SERVICE MANUAL

MODEL: LX-1200/LX-300

MECHANISMS & ELECTRONICS

COOL LAMINATOR
SERVICE MANUAL

MODEL: LX-1200/LX-300

INTRODUCTION

This Service Manual describes the Cool Laminator LX-1200/LX-300 specifications, operating principles of the mechanisms, disassembly and reassembly procedures, and maintenance and troubleshooting procedures.

This Service Manual is intended for use by trained technicians. It is not intended for use by the user.

The manual is divided into the following chapters.

Chapter 1.

SPECIFICATIONS

CONTENTS

Chapter 1. SPECIFICATIONS

1.1 Mechanical Specifications

1.1.1 Appearance

[1] External dimensions (W x D x H) 468 mm x 387 mm x 273 mm

[2] Weight Approx. 8.3 kg (main unit only)

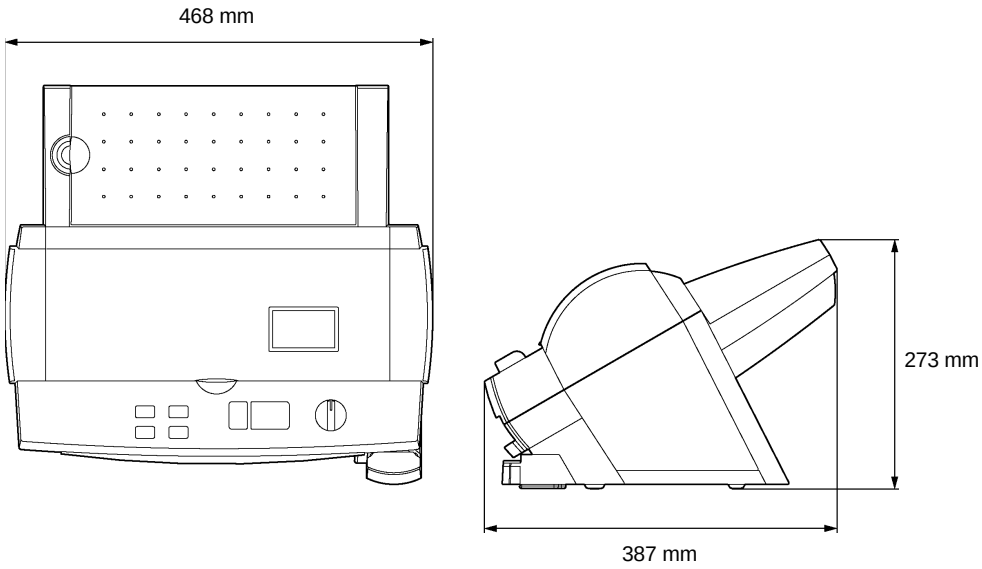

Fig. 1.1-1 Appearance

1.1.2 Operating Panel

[1] Number of Keys — 7 (Start key, Stop key, Cut key, Feed key, Extra border key, Continuous key, Cutting mode selector)

[2] Key Arrangement

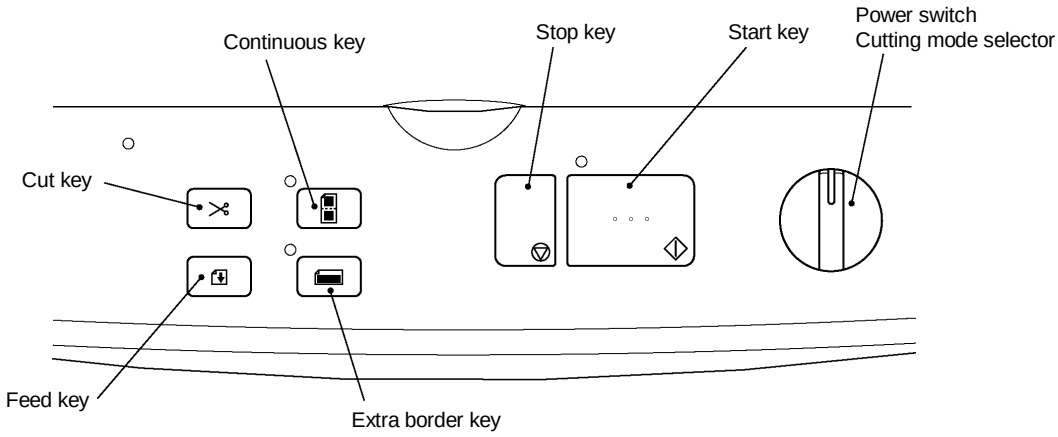

Fig. 1.1-2 Key Arrangement

1.1.3 Indicators

[1] Positions — Start key LED (green)
Continuous key LED (green)
Extra border key LED (green)
Error LED (red)

1.2 Electrical Specifications

1.2.1 Power Supply

[1] Power supply — Commercial power supply (locally available power supply). Converted to DC by the AC adaptor.

Chapter 2.

MECHANISMS

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Chapter 2. MECHANISMS

2.1 Mechanical Operating Principles

2.1.1 Description of Mechanisms (Border Mode)

1. When a document is inserted into the paper loading gate, the paper feed rollers feed it to the driving roller.
2. As the document passes between the paper feed rollers, the paper size detector determines its size (length and width).
3. When the document passes between the film cartridges it is sandwiched between the upper and lower films in the compression-feed area, where the films and document are compressed between the driving roller and sub-roller.
4. The compressed document and film is fed to the cutting area, where it is cut to the document size detected by the paper size detector with borders added. It is then transported to the next stage.
5. The laminated document is fed out of the eject gate by the paper eject rollers.

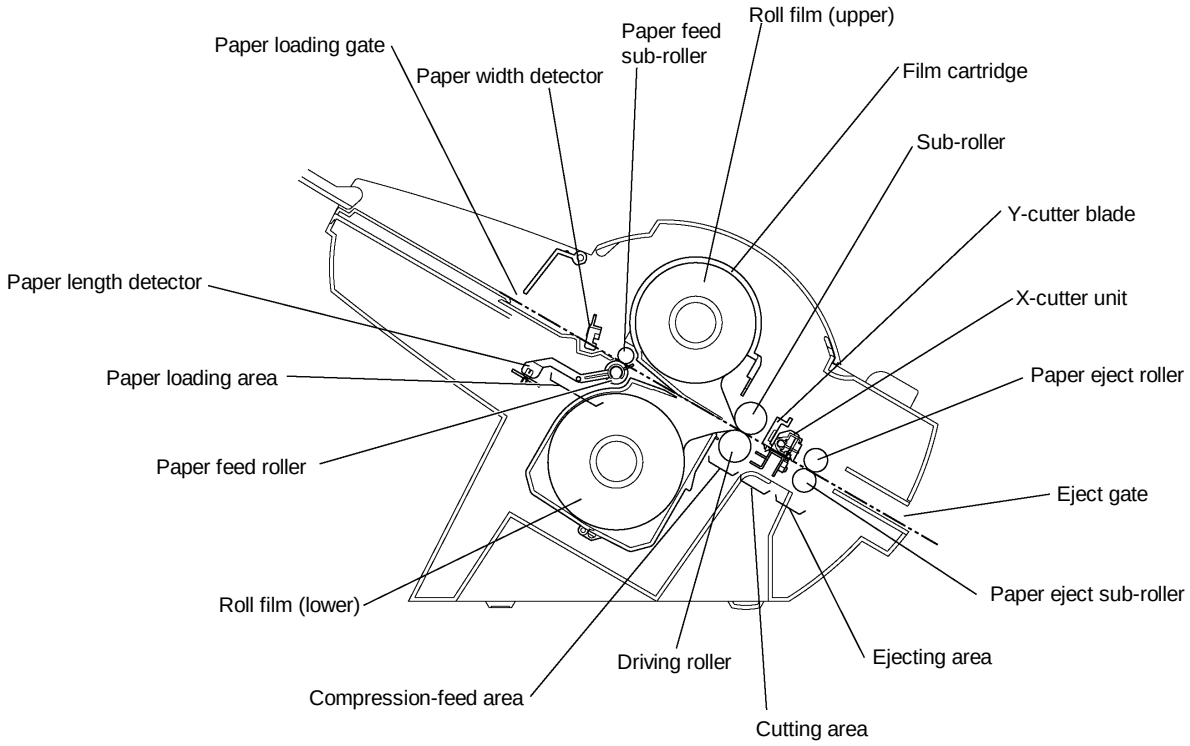


Fig. 2.1-1 Description of Mechanisms

2.1.2 Feed and Compression Mechanisms

The feed and compression mechanism controls the motor drive to feed the document into the film cartridge, compression-feed the films, and eject the laminated document.

