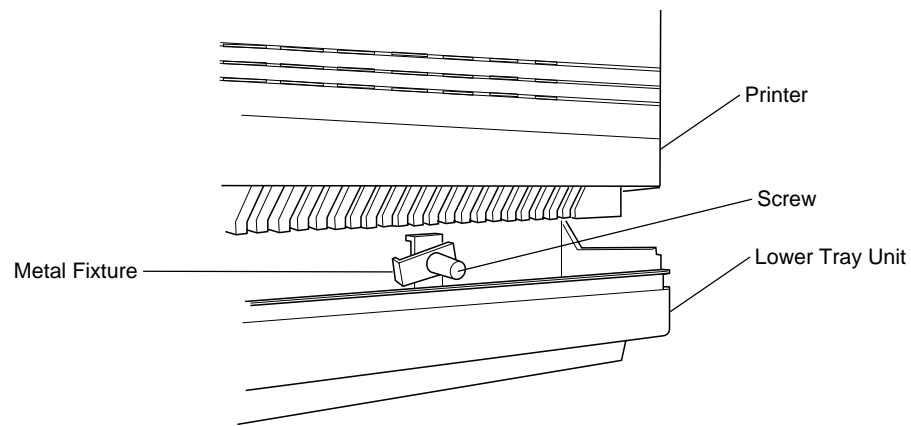


Fig. 9

NOTE:

Check that the two metal fixtures and the two screws were supplied with the lower tray unit.

3.3.2 Connect the LT signal connector into the printer

- 1) Remove the LT connector cover (U) from the printer.
- 2) Connect the LT signal connector into the connector of the printer.

NOTE:

Connect the LT signal connector into the printer connector correctly until it clicks as it locks into position.

- 3) Install the LT connector cover onto the printer.
- 4) Install the LT connector cover (U) onto the lower tray unit.

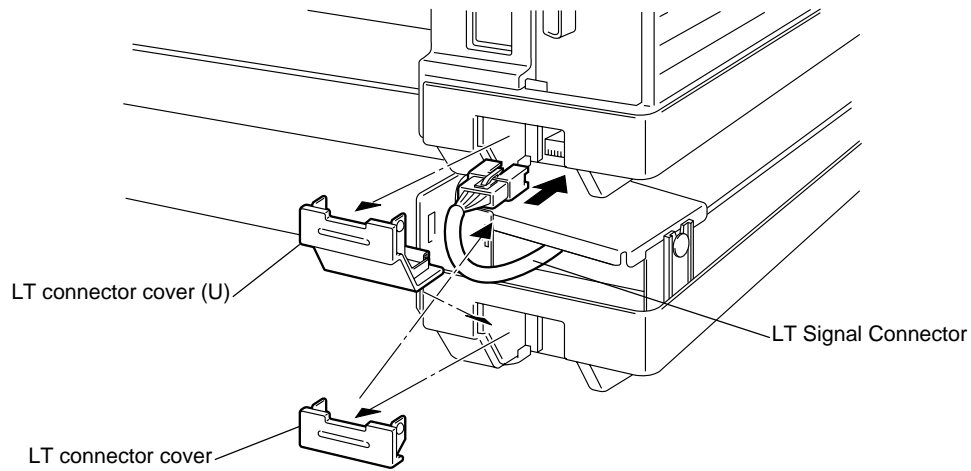


Fig. 10

3.3.3 Install the covers

- 1) Install the side covers R/L onto both sides of the lower tray unit.

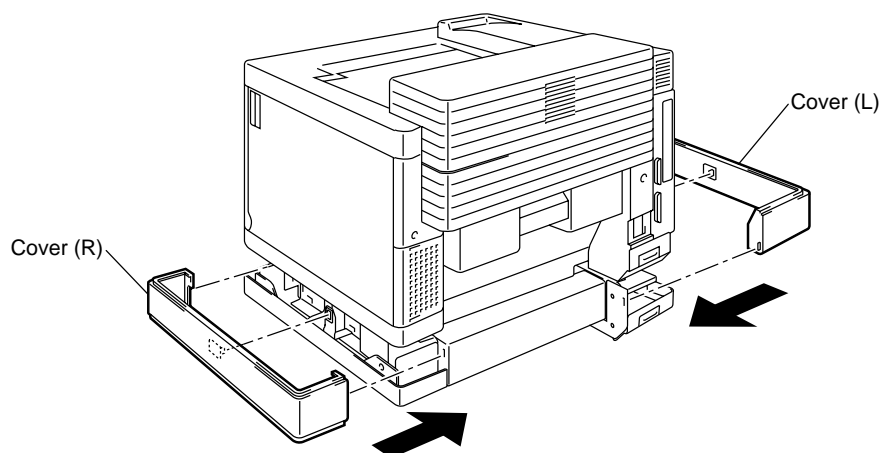


Fig. 11

3.3.4 Relocating the printer / Test print

- 1) If it is necessary to relocate the printer with the lower tray unit installed, hold it under the lower tray unit, it should only be moved by two adults and should be kept level at all times. Care should be taken to not subject the printer to any unnecessary shock during moving the printer.

