brother®

# SERVICE MANUAL

## MODEL: LX-1200/LX-300

MECHANISMS & ELECTRONICS

brother

# 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)

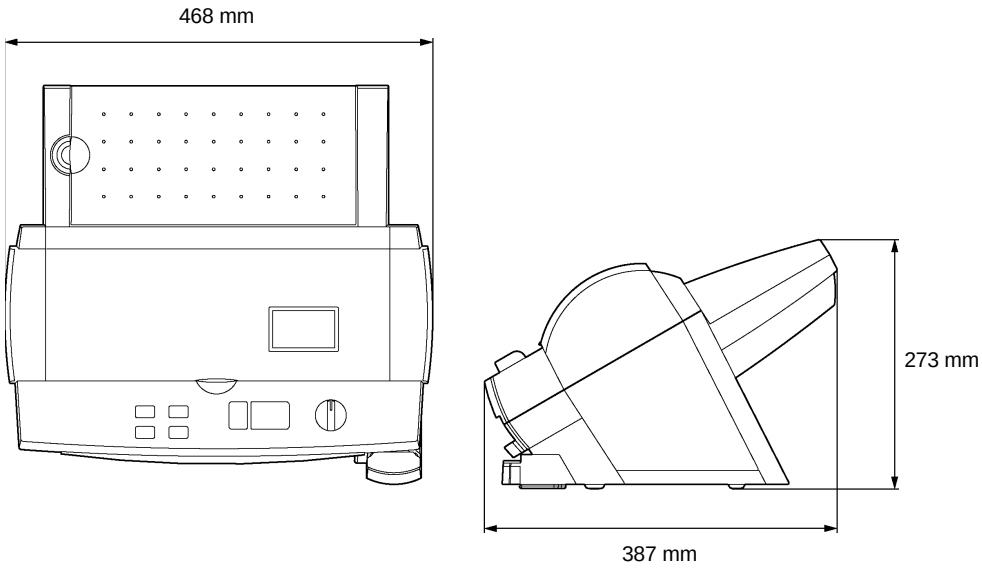


Fig. 1.1-1 Appearance

### 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

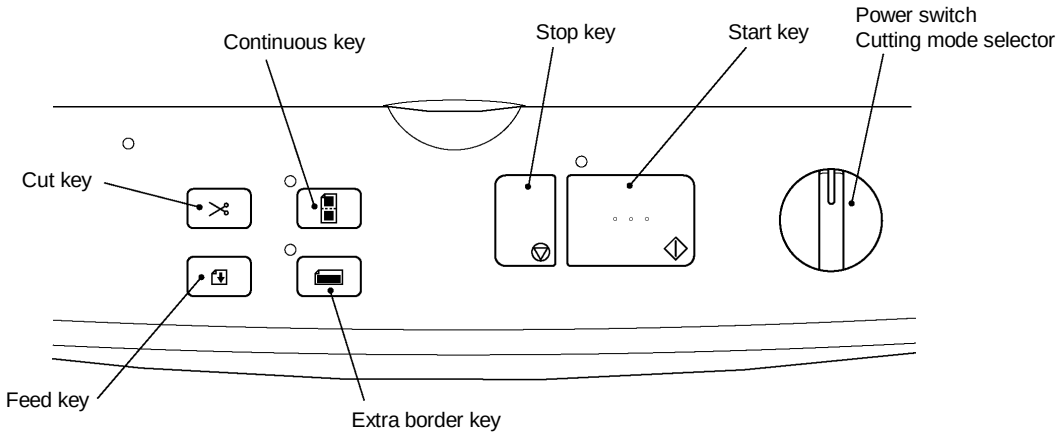


Fig. 1.1-2 Key Arrangement

### 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.

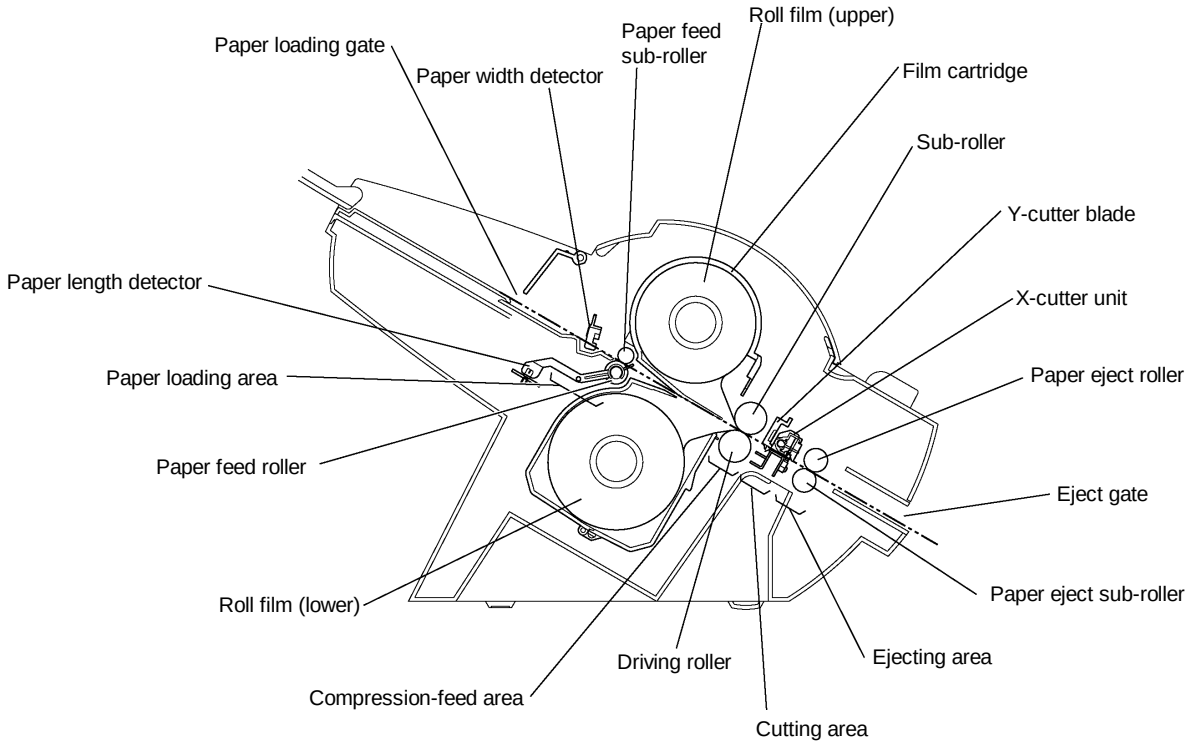



Fig. 2.1-1 Description of Mechanisms

## 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.

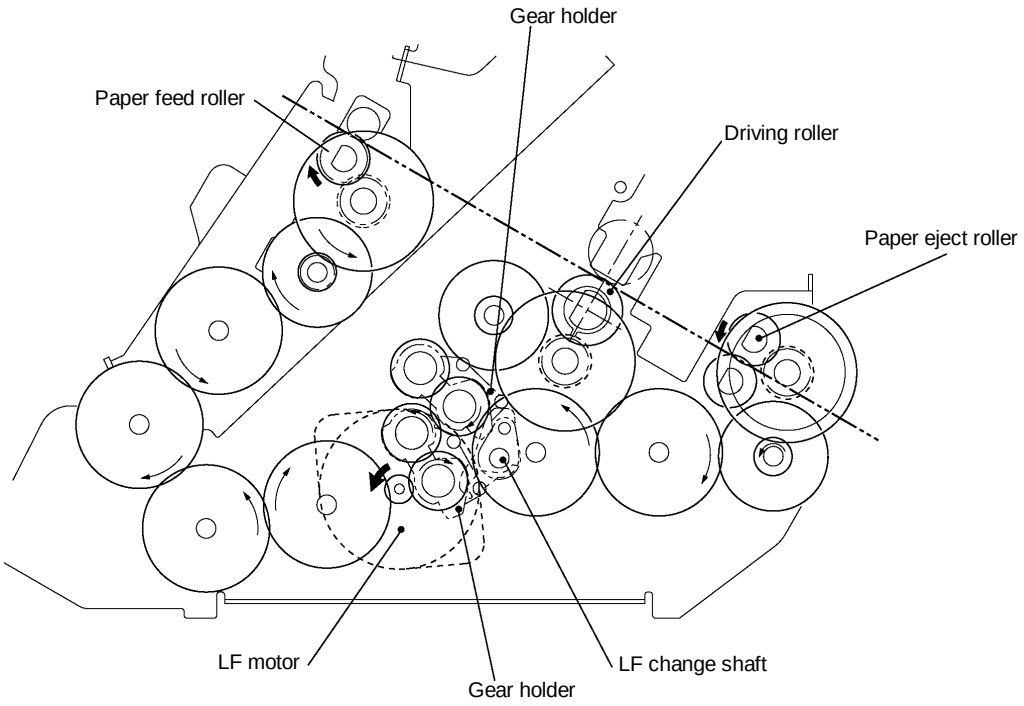



Fig. 2.1-2 Operation when Feeding Document into the Film Cartridge or when Ejecting a Laminated Document

■ 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.

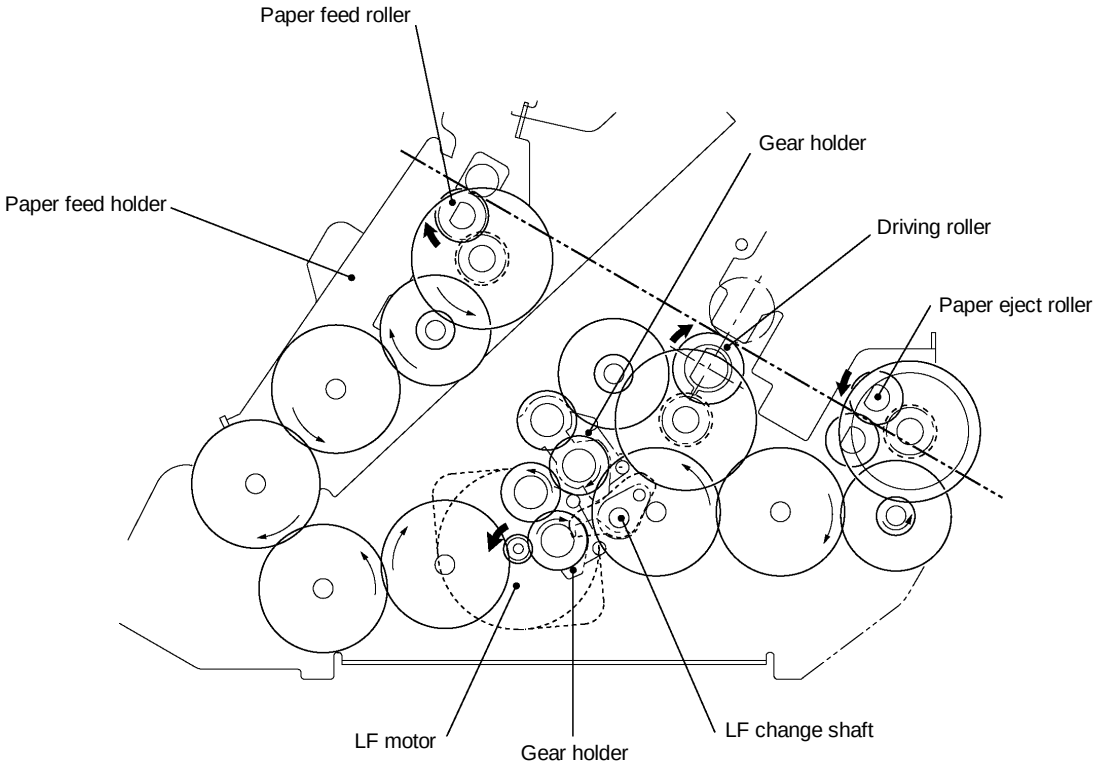



Fig. 2.1-3 Operation during Film Compression-Feed

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.

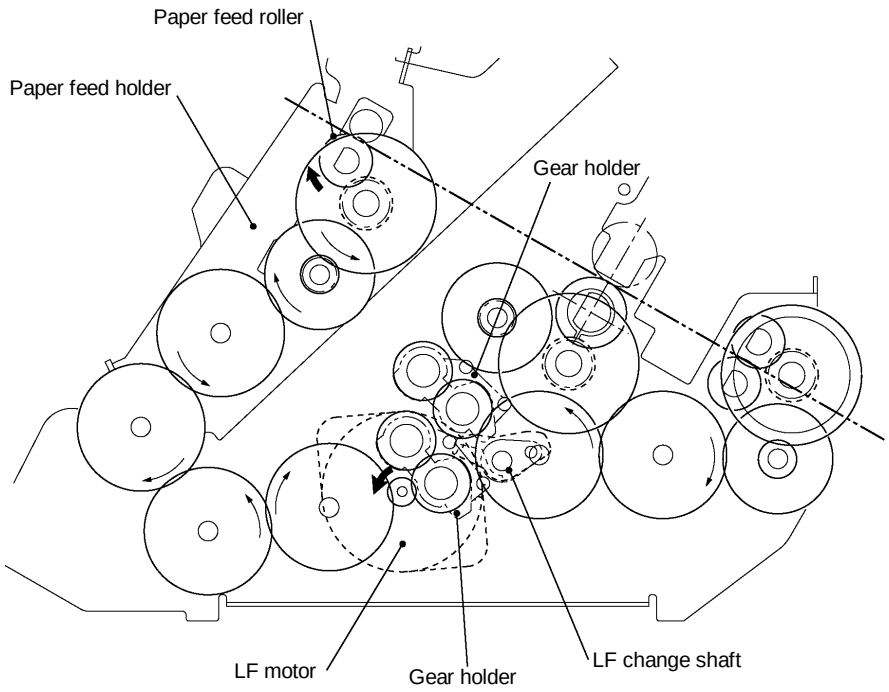



Fig. 2.1-4 Operation when Feeding Document into the Film Cartridge in the Continuous Mode

## 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.

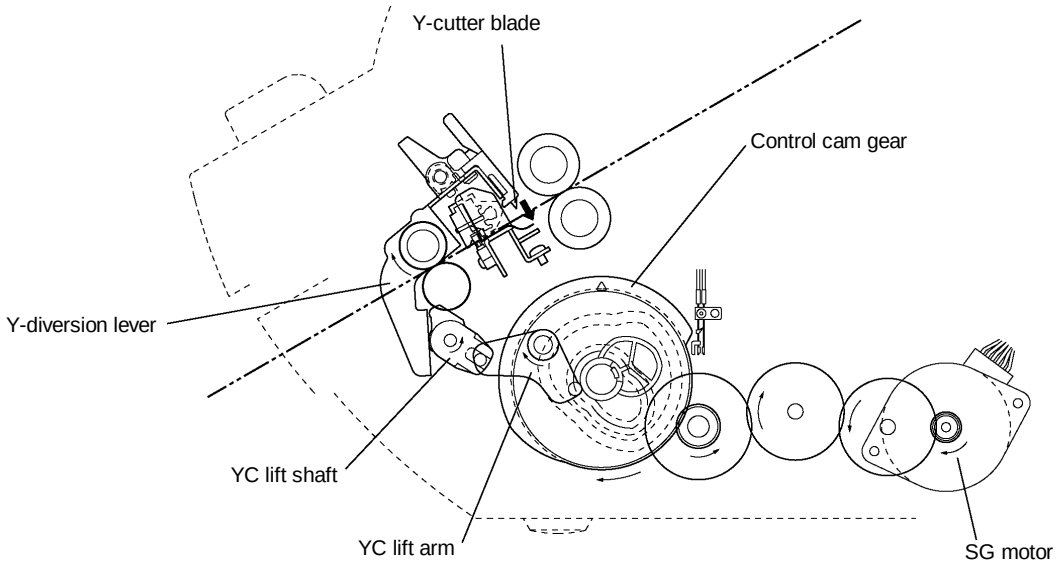



Fig. 2.1-5 Y-Cutter Vertical Drive Operation

■ 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.)

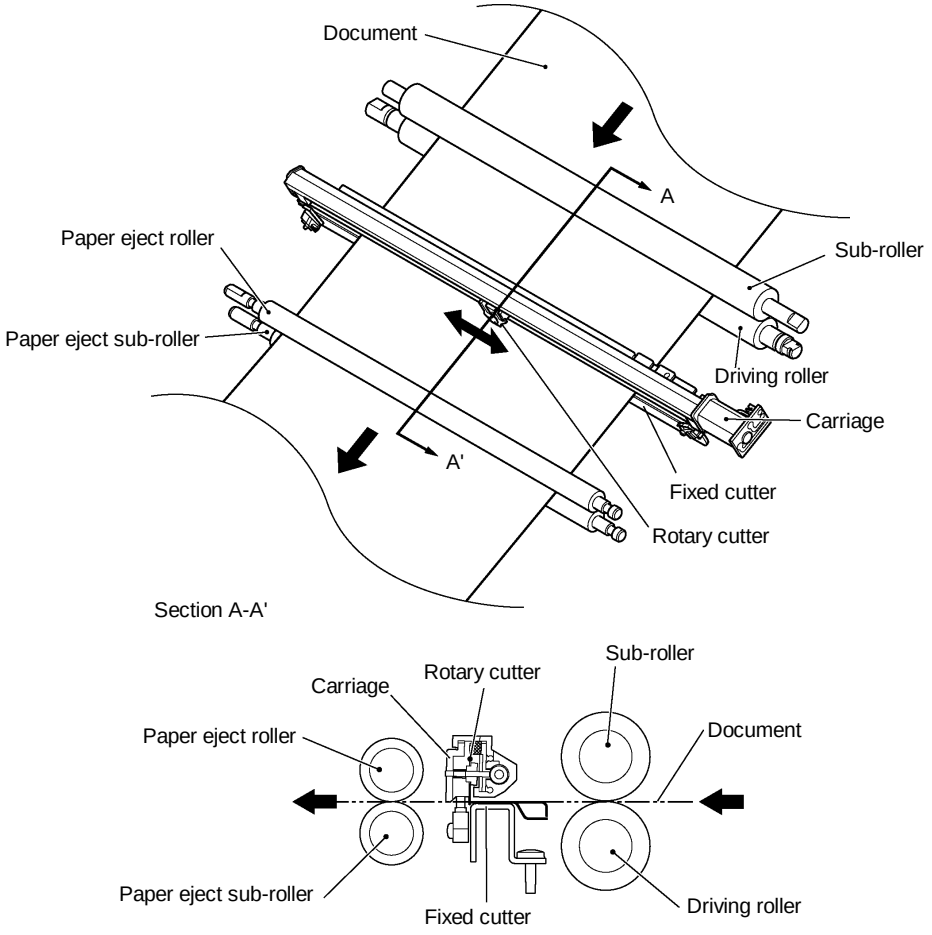



Fig. 2.1-6 Cutting Leading and Trailing Edges (X-cutter Mechanism)

## 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.

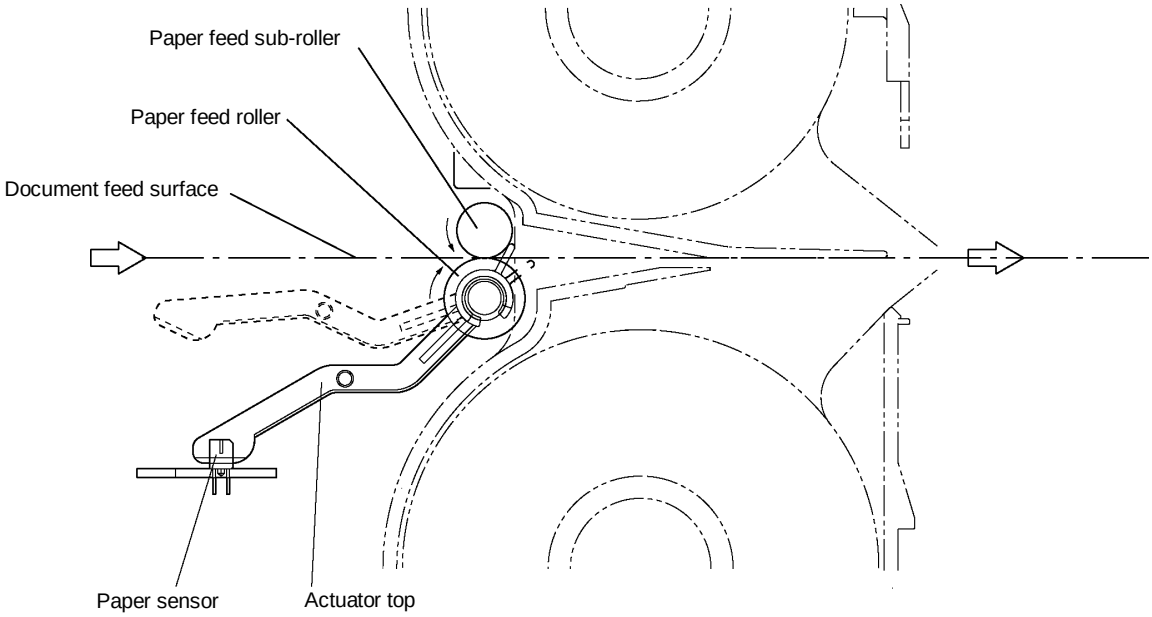
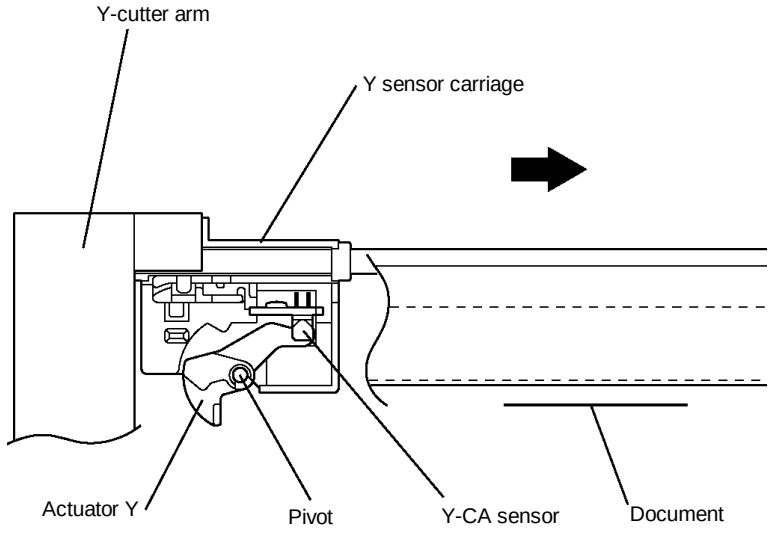


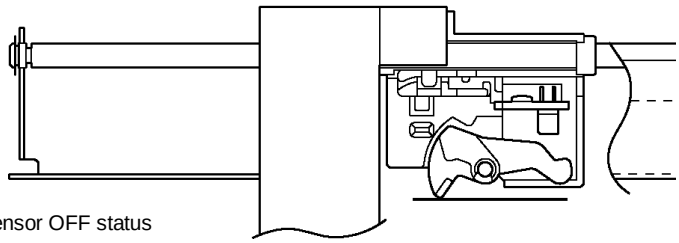

Fig. 2.1-7 Paper Length Detection

■ 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.

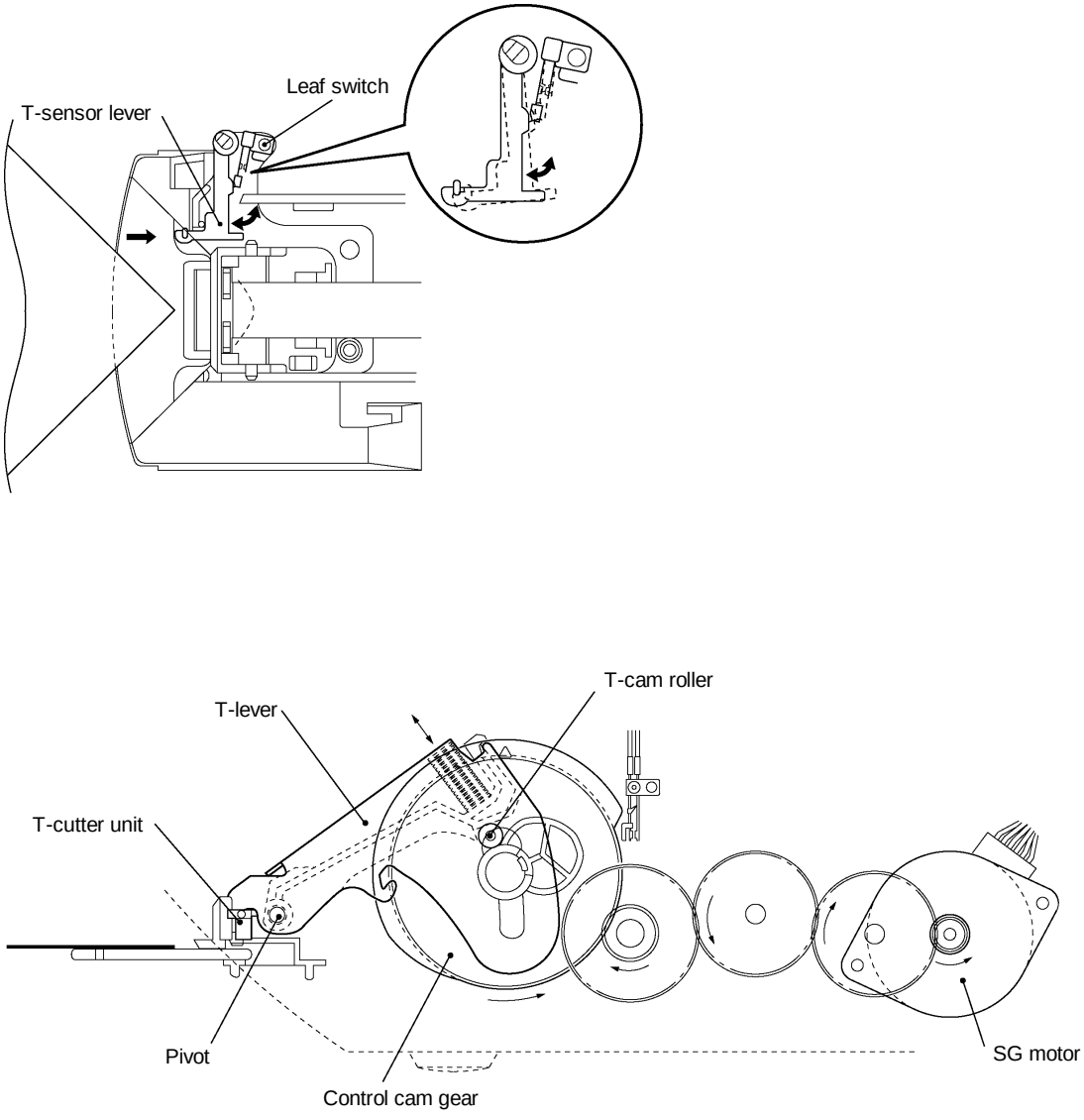



Fig. 2.1-9 Trimming Mechanism

# 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.

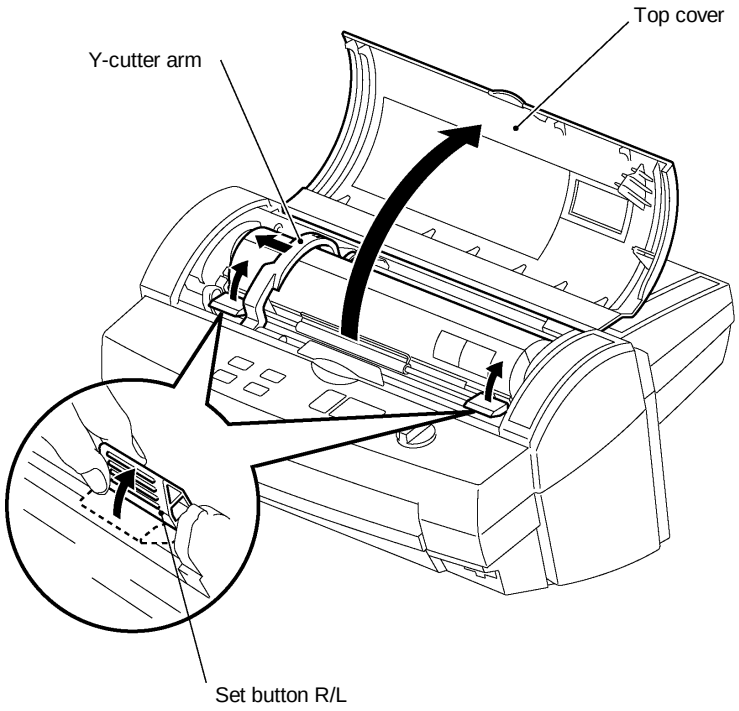



Fig. 3.2-1 Removing the Film Cartridge 1

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

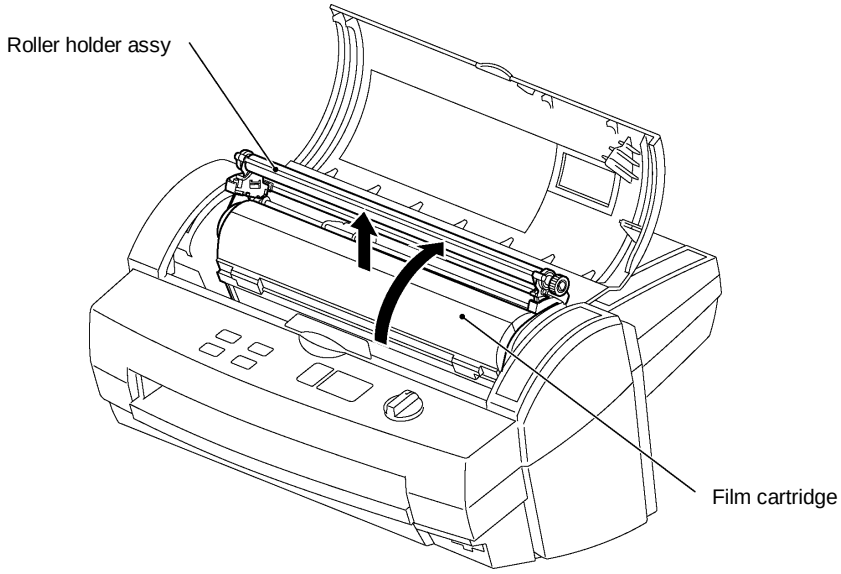



Fig. 3.2-2 Removing the Film Cartridge 2

# 3.3 Covers

## 3.3.1 Removing the Trimmer Cover

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

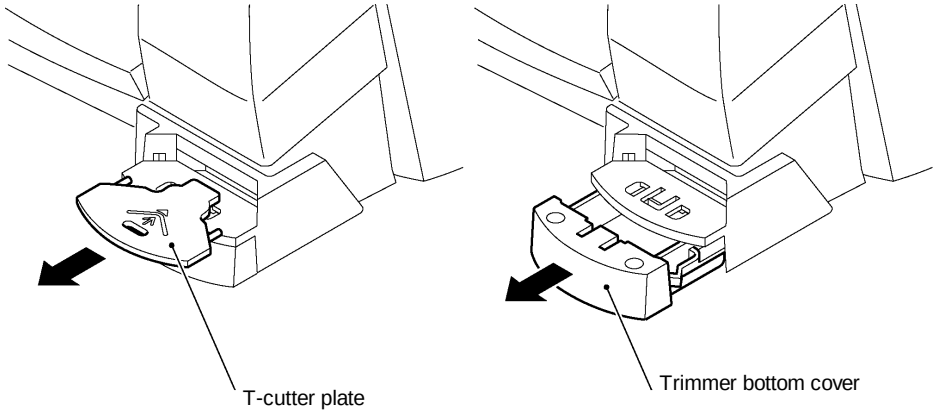



Fig. 3.3-1 Removing the Trimmer cover 1

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

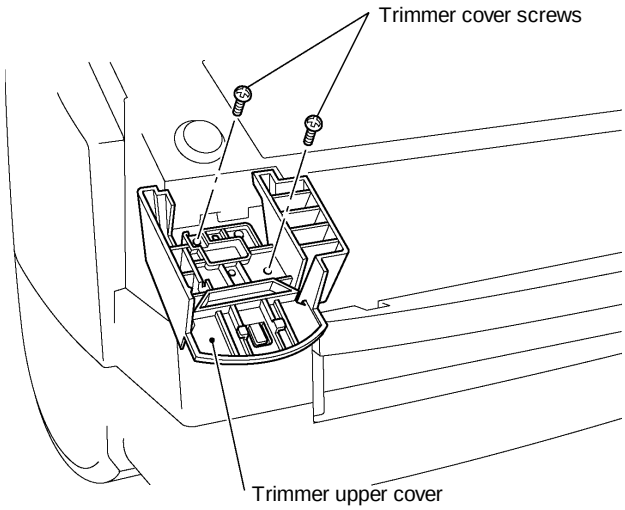



Fig. 3.3-2 Removing the Trimmer cover 2

## 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.

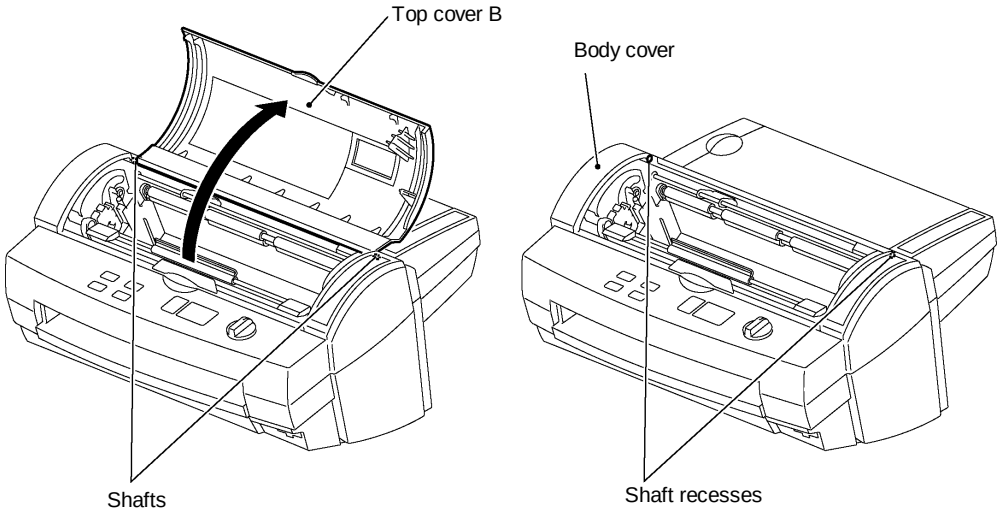



Fig. 3.3-3 Removing the Top Cover B

### 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.

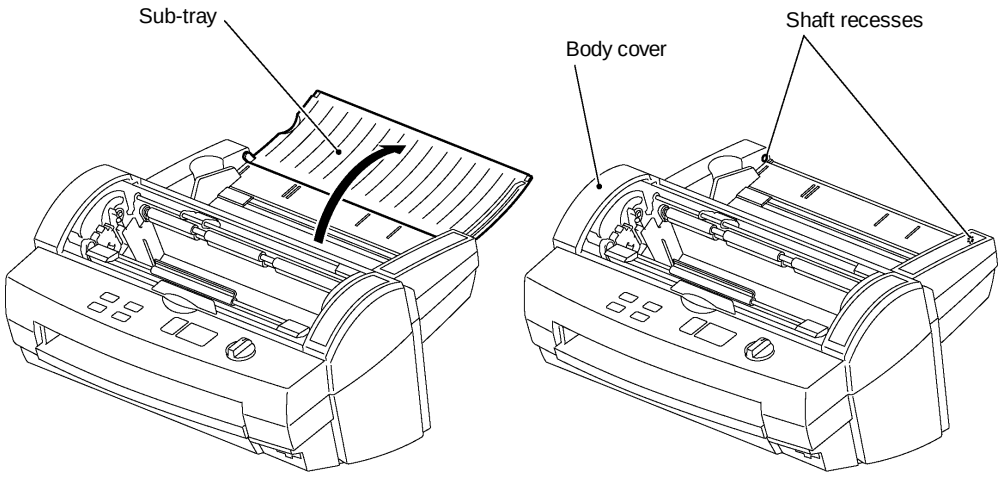



Fig. 3.3-4 Removing the Sub-tray

### 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.

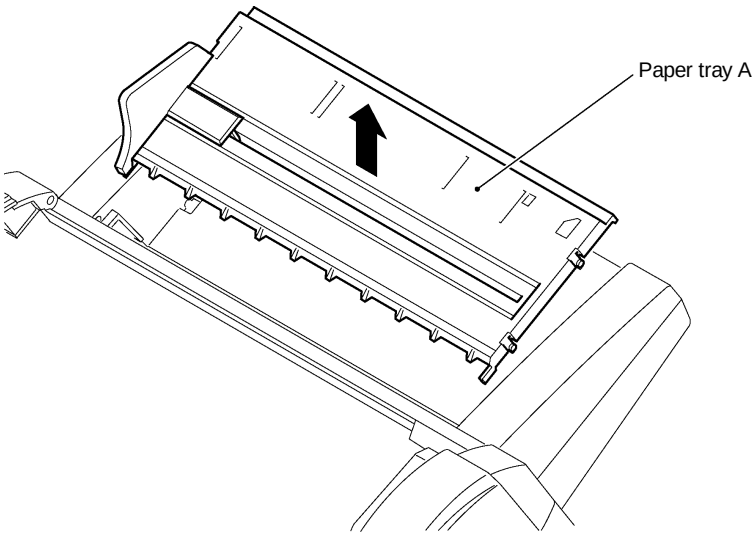



Fig. 3.3-5 Removing Paper Tray A

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

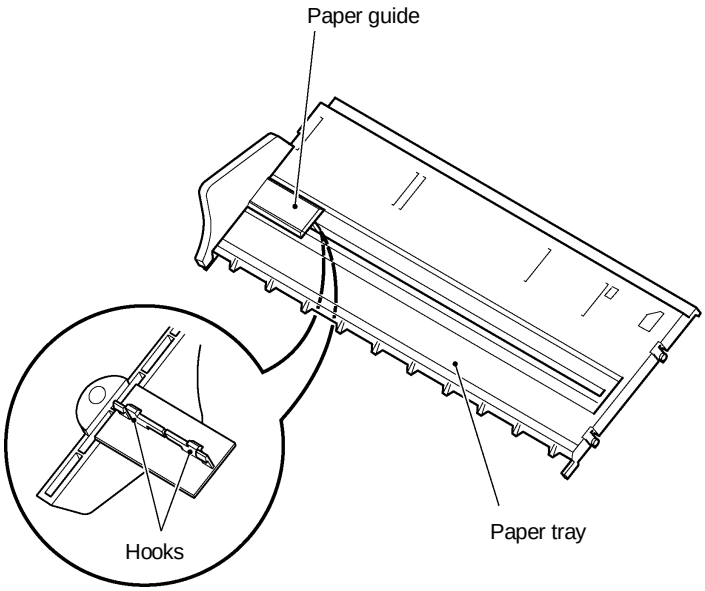



Fig. 3.3-6 Removing the Paper Guide

## 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.

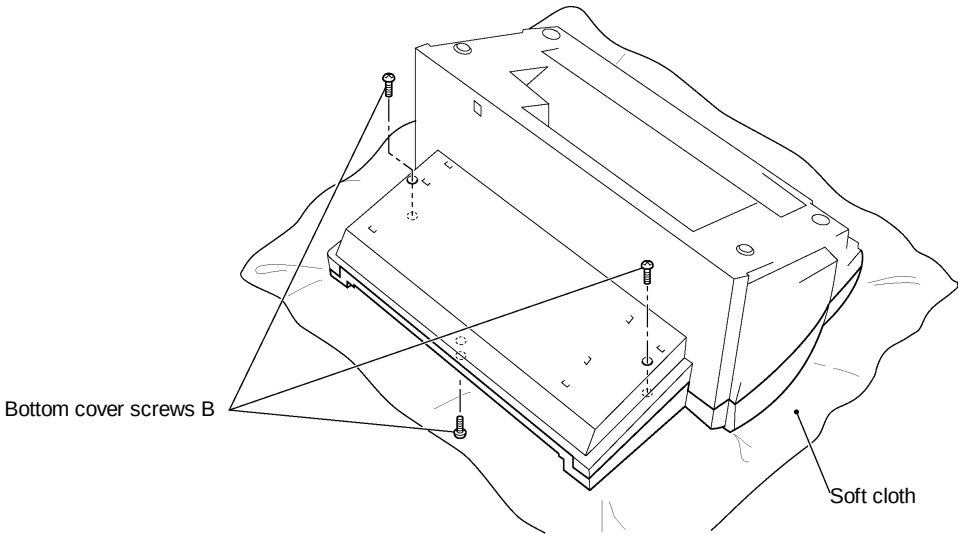



Fig. 3.3-7 Removing the Body Cover 1

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.

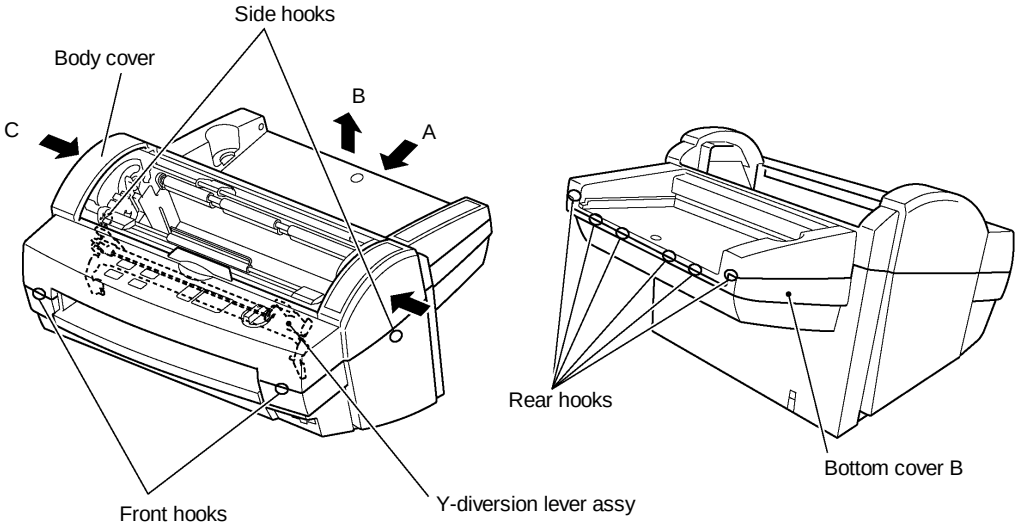



Fig. 3.3-8 Removing the Body Cover 2

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

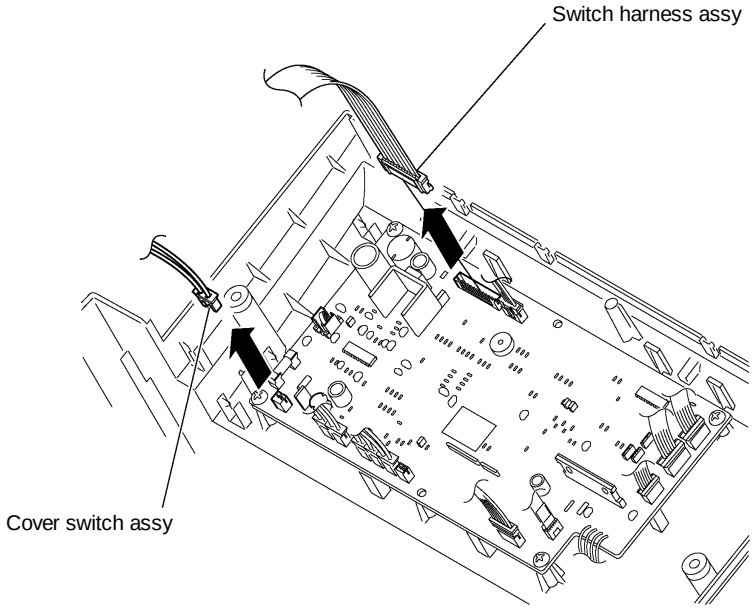



Fig. 3.3-9 Removing the Body Cover 3

### 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.

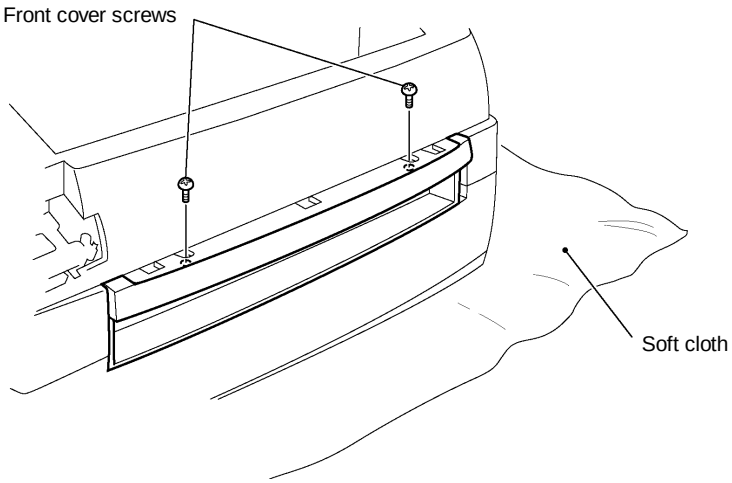



Fig. 3.3-10 Removing the Front Cover 1

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

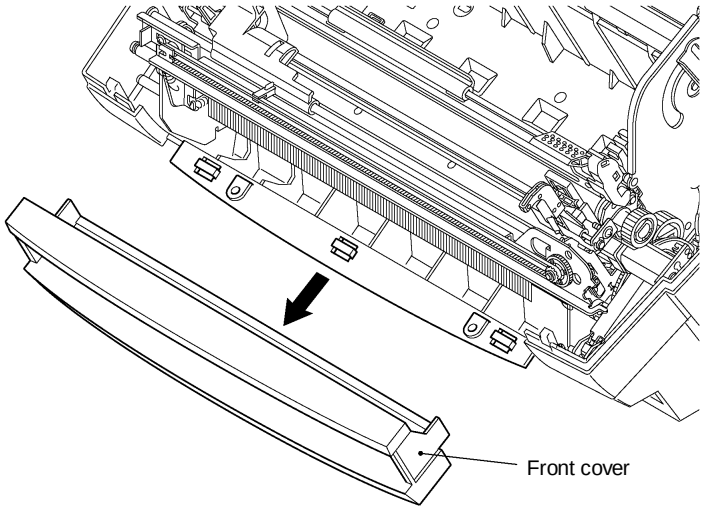
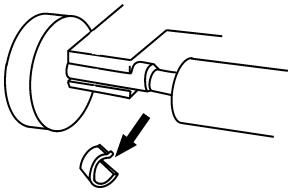



Fig. 3.3-11 Removing the Front Cover 2

## 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.

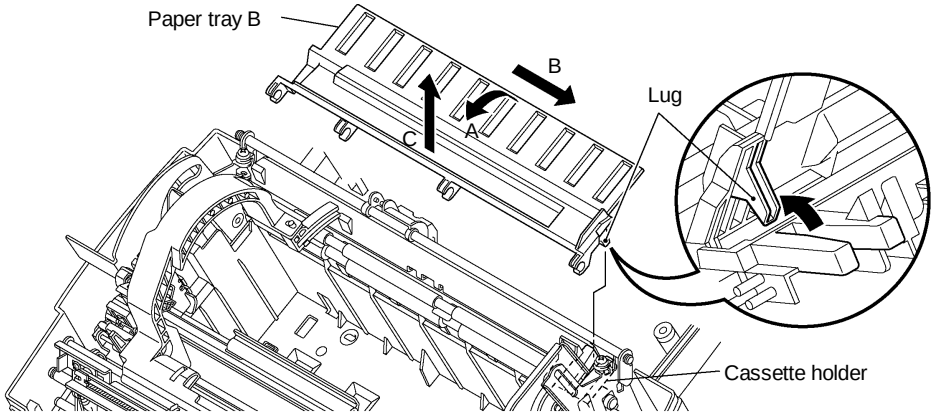



Fig. 3.3-12 Removing Paper Tray B

## 3.3.8 Removing the Back Cover

1. Remove the Back cover spring.

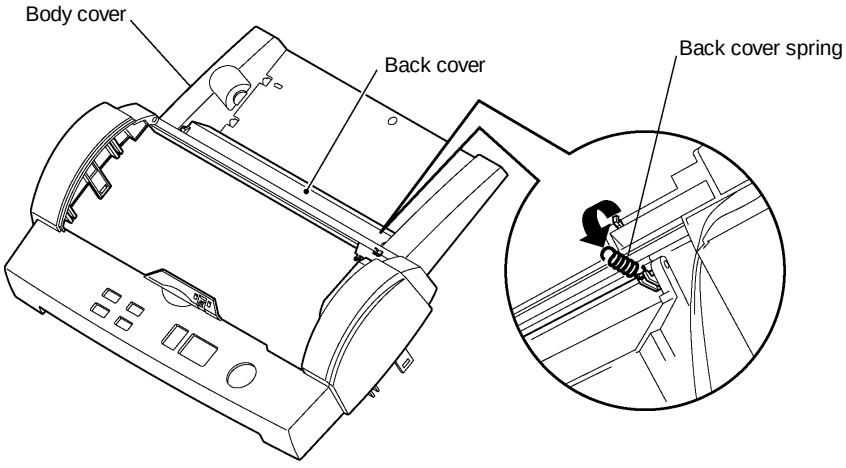



Fig. 3.3-13 Removing the Back Cover 1

2. Flex the center of the Back cover toward you to release the shafts from the shaft recesses in the Body cover. Remove the Back cover.
   During this operation, take care not to deform the film attached to the Back Cover.