The operation is basically divided into three separate operations: feeding a document into the Film cartridge, compression-feeding the films, and ejecting the laminated document.

Normal Mode

When documents are laminated one at a time (that is, not in the Continuous mode), the lamination operation comprises the operations A and B below.

- A. Feeding document into Film cartridge and ejecting the laminated document
  1. The SG motor mounted at the right of the chassis runs to rotate the Control cam gear (also mounted at the right of the chassis) to its prescribed position.
  2. As the Control cam gear rotates, the LF change shaft is rotated to its prescribed position by the cam on the Control cam gear.
  3. A cam is mounted on the LF motor end of the LF change shaft (at the left of the chassis). As the LF change shaft rotates, this cam rotates the two Gear holders at the left of the chassis, which transmit the LF motor drive as shown in the diagram.
  4. As a result of steps 1 to 3 above, the drive is transmitted to the Paper feed roller and Paper eject roller. The document is fed into the Film cartridge by the Paper feed roller as the LF motor rotates. After the trailing edge has been cut by the X cutter, the laminated document is ejected by the Paper eject roller.

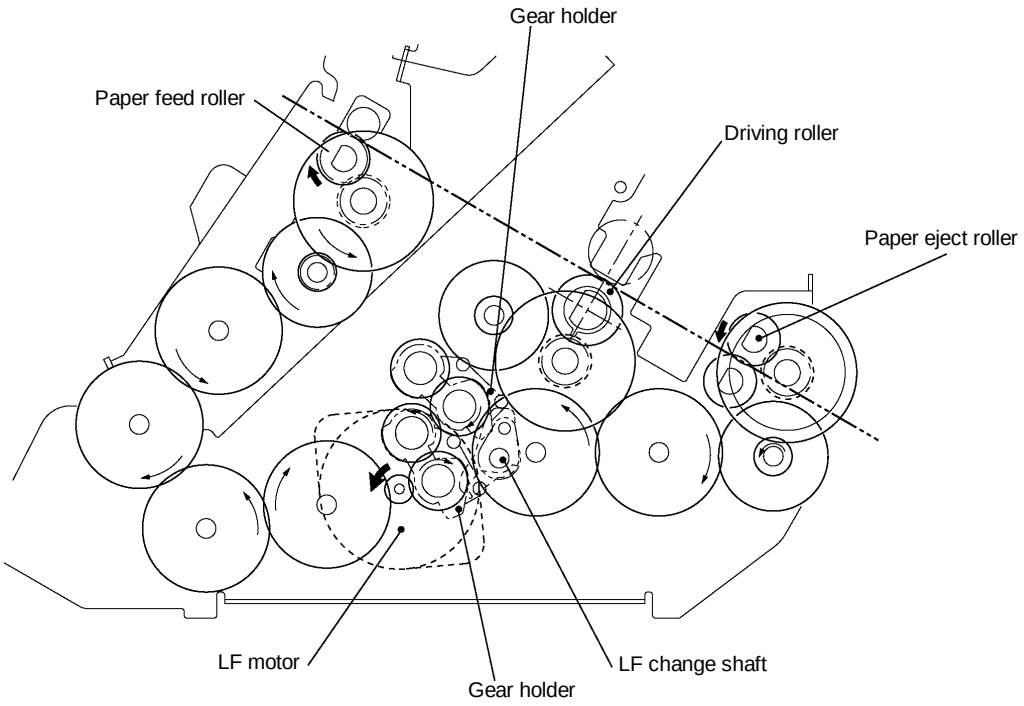


Fig. 2.1-2 Operation when Feeding Document into the Film Cartridge or when Ejecting a Laminated Document

■ B. Compression-feeding the films

1. The SG motor mounted at the right of the chassis runs to rotate the Control cam gear (also mounted at the right of the chassis) to its prescribed position.
2. As the Control cam gear rotates, the LF change shaft is rotated to its prescribed position by the cam on the Control cam gear.
3. A cam is mounted on the LF motor end of the LF change shaft (at the left of the chassis). As the LF change shaft rotates, this cam rotates the two Gear holders at the left of the chassis, which transmit the LF motor drive as shown in the diagram.
4. As a result of steps 1 to 3 above, the drive is transmitted to the Driving roller that compresses the films. During this operation, the Paper feed roller and Paper eject roller rotate continuously to feed in documents and eject laminated documents.

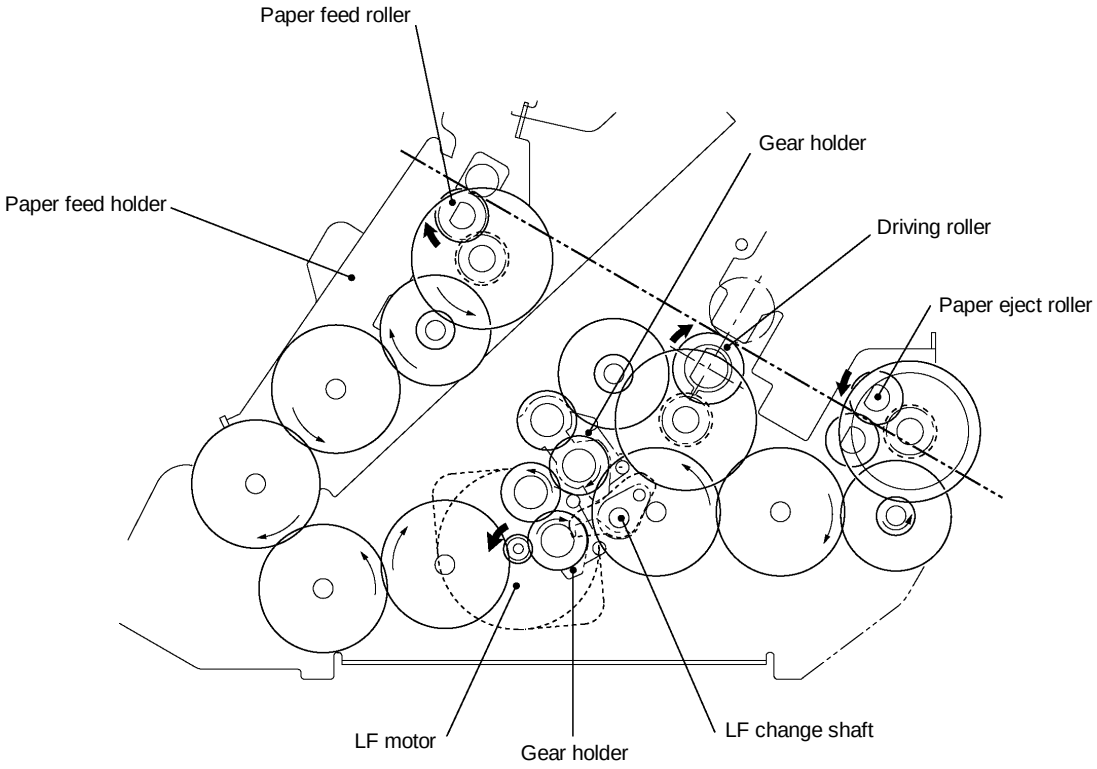


Fig. 2.1-3 Operation during Film Compression-Feed

Continuous Mode

When the second or subsequent document are inserted in the Continuous mode, the operation C described below feeds the documents to the prescribed position.