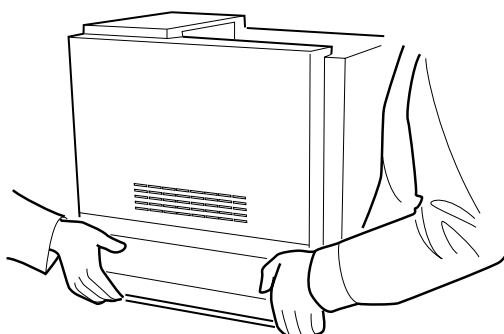


Fig. 12



CAUTION

- The printer with the lower tray unit installed weighs approximately 40kg, so it is too heavy for one person to carry. It needs two adults to move the printer.
- If the printer and the lower tray unit are relocated separately, ensure that you disconnect the LT signal connector from the printer before lifting up the printer from the lower tray unit.

- 2) After all the installation steps are finished, load paper only into the media cassette of the lower tray unit and implement the test print.

4. MAINTENANCE

4.1 Daily Maintenance

You need not daily maintenance for the lower tray unit such as cleaning.

4.2 Periodic Maintenance

You need not to replace any parts periodically. However, it is recommended for high performance of paper feeding that the following parts are replaced in accordance with the periodic replacement cycle of printer parts.

Description	Part No.	Replacement Cycle
Paper Feeding Roller	UH3485001	Every 120K print
Separation Pad	UH3486001	Every 120K print

5. DISASSEMBLY

When disassembling the lower tray unit, follow the instructions in the sections below referring to Figure 13;