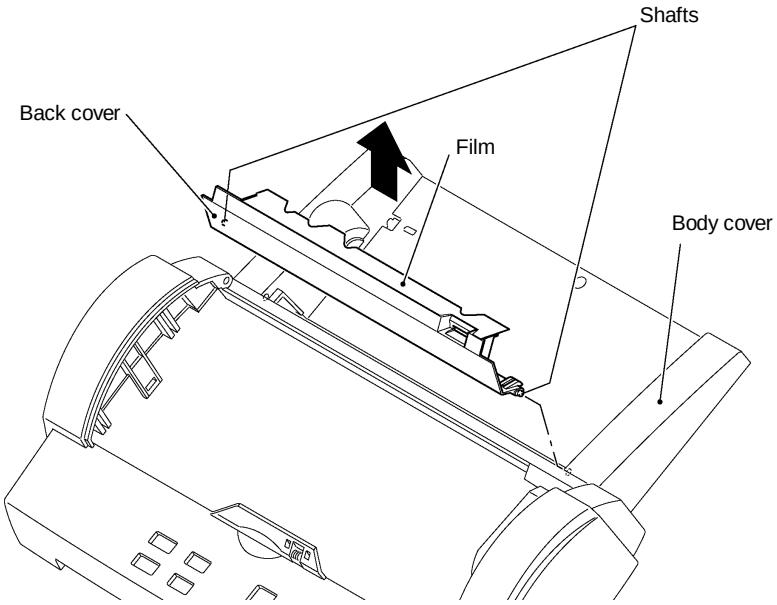



Fig. 3.3-14 Removing the Back Cover 2

## 3.3.9 Removing the Cover Switch

1. Remove the cover switch screw. Remove the cover switch assy.

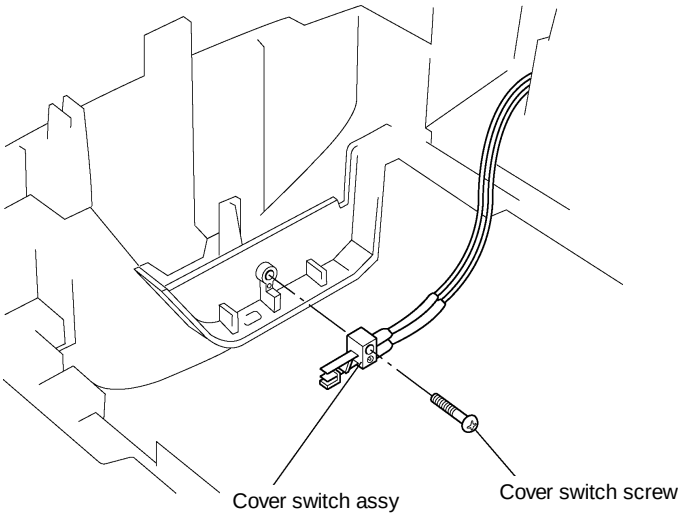



Fig. 3.3-15 Removing the Cover Switch Assy

### 3.3.10 Removing the Dial Switch Holder Assy B

1. Remove the eight Dial holder screws. Remove the Dial switch holder assy B.
2. Disconnect the Push SW assy 1 (white) and Push SW assy 2 (red) connectors from the SW PCB.
   * Take care not to apply force to the connectors between switch and harness in Push switch assy 1 and 2.

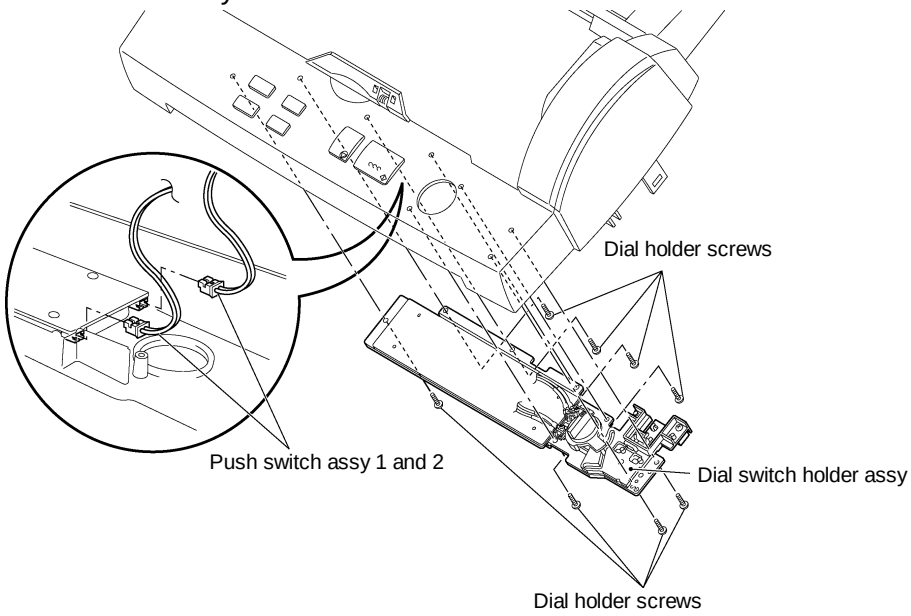



Fig. 3.3-16 Removing the Dial Switch Holder Assy

### 3.3.11 Removing the Push Switch Assy

1. Remove the two Push switch screws. Remove the Push SW assy 1 (white) and Push SW assy 2 (red).
   * Before removing the Push SW assy 1 and 2, turn the Dial switch such that it does not touch the push switches (mid-point between Push SW assy 1 and Push SW assy 2).
   * Take care not to apply force to the connectors between the Push switch and harness.

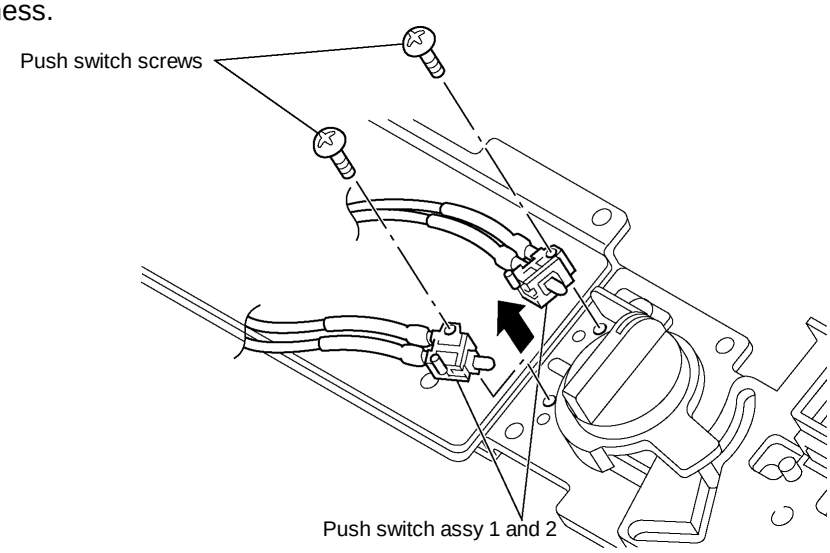



Fig. 3.3-17 Removing the Push Switches

# 3.4 Chassis Assy

## 3.4.1 Removing the Harness Connectors

1. Remove 11 harness connectors from the Main PCB. Do not remove the power harness assy (red/black CN13).

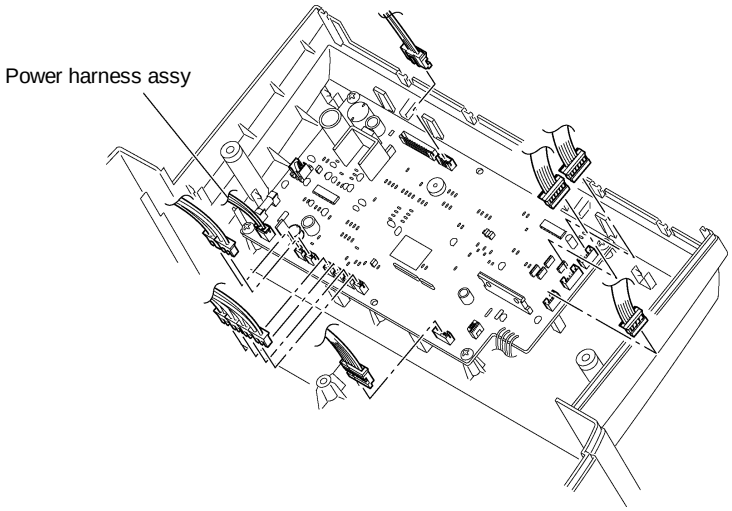



Fig. 3.4-1 Removing the Harness Connectors 1

2. Disconnect the harnesses from the eight hooks on the Bottom cover B.

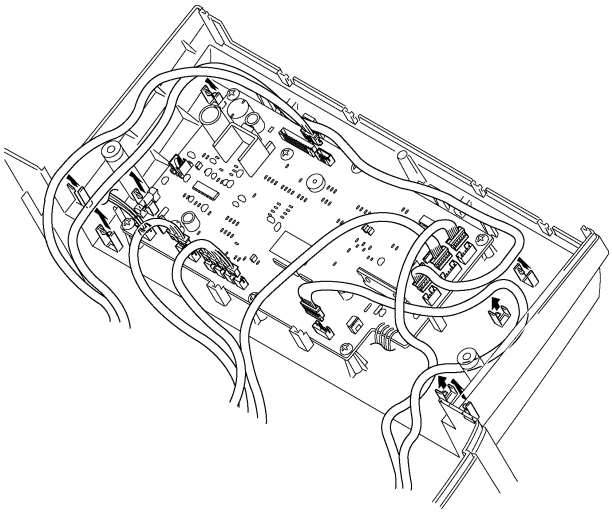


Fig. 3.4-2 Removing the Harness Connectors 2

3. Peel off the tape that holds the harnesses inside the right of Bottom cover B, then remove the harnesses from the Bottom cover B.

### 3.4.2 Removing the PST PCB (Paper Sensor PCB)

Remove the PST PCB (Paper sensor PCB) screws from the Main chassis B, then remove the PST PCB (Paper sensor PCB).

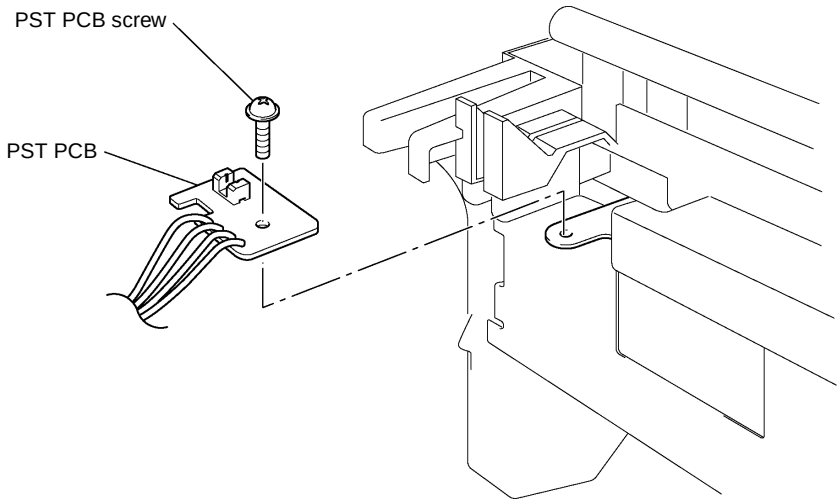



Fig. 3.4-3 Removing the PST PCB (Paper Sensor PCB)

### 3.4.3 Removing the Chassis Assy

1. Remove the Ground wire screw from the Main chassis B, then disconnect the ground wire.

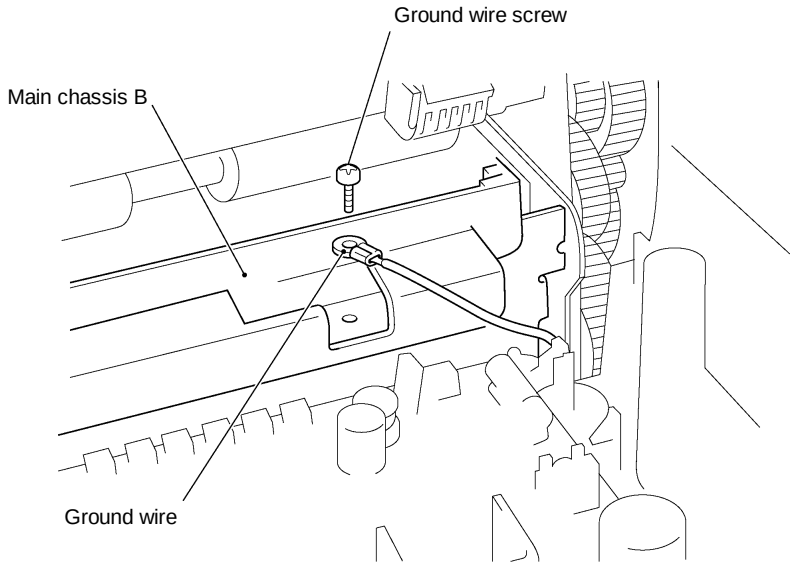



Fig. 3.4-4 Removing the Chassis Assy 1

2. Remove the two Bottom cover screws B and the washers from under the Bottom cover B.
   * When inverting the unit to perform this work, place it on a soft cloth to avoid scratching the cover.

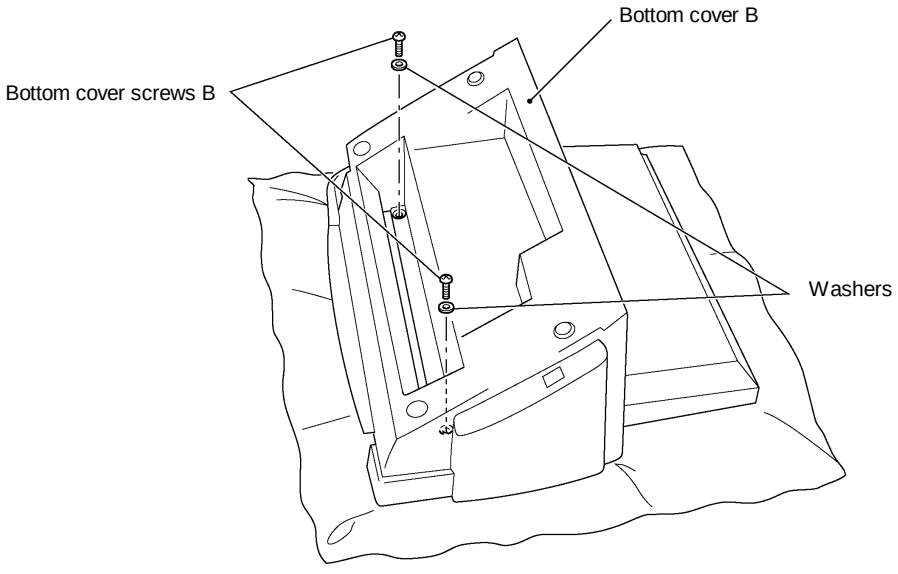



Fig. 3.4-5 Removing the Chassis Assy 2

3. Open the Roller holder assy, then remove the four Bottom cover screws with four washers from under the Chassis assy. CL2000011

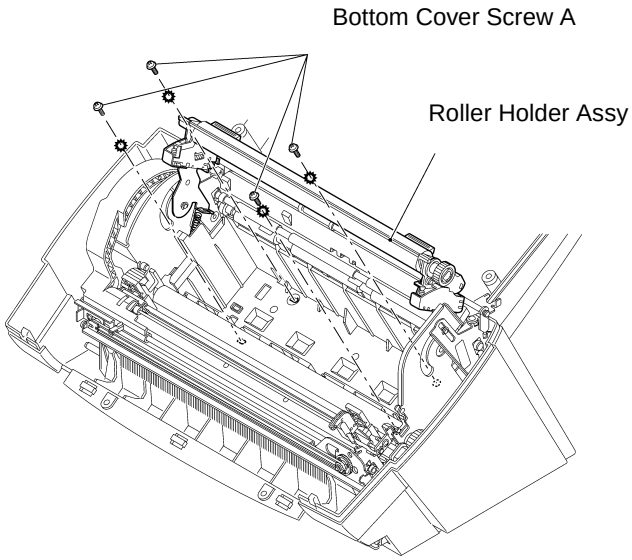



Fig. 3.4-6 Removing the Chassis Assy 3

4. Pull out the Chassis assy from Bottom cover.

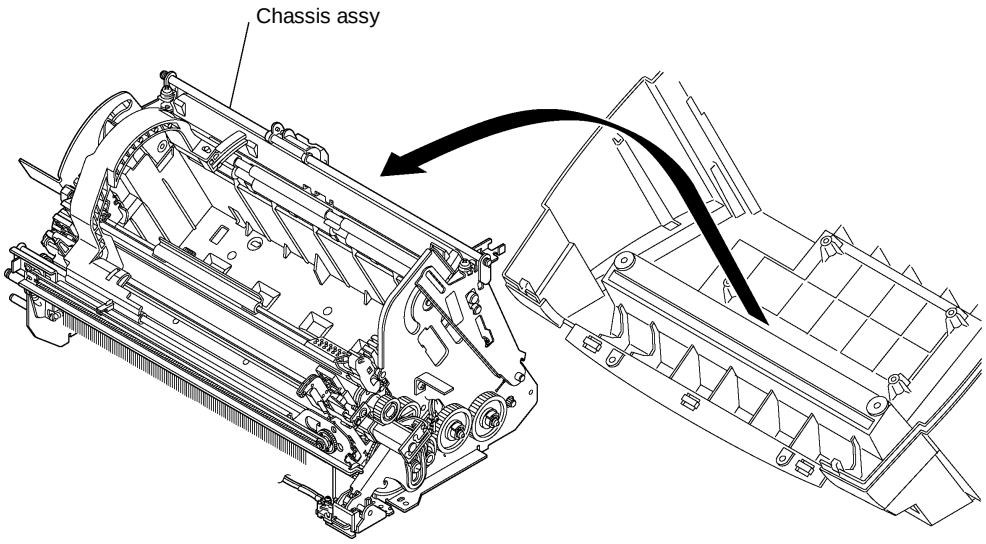



Fig. 3.4-7 Removing the Chassis Assy 4

# 3.5 PCBs

## 3.5.1 Removing the Main PCB

1. Disconnect the power harness assy (red/black) from the Main PCB.
2. Remove the four Main PCB screws. Remove the Main PCB.

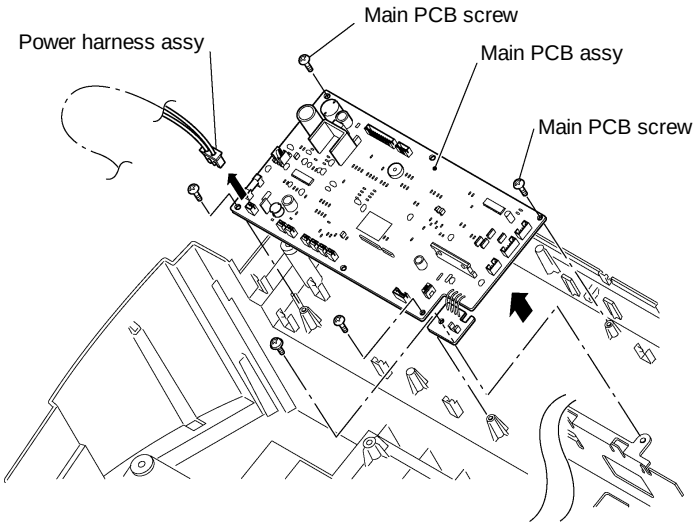



Fig. 3.5-1 Removing the Main PCB

## 3.5.2 Removing the Jack PCB Assy

Remove the Jack PCB screw and remove the Jack PCB assy.

* The core shown in the diagram is fitted in the EU-specification LX-300 only.

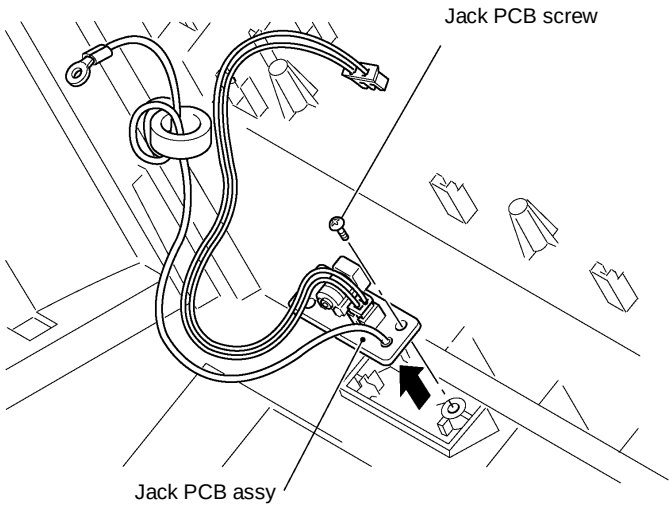



Fig. 3.5-2 Removing the Jack PCB Assy

### 3.5.3 Removing the Switch PCB Assy

1. Remove the eight Switch PCB screws from under the Body cover. Remove the Switch PCB assy.

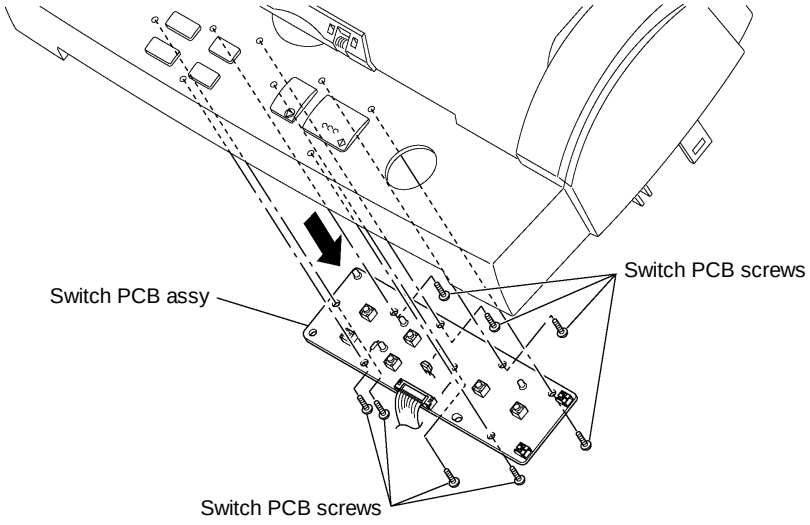



Fig. 3.5-3 Removing the Switch PCB Assy 1

2. Remove the Start key, Stop key, Two-connection switch, Continuous key, and Extra border key.

   The LED lenses can be removed from the Top cover by pushing them hard with a fine object such as a pen tip.

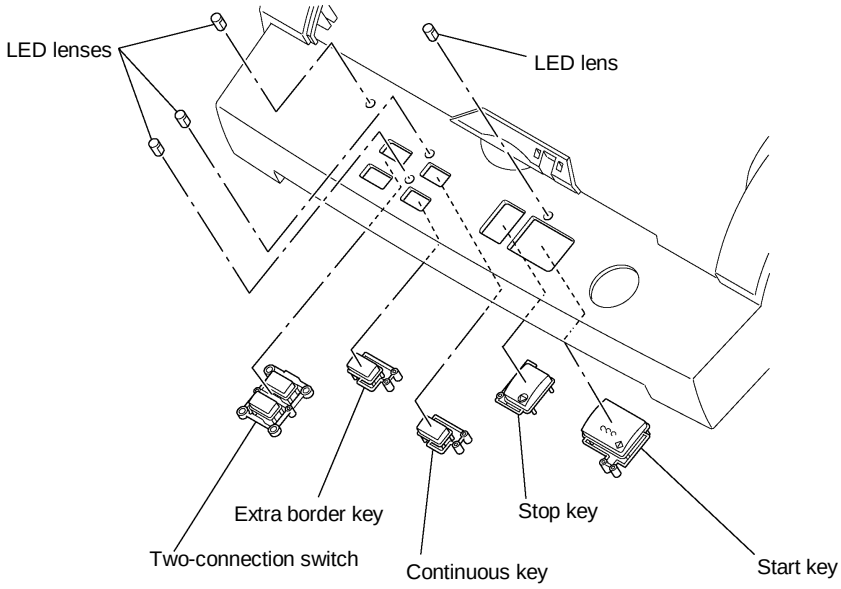



Fig. 3.5-4 Removing the Switch PCB Assy 2

# 3.6 X-cutter Unit

## 3.6.1 Removing the X-cutter Unit

1. Remove the Y-cutter assy.
2. Remove the two X-cutter screws. Move the X-cutter unit toward the right to remove it.
   * Remove the Chassis assy from the Bottom cover when replacing the X-cutter unit.

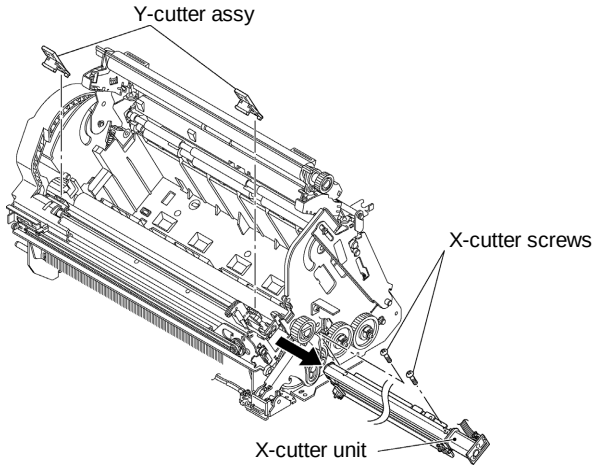



Fig. 3.6-1 Removing the X-cutter Unit

## 3.6.2 Removing the Leaf Switch F Assy.

Remove the Leaf switch F screw, then remove the Leaf switch F assy.

* Take care not to bend the connector root on the Leaf switch F assy harness.

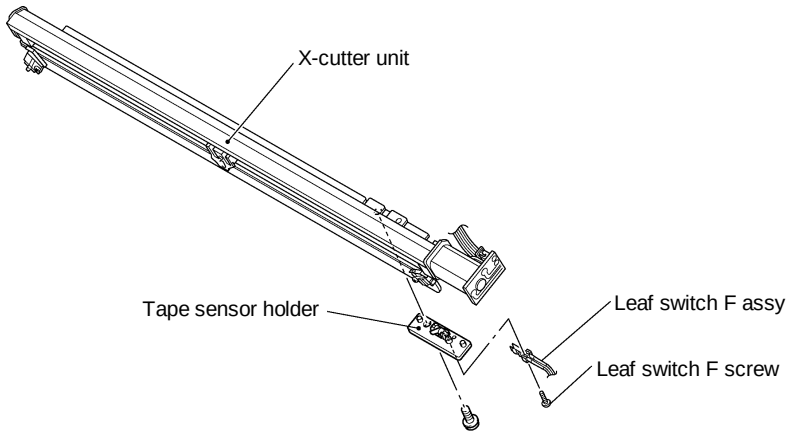



Fig. 3.6-2 Removing the Leaf Switch F Assy

# 3.7 Y-CA Chassis Assy and Y-cutter Arm

## 3.7.1 Removing the Y-CA Chassis Assy

1. Remove the Y extension springs.
2. While the Roller holder is locked, remove the two Y-CA chassis screws.
3. Disengage the end of the Y-cutter arm from the Y sensor carriage by moving it in direction A. Remove the Y-CA chassis assy.

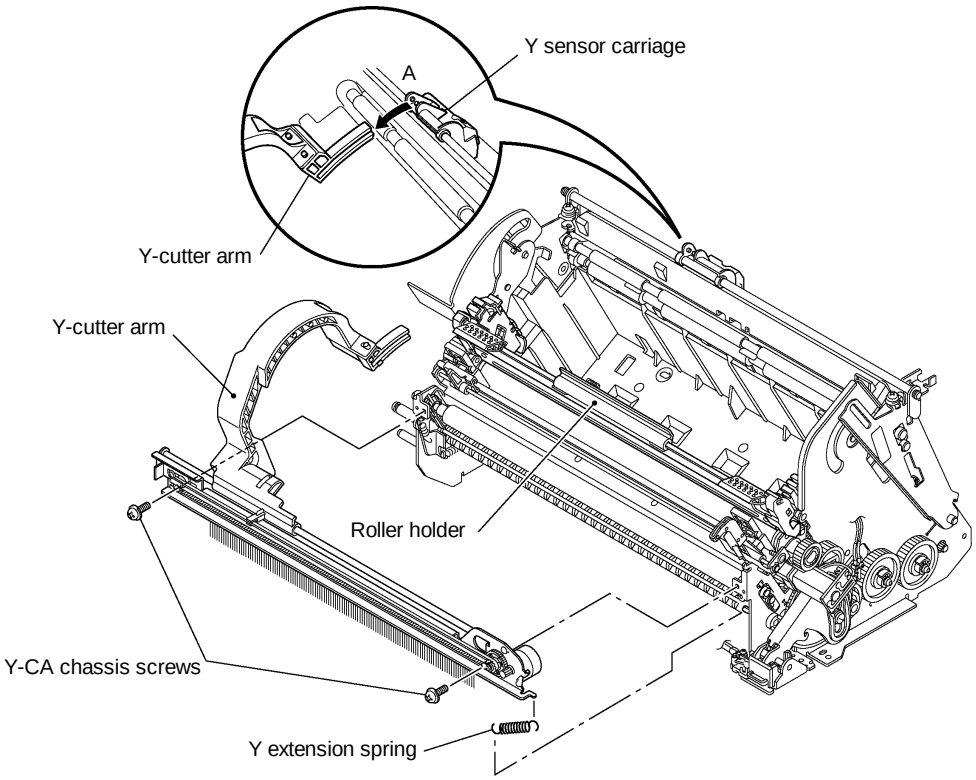



Fig. 3.7-1 Removing the Y-CA Chassis Assy

### 3.7.2 Removing the Y-CA Motor

1. Remove the Y-CA motor screws and remove the Y-CA motor.

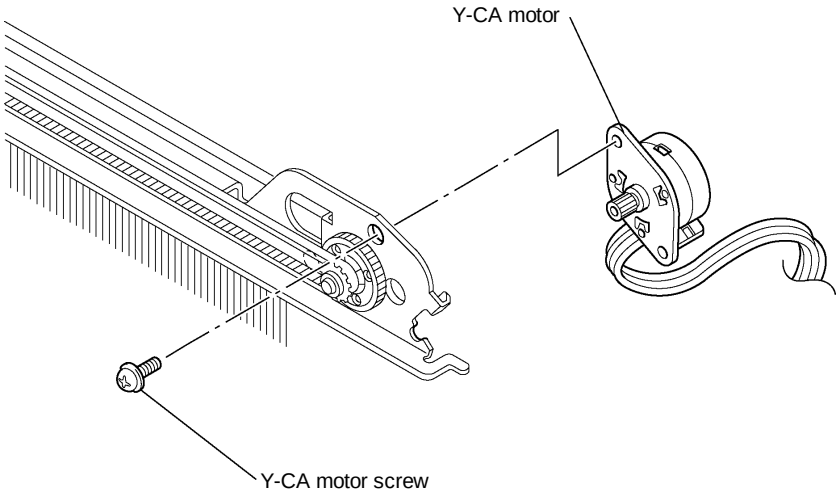



Fig. 3.7-2 Removing the Y-CA Motor

### 3.7.3 Removing the Y-cutter Arm

1. Remove the retaining ring from the Y-cutter arm shaft, pull out the Y-cutter arm shaft, and remove the Y-cutter arm.
2. Remove the Y-CA arm screw, then remove the Y-CA arm.

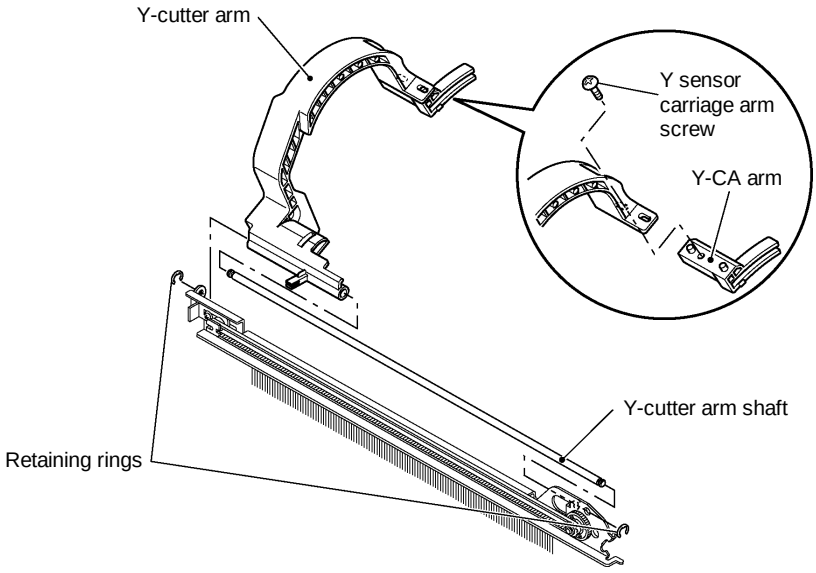



Fig. 3.7-3 Removing the Y-cutter Arm

# 3.8 Y-sensor Rail Unit

## 3.8.1 Removing the Y-sensor Rail Unit

1. Remove the F cable from the Cassette holder.
2. Remove the two Y-sensor rail screws.
3. Disengage the tip of the Actuator top from the film hole, then remove the Y-sensor rail unit in the direction of the arrow.

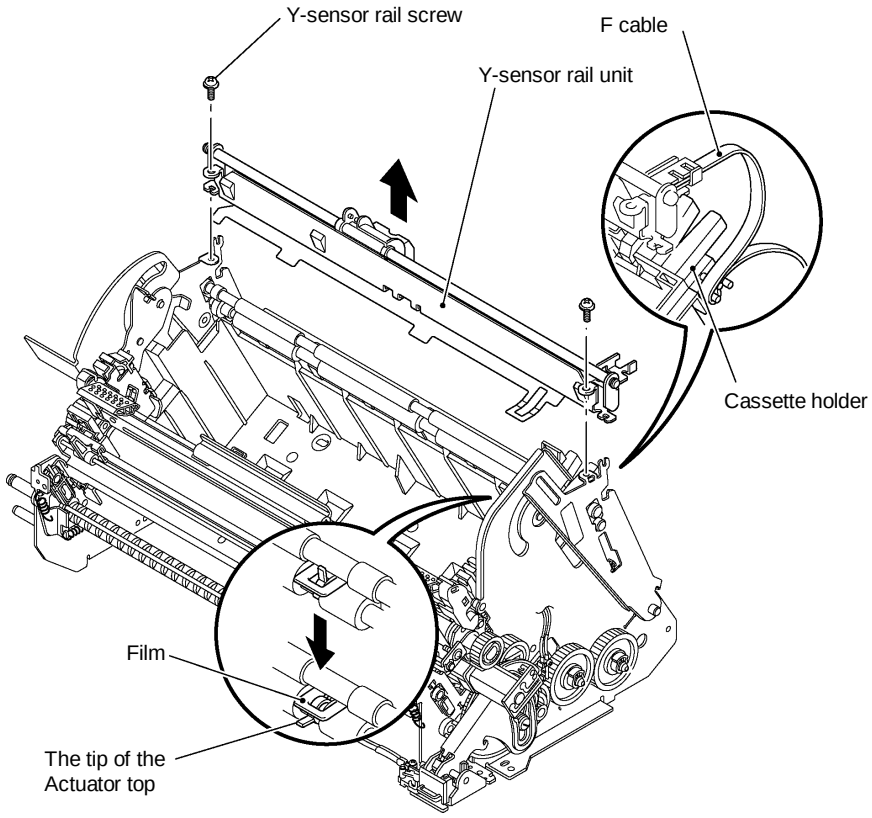



Fig. 3.8-1 Removing the Y-sensor Rail Unit

### 3.8.2 Disassembling the Y-sensor Rail Unit

1. Remove the Retaining ring from the Y-sensor shaft, then pull out the Y sensor shaft.
2. Remove the FPC holder A from the Y-sensor rail, then remove the Y-sensor carriage.

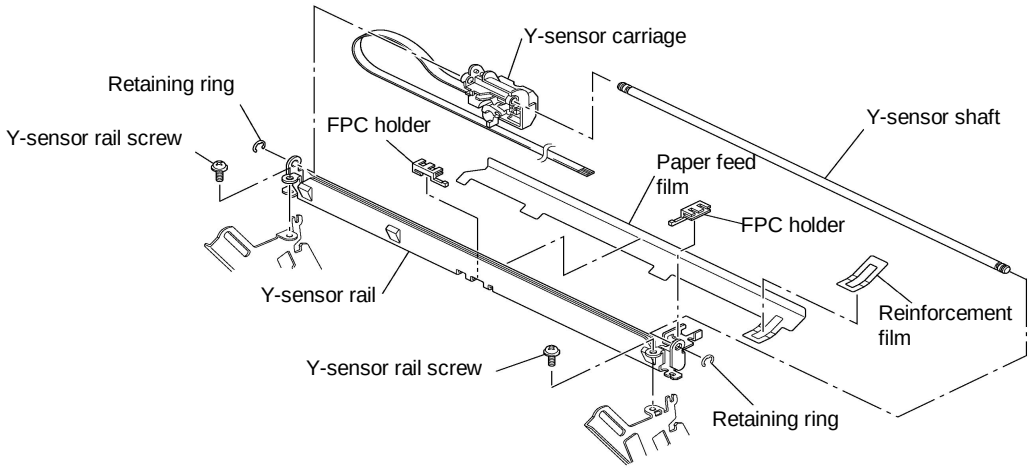



Fig. 3.8-2 Disassembling the Y-sensor Rail Unit

# 3.9 Roller Holder Assy

## 3.9.1 Removing the Roller Holder Assy

1. Lift up the Roller holder unit and disconnect the Roller holder return spring.
2. Remove the four Retaining rings (two from the Roller holder, two from the Paper feed holder), then remove the Roller holder unit.
3. Remove the plastic spacer from the rivet pins at each end of the Roller holder assy.

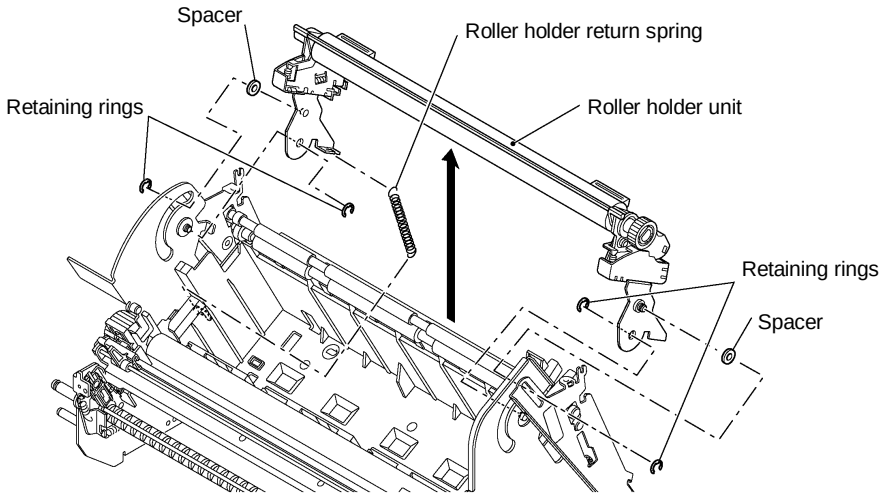



Fig. 3.9-1 Removing the Roller Holder Assy

# 3.10 Paper Feed Roller

## 3.10.1 Removing the Paper Feed Holder Assy

1. Remove the two Idle gears A, one Double gear B, one Double gear A, the Roller gear AD, and the two Paper feed roller springs from the Paper feed holder L assy, then remove the Paper feed roller unit.

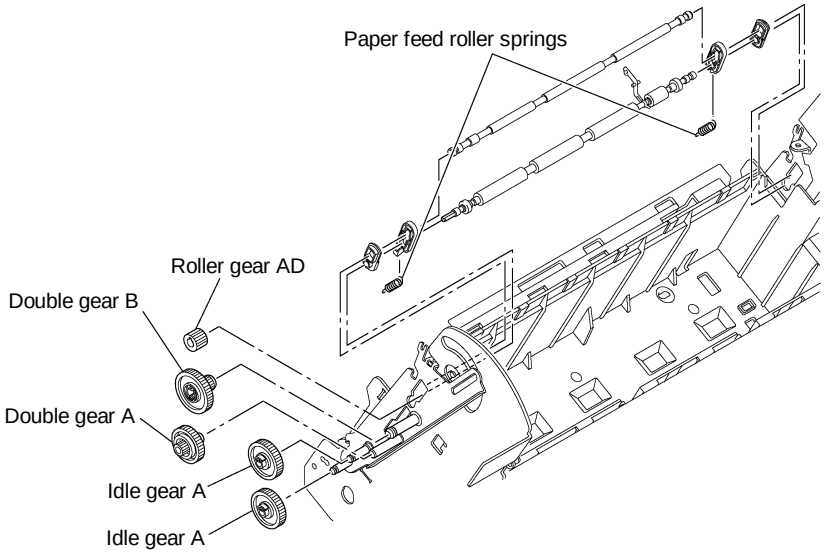



Fig. 3.10-1 Removing the Paper Feed Holder Assy

2. Rotate the Paper feed holder plates L/R backward. Remove the Paper feed holder plates L/R by pulling the hooks out of the cut-outs in the Chassis L/R.

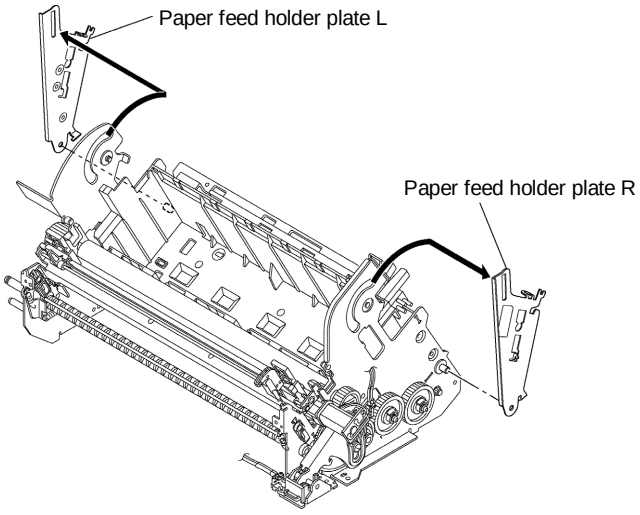



Fig. 3.10-2 Removing the Paper Feed Holder Plates L/R

3. Remove the Bearing and Sub-bearing and remove the Actuator top from the Paper feed roller assy.

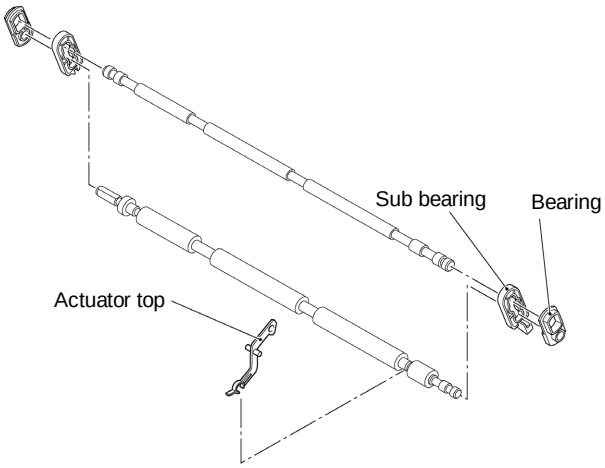



Fig. 3.10-3 Removing the Actuator Top

# 3.11 Left Side of the Main Chassis

## 3.11.1 Removing the LF Motor

1. Remove the three LF motor holder screws, then remove the LF motor holder assy and the three Spacers.
2. Remove the two LF motor screws from the LF motor holder assy, then remove the LF motor.

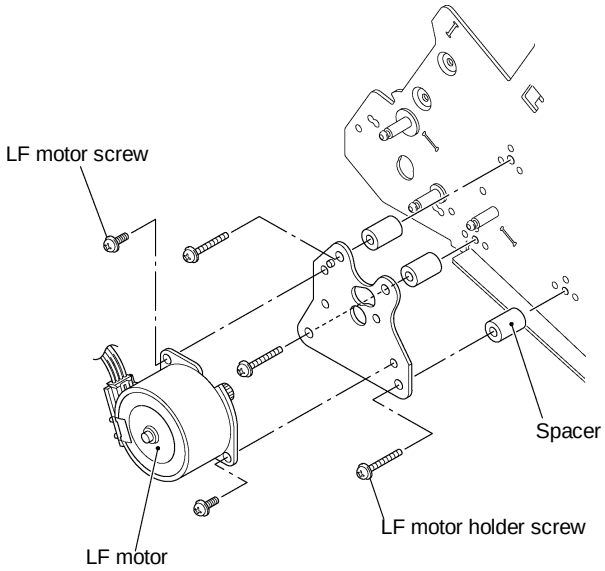



Fig. 3.11-1 Removing the LF Motor

### 3.11.2 Removing the Gears

1. Remove the gears according to the sequence of numbers in the diagram below.

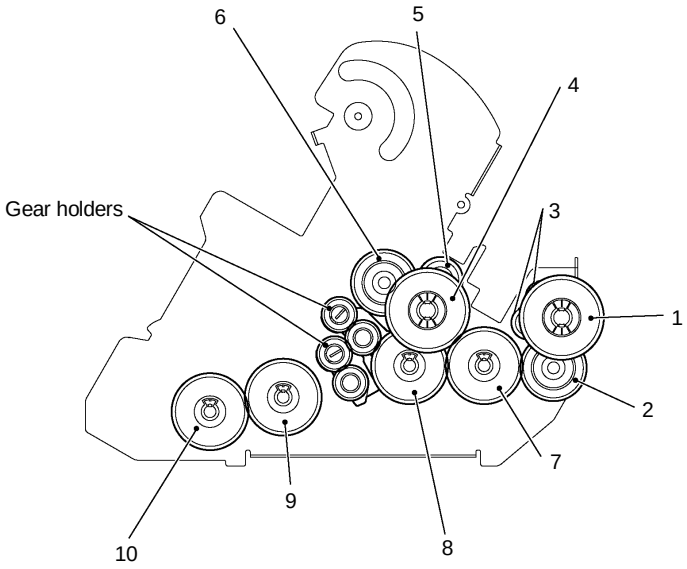



Fig. 3.11-2 Removing the Gears

2. Remove the two Gear holders simultaneously. Remove the Gear holder spring from the Gear holders.
   * The Gear holder spring may be stretched if the Gear holders are removed separately.

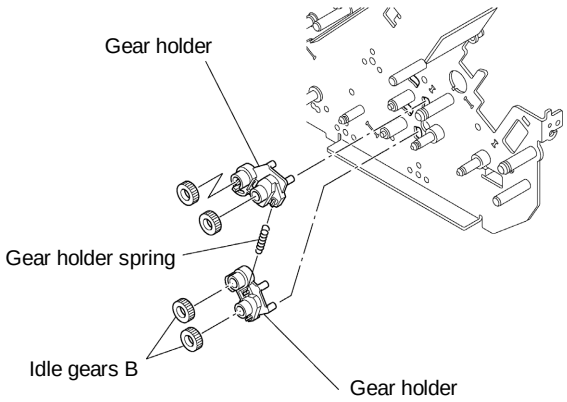



Fig. 3.11-3 Removing the Gear Holders and Gear Holder Spring

# 3.12 Right Side of the Main Chassis

## 3.12.1 Removing the Right Side of the Chassis

1. Remove the two Idle gears A.
2. Remove the two SG motor screws and remove the SG motor.
3. Remove the Leaf switch SG screw, then remove the Leaf switch SG assy.
4. Remove the T-lever shaft.