■ C. Feeding Document Only into Film Cartridge

1. The SG motor mounted at the right of the chassis runs to rotate the Control cam gear (also mounted at the right of the chassis) to its prescribed position.
2. As the Control cam gear rotates, the LF change shaft is rotated to its prescribed position by the cam on the Control cam gear.
3. A cam is mounted on the LF motor end of the LF change shaft (at the left of the chassis). As the LF change shaft rotates, this cam rotates the two Gear holders at the left of the chassis, which transmit the LF motor drive as shown in the diagram.
4. As a result of steps 1 to 3 above, the drive is transmitted to the Paper feed roller only. A document is fed into the Film cartridge by the Paper feed roller as the LF motor rotates.

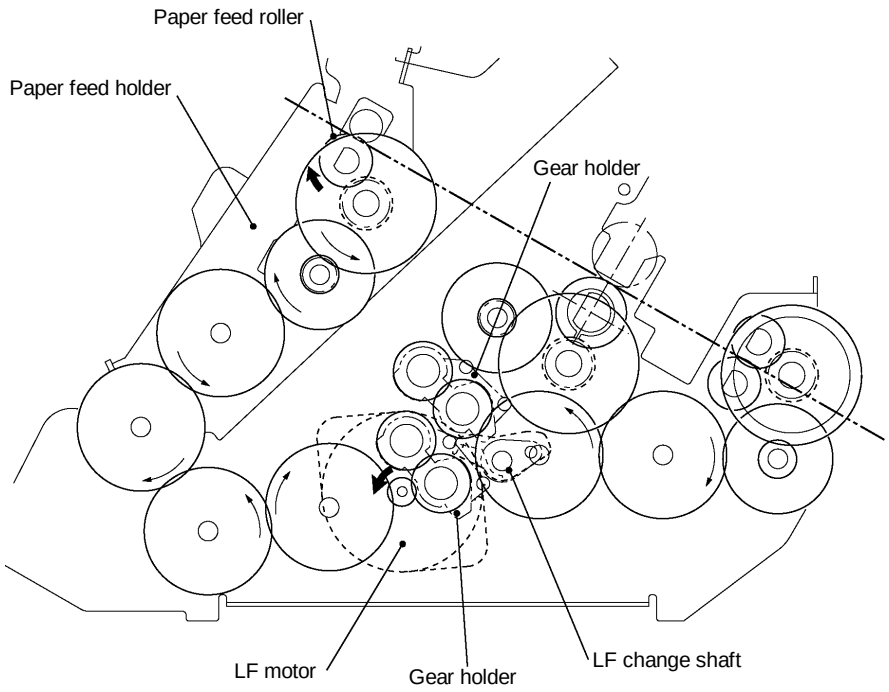


Fig. 2.1-4 Operation when Feeding Document into the Film Cartridge in the Continuous Mode

2.1.3 Cutter Mechanism (Border Mode)

The cutter mechanism cuts the laminated document to the size of the document plus an added border. Both edges of the films are cut to suit the width of the document and the leading edge and trailing edge are cut according to the document length.

- Y-Cutter Vertical Drive Operation

  The SG motor drive rotates the Control cam gear to its prescribed position. This rotation is transmitted via the YC lift arm and YC lift shaft to rotate the Y-diversion lever and set the Y cutter to the cutting position.

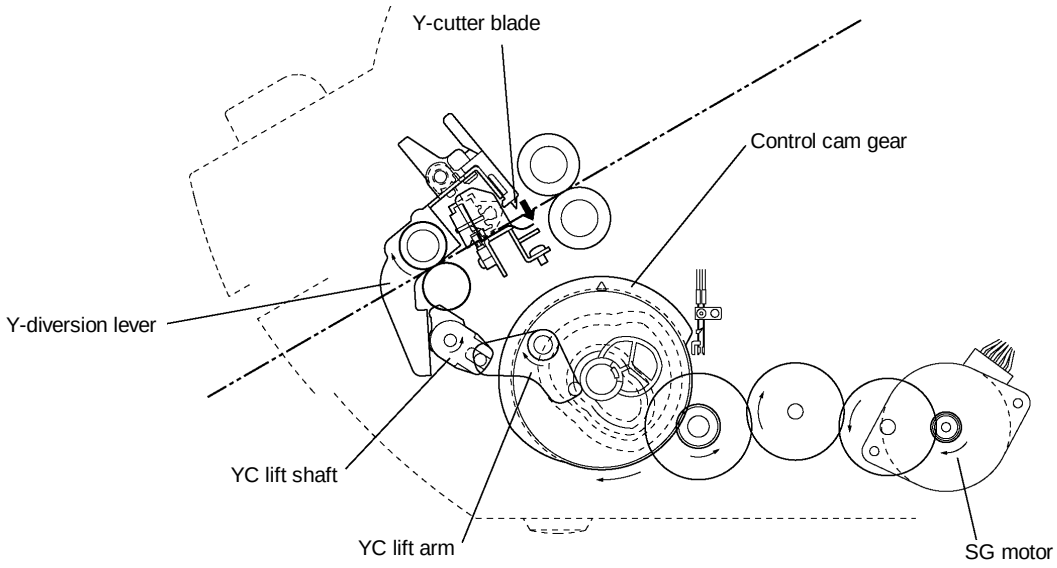


Fig. 2.1-5 Y-Cutter Vertical Drive Operation

■ Cutting Leading and Trailing Edges (X-cutter Mechanism)

1. All the rollers which feed the document stop when the cut position at the leading edge of the document reaches the cutting position of the rotary cutter and fixed-blade cutter.
2. The DC motor rotates to drive the carriage in the X-cutter assy via the spiral mechanism (not illustrated).
3. As the carriage makes a reciprocal movement, the rotary cutter attached to the carriage moves against the fixed cutter to cut the compressed leading edge of the document.
4. The rotation of the rollers which feed the document restarts when the cutting of the leading edge is complete. Then, when the cut position at the trailing edge of the document reaches the cutting position of the rotary cutter and fixed-blade cutter, the feed rollers stop again.
5. The document trailing edge is cut in the same way as the leading edge by a reciprocal movement of the rotary cutter attached to the carriage.
6. The rotation of the Paper eject roller and Paper feed roller restarts to feed the laminated document from the eject gate after the cutting of the trailing edge is complete. (In this timing, the driving roller does not rotate.)