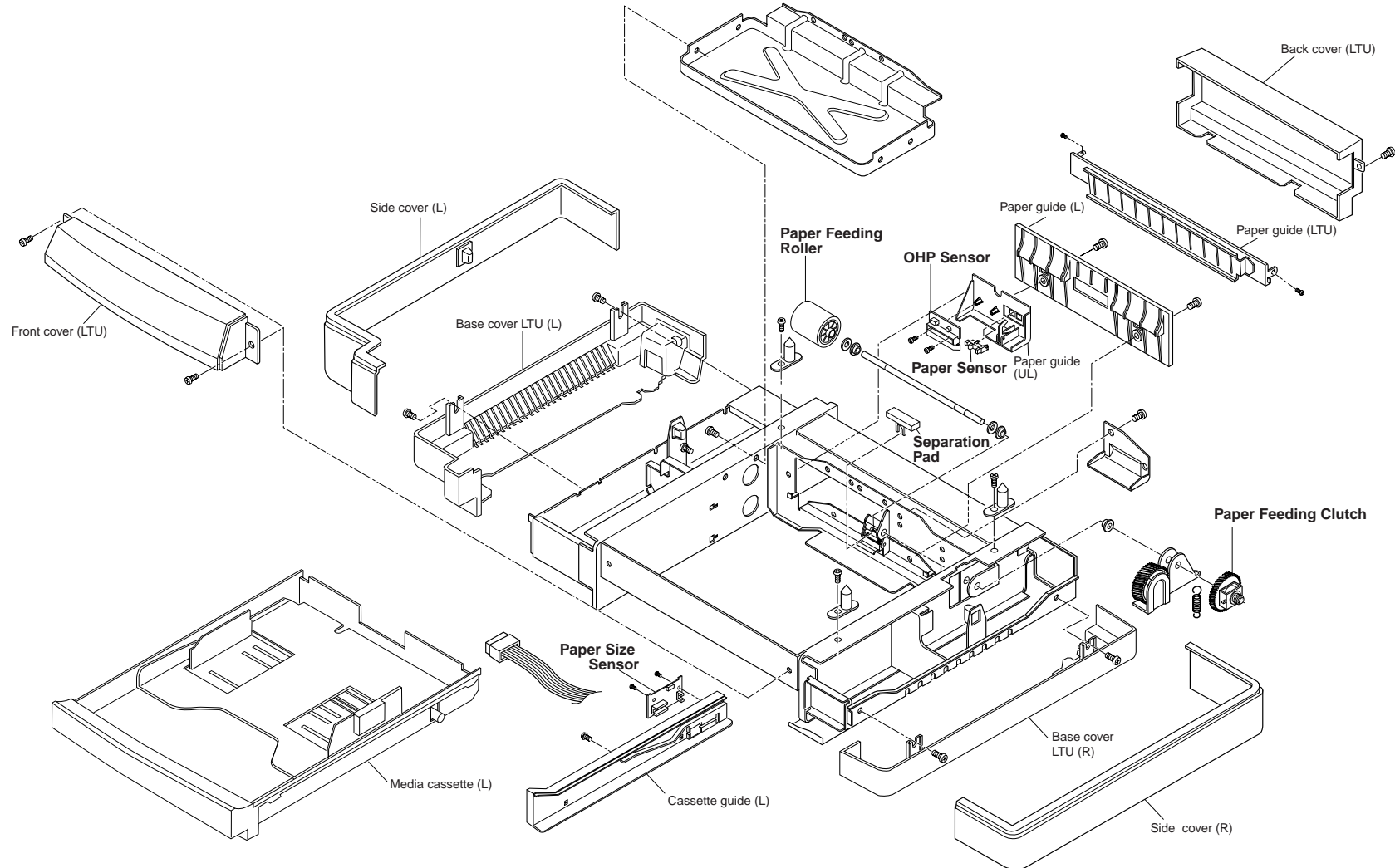


Fig. 13

5.1 Paper Sensor (PEL) / OHP Sensor (OHPL)

- 1) Remove the BT4x8 screw (1 pc.) to remove the back cover (LTU).
- 2) Remove the screws (2 pcs.) to remove the paper guide (LTU).
- 3) Remove the ST4x6 screws (2 pcs.) to remove the paper guide (L).
- 4) Remove the ST4x6 screws (2 pcs.) to remove the paper guide (UL) assembly.
- 5) Remove the paper sensor connector.
- 6) Remove the paper sensor from the paper guide (UL).
- 7) Remove the BT3x6 screws (2 pcs.) to remove the OHP sensor from the paper guide (UL).
- 8) Remove the OHP sensor harness connector.

5.2 Paper Size Sensor (PSU)

- 1) Remove the BT4x8 (2 pcs.) screws to remove the base cover LTU (L).
- 2) Remove the ST3x6 screws (2 pcs.) to remove the front cover (LTU).
- 3) Remove the BT3x8 screw of the cassette guide (L) assembly.
- 4) Pull the cassette guide (L) toward you while pushing the front catch to release the guide from the plastic catches.
- 5) Remove the connector of the paper size sensor.
- 6) Remove the cassette guide (L) assembly from the frame.
- 7) Remove the BT3x8 screws (2 pcs.) to remove the paper size sensor from the cassette guide (L).

5.3 Paper Feeding Clutch

- 1) Remove the BT4x8 screws (2 pcs.) to remove the base cover LTU (R).
- 2) Remove the BT4x8 screw (1 pc.) to remove the back cover (LTU).
- 3) Remove the harness connector of the paper feeding clutch.
- 4) Remove the ST3x6 screw (1 pc.) to remove the clutch cover.
- 5) Remove the stopper ring from the paper feeding clutch shaft.
- 6) Remove the paper feeding clutch from the shaft.

Note:

When removing the clutch cover, the spring installed onto the clutch cover comes off.

5.4 Paper Feeding Roller / Separation Pad

- 1) Remove the BT4x8 screw (1 pc.) to remove the back cover (LTU).
- 2) Remove the screws (2 pcs.) to remove the paper guide (LTU).
- 3) Remove the ST3x6 screws (2 pcs.) to remove the paper guide (L).
- 4) Remove the ST3x6 screws (2 pcs.) to remove the paper guide (UL).
- 5) Disconnect the harness from the paper guide (UL).
- 6) Remove the paper feeding roller by pushing it to the right viewed from the rear of the unit.
- 7) Pull up and remove the separation pad.



CAUTION

Do not touch the surface of the paper feeding roller and separation pad.

6. CLEARING PAPER JAMS

6.1 Paper Feeding Jam

- 1) Pull out the media cassette (L).
- 2) Remove the paper remaining inside the printer.
- 3) Open the rear cover to check no paper remains.
- 4) Close the rear cover.

6.2 Inner Jam / Outer Jam

Both inner jam and outer jam actually occur inside the printer.

Refer to Section 3.2 & 3.3 in Chapter VIII of the HL-2400C service manual.