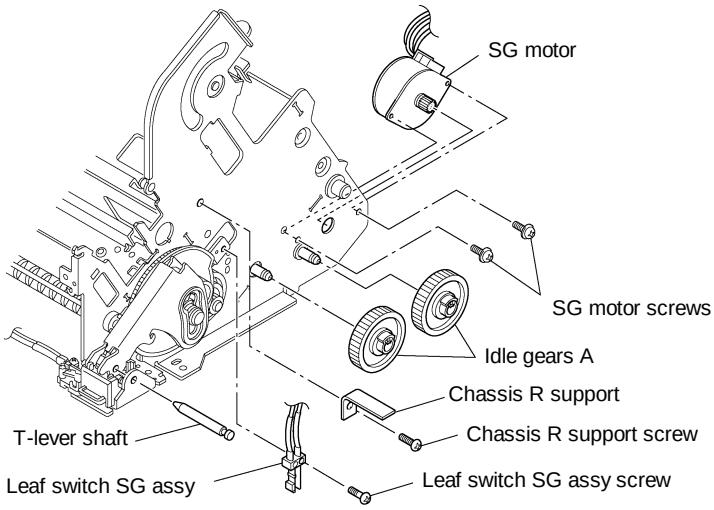



Fig. 3.12-1 Removing the Right Side of the Chassis 1

5. Push down on the T-lever unit to align the slot hole with the shaft, then remove the unit.

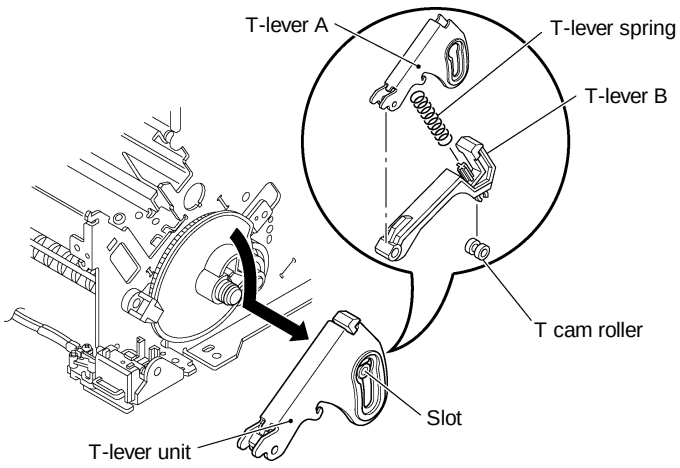



Fig. 3.12-2 Removing the T-lever Unit

6. Remove the Control cam gear and Double gear S.

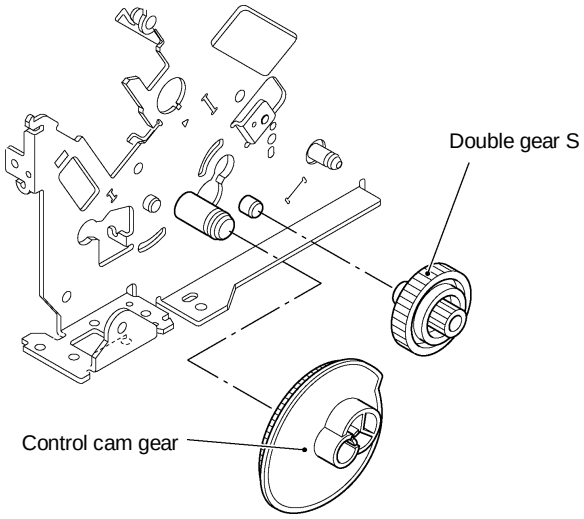



Fig. 3.12-3 Removing the Right Side of the Chassis 2

7. Remove the screws, then remove the Chassis R support. (See Fig. 3.12-1.)

## 3.12.2 Removing the YC Lift Shaft and LF Change Shaft

1. Remove the Paper eject roller springs.
2. Remove the Y extension spring.
3. Remove the Retaining ring for the YC lift shaft at the left side of the Main chassis.

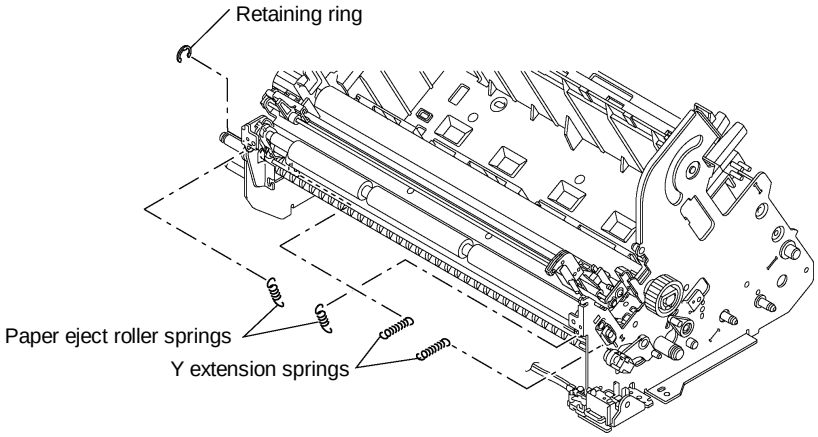



Fig. 3.12-4 Removing the YC Lift Shaft and LF Change Shaft 1

4. Move the YC lift shaft several millimeters toward the right side of the Main chassis and remove the YC Lift arm.

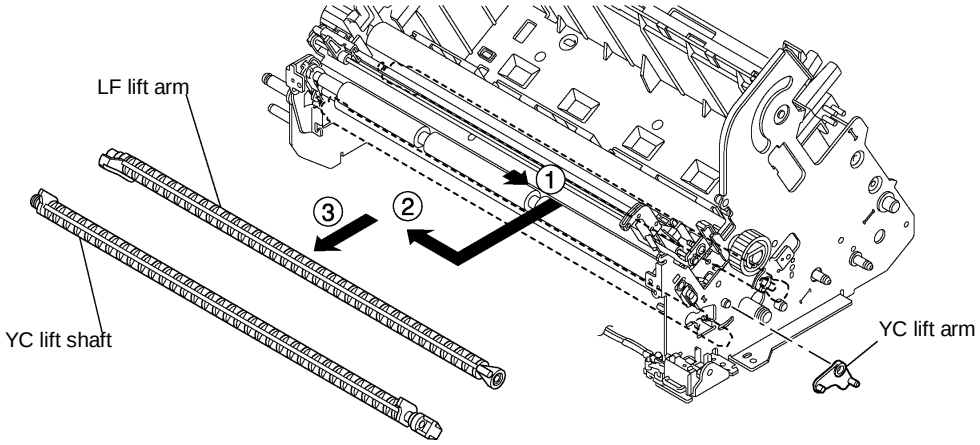



Fig. 3.12-5 Removing the YC Lift Shaft and LF Change Shaft 2

5. Remove the left end of the YC lift shaft from the Chassis L. Remove the YC lift shaft by pulling the right end of the YC lift shaft through the hole in Chassis R toward the middle of the chassis.
6. Move the LF change shaft several millimeters toward the Main chassis R. Remove the LF change shaft by pulling the right end of the shaft through the hole in Chassis R toward the middle of the chassis.
   * When pulling the right end of the YC lift shaft and LF change shaft through the hole in Chassis R, tilt the shafts so that they can be pulled smoothly. Never pull them through the hole forcibly.

# 3.13 Paper Eject Roller

## 3.13.1 Removing the Paper Eject Roller Unit

1. Push down the Paper eject shaft holder until they becomes free.
2. Push the Paper eject roller toward the left and remove it from the right end.
3. Remove the Paper eject sub-roller in exactly the same manner as the Paper eject roller: move it toward the left then remove it from the right end.

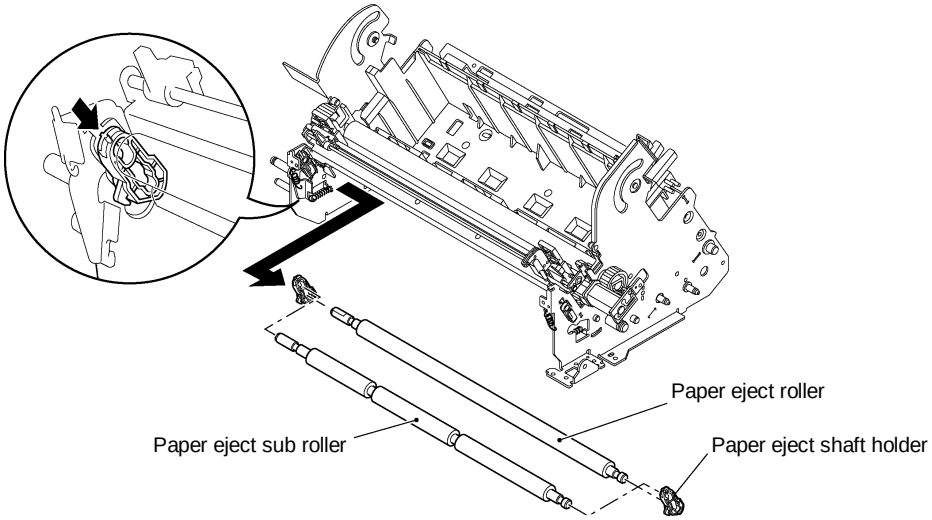



Fig. 3.13-1 Removing the Paper Eject Roller Unit 1

4. Remove the Paper eject roller bearing hook, then remove the Paper eject roller bearing.

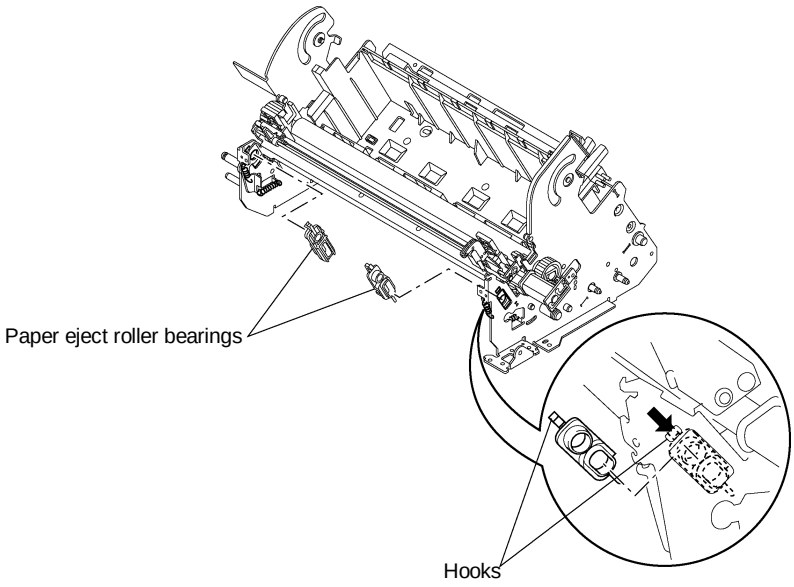



Fig. 3.13-2 Removing the Paper Eject Roller Unit 2

# 3.14 Y-diversion Lever

## 3.14.1 Removing the Y-diversion Lever Assy

1. Lift the Y-diversion lever assy to remove it.

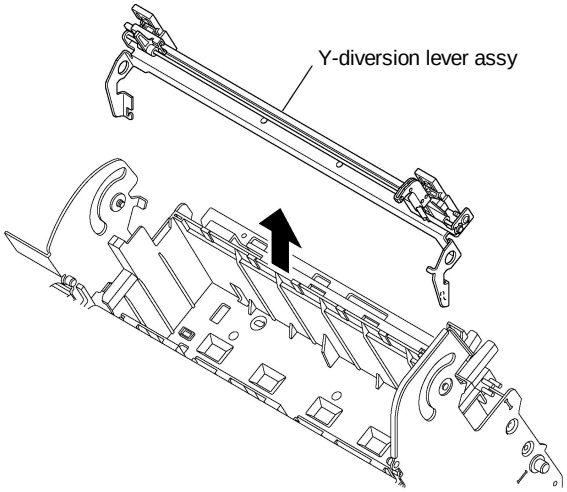



Fig. 3.14-1 Removing the Y-diversion Lever

# 3.15 Trimming Mechanism

## 3.15.1 Disassembling the Trimming Mechanism

1. Remove the Leaf switch TRI screw, then remove the Leaf switch assy TRI.
2. Remove the T-cutter screw, then remove the T-cutter assy.

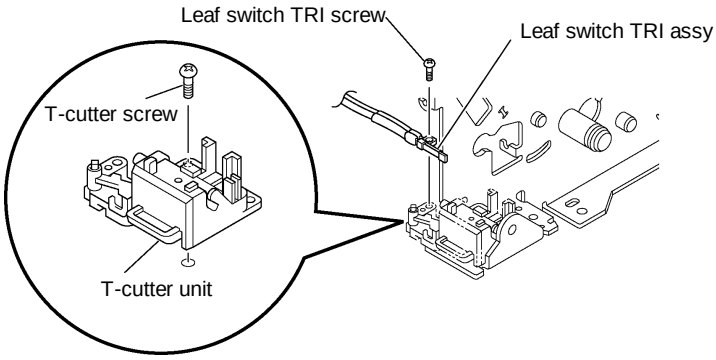



Fig. 3.15-1 Disassembling the Trimming Mechanism

# 3.16 Driving Roller

## 3.16.1 Removing the Driving Roller

1. Remove the Roller gear CD.
2. Remove the Retaining ring, push the Driving roller assy toward the left then remove it from the right end.
3. Remove the Bearings R/L.

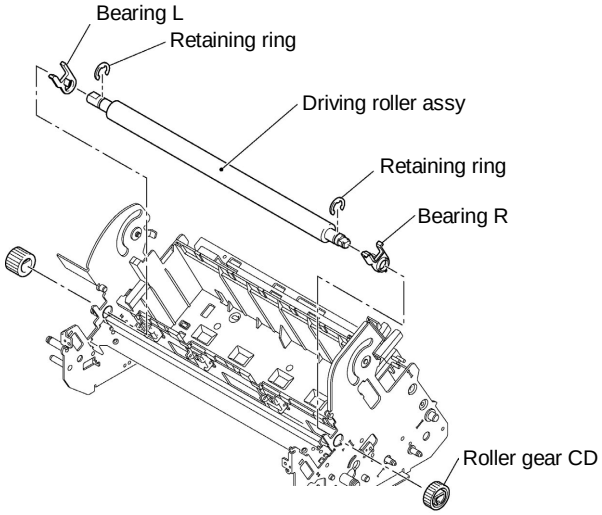



Fig. 3.16-1 Removing the Driving Roller

# 3.17 Main Chassis B

## 3.17.1 Removing the Main Chassis B

1. Disengage the harness from the hooks under the Cassette holder and the Edging saddle at the rear of the main chassis B.
2. Remove the Edging saddle from the rear of the main chassis B.
3. Remove the tape holding the ENC sensor harness.
4. Remove the Leaf switch C3/C4 screws, then remove the Leaf switch C3/C4 assemblies.
5. Remove the two Cassette actuators.

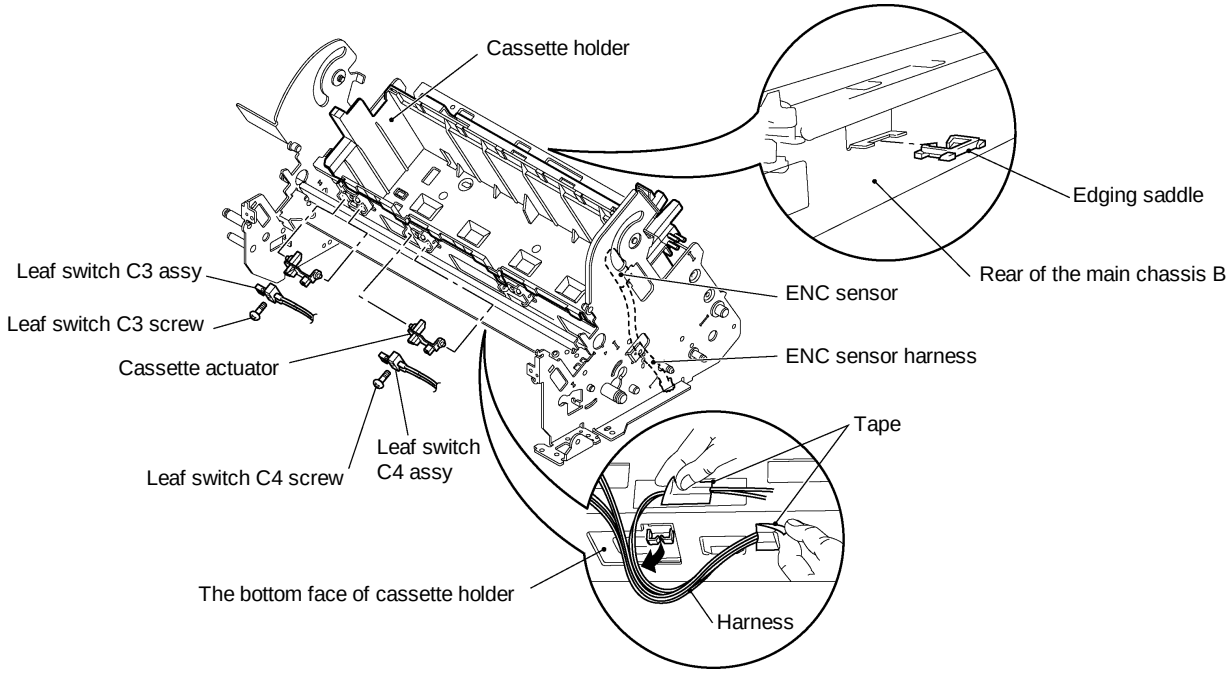



Fig. 3.17-1 Removing the Main Chassis B

### 3.17.2 Removing the Cassette Holder

1. Push in the three hooks on the front face that fix the Cassette holder.
2. Pull out the Cassette holder in the direction of the arrow.

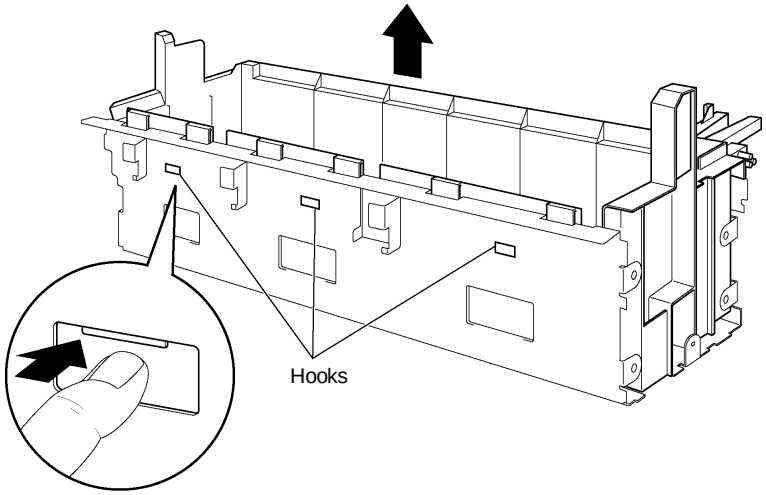



Fig. 3.17-2 Removing the Cassette Holder

### 3.17.3 Removing the ENC Sensor PCB

Remove the ENC sensor PCB screw, then remove the ENC sensor assy.

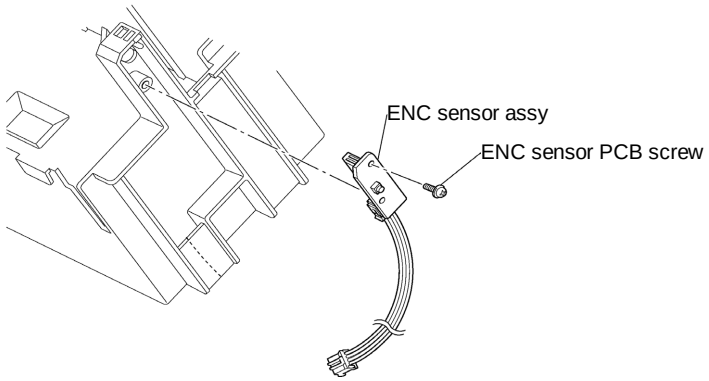



Fig. 3.17-3 Removing the ENC Sensor PCB

### 3.17.4 Removing the Main Chassis L, R, and F

Remove the ten Side chassis screws (five each side), then remove the Main chassis L, R, and F.

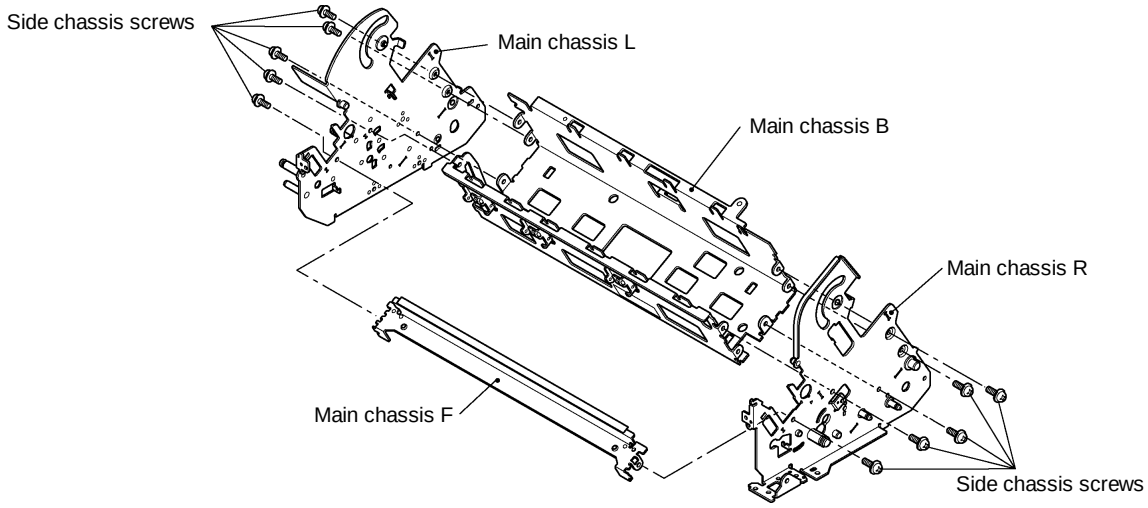



Fig. 3.17-4 Removing the Main Chassis L, R, and F

# Chapter 4.

# ASSEMBLY PROCEDURES

# CONTENTS

## Chapter 4. ASSEMBLY PROCEDURES

# 4.1 Safety Precautions

- When conducting reassembly 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 installed when replacing parts.
- Tighten all screws to the torque specified in the table below.
- As a safety precaution, wear gloves when conducting assembly operations.

# 4.2 Table of Tightening Torques

| Name of screw | Qty. | Screw size | Tightening torque | See page |
|---|---|---|---|---|
| Side chassis screw | 10 | TAPTITE, CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Reinforcing plate for frame R screw | 2 | TAPTITE, CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| ENC PCB screw | 1 | TAPTITE, BIND B M3 × 8 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Leaf switch C3 screw | 1 | SCREW, PAN M2.6 × 10 | 0.196 to 0.392 N•m (2 to 4 kgf•cm) | |
| Leaf switch C4 screw | 1 | SCREW, PAN M2.6 × 10 | 0.196 to 0.392 N•m (2 to 4 kgf•cm) | |
| Leaf switch TRI screw | 1 | TAPTITE, PAN B M2 × 6 | 0.196 to 0.392 N•m (2 to 4 kgf•cm) | |
| Leaf switch F screw | 1 | TAPTITE, PAN B M2 × 6 | 0.196 to 0.392 N•m (2 to 4 kgf•cm) | |
| Sensor holder screw | 1 | TAPTITE, CUP S M2.6 × 6 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| X-cutter screw | 2 | SCREW, BIND M3 × 6 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Detent plate screw | 1 | TAPTITE, BIND B M3 × 8 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Plate spring 3 screw | 1 | TAPTITE,CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Leaf switch SG screw | 1 | SCREW, PAN M2.6 × 10 | 0.196 to 0.392 N•m (2 to 4 kgf•cm) | |
| SG motor screw | 2 | TAPTITE, CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| LF motor screw | 2 | TAPTITE, CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| LF motor holder screw | 3 | TAPTITE, CUP M3 × 20 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Y-CA sensor PCB screw | 1 | TAPTITE, PAN B M2 × 8 | 0.196 to 0.392 N•m (2 to 4 kgf•cm) | |
| Y-sensor rail screw | 2 | TAPTITE,CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Y-sensor carriage arm screw | 1 | SCREW, BIND B TITE M3 × 10 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Y-CA motor screw | 1 | SCREW, FLANGED M2.6 × 5 | 0.196 to 0.392 N•m (2 to 4 kgf•cm) | |
| Sensor holder screw | 1 | TAPTITE, CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Y-CA chassis screw | 2 | TAPTITE, CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Switch PCB screw | 8 | TAPTITE, BIND B M3 × 12 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Jack PCB screw | 1 | TAPTITE, BIND B M3 × 8 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Main PCB screw | 4 | TAPTITE, BIND B M3 × 8 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Bottom cover screw A | 4 | TAPTITE, CUP B M4 × 12 | 0.98 to 1.176 N•m (10 to 12 kgf•cm) | |
| Bottom cover screw B | 2 | SCREW, BIND M3 × 6 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Ground wire screw | 1 | SCREW, CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| PST PCB screw | 1 | SCREW, BIND M3 × 6 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Push switch 1 screw | 1 | SCREW, PAN M1.7 × 6 | 0.075 to 0.125 N•m (0.77 to 1.26 kgf•cm) | |
| Push switch 2 screw | 1 | SCREW, PAN M1.7 × 6 | 0.075 to 0.125 N•m (0.77 to 1.26 kgf•cm) | |
| Dial holder screw | 8 | TAPTITE, BIND B M3 × 8 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Plate spring screw | 1 | SCREW, FLANGED M2.6 × 5 | 0.196 to 0.392 N•m (2 to 4 kgf•cm) | |
| Plate spring 2 screw | 1 | SCREW, FLANGED M2.6 × 5 | 0.196 to 0.392 N•m (2 to 4 kgf•cm) | |
| Adjustment plate screw | 1 | TAPTITE, BIND B M3 × 8 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Cover switch screw | 1 | TAPTITE, PAN B M2.6 × 12 | 0.196 to 0.392 N•m (2 to 4 kgf•cm) | |
| Front cover screw | 2 | TAPTITE, BIND B M2.6 × 8 | 0.25 to 0.35 N•m (2.55 to 3.57 kgf•cm) | |
| Bottom cover screw A | 3 | TAPTITE, BIND B M3 × 8 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Trimmer bottom cover | 2 | SCREW, BIND M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| T-cutter screw | 1 | TAPTITE, CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |
| Chassis R support screw | 1 | TAPTITE, CUP M3 × 5 | 0.49 to 0.686 N•m (5 to 7 kgf•cm) | |

# 4.3 Main Chassis B

## 4.3.1 Installing the Main Chassis L, R, and F

1. Insert the lugs on the Main chassis B and F into the square holes in the Main chassis L and R. Assemble the Main chassis L, R, F, and B with the ten Side chassis screws (five each side).
2. Attach the Edging saddle to the Main chassis B.

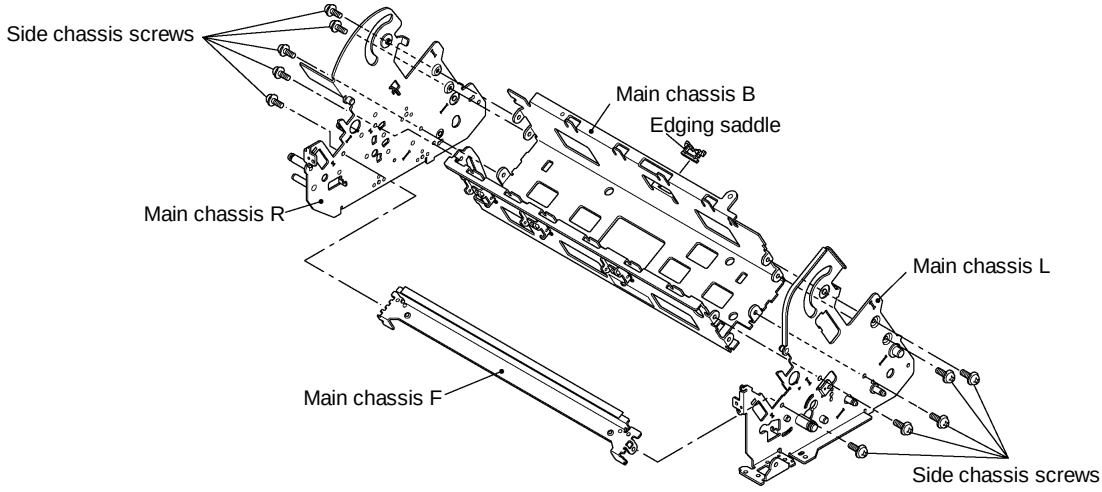



Fig. 4.3-1 Installing the Main Chassis L, R, and F

## 4.3.2 Installing the ENC Sensor PCB

Align the boss on the ENC sensor PCB assy. Attach the ENC sensor PCB assy to the Cassette holder with the ENC sensor PCB screw.

Pass the ENC sensor harness through the hole in the Cassette holder.

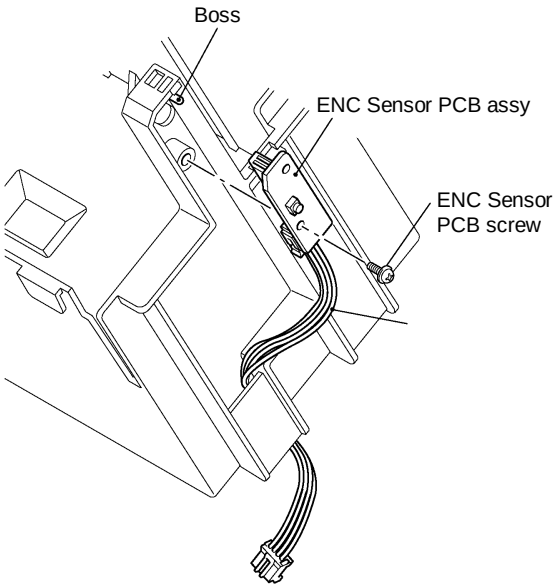



Fig. 4.3-2 Installing the ENC Sensor PCB

### 4.3.3 Installing the Cassette Holder

1. Pass the ENC sensor PCB harness through the hole in the bottom of Main chassis B.
2. Insert the lugs at the front of the Cassette holder and click the hooks at the rear onto Main chassis B.

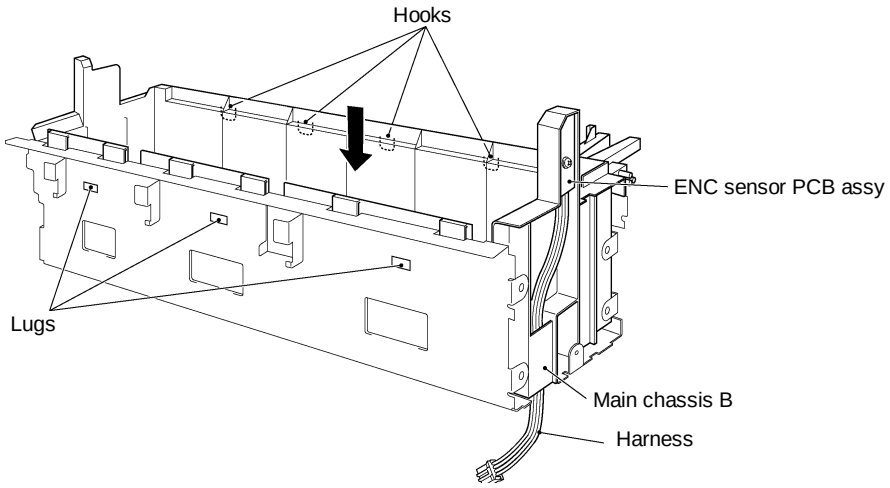



Fig. 4.3-3 Installing the Cassette Holder

(Chassis R, L and F are omitted for explanation.)

### 4.3.4 Installing the Main Chassis B

1. Install the two Cassette actuators.
2. Install the Leaf switch C3 (red) and C4 (yellow) assemblies using the Leaf switch C3/C4 screws.
   * Take care not to deform the tip of the leaf switch.
3. Engage the Leaf switch C3 and C4 harness into the hook under the Cassette holder, then pass it through the Edging saddle under the Chassis B.

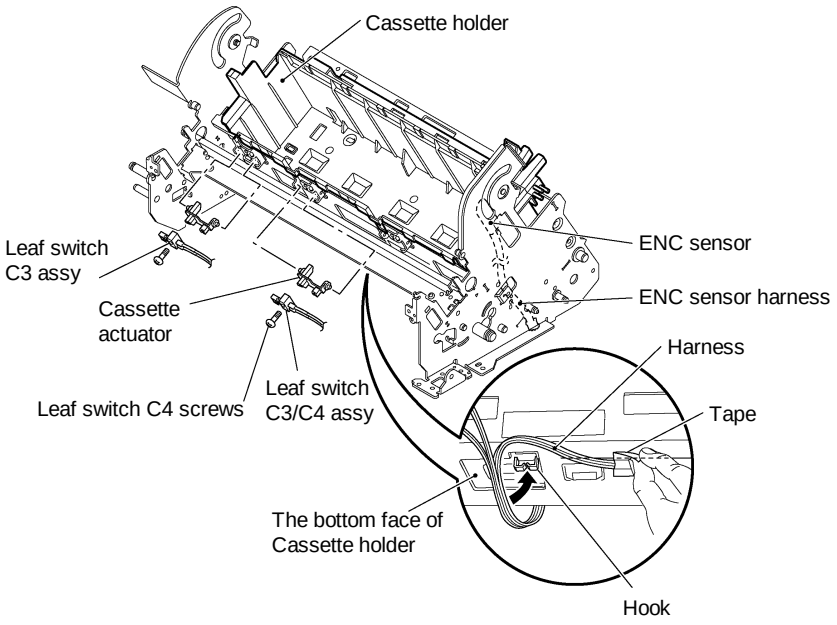



Fig. 4.3-4 Installing the Main Chassis B

4. Tape the ENC sensor PCB harness inside the marked line (the side of the Cassette holder hooks) under the Chassis B, then return the harness to the Edging saddle under the Chassis B.

# 4.4 Driving Roller

## 4.4.1 Installing the Driving Roller

1. Attach the Retaining ring to the right end of the Driving roller assy (with the shorter metal part).
2. Insert the Bearings L/R into the Driving roller. Mount it sequentially into Main chassis L and Main chassis R.
3. After installing Bearings L/R into the Main chassis L/R, attach the Retaining ring to the left end of the Driving roller assy.
4. Install the Roller gear CD.

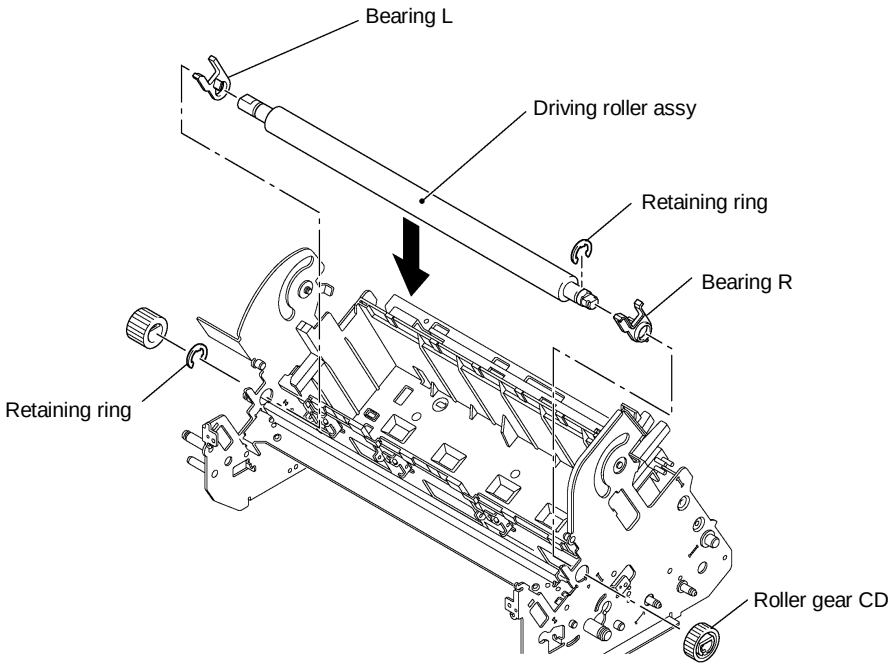



Fig. 4.4-1 Installing the Driving Roller

# 4.5 Trimming Mechanism

## 4.5.1 Assembling the Trimming Assy

1. Align the Leaf switch assy TRI with the T-cutter assy boss hole and attach it with the Leaf switch TRI screw.
2. Fasten the harness to the hooks.

   Engage the harness into the hook under the Cassette holder, then fix it with tape on the two marked areas (Chassis B front face and Chassis R inside surface).
3. Align the T-cutter assy with the boss holes and install it with the T-cutter screw.

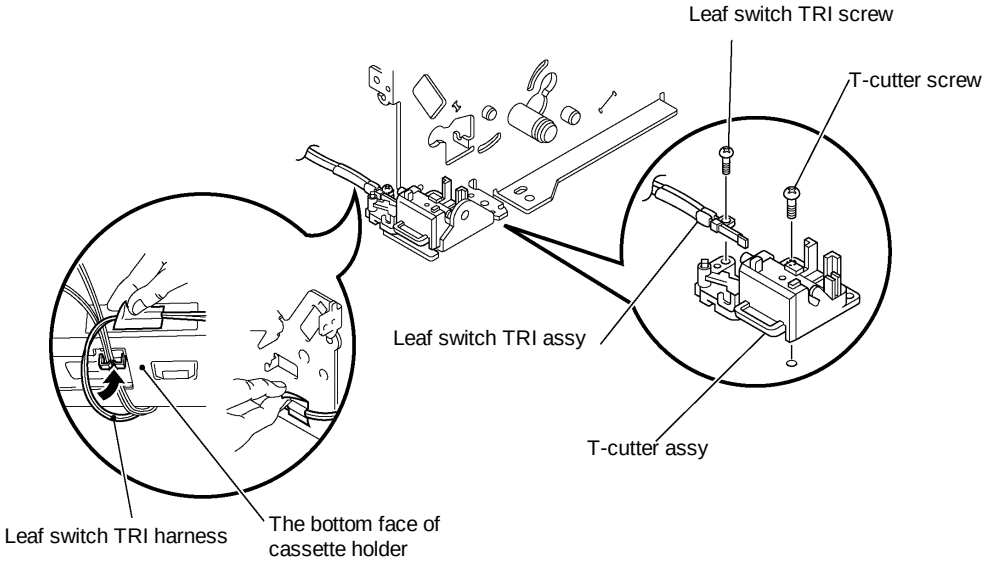



Fig. 4.5-1 Assembling the Trimming Assy

# 4.6 Paper Eject Roller and Y-diversion Lever

## 4.6.1 Installing the Paper Eject Roller Unit and Y-diversion Lever

1. Temporarily position the Y-diversion Lever assy on the Main chassis F.

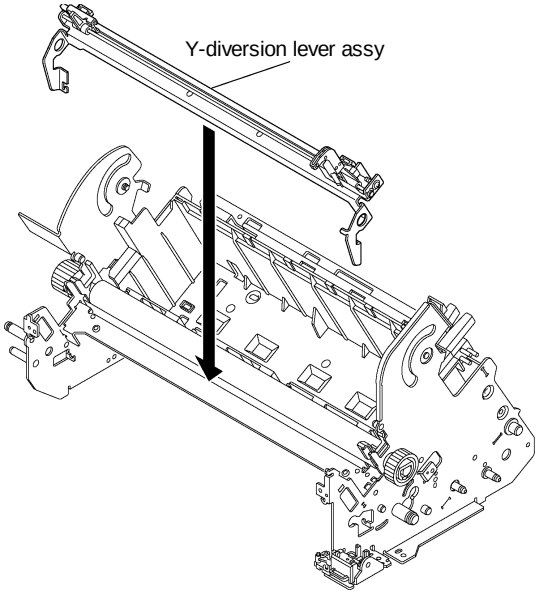



Fig. 4.6-1 Installing the Y-diversion Lever 1

2. Install the Paper eject roller bearings such that the Y-diversion lever arms are sandwiched between the Paper eject roller bearing and the Main chassis L/R. Fasten the Paper eject roller bearings with the Hooks (both L/R).

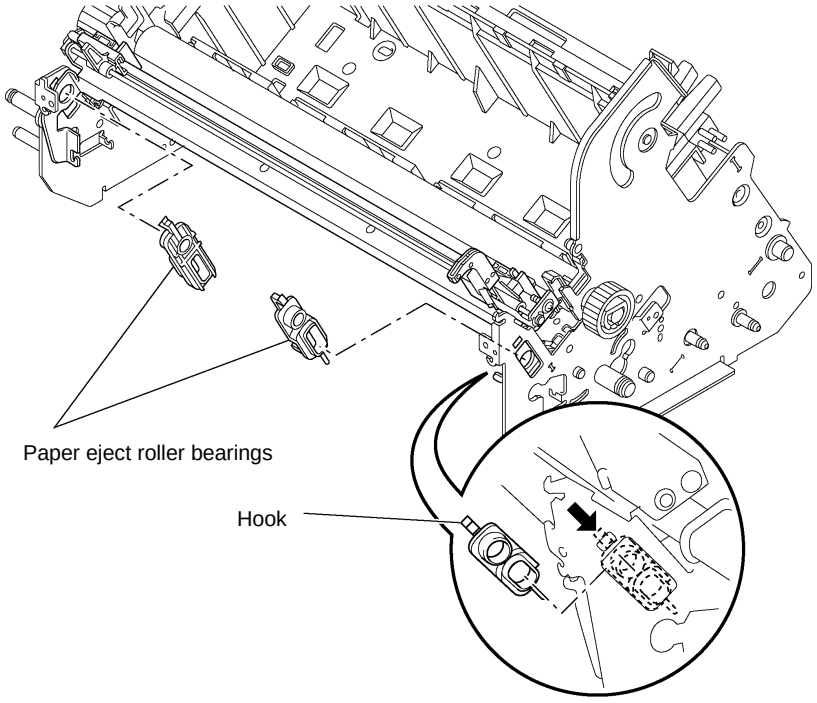



Fig. 4.6-2 Installing the Y-diversion Lever 2

### 4.6.2 Installing the Paper Eject Roller

1. With both ends of the Paper eject roller inserted in the Paper eject shaft holders, move the Paper eject roller first to the left, then to the right, to insert it into the Paper eject roller bearings. (Insert them to the end of the rubber, ensuring that the Paper eject roller shaft holders are correctly oriented vertically.)
2. After inserting the Paper eject roller into the bearings, move the Paper eject roller shaft holders outward to engage with the groove in the Paper eject roller.
3. Move the paper eject sub-roller to the left, then to the right, to insert it into the Paper eject shaft holders and the Paper eject roller bearings.

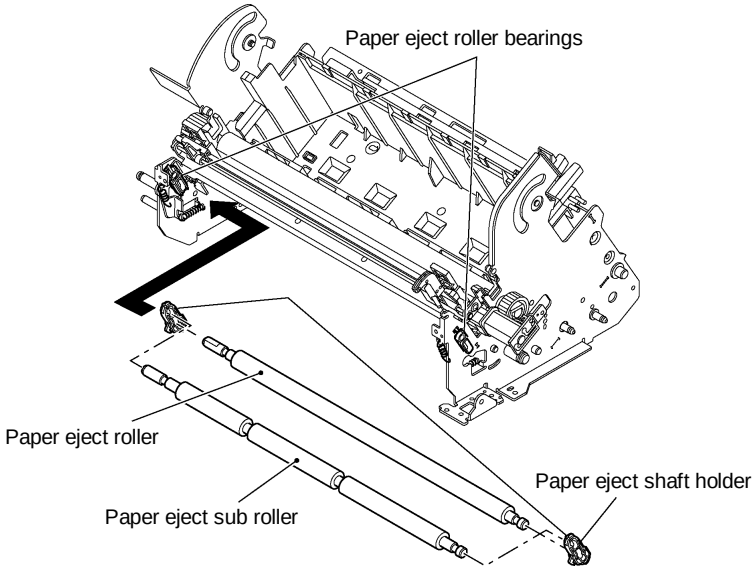



Fig. 4.6-3 Installing the Paper Eject Roller 1

4. Align the grooves in the Paper eject roller and Paper eject sub-roller shafts at the Paper eject shaft holders and push up the Paper eject shaft holders to lock them (both sides).

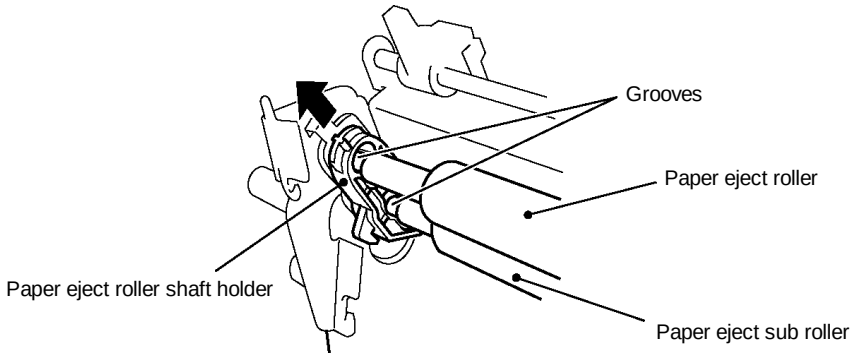



Fig. 4.6-4 Installing the Paper Eject Roller 2

# 4.7 Right Side of the Main Chassis

## 4.7.1 Installing the YC Lift Shaft and LF Change Shaft

1. Move the LF change shaft first to the right, then to the left, to install it into the Main chassis L and R.
2. Insert the right end of the YC Lift Shaft into the Main chassis R, then attach the YC lift arm to it.
3. With the boss of the YC lift arm inserted into the groove at the right end of the YC lift shaft, insert the left end of the YC lift shaft into the Main chassis L and attach the retaining ring outside Chassis L.

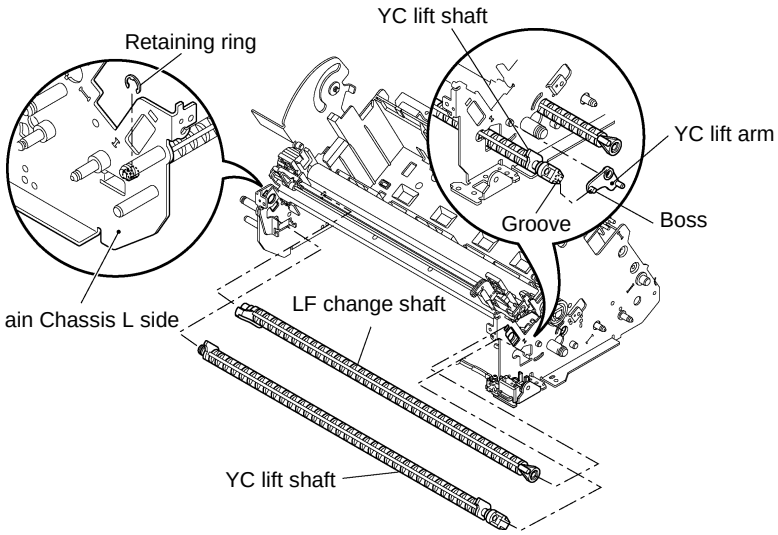



Fig. 4.7-1 Installing the YC Lift Shaft and LF Change Shaft 1

4. Attach the Y extension springs between the hooks inside the Main chassis L/R and the Y-diversion lever.
5. Attach the Paper eject roller springs between the Paper eject shaft holder hooks and the Main chassis L/R.

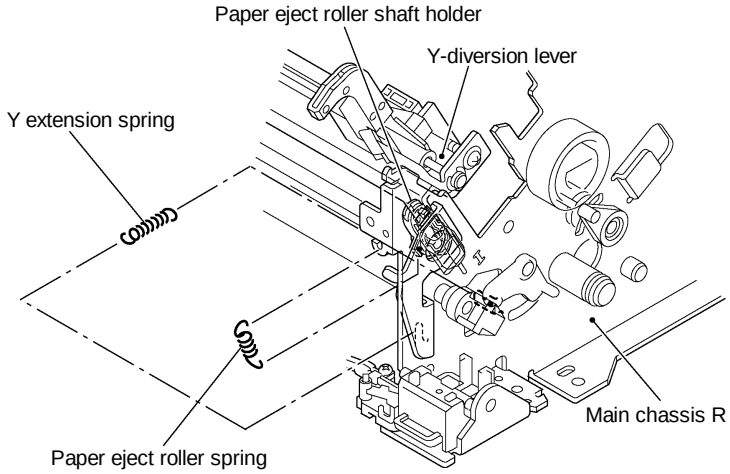



Fig. 4.7-2 Installing the YC Lift Shaft and LF Change Shaft 2

## 4.7.2 Installing the Right Side of the Chassis

1. Install the Double gear S.
2. Position the YC lift shaft as shown in the diagram.
3. Install the Control cam gear with the triangular mark on the Control cam gear aligned with the triangular hole in the Chassis.
   * Ensure that the boss at the right end of the LF change shaft and YC lift arm is inserted correctly into the grooves in the Control cam gear. The bosses are correctly inserted if the Control cam gear rotates smoothly when the Y-diversion lever is pressed.