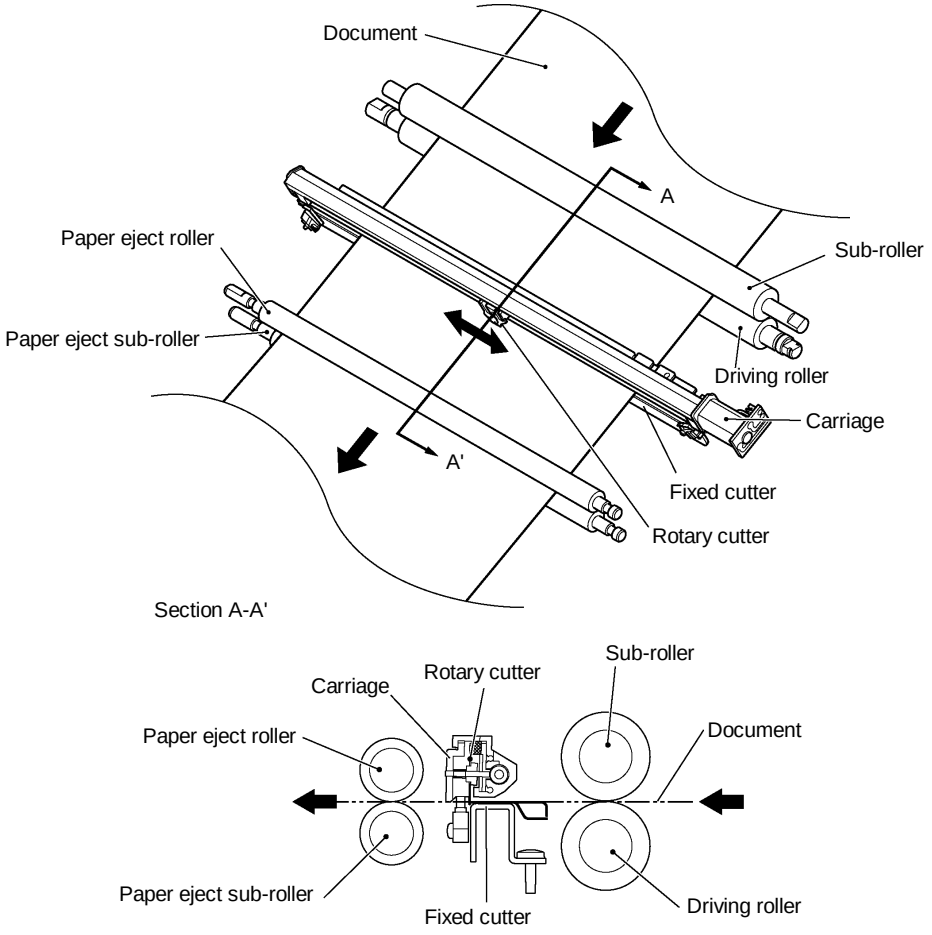


Fig. 2.1-6 Cutting Leading and Trailing Edges (X-cutter Mechanism)

2.1.4 Paper Size Detector Mechanism

- Paper Length Detection
  1. When the leading edge of the document passes between the Paper feed rollers, the Actuator top operates about the pivot to turn on the Paper sensor and detect the document leading edge.
  2. When the trailing edge of the document passes out of the Paper feed rollers, the Actuator top reverts to its original position to turn off the Paper sensor and detect the document trailing edge.

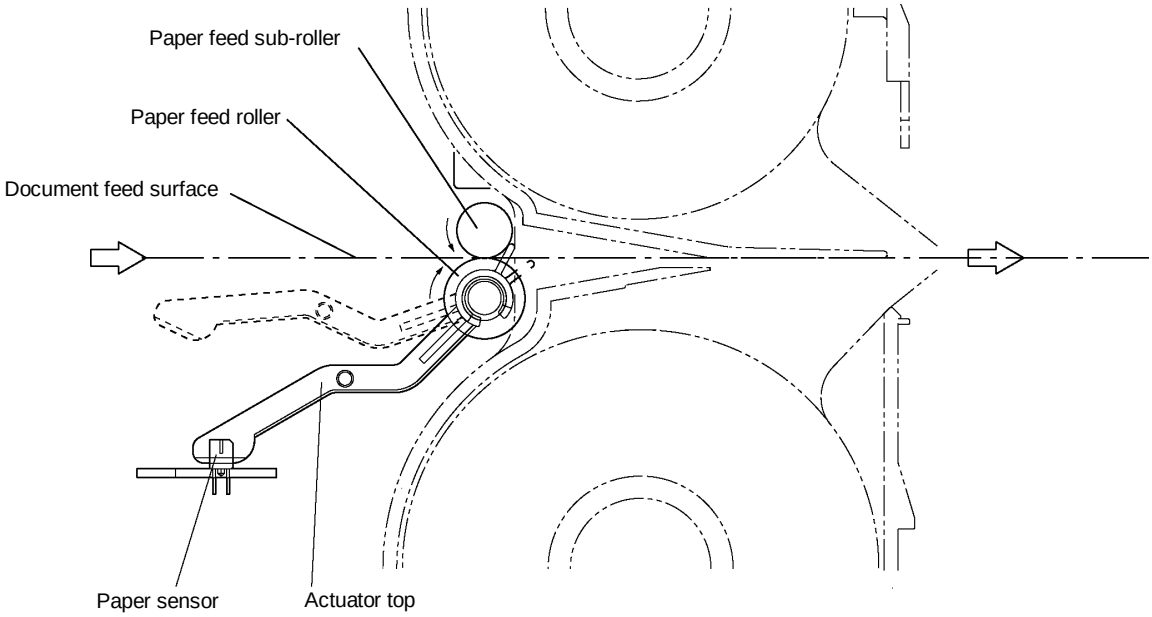
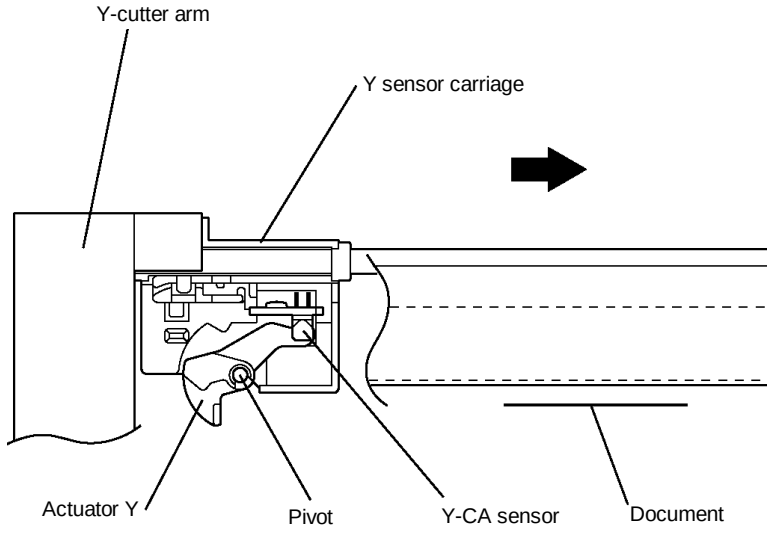


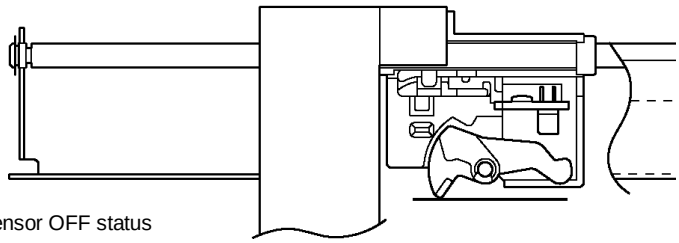
Fig. 2.1-7 Paper Length Detection

■ Paper Width Detection (Y-CA sensor)

1. As the Y-cutter arm (Y-CA sensor carriage) moves in the direction of the arrow, the document contacts the Actuator Y, which rotates about the pivot to switch off the Y-CA sensor (photosensor).
2. When the Y-CA sensor turns off, the Y-cutter arm movement stops and this position is detected as the document width.