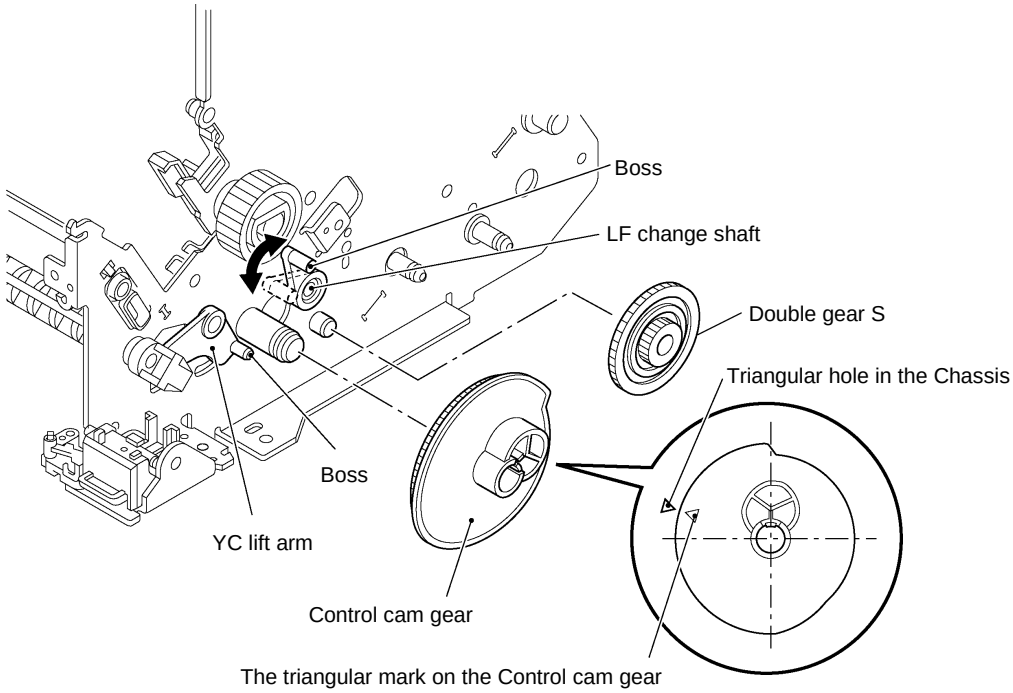



Fig. 4.7-3 Installing the Right Side of the Chassis 1

4. Install the T-lever A to the Main chassis R.

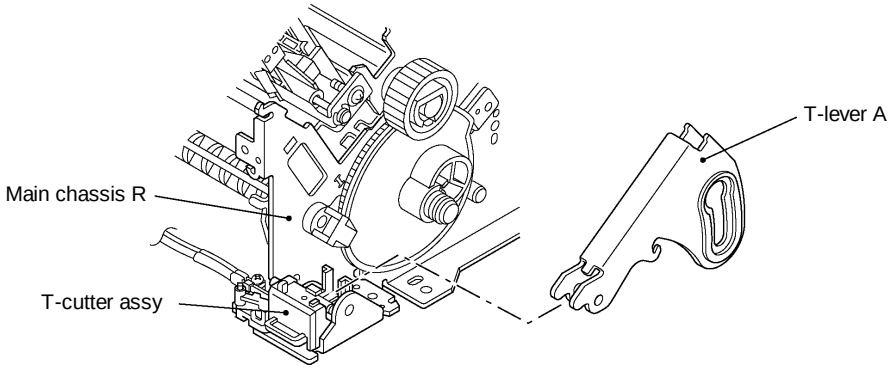



Fig. 4.7-4 Installing the Right Side of the Chassis 2

5. Install the T-lever B, T-cam roller, and T-cam spring onto T-lever A.

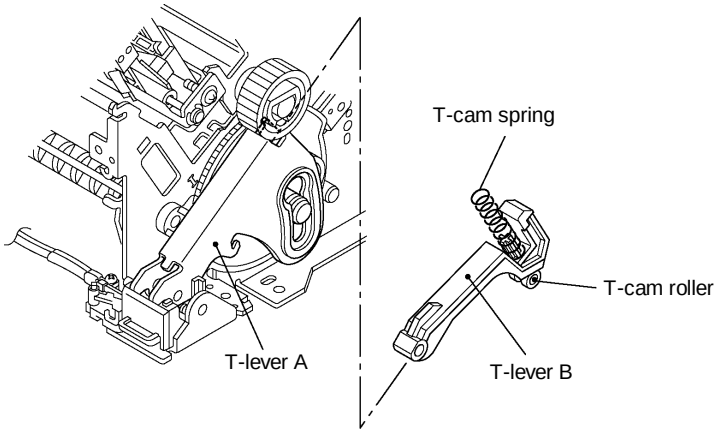



Fig. 4.7-5 Installing the Right Side of the Chassis 3

6. Insert the T-lever shaft into the shaft holes in the Main chassis R and T-lever A/B.

   Push in the T-lever shaft until the groove in the shaft engages with the hook on the T-cutter assy.

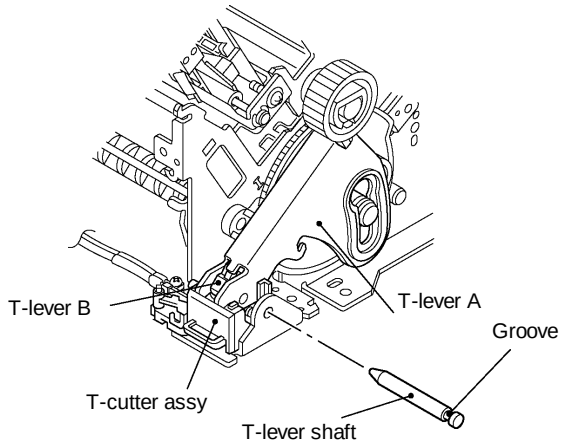



Fig. 4.7-6 Installing the Right Side of the Chassis 4

7. Align the Leaf switch SG assy with the boss hole and fasten it with the Leaf switch SG screw.

   Before installing the Leaf switch SG assy, turn the Control cam gear to a position where it cannot interfere with the Leaf switch.
8. Install the SG motor with the two SG motor A screws.
9. Install the Idle gears A.
10. Attach the Chassis R support with the Chassis R support screw.

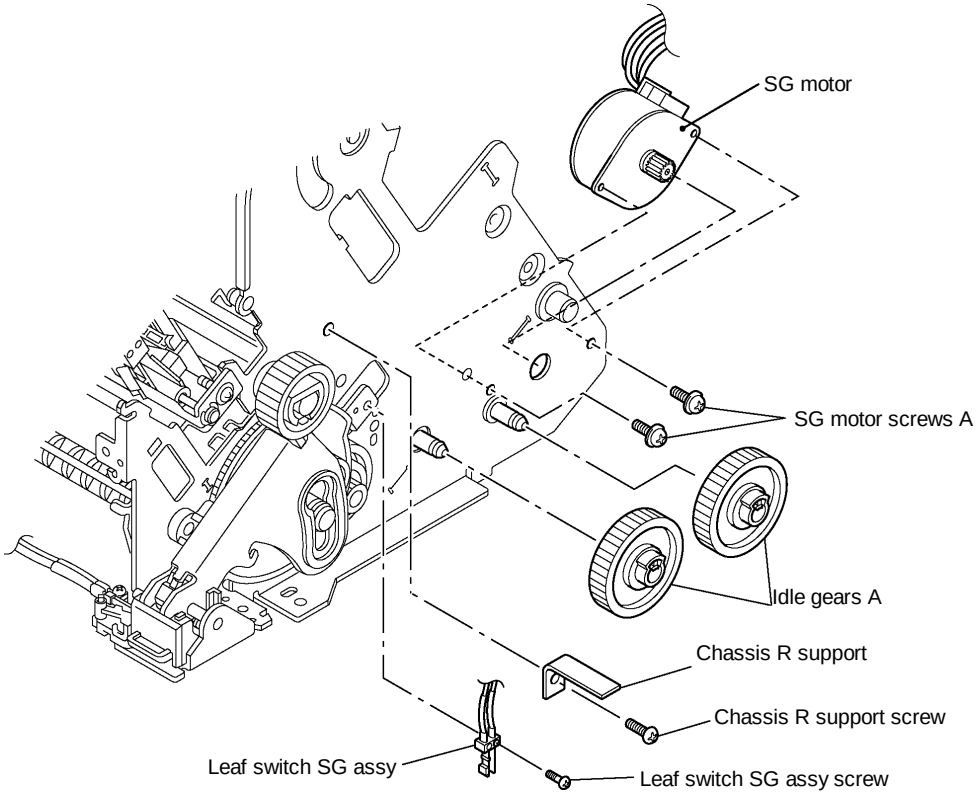



Fig. 4.7-7 Installing the Right Side of the Chassis 5

# 4.8 Left Side of the Chassis

## 4.8.1 Installing the Gears

1. Mount the two Gear holders to the Main chassis L, then attach the Gear holder springs.

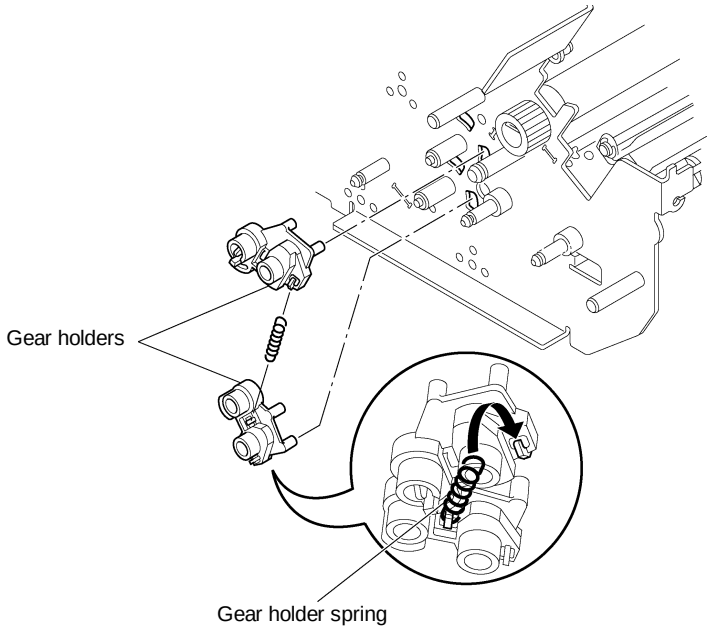



Fig. 4.8-1 Installing the Gears 1

2. Install the gears according to the sequence shown in the diagram below.
   Push the shaft into a gear or holder with a hook until the hook engages.

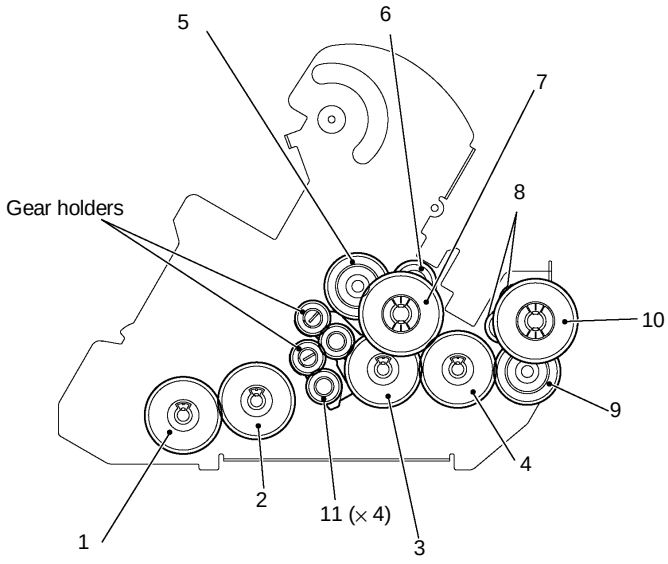



Fig. 4.8-2 Installing the Gears 2

### 4.8.2 Installing the LF Motor

1. Attach the LF motor to the LF motor holder using the LF motor screws.
2. Insert the LF motor holder screws into the LF motor holder assy. Put the Spacers over the three protruding screws. Mount the LF motor holder assy to the Main chassis L.
   * Fix the LF motor holder to the positioning pins, then fasten it firmly and correctly in place with the screws.

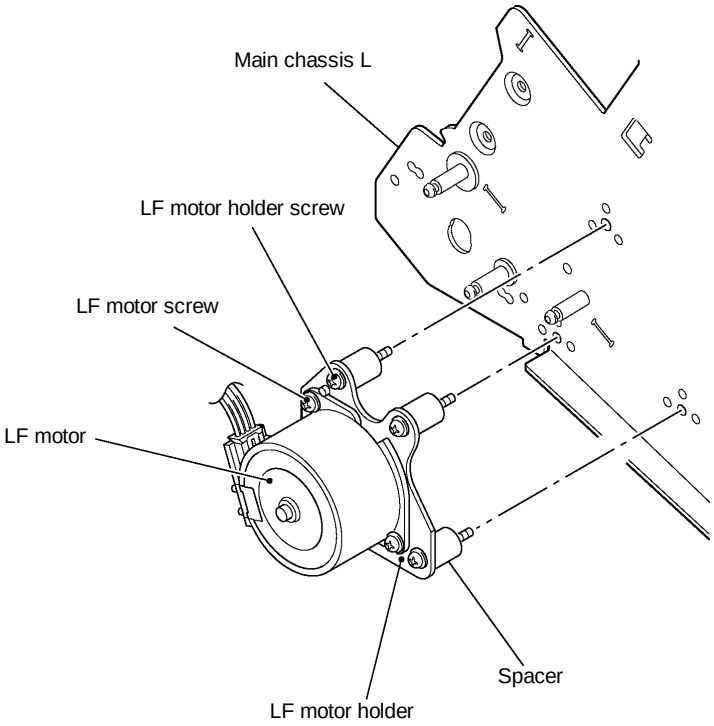



Fig. 4.8-3 Installing the LF Motor

# 4.9 Paper Feed Roller

## 4.9.1 Installing the Paper Feed Holder Assy and the Paper Feed Roller Assy

1. Attach the Paper feed holder plates L (with shaft) and R to the Main chassis L and R.
   * Assemble with the hooks on the Paper feed holder plates L/R engaged in the cut-outs in the Chassis L/R.

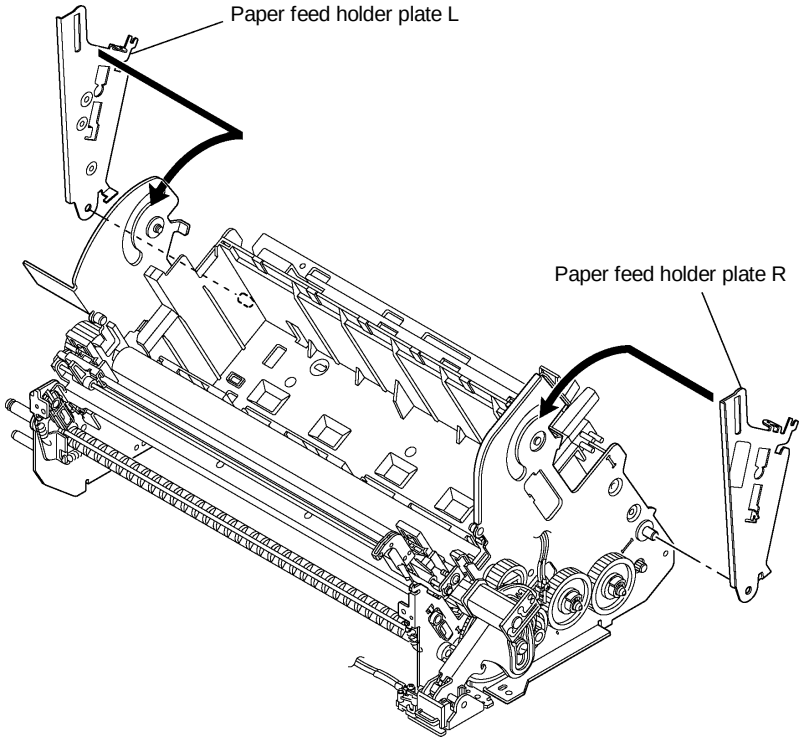



Fig. 4.9-1 Installing the Paper Feed Holder Assy

2. Install the Actuator top in the Paper feed holder assy.
3. Install the Bearing and Sub-bearing onto the Paper feed roller and Paper feed sub-roller. Insert the rollers through the slots in the Paper feed holder plates L and R.
   * Ensure that the Actuator top fits into Part A of the Cassette holder.

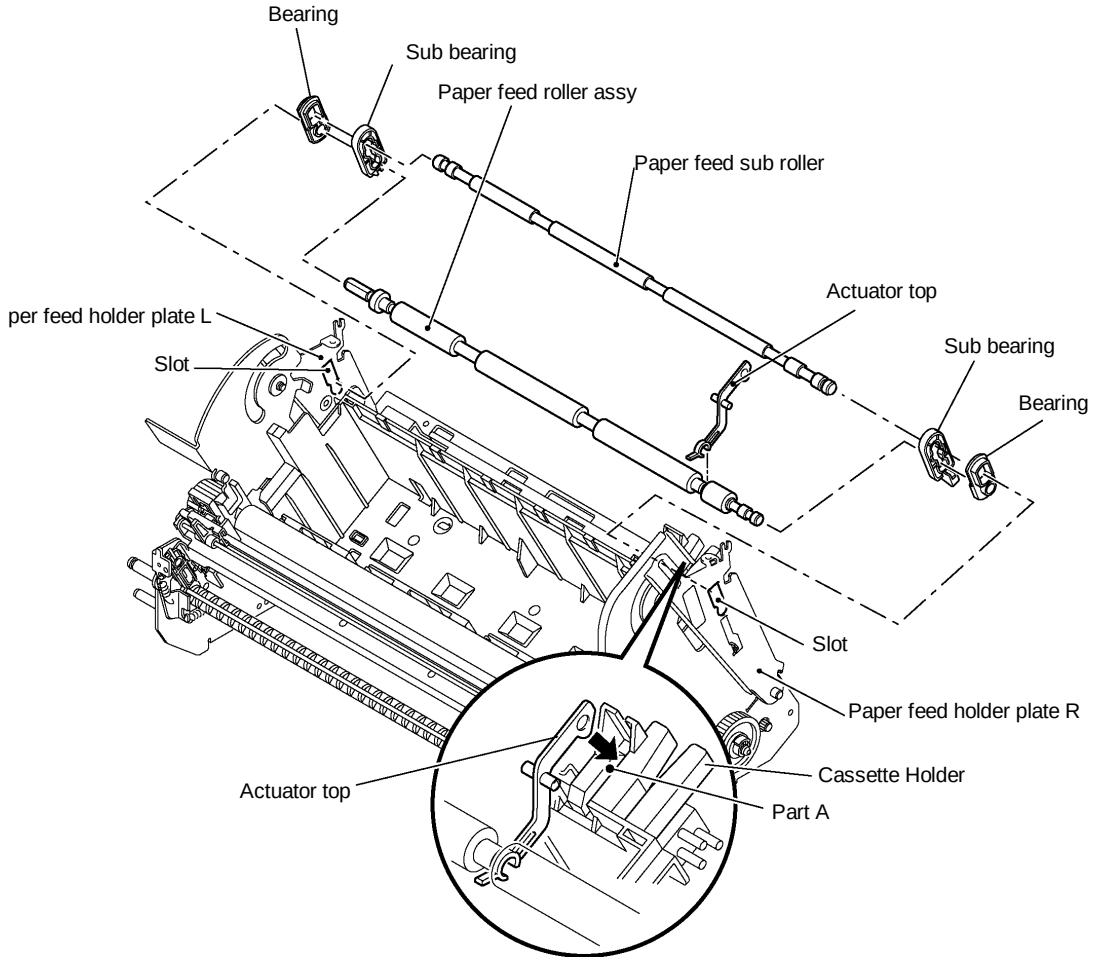



Fig. 4.9-2 Installing the Paper Feed Roller Assy 1

4. Attach the Paper feed roller springs to the left and right Sub bearing hooks and the Paper feed holder plates L and R.

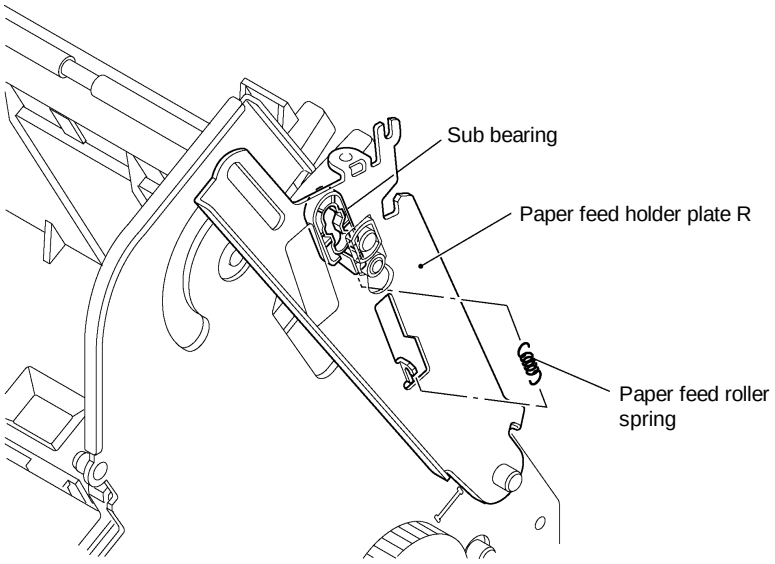



Fig. 4.9-3 Installing the Paper Feed Roller Assy 2

5. Attach the two Idle gears A, one Double gear B, one Double gear A, and the Roller gear AD to the Paper feed holder plate L.

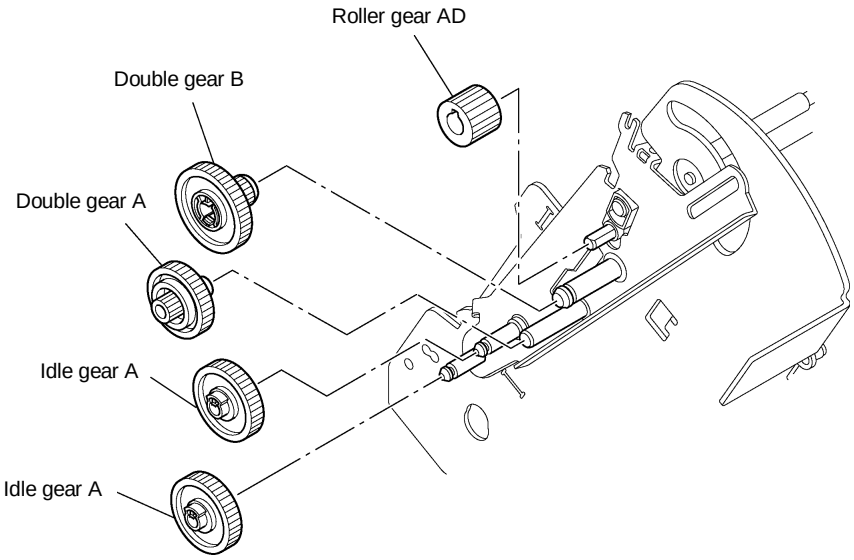



Fig. 4.9-4 Installing the Paper Feed Roller Assy 3

# 4.10 Roller Holder Assy

## 4.10.1 Installing the Roller Holder Assy

1. Install the pivots for Roller holder rotation onto the Main chassis shafts.
2. Mount the plastic spacers to the lugs (rivet pins) at each end of the Roller holder assy.
3. Pass the lugs (rivet pins) on the roller holder unit through the curved slots on the Main chassis L and R and the slots on top of the Paper feed roller plate.
4. Fasten the Roller holder in position with the four Retaining rings.
5. Install the Roller holder return spring while the Roller holder unit is open.

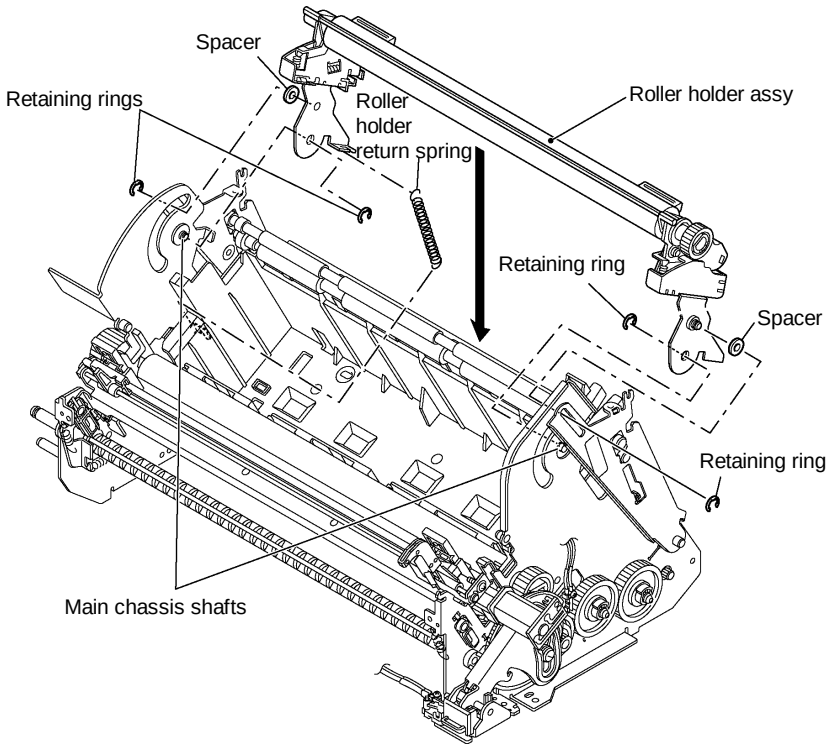



Fig. 4.10-1 Installing the Roller Holder Assy

# 4.11 Y-sensor Rail Unit

## 4.11.1 Assembling the Y-sensor Rail Unit (Attaching Y-sensor PCB Assy)

1. Bend the sensor flat cable to the dimensions shown in the diagram below.

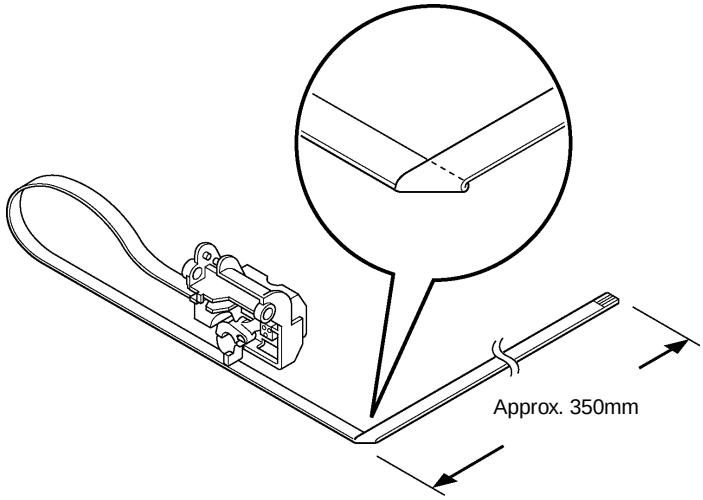



Fig. 4.11-1 Bending the Sensor Flat Cable to the Dimensions

2. Attach the FPC holders A to the flat cable.
3. Locate the sensor flat cable inside the Y-sensor rail unit.

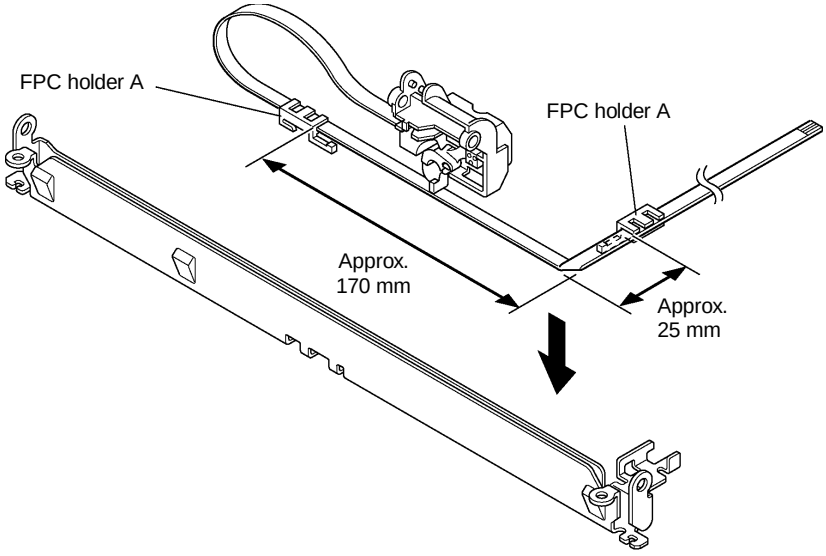



Fig. 4.11-2 Sensor Flat Cable Location

4. Stick the Film and Reinforcement film to the Y-sensor rail unit.
5. Install the FPC holders A in the Slots in the Y sensor rail unit.
6. Pass the Y-sensor shaft through the Y-sensor rail and Y-sensor carriage and fasten with a Retaining ring at each end.
7. Check that the sensor cable is not tight when the Y-sensor carriage is moved to the left end, as shown in the diagram below.

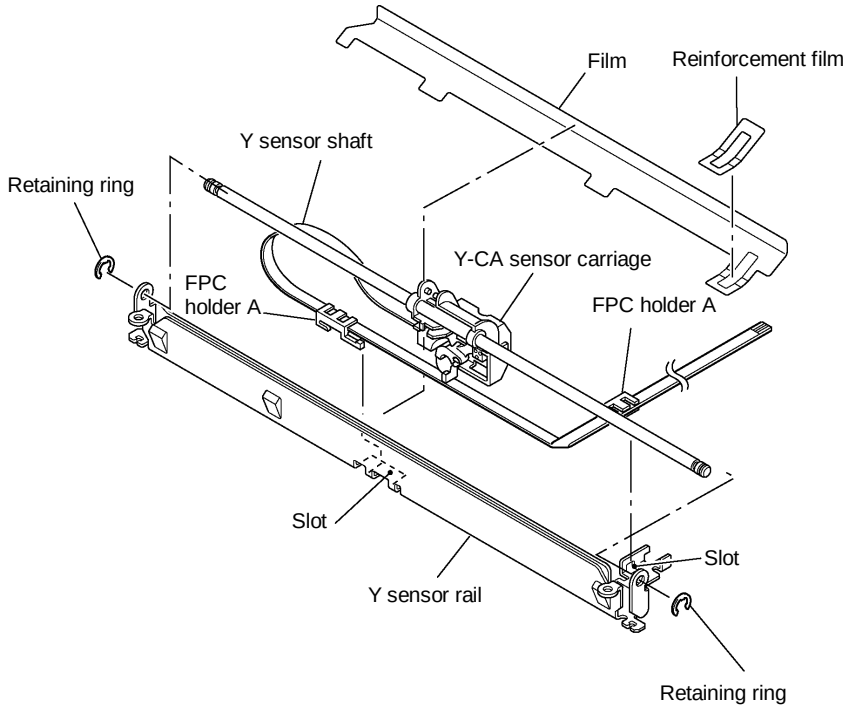



Fig. 4.11-3 Assembling the Y-sensor Rail Unit

### 4.11.2 Installing the Y-sensor Rail Unit

1. Locate the groove on the Y-sensor shaft into the Paper feed holder plate and fasten with the two Y-sensor rail screws.
   * Ensure that film is inserted between the Paper feed roller and Paper feed sub-roller during installation.
   * Pass the part of the Paper feed film with the Reinforcement film attached between the Paper feed roller and Paper feed sub-roller, then pass the end of the Actuator top through the hole in the Paper feed film.

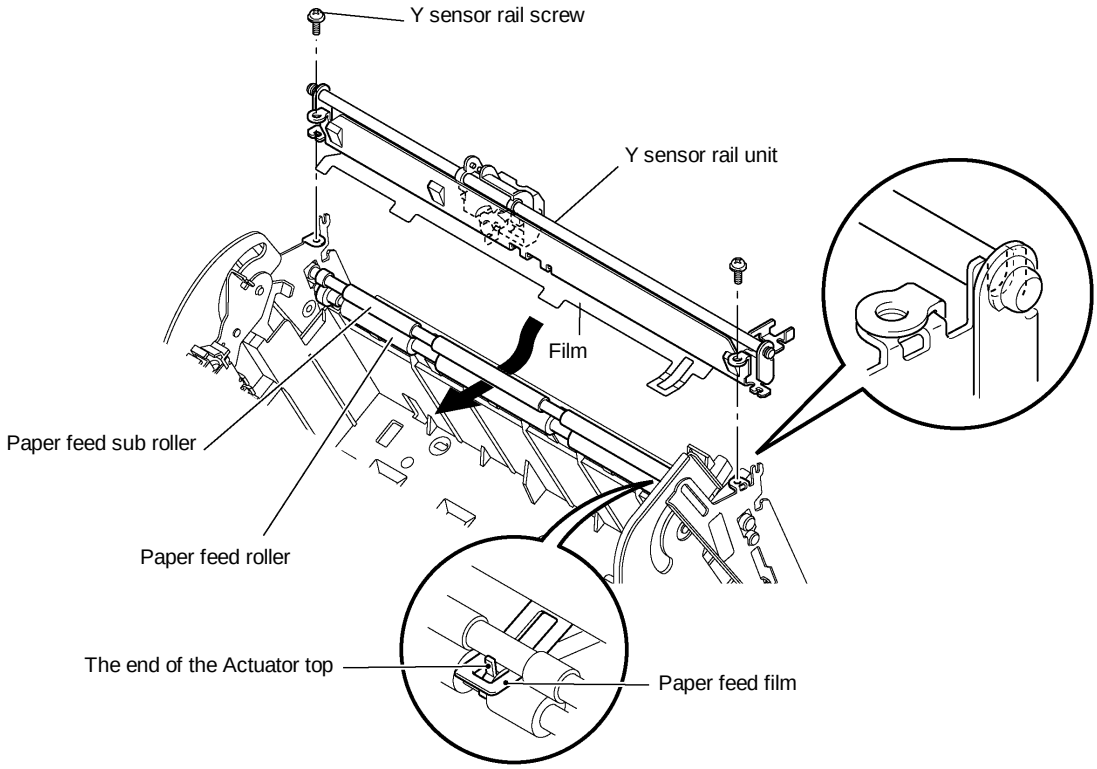



Fig. 4.11-4 Assembling the Y-sensor Rail Unit

# 4.12 Y-CA Chassis Assy and Y-Cutter Arm

## 4.12.1 Installing the Y-cutter Arm

1. Mount the Y-sensor carriage arm to the Y-cutter arm with the Y-CA arm screw.

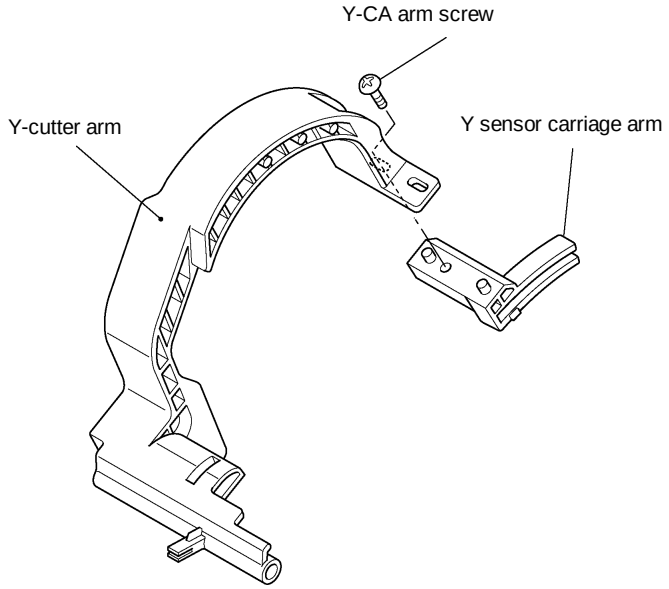



Fig. 4.12-1 Installing the Y-cutter Arm 1

2. Pass the Y-cutter arm shaft through the Y-CA chassis assy and Y-cutter arm and fasten with a Retaining ring at each end.

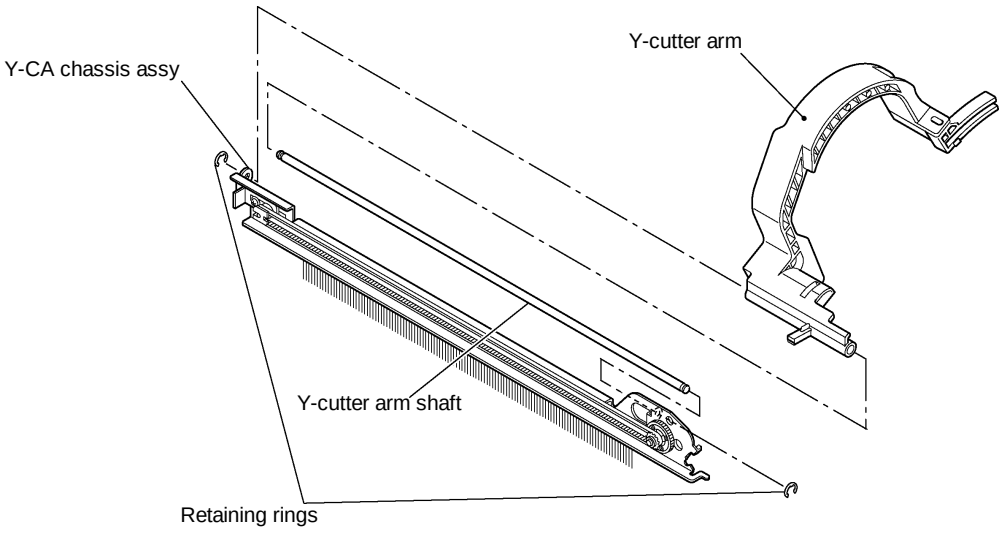



Fig. 4.12-2 Installing the Y-cutter Arm 2

### 4.12.2 Installing the Y-CA Motor

1. Mount the Y-CA motor to the Y-CA chassis assy with the Y-CA motor screws.

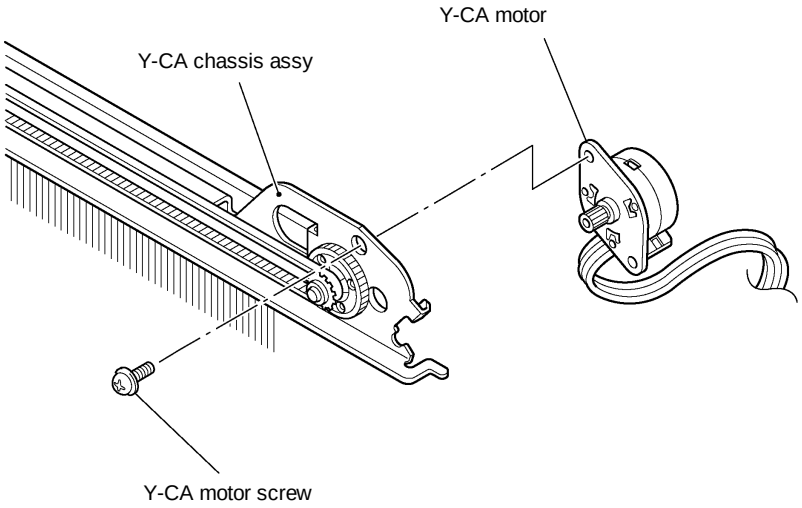



Fig. 4.12-3 Installing the Y-CA Motor

### 4.12.3 Installing the Y-CA Chassis Assy

1. Insert the end of the Y-cutter arm into the Y sensor carriage.

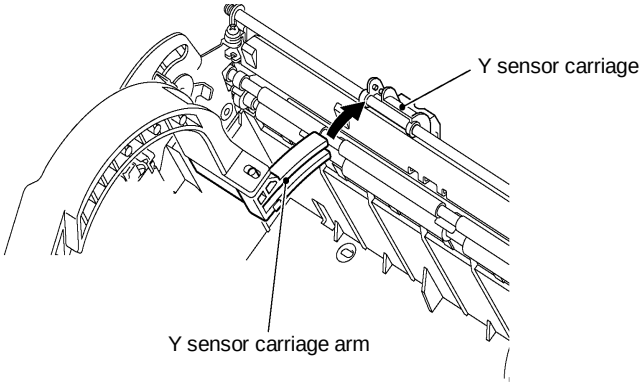



Fig. 4.12-4 Installing the Y-CA Chassis Assy 1

2. Insert the lugs on the Y-cutter guide L into the slots (Part A) on the Y-cutter arm.
3. Insert the Y-CA timing belt into the groove in the Y-cutter arm.
4. Install the Y-CA chassis assy with the two Y-CA chassis screws.
   * Set the left and right Embosses into the holes in the Y-CA chassis before tightening the screws.
5. Attach the Y extension spring to the Y-diversion lever and the Y-CA chassis assy.

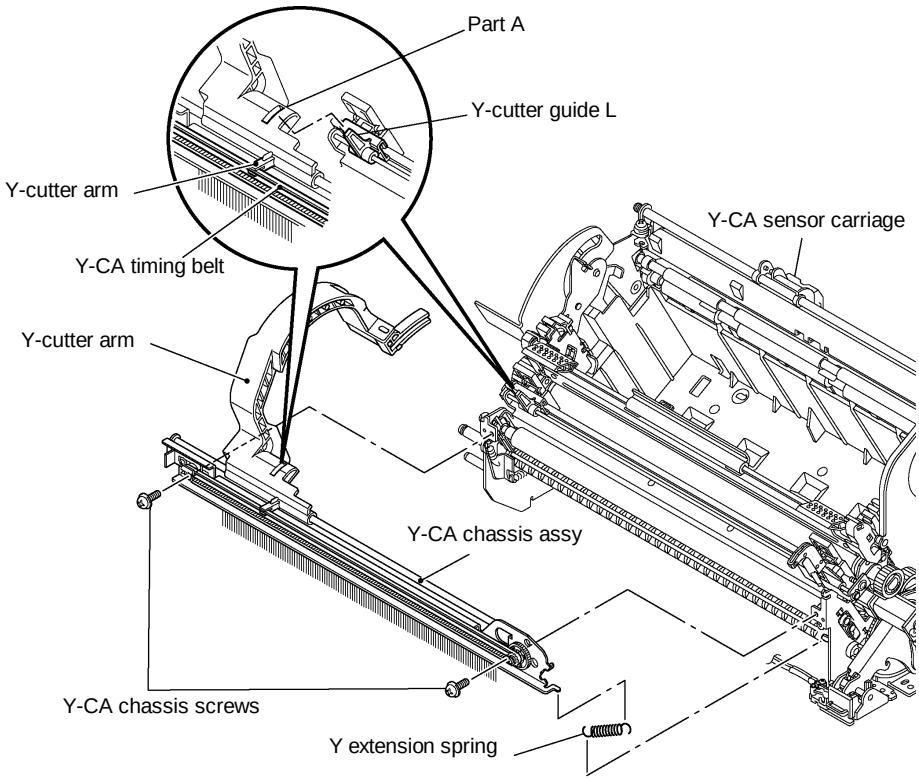



Fig. 4.12-5 Installing the Y-CA Chassis Assy 2

# 4.13 X-cutter Unit

## 4.13.1 Installing the Leaf Switch F Assy

1. Attach the Leaf switch F assy to the Tape sensor holder with the Leaf switch F screw.

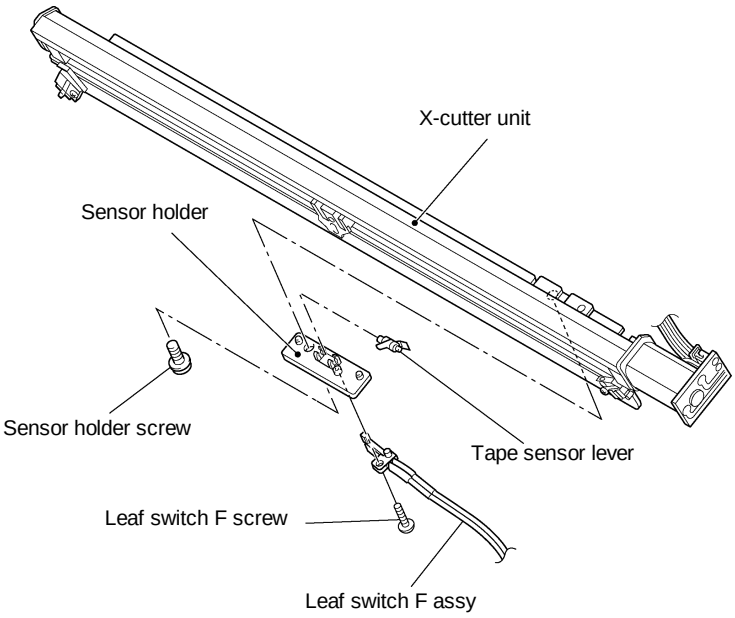



Fig. 4.13-1 Installing the Leaf Switch F Assy

## 4.13.2 Installing the X-cutter Unit

Slide the X-cutter unit into position from the right side of the main unit and fasten it in position with the two X-cutter screws.

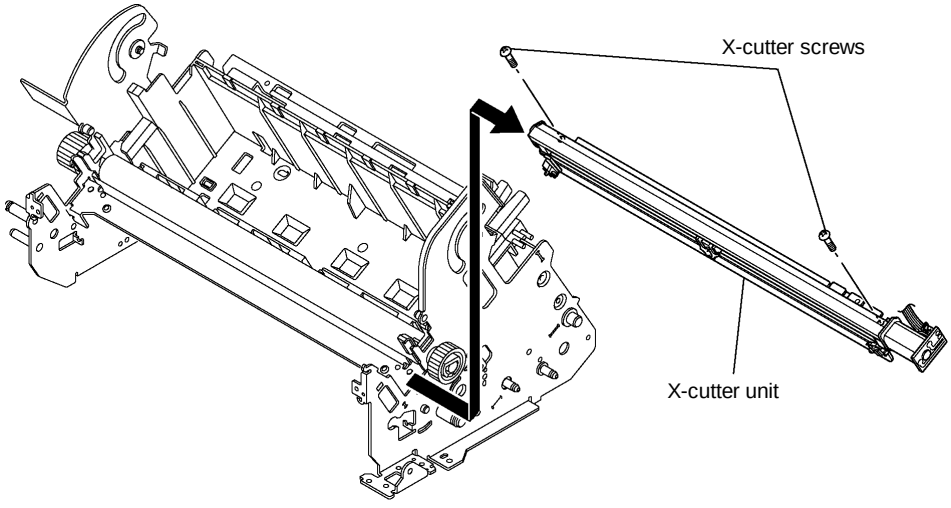



Fig. 4.13-2 Installing the X-cutter Unit

# 4.14 Harnesses

## 4.14.1 Installing the Harnesses

Attach the following harnesses to the Main chassis B Edging saddle.

- SG motor harness (black)
- ENC harness assy (white)
- Leaf switch TRI harnesses (black) x 2
- Leaf switch C3 (red)/C4 (yellow) harness

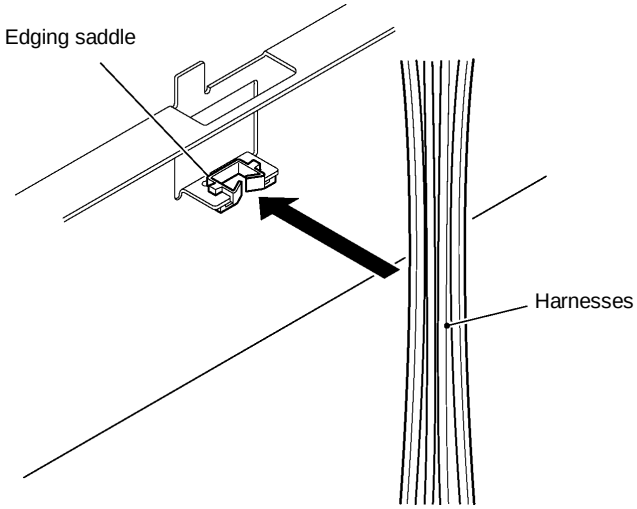



Fig. 4.14-1 Installing the Harnesses

# 4.15 PCBs

## 4.15.1 Installing the Jack PCB Assy

Install the Jack PCB assy with the Jack PCB screw.

* The Core shown in the diagram is applicable to EU-specification units only (LX-300).

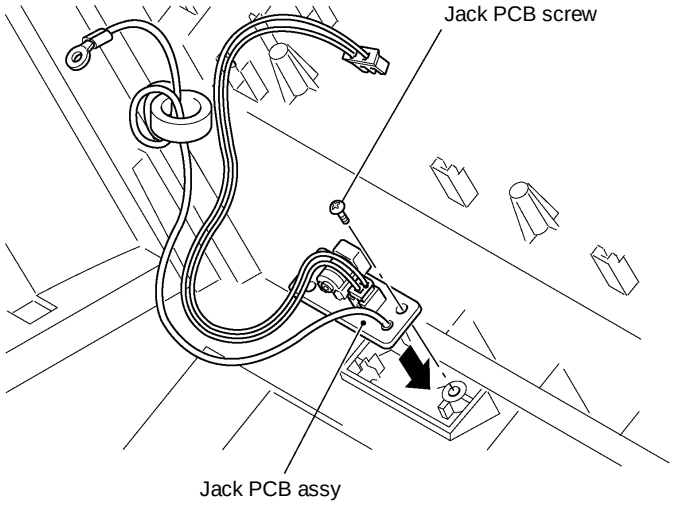



Fig. 4.15-1 Installing the Jack PCB Assy

## 4.15.2 Installing Main PCB Assy 1

1. Install the Main PCB assy 1 to the Bottom cover with the four Main PCB screws.
   * On a newly supplied part, cut away the PST SENSOR PCB assy.
2. Attach the Jack PCB Power harness assy (red/black) to the Main PCB assy 1.