∗ Photosensor ON status



∗ Photosensor OFF status

Fig. 2.1-8 Paper Width Detection

2.1.5 Trimming Mechanism

1. When a corner of the laminated document is inserted over the T-cutter plate, the T-sensor lever operates a leaf switch (TRI) that detects the document.
2. When the document is detected, the motor gear of the SG Motor rotates from its reference position to the prescribed position to rotate the Control cam gear in the direction of the arrow (counterclockwise) via a series of gears.
3. Rotation of the Control cam gear forces the T-cam roller to move vertically, such that T-lever also moves vertically, rotating around its pivot.
4. As T-lever moves vertically, the T-cutter assy mounted on the end of T-lever moves up and down, trimming the corner of the laminated document into a rounded radius.

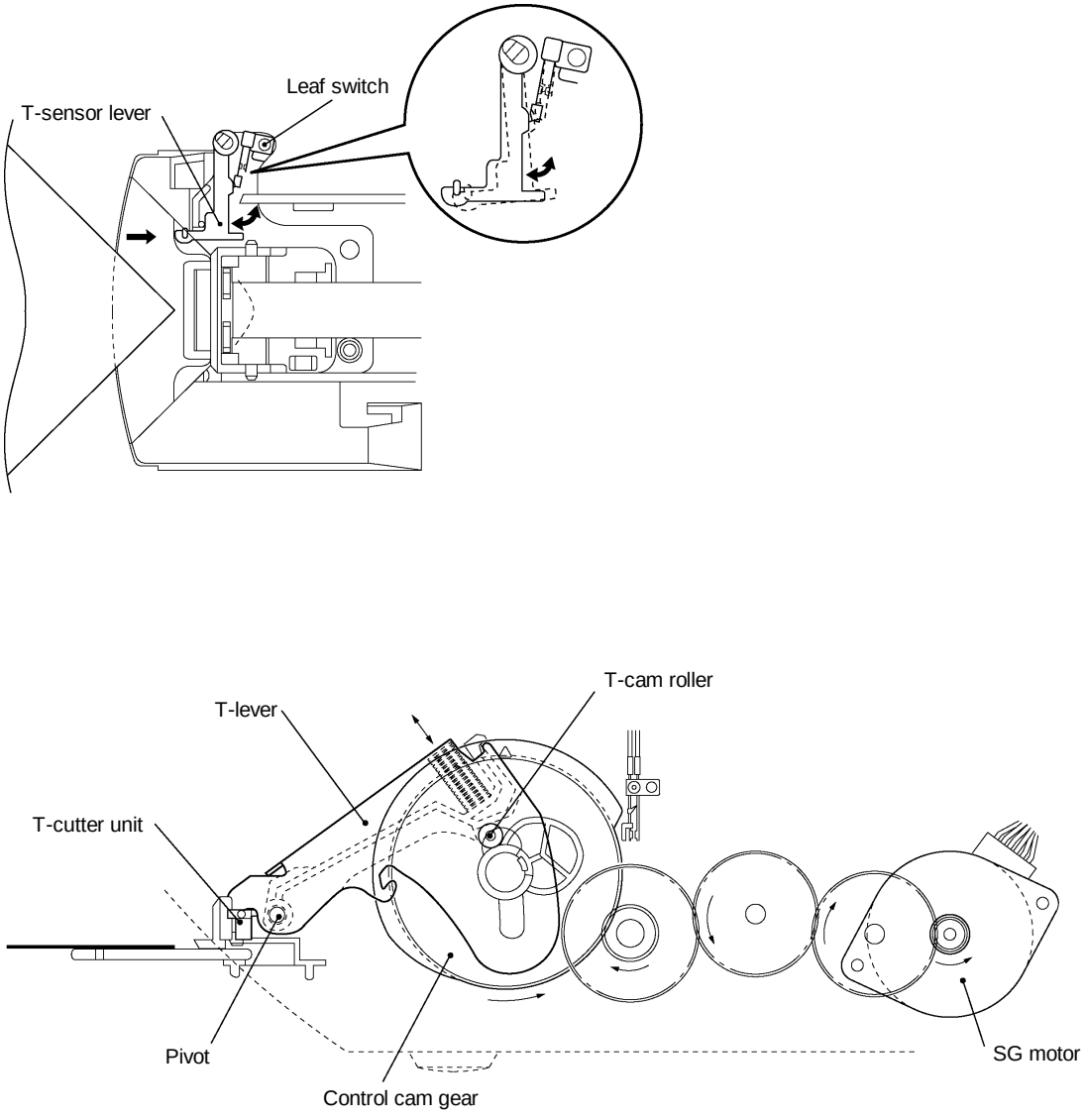


Fig. 2.1-9 Trimming Mechanism

Chapter 3.

DISASSEMBLY PROCEDURES

CONTENTS

Chapter 3. DISASSEMBLY PROCEDURES

3.1 Safety Precautions

- When conducting disassembly operations, place the unit on a grounded anti-static sheet. LSI and other electronic components are sensitive to static electricity and may be damaged if touched while charged.
- Before transporting a circuit board, wrap it in a conducting sheet such as aluminum foil.
- When using a soldering iron or other heat-producing tool, ensure that heat does not damage wires, circuit boards, or plastic parts such as covers.
- Take care not to lose small screws or washers removed when replacing parts.
- As a safety precaution, wear gloves when conducting disassembly operations.

3.2 Removing the Film Cartridge

1. Open the top cover and move the Y-cutter arm as far as possible to the left.
2. Push the Set buttons R/L in the direction indicated by the arrow to unlock the Roller holder assy.