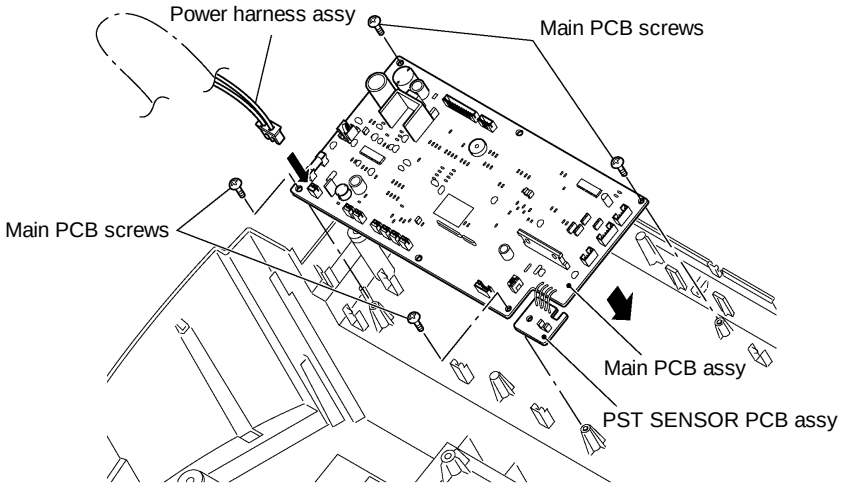



Fig. 4.15-2 Installing Main PCB Assy 1

# 4.16 Chassis Assy CL2000011

## 4.16.1 Installing the Chassis Assy

1. Locate the Chassis assy aligned with the two bosses on the Bottom cover B. Fasten it with the four Bottom cover screws A with four washers.

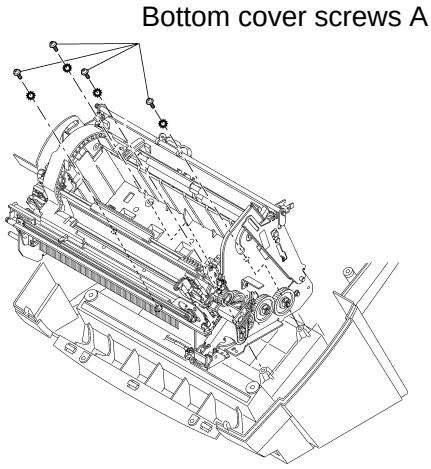



Fig. 4.16-1 Installing the Chassis Assy 1

2. Install the Chassis assy under the Bottom cover B using the two Bottom cover screws B and Spring washers.

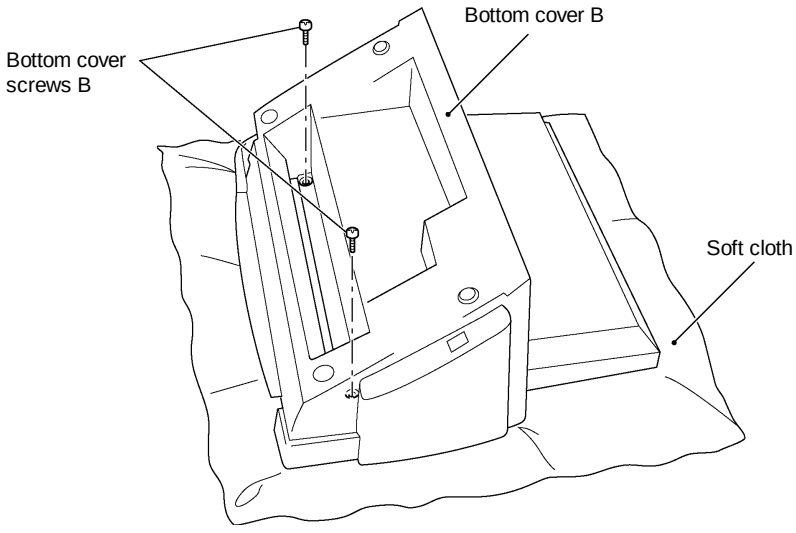



Fig. 4.16-2 Installing the Chassis Assy 2

3. Attach the Ground wire to the Main chassis B using the Ground wire screw.

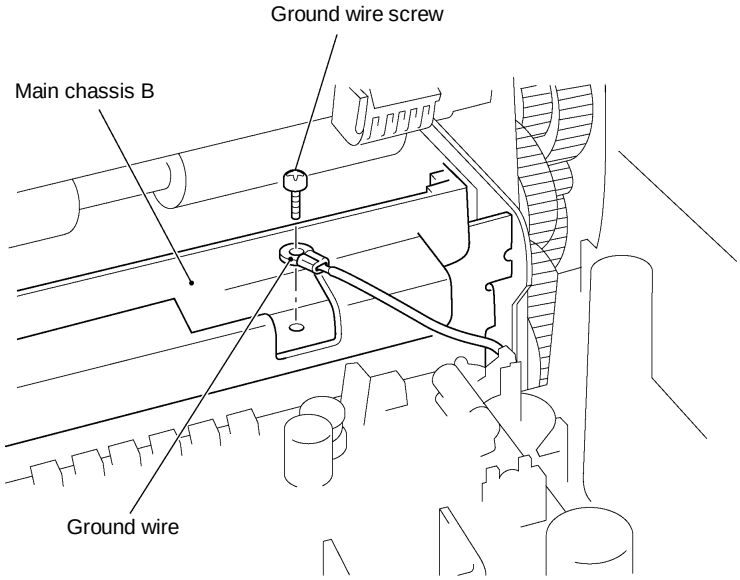



Fig. 4.16-3 Installing the Chassis Assy 3

* The Chassis perpendicularity must be adjusted after the Chassis assy is installed to the Bottom cover. See Section 6. Maintenance.

## 4.16.2 Installing the PST SENSOR PCB Assy

Attach the PST SENSOR PCB assy to the Main chassis B with the PST SENSOR PCB screws.

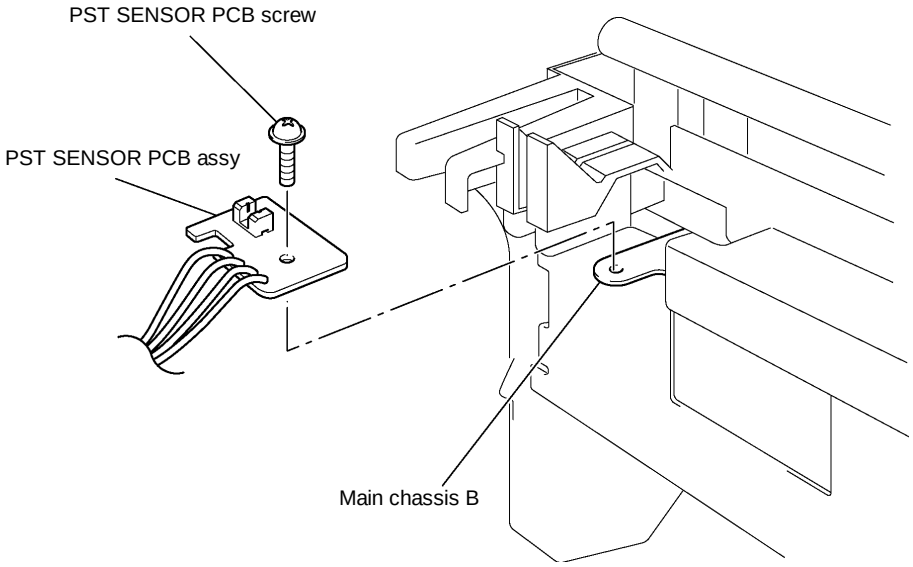
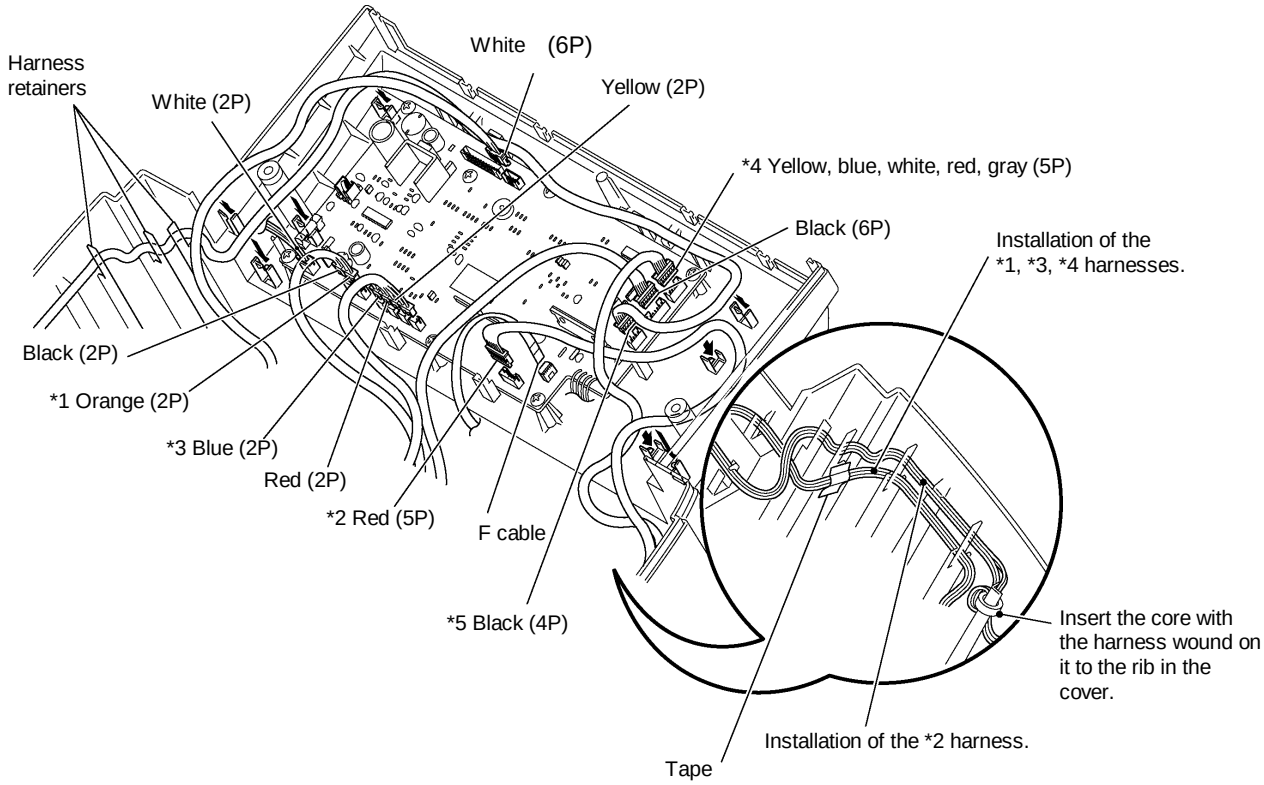



Fig. 4.16-4 Installing the PST SENSOR PCB Assy

## 4.16.3 Installing the Harness Connectors CL2000011

1. Attach the harness connectors (except the power harness assy) to the Main PCB according to the color sequence shown in the diagram.
2. Connect the harnesses along the paths shown in the diagram.
3. Tape harnesses *1, *3, and *4 to the right face of Bottom cover B.
   Pass the *5 Black (4P) cable through the three harness retainers.
4. Install the F cable as shown in the diagram below.



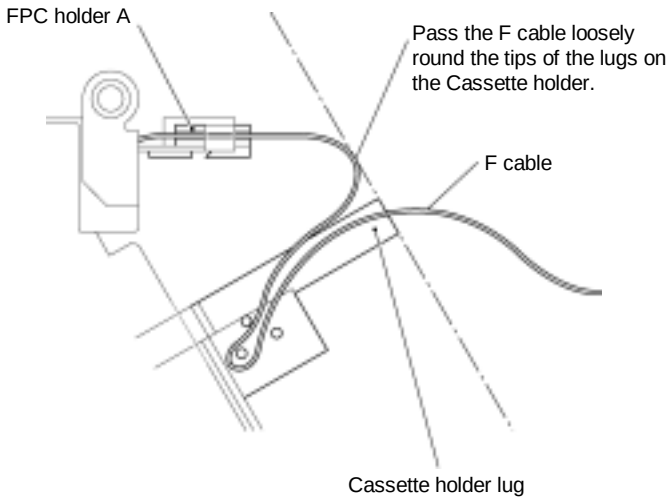




Fig. 4.16-5 Installing the Harness Connectors

# 4.17 Covers

## 4.17.1 Installing the Push SW Assy

Attach the Push SW assy 1 and Push SW assy 2 to the Dial switch holder with the Push switch screws.

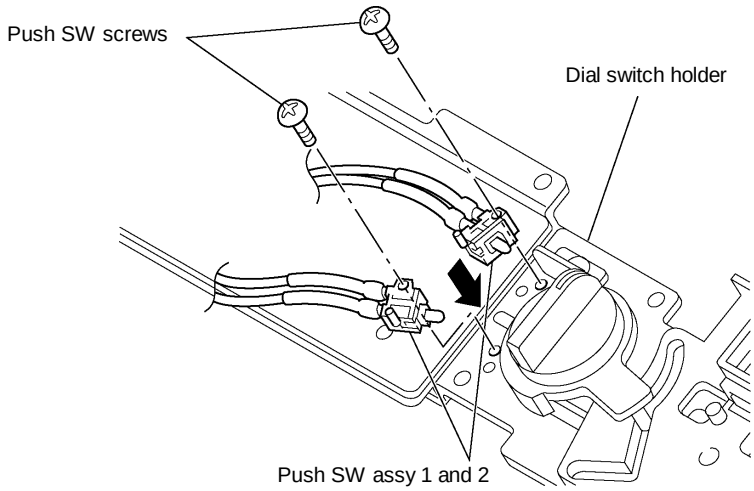



Fig. 4.17-1 Installing the Push SW Assy

## 4.17.2 Installing the Dial Switch Holder Assy

1. Connect the Push SW assy 1 and Push SW assy 2 harness connectors to the SW PCB.

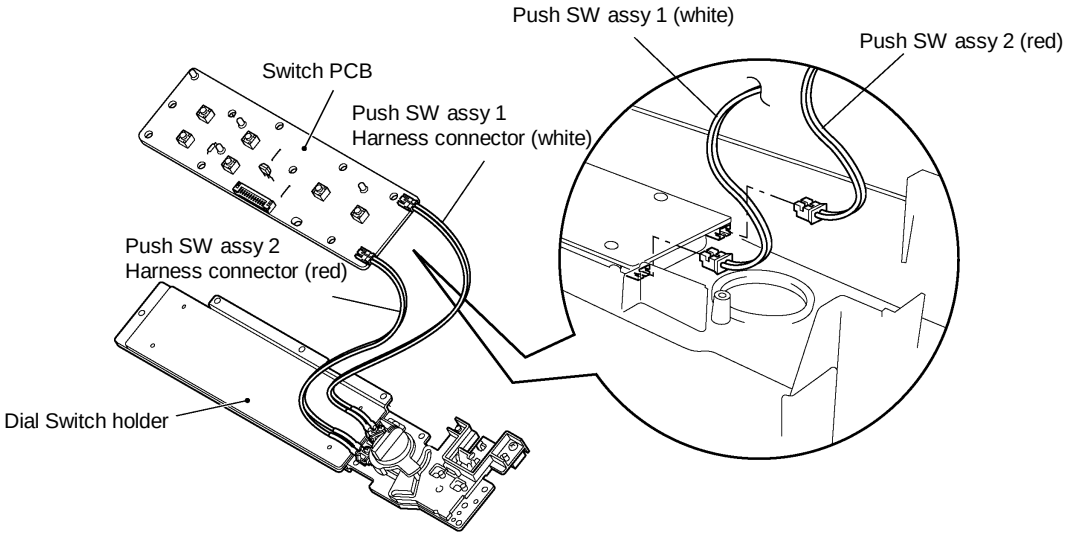



Fig. 4.17-2 Installing the Dial Switch Holder Assy 1

2. Turn over the Body cover and attach the Start key, Stop key, Two-connection switch, Continuous key, and Extra border key.

   Check that the LED lenses are correctly aligned with the front of the cover.

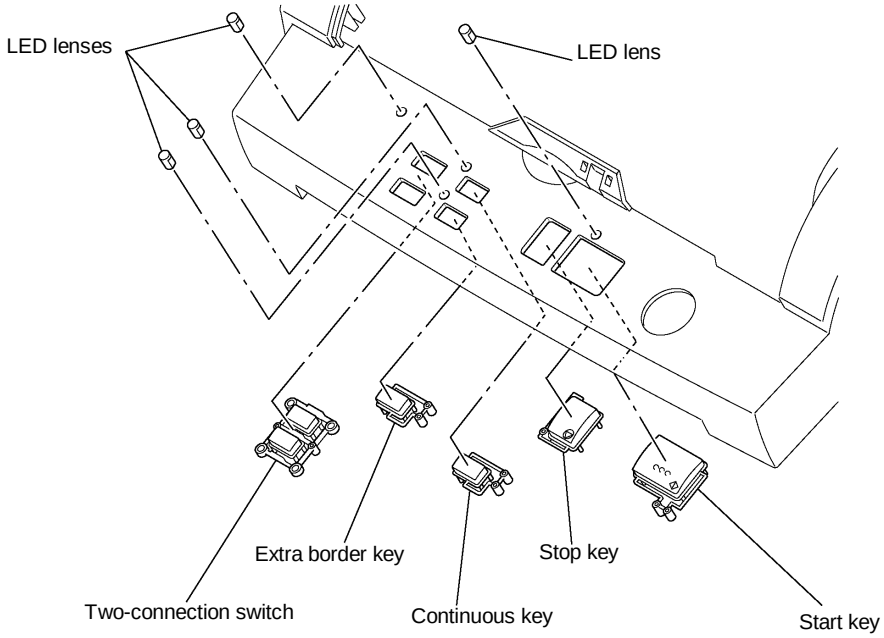



Fig. 4.17-3 Installing the Dial Switch Holder Assy 2

3. Mount the SW PCB assy to the Body cover with the eight SW PCB screws.

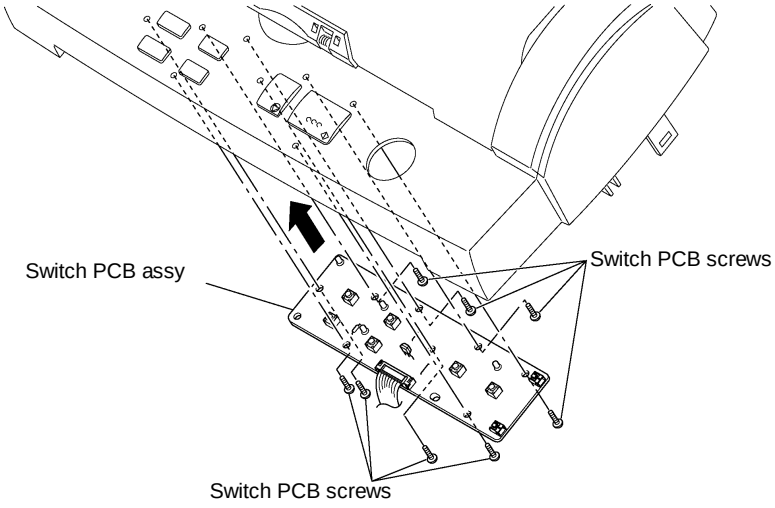



Fig. 4.17-4 Installing the Dial Switch Holder Assy 3

4. Attach the Dial switch holder assy to the Body cover with the Dial switch holder screws.

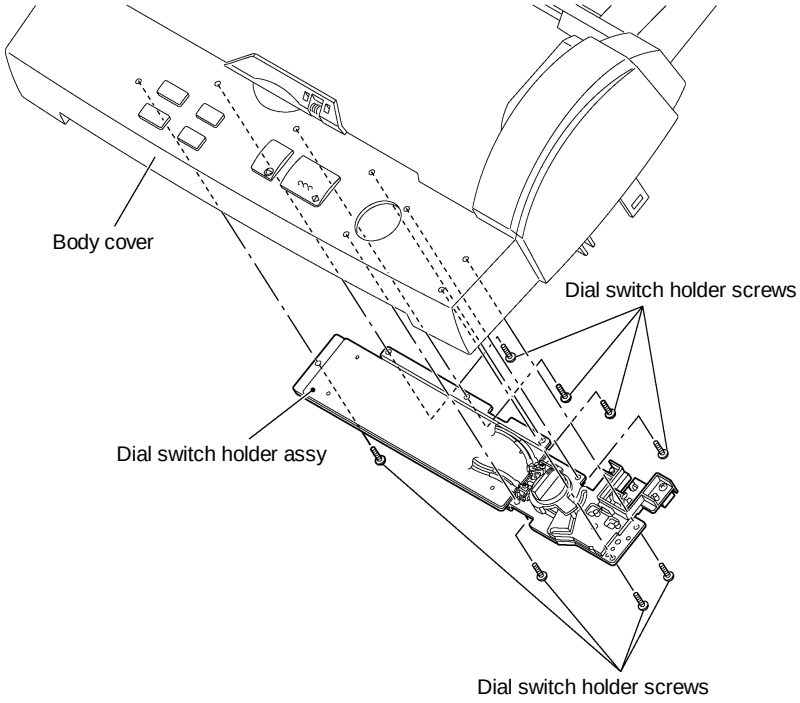



Fig. 4.17-5 Installing the Dial Switch Holder Assy 4

### 4.17.3 Installing the Cover Switch

1. Align the Cover SW assy with the boss hole on the inside surface at the right of the Body cover and attach it with the Cover switch screw.
2. Install the harnesses for the Dial SW assy and Cover SW assy inside the right of the Body cover and fasten them with the hooks (Part A).

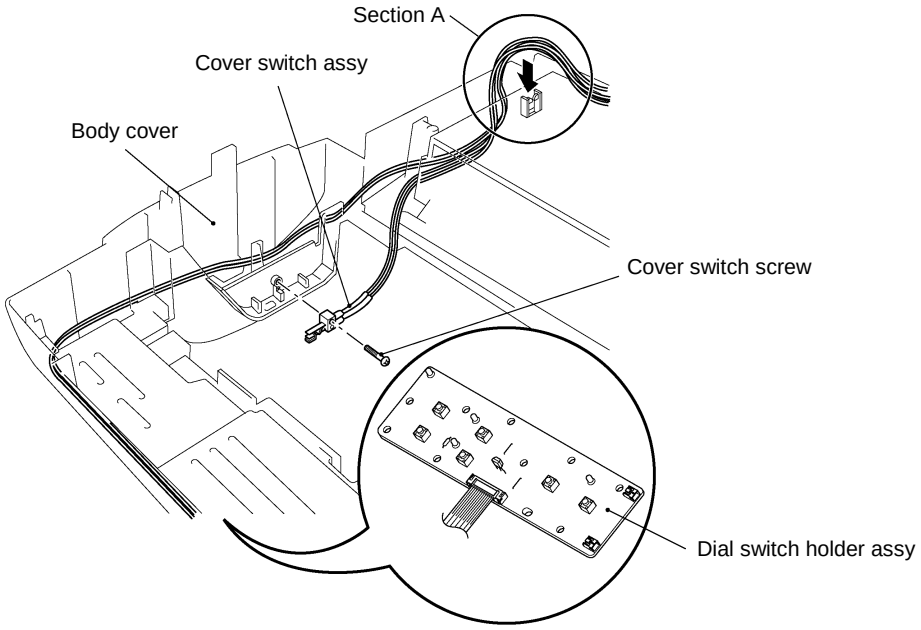



Fig. 4.17-6 Installing the Cover Switch

### 4.17.4 Installing the Back Cover

1. Install the Back cover by flexing the cover and inserting the shafts into the shaft recesses in the Body cover.
2. Install the Back cover spring.

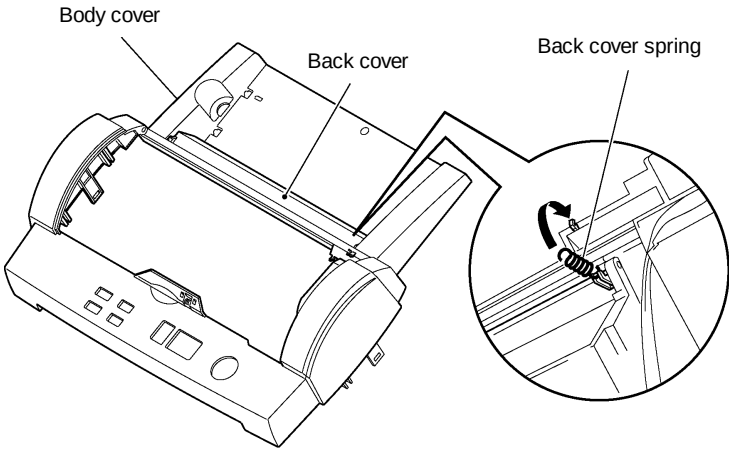



Fig. 4.17-7 Installing the Back Cover

## 4.17.5 Installing Paper Tray B CL2000011

1. Insert the Paper tray B onto the Paper feed roller from the direction of arrow A, then slide it in the direction of arrow B to engage the lugs into slits in the Cassette holder.

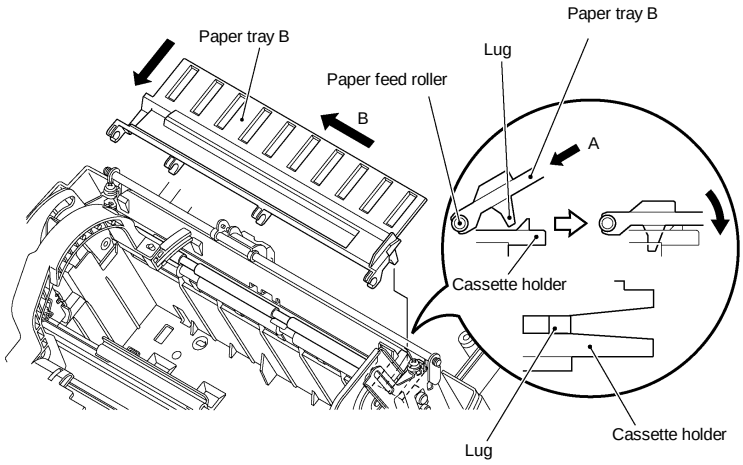
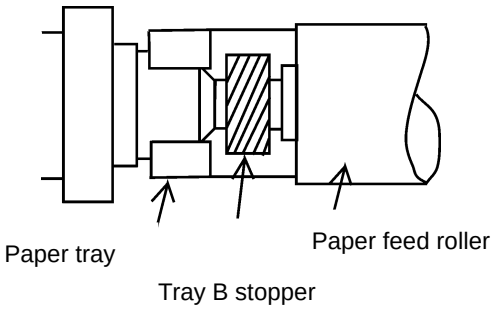



Fig. 4.17-1 Installing Paper Tray B

2. Insert the Tray B stopper onto the Paper feed roller.

* After assembling Paper Tray B with Paper feed roller, insert Tray B stopper onto the slashed portion of the right figure.

Left side of Paper feed roller




## 4.17.6 Installing the Front Cover

1. Align the hooks at the bottom and insert the Front cover.

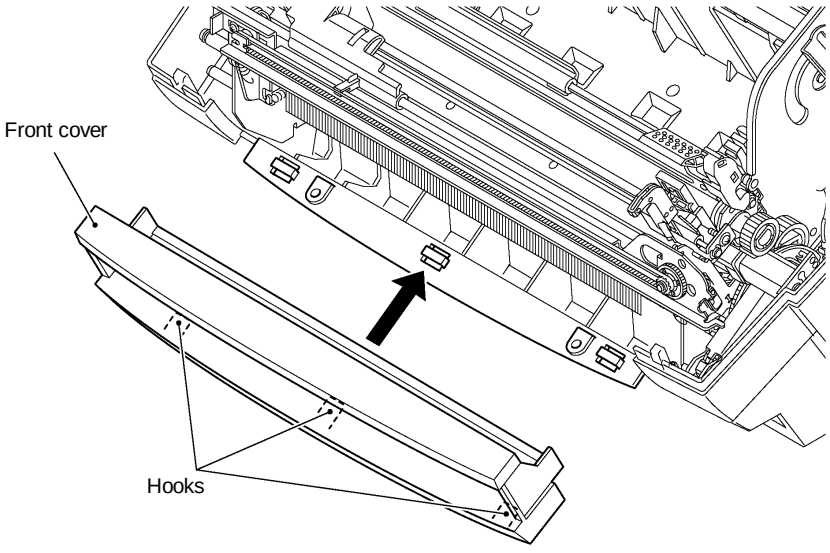



Fig. 4.17-1 Installing the Front Cover 1

2. Fasten the Front cover with the two Front cover screws at the rear.

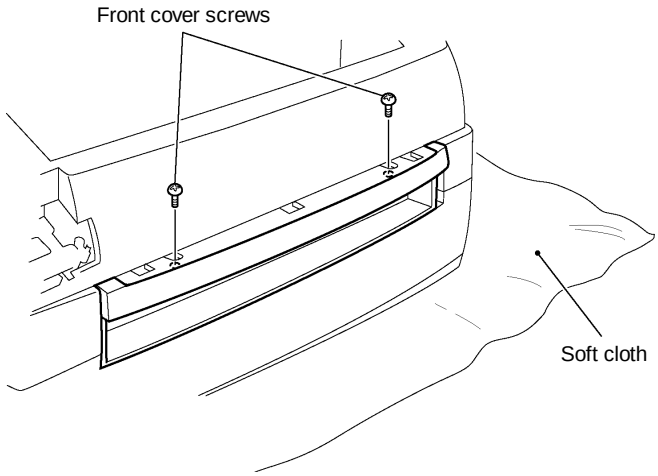



Fig. 4.17-10 Installing the Front Cover 2

## 4.17.7 Installing the Body Cover

1. Connect the Switch harness assy and the Cover SW assy to the Main PCB.

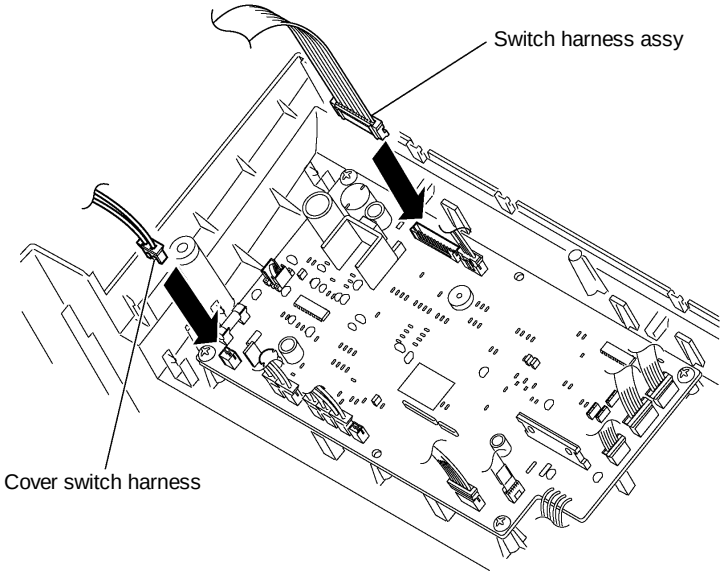



Fig. 4.17-11 Installing the Body Cover 1

2. Put the Body cover on the Bottom cover, slightly in front of its correct position. Insert the Paper tray B into the paper feed slot in the Body cover.
3. Insert the Y-cutter guide R lug into the slots in the Dial SW assy in front of the Body cover.

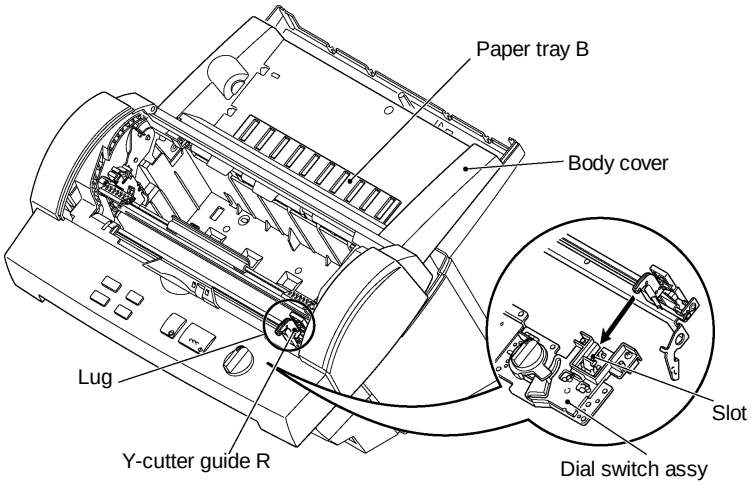



Fig. 4.17-12 Installing the Body Cover 2

4. Push the Body cover down while holding down the Y-diversion lever.
   * Take care not to apply too much force. Not much force is required if Step 3 is conducted correctly.
5. Check that the two hooks at the front of the Body cover are engaged. Repeat from step 2 if the hooks are not engaged.
6. Check that the two hooks at the sides of the Body cover are engaged. Press down on Part A if the hooks are not engaged.
7. Push down the rear of the Body cover to engage the six hooks.

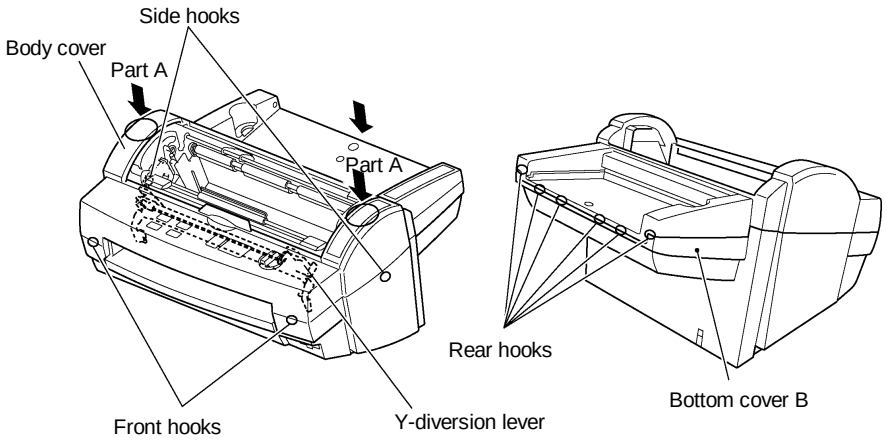



Fig. 4.17-13 Installing the Body Cover 3

8. Fasten the Body cover with the two Bottom cover screws A under the cover and the single screw at the top.
   * When inverting the unit to perform this work, place it on a soft cloth to avoid scratching the cover.

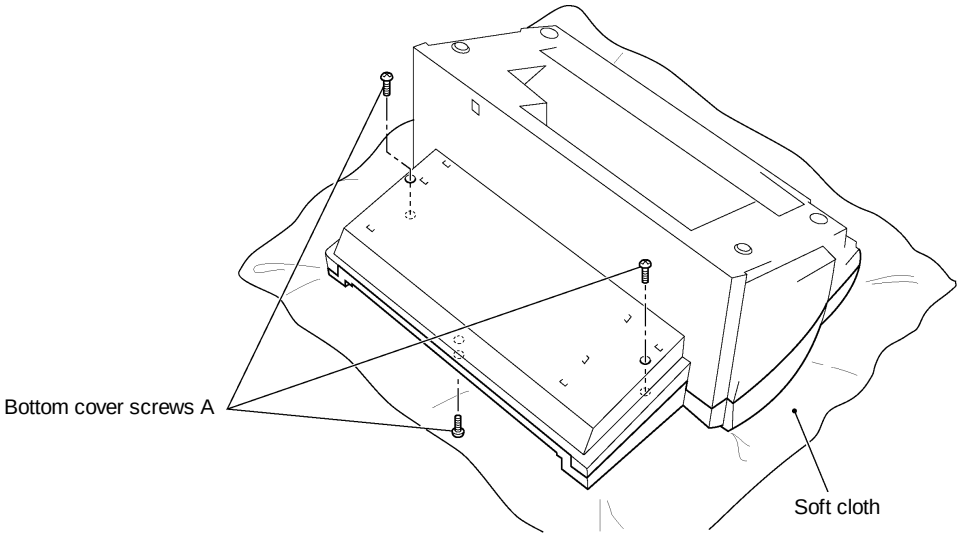



Fig. 4.17-14 Installing the Body Cover 4

## 4.17.8 Installing the Paper Tray A and Paper Guide

1. Engage the hooks at the rear of the Paper guide into the grooves in Paper tray A.

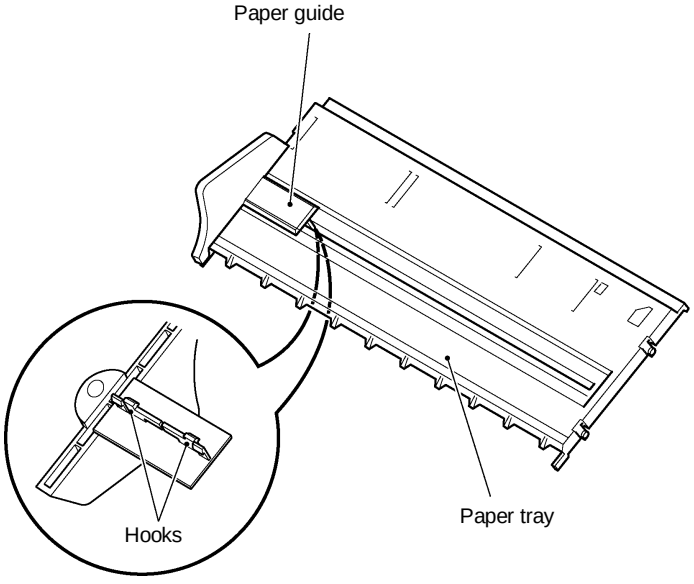



Fig. 4.17-15 Installing the Paper Guide

2. Insert the Paper tray hooks at the left edge and the Body cover, then insert the hooks at the right edge.

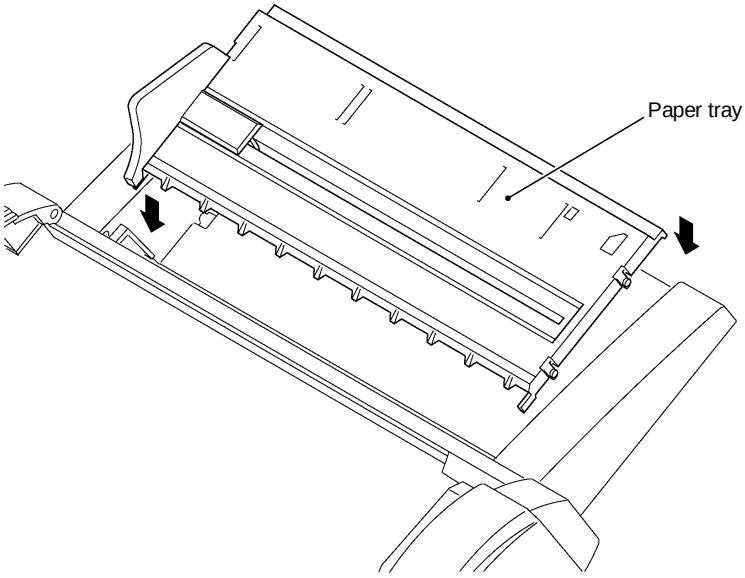



Fig. 4.17-16 Installing the Paper Tray

## 4.17.9 Installing the Sub-tray

Flex the center of the Sub-tray toward you and insert the shafts into the shaft recesses in the Body cover to install the Sub-tray. The Sub-tray can be folded in the direction of the arrow.

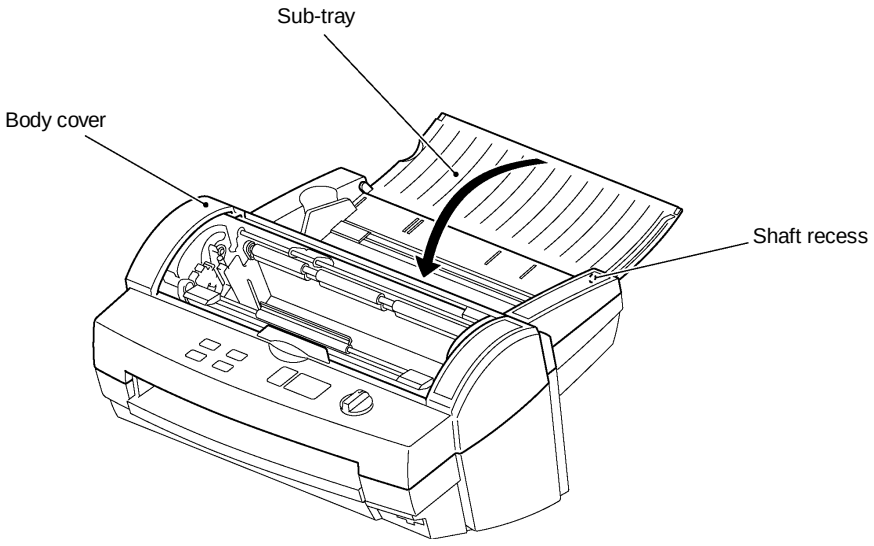



Fig. 4.17-17 Installing the Sub-tray

## 4.17.10 Installing the Top Cover B

With the Top cover B in the open position, insert the shafts into the shaft recesses in the Body cover to install the Top cover B.

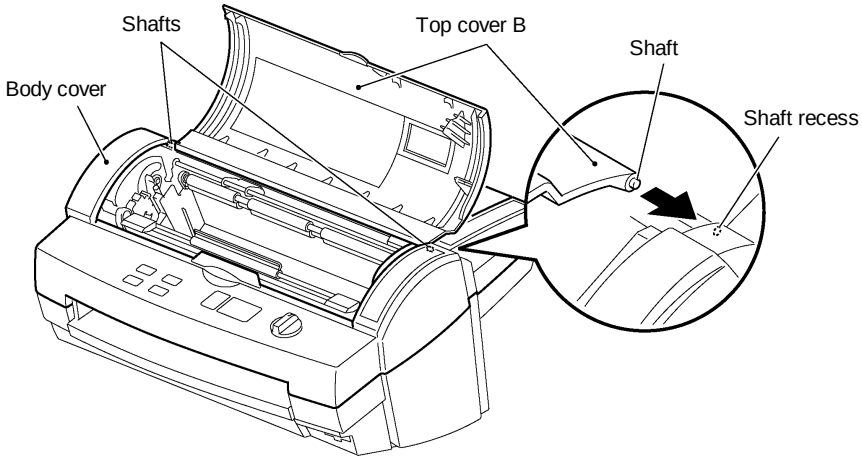



Fig. 4.17-18 Installing the Top Cover B

## 4.17.11 Installing the Trimmer Upper Cover

1. Insert Part A of the Chassis into Part B of the Trimmer upper cover. Align the two bosses and fasten the cover with the two Trimmer upper cover screws.

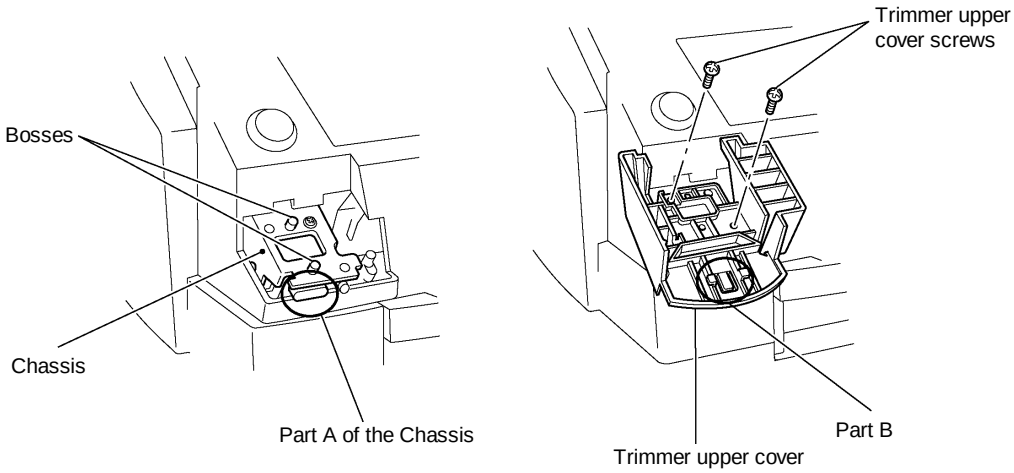



Fig. 4.17-19 Installing the Trimmer Cover 1

2. Insert the T-cutter plate into Trimmer upper cover.
3. Insert the Trimmer bottom cover.

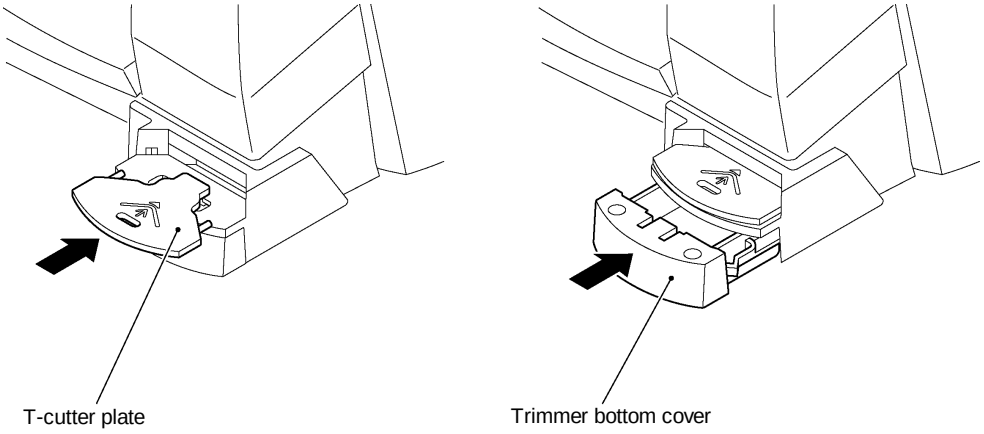



Fig. 4.17-20 Installing the Trimmer Cover 2

# 4.18 Installing the Y-cutter

Slide the Y-cutters from each end of the Y-diversion lever and pull them upward to install them.

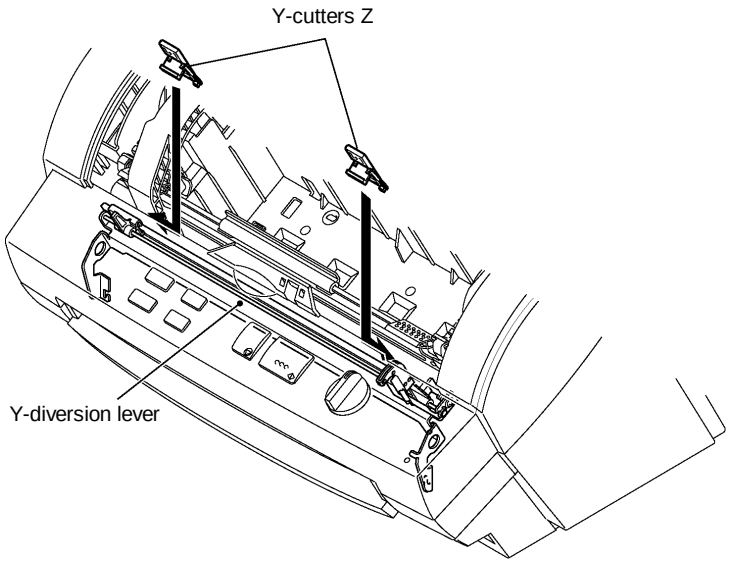



Fig. 4.18-1 Installing the Y-cutter

# 4.19 Installing the Film Cartridge

## 4.19.1 Installing the A3 Cartridge

1. Insert the Film cartridge with the tape outlet toward you and lower the Roller holder assy.

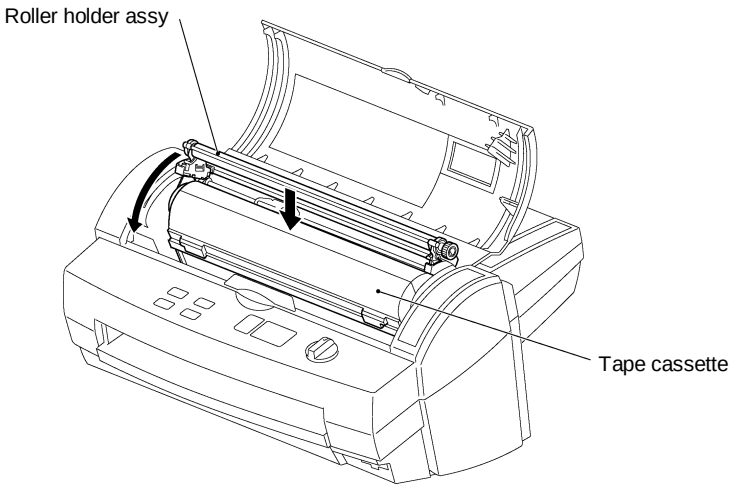



Fig. 4.19-1 Installing the Film Cartridge 1

2. Push the Set buttons R/L to lock the Roller holder assy. Close the Top cover.

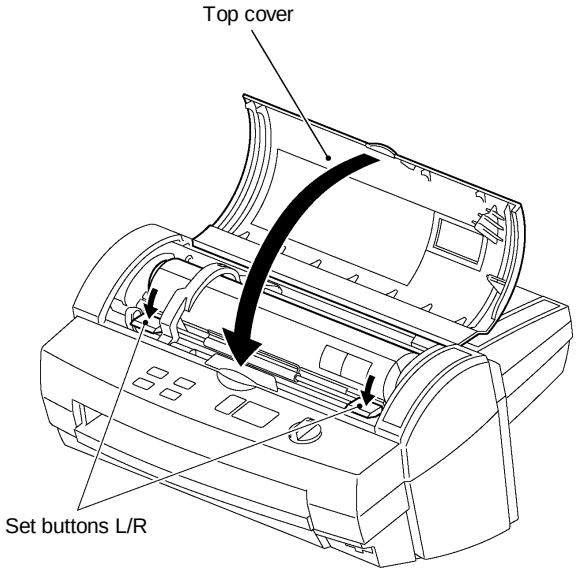



Fig. 4.19-2 Installing the Film Cartridge 2

* For a detailed description how to install the Film cartridge, see 6.2.1 Replacing the Cartridge in Section 6. Maintenance.