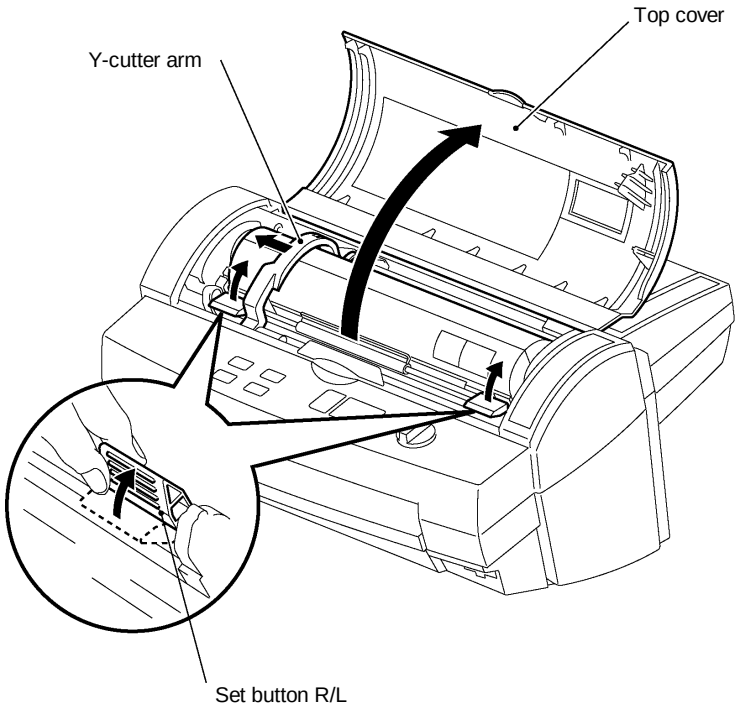


Fig. 3.2-1 Removing the Film Cartridge 1

3. Lift up the Roller holder assy and pull out the Film cartridge.

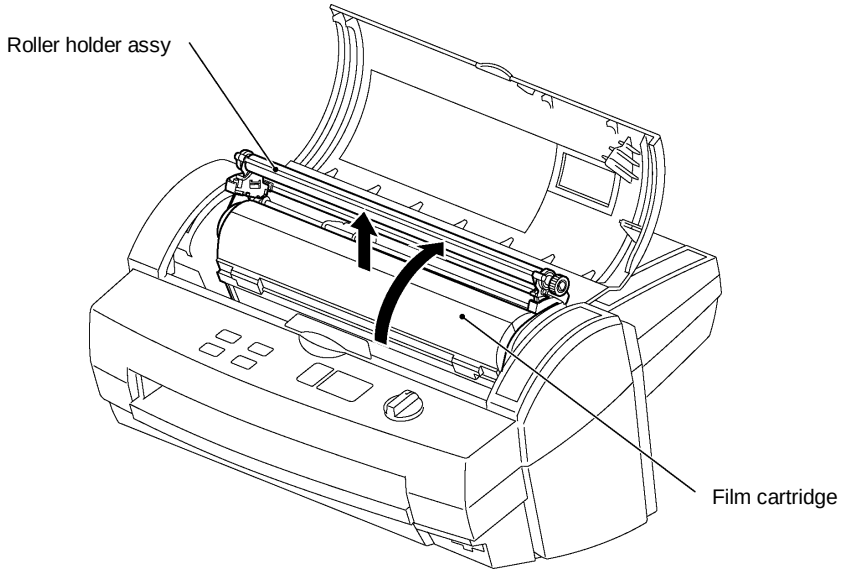


Fig. 3.2-2 Removing the Film Cartridge 2

3.3 Covers

3.3.1 Removing the Trimmer Cover

1. Pull out the T-cutter plate and the Trimmer bottom cover.

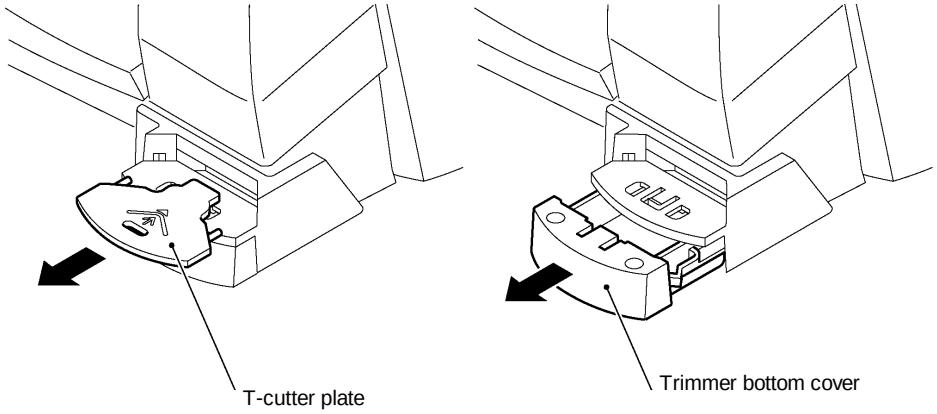


Fig. 3.3-1 Removing the Trimmer cover 1

2. Remove the two Trimmer cover screws. Remove the Trimmer upper cover.

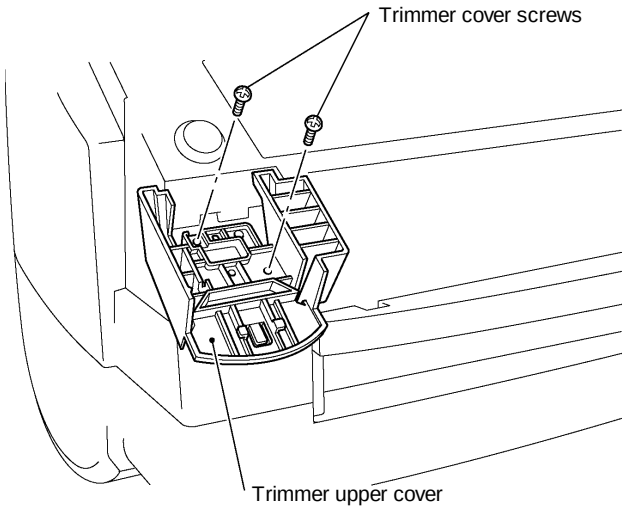


Fig. 3.3-2 Removing the Trimmer cover 2

3.3.2 Removing the Top Cover B

Open the Top cover B. Lift the Top cover B shafts out of the shaft recesses in the Body cover and remove Top cover B.

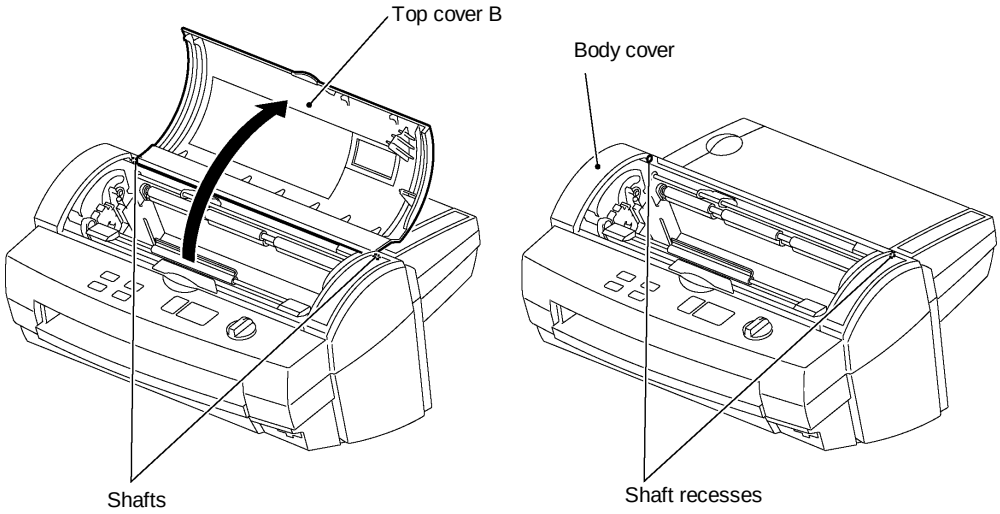


Fig. 3.3-3 Removing the Top Cover B

3.3.3 Removing the Sub-tray

1. Open the Sub-tray.
2. Flex the center of the sub-tray toward you to release the shafts from the shaft recesses in the Body cover. Remove the sub-tray.

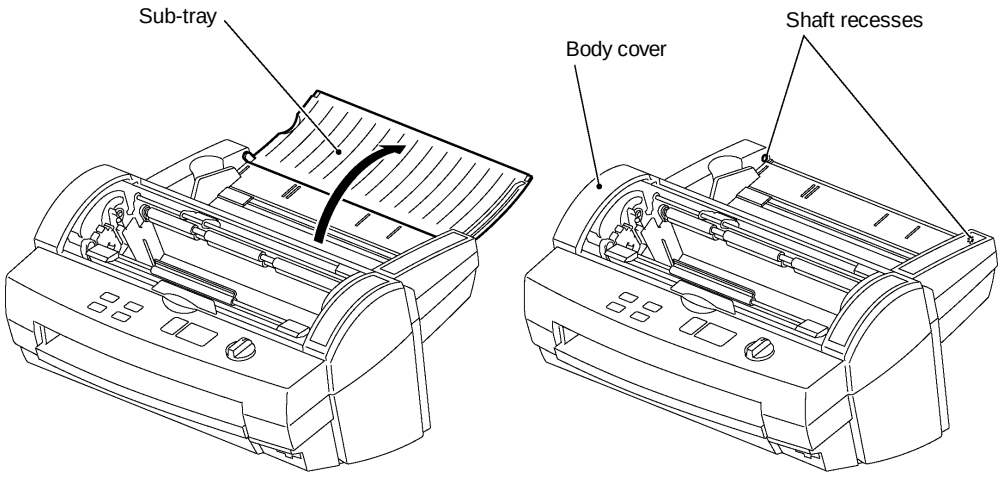


Fig. 3.3-4 Removing the Sub-tray

3.3.4 Removing Paper Tray A and Paper Guide

1. Flex the center of the top of Paper tray A in the direction of the arrow, then release the left and right hooks. Pull Paper tray A upward to remove it.

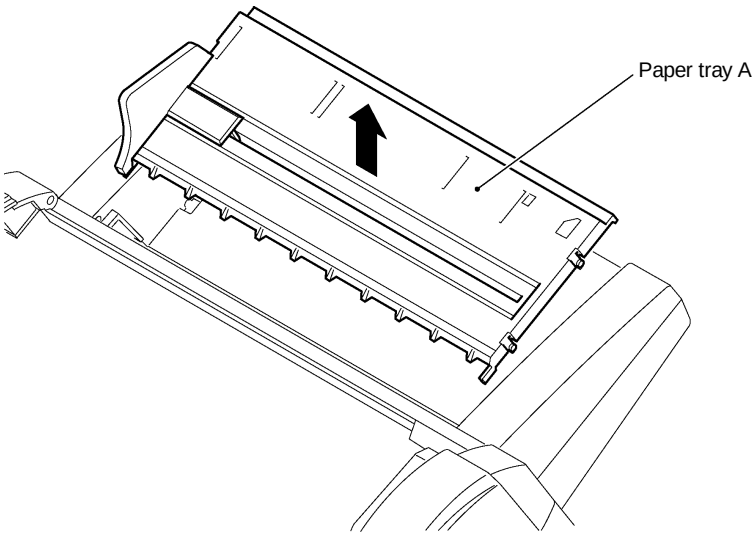


Fig. 3.3-5 Removing Paper Tray A

2. Disengage the Paper guide hooks (at the rear of the Paper tray) from Paper tray A. Remove the Paper guide. CL2000011

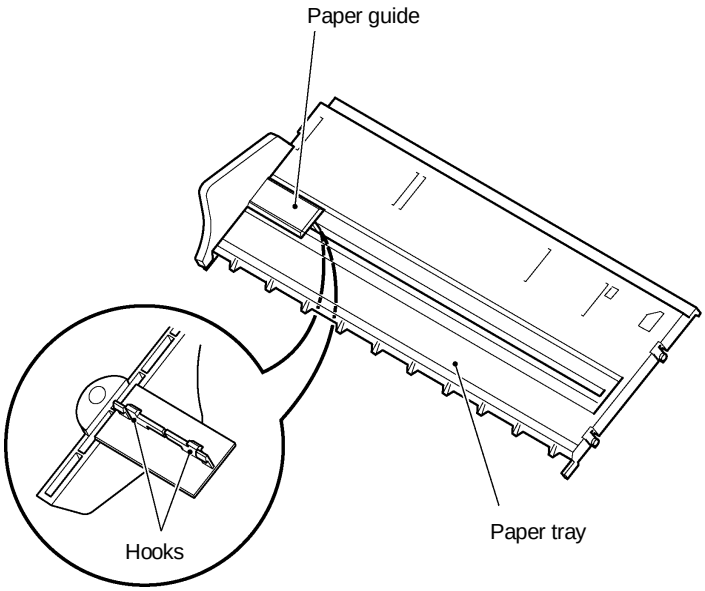


Fig. 3.3-6 Removing the Paper Guide

3.3.5 Removing the Body Cover

1. Remove the two Bottom cover screws B from the bottom of the Bottom cover B.
   And remove one screw from the surface of Body cover.
   * When inverting the unit to perform this work, place it on a soft cloth to avoid scratching the cover.

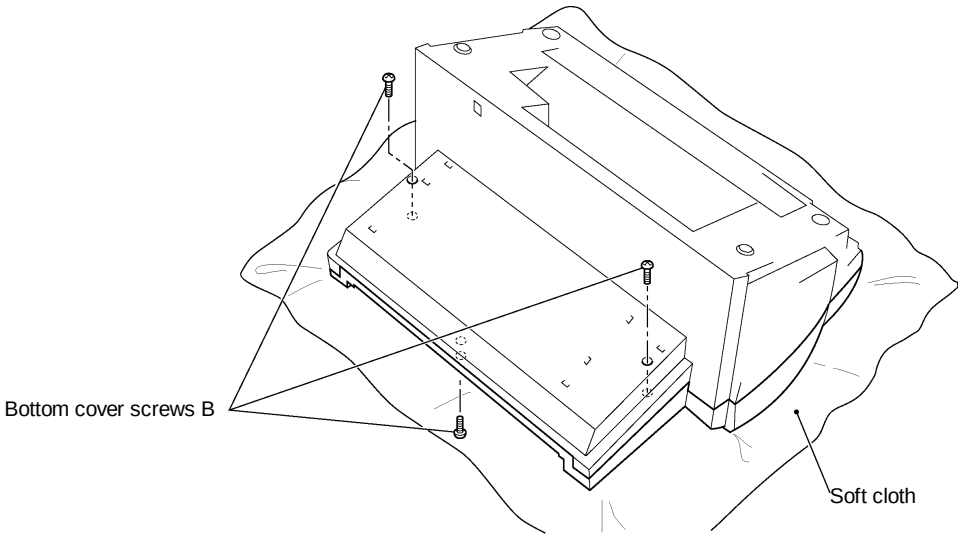


Fig. 3.3-7 Removing the Body Cover 1

2. Lift the rear of the Bottom cover in the direction of arrow B while pushing it in the direction of arrow A to release the six hooks on the rear face.
3. Push the sides of Body cover in the directions indicated by the arrows C to release the hook at the left and right side.
4. Push on the Y-diversion lever assy and release the two hooks from the front of the Body cover.