### 4.19.2 Installing the A4/A6 Cassette Attachment

1. Insert the A4/A6 cassette attachment with the handle at the left.
2. Follow the method described for the A3 cartridge to insert the A4/A6 cartridge.

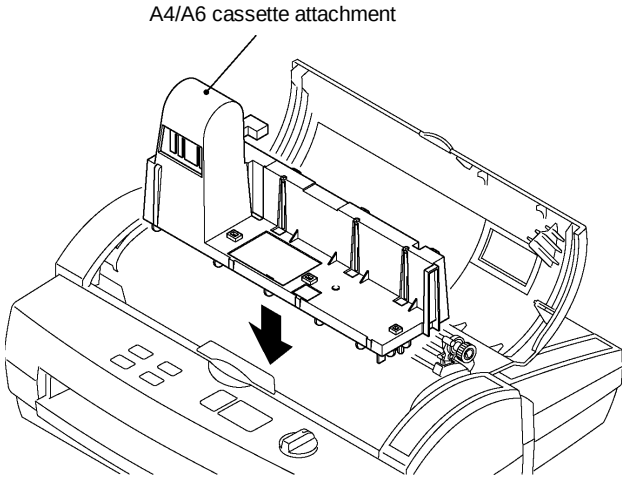



Fig. 4.19-3 Installing the A4/A6 Cassette Attachment

# Chapter 5.

# ELECTRONIC CONTROLLERS

# CONTENTS

## Chapter 5. ELECTRONIC CONTROLLERS

# 5.1 Electronic Parts

## 5.1.1 Configuration of the Electronic Parts

The electronic parts of the unit comprise the following PCBs and an AC adaptor.

- Main PCB
- Switch PCB
- Jack PCB
- Paper size sensor PCB (Y-CA sensor PCB)
- ENC PCB
- Document Detect PCB (PST sensor PCB)
- AC adaptor

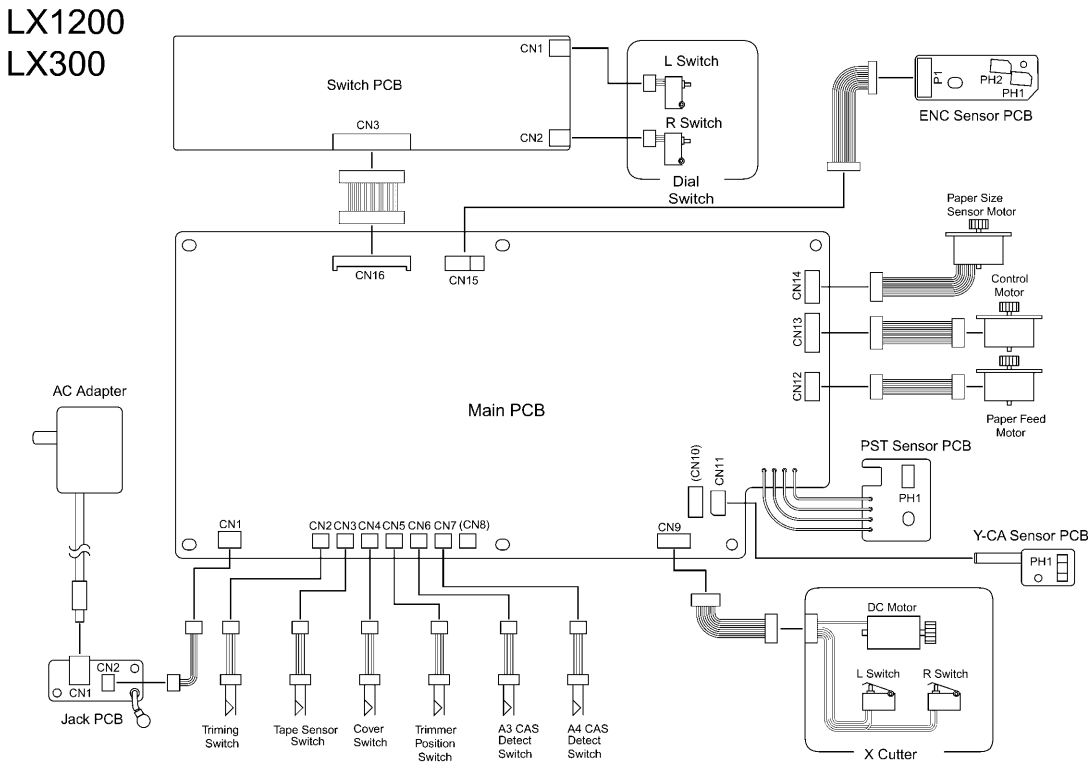



Fig. 5.1-1 Configuration of the Electronic Parts

## 5.1.2 Outline of the Electronic Parts

Each PCB and the AC adaptor are described below.

- Main PCB

  The main PCB is located below the paper guide. It is connected to all PCBs, motors, switches, and cables.

  It converts the unstabilized DC voltages input from the Jack PCB to stabilized +5V and +24V DC voltages, which are supplied to all controllers.

  The Main PCB controls motors, LED indicators, and buzzers according to the signals input from the detector circuits on the Switch PCB, Paper size sensor PCB, ENC PCB, and on the Main PCB itself.

- Switch PCB

  The Switch PCB is located at the rear of the Body cover. It is connected by a cable to the Main PCB.

  On the Switch PCB are mounted the Two-connection switch, Start key, Stop key, Continuous key, and Extra border key. LEDs to indicate power ON, continuous mode, extra and errors; and connectors to connect to push switches of dial switch.

- Jack PCB

  The Jack PCB is located at the jack input at the rear of the bottom cover. It supplies unstabilized DC voltages from the AC adaptor to the Main PCB.

- Paper size sensor PCB (Y-CA sensor PCB)

  The Paper size sensor PCB is located on the Y-carriage. The sensor to detect the document width is mounted on this PCB.

- ENC PCB

  The ENC PCB is located on the side of the film cartridge holder. The sensor to detect the film type is mounted on this PCB.

- Document Detect PCB (PST sensor PCB)

  The PST sensor PCB is mounted on the Paper feed roller unit. Sensor on the PCB detects whether a document is inserted.

- AC adaptor

  The AC adaptor converts the input AC voltage to an unstabilized DC voltage. The AC adaptor plug is connected to the Jack PCB connector.

# 5.2 Operation of Each Part

This unit is operated by three 24 V stepping motors and one DC motor (for the X-cutter assy). The operation of each motor shown in Fig. 5.1-1 is described below.

- LF motor

  This motor is used to feed the document and film and to eject the film.

  The motor is a 49 mm dia. 48-step PM stepping motor. It is set to feed the document and film approximately 1 mm per 19 steps using 2-2 bipolar drive.

- SG Motor

  This motor conducts trimming operation, drives the Y-cutter vertical movement, and switches between document feed, film feed, and film ejection.

  The motor is a 42 mm dia. 48-step PM stepping motor. A single trimming operation is completed by 266 steps in the reverse direction from the home position, then 266 steps in the forward direction. Selection between document feed, film feed, and film ejection occurs within 515 steps from the home position. The Y-cutter vertical movement requires approximately 407 steps.

- Y-CA motor

  This motor moves the Y-carriage to the edge of the document.

  The Y-cutter and paper size sensor PCB are mounted on the Y-carriage. The motor is a 24 mm dia. 24-step PM stepping motor. It is set to feed the Y-carriage approximately 1 mm per 5 steps using 2-2 phase drive.

- X-cutter (DC motor)

  This 24V DC motor and two cutter position detector switches are mounted on the X-cutter. The direction of cutter movement is determined by the direction of current flow in the DC motor.

# 5.3 Main PCB

Fig. 5.3-1 shows a block diagram of the electrical parts.

The Main PCB comprises the CPU, detector circuits (including switch status detection), motor drive circuits, and power circuits.

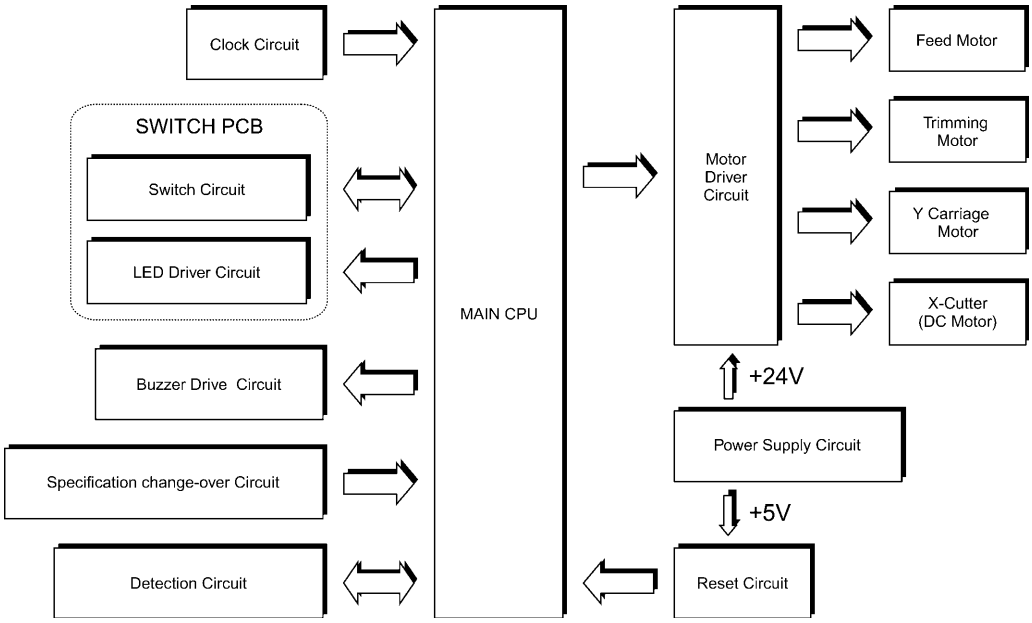



Fig. 5.3-1 Block Diagram of the Electrical Parts

■ Main CPU

The main CPU is an 8-bit CMOS microcontroller that controls the overall system.

The main CPU incorporates 1 kB RAM, 32 kB ROM, and 72 I/O ports.

The I/O map for the I/O ports is shown in Table 5.3-1 overleaf.

Table 5.3-1 CPU I/O Map

| Port | Pin No. | I/O | |
|---|---|---|---|
| P07 | 72 | OUT | N.C. |
| P06 | 71 | OUT | LF CURRENT SWITCH 0 |
| P05 | 70 | OUT | LF CURRENT SWITCH 1 |
| P04 | 69 | OUT | LF MOTOR PHASE /A |
| P03 | 68 | OUT | LF MOTOR PHASE A |
| P02 | 67 | OUT | LF MOTOR PHASE /B |
| P01 | 66 | OUT | LF MOTOR PHASE B |
| P00 | 65 | OUT | LF CURRENT SWITCH 2 |
| P17 | 24 | IN | TPS |
| P16 | 23 | IN | COV |
| P15 | 22 | IN | TR-G |
| P14 | 21 | IN | CASSETTE SIZE A3 |
| P13 (DVO) | 20 | OUT | BUZZER |
| P12 | 19 | OUT | N.C. |
| P11 (INT1) | 18 | OUT | N.C. |
| P10 | 17 | OUT | N.C. |
| P23 | 80 | IN | X-CUT2 |
| P22 | 5 | IN | X-CUT1 |
| P21 | 6 | IN | N.C. |
| P20 | 8 | IN | CASSETTE SIZE A4 |
| P36 | 79 | OUT (30mA) | ENC1-LED |
| P35 | 78 | OUT (30mA) | ENC-LED |
| P34 | 77 | OUT (30mA) | LED 1 |
| P33 | 76 | OUT (30mA) | LED 2 |
| P32 | 75 | OUT (30mA) | PST-LED |
| P31 | 74 | OUT (30mA) | YCA-LED |
| P30 | 73 | OUT (30mA) | LED 4 |
| P47 | 48 | OUT | SG MOTOR PHASE A |
| P46 | 47 | OUT | SG MOTOR PHASE B |
| P45 | 46 | OUT | SG MOTOR PHASE C |
| P44 | 45 | OUT | SG MOTOR PHASE D |
| P43 | 44 | OUT | YA MOTOR PHASE A |
| P42 | 43 | OUT | YA MOTOR PHASE B |
| P41 | 42 | OUT | YA MOTOR PHASE C |
| P40 | 41 | OUT | YA MOTOR PHASE D |
| P54 | 29 | OUT | YA MOTOR HIGH VOLT |
| P53 | 28 | OUT | SG MOTOR HIGH VOLT |
| P52 | 27 | OUT | LED 3 |
| P51 | 26 | IN | ON/OFF SWITCH 1 |
| P50 | 25 | IN | ON/OFF SWITCH 2 |
| P67 | 37 | OUT | DC-IN4 |
| P66 | 36 | OUT | DC-IN3 |
| P65 | 35 | OUT | DC-IN2 |

| Port | Pin No. | I/O | |
|---|---|---|---|
| P64 | 34 | OUT | DC-IN1 |
| P63 | 33 | OUT | N.C. |
| P62 (AIN2) | 32 | AIN | ENC |
| P61 (AIN1) | 31 | AIN | ENC1 |
| P60 (AIN0) | 30 | AIN | ACV |
| P77 | 56 | IN | SP9 |
| P76 | 55 | IN | SP10 |
| P75 | 54 | IN | SP11 |
| P74 | 53 | IN | SP12 |
| P73 | 52 | IN | PST |
| P72 | 51 | IN | YCA |
| P71 | 50 | OUT | N.C. |
| P70 | 49 | OUT | N.C. |
| P87 | 64 | IN | SP1 |
| P86 | 63 | IN | SP2 |
| P85 | 62 | IN | SP3 |
| P84 | 61 | IN | SP4 |
| P83 | 60 | IN | SP5 |
| P82 | 59 | IN | SP6 |
| P81 | 58 | IN | SP7 |
| P80 | 57 | IN | SP8 |
| P97 | 16 | OUT | N.C. |
| P96 | 15 | OUT | N.C. |
| P95 | 14 | IN | KI2 |
| P94 | 13 | IN | KI1 |
| P93 | 12 | IN | KI0 |
| P92 | 11 | OUT | KO2 |
| P91 | 10 | OUT | KO1 |
| P90 | 9 | OUT | KO0 |
| XIN | 3 | IN | XIN |
| XOUT | 2 | OUT | XOUT |
| /RESET | 4 | IN | /RESET |
| TEST | 7 | IN | TEST |
| VDD | 40 | | VDD |
| VSS | 1 | | VSS |
| VAREF | 39 | | VAREF |
| VASS | 38 | | VASS |

■ Clock Circuit

The main CPU incorporates a clock-generation circuit which uses externally mounted components. This circuit and the main CPU internal circuit generate an 8 MHz clock signal.

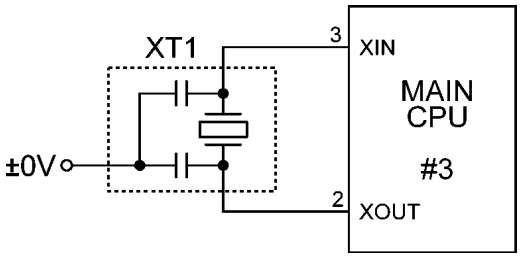



Fig. 5.3-2 Clock Circuit

■ Reset Circuit

This circuit resets the main CPU when the power is turned ON or OFF. S-80943ANMP-DD7 is used as the reset IC in this circuit.

When the power is turned ON, the reset IC holds the reset output Low for approximately 5 ms after the +5V DC power supply applied voltage reaches 4.3 V. After this period the reset output becomes High to clear the main CPU reset status.

When the power is turned OFF, after the +5V DC power supply applied voltage drops to 4.3 V, or below, the reset IC sets the reset output Low to reset the main CPU.

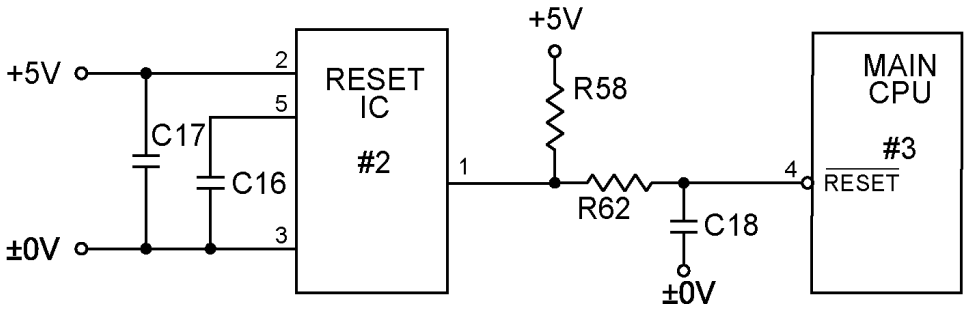



Fig. 5.3-3 Reset Circuit

■ Buzzer Drive Circuit

This circuit sounds the piezoelectric buzzer.

To sound the buzzer, the main CPU outputs a 4 kHz squarewave with 50% duty from port DV0 (P13). This signal is used to generate the buzzer sound.

To stop the buzzer, the port status is set to High level using R69 in the input mode.

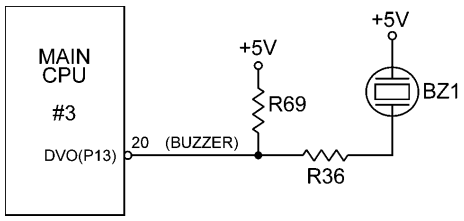



Fig. 5.3-4 Buzzer Drive Circuit

■ LED Drive Circuit

This circuit drives the four LED indicators mounted on the Switch PCB.

The LED4, LED2, and LED1 are directly driven by the high-current ports P30, P33, and P34 on the main CPU. The main CPU output port P52 lights LED3 via Q1. The LED lights when the output is Low.

When not lit, the LED is in the high-impedance status and the port level is indeterminate.

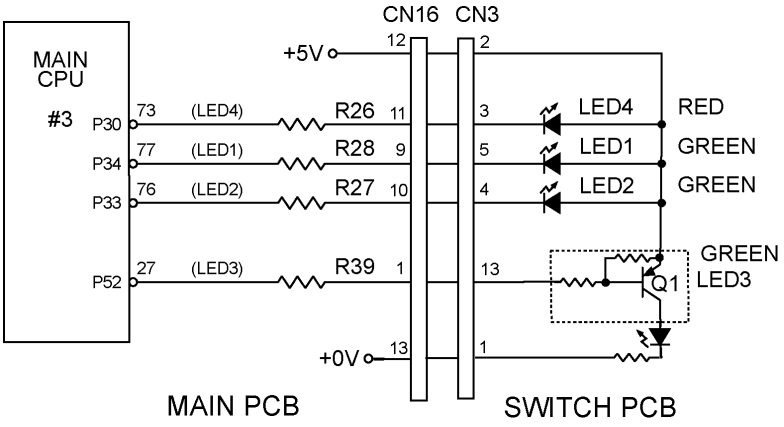



Fig. 5.3-5 LED Drive Circuit

■ Specification Switching Circuit

This circuit reads the specification switching information.

The specification switching is conducted by a ROM program built into the main CPU according to the solder point settings on the PCB.

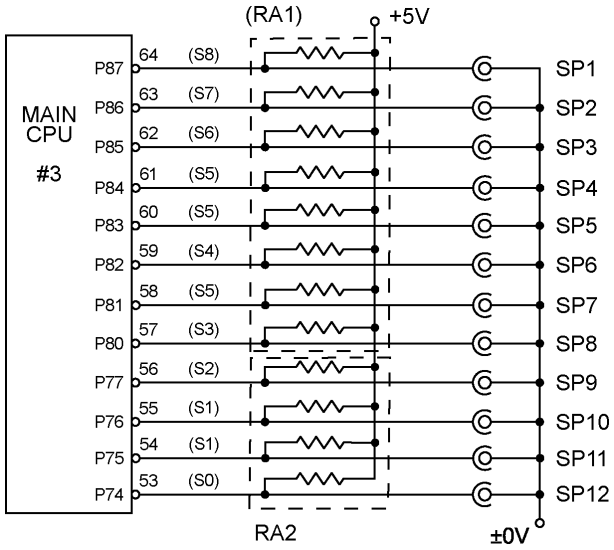



Fig. 5.3-6 Specification Switching Circuit

* Note that the solder point specifications change according to the CPU display format.
Check the solder specifications in the P/L PCB diagram.

■ Detector Circuits

These circuits detect the status of the switches and keys that operate the unit (Two-connection switch, Start key, Stop key, Dial switch, Continuous key, and Extra border key) and the sensors that determine the film type, document length and width, and cover open/closed status. The Main CPU controls the motors, LEDs and buzzer according to these input signals.

■ Motor Drive Circuits

These circuits convert the motor control signals output from the main CPU output ports to 24V drive signals and supplies these voltage signals to each motor.

■ Power Supply Circuits

These circuits convert the unstabilized DC power supply input from the Jack PCB into a stabilized +5V DC power supply for the logic ICs, including the main CPU, and into a stabilized +24V DC power supply to drive the motors.

# 5.4 Detector Circuits

These circuits detect the status of the switches and keys that operate the machine (Two-connection switch, Start key, Stop key, Dial switch, Continuous key, and Extra border key) and the sensors that determine the film type, document length and width, and cover open/closed status.

The circuits that detect each switch and sensor are listed below.

In addition, a separate switch to detect the motor initial status is also mounted.

- Switch scan circuit — Two-connection switch, Continuous key, Extra border key, Start key, and Stop key
- Dial switch circuit — RSW1•RSW2 switches
- Cover switch circuit — Cover switch
- Paper width detector circuit — YCA-F sensor
- Paper length detector circuit — PST switch
- Cartridge type detector circuit — CSIZE3•CSIZE4 switch
- Film type detector circuit — ENC sensor
- Film feed detector circuit — TPS switch
- Input voltage detector circuit — ACV signals

■ Switch Scan Circuit

This circuit in the main CPU scans the status of the FEED • CUT • START • STOP • CONT • EXTRA BORDER key, and TRI switch (leaf switch) at 15 ms intervals to continuously detect the status of each switch.

The circuit comprises a matrix of three output ports (P90, P91, P92) and three input ports (P93 to P95). A Low signal is output at 5 ms intervals from one of the two output ports and the switch status at that time is detected from the status of P93 to P95).

- When the main CPU detects that the Feed switch was pressed, it starts the document and film feed operation. The document and tape are fed in approximately 0.5 mm intervals but the document and tape are fed continuously while the Feed switch is held down.
- When the main CPU detects that the CUT switch was pressed, it operates the X-cutter to start the film-cutting operation.
- When the main CPU detects that the TRI switch was pressed, it starts the trimming operation.
- When the main CPU detects that the Start switch was pressed, it starts feeding and compressing the document in the selected automatic cutting mode.
- Automatic cutting operation is stopped when the main CPU detects that the Stop switch was pressed. Automatic cutting operation restarts when the Start switch is pressed again.
- The continuous mode is selected when the Continuous key (CONT SW) is pressed.
- The Extra border mode is selected when the main CPU detects that the Extra border key was pressed.

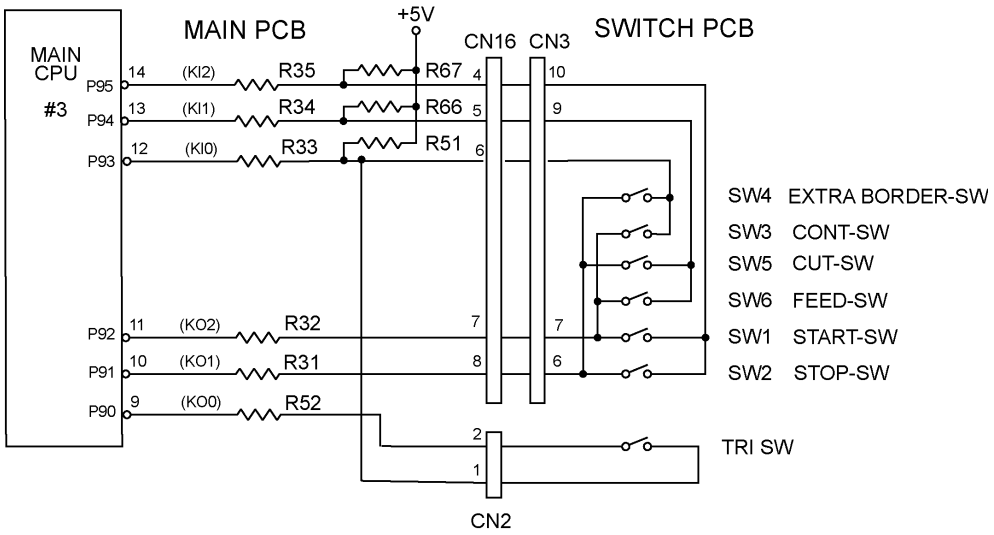



Fig. 5.4-1 Switch Scan Circuit

■ Dial Switch Circuit

This circuit detects the automatic cutting mode selected on the Cutting mode selector switch.

This circuit comprises two push switches (RSW1, RSW2) mounted on each side of the dial switch. The signals detected by these two push switches are input to the Main PCB via the Switch PCB. The Dial switch circuit adopts one of four statuses corresponding to each of the following permutations: RSW1 OFF and RSW2 OFF, RSW1 ON and RSW2 OFF, RSW1 OFF and RSW2 ON, or RSW1 ON and RSW2 ON.

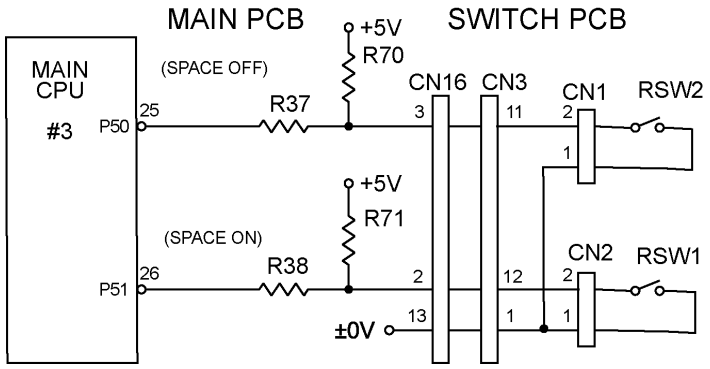



Fig. 5.4-2 Dial Switch Circuit

■ Cover Switch Circuit

This circuit detects whether the cover is open or closed.

The cover switch is located in the center of the body cover.

The signal detected by the cover switch (leaf switch) is input to the Main PCB via the Switch PCB.

The cover switch turns OFF when the cover is open and the CPU input signal (COVER) P16 becomes High status.

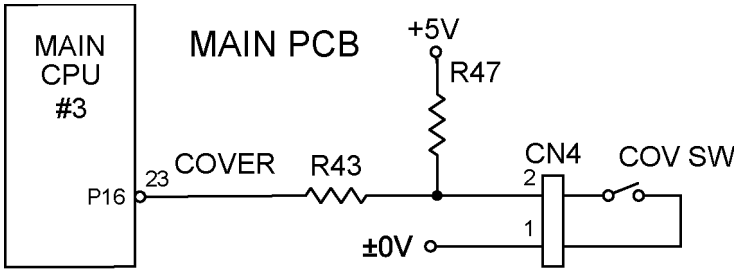



Fig. 5.4-3 Cover Switch Circuit

■ Paper Width Detector Circuit (YCA-F sensor PCB)

This circuit detects the width of the document and determines the Y-carriage position. It also determines the Y-carriage standby position when the power is ON or the cover is closed.

This circuit comprises the transmissive photosensor PH1 mounted on the Paper width detector PCB that is attached to the Y-carriage. If the Y-carriage is in its standby position, the photosensor is not interrupted. When the main CPU output P31 (YCA-LED) is Low, the input signal P72 (YCA-F) becomes Low.

When the Y-carriage motor rotates after the insertion of a document, the Y-carriage moves from the standby position to cause the Actuator Y to cut off the photosensor. Further rotation of the Y-carriage motor moves the Y-carriage to the edge of the document, where the Actuator Y having cut off the photosensor (Y-CA sensor) comes off the photosensor, thereby detecting the edge of the document. Also, determines the Y-carriage (Y-cutter) position meeting the selected Auto Cut mode status.

When the document edge is detected, the main CPU input signal P72 (YCA-F) becomes Low. However, as P31 is normally at High-impedance status, the photosensor (Y-CA sensor) does not operate and the main CPU input signal P72 (YCA-F) remains High, irrespective of the Y-carriage position.

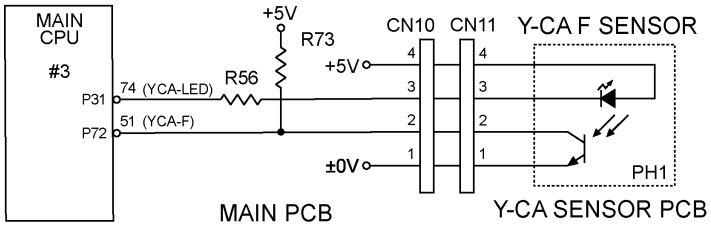



Fig. 5.4-4 Paper Width Detector Circuit

■ Document Detect PCB (PST sensor PCB)

This circuit detects the length of the document and determines the X-cutter position.

This circuit comprises the transmission photosensor PH1 on the PST sensor PCB. It is mounted on the Paper eject roller unit. When a document is inserted, it displays the Sensor lever that was cutting the photosensor to turn ON the photosensor PH1 and set the CPU input signal (P52) to Low status.

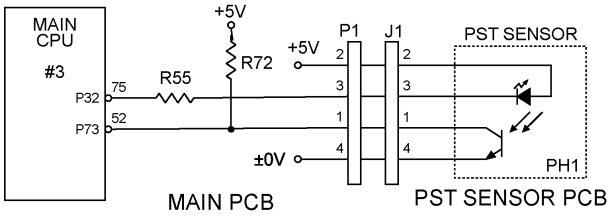



Fig. 5.4-5 Document Detect Circuit

■ Cartridge Type Detector Circuit

This circuit detects the type of film cartridge.

The Cartridge type detector switch CSIZE3 is mounted at the film cartridge inlet. When an A3 film cartridge is inserted, the A3 film cartridge presses the Cartridge type detector switch CSIZE3 and turns it ON (P14 becomes LOW).

The Cartridge type detector switch CSIZE4 is mounted at the film cartridge inlet. When an A4 film cartridge is inserted, the A4 film cartridge presses the Cartridge type detector switch CSIZE4 and turns it ON (P20 becomes LOW).

The Cartridge type detector switches remain OFF when an A6 film cartridge is inserted and when no film cartridge is inserted.

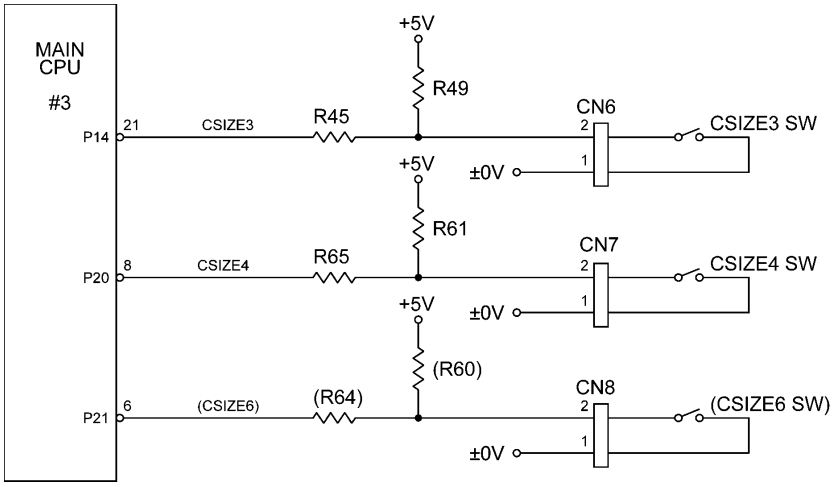



Fig. 5.4-6 Cartridge Type Detector Circuit Film Type Detector Circuit

■ Film Type Detector circuit (ENC sensor PCB)

This circuit detects the type of film.

This circuit comprises a reflective photosensor that is mounted on the film detector PCB, located on the side of the film cartridge holder. The reflective photosensor reads the silver-black target pattern along the side of the film to determine the film type.

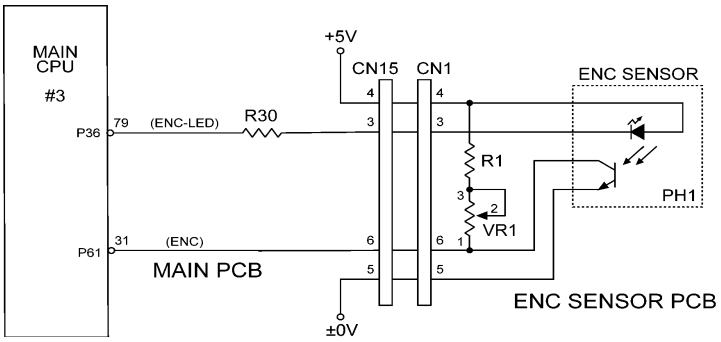



Fig. 5.4-7 Film Type Detector Circuit

■ Film Feed Detector Circuit

This circuit detects the film feed status to prevent jams if a problem occurs.

The film feed detector switch TPS is mounted before the paper eject roller and if there's no problem with the film during document feed or compression, the film presses against the film feed detector switch TPS and sets the ON (input Low).

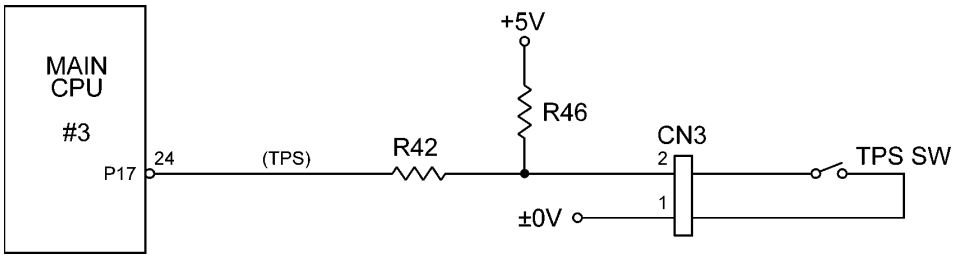



Fig. 5.4-8 Film Feed Detector Circuit

■ Input Voltage Detector Circuit

This circuit detects the AC adaptor output voltage to prevent danger due to an AC adaptor that is faulty or incorrectly inserted.

The AC adapter output voltage is split by R25 and R50 and input to the CPU A/D converter port P60.

The CPU detects the AC adapter output voltage from the voltage input to the CPU A/D converter port P60.

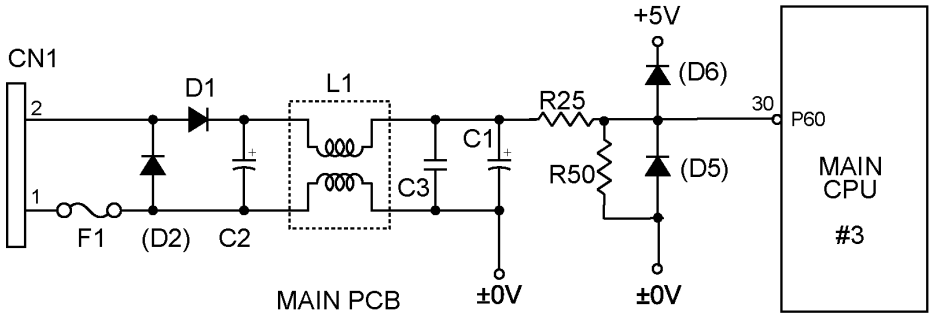



Fig. 5.4-9 Input Voltage Detector Circuit

# 5.5 Motor Drive Circuits

■ Paper Feed Motor Drive Circuit

This circuit conducts the paper feed motor bipolar drive using 2-2 phase excitation from the +24 VDC stabilized constant voltage.

The stepping motor excitation phases A, $\overline{A}$ , B, and $\overline{B}$ are controlled by main CPU ports P03, P02, P04, and P01 and the Paper feed motor is controlled by Driver #6. The Paper feed motor current limit values can be switched using P00, P05, and P06.

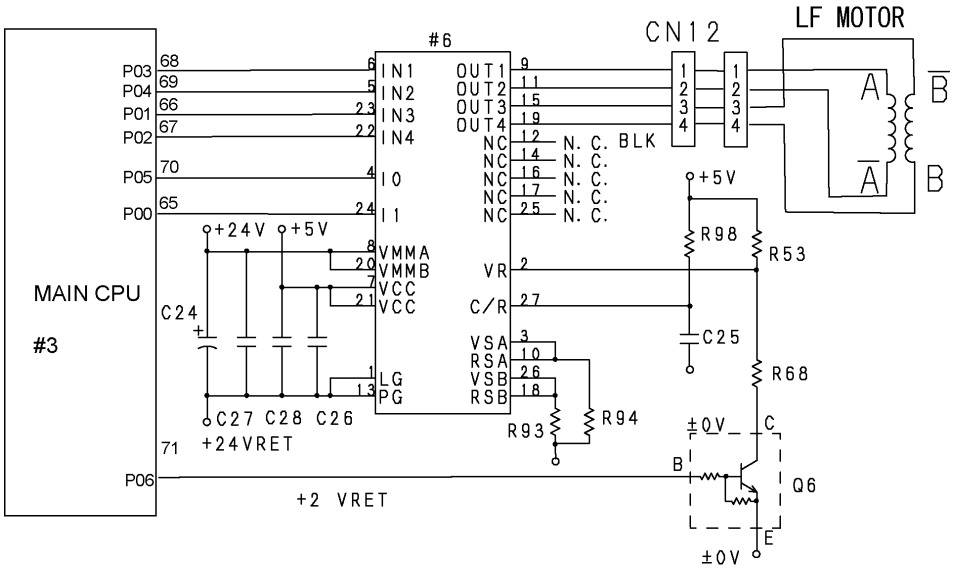



Fig. 5.5-1 Paper Feed Motor Drive Circuit

■ SG Motor Drive Circuit

This circuit drives the SG motor using 2-2 phase excitation from the +24 VDC stabilized constant voltage.

The stepping motor excitation phases A, B, C, and D are controlled by main CPU ports P47, P46, P45, and P44 and the four transistors Q17 to QA20 drive the SG motor.

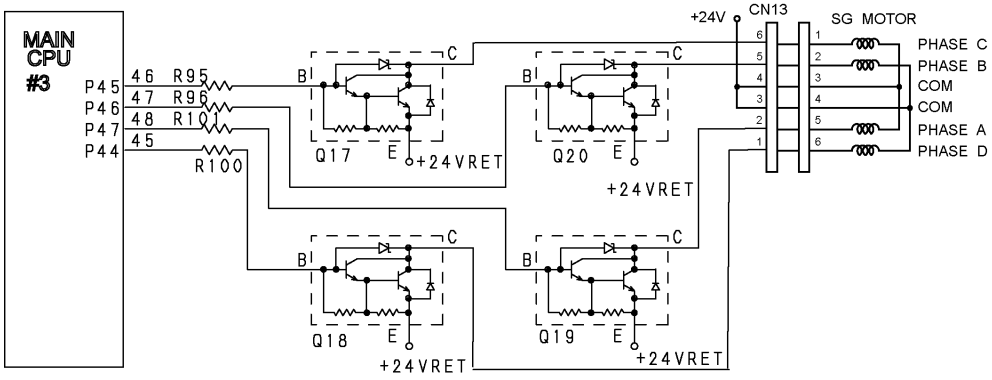



Fig. 5.5-2 SG Motor Drive Circuit

■ SG Motor Home-position Detector Circuit

This circuit detects when the SG motor is at the Trimming cam home position.

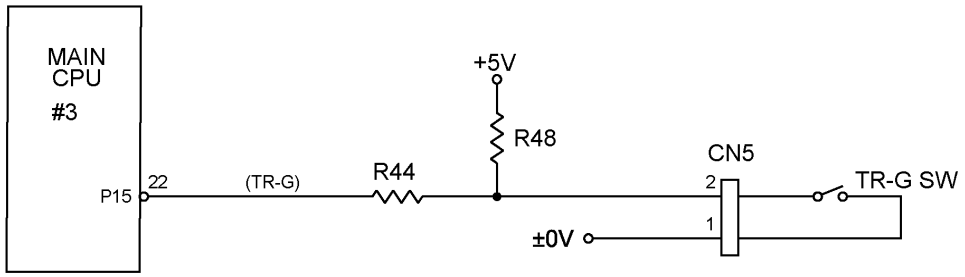



Fig. 5.5-3 SG Motor Home-position Detector Circuit

■ Y-CA Motor Drive Circuit

This circuit drives the Y-CA motor using 2-2 phase excitation from the +24V DC stabilized constant voltage and maintains a low voltage during LF motor operation.

The stepping motor excitation phases A, B, C, and D are controlled by main CPU ports P43, P42, P41, and P40, respectively. The seven transistor arrays incorporated into #5 drive the Y-CA motor.

The drive voltage is controlled by the main CPU port P54, which applies +24V DC to the Y-CA motor through transistors Q16.

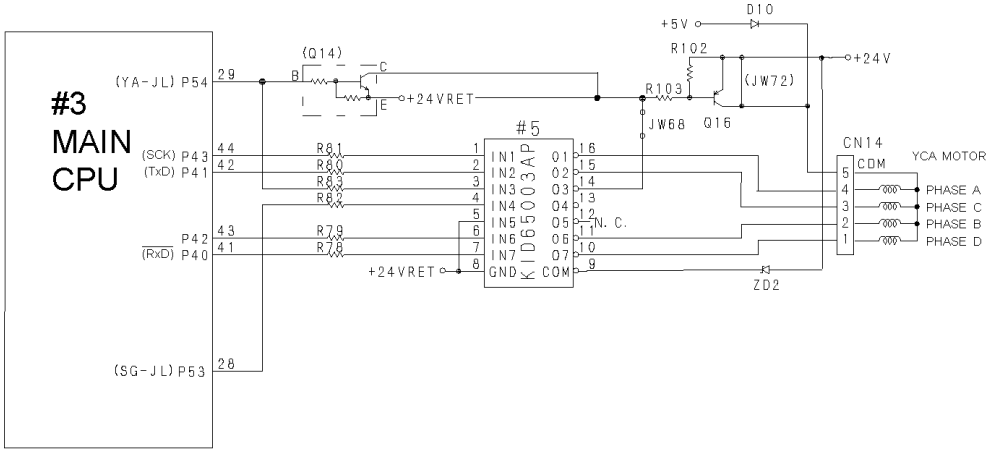



Fig. 5.5-4 Y-CA Motor Drive Circuit

■ X-cutter Motor Drive Circuit

This circuit drives the DC motor with the +24V DC stabilized constant voltage.

The X-cutter comprises a DC motor and two switches. The DC motor is controlled by the main CPU ports P64 to P67 and is driven by the DC motor control circuit. The two switches are detected by ports P22 and P23. The operation of the DC motor for each control port status is listed in Table 5.5-1.

Table 5.5-1 DC Motor Control

| P67 | P66 | P65 | P64 | DC Motor Drive |
|---|---|---|---|---|
| High | Low | Low | High | TURN LEFT |
| Low | High | High | Low | TURN RIGHT |
| High | Low | High | Low | BRAKE |
| Low | Low | Low | Low | OFF |

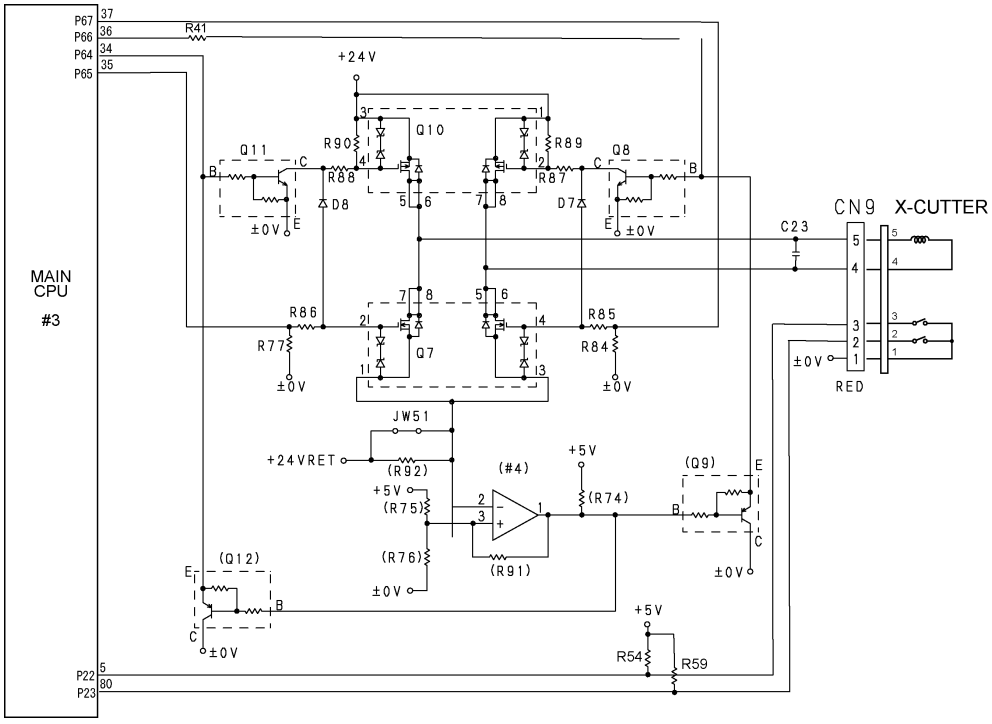



Fig. 5.5-5 X-cutter Motor Drive Circuit

# 5.6 Power Supply Circuits

The power supply circuits receive the unstabilized DC voltage supplied to CN1 from the AC adaptor through the Jack PCB via fuse F1 (protective circuit), and the filter circuit.

The 2-channel switching power IC (IC#1) in the circuits converts the unstabilized DC voltage into a stabilized +5V voltage (logic power supply) and into a stabilized +24V DC voltage (drive power supply).

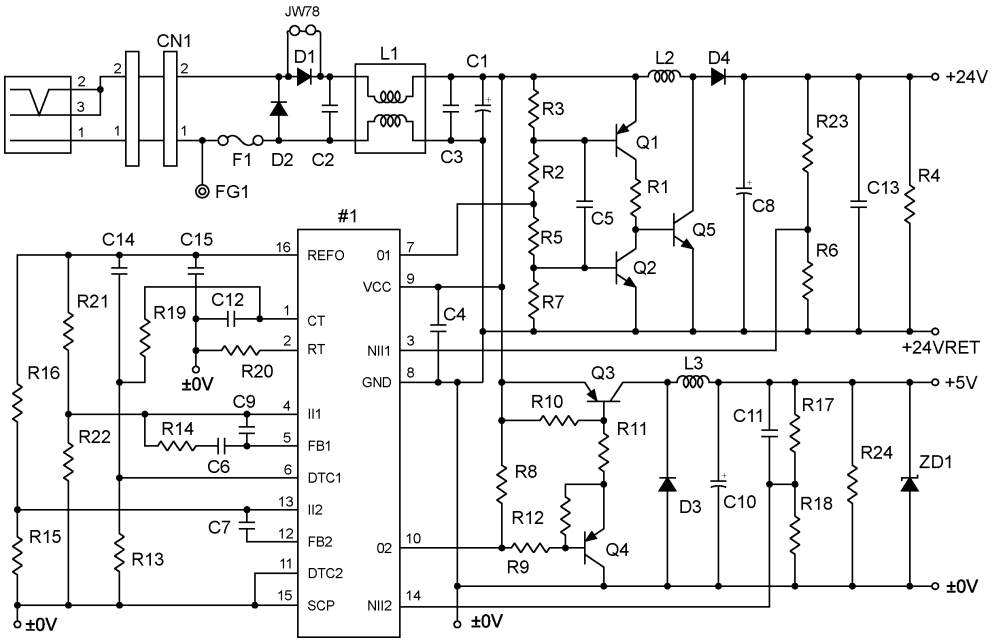



Fig. 5.6-1 Power Supply Circuits

■ +5V Power Supply

Fig. 5.6-2 shows the timing chart of the power IC (IC#1) for the +5V DC power supply during idling.