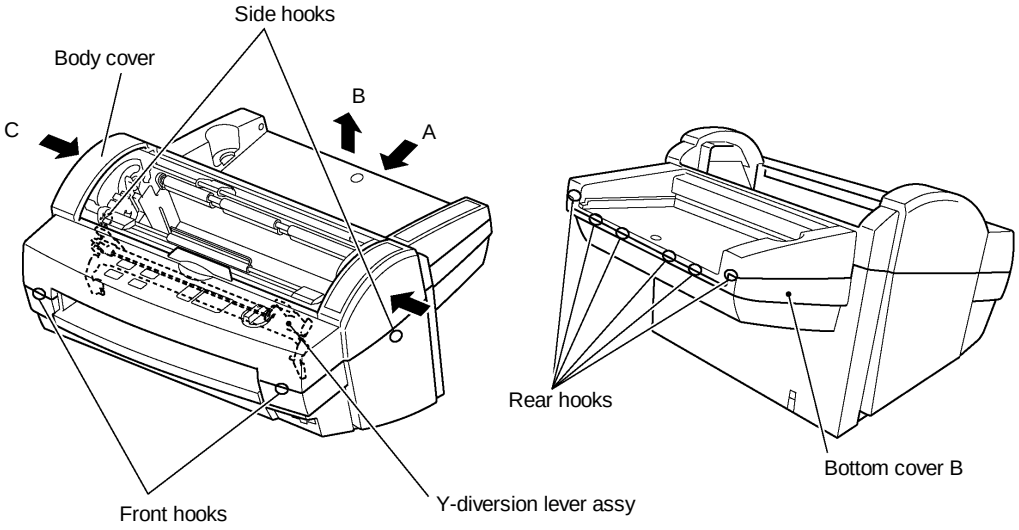


Fig. 3.3-8 Removing the Body Cover 2

5. Disconnect the Switch harness assy and the Cover switch assy connectors from the Main PCB and remove the Body cover.

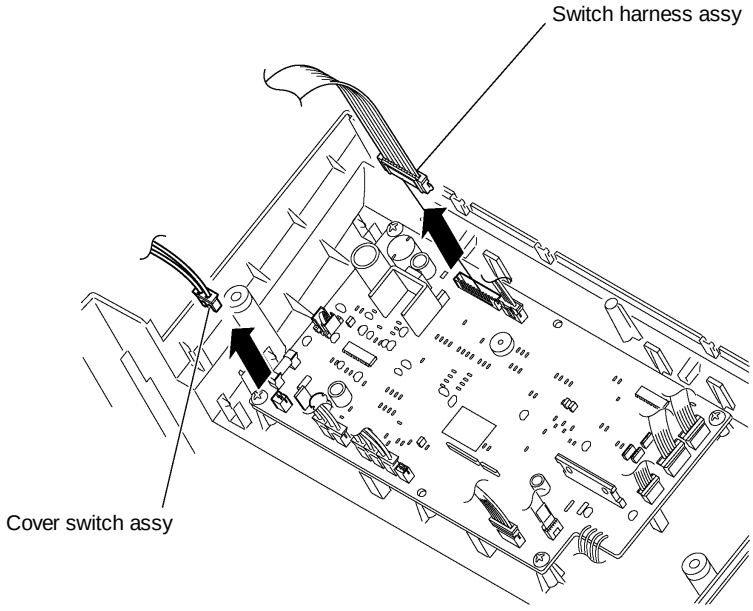


Fig. 3.3-9 Removing the Body Cover 3

3.3.6 Removing the Front Cover

1. Remove the two Front cover screws under the Bottom cover B.
   * When removing the Body cover, remove the two Front cover screws and the two screws at the rear of the Bottom cover B at the same time.
   * When inverting the unit to perform this work, place it on a soft cloth to avoid scratching the cover.

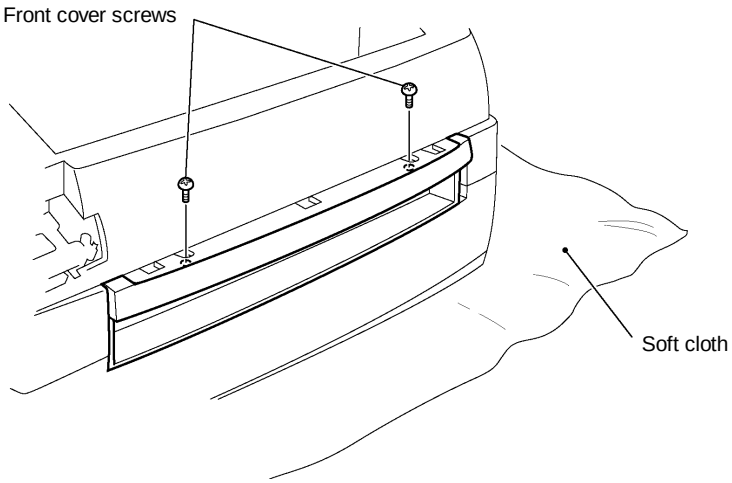


Fig. 3.3-10 Removing the Front Cover 1

2. Pull the front cover forward to remove it.
   (The Body cover must be removed before removing the Front cover.)

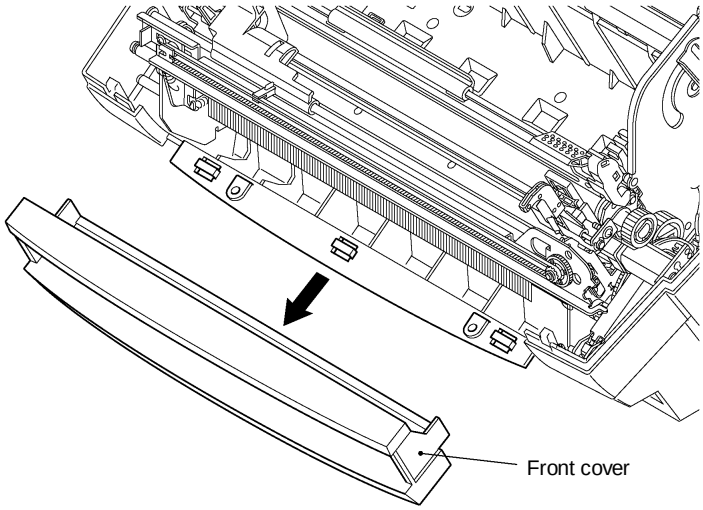
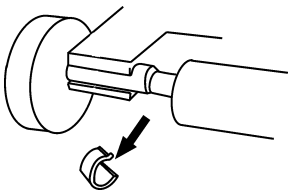


Fig. 3.3-11 Removing the Front Cover 2

3.3.7 Removing Paper Tray B CL2000011

1. Remove Tray B Stopper.



2. Lift the top of Paper tray B in the direction of arrow A to disengage the lug from the Cassette holder.
3. Slide Paper tray B in the direction of arrow B, then lift it in the direction of arrow C to remove it.

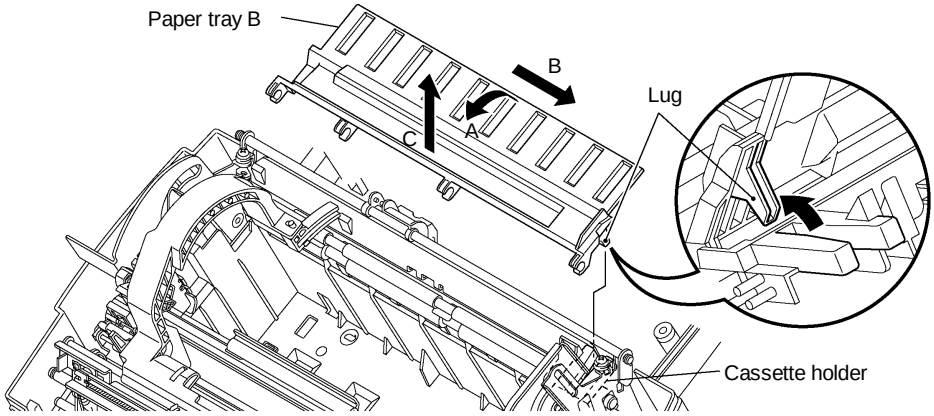


Fig. 3.3-12 Removing Paper Tray B

3.3.8 Removing the Back Cover

1. Remove the Back cover spring.

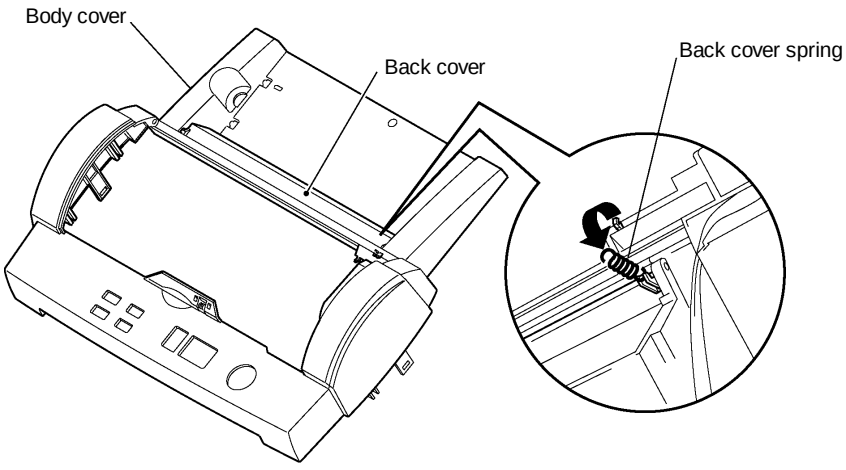


Fig. 3.3-13 Removing the Back Cover 1