In this circuit, the transistor Q3 switches at approximately 100 kHz to convert the unstabilized input voltage to a stabilized +5V supply.

When transistor Q3 is ON, energy accumulates in the coil L3 and electrolytic capacitor C10 until they are able to supply a +5V voltage. Transistor Q3 turns OFF and the energy is supplied by diode D3. The transistor Q3 switching ratio is changed by the load current to create a stable supply. This control is conducted in the power IC.

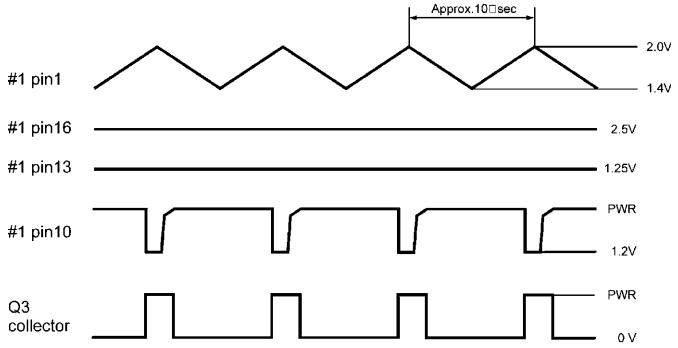



Fig. 5.6-2 +5V Power Supply

■ +24V Power Supply

Fig. 5.6-3 shows the timing chart for the +24V DC power supply during idling.

In this circuit, the transistor Q5 switches at approximately 100 kHz to convert the unstabilized input voltage to a stabilized +24V supply.

When transistor Q5 is ON, energy accumulates in the coil L2. When transistor Q5 turns OFF, this energy is supplied through diode D4 to the electrolytic capacitor C8, where it accumulates and is output as +24V DC.

The transistor Q5 switching ratio is changed by the load current to create a stable supply. This control is conducted in the power IC.

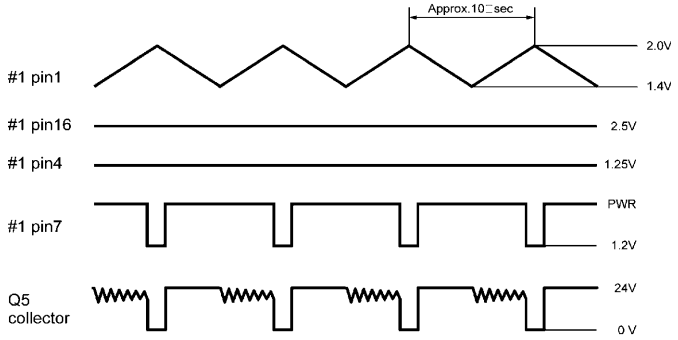



Fig. 5.6-3 +24V Power Supply

# Chapter 6.

# MAINTENANCE

# CONTENTS

## Chapter 6. MAINTENANCE

# 6.1 Lubrication

After the parts of 6.1.3 are replaced, apply lubricant to the positions indicated in 6.1.3 Lubrication Positions below. If only one of a pair of touching parts is replaced, lubricant remains on the other part and no further lubrication is required. If both of a pair of touching parts is replaced, lubricant must be applied to the indicated position.

## 6.1.1 Table of Lubricants

Use the lubricants designated below. The codes in the table below are used in the descriptions in section 6.1.3.

| Code | Lubricant Name |
|---|---|
| E | Epinoc grease #1 |
| S | Silicon grease KS64F |

## 6.1.2 Precautions during Lubrication

- Do not apply lubricant to parts other than the specified parts. The lubricant may adversely affect plastic parts or PCBs.
- Take care not to apply too much lubricant, which can then drip onto other parts. As a guideline, apply a drop the size of a grain of rice.
- Apply lubricant to contacting areas or sliding surfaces of each part at the designated position.

## 6.1.3 Lubrication Positions

■ Chassis

- Idle gear B shaft (4 positions)

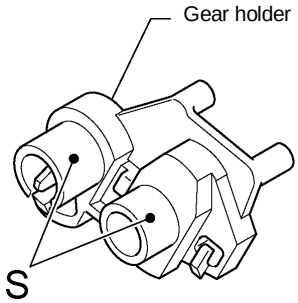
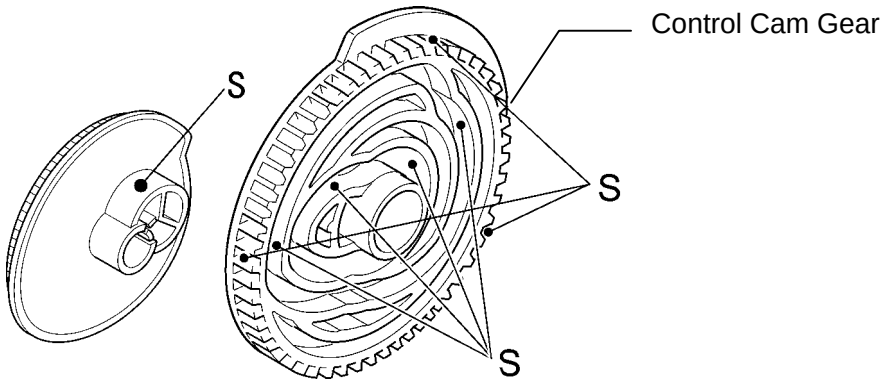



Fig. 6.1-1 Idle Gear B Shaft

- Cam groove on side of Control cam gear (8 positions)  CL2000010, CL2000016




✳ Apply lubricant to inside of cam groove on Control Cam Gear.

Fig. 6.1-2  Cam Groove on Side of Control Cam Gear

- LF motor gear  (1 position)

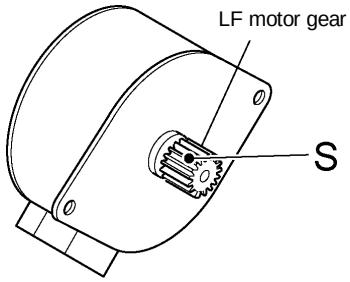



Fig. 6.1-3  LF Motor Gear

- SG motor gear (1 position)

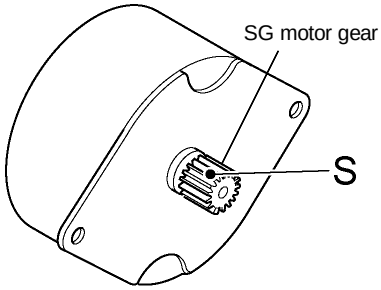



Fig. 6.1-4  SG Motor Gear

- Roller holder shaft (2 positions)

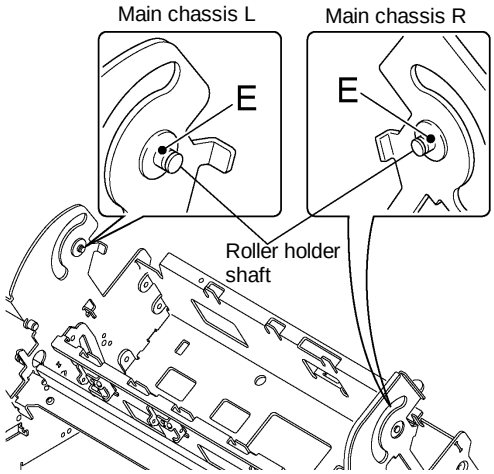



Fig. 6.1-5 Roller Holder Shaft

- Sliding surfaces of sub roller shafts in Bearings R/L (4 positions)

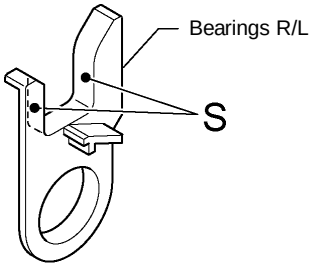



Fig. 6.1-6 Sliding Surfaces of Sub Roller Shafts in Bearings R/L

- Engaged parts of YC lift shaft (2 positions)

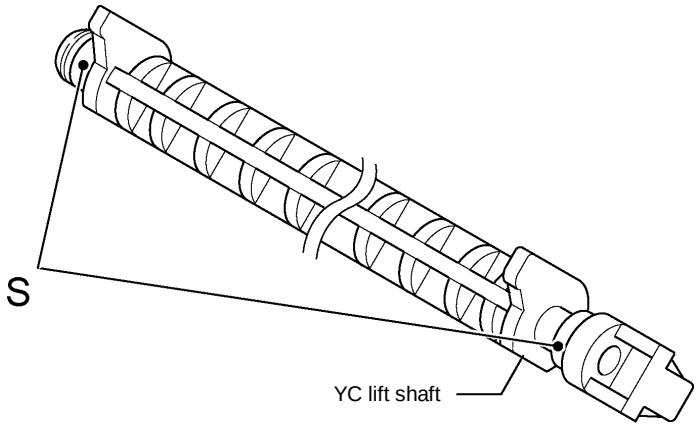



Fig. 6.1-7 Engaged Parts of YC Lift Shaft

- Link between YC lift shaft and YC lift arm (1 position) CL2000010

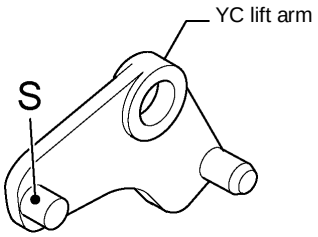



Fig. 6.1-8 Link Between YC Lift Shaft and YC Lift Arm

- Engaged parts of LF change shaft (2 positions)

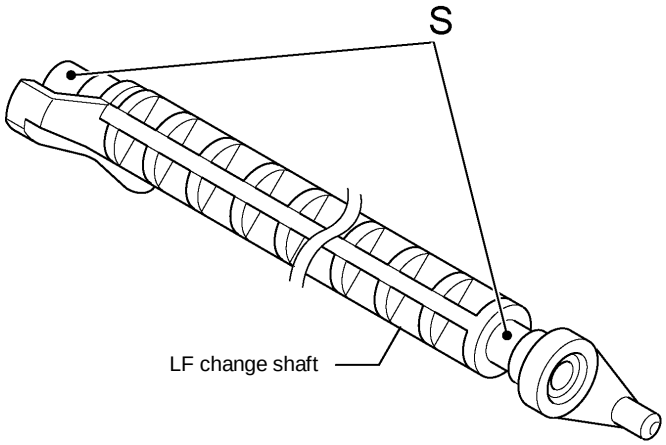



Fig. 6.1-9 Engaged Parts of LF Change Shaft

- Gear holder change cam surface on LF change shaft (2 position)

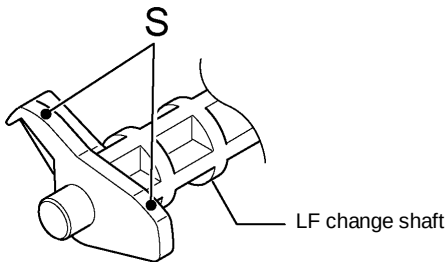



Fig. 6.1-10 Gear Holder Change Cam Surface on LF Change Shaft

- Roller Holder
  - Sub roller shaft bearings (2 positions)

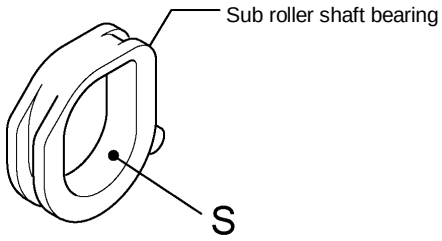



Fig. 6.1-11 Sub Roller Shaft Bearings

  - Roller holder spring mounting (1 position)

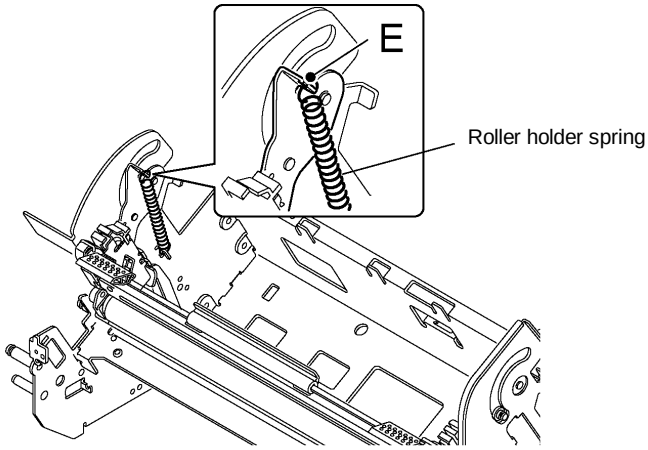



Fig. 6.1-12 Roller Holder Spring Mounting

■ Y-cutter Arm

- Y-cutter arm shaft (1 position)

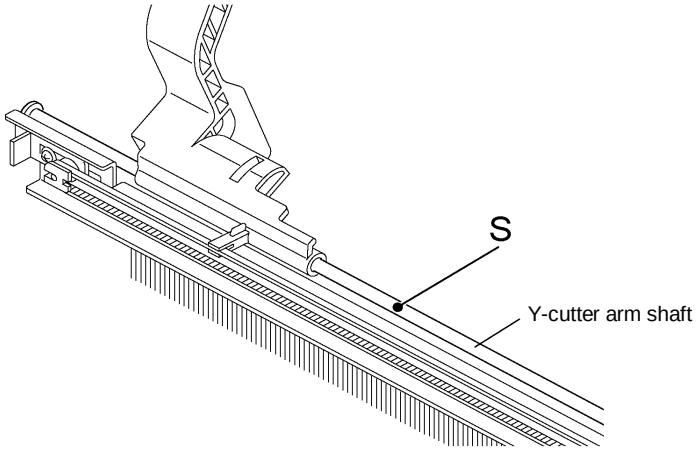



Fig. 6.1-13 Y-cutter Arm Shaft

- Y-sensor shaft (1 position)

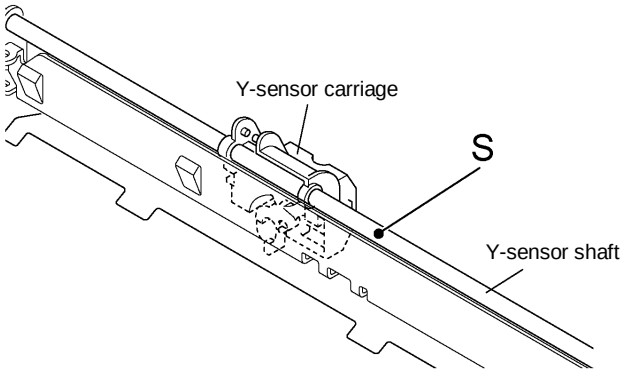



Fig. 6.1-14 Y-sensor Shaft

■ Paper Feed Roller

- Paper feed roller and Paper feed sub-roller shafts (4 positions)

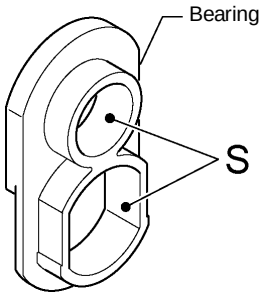



Fig. 6.1-15 Paper Feed Roller and Paper Feed Sub-roller Shafts

- Sliding surfaces of Paper feed sub-roller shaft holder shafts (4 positions)

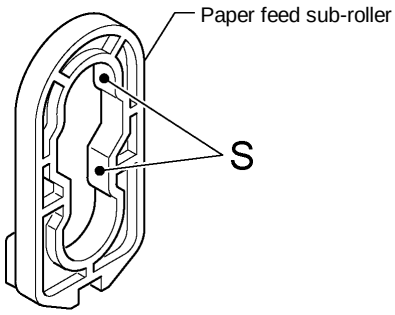



Fig. 6.1-16 Sliding Surfaces of Paper Feed Sub-roller Shaft Holder Shafts

- Paper tray B shaft bearings (4 positions)

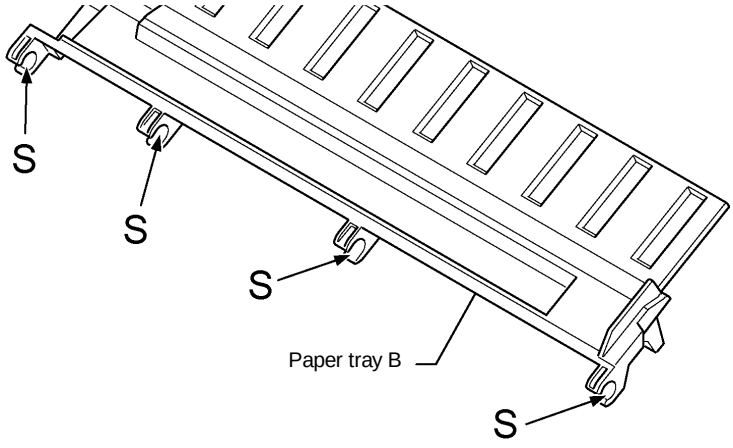



Fig. 6.1-17 Paper Tray B Shaft Bearings

- Left/right contact points between Paper feed roller spring and Chassis B (2 positions)

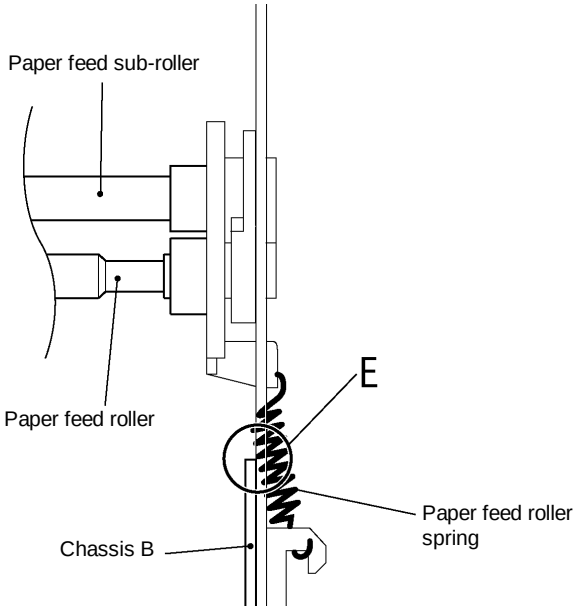



Fig. 6.1-18 Left/right Contact Points Between Paper Feed Roller Spring and Chassis B

■ Driving Roller

- Driving roller shaft bearings (2 positions)

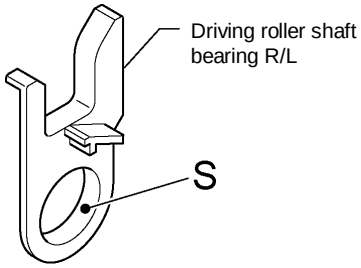



Fig. 6.1-19 Driving Roller Shaft Bearings

■ Paper Eject Roller

- Paper eject roller and Paper eject sub-roller shaft bearings (4 positions)

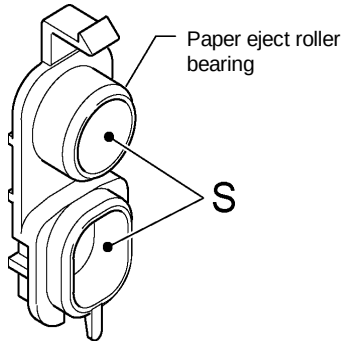



Fig. 6.1-20 Paper Eject Roller and Paper Eject Sub-roller Shaft Bearings

- Sliding surfaces of Paper eject roller shaft holder shafts (4 positions)

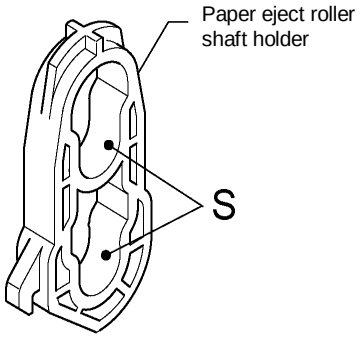



Fig. 6.1-21 Sliding Surfaces of Paper Eject Roller Shaft Holder Shafts

■ Trimmer Unit CL2000010

- Sliding surfaces of T-cutter unit and T-paper guide (6 positions)

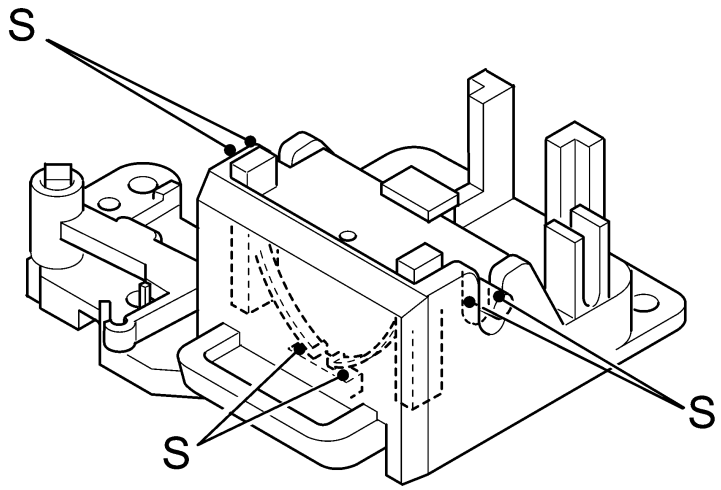



Fig. 6.1-22 Sliding Surfaces of T-cutter Unit and T-paper Guide

- Rotation points of T-lever A (2 positions)

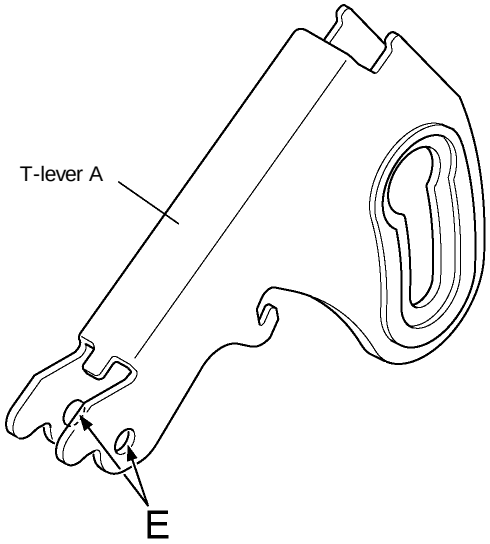



Fig. 6.1-23 Rotation Points of T-lever A

■ Y-Diversion Lever

- Y-cutter guide shaft (1 position)

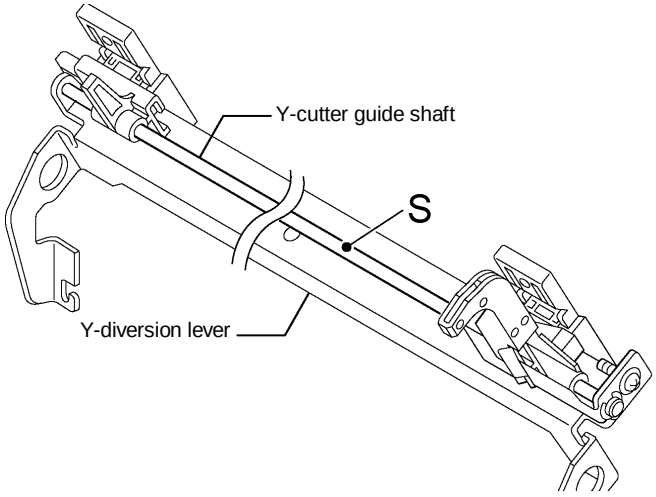



Fig. 6.1-24 Y-cutter Guide Shaft

- Sliding surfaces of Y-diversion lever and YC lift shaft (2 positions)

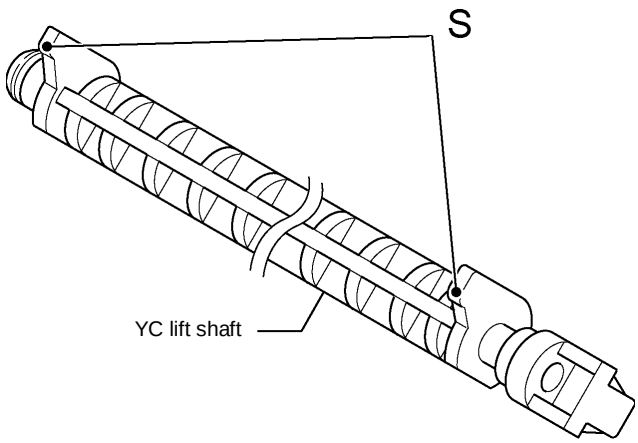



Fig. 6.1-25 Sliding Surfaces of Y-diversion Lever and YC Lift Shaft

# 6.2 Replacing the Cartridge and Film

## 6.2.1 Replacing the Cartridge

[1] Turn off the power switch and open the top cover.

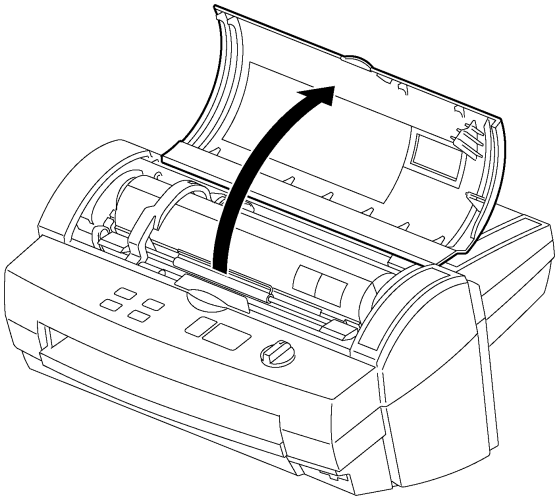


Fig. 6.2-1 Replacing the Cartridge 1

[2] Push the Set buttons R/L in the direction indicated by the arrow to unlock the Roller holder assy. Hold the Set buttons and lift the Roller holder assy.

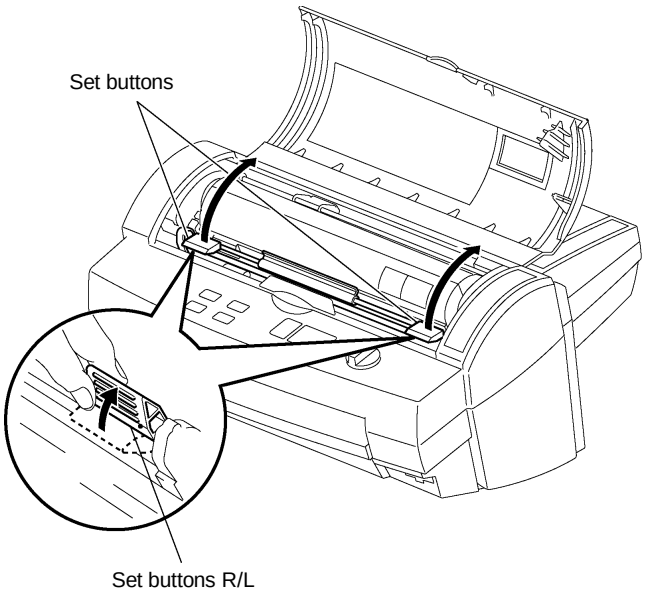



Fig. 6.2-2 Replacing the Cartridge 2

[3] Carefully remove the cartridge.

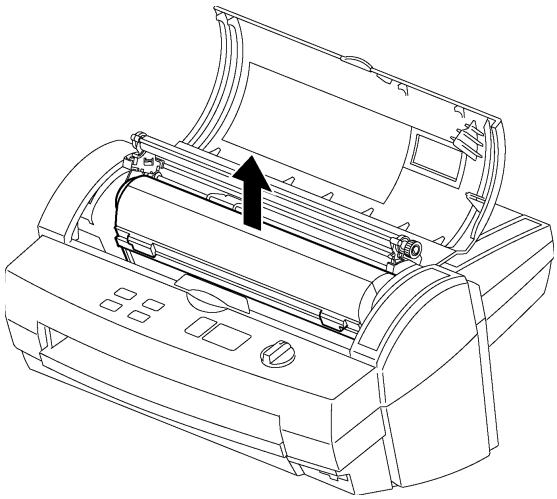


Fig. 6.2-3 Replacing the Cartridge 3

[4] Gently install the new cartridge.

Check the following items before inserting the cartridge.

- Cartridge shutter is fully closed.
- The edge of the sheet is parallel with the cartridge film outlet. If the edge is not parallel, cut it parallel with scissors. (See page 6-17.)

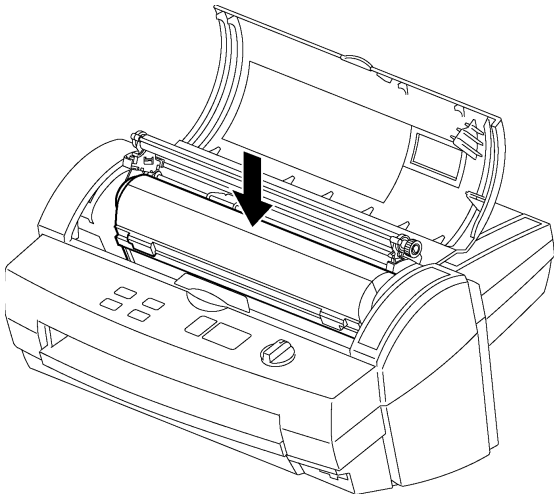


Fig. 6.2-4 Replacing the Cartridge 4

[5] Lower the roller holder assy and push the set buttons in the direction of the arrows to lock the roller holder assy in position.

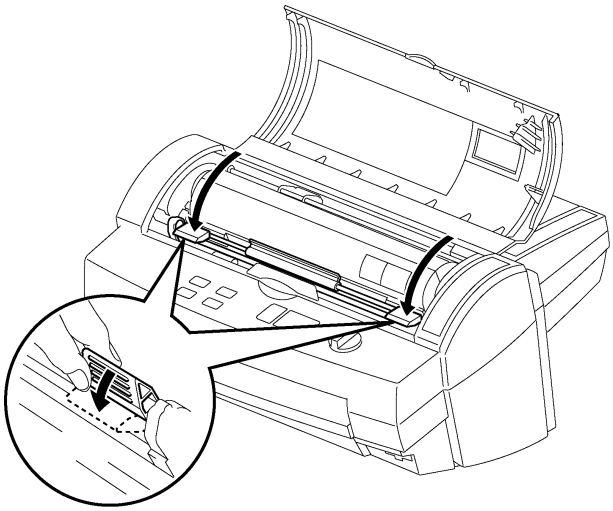


Fig. 6.2-5 Replacing the Cartridge 5

[6] Close the top cover.

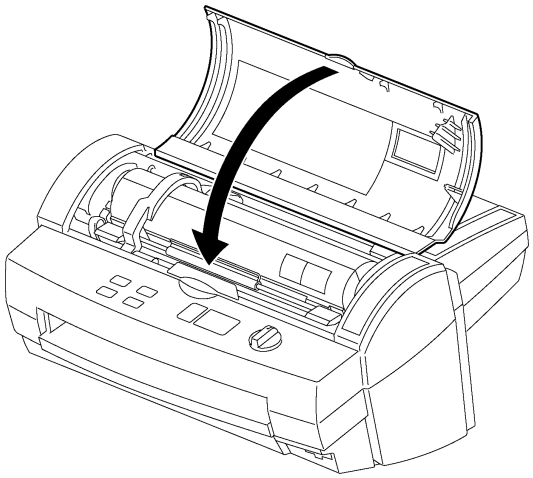


Fig. 6.2-6 Replacing the Cartridge 6

[7] Turn on the power switch and press the Feed key to feed out some sheet and remove the slackness in the sheet. Hold down the Feed key until the edge of the sheet reaches the eject gate.

[8] Press the Cut key to cut off the end of the sheet fed out to remove the slackness.

### 6.2.2 Replacing the Sheet

[1] Carefully remove the cartridge.

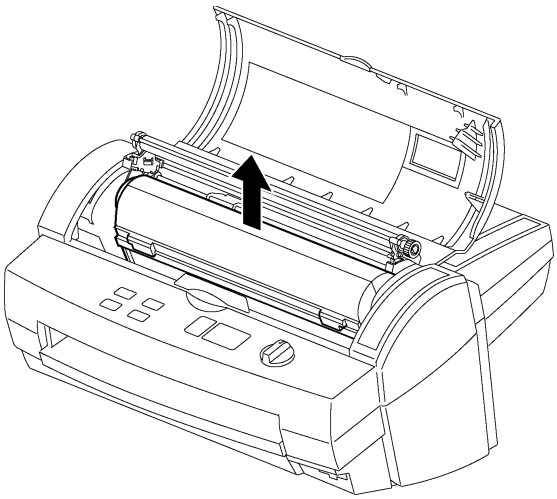


Fig. 6.2-7 Replacing the Sheet 1

[2] Open the cartridge shutter, then open the cartridge cover.

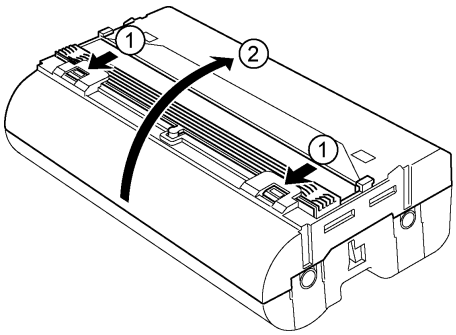



Fig. 6.2-8 Replacing the Sheet 2

[3] Remove the old sheet.

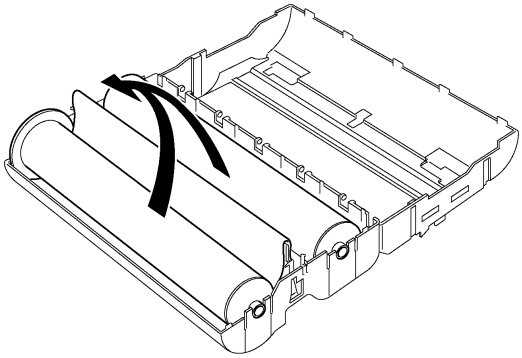


Fig. 6.2-9 Replacing the Sheet 3

[4] Hold the yellow plastic holders of the new film, align the arrow marks and L/R marks of the Cartridge bottom cover and the plastic holders, and insert the film into the cartridge as shown in the diagram. It is not possible to insert the film in the wrong direction.

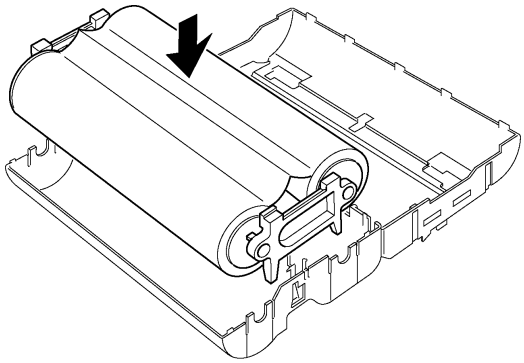


Fig. 6.2-10 Replacing the Sheet 4

[5] Detach the plastic holders in the direction of the arrow.

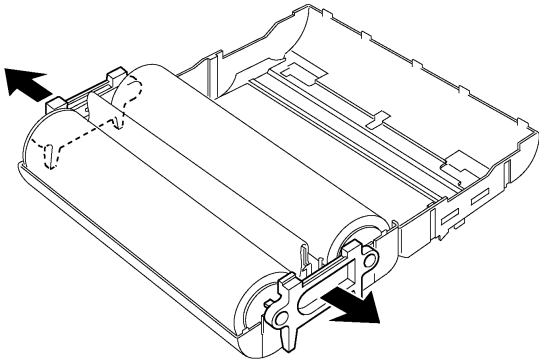


Fig. 6.2-11 Replacing the Sheet 5

[6] Close the cartridge cover, ensuring that the edge of the sheet protrudes from the cartridge film outlet.

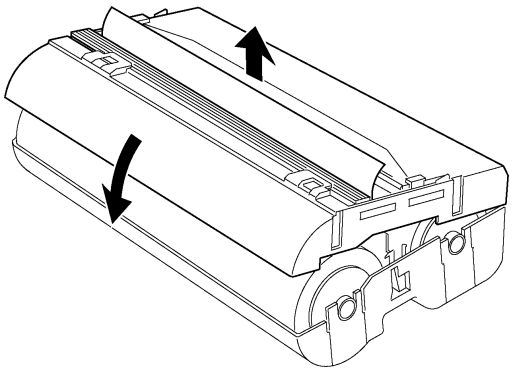


Fig. 6.2-12 Replacing the Sheet 6

[7] Press the shutter buttons and close the shutter.

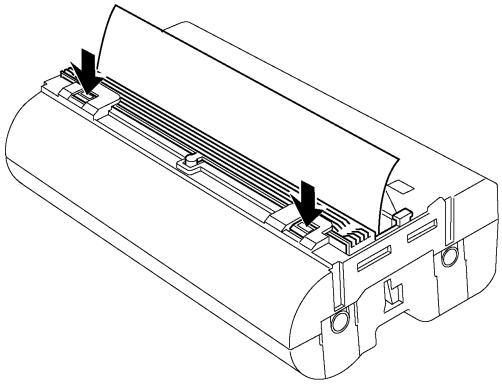


Fig. 6.2-13 Replacing the Sheet 7

[8] Check that the edge of the sheet is parallel with the cartridge film outlet. If the edge is not parallel, cut it parallel with scissors.

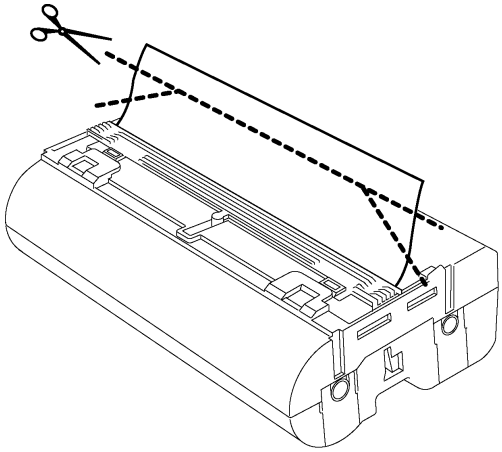


Fig. 6.2-14 Replacing the Sheet 8

[9] Gently insert the cartridge.

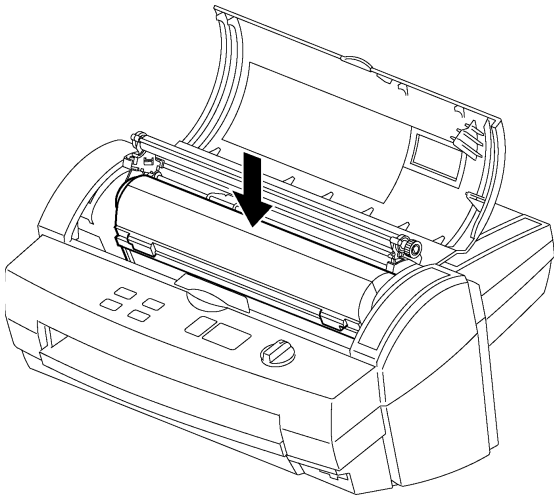


Fig. 6.2-15 Replacing the Sheet 9

Note: After removing sheet from its sealed pack, it will dry up if not inserted into the cartridge.

# 6.3 Adjustments CL2000010

## 6.3.1 Adjusting the Right Y-cutting Position (Border Mode)

1. Before adjustment, laminate in the Border Mode to check the amount of border.
2. Turn off the power supply and pull the AC adapter jack from the unit.
3. Turn on the power, then turn the dial switch to the Border position.
4. Loosen screws 1 and 2 and move Adjustment plate in the direction of the arrow indicated in the diagram below. This moves the Y-cutter attached to the Y-cutter guide to adjust the cutting position for the right edge of the film.

   In the diagram below, move the Adjustment plate to the right to increase the margin between the film and the document.
5. After adjustment, tighten Screw 2, then tighten Screw 1. Laminate a test document to check if the amount of border has improved.
6. Repeat steps 2 to 5 until the borders are correct.
   * If the right border is adjusted in the Border Mode, the No Border mode is adjusted simultaneously, so do not adjust again in the No Border mode.

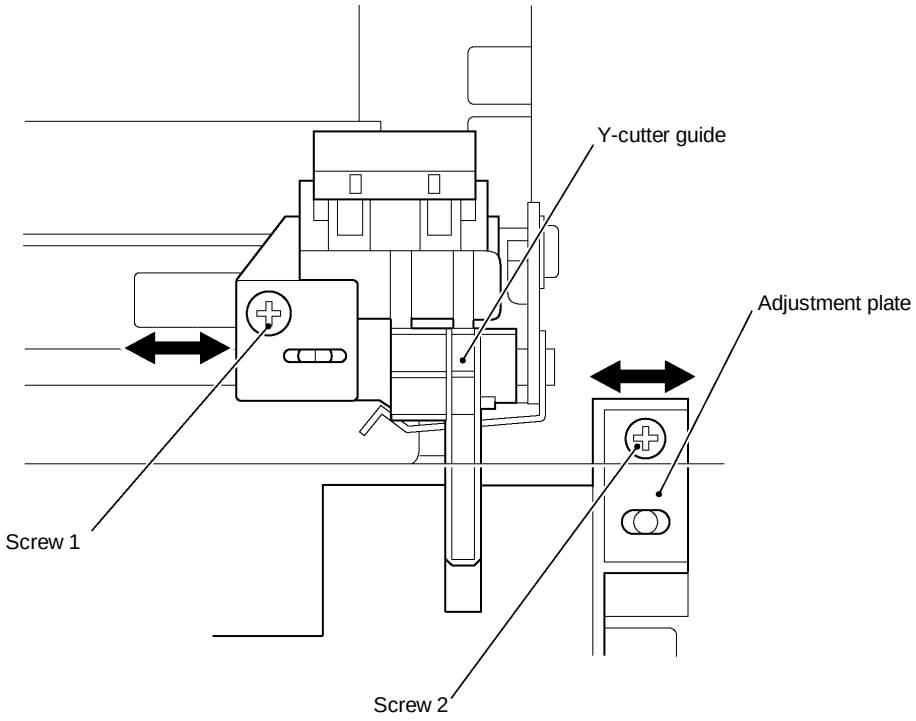



Fig. 6.3-1 Adjusting the Right Y-cutting Position

## 6.3.2 Adjusting the Left Y-cutting Position CL2000010

1. Before adjustment, laminate in the Border Mode to check the amount of border.
2. Turn off the power supply and pull the AC adapter jack from the unit.
3. Loosen the screw and move the Y-sensor carriage arm left or right. This moves the detection position of the sensor attached to the Y-sensor carriage and adjusts the cutting position for the left edge of the film.

   In the diagram below, move Y-sensor carriage arm to the right to increase the margin between the film and the document.
4. After adjustment, tighten the Screw. Laminate a test document to check if the amount of border has improved.
5. Repeat steps 2 to 4 until the borders are correct.

   * If the left border is adjusted in the Border Mode, the No Border mode is adjusted simultaneously, so do not adjust again in the No Border mode.

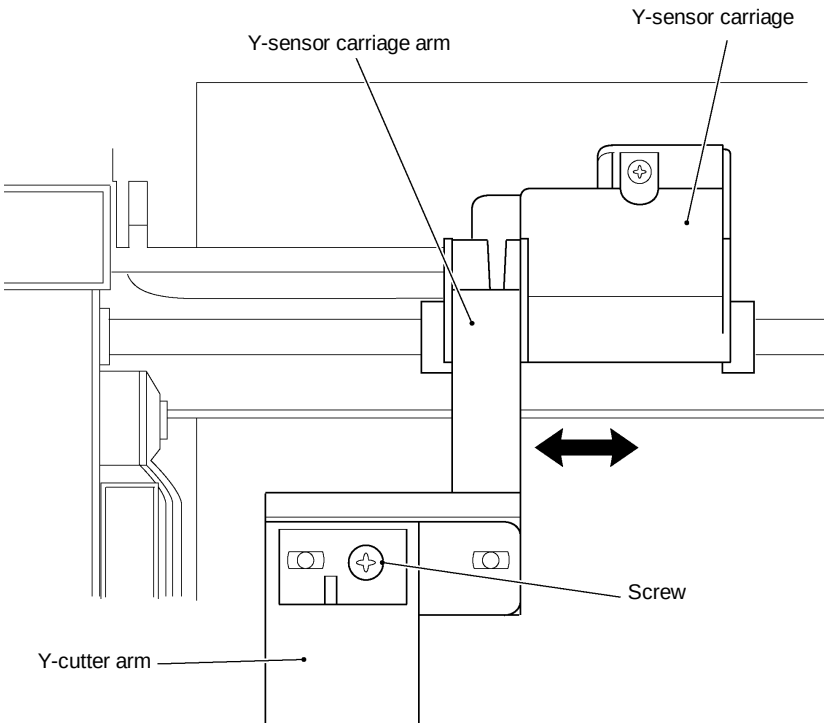
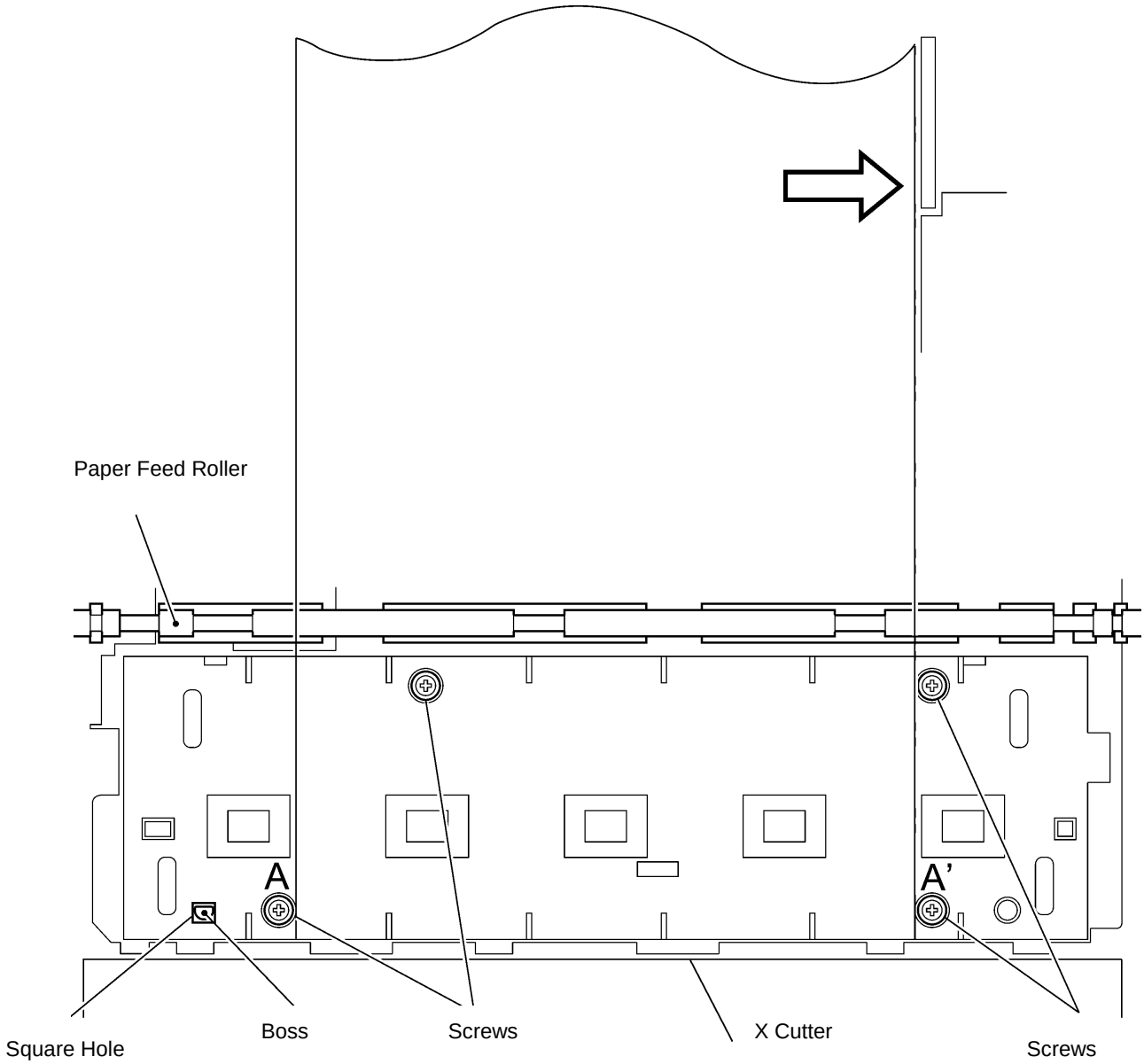



Fig. 6.3-2 Adjusting the Left Y-cutting Position

### 6.3.3 Adjusting Perpendicularity of Chassis and Document CL2000012

1. Loosen the four screws under the Bottom cover, as shown in the diagram below.
2. Insert the L-shaped jig for perpendicularity adjustment between the square holes in the Chassis and bosses protruding from the Bottom cover. Push the Chassis into position in the direction of the arrow shown in the diagram.
3. Taking care not to displace the Chassis, tighten the screws A and A'. Remove the jig and tighten the remaining two screws.



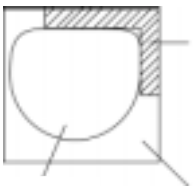




Fig. 6.3-3 Adjusting Perpendicularity of Chassis and Document

# Chapter 7.

# TROUBLESHOOTING

# CONTENTS

## Chapter 7. TROUBLESHOOTING

# 7.1 Outline

It is extremely difficult to determine when and where a problem may arise and to determine the cause of a problem that did arise. It is even more difficult to formulate remedies for theoretical problems which may or may not occur. This chapter gives examples of actual problems that have occurred, together with suggested remedies. While this chapter may not allow all faults to be remedied, use it as one means of rectifying problems.

# 7.2 Precautions during Repair

Always follow the precautions below when repairing the unit.

1. Always unplug the AC adaptor from the main power socket before removing a cover, adjusting mechanical parts, or removing a PCB.
2. Always unplug the AC adaptor from the main power socket before measuring conductivity with a circuit tester.
3. When removing a connector, pull on the body of the connector, not on the lead attached to it.

# 7.3 After Making a Repair

Always test the unit after diagnosing and repairing a problem to ensure that the problem is completely remedied.

When the cause of a problem is identified, make a note of it in the troubleshooting procedures for future reference.

# 7.4 Basic Checks

Check the following items whenever a problem occurs.

- Check the power supply voltage.

  Make sure that the AC input voltage, the AC adaptor output voltage, and the DC supply voltage for each part are at the prescribed value.

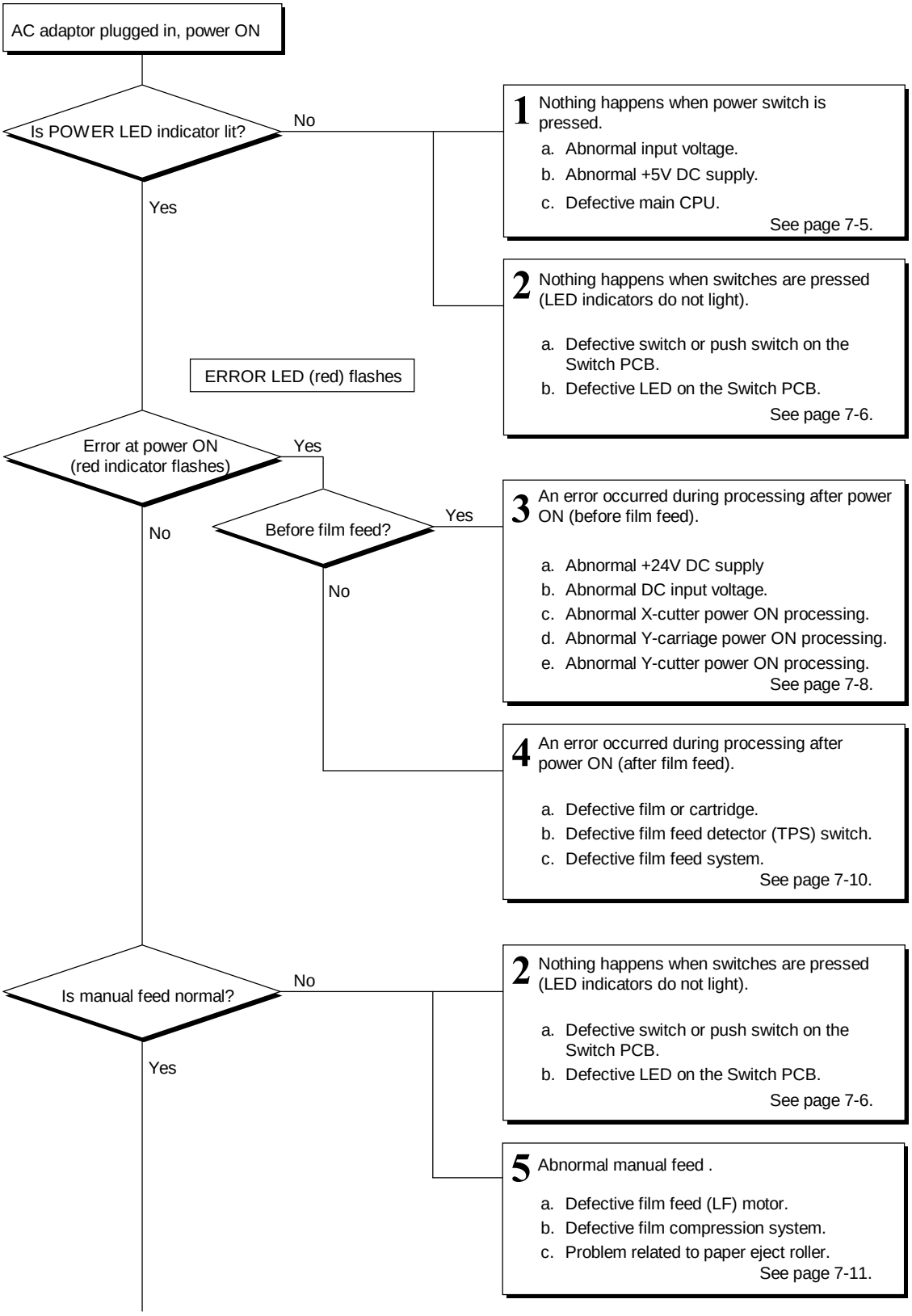
- Check the connectors.

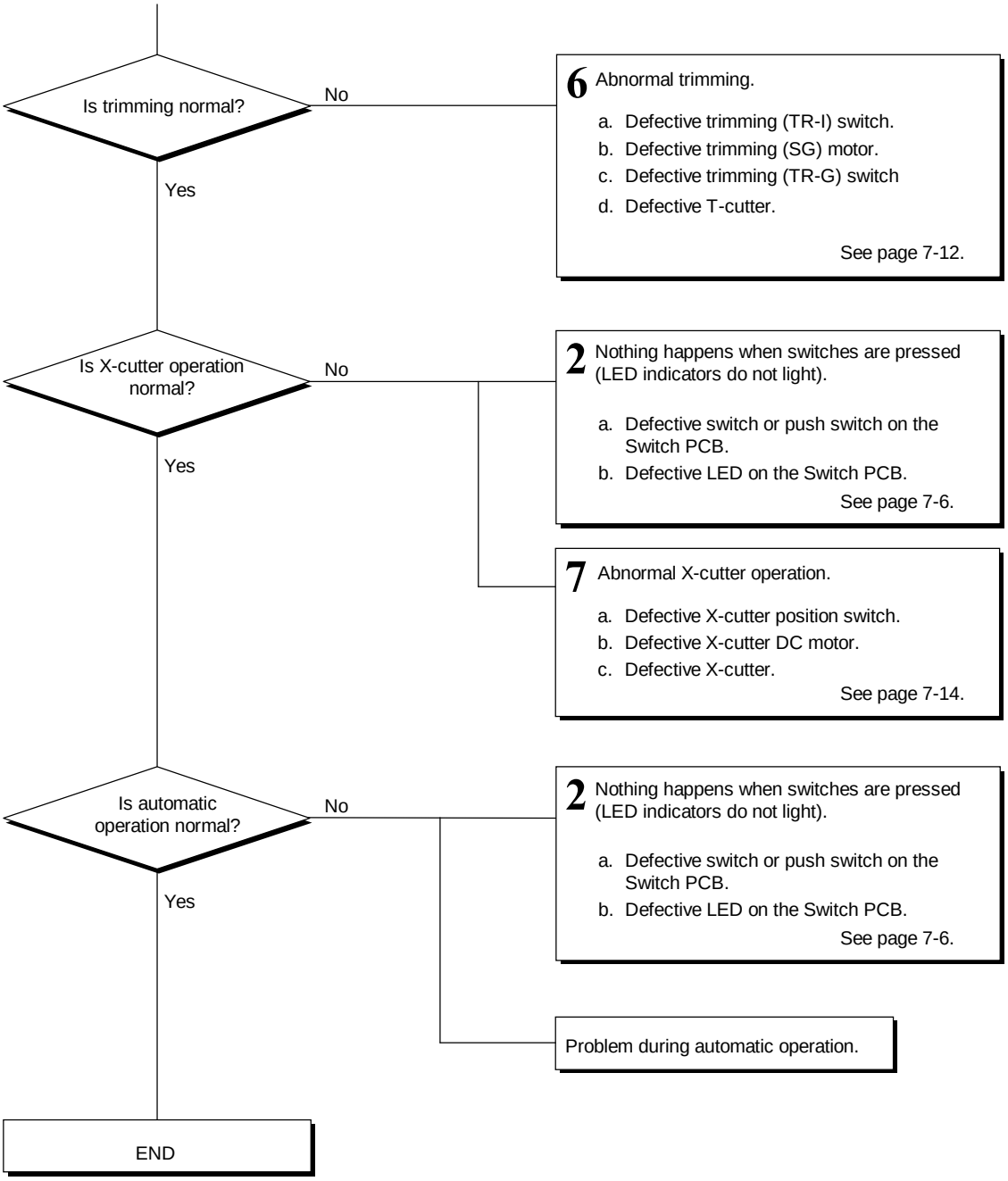
  Ensure that no connector is loose or disconnected.

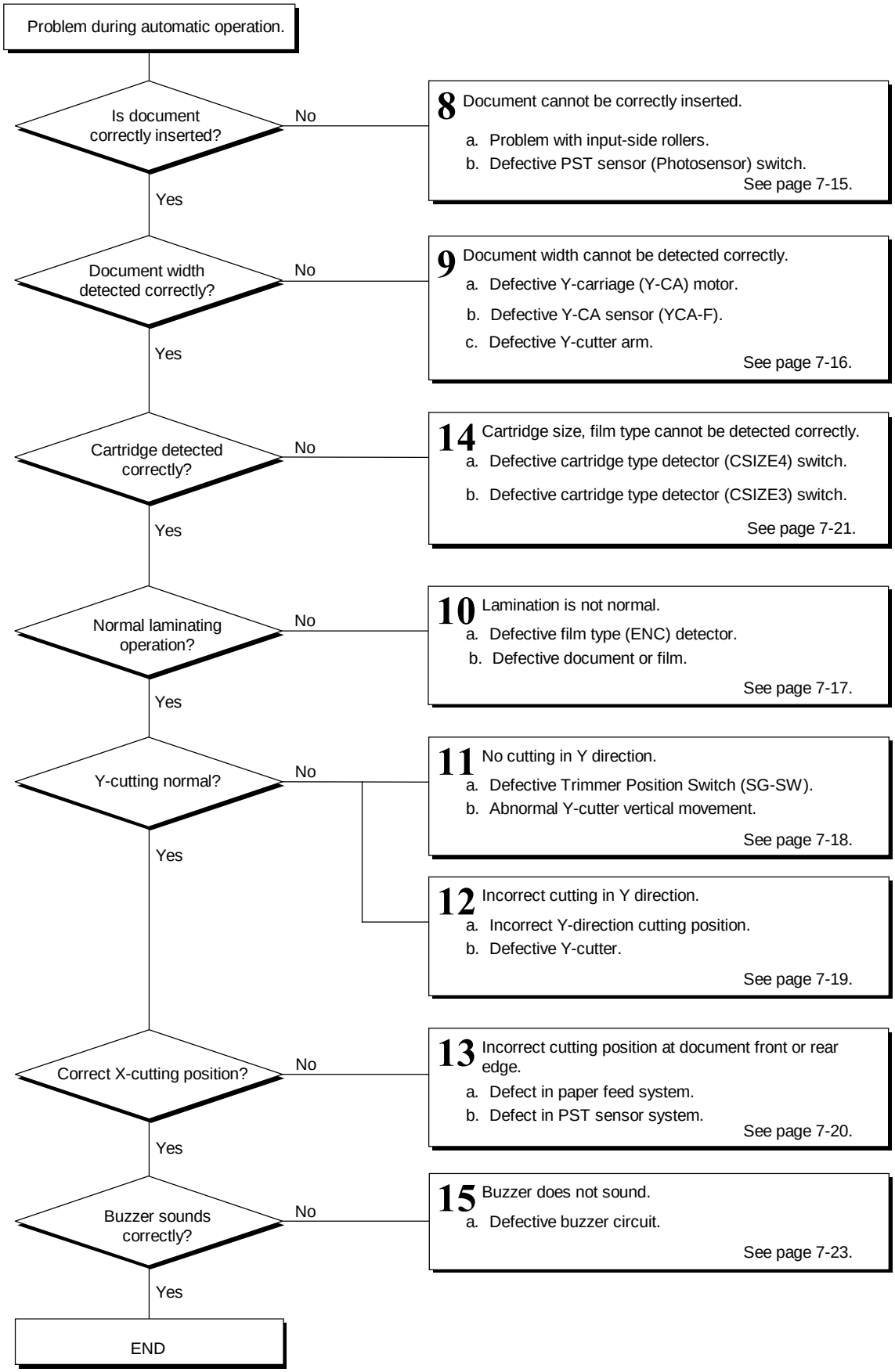
- Check the fuses.

  Check if the fuse F1 or thermal fuse in the AC adaptor has blown.

# 7.5 Troubleshooting Flowcharts




Is trimming normal?
No
6 Abnormal trimming.
a. Defective trimming (TR-I) switch.
b. Defective trimming (SG) motor.
c. Defective trimming (TR-G) switch
d. Defective T-cutter.
See page 7-12.
Yes
Is X-cutter operation normal?
No
2 Nothing happens when switches are pressed (LED indicators do not light).
a. Defective switch or push switch on the Switch PCB.
b. Defective LED on the Switch PCB.
See page 7-6.
Yes
7 Abnormal X-cutter operation.
a. Defective X-cutter position switch.
b. Defective X-cutter DC motor.
c. Defective X-cutter.
See page 7-14.
Is automatic operation normal?
No
2 Nothing happens when switches are pressed (LED indicators do not light).
a. Defective switch or push switch on the Switch PCB.
b. Defective LED on the Switch PCB.
See page 7-6.
Yes
Problem during automatic operation.
END


Problem during automatic operation.
Is document correctly inserted?
No
8 Document cannot be correctly inserted.
a. Problem with input-side rollers.
b. Defective PST sensor (Photosensor) switch.
See page 7-15.
Yes
Document width detected correctly?
No
9 Document width cannot be detected correctly.
a. Defective Y-carriage (Y-CA) motor.
b. Defective Y-CA sensor (YCA-F).
c. Defective Y-cutter arm.
See page 7-16.
Yes
Cartridge detected correctly?
No
14 Cartridge size, film type cannot be detected correctly.
a. Defective cartridge type detector (CSIZE4) switch.
b. Defective cartridge type detector (CSIZE3) switch.
See page 7-21.
Yes
Normal laminating operation?
No
10 Lamination is not normal.
a. Defective film type (ENC) detector.
b. Defective document or film.
See page 7-17.
Yes
Y-cutting normal?
No
11 No cutting in Y direction.
a. Defective Trimmer Position Switch (SG-SW).
b. Abnormal Y-cutter vertical movement.
See page 7-18.
12 Incorrect cutting in Y direction.
a. Incorrect Y-direction cutting position.
b. Defective Y-cutter.
See page 7-19.
Yes
Correct X-cutting position?
No
13 Incorrect cutting position at document front or rear edge.
a. Defect in paper feed system.
b. Defect in PST sensor system.
See page 7-20.
Yes
Buzzer sounds correctly?
No
15 Buzzer does not sound.
a. Defective buzzer circuit.
See page 7-23.
Yes
END

# 7.6 Troubleshooting Tables

**1** Nothing happens when power switch is pressed. (LED indicator does not light.)

a. Abnormal input voltage.

b. Abnormal +5V DC supply.

c. Defective main CPU.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Abnormal input voltage | Are AC adaptor, Jack PCB, power harness correctly connected? | Defective harness connection. | Connect harness | | 3.3.3<br>3.3.4<br>3.3.5<br>3.5.1 |
| | Is fuse F1 on Main PCB blown? | Blown fuse. | Replace fuse. | | |
| | Is AC adaptor output voltage normal (about 21V DC at rated input)? | Defective AC adaptor. | Replace AC adaptor. | | ––– |
| | Is AC adaptor voltage applied to connector CN1 on Main PCB? | Defective Jack PCB. | Replace Jack PCB. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.5.2 |
| | | Defective power harness. | Replace power harness. | | 3.3.1<br>3.3.2<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4.1 |
| b. Abnormal +5V DC supply | Is power supply IC#1 (Pin 10) output Low or switching? | Defective power supply IC#1. | Replace Main PCB assy. | Replace IC#1. | 3.3.3<br>3.3.4<br>3.3.5<br>3.5.1 |
| | When power supply IC#1 (Pin 10) output is Low, is transistor Q4 ON? | Defective transistor Q4. | Replace Main PCB assy. | Replace Q4. | |
| | When transistor Q4 is ON, is transistor Q3 ON? | Defective transistor Q3. | Replace Main PCB assy. | Replace Q3. | |
| | | Zener diode ZD1 is shorted. | Replace Main PCB assy. | Replace ZD1.<br>Replace Q3. | |
| c. Defective main CPU | Is Reset (Pin 4) of the main CPU #3 High? | Defective reset IC#2. | Replace Main PCB assy. | Replace IC#2. | |
| | Is oscillator waveform output from XIN (Pin 3) and XOUT (Pin 2) of the main CPU#3? | Defective oscillator XT1. | Replace Main PCB assy. | Replace XT1. | |
| | | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | |

**2** Nothing happens when switches are pressed.

a. Defective switch or push switch on the Switch PCB.

b. Defective LED on the Switch PCB.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defective switch or push switch on the Switch PCB | Is Switch PCB correctly mounted? | Defective Switch PCB mounting. | Correctly mount Switch PCB. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.3.7<br>3.3.8<br>3.3.9<br>3.3.10 |
| | Is switch harness assy correctly connected? | Defective connection of switch harness assy. | Correctly connect switch harness assy. | | |
| | Is the white lead connector connected to CN1 on the Switch PCB? | Push switch assy not connected. | Correctly connect the push switch assy. | | |
| | Is the red lead connector connected to CN2 on the Switch PCB? | Push switch assy not connected. | Correctly connect the push switch assy. | | |
| | When switch SW1 to SW6 is pressed on the Switch PCB, does the switch become conducting? | Conductivity problem in switch SW1 to SW6. | Replace the Switch PCB. | Replace switch SW1 to SW6. | |
| | When push switch RSW1•RSW2 is shorted, does the connector on the push switch assy become conducting? | Defective push switch assy. | | Replace push switch assy 1.<br>Replace push switch assy 2. | |
| | When switch SW1 to SW6 is pressed on the Switch PCB or the push switch assy is shorted, can the conductivity be checked at CN16 on the main CPU? | Defective switch harness assy. | Replace switch harness assy. | | |
| | If conductivity can be checked at CN16 on the main CPU when switch SW1 to SW4 is pressed or the push switch assy is shorted, can the conductivity be checked at the main CPU ports? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | |
| | | Defective series resistor on main CPU. | Replace Main PCB assy. | Replace series resistor. | |
| | If conductivity can be checked at the main CPU ports when switch SW1 to SW4 is pressed or the push switch assy is shorted, is this recognized by the main CPU? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | 3.3.3<br>3.3.4<br>3.3.5<br>3.5.1 |

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| b. Defective LED on the Switch PCB | Low output from the main CPU ports P30 (Pin 73), P33 (Pin 76), P34 (Pin 77), and P52 (Pin 27) that drive indicators LED1 to LED4? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | 3.3.3<br>3.3.4<br>3.3.5<br>3.5.1 |
| | Does LED1 to LED4 light when Pin 1, Pin 9 to Pin 11 on Main PCB connector CN16 is Low? | Defective switch harness assy. | Replace switch harness assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.5.3 |
| | | Defective LED1 to LED4. | Replace the Switch PCB. | Replace indicator LED1 to LED4. | 3.3.3<br>3.3.4<br>3.3.5<br>3.3.7<br>3.3.8<br>3.3.9<br>3.3.10<br>3.5.3 |

**3** An error occurred during processing after power ON (before film feed).

a. Abnormal +24V DC supply
b. Abnormal DC input voltage.
c. Abnormal X-cutter power ON processing.
d. Abnormal Y-carriage power ON processing.
e. Abnormal Y-cutter power ON processing.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Abnormal +24V DC supply | Is +24V DC voltage at ±0V? | Coil L2 discharged. | Replace Main PCB assy. | Replace L2. | 3.3.3<br>3.3.4 |
| | | Conductivity problem with diode D4. | Replace Main PCB assy. | Replace D4. | 3.3.5<br>3.4.2<br>3.5.1 |
| | Does +24V DC voltage exceed 24 V at the same level as the AC adaptor output voltage (at rated AC input)? | Defective AC adaptor. | Replace AC adaptor. | | —— |
| | Is power supply IC#1 (Pin 7) switching? | Defective power supply IC#1. | Replace Main PCB assy. | Replace IC#1. | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | Is transistor Q1 collector voltage switching between 0 V and input voltage? | Defective transistor Q1. | Replace Main PCB assy. | Replace Q1. | |
| | | Defective transistor Q2. | Replace Main PCB assy. | Replace Q2. | |
| | Is transistor Q5 collector voltage switching between +24 V and 0 V? | Defective transistor Q5. | Replace Main PCB assy. | Replace Q5. | |
| b. Abnormal DC input voltage | Is input voltage from AC adaptor between 16 V and 23 V (at rated input)? | Defective AC adaptor. | Replace AC adaptor. | | —— |
| | Is main CPU port P60 (Pin 30) between 2.0 V and 2.9 V (using rated AC input)? | Defective resistors R25 and R50. | Replace Main PCB assy. | Replace resistors R25 and R50. | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| c. Abnormal X-cutter power ON processing | X-cutter does not move at all? | Foreign matter stuck in cutter. | Clean out foreign matter. | | —— |
| | | Defective X-cutter. | Replace the X-cutter assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.6.1 |
| | Error occurs during X-cutter position detection? | See **7** Abnormal X-cutter operation. | | | |

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| d. Abnormal Y-carriage power ON processing | Actuator Y cuts photosensor at start position?<br>Photosensor cut off when not at start position? | Deformed Y sensor rail. | Replace the Y sensor rail. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.7.3<br>3.8 |
| | | Actuator Y incorrectly installed. | | | |
| | | Defective actuator Y. | Replace the Y sensor carriage unit. | | |
| | Error during Y-carriage position detection? | See **9** Document width cannot be detected correctly. | | | |
| e. Abnormal Y-cutter power ON processing | Error during Y-cutter position detection? | See **11** No cutting in Y direction. | | | |

**4** An error occurred during processing after power ON (after film feed).

a. Defective film or cartridge.
b. Defective film feed detector (TPS) switch.
c. Defective film feed system.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defective film or cartridge | Is the film cartridge correctly mounted? | Defective film cartridge mounting. | Correctly mount the film cartridge. | | 3.2 |
| | Does film remain in the cartridge? | No film remaining. | Replace the film. | | |
| | Is the cartridge deformed or cracked? | Defective cartridge. | Replace the cartridge. | | |
| b. Defective film feed detector (TPS) switch. | Is the orange lead connector connected to CN3 on the Main PCB? | Leaf switch assy not connected. | Correctly connect the leaf switch assy. | | 3.3.3<br>3.3.4<br>3.3.5 |
| | Does the sensor lever press the film feed detector (TPS) switch (leaf switch F assy) when film is inserted? | Incorrectly installed leaf switch F assy. | Correctly install the leaf switch F assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.6.2 |
| | Is the leaf switch open when no film is inserted? | Incorrectly installed T-sensor lever. | Correctly install the T-sensor lever. | | |
| | | Defective T-sensor lever. | Replace the T-sensor lever. | | |
| | Is main CPU port P17 (Pin 24) at High level when leaf switch TPS is open? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective pull-up resistor R46. | Replace Main PCB assy. | Replace R46. | |
| | When leaf switch TPS is shorted, is CN3 on the Main PCB shorted? | Defective leaf-switch F assy. | Replace leaf-switch F assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.6.2 |
| | Is main CPU port P17 (Pin 24) at Low level when CN3 on the Main PCB is shorted? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective series resistor R42. | Replace Main PCB assy. | Replace R42. | |
| | When main CPU port P17 (Pin 24) is at Low level, is this recognized by the main CPU? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | |
| c. Defective film feed system | Defective film feed (LF) motor. | See **5** Abnormal manual feed . | | | |
| | Defective film compression system. | | | | |

## 5 Abnormal manual feed

a. Defective film feed (LF) motor.

b. Defective film compression system.

c. Problem related to paper eject roller.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defective film feed (LF) motor | Is the black lead connector connected to CN12 on the Main PCB? | Motor harness assy not connected. | Correctly connect the motor harness assy. | | 3.3.3<br>3.3.4<br>3.3.5 |
| | Are pulses output from output ports P01 to P04 (Pin 66 to Pin 69) of the main CPU#3? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | During High output of the Main CPU #3 output ports P02 and P03 (Pins 67, 68) when the outputs of P01 and P64 (Pins 66, 69) are Low and the output of either or both P05 and P00 (Pins 70 and 65) is Low, are the driver #6 OUT 1 (Pin 9) and OUT 4 (Pin 19) outputs approximately 24 V and the OUT 2 (Pin 11) and OUT 3 (Pin 15) outputs approximately 0 V? | Defective driver #6. | Replace Main PCB assy. | Replace #6. | |
| | Conductivity in motor harness assy? | Defective motor harness assy. | Replace motor harness assy for LF motor. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4 |
| | Is the resistance value correct (approx. 5.5 ohms) between phases A- $\overline{A}$ and B- $\overline{B}$ of the LF motor (PM motor L)? | Defective LF motor. | Replace LF motor. | | |
| b. Defective film compression system. | Are top and bottom feed rollers correctly engaged? | Roller holder unit is incorrectly set up. | Correctly set up the roller holder unit. | | 6.2 |
| | Is film correctly placed between the feed rollers? | Defective cassette setting. | Set the cassette correctly. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.13 |
| c. Problem related to paper eject roller | Film or other foreign matter stuck to top or bottom paper eject roller. | Foreign matter stuck to roller. | Clean off foreign matter. | | |
| | Do the top and bottom paper eject rollers move smoothly? | Problem with paper eject rollers. | Apply KS64F silicon grease to the four bearings. | | |

## 6 Abnormal trimming

a. Defective trimming (TR-I) switch.
b. Defective control (SG) motor.
c. Defective trimming (TR-G) switch.
d. Defective T-cutter.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defective trimming (TR-I) switch | Is document correctly inserted? | Document inserted incorrectly. | Correctly insert the document. | | ––– |
| | Does the T-sensor lever press the trimming switch (leaf switch TRI assy) when a document is inserted?<br>Is the leaf switch open when no document is inserted? | Incorrectly installed trimming switch. | Correctly install the trimming switch. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.15 |
| | | Incorrectly installed T-sensor lever. | Correctly install the T-sensor lever. | | |
| | | Defective T-sensor lever. | Replace the T-cutter assy. | | |
| | Is the black lead connector connected to CN2 on the Main PCB? | Leaf switch assy not connected. | Correctly connect the leaf switch assy. | | 3.3.3<br>3.3.4<br>3.3.5 |
| | Is main CPU port P93 (Pin 12) at High level when trimming switch TR-I is open and SW3 and SW4 on the Switch PCB are not pressed? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective pull-up resistor R51. | Replace Main PCB assy. | Replace R51. | |
| | When trimming switch TRI is shorted, is CN2 on the Main PCB shorted? | Defective trimming-switch TRI assy. | Replace trimming-switch TRI assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.15 |
| | Is main CPU port P93 (Pin 12) at Low level when CN2 on the Main PCB is shorted? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective series resistor R33. | Replace Main PCB assy. | Replace R33. | |
| | When Main CPU port P93 (Pin 12) is at Low level, is this recognized by the main CPU? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | |

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| b. Defective control (SG) motor. | Is the black lead connector connected to CN13 on the Main PCB? | Motor harness assy not connected. | Correctly connect the motor harness assy. | | 3.3.3<br>3.3.4<br>3.3.5 |
| | Are pulses output from output ports P44 to P47 (Pin 45 to Pin 48) of the main CPU#3? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | When the output from output ports P44 to P47 (Pin 45 to Pin 48) of the main CPU#3 is High, is the output from transistor array Q17 to Q20 Low? | Defective transistor array Q17 to Q20. | Replace Main PCB assy. | Replace Q17 to Q20. | |
| | Is +24V DC applied to Pins 3 and 4 of connector CN13 on the Main PCB? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | |
| | Conductivity in motor harness assy? | Defective motor harness assy. | Replace motor harness assy for SG motor. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4 |
| | Correct resistance value (approx. 38 ohms) between each phase of the SG motor and the COM pin? | Defective SG motor. | Replace SG motor. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.12 |
| c. Defective trimming (TR-G) switch. | Is the blue lead connector connected to CN5 on the Main PCB? | Leaf switch assy not connected. | Correctly connect the leaf switch assy. | | 3.3.3<br>3.3.4<br>3.3.5 |
| | Is main CPU port P15 (Pin 22) at High level when leaf switch SG assy is open? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective pull-up resistor R48. | Replace Main PCB assy. | Replace R48. | |
| | When leaf switch SG assy is shorted, is CN5 on the Main PCB shorted? | Defective leaf switch SG assy. | Replace leaf switch SG assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.12.1 |
| | Is main CPU port P15 (Pin 22) at Low level when CN5 on the Main PCB is shorted? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective series resistor R44. | Replace Main PCB assy. | Replace R44. | |
| | When main CPU port P15 (Pin 22) is at Low level, is this recognized by the main CPU? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | |
| d. Defective T-cutter. | No cutting occurs despite a grating noise is heard? | The T-cutter plate is not installed. | Install the T-cutter plate. | | 3.3.1 |
| | | The T-cutter plate is not installed correctly. | Correctly install the T-cutter plate. | | 3.3.1 |
| | Cutting position is correct but cutting is incomplete? | Defective T-cutter plate. | Replace the T-cutter plate. | | |

## 7 Abnormal X-cutter operation.

a. Defective X-cutter position switch.

b. Defective X-cutter DC motor.

c. Defective X-cutter.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defective X-cutter position switch | The X-cutter rotary cutter is at the left or right end but neither Pin 2 nor 3 is continuous with Pin 1? Alternatively, both Pin 2 and 3 are continuous with Pin 1? | Defective X-cutter unit. | Replace the X-cutter unit. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.6.1 |
| | Conductivity between Pins 1, 2, and 3 of the X-cutter harness assy? | Defective X-cutter harness assy. | Replace the X-cutter harness assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4 |
| | During X-cutter operation, do main CPU#3 port P22 (Pin 5) and port P23 (Pin 80) switch to High level? | Defective pull-up resistors R54 and R59. | Replace Main PCB assy. | Replace R54 and R59. | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | When main CPU port P22 (Pin 5) and port P23 (Pin 80) are at Low level, is this recognized by the main CPU? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | |
| b. Defective X-cutter DC motor | During normal output of the Main CPU #3 output ports P64 to P67 (Pins 34 to 37), do the outputs between the FET array Q10 Pin 5 and Pin 7 alternate between 0 V and 24 V? | Defective FET arrays Q7, Q10. | Replace main PCB assy. | Replace Q7, Q10. | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | Conductivity between Pins 4 and 5 of the X-cutter harness assy? | Defective X-cutter harness assy. | Replace the X-cutter harness assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4 |
| | Normal resistance (approx. 30 ohms) between Pins 4 and 5 of the X-cutter harness assy (DC motor resistance value)? | Defective X-cutter unit. | Replace the X-cutter unit. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.6.1 |
| c. Defective X-cutter | Does the rotary cutter rotate when the DC motor rotates? | Defective X-cutter unit. | Replace the X-cutter unit. | | |
| | Cutting of only halfway? | Defective X-cutter unit. | Replace the X-cutter unit. | | |
| | | Metal or other foreign matter in the laminated document. | Remove the foreign matter and replace the X-cutter unit. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.6.1 |

**8** Document cannot be correctly inserted.

a. Problem with input-side rollers.

b. Defective PST sensor (photosensor) switch.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Problem with input-side rollers | Is document correctly inserted against the paper feed roller? | Document inserted incorrectly. | Correctly insert the document. | | ––– |
| | Is document correctly aligned at right edge? | Document inserted incorrectly. | Correctly insert the document. | | ––– |
| | Is document inserted at an slant? | Defective paper feed roller springs. | Correctly install springs. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4 |
| | | Are the paper reference in the body cover and paper feed roller perpendicular? | Readjust. | | 6.3.3 |
| b. Defective PST sensor (photosensor) | When a document is inserted, does the Actuator top interrupt the PST sensor?<br>Is the sensor interrupted when no document is inserted? | PST sensor incorrectly mounted. | Correctly mount the PST sensor. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1<br>3.10 |
| | | Actuator top incorrectly mounted. | Correctly mount the Actuator top. | | |
| | | Actuator top defective. | Replace the Actuator top. | | |
| | Is photosensor PH1 on the PST PCB functioning correctly? | Photosensor PH1 defective. | Replace photosensor PH1. | Replace PH1. | |

**9** Document width cannot be detected correctly.

a. Defective Y-carriage (Y-CA) motor.
b. Defective sensor unit (YCA-F).
c. Defective Y-cutter arm.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defective Y-carriage (Y-CA) motor | Is the Y-CA motor harness connected to connector C14 on the Main PCB? | Motor harness not connected. | Correctly connect the motor harness. | | 3.3.3<br>3.3.4<br>3.3.5 |
| | Are pulses output from output ports P40 to P43 (Pin 41 to Pin 44) of the main CPU#3? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | |
| | When the output from output ports P40 to P43 (Pin 41 to Pin 44) of the main CPU#3 is High, is the output from transistor array #5 Low? | Defective transistor array #5. | Replace main PCB assy. | Replace QA5. | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | During High output (4V min.) of the Main CPU#3 output port P54 (Pin 29), is +24 V applied to the CDM pin (Pin 5) of CN14? | Defective transistor #5. | Replace Main PCB assy. | Replace Q5. | |
| | | Defective transistor Q16. | Replace Main PCB assy. | Replace Q16. | |
| | | Conductivity problem in Main PCB. | Replace Main PCB assy. | | |
| | Correct resistance value (approx. 227 ohms) between each phase of the Y-CA motor and the COM pin? | Defective Y-CA motor. | Replace the Y-CA motor. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.7 |
| b. Defective sensor unit (YCA-F). | Is the flat cable connected to connector CN11 (CN10) on the Main PCB? | Defective connection of the flat cable. | Correctly connect the flat cable. | | 3.3.3<br>3.3.4<br>3.3.5 |
| | Actuator Y cuts photosensor when a document is inserted? | Actuator Y incorrectly installed. | Replace the Y sensor carriage. | | |
| | Photosensor cut off when no document is inserted? | Defective actuator Y. | Replace the Y sensor carriage. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.7<br>3.8 |
| | Is photosensor PH1 on the Y-CA sensor PCB working correctly? | Defective photosensor PH1. | Replace the Y-CA sensor PCB. | Replace PH1. | |
| | Normal Conductivity in Y-CA sensor PCB flat cable? | DisConductivity in flat cable. | Replace the Y-CA sensor PCB. | Replace the sensor harness 750X4. | |
| c. Defective Y-cutter arm | Does the Y-cutter arm move when the Y-CA motor rotates? | Y-cutter arm and timing belt incorrectly installed. | Correctly install the timing belt. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.8 |
| | Y-cutter arm is caught during its movement? | Foreign matter stuck to Y-sensor rail, Y-sensor shaft and Y-cutter arm shaft. | Clean off the foreign matter. | | |
| | Is the Y-cutter arm separated from the sensor rail? | The Y-cutter arm shaft is incorrectly installed. | Correctly install the Y-cutter arm shaft. | | |

**10** Lamination is not normal.

a. Defective ENC PCB assy.

b. Defective document or film.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defective ENC PCB assy. | Is the white lead connector connected to CN15 on the Main PCB? | Defective harness assy connection. | Correctly connect the harness assy. | | 3.3.3<br>3.3.4 |
| | Is the white lead harness assy connected to the ENC sensor assy? | Defective harness assy connection. | Correctly connect the harness assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.6.1<br>3.7.1<br>3.7.3<br>3.8.1<br>3.10<br>3.13<br>3.14<br>3.16<br>3.17 |
| | Is the ENC sensor assy correctly installed on the cassette holder? | Incorrectly installed ENC sensor assy. | Correctly install the ENC sensor assy. | | |
| | Conductivity in ENC harness assy? | Defective ENC harness assy. | Replace the ENC harness assy. | | |
| | When the output from output port P36 (Pin 79) of the main CPU#3 is Low, does the output from CN15 Pin 6 vary between 0 and 4V DC due to silver-black targets? | Defective photosensor in ENC sensor assy. | Replace ENC sensor assy. | Replace the photosensor. | |
| | | ENC sensor assy incorrectly adjusted. | Replace ENC sensor assy. | | |
| b. Defective document or film | Is a cartridge mounted? | No cartridge mounted. | Mount a cartridge. | | 6.2 |
| | Does film remain in the cartridge? | No film remaining. | Replace the film. | | |
| | Is silver-black foil stuck to the edge of the film? | Defective film. | Replace the film. | | |

**11** No cutting in Y direction.

a. DefectiveTrimmer Position Switch (SG-SW).

b. Abnormal Y-cutter vertical movement.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defective Trimmer Position Switch (SG SW) | Is the blue lead connector connected to CN5 on the Main PCB? | Leaf switch assy not connected correctly. | Correctly connect the leaf-switch assy. | | 3.3.3<br>3.3.4<br>3.3.5 |
| | Is main CPU port P15 (Pin 22) at High level when leaf switch SG assy is open? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective pull-up resistor R48. | Replace Main PCB assy. | Replace R48. | |
| | When leaf switch SG assy is shorted, is CN5 on the Main PCB shorted? | Defective leaf switch assy. | Replace leaf switch SG assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.12.1 |
| | Is main CPU port P15 (Pin 22) at Low level when CN5 on the Main PCB is shorted? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective series resistor R44. | Replace Main PCB assy. | Replace R44. | |
| | When main CPU port P15 (Pin 22) is at Low level, is this recognized by the main CPU? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | |
| b. Abnormal Y-cutter vertical movement | Does the Y-diversion lever rotate when the control cam gear rotates? | Y-extension springs incorrectly installed. | Correctly install Y-extension springs. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4 |
| | Is Y-cutter assy mounted correctly? | Foreign matter under the Y-diversion lever | Clean out foreign matter. | | |
| | | Incorrectly mounted Y-cutter assy. | Mount the Y-cutter assy correctly. | | —— |

**12** Incorrect cutting in Y direction.

a. Incorrect Y-direction cutting position.

b. Defective Y-cutter.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Incorrect Y-direction cutting position | Does the right cutter move when the mode is changed? | Y-cutter guide R and adjustment plate incorrectly installed. | Correctly reassemble the body cover. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.7<br>4.12 |
| | Does the left cutter move when the Y-carriage moves? | Y-cutter arm and Y-cutter guide incorrectly installed. | Correctly reassemble Y-cutter arm. | | |
| | Right cut position is always displaced in one direction. | Incorrect adjustment of slide plates. | Readjust. | | ––– |
| | Left cut position is always displaced in one direction. | Incorrect adjustment of Y-sensor unit. | Readjust the Y-sensor unit. | | ––– |
| | Does Y-cutter arm move smoothly? | Defective Y-cutter arm movement. | Apply KS64F silicon grease to Y-cutter arm shaft and sensor shaft. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4 |
| b. Defective Y-cutter | Is the Y-cutter unit correctly installed? | Incorrectly installed Y-cutter unit. | Correctly install the Y-cutter unit. | | 4.18 |
| | Y-cutter makes jagged cuts? | Defective Y-cutter unit. | Replace Y-cutter unit. | | |

**13** Incorrect cutting position at document front or rear edge.

a. Defect in paper feed system.

b. Defect in paper sensor system.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defect in paper feed system | Do gear holder and idle gear B move smoothly? | Defective operation of gear holder and idle gear B. | Apply KS64F silicon grease to the four idle gear B.<br>Replace the gear holder and idle gear B. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.11 |
| | Does the rollers slip? | Dirt or other foreign matter stuck to rollers. | Clean the rollers. | | ––– |
| | Is LF motor out of step? | Defective driving roller shaft. | Apply KS64F silicon grease to the driving roller shaft bearings. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4 |
| b. Defect in paper sensor system | Defective paper sensor | Defective paper sensor.<br>See **8**-b. | Replace the paper sensor. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.8<br>3.10 |
| | Deformed actuator top? | Defective actuator top. | Replace the actuator top. | | |
| | Does the actuator top work smoothly? | Defective actuator top. | Replace the actuator top. | | |

**14** Cartridge size, film type cannot be detected correctly.

a. Defective cartridge type detector (CSIZE4) switch.

b. Defective cartridge type detector (CSIZE3) switch.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defective cartridge type detector (CSIZE4) switch | Is the yellow lead connector connected to CN7 on the main PCB? | Leaf switch assy not connected. | Correctly connect the leaf switch assy. | | 3.3.3<br>3.3.4<br>3.3.5 |
| | Is the cartridge leaf switch CSIZE4 pressed when an A4 cartridge is inserted? | Incorrectly installed leaf switch assy. | Correctly install the leaf switch assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.17 |
| | Is the cartridge leaf switch CSIZE4 not pressed when an A4 cartridge is inserted? | Incorrectly inserted cartridge? | Re-insert the cartridge. | | 6.2 |
| | Is the cartridge leaf switch CSIZE4 not pressed when an A6 cartridge is inserted? | Incorrectly installed leaf switch assy. | Correctly install the leaf switch assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.17 |
| | Is main CPU port P20 (Pin 8) at High level when leaf switch CSIZE4 is open? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective pull-up resistor R61. | Replace Main PCB assy. | Replace R61. | |
| | When leaf switch CSIZE4 is shorted, is CN7 on the Main PCB shorted? | Defective leaf switch assy. | Replace leaf switch C4 assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.17 |
| | Is main CPU port P20 (Pin 8) at Low level when CN7 on the Main PCB is shorted? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective series resistor R65. | Replace Main PCB assy. | Replace R65. | |
| | When main CPU port P20 (Pin 8) is at Low level, is this recognized by the main CPU? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | |

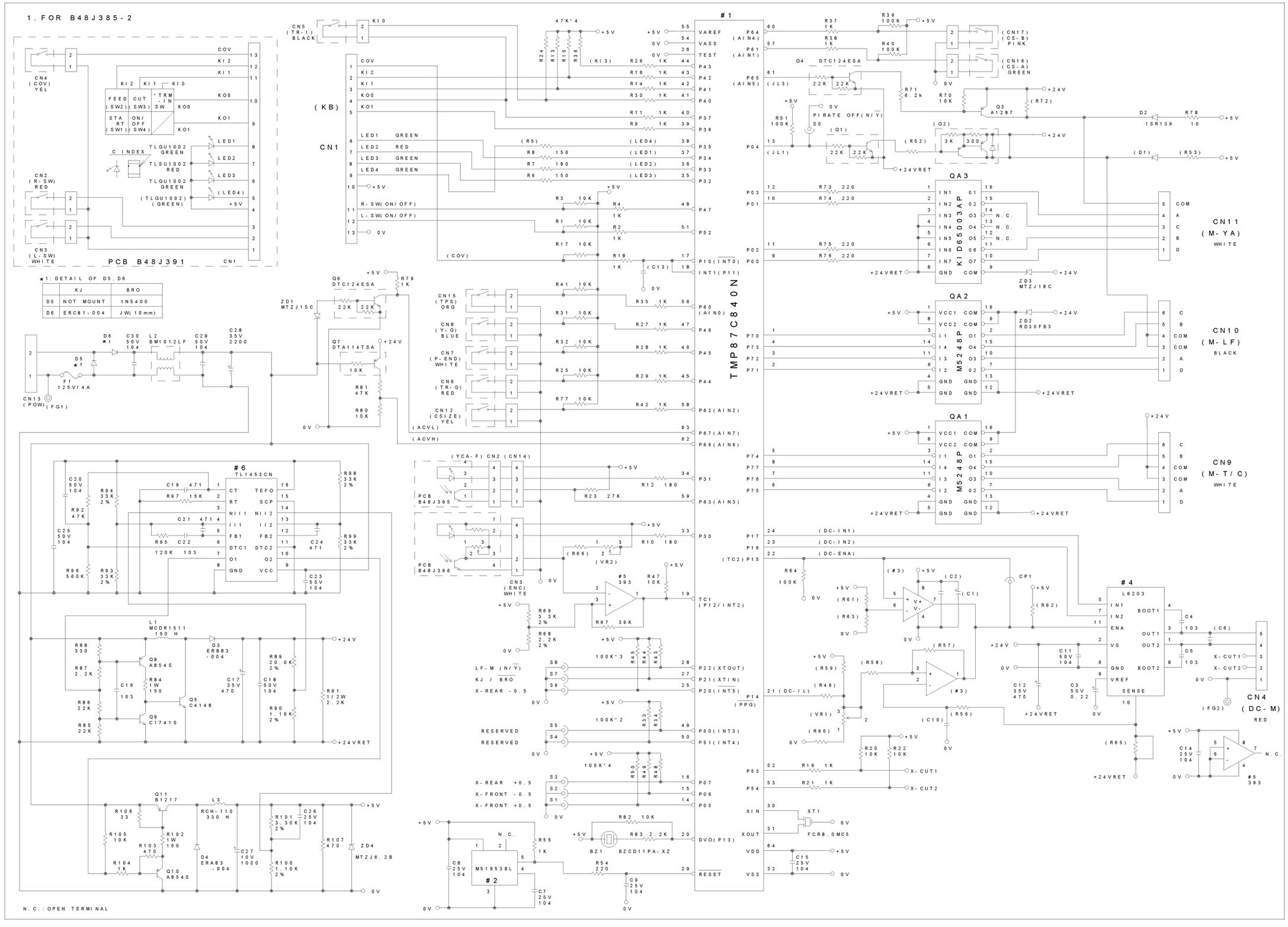
| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| b. Defective cartridge type detector (CSIZE3) switch | Is the red lead connector connected to CN6 on the main PCB? | Leaf switch assy not connected. | Correctly connect the leaf switch assy. | | 3.3.3<br>3.3.4<br>3.3.5 |
| | Is the cartridge leaf switch CSIZE3 pressed when an A3 cartridge is inserted? | Incorrectly installed leaf switch assy. | Correctly install the leaf switch assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.17 |
| | Is the cartridge leaf switch CSIZE3 not pressed when an A3 cartridge is inserted? | Incorrectly inserted cartridge? | Re-insert the cartridge. | | 6.2 |
| | Is the cartridge leaf switch CSIZE3 not pressed when an A4 or A6 cartridge is inserted? | Incorrectly installed leaf switch assy. | Correctly install the leaf switch assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.17 |
| | Is main CPU port P14 (Pin 21) at High level when leaf switch CSIZE3 is open? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective pull-up resistor R49. | Replace Main PCB assy. | Replace R49. | |
| | When leaf switch CSIZE3 is shorted, is CN6 on the Main PCB shorted? | Defective leaf switch assy. | Replace leaf switch C3 assy. | | 3.3.1<br>3.3.3<br>3.3.4<br>3.3.5<br>3.4<br>3.17 |
| | Is main CPU port P14 (Pin 21) at Low level when CN6 on the Main PCB is shorted? | Conductivity problem in Main PCB. | Replace Main PCB assy. | | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | | Defective series resistor R45. | Replace Main PCB assy. | Replace R45. | |
| | When main CPU port P14 (Pin 21) is at Low level, is this recognized by the main CPU? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | |

## 15 Buzzer does not sound.

a. Defective buzzer circuit.

| Problem | Check Item | Cause | Remedy | Repair | See Section |
|---|---|---|---|---|---|
| a. Defective buzzer circuit | Are 4 kHz pulses output from DV0 (Pin 20) on main CPU#3? | Defective main CPU#3. | Replace Main PCB assy. | Replace CPU#3. | 3.3.3<br>3.3.4<br>3.3.5<br>3.4.2<br>3.5.1 |
| | Are correct voltages applied across buzzer BZ1? | Defective resistors R36 and R69. | Replace Main PCB assy. | Replace R36 and R69. | |
| | Buzzer BZ1 does not sound? | Defective buzzer BZ1. | Replace Main PCB assy. | Replace BZ1. | |

# Appendix Main PCB Circuit Diagram



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